

# **TWACS<sup>®</sup> NG**

## **Release 3.2**

### **Operational Process Guide**

**Y10433-TUM Rev H**



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# Table of Contents

Chapter 1: Introduction	1
Support . . . . .	1
Product Returns . . . . .	1
Related Documentation . . . . .	2
Let Us Know How We're Doing . . . . .	2
TWACS System Overview . . . . .	3
TWACS NG Master Station . . . . .	5
Master Controller (MC) . . . . .	5
Distributed Master Controller (DMC) . . . . .	5
Voice-Grade Communications Equipment . . . . .	5
Substation Communications Equipment (SCE) . . . . .	6
Control and Receiving Unit . . . . .	8
Outbound Modulation Unit . . . . .	8
Modulation Transformer Unit . . . . .	9
Inbound Pickup Unit . . . . .	9
Remote Communications Equipment (RCE) . . . . .	10
Meter Transponders . . . . .	11
Load Control Transponders . . . . .	14
Disconnect Switch Interbase . . . . .	15
TWACS® NG Overview . . . . .	16
Advanced Metering Infrastructure . . . . .	17
Billing File Creation . . . . .	17
How TWACS NG Executes AMI . . . . .	17
Mapping Reads to TWACS NG . . . . .	20
Load Control Management . . . . .	22
Revenue Protection . . . . .	22
Outage Restoration and Verification . . . . .	23
Using Gas and Water Meters . . . . .	23
Log Files in TWACS NG . . . . .	24
Keeping Distribution Mapping Straight . . . . .	25
TWACS NG Features . . . . .	26
Interval Data Reads . . . . .	26
Read Historical Outage Data . . . . .	26
Load Control Management . . . . .	26
Remotely Upgrade RCE Firmware . . . . .	26
Substation Communication Equipment Command Router Expediter . . . . .	27
Demand Data Response . . . . .	27
TOU/Critical Peak Pricing . . . . .	27
Line-Voltage Monitoring . . . . .	27
Outage Assessment and Restoration Monitoring . . . . .	27
Remote Service Connect/Disconnect . . . . .	27
Tamper/Theft Detection . . . . .	27
Short-hop Radio Frequency (RF) Metering Solutions for Water, Gas, Propane, and Pit Water Meters . . . . .	28
Support for New XM and S4 Transponders . . . . .	28
Support for EMT-XMP, UMT-C-KV v1.1 and UMT-R-F v2.0 Transponders . . . . .	28
TWACS-20 Support . . . . .	28

New Transponder Commands . . . . .	28
MIRA Board Support . . . . .	28
Transponder Search Capabilities Expanded . . . . .	29
Batch File Generation and Export. . . . .	29
Quick Deployment . . . . .	29
Easy RCE Installation . . . . .	29
Daylight Saving Time Auto-shift Opt-out Functionality . . . . .	29
Operational Processes & Roles. . . . .	30
Software Components . . . . .	31
Pre-operational Checks and Setup . . . . .	31
Rate Code/Demand Configuration . . . . .	31
Register Profiles . . . . .	34
View Register Profiles . . . . .	34
Add Register Profiles . . . . .	37
 <b>Chapter 2: Set Up TWACS® NG</b>	 <b>39</b>
Adding and Editing TWACS NG Users . . . . .	39
Delete a User . . . . .	41
Lookup TWACS NG Users . . . . .	42
New Password . . . . .	44
Substations . . . . .	45
Add Substation . . . . .	45
Assign a Substation to a Region. . . . .	49
Lookup and Edit Substation . . . . .	50
Edit Substation . . . . .	50
Substation Communications Equipment (SCE) . . . . .	52
Add SCE . . . . .	52
Adding Basic Information . . . . .	53
Control and Receiving Unit (CRU) Tab. . . . .	59
Inbound Pickup Unit (IPU) Information Tab, Part 1 . . . . .	60
Inbound Pickup Unit (IPU) Information Tab, Part 2 . . . . .	61
Inbound Pickup Unit (IPU) Information Tab Part 3 . . . . .	62
Preview SCE Tab . . . . .	63
Associate SCE with a System Configuration . . . . .	63
Lookup and Edit SCE. . . . .	66
Distributed Master Control (DMC) Servers. . . . .	69
Add DMC . . . . .	69
MC-DMC Communication Parameters . . . . .	71
MC-DMC Communication Protocols . . . . .	71
Deleting a DMC from TWACS NG . . . . .	73
Lookup and Edit DMCs . . . . .	73
Editing a DMC. . . . .	75
Hub Files . . . . .	76

Transponders . . . . .	77
Adding a Transponder into TWACS NG . . . . .	77
Register Profile Names. . . . .	79
Naming . . . . .	79
Register Mapping . . . . .	80
Meter Data Recording . . . . .	80
Looking up and Editing Transponder Path Statistics. . . . .	80
Edit Transponder Path Statistics . . . . .	82
View Transponder Indicator List . . . . .	83
Lookup TWACS Transponder Path Statistics . . . . .	86
Edit Path & Search States . . . . .	88
The Logic of Paths and Search States . . . . .	88
A Short Primer on Path Statuses and Path States . . . . .	88
How Previously Good Transponders Change to Lost Status . . . . .	90
Recovering a Transponder in Lost Status . . . . .	90
TWACS NG Transaction Status/Substation Flowchart . . . . .	92
Transponder Prioritization. . . . .	93
Fast Track Search and Initialization . . . . .	94
Initialize Transponders . . . . .	96
Integration Hub . . . . .	96
Initialize Transponder Basics . . . . .	96
Regular Initialization Steps . . . . .	96
Scalable Deployment Steps . . . . .	97
Re-initialize . . . . .	97
Re-Initialize Process. . . . .	97
Resume Initialize . . . . .	98
Additional Initialize Step Information . . . . .	98
Super Initialize Transaction . . . . .	98
Verify Product . . . . .	98
Reset Indicators . . . . .	98
De-assign Two-Way Address . . . . .	98
Initialize Switch Status . . . . .	98
Write Billing Cycle Date . . . . .	98
Set Daily Shift Time Electric . . . . .	99
Mark for Two-way Assignment . . . . .	99
Write Interval Duration . . . . .	99
Write Interval Duration Multi Channel. . . . .	99
Mask Indicators . . . . .	99
Finalize Transponder Initialization . . . . .	99
Historical Data Collection . . . . .	99
Fast Track . . . . .	100
Lookup End Devices . . . . .	100
Add Messages . . . . .	101
Setting Up E-mail Notifications. . . . .	103
Steps to set-up email notifications: . . . . .	104
Two-Way Addressing and Function Group Units (FGUs) . . . . .	108
Autonomous Outage Pinging (AOP) . . . . .	109
Outage/Restoration Types . . . . .	111

<b>Chapter 3: Operating TWACS® NG</b>	<b>113</b>
Call Center Support Screen . . . . .	113
Transponder Selection . . . . .	114
Historical Data . . . . .	116
On Request Commands . . . . .	117
Lookup End Devices . . . . .	121
Events Overview . . . . .	123
Lookup Events . . . . .	123
Add Events . . . . .	125
Associate Schedule . . . . .	125
Create New Schedule . . . . .	126
Associate Program and Sets . . . . .	127
Prioritization and the Importance of Priority . . . . .	128
Priorities for Scheduled events. . . . .	128
Transaction Prioritization . . . . .	129
Substation Operation Modes . . . . .	131
View Calendar . . . . .	131
Programs . . . . .	132
Lookup Programs . . . . .	134
Add Programs. . . . .	135
Schedules . . . . .	138
Lookup Schedule . . . . .	138
Add Schedule . . . . .	140
Add Custom Schedules. . . . .	143
Sets. . . . .	144
Lookup Sets . . . . .	145
Add Sets . . . . .	147
Adding Static Sets . . . . .	147
Adding Dynamic Sets . . . . .	149
Batch Export Files . . . . .	150
Disconnect Switches and Remote Disconnections . . . . .	151
Business Rules for Connecting and Disconnecting . . . . .	153
Lookup Disconnection Rules . . . . .	153
Add Connection Rules . . . . .	154
Add CIS Flag . . . . .	155
Load Control. . . . .	156
Create and Maintain Load Control Events . . . . .	156
Lookup Event Schedule . . . . .	159
Maintain Load Control Class . . . . .	160
Read Load Control Class . . . . .	161



<b>Chapter 4: Maintenance, Monitoring &amp; Administration</b>	<b>163</b>
Current Status . . . . .	163
View Dashboard . . . . .	163
Understanding Sections of the Dashboard . . . . .	163
Events Performance Measures . . . . .	165
Notifications . . . . .	167
Lookup Messages . . . . .	167
View Notifications . . . . .	168
Troubleshooting Notification Messages . . . . .	170
Transponder . . . . .	173
View Transponder Indicator List . . . . .	173
Equipment Tests . . . . .	176
Test Transponder . . . . .	176
Transponder Quick Test . . . . .	177
Transponder Group Test . . . . .	177
Test SCE . . . . .	180
SCE Ping Test . . . . .	181
SCE Group Test . . . . .	181
Run Diagnostics on a Substation . . . . .	182
Test DMC . . . . .	190
Outage Recovery and Switching . . . . .	191
Viewing the Outage Switch List . . . . .	196
Verifying Outage Restoration . . . . .	196
Power Reliability Data Overview - TWACS NG . . . . .	197
CIM XML Controls . . . . .	199
Revenue Protection Messages . . . . .	200
Reverse Rotation . . . . .	200
Usage Monitoring . . . . .	200
Alert Profile 1: Residential Customer - Active Account . . . . .	201
Alert Profile: Residential Customer - Inactive Account . . . . .	201
Alert Profile: Residential Customer - Disconnected Account . . . . .	201
Lookup Revenue Protection Messages . . . . .	201
View Revenue Protection Messages . . . . .	202
Add Alert Profiles . . . . .	206
Viewing or Modifying an Existing Alert Profile . . . . .	207
Creating a New Usage Alert Profile . . . . .	209
Add Alert Check . . . . .	210
View Usage Alert Check List . . . . .	211
Add New Alert Check . . . . .	211
Business Rules for Connecting and Disconnecting . . . . .	212
Lookup Disconnection Rules . . . . .	212
Add Connection Rules . . . . .	213
Add CIS Flag . . . . .	214
Configure User IDs . . . . .	214
Delete a User . . . . .	216
Resetting Passwords . . . . .	216

Daylight Saving Time . . . . .	217
Transponder Handling of Synchronization Commands . . . . .	217
Transition to Daylight Saving Time in the Spring . . . . .	218
Consumption and Mapped Register Data . . . . .	218
Interval Data . . . . .	219
Configuring SCEs for Daylight Saving Time . . . . .	222
Transition from Daylight Saving Time in the Fall . . . . .	225
Consumption and Mapped Register Data . . . . .	225
Interval Data . . . . .	226
Example 2: . . . . .	227
Implications for 2007 Extended Daylight Saving Time . . . . .	228
Future Considerations to Reduce Estimated Intervals . . . . .	228
Interpreting Comm Server Notifications . . . . .	229
Operation Status definitions: . . . . .	229
Connection Status Definitions: . . . . .	229
Description of Common Status Combinations . . . . .	230
 <b>Appendix A: Batch Export</b>	 <b>231</b>
Batch Export Overview . . . . .	231
Meter Read . . . . .	231
Indicator Read . . . . .	231
Interval Data Read . . . . .	231
Batch export Scheduling . . . . .	232
Batch Export Output files . . . . .	232
Property Files . . . . .	232
 <b>Appendix B: Batch Jobs</b>	 <b>235</b>
Hub Load of Client Data . . . . .	235
CIS Data Load Overview. . . . .	236
Batch Jobs Overview . . . . .	236
Quartz CronTrigger . . . . .	236
Location of MC/DMC CronTrigger Files . . . . .	238
MC Batch Jobs . . . . .	238
DMC Batch Jobs: . . . . .	240
Troubleshooting: . . . . .	242
 <b>Appendix C: Hub Load of Client Data</b>	 <b>243</b>
Hub Load of Client Data . . . . .	243
CIS Data Load Overview. . . . .	244
 <b>Appendix D: User Roles in TWACS NG</b>	 <b>245</b>
<b>Index</b>	<b>269</b>

# INTRODUCTION

This chapter contains general information about this manual, important safety warnings to observe when using this product, contact information to receive support, and an overview of the TWACS system.

## Support

To return Aclara products for repair, complete the Service & Repair RMA Request through the TWACS Customer Portal (<http://customer.aclaratech.com>), providing as much detail about the problem as possible. If you have any questions regarding your return, please contact [twacsрма@aclara.com](mailto:twacsрма@aclara.com) or call 1-800-892-9008 and choose the Service and Repair option.:

- User Guides
- Service Advisories
- Training Registration
- Certified Partner Information
- Current News
- FAQs
- Customer Discussion Threads
- Upcoming Events
- User Group Conference Information
- *The Power Line* Newsletter

If, at any time, you would like to speak with an Aclara representative about any product or service or if you do not have a username and password to access the Portal, please contact Aclara Customer Care:

Email: [care@aclara.com](mailto:care@aclara.com)

Phone: 1-800-892-9008

Address: Aclara  
945 Hornet Drive  
Hazelwood, MO 63042  
USA

## Product Returns

**IMPORTANT** Before returning product to Aclara, make sure you have identified the root cause of the problem. As needed, perform troubleshooting requesting Technical Support through Aclara Customer Care when additional assistance is required. It is critical to identify the root problem to avoid shipping hardware for repairs when the problem lies elsewhere.

To return Aclara products for repair, complete the Service & Repair RMA Request through the TWACS Customer Portal (<http://customer.aclaratech.com>), providing as much detail about the problem as possible. If you have any questions regarding your return, please contact [twacsрма@aclaratech.com](mailto:twacsрма@aclaratech.com) or call 1-800-892-9008 and choose the Service and Repair option.

## Related Documentation

The following publications are referenced in this manual. The documents listed below plus the latest version of all other Aclara technical publications are available through the TWACS Portal (<http://customer.aclaratech.com>).

### ***TWACS® NG Application Release Notes (Y10591-TUM)***

Details the latest feature changes between the present and previous release of TWACS NG.

### ***TWACS® NG System Help (Y20009-HLP)***

Built into the TWACS® NG interface, topic and index-searchable online system help is available.

### ***MIRA Technical Manual (Y10038 TM)***

Covers all information needed to upgrade a CRU with the MIRA board and configure the TWACS system for use with the MIRA board.

### ***Load Control Transponder User Guide (Y10385 TM)***

Provides a functional description, as well as troubleshooting information and technical specifications for the Load Control Transponder.

### ***Disconnect Switch Interbase User Guide (Y10341 TM)***

Provides a functional description, as well as troubleshooting information and technical specifications for the DSI collar.

## Let Us Know How We're Doing

In an ongoing effort to produce effective documentation, the Technical Publications department at Aclara welcomes any feedback you can offer regarding this manual.

Please relay feedback, including suggestions for improvement or to alert us to corrections, by sending an email to [techpubs@AclaraTech.com](mailto:techpubs@AclaraTech.com) or calling Aclara Customer Care at 1-800-892-9008.

# TWACS System Overview

The TWACS<sup>®</sup> system is a fixed network, utility communication system. Running at a centralized location, the TWACS operating software communicates with end points, such as meters, by way of existing power lines. The TWACS system allows full two-way access to and from the consumer's meter, providing communication and control features for the Utility.

The TWACS system consists of three levels of components:

- Master Station (MS)

The Master Station TWACS operating software, either TWACS Net Server (TNS) or TWACS<sup>®</sup> Network Gateway (TWACS NG), is the chief component of the entire Two-Way Automatic Communication System (TWACS). The Master Station software manages all collected metering and interval data as well as the connection between the utility and the consumer's premises. TNS is Aclara's standard solution while TWACS NG is available for very large deployments requiring a high volume of readings for time-of-use or critical peak pricing programs.

The primary functions of TNS and TWACS NG are:

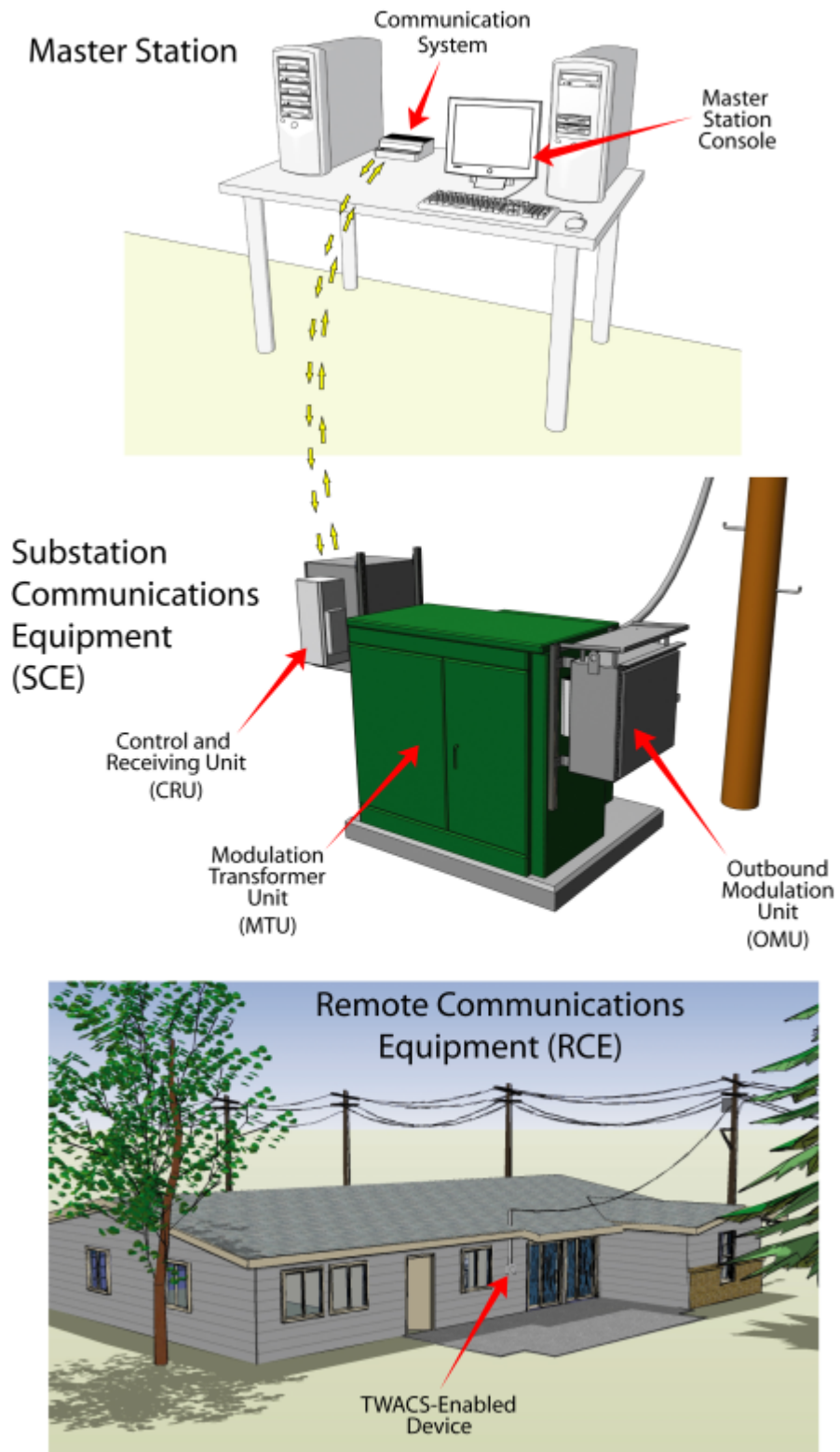
- Managing the TWACS system communication network.
- Supporting applications such as metering, troubleshooting, outage detection, and load control.
- Collecting remote meter data for the database server, which forwards the data to a third-party utility software application.

TNS and TWACS NG are part of the corporate enterprise network. The system is based on the Oracle<sup>®</sup> database, which is an open system, meaning it can interact and inter-operate with other applications on local and remote systems, on a variety of hardware platforms, and in a number of software environments. The system provides the user interfaces for configuring the necessary parameters to retrieve and send data.

- Substation Communications Equipment (SCE)
- Remote Communications Equipment (RCE)

This is the level at which the meter transponder resides within the electric meter.

As shown in the illustration on the following page, outbound messages originate in the Master Station and pass through the substation to the transponder (RCE). Inbound meter data is sent from the transponder to the SCE, where it is decoded and then sent to the Master Station for analysis or bill file creation.



## **TWACS NG Master Station**

The Master Station consists of two primary classifications of server hardware components – Master Controller (MC) and Distributed Master Controllers (DMC) – and voice-grade communication equipment. The MC and DMC together including all associated software make up the TWACS Network Gateway (TWACS NG). The dual server structure combines to manage data, send data and commands to Substation Communications Equipment (SCE), and, in return, receive data from SCE. In addition, the MC and DMC integrate the functionality of TWACS NG with the customer database of your proprietary Customer Information System (CIS).

### **Master Controller (MC)**

The Master Controller stores all data and is the starting point for all communication and data retrieval for the TWACS system. From web-enabled computers, CSRs and other TWACS NG operators connect to the TWACS NG operating software running on the MC. For high reliability and fast performance, the MC is clustered with and controls one or more Distributed Master Controllers (DMCs), which communicate directly with Substation Communications Equipment (SCE).

The MC is a Unix database server running Oracle software. An application server, the Master Controller manages role-based security and online applications. The profile of an MC is almost identical to that of a DMC, but only the MC interfaces with a utility's existing proprietary Customer Information System.

### **Distributed Master Controller (DMC)**

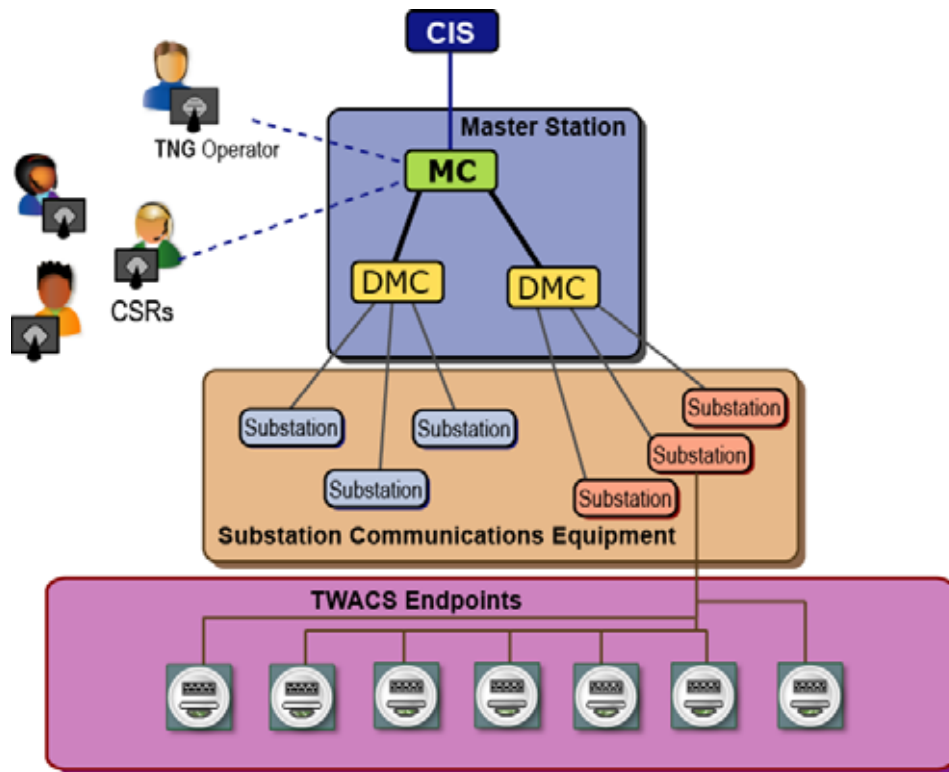
A DMC stores essentially the same data as the MC, but only for specified substations, and a DMC handles all communication with those substations. As DMCs collect data from RCEs, data records are sent to the MC.

A Distributed Master Controller is a Unix workstation or PC with a profile almost identical to the MC. Several DMCs can be deployed to provide scalability and increased reliability for the TWACS NG system. Depending on your processing needs, one or more DMCs can be located in the same data center as the Master Controller, or in remote data centers. Conversely, one or more DMCs can be located within the same server or even within the same server as the MC.

### **Voice-Grade Communications Equipment**

Master Station to SCE communications are through a standard voice-grade communications link, carried on a variety of physical media (DSL, cable, microwave, hybrid fiber/coax, radio, etc.). Both public and private networks are options – the choice is based on the utility's existing wide-area communications assets and other factors within their territories.

## Master Station Architecture



## Substation Communications Equipment (SCE)

Located in utility substations, Substation Communications Equipment (SCE) receives commands *from* and interfaces *with* the electrical distribution system enabling communication with Remote Communications Equipment (RCEs) at customer premises. SCE components include:

- Control and Receiving Unit (CRU)
- Outbound Modulation Unit (OMU)
- Modulation Transformer Unit (MTU)
- Inbound Pickup Unit (IPU)

This section provides an overview of SCE and SCE functionality. For complete details, refer to the *SCE Technical Manual* (Y10380TM).

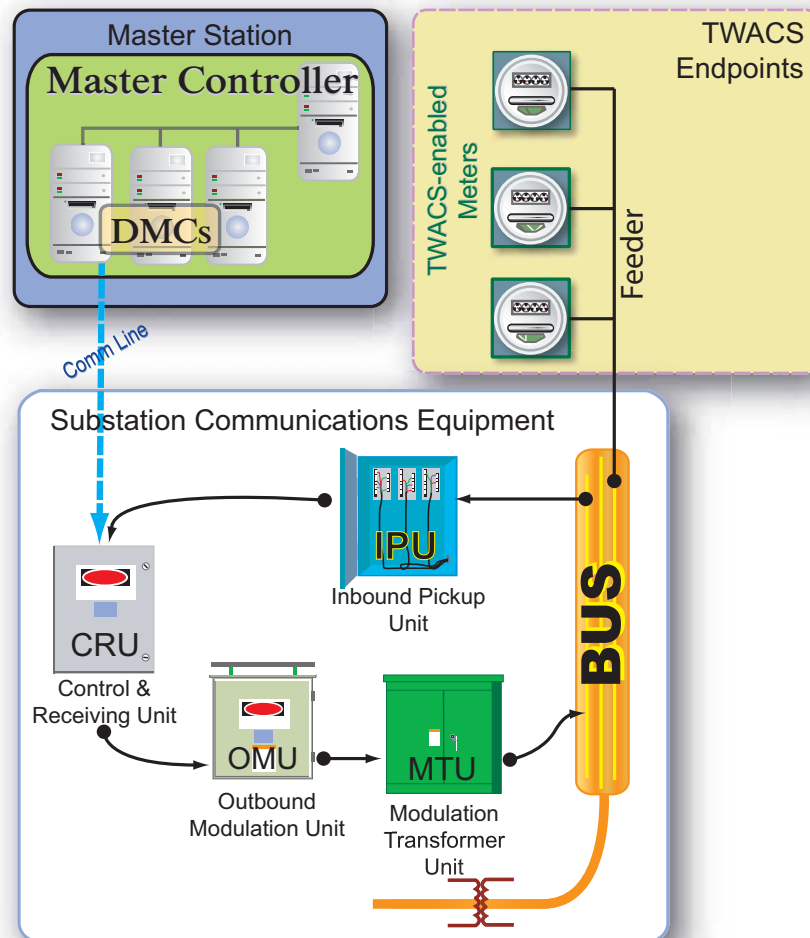


## Substation Communications Equipment



When the Master Station sends commands over the communications link to the SCE, the Control and Receiving Unit (CRU) receives the command. The CRU manages all commands from the Master Station and triggers the Outbound Modulation Unit (OMU) to send TWACS outbound commands. TWACS outbound commands generated by the OMU are coupled to the power lines through the Modulation Transformer Unit (MTU). A few seconds later, the meter or other Remote Communications Equipment (RCE) receive the outbound signal. The meter responds by sending back an inbound response over the power lines. The Inbound Pickup Unit (IPU) picks up the inbound response and forwards the response back to the CRU. The CRU decodes the response and sends it back to the DMC over the communications link, which in turn, feeds information to the Master Station.

## SCE Information Flow



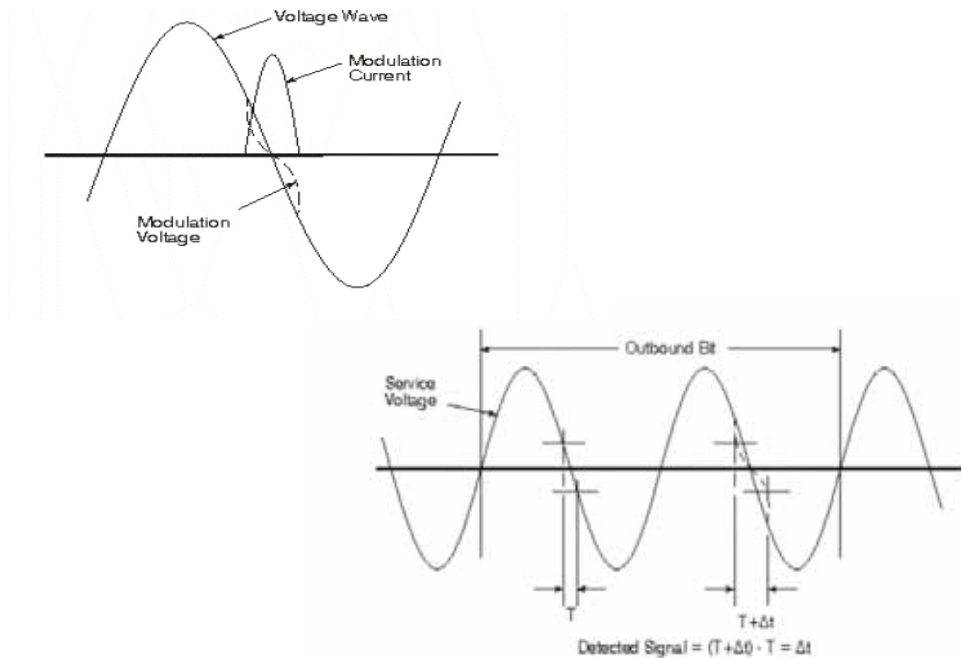
## Control and Receiving Unit

The Control and Receiving Unit (CRU) controls all SCE functionality. Each substation requires one CRU. The CRU monitors and manages communications between the DMC and the Remote Communications Equipment (RCEs). The CRU is responsible for directing the OMU to perform outbound signaling and for converting the inbound analog signal received from the IPUs into digital form. The CRU includes communication ports for connection to voice-grade communication equipment receiving commands from the DMC.

## Outbound Modulation Unit

The Outbound Modulation Unit (OMU) is responsible for injecting the TWACS outbound commands onto the power line network. The phase and signal mode (A N, B N, C N, A B, B C, C A) used by the OMU to communicate with RCEs is specified by the Master Station. Typically there can be three phases (Phase A, Phase B, Phase C) and Neutral. The OMU performs its function only when directed by the CRU. One OMU is required for each independent bus.

The OMU generates outbound signaling by modulating the 60 Hz voltage wave near the zero crossing. This allows binary information to be sent to the transponder. The transponder then detects the voltage modulation.



## Modulation Transformer Unit

The Modulation Transformer Unit (MTU) is typically a three-phase pad mount distribution transformer (or a bank of three single-phase transformers) that steps down the 4,000 to 35,000 volts common for a bus or feeder to both allow OMU operation and couple the outbound TWACS signal onto the power line. One MTU is required for each OMU in the substation.

## Inbound Pickup Unit

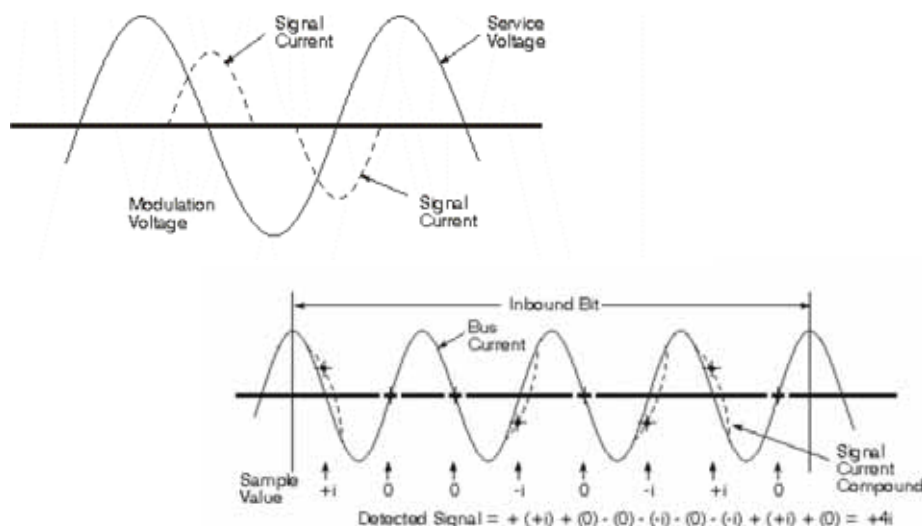
Inbound Pickup Units (IPUs) are passive current transformers that transform inbound signal currents to voltages. This allows reception and decoding of the inbound TWACS signal by the CRU. IPUs are installed at selected detection points, usually in the feeder bays and in-series with the feeder metering circuits.

## Remote Communications Equipment (RCE)

Remote Communications Equipment – TWACS transponders – reside at the end consumer's premises. Three basic TWACS transponders are available:

- **Meter transponders** – integrated with an electric meter, enables remote access to electric consumption, demand, and other related billing information.
- **Load Control Transponder** – used as part of a load control scheme to remotely control deferrable customer loads such as central air conditioning units, electric water heaters, heat pumps, pool pumps, and baseboard heaters.
- **Disconnect Switch** – allows for the electric service to be turned on or off from the utility central office.

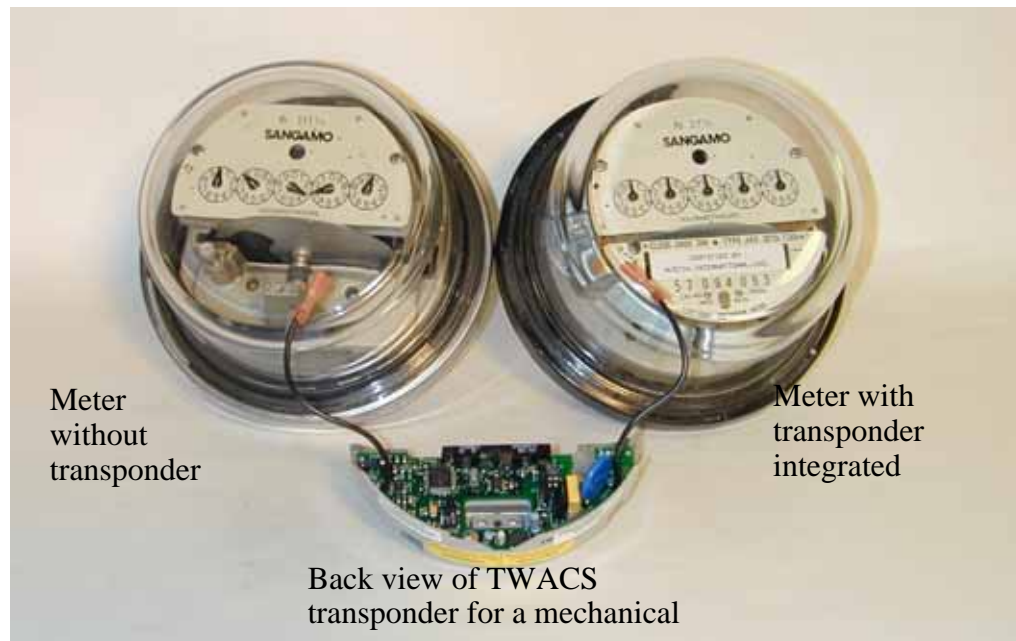
TWACS transponders generate inbound communications by drawing current as the voltage waveform nears the zero crossing point. This creates a current pulse, which is sensed and decoded by Substation Communications Equipment.



This section provides details on each basic kind of TWACS transponder. For a listing of all transponders available and, as applicable, the associated meter make and model, go to [www.twacs.com](http://www.twacs.com).

## Meter Transponders

The Aclara family of meter transponders covers a wide range of electric meters both commercial and residential and provides a diverse array of benefits and functionality for your TWACS system. In essence, the transponder continuously reads electrical consumption information from the meter and stores that information in transponder registers. When the transponder responds to outbound commands received over the power line, it sends back the requested information from the appropriate registers.



The transponder is located within the meter glass dome. The transponder either optically reads a stripe as the disk rotates (for electromechanical meters) or connects directly to a port inside an electronic meter.

**Data storage.** Transponders store a variety of information for retrieval over the power line. Transponders contains algorithms and programming that use electrical consumption information from the meter to calculate and store usage information such as peak demand and interval data at 60, 30, or 15-minute intervals depending on the transponder. For complete details on the data available in transponder registers, consult with the TWACS transponder user documentation.

**Addressing modes.** TWACS uses various addressing modes to communicate with transponders. Several transponder registers are reserved for the transponder TWACS Serial Number and a system-assigned two-way address. Both the serial number and the two-way address provide for different modes of communication that allow one command from the DMC to be broadcast to a specific RCE using serial number addressing or one command to be broadcast to many RCE using the two-way addressing scheme. A utility may enter both the meter number and the TWACS Serial Number into the TWACS operating software, or the utility might decide to track customer accounts using the TWACS Serial Number only.



TWACS  
Serial

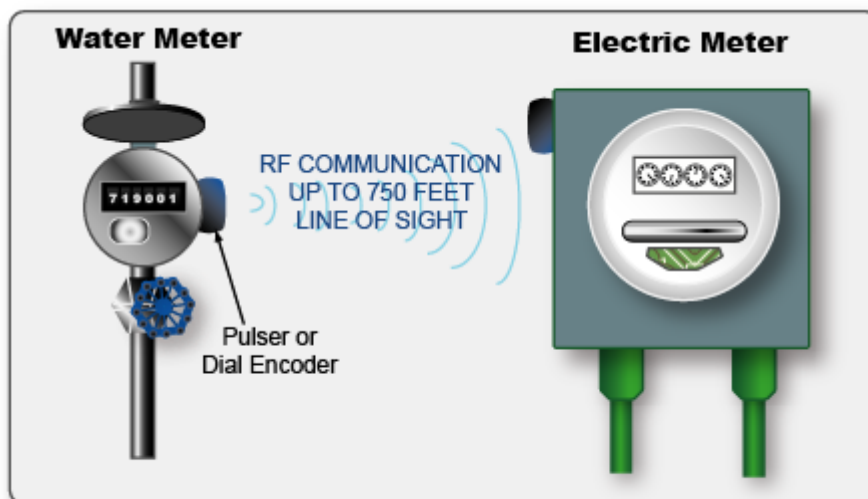
Meter  
Manufacturer  
Serial

**Multi-port transponders.** Various multi-port TWACS transponders have been developed that allow metering data to be read from external electric, water, or gas meters. Some transponders allow a wired connection to water or gas meters. Other transponders contain short-hop radio frequency (RF) transceivers, which communicate with similar transceivers in the gas or water meter.



External Auxiliary  
Ports

**Detection and diagnostics.** Some transponders have various diagnostic and detection features. For tamper detection, these transponders record, in transponder registers, reverse energy flow and zero energy usage for 24 hours. If either of these conditions are detected, a flag is set and header information of the TWACS-enabled device's inbound responds to TWACS outbound commands from the Substation Communications Equipment. The reverse energy flow can assist in revenue recovery. Each transponder also maintains a count of the number of power outages. These counts can be used for service reliability information as well as an indicator of meter removals which can suggest possible tampering.





## Load Control Transponders

A load control transponder (LCT) is Remote Communications Equipment installed on the customer premises serving a scheme to divert load to help avoid brownouts during times of peak usage. With LCTs, the utility remotely turns off high-consumption components (for example, central air conditioning, electric water heaters, pool heaters, heat pumps, baseboards, and pool pumps) for short intervals.

To minimize inconvenience to customers, utilities shed load during peak times for selected components. LCTs provide the utility with independent control over each component in a load control scheme. Up to two components can be governed by each load control transponder. In some meter transponders, load control capabilities are built-in; for example, the Altimus EMT-3A transponder integrated with the Landis+Gyr Altimus meter. (For complete details on the Load Control Transponder, refer to the *Load Control Transponder User Guide*.)

LCT





## Disconnect Switch Interbase

As Remote Communications Equipment, the Disconnect Switch Interbase (DSI) transponder provides for remote whole-house service disconnect and reconnect. The DSI allows a Customer Service Representative (CSR) to disconnect and reconnect individually metered residential or small commercial, single phase 200 Amp services remotely from the utility office.

The DSI disconnects the electric service to the home while leaving the meter powered for monitoring or communication purposes. The DSI's universal design fits most residential applications. Compatibility is assured with 200 Amp 4-jaw form 2S residential sockets. It is also compatible with select 5-jaw form 12S/25S residential sockets. The DSI works with meters both old and new, electromechanical and electronic. Following are three primary benefits for the disconnect/connect feature. (For complete details, refer to the *Disconnect Switch Interbase User Guide*.)

- Revenue collection tool for problem accounts
- Customer service value-added enhancement for seasonal and rental customers
- Improved efficiency for safe and convenient connects and disconnects from the central office



## TWACS® NG Overview

Besides providing for Advanced Metering Infrastructure, the TWACS NG system delivers many other capabilities\* including:

- Interval Data Reads
- Read Historical Outage Data
- Load Control Management (plug-in component)
- Ability to Remotely Upgrade RCE Firmware Programmatically (plug-in component)
- Substation Communication Equipment Command Expediter Router (plug-in component)
- Support for Demand Metering
- TOU/Critical Peak Pricing
- Line-Voltage Monitoring
- Outage Management Features
- Remote Service Connect/Disconnect
- Tamper/Theft Detection
- Short-hop Radio Frequency (RF) Metering Solutions for Water, Gas, Propane, and Pit Water Meters
- Support for the new XM and S4 transponders, as well as the EMT-XMP, UMT-C-KV v1.1, and UMT-R-F v2.0 model transponders.
- MIRA board support has been added to the Substation Communications Equipment maintenance screens.
- Transponder Indicators and Alarms have Improved Response and Functionality
- User-Controlled Transaction Prioritization
- Daylight Saving Time Auto-shift Opt-out Functionality

*\* Some of the features listed above are scheduled for implementation in upcoming releases, and may not be included in Release 3.1*

## Advanced Metering Infrastructure

Traditionally, utilities read meters manually. A technician goes from one meter to the next documenting readings from each customer's meter. Using the Advanced Metering Infrastructure (AMI) function of TWACS, utilities can read meters to get a consumption reading, to monitor their peak energy usage, or to search for scenarios that may indicate power outage patterns, malfunctioning meters, or tampering. And utilities can do so at various times of the month without ever dispatching a person to a meter site. AMI provides a level of cost savings for the utility and enables the utility to gather information that was not previously available with manual reads, including the ability to create and market information-based value-added services to utility customers.

The utility creates Programs, Sets, Schedules, and Events using TWACS NG that innovate automatic meter reading possibilities.

## Billing File Creation

The billing file creation process runs daily, selecting valid meter reads and placing them in a staging file for eventual inclusion in the billing file. The billing file is stored in a location specified by the utility. The location must be on the TWACS NG server or be reachable by TWACS NG as a mapped drive on the enterprise network. Aclara requires the full path description four weeks prior to TWACS NG implementation. For further information refer to the Billing File Creation Appendix.

## How TWACS NG Executes AMI

AMI is a valuable tool in aiding customers and utilities to resolve problems and manage energy use. Problem resolutions may involve explaining why a customer had a higher than normal bill or comparing energy consumption between customers not being home and when they are home. Other resolutions could include analyzing energy consumption to determine the costs of extended operating hours for a business, forecasting capacity for a substation, and determining which customers have had a recent increase in usage.

## On-Request Meter Reads

Customer Service Representatives (CSRs) often receive calls relating to billing questions. For manual meter reading, the utility would dispatch meter readers or customers would self-read their meters for an accurate count or verification. The TWACS system enables CSRs to take an immediate reading while the customer is on the telephone. This on-request read capability provides CSRs with new capabilities not available with the previous manual process.

## Daily, Hourly, or Interval Data Reads

The frequency of the reads the utility performs on meters can include daily, hourly, or interval. With daily reads, the utility programs the TWACS NG system to collect the meter information every day. The meter marks a daily freeze read at midnight, and the utility has until midnight the next day to read the meter before the next day's read replaces the previous read. (Some transponders such as the UMT, XM, and XMP can maintain data for up to seven days.) With hourly reads, the utility reads the meters three times per day, and collects the information stored in the meter's registers for the previous eight hours. Some meters are capable of more frequent reads. Commercial customers may want electricity usage information in 15- or 30-minute intervals; however, the customer needs a meter capable of interval usage tracking

If the utility wants readings every	then you read	or every x hours
Day	1 time per day	24 hours
Hour	3 times per day	8 hours
30 minutes	6 times per day	4 hours
15 minutes	12 times per day	2 hours
	11 times per day	2 hours 10 minutes
	10 times per day	2 hours 24 minutes
	9 times per day	2 hours 40 minutes

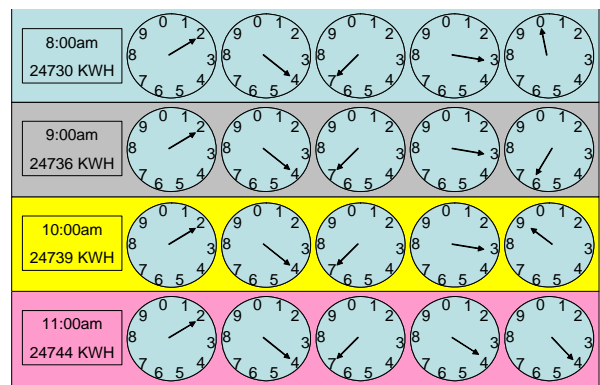
Interval data collection depends on the **consumption value** chosen for primary metering, and the **interval duration value** chosen for the recording. Some meters have a fixed interval duration of 60 minutes. Others are adjustable to 60, 30, or 15-minute intervals.

Where billing is concerned, the TWACS NG system reads and records the kilowatt number displayed by the meter (although some meters can be configured to record kVARh instead). It compares and subtracts the older kWh reading from the newer kWh reading to determine the usage for a given interval. If the interval data indicates reverse flow, or if the timebase was inoperable for that interval, the interval data will be marked "invalid."

Following are some definitions related to common industry terms for units of usage:

- **Energy Reading** – The kWh or kVARh value on the meter dials at a given moment in time.
- **Interval** – The amount of time between two specified instants.
- **Interval Data** – Data computed as the difference in readings between the start and the end of the interval.
- **Interval Data Readings (IDR)** – Interval Data presented as a series of sequential values. If the item being computed is an energy reading, then it is equivalently called **Load Profile Data**.

In the graphic example, at 8:00 the meter shows a kWh reading of 24730.



At 9:00 the meter shows 24736kWh, with an hourly consumption of 6kWh. The 6kWh is derived by subtracting the 8:00 AM reading from the 9:00 AM reading. The table below shows readings at 60-minute intervals and the resulting hourly consumption.

**Disconnect/Connect**

Using the service disconnect/connect function, the CSRs can perform a near immediate physical deactivation and reactivation of service without dispatching a meter technician to the premise.

In the TWACS system, meters are equipped with collars that receive and respond to commands from the system to disconnect or re-connect the power in a matter of seconds. Connections may be made in response to a new customer requesting power. Disconnects may be performed on bad credit customers or performed at the time of account closeouts.

FOR  
EXAMPLE

When customers relocate and want a service disconnection, the CSR can perform an immediate disconnect. This can be followed by an on-request meter read to issue the final bill while the customer is still on the telephone.

## Demand Reads

Some TWACS transponders measure the amount of energy used in a given number of minutes and track or store the highest usage. For certain TWACS transponders, the interval can be set to 15, 30, or 60 minutes. With TWACS NG, a demand read can be issued that reads this maximum value (or referred to as total demand).

Total demand reads have several uses that are listed below:

- Billing needs
- Determine tariff components for determining a billing rate for customers, particularly commercial customers
- Estimating usage for a customer or group of customers
- Such estimates can be particularly crucial in a short-term energy crisis created by high use or power failure.

## Mapping Reads to TWACS NG

### Custom Data - Automatic Reads

TWACS NG reads most meters automatically based on the Programs, Sets, Schedules, and Events that the individual utility creates and customizes. These functions are found in the sidebar menus that are available from Custom Data on the menu bar. When TWACS NG automatically reads meters, it sends commands to other end devices, creates billing files, and other output data.

### Applications - More Read Functions

The meter read functions of AMR are found under the **Applications** tab on the TWACS NG menu bar. The system displays the daily meter read results that contain the meter read properties and meter reading results.

The properties contain customer account information, TWACS communication path, current utility information, summary data, and meter constants. The current read data summary contains the high usage, low usage, and total usage for a given date. Any data validation errors are also shown.

The meter reading results contain the read date and time, consumption read in kWh and pulses, reverse rotation, demand and related information.

In addition, TWACS NG produces Historical Data for a selected meter (transponder) with the following choices:

- A Daily Usage Profile graph showing the energy usage and Power Down count for a chosen date range
- Command History  
Where you have a choice of commands An example is the ARM Connect/Disconnect Switch
- Daily Meter Read Results
- Load Profile for date range and choice of ampules or kWh data type

### **On-Request Command**

TWACS NG features the following commands to be viewed or issued for a specific meter (transponder):

**Meter Reads (Electric, Gas, Water meters)** — Read the present consumption register for the meter.

**Reverse Energy Reads (Electric meters only)** — Read the present consumption and reverse energy register for the meter.

**Demand Read - No Reset (Electric meters only)** — Read the present consumption and demand registers for the meter.

**Demand Read And Reset (Electric meters only)** — Read and reset the demand register and read the present consumption registers.

**Demand Reset** — Read the demand register and reset it for electric meters.

**Verify Power (Electric meters only)** — Issue a “ping” command to the meter to verify power on state and communication.

**Voltage Read (Electric meters only)** — Read voltage register and the power down count for the meter. Used for resolving power quality issues.

**Connect/Disconnect (Electric disconnect switch only)** — Operate the switch to disconnect or connect power.

## Load Control Management

Load Control Management may help flatten the spikes of peak demand usage and avoid brownouts. It uses the same infrastructure that AMR uses. Using load control, the utility can remotely power off or on components located at the customer's location, residential or commercial, that draw substantial levels of power. The utility sets up these large power draw components, such as water heaters or air conditioners, for load control. Using load control can benefit the management of energy consumption by:

- Reducing the potential for brownouts and ensuring that load does not exceed supply
- Helping utilities avoid buying or generating energy during times of peak network demand and avoiding long-term contractual penalties as the result of a ratcheted demand purchase agreement
- Helping customers request help to control their energy costs.
- Creating windows of opportunity for customers to shed peak time rate power costs through pricing changes from deregulation.

## Revenue Protection

TWACS detects meter tampering to reduce energy theft. Customers who pirate electricity either disconnect the meter for a period of time or turn the meter to run in reverse. TWACS transponders report no pulse in 24-hours, reverse rotation, and power down count to indicate possible tampering.

- **No Pulses in 24 Hours** – Indicates if the meter has not recorded energy use in a 24-hour period. (It may be normal for some customers who have barns, light poles, or vacation homes to go one day or more without energy consumption.) TWACS NG provides the ability to identify meters with no energy use for longer, configurable time periods.
- **Reverse Rotation** – This indicator identifies if the meter has run in reverse. If the feeds on the meter have been reversed, the meter will run in the opposite direction. This results in recording less usage and, therefore, a smaller bill. A TWACS transponder in a meter can detect this condition, report the theft attempt, and bill for the pulses in the reverse direction. (Some customers have their own power co-generation equipment, and these accounts are flagged to be excluded from the Reverse Rotation reports.)
- **Power Down Count** – Every time a meter loses power, it increments the power down count when the power is restored. The transponder in the meter tracks the outage through the power down count. If the meter is disconnected during a billing cycle, the power had been intermittently bypassed. The TWACS system records the power down count, which can indicate theft. (The power down count is also referred to as the blink count.)



The Revenue Protection functions are found under the **Applications** tab on the TWACS NG menu bar. These functions provide revenue protection messages defined by date range, district, and severity level. The messages are generated through **Alert Profiles** and **Alert Checks**. Alert Checks work with business rules. The individual utility defines its business rules according to how it wants to run its business.

## Outage Restoration and Verification

The TWACS system enables the utility to detect outage counts and collect availability information in real-time to isolate trouble and avert major failures.

**FOR EXAMPLE** Frequent power interruptions can be distinguished between a customer or utility problem. The TWACS system can indicate when the service is restored after an outage, provide accurate estimates of loss that can be calculated at various levels and determine when the power is lost and where the lost power is going.

Two menus are used for outage restoration and verification: Applications and System Monitoring on the TWACS NG menu bar.

- In Applications, the Revenue Protection functions provide alert messages.
- In System Monitoring the following side menus provide the following functions:
  - **Current** - Summaries of current statistics
  - **Transponders** - Information on indicators and path statistics
  - **Equipment Tests** - Testing and diagnosing equipment
  - **Communication Path** - Statistics of performance across paths and signal strengths.

Beginning with Release 3.0, TWACS NG enables transformers to act as a critical relay point by scanning a feeder for outages and notifying the system of any large scale anomalies. TWACS NG operators can prompt transformers to check grouped transponders using a scan request.

## Using Gas and Water Meters

The TWACS system enables the utility to interact with other meters on the customer's premise. The electrical system provides an ideal path for flow of two-way information (unlike gas and water paths). The utility can use the communication path, enabled by the TWACS system, to read water and gas meters. This function can automate water and gas meter reading and enhance profitability.

**FOR** Electric meters equipped with MultiPort or RFL solutions, such as the  
**EXAMPLE** Schlumberger CENTRON RF, have inputs for water and gas meters. The TWACS system is capable of reading all three meters automatically.

## Log Files in TWACS NG

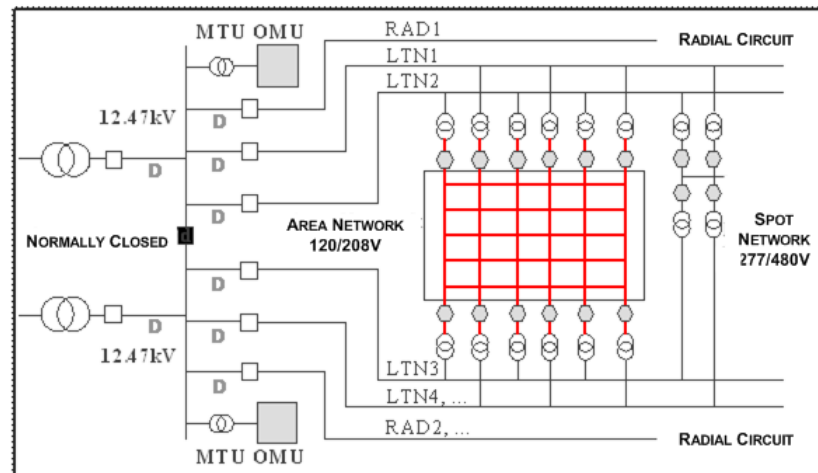
TWACS NG tracks some historical information about TWACS NG activity in TWACS NG databases. This information is available using the TWACS NG programs. AMR read data is an example of this type of information. TWACS NG also uses a number of log files that track historical information about various aspects of TWACS NG operation. TWACS NG users often view log files using a standard text editor like Microsoft® WordPad®. Aclara programmers and Technical Support personnel use some of the log files to determine program problems. Utility employees will find some of the log files relevant when performing basic tasks within TWACS NG. Some of the relevant log files are shown in the table below.

Log Name	File Name	Purpose
DCSILog	DCSILog.txt	MC log (page crashes and application problems)
DCSILogDMC	DCSILogdmc.txt	DMC log (batch job failures, transaction failures) rolls over every 5 MB, keeps up to 25 files
TR	tr.log	Confirmed sends
TRAll	trall.log	All commands
Commserver	Comm.log (contains transaction ID)	When the comm server rebooted, the file is overwritten
SP	sp.log	similar to comm server log

The utility should contact Aclara Customer Care if a server process continually fails.

