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IC: 5294A-EC6R1S2**

**FCC Rule Part: 15.247
IC Radio Standards Specification: RSS-210**

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**Manufacturer: Landis+Gyr Technology, Inc.
Model: Gridstream RF Enhanced A3**

Manual

**Gridstream RF
Enhanced
Elster A3 Endpoint
User Guide**

Publication: 98-1671 Rev AA



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1

Endpoint Overview

Gridstream RF Enhanced Elster A3 Endpoint



Figure 1 - 1. Gridstream RF Enhanced Elster A3 Meter and Module

Endpoint Usage

The Gridstream RF Enhanced Elster A3 endpoint will be used for commercial and industrial metering applications.

The Gridstream RF Enhanced Elster A3 communication module requires professional installation by qualified personnel.

Required Software

To work with the endpoint, you need one of the following software tools:

- Command Center version 6.2 or later
- RadioShop version 6.2 or later
- Endpoint Testing Manager version 6.2.28 or later

Labels

The endpoint includes the following label:



Figure 1 - 2. Label Identification

1. LAN ID, includes programmed module part number (printed and barcoded)



NOTE: The LAN ID is a unique identifier for each endpoint. It always displays in hex. Landis+Gyr provides the LAN address. You cannot change the LAN ID of a radio.

2. Product ID (printed and bar-coded)
3. FCC ID:R7PEC6R1S2
4. IC ID: 5294A-EC6R1S2

Features and Functions

Using the Elster A3 Meter with the Gridstream RF Enhanced Communication Module, you can:

- Integrate the endpoint into all forms, classes and voltages of the Elster A3 meter
- Communicate via serial connection between the endpoint and the meter through the meter's provided interface
- Support all levels of meter passwords
- Download radio firmware

Communicating via Meter to Endpoint Connection

The serial connection is a 26-pin header that contains:

- Full duplex serial connection. The baud rate is 9600, 8 bits, 1 stop bit, no hardware handshaking.
- Power fail indication signal from the meter that tells the endpoint to disconnect from drawing power from the meter
- DC power line which supplies power to the module from the meter

- Signal pass through between meter and Elster option board

Auto-Registration

Endpoint firmware version 9.28 or later and module Device Control Word (DCW) 7.55 or later is required for auto-registration. After the meter/endpoint is installed in the field it will automatically register with the Head End System. No special tools are needed during installation as the normal Utility meter swap process can be utilized.

The meter automatically sends in the registration information containing items on how the meter/communication module is configured so the host can properly interpret the incoming data. Some of the items contained in this are as follows:

- Default Gridstream RF Collector destination
- Reporting interval for Register Data
- Reporting interval for Interval Data
- Meter's AMR-level security password
- Time Synchronization parameters
- GMT offset
- Periodic Register Data reporting
- Periodic LP Data reporting
- Meter configuration information

Once this information has been sent the meter/communication module starts collecting and sending based on the default configuration loaded during manufacturing.

Retrieving Data

The communication module performs data retrieval from the meter on request (ORR) or autonomously (periodically reported).

Availability of the following features depends on meter configuration. On Request Reads (ORR) available with this communication module are:

- Register Data (Standard Table 23) which includes consumption, demand and TOU values.
- Load Profile or Interval Data (Standard Table 64).
- Revenue Integrity Services which includes instantaneous measurements related to line voltage, current and phase angle.

Availability of the following features depends on meter configuration. Options for periodically reported data with this module include:

- Register Data & Status Flags (Standard Tables 23 & 3) which includes consumption, demand, TOU values and meter status.
- Load Profile or Interval Data & Status Flags (Standard Tables 64 & 3) which includes interval data and meter status.

Demand Reset

When Command Center delivers a Demand Reset command, the communication module passes the command to the meter, which performs the Demand Reset on the meter. The meter/communication module then passes the previous demand data captured by the meter (Standard Table 25) to Command Center for processing.

Time Synchronization

Time synchronization is the process of keeping the meter time synchronized with the Gridstream RF network time within a configurable limit. The communication module automatically keeps its time synchronized with the Gridstream RF network via periodic background process. The communication module reads the meter date/clock table (Standard Table 52) periodically, determined by its configuration. If the time drift between the meter and communication module exceeds the configured threshold, it sends a time synchronization alert message to Command Center. Command Center schedules a time change event for the meter and sends it to the communication module. The time of the change is determined such that the meter's data integrity is maintained. At the scheduled time, the communication module executes the standard procedure to change date/time on the meter.

Power Outage/Restoration

When an outage occurs, the meter uses an early power failure signal to alert the communication module to disconnect from the meter's power immediately. The communication module saves critical module data to non-volatile memory and creates and sends a power outage message. This message includes the following information:

- LAN ID
- Outage time
- Reboot count

The communication module sends the message, then assists with routing other packets until the back-up energy source can no longer keep the radio alive. The time that this energy source is available varies with several factors, including amount of data packets being routed, environmental conditions and age of meter/communication module. Generally, a hold-up time of ~120 seconds is typical.

At restoration, the communication module first acquires network connectivity. With network communications restored, the communication module sends a power restoration message that includes details such as:

- LAN ID
- Outage time
- Restoration time
- Reboot count

The communications module stores a history of up to the last five power outage and restoration event pairs. Command Center can request this data.

ZigBee

Support for HAN devices is provided via the ZigBee module, which is certified to Smart Energy Profile 1.1.

Supporting Passwords

The meter/communication module supports passwords provided by the utility. See publication 98-1055 *Gridstream 2-way Endpoint Testing Manager User Guide* for information regarding loading password into module.

Downloading Firmware

Communications module firmware can be upgraded via Command Center or ETM.

Encrypting Data

The Gridstream RF Network currently supports use of one encryption key per network. If you enable the Gridstream RF Enhanced with encryption, Command Center must have a matching encryption key.

Configuration Tables

The Gridstream RF Endpoint Configuration structure passes the data to configure the endpoint. It is used for both C&I and Residential applications.

This table is currently 55 bytes long. It contains information necessary to configure several services on the endpoint, such as firmware reads and autonomous data return configuration.

The endpoint receives the packet, and using the data, configures its own operation. The host maintains a record of the endpoint's configuration.

Item	Other
Packet Contents	Identifies which elements in this packet are set. Elements that are not set are ignored. There still must be a place in the packet for it, though.
Config Byte 1	Not Used
Config Byte 2	Not Used
Config Byte 3	Not Used
Config Byte 4	Not Used
Config Byte 5	Not Used
Reporting Interval LP	In Minutes.
Pump Period Register	In Minutes.
Pump Period RIS	In minutes. The period for the RIS/Vector/Voltage data pump.
Pump Period Status	In minutes. The period for the Device Status (SO3, typically) data pump

Item	Other
Pump Period Snap Read	Snap Reads will be delivered at a pseudo-random time, which will occur in the first X hours of each day. X is the value that is provided here. It will default to 2. The process is: this value, which is in hours, will be converted to minutes. The LAN ID will be mod-ed with this minute value, and the result will be the minute of the day that the self read is transmitted.
User ID	2 byte User ID used while running ANSI Logon Service
Logon User	10 byte User Name that is used while running the ANSI Logon Service
Security Password	The full 20 bytes are required.
Sustained Outage Duration	Defines the number of seconds after which an outage will be classified as sustained. If less than this amount, the outage is momentary. A value of zero will cause all outages to be considered "sustained".
Max Meter Time Drift	The number of seconds that the meter clock can drift from the radio clock, after which an alarm is triggered.
Meter Time Read Period	The number of seconds that the meter clock can drift from the radio clock, after which an alarm is triggered.
GMT Offset	The GMT Offset in 15 minute increments. Signed.

Theory of Operation

The Gridstream RF Enhanced Elster A3 module is an electric endpoint with 900MHz Gridstream and ZigBee communications on a single PCB. This product will be integrated into the Elster A3 meter. The following figure shows the high-level block diagram of the module. Each functional block is described in the following sections.

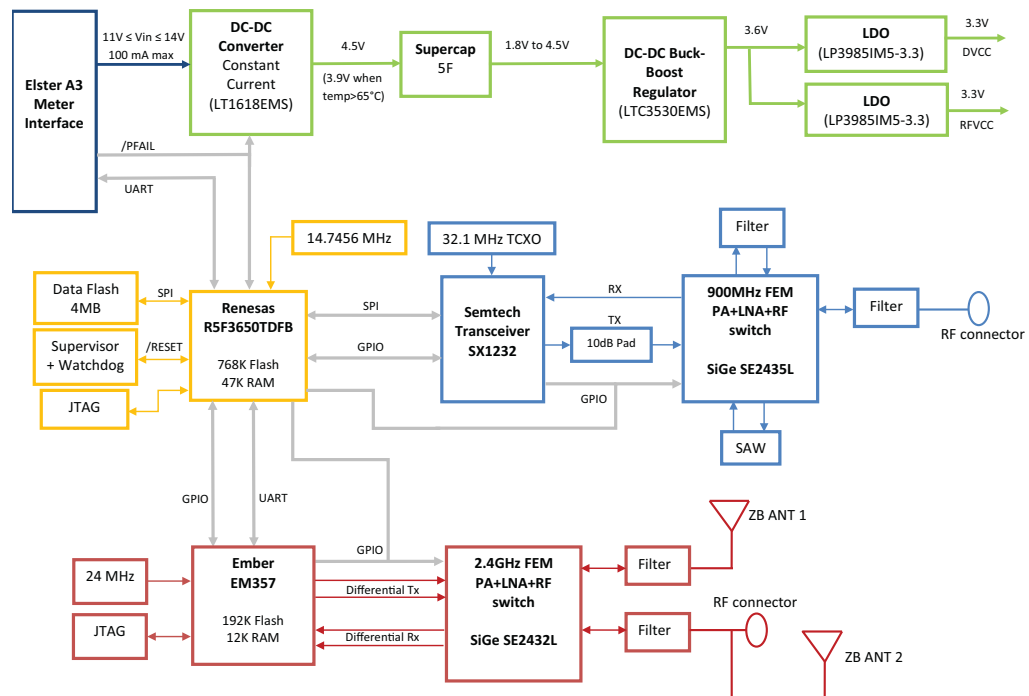


Figure 1 - 3. Block Diagram

FCC and Industry Canada Compliance

FCC Class B

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the Instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Consult Landis+Gyr or an experienced radio technician for help



WARNING: Changes or modifications to this device not expressly approved by Landis+Gyr could void the user's authority to operate the equipment.

RF Exposure

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Industry Canada

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

This radio transmitter (**5294A-EC6R1S2**) has been approved by Industry Canada to operate with the antenna types listed below, with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Le présent émetteur radio (**5294A-EC6R1S2**) a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

Approved Antennas: Omni-directional whip antenna, 5.5 dBi gain, 902-928 MHz, antenna impedance is 50 ohms.