## Keeping Distribution Mapping Straight

Utility distribution maps and actual distribution facility configurations do not always match. Keeping these two elements synchronized is particularly challenging when cabling is underground and not visible. Using the TWACS system, the utility can validate and correct distribution mapping, avoiding costly mistakes. For example, a neighborhood which is documented on the wrong phase can have problems if they are redirected to another distribution path and consumption estimates are exceeded. Using the TWACS system, the utility can improve the accuracy of maps to avoid these types of mistakes.



## TWACS NG Features

The TWACS Network Gateway software is powered by many operational features requested by utilities as diverse as small rural cooperatives and large utilities in major metropolitan markets. It is unlikely that any one service provider will utilize *every* available feature.

### Interval Data Reads

The most valuable commodity within the culture of a utility is data. Beyond basic daily consumption, being able to recall usage rates at a rate as frequent as every fifteen minutes can be a valuable tool for assisting customers in their bid to understand their own usage patterns. The TWACS system can retrieve interval data reads to the frequency rate of the available registers in the meters used by your utility.

### Read Historical Outage Data

The UMT-R and UMT-C transponders were designed with circuit boards to include a real-time clock and super capacitor. These extra components allow the transponder to know the time at the end of a power outage and record specific details about the length and type of outage.

To support the retrieval of historical outage data, TWACS NG Release 3.0 allows the creation scheduled events to read time-stamped interruption data for specified transponders. It also enables the creation of scheduled events to read daily interruption summary data for specified transponders. And finally, it provide reports to view collected time-stamped and daily interruption data for selected transponders for a specified time period.

### Load Control Management

TWACS NG supports the use of Load Control devices that disable high-usage devices such as water heaters, air conditioning compressors, water pumps, or hot tubs for short periods to trim peak energy usage during brownout concerns or high usage periods. On-Request Demand Data Response

TWACS NG, like most AMI applications, works most efficiently when data is retrieved as a scheduled event, but CSR demand requests receive priority and can return readings in less than thirty seconds.

### Remotely Upgrade RCE Firmware

TWACS NG users can leverage the power of the TWACS Network to patch or update the firmware within TWACS end devices using the TWACS interface to deliver update packets on a incremental schedule.

## **Substation Communication Equipment Command Router Expediter**

The command router optimizes the communications traffic of the plug-in components of the TWACS NG interface. Because the plug-in components (Standard beginning with Release 3.0) each create additional layers of communications “chatter”, the command router is needed to manage the flow of the additional communication commands to the appropriate Substation Communications Equipment for optimal performance.

## **Demand Data Response**

The XMP and UMT-R transponders support multiple configurations of demand length and type. Utilities can specify the demand length and type based on the rate code associated with the meter/transponder.

## **TOU/Critical Peak Pricing**

The variety of ways in which TWACS NG data can support various pricing schemas allows utilities to monitor and bill for time-of-use tiered billing or maximum peak usage.

## **Line-Voltage Monitoring**

Customer Service Representatives have the ability to ping the meter for an almost instantaneous voltage check. This is yet another powerful feature to prevent unnecessarily rolling a service truck, or at least providing the service crew with more information prior to arrival at a trouble-call location.

## **Outage Assessment and Restoration Monitoring**

Manual outage reassignment of Function Group Units are enabled. This alerts system administrators to opportunities to restore some outages through manual bus switching that will revert back to normal when service is restored.

## **Remote Service Connect/Disconnect**

Using a Disconnect Switch Interbase collar, authorized personnel can remotely turn power on or off from the Utility Master Station in a matter of seconds.

## **Tamper/Theft Detection**

Among a host of revenue protection features, transponders can immediately notify a specified list of utility personnel if any reverse rotation or suspicious outage occurs. It is also possible to define “normal” usage parameters for a host of usage profiles (residential, residential unoccupied, vacation home, streetlights, etc.) and receive immediate notification of any suspicious usage patterns.

## Short-hop Radio Frequency (RF) Metering Solutions for Water, Gas, Propane, and Pit Water Meters

TWACS NG can return usage readings and other information for a variety of consumable utilities with meters wired for short-hop RF.

## Support for New XM and S4 Transponders

Support for certain models of XM and S4 transponders were incorporated into TWACS NG Release 1.5, and additional support for functionality will be expanded in subsequent releases.

## Support for EMT-XMP, UMT-C-KV v1.1 and UMT-R-F v2.0 Transponders

Support for specific new models of transponders were added into TWACS NG.

## TWACS-20 Support

Users of the TWACS-20 network protocols can leverage their TWACS-20 substation equipment for superior communication network response

## New Transponder Commands

- 60 minute net consumption for the IMT-XMP Transponder
- 15 minute net consumption for the EMT-XMP, UMT-R-F v2.0 (10 intervals per command)
- 15 minute net consumption for the KV v1.1 Transponders (11 intervals per command)

## MIRA Board Support

TWACS NG is fully compatible with the powerful MIRA board now available for the Substation Communications Equipment. See the *MIRA Technical Manual (Y10038)* for more information.

## Transponder Search Capabilities Expanded

There is support for the ability for the user to manually initiate a search for a transponder. For all transponders listed on Lookup Results on the “Edit Path & Search States” web page, a Search link is provided. After the user clicks the **Search** link, TWACS NG will initiate a search starting with the last known substation and then checking all designated alternate substations.

## Batch File Generation and Export

Selections have been added to the TWACS NG interface to generate batch jobs on the Master Controller, as well as exporting batch jobs reports a specified 12 hour time frame.

## Quick Deployment

Hundreds of TWACS NG system setup steps, commands, and installation download routines have been programmatically automated, dramatically simplifying the first-time deployment of a TWACS NG environment.

## Easy RCE Installation

A single command now initiates all RCEs. It can be used in place of multiple commands to optimize the effort required to put an RCE into operation and begin reading meters.

## Daylight Saving Time Auto-shift Opt-out Functionality

While the TWACS NG software automatically adjusts for daylight saving time, some customers expressed the desire to disable the auto correction. Opt-out functionality was added to TWACS NG beginning with Release 3.0.

## Operational Processes & Roles

Every organization utilizing TWACS NG has their own organizational structure and defined user roles. User roles can be mapped against eleven pre-defined TWACS NG user roles.

**Billing Analyst** - Utility personnel concerned in billing data.

**Billing Manager** - User authorized to override data designated for publishing in the billing file.

**Customer Service Representative** - Users involved in servicing customer accounts.

**Distribution Engineer (Planner)** - Utility personnel who are interest in current information regarding the state of the distribution system.

**External System** - A trusted system located at the utility.

**Field Service Person** - Aclara personnel who have hardware setup privileges.

**Internal System** - A TWACS NG Component.

**Meter Technician** - Technicians certified to update transponder and end-device related data.

**Rate/Research Analyst** - Utility personnel interested in historic billing data.

**System Administrator** - An administrator user with “super user” privileges for maintaining the system.

**TWACS NG Operator** - Any regular user of the system.



## Software Components

TWACS NG requires the following components:

- Java software components
- Oracle Database Enterprise Edition
- BEA WebLogic Application Server (with embedded LDAP server)

Report writing software, licensed by the utility, can also be integrated by Aclara with the Oracle database. Alternatively, the utility could purchase an unrestricted Oracle database license, or set up a separate reporting environment.

The TWACS system controller has distributed architecture based on open source Java Message Service (JMS) functionality. This allows certain functionality to be pushed down from the Master Controller to distributed master controllers (DMCs). The Distributed Master Controller can be a lower-cost workstation or PC. The Master Controller has the complete Oracle database and manages the overall scheduling and storage of transactions.

In case the communication link with the Master Controller is broken, each Distributed Master Controller can manage communications autonomously with a subset of the utility's meters. As data is collected by each DMC, it is replicated to the Master Controller. The distributed architecture allows the system to continue to issue scheduled commands, gather and process metering data, and save information locally at the DMC in the event that the communications link to the Master Station is lost.

## Pre-operational Checks and Setup

The purpose of this section is to inform the user of any initial pre-operational checks or procedures that will ensure a successful initial deployment of transponders into the TWACS NG system.

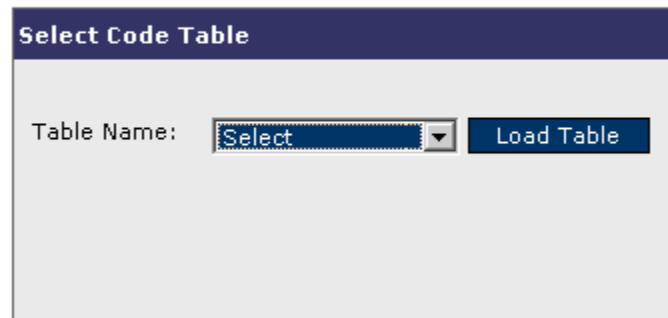
### Rate Code/Demand Configuration

Rate Code is a required field in the TWACS NG hub load files. TWACS NG will validate any value that is entered for the Rate Code. These values will have to be entered into TWACS NG prior to loading any transponders into the system. The first step is to determine the rate codes that could be placed into TWACS NG from a Meter Data Management (MDM) or Customer Information system (CIS). The next step is to input these values into TWACS NG using the graphical user interface.

Navigate to the **System Configuration** tab and click on **Lookup/Edit Tables**

## CODE TABLE MAINTENANCE

## Select Code Table



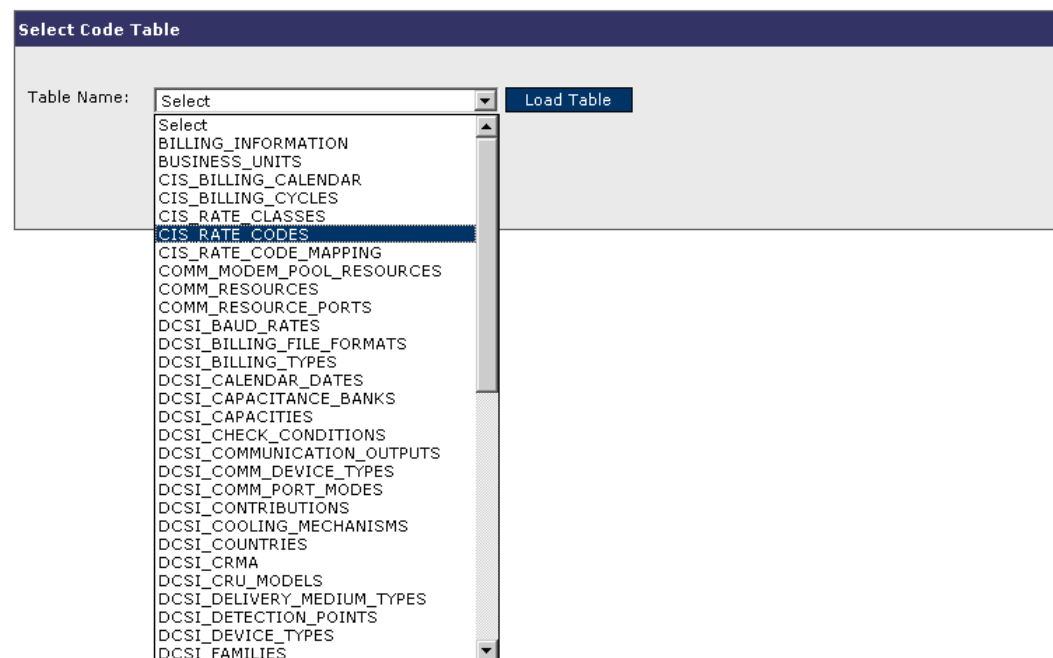
Select Code Table

Table Name: Select Load Table

Utilize the dropdown menu to select **CIS\_Rate\_Codes** then click the **Load Table** button.

## CODE TABLE MAINTENANCE

## Select Code Table



Select Code Table

Table Name: Select Load Table

- Select
- BILLING\_INFORMATION
- BUSINESS\_UNITS
- CIS\_BILLING\_CALENDAR
- CIS\_BILLING\_CYCLES
- CIS\_RATE\_CLASSES
- CIS\_RATE\_CODES**
- CIS\_RATE\_CODE\_MAPPING
- COMM\_MODEM\_POOL\_RESOURCES
- COMM\_RESOURCES
- COMM\_RESOURCE\_PORTS
- DCSI\_BAUD\_RATES
- DCSI\_BILLING\_FILE\_FORMATS
- DCSI\_BILLING\_TYPES
- DCSI\_CALENDAR\_DATES
- DCSI\_CAPACITANCE\_BANKS
- DCSI\_CAPACITIES
- DCSI\_CHECK\_CONDITIONS
- DCSI\_COMMUNICATION\_OUTPUTS
- DCSI\_COMM\_DEVICE\_TYPES
- DCSI\_COMM\_PORT\_MODES
- DCSI\_CONTRIBUTIONS
- DCSI\_COOLING\_MECHANISMS
- DCSI\_COUNTRIES
- DCSI\_CRMA
- DCSI\_CRU\_MODELS
- DCSI\_DELIVERY\_MEDIUM\_TYPES
- DCSI\_DETECTION\_POINTS
- DCSI\_DEVICE\_TYPES
- DCSI\_FAMILIES

The TWACS NG system has two default rate codes of **Residential** and **Commercial**. For each of these rate codes there are associated demand configurations. To add a new rate code, click the **New Record** button.

CODE TABLE MAINTENANCE  
CIS\_RATE\_CODES List View

List View of Records

3 Records found.

New Record

Refresh

<input type="checkbox"/>	RATE_CLASS_ID	RATE_CODE_ID	RATE_CODE	DEMAND_CONFIGURATION	Options
<input type="checkbox"/>	1	401	RESIDENTIAL	4	<a href="#">View</a>   <a href="#">Edit</a>
<input type="checkbox"/>	1	402	COMMERCIAL	6	<a href="#">View</a>   <a href="#">Edit</a>
<input type="checkbox"/>	1	501	REG	4	<a href="#">View</a>   <a href="#">Edit</a>

Delete

Select the rate class ID. Choose a rate code ID; this would typically be associated to a MDM/CIS identification number. Provide the user defined **Rate Code**. When adding the rate code to the Hub Load Files this name must use the exact spelling and capitalization. Select the demand configuration. All US transponders support 15 MIN FIXED BLOCK.

CODE TABLE MAINTENANCE  
CIS\_RATE\_CODES Detail View

Save

Cancel

Detail View of Record

RATE\_CLASS\_ID:

RATE\_CODE\_ID:

RATE\_CODE:

DEMAND\_CONFIGURATION:

- Select
- Select
  - DEMAND NOT APPLICABLE
  - 5 MIN FIXED BLOCK
  - 10 MIN FIXED BLOCK
  - 10 MIN ROLLING - 5 MIN SUBINTERVAL
  - 15 MIN FIXED BLOCK
  - 15 MIN ROLLING - 5 MIN SUBINTERVAL
  - 30 MIN FIXED BLOCK
  - 30 MIN ROLLING - 5 MIN SUBINTERVAL
  - 30 MIN ROLLING - 10 MIN SUBINTERVAL
  - 30 MIN ROLLING - 15 MIN SUBINTERVAL
  - 60 MIN FIXED BLOCK
  - 60 MIN ROLLING - 5 MIN SUBINTERVAL
  - 60 MIN ROLLING - 10 MIN SUBINTERVAL
  - 60 MIN ROLLING - 15 MIN SUBINTERVAL
  - 60 MIN ROLLING - 20 MIN SUBINTERVAL
  - 60 MIN ROLLING - 30 MIN SUBINTERVAL

Delete

New Record

**NOTE:** Not all transponders support demand configuration. For questions please call Aclara PLS technical support.)

When finished click the Save button.

## Register Profiles

Some TWACS transponders can collect and store incremental interval data from various data registers stored in the transponder. When the transponder is configured it can store multiple channels of information on multiple data registers. For example: Certain transponders can store forward net consumption in 60 minute intervals in channel 1 and also store reverse consumption in 60 minute intervals in channel 2. These configurations are labeled in TWACS NG as Register Profiles. Each register profile is different in that it will bin data at different intervals such as 60, 30 or 15 minute intervals or with different data registers.

For each type of meter, where register profiles are supported, there must exist either a default register profile or a register profile must be given in the Integration Hub Load files in the Transponder file. If a correct default register profile exists there is no need to add the register profile into the Integration Hub Load file.

It is important to note how the transponders are initially set from the manufacturer so that the correct default register profile can be created and/or added to the Integration Hub Load files.

This section is designed to inform the user of how to check the register profiles for meter types and determine:

1. The register profiles available for each meter type.
2. If there exists a correct default profile for each meter type.
3. Determine the exact name of register profile that can be added to the Integration Hub Load Transponder file for integration into TWACS NG, if needed.
4. The ability to add a register profile if a default does not exist, if the default is incorrect or an additional register profile is required.

## View Register Profiles

To view the register profiles Login to TWACS NG and navigate to the **System Configuration** tab and click on the **Lookup Register Profiles** link.

LOOKUP REGISTER PROFILES

Lookup Criteria	
Transponder Type:	--Select--
Transponder Model:	--Select--
Register Profile:	--Select--
<input type="button" value="Lookup"/> <input type="button" value="Show All"/>	

Select the **Transponder Type** then click the **Lookup** button.

LOOKUP REGISTER PROFILES

**Lookup Criteria**

Transponder Type:  Transponder Model:

Register Profile:

---

Lookup Results

12 record(s) found.

Transponder Name	Transponder Type	Transponder Model ▲	Register Profile	Register Mapping	Interval Configuration
UMT-F-R2.1	97	1	UMT-F-R2.1_01	UMT-F-R2.1 MAPPED REGISTERS PROGRAM 01	2CH 1A 15N
UMT-F-R2.1	97	2	UMT-F-R2.1_01	UMT-F-R2.1 MAPPED REGISTERS PROGRAM 01	2CH 1A 15N
UMT-F-R2.1	97	3	UMT-F-R2.1_01	UMT-F-R2.1 MAPPED REGISTERS PROGRAM 01	2CH 1A 15N
UMT-F-R2.1	97	4	UMT-F-R2.1_01	UMT-F-R2.1 MAPPED REGISTERS PROGRAM 01	2CH 1A 15N
UMT-F-R2.1	97	5	UMT-F-R2.1_01	UMT-F-R2.1 MAPPED REGISTERS PROGRAM 01	2CH 1A 15N
UMT-F-R2.1	97	6	UMT-F-R2.1_01	UMT-F-R2.1 MAPPED REGISTERS PROGRAM 01	2CH 1A 15N
UMT-F-R2.1	97	7	UMT-F-R2.1_01	UMT-F-R2.1 MAPPED REGISTERS PROGRAM 01	2CH 1A 15N
UMT-F-R2.1	97	8	UMT-F-R2.1_01	UMT-F-R2.1 MAPPED REGISTERS PROGRAM 01	2CH 1A 15N
UMT-F-R2.1	97	9	UMT-F-R2.1_01	UMT-F-R2.1 MAPPED REGISTERS PROGRAM 01	2CH 1A 15N
UMT-F-R2.1	97	10	UMT-F-R2.1_01	UMT-F-R2.1 MAPPED REGISTERS PROGRAM 01	2CH 1A 15N
UMT-F-R2.1	97	11	UMT-F-R2.1_01	UMT-F-R2.1 MAPPED REGISTERS PROGRAM 01	2CH 1A 15N
UMT-F-R2.1	97	12	UMT-F-R2.1_01	UMT-F-R2.1 MAPPED REGISTERS PROGRAM 01	2CH 1A 15N

Make a note of the type and model number.

By clicking the **Register Mapping** name the user can identify the data registers that can be used in the profile.

#### REGISTER PROFILE MAINTENANCE

##### Register Mapping Configuration Detail

Register Mapping: <input type="text" value="UMT-F-R2.1_MAPPED REGISTERS PROGRAM 01"/>				
	Register ID	Source	Measurement	Fixed Mapping
0	306	METER	PRESENT FORWARD CONSUMPTION_UMT-R-F (PULSES)	No
1	307	METER	PRESENT VOLTAGE 1_UMT-F-R	No
2	308	METER	PRESENT FORWARD CONSUMPTION_UMT-R-F (PULSES)	No
3	309	METER	PRESENT REVERSE CONSUMPTION_UMT-R-F (PULSES)	No
10	316	METER	INSTANTANEOUS LOAD WATTS	No

By scrolling to the right in the **Lookup Register Profiles** screen the user can see the **Interval Configuration** and the **Default** indicator.

## LOOKUP REGISTER PROFILES

Lookup Criteria	
Transponder Type:	97
Transponder Model:	--Select--
Register Profile:	--Select--
<input type="button" value="Lookup"/> <input type="button" value="Show All"/>	

## Lookup Results

12 record(s) found.

[Add Register Profile](#)

Register Profile	Register Mapping	Interval Configuration	Default	Options
UMT-F-R2.1_01	UMT-F-R2.1 MAPPED REGISTERS PROGRAM 01	<a href="#">2CH 1A 15 MIN UNSIGNED NET KWH</a>	Yes	
UMT-F-R2.1_01	UMT-F-R2.1 MAPPED REGISTERS PROGRAM 01	<a href="#">2CH 1A 15 MIN UNSIGNED NET KWH</a>	Yes	
UMT-F-R2.1_01	UMT-F-R2.1 MAPPED REGISTERS PROGRAM 01	<a href="#">2CH 1A 15 MIN UNSIGNED NET KWH</a>	Yes	
UMT-F-R2.1_01	UMT-F-R2.1 MAPPED REGISTERS PROGRAM 01	<a href="#">2CH 1A 15 MIN UNSIGNED NET KWH</a>	Yes	
UMT-F-R2.1_01	UMT-F-R2.1 MAPPED REGISTERS PROGRAM 01	<a href="#">2CH 1A 15 MIN UNSIGNED NET KWH</a>	Yes	
UMT-F-R2.1_01	UMT-F-R2.1 MAPPED REGISTERS PROGRAM 01	<a href="#">2CH 1A 15 MIN UNSIGNED NET KWH</a>	Yes	
UMT-F-R2.1_01	UMT-F-R2.1 MAPPED REGISTERS PROGRAM 01	<a href="#">2CH 1A 15 MIN UNSIGNED NET KWH</a>	Yes	
UMT-F-R2.1_01	UMT-F-R2.1 MAPPED REGISTERS PROGRAM 01	<a href="#">2CH 1A 15 MIN UNSIGNED NET KWH</a>	Yes	
UMT-F-R2.1_01	UMT-F-R2.1 MAPPED REGISTERS PROGRAM 01	<a href="#">2CH 1A 15 MIN UNSIGNED NET KWH</a>	Yes	
UMT-F-R2.1_01	UMT-F-R2.1 MAPPED REGISTERS PROGRAM 01	<a href="#">2CH 1A 15 MIN UNSIGNED NET KWH</a>	Yes	
UMT-F-R2.1_01	UMT-F-R2.1 MAPPED REGISTERS PROGRAM 01	<a href="#">2CH 1A 15 MIN UNSIGNED NET KWH</a>	Yes	
UMT-F-R2.1_01	UMT-F-R2.1 MAPPED REGISTERS PROGRAM 01	<a href="#">2CH 1A 15 MIN UNSIGNED NET KWH</a>	Yes	

By clicking on the Interval Configuration text link for a specific type and model the user will be able to identify the data register and interval configuration for the transponder.

## REGISTER PROFILE MAINTENANCE

## Interval Configuration Detail

Interval Configuration:		2CH_1A_15 MIN_UNSIGNED NET KWH	Transponder Type:	97	Transponder Model:	1
Channel	Active	Transponder Source Register Number	Measurement	Sample Rate	Intervals Per Command	Interval Data Length
0	Yes	1857	PRESENT NET CONSUMPTION_UMT-F-R2.1	15 minutes	10	8 bits

## Add Register Profiles

If a register profile does not exist or if a profile does not exist that accommodates the users needs a register profile can be added through the GUI.

Login to TWACS NG and navigate to the **System Configuration** tab and click the **Add Register Profiles** link.

### LOOKUP REGISTER PROFILES

Select the appropriate **Transponder Type/Model**. Provide the appropriate **Register Profile** name to associate to the profile. (In the example below the name has a 01 instead of a 01 to maintain known naming conventions.) Select from the available **Register Mapping** values. Select an appropriate interval configuration from the available configurations.

### ADD REGISTER PROFILES

Click **Save**.

To view the changes go back to **View Register Profiles** and enter the appropriate criteria.

## LOOKUP REGISTER PROFILES

Lookup Criteria	
Transponder Type:	97
Transponder Model:	1
Register Profile:	--Select--
<div>Lookup Show All</div>	

## Lookup Results

2 record(s) found.

[Add Register Profile](#)

Order	Register Profile	Register Mapping	Interval Configuration	Default
▲	UMT-F-R2.1_01	UMT-F-R2.1 MAPPED REGISTERS PROGRAM 01	2CH 1A 15 MIN UNSIGNED NET KWH	Yes
	UMT-F-R2.1_02	UMT-F-R2.1 MAPPED REGISTERS PROGRAM 01	2CH-2A 60MIN FORWARD AND REVERSE KWH	



# SET UP TWACS® NG

This chapter provides information for creating, maintaining, and deleting TWACS NG users. It also covers how to assign user roles, and how those roles determine which message notifications users see and search.

## Adding and Editing TWACS NG Users

To add a new TWACS NG system user begin by navigating to the **User Setup** tab, and then click **Add User**.



The **Maintain Users - Add User** screen displays.

**MAINTAIN USERS**  
Add User

Fields marked with \* are required.

**Enter User Details**

<b>User ID *:</b>	<input type="text"/>	
<b>Password *:</b>	<input type="text"/>	<input type="button" value="Generate Password"/>
		<b>Send Welcome Email</b> <input type="checkbox"/>
<b>Email Address *:</b>	<input type="text"/>	(XXXX@XXXX.XXXX) or (XXXX@XXXX.XXXX.XXXX)
<b>First Name *:</b>	<input type="text"/>	<b>Last Name *:</b> <input type="text"/>
<b>Address Line 1:</b>	<input type="text"/>	<b>Address Line 2:</b> <input type="text"/>
<b>City:</b>	<input type="text"/>	<b>State/Province*:</b> <input type="text"/>
<b>Country:</b>	-- Select --	
<b>Zip/Postal Code:</b>	<input type="text"/>	
<b>Home Phone:</b>	<input type="text"/>	
<b>Work Phone:</b>	<input type="text"/>	
<b>Work Phone Extension:</b>	<input type="text"/>	
<b>Cell Phone:</b>	<input type="text"/>	
<b>Pager:</b>	<input type="text"/>	
<b>Business Unit *:</b>	WISCONSIN PUBLIC S	
<b>Available User Roles:</b>	<b>Assigned User Roles *:</b> <input type="text"/>	
BILLING ANALYST BILLING MANAGER CUSTOMER SERVICE REPRESENTATIVE DISTRIBUTION ENGINEER (PLANNER) DISTRIBUTION OPERATIONS PERSON EXTERNAL SYSTEM FIELD SERVICE PERSON	>>> <<< > <	<input type="button" value="Save"/> <input type="button" value="Cancel"/>

Use the following procedure to add new users along with the information on their user role and other relevant contact information.

Add the following critical user information, as appropriate.

- **User ID:** Provide a unique user ID for the user.
- **Password:** Click **Generate Password** to auto-generate password or enter a specific password. Upon the end users initial login, the user is required to change the password. Whether the user chooses to type a password or click on the “Generate Password” link, it will show as encrypted and will not display the actual characters. Therefore, if the utility chooses not to send a welcome email, then they will need to type the password so they know what the initial password is. The new user will be prompted to change this password at their first login.
- **Email address:** Enter the email address where the system can send emails to the user.
- **First Name/Last Name:** Enter the first name and last name of the user.
- **Address Line 1/Line 2:** Enter the address information including street name of the user business location.
- **City/State/Country:** Enter the city, state and country of the user business location.
- **Zip Code:** Enter the five-digit postal code with (optional) four-digit extension.
- **Home Phone/Work Phone/Cell Phone/Pager:** Enter the relevant phone numbers.
- **Business Unit:** This is already defined in the database.
- **Select the User Role:** To select the user roles:
  - Select one or more roles in the left multi-select boxes by using the CTRL key.
  - Click the > button to move these roles over to the right multi-select box. To deselect any of the roles, select that item on the right multi-select box and click the < key.
  - To apply all roles click the >> key.
  - Click **Save** to save your changes. The system will send an automated e-mail to the new user with the User ID and the password if the checkbox is marked. The user must change the password the first time they log in.

## Delete a User

1. Access the user using the User Setup > Lookup Users.

Enter the user name or ID number in the Lookup Criteria dialog.

### LOOKUP USERS

#### Find User(s)

Lookup Criteria	
Last Name: <input type="text" value="fence"/>	(e.g., abc*, ABC*)
User ID: <input type="text"/>	(e.g., A*, 23H*)
User Role: <input type="text" value="--Select--"/>	
<input type="button" value="Lookup"/> <input type="button" value="New User"/>	

Lookup Results :

**1 Users found matching lookup criteria.**

<input type="checkbox"/>	User ID ▼	Name	Email	Business Unit	Options
<input type="checkbox"/>	csr1	Noah Fence	csr1@powerstation.com	WISCONSIN PUBLIC SERVICE - ELECTRIC	<a href="#">View</a>   <a href="#">Edit</a>

2. Click Lookup.
3. Select the checkbox next to the user you wish to delete and click Delete. (Once deleted, a user cannot be restored.)

**1 Users found matching lookup criteria.**

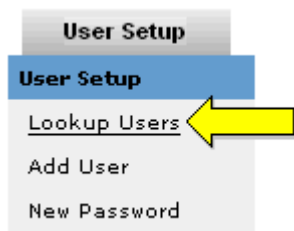
<input checked="" type="checkbox"/>	User ID ▼	Name
<input checked="" type="checkbox"/>	csr1	Noah Fence



## Lookup TWACS NG Users

Viewing, adding, and modifying users begins with referencing the Lookup Users screen.

Select the User Setup tab > Lookup Users.



The Lookup Users screen displays.

### LOOKUP USERS

#### Find User(s)

Lookup Criteria	
Last Name: *	(e.g., abc*, ABC*)
User ID:	(e.g., A*, 23H*)
User Role: --Select--	Lookup
--Select-- BILLING ANALYST BILLING MANAGER CUSTOMER SERVICE REPRESENTATIVE DISTRIBUTION ENGINEER (PLANNER) DISTRIBUTION OPERATIONS PERSON EXTERNAL SYSTEM FIELD SERVICE PERSON INTERNAL SYSTEM METER TECHNICIAN RATE/RESEARCH ANALYST	

1. Enter any search qualifier (using wildcard, if necessary), or make use of the User Role drop-down and click **Lookup**.
2. The Lookup Results screen for the specified search results displays.

Lookup Results :

11 Users found matching lookup criteria.

	User ID ▼	Name	Email	Business Unit	Options
	cs7718434543w	Customer Service	service110@Ipower.com	WENMINUCHE RURAL COOPERATIVE	<a href="#">View</a>   <a href="#">Edit</a>
	CustServ117y	Customer Service	service112@Ipower.com	WENMINUCHE RURAL COOPERATIVE	<a href="#">View</a>   <a href="#">Edit</a>
	cs4829342344w	Customer Service	service220@Ipower.com	WENMINUCHE RURAL COOPERATIVE	<a href="#">View</a>   <a href="#">Edit</a>
	CustServ226y	Customer Service	service226@Ipower.com	WENMINUCHE RURAL COOPERATIVE	<a href="#">View</a>   <a href="#">Edit</a>
	cs542384323w	Customer Service	service231@Ipower.com	WENMINUCHE RURAL COOPERATIVE	<a href="#">View</a>   <a href="#">Edit</a>

[Delete](#)

- Clicking the **View** or **Edit** link under the **Options** column takes you to the Maintain Users screen where you can either view, change data, or delete the account for the user you specified.

Enter User Details

User ID \*:
CustServ117y

Password \*:

.....

Generate Password

Send Welcome Email
☒

Email Address \*:
ervice117@ipower.com
( xxx@xxx.xxx ) or ( xxx@xxx.xxx.xxx )

First Name \*:
Noah
Last Name \*:
Fence

Address Line 1:
84 RR 7
Address Line 2:
Suite 100

City:
Conoyerville
State/Province\*:
TX

Country:
-- Select --

Zip/Postal Code:

Home Phone:

Work Phone:

Work Phone Extension:

Cell Phone:

Pager:

Business Unit \*:
WEMINUCHE RURAL

Available User Roles:

BILLING ANALYST  
BILLING MANAGER  
DISTRIBUTION ENGINEER (PLANNER)  
DISTRIBUTION OPERATIONS PERSON  
EXTERNAL SYSTEM  
FIELD SERVICE PERSON  
INTERNAL SYSTEM

>>  
<<  
>  
<

Assigned User Roles \*:

CUSTOMER SERVICE REPRESENTATIVE

Save
Cancel

**NOTE:** Edit should only be used when changes are required.

TWACS® NG Operational Process Guide

43

## New Password

It is easy to issue an existing user a new password. Users are encouraged to change their own passwords frequently.

From the User Setup tab, select New Password.



The Change Password screen displays.

### CHANGE PASSWORD - TWACS NEXT GENERATION

Fields marked with \* are required.

Change Password Details	
Username :	CustServ117y
Old Password * :	<input type="password"/>
New Password * :	<input type="password"/> The New Password cannot be the same as the Old Password. The New password must be alphanumeric, at least 8 characters in length and must contain at least 1 digit and 1 special character (\$, #, etc)
Confirm New Password * :	<input type="password"/> New Password must match password entered in the Confirm New Password field.
Security Question :	<input type="text"/> The security question should be less than 255 characters long. The security question should remind you of your password. It should not contain or give away your password.
Security Answer * :	<input type="password"/> Security answers are case sensitive.
<input type="button" value="Change Password"/>	

1. Enter the old and new passwords, and then confirm the new password. A security question is not required, but a security answer is. In event of a user forgetting their password, this security question and answer is critical to the TWACS NG system being able to auto-retrieve/reset a password.
2. Upon completion click **Change Password**.

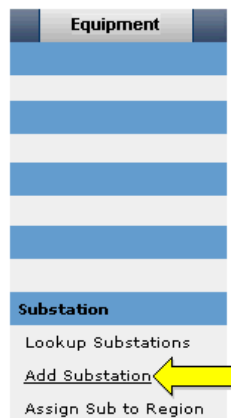
For more information on User Roles, see Appendix C.

# Substations

Substations are the first relay link between the meter transponder and the Master Controller and must be defined in TWACS NG.

## Add Substation

To add a substation to TWACS NG, select the **Equipment** tab > **Add Substation**.



The Maintain/Create/Edit Substation screen displays, defaulted to the Basic Information tab.

**MAINTAIN SUBSTATION - CREATE/EDIT SUBSTATION**  
**Input Basic Information**

To create a new substation complete all steps below. Please use the tabs below to complete required fields.  
 \* Required Fields

Basic Info Bus Feeder Alternate Substation Preview Save Cancel

**Substation Name:** **ID:** **Substation Design Status:** Edit

**Substation Information**

Substation ID \*:  Operation Mode\*: Normal

Substation Name \*:

**Substation Information**

Street :   
 City:   
 State/Province:   
 Zip/Postal Code:   
 Phone:   
 Comments:

**Substation Attributes**

Voltage\*:  KV  
 Altitude:   
 Longitude:   
 Latitude:

Edit Delete

Add the following information to the Basic Information tab as needed.

- Enter a **Substation ID** (required).
- Enter a **Substation Name** (required).
- Select an **Operation Mode** (required). The default selection is Normal mode. The Operation Mode changes the priority of commands to the SCE.
- Enter the substation address information under the **Substation Information** dialog (optional).
- Enter a **Voltage** value in KV for the substation (required).
- Enter the **Altitude** for the substation (optional).
- Enter the **Longitude** of the substation (optional). The longitude format should be decimal degrees out to 6 places (e.g. +/- 31.123456).
- Enter the **Latitude** of the substation (optional). The latitude format should be decimal degrees out to 6 places (e.g. +/- 70.123456)

Click the **Bus** tab. The system will automatically save your work as it moves between the tabs. The Input Bus Information screen displays.

Add the following information to the **Bus** tab as needed.

- Enter a **Bus Name** (required).
- Select a **Phase** setting (optional).
- Select a **Neutral** setting (optional). Only enter this value if you have bus-level detection for the SCE (Not feeder-level detection).

Click on the **Feeder** tab. The Input Feeders Information screen displays.

#### MAINTAIN SUBSTATION - CREATE/EDIT SUBSTATION

##### Input Feeders Information

To create a new substation complete all steps below. Please use the tabs below to complete required fields.

[Basic Information](#)
[Bus](#)
[Feeder](#)
[Alternate Substation](#)
[Preview](#)

[Save](#)
[Cancel](#)

Substation Name: Test Portofino

ID: 777

Substation Design Status: Edit

Feeder Information

		CT RATIO			
Select	SCE-Feeder ID*	Feeder Name*	Bus connected	Phase A,B,C	Neutral
<input checked="" type="checkbox"/>	77	Feeder77	1	200:5	200:5
<input type="checkbox"/>			Select	Select	Select
<input type="checkbox"/>			Select	Select	Select

[Delete](#)



Add the following information to the **Feeder** tab as needed.

- Enter a value for the **SCE-Feeder ID** (required). Enter the bus number if using bus detection.
- Enter a name for the feeder in the **Feeder Name** field (required). For bus detection, use a value like “Bus Name” followed by the feeder (e.g. Bus 1 Feeder 1)
- Select which bus this feeder is connected to using the **Bus Connected** drop-down (required).
- Select which phase setting to use from the **Phase A,B,C** drop-down. This is required for feeder-level detection. An error will occur if you use bus detection and enter values into the Bus CT ratios.
- Select a neutral setting to use from the **Neutral** drop-down (optional for feeder detection. Don’t use if using bus-level detection).
- Click **Save**.

Click on the **Alternate Substation** tab. The Alternate Substation Information screen displays.

MAINTAIN SUBSTATION - CREATE/EDIT SUBSTATION

Input Alternate Substation Information

---

Basic Information Bus Feeder **Alternate Substation** Preview Save Cancel

Substation Name: Test Portofino ID: 777 Substation Design Status: Edit

For Transponder searching purposes, alternate Substations will be used in the order they appear in the list.

Add Substation(s)

Delete

Defining an alternate substation is an optional step. If you do not need to define an alternate substation you can skip the three sub-steps below.

- Click **Add Substation(s)**.
- On the pop-up screen, select one or more substations to use as alternate substations.
- Click **Save**.

**NOTE** Substations have three design status modes.

- The **Edit** status is used when changing parameters for a substation or when creating a new substation.
- The **Review** status is an intermediate status that allows another person to review any input before marking a substation as complete and ready for use.
- The **Complete** status is used to mark a substation as complete and ready for use. The **Complete** status selection is not available until after the **Review** input has been saved.

In the Substation Design Status drop-down, select **Review**.

Click **Save**. This is an important opportunity to review your settings for accuracy before activating the substation.

In order to use the substation that you just created it needs to be put into a **Substation Design Status of Complete**.



Make one final examination of the substation critical information by selecting the **Preview** tab and reviewing the various tables.

**MAINTAIN SUBSTATION - CREATE/EDIT SUBSTATION**  
**Preview Substation**

Please preview the substation information below.

Basic Information Bus Feeder Alternate Substation **Preview** Save Cancel

Substation Name: Test Portofino ID: 777 Substation Design Status: Edit

Substation Information	Substation Ids	Substation Attributes
Street : City: State/Province: Zip/Postal Code: Phone: Comments:	Substation ID : 777 Substation Name : Test Portofino Operation Mode : Normal	Voltage: 12.0 KV Altitude: 0 Feet Longitude: 0.0 Degrees Latitude: 0.0 Degrees

**Bus Information**

Bus Name*	CT RATIO		
	Phase A,B,C	Neutral	
1	200:5	1200:5	

**Feeder Information**

Feeder Name*	Bus connected*	CT RATIO	
		Phase A,B,C	Neutral
Feeder77	1	-	-

**Alternate Substation Information**

Click **Save**.

## Assign a Substation to a Region

Assigning a substation to a region is a means by which a search process can examine all the substations in a given geographic area. To assign a substation to a region, begin by selecting the **Equipment** tab > **Assign Sub to Region**.

The Associates Substations screen displays.

SEARCH REGIONS  
**Associate Substations**

\* Required Fields Save Cancel

Select Region

Region Name\*:

-- Select --

-- Select --  
Conoyerville  
DavisRegion  
Korkosivina  
St. Sartori

To assign a substation to a region, use the following procedure.

1. Select a **Region Name** from the drop-down menu.
2. With the region selected, a **Member List of Substations** will appear below the **Select Region** dialog.

SEARCH REGIONS  
**Associate Substations**

\* Required Fields Save Cancel

Select Region

Region Name\*:

DavisRegion

Member List

Add Substation(s)

**1 Members found.**

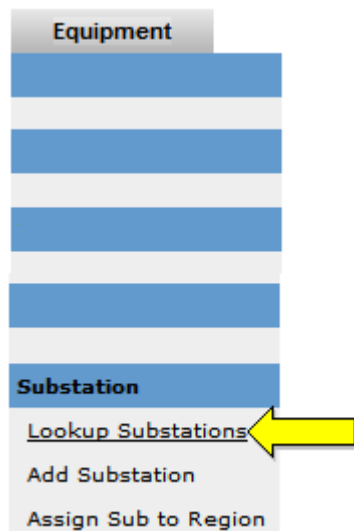
<input type="checkbox"/>	Substation Name	SCE Number
<input checked="" type="checkbox"/>	ConoyervilleSub4	

Delete

3. Select the appropriate substation(s) to apply to a region. With the region selected, click **Add**.
4. Click **Save**.

## Lookup and Edit Substation

You can add, edit, or delete substations from TWACS NG. To lookup substation information, select the **Equipment** tab > **Lookup Substations**.



1. In the Lookup Criteria region, enter the **Substation Name**, **Substation ID** or **SCE**, using wildcards as necessary.

### LOOKUP SUBSTATION

Lookup Criteria	
Substation Name:	<input type="text" value="port*"/>
Substation ID:	<input type="text"/>
SCE :	<input type="text"/>
<input type="button" value="LookUp"/>	

2. Click **Lookup**. The Substation List displays the list of substations that match your search criteria.

Substation List						
1 Substations found						<input type="button" value="New Substation"/>
Substation Name▲	Substation ID	SCE	Status	Operation Mode	Options	
PORTOFINO	PORTOFINO	0014	Complete	Normal	View   Edit	

## Edit Substation

After using the **Lookup Substations** function, click **Edit** under the **Options** column.

**NOTE:** While Substations are undergoing editing, any associated Substation Communications Equipment will go offline.

The Maintain/Create/Edit Substation screen displays, defaulted to the Basic Info tab.

**MAINTAIN SUBSTATION - CREATE/EDIT SUBSTATION**  
**Input Basic Information**

To create a new substation complete all steps below. Please use the tabs below to complete required fields.  
 \* Required Fields

**Basic Info** **Bus** **Feeder** **Alternate Substation** **Preview** **Save** **Cancel**

Substation Name: DummySub1 ID: 123 Substation Design Status: **Edit**

**Substation Information**

Substation ID \*: 0074 Operation Mode\*: Normal

Substation Name \*: Portofino0074

**Substation Information**

Street :  
 City:  
 State/Province:  
 Zip/Postal Code:  
 Phone:  
 Comments:

**Substation Attributes**

Voltage\*: 12.0 KV  
 Altitude:  
 Longitude:  
 Latitude:

**Edit** **Delete**

After modifying, editing, or adding any additional information on the **Basic Info**, **Bus**, **Feeder**, or **Alternate Substation** tabs, use the following procedure:

1. Click **Save**.
2. In the Substation Design Status drop-down, select **Review**.
3. Click **Save**. This is an important opportunity to review your settings for accuracy before activating the substation.
4. In order to use the substation that you just created it needs to be put into a **Substation Design Status** of **Complete**.

**Substation Design Status:** Review

Complete  
 Edit  
 Review

Make one final examination of the substation critical information by selecting the **Preview** tab and reviewing the various tables.

**MAINTAIN SUBSTATION - CREATE/EDIT SUBSTATION**  
**Preview Substation**

Please preview the substation information below.

Basic Information Bus Feeder Alternate Substation **Preview** Save Cancel

Substation Name: Test Portofino ID: 777 Substation Design Status:

Substation Information <input type="button" value="Edit"/>	Substation Ids <input type="button" value="Edit"/>	Substation Attributes <input type="button" value="Edit"/>
Street :	Substation ID : 777	Voltage: 12.0 KV
City:	Substation Name : Test Portofino	Altitude: 0 Feet
State/Province:	Operation Mode : Normal	Longitude: 0.0 Degrees
Zip/Postal Code:		Latitude: 0.0 Degrees
Phone:		
Comments:		

Bus Information <input type="button" value="Edit"/>			
Bus Name*	CT RATIO		
	Phase A,B,C	Neutral	
1	200:5	1200:5	

Feeder Information <input type="button" value="Edit"/>			
Feeder Name*	Bus connected*	CT RATIO	
		Phase A,B,C	Neutral
Feeder77	1	-	-

5. Click Save.

## Substation Communications Equipment (SCE)

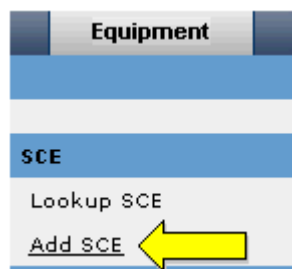
The DMC (Distributed Master Controller) controls the transactions to the SCE (Substation Communications Equipment). This promotes efficient distribution in the field since it separates functions for SCE in a stand-alone mode. This becomes necessary when the Master Controller (MC) and the DMC communicate infrequently.

Only those users with access privileges can perform equipment test activities.

SCE must be associated with a substation. **You must create a substation prior to creating an SCE.**

### Add SCE

To add Substation Communications Equipment (SCE) to the TWACS NG system, select the Equipment tab > Add SCE.



The Maintain/Create/Edit SCE screen displays.

**Basic Information** | CRU | IPU | Preview

Substation: SCE Name: SCE Number:  
 Operational Status: Offline SCE Design Status: Edit

**Substation Control Equipment Information**

SCE Name\*: SCE Number\*: Comm. Resource: Select  
 Substation Name\*: DMC: Select DMC Exchange Format\*: Select

**Time Synchronization**

Interval\*: 15 Min. Window\*: 5 Min.  
 Delay\*: 5 Min.  
☒ T10 Only  
☐ T10 & TS

**Communication Port Configuration**

Mode\*: ADLC  
 Drop Id\*:

**SCE Configuration Key**

Bit No.	Value Name	Bit No.	Value Name	Bit No.	Value Name
31	<input checked="" type="checkbox"/> Daylight Save Time Shift	21	<input type="checkbox"/> MTU Type	10	<input type="checkbox"/> NA
30	<input checked="" type="checkbox"/> Direct MS/RCE Time Sync	20	<input type="checkbox"/> Outbound Spillover Cntl	9	<input type="checkbox"/> NA
29	<input checked="" type="checkbox"/> Supports Multiple RPAs	19	<input type="checkbox"/> IPU Input Shadowing	8	<input type="checkbox"/> NA
28	<input type="checkbox"/> Time Slicing Enable	18	<input type="checkbox"/> Concurrent Phase (CPC)	7	<input type="checkbox"/> NA
27	<input type="checkbox"/> SCE Load Control Enable	17	<input type="checkbox"/> CPC-Auto Detect Switch	6	<input type="checkbox"/> NA
26	<input type="checkbox"/> SCE Time	16	<input type="checkbox"/> CPC-OB Cancellation	5	<input type="checkbox"/> NA
25	<input checked="" type="checkbox"/> SCE Date/Time Change Notification	15	<input type="checkbox"/> CPC-IB Cancellation	4	<input type="checkbox"/> NA
24	<input type="checkbox"/> Line-Line Retry	14	<input type="checkbox"/> NA	3	<input type="checkbox"/> NA
23	<input checked="" type="checkbox"/> Advance Search Capable	13	<input type="checkbox"/> NA	2	<input type="checkbox"/> NA
22	<input type="checkbox"/> MCAA Installed	12	<input type="checkbox"/> NA	1	<input type="checkbox"/> NA
		11	<input type="checkbox"/> NA	0	<input type="checkbox"/> Inbound Acquisition

Initialize SCE Edit

To add a new SCE into TWACS NG use the following procedure.

## Adding Basic Information

1. In the Substation Communications Equipment Information region, enter a unique incremental value for the SCE Number (required).

**Substation Control Equipment Information**

SCE Name\*: SCE Number\*: Comm. Resource: Select  
 Substation Name\*: DMC: Select DMC Exchange Format\*: Select

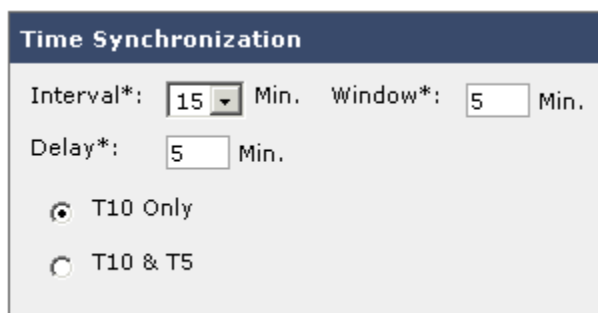
2. Select a substation to use from the **Substation Name** drop-down (required).
3. Associate a DMC using the **DMC** drop-down (this field is optional during initial creation of SCE. If not selected during creation you will need to return at a later point and select a DMC to use).
4. Select a communication resource to use for this SCE from the **Comm Resource** drop-down (this field is optional during initial creation of SCE. If

not selected during creation you will need to return at a later point and select a Comm Resource value to use).

5. The **Exchange Format** drop-down allows those utilizing the **TWACS-20** environment to maximize their system usage and get the fastest processing available by selecting it from the menu. Otherwise the system defaults to the **TWACS-10** standard.

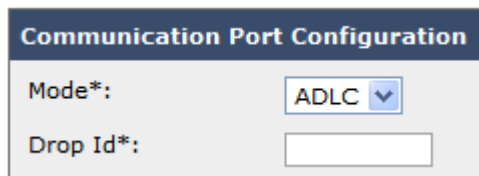
**NOTE:** For TWACS-20 Exchange Format the substation must have the SCE 2.0 Upgrade Kit, includes an RTRA, S-MIRA, IOX, and various firmware upgrades.

6. In the Time Synchronization dialog specify a time **Interval**, **Window**, and **Delay** (required).



The Time Synchronization dialog box has a title bar 'Time Synchronization'. It contains three input fields: 'Interval\*' with a dropdown menu showing '15' and 'Min.' to its right, 'Window\*' with a text box containing '5' and 'Min.' to its right, and 'Delay\*' with a text box containing '5' and 'Min.' to its right. Below these fields are two radio button options: 'T10 Only' (which is selected) and 'T10 & T5'.

7. Select a time synchronization mode (required). Available options are **T10 Only** mode or **T10 & T5** mode. Use the **T10** setting if you have TWACS-20 equipped substation.
8. In the Communication Port Configuration dialog select **Configuration Mode** and **Drop Id** (required). Drop Ids must be unique across each TWACS NG Comm Server.



The Communication Port Configuration dialog box has a title bar 'Communication Port Configuration'. It contains two input fields: 'Mode\*' with a dropdown menu showing 'ADLC' and a small downward arrow, and 'Drop Id\*' with an empty text box.



9. From the SCE Configuration Key region, select any SCE Configuration Key values that you wish to use for the current SCE (values 0 through 31). To enable/disable the available SCE Configuration Key check boxes or to set which SCE Configuration Key check boxes should be selected/deselected by default, simply change the corresponding values in the SCE\_CONFIG\_KEY\_ATTR table.

SCE Configuration Key					
Bit No.	Value Name	Bit No.	Value Name	Bit No.	Value Name
31	<input checked="" type="checkbox"/> Daylight Save Time Shift	21	<input type="checkbox"/> MTU Type	10	<input type="checkbox"/> NA
30	<input checked="" type="checkbox"/> Direct MS/RCE Time Sync	20	<input type="checkbox"/> Outbound Spillover Cntl	9	<input type="checkbox"/> NA
29	<input checked="" type="checkbox"/> Supports Multiple RPAs	19	<input type="checkbox"/> IPU Input Shadowing	8	<input type="checkbox"/> NA
28	<input type="checkbox"/> Time Slicing Enable	18	<input type="checkbox"/> Concurrent Phase (CPC)	7	<input type="checkbox"/> NA
27	<input type="checkbox"/> SCE Load Control Enable	17	<input type="checkbox"/> CPC-Auto Detect Switch	6	<input type="checkbox"/> NA
26	<input type="checkbox"/> SCE Time	16	<input type="checkbox"/> CPC-OB Cancellation	5	<input type="checkbox"/> NA
25	<input checked="" type="checkbox"/> SCE Date/Time Change Notification	15	<input type="checkbox"/> CPC-IB Cancellation	4	<input type="checkbox"/> NA
24	<input type="checkbox"/> Line-Line Retry	14	<input type="checkbox"/> NA	3	<input type="checkbox"/> NA
23	<input checked="" type="checkbox"/> Advance Search Capable	13	<input type="checkbox"/> NA	2	<input type="checkbox"/> NA
22	<input type="checkbox"/> MCAA Installed	12	<input type="checkbox"/> NA	1	<input type="checkbox"/> NA
		11	<input type="checkbox"/> NA	0	<input type="checkbox"/> Inbound Acquisition

## Bit Descriptions

### Bit 31 – Daylight Saving Time Shift

**Enabled** - Allow time shift parameters to be downloaded and used in the substation

**Disabled** -Do not allow time shift parameters to be set in the substation

### Bit 30 – Time Sync Option

**Enabled** - Allow Master Station single transponder time sync commands

**Disabled** - Master Station single transponder time sync commands will not be allowed and will return an execution status 24 (Invalid Function)

### Bit 29 – Multiple RPA

**Enabled** - Allows for more than one CRPA/CRMA or MIRA board in a card cage

**Disabled** - Only allows one board in system and will return Exec Status 22 if the equipment tables are downloaded and set up for more than 1 CRPA/CRMA or MIRA board

**Bit 28 – Time Slice**

**Enabled** - Time slice tables can be downloaded to the substation

**Disabled** - Time slice tables will not be accepted by the substation and will return Exec Status 22

**Bit 27 – SCE Load Control – All On Off**

**Enabled** - Local SCE load control enabled

**Disabled** - Local SCE load control disabled. This should always be set to 0. When read, it indicates whether Local SCE load control is enabled at the substation. “Local SCE Load Control” is a SCADA relay input at the substation that can be used to trigger automatic RCE Load Control Commands. This is an option that is not installed on most SCEs.

**Bit 26 – SCE Time**

**Enabled** - Will return a notification back to the Master Station when the SCE time parameter table is modified

**Disabled** - No notifications will be generated

**Bit 25 – Date/Time Change Notification**

**Enabled** - Will return a notification back to the Master Station when the Sub Date and Time are modified

**Disabled** - No notifications will be generated

**Bit 24 – Line-Line Retry**

**Enabled** - When a line-ground two-way message is not decoded successfully this will allow a line-line retry to run in an attempt to read the message

**Disabled** - The automatic retries will not be enabled

**Bit 23 – Advanced Search**

**Enabled** - Allow the CRPA/CRMA advanced search feature to be used

**Disabled** - Advanced search is not allowed (Currently this is a sticky on bit which means that this config key is always forced on by the substation and cannot be modified)

**Bit 22 – MCAA (Defunct. Reserved for future use.)**

**Bit 21 – MTU Type**

**Enabled** - Should be enabled on Delta Wye configurations

**Disabled** - Standard systems that do not contain Delta Wye transformers

**Bit 20 – Outbound Spillover**

**Enabled** - Indicates that the system has spillover signal from one bus to another. The substation will ensure that messages on the same phasor do not run concurrently on separate buses so there is no message corruption

**Disabled** - Messages on the same phasor can run concurrently on different buses, for example Phasor ANA on Bus1 and ANA on Bus2 can run at the same time

**Bit 19 – IPU Input Shadowing**

**Enabled** - This option is used when CRPA/CRMA boards are used in a concurrent configuration. Each board set has access to all 32 IPU's and if the first board set is busy, it will “shadow” the message to the next board for concurrency

**Disabled** - CRPA/CRMA boards are used without concurrency (When MIRA boards are used this Configuration Key is ignored)

**Bit 18 – Concurrent Phase Communication**

**Enabled** - Allows concurrent messages to run on different phasors (e.g., ANA-BNB-CNC)

**Disabled** - Do not allow concurrent communications to run

**Bit 17 – CPC - Auto Detect Switch**

**Enabled** - Line-Line transactions can possibly create more concurrency if the detection point is switched and this option allows this to happen (Example: ABA-BCB cannot run because the B inbound would also have inbound from the AB phasor so TWACS NG switches the detection point to ABA-BCC and then the message can run concurrently with no issues).

**Disabled** - Detection point switching is not allowed to occur (If the Inbound Cancellation Configuration Key is enabled and MIRA boards are used, this Configuration Key is automatically disabled due to the fact that now the original transaction in the example is a valid transaction ABA-BCB).

**Bit 16 – CPC - Outbound Cancellation**

**Enabled** - MIRA NGT 1.6 adds support for new algorithms that can increase the throughput of a system, this will allow the outbound messages to be canceled from inbound detection which can increase the throughput of all messages in the system (an example would be that time sync messages could run on top of existing inbound messages without waiting for the inbound messages to complete).

**Disabled** - Do not allow outbound messages to run on top of existing messages) This was implemented to support substations with Neutral Reactors and/or 3-wire distribution networks.

**Bit 15 – CPC - Inbound Cancellation**

**Enabled** - MIRA NGT 1.6 adds support for new algorithms that can increase the throughput of a system, allowing the inbound messages from other feeders and phase to be cancelled out for better reads and more accurate results

**Disabled** - Do not use the inbound cancellation algorithms. This was implemented to support substations with Neutral Reactors and/or 3-wire distribution networks

**Bits 14-5 Reserved for future use and should remain disabled**

**Bits 4-3 – Concurrent Phase Eng. Test**

**Enabled** - This is for engineering testing only

**Disabled** - This is the setting every customer should use

**Bits 2-1 – Reset Delay**

**Enabled** - This is for engineering testing only

**Disabled** - This is the setting every customer should use

**Bit 0 – Inbound Acquisition Statistics**

**Enabled** - When RCE response entry format 0 is used and this config key is on, the extra six bytes of acquisition data will be returned just as in RCE response entry format 1

**Disabled** - RCE response entry format 0 will be returned as normal without the extra six bytes of acquisition data

## Control and Receiving Unit (CRU) Tab

1. Click on the CRU tab. TWACS NG will automatically save your work as it moves between the tabs on the screen. The Control & Receiving Unit Information region displays.

Basic Information

CRU

IPU

Preview

Substation : TR1
SCE Name : TR1 1
SCE Number: 1
Operational Status: Online
SCE Design Status: Complete

### CRU Cabinet Information

CRU Model: Indoor Tall
Heater: Yes
Cooling Mechanism: Fan Only

### CRU Power Supply Assembly (CPSA)

Voltage: 120 V

### Substation Control Processor Assembly (SCPA)

Firmware Version: 99.99
Hardware Version: 99.99
Queue Size\*: 25

### Receiver Information

Receiver Type\*: CRPA
Response Mode \*: LINK LEVEL

Slot #	Installed*	Firmware Version	Hardware Version
1	Yes	99.99	99.99
2	No	99.99	99.99
3	No	99.99	99.99
4	No	99.99	99.99

### Correlation Receiver Multiplexer Assembly (CRMA)

A CRMA board is only installed if, CRPA is receiver type selected.

Slot #	Installed*
1	Yes
2	No
3	No
4	No

### First OMU Fiber Interface Assembly (OFIA)

OMU ID	OMU Installed	Bus	OMU Firing Angles/Phase (Degrees)						OMU Status	Phase Signal Map	Firmware Version	Hardware Version				
			Line to Neutral			Line to Line										
			AN	BN	CN	AB	BC	CA								
1	Yes	Bus1	20	20	20	20	20	20	Offline	0	99.99	99.99				
2	No	Bus1	22	22	22	22	22	22	Offline	0	99.99	99.99				
3	No	Bus1	22	22	22	22	22	22	Offline	0	99.99	99.99				
4	No	Bus1	22	22	22	22	22	22	Offline	0	99.99	99.99				

2. In the CRU Cabinet Information dialog, select the **CRU Model**, **Heater**, and **Cooling Mechanism** options (required).
3. In the CRU Power Supply Assembly (CPSA) dialog, select a **Voltage** value (required).

- Under the Substation Control Processor Assembly (SCPA) region, the firmware version will be read back from the SCE once the SCE is initialized.

Enter in the queue size for the SCPA. The default value is 25. With a standard TWACS 10 SCE installation the highest SCPA queue size is 25.

If you have an SCE 2.0 upgrade kit installed, the queue size can be set between 1 and 36.

- In the Receiver Information dialog, pick MIRA or CRMA for the receiver type. Pick a **Response Mode**. The firmware version will be read back from the SCE once the SCE is initialized.

Enter the **Slot** and **Installed** information (required – default values provided).

- In the first OMU Fiber Interface Assembly (OFIA) region, enter the **OMU ID**, **OMU Installed**, **Bus**, **Line to Neutral** (AN, BN, CN), **Line to Line** (AB, BC, CA). The **OMU Status**, **Phase Signal Map**, **Firmware Version**, and **Hardware Version** values are loaded when the substation is initialized.
- If you have a second or third OMU Fiber Interface Assembly (OFIA) installed, follow the same steps as noted above for each.

## Inbound Pickup Unit (IPU) Information Tab, Part 1

IPUs are installed in the field and any necessary IPU information should be collected by field personnel prior to completing the following steps.

- Click on the IPU tab. TWACS NG will automatically save your work as it moves between the tabs on the screen.

Basic Information | CRU | **IPU** | Preview

Substation Name: Davetown SCE Name: Davetown 50 SCE Number: 50 Operational Status: Offline SCE  
Design Status: Edit

### Inbound Pickup Unit Information

Detection parameters have been configured with default values. To edit that click the edit link.

Bus Name	Feeder Name	Phase A		Phase B		Phase C		Neutral		Detection Parameters
		undefined	Input (1-32)	undefined	Input (1-32)	undefined	Input (1-32)	undefined	Input (1-32)	
Dave West	Feeder1	None	1	None	2	None	3	None	4	Detection Parameters
	Feeder2	None	None	None	None	None	None	None	None	Detection Parameters
		None	None	None	None	None	None	None	None	Detection Parameters
		None	None	None	None	None	None	None	None	Detection Parameters

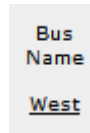
Yellow arrows point to the 'Input (1-32)' dropdowns for Phase A, Phase B, Phase C, and Neutral, with the word 'UNIQUE' written in yellow boxes next to them, indicating that each input must be unique.

2. For each **Bus** and **Feeder** combination, enter CRMA and Input values for **Phase A** (required), **Phase B** (required), **Phase C** (required), and **Neutral** (optional).
3. Click Save.

## Inbound Pickup Unit (IPU) Information Tab, Part 2

This section details how to configure the TWACS Communication Protocol.

1. For each **Bus** click on the bus name to edit the settings.



2. The **Bus Parameters** dialog displays.

### BUS PARAMETERS

Bus Name:	Dave West		
<b>Communication Options</b>			
Power Line Protocol*:	TWACS-10	Maximum Number of Concurrent Feeders*:	1
<b>Command Information</b>			
TWACS-20 Error Detection and Correction*:	LDPC24	TWACS-10 Error Detection and Correction:	CRC Hamming with LDPC
			<input type="button" value="Save &amp; close"/> <input type="button" value="Cancel"/>

**NOTE:** For this screen you must be familiar with the type of TWACS SCE equipment installed in the substation.

3. Select the **Power Line Protocol**: TWACS-10 or TWACS-20, matching the address hashing.
4. Select the Maximum Number of Concurrent Feeders.
  - For TWACS-10 the default and maximum value should be 1.
  - For TWACS-20 the default value is 6. Do not exceed the number of feeders in service per bus. The range goes from one to eight concurrent feeders. Setting the number of concurrent feeders too high may lower reliability.
5. Select the Command Information.
  - TWACS-20 LDPC24 is the default.
  - TWACS-10 It defaults to CRC & Hamming with LDPC.
6. Click Save and Close.

## Inbound Pickup Unit (IPU) Information Tab Part 3

### Inbound Detection Parameters Pop-up

INBOUND DETECTION PARAMETERS

Bus Name: Bus1  
Feeder Name: Feeder1

☐ Multi Bit ☒ Detection/Correction

**Unit Channel Map**


A 1 6 9 12 14 15

**Group Channel Map**

A 1 6 9 12 14 15

Phase Delay		Detection Window			Inbound Scalars	
LG*	LL*	Count*	Deg*	Bits*	Neutral*	Phase*
135	135	12	5	7	100	100

Inbound Communication Options		Selective Notch Filter
Search	Two-Way	Threshold
<input type="checkbox"/> Reserved	<input type="checkbox"/>	135
<input type="checkbox"/> Selective Notch Filter	<input type="checkbox"/>	
<input type="checkbox"/> Noise Subtraction	<input type="checkbox"/>	
<input type="checkbox"/> Optimum Channel	<input type="checkbox"/>	



1. Click the detection parameters for each feeder.
2. Make changes to the **Multi-Bit/Detection Correction**. The **Multi-Bit** feature will be turned off and the **Detection/Correction** (Hamming Bit) option will be turned on by default. This setting is recommended for the most reliable reads.
3. Select the **Unit Channel Map** options. It is recommended that all six channels be enabled for Group Channel Map.
4. Select the **Phase Delay** options, **Detection Window** options, and **Inbound Scalars** options.
5. Select the **Inbound Communication Options** settings and the **Selective Notch Filter** options.
6. Click **Save & Close**.

After completion of the information into the Inbound Detection Parameters, users are returned to finish entry of data into the Inbound Pickup Unit Information screen.

Once you have completed the CRMA, Input, and Detection Parameters for each row, click **Save**.



## Preview SCE Tab

1. Click the **Preview SCE** tab.
2. Review the information.
3. In the SCE Design Status drop-down, select **Review**. SCEs have three design status modes.
  - **Edit** status is used when changing parameters for an SCE or when creating a new SCE.
  - **Review** status is an intermediate status that allows another person to review any input before marking an SCE as complete and ready for use.
  - **Complete** status is used to mark an SCE as complete and ready for use.
4. Set the SCE Design Status to **Complete**.
5. Click **Save**.
6. If the status is complete, after clicking **Save** the following message displays:

**If the receiver type is a MIRA there must be at least one MIRA board configured.**

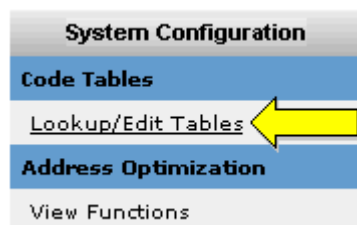
**If the receiver type is CRPA there must be at least 1 CRPA and CRMA board configured.**

**There is at least one OFIA, OMU, and IPU screen.**

7. Click **Close** and make any necessary changes.

## Associate SCE with a System Configuration

From the main TWACS NG interface select the **System Configuration** tab > **Lookup/Edit Tables**.



The Code Table Maintenance screen displays.

## CODE TABLE MAINTENANCE

## Select Code Table

Select Code Table	
Table Name:	<b>SUBSTATION CONTROL EQUIPMENTS</b>

To associate an SCE with a system configuration, use the following procedure.

1. From the Table Name drop-down, select **SUBSTATION\_CONTROL\_EQUIPMENT**. The **List View of Records** displays.

## CODE TABLE MAINTENANCE

## SUBSTATION\_CONTROL\_EQUIPMENTS List View

List View of Records			
17 Records found.		<a href="#">New Record</a>	<a href="#">Refresh</a>
<input type="checkbox"/>	SCE_ID ▲	SCE_NAME	Options
<input type="checkbox"/>	1	KORKOSIVINA 0091	<a href="#">View</a>   <a href="#">Edit</a>
<input type="checkbox"/>	2	CONOYERVILLE 007	<a href="#">View</a>   <a href="#">Edit</a>
<input type="checkbox"/>	3	ST. SARTORIO 0018	<a href="#">View</a>   <a href="#">Edit</a>
<input type="checkbox"/>	4	PORTOFINO 0014	<a href="#">View</a>   <a href="#">Edit</a>

2. Select the new substation that you just created from the list of results and click **Edit**. The Substation Communications Equipment Detail View displays.

## CODE TABLE MAINTENANCE

## SUBSTATION\_CONTROL\_EQUIPMENTS Detail View

Detail View of Record			
SCE_ID:	10	DIAL_UP_PHONE_NUMBER:	
CONNECT_RETENTION_TIME:		CONNECT_REDIAL_TIME:	
REDIAL_TIME_INTERVAL:		CONNECTION_STRING:	
REDIAL_RETRY_ATTEMPTS:		TIME_INTERVAL_UOM:	
DIALING_TIME:		DEDICATED_LINE_TYPE:	
DEDICATED_LINE_PROVIDER:		DEDICATED_LINE_ID:	
DEDICATED_LINE_BOARD:		OTHER_PARAM_TO_DISCUSS:	
SCE_NAME:	PORTOFINO 0014		
		<a href="#">Delete</a>	<a href="#">New Record</a>

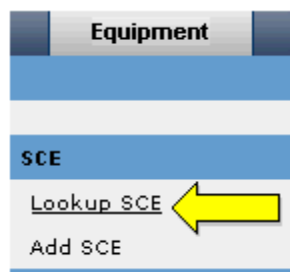
Several of the fields are already populated.

- Enter an **SCE ID** (required).
- Enter the **Connect Retention Time** (required).
- Enter the **Redial Time Interval** (required if using a dial-up modem).
- Enter the **Redial Retry Attempts** (required if using a dial-up modem).
- Enter the **Dialing Time** (required if using a dial-up modem).
- Enter the **Dedicated Line Provider** (optional).
- Enter the **Dedicated Line Board** (required).
- Enter the **SCE Name** (required).
- Enter the **Dial-up Phone Number** (required if using a dial-up modem).
- Enter the **Connect Redial Time** (required if using a dial-up modem).
- Enter the **Connection String** (optional).
- Enter the **Time Interval UOM** (optional).
- Enter the **Dedicated Line Type** (optional).
- Enter the **Dedicated Line ID** (required).

3. Click **Save**.

### Final SCE Deployment Procedure

Return to the **Equipment** tab > **Lookup SCE**.



The SCE Lookup screen displays. Use the following procedure to complete the deployment of Substation Communications Equipment.

1. Enter the name of the new SCE that you created (using wildcards if necessary), or click **Show All**. The SCE List displays.
2. Select the **Edit** link under the SCE Options column. The Maintain/Create/Edit SCE screen displays.
3. If you are ready to begin using your SCE, change the **Operational Status** to **Online**.

**Substation:** PORTOFINO



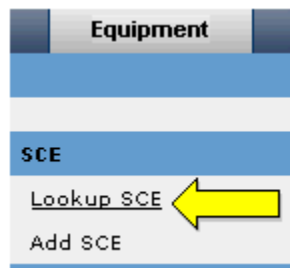
4. As soon as you change this status the system will begin communicating with your SCE. Be sure that your SCE setup and configuration is complete before changing the **Operational Status** to **Online**.

Your new SCE setup is now complete. To test ping the SCE, go to the **Equipment** tab > **Test SCE**.

**NOTE** The system allows saving **Online** only when the SCE Design Status is set to Complete. If the SCE Design status is in Review, the Complete option will not display.

## Lookup and Edit SCE

You can add, edit, or delete Substation Communications Equipment (SCE). To access the SCE select the **Equipment** tab > **Lookup SCE**.



The SCE Lookup screen displays.

### SCE LOOKUP

Lookup Criteria	
Substation Name:	<input type="text"/>
SCE Number:	<input type="text"/>
<input type="button" value="LookUp"/> <input type="button" value="Show All"/>	

To view SCE information, use the following procedure.

Either enter a **SCE Name** (using wildcards if necessary) and click **Lookup**, or click **Show All** to display all of the available SCEs. The SCE List displays all SCEs that match your search criteria.

Clicking the **View** link under the SCE Options column launches the Maintain/Create/EDIT SCE screen, defaulted to the Basic Information tab.

[Basic Information](#)
[CRU](#)
[IPU](#)
[Preview](#)

**Substation:**  
**Operational Status:** Offline
**SCE Name:**  
**SCE Design Status:** Edit
**SCE Number:**

**Substation Control Equipment Information**

SCE Name\*:       SCE Number\*:       Comm. Resource: Select  
Substation Name\*:       DMC: Select DMC      Exchange Format\*: Select

**Time Synchronization**

Interval\*: 15 Min.      Window\*: 5 Min.  
Delay\*: 5 Min.  
☒ T10 Only  
☐ T10 & T5

**Communication Port Configuration**

Mode\*: ADLC  
Drop Id\*:

**SCE Configuration Key**

Bit No.	Value	Name	Bit No.	Value	Name	Bit No.	Value	Name
31	<input checked="" type="checkbox"/>	Daylight Save Time Shift	21	<input type="checkbox"/>	MTU Type	10	<input type="checkbox"/>	NA
30	<input checked="" type="checkbox"/>	Direct MS/RCE Time Sync	20	<input type="checkbox"/>	Outbound Spillover Cntl	9	<input type="checkbox"/>	NA
29	<input checked="" type="checkbox"/>	Supports Multiple RPAs	19	<input type="checkbox"/>	IPU Input Shadowing	8	<input type="checkbox"/>	NA
28	<input type="checkbox"/>	Time Slicing Enable	18	<input type="checkbox"/>	Concurrent Phase (CPC)	7	<input type="checkbox"/>	NA
27	<input type="checkbox"/>	SCE Load Control Enable	17	<input type="checkbox"/>	CPC-Auto Detect Switch	6	<input type="checkbox"/>	NA
26	<input type="checkbox"/>	SCE Time	16	<input type="checkbox"/>	CPC-OB Cancellation	5	<input type="checkbox"/>	NA
25	<input checked="" type="checkbox"/>	SCE Date/Time Change Notification	15	<input type="checkbox"/>	CPC-IB Cancellation	4	<input type="checkbox"/>	NA
24	<input type="checkbox"/>	Line-Line Retry	14	<input type="checkbox"/>	NA	3	<input type="checkbox"/>	NA
23	<input checked="" type="checkbox"/>	Advance Search Capable	13	<input type="checkbox"/>	NA	2	<input type="checkbox"/>	NA
22	<input type="checkbox"/>	MCAA Installed	12	<input type="checkbox"/>	NA	1	<input type="checkbox"/>	NA
			11	<input type="checkbox"/>	NA	0	<input type="checkbox"/>	Inbound Acquisition

Initialize SCE
Edit

## Edit SCE

Editing SCE information on the various tabs of the View Details screen allows you change information about the SCE including changing SCE associations with a DMC.

To edit a SCE use the following procedure.

1. Lookup the SCE information using the Lookup SCE function.
2. From the Results List display, click the Edit link under the SCE Options column.
3. The Maintain/Create/Edit SCE screen displays.

Basic Information | CRU | IPU | Preview

Substation: **Operational Status:** Offline **SCE Name:** **SCE Design Status:** Edit **SCE Number:**

**Substation Control Equipment Information**

SCE Name\*: SCE Number\*: Comm. Resource: Select  
 Substation Name\*: DMC: Select DMC Exchange Format\*: Select

**Time Synchronization**

Interval\*: 15 Min. Window\*: 5 Min.  
 Delay\*: 5 Min.  
☒ T10 Only  
☐ T10 & T5

**Communication Port Configuration**

Mode\*: ADLC  
 Drop Id\*:

**SCE Configuration Key**

Bit No.	Value	Name	Bit No.	Value	Name	Bit No.	Value	Name
31	<input checked="" type="checkbox"/>	Daylight Save Time Shift	21	<input type="checkbox"/>	MTU Type	10	<input type="checkbox"/>	NA
30	<input checked="" type="checkbox"/>	Direct MS/RCE Time Sync	20	<input type="checkbox"/>	Outbound Spillover Cntl	9	<input type="checkbox"/>	NA
29	<input checked="" type="checkbox"/>	Supports Multiple RPAs	19	<input type="checkbox"/>	IPU Input Shadowing	8	<input type="checkbox"/>	NA
28	<input type="checkbox"/>	Time Slicing Enable	18	<input type="checkbox"/>	Concurrent Phase (CPC)	7	<input type="checkbox"/>	NA
27	<input type="checkbox"/>	SCE Load Control Enable	17	<input type="checkbox"/>	CPC-Auto Detect Switch	6	<input type="checkbox"/>	NA
26	<input type="checkbox"/>	SCE Time	16	<input type="checkbox"/>	CPC-OB Cancellation	5	<input type="checkbox"/>	NA
25	<input checked="" type="checkbox"/>	SCE Date/Time Change Notification	15	<input type="checkbox"/>	CPC-IB Cancellation	4	<input type="checkbox"/>	NA
24	<input type="checkbox"/>	Line-Line Retry	14	<input type="checkbox"/>	NA	3	<input type="checkbox"/>	NA
23	<input checked="" type="checkbox"/>	Advance Search Capable	13	<input type="checkbox"/>	NA	2	<input type="checkbox"/>	NA
22	<input type="checkbox"/>	MCAA Installed	12	<input type="checkbox"/>	NA	1	<input type="checkbox"/>	NA
			11	<input type="checkbox"/>	NA	0	<input type="checkbox"/>	Inbound Acquisition

Initialize SCE Edit

4. Change the SCE Design Status field on top of the page to **Edit**.

SCE Design Status: Complete

Complete  
Edit

5. Edit your changes throughout the tabs and dialog boxes as necessary.
6. Once you are done with your changes, change the configuration status back to **Complete** in the Primary DMC dialog box click **Save**.

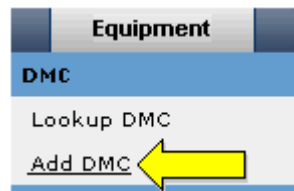
## Distributed Master Control (DMC) Servers

DMC (Distributed Master Controller) controls the transactions to the SCE (Substation Communications Equipment). This promotes efficient system distribution in the field since it separates functions for SCE in a standalone mode. This is especially necessary when the Master Controller and the Distributed Master Controller communicate on an infrequent basis.

Only those users with access privileges can perform equipment test activities.

### Add DMC

To add a Distributed Master Controller (DMC) to the TWACS NG system, select the **Equipment** tab > **Add DMC**.



The Create DMC screen displays.

MAINTAIN DMC-CREATE / EDIT DMC  
Input Basic Information

To create a new DMC complete all steps below. Please use the tabs below to complete required fields.  
\* Required Fields

Primary DMC

Save Cancel

Basic Information DMC Details DMC-SCE Preview

**Primary DMC Main Information**

DMC Name \*:

Latitude:

Longitude:

Configuration:

Location:

Configuration Status \*:

**Physical Address**

Country:

Address Line 1:

Address Line 2:

City:

State/ Province:

ZIP/Postal Code:

Facility Phone:

To add a new DMC to TWACS NG use the following procedure.

1. Enter a **DMC Name** (required). A unique DMC name is required for each DMC in your system.
2. Enter the **Latitude** of the DMC (optional). The Latitude format can have decimal degrees out to 6 places (e.g. 30.123456).
3. Enter the **Longitude** of the DMC (optional). The Longitude format can have decimal degrees out to 6 places (e.g. 90.123456).
4. Select the **Configuration** of the DMC.
  - Select **Local** if the DMC is installed on the same machine as the MC.
  - Select **Distributed** if the DMC is installed on a different machine than the MC (when the DMC is used in a remote location).
5. Select the **Location** of the DMC (optional). Examples of DMC location options are CRU cabinets, Substation-DMC cabinets, substation structures, offices, data centers, etc.
6. Set the **Configuration Status** to **Draft**. This will be changed to **Complete** during a later step in the setup process.
7. Enter the **Physical Address** of the DMC (optional).
8. Click on the **DMC Details** tab. (The system will automatically save your work as it moves between the tabs on the screen.) The **MC-DMC Communication Parameters** and **Protocols** regions display.

The screenshot displays the 'DMC Details' configuration page. At the top, there are four tabs: 'Basic Information', 'DMC Details' (which is active), 'DMC-SCE', and 'Preview'. Below the tabs, the following information is displayed: 'DMC Name: Test Thursday', 'DMC Id: 5', and 'Configuration Status: Draft'. The main content area is divided into two sections. The first section, 'MC-DMC Communication Parameters', has a 'Primary \*' header and contains fields for 'Connection Type' (set to 'LAN'), 'Connection' (set to 'Always Connected'), 'Connection Frequency' (with a dropdown), 'Starting From' (with a date/time picker), and 'DMC Phone'. The second section, 'MC-DMC Communication Protocols', also has a 'Primary \*' header and contains fields for 'IP Config' (set to 'Static'), 'IP Address: \*', 'Subnet Mask', 'Default Gateway', 'Proxy Address', 'DMC Host Name', 'DMC DNS Server', and 'Authentication Type: \*' (set to 'None').



9. TWACS NG begins with a default **DMC Id** of **1** and automatically increments this number every time a DMC is added. If an alternate DMC ID is specified then the Communication Server configuration will need to be updated to reflect the alternate ID.

## MC-DMC Communication Parameters

The MC-DMC Communication Parameters may not be editable, depending on your TWACS NG configuration.

If this section is grayed out skip to the **MC-DMC Communications Protocols** section below.

1. Select a **Connection Type** (optional).
2. Select the **Connection** to use (optional).
3. Select the **Connection Frequency** (optional).
4. Select the **Starting From** period (optional).
5. Enter a **DMC Phone** number (optional).

## MC-DMC Communication Protocols

1. Select the **IP Config** value: static or dynamic IP (required).
2. Enter the **DMC IP Address** (required). If the DMC is on the same server as the MC, enter the IP address of the MC server.
3. Enter a **Subnet Mask, Default Gateway, Proxy Address, DMC Host Name**, and **DMC DNS Server** (all optional fields).
4. Select the **Authentication Type** from the drop-down (optional).
5. Click the **Save** button at the top of the screen.
6. Click on the **System Configuration > Code Table > Lookup/Edit Tables** link on the TWACS NG Main Menu navigation at the top of the screen. The Code Table Maintenance screen displays.

### CODE TABLE MAINTENANCE

#### Select Code Table

The screenshot shows a web-based interface for selecting a code table. The title is "Select Code Table". Below the title, there is a label "Table Name:" followed by a dropdown menu. The dropdown menu is open, showing a list of code table names. The name "DMC\_COMM\_RESOURCES" is highlighted in blue, and a yellow arrow points to it. The list of code table names includes: DCSI\_SERVICE\_TYPES, DCSI\_SIZES, DCSI\_STATES, DCSI\_SUBSCRIBER\_TYPES, DCSI\_SYSTEM\_FLAGS, DCSI\_UOM, DCSI\_VOLTAGES, DCSI\_WIRING\_CONFIG, DMC\_COMM\_RESOURCES, REGIONS, and SUBSTATION\_CONTROL\_EQUIPMENTS.

7. Select **COMM\_RESOURCES** from the drop-down. Add a new record to the table by selecting **DMC\_COMM\_RESOURCE\_PORTS** from the dropdown. The **DMC\_COMM\_RESOURCES List View** displays.

CODE TABLE MAINTENANCE  
DMC\_COMM\_RESOURCES List View

---

List View of Records

---

22 Records found. New Record Refresh

<input type="checkbox"/>	DIST_MASTER_CONTROL_ID ▲	COMM_RESOURCE_ID	Options
<input type="checkbox"/>	1	3	<a href="#">View</a>   <a href="#">Edit</a>
<input type="checkbox"/>	1	4	<a href="#">View</a>   <a href="#">Edit</a>
<input type="checkbox"/>	1	5	<a href="#">View</a>   <a href="#">Edit</a>
<input type="checkbox"/>	1	6	<a href="#">View</a>   <a href="#">Edit</a>
<input type="checkbox"/>	1	7	<a href="#">View</a>   <a href="#">Edit</a>
<input type="checkbox"/>	1	8	<a href="#">View</a>   <a href="#">Edit</a>
<input type="checkbox"/>	1	9	<a href="#">View</a>   <a href="#">Edit</a>
<input type="checkbox"/>	1	10	<a href="#">View</a>   <a href="#">Edit</a>

Delete

8. Select the checkbox for the specific DMC you just created and click the **Edit** link under the **Options** column. The Detail View displays.

CODE TABLE MAINTENANCE  
DMC\_COMM\_RESOURCES Detail View

---

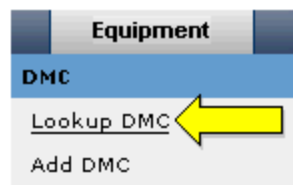
Save Cancel

Detail View of Record

DIST\_MASTER\_CONTROL\_ID:  COMM\_RESOURCE\_ID:

Delete New Record

9. Enter the ID of the DMC you created above in the **DIST\_MASTER\_CONTROL\_ID** field and enter the ID of an available Communication Resource in the system which you wish to associate to the DMC in the **COMM\_RESOURCE\_ID** field.
10. Click **Save**.
11. Return to the **Equipment > Lookup DMC** screen.



12. Enter the ID or name of the DMC you just created (use wildcard characters, if necessary).
13. Click the **Edit** link next to your DMC in the **Results List**.
14. Change the Configuration Status from **Draft** to **Complete**.

15. Click **Save**.
16. Your new DMC setup is now complete. You can now create a new Substation.

## Deleting a DMC from TWACS NG

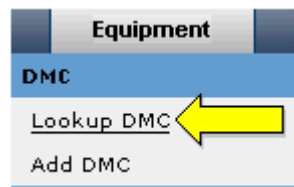
You can delete a Distributed Master Controller (DMC) to remove it from the system. Only users with administrative privileges can perform this function. Deleting a DMC should be done judiciously, since all the information may not be recoverable once deleted. DMCs must be disassociated with any SCEs before they can be deleted. To disassociate the SCE from DMC, you must edit the DMC and remove associations on the **DMC-SCE** tab.

To delete a DMC, go to the **Equipment** tab, then select **Lookup DMC**. Identify the DMC you wish to delete and click the **View** link. Use the following procedure.

1. On the detail view page, click **Delete**.
2. Confirm on the Delete Confirmation page that you intend to delete the DMC.

## Lookup and Edit DMCs

You can add, edit, or delete a Distributed Master Controller (DMC). To access the DMC select the **Equipment** tab > **Lookup DMC**.



The Lookup DMC screen displays.

LOOKUP DMC

**View**

---

\* Required field

Lookup Criteria	
DMC Name*:	<input type="text" value="f*"/> (e.g., abc*, ABC*)
DMC ID:	<input type="text"/>
<input type="button" value="Lookup"/> <input type="button" value="Show All"/>	

To view DMC information, use the following procedure.

1. Either enter a DMC Name (using wildcards if necessary) and click **Lookup**, or click **Show All** to display all of the available DMCs. The Results List displays all DMCs that match your search criteria.

Look Up Results :

1 Results found Add DMC

DMC Name ▲	DMC ID	Operational Status	Configuration status	Deployment Status	Options
FOGTMC1	1	Online	Complete	Local	<a href="#">View</a>   <a href="#">Edit</a>   <a href="#">Synch Status</a>

2. Click the **View** link under the **Options** column to launch the View Details screen.

VIEW DETAILS - DMC  
Detailed View

Primary DMC Back Edit Delete

---

**DMC Name:** FOGTMC1 **DMC Id:** 1 **Configuration Status:** Complete

**Main Information**

Model Number *:	Value 1
Latitude:	30.30
Longitude:	99.46
Deployment:	Local
Location:	Office or Data Center

**Physical Address**

Address Line 1:	27 Royal Flag Pkwy		
Address Line 2:			
City:	Conoverville	State/Province:	Texas
Country:	USA	ZIP/Postal Code:	79360
Facility Phone:	5555556174		

**MC-DMC Communication Parameters**

**Primary \***

Connection Type:	LAN
------------------	-----

**MC-DMC Communication Protocols**

**Primary \***

IP Config:	Static
IP Address:	00.000.006.010
Protocol Type1:	
Protocol Type2:	
Subnet Mask:	
Default Gateway:	
Proxy Address:	
DMC Host Name:	
DMC DNS Server:	

Authentication Type: None

**SCE Information**

SCE Name	Operational Status	Communication Resource Name	Communication Type
<a href="#">Hobbs8091</a>	Offline	DCS1_DMC1-SP1	Serial IP Port
<a href="#">Lexington 7007</a>	Online	DCS1_DMC1-SP2	Serial IP Port
<a href="#">Denver City 7010</a>	Online	DCS1_DMC1-SP3	Serial IP Port
<a href="#">Kerkovivina 7055</a>	Online	DCS1_DMC1-SP15	Serial IP Port
<a href="#">Seagraves 7079</a>	Online	DCS1_DMC1-SP16	Serial IP Port
<a href="#">Wellman 7093</a>	Online	DCS1_DMC1-SP17	Serial IP Port

Back Edit Delete

## Editing a DMC

Editing a DMC allows you change information about the DMC including changing SCE associations. To edit a DMC use the following procedure.

1. Lookup the DMC information using the **Lookup DMC** function.
2. From the Results List display, click the **Edit** link under the **Options** column.
3. The Edit DMC screen displays.

### MAINTAIN DMC-CREATE / EDIT DMC

#### Input Basic Information

To create a new DMC complete all steps below. Please use the tabs below to complete required fields.

\* Required Fields

**"You can only change certain fields at this time."**

**To change rest of the modifiable fields please change the status to DRAFT."**

**Primary DMC**

Basic Information | DMC Details | DMC-SCE | Preview Save Cancel

---

**Primary DMC Main Information**

DMC ID : \*

DMC Name \*:

Latitude:

Longitude:

Configuration:

Location:

Configuration Status \*:

---

**Physical Address**

Country:

Address Line 1:

Address Line 2:

City:

State/ Province:

ZIP/Postal Code:

Facility Phone:

4. Change the configuration status field on top of the page to **Draft**.



5. Edit your changes as necessary.
6. Once you are done with your changes, change the configuration status back to **Complete** in the Primary DMC region and click **Save**.

## Hub Files

The five flat files handled by the Integration Hub deal primarily with a small set of database tables. These tables involve data for accounts, transponders, end devices and premises as well as the associations between some of these records.

A suite of updated API documentation is available for developing either customer or third-party application programming interfaces.

Please reference the latest revision of the appropriate document for your needs.

- **Y10595-TUM TWACS NG Data Load Overview**
- **Y10596-TUM TWACS NG Batch Export File User Guide**
- **Y10564-TUM TWACS NG CIM XML Meter Control**
- **Y10565-TUM TWACS NG CIM XML Meter Reading**
- **Y10566-TUM CIM XML Verify Meter Power**
- **Y30000-APN CIM XML API Overview**
- **Y50021-DSD TWACS NG API Web Services Interface Design Specifications**

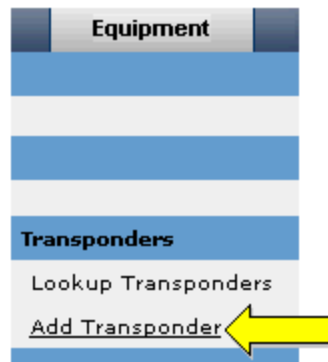
# Transponders

Transponders are communication devices associated with field end devices. You can lookup, edit, and add a transponder in the TWACS NG system.

## Adding a Transponder into TWACS NG

To add a transponder, select the **Equipment** tab > **Add Transponders**.

The Maintain Transponder screen displays.



To add a transponder use the following procedure.

1. Enter the Communication Serial Number and click **Save & Continue**. (You can also enter a Reused, out-of-service serial number.)

The next Maintain Transponder screen displays, defaulted to the Basic Information tab.

### MAINTAIN TRANSPONDER

#### Add Transponder - Capture Serial Number

Please Capture the Communication Serial Number:

\* Required Field.

Save & Continue

Cancel

#### Transponder Information

Communication Serial Number\*: 5555555

2. Enter the essential transponder information. The system may populate the **Type** and **Model** based on the entered serial number, or it may fall to the user to select these criteria from the drop-down menus.
3. Select a register profile or the system assigns the default register profile.
4. Enter the **Manufacturer Date Code** (required).
5. Click **Save**. You can associate this transponder with an end device/meter.

- Click on the **Register Configuration** tab to view the register configuration. This information cannot be modified.

MAINTAIN TRANSPONDER  
View Transponder - Register Configuration

Basic Information **Register Config** Port Mapping Address Assignments

Register ID	Register Name	Port #	Service Type	End Device Designation	Access
-1	DUMMY REGISTER				R
16	ADDRESS ASSIGNED TWO-WAY SLOT 0				RW
17	ADDRESS ASSIGNED TWO-WAY SLOT 1				RW
24	ADDRESS SERIAL NUMBER				RW SEC
25	COMMUNICATION EVALUATION COMMAND COUNT				RWV

- Click on the **Port Mapping** tab to preview the port mappings. This information cannot be modified.

MAINTAIN TRANSPONDER  
View Transponder-Mapping

Basic Information Register Config **Port Mapping** Address Assignments

Port Number	Service Type	End Device Type	Meter/End Device ID
0	Electric	Single-phase Electromechanical Meter	Z0009180

**NOTE** The TWACS NG system initiates a search to find the path of the transponder. When the transponder has been installed and searched, but before it is initialized, the transponder path state is *new* and the search state is *ready*. After a transponder is initialized or operational, its path state is *good* and its search state *done*.

For the off-line state, the path state should be left as *good* and the search state *done*. In these cases the transponder will no longer be in use by any programs. If it is still associated with a program or other commands executed on it, the transponder should go through the defined path and search state update routines. If a transponder is just *active*, the search and path states should again be *null* until it is integrated, installed, and searched in.



8. Click on the **Address Information** tab to preview the Function, Group, and Unit address information.

MAINTAIN TRANSPONDER  
View Transponder - Address Assignments

Basic Information | Register Config | Port Mapping | **Address Assignments**

**Address Assignments**

Communication Serial Number: 5555555  
Transponder Type: 21  
Transponder Model: 52  
**TWO-WAY**

	Function	Group Number	Unit Number	Address Slot Status	Date
Assign Two-way address slot 0	1	14	1	ASSIGNED	04/08/2005

## Register Profile Names

In short, TWACS NG treats the register profile name as an arbitrary “string”. Any encoded phrases are there for the benefit of the human user’s understanding – not the machine.

A register profile defines a particular configuration for the transponder, and identifies the register mapping used, as well as other attributes surrounding the collection of interval data.

Register profile names became an optional field in the data hub. They need not be supplied. If they are not supplied, the transponder will operate with the “default” configuration as described in the table below.

## Naming

If registers are custom-mapped for a particular TWACS NG customer, an abbreviation of the customer name *may* or *may not* appear in the register profile. Many of the register names end with a helpful designation like “\_15M”. This is an indication that the transponders in question ship with registers defaulted to collect data every 15 minutes.

Not all transponder registries can be modified. Some transponders ship with a fixed data collection interval (typically every 60 minutes).

## Register Mapping

Advanced meters have many hundreds of data elements from which may be metered. Exactly which data elements are metered is often a meter configuration issue. Of the data elements which are metered, the subset captured by the transponder is a “register mapping” issue. The configuration loaded into the transponder determines which data elements are retrieved from the meter, and which transponder registers in which they are stored.

## Meter Data Recording

### Interval Length

The time span between which meter data recording samples are taken is known as the **Interval Length**. Interval lengths of 60 minutes are common in the transponder equipment. Some hardware is capable of higher sampling rates such as 30 or 15 minute intervals. The register profile identifies the sample rate to be used.

### Channel Number

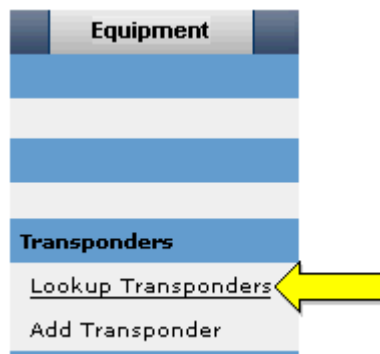
Some transponder models are capable of recording multiple channels of meter data. Each channel will identify the data element and the interval length with which it is recorded.

### Outage

The choice of a particular register profile will identify if the transponder is identified as one that may be included in checks to verify meter power. It is a “yes or no” decision.

## Looking up and Editing Transponder Path Statistics

To lookup transponder information, select the **Equipment** tab > **Lookup Transponders**.



The Lookup Transponder screen displays.

#### LOOKUP TRANSPONDER

**Lookup Criteria**

Communication Serial Number:

Manufacturer Date Code:

Transponder Type:

Transponder Model:

**Path**

Substation Name:

Bus:

Feeder:

Phase:

Advanced Lookup

Lookup

Show All

To view or edit transponder details, use the following procedure.

1. Enter any search criteria and click **Lookup**. You can toggle to additional search criteria using **Advanced Lookup**. The Lookup Results screen displays.

Lookup Results								
30 Transponder(s) Found								New Transponder
Communication Serial Number ▲	Manufacturer Date Code	Transponder Type	Transponder Model	Installation Status	Substation Name	Bus	Feeder	Phase
0189295	Z052501001	70	32	Operational	PORTOFINO	2	BUS2CT	aBc
0189296	Z000501001	70	32	Operational	PORTOFINO	2	BUS2CT	BN
0189297	Z052501001	70	32	Operational	PORTOFINO	2	BUS2CT	BN
0189299	Z000501001	70	32	Operational	PORTOFINO	2	BUS2CT	BN
0189314	Z052501001	70	32	Operational	PORTOFINO	2	BUS2CT	BN
0189319	Z000501001	70	32	Operational	PORTOFINO	2	BUS2CT	aBc
<div> Display Page 3 of 67 &lt;&lt; 1 2 3 4 5 6 7 8 9 10 &gt;&gt; next 10 Display All </div>								

## Edit Transponder Path Statistics

1. Under the **Options** column, select the **Edit** link. The Maintain Transponder screen displays, defaulted to the Basic Information tab.

MAINTAIN TRANSPONDER  
Update Transponder - Basic Information

\* Required Field.

Save Cancel

Basic Information Register Config Port Mapping Address Assignments

Transponder Information																			
Communication Serial Number*	00411442																		
Installation Status:	Operational																		
Transponder Type:	70																		
Transponder Model:	32																		
Register Profile :	UMT-F-R1																		
Manufacturer Date Code* :	A052501001																		
Firmware Version:	1.5																		
Hardware Version:	1.5																		
Country:	USA																		
<input type="checkbox"/> BLP Support <input type="checkbox"/> SoRBE Enabled <input type="checkbox"/> Multiport Hardware	Port Count: 1																		
<table border="1"> <thead> <tr> <th colspan="2">Current Path Map</th> </tr> </thead> <tbody> <tr> <td>Substation Name:</td> <td>PORTOFIND</td> </tr> <tr> <td>Bus:</td> <td>2</td> </tr> <tr> <td>Feeder:</td> <td>BUS2CT</td> </tr> <tr> <td>Phase:</td> <td>abC</td> </tr> <tr> <td>Signal:</td> <td>10</td> </tr> <tr> <td>Detection Point:</td> <td>C</td> </tr> <tr> <td>Protective Device:</td> <td></td> </tr> <tr> <td>Transformer ID:</td> <td>0068267080</td> </tr> </tbody> </table>		Current Path Map		Substation Name:	PORTOFIND	Bus:	2	Feeder:	BUS2CT	Phase:	abC	Signal:	10	Detection Point:	C	Protective Device:		Transformer ID:	0068267080
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Protective Device:																			
Transformer ID:	0068267080																		

2. You can modify **Installation Status**, **Transponder Type**, **Register Profile**, and **Manufacturer Date Code** (required).

**NOTE** If you are editing a CMT transponder then you can select a different Register Profile, otherwise the TWACS NG system automatically maps the transponder to the system default register profile.

**NOTE** Changing the register profile will re-initialize the CMT transponder.

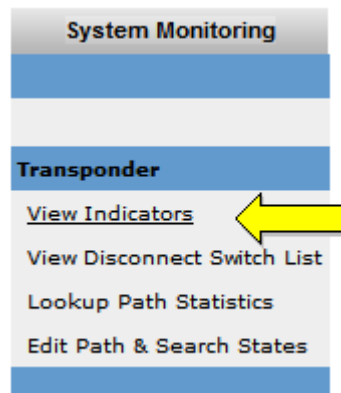
3. Click **Save** to change the state of the transponder. You can now associate this transponder with an end device/meter.

**NOTE** You cannot modify Register Configuration and Port Mapping information.

## View Transponder Indicator List

Transponders communicate with the TWACS NG system to provide critical usage data. Transponders have a built-in logic routine to detect and record diagnostic information on assigned meters. These indicators are set in the transponder hardware itself, and then communicated back to the system using TWACS NG.

To access the **View Indicators** screen, select the **System Monitoring** tab > **View Indicators**.



The Indicator List screen displays.

### VIEW TRANSPONDER INDICATOR LIST

\* Required Fields

Transponder Indicator Lookup	
Indicator Type*:	<input type="text" value="All"/>
Serial Number:	<input type="text"/>
Port Number:	<input type="text" value="-Select-"/>
Meter/End Device ID:	<input type="text"/>
Account Number:	<input type="text"/>
Report Start Date:	<input type="text" value="3/31/2006"/>
Report End Date:	<input type="text" value="3/31/2006"/>
<input type="button" value="Lookup"/>	

The Indicator List screen provides you with a mechanism to view end devices/transponders that have diagnostic or tamper indicators set.

To examine the indicators in the indicator list, use the following procedure.

1. From the Transponder Indicator Lookup box, select an indicator type in this required field. The choices for indicator types are as follows:
  - All
  - Alarm
  - Diagnostic
  - Power Quality
  - Tamper
2. Select or type the information for **Serial Number**, **Port Number**, **Meter/End Device ID**, and **Account Number**. Click the calendar icon to select the beginning and ending report dates.
3. Click **Lookup**. The Lookup Results display the end devices/meters that match your search criteria.

Lookup Results:							
11 device(s) found.							
<b>Summary</b>							
<b>Indicator</b>				<b>Count</b>			
NO_PULSES_24_HRS				12			
DIAGNOSTIC				1			
<b>Account Number ▲</b>	<b>Meter / End Device ID</b>	<b>Comm. Serial Number</b>	<b>Port Number</b>	<b>Indicator</b>	<b>Indicator Type</b>	<b>Report Date/Time</b>	<b>Process Date/Time</b>
A2292003	D1792003	2792003	0	NO_PULSES_24_HRS	TAMPER	3/31/06 12:37 PM	
A2292008	D1792008	2792008	0	NO_PULSES_24_HRS	TAMPER	3/31/06 12:38 PM	
A2292810	D1792810	2792810	0	NO_PULSES_24_HRS	TAMPER	3/31/06 12:37 PM	
A2292813	D1792813	2792813	0	NO_PULSES_24_HRS	TAMPER	3/31/06 12:38 PM	
A2292816	D1792816	2792816	0	NO_PULSES_24_HRS	TAMPER	3/31/06 12:37 PM	
A2292820	D1792820	2792820	0	NO_PULSES_24_HRS	TAMPER	3/31/06 12:38 PM	
A2292828	D1792828	2792828	0	NO_PULSES_24_HRS	TAMPER	3/31/06 12:24 PM	
A2292829	D1792829	2792829	0	NO_PULSES_24_HRS	TAMPER	3/31/06 12:37 PM	
A2292838	D1792838	2792838	0	NO_PULSES_24_HRS	TAMPER	3/31/06 12:38 PM	
A2253765	D4853765	2853765	0	DIAGNOSTIC	DIAGNOSTIC	3/31/06 12:38 PM	
A2219979	D4919979	2219979	0	NO_PULSES_24_HRS	TAMPER	3/31/06 12:38 PM	
A2219991	D4919991	2219991	0	NO_PULSES_24_HRS	TAMPER	3/31/06 10:24 AM	
A2219991	D4919991	2219991	0	NO_PULSES_24_HRS	TAMPER	3/31/06 10:28 AM	

4. To view detailed information on a transponder, click the underscored communication serial number. The Basic Information screen displays, populated with the details.

**MAINTAIN TRANSPONDER**  
View Transponder - Basic Information

Basic Information | Register Config | Port Mapping | Address Assignments | View Statistics

**Transponder Information**

Communication Serial Number\*: 1792828

Installation Status: Active      Service Voltage:      Demand Interval: 15

Transponder Type: 21      Demand Subinterval: 15

Transponder Model: 52      Load Profile: 60

Register Profiles: IMT3H-1P-FIXEDKH

Manufacturer Date Code\*: 1/1/2004

Disconnect Switch: Unknown

Connect Cmd Last Executed:

Firmware Version: 1.1

Hardware Version: 1.1

Country: USA

☐ BLP Support

☐ SoRBE Enabled

☐ Multiport Hardware      Port Count: 1

**Current Path Map**

Substation Name:	Robertson
Bus:	Bus1
Feeder:	Feeder1
Phase:	AN
Signal:	70
Detection Point:	A
Protective Device:	2
Transformer ID:	X125

Edit

5. In addition, you can **Edit** and **View** statistics.

## Lookup TWACS Transponder Path Statistics

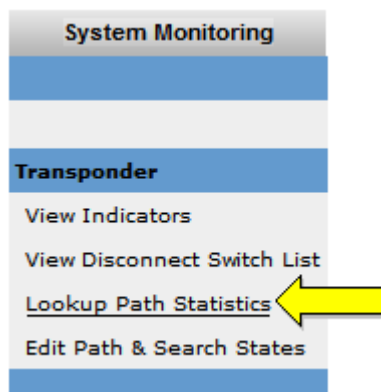
The path refers to the path states in TWACS NG's ability to find and search-in transponders. The four path states are as follows:

- **New** - The device is installed, but no activity has occurred.
- **Lost** - The device has communicated at some point, but no longer meets communication requirements.
- **Tentative** - The device has been found but the inbound signal strength is lower than expected.
- **Good** - The device's communication meets requirements.

Once a path is established, one of five search states can be applied to the path:

- **Ready** - The TWACS-enabled device is ready to be searched and will start searching at the next execution of the a Search Batch job.
- **Searching** - TWACS NG is actively issuing TWACS transactions to locate the device.
- **Failed** - The process is complete, including all retries, but was unable to locate the device.
- **Pending Analysis** - A state that provides a buffer to prevent searches from taxing the limits of the available bandwidth. These will automatically transition to the Searching state as device searches are completed.
- **Done** - The search process for the device is completed, successful, and no further transactions are required.
- **Outage or Switch** - The transponder is marked for outage or switching analysis.

To access the Lookup Path Statistics screen, select the **System Monitoring** tab > **Lookup Path Statistics**.





The Lookup Criteria region displays.

#### LOOKUP TWACS TRANSPONDER PATH STATISTICS

**Lookup Criteria**

TWACS Communication Serial Number:

Path State  Search State  Active Ind  Detect Point  Detect Type

**Path**

Sub Name:  Bus Name:

Fdr Name:  Phasor:

Protective Device:  Line Section:

Pole Number:  Transformer:

Region

**Lookup**

When you lookup transponders all the available input fields serve to filter and narrow your search (except for the **Sub Name** and the **TWACS Communication Serial Number**).

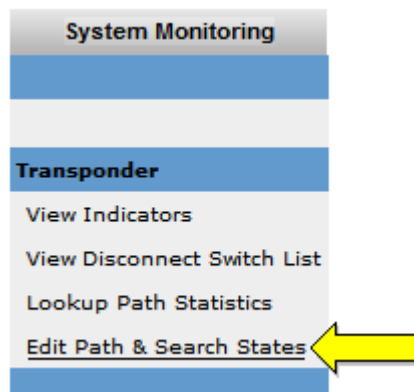
Entering the **TWACS Communication Serial Number** or **Sub Name** will return a single unique transponder path.

After clicking **Lookup**, the Results list displays the path statistics.

Transponder State	TWACS Serial #	Path State	Search State	Sub Name	Bus Name	Fdr Name	Phasor	Date Assigned	Region	Region Trust Flag	Protective Device
Operational	1792002	Good	Done	Rosfrack	Bus1	Feeder1	BN	Apr 06, 2005	false		F9076
Operational	1792008	Good	Done	Rosfrack	Bus1	Feeder1	BN	Apr 06, 2005	false		F9076
Operational	1792010	Good	Done	Rosfrack	Bus1	Feeder1	CN	Apr 06, 2005	false		F9076
Operational	1792013	Good	Done	Rosfrack	Bus1	Feeder1	AN	Apr 16, 2005	false		F9076
Operational	1792016	Good	Done	Rosfrack	Bus1	Feeder1	BN	Apr 06, 2005	false		F9076
Installed	1792018	New	Failed				--		false		F9076
Operational	1792020	Lost	Failed	Rosfrack	Bus1	Feeder1	CA	Apr 06, 2005	false		F9076
Operational	1792024	Lost	Searching	Rosfrack	Bus1	Feeder1	BN	Apr 06, 2005	false		F9076
Operational	1792028	Good	Done	Rosfrack	Bus1	Feeder1	AN	Apr 06, 2005	false		F9077
Operational	1792022	Good	Done	Rosfrack	Bus1	Feeder1	CH	Apr 06, 2005	false		F9077
Operational	1792034	Good	Done	Rosfrack	Bus1	Feeder1	AN	Apr 06, 2005	false		F9077
Operational	1792037	Good	Done	Rosfrack	Bus1	Feeder1	BN	Apr 06, 2005	false		F9077
Operational	1792038	Good	Done	Rosfrack	Bus1	Feeder1	CH	Apr 05, 2005	false		F9077
Offline	1792039						--		false		
Operational	1792043	Good	Done	Rosfrack	Bus1	Feeder1	BN	Apr 06, 2005	false		F9077
Operational	1792045	Good	Done	Rosfrack	Bus1	Feeder1	AN	Apr 05, 2005	false		F9077

## Edit Path & Search States

To access the Lookup Path Statistics screen, select the **System Monitoring** tab > **Edit Path & Search States**.



The Transponder Path Action dialog displays below the Lookup Path Statistics region.

A screenshot of a dialog box titled 'Transponder Path Action'. It contains two dropdown menus: 'New Path State' and 'New Search State', both with 'Select' as the current value. To the right of these is a text area labeled 'Action Comments'. At the bottom right of the dialog is a blue button labeled 'Update Path'.

This gives you the ability to manually override any existing path states and search states.

## The Logic of Paths and Search States

This section describes what causes a transponder path state to change from **Good** to **Lost**, and how the system restores the transponders to a status of **Good**.

### A Short Primer on Path Statuses and Path States

**Path** defines the TWACS Outbound and Inbound communication parameter and consists of substation, bus, feeder, phasor and detection point. Transponder path state and search state provide information on the health of the communication to a particular unit.

There are four possible transponder path states:

- **New** – Transponder is installed but no activity has occurred.
- **Lost** – Transponder communicated at one time, but no longer meets the required communication requirements
- **Tentative** – Transponder has been found but inbound signal strength is less than expected, which may indicate the transponder is on a crosstalk path. The system will automatically search this transponder again.
- **Good** – Meets expected communication requirements.
- **Outage** - There is a service outage at the location served by this transponder. Users must manually code transponders into this state if they identify an outage.
- **Switch** - The system has automatically detected this transponder (and possibly others on the same path) have been switched to a new path.

There are five possible transponder search states:

- **Ready** – Transponder is “ready” to be searched and will start searching at the next execution of the Search Batch job
- **Searching** – Actively issuing transactions to locate the transponder
- **Done** – Process is complete and successful; no further transactions will be issued
- **Failed** – Process is complete but was unable to find the transponder; All retries have been exhausted; No further transactions will be issued until user intervention via the GUI updates the search state back to **Ready**.

A transponder’s search state is set to **Lost** if the number of failures to communicate exceed the minimum consecutive failed communications (CFC) count (or Group CFC). Group CFC is based only on the current day’s activity. If ten or more units on the same path meet or exceed the Minimum Group CFC they are set to **Lost**.

In order to understand path states, it’s important to understand the outage switching functionality described in Chapter Four, *Viewing the Outage Switch List* .

## How Previously Good Transponders Change to Lost Status

For the following example, we assume that the transponder in the meter has, at some point, been assigned a path state of **Good** or **Tentative**. In other words, it is assumed that this is not a new installation, and the meter has already produced a number of successful reads.