2

Command Center Deployment/Configuration

Deployment

Auto Registration

Landis+Gyr RF Gridstream RF Enhanced Elster A3 module is Plug and Play; meters equipped with Landis+Gyr endpoints arrive from the factory in operational mode, ready to be installed at a service location. Along with the meters, a Meter Manufacturer File is provided to the utility. This file contains meter number/serial number combinations; the file must be uploaded into Command Center prior to installation of endpoints in the field.

A meter installer installs the endpoint at the service location.

Once installed, the endpoint will begin the following auto-registration process:

1. The endpoint listens for RF traffic and evaluates its neighbors, searching for the best possible path to the collector. The best path is the one with the fewest hops to the Collector and through an endpoint with the highest Receive Signal Strength Indicator (RSSI) (RSSI is the receive signal strength from the node. It is a rough indicator of how strong the signal is from the radio).
2. Having identified the best path, the endpoint will transmit the following two packets:
 - **RF Registration Packet:** The RF Registration Packet identifies for the Collector the return path to the endpoint. This is achieved by each intermediary endpoint adding its LAN address to the endpoint's RF Registration Packet as it travels to the Collector. Once the RF Registration Packet is received, the endpoint will transition to Discovered in Command Center. The RF Registration will continue to be sent until the SetWAN command is received from Command Center.
 - **Init Push:** The Init Push packet contains configuration information about the meter, that allows Command Center to understand the configuration of the meter. The Init Push is transmitted until the SetWAN command is received from Command Center.
3. Once the RF Registration Packet and Init Push are received, Command Center will validate the configuration and, if validated, begin accepting readings from the endpoint. The endpoint will remain in Discovered status until the SetWAN command is received by the endpoint.
4. The SetWAN command is issued to the endpoint when Command Center receives latitude and longitude information AND the endpoint's closest neighbor has a WAN address. The SetWAN command provides the endpoint with its WAN address. The WAN address is the radio's physical location (Latitude and Longitude) expressed in degree, minutes and seconds. The SetWAN command achieves two way communication with the endpoint. The SetWAN tells the endpoint that we have received your configuration information and it is OK to stop sending it in.



NOTE: If Installation Data is received before an Init Push has been received, the installation record will be stored awaiting the Init Push from the device.

Endpoint Status

Endpoints will move from one status to another during the deployment process. The following are various endpoint statuses:

- **Installed.** Endpoints in the Installed status have been deployed in the field, but Command Center has not received the RF Registration packet.
- **Discovered.** Endpoints in the Discovered status have transmitted an RF Registration Packet. The RF Registration Packet identifies for the Collector the return path to the endpoint. This is achieved by each intermediary endpoint adding its LAN address to the endpoint's RF Registration Packet as it travels to the Collector.
- **Normal.** Endpoints in the Normal status have transmitted an Init Push packet containing configuration information AND have acknowledged a SetWAN command from Command Center. The SetWAN command provides the endpoint with its WAN address. The WAN address is the radio's physical location (Latitude and Longitude) expressed in degree, minutes and seconds.
- **Lost.** Endpoints in the Lost status have reported an outage event. When the endpoint loses power, it will transmit a "Power Outage Event" to Command Center. Once power has been restored, the endpoint transmits a "Power Restore Event". The endpoint will then transition back to Normal status.
- **Configure.** Endpoints in the Configure status are endpoints that have been recently added to a new configuration group and have not yet confirmed the receipt of configuration commands.
- **Failed.** Endpoints and/or meters in the Failed status have failed a re-configuration attempt or have failed a work flow process. Work flow processing will determine if configuration changes such as time zone updates, reconfiguring of endpoints, meter change programs have been successful. Endpoints must be manually removed from the Failed status, generally by attempting the work process again.
- **Archive.** Endpoints in Archive status are no longer in use within the Mesh System, for example, damaged endpoints. Endpoints must be manually entered into Archive status.
- **Inventory.** Endpoints in Inventory status have not yet been deployed in the field. These may be recently purchased meters or meters that have been removed from the field and are awaiting redeployment.

Meter Manufacturer Data

The Meter Manufacturer Data screen allows the user to import an XML or CSV file supplied by the meter manufacturer so the utility does not have to key in meters and endpoints by hand.

1. Click **Operations > Import > Meter Manufacturer Data** to display the Import Meter Manufacturer Data screen.

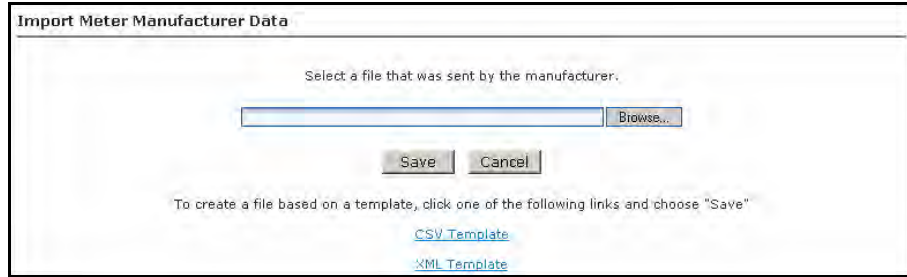


Figure 2 - 1. Import Meter Manufacturer Data

2. Click the **Browse** button to navigate to, and select, a file that was sent by the meter manufacturer.
3. Click the **Save** button to import the file into the database.

The Meter Manufacturer Data Import (Upload Complete) window will appear displaying the Error Summary (if applicable) and Successful Entries.

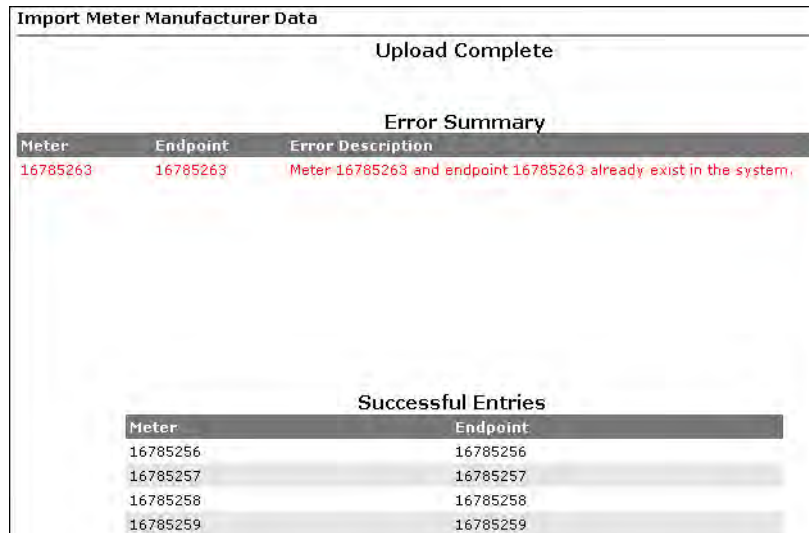


Figure 2 - 2. Upload Complete Window



NOTE: Any entries under Error Summary will be red text. The usual reason for an entry under Errors is that the endpoint already exists in the system. If file parsing errors or other file-related errors occur, contact the meter manufacturer that supplied the file.

4. Successful entries will be added to inventory and will be displayed on the dashboard as Inventory status.

Import Installation File

Meter deployment details can be imported by use of an Installation File provided by the installer. Following is the procedure for importing the installation file.

1. Click **Operations > Import > Import Installation File** to display the Import Installation File screen.

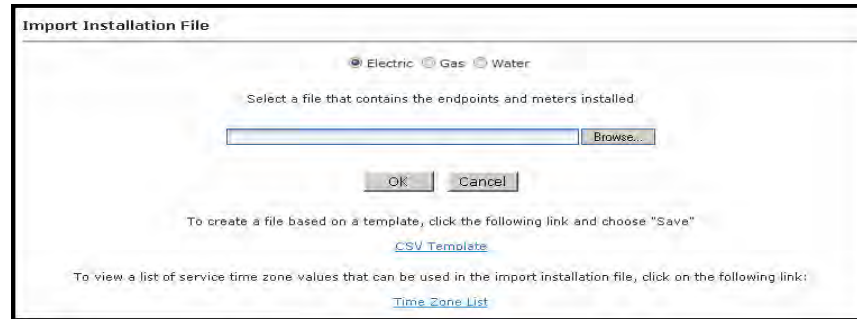


Figure 2 - 3. Import Installation File Screen

2. Enter the Path to the file.

...or...

3. Click the **Browse** button to navigate to, and select, a file containing the endpoint information.

4. Click **OK** to upload the file. The information imported via the Installation File:

Table 2 - 1. Installation File Fields

Data	Format	Format/Description
User ID*	AlphaNum (30)	Login assigned by the utility for the installer. Utility may elect to use "1" for System usage.
Installation Date*	Date MM/DD/YYYY 12/26/2009	Actual date the meter was installed. This date is used in various Command Center reports to track deployment statistics.
Installation Time*	TimeHHMMAM/PM 11:12 AM	Actual time the meter was installed. This date is used in various Command Center Reports to track deployment statistics.
Change Out meter number	AlphaNum (20)	The meter being replaced with a new meter. Meter change out information is displayed in the notes section of the endpoint information screen.
Change Out meter kWh	AlphaNum (20)	The kWh reading on the meter being replaced Meter change out kWh information is displayed in the notes section of the endpoint information screen. Variable Character.
Installed Meter Number*	AlphaNum (20)	Meter number of the new meter being installed. This meter must exist in Command Center prior to importing the Import Installation File. Must parse to Decimal format.
Installed Endpoint Serial Number*	Decimal (9)	The serial number of the new meter being installed. Note: Endpoint serial numbers must be converted from Hex to Decimal.
Installed Meter kWh	Decimal (9)	Initial reading of the new meter.
Service Latitude	Decimal (12,8)	GPS latitude.
Service Longitude	Decimal (12,8)	GPS longitude.
Service Location	AlphaNum (100)	Meter service location.
* Indicates a required field.		

Table 2 - 1. Installation File Fields (Continued)

Data	Format	Format/Description
Service Time Zone	See formatting below.	The service time zone may be entered to specify the correct time zone for the service location.
* Indicates a required field.		

Import Information File CSV Format requirements



CAUTION: Required fields are UserID, Installed Date, InstalledTime, InstalledMeterNo, and InstalledEndpointSN. If these fields are not populated, the file will not be processed. Service Location is required if the Latitude and Longitude fields are populated. Command Center will ignore the latitude and longitude values if Service Location is not provided.

The Import Installation File window provides a CSV template link. Click this link to view the format requirements for the file. This template can be saved to a network location or local machine and provided to the installer.

The Installation file must be of the following format:

- The first line must be a header.
- A comma is required to separate each item even if no data exists.
- A Service location is required if the service latitude and longitude are provided.

Time Zone

In order to report reading time correctly, the endpoint must be programmed with the appropriate time zone; this is achieved by sending commands to the endpoint that indicates the time zone in which the endpoint is installed and whether Daylight Savings Time (DST) is observed in the given time zone.