A transponder with a path state of **Good** will change to **Lost** if there are a consecutive number of read failures that exceed the parameter known as **Min CFC** or **Min Group CFC**. The threshold for failures is user-defined system parameter. Generally, the default value for permissible consecutive read failures is five. If the TWACS NG system fails to read a known transponder five times in a row, the path state changes to **Lost**, and the search state changes to **Ready**. **Min Group CFC** is a threshold that sets search state to **Pending Analysis** if more than  $x$  (configurable parameter) units on the same path (the higher of 5 units or 5% of total units in group) should be searched at the same time. If the limit is met, then the remaining **Lost** units on the same path will be marked as the **Pending Analysis** search state. This prevents excessive traffic in the event that a whole bus goes down.

Failures are defined as and can be any combination of the items below:

- The TWACS communication fails either outbound or inbound such that the RCE response status is non-zero.
- The command fails at the SCE level such that the SCE execution status is non-zero.

## Recovering a Transponder in Lost Status

If a transponder has moved to a path status of **Lost**, its search state will be **Ready** and on the next run of the **search batch**, the **job will start searching a new path for that transponder**. Once the transponder is located on a new path that meets the requirements for good communication the path will be updated and the path state set to **Good**. If the transponder is not found and the search escalation and retry rules have been exceeded the path state will remain as **Lost** and the search state will be set to failed.

When the user is ready to resubmit a transponder with a path state **Lost** and search state **Failed**, the TWACS NG System Monitoring and Equipment tab can be used to change the search state from **Failed** to **Ready**.

To access the transponder path statistics, go to the **System Monitoring** tab > **Lookup Path Statistics** function.

#### LOOKUP TWACS TRANSPONDER PATH STATISTICS

**Lookup Criteria**

TWACS Communication Serial Number:

Path State:  Search State:  Active Ind:  Detect Point:  Detect Type:

**Path**

Sub Name:  Bus Name:

Fdr Name:  Phasor:

Protective Device:  Line Section:

Pole Number:  Transformer:

Region:

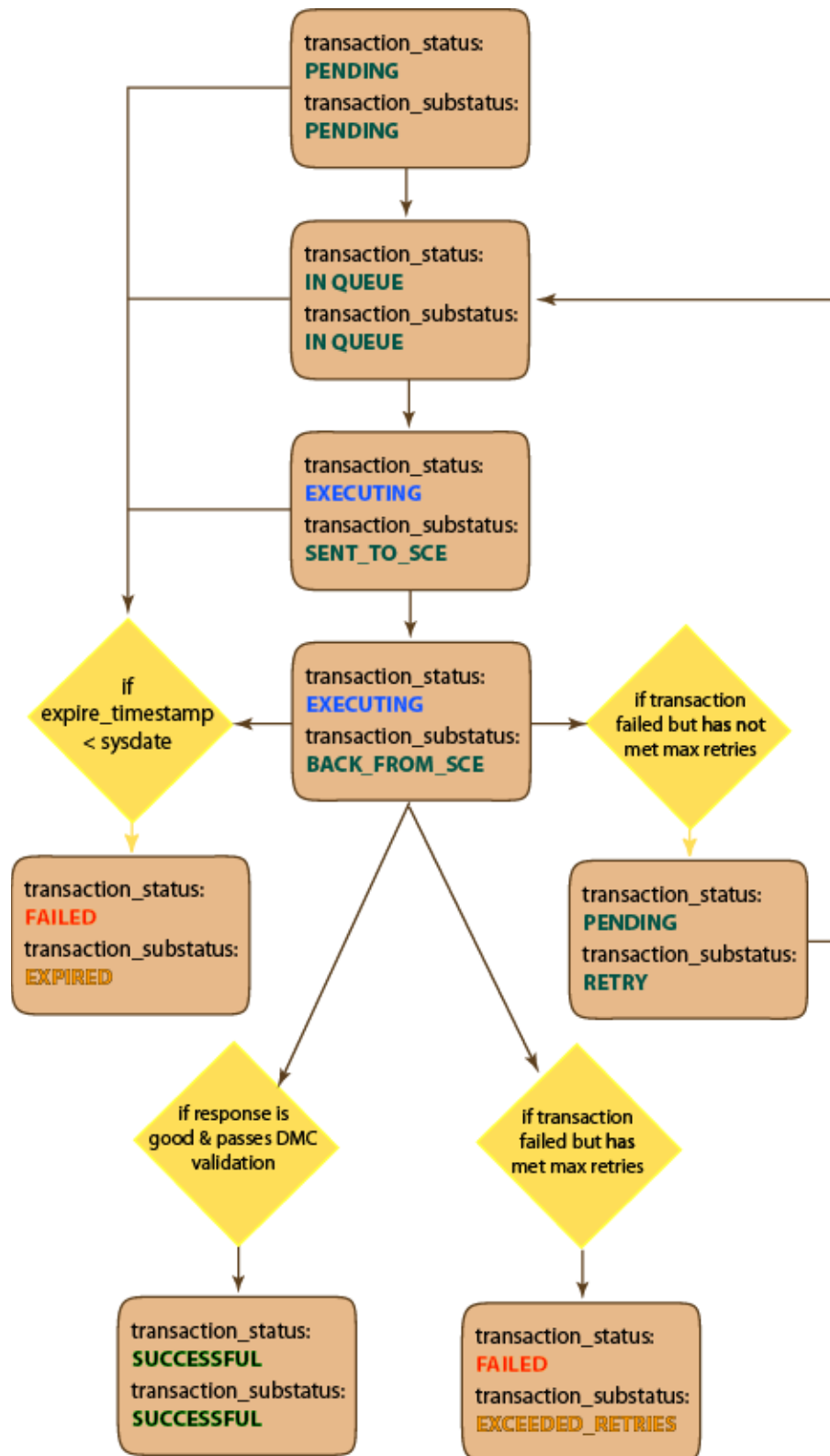
**Lookup**

After entering the available criteria for either the transponder or path and clicking **Lookup**, the path statistics display, including the **Path State** and **Search State**.

Transponder State	TWACS Serial # ▲	Path State	Search State	Sub Name	Bus Name	Fdr Name	Phasor	Date Assigned
Operational	9992803	Good	Done	Sub1	Bus1	Feeder1	BN	Apr 06, 2005
Operational	9992808	Good	Done	Sub1	Bus1	Feeder1	BN	Apr 06, 2005
Operational	9992810	Good	Done	Sub1	Bus1	Feeder1	CN	Apr 06, 2005
Operational	9992813	Good	Done	Sub1	Bus1	Feeder1	AN	Apr 16, 2005
Operational	9992816	Good	Done	Sub1	Bus1	Feeder1	BN	Apr 06, 2005
Installed	9992818	New	Failed	Sub1				--
Operational	9992820	Lost	Failed	Sub1	Bus1	Feeder1	CA	Apr 06, 2005
Operational	9992824	Lost	Searching	Sub1	Bus1	Feeder1	BN	Apr 06, 2005
Operational	9992828	Good	Done	Sub1	Bus1	Feeder1	AN	Apr 06, 2005
Operational	9992829	Good	Done	Sub1	Bus1	Feeder1	CN	Apr 06, 2005
Operational	9992834	Good	Done	Sub1	Bus1	Feeder1	AN	Apr 06, 2005
Operational	9992837	Good	Done	Sub1	Bus1	Feeder1	BN	Apr 06, 2005
Operational	9992838	Good	Done	Sub1	Bus1	Feeder1	CN	Apr 05, 2005
Offline	9992839			Sub1				--
Operational	9992843	Good	Done	Sub1	Bus1	Feeder1	BN	Apr 06, 2005
Operational	9992845	Good	Done	Sub1	Bus1	Feeder1	AN	Apr 05, 2005

## TWACS NG Transaction Status/Substation Flowchart

This flowchart illustrates TWACS NG's transaction status processing.



## Transponder Prioritization

Some transponders can be designated to search faster than others. TWACS NG ships configured with the following transponder settings:

Search priority = 4000

FGU assignment priority = 5000

lostMaxPercentToSearch = 5

lostMaxNumberToSearch = 20

lostMaxResponsetime=30 (minutes)

The **Search** and **FGU** priority are set very high so that any of these would take priority over the standard event transactions. The number of searches or FGU assignment transactions are a small fraction of the total event transactions, and users would typically want to get any Lost or Tentative meters researched immediately so they can be read. Users also want any FGU assignments to complete immediately so TWACS NG doesn't have to send out the transaction serially.

Here is a search scenario that illustrates the importance of the **lostMax** values.

Assume that **Search** currently runs once an hour at the start of the hour.

When the search batch job runs, it will reference the priority.properties file for the "lostMax" values.

The two values, (**lostMaxPercentToSearch** and **lostMaxNumberToSearch**), determine how many transponders to search first while in the **Lost** scenario. The higher of the two values determine how many transponders the search batch job will move from **Lost/Ready** to **Lost/Searching**.

For purposes of example, assume that 500 transponders are in **Lost/Ready**.

Five percent of 500 = 25

25 is greater than 20. Therefore, **Search** will move 25 of the **Lost** transponders from **Ready** to **Searching**.

The next time the search batch job runs an hour hence, it will reference the three **lostMax** values again. If there are still transponders in **Lost/Searching**, but they have been searching for more than 30 minutes, then they will not be counted when TWACS NG decides how many more **Lost** transponders to move to **Searching**.

In the example above, you have 475 transponders remaining in **Lost/Ready**.

Five percent of 475 = 23.75 = 23

Again, 23 is greater than 20. Therefore, search will move 23 more transponders to **Lost/Searching**.

However, if there were still **Lost** transponders in **Searching**, but haven't been searched for 30 minutes, then it will affect how many **Lost** transponders search move to **Searching** status.

Assume there are still 5 transponders in **Lost/Searching** that haven't been searching for 30 minutes.

It would still go through the calculations:

Five percent of 475 = 23.75 = 23

Again, 23 is higher than 20. But five transponders need to be removed since there have been five in **Searching** status for less than 30 minutes.

Therefore, **Search** would move 18 **Lost/Ready** transponders to **Lost/Searching** status.

These configurable **lostMax** values exist to control the number of searches and prevent a flood of transactions from impacting the system. Keep in mind that the **lostMax** values have nothing to do with transponders in **New** or **Tentative**. These values were initially created prior to implementing the **Switching** functionality. Therefore, if users choose the **Switching** functionality, few transponders should ever move to **Lost** status. Instead, they would move to **Switched**. If not using the **Switching** functionality, then consider where these values might be set for maximum system efficiency.

## Fast Track Search and Initialization

TWACS NG provides options for searching and initializing transponders that will allow the user to tune the application to better meet operating conditions:

- The user has the ability to designate select transponders to utilize higher priorities than those assigned during the normal initialization process. This is referred to as **Fast Track** initialization. The actual priorities are set using a property file.
- All fast track transponders are of a higher priority. Since no distinction in priority is made within those that are designated fast track, it's recommended to limit the fast track to a relatively small subset of all transponders being installed.
- From the Code Table Maintenance screen, the user will select the **FAST\_TRACK\_SEARCH\_INITIALIZE** table to begin the process to add/edit/delete a type and rate code combination for fast track processing.



## CODE TABLE MAINTENANCE

## FAST\_TRACK\_SEARCH\_INITIALIZE List View

List View of Records

8 Records found.

New Record

Refresh

<input type="checkbox"/>	RATE_CODE_ID ▲	RCE_TYPE_NBR	Options
<input type="checkbox"/>	1	100	<a href="#">View</a>   <a href="#">Edit</a>
<input type="checkbox"/>	1	40	<a href="#">View</a>   <a href="#">Edit</a>
<input type="checkbox"/>	2	100	<a href="#">View</a>   <a href="#">Edit</a>
<input type="checkbox"/>	2	30	<a href="#">View</a>   <a href="#">Edit</a>
<input type="checkbox"/>	2	34	<a href="#">View</a>   <a href="#">Edit</a>
<input type="checkbox"/>	2	21	<a href="#">View</a>   <a href="#">Edit</a>
<input type="checkbox"/>	2	40	<a href="#">View</a>   <a href="#">Edit</a>
<input type="checkbox"/>	ALL	ALL	<a href="#">View</a>   <a href="#">Edit</a>

Delete

Once the user has either selected the **Edit** link, or clicked on **New Record**, a type and rate code combination can be selected for inclusion in fast track.

## CODE TABLE MAINTENANCE

## FAST\_TRACK\_SEARCH\_INITIALIZE Detail View

Save

Cancel

## Detail View of Record

Transponder Type:

100 ▼

Rate Code:

 RESIDENTIAL ▼  
 Select  
 COMMERCIAL  
**RESIDENTIAL**  
 STREET LIGHTING  
 ALL

Previous

Next Record

# Initialize Transponders

The initialize transponder process is initiated in two ways: via the integration hub or the user interface.

## Integration Hub

Initializing transponders through the Integration Hub uses five integration hub files. The initialization process can begin with either new transponders or existing transponders. When new transponders are installed at a customer residence and the Integration Hub files are populated correctly and placed in the correct directory within TWACS NG, a batch process within TWACS NG will assimilate the information contained in the Integration Hub files. At this point the new transponders have an installation status of **Installed**, a path state of **New** and a search state of **Ready**.

When the Search Transponder batch job executes, it accumulates any transponder with a path state of **New**, a search state of **Ready** and begins the process of finding the best path to the transponder connected at the customer's residence. When the transponder's best path has been established, the transponder's path state becomes **Good** and the transponder's search state changes to **Done**. A path state of **Good** and search state of **Done** is a prerequisite before the initialize process can begin.

## Initialize Transponder Basics

The regular initialize process consists of twelve steps. The scalable deployment initialize process consists of nine. Some of the steps in the initialize process can be disabled through code tables based on type and model. The scalable deployment process will only be used with those transponders that support this type of transaction. Some steps in the initialize process may be skipped if the data contained within the transponder has not changed since initial initialization or if the transaction is not supported the transponder in question. Table 1 below provides a brief description of the Regular Initialize and Scalable Deployment Initialize steps.

### Regular Initialization Steps

1. Verify product
2. Reset indicators
3. De-assign two-way address
4. Initialize switch status for transponders having switching capability
5. Write billing cycle date
6. Set daily shift time electric
7. Mark for two-way assignment
8. Write interval duration

9. Write interval duration multi-channel (if supported)
10. Mask indicators (if configured)
11. Finalize transponder initialization
12. Collect historical data
13. Update Demand Configuration (if type model is configured)

## **Scalable Deployment Steps**

1. Super Initialize Transactions
2. Initialize switch status for those transponders with switching capability
3. Mark for two-way assignment
4. Write interval duration
5. Write interval duration multi-channel (if supported)
6. Mask indicators (if configured)
7. Finalize transponder initialization
8. Collect historical data
9. Update Demand Configuration (if type model is configured)

## **Re-initialize**

The re-initialize process will be invoked when either the Integration Hub process or user interface changes parameters which directly effect the transponders configuration. For example, if the integration hub process changes the register profile of a transponder, the transponder will be marked internal to the TWACS NG database to re-initialize. There are six steps in the re-initialize process. Some of the steps can be configured to be disabled through code table maintenance.

### **Re-Initialize Process**

1. Write Billing Cycle Date
2. Set daily shift time electric
3. Mark for FGU assignment
4. Write interval duration
5. Write interval duration multi-channel
6. Finalize transponder initialization.
7. Update Demand Configuration (if type model is configured)

## Resume Initialize

If any of the initialization process steps fail, the user can mark the transponder to resume initialization process through maintain transponder on the TWACS NG web application. When the transponder is marked for resume initialization a TWACS NG batch process will continue from the failed initialize step and attempt to proceed to the next step(s.)

## Additional Initialize Step Information

### Super Initialize Transaction

Certain transponders support this transaction to increase the throughput of the initialize transponder process. This transaction incorporates the commands Verify Product, Reset Indicators, De-assign two way address, Write Billing Cycle Date, and Set Daily Shift Time Electric.

### Verify Product

When the type of product is received TWACS NG will validate that the value received from the transponder and the value that was assimilated by the Hub Integration process are the same. If they are not TWACS NG will change the value assimilated by the Hub Integration process to match the value received by the transponder. TWACS NG will then validate the  $K_h$  and  $M_p$  constants provided by the Integration Hub process against the values stored in the TWACS NG database. If they are different the TWACS NG system will send a notification indicating these two values do not match.

### Reset Indicators

This will ensure all transponders start from a known state as it relates to tamper, diagnostic and alarm indicators.

### De-assign Two-Way Address

This command ensures all transponders do not have a previous two-way address that could interfere with TWACS communications.

### Initialize Switch Status

This transaction is only valid for switch-enabled transponders. This will read the status of the switch and store the statistics in the TWACS NG database. It is important that all switch-enabled transponders are initialized.

### Write Billing Cycle Date

Some transponders store billing cycle information in a designated register for collection at a later date. The billing cycle date is sent to the transponder such that the transponder can shift the appropriate data into designated billing cycle registers.

## Set Daily Shift Time Electric

Most transponders have special daily shift registers to store daily information. This time is written to the transponder such that the transponders have knowledge of when to shift daily information into the designated daily shift registers. The default time is midnight and the default setting in TWACS NG is midnight as well. This value can be changed for all transponders through property file.

## Mark for Two-way Assignment

This is a flag that is set in the TWACS NG database informing TWACS NG application to perform the Two-Way Address Assignment Process.

## Write Interval Duration

Some transponders support the ability to collect interval data utilizing various data registers. For example: Some transponders can collect Forward Energy, Net Energy or Reverse Energy. This is supported by changing the register profile of a transponder. When the information in the Integration Hub Files indicates a register profile TWACS NG will send a transaction to the transponder to configure the transponder based on the information in the Integration Hub Files. The register profile can also be changed through the User Interface (UI.) When register profile is changed through either Integration Hub Process or UI the transponder will be marked for the re-initialization process.

## Write Interval Duration Multi Channel

Some transponders support the ability to collect interval data utilizing various data registers split across multiple channels. For example: Some transponders can collect Forward Energy and Net Energy or Net Energy and Reverse Energy in channel 1 and 2 respectively.

## Mask Indicators

For some indicators in transponders may be unwanted or do not apply to the specific rate the customer that is being billed. These unwanted indicators can be masked so that they are not sent to TWACS NG. Indicator masks can be added through code tables in the UI. If the transponder's type and model is configured to update demand configuration, the system sends a command to update demand configuration.

## Finalize Transponder Initialization

The transponder is set to have a path state of **Good**, a search state of **Done** and will send a notification indicating successful initialization.

## Historical Data Collection

The TWACS NG system will attempt to collect historical interval readings from the newly initialized transponders.

## Fast Track

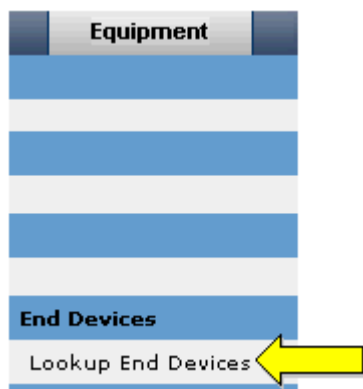
Fast track is a methodology used to change the TWACS NG priority of Search Process and Initialize Process transactions. The Search Process and Initialize Process transactions can have the same or different priorities, configurable in the **priority.properties** and **initTransponder.properties** files. By default, values are set to the same integer. Users can add to the fast track list by rate code and transponder family. The list can be viewed by logging into the application and clicking the **System Configuration** tab > **Lookup/Edit Tables** > **Fast\_Track\_Search\_Initialize**.

## Lookup End Devices

The **Lookup End Devices** screen is a convenient reference screen that Customer Service Representatives (CSRs) can use to obtain the following information:

- Account Number
- Communication Serial Number
- Meter/End Device ID:
- Premise ID

To access the Lookup End Devices screen, select the **Equipment** tab > **Lookup End Devices**.



The Basic Lookup Criteria input region displays.

All input fields in the Lookup Criteria region accept wildcard characters.

You have three primary functions to execute based on the full or partial input of one or more critical identifiers or wildcard entries.

- Advanced Lookup
- Lookup

- Show All

The **Advance Lookup** button will toggle between the **Basic Lookup** criteria input section and an **Advanced Lookup** input.

You can cross-reference any criteria by entering one valid field of criteria and clicking **Lookup**. The Lookup Results screen displays.

For a complete list of all end devices, you can click the **Show All** button. The first page of the entire end device catalog displays.

from additional drop-down menus. Once these sort qualifiers have been determined, the Lookup Results screen will display.

#### MESSAGE LOOKUP

\* Required Fields

Message Lookup

Message Type :

Severe

Message Source :

SCE

Lookup

Lookup Results :

3 Message(s) found .

Select

<input type="checkbox"/>	Message ▲	Message Type	Message Source
<input type="checkbox"/>	SCE <Number> initialized successfully	Severe	SCE
<input type="checkbox"/>	Initialize SCE Failed	Severe	SCE
<input type="checkbox"/>	Exception happened in the processing of transactions during the initialization of SCE	Severe	SCE

## Add Messages

TWACS NG Administrators can add system notifications using the **Add Messages** function subset of the **User Setup** tab.

The system already contains a host of messages. Before you create a notification message, ensure a similar message does not already exist.





The Add Message to Notification Mapping screen displays.

#### ADD MESSAGE TO NOTIFICATION MAPPING

\* Required Fields

Notification Information

Notification Category\* : ACCOUNT

Notification Subcategory\* : --Select--

Notification Type\* : --Select--

Message\* :

Add Message

Cancel

Using the drop-down selections for the required category, subcategory, and notification type, enter the appropriate classifications for the message that you are about to create. Then click **Add Message**.

Enter your notification message and click **Save** when complete.

## Setting Up E-mail Notifications

The notifications returned in the View Notifications Screen in TWACS NG can also be sent to an email address. The process involves selecting which notifications are to be sent to the users, modifying property files, and updating database tables.

Before you begin you should verify that your email provider will allow the TWACS NG MC Application Server to pass data to the email server on port 25. If a firewall is in place you will need to provide them the TWACS NG application server network IP address or host name so the email service provider can open the firewall. Last, you will need to obtain the email server host name from your email service provider.

**NOTE:** There is no way to segregate the emails into different groups, such as SCE notifications going to substation technicians, DMC errors going to software engineers, etc. Several low cost software applications are available from other vendors that can distribute the email messages accordingly.

## Steps to set-up email notifications:

1. Begin by selecting which notifications for which users need notifications. Run the following query on the MC database to generate a list of notifications which can be sent via email.

```
-- Run on MC Database
SELECT error_number, ERROR_TYPE, error_source,
       notification_name, error_condition,
       notification_required
FROM notification_error_definitions
WHERE persist_required = 'Y'
ORDER BY 1;
```

Sometimes the `notification_required` field equals Y. If the **notification\_required** field is set to **Y**, it means the notification is defaulted to send an email notification. Additional notification summary information may be found in the **DebugMessageResources.properties** file located under the common directory.

2. Once the email notifications are selected the database administrator must run the following database update scripts.

For notifications which receive emails put the `error_number` of the notifications which currently have a **notification\_required** field of **N** separated by commas into the open parenthesis field below.

```
-- Run on MC Database
UPDATE notification_error_definitions
SET notification_required = 'Y'
WHERE error_number IN ( );

COMMIT;
```

For notifications which do not receive emails put the **error\_number** of the notifications that currently have a **notification\_required** field of **Y** separated by commas into the open parenthesis below.

```
-- Run on MC Database
UPDATE notification_error_definitions
SET notification_required = 'N'
WHERE error_number IN (?);

COMMIT;
```

Run the following query to verify the expected results.

```
-- Run on MC Database
SELECT  error_number
        FROM notification_error_definitions
        WHERE notification_required = 'Y'
ORDER BY 1
```

**NOTE:** The user needs to run a COMMIT command for the database table to be changed.

3. Next, make edits to the twacsconfig.properties file located in the com/twacs/config/common/resources folder on the MC application server.

Midway through the file note the following:

```
*****
#Email Properties
SMTP_HOST=
FROM_ADDR=
TO_ADDR=
# This is either true or false
MAIL_DEBUG=true
# Change this to System/application admin-email
ADMIN_EMAIL=
# This value shall be non-zero, At least ONE
RETRY_ATTEMPTS=2
```

Insert the SMTP\_HOST obtained from your email service provider. Also, insert the FROM\_ADDR and TO\_ADDR. The TO\_ADDR can be a list of addresses to send notifications although each address should be separated by a semicolon delimiter. If the ADMIN\_EMAIL is not already set-up provide an admin email address. The admin receives attempted messages which return errors.

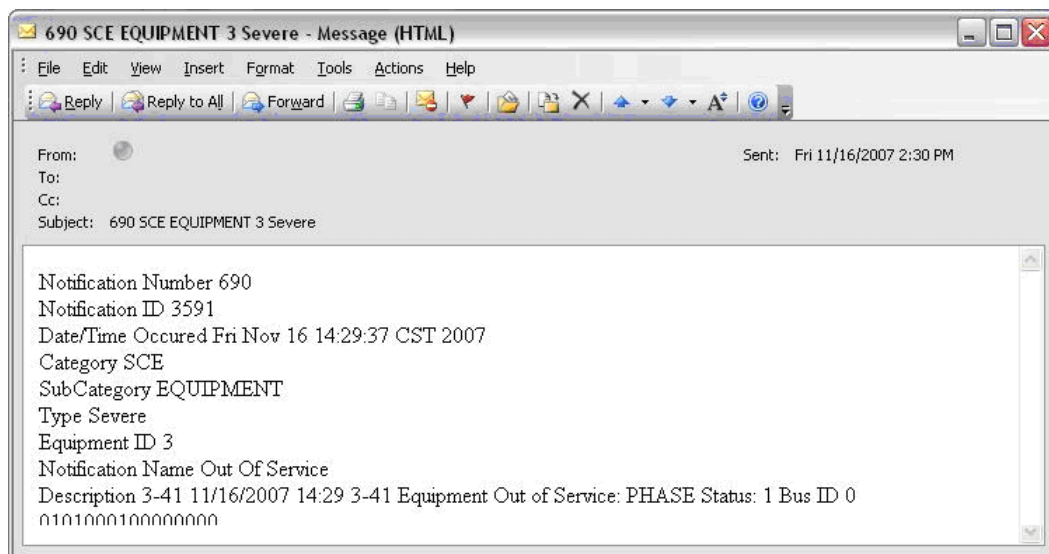
4. You can also make changes to the DefXHrs field while editing the twacsconfig.properties file. This field should be located just below the email properties in the twacsconfig.properties file.

```
# Notifications can either happen eagerly, at the time exception
creation, or
# lazily, at the exit of EJB invocations. Value "true" will force eager
notifications,
# anything else, no property or a non "true" value will cause lazy
notifications.
DefXHrs = 8
```

The value of **DefXHrs** builds a parent-to-child relationship with the notifications which throttles the frequency you will receive messages. A parent to child relationship occurs with all notifications that have the same category, subcategory, type, and equipment id. The parent is the first notification to come in under the group and an email will be sent. Any notifications that follow with the same criteria will come in as children to the first notification and no email will be sent until the notification is marked as **Resolved** in the database or the value **DefXHrs** exceeds the time of the last notification.

**NOTE:** The changes won't be made until the user bounces the application server.

5. After saving the properties files bounce the TWACS NG application servers to initiate the setting changes in steps 3 and 4.
6. You should now receive email notifications for your selected criteria. The message below is an example of what the email message will look like. It displays the Notification number, Category, Subcategory, Equipment ID, and type in the subject along with additional information in the message.



If message seem to come intermittently intermittent messages or no messages at all check the following:

- Verify the connection between the TWACS NG application server and mail server.
- Verify the email is not identified as spam.
- Verify the system admin did not receive an error message.
- Verify the notification is persisted to the database and the **PERSIST\_REQUIRED** and **NOTIFICATION\_REQUIRED** flags are both set to **Y** in the **NOTIFICATION\_ERROR\_MESSAGE** table.
- Verify the notification is a parent notification. If the notification is a child notification then the notification time must have exceeded the last notification time more than **DefXHrs**.
- Verify the value of **DefXHrs** is set in the **twacsconfig.properties** file is set and is not **NULL**.

## Two-Way Addressing and Function Group Units (FGUs)

Two-Way addressing is a TWACS communication standard created specifically for increasing throughput of TWACS communication.

Transponders in an electrical distribution system are connected in a specific path. Extending from the distribution **substation** are **buses**. Substation buses extend to distribution **feeders**. Distribution feeders are comprised of three individual and separate **phases**; **A**, **B** and **C**. In most instances residential customers are connected to one of these three phases. Therefore, each transponder connected to the electrical distribution network has a distinct substation, bus, feeder and phase. The combination of the substation, bus, feeder and phase is a **communication path**. When groups of transponders are on the same path and are of the same family, TWACS NG can employ two-way addressing to communicate to those transponders more effectively. Each transponder is assigned a **Function, Group and Unit (FGU)** number based on the path, family and, in some cases, certain billing information such as the billing cycle number. The combination of FGU and billing information is referred to as a **Two-Way Address**. When transactions are created, TWACS NG uses a grouping process to consolidate transactions by their Two-Way Address. The grouping process is a TWACS NG batch process that has a configurable execution interval. The execution interval can be edited in the **quartzJobConfigDMC.properties** file located on the DMC.

Two-way addressing is an effective way to communicate with many transponders at one time. This method of communication is much more efficient than the alternative of communicating with each transponder individually. When the SCE receives the command with a two-way address, it broadcasts the command to all of the transponders on the specified communication path instead of lots of individual commands. Upon receiving a two-way addressed command from the SCE, a transponder will wait a specific amount of time before responding to the SCE. The amount of time the transponder waits is based upon its position in the two-way address group. The pause is necessary so that the other transponders in the address group who received the message won't interfere with each other's communications. The SCE will gather the collective responses from all the transponders and send them back to TWACS NG in one command as a list of responses, maximizing communication bandwidth and network traffic.

Two-way addresses are made up of a hierarchy of **function id**, **group number** and **unit number**. A function can contain up to 262,143 groups and a group can contain up to 255 units. When a two-way address is assigned, the transponder stores its given function, group, and unit number. Some transponders can store multiple addresses. When the SCE broadcasts a command to the RCE devices, each device checks its own two-way address(es) and responds if necessary.

The function number is the highest level in the hierarchy. The function number is frequently used to classify transponders by operation being performed. For example, function 1 may be used for AMI and function 6 may be used for outage. Function ranges for separate applications are configurable. The configurations can be modified in the **FGUAssignment.properties** file. Each of these operations needs to communicate with the same RCE devices, but they have different requirements. The meter reading operation needs to communicate with transponders based upon a schedule that allows all of the meter readings to be gathered in a certain period of time. The outage operation needs to send transactions to transponders to ensure power is still on. There can be a range of functions assigned for the same operation. The group number is the middle of the hierarchy and is used to break the function into sets based on the communication path, type and model, and attributes. The unit number is the bottom of the hierarchy and is used as a unique identifier for each transponder within the group. The unit number is what the transponders use to determine the amount of time to pause before responding to an SCE command.

## Autonomous Outage Pinging (AOP)

AOP function provides an automated way for the TWACS system to detect outage and restoration events through the utility's infrastructure network. Rather than wait for trouble calls and customer complaints to initiate a search for power outages, the AOP functionality immediately recognizes when a pattern of missing data equates to a probable outage in a particular location.

A checkbox within the SCE interface screen enables the functionality.

Go to **Equipment > Lookup SCE**. Either enter an SCE name or use the search features. Under the **SCE Options** column, click the link to **View** an SCE.

The **Edit SCE** screen displays.

Near the top right of the interface is a link for **Outage Pinging**. Click the link.

## AUTONOMOUS OUTAGE PINGING CONFIGURATION

Please complete required fields.

\* Required Fields

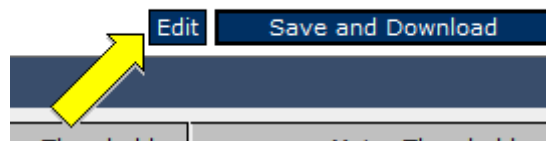
Substation Name: **D1SUB1**    SCE Name: **D1SUB1 111**    SCE Number: **101**Operational Status: **Online**

SCE Configuration Command Status:

Autonomous Outage Pinging Configuration										
Select All	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>							
Bus Name	Enable Outage Pinging	Enable SCE Logging	Enable Statistics	Meter Ping Period (minutes)	Meter Ping Execution Window (minutes) *	Transformer Thresholds		Meter Thresholds		
						Outage Consecutive Failures *	Restoration Consecutive Successes *	Outage Consecutive Failures *	Consecutive Failures after Transformer Outage *	Restoration Consecutive Successes *

A new pop-up window with the Autonomous Outage Pinging Configuration interface displays.

Click **Edit**.



The checkboxes and numerical inputs are now active and adjustable. You can enable the outage pinging, enable the logging, and/or enable the statistics.

Autonomous Outage Pinging Configuration										
Select All	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>							
Bus Name	Enable Outage Pinging	Enable SCE Logging	Enable Statistics	Meter Ping Period (minutes)	Meter Ping Execution Window (minutes) *	Transformer Thresholds		Meter Thresholds		
BUS1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	45	5	3	1	3	2	1

The functionality of the Autonomous Outage System is shared between the CCE and the SCE. The CCE creates the AOP transactions to poll all selected meters and configures the SCE with an AOP schedule, along with other information required to perform the AOP function. The SCE executes the AOP transactions according to the schedule provided, processes the responses and updates the outage state for each transponder and transformer. The SCE then sends any outage state changes to the CCE. The CCE processes the state change messages and sends updates to all external system which have subscribed to Outage state changes.



## Outage/Restoration Types

The system supports two types of outages: **meter** outages and **transformer** outages. A meter outage is detected when an individual meter fails to respond and a meter restoration is reported when the meter responds successfully.

A transformer outage is derived from meters which are served from the transformer. Typically multiple meters on the same transformer must fail before a meter outage is reported. A transformer outage may be reported before the meters on the same transformer is reported, since each meter must fail consecutive times, while a transformer outage only requires multiple units on the same transformer to fail.



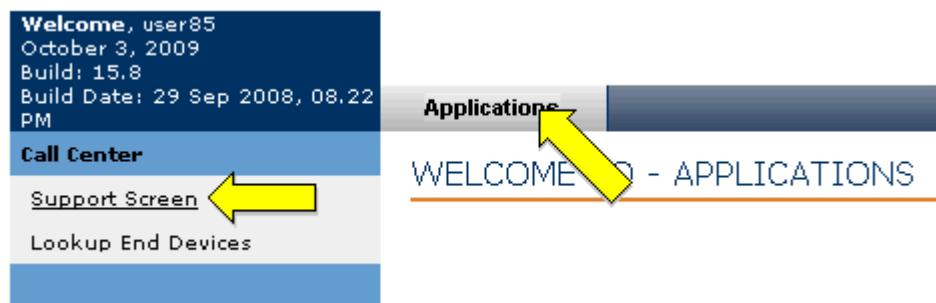
# OPERATING TWACS<sup>®</sup> NG

This chapter provides information for using the TWACS NG functionality that is used primarily by CSRs in support of servicing customer requests.

## Call Center Support Screen

The Call Center Support Screen is a centralized interface for many of the functions that Customer Service Representatives (CSRs) use to search information and service customer requests.

To access the support screen, select the **Applications** tab > **Support Screen**.



The Call Center Support screen displays.

**CALL CENTER SUPPORT**

---

**Transponder Selection**

Service Type:  Premise ID:  Transponder Serial Number:

Account Number:  Meter / End Device ID:

---

**Historical Data**

☒ **Daily Usage Graph** ☐ **Command History**  
 Select Command(s):

☐ **Daily Meter Read Results** ☐ **Load Profile**  
 Start:  End:  Select Data Type: ☒ Pulses ☐ kWh

---

**On-Request Command**

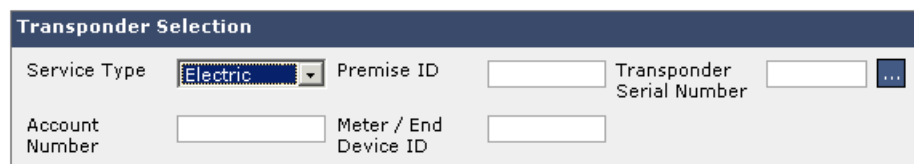
From this centralized interface, CSRs can perform the following tasks:

- Retrieve account numbers or other transponder identification information
- Retrieve historical account data for usage levels
- Initiate the most common service tasks with the click of an icon, including:
  - Read a meter
  - Collect data from a meter's reverse energy register
  - Perform a Demand Read
  - Perform a Demand Read and reset the demand
  - Perform a Demand Reset
  - Verify power to a given service and check power down counts
  - Take voltage readings
  - Connect or disconnect power to a customers equipped with a switching-capable transponder

## Transponder Selection

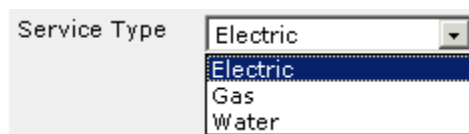
Using the input fields in the Transponder Selection section, enter any single critical identifier, including:

- The Premise ID
- Customer Account Number
- Meter or End Device ID
- Transponder Serial Number



The screenshot shows a form titled "Transponder Selection". It contains four input fields: "Service Type" (a dropdown menu with "Electric" selected), "Premise ID" (a text box), "Transponder Serial Number" (a text box with a blue ellipsis button to its right), and "Account Number" (a text box). Below the "Service Type" dropdown, there is a label "Meter / End Device ID" next to a text box.

With at least one critical account identifier entered in the Transponder Selection section, you can begin using either the Historical Data functions or initiate an On-Request command. Ensure that the Service Type drop-down menu reflects the appropriate type of utility meter for your query.



This is a close-up of the "Service Type" dropdown menu. The menu is open, showing three options: "Electric" (which is highlighted in blue), "Gas", and "Water".

The default Transponder Selection section inputs accept wildcard characters (preceded by a letter or number) if you provide some initial information. If you wish to search using wildcards, or if you want to cross-reference any given critical account identifier against another, click the ellipsis button. The Lookup Criteria dialog displays.

#### LOOKUP END DEVICE

**Lookup Criteria**

Account Number:

Communication Serial Number:

86333386

Meter /EndDevice ID:

Premise ID:

Lookup

Enter any of the four available lookup criteria and click **Lookup**. A Lookup Results dialog expands into the existing dialog.

Lookup Results:

1 End Devices found.

Account # ▲	Meter/End Device ID	Premise ID	Service Type	Device Type	Manufacturer	Status	Comm. Serial Number	Options
715530518	D86333386	715530518DS1	Electric	Disconnect L Switch		Installed	86333386	View

Replace

The results provide you with other critical details that can be used to cross-reference other details.

You are presented with links in this dialog that can launch additional information screens (e.g., Premise ID).

## MAINTAIN END DEVICE

### View Premise Information

Premise Information	
Premise ID*:	715530518DSI
Address1:	83 DOWAGER DRIVE
Address2:	
Address3:	
City:	POCATELLO
Country:	USA
State:	ID
Zip/Postal Code:	83201
Latitude:	0 0 0
Longitude:	0 0 0
Altitude / Elevation:	

Depending on your search criteria, and whether or not you searched using wildcard characters, you may be presented with one result, or several. Select the desired device using the radio button on the left, and click the **Replace** button. The **Replace** button populates the Transponder Selection section with the necessary account information.

With at least one critical identifier entered in the Transponder Selection section, you can either retrieve **Historical Data** for the account, or complete an **On-Request Command**.

For additional assistance identifying meters and end devices, see **Equipment > Lookup End Devices**.

## Historical Data

The Historical Data section of the Call Center Support screen retrieves view-only information for the account or transponder selected in the Transponder Selection section of the interface.

Historical Data			
<input checked="" type="radio"/> <b>Daily Usage Graph</b>		<input type="radio"/> <b>Command History</b> Select Command(s): ARM CONNECT/DISCONNECT SWITCH	
<input type="radio"/> <b>Daily Meter Read Results</b> Start: <input type="text"/> End: <input type="text"/>		<input type="radio"/> <b>Load Profile</b> Start: <input type="text"/> End: <input type="text"/> Select Data Type: <input checked="" type="radio"/> Pulses <input type="radio"/> kWh	
<input type="button" value="Lookup"/>			

Available historical data includes the following:

- Daily usage

- History of on-request commands issued to the transponder
- Usage for a given date range
- The entire profile for a given date range (by either pulses or kWh)

### Daily Usage Graph

If scheduled events have collected usage data, then the daily usage profile may display a daily usage graph. This shows the total consumption of the transponder/end device for a 24 hour window.

### Command History

The Command History provides the ability to see all commands issued to a specified transponder through the TWACS NG Call Center Support Screen. Use the **Select Command(s)**: drop-down menu to select from a pre-defined list of commands that could have been used to monitor or service a customer's account.

### Daily Meter Read Results

The Daily Meter Read Results history will retrieve the profile for a meter for a given date range.

### Load Profile

Displays the Load Profile data for each interval in either pulses or kWh.

## On Request Commands

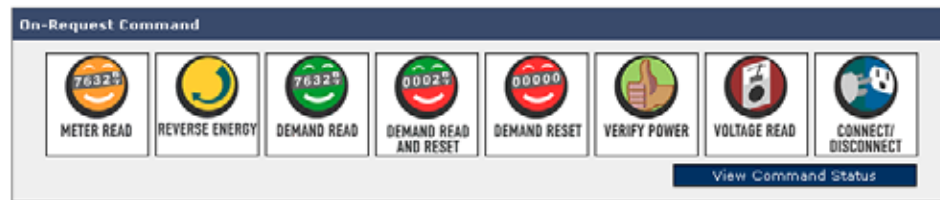
With a specified identifying criteria in the Transponder Selection section, users can send several **On Request Commands** to an end device/meter. Not all commands may be active for all users. It is common for there to be a short lag time between the execution of a command and when the results actuate. After executing an on request command, the command status will change to **pending**, and the screen will refresh periodically until the status changes to **complete**.

It is possible that, due to system availability, some response times could be longer. In event of an exceptionally long response time, bring it to the attention of your system administrator.

Following are the On Request commands supported by TWACS NG.

- Meter Read
- Reverse Energy
- Meter Read Demand Reset
- Demand Reset
- Verify Power
- Voltage Read

- Connect/Disconnect



## Meter Read

The **Meter Read** command returns only the current dial reading for a given transponder/end device, as well as the read date/time, and any indicators.



## Reverse Energy

The **Reverse Energy** command returns the kWh readings recorded by the transponder for both consumption and reverse readings. A reverse energy reading greater than 0 kWh may indicate tampering with a meter, or it may indicate that the customer has some power generation capability. The screen may refresh several times while the Command Status is **Pending**. Eventually the screen will refresh itself with a **Command Status** of **Successful** and return any reverse energy reading under **Command Value**.

Command Results:	
Command Status:	SUCCESSFUL
Command Name:	CALL CENTER - REVERSE ENERGY
Service Type:	Electric
Command Value:	
Consumption Reading	97 kWh
Reverse Energy Reading	100 kWh
Read Date/Time:	10/10/2006 12:08:08
Diagnostics:	N
Tamper:	Y
Alarms:	Y
Power Quality:	N

## Demand Read

The **Demand Read** command returns the peak demand as recorded by the transponder or the meter since the last reset. This value may be the peak demand during an interval (15, 30, 60 minutes) since the last reset, or it may be a rolling average of the previous interval period.

**NOTE:** If the user changes the demand configuration for a transponder, which is done by sending a new rate code with a different demand configuration, demand data recorded by the transponder prior to the configuration change should not be requested because it could potentially be calculated incorrectly.

## Demand Read and Reset

The **Demand Read and Reset** command returns the peak demand value as specified by the transponder used by a utility, and then zeros this value. **Do not reset a demand read indiscriminately!** Only reset demand usage when a new customer moves into existing premises, or when instructed by the business rules of your utility.

**NOTE:** If a demand reset is sent to a transponder, another demand reset cannot be sent within 12 hours. In addition, changing the demand configuration by sending a new rate code cannot be done within 12 hours of a demand reset. This could potentially cause demand data to be calculated incorrectly.

### Demand Reset

The **Demand Reset** command zeros the peak demand value. **Do not reset a demand read indiscriminately!** Only reset demand usage when a new customer moves into existing premises, or when instructed by the business rules of your utility.

### Verify Power

The **Verify Power** command checks the status of a transponder, and also returns the power down count.

### Voltage Read

The **Voltage Read** command returns a voltage reading to the specified transponder/end device. The screen may refresh several times while the **Command Status** is **Pending**. Eventually the screen will refresh itself with a Command Status of **Successful** and return a voltage reading and service interruption count under **Command Value**.

<b>Command Results:</b>	
<b>Command Status:</b>	SUCCESSFUL
<b>Command Name:</b>	CALL CENTER - VOLTAGE READ
<b>Service Type:</b>	Electric
<b>Command Value:</b>	
Voltage Reading	277 Volts
Power Down Count	19
<b>Read Date/Time:</b>	10/10/2006 11:53:46

### Connect/Disconnect

You can also remotely **Connect** and **Disconnect** the power to an account, if an end device with switching capability is installed on the premise.

### View Command Status

The **View Command Status** button returns an audit list of all the commands that you initiated over the past 24 hours. The **View Results** link can provide additional data on the results of the command execution.

Start Date/Time	Command Name	Communication Serial Number	Meter / End Device ID	Status	Action
10/10/2006 12:08:08	CALL CENTER - REVERSE ENERGY	4409843	L00694595	SUCCESSFUL	<a href="#">View Results</a>
10/10/2006 11:53:46	CALL CENTER - VOLTAGE READ	4409843	L00694595	SUCCESSFUL	<a href="#">View Results</a>

## Lookup End Devices

The Lookup End Devices screen is a convenient reference screen that Customer Service Representatives (CSRs) can use to obtain the following information:

- Account Number
- Communication Serial Number
- Meter/End Device ID
- Premise ID

To access the Lookup End Devices screen, select the **Applications** tab > **Lookup End Devices**.



The Basic Lookup Criteria input region displays.

Lookup Criteria			
Account Number:	<input type="text"/>	Communication Serial Number:	<input type="text"/>
Meter /EndDevice ID:	<input type="text"/>	Premise ID:	<input type="text" value="884071148"/>
		<input type="button" value="Advanced Lookup"/>	<input type="button" value="Lookup"/> <input type="button" value="Show All"/>

All input fields in the Lookup Criteria region accept the use of wildcard characters, as long as they are chained to a letter or number.

You have three primary functions to execute based on the full or partial input of one or more critical identifiers or wildcard entries.

- Advanced Lookup
- Lookup
- Show All

The **Advanced Lookup** button will toggle between the Basic Lookup criteria input section and an Advanced Lookup input.

**LOOKUP END DEVICE**

Lookup Criteria			
Communication Serial Number:	<input type="text"/>	Transponder Type:	-- Select --
Installation Status:	-- Select --	Transponder Model:	-- Select --
Meter/End Device ID:	<input type="text"/>	Meter/End Device Status:	-- Select --
Service Type:	-- Select --	Meter Form:	-- Select --
Meter/End Device Type:	-- Select --	Meter Class:	-- Select --
Meter/End Device Model:	-- Select --	Account Number:	<input type="text"/>
Service Voltage:	<input type="text"/>	Premise ID:	<input type="text"/>
Usage Alert Profile Override:	-- Select --	Usage Alert Profile Override Expiration Date:	<input type="text"/>
		Path	Substations: <input type="text"/>
			Bus: <input type="text"/>
			Feeder: <input type="text"/>
			Phase: -- Select --
		Programs:	<input type="text"/>
		Cycle:	-- Select --
		Revenue Protection Watch List:	-- Select --
<input type="button" value="Basic Lookup"/> <input type="button" value="Lookup"/> <input type="button" value="Show All"/>			

You can cross-reference any criteria by entering one valid field of criteria and clicking **Lookup**. The Lookup Results screen displays.

Lookup Results:

**1 End Devices found.**

Account #	Meter/End Device ID	Premise ID	Service Type	Device Type	Manufacturer	Status	Comm. Serial Number	Options
884071148	20055751007	884071148	Electric	Single Phase Solid State Meter	L	Installed	5223583	<a href="#">View</a>

For a complete list of all end devices, you can click the **Show All** button. The first page of the entire end device catalog displays.

**32152 End Devices found.**

Account #	Meter/End Device ID	Premise ID	Service Type	Device Type	Manufacturer	Status	Comm. Serial Number	Op
107071140	L0080751007	107071140	Electric	Single Phase Solid State Meter	L	Installed	2223592	<a href="#">View</a>
133330055	L0088685962	133330055	Electric	Single Phase Solid State Meter	L	Installed	9191449	<a href="#">View</a>
167679024	L0080752491	167679024	Electric	Single Phase Solid State Meter	L	Installed	9199069	<a href="#">View</a>
191913034	L0088752488	191913034	Electric	Single Phase Solid State Meter	L	Installed	9190979	<a href="#">View</a>
191919230	L0088745299	191919230	Electric	Single Phase Solid State Meter	L	Installed	2225862	<a href="#">View</a>
125253013	L0080742407	125253013	Electric	Single Phase Solid State Meter	L	Installed	2221572	<a href="#">View</a>
178782936	L0088685275	178782936	Electric	Single Phase Solid State Meter	L	Installed	9196379	<a href="#">View</a>
101017436	L0080743769	101017436	Electric	Single Phase Solid State Meter	L	Installed	2221862	<a href="#">View</a>
10808855	L0088684227	10808855	Electric	Single Phase Solid State Meter	L	Installed	9199319	<a href="#">View</a>
110102911	L0088750705	110102911	Electric	Single Phase Solid State Meter	L	Installed	2222632	<a href="#">View</a>
171710739	L0088744094	171710739	Electric	Single Phase Solid State Meter	L	Installed	2220232	<a href="#">View</a>
12727419	L0088740687	12727419	Electric	Single Phase Solid State Meter	L	Installed	9207390	<a href="#">View</a>

Display Page 1 of 644 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 >> next 10 Display All

## Events Overview

Events are scheduled programmatic collections of customer data. There are three components of an event:

- The **Program** defines which data you want to gather.
- The **Schedule** defines when you want to gather it.
- The **Set** defines who (which accounts) is affected by the program. (i.e. which of the various billing cycles applies to the event.)

Using the functions under the **Events** menu, you can **Lookup Events**, **Add Events** and **View the Event Calendar**. These menus interact with the programs, schedules, and sets in Custom Data.

An event represents the combination of one or more programs, a schedule, and a set of end devices. For example, an event would be: “Read Meters Numbered 1 through 3333333 on the specified day for all billing cycles that are active throughout the Monday and Tuesday set of a month.”

Once an event is associated with a schedule, the system places each event occurrence or execution on the calendar. When an event is executed it generates a set of jobs, each of which allows you to monitor the transactions occurring on transponders on a single SCE.

## Lookup Events

Custom Data Events screens manage events using the following functionality:

- Lookup Event
- Add Events
- Event Details
- View Calendar
- View Meter Read Completion Status
- Edit Events
- View Job List


To access the Lookup Events screen, select the Custom Data tab > Lookup Events.



The Lookup Criteria dialog box displays.

#### EVENTS LOOKUP

**Lookup Criteria** Last Refreshed: 24 Oct, 2006 10:24

Date:   Schedule:  Event Status:

Application:  Event Name:  Event ID:

Application dropdown options: All, BILLING - ADVANCED, BILLING - STANDARD, CONNECT/DISCONNECT


To lookup an event, use the following procedure.

1. Click the calendar icon and select a date.
2. Enter any optional information; **Schedule**, **Event Status**, **Application**, **Event Name**, or **Event ID**.
3. Click **Lookup**.

The Lookup Results screen displays the events that match the corresponding criteria you entered.

Lookup Results:

Total Events: 3

Event ID	Event Name ▲	Application	Schedule	Event Status	Options
5005	<a href="#">CustomEventTest</a>	BILLING - ADVANCED	CustomEvent	Active	<a href="#">View Jobs</a>   <a href="#">Edit</a>   <a href="#">CompletionStatus</a>
5106	<a href="#">NF Max Demand Date Time</a>	-	<a href="#">NF Custom Calendar Schedule</a>	Active	<a href="#">View Jobs</a>   <a href="#">Edit</a>   <a href="#">CompletionStatus</a>
5101	<a href="#">NF recurring power down count</a>	OUTAGE AND POWER QUALITY	<a href="#">NF Recurring Schedule Resolving Every Day</a> 	Active	<a href="#">View Jobs</a>   <a href="#">Edit</a>   <a href="#">CompletionStatus</a>

## Add Events

To access the Add Events screen, select the **Custom Data** tab > **Add Events**.



The Add Event screen displays.

To add an event begin with the Event Information dialog box.

MAINTAIN EVENTS  
Add Event

 A screenshot of the 'Event Information' dialog box. It has a title bar 'Event Information' and two buttons 'Save' and 'Cancel' in the top right. The form contains three fields: 'Event ID:' (disabled), 'Event Name:' (text input), and 'Event Description:' (text area). The 'Event Status:' is set to 'DRAFT'.

1. Enter an event name.
2. Describe the event in the Event Description field.
3. Next, either define a schedule through the Associate Schedule dialog box or by clicking the **Create New Schedule** link.

## Associate Schedule


1. From the Associate Schedule dialog box,

 A screenshot of the 'Associate Schedule' dialog box. It has a title bar 'Associate Schedule'. Below the title bar, there is a 'Schedule:' label followed by a text input field, an ellipsis button (...), and a link labeled 'Create New Schedule'.

click the ellipsis button. The Schedule List Lookup region displays.

## SCHEDULE LOOKUP

**Schedules List Lookup**

Date:   Schedule Name:

2. Either enter a search criteria string in the Schedule Name, and/or select the calendar icon to define a date, and then select **Lookup**. The Results List displays.

Lookup Results:

Total Schedules: 11

Schedule Name▲	Target Date	Target Time	Start Before	End After	Window Interval	Resource	Created Date
<input type="radio"/> DSI Morning Short Read	May 04, 2005	05:00	0 Minute	2 Hour	Once	DAILY	May 03, 2005 02:4
<input type="radio"/> Mtr Read Recovery 11am	Aug 03, 2005	11:00	0 Minute	3 Hour	Once	DAILY	Aug 03, 2005 10:0
<input type="radio"/> Patch: 20 Read All 10 17	Oct 17, 2005	01:00	55 Minute	11 Hour	Once		Oct 16, 2005 08:2
<input type="radio"/> Patch: 20 Repeat Bmark 10 15	Oct 15, 2005	01:00	59 Minute	9 Day	Once		Oct 14, 2005 05:5
<input type="radio"/> Production Billing Read	Jul 09, 2005	00:10	0 Minute	0 Hour	Once	DAILY	Jul 08, 2005 06:32
<input type="radio"/> QA Billing Read	Jul 24, 2005	09:00	0 Minute	2 Hour	Once	DAILY	Jul 23, 2005 12:46
<input type="radio"/> Small System Test DS Cycle 5	Jul 05, 2005	04:05	0 Minute	4 Hour	Once	DAILY	Jul 04, 2005 02:16
<input type="radio"/> Small System Test Rev Rotation Read	Jul 05, 2005	00:05	0 Minute	4 Hour	Once	DAILY	Jul 04, 2005 04:27
<input type="radio"/> T QA Hourly 04:00	Jan 23, 2005	00:10	0 Minute	4 Hour	Once	DAILY	Jan 22, 2005 06:04
<input type="radio"/> T QA Hourly 12:00	Jan 23, 2005	00:10	0 Minute	4 Hour	Once	DAILY	Jan 22, 2005 06:11
<input type="radio"/> T QA Hourly 20:00	Jan 23, 2005	16:10	0 Minute	4 Hour	Once	DAILY	Jan 22, 2005 06:11

3. Click the radio button on the desired schedule. The Lookup region from step one populates with the schedule with which you associated it.

## Create New Schedule

1. From the Associate Schedule dialog box, click the Create New Schedule link.

**Associate Schedule**

Schedule:   [Create New Schedule](#)



2. The Add Schedule screen displays. Define a single or reoccurring schedule using the various regions.

MAINTAIN SCHEDULES  
ADD SCHEDULE

---

**Schedule Information :** Save Close

Schedule Name:

Schedule Description:

☒ Single Schedule (No Recurrence)
 ☐ Recurring Schedule
 ☐ Use Custom Calendar

**Timing Information**

Target Date:  Target Time:  Data Available :  Hours

Start Before Target:  Minutes End After Target:  Minutes

Run this event between start and end date and time at the following interval(s):

☒ Once  
☐ Every  Hours

**Schedule Recurrence Parameters**

☒ No End Date  
☐ End after  occurrences  
☐ End Date:  End Time:

**Schedule Repeats**

☒ Hourly Every  Hours  Minutes  
☐ Daily Recur Every  Day(s)  
☐ Weekly Recur Every  Week(s) on ☐ Sun ☐ Mon ☐ Tue ☐ Wed ☐ Thu ☐ Fri ☐ Sat  
☐ Monthly Day  of every month  
☐ Yearly Every

## Associate Program and Sets

1. In the Associate Program and Sets dialog, click the ellipsis button to navigate to Lookup Customer Program, enter your search criteria, click the radio button on the desired program, and click **Select** or click **Create New Schedule** and enter the required information.

**Associate Program and Sets**

[Create New Program](#) [Create New Set](#)

☐ Program:  ... Sets:  Add sets  
Delete selected sets

☐ Program:  ... Sets:  Add sets  
Delete selected sets

Delete Add More

2. To add more programs and sets, click **Add More**. To delete a program and sets, select the desired program and set and click **Delete**.
3. Click **Save**.

## Prioritization and the Importance of Priority

Priorities are the method which TWACS NG identifies how and when system resources are allocated to scheduled events as well as system background tasks. The system needs to know which items merit attention before competing alternatives tasks.

There are two main groups of tasks that need to be prioritized in the TWACS NG system. They are defined as the scheduled events and the background tasks that are required for the system to operate and remain optimized.

The scheduled events are user defined and setup to perform tasks such as anchor reads, interval data reads or a host of other possibilities. These tasks are defined and prioritized according to the utility's business model. Priorities are easily defined at the time of program creation, allowing the system to more dynamically adapt to the individual needs of each utility.

The background transactions are searches, FGU assignments, RCE initialization, etc. These transactions support system functionality that must take place for the system to operate correctly as well as efficiently.

### Priorities for Scheduled events.

The scheduled events have a priority that is configured when the program is created in application. The below screen shot illustrates how the priorities are set on the maintain programs screen.

For example:

- Scheduled event priorities are assigned within the program.
- All applications have the same range, (1-1000).
  - This range is predefined in the PRG\_TYPE\_PRIORITIES table in the database. If the range ever needs changed, this is the place to do it.

## Transaction Prioritization

All events ultimately produce transactions that must be prioritized and executed based upon the priority that is calculated by the application. It is important to understand how the system calculates priorities at the transaction level so a user can accurately predict how events will perform in any scenario.

- TNG 3.X prioritization scheme
  - Bus/phase concurrency
- Mixing scheduled event transactions and background transactions
  - Background transactions are searches, FGU assignments, RCE initialization, etc.
- Create a new sorting algorithm that takes into account the important items
  - Retry count, group size, priority and target time

If two transactions fall into the same rank of the sorting algorithm, the one with the higher priority wins. If they are still the same, the one closest to it's target time becomes the tie breaker. If both are after the target time, the one closer to the expiration time wins.

Rank	Target Date Time	Average Retry Count	Group Size
1	Future – Today	= 0	16 or more
2	Future – Today	0 - 1	16 or more
3	Future - Today	= 0	<16
4	Future - Today	0 - 1	<16
5	Future - Today	1 - 2	Any
6	Future - Today	2 - 3	Any
7	Future - Tomorrow	= 0	16 or more
8	Future - Today	> 3	Any
9	Future - Tomorrow	0 - 1	16 or more
9	Future - Tomorrow	= 0	<16
10	Future - Tomorrow	0 - 1	<16
11	Future - Tomorrow	1 - 2	Any
12	Future - Tomorrow	2 - 3	Any
13	Future - Tomorrow	> 3	Any
14	Past	= 0	Any
15	Past	0 - 1	Any
16	Past	1 - 2	Any
17	Past	2 - 3	Any
18	Past	>3	Any

Transaction Scheduler goes through the following steps for each SCE

- Retrieve all the **Pending** transactions for a particular SCE that are in the execution window.

- Split the **Pending** transactions into bus/phase lists based on its commPath. For each bus/phase, two lists are maintained, one for scheduled transactions and the other for background ones.
    - The number of background transactions is configurable
    - BackgroundTransactionPercentage=12.0, located in the **scheduler.properties** file in the DMC/resources directory
  - For each list, apply a set of rules including
    - Priority sorting, the sorting algorithm on the previous slides
    - Cut the transactions list based on a configured limit to make the following algorithms faster
    - TransactionCountFilterScheduler.max.transaction.count.batch=500, located in the **scheduler.properties** file in the DMC/resources directory
    - Load EventCache, which includes all transaction related information
    - Run mini-Grouper and mini-Aggregator
    - Run another sorting on each bus/phase list, the sorting algorithm on the previous slides
  - For each bus/phase, insert background transactions into its corresponding scheduled transactions
  - Run BusPhaseInterleave sorter and count filter to rearrange transactions and cut the result transaction list to the right size.
  - The remaining list will feed to TransactionQueue by calling the appendToQueue() method.
- 
- Instead of retrieving both **Pending** and **In Queue** transactions, only the **Pending** transactions are retrieved. The impact of this is that the existing **In Queue** transactions will not be touched. Once a transaction is in **In Queue** state, only in the following cases will it change status.
    - Sent out by SCPAQueueManager. In this case, the status will change to EXECUTING/SENT\_TO\_SCE
    - Timed out when it stays in the queue too long.
    - TransactionQueueTimeout=900000 located in the SCEEngineConf.properties file in the DMC/resources directory. In this case, the status will be changed to PENDING.
    - Picked by the Failed Batch Job to be expired. In this case the status will change to FAILED/EXPIRED

## Substation Operation Modes

Substation operation modes, (Normal, Storm, Deployment and Utility-defined), were initially included so the utility could change the Operation Mode of a substation, which would in turn use different priorities for the scheduled and background transactions.

It has been standard practice thus far to make the priority the same across the four operation modes and leave the mode as **Normal** for each substation. It is highly recommended that they are not used and the above stated practice is adhered to.

## View Calendar

To view the **Event Calendar**, select the Custom Data tab > View Calendar.



The Events Calendar displays.

VIEW EVENTS LIST  
Event Calendar

Please click on a date to view, edit and/or remove events. Last Refreshed: October 24, 2005, 04:28

Add Event

October 2005						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1 BILLING - STANDARD:3 LOAD PROFILE:4 CONNECT/DISCONNECT:3 SYSTEM CONFIGURATION:6
2 BILLING - STANDARD:3 LOAD PROFILE:4 CONNECT/DISCONNECT:2 SYSTEM CONFIGURATION:6	3 BILLING - STANDARD:3 LOAD PROFILE:4 CONNECT/DISCONNECT:2 SYSTEM CONFIGURATION:6	4 BILLING - STANDARD:3 LOAD PROFILE:4 CONNECT/DISCONNECT:2 SYSTEM CONFIGURATION:6	5 BILLING - STANDARD:3 LOAD PROFILE:3 CONNECT/DISCONNECT:2 SYSTEM CONFIGURATION:5	6 BILLING - STANDARD:3 LOAD PROFILE:10 CONNECT/DISCONNECT:2 SYSTEM CONFIGURATION:4	7 BILLING - STANDARD:3 LOAD PROFILE:12 CONNECT/DISCONNECT:2 SYSTEM CONFIGURATION:6	8 BILLING - STANDARD:3 LOAD PROFILE:10 CONNECT/DISCONNECT:2 SYSTEM CONFIGURATION:6
9 BILLING - STANDARD:3 LOAD PROFILE:4 CONNECT/DISCONNECT:2 SYSTEM CONFIGURATION:5	10 BILLING - STANDARD:3 LOAD PROFILE:4 CONNECT/DISCONNECT:2 SYSTEM CONFIGURATION:5	11 BILLING - STANDARD:3 LOAD PROFILE:10 CONNECT/DISCONNECT:2 SYSTEM CONFIGURATION:11	12 BILLING - STANDARD:3 LOAD PROFILE:4 CONNECT/DISCONNECT:2 SYSTEM CONFIGURATION:6	13 BILLING - STANDARD:3 LOAD PROFILE:4 CONNECT/DISCONNECT:2 SYSTEM CONFIGURATION:4	14 BILLING - STANDARD:3 LOAD PROFILE:4 CONNECT/DISCONNECT:2 SYSTEM CONFIGURATION:6	15 BILLING - STANDARD:3 LOAD PROFILE:4 CONNECT/DISCONNECT:2 SYSTEM CONFIGURATION:6
16 BILLING - STANDARD:3 LOAD PROFILE:4 CONNECT/DISCONNECT:2 SYSTEM CONFIGURATION:12	17 BILLING - STANDARD:3 LOAD PROFILE:4 CONNECT/DISCONNECT:2 SYSTEM CONFIGURATION:6	18 BILLING - STANDARD:3 LOAD PROFILE:4 CONNECT/DISCONNECT:2 SYSTEM CONFIGURATION:6	19 BILLING - STANDARD:3 LOAD PROFILE:7 CONNECT/DISCONNECT:2 SYSTEM CONFIGURATION:10	20 BILLING - STANDARD:3 LOAD PROFILE:6 CONNECT/DISCONNECT:2 SYSTEM CONFIGURATION:10	21 BILLING - STANDARD:3 LOAD PROFILE:4 CONNECT/DISCONNECT:2 SYSTEM CONFIGURATION:10	22 BILLING - STANDARD:3 LOAD PROFILE:4 CONNECT/DISCONNECT:2 SYSTEM CONFIGURATION:6
23 BILLING - STANDARD:3 LOAD PROFILE:4 CONNECT/DISCONNECT:2 SYSTEM CONFIGURATION:6	24 BILLING - STANDARD:3 LOAD PROFILE:7 CONNECT/DISCONNECT:2 SYSTEM CONFIGURATION:6	25 BILLING - STANDARD:3 LOAD PROFILE:5 CONNECT/DISCONNECT:2 SYSTEM CONFIGURATION:4	26 BILLING - STANDARD:3 LOAD PROFILE:4 CONNECT/DISCONNECT:2 SYSTEM CONFIGURATION:4	27 BILLING - STANDARD:3 LOAD PROFILE:4 CONNECT/DISCONNECT:2 SYSTEM CONFIGURATION:4	28 BILLING - STANDARD:3 LOAD PROFILE:4 CONNECT/DISCONNECT:2 SYSTEM CONFIGURATION:4	29 BILLING - STANDARD:3 LOAD PROFILE:4 CONNECT/DISCONNECT:2 SYSTEM CONFIGURATION:6
30 BILLING - STANDARD:3 LOAD PROFILE:4 CONNECT/DISCONNECT:2 SYSTEM CONFIGURATION:4	31 BILLING - STANDARD:3 LOAD PROFILE:4 CONNECT/DISCONNECT:2 SYSTEM CONFIGURATION:4					

You can lookup, add, edit, and remove events on this screen by clicking on a desired calendar date.

The View Events List screen opens with the current month displaying all the scheduled events. The calendar shows the number of events and the name of the event's application for the scheduled date. You may view previous or next months.

To see previous or next month, click the **Previous Month** or **Next Month** button, or use the scroll boxes to select the months and years and click the **Lookup** button.

To view the event by the scheduled date, double-click on the desired date. The scheduled events for that date display on the Events Lookup screen in the **Lookup Results** section.

Lookup Results:					
Total Events: 14					
Event ID	Event Name	Application	Schedule	Event Status	Options
2228	DSI Morning <a href="#">Status Read</a>	CONNECT/DISCONNECT	DSI Morning Short <a href="#">Read</a>		<a href="#">View Jobs</a>   <a href="#">Edit</a>   <a href="#">Completion Status</a>
4684	<a href="#">Recover:-</a> 07/06/2005-S- DSI Morning <a href="#">Status Read</a>	CONNECT/DISCONNECT	DSI Morning Short <a href="#">Read</a>		<a href="#">View Jobs</a>   <a href="#">Edit</a>   <a href="#">Completion Status</a>
3140	T-QA Hourly 4am- Midnight	-	T-QA Hourly 04:00		<a href="#">View Jobs</a>   <a href="#">Edit</a>   <a href="#">Completion Status</a>
4681	<a href="#">Recover:-</a> 07/06/2005-S-T QA Hourly 4pm- Midnight	LOAD PROFILE	T-QA Hourly 04:00		<a href="#">View Jobs</a>   <a href="#">Edit</a>   <a href="#">Completion Status</a>
3138	T-QA Hourly Midnight-8am	-	T-QA Hourly 12:00		<a href="#">View Jobs</a>   <a href="#">Edit</a>   <a href="#">Completion Status</a>
112964	Tes-Q8-16.rpt <a href="#">Smart 50aa 10 24</a>	LOAD PROFILE	Tes-Q8-16.rpt <a href="#">Smart all 10 24</a>	Active	<a href="#">View Jobs</a>   <a href="#">Edit</a>   <a href="#">Completion Status</a>

From the results, you can click on the underscored, linked items to get details on an event and its associated schedule, programs and sets.

Or, from the Lookup Results section, you can click on one of the following actions under the **Options** column:

- View Event Jobs List
- Edit Events
- Event Completion Status

You can add an event by clicking **Add Event**.

## Programs

Programs, event, schedules, and sets interact to perform two functions:

- Collecting data (meter reads)
- Controlling transponders/end devices

The requirements of the resource provider determine the nature of the program. (e.g., which data to collect and the priority for that data.)

The menus under **Programs** interact with the events, schedules, and sets determined in the menus under the Custom Data tab.

This **Programs** menu has the following functionality for managing programs:

- Lookup Programs
- Add Programs

## Lookup Programs

To access the Lookup Programs screen, select the Custom Data tab > Lookup Programs.



The Lookup Customer Program screen displays.

### LOOKUP CUSTOMER PROGRAM

Lookup Criteria			
Program Name:	<input type="text"/>	Service Type:	--Select--
Application:	--Select--	Program Status:	--Select--
		<input type="button" value="Lookup"/>	<input type="button" value="New Program"/>

To add a new program, see the section on *Add Programs* on page 135. To examine an existing program, use the following procedure.

1. Enter at least one criterion in the Lookup Criteria fields and press Lookup. The Lookup Results screen displays programs that match the parameters of the Lookup Criteria region.

Lookup Results :

2 programs found.

Program Name ▲	Application	Service Type	Program Status	Description	Options
<u>NF once test Max Demand</u>	DAILY - ADVANCED	Electric	Active	READ PRESENT MAXIMUM DEMAND (kW) M/O DR	<a href="#">View</a> <a href="#">Edit</a> <a href="#">Delete</a>
<u>NF Programmable Register Read</u>	DAILY - ADVANCED	Electric	Active	Read Rate A/B kWh,Max kWh,Max kWh Date & Time,Read Present Reading (Elect)_EMTS,Read Demand,Reset Counter,Read Present negative,Consumption (kWh)_EMTS,Read TOU Schedule ID	<a href="#">View</a> <a href="#">Edit</a> <a href="#">Delete</a>

The fewer information criteria you enter, the broader your search results will be.



2. The Lookup Results dialog displays the search results. To view the details, click on the **Program Name**, **View**, or **Edit** link in the **Options** column. The Program Information region displays.

MAINTAIN PROGRAM  
View Program - Program Information

Program Information | Data Retrieval

Edit Cancel

**Basic Information**

Program Name\*: NF once test Max Demand  
Program Description\*: READ PRESENT MAXIMUM DEMAND (KW) W/O DR  
Application\*: DAILY - ADVANCED Service Type\*: Electric  
Status\*: Active  
Priority\*: 

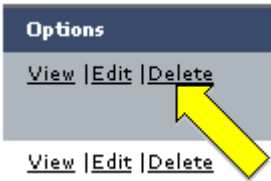
Operation Mode	Range	Default
Storm	200 to 400	200
Deployment	400 to 600	400
Normal	600 to 800	800
Utility-Defined	600 to 800	600

 Maximum Retries\*: 10

Created By: user1 03/31/06 11:36 Last Updated By: user1 03/31/06 11:36

Delete

3. To delete a program, click the **Delete** link in the **Options** column.



After clicking the **Delete** link, the program status is marked **Inactive**.

### Add Programs

To access the Lookup Programs screen, select the **Custom Data** tab > **Add Programs**.



The Add Program - Basic Information screen displays.

MAINTAIN PROGRAM  
Add Program - Basic Information

Save and Continue Cancel

**Basic Information**

Program Name\*:

Program Description\*:

Application\*: --Select-- Service Type\*: --Select--

Program Status\*: Active

Program Priority\*: **Operation Mode** Range Default Maximum tries\*:  ☐ Unlimited

To add a program, enter or select the following required information:

1. Enter the **Program Name**, **Program Description** and select **Application**.

**NOTE** When you select an application, the system determines the program priority.

2. From the drop-down menus, select the default **Service Type** and **Program Status**.
3. **Program Priority** is determined by the application selection that fills the columns with the values. You can change the Default column values as long as they fall within the specified range.

Operation Mode	Range	Default
Deployment	200 to 400	200
Normal	400 to 600	400
Utility-Defined	400 to 600	400
Storm	800 to 1000	800

- Click **Save & Continue**. The Maintain Program Edit Program - Basic Information screen displays.

**MAINTAIN PROGRAM**  
Edit Program - Basic Information

Program Information | Data Retrieval | Save | Cancel

**Basic Information**

Program Name\*: Quality

Program Description\*: Quality Description

Application\*: OUTAGE AND POWER QUALITY

Program Status\*: Active

Program Priority\*: 

Operation Mode	Range	Default
Deployment	200 to 400	200
Normal	400 to 600	400
Utility-Defined	400 to 600	400
Storm	800 to 1000	800

Service Type\*: Electric

Maximum Retries\*: 5 ☐ Unlimited

Created By: user1 04/12/06 11:11

Last Updated By: user1 04/12/06 11:11

Delete

- Click the **Data Retrieval** tab where you select the data you need to retrieve or actions to perform. The programs are determined by the utility.

**MAINTAIN PROGRAM**  
Edit Program - Device Information

Program Information | Data Retrieval | Save | Cancel

Please select the items you wish to retrieve or actions you wish to perform.

**PING**

☐ SERIAL NUMBER SUPPRESSED DATA

☐ TEST COMMUNICATION STATUS - ANY COMMAND

☐ TEST COMMUNICATION STATUS - GROUP PING

☐ TEST COMMUNICATION STATUS - PING COMMAND

**POWER QUALITY DATA**

☐ NBR. OF POWER OUTAGES

☐ PQ/OUTAGE INDICATORS

- When you have finished with your selection, click the **Save** button.

## Schedules

Programs, events, schedules, and sets, interact to perform two functions:

- Collecting data (meter read)
- Controlling transponders/end devices

A schedule identifies the date and time when events occur. Schedules can be single events, recurring schedules, or custom calendars. The custom calendars have more than one date and time for an event, and these events do not occur with regular frequency.

A schedule may be created for one or more programs. Once a schedule is defined and associated with an event, occurrences are placed on the calendar. When a schedule is changed, it affects the future occurrences for any event applied to that schedule.

This Schedule menu has the following functionality for managing schedules:

- Lookup Schedules
- Add Schedules

### Lookup Schedule

In order to perform any task associated with schedules (except adding a new schedule), use Lookup Schedules. To access the Lookup Schedule screen, select the Custom Data tab > Lookup Schedules.




The Schedule Lookup screen displays.

## SCHEDULE LOOKUP

### Schedules List Lookup

Date: 



Schedule Name:

Lookup

New Schedule

1. Either click the calendar icon and select a date or enter the name of the schedule (or partial name using wildcards).



2. Click the **Lookup** button. The Lookup Results displays the schedules that fit your search criteria.

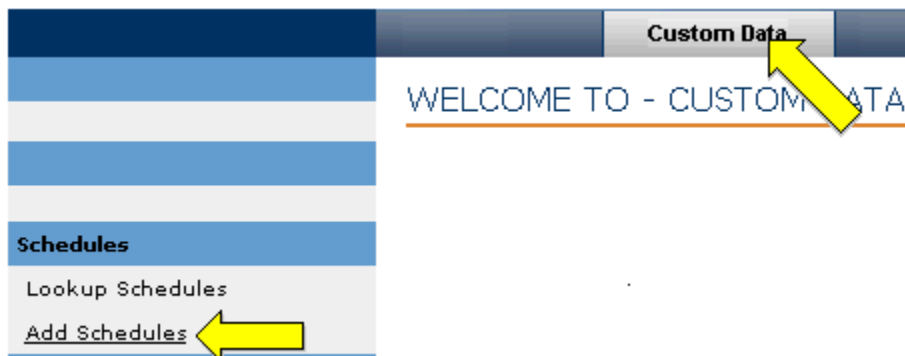
Lookup Results:

Total Schedules: 16

Schedule Name ▲	Target Date	Target Time	Start Before	End After	Window Interval	Recurrence	Created Date
<a href="#">DSI Morning Short Read</a>	May 04, 2006	05:00	0 Minute	2 Hour	Once	DAILY	May 03, 2006 02:45:59
<a href="#">Mr Read Recovery 11am</a>	Aug 03, 2006	11:00	0 Minute	3 Hour	Once	DAILY	Aug 03, 2006 10:09:50
<a href="#">Patch: 21 All UMTs 10 18</a>	Oct 18, 2006	01:00	30 Minute	23 Hour	Once		Oct 17, 2006 06:04:58
<a href="#">Patch: 20 Repeat Remark 10 15</a>	Oct 15, 2006	01:00	59 Minute	9 Day	Once		Oct 14, 2006 05:58:28
<a href="#">Production Billing Read</a>	Jul 09, 2006	00:10	0 Minute	8 Hour	Once	DAILY	Jul 08, 2006 06:32:00
<a href="#">QA Billing Read</a>	Jul 24, 2006	09:00	0 Minute	2 Hour	Once	DAILY	Jul 23, 2006 12:46:03
<a href="#">Small System Test D5 Cycle 5</a>	Jul 05, 2006	04:05	0 Minute	4 Hour	Once	DAILY	Jul 04, 2006 02:18:07
<a href="#">Small System Test Rev Rotation Read</a>	Jul 05, 2006	00:05	0 Minute	4 Hour	Once	DAILY	Jul 04, 2006 04:27:25
<a href="#">T QA Hourly 04:00</a>	Jun 23, 2006	00:10	0 Minute	4 Hour	Once	DAILY	Jun 22, 2006 06:04:20
<a href="#">T QA Hourly 12:00</a>	Jun 23, 2006	08:10	0 Minute	4 Hour	Once	DAILY	Jun 22, 2006 06:11:25
<a href="#">T QA Hourly 20:00</a>	Jun 23, 2006	16:10	0 Minute	4 Hour	Once	DAILY	Jun 22, 2006 06:12:39
<a href="#">Tm Prod DSI Read 10 12</a>	Oct 19, 2006	10:00	0 Minute	1 Hour	Once		Oct 18, 2006 09:21:47
<a href="#">Tm Prod Hrv 00-08 10 12</a>	Oct 19, 2006	09:00	0 Minute	8 Hour	Once		Oct 18, 2006 09:11:14
<a href="#">Tm Prod Hrv 08-16 10 12</a>	Oct 19, 2006	17:00	0 Minute	8 Hour	Once		Oct 18, 2006 09:13:20
<a href="#">Tm Prod Hrv 16-24 10 12</a>	Oct 19, 2006	01:00	0 Minute	8 Hour	Once		Oct 18, 2006 09:02:58
<a href="#">Tm Production D5TC 10 12</a>	Oct 19, 2006	01:00	55 Minute	7 Hour	Once		Oct 18, 2006 09:00:56

## Add Schedule

To add a new schedule to the Add Schedules screen, select the **Custom Data** tab > **Add Schedules**.



The screen displays four Add Schedule regions.

**MAINTAIN SCHEDULES**  
**ADD SCHEDULE**

---

**Schedule Information :** Save Cancel

\*Schedule Name:

\*Schedule Description:

☒ Single Schedule (No Recurrence) ☐ Recurring Schedule ☐ Use Custom Calendar

**Timing Information**

Target Date:  Target Time:

Start Before Target:  Hours  End After Target:  Hours

**Schedule Recurrence Parameters**

☒ No End Date

☐ End after  occurrences

☐ End Date:  End Time:

**Schedule Repeats**

☒ **Hourly** Every  Hours  Minutes

☐ **Daily** Recur Every  Day(s)

☐ **Weekly** Recur Every  Week(s) on ☐ Sun ☐ Mon ☐ Tue ☐ Wed ☐ Thu ☐ Fri ☐ Sat

☐ **Monthly** Day  of every month

☐ **Yearly** Every

1. In the Schedule Information region, enter a unique **Schedule Name** and **Description** in the appropriate fields. The system will verify that the name is unique.

2. Click the radio button to select from the various schedule types.

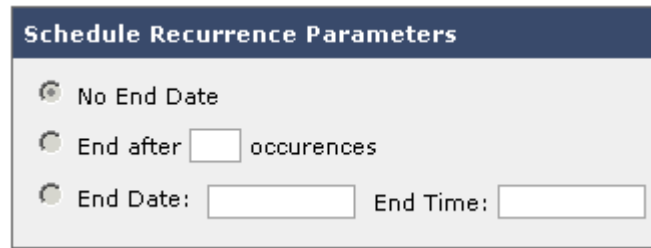
☒ Single Schedule (No Recurrence)  
 ☐ Recurring Schedule  
 ☐ Use Custom Calendar

- Single Schedule (No Recurrence)
- Recurring Schedule
- See the section *Add Custom Schedules* on page 143 for details regarding adding a custom schedule.

3. In the Timing Information region, complete the following tasks.

- Select the desired date you want for the **Target Date** and enter **Target Time** in 24 hour, HH:MM format.
- The Target Time is when the customer wants data to be available for batch export. Depending on the times entered for Start Before Target and End After Target users can determine the overall command prioritization of the event. The prioritization structure is different for the time prior to the target time as opposed to the end after target time. This is to allow longer time frames or data collection which enable TWACS NG to utilize communication bandwidth in a more efficient manor. Target Time minus Start Before Target reflects the Start Date/time; Target Time plus End After Target reflects the End Date/time.

4. Selections from Schedule Recurrence Parameters are for defining recurrent schedules. Click the radio button to select one of the following types of End Dates.



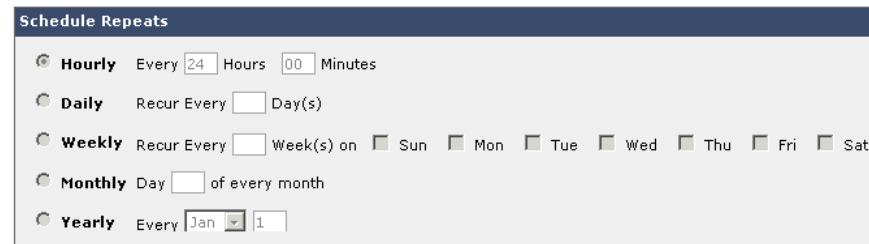
**Schedule Recurrence Parameters**

☒ No End Date

☐ End after  occurrences

☐ End Date:  End Time:

- No End Date
  - End after a specific number of occurrences
  - A fixed end date and time of day entered in 24 hour format
5. For recurrent schedules, select one of the frequency options under the Schedule Repeats region.



**Schedule Repeats**

☒ **Hourly** Every  Hours  Minutes

☐ **Daily** Recur Every  Day(s)

☐ **Weekly** Recur Every  Week(s) on ☐ Sun ☐ Mon ☐ Tue ☐ Wed ☐ Thu ☐ Fri ☐ Sat

☐ **Monthly** Day  of every month

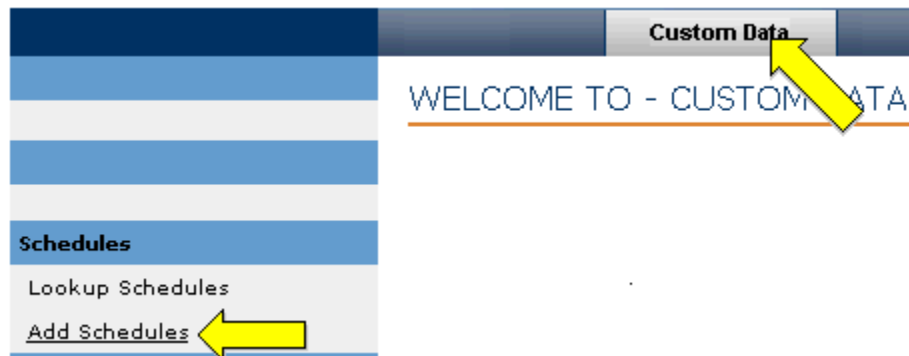
☐ **Yearly** Every

- Hourly with the hours and minutes frequency
- Daily with day period frequency and whether or not to include business days
- Weekly with weekly period frequency and days of the week for the occurrence
- Monthly with the date of the month and whether or not to use business days only (system will use nearest business day if the date falls on a non-business day)
- Yearly with the month and date of the year



## Add Custom Schedules

To add a custom schedule, begin by accessing the Add Schedules screen under the Custom Data tab.



The screen displays the four Add Schedule regions.

1. In the Schedule Information region, enter a unique **Schedule Name** and **Description** in the appropriate fields. The system will verify that the name is unique.

### MAINTAIN SCHEDULES

#### ADD SCHEDULE

 A screenshot of the 'ADD SCHEDULE' form. The form has a title bar that says 'Schedule Information :'. In the top right corner of the form, there are two buttons: 'Save' and 'Cancel'. Below the title bar, there are two input fields. The first is labeled 'Schedule Name:' and has a text input box. The second is labeled 'Schedule Description:' and has a larger text area with up and down arrow buttons on the right side.

2. Click the radio button for **Use Custom Calendar**.

☐ Single Schedule (No Recurrence)
 ☐ Recurring Schedule
 ☒ Use Custom Calendar

3. A **Custom Calendar** button appears to the right of the radio button. Click the **Custom Calendar** button. The **Modify Custom Calendar** screen displays.

4. You can now enter up to fifty-two schedule events by **Target** date and time, **Start** date and time, and **End** date and time in 24-hour HH:MM format.
5. Click **Save** to save changes, or **Save & Exit** to save changes and return to the **Schedule Information** screen.

## Sets

A **Set** contains grouped transponders or end devices (referred to as members and elements) that are organized by the type of commands they receive. Some examples of sets follow.

- Grouping by billing cycle
- Grouping by customer rate code
- Grouping by protective device

You can choose commands available in the **Commands** topic to build the programs. These programs are sent to the sets or grouped transponders.

A set can be dynamic or static. TWACS NG will add or delete members (transponders) from a dynamic set automatically based on the selection of specified parameters. Members of a static set remain constant unless changed by the editor of the set.

The menus under **Lookup Sets** and **Add Sets** interact with the event, schedule, and program menus under the **Custom Data** tab.

**NOTE:** You need the proper access privileges to edit sets.

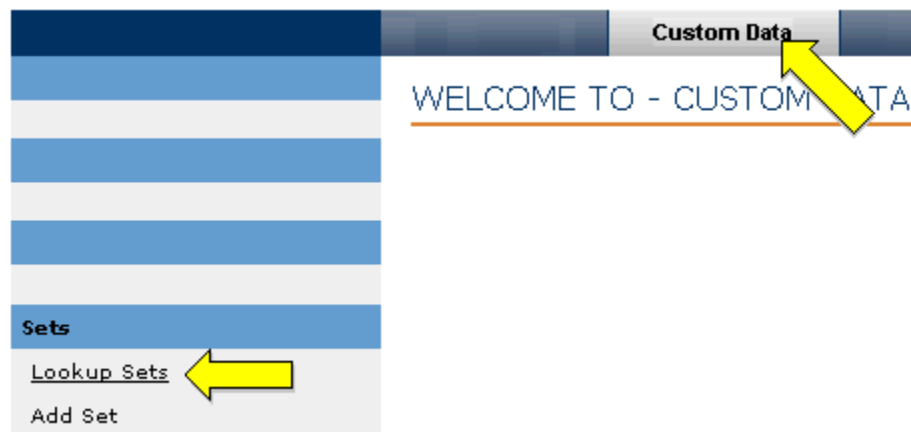
**NOTE:** Deleting sets may break associated events. TWACS recommends that users avoid deleting sets.

To manage end device sets, use the following functionality:

- Lookup Sets
- Add Sets
- Add Members to New Static Sets
- Edit Static Set
- Add Members to New Dynamic Sets
- Edit Dynamic Set
- View Set End Device Member Lists

## Lookup Sets

To access the Lookup Sets screen, select the **Custom Data** tab > **Lookup Sets**.



The Lookup Sets region displays.

**LOOKUP SETS**

---

\* Required Fields

**Lookup criteria**

Set Name\*:  Set Type:

1. If you want to add a new set click **New Set**. See the section on *Add Sets* on page 147 for more details.
2. Enter a **Set Name** or a wildcard string, select either a static or dynamic **Set Type** and click **Lookup**.

- The Results List displays the name, type, number of elements (meters), and last-modified date.

Lookup Results:

1 Sets found.

Set Name <sup>A</sup>	Set Type	Count of Elements	Created Date	Last Modified Date	Options
Alpha Set 10	Static	10	Jul 14,2007 14:50	Jul 14,2007 14:58	<a href="#">View</a> / <a href="#">Edit</a> / <a href="#">Delete</a>

You can **View**, **Edit** or **Delete** any set in the list. Only users with administrator-assigned privileges can delete or edit sets.

- If you select the **Edit** link under the **Options** column, the View Set screen displays.

MAINTAIN SETS

View Set

Required Fields

[Edit](#) [Delete](#) [Cancel](#)

Set Information

Set Name:	Alpha Set 10	Service Type: Electric	Set Type: Static
Description*:	Ten UMTs removed and replaced for end to end testing		

Static Set Members List

10 Members found.

End Device ID	TWACS Comm S/N	Account #	Substation	Bus	Feeder	Protective Device	Transformer
L0028680125	1210112	7420470	IDAHOFLS	4	BUS4CT		3338143330
L0038689237	1210188	7420471	IDAHOFLS	4	BUS4CT		3338143330
L0048688140	0209467	7420472	IDAHOFLS	4	BUS4CT		3338143330
L0098680892	1210299	7420473	IDAHOFLS	4	BUS4CT		3338143330
L0048688941	1211460	7420474	IDAHOFLS	4	BUS4CT		3338143330
L0078688878	0208795	7420475	IDAHOFLS	4	BUS4CT		3338143330
L0078680973	1211081	7420476	IDAHOFLS	4	BUS4CT		3338143330
L0068680967	0209383	7420477	IDAHOFLS	4	BUS4CT		3338143330
L0018688012	0208825	7420478	IDAHOFLS	4	BUS4CT		3338143330
L0018688116	0208915	7420479	IDAHOFLS	4	BUS4CT		3338143330

## Add Sets

To access the Add Set screen, select the **Custom Data** tab > **Add Set**.



The New Set screen displays.

### MAINTAIN SETS

#### New Set

\* Required Fields

Save & Continue

Cancel

#### Basic Information

Set Name\*:

Set Type\*:

Service Type\*:

Set Description\*:

1. In the Basic Information dialog, enter the **Set Name**, select a **Set Type** (either static or dynamic), select **Service Type**, and describe the set in the Description box.
2. Click **Save & Continue**.

A validation check is done on the set name. If the name is already being used, the following message will display: "Set name already in use, please use a different set name."

Depending on which **Set Type** you selected, see the instructions for either *Adding Static Sets* on page 147 or *Adding Dynamic Sets* on page 149.

## Adding Static Sets

Transponders of a static set remain constant. To add a static set from the New Set screen, start at the New Static Set screen.

## MAINTAIN SETS

## New Static Set- Member List

Set Information	
Set Name:	Static Test Set 15
Service Type:	Electric
Set Type:	Static
Set Description*:	Description for Static Test Set 15

---

Static Set Members List

1. Begin by entering a **Set Name** and **Set Description**.
2. Click **Add Meter/End Device**.
3. The **Lookup Criteria** dialog displays.

## LOOKUP END DEVICE

Lookup Criteria			
Communication Serial Number:	<input type="text"/>	Transponder Type:	-- Select --
Installation Status:	-- Select --	Transponder Model:	-- Select --
Meter /End Device ID:	<input type="text"/>	Meter /End Device Status:	-- Select --
Service Type:	Electric	Meter Form:	-- Select --
Meter /End Device Type:	-- Select --	Meter Class:	-- Select --
Meter /End Device Model:	-- Select --	Account Number:	<input type="text"/>
Service Voltage:	<input type="text"/>	Premise ID:	<input type="text"/>
Usage Alert Profile Override:	-- Select --	Usage Alert Profile Override Expiration Date:	<input type="text"/>

**Path**  
 Substation:   
 Bus:   
 Feeder:   
 Phase: -- Select --  
 Program:  ...  
 Cycle: -- Select --  
 Revenue Protection Watch List: -- Select --

4. Enter your end device/transponder criteria and click **Lookup**.
5. The **Lookup Results** display a list of meters matching your search criteria. Select the check box corresponding to the meters you want to add to your set and click **Save**.

## Adding Dynamic Sets

In a dynamic set, transponders can be added or deleted automatically depending how it is set up.

If you selected dynamic sets from the New Set screen, Save & Continue displays. Clicking this button displays the New Dynamic Set screen.

**MAINTAIN SETS**  
New Dynamic Set

\* Required Fields Save Cancel

**Basic Information**

Set Name:  Service Type: Electric Set Type: Dynamic  
Description\*:

**Meter/End Device Selection Criteria**

**Basic**

Meter Form:   
12K  
12S

End Device Type:   
Disconnect Switch  
Single Phase Solid S

Transponder Type:   
21  
30

Size:   
1/2"  
5/8"

Capacity:   
1400  
2300

Meter Class:   
10  
100

End Device Model:

Transponder Model:

End Device Status:   
Manufactured  
Active

Service Voltage:

**Account**

Account Number:

Rate Class:   
PAGE 8.201

State/Province:

Billing Cycle:   
1  
2

Zip/Postal Code:

Route ID:   
61  
62

**Path**

Substation:  ... Reset Bus:

Feeder:  Phase:   
Ab  
Abc

Transformer:  ... Reset Protective Device:  ... Reset

View Current Members

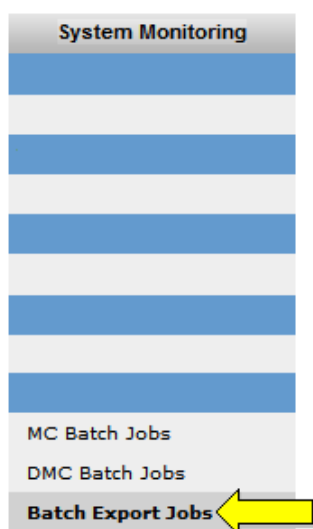
1. In the Meter/End Device Selection Criteria dialog select all of the critical data from drop-down menus and input any necessary identifiers into the appropriate input fields.
2. Upon completion of the dynamic sets dialogs, click **Save**.

## Batch Export Files

Only two user roles have access rights to access batch jobs scheduling: System Administrator and TWACS NG Operator.

**NOTE** Do not manually execute batch jobs using the following process unless you are knowledgeable about the process. Never manually run a batch job at the same time it is scheduled to run or close proximity to its scheduled run time. If you are unsure of this process or have questions, please contact Aclara's Customer Care.

Authorized users can generate a variety of batch export files for a previous 12 hour time window by selecting the **System Monitoring** tab > **Batch Export Files**.



The Batch Export Job screen displays.

**SYSTEM MONITORING**  
**Batch Export Job**

---

**Batch Export**

Start Date:

Start Time:

End Date:

End Time:

File Type:

Using the calendar pop ups, select either the same or consecutive Start and End Dates. Enter a Start and Stop time in 24 hour format creating a time range less than 12 hours in duration.



**SYSTEM MONITORING**  
**Batch Export Job**

---

**Batch Export**

Start Date: 05/15/2007 Start Time: 00:01  
 End Date: 05/15/2007 End Time: 11:01  
 File Type: ALL  
 ALL  
 Meter Read  
 Indicator  
 Interval Read

Submit Cancel

Select any of the available batch jobs available from the **File Type** drop-down menu.

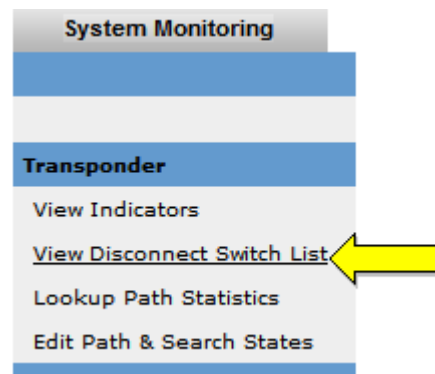
Click the **Submit** button.

The location of the saved file and the delimiter's used in the export files are determined by the **batchexport.property** file located on the DMC. The batch export job also runs as defined in the **QuartzJobConfig.properties** file, also located on the Master Controller.

## Disconnect Switches and Remote Disconnections

Some RCE meters are manually connected to an intermediate Disconnect Switch Interbase collar. The disconnect switch can be hardware mounted between the electrical meter and the electrical service, or it can be an integrated switch within the end device. Using a TWACS NG command, TWACS NG operators with the proper user roles can remotely disconnect and reconnect service to a consumer.

Under the **System Monitoring** tab, **Transponder** section, select **View Disconnect Switch List**.



The View Disconnect Switch List interface displays.

## VIEW DISCONNECT SWITCH LIST

Lookup Criteria			
TWACS Communication Serial Number	<input type="text"/>	Switch Status	Select ▼
Premises ID	<input type="text"/>	Voltage Sensed	Select ▼
Voltage Sensed Date/Time	Start Date: <input type="text"/>	End Date: <input type="text"/>	
Push Button Date/Time	Start Date: <input type="text"/>	End Date: <input type="text"/>	
		<input type="button" value="Lookup"/>	<input type="button" value="ShowAll"/>

Use either the **Show All** button to display the list of accounts which employ a switch-enabled end device, or you may enter select criteria to limit your results. Criteria can be as specific as a **TWACS number**, a **Premises ID**, or the current state of all collars by **switch status** or **voltage sensed**.

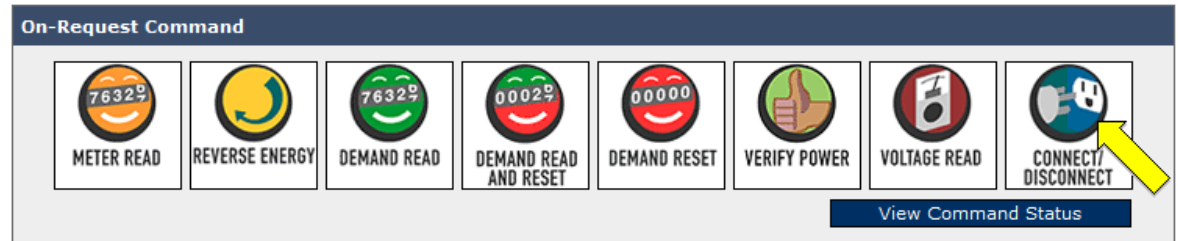
Switch Status	Select ▼
	Select
	Open
	Closed
	Armed
	Unknown
Voltage Sensed	Select ▼
	Select
	Y
	N

Alternatively, users can winnow results by a calendar window for voltage detection or the last time the arming feature of the transponder was engaged.

Once the sort criteria is fixed, clicking **Lookup** returns results which match.

Lookup Result											
3 Disconnect Switches found.											
Comm. Serial Number ▲	Switch Status	Switch Status Date/Time	Voltage Sensed	Voltage Sensed Date/Time	Push Button Date/Time	Installation Status	Premises ID	CIS Account Status	Associated Meter Comm. SN	Meter Usage Most Recent reads(kWh)	
11197895	Closed	06/04/2007 14:22:09	Y	06/04/2007 14:22:20		Operational	P11197895	Active	NO METER		
11197900	Armed	06/04/2007 00:00:00	N			Operational	P11197900	Active	NO METER		
11197909	Closed	05/29/2007 18:05:45	Y	06/04/2007 15:58:48	05/29/2007 17:01:40	Operational	P11197909	Active	NO METER		

A meter equipped with a switch, armed, and displaying an installation status of **Operational** and an account status of **Active** can be remotely connected and disconnected through the Call Center Support Screen by clicking the **Connect/Disconnect** icon under the **On-Request Command** menu.



It's good practice to check the list of check status of active disconnections once a day to verify that no voltage is sensed.

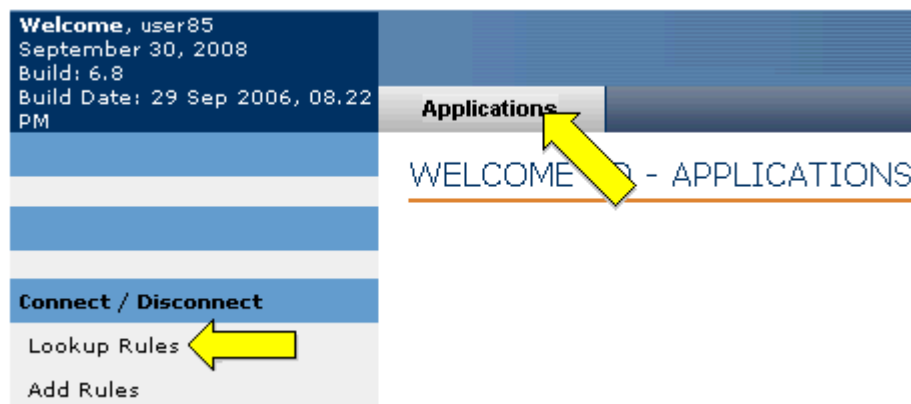
## Business Rules for Connecting and Disconnecting

Business rules for connecting and disconnecting a transponder or end device are essential to ensure regulatory compliance and considerations for customers with health and life support concerns. For the most part, life support and disconnection restrictions are read directly from the account information in the Customer Information System (CIS). These rules are configurable because they differ among utilities and may change over time.

Execution of a connect/disconnect command from the CSR support screen is validated against any applicable business rules.

## Lookup Disconnection Rules

To access the Lookup Rules screen go to the **Applications** tab > **Lookup Rules**.



The View Business Rules screen displays.

#### MAINTAIN CONNECT/DISCONNECT BUSINESS RULES

##### View Business Rules

Results List

0 Active & 0 Inactive Business Rule(s) were found.

[Add Business Rules](#)

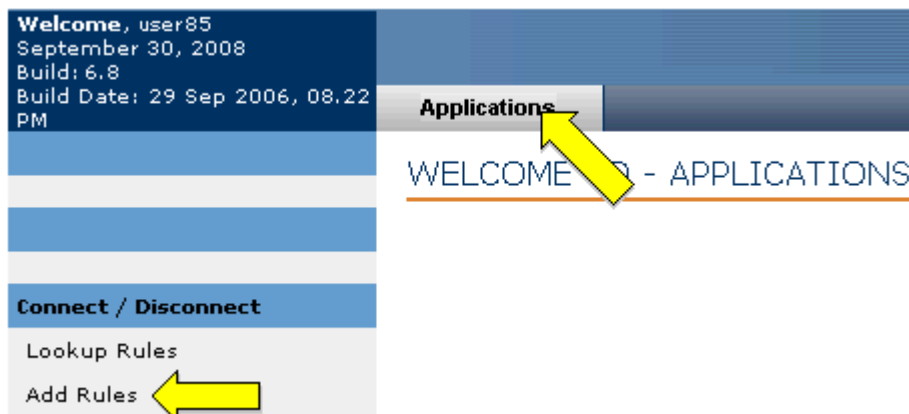
Business Rule	Description	Rule Status	Last Updated	Actions
---------------	-------------	-------------	--------------	---------

Any active or inactive business rules in effect will display in the Results List and can be sorted by name, status, and last update.

To add a new business rule, click **Add Business Rules**.

## Add Connection Rules

To access the **Add Rules** screen go to the **Applications** tab > **Add Rules**.



The Add Business Rule screen displays.

## MAINTAIN CONNECT/DISCONNECT BUSINESS RULES

## Add Business Rule

\* Required Fields.

Save

Cancel

## Business Rule Details

Name\*:

Description\*:

Rule Status\*:

## Rule Definition

Description\*:

Timing\*:

Between

AND

☐

Daily Only

CIS Flags\*:

Add CIS Flag

To add a business rule, use the following procedure.

1. In the Business Rule Details dialog, enter the name and description for new business rule.
2. Select a **Rule Status** of Active or Inactive.
3. In the **Rule Definition** portion, select the **Rule Definition Description** of **Allow** or **Restrict** and connect or disconnect.
4. From **Timing**, select the beginning and ending dates and times.

**NOTE** Time is represented in 24-hour military format.

5. If you need to add a CIS flag, click **Add CIS**.
6. Click **Save**.

## Add CIS Flag

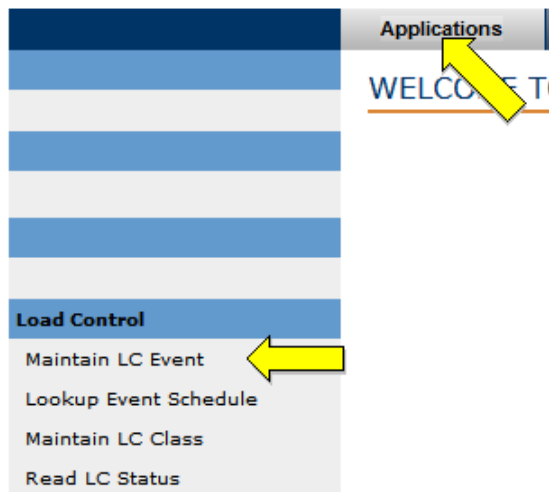
1. If you need to add a CIS Flag, click **Add CIS Flag** from the Add Rules screen. The Add CIS Flag screen displays.
2. Select **CIS Flag** checkbox if you want the whole list or select the individual flag or flags you want.
3. Click **Save**. The system adds the flags to the current rule being added or edited.

## Load Control

The load control functionality is available as a plug-in component of TWACS NG and may not be available in all versions and builds. The load control screens can only affect those accounts or location where a Load Control Transponder (LCT) is employed.

### Create and Maintain Load Control Events

To create, maintain, or change a load control event, go to the **Applications** tab > **Maintain Load Control Event**.



The Load Control Event Defaults screen displays defaulted to the **X/Y coordinates** tab.

#### LOAD CONTROL EVENT DEFAULTS Create Load Control Event

To create a new event Complete all the steps below (All fields are Required)

**Load Control XY Address**

Class\* : -- Select -- X Address : Y Address :

Port : Off Time(Mins)\* : 1 Delay (Mins)\* : 1 Number of Cycles\* :

Substation\* : ☐ All ☒ One

Run Event\* : ☒ Immediate ☐ Schedule

**Load Control Event Schedule**

Current Time : December 04, 2007 10:04:47

Description :

Start Date\* : Time\* : 12:00 AM

End Date\* : Time\* : 12:00 AM

☒ Once\* - or - ☐ Every\* 1 Months

On the following days of the week

☒ Mon ☒ Tue ☒ Wed ☒ Thu ☒ Fri ☒ Sat ☒ Sun

Use the X/Y coordinates to create a Load Control Transponder event for all the LCT devices that have the same X/Y addresses.

Begin by selecting the LCT class type from the **Class** drop down menu.

Class\* : -- Select --

-- Select --

AC-1

Specify the duration of the **Off Time** in minutes, the **Delay** time between off cycles, and the **Number of Cycles** that the LCT device will cycle off.

At the bottom of the input interface enter a description for the LCT event and a start and either a start and end date (and time) or days of the week that the LCT event is scheduled to run.

Using the **Function Tab** to create events begins with determining the Function Range of the starting and ending values for devices within a range of functions.

You can specify the port number of affected LCT devices and the Substations involved.

### LOAD CONTROL EVENT DEFAULTS

#### Create Load Control Event

To create a new event Complete all the steps below (All fields are Required)

X/Y Address	Function	Serial Number	<input type="button" value="Save"/> <input type="button" value="Cancel"/>
-------------	----------	---------------	---

#### Load Control Function

Function Range : Starts\* : 1   Ends\* : 1

Port\* :  Off Time(Mins)\* : 1   Delay (Mins)\* : 1   Number of Cycles\* :

Substation\* : ☐ All ☒ One

Run Event\* : ☒ Immediate ☐ Schedule

#### Load Control Event Schedule

Current Time :

Description :

Start Date\* :

End Date\* :

☒ Once\*      - or -     
 ☐ Every\*

On the following days of the week

☒ Mon
 ☒ Tue
 ☒ Wed
 ☒ Thu
 ☒ Fri
 ☒ Sat
 ☒ Sun

At the bottom of the input interface enter a description for the LCT event and a start and either a start and end date (and time) or days of the week that the LCT event is scheduled to run.



Using the **Serial Number** tab, you can create LCT events using the **Serial Number** of the LCT devices.

#### LOAD CONTROL EVENT DEFAULTS

##### Create Load Control Event

To create a new event Complete all the steps below (All fields are Required)

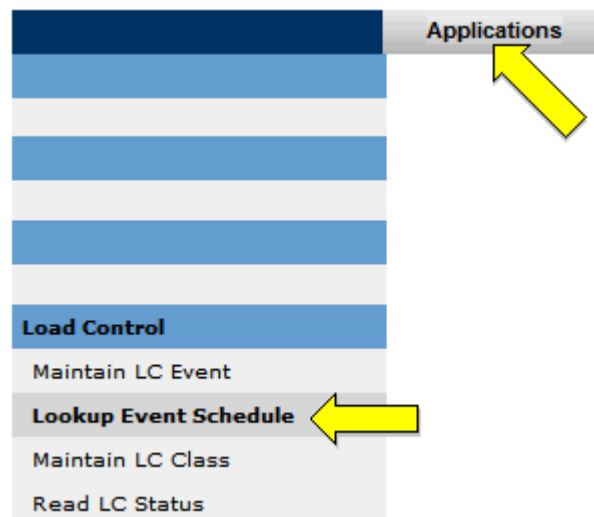
X/Y Address		Function		Serial Number		Save		Cancel	
-------------	--	----------	--	---------------	--	------	--	--------	--

<b>Load Control Serial Number</b>											
Serial Number* :		...		Substation* :							
Port* :		Off Time(Mins)* :		1		Delay (Mins)* :		1		Number of Cycles* :	
Run Event* : <input checked="" type="radio"/> Immediate <input type="radio"/> Schedule											
<b>Load Control Event Schedule</b>											
Current Time :		December 04, 2007 10:19:46									
Description :											
Start Date* :						Time* :		12:00 AM			
End Date* :						Time* :		12:00 AM			
<input checked="" type="radio"/> Once*		- or -		<input type="radio"/> Every*		1				Months	
On the following days of the week											
<input checked="" type="checkbox"/> Mon		<input checked="" type="checkbox"/> Tue		<input checked="" type="checkbox"/> Wed		<input checked="" type="checkbox"/> Thu		<input checked="" type="checkbox"/> Fri		<input checked="" type="checkbox"/> Sat	
										<input checked="" type="checkbox"/> Sun	

## Lookup Event Schedule

To lookup a load control event, go to the **Applications** tab > **Lookup Event Schedule**.



The View Load Control Event Schedule screen displays.

#### LOAD CONTROL

##### View Load Control Event Schedule

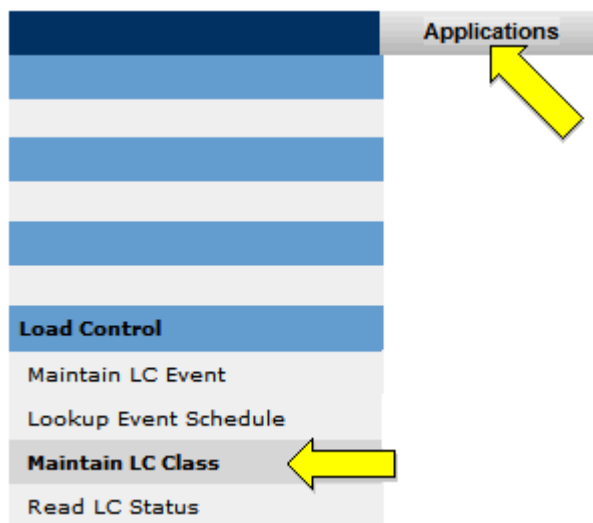
To view a list of events, select the status type. To view details of an event, select its event number. To update an event's status select a new status

Display Jobs by Status :						<input checked="" type="checkbox"/> Active	<input checked="" type="checkbox"/> Hold	<input type="checkbox"/> Done	<input type="checkbox"/> Invalid	<a href="#">Lookup</a>
<b>Lookup Results</b>										
0 Records Found.										
<b>No Event Schedules Found</b>										
										<a href="#">(Display All)</a>

This is a simple display screen that sorts existing LCT events by job status.