The Installation File should include the endpoint time zone. Clicking the Time Zone List link will open a document that displays a list of valid time zone designations by country.

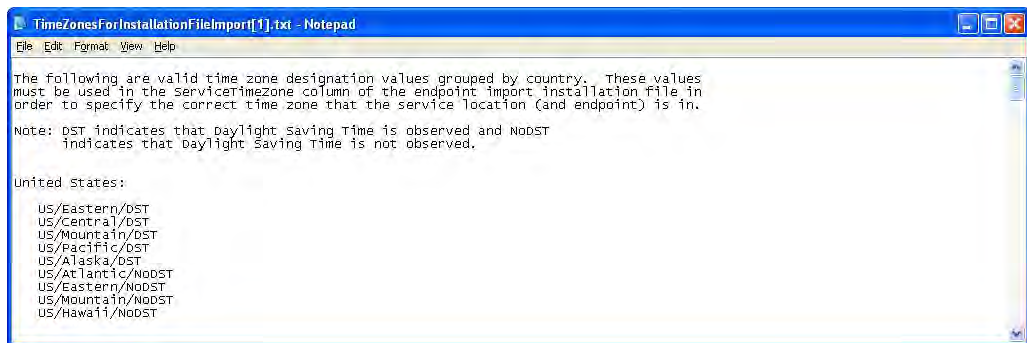


Figure 2 - 4. Time Zones

Tracking and Deployment

Deployment Status

Deployment Status enables users to monitor the find process when endpoints are being deployed on a system.

1. Click **Network > Deployment Status** to display the Deployment Status Report screen.

Figure 2 - 5. RF Deployment Status Screen

2. Choose the Selection Criteria:

A. **All**

...or...

B. **Collector.** Select the desired collector from the drop-down menu.

3. Select a Date Range:

A. **Start Date.** Click the calendar icon, and then click on the desired start date.

B. **End Date.** Click the calendar icon and then click the desired end date.

4. Click the **OK** button to display the RF Deployment Status Report.

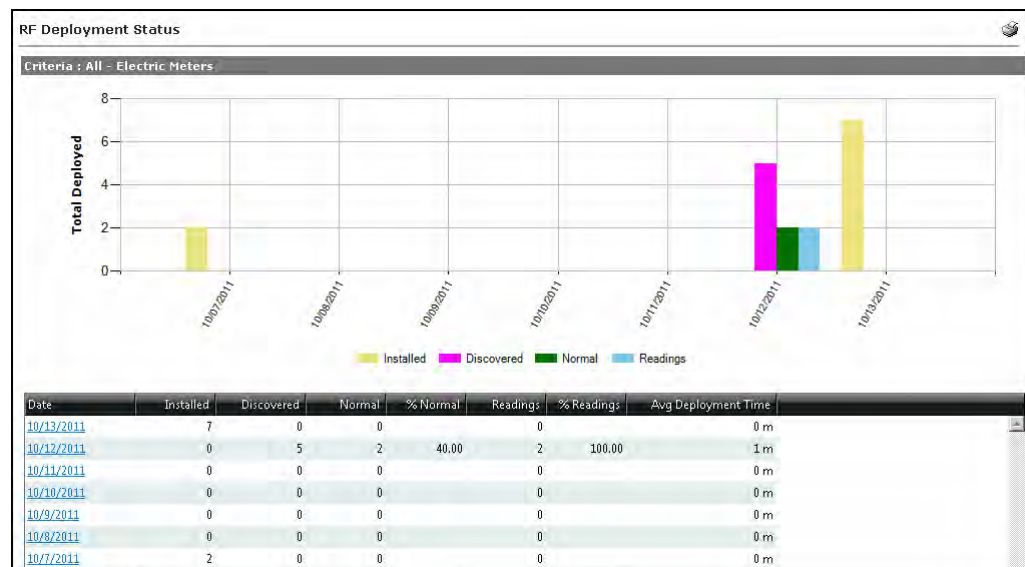


Figure 2 - 6. RF Deployment Status Report

The RF Deployment Status Report displays a graph representing 14 days of installation statistics and a chart. Time periods longer than 14 days may be selected, but will not be presented on the graph due

to space limitations. By clicking on a specific date, each endpoint registering that day displays installation, registered, normal and reading status for this date. Information on the report is updated as the information is received by Command Center on a rolling seven day basis. Installation information is populated from the RF Installation File Import process. Registered and Normal status updates are based on receipt of the two registration requests from the endpoints. Readings are based on the first reading received from the endpoint. Average deployment time is based on the time it takes to go from installed to normal.

5. Click on the **Date** link to display the Gridstream Meters Deployed By Day report.

Figure 2 - 7. RF Meters Deployed by Day

RF Installation Status

The RF Installation Status Report is intended to be used by utilities during mass deployment. It can be used as an installation tool to determine how many meters have been installed over a specified time frame and of those meters how many have been discovered, how many have moved to normal status, how many are sending readings, and how many have sent readings in the past 24 hours.

Following is the procedure for viewing the RF Installation Status report:

1. From Command Center, select **Network > RF Installation Status**. The RF Installation Status window will open.

Figure 2 - 8. RF Installation Status

2. **Selection Criteria.** Select All to view results for all collectors in the system

...or...

Select the desired collector from the drop down box to view results for only that collector.

3. **Date Range.** Enter a Start Date and End Date. Select the Calendar icon to view a calendar and make date selections if needed.
4. Click **OK**. The RF Installation Status report will be displayed, shown in Figure 2 - 9.



Figure 2 - 9. RF Installation Status Report

The following information is displayed in the report:

- **Day.** This number will increment for each day the user has selected to display.
- **Date.** This will display the dates selected in generation of the report. Click the date link to view a list of all meters deployed on the selected date.
- **Daily Installed.** This will display the number of endpoints installed for that particular day. The daily installed data is imported into Command Center via the Installation File.
- **Discovered.** Of the total number of meters installed on the summary date, the total number of those that have transitioned into a Discovered state and the percentage (Discovered meters/Installed meters).
- **Normal.** Of the number of meters installed on the summary date, the total of those meters that have transitioned to a normal state at that point in time and the percentage (Normal meters/Installed meters).
- **Readings.** Of the total number of meters installed on that day, the number of those meters that have sent in a billable reading packet, and the percentage (meters that have sent a billable reading packet/total meters installed on that day).
- **Readings past 24 Hours.** Of the meters that were installed on that day, the total number of meters that sent in a billable readings packet in the last 24 hours (from the point the report was generated) and the percentage (meters that sent in a billable readings packet in the last 24 hours/total meters installed on that day).
- **Cumulative installed.** The total number of meters that have been installed up to that date.
- **Normal.** The total cumulative number of meters that have transitioned to Normal status up to that date.

The color-coded bar graph displays the following deployment information:

- Cumulative number of meters installed for each date (Grey).
- Current number of meters that have transitioned to Normal status (Green).

- Number of installed meters that have sent in a billable reading in the last 24 hours (Blue).

Endpoint Configuration

Packet Definitions

Creating a packet definition is necessary to reconfigure the packet payload of an endpoint. Packet definitions can contain several different user-configurable data elements.



NOTE: RF endpoints allow a user to return up to 6 registers. However, the more registers returned, the greater the strain on the network.

1. Click **Setup > Packet Definitions > RF Residential**

The Packet Definitions screen will be displayed.

Name	Type	Notes	Actions
Landis & Gyr Residential Packet Definition A	On Demand	kWh, Received kWh, Voltage Phase A	[Icons]
Landis & Gyr RIS Read Packet Definition	On Demand	S+U voltage and phase angle data	[Icons]
Landis & Gyr Self Read Packet Definition	On Demand	S+U midnight aligned self read packet	[Icons]
LG RF Phase Voltage Report Packet Definition	On Demand	Special packet for use with on-demand function of the RF Phase Voltage Report	[Icons]
Meter Status Flags	On Demand	Packet to Retrieve Meter Status Flags	[Icons]
New Test TOU	On Demand		[Icons]
RF FocusAX Default MultiSpeak OnDemand Read	On Demand	Default packet for RF FocusAX On Demand reads requested through MultiSpeak	[Icons]
Test TOU	On Demand		[Icons]

Figure 2 - 10. Packet Definitions Screen

2. In the Packet Definitions screen (above) click the **New** button to display the Packet Definition window.

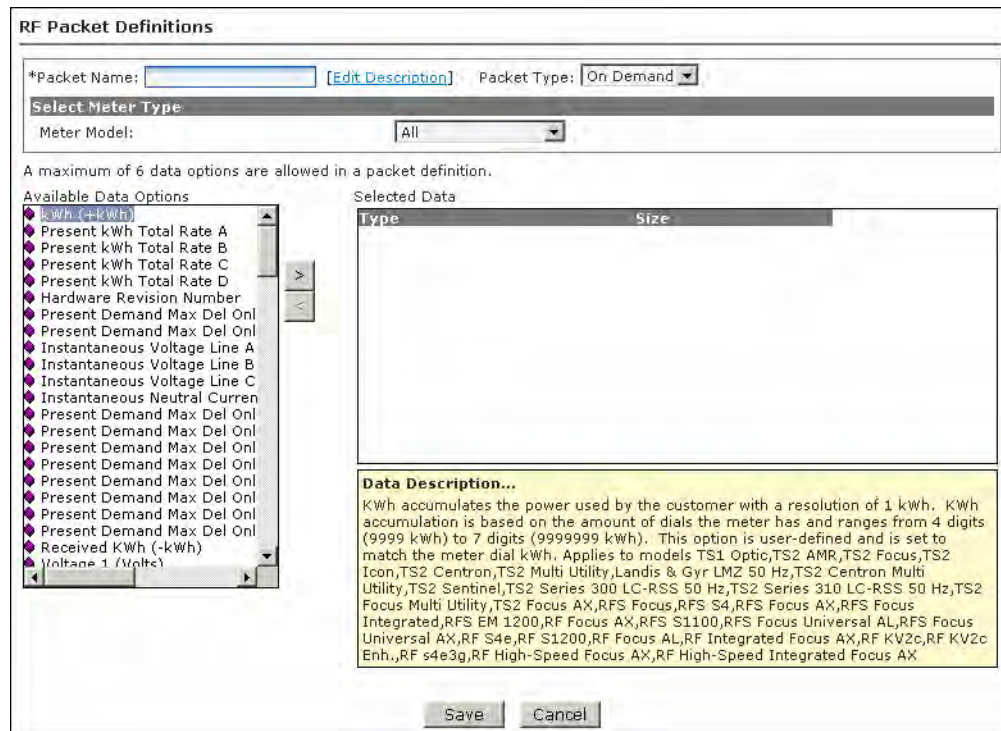


Figure 2 - 11. The Packet Definition Window

3. Enter a name in the **Packet Name** field. The name should be unique to the organization.
4. Click the **Edit Description** link to enter any desired notes for the packet definition. If any notes were entered, click the **OK** button to save them.
5. Select a **Packet Type** from the drop-down.
 - **On Demand.** Used for RF Endpoints.
 - **Daily Packet Type.** Used for PLC Endpoints
6. Select the **Meter Type** from the drop-down.
7. Select the desired data options from the **Available Data Options** window on the left side of the screen.

To view a description of each available data option, click once on the data element. A description of the data element will be displayed in the yellow shaded box in the lower-center area of the screen.



NOTE: The available data options vary depending on the type of endpoint.

8. Click the right pointing arrow to move the data option to the Selected Data window.

As you select data options, monitor the Packet Capacity gauge on the right of the screen. Each selection will add to the percentage total. If your selections exceed 100 percent, a message will be displayed when you click the Save button indicating that packet capacity must be 100% or less and can contain six or fewer data items. You can remove selections from the Selected Data window by clicking to highlight the selection and then click the left pointing arrow to remove the selection.

9. After selecting all of the desired data options, click the **Save** button to save the new packet definition.

Alarm Definitions

Alarm Definitions determine what type of response the given Events will trigger, including Dashboard Alerts and Email Alerts. Alarm Definitions must be created prior to Meter Configuration Groups in order to be programmed to a module.

1. Click **Setup > Alarm Definitions** and select the appropriate endpoint type to display the Alarm Definitions screen.

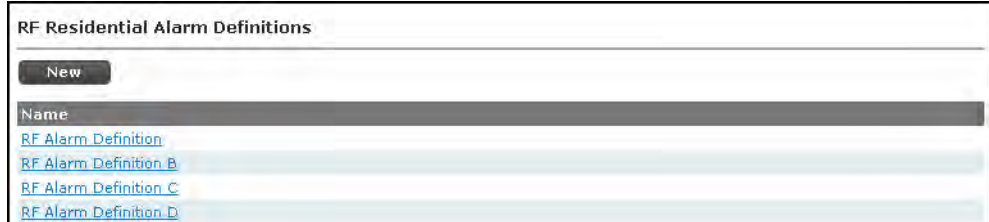


Figure 2 - 12. Alarm Definitions screen

2. Click the **New** button to display the Alarm Definition screen.

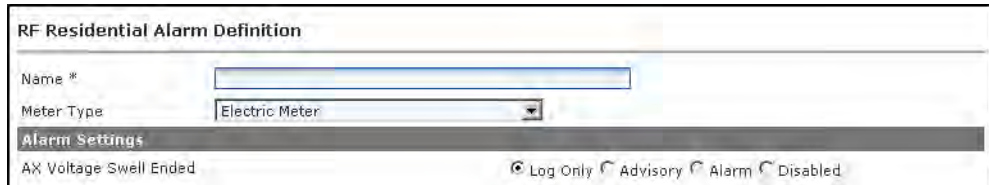


Figure 2 - 13. Alarm Definition screen

3. Enter an Alarm Definition name in the Name field.
4. Choose the desired setting for each event. See below for setting descriptions.

		Available Settings			
Result		Disabled	Log Only	Advisory	Alarm
Event is:	Logged in module		✓	✓	✓
	Available via request		✓	✓	✓
	Included in next			✓	
	Transmitted immediately				✓
	Flagged on Dashboard				✓
	Included in E-mail Alerts			✓	✓



NOTE: The default Alarm Definition settings represent the recommendation of Landis+Gyr.

5. Click the **Save** button.

An Alarm Definition can only be edited if it is not already part of an existing Configuration Group.

Meter Configuration Groups

A Configuration Group is a type of Command Addressing Group. A meter can be a member of only one configuration group. All members of a configuration group must be assigned the same configuration settings. Configuration groups are used to drive group-based reconfigurations for multiple endpoints.

Each endpoint type is manufactured with a default configuration group.

The data transmitted by an RF module, how frequently the data is sent, and how the module responds to conditions in the field, is dictated by the endpoint's Configuration Group.

An RF Endpoint configuration consists of the following:

- **Packet Definitions** that are built for various data elements to be captured by the endpoint.
- **Alarm Definitions** that establish the priority associated with events that occur in the RF endpoints.
- **RF Network Settings** that establish the outage wait and time synchronization settings.
- A **schedule** that includes the commands and packet definitions, along with time settings and frequency settings associated with data transmission, that are stored in the endpoint.



NOTE: During the Auto-registration process, the module transmits an Init Push packet which indicates its configuration. This enables Command Center to associate the endpoint with the appropriate configuration group. If the configuration transmitted does not match an existing configuration in Command Center, a new configuration group may be auto-generated to which the endpoint will be assigned. For this process to occur, the Auto Generate Meter Configuration Groups setting must be enabled in System Settings.

1. Click **Setup > Groups > Meter Configuration Groups** and select the endpoint type.

The Configuration Group screen will be displayed.

Name	Meters	Notes	Actions
LG RF Focus AL Configuration Group	0	LG Gridstream RF Focus AL Configuration Group	[Icons]
LG RF Focus AL Configuration Group B	0	LG Gridstream RF Focus AL Configuration Group B	[Icons]
LG RF Focus AL Configuration Group C	0	LG RF Focus AL Configuration Group C	[Icons]
LG RF Gas Configuration A	6	LG RF Gas Configuration A	[Icons]
LG RF Residential Configuration A	0	LG RF Residential Configuration A	[Icons]
LG RF Residential Configuration B	0	LG Gridstream RF Residential Configuration B	[Icons]
LG RF Residential Configuration C	1	LG RF Residential Configuration C	[Icons]
LG RF Residential Configuration D	4	LG RF Residential Configuration D	[Icons]

Figure 2 - 14. Configuration Groups Window

If you wish to view the details of an existing configuration group, perform the following steps.

- A. In the Configuration Group window click the **View Meters** icon for the Configuration Group you want to view to display the Group Summary window.

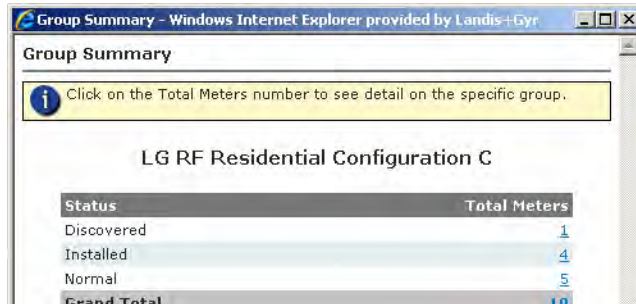


Figure 2 - 15. Group Summary Window

The group membership list window displays the following categories:

- **Status.** Status is the current status of the meter.
- **Total Meters.** Displays the total number of meters in each status.

- B. Click any of the meter number links to view the **Endpoint Properties** window for the selected meter.
2. In the Configuration Groups window click the **New** button to display the Configuration Group Properties window.

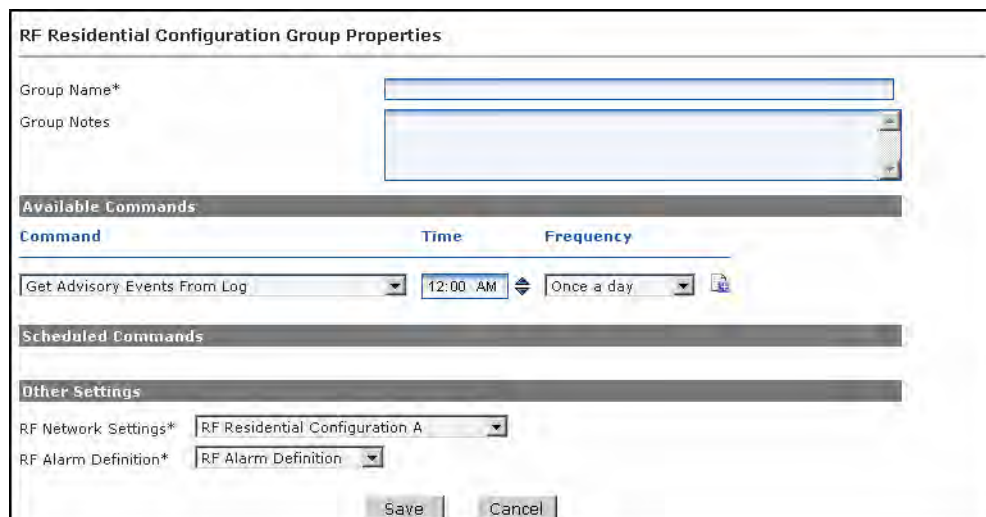


Figure 2 - 16. Configuration Group Properties Window

3. Enter a **Group Name**. The name must be unique within the organization.
4. Enter any desired **Group Notes**.
5. To set up **Scheduled Commands** use the following steps:
 - A. Select the desired packet definition from the Command drop-down.
 - B. Select the **Time** at which the reading will be taken from the meter. Adjust the time by clicking on either the hours, minutes, or AM/PM and then using the up or down arrow.
 - C. Select the **Frequency** with which the reading will be taken from the meter.

If either Every n minutes or Every n hours is selected, an additional field, N, will be displayed.



Figure 2 - 17. Frequency Interval

- Select the desired interval from the **Frequency** drop-down.
- D. Click the **Schedule Command** icon to add the command to the Scheduled Commands list.

Scheduled Commands				
Command	Time	Frequency	Interval Length	Delayed
Interval Usage Data	N/A	Every Hour	5	<input type="checkbox"/>
Landis & Gyr Residential Packet Definition A	12:00 AM	Once Per Day	N/A	<input checked="" type="checkbox"/>

Figure 2 - 18. Scheduled Commands

- E. (Gridstream endpoints only) Select the **Delayed** check-box for a command.
- Repeat step 5 for any additional commands.
 - Select the **Endpoint Transmit Interval** from the drop-down. This setting determines how often the endpoint will transfer its readings to Command Center.
 - Select the appropriate RF Network Settings from the drop-down.

Table 2 - 2. RF Network Settings Parameters

Parameter	Default RF Collector Configuration	Hunt RFS Residential Configuration A	Hunt RFS S4 Configuration A	Hunt RFS Gas Configuration	RF Residential Configuration A	LG AU Residential Network Configuration A	LG RF Commercial Configuration A
Outage Wait Value*		6	6	6		30	
Tamper Threshold**	10	0	0	0	30	0	10
Time Synchronization (X, Y)†	1,1	20, 60	20, 60	20, 60	20, 360	20, 60	20, 1
*Outage Wait Value	The length of time (in seconds) that an endpoint will wait during a power outage situation before sending an outage notification to Command Center.						
**Tamper Threshold	The number of reverse pulses of -kWh an endpoint must see within an interval before triggering a "Tamper Alert".						
†Time Synchronization	The number of seconds that the meter time may drift before an automated time synchronization must be performed (X), or an alert must be generated and sent to Command Center (Y).						