## Maintain Load Control Class

To cross reference a LCT event against an established Load Control Class go to the Applications tab > Maintain LC Class.



The Maintain Load Control Class screen displays.

#### LOAD CONTROL

##### Maintain Load Control Class

To create a new class add a new record. To sort the results select the column title. To delete a class select delete

<a href="#">Add New Relationship</a>				
Class Name	Class Description	X Address	Y Address	Option
AC-1	Air Conditioningsection 1	1	1	<a href="#">Delete</a>
One item found.1				
				<a href="#">(Display All)</a>

Click **Add New Relationship**. The Create Load Control Class screen displays.

LOAD CONTROL

Create Load Control Class

To create a new class enter data in the following fields

(\* Required Fields)

Create Load Control Class

Class Name\*:

Description :

X Address\*:

Y Address\*:

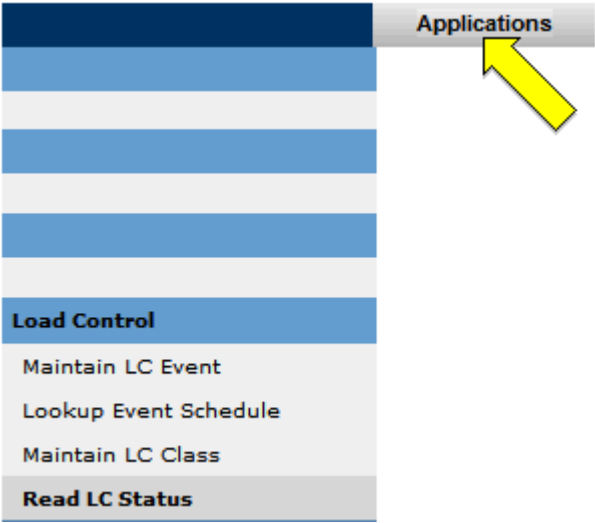
Save

Cancel

Create a **Class Name**, **Description** and **X** and **Y Address**.

### Read Load Control Class

To read the current status of a LCT event go to the **Applications** tab > **Read LC Class**.



The Load Control Read Status screen displays.

**LOAD CONTROL**  
**Read Status**

To read the status for a specific LCT port, enter a Serial Number and Port

Serial Number :					...	Port :			Lookup	Read Status
										Refresh
(Display All)										

This interface allows you to research the status of a Load Control Transponder device to determine whether or not the port is currently activated by a load control event.

If the Read LCT Status command returns a status of **Bad**, the bad status could be due to one of the following reasons:

- The SCE is not decoding the transponder response correctly (RCE=3)
- A substation is offline (TNS=104)
- SCE equipment is “broken” (SCE=6)

The plug-in will store a record in the database table with the SCE and RCE status codes explaining the error. TWACS NG will display the status numbers but there is not a way for the user to figure out that a TNS=105 is a timed out command using just the GUI. There is a table in the plug-in schema named ResponseStatusXref that lists all of the error codes and their description.

# MAINTENANCE, MONITORING & ADMINISTRATION

This chapter provides information on the monitoring functions of the TWACS NG interface, and how to run communication tests on the transponder, SCE, and DMCs.

## Current Status

The four menus under the Current section of the **System Monitoring** tab menus are **View Dashboard** and **Events Performance**, **View Notifications** and **Router**.

Many of the essential monitoring and measurement criteria used by your utility system are captured on one of these four screens. The dashboard graphically represents system performance, while the Events Performance screen breaks information down into metrics. View Notifications allows users to view any notifications generated across the system.

## View Dashboard

The TWACS NG Dashboard provides a centralized view of the system's overall performance, including meter reads, and equipment status. The dashboard menu provides response times for on-request interactive commands.

The dashboard is used to view the operation of the system at an overview level.

It also displays **Initialization** and **Search Status** numbers for the transponders and end devices.

## Understanding Sections of the Dashboard

Transaction History displays the transaction history graph for the current day and the past seven days.

- Transaction History displays the total percentage of successful transactions for each hour interval during the current day. The percentage of successful transactions is calculated as successful transactions divided by total transactions. CSR Command History displays the total percentage of successful transactions by day for the last seven days.

**Transponders** display two installation port number metrics sets.

- Transponder Installation Status provides the total number of transponders in the system: Installed, Operational, Active, Inventoried, Quarantined, and/or Deleted.
- Port Number Utilization displays the total number of end devices/meters installed on each port across all transponders in the system. A transponder (depending on the model) can have up to 4 ports, ports 0 through 3. Each port represents a different service type. Port 0 is always electric while port 1 may represent natural gas and port 2 may be water, etc.

Search Performance displays the overall search statuses for all Transponders within the system.

- New Transponders Added
- Transponders which have been **Lost**
- Transponders which have been **Switched**
- Transponders associated with an **Outage**.

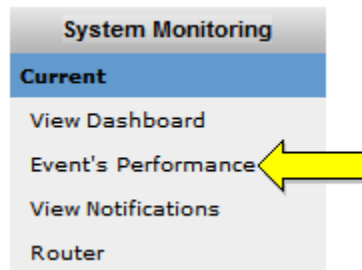
Equipment Status displays summary status for DMCs and SCE with the following information:

- DMC Operational Status -Total number of DMCs that are **Active, Draft, Out of Service, Online, and Complete**.
- SCE Operational Status: Total number of SCEs that are **Online** or **Offline**.
- Call Center Support Command History is the performance history of commands, successful and failed, initiated by a Call Center Support Representative (CSR) during the previous day. The bar graph shows the number of commands, successful and unsuccessful, by response time groups.

## Events Performance Measures

As each Distributed Master Control (DMC) server synchronizes with the Master Control (MC) server, a completion status is generated. This completion data serves as the building blocks of metrics that can be early indicators of performance issues.

To access the View Events Performance Measures screen, select the **System Monitoring** tab > **Events Performance**.



The View Event Performance Measures screen displays.

### VIEW EVENT PERFORMANCE MEASURES

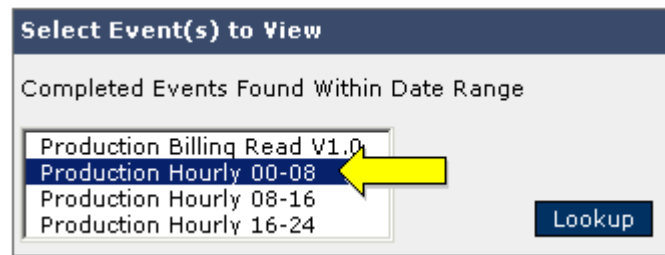
 A screenshot of the 'VIEW EVENT PERFORMANCE MEASURES' screen. The top section is titled 'Select Range to Search for Events'. It contains a 'Date Range\*' label, 'Start Date' and 'End Date' fields both set to '11/04/2006', and a 'Generate Event List' button. Below this is another section titled 'Select Event(s) to View' with the text 'Completed Events Found Within Date Range:' and an empty list box. A 'Lookup' button is located at the bottom right of this section.

To search for the events, use the following procedure:

1. Begin by entering a date range defining the events for which you are searching, or use the calendar icons to select a date.
2. With the date range defined, click **Generate Event List**.
3. A list of events matching the date parameters appears in the Select Event(s) to View region.

 A screenshot of the 'VIEW EVENT PERFORMANCE MEASURES' screen, specifically the 'Select Event(s) to View' section. The text 'Completed Events Found Within Date Range:' is followed by a list box containing four items: 'Production Billing Read V1.0', 'Production Hourly 00-08', 'Production Hourly 08-16', and 'Production Hourly 16-24'. A 'Lookup' button is located at the bottom right of the list box.

4. Select the desired event from the region. You can select multiple events by pressing and holding the **Ctrl** key while selecting multiple events with the left mouse key.



5. Click **Lookup**. The results list displays.

Results List : [Export](#)

1 Items found.

Performance Totals					
Attempted Reads	Successful Reads	Unsuccessful Reads	Read Success %	Exception Reads	Adjusted Read Success %
1133	1133	0	100.0	0	100.0

Date ▲	Event	Program	Attempted Reads	Successful Reads	Unsuccessful Reads	Read Success %	Exception Reads	Adjusted Read Success %
11/04/2006	Production Hourly 00-08	Hourly Midnight-8am	1133	1133	0	100.0	0	100.0

6. More information on the performance metrics returned:
  - **Attempted Reads:** Total number of initial read transactions generated from a meter read event.
  - **Successful Reads:** Total number of successful reads out of the total attempted reads.
  - **Unsuccessful Reads:** Total number of unsuccessful reads out of the total attempted reads.
  - **Read Success%:** Percentage of successful reads out of the total attempted reads.
  - **Exception Reads:** The number of initial read transactions generated from a meter read job that returned an error number.
  - **Adjusted Read (%) Percentage:** Calculated as Successful Reads divided by (Attempted Reads -Exception Reads).
  - **Results list:** This list displays the performance statistics for each of the selected events. The metrics are the same as the ones above. The results may span multiple screens depending on the number of events listed.
7. To view exceptions on the events performance, click the **Detail** link under the **Option** column. The exception detail screen displays the error number, followed by a yes/no indicator for exceptions, the description of the error, and the number of transponders in error for that error number.



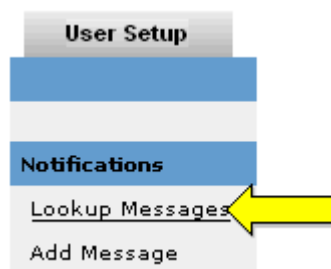
## Notifications

System messages and notifications can be enabled by assigning specific users to receive specific categories of system notifications. Notifications and messages confirm the completion of scheduled tasks, and alert the System Administrator to potential failures and critical scenarios that may require skilled intervention.

The concept of associating and viewing system messages with TWACS NG users can be confusing to those new to the application. It is an administrative function and may best be revisited after gaining familiarity with the functionality found under the **Applications** menu.

## Lookup Messages

TWACS NG Administrators can access system notifications using the **Lookup Messages** function subset of the **User Setup** tab.



The Notification Lookup region displays.

### VIEW NOTIFICATION MAPPING LIST

\* Required Fields

Notification Lookup	
Notification Category :	--Select--
Notification Subcategory :	--Select--
Notification Type :	--Select--

Lookup Show All New Mapping

You can view all the notification messages by clicking **Show All**.

## VIEW NOTIFICATION MAPPING LIST

\* Required Fields

Notification Lookup	
Notification Category :	--Select--
Notification Subcategory :	--Select--
Notification Type :	ACCOUNT BILLING DMC LOAD CONTROL LOAD MANAGEMENT METER READING OUTAGE MANAGEMENT PHYSICAL RESOURCES RATE RESEARCH REPORTING

Lookup Show All New Mapping

Or sort by notification category, subcategory, or type using the drop-down menu, and click **Lookup**. You may be presented with further qualifiers

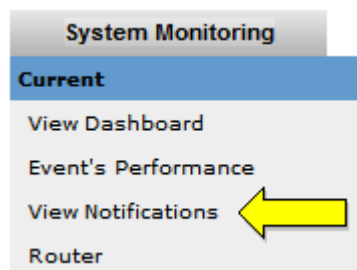
## View Notifications

Notification messages should be read and processed promptly. While some notification messages are obviously more important than others, all notification messages should be researched and acknowledged.

Once you have identified and examined a notification message you will have the option to either mark the notification as **resolved** or **acknowledged**. Not every notification contains information that is actionable. Some notifications are merely informational. In cases where notifications are acknowledged, users may also assign a “shelf-life” for acknowledged notifications to remain visible to the notification system.

Those notifications associated with the Substation Communications Equipment tend to be the most critical and should be researched first.

To access the View Notifications screen, select the **System Monitoring** tab > **View Notifications**.



The Notification Search window displays.

## CURRENT - VIEW NOTIFICATIONS

**Notification Search:**

Notification Category:

Notification Subcategory:

Notification Number:

Equipment ID :  ...

Date of Occurrence : Start:   End:

You can search by subsets of the following notification categories:

- **Disconnect Switch**
- **DMC**
- **Integration Hub**
- **Outage/Switch**
- **Register Profile**
- **SCE**
- **System**
- **Transponder**

**Notification Search:**

Notification Category:

--Select--  
DISCONNECTSWITCH  
DMC  
INTEGRATIONHUB  
OUTAGE/SWITCH  
REGISTERPROFILE  
SCE  
SYSTEM  
TRANSPONDER

Each category has its own list of notification subcategories.

## CURRENT - VIEW NOTIFICATIONS

**Notification Search:**

Notification Category: SCE

Notification Subcategory: --Select--

--Select--

CRU  
COMMUNICATION  
EQUIPMENT  
INITIALIZE  
OMU  
SYSTEM MANAGEMENT  
SYSTEM MONITORING

Lookup

When all search criteria have been defined, click **Lookup**. The Lookup Results list displays all notifications that match the search criteria.

**Lookup Results :**

115 Notifications found matching lookup criteria. [Export](#)

Notification #	Date/Time	Category	Subcategory	Equipment ID	Instances	Status	Acknowledgement Expir
52271	05/16-01:27	SCE	EQUIPMENT	CONOVERVILLE1	2	Resolved	
52392	05/16-06:31	SCE	SYSTEM MONITORING	CONOVERVILLE1	1		05/16/2006 2:31 PM
52393	05/16-06:31	SCE	SYSTEM MONITORING	CONOVERVILLE1	1		05/16/2006 2:31 PM
52394	05/16-06:31	SCE	SYSTEM MONITORING	CONOVERVILLE1	1		05/16/2006 2:31 PM
52395	05/16-06:31	SCE	SYSTEM MONITORING	CONOVERVILLE1	1		05/16/2006 2:31 PM
52396	05/16-06:31	SCE	SYSTEM MONITORING	CONOVERVILLE1	1		05/16/2006 2:31 PM
52397	05/16-06:31	SCE	SYSTEM MONITORING	CONOVERVILLE1	1		05/16/2006 2:31 PM
52398	05/16-06:31	SCE	SYSTEM MONITORING	CONOVERVILLE1	1		05/16/2006 2:31 PM
52399	05/16-06:31	SCE	SYSTEM MONITORING	CONOVERVILLE1	1		05/16/2006 2:31 PM

## Troubleshooting Notification Messages

Only users with system administration privileges can process notification messages. Notification messages should be read and processed promptly. While some notification messages are obviously more important than others, *all* notification messages should be researched and acknowledged.

Once you have identified and examined a notification message you will have the option to either mark the notification as “resolved” or “acknowledged.” Not every notification contains information that is actionable. Some notifications are merely informational. In cases where notifications are acknowledged, users may also assign a “shelf-life” for acknowledged notifications to remain visible to the notification system.

Those notifications associated with the Substation Communications Equipment tend to be the most critical and should be researched first.

Use the **View Notifications** procedure (previous section) to display all notifications matching the search criteria.

**Lookup Results :**  
115 Notifications found matching lookup criteria. [Export](#)

Notification #	Date/Time	Category	Subcategory	Equipment ID	Instances	Status	Acknowledgement Expir
52271	05/16-01:27	SCE	EQUIPMENT	CONOYERVILLE1	2	Resolved	
52392	05/16-06:31	SCE	SYSTEM MONITORING	CONOYERVILLE1	1		05/16/2006 2:31 PM
52393	05/16-06:31	SCE	SYSTEM MONITORING	CONOYERVILLE1	1		05/16/2006 2:31 PM
52394	05/16-06:31	SCE	SYSTEM MONITORING	CONOYERVILLE1	1		05/16/2006 2:31 PM
52395	05/16-06:31	SCE	SYSTEM MONITORING	CONOYERVILLE1	1		05/16/2006 2:31 PM
52396	05/16-06:31	SCE	SYSTEM MONITORING	CONOYERVILLE1	1		05/16/2006 2:31 PM
52397	05/16-06:31	SCE	SYSTEM MONITORING	CONOYERVILLE1	1		05/16/2006 2:31 PM
52398	05/16-06:31	SCE	SYSTEM MONITORING	CONOYERVILLE1	1		05/16/2006 2:31 PM
52399	05/16-06:31	SCE	SYSTEM MONITORING	CONOYERVILLE1	1		05/16/2006 2:31 PM

You may have to scroll to the right to see the **Edit Review** link at the end of a specific notification number. You can click on a specific line item instance in the results to see more details on the notification.

#### VIEW NOTIFICATION INSTANCES

Lookup Criteria				
<b>Notification Category:</b>	SCE			
<b>Subcategory:</b>	SYSTEM MONITORING			
<b>Equipment ID:</b>	CONOYERVILLE1			
<b>Notification Number:</b>	52392			

Notification Id	Date/Time	Type	Name	Notification Description
63860	05/16/2006-06:31	Notice	Time	Transaction has Expired


[Close](#)

When prioritizing the actionable importance of notifications, pay special attention to the **Type** designation. Look for **Type** statuses with weighted designations. **Fatal** severity types should be processed with priority.

You can change the status of the notification by clicking **Edit**.

The Edit Notification Status region displays.

### EDIT NOTIFICATION STATUS



Notification Status

Status: ---Select---

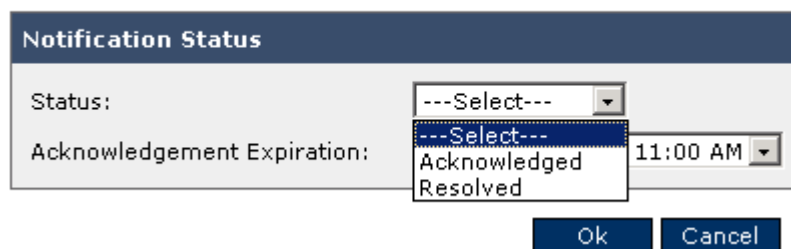
Acknowledgement Expiration: 05/17/2006 11:00 AM

Ok Cancel

You have the option to change the status to either **Acknowledged** or **Resolved**.

The Acknowledgement Expiration defaults to approximately one day. If you wish to extend the duration for which acknowledged notifications remain visible, change the expiration parameters.

### EDIT NOTIFICATION STATUS



Notification Status

Status: ---Select---

Acknowledgement Expiration: ---Select---  
Acknowledged  
Resolved 11:00 AM

Ok Cancel

Upon receipt of a message notification e-mail, the administrator should mark the notification status as **Acknowledged**.

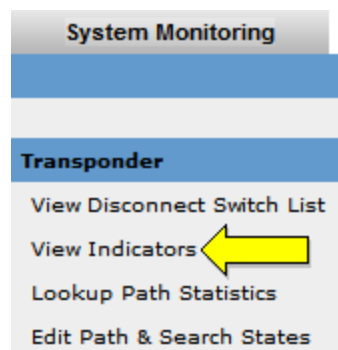
Upon resolution of the notification scenario, the administrator should change the notification status to **Resolved**.

# Transponder

## View Transponder Indicator List

Transponders communicate with the TWACS NG system to provide critical usage data. Transponders have a built-in logic routine to detect and record diagnostic information on assigned meters. These indicators are set in the transponder hardware itself, and then communicated back to the system using TWACS NG.

To access the **View Indicators** screen, select the **System Monitoring** tab > **View Indicators**.



The Indicator List screen displays.

### VIEW TRANSPONDER INDICATOR LIST

\* Required Fields

Transponder Indicator Lookup	
Indicator Type*:	All <input type="button" value="v"/>
Serial Number:	<input type="text"/>
Port Number:	-Select- <input type="button" value="v"/>
Meter/End Device ID:	<input type="text"/>
Account Number:	<input type="text"/>
Report Start Date:	3/31/2006 <input type="button" value="calendar"/>
Report End Date:	3/31/2006 <input type="button" value="calendar"/>
<input type="button" value="Lookup"/>	

The Indicator List screen provides you with a mechanism to view end devices/transponders that have diagnostic or tamper indicators set.

To examine the indicators in the indicator list, use the following procedure.

- From the Transponder Indicator Lookup box, select an indicator type in this required field. The choices for indicator types are as follows:
  - All
  - Alarm
  - Diagnostic
  - Power Quality
  - Tamper
- Select or type the information for **Serial Number**, **Port Number**, **Meter/End Device ID**, or **Account Number**. Click the calendar icon to select the beginning and ending report dates.
- Click **Lookup**. The Lookup Results display the end devices/meters that match your search criteria.

Lookup Results:							
11 device(s) found.							
<b>Summary</b>							
<b>Indicator</b>				<b>Count</b>			
NO_PULSES_24_HRS				12			
DIAGNOSTIC				1			
<b>Account Number A</b>	<b>Meter / End Device ID</b>	<b>Comm. Serial Number</b>	<b>Port Number</b>	<b>Indicator</b>	<b>Indicator Type</b>	<b>Report Date/Time</b>	<b>Process Date/Time</b>
A2292803	D1792803	2792803	0	NO_PULSES_24_HRS	TAMPER	3/31/06 12:37 PM	
A2292808	D1792808	2792808	0	NO_PULSES_24_HRS	TAMPER	3/31/06 12:38 PM	
A2292810	D1792810	2792810	0	NO_PULSES_24_HRS	TAMPER	3/31/06 12:37 PM	
A2292813	D1792813	2792813	0	NO_PULSES_24_HRS	TAMPER	3/31/06 12:36 PM	
A2292816	D1792816	2792816	0	NO_PULSES_24_HRS	TAMPER	3/31/06 12:37 PM	
A2292820	D1792820	2792820	0	NO_PULSES_24_HRS	TAMPER	3/31/06 12:38 PM	
A2292828	D1792828	2792828	0	NO_PULSES_24_HRS	TAMPER	3/31/06 12:24 PM	
A2292829	D1792829	2792829	0	NO_PULSES_24_HRS	TAMPER	3/31/06 12:37 PM	
A2292838	D1792838	2792838	0	NO_PULSES_24_HRS	TAMPER	3/31/06 12:38 PM	
A2253765	D4853765	2853765	0	DIAGNOSTIC	DIAGNOSTIC	3/31/06 12:38 PM	
A2219979	D4919979	2919979	0	NO_PULSES_24_HRS	TAMPER	3/31/06 12:38 PM	
A2219991	D4919991	2919991	0	NO_PULSES_24_HRS	TAMPER	3/31/06 10:24 AM	
A2219991	D4919991	2919991	0	NO_PULSES_24_HRS	TAMPER	3/31/06 10:28 AM	



4. To view detailed information on a transponder, click the underscored communication serial number. The Basic Information screen displays, populated with the details.

**MAINTAIN TRANSPONDER**  
View Transponder - Basic Information

Basic Information Register Config Port Mapping Address Assignments View Statistics

**Transponder Information**

Communication Serial Number*: 1792828	
Installation Status:	Active
Transponder Type:	21
Transponder Model:	52
Register Profiles:	IMT3H-1P-FIXEDKH
Manufacturer Date Code* :	1/1/2004
Disconnect Switch:	Unknown
Connect Cmd Last Executed:	
Firmware Version:	1.1
Hardware Version:	1.1
Country:	USA
<input type="checkbox"/> BLP Support <input type="checkbox"/> SoRBE Enabled <input type="checkbox"/> Multiport Hardware	
Port Count: 1	

Service Voltage: Demand Interval: Demand Subinterval: Load Profile::

15 15 60

**Current Path Map**

Substation Name:	Robertson
Bus:	Bus1
Feeder:	Feeder1
Phase:	AN
Signal:	70
Detection Point:	A
Protective Device:	2
Transformer ID:	X125

Edit

In addition, you can **Edit** and **ViewStatistics**.

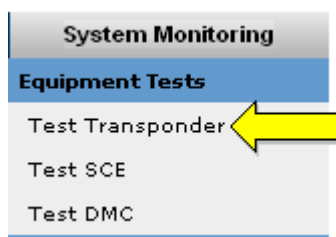
## Equipment Tests

Users can only perform those equipment test activities for which they have been assigned access privileges.

This section of the **System Monitoring** tab provides for the troubleshooting and testing of field equipment. Three equipment choices and two test results functions use the Field Equipment Exerciser screen that displays the corresponding tab for the desired equipment or test results.

### Test Transponder

To access the Field Equipment Exerciser select the **System Monitoring** tab > **Test Transponder**.



The Field Equipment Exerciser screen displays, defaulted to the Transponder tab.

#### FIELD EQUIPMENT EXERCISER Test and Diagnose – Transponders

To test and diagnose Transponders complete all steps below.

\* Required Fields

DMC
SCE
Transponder
Test Results Lookup
View Test Results

Perform Quick Test or Lookup and add Transponders for specific Test commands.

**Transponder Ping Test**

Communication Serial Number:  OR Meter/End Device ID:  Ping

**Transponder Group Test**

Request: --Select one-- Execute Now

Transponder List

Add Transponders

<input type="checkbox"/>	Comm. Serial Number	Transponder Name	Type	Model	Substation Bus	Feeder	PhasOR
<span>Remove</span>							

You can perform a quick test on one transponder, issue specific commands for specific transponders, issue a specific command to a selected list of transponders, and review results.

## Transponder Quick Test

1. In the Transponder Ping Test box, enter the Transponder Serial Number or the Meter ID.
2. Click the **Ping** button.
3. Review the results.

## Transponder Group Test

1. In the Transponder Group Test box, select a command from the drop-down menu.
2. If required, enter the Register ID and additional parameters.
3. To select transponders, click **Add Transponder** to display the Lookup Criteria screen.
  - Enter search criteria and click **Lookup**. The Lookup Results display transponders that match your search criteria.

LOOKUP TRANSPONDER

The screenshot shows the 'LOOKUP TRANSPONDER' interface. It has two main sections: 'Lookup Criteria' and 'Lookup Results'.

**Lookup Criteria:** This section contains various input fields and dropdown menus for searching transponders. Fields include: Communication Serial Number (\*g), Manufacturer, Date Code, Disconnect Switch Status, Transponder Type, Transponder Model, Installation Status, End Device Status, Meter Number, Meter Form, Service Type, Meter Class, End Device Type, Account Number, End Device Model, Premise ID, Service Voltage, Path (Substation Name, Bus, Feeder, Phase), and Program. A 'Lookup' button is at the bottom right.

**Lookup Results:** This section shows a table of found transponders. The title is '7 Transponder(s) Found'. The table has columns: Communication Serial Number, Manufacturer, Date Code, Transponder Type, Transponder Model, Installation Status, Disconnect Switch Status, Substation Name, Bus, Feeder, and Phase. Four transponders are listed, all with a status of 'Active' and 'Unknown' disconnect switch status.

Communication Serial Number	Manufacturer	Date Code	Transponder Type	Transponder Model	Installation Status	Disconnect Switch Status	Substation Name	Bus	Feeder	Phase
1792808		1/1/2004	21	52	Active	Unknown	Robertson	Bus1	Feeder1	BN
1792818		1/1/2004	21	52	Active	Unknown	Robertson	Bus1	Feeder1	AN
1792828		1/1/2004	21	52	Active	Unknown	Robertson	Bus1	Feeder1	CN
4711688		1/1/2004	38	132	Active	Unknown	Robertson	Bus1	Feeder1	CN

- Select the desired transponder check boxes from the list or select the check box from heading column if you want the whole list.
- Click **Add** from the Lookup Transponder screen. The system displays the Field Equipment Exerciser screen with selected transponders.

If you need to remove a transponder, select the corresponding check box and click **Remove**.

4. Click **Execute now** to issue the command to the list of transponders.

**NOTE:** Not all RCE types and models can support all commands. If the command cannot be executed, the system prompts you and displays a list of RCEs that cannot execute the issued command. You have a choice to execute the command on the rest or cancel the test.

### Test Communication Tool

When viewing results for of the Test Communication Tool (TCT) and related path statistics, the resulting values have specific definitions in relation to TWACS communication.

**Comm Evaluation Mean Signal Strength:** This value indicates the amount of TWACS communication signal the RCE detects from the SCE Equipment over the power line. This value can also be referred to as Outbound Signal Strength. Any value over 25 is sufficient for the RCE to detect an outbound request. This is a direct correlation to the firing angle of the OMU with respect to the default firing angle of 22 degrees. The higher the OMU firing angle of the OMU, the larger the returned value of the Comm Evaluation Mean Signal Strength.

**Comm Evaluation CMD Count:** This is an integer value which indicates the number of times an outbound message was received by the RCE. The value ranges from zero to 255 and will be reset to zero when the RCE experiences a power outage. This value is useful in determining outbound or inbound communication failures.

For example, if three Test Communication Tool commands are sent to an RCE there could be three scenarios:

**Scenario 1:**

Transaction Received by TWACS NG	COMM EVALUATION CMD COUNT	Indication
Yes	1	Communication 100% no inbound or outbound errors
Yes	2	
Yes	3	

**Scenario 2:**

Transaction Received by TWACS NG	COMM EVALUATION CMD COUNT	Indication
Yes	1	Outbound Communication Error. RCE did not decode outbound request.
No	No Response	
Yes	2	

**Scenario 3:**

Transaction Received by TWACS NG	COMM EVALUATION CMD COUNT	Indication
Yes	1	Inbound Communication Error. SCE did not decode RCE response.
No	No Response	
Yes	3	

**Method Status (MS):** This value identifies the number of decoding attempts that were required to decode the inbound signal. The values will range from zero (unsuccessful decoding) to 254. The higher the number, the easier it was to decode the signal.

**Normalized Signal Strength (ISS):** This value indicates the signal strength calculated by the Inbound Receiver and is scaled using either the neutral or phase (inbound) scalars present in the downloaded Detection Parameter Table specific to a bus and feeder. The Detection Parameter Table is downloaded during Initialize SCE.

**Channel:** This value is the specific inbound channel that the SCE used while performing inbound acquisition of the RCE response.

**Acquisition Window (IWIN):** When the SCE performs inbound detection the acquisition window indicates the aggregate location on the ac waveform where the inbound signal was detected. The value identifies the particular inbound acquisition window that was used by the Inbound Receiver to detect RCE inbound data. A value of zero indicates that the signal is in the center window. Valid values are between -18 and +17. Each count is measured in degrees, based on the detection window degrees (typically five degrees) beginning at the end of the Phase Delay (typically 135 degrees.)

**CRMA ID:** This value identifies the ID of the CRMA/MIRA that was used during inbound detection of each transaction.

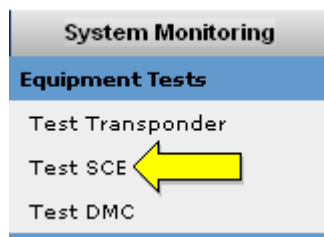
**Inbound Signal Quality (IQUAL):** For MIRA Firmware Versions less than 1.42 this field returns the “Quality” of the inbound signal that was measured by the inbound receiver. The quality is a number from 0 to 100. The closer the value is to 100 the better the signal quality. For MIRA firmware greater than 1.42 this field returns the “Signal to Noise Ratio” (SNR) of the inbound signal that was measured by the inbound receiver. The SNR has a range of 0.00 to 25.5 and is measured in dB and is scaled by a factor of ten before it is returned to Master Station. Values above eight indicate the inbound signal should be easy to decode. The higher the SNR value the better.

**Comm Evaluation Window Data:** This value is the location on the AC waveform of where the RCE detected the outbound request from the SCE. This value has a range from zero to 15 and any value three and above indicates a good location.

## Test SCE

The TWACS NG system allows you to communicate directly for troubleshooting purposes to the SCE by issuing specific commands directly from a user interface.

To access the Field Equipment Exerciser select the **System Monitoring** tab > **Test SCE**.



The Field Equipment Exerciser screen displays, defaulted to the SCE tab.

## SCE Ping Test

1. In the SCE Ping Test section, enter the SCE Number.
2. Click **Ping**.
3. Review the results.

## SCE Group Test

1. In the section SCE Group Test choose a command in the drop-down.
2. Enter the additional parameters (if required).
3. To select SCEs, click **Add SCEs**. The Lookup Criteria screen displays.
  - Enter search criteria and click **Lookup**. The Lookup Results display SCEs that match your search criteria.
  - Select the desired SCEs check boxes from the list or select the check box from heading column if you want the whole list.
  - Click **Add** from the Lookup SCEs screen. The system displays the Field Equipment Exerciser screen with selected SCEs.
  - If you need to remove any SCEs, select the corresponding check box and click **Remove**.
4. Click **Execute Now** to issue the command to the list of SCEs.

**NOTE:** Not all SCE types and models can support all commands. If the command cannot be executed, the system prompts you and displays a list of SCEs that cannot execute the issued command. You have a choice to execute the command on the rest or cancel the test. Click **OK** to test the SCEs.

5. Retain the **Test ID** by writing it down or pasting it. You will need this ID to review the results of your tests.

**FIELD EQUIPMENT EXERCISER**  
**Test Results Lookup**

To look up test results complete all steps below.  
 \* Required Fields

DMC SCE Transponder **Test Results Lookup** View Test Results

**Test Criteria**

Test ID:  Test Type:

User Role:  User ID:

Start Date\*:  End Date:

Start Time\*:  Hours  Minutes End Time:  Hours  Minutes

**Test Results List**

1 Tests found.

Test ID	Test Type	Execution Date-Time
569	SCE	04/14/2005 01:27

## Run Diagnostics on a Substation

Select the System Monitoring tab and click Test SCE.

**System Monitoring**

Current

Transponder

Equipment Tests

Test Transponder

**Test SCE** ←

Test DMC



The Field Equipment Exerciser screen displays, defaulted to the SCE tab.

#### FIELD EQUIPMENT EXERCISER

##### Test and Diagnose – SCE

To test and diagnose SCEs complete all steps below.

\* Required Fields

DMC
SCE
Transponder
Test Results Lookup
View Test Results

Perform Quick Test by entering SCE Number or Lookup and add SCEs for specific Test commands.

**SCE Ping Test**

SCE Number: --Select one-- Ping

**SCE Group Test**

SCE Request: PERFORM SCE DIAGNOSTICS

EQUIPMENT TYPE

EQUIPMENT ID

DIAGNOSTIC TEST

Execute Now

---

SCE List

Add SCEs

<input type="checkbox"/>	Substation	DMC	SCE Number	Comm. Resource	SCE Operation Status
<input type="checkbox"/>					

Remove

Select the substations you wish to test using the **Add SCEs** button.

Check the box next to the SCE on which diagnostics will be run.

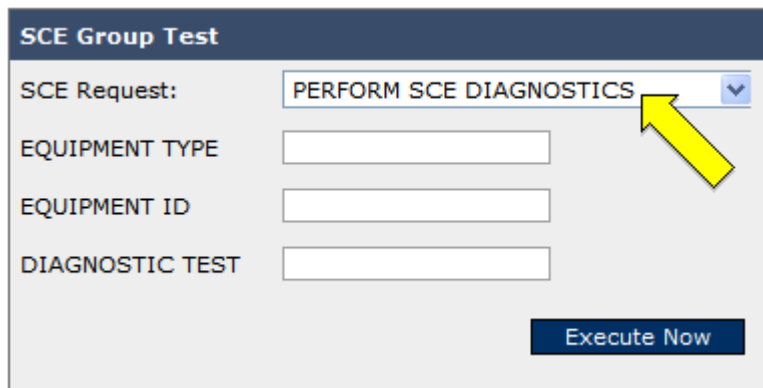
#### SCE List

Add SCEs

<input type="checkbox"/>	Substation	DMC	SCE Number	Comm. Resource	SCE Operation Status
<input checked="" type="checkbox"/>	Davetown	2	50		Offline

Remove

Under the SCE Group Test dialog, select the **SCE Request** for PERFORM SCE DIAGNOSTICS.

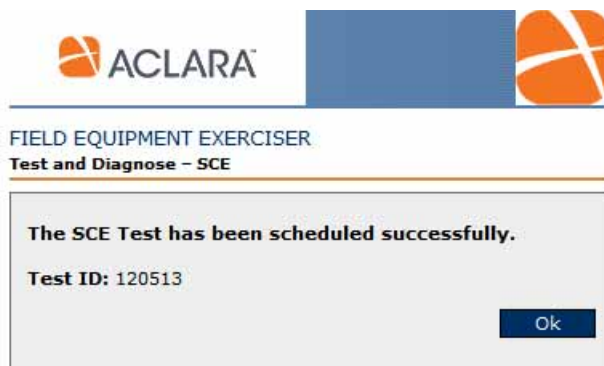


Use the **Equipment Type**, **Equipment ID**, and **Diagnostic Test** code from the following table based on the type of equipment used in the substation. The diagnostics will run a self test on the board. The diagnostic test 7, Equipment type 1, Equipment ID, will schedule a test on the OMU.

Equipment Type	SCPA	CRPA/MIRA	CRMA/MIRA	OFIA	OMU	OMU Test Fire
Diagnostic Test	3	2	8	9	1	7
Equipment ID	0	1-4	0-3	1-3	1-12	1-12

Click **Execute Now**, then **OK**.

A confirmation screen notifies that the test has been scheduled.



Click on the refresh option in your internet browser to display updated information.

**MC/DMC/SCESuccessful**, means that the test was performed and a response has been returned. The relationship of the response in the Field Equipment Exerciser confirmation screen is represented by the conditions in the following table.

MC	DMC	SCE	Overall State
--	--	--	Waiting for execution
Failed	Failed	--	No response received (likely timed out)
Success	Success	Success	Ping successful
Success	Success	Status Short Description (see descriptions which follow)	Problem occurred

SCE	Short Description	Full Description
1	Trans Buffer Full	A command was sent to the substation and the substation buffer was full of commands with the same priority. The command was rejected by the substation.
2	Trans Not Found	An attempt was made to cancel a command at the substation and the command was not found in the substation buffer.
3	Duplicate Transaction	A command was sent to the substation that has the same substation exchange ID as a command already at the substation. The command has been rejected by the substation.
4	Trans Bumped not Executed	The substation buffer is full of commands but a command with a higher priority than any command in the substation buffer was received. The substation replaced the lowest priority and most current command in the buffer with the higher priority command. The substation returned the bumped command without executing it.

5	Transaction Expired	The command in the substation buffer has not been executed before the substation time-out time. The command is returned by the substation without it being executed.
6	Equipment not Operational	A command was sent to the substation and the equipment to be used by the substation to sent the command is not operational.
7	Error in Command Parameter	The command sent to the substation is not formatted correctly. There is a problem with the command structure. Call Aclara Support for analysis and resolution.
8	Error in RCE Comm Option	The command sent to the substation is not formatted correctly.
9	Error in Path Definition	The command sent to the substation is not formatted correctly.
10	Error in Address Parameter	The command sent to the substation is not formatted correctly. There is a problem with the command structure. Call Aclara.
11	Error in Command Information	The command sent to the substation is not formatted correctly.
12	Table Entry not Found	1. The command sent to the substation cannot be executed by the substation. The table information for the command does not match the substation tables at the substation. 2. The substation does not have table information.
13	Execution Halted	The command was stopped at the substation.
14	Pending Transaction Cancelled	A waiting command was stopped at the substation.
15	Executing Transaction Canceled	The command was stopped at the substation.
16	Execution Aborted by Restart	The substation has performed a priority 255 command, or a restart was received and was subsequently canceled.

17	Table Not Could - Log Empty	1. The command sent to the substation cannot be executed by the substation. The table information for the command does not match the substation tables at the substation. 2. The substation does not have table information.
18	Table Already Locked	This error is caused by attempting to lock the substation table during a table download when the table was already locked.
19	Link Out of Order - Not Executed	This command is not used by TNS. It should not occur.
20	Invalid Length	The command sent to the substation is not formatted correctly.
21	Invalid Type	The command sent to the substation is not formatted correctly.
22	Invalid ID	The command sent to the substation is not formatted correctly.
23	Invalid Priority	The command sent to the substation is not formatted correctly.
24	Invalid Function	The command sent to the substation is not formatted correctly.
25	Invalid Date/Time	The command sent to the substation is not formatted correctly.
26	Invalid Header Fields	The command sent to the substation is not formatted correctly.
27	Call Aclara	The command sent to the substation is not formatted correctly.
28	Call DSCI	The command sent to the substation is not formatted correctly.
29	Invalid Retry/Repeat Value	The command sent to the substation is not formatted correctly.
30	Invalid Phase	The command sent to the substation is not formatted correctly.

31	Invalid Signal Mode	The command sent to the substation is not formatted correctly.
32	Invalid Detection Point	The command sent to the substation is not formatted correctly.
33	Invalid RCE Address Mode	The command sent to the substation is not formatted correctly.
34	Call Aclara	The command sent to the substation is not formatted correctly.
35	Invalid RCE Command Generation	The command sent to the substation is not formatted correctly.
36	Invalid RCE Parameter Bits	The command sent to the substation is not formatted correctly.
37	Invalid RCE Response Length	The command sent to the substation is not formatted correctly.
38	Invalid RCE Response Mode	The command sent to the substation is not formatted correctly.
39	Invalid Entry Count	The command sent to the substation is not formatted correctly.
40	Invalid Entry Length	The command sent to the substation is not formatted correctly.
41	SCE Load Ctrl Not Present at SCE	N/A
42	SCE Load Ctrl Executing	N/A
70	Communication Window Insufficient	In the tables downloaded to the substation, the acquisition window is too small
71	Invalid Start/Stop Hr	N/A
72	Invalid Window Span	N/A
73	Invalid Initial Delay	N/A
74	Invalid Active Comm	N/A
75	Invalid Repetition Count	N/A
76	Invalid Active Comm Void	N/A
77	Time Slice Params in Conflict	N/A
78	All 24 hrs Not Defined	N/A
99	Multiple Hdrw Problem Detected	Substation equipment has multiple problems.

120	Allocation Error	CRPA had an error allocating the appropriate equipment to perform the requested command.
121	Timeout on Request to OMU	N/A
122	Requested Equip is Busy	The SCE equipment needed is busy.
123	CPA Out of Buffers	The CRPA has run out of memory for the command requested.
170	Executed Recvd, OMU never set up	The OMU will not set up for the requested command.
171	Outbound Signaling Setup, Waiting for execute	OMU is waiting to send the command.
172	Requested OFIA Not Installed	OFIA that is requested is not in the card cage assembly or has been marked out of service.
200	Invalid Parameter Index	CRPA problem.
220	CRPA not set up for Inbound acquisition	CRPA problem.
221	Waiting for OMU EOM Pulse.	CRPA is waiting for OMU's end of message pulse.
222	EOM Received, Inbound not complete	CRPA is completing inbound acquisition.
223	Equip Not Installed	The requested equipment is not installed in the CRU.
230	Transmit Frame Truncated	N/A

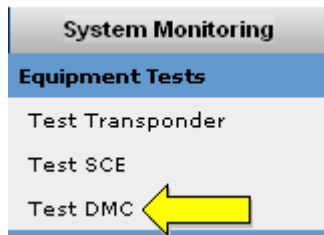
**Entry Count** indicates the number of exceptions. Zero are expected.

A **General Status** of zero indicates zero exceptions (good) A one indicates there has been an exception or a failure

If exceptions appear, go to the **System Monitoring** tab> **View Notifications** to investigate the notification.

## Test DMC

To access the Field Equipment Exerciser select the **System Monitoring** tab > **Test DMC**.



The Field Equipment Exerciser screen displays, defaulted to the DMC tab.

### FIELD EQUIPMENT EXERCISER

#### Test and Diagnose – DMC

To test and diagnose DMCs complete all steps below.

\* Required Fields

 A screenshot of the 'FIELD EQUIPMENT EXERCISER' interface. At the top, there are five tabs: 'DMC', 'SCE', 'Transponder', 'Test Results Lookup', and 'View Test Results'. The 'DMC' tab is selected. Below the tabs, there is a section titled 'Perform a Ping Test by entering the DMC Name.' Inside this section, there is a sub-section titled 'DMC Test'. This sub-section contains a label 'DMC Name:' followed by a dropdown menu showing 'Select DMC' and a 'Ping' button.

You can issue **Ping** commands to confirm the connection to the DMC and review the results.

1. In the DMC Test region, select the DMC ID from the drop-down.
2. Click Ping.
3. Review the results in the Test Results section.

#### Test Results

DMC ID	DMC Name	IP Address	Status	Round Trip Time
1	DMC1	10.155.104.110	Online	0 milliseconds



## Outage Recovery and Switching

TWACS NG has an automated process that identifies when a large number of transponders on the same path stop communicating.

For this automated process, two batch jobs should be enabled; SwitchingDetectionBatchJobMaster and SwitchingExtentBatchJobMaster. (Details on how to enable these batch jobs are available in the deployment guide).

There are two configurable values related to this functionality located in the CommPath.properties file:

- **THRESHOLD.CFC**
- **THRESHOLD.DETECT**

Related Default values are **3** for the CFC, (consecutive fail count), and **25** for DETECT. These values tell the functionality to look for transponders where there are at least 25 transponders on the same path that have failed to communicate more than 3 consecutive times. The users may decide to adjust the DETECT number based on the minimum number of transponders on the same path.

When a possible switch is detected, (the above criteria being met), a notification generates indicating the path where the problem exists. An email notification is sent if email notifications were set up. TWACS NG first pings all transponders on the problem path. All non-responsive transponders have their path state changed to **Switch** and search state changed to **Ready**. This terminates events with those transponders since TWACS NG only executes scheduled transactions for transponders that have path states of **Good** or **Tentative**. Once the extent of the outage is determined, another notification generates indicating the number of transponders affected. Another email notification is sent.

If the TWACS NG user knows (or suspects) the problem was caused by an outage, the administrator can update the path state to **Outage** and search state to **Ready**.

**NOTE:** Please note that the system will not automatically change transponder path states to "Outage" with this functionality.

When the outage has been restored, the operator can use the **Restoration Check** button to ping the transponders from the *System Monitoring tab > Edit Path & Search States* screen. All responding transponders will have their path state set to **Good** and search state set to **Done**, reestablishing TWACS communication.

If the communication outage was caused by a utility switching event (or if the operator isn't sure why a set of transponders isn't communicating) the operator should search a few of the transponders. This can be done by using the **Search** link for the individual transponder from the *System Monitoring* tab > *Edit Path & Search States* screen.

Lookup Results

300 Transponder Paths found. Restoration Check

CS ID#	Path State	Search State	Sub Name	Bus Name	Feeder Name	Phasor	Date Assigned	Transformer	Protective Device	Region	Line Section	Pole#	
961	Good	Done	D15UB2	D152B051	D152B1FD01	AN	Oct 08, 2007	X123	PD13		1	P-A120	<a href="#">Search</a>
962	Good	Done	D15UB2	D152B051	D152B1FD01	AN	Oct 08, 2007	X123	PD13		1	P-A120	<a href="#">Search</a>
963	Good	Done	D15UB2	D152B051	D152B1FD01	AN	Oct 08, 2007	X123	PD13		1	P-A120	<a href="#">Search</a>
964	Good	Done	D15UB2	D152B051	D152B1FD01	AN	Oct 08, 2007	X123	PD13		1	P-A120	<a href="#">Search</a>
965	Good	Done	D15UB2	D152B051	D152B1FD01	AN	Oct 08, 2007	X123	PD13		1	P-A120	<a href="#">Search</a>
966	Good	Done	D15UB2	D152B051	D152B1FD01	AN	Oct 08, 2007	X123	PD13		1	P-A120	<a href="#">Search</a>
967	Good	Done	D15UB2	D152B051	D152B1FD01	AN	Oct 08, 2007	X123	PD13		1	P-A120	<a href="#">Search</a>
968	Good	Done	D15UB2	D152B051	D152B1FD01	AN	Oct 08, 2007	X123	PD13		1	P-A120	<a href="#">Search</a>
969	Good	Done	D15UB2	D152B051	D152B1FD01	AN	Oct 08, 2007	X123	PD13		1	P-A120	<a href="#">Search</a>
970	Good	Done	D15UB2	D152B051	D152B1FD01	AN	Oct 08, 2007	X123	PD13		1	P-A120	<a href="#">Search</a>
971	Good	Done	D15UB2	D152B051	D152B1FD01	AN	Oct 08, 2007	X123	PD13		1	P-A120	<a href="#">Search</a>
972	Good	Done	D15UB2	D152B051	D152B1FD01	AN	Oct 08, 2007	X123	PD13		1	P-A120	<a href="#">Search</a>
973	Good	Done	D15UB2	D152B051	D152B1FD01	AN	Oct 08, 2007	X123	PD13		1	P-A120	<a href="#">Search</a>
974	Good	Done	D15UB2	D152B051	D152B1FD01	AN	Oct 08, 2007	X123	PD13		1	P-A120	<a href="#">Search</a>
975	Good	Done	D15UB2	D152B051	D152B1FD01	AN	Oct 08, 2007	X123	PD13		1	P-A120	<a href="#">Search</a>
976	Good	Done	D15UB2	D152B051	D152B1FD01	AN	Oct 08, 2007	X123	PD13		1	P-A120	<a href="#">Search</a>

The user should pick a few transponders across different phasors for searching. The TWACS serial numbers should be noted so the user can monitor the search and lookup the new path once the search is complete.

Once the new path is determined, then the operator can manually move other transponders to the new path as appropriate. Once this is done, the path state automatically gets set to **Good** and search state to **Done**, reestablishing TWACS communication. The transponder will also be flagged for a new two-way address.

From the *Edit Path & Search States* screen, users can use the **Search** link, **Restoration Check** button and the **Update Path** button in different combinations to recover communication with transponders designated as **Switch** or **Outage**.

**NOTE:** The user should be certain of the new path before using the **Update Path** button.

1. The user first identifies transponders affected by a switching event. On the **Maintain TWACS transponder paths** interface, the user enters the communication path on which the event is detected and/or selects the path state as **Switch** from the drop down as the lookup criteria in the Transponder Path Lookup section. When the user clicks on the **Lookup** button, the system displays all transponders meeting the criteria in the lookup results section of the screen.

#### MAINTAIN TWACS TRANSPONDER PATHS

**Transponder Path Lookup**

TWACS Communication Serial Number:

Path State:  Search State:  Active Ind:

**Path**

Sub Name:  Bus Name:

Fdr Name:  Phasor:

Protective Device:  Region:

Line Section:  Transformer:

Pole Number:  Max Rows Returned:

**Lookup**

2. In the list of transponders displayed on the lookup results screen each transponder has an associated search link. Searching for a sample group of transponders amongst the list of transponders may give the user a hint as to where the transponders may have been. Users can click on the Search link for any transponder.

When the user clicks on the **Search** link, the system displays a confirmation window asking the user to confirm the request to issue the search request for the transponder. If the user clicks on the **Cancel** button in the confirmation window, the user returns to the previous **Maintain TWACS Transponder Paths** screen and a search is not issued for the transponder.

If the user clicks the **OK** button on the confirmation window then the user returns to the previous **Maintain TWACS Transponder Paths** screen and the system issues a search for the transponder on its original substation. If the transponder is not found on the original substation, each alternate substation is searched until the transponder is found. If the search fails, the search state will be changed to **Failed** and the path state will remain the same as it was.

Transponder Path Action

New Path State

Select

New Search State

Failed

Action Comments

Update Path

Path Update

New Path

Sub Name

Select

Bus Name

Select

Fdr Name

Select

Phasor

Select

Update Path

#### Search Results

#### 62 Transponder Paths found.

Transponder State	TWACS Serial #	Path State	Search State	Sub Name	Bus Name	Fdr Name	Phasor	Date Assigned	Region	Region Trust Flag
Operational	10431516	Good	Done	TR1	Bus1	Feeder51	CN	Sep 07, 2006	false	
Operational	10431520	Good	Done	TR1	Bus1	Feeder51	BN	Sep 07, 2006	false	
Operational	10431542	Good	Done	TR1	Bus1	Feeder51	AN	Sep 07, 2006	false	
Operational	10431553	Good	Done	TR1	Bus1	Feeder51	BN	Sep 07, 2006	false	
Operational	172696	Good	Done	TR1	Bus1	Feeder51	CN	Sep 07, 2006	false	

- Using the **Transponder Path Lookup** section, the user looks up the transponder on which the search was conducted. The user can use the search and path states of the transponders to indicate whether a search has been completed and if it successfully found any transponders. If search has not completed, the search state of the transponder will be marked as **Searching**. If search is completed, the search and path state of the transponder indicate whether the transponder is found by search.

The following table indicates the search and path state of the transponder post completion of search. The table assumes that the search retry count is set to zero.

Search State	Path State	Transponder "Found"		
		SS>=Threshold	SS<Threshold	Transponder "Not Found"
Ready	Tentative	Done/Good	Done/Tentative	Ready/Lost
	Lost	Done/Good	Ready/Tentative	Failed/Lost
	Outage	Done/Good	Ready/Tentative	Failed/Outage
	Switch	Done/Good	Ready/Tentative	Failed/Switch
Pending Analysis	Tentative	Done/Good	Done/Tentative	Ready/Lost
	Lost	Done/Good	Ready/Tentative	Failed/Lost
	Outage	Done/Good	Ready/Tentative	Failed/Outage
	Switch	Done/Good	Ready/Tentative	Failed/Switch

If search is unable to find any transponders successfully, the user may choose to update the path state of all **Switch** transponders to **Outage**. The user marks them for on outage analysis with the assumption that these transponders may be affected by outage and could be recovered on the same communication path.

4. The user uses the restoration ping capability on the **Maintain TWACS Transponder Paths** interface to issue a restoration ping for all transponders marked for outage analysis. If the user is unable to find transponders using the restoration ping, the user can also use the search link to search for transponders. The user uses the restoration ping or the search link on the screen until some or all transponders are found.

The user determines if the sample transponders are found on a communication path different from the one they were on originally. If search finds the sample transponders on the same communication path as they were previously on, the user looks for transponders using the restoration ping available on the screen. A restoration ping button appears on the screen along with a list of transponders depending on the search criteria. The restoration ping issued from the screen will ping all transponders in the **Lookup Results** list. When the user clicks on the restoration ping button, the system pings all transponders in the lookup results list on their respective communication paths. Once all transponders are found using the restoration ping, go to step 6.

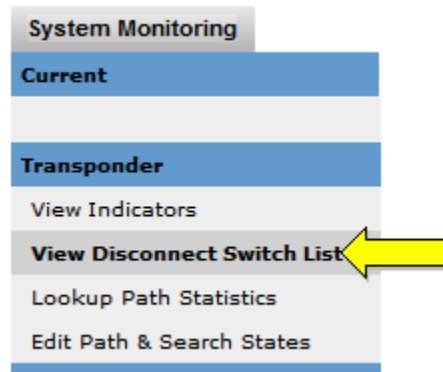
5. If the sample transponders are found on a new communication path, the user updates all other affected transponders on the communication path that the sample transponders were previously on to the new communication path the sample transponders were found on.

On the 'Maintain TWACS transponder paths' screen, user looks up transponders using the communication path the sample transponders were previously on and selecting the path state as **Switch** as the lookup criteria. (**Outage** may be selected as the path state in the event that the user had previously updated the transponders to outage analysis in step 3.) When the user clicks on the **Lookup** button, the screen displays a list of transponders matching the search criteria in the lookup results section.

6. The user selects the new communication path that the sample transponders are found on in the **Update Path** section of the screen. When the user clicks on the **Update Path** button, the system updates all transponders in the lookup results section of the screen. The system also updates other statistics for the transponders. These statistics include all transponder statistics that are updated when the search process finds a transponder with path state **Lost**. The search and path state of the transponders are also updated. The system executes any pending transactions for the transponders using the communication path they are found on as efficiently as possible.

## Viewing the Outage Switch List

1. To view the **Disconnect Switch List**, under the **System Monitor** tab, select **View Disconnect Switch List**.



2. The View Disconnect Switch List displays.

**VIEW DISCONNECT SWITCH LIST**

Lookup Criteria			
TWACS Communication Serial Number	<input type="text"/>	Switch Status	Select <input type="button" value="v"/>
Premises ID	<input type="text"/>	Voltage Sensed	Select <input type="button" value="v"/>
Voltage Sensed Date/Time	Start Date: <input type="text"/> <input type="button" value="calendar"/>	End Date: <input type="text"/> <input type="button" value="calendar"/>	
Push Button Date/Time	Start Date: <input type="text"/> <input type="button" value="calendar"/>	End Date: <input type="text"/> <input type="button" value="calendar"/>	
		<input type="button" value="Lookup"/>	<input type="button" value="ShowAll"/>

## Verifying Outage Restoration

1. Log in the system and click **System Monitoring > Edit Path & Search States**.
2. Enter appropriate criteria into the Transponder Path Lookup section and click **Lookup** to list the transponders to check.
3. In the Transponder Path Lookup section, select **Outage** for **New Path State** and select **Ready** for **New Search State**. Click **Update Path/Search State**.
4. Click **Lookup** to refresh the list of transponders to check. Scroll down the page and verify that the **Path State** and **Search State** are now set to **Outage** and **Ready** respectively.
5. Click **Restoration Check**. Click **OK** button on each of the next two popup windows.

6. Click **Lookup** button. As transponders communicate, (i.e., they have power), the **Path State** will become **Good** and the **Search State** changes to **Done**. This results in the transponders being removed from the lookup results. Ones that remain on the list should be investigated for outage restoration.

## Power Reliability Data Overview – TWACS NG

The circuit boards in some versions of the UMT-R and UMT-C transponders include a real-time clock and super capacitor that enable them to maintain the time at the end of a power outage and to record specific details about the length and type of outage.

TWACS NG provides the functionality to allow the user to harvest simply the number of power interruptions from the transponder, as well as various types of more detailed outage (power reliability) data.

To collect the number of power interruptions, the user can schedule the collection of **Power-Down Counts** from all transponders or from a select group of transponders where the customer may be experiencing excessive power interruptions.

With detailed outage data collection TWACS NG provides the functionality to allow the user to harvest a **Summary of Daily Interruption Data**. The user can schedule the collection of this summary data for a selected set of transponders. In the request, the user must specify the start date of the collection window, and either a seven or 14 day collection period. TWACS NG will then deliver the following data both in the User Interface using a predefined APEX report, and via the batch export files:

- Summed **Total Number of Sustained Interruption per Day** for the specified period
- Summed **Total Number of Sustained Interruption per Day** for the specified period
- Summed **Total Number of Momentary Interruptions Events per Day** for the specified period
- Summed **Total Number of Momentary Interruption per Day** for the specified period
- For each of the days represented in the data, TWACS NG also provides an indication of:
  - No interruptions occurred
  - Only momentary interruptions were recorded
  - Only sustained interruptions were recorded
  - Both sustained & momentary interruptions were recorded

Once the user identifies a specific date from the Summary of Daily Interruption Data, TWACS NG provides functionality to allow more specific information to be harvested from the transponder(s) for the date identified from a **Detailed Daily Interruption Summary Data** report. This data is collected when the user schedules an event in TWACS NG to harvest the following:

- Total Sustained Interruption Duration for the day (presented in seconds)
- Total Number of Sustained Interruptions during the day
- Total Number of Momentary Interruptions during the day
- Total Number of Momentary Interruptions Events during the day

TWACS NG provides the functionality to allow the user to harvest **Detailed Time Stamped Interruption Data**. The user can schedule events to harvest the following information for a specific interruption on a given date. Stated more specifically, the user can schedule to collect the following data for up to 12 individual interruptions for a given day:

- The start time of the interruption on the selected date
- The sustained interruption duration
- The number of momentary interruptions during a momentary event



## Glossary of Terms

Term	Description
Transponder Power-down Count	A 'power-down' counter is incremented in the transponder when the line voltage has dropped below the acceptable threshold causing the transponder electronics to suspend all its normal activities. The transponder will be considered 'powered up' when it resumes the normal activities after completing the power-up sub-routines.
Momentary Interruption	As per the IEEE-1366, a Momentary Interruption is defined as: A single operation of an interrupting device that results in a voltage zero. For example, two circuit breaker or recloser operations (each operation being an open followed by a close) that momentarily interrupts service to one or more customers is defined as two momentary interruptions.
Momentary Interruption Event	<p>As per the IEEE-1366, a Momentary Interruption Event is defined as: An interruption of duration limited to the period required to restore service by an interrupting device. A note follows the definition: Such switching operations must be completed within specified period of 5 minutes or less. This definition includes all reclosing operations that occur within five minutes of the first interruption. For example, if a recloser or circuit breaker operates two, three, or four times and then holds (within five minutes of the first operation) those momentary interruptions shall be considered one momentary interruption event.</p> <p>The following explains the definition of Momentary Interruption Event that is followed throughout this document.</p> <p>If there is one, two, three, or four consecutive momentary interruptions within five minutes of first momentary interruption, those momentary interruptions shall be considered one Momentary Interruption Event.</p>
Sustained Interruption	<p>As per the IEEE-1366, a Sustained Interruption is defined as: any interruption not classified as a part of a Momentary Interruption Event. That is, any interruption that lasts more than 5 minutes.</p> <p>Throughout this document, a Sustained Interruption is defined as: any power-down of the RCE that lasts more than the duration chosen by the sustained interruption duration criterion. A customer might choose any duration from 1 minutes up to 8 minutes in a step of 2.5 seconds. The default value shall be 5.0 min. This must be predefined in the transponder, and cannot be reconfigured using TWACS NG.</p>

## CIM XML Controls

The TWACS® NG master station is designed to offer scalability and other features required by large utilities. The communication system is used to read meters, test for outages, connect and disconnect service.

There are a number of ways to represent data and transport data between systems. For data representation, TWACS NG uses a unique flat file format for import and export of most data in a batch process, but also supports an XML interface based on the CIM.

See the suite of documentation on the CIM for more information.

## Revenue Protection Messages

Usage alert messages provide test results that indicate when a meter has failed one of several diagnostic tests that may or may not be indicative of tampering.

TWACS NG looks at revenue protection from two perspectives: Reverse rotations and unusual usage monitoring.

### Reverse Rotation

There are few plausible explanations for reverse rotations unless the account has been identified as a co-generation account. As such, reverse rotation alerts will automatically be sent to the Messages section of Revenue Protection, and can be confirmed using the **Reverse Energy command** on the Call Center Support Screen. Virtually all instances of unexplained reverse rotations should have a **Severity Level** status of critical, and prompt immediate investigation.

If a reverse rotation alert is detected, usage monitoring checks will continue to run.

### Usage Monitoring

Unusual usage monitoring is established through the use of **Alert Profiles** and **Alert Checks**.

An alert profile is a general classification applied to an account that describes the expected usage for that account at the present time. For example, an average residential customer has a somewhat predictable range of expected resource usage.

If there were suddenly absolutely no usage for several days, that may indicate an unusual situation that needs to be investigated. As another example, a residential home where the owners have moved out, but the utilities remain on and active while the real estate agents show the house on weekends would also have a different, yet predictable usage profile. If that account started showing everyday usage at levels of a normal occupation, then that also may indicate a situation that needs to be addressed. And if a residential or commercial customer who has had services disconnected starts showing any usage at all, that would be another situation warranting inspection.

Alert profiles are authored by customers and associated to TWACS NG using a customer provided code during the TWACS NG setup process.

Each of those three account examples represents a different **Alert Profile**.

### **Alert Profile 1: Residential Customer - Active Account**

**Sample Alert Check:** Is the customer using 25% *more* resources than other customers in the same location for more than five days in a row? (If so, mark the severity level as “low.” If it is still this way after 15 days, then mark it “medium.”)

**Sample Alert Check:** Is the customer using 50% *fewer* resources than other customers in the same area for more than five days in a row? (If so, mark the severity level as “low.” If it is still this way after 15 days, then mark it “medium.”)

**Sample Alert Check:** Is the customer using 0 kWh for even one day? (If so, mark the severity level as “high.”)

### **Alert Profile: Residential Customer - Inactive Account**

**Sample Alert Check:** Is the premises consuming more than 5 kWh per day for more than three weekdays in a row? (If so, mark the severity as “low.”)

**Sample Alert Check:** Is the premises consuming more than 20 kWh per day for more than five weekdays in a row? (If so, mark the severity as “medium.”)

### **Alert Profile: Residential Customer - Disconnected Account**

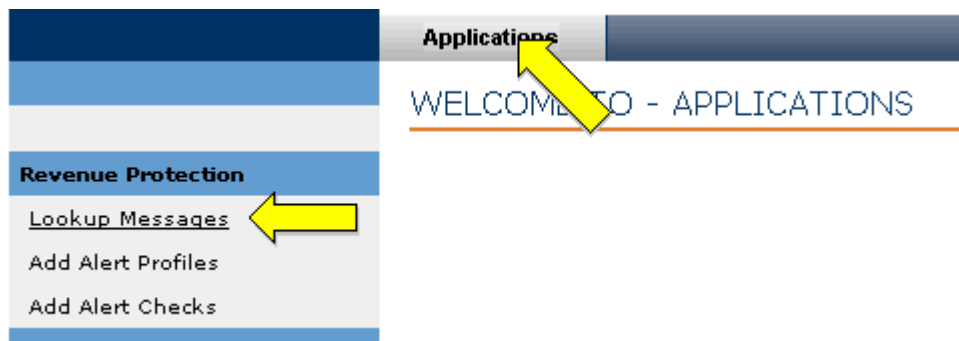
**Sample Alert Check:** Is the premises consuming more than 0 kWh per day? (If so, mark the severity as “critical.”)

## **Lookup Revenue Protection Messages**

The Lookup Messages screen is a convenient reference screen that Customer Service Representatives (CSRs) can use to search for the following information:

- Usage alerts for a given usage profile
- Usage alerts for a specific transponder/end device
- Usage alerts for accounts that may be on a revenue protection watch list

To access the Lookup Revenue Protection Messages screen, select the **Applications** tab > **Lookup Messages**.



The View Revenue Protection Messages screen displays.

#### VIEW REVENUE PROTECTION MESSAGES

##### View Revenue Protection Messages

Revenue Protection Message Query Options		
<b>Date Range*:</b>		
Start Date: 10/05/2006	End Date: 10/11/2006	
<b>Usage Alert Profile*:</b>	<b>District*:</b>	<b>Severity Level*:</b>
VIEW ALL Street Lighting - Default (Electric) Residential - Default (Electric) Residential Active Acct	VIEW ALL	VIEW ALL Critical High Medium
<b>Additional Options:</b>		
<input type="checkbox"/> Limit to Meters in the Revenue Protection Watch List		
<input checked="" type="checkbox"/> Specify Meter/End Device ID: <input type="text"/>		
<b>Lookup</b>		

## View Revenue Protection Messages

To view Revenue Protection Messages, use the following procedure.

1. Enter a Start Date and End Date in the **Date Range** fields, or select them from the dynamic calendar icons.
2. Select an option in the Usage Alert Profile or choose **View All**.
3. Select a District or **View All**.
4. Select the Severity Level or **View All**.

- Click the check box to limit the search to transponders/end devices in the Revenue Protection Watch List.

**or...**

Specify Meter/End Device ID by entering the account number or selecting the ellipsis button to search for the ID number (or both).

- Click the **Lookup** button. The Lookup Results screen displays any alerts matching your search criteria.

Lookup Results									
1 Results Found									<a href="#">Export</a>
Highest Message Severity ▲	Date/Time of Last Message	Meter/End Device ID	Comm Serial Number	District	Number of Messages	Last Applied Usage Alert Profile	Usage Alert Profile Override	Revenue Protection Watch List	Options
High	04/10/06 23:10:23	M4920010	1120010	Chicout	1	Commercial - Default (Electric)	None	Yes	<a href="#">View Message Details</a>

Each column on the Lookup Results screen contains the following information:

- Highest message severity
- Date / Time of last message
- Meter / End Device ID
- Communication serial number
- District where the transponder/end device is located
- Number of messages related to the account
- The usage profile under which the account is classified
- Usage alert profile overrides
- Indicator for whether or not the account is on the Revenue Protection Watch List.

### Interpreting Revenue Protection Messages

- After finding a Revenue Protection message using the Lookup function, select the **View Message Details** link under the Options column.

2. Select **View Message Details** for the desired protection message under the **Options** column in the Lookup Results list.

VIEW REVENUE PROTECTION MESSAGES  
View Message Details

**Meter/End Device Details**

Meter/End Device ID: M0020010 [View Meter Read Results](#)

Comm Serial Number: 0020010

District: Doughtyville

Current System-Assigned Usage Alert Profile: Commercial - Default (Electric)

Override Usage Alert Profile: None [Set Override](#)

Override Expiration Date: None

On Revenue Protection Watch List?: Yes [Add](#) [Remove](#)

---

60 Day Message History (02/22/06 through 04/23/06)


[Export](#)

Date / Time ▼	Severity Level	Alert Check	Usage Alert Profile at Time of Message
04/18/06 23:10:23	High	One or More No pulse checks	Commercial - Default (Electric)
04/16/06 23:10:20	High	One or More No pulse checks	Commercial - Default (Electric)
04/15/06 12:26:51	High	One or More No pulse checks	Commercial - Default (Electric)
04/15/06 12:33:59	High	One or More No pulse checks	Commercial - Default (Electric)

3. If you want to view the data that caused the message to be generated, click on **View Meter Read Results** link.

The Call Center support screen appears with the transponder populated. Use the radio buttons on the Call Center support screen to view historical data or the transponder.

4. If you want to override the meter's current profile with a different or new profile, click on the **Set Override** link and select the new alert profile.

Override Usage Alert Profile: None [Set Override](#) 

5. Click the **Export** button to open the message history into an independent view.

## Override System-Assigned Usage Alert Profile



If you wish to change an existing alert profile from the Meter/End Device Details screen, use the following procedure.

1. Query for existing revenue alert messages using the Revenue Protection Messages query screen.

### VIEW REVENUE PROTECTION MESSAGES

#### View Revenue Protection Messages

**Revenue Protection Message Query Options**

**Date Range\*:**  
 Start Date:   End Date:  

**Usage Alert Profile\*:**


VIEW ALL  
Street Lighting - Default (Electric)  
Residential - Default (Electric)  
Residential Active Acct

**District\*:**

VIEW ALL

**Severity Level\*:**

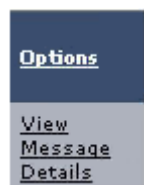
VIEW ALL  
Critical  
High  
Medium

**Additional Options:**  
☐ Limit to Meters in the Revenue Protection Watch List  
☒ Specify Meter/End Device ID:  


2. Further examine any results returned in step one using the Lookup Results screen.

Lookup Results									
1 Results Found									<input type="button" value="Export"/>
Highest Message Severity ▲	Date/Time of Last Message	Meter/End Device ID	Comm Serial Number	District	Number of Messages	Last Applied Usage Alert Profile	Usage Alert Profile Override	Revenue Protection Watch List	Options
High	04/18/06 23:10:23	M4920010	1120010	Chicout	1	Commercial - Default (Electric)	None	Yes	<a href="#">View Message Details</a>

3. Under the **Options** column, select [View Message Details](#).



4. From the *Meter/End Device Details* screen, click the Set Override link.

Override Usage Alert Profile: None [Set Override](#) 

The Override System Assigned Usage Alert Profile screen displays.

[VIEW REVENUE PROTECTION MESSAGES](#)  
**Override System Assigned Usage Alert Profile**

Select a usage alert profile to manually assign to the current meter, and alter the expiration date if needed.

Select	Usage Alert Profile Name	Usage Alert Profile Description
<input type="radio"/>	Commercial - Default (Electric)	commercial electric
<input type="radio"/>	Street Lighting - Default (Electric)	sl users
<input type="radio"/>	uatMak Test	
<input type="radio"/>	uatmakwatertest	test
<input type="radio"/>	Residential - Default (Electric)	residential electric users

Expiration Date:

- Whenever you select the radio button to assign a new usage alert profile, a calendar icon appears. Click on the calendar icon to select an expiration date.
- Click **Confirm Override**.
- Click **Yes** to confirm override details. The system assigns the new usage alert profile to the account.

## Add Alert Profiles

Alert profiles are general classifications applied to an account that describes the expected usage for that account at the present time. You can customize and add your own alert profiles through the Add Alert Profiles dialog. To access the Add Alert Profiles screen, select the **Applications** tab > **Add Alert Profiles**.

**Welcome**, user85  
 September 30, 2008  
 Build: 6.8  
 Build Date: 29 Sep 2006, 08.22 PM

**Revenue Protection**

- Lookup Messages
- Add Alert Profiles**
- Add Alert Checks

**Applications**

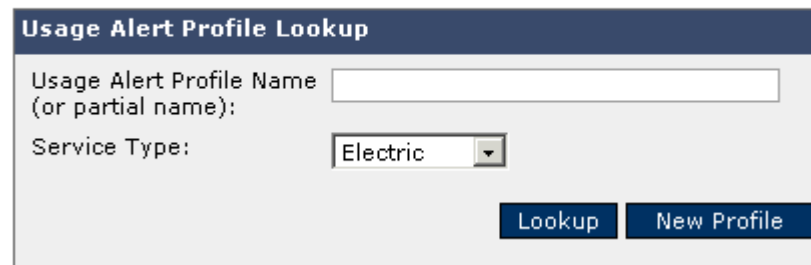
WELCOME TO - APPLICATIONS



The **Usage Alert Profile Lookup** dialog box displays.

#### MAINTAIN USAGE ALERT PROFILES

##### Usage Alert Profile Lookup



The dialog box titled "Usage Alert Profile Lookup" has a dark blue header. Below the header, there are two input fields: "Usage Alert Profile Name (or partial name):" with a text box, and "Service Type:" with a dropdown menu showing "Electric". At the bottom right, there are two buttons: "Lookup" and "New Profile".

From this dialog box, you can perform one of two operations:

- You can **Lookup** an existing alert profile for reference, modification, or to duplicate the critical data into a new profile.
- You can begin creating a new alert profile from scratch using the **New Profile** button.

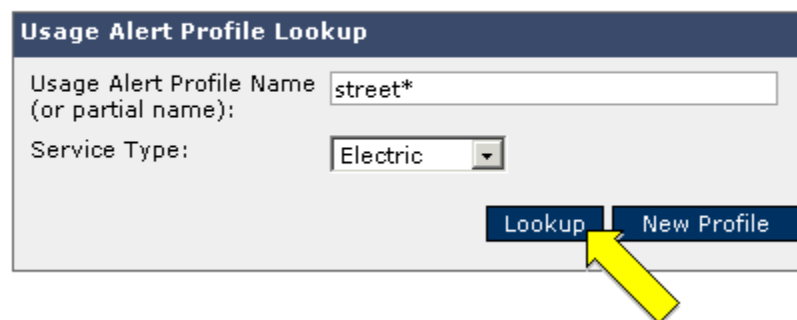
## Viewing or Modifying an Existing Alert Profile

To lookup an existing alert profile, enter one of the following into the Usage Alert Profile Name field:

- A full, previously defined alert profile name
  - A partial, previously defined alert profile name with a wildcard character
  - Leave the field blank to return the entire list of alert profiles
1. Enter any of the three types of acceptable search strings into the Usage Alert Profile Name region.

#### MAINTAIN USAGE ALERT PROFILES

##### Usage Alert Profile Lookup



The dialog box titled "Usage Alert Profile Lookup" is shown with the "Usage Alert Profile Name (or partial name):" field containing the text "street\*". The "Service Type:" dropdown menu still shows "Electric". A yellow arrow points to the "Lookup" button. The "New Profile" button is also visible.

- Press the **Lookup** button. A Results List displays beneath the *Profile Lookup* region.

Results List

1 Results found Export

Select	Usage Alert Profile Name	Usage Alert Profile Description	Options
<input type="checkbox"/>	Street Lighting - Default (Electric)	Default profile for electric street lighting.	<a href="#">View</a>   <a href="#">Edit</a>

Delete

- The **Export** button will export the current profile information into a spreadsheet or database application, so that it may be manipulated in its source format.
  - The **Delete** button will delete the profile entirely.
- Under the **Options** column click the **View** link to see any alert checks that are already applied to the profile.

MAINTAIN USAGE ALERT PROFILES

View Usage Alert Profile Cancel

Usage Alert Profile Details

Usage Alert Profile Name:\* Street Lighting - Default (Electric)

Service Type:\* Electric

Usage Alert Profile Description: Default profile for electric street lighting.

Usage Alert Checks Currently Assigned to this Profile

Usage Alert Check Name	Usage Alert Check Description	Warning Severity Level
Significant Increase in Power Consumption	This check looks for a significant increase in power consumption on a meter compared to the meter's recent usage pattern.	Medium

- Press **Cancel** to return to the Results List.
- Under the **Options** column click the **Edit** link to modify the alert profile. The Edit Usage Alert Profile screen displays.

MAINTAIN USAGE ALERT PROFILES

Edit Usage Alert Profile Save Cancel

Usage Alert Profile Details

Usage Alert Profile Name:\*

Service Type:\*

Usage Alert Profile Description:

Usage Alert Checks Currently Assigned to this Profile Add Checks

Select	Usage Alert Check Name	Usage Alert Check Description	Warning Severity Level
<input type="checkbox"/>	Significant Increase in Power Consumption	This check looks for a significant increase in power consumption on a meter compared to the meter's recent usage pattern.	Medium

Remove Selected Checks

You can now perform one of the following procedures:

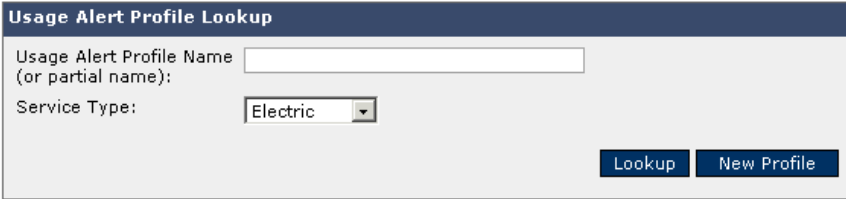
- Change details in the Usage Alert Profile Details section and press **Save**.
- Check any existing alerts and press **Remove Selected Checks** to clear the alert checks.
- Press **Add Checks** to add a new alert check to a profile.

## Creating a New Usage Alert Profile

To add a new or custom alert profile, use the following procedure.

1. From the Usage Alert Profile region, click **New Profile**.

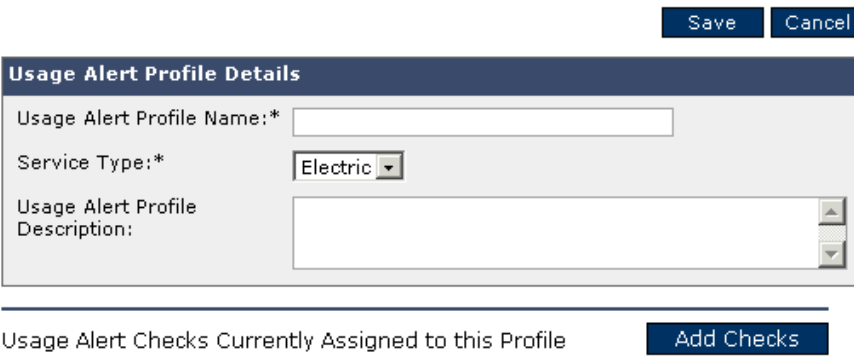
MAINTAIN USAGE ALERT PROFILES  
Usage Alert Profile Lookup



The screenshot shows the 'Usage Alert Profile Lookup' form. It has a title bar 'Usage Alert Profile Lookup'. Below it, there is a text input field for 'Usage Alert Profile Name (or partial name):' and a dropdown menu for 'Service Type:' with 'Electric' selected. At the bottom right, there are two buttons: 'Lookup' and 'New Profile'.

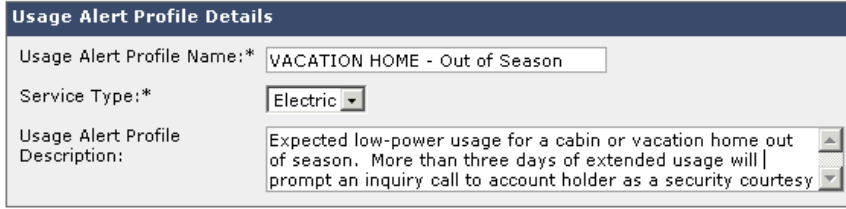
2. The Create Usage Alert Profile screen displays.

MAINTAIN USAGE ALERT PROFILES  
Create Usage Alert Profile



The screenshot shows the 'Create Usage Alert Profile' form. It has a title bar 'Create Usage Alert Profile'. Below it, there is a 'Save' button and a 'Cancel' button. The main section is titled 'Usage Alert Profile Details' and contains three fields: 'Usage Alert Profile Name:\*' (text input), 'Service Type:\*' (dropdown menu with 'Electric' selected), and 'Usage Alert Profile Description:' (text area). Below the details section, there is a section titled 'Usage Alert Checks Currently Assigned to this Profile' with an 'Add Checks' button.

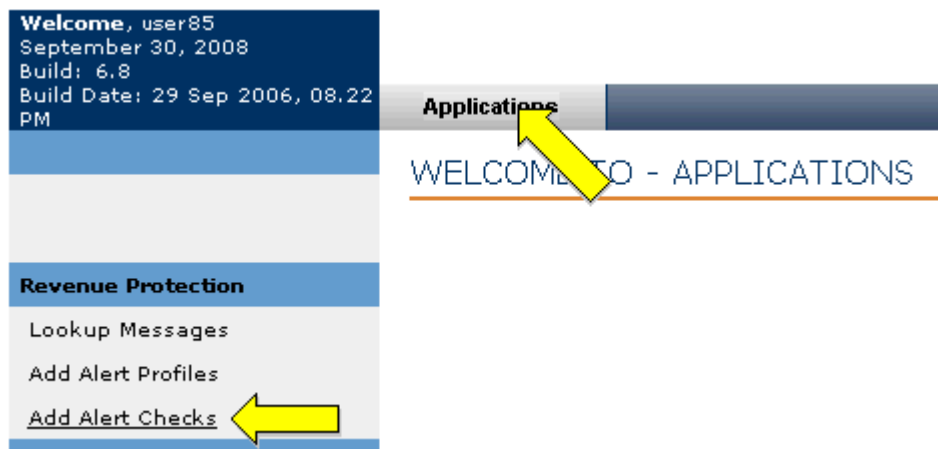
3. Enter a name and description for your new profile.
4. When complete, click the **Save** button.



The screenshot shows the 'Create Usage Alert Profile' form after data entry. The 'Usage Alert Profile Name:\*' field now contains 'VACATION HOME - Out of Season'. The 'Service Type:\*' dropdown remains 'Electric'. The 'Usage Alert Profile Description:' text area now contains the text: 'Expected low-power usage for a cabin or vacation home out of season. More than three days of extended usage will prompt an inquiry call to account holder as a security courtesy'. The 'Add Checks' button is still visible at the bottom.

## Add Alert Check

Alert checks are parameters of expected usage that are applied to an alert profile. Whenever resource usage falls out of the parameter range, an alert check issues a revenue protection message. To access the Add Alert Check screen, select the Applications tab > Add Alert Checks.



The Usage Alert Check Lookup screen displays.

### VIEW USAGE ALERT CHECK LIST

Usage Alert Check Lookup	
Usage Alert Check Name:	<input type="text"/>
Service Type:	-- Select -- <input type="button" value="v"/>
Warning Severity Level:	View All <input type="button" value="v"/>
<input type="button" value="Lookup"/> <input type="button" value="Add"/>	

## View Usage Alert Check List

To view an existing Usage Alert Check, use the following procedure.

1. Enter Usage Alert Check Name, using wildcards if necessary. You can also sort by **Service Type** or **Warning Severity Level**.

### MAINTAIN USAGE ALERT CHECKS

#### View Usage Alert Check List

**Usage Alert Check Lookup**

Usage Alert Check Name:   
Service Type:   
Warning Severity Level:

2. Click the **Lookup** button. The Results List displays the usage alert checks that match your search criteria.

Results List				
1 Results found			<input type="button" value="Add"/>	<input type="button" value="Export"/>
Select	Usage Alert Check Name ▲	Usage Alert Check Description	Warning Severity Level	Options
<input type="checkbox"/>	Any Consumption	This triggers if there is any consumption on the meter.	High	<a href="#">View</a> <a href="#">Edit</a>
<input type="button" value="Delete"/>				

3. Use the check box to select the appropriate usage alert checks you want to view or modify. From the **Options** column you can **View** or **Edit** the existing alert checks.

## Add New Alert Check

To add a new Usage Alert Check, use the following procedure.

1. Begin by completing the Usage Alert Check Lookup region.

### MAINTAIN USAGE ALERT CHECKS

#### View Usage Alert Check List

**Usage Alert Check Lookup**

Usage Alert Check Name:   
Service Type:   
Warning Severity Level:

2. Click **Add**. The Create Usage Check Alert screen displays.

MAINTAIN USAGE ALERT CHECKS  
Create Usage Alert Check

Save Cancel

**Usage Alert Check Information**

Usage Alert Check Name\*:  Service Type:

Description\*:

Warning Severity Level:

Add Rule

3. Add rules using **Add Rule**. See the section on adding business rules for more information.

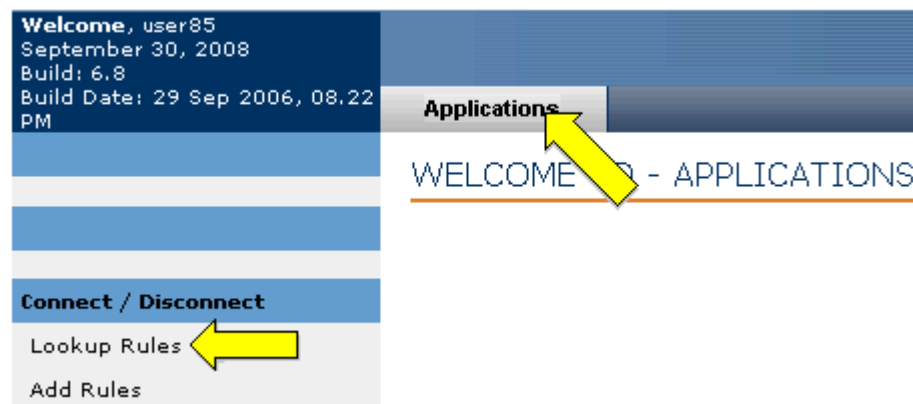
## Business Rules for Connecting and Disconnecting

Business rules for connecting and disconnecting a transponder or end device are essential to ensure regulatory compliance and considerations for customers with health and life support concerns. For the most part, life support and disconnection restrictions are read directly from the account information in the Customer Information System (CIS). These rules are configurable because they differ among utilities and may change over time.

Execution of a connect/disconnect command from the CSR support screen is validated against any applicable business rules.

### Lookup Disconnection Rules

To access the Lookup Rules screen go to the **Applications** tab > **Lookup Rules**.



The View Business Rules screen displays.

#### MAINTAIN CONNECT/DISCONNECT BUSINESS RULES

##### View Business Rules

##### Results List

**0 Active & 0 Inactive Business Rule(s) were found.**

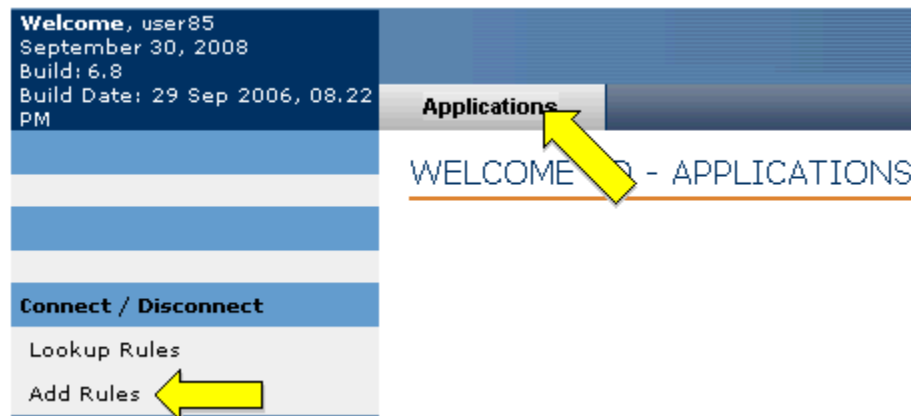
<u>Business Rule</u>	<u>Description</u>	<u>Rule Status</u>	<u>Last Updated</u>	<u>Actions</u>
----------------------	--------------------	--------------------	---------------------	----------------

Any active or inactive business rules in effect will display in the Results List and can be sorted by name, status, and last update.

To add a new business rule, click **Add Business Rules**.

## Add Connection Rules

To access the Add Rules screen go to the **Applications** tab > **Add Rules**.



The Add Business Rule screen displays.

#### MAINTAIN CONNECT/DISCONNECT BUSINESS RULES

##### Add Business Rule

\* Required Fields.

Save Cancel

Business Rule Details	
Name*:	<input type="text"/>
Description*:	<input type="text"/>
Rule Status*:	Active <input type="button" value="v"/>
<b>Rule Definition</b>	
Description*:	Allow <input type="button" value="v"/> CONNECT <input type="button" value="v"/>
Timing*:	Between <input type="text"/> <input type="button" value="v"/> 00:00 <input type="button" value="v"/> AND <input type="text"/> <input type="button" value="v"/> 00:00 <input type="button" value="v"/> <input type="checkbox"/> Daily Only
CIS Flags*:	<input type="button" value="Add CIS Flag"/>

To add a business rule, use the following procedure.

1. In the Business Rule Details dialog, enter the name and description for new business rule.
2. Select a **Rule Status** of Active or Inactive.
3. In the **Rule Definition** portion, select the **Rule Definition Description** of **Allow** or **Restrict** and connect or disconnect.
4. From **Timing**, select the beginning and ending dates and times.

**NOTE** Time is represented in 24-hour military format.

5. If you need to add a CIS flag, click **Add CIS Flag**.
6. Click **Save**.

## Add CIS Flag

1. If you need to add a CIS Flag, click **Add CIS Flag** from the Add Rules screen. The Add CIS Flag screen displays.
2. Select **CIS Flag** checkbox if you want the whole list or select the individual flag or flags you want.
3. Click **Save**. The system adds the flags to the current rule being added or edited.

## Configure User IDs

To add a new TWACS NG system user begin by navigating to the **User Setup** tab, and then click **Add User**.





The **Maintain Users - Add User** screen displays.

**MAINTAIN USERS**  
**Add User**

Fields marked with \* are required.

**Enter User Details**

User ID \*:

Password \*:  **Generate Password**

Send Welcome Email ☐

Email Address \*:  (xxx@xxx.xxx) or (xxx@xxx.xxx.xxx)

First Name \*:  Last Name \*:

Address Line 1:  Address Line 2:

City:  State/Province\*:

Country:

Zip/Postal Code:

Home Phone:

Work Phone:

Work Phone Extension:

Cell Phone:

Pager:

Business Unit \*:

**Available User Roles:**

- BILLING ANALYST
- BILLING MANAGER
- CUSTOMER SERVICE REPRESENTATIVE
- DISTRIBUTION ENGINEER (PLANNER)
- DISTRIBUTION OPERATIONS PERSON
- EXTERNAL SYSTEM
- FIELD SERVICE PERSON

**Assigned User Roles \*:**

You can also access this screen from the Lookup User function by clicking **New User**. Use the following procedure to add new users along with the information on their user role and other relevant contact information.

4. Add the following critical user information, as appropriate.
  - **User ID:** Provide a unique user ID for the user.
  - **Password:** Click **Generate Password** to auto-generate password or enter a specific password. Upon the end users initial login, the user is required to change the password.
  - **Email address:** Enter the email address where the system can send emails to the user.
  - **First Name/Last Name:** Enter the first name and last name of the user.
  - **Address Line 1/Line 2:** Enter the address information including street name of the user business location.
  - **City/State/Country:** Enter the city, state and country of the user business location.
  - **Zip Code:** Enter the five-digit postal code with (optional) four-digit extension.
  - **Home Phone/Work Phone/Cell Phone/Pager:** Enter the relevant phone numbers.
  - **Business Unit:** This is already defined in the database.

**5. Select the User Role:** To select the user roles:

- Select one or more roles in the left multi-select boxes by using the CTRL key.
- Click the > button to move these roles over to the right multi-select box. To deselect any of the roles, select that item on the right multi-select box and click the < key.
- To apply all roles click the >> key.

**6. Click Save** to save your changes. The system will send an automated e-mail to the new user with the User ID and the password if the checkbox is marked. The user must change the password the first time they log in.

## Delete a User

1. On the Lookup Results screen or View User Details screen, click **Edit** to edit an existing user. The system requests a confirmation.
2. Click **Delete** to delete this user. (Once deleted, a user cannot be restored.)

## Resetting Passwords

It is easy to issue an existing user a new password. Users are encouraged to change their own passwords frequently.

From the User Setup tab, select New Password.



The Change Password screen displays.

**CHANGE PASSWORD - TWACS NETWORK GATEWAY**

Fields marked with \* are required.

Change Password Details	
Username :	user1
Old Password * :	<input type="password"/>
New Password * :	<input type="password"/> The New Password cannot be the same as the Old Password. The New password must be alphanumeric, at least 8 characters in length and must contain at least 1 digit and 1 special character (\$, #, etc)
Confirm New Password * :	<input type="password"/> New Password must match password entered in the Confirm New Password field.
Security Question *:	<input type="text"/> The security question should be less than 255 characters long. The security question should remind you of your password. It should not contain or give away your password.
Security Answer *:	<input type="text"/> Security answers are case sensitive.

**Change Password**

1. Enter the old and new passwords, and then confirm the new password. A security question is not required, but a security answer is. In event of a user forgetting their password, this security question and answer is critical to the TWACS NG system being able to auto-retrieve/reset a password.
2. Upon completion click **Change Password**.

## Daylight Saving Time

For TWACS NG installations, there are three distinct parts of the TWACS system where the current time is maintained.

- The Distributed Master Controller (DMC) maintains local time. It is expected that each DMC will be synchronized with a master time source provided by the utility or externally.
- The Substation Communications Equipment (SCE) periodically receives time synchronizations from the DMC.
- Periodically, the SCE broadcasts time synchronization commands on the power line. Aclara recommends that this broadcast be done every 15 minutes.
- Newly-installed transponders and those restored after an outage will not have the time until they receive a synchronization command from the SCE. (Note that the UMT-R and UMT-C transponders maintain a real-time clock powered by a capacitor. When fully charged, the capacitor provides approximately 24 hours of standby power to maintain the time.)

## Transponder Handling of Synchronization Commands

Within the XMP, UMT-R and UMT-C, Aclara has standardized the way the transponder responds to synchronization commands. Each of these follows this rule:

**If the transponder's time differs from the system's time sync by more than the user-configurable register, a *time discontinuity* is considered to have occurred.**

To meet the accuracy requirements of the ANSI C12.1 standard, Aclara recommends the user-configurable register be set between 15 seconds and two minutes. This register is set when the transponder is programmed during meter integration.

- XMP and UMT-R transponders have a default of 15 seconds.
- UMT-C transponders have a default of 120 seconds.

Two types of time discontinuity may occur:

- **Forward** time discontinuity occurs when the time synchronization moves the transponder's time to the future. Forward time discontinuities can occur after an extended power outage and during the change from Standard Time to Daylight Savings Time. If a valid time sync exists when power is restored after a power outage, the RCE shall treat the time adjustment as a forward time discontinuity.
- **Reverse** time discontinuity occurs when the time synchronization moves the transponder's time to the past. Reverse time discontinuities occur during the change from Daylight Savings Time to Standard Time.

For interval and demand in the XMP, UMT-R and UMT-C transponders, Aclara has taken a conservative approach to avoid the presentation of “too large” calculations. Each calculation requires two data points, at the beginning and end of the interval.

- For demand calculations, if either data point is unavailable, then that demand value is not included in the peak demand calculation.
- For interval data calculations, if either data point is unavailable, the interval is marked by the transponder as invalid. For reverse time discontinuities, a single interval cannot contain more than one interval's worth of data to prevent false peaks from occurring.

## Transition to Daylight Saving Time in the Spring

After the SCE updates its time during the Daylight Saving Time transition, all subsequent synchronization commands will have the updated time. The time synchronization command must be received by the transponder. *Depending on when the time synchronization command is received*, this could result in the transponder recording usage after 2:00 am.

## Consumption and Mapped Register Data

Since most utilities collect consumption and mapped registers that “shift” at midnight, the transition to Daylight Saving Time has minimal effect. Once the transponder receives the updated time from the SCE, it detects a forward time discontinuity and updates its internal time.

Real-time requests for consumption and mapped register data are always time-stamped based on the time of the SCE.

## Interval Data

The transition to Daylight Saving Time in the spring is treated as a forward time discontinuity.

When the transponder detects a forward time discontinuity, the current interval being processed and all intervals until the next interval boundary are marked invalid. When retrieved by TWACS NG, the transponder indicates these intervals are invalid. These intervals are then marked as invalid in the data export from TWACS NG.

Depending on when the time synchronization command is received by the transponder, this could result in the transponder recording usage after 2:00 am. (See example 2 below.) Because of the uncertainty of when the transponder receives the time synchronization command, the TWACS NG Batch Export process marks otherwise valid intervals as **Suspect**. This alerts the utility's meter data management (MDM) system which can then correct or estimate this interval.

### Example 1:

**The transponder receives the DST time synchronization at 02:02, which updates the time to 3:02.**

The transponder is configured to collect 60 minute interval data:

Interval	Transponder Action	TWACS NG Batch Export Action	Recommended MDM Action
2:00 – 2:59	Mark interval invalid.	Mark interval invalid.	Ignore the interval.
3:00 – 3:59	Mark interval invalid.	Mark interval invalid.	Reconstruct using midnight anchor readings.

The transponder is configured to collect 30 minute interval data:

Interval	Transponder Action	TWACS NG Batch Export Action	Recommended MDM Action
2:00 – 2:29	Mark interval invalid.	Mark interval invalid.	Ignore the interval.
2:30 – 2:59	Mark interval invalid.	Mark interval invalid.	Ignore the interval.
3:00 – 3:29	Mark interval invalid.	Mark interval invalid.	Reconstruct using midnight anchor readings.
3:30 – 3:59	Valid interval	Valid interval	None.

The transponder is configured to collect 15 minute interval data:

Interval	Transponder Action	TWACS NG Batch Export Action	Recommended MDM Action
2:00 – 2:14	Mark interval invalid.	Mark interval invalid.	Ignore the interval.
2:15 – 2:29	Mark interval invalid.	Mark interval invalid.	Ignore the interval.
2:30 – 2:44	Mark interval invalid.	Mark interval invalid.	Ignore the interval.
2:45 – 2:59	Mark interval invalid.	Mark interval invalid.	Ignore the interval.
3:00 – 3:14	Mark interval invalid.	Mark interval invalid.	Estimate the interval.
3:15 – 3:29	Valid interval	Mark interval as suspect.	Estimate the interval.
3:30 – 3:44	Valid interval	Valid interval	None.
3:45 – 3:59	Valid interval	Valid interval	None.

**Example 2:**

**The transponder receives the DST time synchronization at 02:23, which updates the time to 3:23.**

The transponder is configured to collect 60 minute interval data:

Interval	Transponder Action	TWACS NG Batch Export Action	Recommended MDM Action
2:00 – 2:59	Mark interval invalid.	Mark interval invalid.	Ignore the interval.
3:00 – 3:59	Mark interval invalid.	Mark interval invalid.	Reconstruct using midnight anchor readings.

The transponder is configured to collect 30 minute interval data:

Interval	Transponder Action	TWACS NG Batch Export Action	Recommended MDM Action
2:00 – 2:29	Mark interval invalid.	Mark interval invalid.	Ignore the interval.
2:30 – 2:59	Mark interval invalid.	Mark interval invalid.	Ignore the interval.
3:00 – 3:29	Mark interval invalid.	Mark interval invalid.	Reconstruct using midnight anchor readings.
3:30 – 3:59	Valid interval	Valid interval	None.

The transponder is configured to collect 15 minute interval data:

Interval	Transponder Action	TWACS NG Batch Export Action	Recommended MDM Action
2:00 – 2:14	Valid interval	Mark interval as suspect.	Correct the timestamp.
2:15 – 2:29	Mark interval invalid.	Mark interval invalid.	Ignore the interval.
2:30 – 2:44	Mark interval invalid.	Mark interval invalid.	Ignore the interval.
2:45 – 2:59	Mark interval invalid.	Mark interval invalid.	Ignore the interval.
3:00 – 3:14	Mark interval invalid.	Mark interval invalid.	Estimate the interval.
3:15 – 3:29	Mark interval invalid.	Mark interval invalid.	Estimate the interval.
3:30 – 3:44	Valid interval	Valid interval	None.
3:45 – 3:59	Valid interval	Valid interval	None.

## Configuring SCEs for Daylight Saving Time

**IMPORTANT:** The following steps should be performed prior to the Daylight Saving Time (DST) change. It is recommended that these steps be performed as close to the DST transition date as possible because, in the unlikely event of an SCE cold restart, this information will be lost and need to be re-downloaded to the SCE.

**NOTE:** No changes are necessary for the Operating System(s), Database(s) or Application(s).

1. Click the **System Monitoring** tab, then **Test SCE**. The **Field Equipment Exerciser** screen displays, defaulted to the **SCE** tab.

### FIELD EQUIPMENT EXERCISER

#### Test and Diagnose – SCE

To test and diagnose SCEs complete all steps below.

\* Required Fields

DMC
SCE
Transponder
Test Results Lookup
View Test Results

Perform Quick Test by entering SCE Number or Lookup and add SCEs for specific Test commands.

**SCE Ping Test**

SCE Number: --Select one-- Ping

**SCE Group Test**

SCE Request: PERFORM SCE DIAGNOSTICS

EQUIPMENT TYPE

EQUIPMENT ID

DIAGNOSTIC TEST

Execute Now

SCE List

Add SCEs

<input type="checkbox"/>	Substation	DMC	SCE Number	Comm. Resource	SCE Operation Status
<span>Remove</span>					



2. In the SCE List section at the bottom of the screen, click **Add SCEs**. In a pop-up box the Lookup SCE menu displays.

#### LOOKUP SCE

**Lookup Criteria**

Substation Name:

SCE Number:

LookUp

Show All

Cancel

3. Click **Show All**. Click **Yes** when the **Confirm Show All** pop-up dialog appears.
4. The **SCE List** displays at the bottom of the dialog. Click in the check box next to a specific **Substation Name** to select desired SCEs. Then click **Add**.

#### SCE List

3 SCEs found.

<input type="checkbox"/>	<u>Substation Name</u> ▲	<u>SCE Number</u>	<u>SCE Operational Status</u>	<u>DMC</u>	<u>SCE Design Status</u>
<input checked="" type="checkbox"/>	<u>TR1</u>	<u>1</u>	Online	<u>DMC1</u>	Complete
<input checked="" type="checkbox"/>	<u>TR2</u>	<u>2</u>	Online	<u>DMC1</u>	Complete
<input checked="" type="checkbox"/>	<u>TR3</u>	<u>3</u>	Online	<u>DMC1</u>	Complete
<div>Add</div>					

5. The **Field Equipment Exerciser** screen returns with the SCEs populated in the **SCE List** at the bottom of the screen.

DMC SCE Transponder Test Results Lookup View Test Results

Perform Quick Test by entering SCE Number or Lookup and add SCEs for specific Test commands.

**SCE Ping Test**

SCE Number: --Select one-- Ping

**SCE Group Test**

SCE Request: PERFORM SCE DIAGNOSTICS

EQUIPMENT TYPE

EQUIPMENT ID

DIAGNOSTIC TEST

Execute Now

**SCE List**

Add SCEs

	Substation	DMC	SCE Number	Comm. Resource	SCE Operation Status
<input type="checkbox"/>	TR1	1	1		Online
<input type="checkbox"/>	TR2	1	2		Online
<input type="checkbox"/>	TR3	1	3		Online

Remove

6. Select all the **Substations** in the **SCE List** section of the screen. From the SCE Group Test dialog, select **SET SCE TIMESHIFT PARAMETERS** from the drop-down.

**SCE Group Test**

SCE Request: PERFORM SCE DIAGNOSTICS

EQUIPMENT TYPE

EQUIPMENT ID

DIAGNOSTIC TEST

Execute Now

CANCEL SCE TRANSACTION  
CHANGE SCE EQUIPMENT STATUS  
CHECK SCE DATE/TIME  
PERFORM SCE DIAGNOSTICS  
READ SCE ENVIRONMENT  
READ SCE EQUIPMENT STATUS  
READ SCE EXCEPTION LOG  
READ SCE PROCESSING SNAPSHOT  
READ SCE TABLE CONTENTS  
READ SCE TIMESHIFT PARAMETERS  
SCE RESTART  
SET CONFIGURATION KEY  
SET SCE DATE/TIME  
SET SCE TIMESHIFT PARAMETERS

7. The Test Criteria changes.

8. Enter the following criteria.
- SHIFT AMOUNT: **+1 for Spring. -1 for Fall.**
  - SHIFT DAY: **Day of the month of DST.**
  - SHIFT HOUR: **Hour of DST.**
  - SHIFT MONTH: **Month of DST.**
  - SHIFT YEAR: **Year of DST**
9. Click **Execute Now**. A message displays indicating that the test has been scheduled successfully. Click **OK** to complete.
10. Change to the **View Test Results** tab and refresh the screen until it confirms the response statuses all change to **Successful**.

## Transition from Daylight Saving Time in the Fall

After the SCE updates time back to Standard Time in the fall, all subsequent synchronization commands will have the updated time. The time synchronization command must be received by the transponder. *Depending on when the time synchronization command is received*, this could result in the transponder recording usage after 2:00 am.

## Consumption and Mapped Register Data

Since most utilities collect consumption and mapped registers “shifted” at midnight, the transition to Daylight Saving Time has minimal effect. Once the transponder receives the updated time from the SCE, it detects a reverse time discontinuity and updates its internal time.

Real-time requests for consumption and mapped register data are always time-stamped based on the time as determined by the SCE.

## Interval Data

The transition to daylight saving time in the fall is treated as a reverse time discontinuity.

When the transponder detects a reverse time discontinuity, the current interval being processed is discarded. Intervals previously collected with an end time after the newly updated time will be overwritten by the transponder.

Depending on when the time synchronization command is received by the transponder, this could result in the transponder recording usage after 1:00 am daylight saving time. (See example 2 below.) Because of the uncertainty of when the transponder receives the time synchronization command, the TWACS NG Batch Export process will mark these otherwise valid intervals as “Suspect”. This alerts the utility’s meter data management (MDM) system which can then correct or estimate this interval.

### Example 1:

**The transponder receives the DST time synchronization at 02:03, which updates the time to 1:03.**

The transponder is configured to collect 60 minute interval data:

Interval	Transponder Action	TWACS NG Batch Export Action	Recommended MDM Action
1:00 – 1:59 (DST)	Overwrite interval.	Not included.	Estimate the interval.
1:00 – 1:59 (ST)	Mark interval invalid.	Mark interval invalid.	Estimate the interval.

The transponder is configured to collect 30 minute interval data:

Interval	Transponder Action	TWACS NG Batch Export Action	Recommended MDM Action
1:00 – 1:29 (DST)	Overwrite interval.	Not included.	Estimate the interval.
1:30 – 1:59 (DST)	Overwrite interval.	Not included.	Estimate the interval.
1:00 – 1:29 (ST)	Mark interval invalid.	Mark interval invalid.	Estimate the interval.
1:30 – 1:59 (ST)	Valid interval	Mark interval suspect.	None.

The transponder is configured to collect 15 minute interval data:

Interval	Transponder Action	TWACS NG Batch Export Action	Recommended MDM Action
1:00 – 1:14 (DST)	Overwrite interval.	Not included.	Estimate the interval.
1:15 – 1:29 (DST)	Overwrite interval.	Not included.	Estimate the interval.
1:30 – 1:44 (DST)	Overwrite interval.	Not included.	Estimate the interval.
1:45 – 1:59 (DST)	Overwrite interval.	Not included.	Estimate the interval.
1:00 – 1:14 (ST)	Mark interval invalid.	Mark interval invalid.	Estimate the interval.
1:15 – 1:29 (ST)	Valid interval	Mark interval as suspect.	None.
1:30 – 1:44 (ST)	Valid interval	Valid interval	None.
1:45 – 1:59 (ST)	Valid interval	Valid interval	None.

### Example 2:

**The transponder receives the DST time synchronization at 02:24, which updates the time to 1:24.**

The transponder is configured to collect 60 minute interval data:

Interval	Transponder Action	TWACS NG Batch Export Action	Recommended MDM Action
1:00 – 1:59 (DST)	Overwrite interval.	Not included.	Estimate the interval.
1:00 – 1:59 (ST)	Mark interval invalid.	Mark interval invalid.	Estimate the interval.

The transponder is configured to collect 30 minute interval data:

Interval	Transponder Action	TWACS NG Batch Export Action	Recommended MDM Action
1:00 – 1:29 (DST)	Overwrite interval.	Not included.	Estimate the interval.
1:30 – 1:59 (DST)	Overwrite interval.	Not included.	Estimate the interval.
1:00 – 1:29 (ST)	Mark interval invalid.	Mark interval invalid.	Estimate the interval.
1:30 – 1:59 (ST)	Valid interval	Mark interval suspect.	None.

The transponder is configured to collect 15 minute interval data:

Interval	Transponder Action	TWACS NG Batch Export Action	Recommended MDM Action
1:00 – 1:14 (DST)	Valid interval	Mark interval suspect.	Estimate the interval.
1:15 – 1:29 (DST)	Overwrite interval.	Not included.	Estimate the interval.
1:30 – 1:44 (DST)	Overwrite interval.	Not included.	Estimate the interval.
1:45 – 1:59 (DST)	Overwrite interval.	Not included.	Estimate the interval.
1:00 – 1:14 (ST)	Mark interval invalid.	Mark interval invalid.	Estimate the interval.
1:15 – 1:29 (ST)	Mark interval invalid.	Mark interval invalid.	Estimate the interval.
1:30 – 1:44 (ST)	Valid interval	Valid interval	None.
1:45 – 1:59 (ST)	Valid interval	Valid interval	None.

## Implications for 2007 Extended Daylight Saving Time

Because the TWACS system updates its time on two user-configurable dates, Aclara does not expect the change in the Daylight Saving Time schedule to have an adverse impact on TWACS NG.

## Future Considerations to Reduce Estimated Intervals

Aclara is considering enhancing TWACS NG to allow the utility to configure it to operate on one time throughout the entire year. During periods of Daylight Saving Time, all timestamps being exported from TWACS NG would be converted.

The key advantages running the system on standard time include:

- Estimation of interval data is minimized, particularly in the fall transition period.
- Additional periods are included in demand calculations.

The key disadvantages running the system on Standard Time include:

- Added complexity to TWACS NG Operators when scheduling data collection activities.
- The “daily shift” for daily readings would take place at 11:00 pm during periods of Daylight Saving Time.

# Interpreting Comm Server Notifications

Comm Server Statistics Utility gives a snapshot of “current” communication status at the time the utility is executed. Each SCE currently attached to the Comm server can have a status that is defined by the combination of an Operation Status and a Connection Status. These status values are defined as follows:

## Operation Status definitions:

1. **INITIALIZED:** When the comm server starts up, it fetches connection details for each SCE from the DMC and then requests adlc lm to initialize for the corresponding port of that SCE. Once this is successful for each respective SCE, the comm server marks that SCE’s operation status as “INITIALIZED”
2. **NORMAL:** After a connect request is sent for a port if a successful connect event response is received by comm server from adlc lm for that port, the corresponding SCE is marked “NORMAL”. Also, after an explicit disconnect request is sent for a port, if a successful disconnect event is received by comm server from adlc lm for that port, the corresponding SCE is marked “NORMAL”. (The case of an explicit disconnect is included here for completeness only since it is mainly used for a modem type connection and is not used for a direct serial port connection such as for a satellite link or frame relay).
3. **SLOWPOLL:** Whenever an unscheduled disconnect or a failed connection event is received for a port, the corresponding SCE is marked “SLOWPOLL”. In the slowpoll mode the comm server sends a connect request at intervals defined by the slowpoll timeout specified in `commResource.properties`
4. **INACTIVE:** This state is not applicable for a direct serial port connection such as that for a satellite link or frame relay and should not be observed at PG&E. For SCEs connected via modem, there is a feature in comm server that if there are no transactions being sent to an SCE for a specified amount of time (inactivity period) then comm server sends an explicit disconnect and marks that SCE as “INACTIVE”. This feature allows saving money on phone charges.