- Select an **RF Alarm Definition** from the drop-down.
- Click the **Save** button to save the new configuration group.

Add Meters to a Meter Configuration Group

Adding meters to a configuration group initiates the configuration process.

- Click **Setup > Groups > Meter Configuration Groups** and select the endpoint type.

The Configuration Group screen will be displayed.

Name	Meters	Notes	Actions
LG RF Focus AL Configuration Group	0	LG Gridstream RF Focus AL Configuration Group	[Add] [Edit] [Delete]
LG RF Focus AL Configuration Group B	0	LG Gridstream RF Focus AL Configuration Group B	[Add] [Edit] [Delete]
LG RF Focus AL Configuration Group C	0	LG RF Focus AL Configuration Group C	[Add] [Edit] [Delete]
LG RF Gas Configuration A	6	LG RF Gas Configuration A	[Add] [Edit] [Delete]
LG RF Residential Configuration A	0	LG RF Residential Configuration A	[Add] [Edit] [Delete]
LG RF Residential Configuration B	0	LG Gridstream RF Residential Configuration B	[Add] [Edit] [Delete]
LG RF Residential Configuration C	1	LG RF Residential Configuration C	[Add] [Edit] [Delete]
LG RF Residential Configuration D	4	LG RF Residential Configuration D	[Add] [Edit] [Delete]

Figure 2 - 19. Configuration Group Window

- Click the **Add Meters** icon for the Configuration Group to which you want to add meters in order to display the Add Meters to Group window.

Please Note: When adding endpoints to or removing endpoints from a RFUEndpointConfig group, commands must be issued to the endpoints to reflect the changes you have made. Those commands will be issued the next time the 'Reconfigure Endpoints' process runs. Please check the 'Process Settings' screen for more information on when the 'Reconfigure Endpoints' process will run.

Current Group: **LG S+U Residential Configuration A**

Meter(s)
Enter meter numbers separated by spaces, commas, or semicolons.

Meter File
Each line in the file should contain a single meter number.

Figure 2 - 20. Add Meters to Group Window

- Click the **Meter(s)** radio button and enter individual meter numbers separated by spaces, commas, or semi-colons.
- ...or...
- Click the **Meter File** radio button and then the **Browse** button to browse for a .csv file containing all the necessary meter numbers.
 - Click the **Add** button and then the **Exit** button to save the additions.

After clicking the Add button, the user will receive feedback on how many meter numbers were successfully and/or unsuccessfully added. The reason for an unsuccessful message is that the meter number does not exist.



NOTE: If a meter is already in a configuration group, the meter will be removed from the original and added to the new configuration group.

HAN Setup Process Overview

Pre-requisite:

- Meters must be ZigBee-enabled and in Normal status before any of the following HAN functionality commands are usable.

1. Send the **HAN: Initialization** command to the ZigBee-enabled meter, if not already completed during 5.6 (or later) Gridstream System Release upgrade.
2. **Provision HAN Devices**
3. Provisioned devices can utilize the following **HAN applications**:
 - A. Usage/Metering Information.
 - B. Text Messaging.
 - C. Load Control.
 - D. Pricing/Rate Information.
4. Remove HAN Devices from Home Area Network:
 - A. HAN: Delete Device.
 - B. HAN: Clear Devices.
 - C. Decommission HAN.
5. Management & Troubleshooting:
 - A. Meter Swap out process using Decommission HAN.
 - B. Commission HAN Network for Channel Control.
 - C. Meter LCD Screen for ZigBee Alerts.
 - D. Confirm HAN Radio in Meter is Communicating or HAN is set-up.
 - E. Get information for a specific device.
 - F. Get FW version for the HAN radio.
 - G. Confirm that a HAN device can communicate with the meter.

HAN: Initialization

The **HAN: Initialization** command provides the meter with key information that the Home Area Network will need to properly communicate metering information to HAN devices. This process allows the module firmware to flexibly adjust its meter information collection process to work with any meter or meter program.



NOTE: The HAN: Initialization command is new to Gridstream with System Release 5.6, and required to be sent to all existing or new Home Area Networks.

Please see publication *98-1188: HAN Initialization and Firmware Transition Guide* for more details on the HAN Initialization process. This document includes the full process, as well as expected results or potential issues. It is expected that users will leverage this document in parallel to this user guide.



NOTE: If a HAN command is sent to a meter before the HAN: Initialization command has been successfully sent to a meter, the HAN command will fail and the HAN: Initialization command will be sent to the meter in its place. Once the initialization process is complete, the original HAN command, which was failed, will need to be retried by the user or 3rd party system.

Under the **Manage Tab** on the **Endpoint Information Window**, select the **HAN: Initialization** command from the drop-down menu and press **Send**. This will cause the meter to change from a

status of Normal to a status of Configure. This status change indicates that the HAN initialization process is underway. Once the meter status changes from Configure to Normal the HAN initialization process is complete.

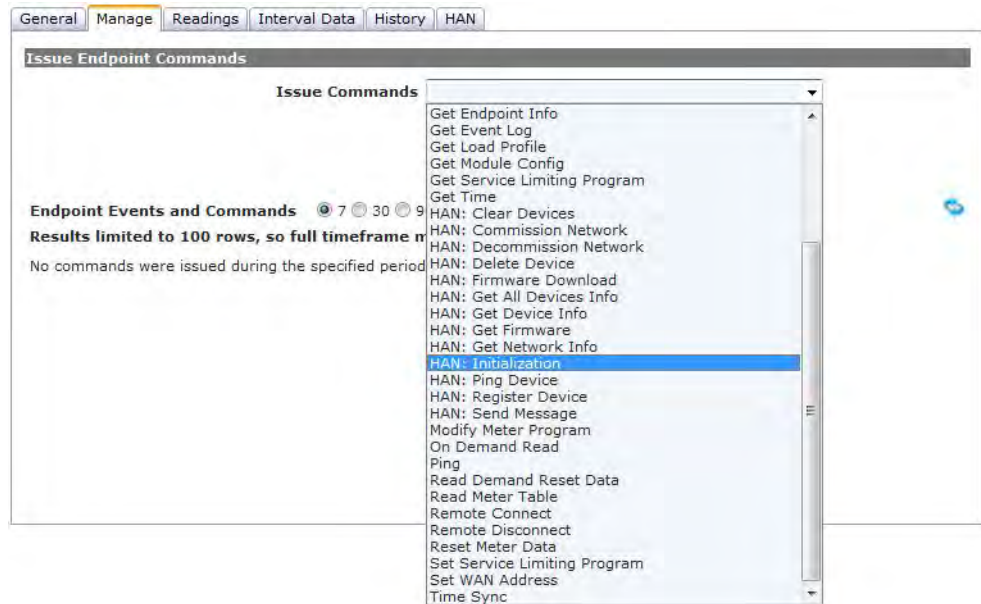


Figure 2 - 21. HAN: Initialization

Provisioning HAN Devices

Provisioning a HAN device (such as a display, smart thermostat, or direct load control unit) *securely joins a specific ZigBee-enabled HAN device with a specific meter* so that they can communicate across their meter's Home Area Network.

When the first HAN device for a meter is provisioned, a Home Area Network is automatically commissioned. This involves Gridstream assigning a Channel (from a list of preferred channels) and HAN ID. If there is a need to specifically assign the Channel and or the HAN ID, use the **HAN: Commission Network** Command, as described under the *Management and Troubleshooting* section below.



NOTE: Up to 5 devices may be provisioned to a single Non-Enhanced meter and up to 10 devices, 8 of which may be DRLC devices, for a single Enhanced Meter.

A device can be provisioned in two ways from Command Center: either 1) **HAN Tab** or 2) **Manage Tab** on the Endpoint Information Window:

1. On the **Endpoint Information Window**, select the **HAN** tab.

Click the **New** button to display the new device fields shown below.



Figure 2 - 22. HAN Tab

...or...

2. On the **Endpoint Information Window**, select the **Manage Tab**.



Figure 2 - 23. Manage Tab

- A. Enter the **MAC Address**. (Listed either on the HAN device or HAN device packaging.)



NOTE: A Media Access Control address (MAC address) is a unique identifier assigned to most network adapters or network interface cards (NICs) by the manufacturer for identification.

- B. Enter the **Install Code**. (Listed either on the HAN device or HAN device packaging)
- C. Click the **Send** button. This will notify the Meter to open a Join Window for the specified HAN device.



NOTE: The window of time during which the customer may complete registration is determined by the user configuration setting in the Organization Information screen and must be set to a value of between 1 to 30 days.

3. The HAN or Manage Tab will be updated with a device status of **Provision Request**, which indicates that the Meter has opened a Join Window for the specified device. The MAC Address and Install Code for the specified device will be shown in the updated window as well.

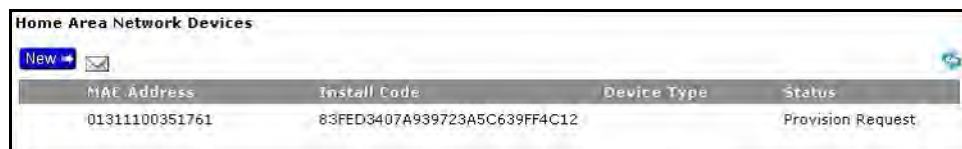


Figure 2 - 24. MAC Address

4. Once initial contact with the specified device has been made, the device status will update to **Find Pending**.



NOTE: You may need to click the Refresh icon periodically to determine if the device has entered the Find Pending status.

5. When the device is in the **Find Pending** status, the customer (end device user in premise) may need to complete registration by joining or accepting the HAN network; if needed, this is often accomplished simply by pressing a button on the device. This is not always necessary because some HAN devices have completely automated this process, requiring no user interaction. This process can vary by HAN device; please consult the device user's guide or manual for details.
6. Once the device joins the HAN network, the Status will change to **Normal** and the Device Type field will be populated. The HAN Device is now joined and ready for use.

Application Summary

For provisioned HAN devices, the following functionality/communication may be possible, depending on what is supported by that device. Gridstream's support of these applications is further detailed in the Command Center User Manual, as well as the Integration Suite SDK.

- **Usage Information:** Once provisioned, HAN devices can receive usage information, such as kWh and kW, as values are updated by the meter.



NOTE: The usage information available to the HAN devices from the meter will depend on the type of meter, as well as the Smart Energy version of the HAN device.

- **Text Messaging:** Character-based text messages can be sent to in-home displays from either Command Center or via Integration Suite.
- **Load Control:** Direct load control commands such as thermostat temperature adjustments and load-based duty cycling can be sent via Integration Suite.
- **Pricing Information:** Energy rate information for both flat or Time-of-Use structured pricing can be sent via Integration Suite.