## Connection Status Definitions:

1. **DISCONNECTED:** When an SCE is disconnected. This occurs when SCE never got connected successfully or comm server detects events such as unscheduled disconnects, failed connection attempts or successful explicit disconnect.
2. **DISCONNECTING:** When an explicit disconnect request is sent resulting in system call `close()`, comm server marks that SCE as “DISCONNECTING”. This is a transition state. As soon as the event for disconnect completion is received the SCE is marked as “DISCONNECTED”

3. **CONNECTING:** When a connect request is sent to adlc lm resulting in a system call open(), the comm server marks the SCE as “CONNECTING”. If the open() call from the adlc lm succeeded, the SCE is marked as “Connected”, otherwise the SCE is marked as “DISCONNECTED”.
4. **CONNECTED:** When a successful connect event is received, SCE is marked as “CONNECTED”

## Description of Common Status Combinations

This section describes the e most commonly seen status combinations when a user runs the statistics utility. These values are depicted below as **Connection Status/Operation Status**.

**Connected/Normal:** SCE is connected and its operation status is normal.

**Connecting/Normal:** Connect request has been sent for SCE and its operational mode is normal.

**Disconnected/Slowpoll:** SCE is disconnected and its operational status has been set to slowpoll so after every slowpoll timeout a connect request will be made to that SCE.

Occasionally, if statistics happened to be run while the comm server was in a transitional phase (e.g., actively attempting to reestablish a connection or in the process of updating the current Operation Status when coming out of a SLOWPOLL condition). These less-common combinations are defined as follows:

**Connecting/Normal:** A connect request has been made, SCE is in normal operational mode and is waiting for success or failed connect event to come back, so that it can be marked either Connected/Normal or Disconnected/Slowpoll.

**Connecting/Initialized:** SCE has been just initialized, a connect request has been made and is waiting for success or failed connect event to come back, so that it can be marked either Connected/Normal or Disconnected/Slowpoll.

**Connecting/Slowpoll:** When SCE is in slowpoll operational status and is not connected, at slowpoll timeout comm server sends connect request for that SCE and marks it **Connecting/Slowpoll**. This transition status combination remains till an event comes back indicating connect was successful or not. Accordingly when the connect successful or Failed event comes back that SCE’s status becomes **Connected/Normal** or **Disconnected/Slowpoll**. Now as connect request leads to an open() call it depends on its completion and hence SCE can remain in **Connecting/Slowpoll** until it completes.

**Connected/Slowpoll:** Occasionally a connect successful event can come back even before SCE can be marked Connected/Normal, so in the next slowpoll time out SCE’s operational status is set to normal and then it will show **Connected/Normal**.



# BATCH EXPORT

## Batch Export Overview

The Batch exporting processes are responsible for gathering eligible data from the Distributed Master Controller database and placing it into properly formatted and delimited text files for use externally of the TWACS NG system. The file specifications and process are defined in depth in **Y10596-H3 1-TUM TNG Harvested dataFatFileInterfaceSpec**. These tasks are handled by several key processes that run in the background. The following list of export jobs run on each of the DMCs .

1. MeterReadCSVExportJobMaster
2. IndicatorCSVExportJobMaster
3. IntervalCVSExportJobMaster

### Meter Read

Data files containing scheduled meter reading collections are critically important to a utility. Meter reading exceeds mere consumption data and can include such values as reverse consumption, tampering flags, blink counts, voltage readings, demand resets, and DSI status.

### Indicator Read

In addition to usage readings (meter reads and interval data reads) meters also store a catalog of important usage indicators. These indicators may include any error conditions that have been detected. Indicators are determined by the needs of the utility and the capability of the specific brand and model of meter being used. Not every available indicator will be useful to every utility.

### Interval Data Read

Many utilities bill based on peak usage levels as an incentive to customers to keep their usage patterns moderated and level, especially commercial and industrial customers. The interval data cross-references peak usage levels across designated time periods (15, 30, 60 minutes, etc.). Data files containing the interval readings are also recorded in an export file.

## Batch export Scheduling

The schedule by which each of these export processes run is controlled by the Quartz scheduling system. The Cron triggers for each of these jobs are located in the QuartzJobConfigDMC.properties file in the resources directory on each DMC. The trigger entries can be customized to meet the data collection needs of each customer based on the events that collect the data and requirements of external systems.

Each of the three listed processes has a separate lock file that is toggled to an executing state when the processes are running. These lock files prevent the processes from starting another iteration of the same job if the first has not completed before the Quartz schedule reaches its start time again. They are listed below and exist in the resources directory on the DMC.

1. MeterReadCSVExportBatchJobLock.properties
2. IndicatorCSVExportBatchJobLock.properties
3. IntervalCSVExportBatchJobLock.properties

## Batch Export Output files

The Batch export processes produce output files that are formatted based on the entries in the export.properties file which is located in the Resources directory on each DMC. Each process produces two types of files. The data files which contain the exported records and a completed file that indicates the export files or files if they are larger than the defined number of records have completed. The output files are placed in the Export directories on the individual DMC's for use by external systems.

## Property Files

The batchexport.properties file is a simple text file on the DMC which defines the contents and location of each type of export file. Specifically, the **batchexport.properties** file contains the following configurable parameters:

- **meterreading.collecteddatafilename, meterreading.outputfilelocation** and **meterreading.outputarchivelocation** – The file name of the export file containing meter reading data, the absolute path of meter reading output file location, and the absolute path of archiving the meter reading output file location.
- **indicator.collecteddatafilename, indicator.outputfilelocation,** and **indicator.outputarchivelocation** - The file name of the export file containing indicator data, the absolute path of indicator output file location, and the absolute path of archiving the indicator output file location.

- **intervalread.collecteddatafilename, intervalread.outputfilelocation, and intervalread.outputarchivelocation** - The file name of the export file containing interval data, the absolute path of interval read output file location, and the absolute path of archiving the interval output file location.
- **Data elements and associated “Include In” specifier** - Specifies the name of the data element that will be reported or not reported in the data file, depending on the value of the associated specifier. The data elements are discussed in detail in subsequent sections.
- **zipoutputfile** – Possible values are “true” and “false”. Set to “true” to zip the output file.
- **data.processing.chunk.size** – Set to an integer value. Data is processed in chunks. This parameter declares the number of records to be processed in a chunk.
- **interval.data.processing.chunk.size** – Set to an integer value. Interval read Data is processed in chunks. Set this value to higher number than the data.processing.chunk.size, as all the interval reads for one transaction are aggregated into one row. That is, if there are 8 intervals reported per transaction, configure this parameter as  $1000 * 8 = 8000$  to get 1000 records processed per chunk.
- **max.records.in.file** – Set to an integer. This specifies the maximum number of records to be written in one file.

- **firstruninterval** – Set to an integer to represent minutes. When batch runs for the first time, this value will be subtracted in minutes from the current time to get the startTimestamp. Only records within the currentTime – firstruninterval range will be exported.
- **delimiter** - Specifies the field delimiter. The default is the pipe (|) symbol.
- **exportbatchlogfile** – Specifies the absolute path of the export batch log file location.
- **datePattern** – Used to append the current system date/time to the export file name.

For a more detailed explanation of batch export files, see the document:  
**API Design Specification: Batch Export Files Y10596-TUM.**

## **BATCH JOBS**

A suite of updated API documentation is available for developing either customer or third-party application programming interfaces.

Please reference the latest revision of the appropriate document for your needs.

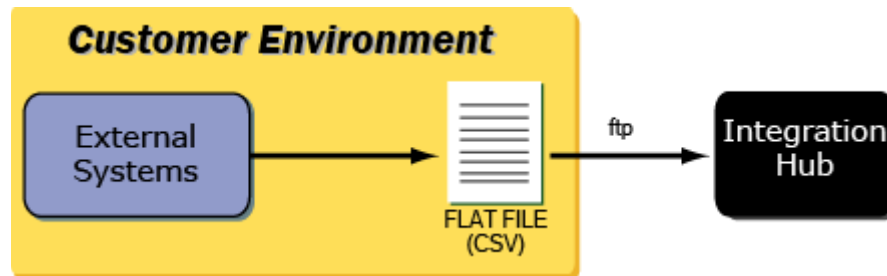
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- **Y10596-TUM TWACS NG Batch Export File User Guide**
- **Y10564-TUM TWACS NG CIM XML Meter Control**
- **Y10565-TUM TWACS NG CIM XML Meter Reading**
- **Y10566-TUM CIM XML Verify Meter Power**
- **Y30000-APN CIM XML API Overview**
- **Y50021-DSD TWACS NG API Web Services Interface Design Specifications**

## **Hub Load of Client Data**

The hub load process is designed to facilitate the loading of external data from a customers CIS system into the TWACS Network Gateway (TWACS NG) system. This approach is based on an automated process which processes delimited files being accessible in specified locations. The standards for file transfer as well as the specifications for the file format are detailed in Y10595-YUM TWACS NG Data Load. The Integration Hub supports incremental updates to add or modify transponder and end device data without the need for a full synchronization.

## CIS Data Load Overview

Loading the data into the TWACS NG database involves the usage of an integration hub. This hub process reads the flat files and stores the data into the appropriate database tables. The flat files are generated by external systems and stored in a location that is accessible via secure file transfer protocol (ftp). The data files will be “pulled” by the TWACS NG system and loaded.



## Batch Jobs Overview

Batch jobs run behind the scenes in TWACS NG and are compartmentalized, meaning each batch job performs a specific function. Batch jobs are invoked via the Quartz Job scheduling system and therefore do not require user intervention. (If there is a need to manually run a batch job, refer to the section in Chapter 3, *Batch Export Files* for instructions).

Quartz is an open source job scheduling system used by J2EE applications and uses Cron Triggers to invoke the batch jobs.

## Quartz CronTrigger

Cron-expressions are used to configure instances of CronTrigger. Cron-expressions are strings that are actually made up of seven subexpressions which describe individual details of the schedule. These subexpressions are separated with white space, and represent the following:

- Seconds
- Minutes
- Hours
- Day-of-Month
- Month
- Day-of-Week
- Year (optional field)

An example of a complete cron-expression is the following string:

**0 0 12 ? \* WED** - translating to “every Wednesday at 12:00 pm.”

Individual subexpressions contain ranges and/or lists. For example, the day of week field in the previous example (WED) can be replaced with “MON-FRI,” “MON, WED, FRI,” or even “MON-WED,SAT.”

Wildcards (the \* character) represent “every” possible value within this field. Therefore the \* character in the “Month” field of the previous example simply means “every possible month.” A '\*' symbol in the Day-of-Week field means “every day of the week.”

All of the fields have a set of valid values that can be specified. These values are intuitive - such as the numbers 0 to 59 for seconds and minutes, and the values zero to 23 for hours. Day-of-Month can be any value 0-31, but be careful to remember the number days in a given month. Months can be specified as values between zero and 11, or by using the strings JAN, FEB, MAR, APR, MAY, JUN, JUL, AUG, SEP, OCT, NOV and DEC. Days-of-Week can be specified as values between one (Sunday) and 7 (Saturday) or by using the strings SUN, MON, TUE, WED, THU, FRI and SAT.

The / character can specify increments to values. For example, if you put “0/15” in the **Minutes** field, it means “every 15 minutes, starting at minute zero.” If you used “3/20” in the Minutes field, it would imply every 20 minutes during the hour, starting at minute three, i.e. the same as specifying “3,23,43” in the Minutes field.

The ? character is allowed for the day-of-month and day-of-week fields. It is used to specify “no specific value.” This is useful when you need to specify something in one of the two fields, but not the other.

The L character is allowed for the day-of-month and day-of-week fields. This character is short-hand for “last,” but it has different meaning in each of the two fields. For example, the value “L” in the day-of-month field means “the last day of the month” - day 31 for January, day 28 for February on non-leap years. If used in the day-of-week field by itself, it simply means “7” or “SAT”. But if used in the day-of-week field after another value, it means “the last xxx day of the month” - for example “6L” or “FRIL” both mean “the last Friday of the month.” When using the “L” option, it is important not to specify lists, or ranges of values, as you'll get confusing results.

The W is used to specify the weekday (Monday-Friday) nearest the given day. As an example, if you were to specify “15W” as the value for the day-of-month field, the meaning is: “the nearest weekday to the 15th of the month.”

The # is used to specify “the nth” XXX weekday of the month. For example, the value of “6#3” or “FRI#3” in the day-of-week field means “the third Friday of the month.”

Here are a few more examples of expressions and their meanings:

- **CronTrigger Example 1** - an expression to create a trigger that simply fires every 5 minutes
  - “0 0/5 \* \* \* ?”
- **CronTrigger Example 2** - an expression to create a trigger that fires every 5 minutes, at 10 seconds after the minute (i.e. 10:00:10 am, 10:05:10 am, etc.).
  - “10 0/5 \* \* \* ?”
- **CronTrigger Example 3** - an expression to create a trigger that fires at 10:30, 11:30, 12:30, and 13:30, on every Wednesday and Friday.
  - “0 30 10-13 ? \* WED,FRI”
- **CronTrigger Example 4** - an expression to create a trigger that fires every half hour between the hours of 8 am and 10 am on the 5th and 20th of every month. Note that the trigger will NOT fire at 10:00 am, just at 8:00, 8:30, 9:00 and 9:30
  - “0 0/30 8-9 5,20 \* ?”

Note that some scheduling requirements are too complicated to express with a single trigger - such as “every 5 minutes between 9:00 am and 10:00 am, and every 20 minutes between 1:00 pm and 10:00 pm.” The solution in this scenario is to simply create two triggers, and register both of them to run the same job.

## Location of MC/DMC CronTrigger Files

The Quartz CronTrigger for the **MC** batch jobs can be found along with the MC properties. The filename of the Quartz CronTrigger used by the MC application is QuartzJobConfig.properties.

The Quartz CronTrigger for the **DMC** batch jobs can be found along with the DMC properties. The filename of the Quartz CronTrigger used by the DMC applications is QuartzJobConfigDMC.properties.

In **Multiple DMC** deployments, each DMC application will reference its own QuartzJobConfigDMC.properties file, so changes to DMC batch jobs require modification of multiple QuartzJobConfigDMC.properties.

After making changes to a Quartz CronTrigger file the application must be restarted for the changes to take effect.

## MC Batch Jobs

The following batch jobs run on the MC application server and utilize resources that exist within the MC and common resource repositories.

**HubFileExchangeJobMaster:** Imports account, premise, installation, transponder, and end device data into TWACS NG.



**ReInitializeTransponderBatchJobMaster:** Reinitializes transponders that have already once been initialized but have since been modified (e.g., the register profile or demand changed).

**ResumeFailedRCEInitJobMaster:** Continues the initialize process on transponders marked Resume Initialize.

**FGUAssignmentJobMaster:** Assigns Function, Group, and Units (FGUs) to transponders marked for re-evaluation.

**SearchTransponderJobMaster:** Issues searches to find the best communication path for the transponder. The Search State must be Ready or Pending\_Analysis and the Path State must be New, Lost, or Tentative.

**TimeSyncJobMaster:** Sends the current time to the SCE.

**WebServiceTimeoutJobMaster:** Times out Web Service commands which have past their expire time.

**RevenueProtectionCheckerJobMaster:** Checks energy consumption against utility set-up rules for rate code and service type. Also, reports suspected thefts.

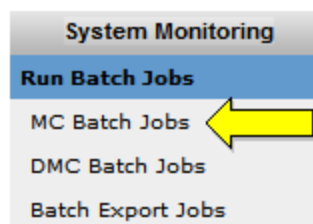
**SwitchingDetectionBatchJobMaster:** Detects transponders which meet the following criteria: Exceed the configurable Consecutive Fail Count (CFC) threshold, and Exceed the configurable count of transponders per path. The job will then send a notification to the end user, mark the path state to Switch and stop searches. Depending on configuration, creates a restoration event to ping all transponders on the same communication path.

**SwitchingExtentBatchJobMaster:** Looks for completed restoration events created by the SwitchingDetectionBatchJobMaster, and sends the failed results the end user. Finally, marks any new failures to 'Switch' and stops searches.

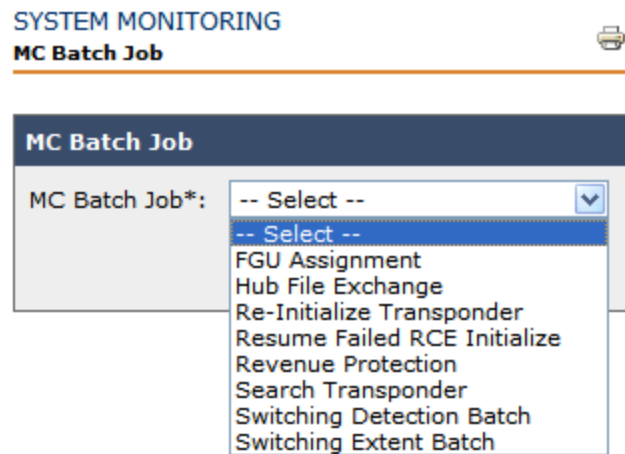
**ViewDashboardJobMaster:** Updates hourly stats on the dashboard.

**ViewDashboardDailyJobMaster:** Updates stats on the daily dashboard.

Some of the above batch jobs are scheduled programmatically and some can be initiated manually. To manually trigger a batch job, from the TWACS NG interface, go to the System Monitoring tab and from the **Run Batch Jobs** section, select **MC Batch Jobs**.



From the resulting interface select one of the manual MC batch job options and click **Submit**.



A red confirmation message confirms that **The Batch Job has been submitted.**

## DMC Batch Jobs:

The following batch jobs run on the DMC application server and utilize resources that exist within the DMC and common resource repositories.

**SchedulerBatchJobMaster:** Creates jobs and transactions for events approaching the execution window.

**GrouperJobMaster:** Groups transactions based on Function, Group, and Unit (FGU) assignment prior to the start of a job.

**TransactionSchedulerBatchJobMaster:** Picks up a certain configurable number of the highest priority PENDING transactions within their execution window and changes them to IN QUEUE.

**TimeOutTransactionsJobMaster:** Finds commands that have been in the SENT\_TO\_SCE substatus for too long and if they are expired or have exceeded retries set them to FAILED. Last it will the commands to the MC or set them to PENDING for future execution.

**FailedJobMaster:** Looks for commands that are PENDING or IN QUEUE that have either passed their expired timestamp or exceeded their number of retries and marks them FAILED/EXPIRED or FAILED/EXCEEDED\_RETRIES respectively.

**EventRetryBatchJobMaster:** Retries RCE initialize events that were previously skipped due to the transponder not having a communication path.

**TransponderIndicatorReplicationBatchJobMaster:** Sends unprocessed indicator information to the MC.

**JobMergerBatchJobMaster:** Verifies any currently incomplete Jobs are actually complete and updates their status to COMPLETED.

**MeterReadCSVExportJobMaster:** Creates the meter read file for billing.

**IntervalCSVExportJobMaster:** Creates the interval data file.

**IndicatorCSVExportJobMaster:** Creates the indicator file when indicators are read.

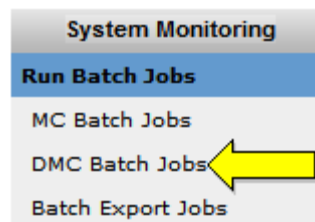
**MeterReadExportJobMaster:** Creates the meter read export for middleware.

**IntervalExportJobMaster:** Creates the interval export for middleware.

**UpdateAopConfigStatusBatchJobMaster:** Updates Autonomous Outage Ping (AOP) configuration information for substations that have been changed. Do not turn on until the SCE is AOP ready.

**CreateAopCommandBatchJobMaster:** Creates Autonomous Outage Ping (AOP) commands, a list of transponders on AOP enabled buses for the SCE to monitor. Do not turn on until the SCE is AOP ready.

Some of the above batch jobs are scheduled programmatically and some can be initiated manually. To manually trigger a batch job, from the TWACS NG interface, go to the System Monitoring tab and from the **Run Batch Jobs** section, select **DMC Batch Jobs**.



From the resulting interface select a specific DMC and one of the manual DMC batch job options and click **Submit**.

 A screenshot of the 'DMC Batch Job' configuration page. The page title is 'SYSTEM MONITORING' and 'DMC Batch Job'. There is a form with two fields: 'DMC Name\*' with a dropdown menu showing 'DMC1', and 'DMC Batch Job\*' with a dropdown menu. The 'DMC Batch Job\*' dropdown is open, showing options: '-- Select --', '-- Select --', 'Failed Job', 'Grouper Job', 'Scheduler Batch', 'Time Out Transactions', and 'Transaction Scheduler Batch'.

A red confirmation message confirms that **The Batch Job has been submitted.**

## Troubleshooting:

Batch Job completes, but the expected results are not achieved.

- Check the application logs for exceptions or warning messages

Batch Job does not complete.

- Check the WebLogic domain logs for stuck threads.
- Check database for rouge queries or database locks.

## HUB LOAD OF CLIENT DATA

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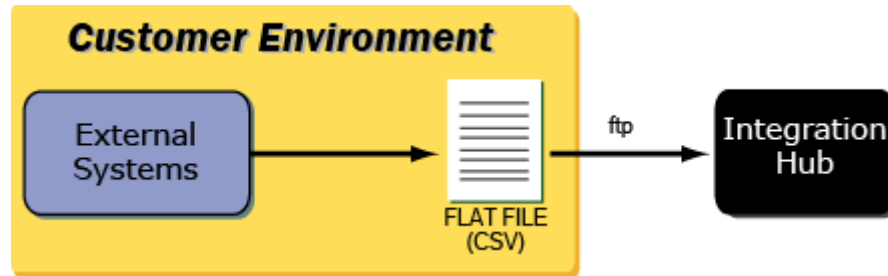
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### Hub Load of Client Data

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## **APPENDIX**

# D

## **USER ROLES IN TWACS NG**

The following tables describe the functions, on what screen the functions appear, and the roles that have access to those functions.

The **All Roles** designation includes the following roles:

- System Administrator
- TWACS NG Operator
- Customer Service Representative (CSR)
- Billing Manager
- Billing Analyst
- Distribution Engineer
- Rate / Research Analyst
- Meter Technician
- Field Service Person
- Distribution Operation Person

### **Users Functions: Login, Password, Users**

Function	Screen Name	Roles that Have Access
Login	Login First Time logon - change password	System Administrator TWACS NG Operator Customer Service
Change password	Forgot password Change password	System Administrator TWACS NG Operator
View Users List	View User List	System Administrator

Function	Screen Name	Roles that Have Access
Maintain User Profile	View User Profile Maintain User Profile	Representative (CSR) Billing Manager Billing Analyst Distribution Engineer Rate / Research Analyst Meter Technician Field Service Person
Maintain Users	System Administration View User Detail Add User Update User	System Administrator

### Distributed Master Controller (DMC) Functions

Function	Screen Name	Roles that Have Access
View DMC		All Roles
View DMC		System Administrator Field Service Person
Maintain DMC	Detailed View	System Administrator TWACS NG Operator Billing Analyst Distribution Engineer (planner) Distribution Engineer Rate/Research Analyst Meter Technician Field Service Person Distribution Operation Person
Maintain DMC	Create/Edit-Basic Information	System Administrator TWACS NG Operator Field Service Person
Maintain DMC	Create/Edit-DMC Details	System Administrator TWACS NG Operator Field Service Person
Maintain DMC	Create/Edit-Comm-Ports	System Administrator TWACS NG Operator Field Service Person
Maintain DMC	Create/Edit-Preview Details	System Administrator TWACS NG Operator Field Service Person



Function	Screen Name	Roles that Have Access
Maintain DMC	Preview Error Message	System Administrator TWACS NG Operator Field Service Person
Perform DMC Server Management	Server Management	System Administrator TWACS NG Operator Field Service Person Distribution Operation Person
Perform DMC Server Management	Performance and Alerts	System Administrator TWACS NG Operator Field Service Person Distribution Operation Person
Execute DMC Synchronization	DMC Synchronization - View and Update	System Administration TWACS NG Operator
Execute DMC Synchronization	Maintain DMC Synchronization Attributes	System Administration TWACS NG Operator
Execute DMC Synchronization	Maintain DMC Synchronization - Attributes - Add Synchronization Item	System Administration TWACS NG Operator

### Communication Resource Functions

Function	Screens	Roles that Have Access
Maintain Communication Resource	View Comm Devices List	System Administrator TWACS NG Operator Distribution Engineer Rate / Research Analyst Meter Technician Field Service Person Distribution Operation Person

Function	Screens	Roles that Have Access
Maintain Communication Resource	View Comm Devices Details (all device types)	System Administrator TWACS NG Operator Distribution Engineer Rate / Research Analyst Meter Technician Field Service Person Distribution Operation Person
Maintain Communication Resource	Create/Edit Device (all device types)	System Administrator TWACS NG Operator Field Service Person Distribution Operation Person

### Path Functions

Function	Screen Name	Roles that Have Access
Maintain TWACS Transponder Path	Maintain TWACS Transponder Path	System Administrator TWACS NG Operator Field Service Person
Maintain Communication Path Signal Strength Threshold	Maintain Communication Path Signal Strength Threshold	All Roles
View Communication Path Performance and Statistics List	View Communication Path Performance and Statistics List	All Roles
View TWACS Transponder Path List	View TWACS Transponder Path List	All Roles

### Substation Functions

Function	Screen Name	Roles that Have Access
Maintain Substation	Create Substation	System Administrator TWACS NG Operator Field Service Person
Maintain Substation	Create Substation - Basic Information	System Administrator TWACS NG Operator Field Service Person
Maintain Substation	Create Substation - Bus	System Administrator TWACS NG Operator Field Service Person

Function	Screen Name	Roles that Have Access
Maintain Substation	Create Substation - Feeder	System Administrator TWACS NG Operator Field Service Person
Maintain Substation	Create Substation - Preview	System Administrator TWACS NG Operator Field Service Person
Maintain Substation	Change Substation Design Status from Edit to Review	System Administrator TWACS NG Operator Field Service Person
Maintain Substation	Change Substation Design Status from Review to Complete	System Administrator TWACS NG Operator Field Service Person
Maintain Substation	Edit Substation	System Administrator TWACS NG Operator Field Service Person
Maintain Substation	Edit Substation - Basic Information	System Administrator TWACS NG Operator Field Service Person
Maintain Substation	Edit Substation - Bus Information	System Administrator TWACS NG Operator Field Service Person
Maintain Substation	Edit Substation - Feeder Information	System Administrator TWACS NG Operator Field Service Person
Maintain Substation	View Substation	All Roles
Maintain Substation	View Substation - Basic Information	All Roles
Maintain Substation	View Substation - Bus	All Roles
Maintain Substation	View Substation - Feeder	All Roles
Maintain Substation	View Substation - Preview	All Roles
View Substation	Substation Lookup	All Roles
View Substation	View Substation List	All Roles
View Substation List	Add Substation Button	System Administrator TWACS NG Operator Field Service Person Distribution Operation Person
View Substation List	Edit Substation	System Administrator TWACS NG Operator Field Service Person Distribution Operation Person

## SCE Functions

Function	Screen Name	Roles that Have Access
View SCE List	SCE Lookup	All Roles
View SCE List	View SCE List	All Roles
View SCE List	Add SCE	System Administrator TWACS NG Operator Field Service Person
View SCE List	Edit SCE	System Administrator TWACS NG Operator Field Service Person
View SCE List	View SCE	All Roles
Maintain SCE Configuration Key Defaults	Edit SCE Configuration Key Defaults	System Administrator TWACS NG Operator Field Service Person
Maintain SCE	Create SCE - Basic Information	System Administrator TWACS NG Operator Field Service Person
Maintain SCE	Create SCE - CRU	System Administrator TWACS NG Operator Field Service Person
Maintain SCE	Create SCE - IPU	System Administrator TWACS NG Operator Field Service Person
Maintain SCE	Create SCE - Preview	System Administrator TWACS NG Operator Field Service Person
Maintain SCE	View SCE - Basic Information	All Roles
Maintain SCE	View SCE - CRU	All Roles
Maintain SCE	View SCE - IPU	All Roles
Maintain SCE	View SCE - Preview Screen	All Roles
Maintain SCE	Edit SCE - Basic Information	System Administrator TWACS NG Operator Field Service Person
Maintain SCE	Edit SCE - CRU	System Administrator TWACS NG Operator Field Service Person

Function	Screen Name	Roles that Have Access
Maintain SCE	Edit SCE - IPU	System Administrator TWACS NG Operator Field Service Person
Query SCE Configuration Key Defaults	Maintain SCE - Check SCE Configuration	System Administrator TWACS NG Operator

## Business Rules Function

Function	Screen Name	Roles that Have Access
Maintain SCE Fault Analyzer Business Rules	SCE Errors	System Administrator TWACS NG Operator
Maintain Connect/Disconnect Business Rules	View Business Rules	System Administrator
Maintain Connect/Disconnect Business Rules	Add Business Rules	System Administrator
Maintain Connect/Disconnect Business Rules	Edit Business Rules	System Administrator

## Transaction Functions

Function	Screen Name	Roles that Have Access
Maintain Transactions	View Transactions List	System Administrator TWACS NG Operator Field Service Person
Maintain Transactions	RCE Transaction Details	System Administrator TWACS NG Operator Field Service Person
Maintain Transactions	SCE Transaction Details	System Administrator TWACS NG Operator Field Service Person

## Program Functions

Function	Screen Name	Roles that Have Access
Maintain Customer Program	Add Basic Information	System Administrator TWACS NG Operator Field Service Person
Maintain Customer Program	Update Program	System Administrator TWACS NG Operator Field Service Person
Maintain Customer Program	View Program Information	All Roles
Maintain Customer Program	Update Data Retrieved	System Administrator TWACS NG Operator Field Service Person
Maintain Customer Program	View Data Retrieved	All Roles
Maintain Customer Program	Update Data Retrieved	System Administrator TWACS NG Operator Field Service Person
Maintain Customer Program	View Data Retrieved	All Roles
Maintain Customer Program	Update Type & Model Information	System Administrator TWACS NG Operator Field Service Person Distribution Operation Person
Maintain Customer Program	View Type and Model Information	All Roles
Maintain Customer Program	Indicators	System Administrator TWACS NG Operator Field Service Person
Maintain Customer Program	Update Enrollment Restrict	System Administrator TWACS NG Operator Field Service Person
Maintain Customer Program	View Enrollment Restrict	All Roles
Maintain Program Type	View Program Types	System Administrator TWACS NG Operator
Maintain Program Type	Add Program Type	System Administrator TWACS NG Operator
Maintain Program Type	Edit Program Type	System Administrator TWACS NG Operator

Function	Screen Name	Roles that Have Access
Maintain Program Type	Add Register Category	System Administrator TWACS NG Operator
View Customer Program List	Lookup	All Roles
View Customer Program List	Lookup - Edit Link	System Administrator TWACS NG Operator Field Service Person
View Customer Program List	Lookup - Delete Link	System Administrator TWACS NG Operator Field Service Person
View Customer Program List	Lookup - Add Customer Program Button	System Administrator TWACS NG Operator Field Service Person

### Set Function

Function	Screen Name	Roles that Have Access
View Set List	View Set List	All Roles
Maintain Sets	Add Set	System Administrator TWACS NG Operator Field Service Person
Maintain Sets		System Administrator TWACS NG Operator Field Service Person
Maintain Sets	Lookup - End Device - Popup	System Administrator TWACS NG Operator Field Service Person
Maintain Sets	Lookup - Transponder - Popup	System Administrator TWACS NG Operator Field Service Person
Maintain Sets	Add Set - With Elements	System Administrator TWACS NG Operator Field Service Person
Maintain Sets	Add Set - Capture Name	System Administrator TWACS NG Operator Field Service Person
Maintain Sets	Update Set	System Administrator TWACS NG Operator Field Service Person
Maintain Sets	View Set	All Roles
Maintain Sets	Print Set	All Roles

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## Maintain Job Functions

Functions	Screen Name	Roles that Have Access
Maintain Jobs	Transaction List	System Administrator TWACS NG Operator Field Service Person
Maintain Jobs	RCE Transaction Details	System Administrator TWACS NG Operator Field Service Person
Maintain Jobs	SCE Transaction Details	System Administrator TWACS NG Operator Field Service Person

## Schedules Functions

Function	Screen Name	Roles that Have Access
View Schedules List	View Schedules List	System Administrator TWACS NG Operator Field Service Person
Maintain Schedules	Calendar	System Administrator TWACS NG Operator Field Service Person
Maintain Schedules	Schedule List	System Administrator TWACS NG Operator Field Service Person
Maintain Schedules	View, Edit, or Add	System Administrator TWACS NG Operator Field Service Person
Maintain Schedules	Delete Occurrences Popup	System Administrator TWACS NG Operator Field Service Person
Maintain Schedules	Edit Occurrences Popup	System Administrator TWACS NG Operator Field Service Person



## Custom Calendar Functions

Function	Screen Name	Roles that Have Access
Custom Calendar	View Custom Calendar	System Administrator TWACS NG Operator Billing Manager Billing Analyst Distribution Engineer Rate / Research Analyst Meter Technician Field Service Person
Custom Calendar	Add Custom Calendar	System Administrator TWACS NG Operator Billing Manager Billing Analyst Distribution Engineer Rate / Research Analyst Meter Technician Field Service Person
Custom Calendar	Add Custom Calendar	System Administrator TWACS NG Operator Billing Manager Billing Analyst Distribution Engineer Rate / Research Analyst Meter Technician Field Service Person

## Command Functions

View Commands	Command Lookup	System Administrator TWACS NG Operator Field Service Person
View Commands	Detailed View	System Administrator TWACS NG Operator Field Service Person

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## Events List Functions

Function	Screen	Roles that Have Access
View Events List	Event Calendar	System Administrator TWACS NG Operator Field Service Person
View Events List	View Events List	System Administrator TWACS NG Operator Field Service Person
View Events List	View Jobs List	System Administrator TWACS NG Operator Field Service Person
View Events List	Resume Job Popup	System Administrator TWACS NG Operator Field Service Person
Maintain Events	View, Edit, or Add	System Administrator TWACS NG Operator Field Service Person
Maintain Events	Task not Pending Popup	System Administrator TWACS NG Operator Field Service Person
Maintain Events	Delete Occurrences Popup	System Administrator TWACS NG Operator Field Service Person
View Event Status Detail List	View Event Status Detail List	All Roles
View Event Status Detail List	View Event Status Detail List	System Administrator TWACS NG Operator Field Service Person

## View End Device Functions

Functions	Screen Name	Roles that Have Access
View End Device List	Lookup	All Roles
View End Device List	Lookup - Edit Link	System Administrator TWACS NG Operator Field Service Person
View End Device List	Lookup - Delete Link	System Administrator TWACS NG Operator Field Service Person

Functions	Screen Name	Roles that Have Access
View End Device List	Lookup - Add End Device Button	System Administrator TWACS NG Operator Field Service Person
View End Device List	Advanced Lookup	All Roles
Advanced Lookup - Edit Link	Advanced Lookup - Edit Link	System Administrator TWACS NG Operator Field Service Person
Advanced Lookup - Delete Link	Advanced Lookup - Delete Link	System Administrator TWACS NG Operator Field Service Person
Advanced Lookup - Add End Device Button	Advanced Lookup - Add End Device Button	System Administrator TWACS NG Operator Field Service Person

### Transponder Functions

Functions	Screen Name	Roles that Have Access
View Transponder List	Lookup	All Roles
View Transponder List	Lookup - Edit Link	System Administrator TWACS NG Operator Field Service Person
View Transponder List	Lookup - Delete Link	System Administrator TWACS NG Operator Field Service Person
View Transponder List	Lookup - Add Transponder Button	System Administrator TWACS NG Operator Field Service Person
View Transponder List	Advanced Lookup	All Roles
View Transponder List	Advanced Lookup - Edit Link	System Administrator TWACS NG Operator Field Service Person
View Transponder List	Advanced Lookup - Delete Link	System Administrator TWACS NG Operator Field Service Person
View Transponder List	Advanced Lookup - Add Transponder Button	System Administrator TWACS NG Operator Field Service Person
Maintain Transponder	Add Transponder	System Administrator TWACS NG Operator Field Service Person

Functions	Screen Name	Roles that Have Access
Maintain Transponder	Add Basic Information	System Administrator TWACS NG Operator Field Service Person
Maintain Transponder	View - Basic Information	All Roles
Maintain Transponder	View - Register Configuration	All Roles
Maintain Transponder	View - Port Mapping	All Roles
Maintain Transponder	View - Indicators	All Roles
Maintain Transponder	Update Transponder	System Administrator TWACS NG Operator Field Service Person
Maintain Transponder	Print Transponder	All Roles
Maintain Transponder	Cancel Add <edit> Confirmation	System Administrator TWACS NG Operator Field Service Person
Maintain Transponder	Re-use Transponder Warning	System Administrator TWACS NG Operator Field Service Person
Maintain Transponder	Forced Program Change Warning	System Administrator TWACS NG Operator Field Service Person
Maintain Transponder	Remove From Service Confirmation	System Administrator TWACS NG Operator Field Service Person
Maintain Transponder	Delete Transponder Warning	System Administrator TWACS NG Operator Field Service Person
Maintain Transponder	Save Confirmation	System Administrator TWACS NG Operator Field Service Person
Maintain Transponder	Record Changed	System Administrator TWACS NG Operator Field Service Person
Manage Transponder Diagnostic and Tamper	View Transponder Diagnostic and Tamper Flag Details	System Administrator TWACS NG Operator Field Service Person

Functions	Screen Name	Roles that Have Access
Manage Transponder Diagnostic and Tamper	View Transponder Diagnostic and Tamper Flag History	System Administrator TWACS NG Operator Field Service Person
View Transponder Diagnostic and Tamper	View Transponder Diagnostic and Tamper List	System Administrator TWACS NG Operator Field Service Person

### Remote Communications Equipment (RCE) Functions

Functions	Screen Name	Roles that Have Access
View RCE Type and Model List	View RCE Type and Model List	System Administrator
Manage RCE Type and Model	View RCE Command List	System Administrator
Manage RCE Type and Model	Add RCE Command - Basic Information	System Administrator
Manage RCE Type and Model	Add RCE Command - Response Parameters	System Administrator
Manage RCE Type and Model	Create Duplicate RCE Command	System Administrator
Manage RCE Type and Model	Edit RCE Command Parameters	System Administrator
Manage RCE Type and Model	Edit RCE Response Parameters	System Administrator
Manage RCE Type and Model	RCE Command Parameters - Add or Edit Register	System Administrator
Manage RCE Type and Model	RCE Response Parameters - Add or Edit Register Data	System Administrator
Manage RCE Type and Model	Register Lookup	System Administrator
Manage RCE Type and Model	View RCE Command List - Confirm Delete	System Administrator
Manage RCE Type and Model	RECE Command List - Add or Edit Command Utility Label	System Administrator
Manage RCE Type and Model	Create Command Tab	System Administrator
Manage RCE Type and Model	Add New Command Tab	System Administrator
Manage RCE Type and Model	Edit Command Tab - Add Command	System Administrator
Manage RCE Type and Model	Edit Command Tab - Confirm Delete	System Administrator

Functions	Screen Name	Roles that Have Access
Maintain RCE Type and Model to Serial Number	View Serial Number Range	System Administrator
Maintain RCE Type and Model to Serial Number	Add Serial Number Range	System Administrator
Maintain RCE Type and Model to Serial Number	RCE Type and Model Serial Number Range - Confirm Delete	System Administrator
Configure RCE Type and model Registers	View RCE Type and Model with Configurable Registers List	System Administrator
Configure RCE Type and model Registers	View RCE Type and Model Command List	System Administrator
Configure RCE Type and model Registers	View RCE Type and Model Register List	System Administrator
Configure RCE Type and model Registers	Configure RCE Type and Model Register	System Administrator
Configure RCE Type and model Registers	Select Serial Number Range	System Administrator
Configure RCE Type and model Registers	Serial Number Range - Confirm Delete	System Administrator

### View Region Functions

Function	Screen Name	Roles that Have Access
View Region List	Lookup	All Roles
View Region List	Lookup - Edit Link	System Administrator TWACS NG Operator Field Service Person
View Region List	Lookup - Delete Link	System Administrator TWACS NG Operator Field Service Person
View Region List	Lookup - Add Region Button	System Administrator TWACS NG Operator Field Service Person

### Maintain Region Functions

Function	Screen Name	Roles that Have Access
Maintain Regions	View Region	All Roles
Maintain Regions	View Region - Edit Region Button	System Administrator TWACS NG Operator Field Service Person

Function	Screen Name	Roles that Have Access
Maintain Regions	View Region - Delete Region Button	System Administrator TWACS NG Operator Field Service Person
Maintain Regions	Add Region	System Administrator TWACS NG Operator Field Service Person
Maintain Regions	Add Region - With Members	System Administrator TWACS NG Operator Field Service Person
Maintain Regions	Edit Region	System Administrator TWACS NG Operator Field Service Person
Maintain Regions	Substation Lookup	System Administrator TWACS NG Operator Field Service Person

### Call Center Functions

Functions	Screen Name	Roles that Have Access
Call Center Support	Enter End Device number and select service type	All Roles
Call Center Support	Daily Profile	All Roles
Call Center Support	On Request Command Status	All Roles
Call Center Support	On Request Command Successful	All Roles
Call Center Support	On Request Command Unsuccessful	All Roles
Call Center Support	View Command History	All Roles
Call Center Support	Meter Read Button	All Roles
Call Center Support	Reverse Energy Button	All Roles
Call Center Support	Demand Read No Reset Button	All Roles
Call Center Support	Demand Reset Button	All Roles
Call Center Support	Verify Power Button	All Roles
Call Center Support	Voltage Read Button	All Roles
Call Center Support	Connect Disconnect Button	All Roles
View Load Data	Basic Information	System Administrator TWACS NG Operator Distribution Engineer Field Service Person

Functions	Screen Name	Roles that Have Access
View Load Data	Data Retrieval	System Administrator TWACS NG Operator Distribution Engineer Field Service Person
View Load Data	Load Data - All Screens	System Administrator TWACS NG Operator Distribution Engineer Field Service Person
View Load Data	Confirm End Device/Register	System Administrator TWACS NG Operator Distribution Engineer Field Service Person
View Voltage Data	Basic Information	System Administrator TWACS NG Operator Distribution Engineer Field Service Person
View Voltage Data	Data Retrieval	System Administrator TWACS NG Operator Distribution Engineer Field Service Person
View Voltage Data	Voltage Data - All Screens	System Administrator TWACS NG Operator Distribution Engineer Field Service Person
View Voltage Data	Basic Information	System Administrator TWACS NG Operator Distribution Engineer Field Service Person
View Power Reliability	Data Retrieval	System Administrator TWACS NG Operator Distribution Engineer Field Service Person
View Power Reliability	View Power Reliability - All Screens	System Administrator TWACS NG Operator Distribution Engineer Field Service Person
View Power Reliability		System Administrator TWACS NG Operator Distribution Engineer Field Service Person



## Maintain End Device Functions

Functions	Screen Name	Roles that Have Access
Maintain End Device	Add Device Type and Model	System Administrator TWACS NG Operator Field Service Person
Maintain End Device	View Device Type and Model	All Roles
Maintain End Device	Update Device Type and Model	System Administrator TWACS NG Operator Field Service Person
Maintain End Device	Add Basic Information - Electric	System Administrator TWACS NG Operator Field Service Person
Maintain End Device	Update Basic Information - Electric	System Administrator TWACS NG Operator Field Service Person
Maintain End Device	View Basic Information - Electric	All Roles
Maintain End Device	Add Basic Information - Gas	System Administrator TWACS NG Operator Field Service Person
Maintain End Device	Update Basic Information - Gas	System Administrator TWACS NG Operator Field Service Person
Maintain End Device	View Basic Information - Gas	All Roles
Maintain End Device	Add Basic Information - Water	System Administrator TWACS NG Operator Field Service Person
Maintain End Device	Update Basic Information - Water	System Administrator TWACS NG Operator Field Service Person
Maintain End Device	View Basic Information - Water	View Roles
Maintain End Device	Add/Update Basic Information- D Network	System Administrator TWACS NG Operator Field Service Person
Maintain End Device	View Basic Information - D Network	All Roles
Maintain End Device	Add/Update Basic Information - Household	System Administrator TWACS NG Operator Field Service Person

Functions	Screen Name	Roles that Have Access
Maintain End Device	View Basic Information - Household	All Roles
Maintain End Device	Add Transponder Information	System Administrator TWACS NG Operator Field Service Person
Maintain End Device	Add/Update Integration Information	System Administrator TWACS NG Operator Field Service Person
Maintain End Device	Add/Update Install Information - Electric	System Administrator TWACS NG Operator Field Service Person
Maintain End Device	Add/Update Install Information - Gas/Water	System Administrator TWACS NG Operator Field Service Person
Maintain End Device	View Install Information - Electric	All Roles
Maintain End Device	View Install Information - Gas	All Roles
Maintain End Device	Add/Update Install - Network/Household	System Administrator TWACS NG Operator Field Service Person
Maintain End Device	View Install Network/Household	All Roles
Maintain End Device	Enrollment Information	System Administrator TWACS NG Operator Field Service Person
Maintain End Device	View Enrollment Information	All Roles
Maintain End Device	Add/Update Premise Information	System Administrator TWACS NG Operator Field Service Person
Maintain End Device	View Premise Information	All Roles
Maintain End Device	Replace Account	System Administrator TWACS NG Operator Field Service Person
Maintain End Device	Print Electric Page 1	All Roles
Maintain End Device	Print Gas Page 1	All Roles
Maintain End Device	Print Water Page 1	All Roles
Maintain End Device	Print Electric/Gas/Water Page 2	All Roles
Maintain End Device	Print D. Network	All Roles
Maintain End Device	Print Household	All Roles

Functions	Screen Name	Roles that Have Access
Maintain End Device	Save Confirmation	System Administrator TWACS NG Operator Field Service Person
Maintain End Device	Cancel Confirmation	System Administrator TWACS NG Operator Field Service Person

### Meter Read Functions

Functions	Screen Name	Roles that Have Access
View Meter Read Performance Measures	View Meter Read Performance Measures	All Roles
View Meter Read Results	View “Load Profile View” Meter Read Results	All Roles
View Meter Read Results	View Validation Error Detail	All Roles
View Meter Read Results	View Load Profile Usage Chart	All Roles

### Usage Alert Functions

Functions	Screen Name	Roles that Have Access
Maintain Usage Alert Checks	Usage Alert checks	System Administrator TWACS NG Operator Field Service Person
Manage Usage Alert Profiles	View Usage Alert Profiles List	All Roles
Manage Usage Alert Profiles	Create Usage Alert Profiles	System Administrator TWACS NG Operator Billing Manager Billing Analyst
Manage Usage Alert Profiles	Edit Usage Alert Profiles	System Administrator TWACS NG Operator Billing Manager Billing Analyst
Manage Usage Alert Profiles	Delete Usage Alert Profiles	System Administrator

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## Revenue Protection Functions

Functions	Screen Name	Roles that Have Access
View Revenue Protection Messages	View Revenue Protection Messages List	System Administrator TWACS NG Operator Billing Manager Billing Analyst Distribution Engineer Rate / Research Analyst Meter Technician Field Service Person
View Revenue Protection Messages	View Revenue Protection Messages Details	System Administrator TWACS NG Operator Billing Manager Billing Analyst Rate / Research Analyst
View Revenue Protection Messages	Add Revenue Protection Watch List	System Administrator TWACS NG Operator Billing Manager Billing Analyst Rate / Research Analyst
View Revenue Protection Messages	Remove from Revenue Protection Watch List	System Administrator TWACS NG Operator Billing Manager Billing Analyst Rate / Research Analyst
View Revenue Protection Messages	Override System Assigned Usage Alert Profile	System Administrator TWACS NG Operator Billing Manager Billing Analyst Rate / Research Analyst

## Business Unit Functions

Functions	Screen Name	Roles that Have Access
Maintain Business Unit	Add Business Unit	System Administrator
Maintain Business Unit	Edit Business Unit	System Administrator
Maintain Business Unit	View Business Unit Details	System Administrator Field Service Person

Functions	Screen Name	Roles that Have Access
Maintain Business Unit	Maintain Business Unit - Confirm Delete	System Administrator
View Business Unit	View Business Unit List	System Administrator Field Service Person

### Function Group (FG) Functions

Functions	Screen Name	Roles that Have Access
Address Assignments	View Address Assignments	All Roles
View FG List	View Function List	All Roles
View FG List	View Group List	All Roles
View FG Unit List	View Unit List	All Roles
Maintain FG Address Business Rules	Edit Function Number Assignments	System Administrator Field Service Person
Maintain FG Address Business Rules	View Function Number Assignments	All Roles
Maintain FG Address Business Rules	Add Group Business Rules	System Administrator Field Service Person
Maintain FG Address Business Rules	Edit Group Business Rules	System Administrator Field Service Person
Maintain FG Address Business Rules	View Group Business Rules	All Roles
Maintain FG Address Business Rules	Add Unit Business Rules	System Administrator Field Service Person
Maintain FG Address Business Rules	Edit Unit Business Rules	System Administrator Field Service Person
Maintain FG Address Business Rules	View Unit Business Rules	All Roles



# Index

## A

- acquisition window 180
- add user e-mail address 40, 215
- addressing modes 12
- alert check 200
  - add 210, 211
  - view usage 211
- alert profile 200
  - create new usage 209
  - override 205
  - view or modify 207
- alert profiles
  - add 206
- AMI 16, 17
- architecture 31
- autonomous outage pinging 109, 110, 241

## B

- batch export files 150
- batch jobs 236
- billing file 17
- blink count 22
- business rules 153, 212
- button
  - command status 120
  - connect/disconnect 120
  - demand read 119
  - demand read and reset 119
  - demand reset 120
  - meter read 118
  - reverse energy 119
  - verify power 120
  - voltage read 120

## C

- calendar
  - view 131
- call center support command history 164
- call center support screen 113
- care@twacs.com 1
- CENTRON 24
- channel 179
- CIM 76
- CIM XML 199
- CIS data load 236, 244
- CIS flag 155, 214
- comm evaluation CMD count 178
- comm evaluation data 180
- comm evaluation mean signal strength 178

- command history 117
- communication port configuration dialog 54
- connect/disconnect button 120
- connecting & disconnecting 153, 212
- connection rules
  - add 154, 213
- control and receiving unit 7, 8
  - adding and configuring to SCE 59
  - commands from the master station 8
- critical peak pricing 27
- CRMA ID 180
- crontrigger 236
- CSR command history 163
- current status 163
- customer care 1

## D

- daily meter read results 117
- daily usage graph 117
- dashboard 163
- data storage 11
- demand data response 26
- demand reads 20
- demand reset button 120
- detection 13
- detection window 62
- diagnostics 13
- disconnect switch interbase 10, 15, 19
- disconnection rules 153, 212
- distributed master controller 5, 69
  - adding 69
  - communication parameters 71
  - communication protocols 71
  - deleting 73
  - editing 75
  - lookup & edit 73
  - test 190
- DMC batch jobs 240, 241
- draft status 76
- DSI 151

**E**

- email set up 104
- end device
  - lookup 100, 121
- energy reading 18
- equipment status 164
- equipment tests 176
- events
  - add 125
  - associate programs and sets 127
  - associate schedule 125
  - create new schedule 126
  - lookup 123
  - overview 123
- events performance measures 165
- export files 150

**F**

- field equipment exerciser 176, 190
- function
  - business rules 251
  - business unit 266
  - call center 261
  - command 255
  - communication resource 247
  - custom calendar 255
  - define, maintain, and view sets 253
  - distributed master controller 246
  - events list 256
  - function group 267
  - login 245
  - maintain end device 263
  - maintain job 254
  - maintain region 260
  - meter read 265
  - path 248
  - program 252
  - remote communications equipment 259
  - revenue protection 266
  - schedules 254
  - substation 248
  - substation communications equipment 250
  - transaction 251
  - transponder 257
  - usage alert 265
  - users 245
  - view end device 256
  - view region 260

**G**

- gas and water meters 23

**H**

- hamming bit 62
- historical data 116
- Hub Files 76
- hub load 243
- hub load of client data 235, 243

**I**

- inbound communications options settings 62
- inbound pickup unit 7, 9
- inbound scalars 62
- inbound signal quality 180
- integration hub 96
- interval data 11, 18, 26

**J**

- Java Message Service 31

**L**

- load control transponder 10, 14, 26
- load control transponders 14
- load profile 117
- log files 24

**M**

- maintain users screen 43
- master controller 5
  - communication parameters 71
  - communication protocols 71
- master station 3, 26
- MC batch jobs 238, 239
- mechanical meter 12
- messages
  - add 101
  - lookup 167
  - revenue protection 200
  - revenue protection, interpreting 203
  - revenue protection, lookup 201
  - revenue protections 202
- meter transponders 11
- method status 179
- MIRA board 28
- modulation transformer unit 7, 9
- multi-port transponders 12



**N**

- no pulses in 24 hours 22
- normalized signal strength 179
- notification
  - acknowledged 172
  - acknowledgement expiration 172
  - information 103
  - lookup 167
  - resolved 172
  - status 172
  - troubleshooting 170
  - view 168
- notification search region 168
- notifications 104

**O**

- on request commands 117
- on-request meter reads 17
- Oracle 31
- outage assessment 27
- outage counts 23
- outbound modulation unit 7, 8
- outbound signal strength 178

**P**

- password
  - add user 40, 215
  - create 44
  - new password 44, 216
- path & search states 88
- peak usage 20
- phase delay 62
- ping command 190
- port number utilization 164
- priority 128
- programs 132
  - add 135
  - lookup 134

**R**

- register profile names 79
- remote communications equipment 3, 6, 10
  - disconnect switch interbase 15
  - load control transponders 14
  - relation to the control and receiving unit 8
- remote disconnection 151
- restoration monitoring 27
- revenue protection 23, 200, 201, 202, 203, 266
- reverse rotation 22, 200

**roles 30**

- by TWACS NG function 246, 247, 248, 250, 251, 252, 253, 254, 255, 256, 257, 259, 260, 261, 263, 264, 266, 267

**S**

- S4 Transponders 28
- schedules 138
  - add 140
  - add custom 143
  - lookup 138
- search performance 164
- select code table dialog 63, 71
- serial number 12
- sets 144
  - add 147
  - dynamic, adding 149
  - lookup 145
  - static, adding 147
- short-hop RF 28
- software 31
  - report writing 31
- substation 45
  - add 45
  - add to region 49
  - edit 50
  - edit/review/complete status 48
  - lookup & edit 50
- substation communications equipment 3, 6, 52
  - add 52
  - adding basic information 53
  - associated with system configuration 63
  - bit descriptions 55
  - complete/edit design status 68
  - configuration key 55
  - connect redial time 65
  - connect retention time 65
  - connection string 65
  - control and receiving unit input 59
  - dedicated line board 65
  - dedicated line ID 65
  - dedicated line provider 65
  - dedicated line type 65
  - deployment, final 65
  - dialing time 65
  - dial-up phone number 65
  - edit 67
  - edit/review/complete status 63
  - group test 181
  - illustrations 7
  - inbound pickup unit add 60
  - inbound responses 13
  - lookup & edit 66

- ping test 181
- redial retry attempts 65
- redial time interval 65
- SCE ID 65
- SCE name parameter 65
- test 180
- time interval unit of measurement 65
- support 1
- support for new XM and S4 transponders 28

## T

- tampering 13, 17, 22, 27, 119
- TCT 178
- technical support 1
- test communication tool 178
- TNS 3

- primary functions 3
- total demand 20
- TOU 27
- transponder 77, 173
  - add 77
  - edit path statistics 82
  - group test 177
  - indicator lookup 84, 174
  - lookup & edit path statistics 80
  - lookup TWACS path statistics 86
  - quick test 177
  - searching in 78
  - selection 114
  - test 176
  - view indicator list 83, 173
- transponder history 163
- transponder installation status 164
- transponder path action dialog 88
- transponder status 86
  - edit path & search states 88
- TWACS
  - three levels of components 3

## U

- unit channel map 62
- usage monitoring 200
- user
  - adding and deleting 39
  - delete 41, 216
  - lookup 42
  - user ID 40, 215

## V

- verify power button 120
- view command status button 120
- view dashboard 163
- view user details 216
- voice-grade communications equipment 5
- voltage monitoring 27
- voltage read button 120

## X

- XM Transponders 28