Remove HAN Devices

Removing (de-provisioning) a HAN device from the Home Area Network can be accomplished in three ways:

- If the user wishes to remove a single HAN device and leave the HAN Network Commissioned, use the **HAN: Delete Device** command under the **Manage Tab** on the **Endpoint Information Screen**.
- If the user wishes to remove ALL HAN devices but leave the HAN Network Commissioned, use the **HAN: Clear Devices** command under the **Manage Tab** on the **Endpoint Information Screen**.
- If a user wishes to remove a single or all HAN devices and decommission the Home Area Network, use the **HAN: Decommission Network** command under the **Manage Tab** on the **Endpoint Information Screen** and click **Send**.



NOTE: If a HAN Network has been decommissioned, when the HAN Network is re-commissioned it will setup new trust center encryption keys and will reassign a random Channel and HAN ID if not specifically assigned through the HAN: Commission Network command. It will be necessary to re-provision any HAN devices since this will be a new unique HAN Network.

Management and Troubleshooting

Meter Swap Out Process using Decommission HAN

For management and troubleshooting of the HAN Network and associated HAN devices, the following commands can be used: Commission Network, Get Network Info, Get Device Info, Get Firmware, and Ping.



NOTE: If a meter needs to be swapped out, the HAN must be decommissioned, or at very least, all the HAN devices must be removed. Removing these devices will allow them to be re-provisioned on the replacement meter.

Commission HAN Network for Channel Control

The **HAN: Commission Network** command is used to commission a HAN network with a specific Channel and HAN ID. This command can be used to troubleshoot scenarios in which there may be channel interference or spotty communication with a HAN device.



NOTE: A HAN Network will be automatically commissioned by provisioning a HAN device to a meter if no HAN network is present. The automatic process will randomly assign the Channel from a list of preferred channels as well as the HAN ID. See the section "Provisioning HAN Devices" for details on adding/provisioning a HAN device to a meter.

1. On the **Endpoint Information Window**, select the **Manage** tab. Select **HAN: Commission Network** from the **Issue Commands** drop-down menu. The user will need to select the **Channel** and **HAN ID**.

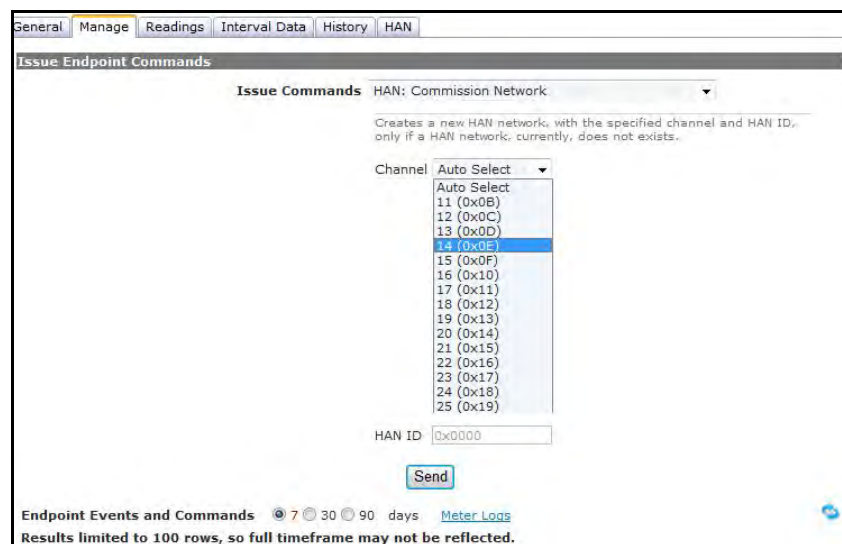


Figure 2 - 25. Commission HAN Network

2. For Channel, choose **Auto Select** which will randomly select a SEP preferred channel

...or...

3. Select a specific channel 11-25.

HAN ID field will display the selected **HAN ID**.

4. Click **Send**.

Meter LCD Screen for ZigBee Alerts



NOTE: After installation, the meter display will flash Z/B under the following conditions:

No network commissioned: The ZigBee module will request the time from the Gridstream radio every 30 seconds after power up and every 15 minutes once it has received the time from the radio.

HAN Network is commissioned: When HAN is present, regardless of any devices present, the ZigBee module will read the meter data every 30 seconds in anticipation of HAN devices needing that information.

Confirm HAN Radio in Meter is Communicating or HAN is set-up

To confirm the existence of a HAN Network or to gather details on the HAN Network, issue the **HAN: Get Network Info** command.

It will return the **Channel** and **HAN ID**.

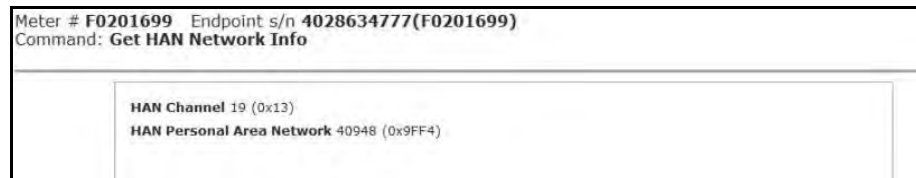


Figure 2 - 26. HAN Network Info

Get information for a specific device

To confirm device details issue the **HAN: Get Device Info** command. It will return the MAC Address, the Installation Code, and Device Type i.e: In Premise Display, Programmable Controllable Thermostat.

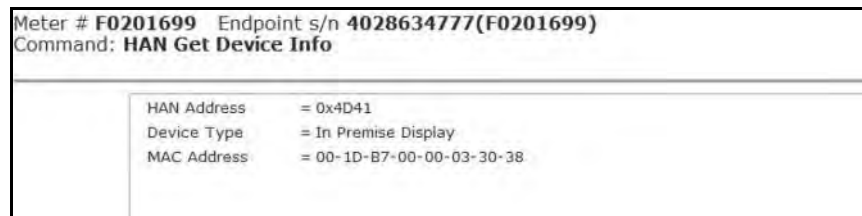


Figure 2 - 27. HAN Device Info

Get Firmware version for the HAN radio

To confirm which firmware the HAN module in the meter is using issue the **HAN: Get Firmware** command. This will return the ZigBee Firmware version number which will allow the user to figure out if the meter is running the proper ZigBee Firmware.



Figure 2 - 28. HAN Firmware Info

Confirm that a HAN device can communicate with the meter

To confirm if Command Center can communicate with a HAN device or whether a HAN device is still in communication with its meter, issue the **HAN: Ping** command. The Ping HAN Device Status will be returned notifying the user that the Ping Command was issued. To verify that the device was Pinged, check the history on the Manage Tab as the response from the device will be logged in the device history.

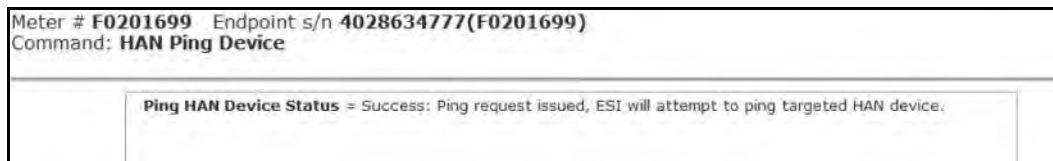


Figure 2 - 29. HAN Ping Device

3

Using Endpoint Testing Manager (ETM)

How To Use ETM

Endpoint Testing Manager (ETM) software provides the user with the ability to verify accurate module-to-meter, meter-to-module, module-to-network, and network-to-module communications. This chapter provides detailed instructions for navigating the software.

Access to Endpoint Test Manager

ETM users must be authenticated into Command Center prior to accessing the ETM application and communicating with devices in the network. The designated Security Administrator for the utility is responsible for configuring the connection to the Command Center server, and for providing log in credentials (including user names and passwords) for those who will require access to the software.

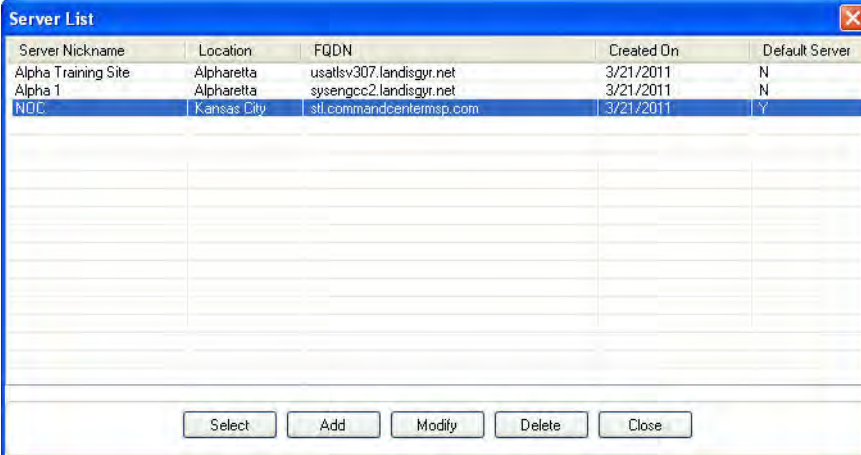
Setting Up Access to the Command Center Server

Before launching the ETM software, a link to the Command Center server must be created. Follow the steps below to create the link to the Command Center server.

- Launch ETM software. The ETM Sign in screen will open. On an initial launch of ETM, the ETM user must be authenticated with the Command Center server. The Command Center server connection places an authentication token on the user's computer. This token is valid for a time specified by the Command Center Administrator. On succeeding launches, the Server Name field may display *Offline*, and may display *Offline* during future logins. Users may login to ETM without Command Center server connection, as long as their authentication token is valid.

Figure 3 - 1. Endpoint Testing Manager - Sign In

- If this launch of ETM is not connected to a server, click the **Select a new server** link. The Server List will appear.



Server Nickname	Location	FQDN	Created On	Default Server
Alpha Training Site	Alpharetta	usatlsv307.landisgyr.net	3/21/2011	N
Alpha 1	Alpharetta	sysengcc2.landisgyr.net	3/21/2011	N
NDC	Kansas City	stl.commandcentermsp.com	3/21/2011	Y

Figure 3 - 2. Server List

- Click the name of the desired server in the Server column to highlight it.
- Click Select. The Server List window will close and the selected server will be displayed on the ETM log in screen.

Adding a New Server

Click **Add** on the Server List. The New Server window will open.

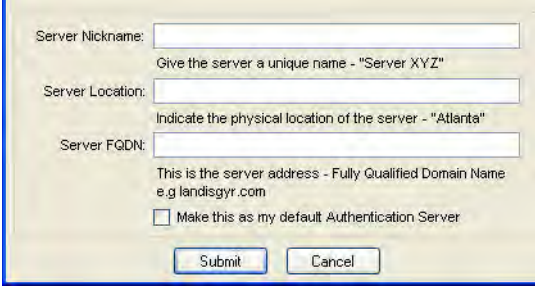


Figure 3 - 3. Endpoint Testing Manager - New Server

- **Server Nickname:** Enter a user-defined name for this server.
- **Server Location:** Enter the physical location of the server.
- **Server FQDN:** Enter the fully qualified domain name for the server. (see example in the New Server display).
- **Make this my default Authentication Server.** Enable this setting to connect to this server each time this instance of ETM starts.
- Click **Submit** to add the new server.

Selecting an alternate existing server

An ETM instance may have multiple servers associated to it. When ETM is first started, the server that has been selected by default will be displayed on the log in screen. The user may choose a different server, if necessary.

Following is the procedure for selecting an alternate server:

From the ETM log-in screen, select the **Select a new server** link. The Server List window will appear.

- Click the name of the desired server in the Server column.
- Click **Select**. The Server List window will close and if ETM can connect to that server, the selected server will be displayed on the ETM login screen.

Modify an existing server

If it is necessary to make modifications to an existing server, this task may be performed in the Server List window, shown previously in Figure 3 - 2.

From the ETM log-in screen, click the **Select a new server link**. In the Server List window, click the name of the server to be modified.

- Select the **Modify** button. The **New Server** window will open.
- Make desired changes.
- Click **Save** to apply changes.
- Click **Close** to close the Server List window and return to the ETM login screen.

Delete an existing server

If it is necessary to delete an existing server, this task may be performed in the Server List window.

In the Server List window, click the name of the server to be deleted.

- Select the Delete button. The selected server will be removed from the Server List.
- Click Close to close the Server List window and return to the ETM login screen.

Add additional servers

If it is necessary to add additional servers, this task may be performed in the Server List window.

In the Server List window, click the **Add** button. The New Server window will open.

- **Server Nickname:** Enter a user-defined name for this server.
- **Server Location:** Enter the physical location of the server.
- **Server FQDN:** Enter the fully qualified domain name for the server. (see example in the New Server display)
- **Make this my default Authentication Server.** Enable this setting to connect to this server each time this instance of ETM starts.
- Click **Submit** to add the new server.
- Click **Close** to close the Server List window and return to the ETM login screen.

After Login: Setup Cautions



NOTE: When ETM is first launched, view the **Connection** tab. Click the checkboxes for both **Display Scrolling Status** and **Enable Test Reports**, and then click **Save Settings**. Until changed, these settings will remain the default each time the ETM application opens.



CAUTION: Upon launch, ETM will attempt connection to the computer's first available serial port. If an Integrated WAN Radio (IWR) is not connected to that serial port, ETM will time out. After ETM times out, click the **Connection** tab to select the serial port connected to the IWR.

Certificate Attributes

The current status of the Mobile Admin Tool (MAT) Certificate can be viewed in the Security display.



Figure 3 - 4. Security Menu Options

From the menu options, select **Security > MAT Certificate Attributes**.

The **Token Attributes** displays the current status of the MAT Certificate received from Command Center.

Title	Value
Network ID	220
Token Sequence Number	1409052812
Lan Address Block	FE FB FF D0
Token Expiration Time Stamp	12-29-2010 06:38:02
Keep-Alive	900
User Priority	0
Signature Expiration Time Stamp	03-08-2011 17:18:02

MAT Certificate is valid for 34 Days 17 Hours 10 Minutes and 15 Seconds

Close

Figure 3 - 5. Token Attributes

- **NetWork ID.** The Network ID is the utility's unique Network Identifier. (For endpoints with v6.x firmware, this parameter cannot be changed in ETM)
- **Token Sequence Number.** The Certificate Sequence number uniquely identifies the certificate issued for the MAT session.
- **Lan Address Block.** The LAN Address Block displays the set of LAN Addresses that the MAT has been provided to use to communicate with endpoints. LAN Address block consists of 16 addresses, and are provided each time a certificate is requested from Command Center.
- **Token Expiration Time Stamp.** Indicates the date and time that the MAT certificate will expire. The default value is 1440 minutes (one day) and is established in Command Center Organization Information settings.

- **Keep Alive.** This value specifies the amount of time that a session between a MAT and an endpoint can be inactive before the endpoint closes the session. The default value is 15 minutes.
- **User Priority.** The user priority field allows a user of a higher or equal priority to preempt an existing MAT Certificate. Users with a lower priority cannot gain access if a higher priority is engaged with the endpoint device. This also provides a method for the system to lockout a rogue user if a problem is detected on the endpoint.
- **Signature Expiration Time Stamp.** This indicates the signature expiration for the MAT Certificate. It is set to three times the MAT Certificate expiration interval by default. This allows the MAT user to attempt to access an endpoint using the certificate and get a response back from the MAT rather than no response for a reasonable period of time before the certificate expires. A signed certificate is only required when endpoints are in ECC mode.

Request MAT Certificate

In the event that a MAT Certificate is reaching its expiration time, a new MAT Certificate may be requested from Command Center by selecting the MAT Certificate option from the Security sub-menu.

From the Menu options, select **Security > Request MAT Certificate**. The Log-in window will open.

Figure 3 - 6. ETM Login screen

- **User Name:** Enter utility-provided user name.
- **Password:** Enter utility-provided password.
- **Server Name:** The Server name field will display the server to which ETM will connect by default.
- Click **OK**. If the user is successfully authenticated by Command Center, and the user has the proper privileges (Access and Certificate Authorization), Command Center will issue a MAT Certificate consistent with the level of security that the utility is using.



NOTE: If a user's session is nearing expiration, the user may also log out of ETM and log back in to get a new Certificate. If the ETM either has no Certificate, or the current MAT Certificate expiration is less than 50% of the original time interval, the MAT requests a new MAT Certificate.

ETM Sign In

The ETM user and the ETM tool must 1) be known to and 2) authenticated by Command Center. The user must have been provided privileges and user credentials in order to access the ETM software. If the user has not been provided with credentials, the user must contact the utility-designated Security Administrator.

The process of authenticating with Command Center provides the user with a **Mobile Admin Tool (MAT) Certificate**. The MAT Certificate confirms and certifies ETM's identity to the endpoints.



CAUTION: ETM login has two modes: one with and one without server access (off-line). In off-line environments, ETM users must go on-line and successfully authenticate themselves to Command Center once every seven days.

Below is the procedure for logging into ETM:

Launch ETM. The **Login to ETM** screen will open.

Figure 3 - 7. Endpoint Test Manager - Sign In

- **User Name:** Enter utility provided your User Name.
- **Password:** Enter utility provided password
- **Server Name:** The Server name field will display the server to which ETM will connect by default. If needed, click the Select a new server link to connect to a different server, as described above.
- Click **OK**. If the user is properly authenticated by Command Center and the user has the proper privileges (Access and Certificate Authorization), Command Center will issue a MAT Certificate consistent with the level of security the utility is using.

If the user name and/or password is not authenticated, a warning dialog box will appear. The user may attempt to log in a total of five times with incorrect credentials before being locked out of the system. The Security Administrator will need to clear the locked out status via Command Center.

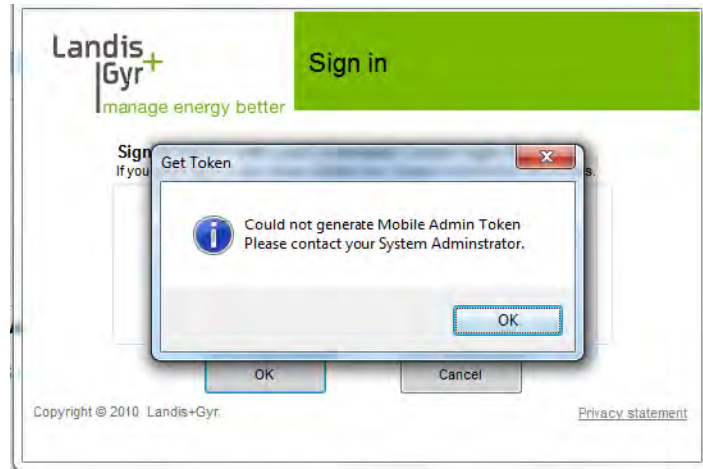


Figure 3 - 8. Login Validation

Even though the user may have certificate privileges, this message indicates that certificate server is not properly set up. (Possible reasons include: the server might be down or the signing utility might not be set up). If the user clicks **OK**, ETM will launch and they will be able to communicate to meters that are not in ECC mode.

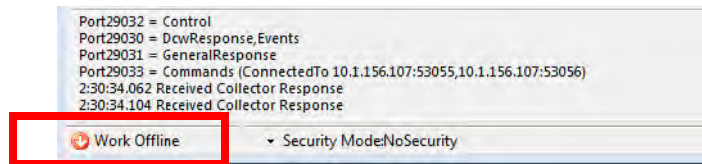


Figure 3 - 9. Login Validation

The authentication process provides the user with the required MAT Certificate. The length of time that the MAT certificate is valid is configured by the utility in the Organization Information settings, with the default being 1440 minutes.



CAUTION: If a MAT Certificate is nearing expiration, the user may log out of ETM and log back in to get a new Certificate. If the ETM instance either has no Certificate, or the current MAT Certificate expiration is less than 50% of the original time interval, the MAT requests a new MAT Certificate.

Using the Bar-code Scanner

Please read the following information before using the barcode scanner to scan meter information.



WARNING: The bar-code scanner contains a laser light. Do not stare directly into the beam.



NOTE: Ensure that the bar-code scanner beam covers the length of the bar-code.

The figure below illustrates the proper method for scanning a bar-code.

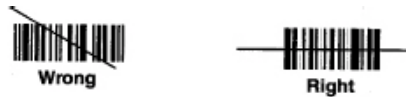


Figure 3 - 10. Using the Bar-code Scanner

Navigating the Software

ETM is an easy-to-use software application that allows you to perform specific configuration, verification, and testing procedures. The application is comprised of an upper menu bar, the tabs listed below, and a Security Status line at the bottom of the display that describes the server connection and displays the connected endpoint's security status.

- Connection
- Head End Radio
- Device Test
- Firmware Download
- Module
- Reporting
- Command Scheduler
- HAN (ONLY appears when a compatible endpoint is connected)
- Universal Event Log
- Service Limiting (ONLY appears when a compatible endpoint is connected)
- Groups
- RF Gas/Water (ONLY appears when the appropriate key is added to the Settings.XML file)
- Collector (ONLY appears when ETM is connected to a Collector)

Use the upper menu bar for exiting ETM, **File > Exit**, or to display or request Security details (as specified in the following section).

Table 3 - 1. Upper Menu Bar Security Details

Field	Description
MAT Certificate Attributes	Displays details about the Mobile Admin Tool certificate received from Command Center.
Request MAT Certificate	Sends a request to Command Center for a Mobile Admin Tool Certificate. Login permissions will vary access to this feature.

ETM can also be configured to display an Activity Log at the bottom of each screen that allows the user to view communication activities between the tool and the endpoint.

Configuring a New Gridstream IWR Radio

These parameters can be set via the **Head End Radio** tab. To configure a new Gridstream IWR radio:

1. Connect the IWR to the PC

2. Select the **Head End Radio** tab
3. Click the **Modify** button
4. Change the radio's Network ID to match the utility-specified Network ID (*for endpoints with firmware version v6.x and higher, this parameter is managed by Command Center and cannot be changed by ETM*)
5. Disable the router bit
6. Disable the timekeeper bit
7. Enable the head-end bit
8. Enable the operational bit
9. Set the baud rate to 38400
10. Enter the Latitude and Longitude in the **LPP Address** field
11. Click **Apply** to save changes.



NOTE: If only the CRC and baud rate are to be changed, a new Gridstream IWR can be configured using ETM's Head-end management. Command Center is used to manage the CRC for endpoints with firmware v6.x and higher.

Meter Shop Best Practices Use Case - Proper IWR Configuration

This procedure describes proper configuration for IWR radios being used by any technician where the radio is on a production network.

Do not:

- Set up your IWR as a router. This will only slow down process actions as the IWR will be busy routing packets unnecessarily. On a production network this will interfere with the local mesh when the radio is turned off.
- Set up your IWR as a head-end. This will cause significant problems with the production mesh network.
- Set up your IWR set as a timekeeper. This is will pass the time of your computer to other network devices.

Using RadioShop, confirm the following settings.



NOTE: For information on RadioShop see RadioShop® Getting Started Guide, Landis+Gyr publication 98-1054.

- Control Byte 1 - 69 is correct for a mobile IWR. The best way to change Control byte 1 is by setting WAN address under configure. As you change from a Mobile IWR to Fixed IWR CB1 changes from 69 > 49.
- Control byte 2 should be HEX 48.
- Control byte 3 should be HEX 50.



CAUTION: Control byte 3 is important. It prevents your radio from advertising a path to the Collector and from trying to register with Command Center every time it is powered on or reset.

- Control byte 4 should be HEX 69.
- Control Byte 4 with RF Filter enabled and wide mode enabled should be HEX 29.
- Control Byte 4 with RF Filter disabled and wide mode enabled should be HEX 28.
- Max LAN Nodes could be set to 28 or 86 depending on your environment. If you are on a deployed Normal meter network, 28 would be the best setting. If you are working in a LARGE meter shop environment handling meter returns, sample testing, and First Article Testing Max LAN Nodes value 56 (hex 86) would be best.



NOTE: Series IV radios appear in Command Center by default.

Authentication Server Connection

If the current instance of ETM is not connected to the Authentication Server, ETM will display **Work Offline** in the status bar.

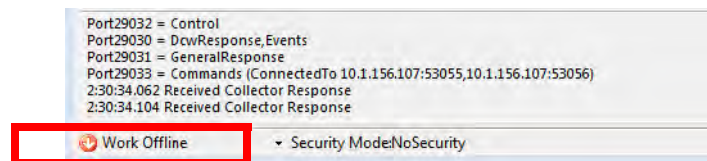


Figure 3 - 11. Login Validation

Connecting to a Collector

On the **Connection** tab, click the **Collector Settings** button to add a Collector. The **Collector List** dialog box will appear.

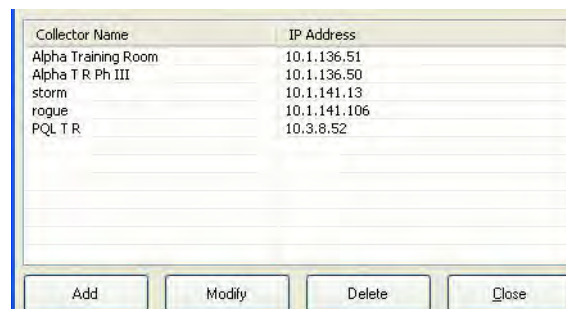


Figure 3 - 12. Collector List Dialog

1. When adding a Collector to the Collector List, click the **Add** button. The **Collector** dialog will appear.

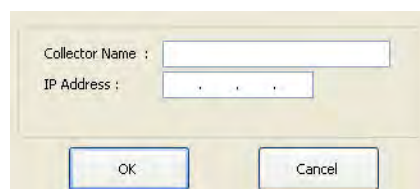


Figure 3 - 13. Collector Dialog

2. Type a unique name into the **Collector Name** field.

3. Type the Collector IP address into the IP Address field with the numbers between the periods.
4. Click the **OK** button to add the Collector.

The added Collector will appear in the **Host:** drop down box, located on the Connection tab.

5. To connect to the Collector, click **Use Collector** from the drop-down box.
6. In the **Host:** drop down box, highlight the name of the Collector you would like to connect to.
7. Click **Connect**.

When the connection is successful, the **Collector** tab will appear in the tab group, ETM will navigate to the **Device Test** tab, and your radio will be set to field mode.

Use the **Disconnect** button on the **Connection** tab to break communications with the Collector and return to standard head-end radio communications using the COM port.

Connection Tab

The **Connection** tab allows the user to view and change the connection information for the radio or Collector connected to the meter being tested. The table below describes the fields on the **Connection** tab.

Table 3 - 2. Connection Tab

Field	Description
Connection Settings	
<connected to a radio> <Connect/Disconnect> - Use COM1 - at <baud rate> drop-down arrow	This button allows the user to Connect or Disconnect, contains a drop down menu that allow the user to choose a COM port or Collector to interface with your radio, and contains another drop down menu (Figure 3 - 14.) to select connection speed for the COM port. The available baud rates are: 9,600 19,200 38,400 (default) 115,200 (for Series IV IWRs) RadioShop can identify the COM port and baud rate of the radio you are using.
<connected to a Collector> <Connect/Disconnect> - Use Collector drop-down arrow - choose Host drop-down arrow	This button provides for Connect or Disconnect, selecting the Collector to connect with, and uses a drop-down menu to list collectors available to host the connected module. When ETM is connected to a Collector, a tab labeled "Collector" appears.
Host	Allows testing meters in the field by displaying available collectors in the drop down box.
Collector Settings <button>	Allows the user to point Endpoint Testing Manager to a specific Collector using the IP address for the desired Collector.
Application Settings	
Display Scrolling Status check-box	Allows the user to choose the amount of detail displayed in the Activity Log at the bottom of each screen.
Enable Test Reports check-box	Determines whether test results are saved to the Test Reports file on your PC.

Table 3 - 2. Connection Tab

Field	Description
Enable Field Mode check-box	Checking this box will allow the user to change the mode of the meter being tested. Unchecking this box allows the user to ensure that meters are not accidentally put into field mode during a meter test and will hide the buttons on the Device Test tab.
AMR Password (Utility) drop down box	This drop down box determines which AMR password is set when the test is run and the DCW is sent to the meter. Clicking the Setup AMR Passwords button allows the user to manage the AMR passwords that are available in this drop down box.
Polling Interval (Secs) drop down box	Determines how often ETM polls the meter for data. Available intervals are: 5 seconds (default) 10 seconds 15 seconds 20 seconds 25 seconds 30 seconds This parameter is also used (and multiplied according to command choice) for meter response time-out settings, except for WECO actions.
Log Trace Level drop down box	Enables the user to specify the level of information that is logged. The choices are: Off: no logging Error: only logs critical exceptions Warning: logs all exceptions Info: logs all messages on a high level Verbose: logs all activity (default)
Current Encryption Key drop down box	Lists available Encryption Key choices.
Timeout Period (Sec) drop down box	Configures the timeout setting parameter for the WECO library.
Import Security Key <button>	Allows the user to import an encryption security key from RadioShop and tell ETM what encryption key is used to encrypt/decrypt the meters tested.
Setup AMR Passwords <button>	If the meter tested supports AMR passwords, the utility can use this feature to give the Gridstream module the same AMR password as the meter so the two can communicate.
Save Settings <button>	This button activates saving connection settings so that next time ETM is launched, the saved settings are restored.
Activity Log	
Insert Comment <button>	Allows a user to insert comments into the Activity Log. These comments will also post to the Log file.

Baud Rate Selection

The **Baud Rate** drop-down menu sets connection communications speed.



Figure 3 - 14. Connection Baud Rate Option Select Drop-down Menu

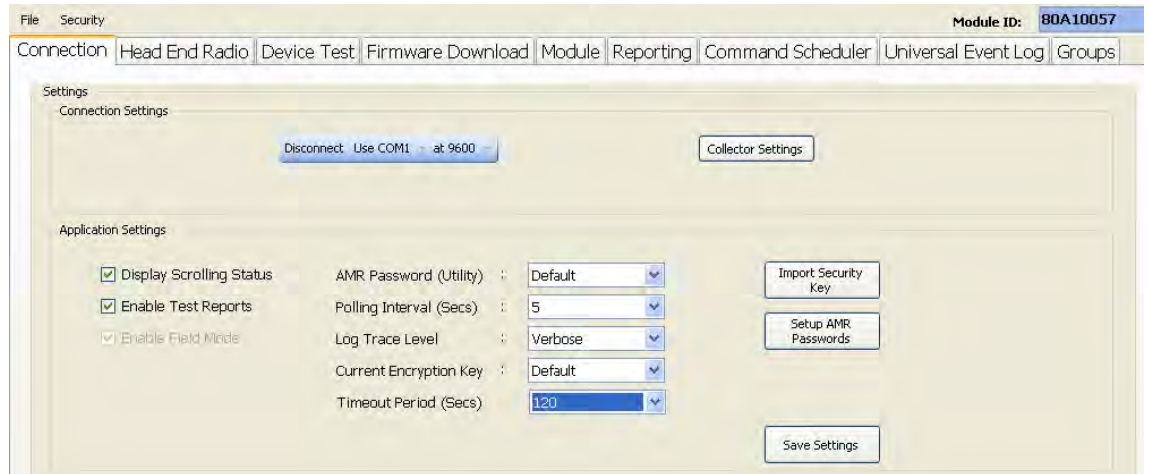


Figure 3 - 15. Connection Tab Connected to a Radio

Connecting to an Endpoint

The user can connect to an endpoint either through the computer’s COM port or through a Collector. The Collector Settings button is separate from the endpoint selection process, and enables operator entry of Collector endpoint connection parameters by using the dialog buttons to fill in or edit table information.

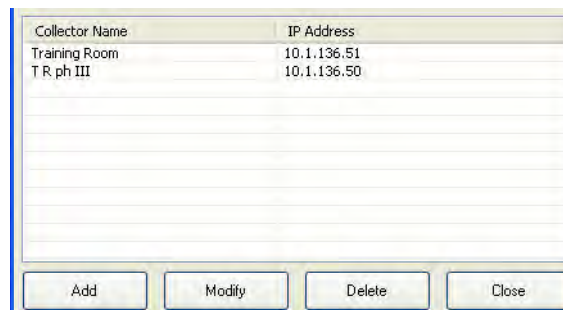


Figure 3 - 16. Connection Tab Collector Settings dialog

When connecting to any endpoint, the user clicks the Use... drop-down and selects either Collector or the computer’s COM port.

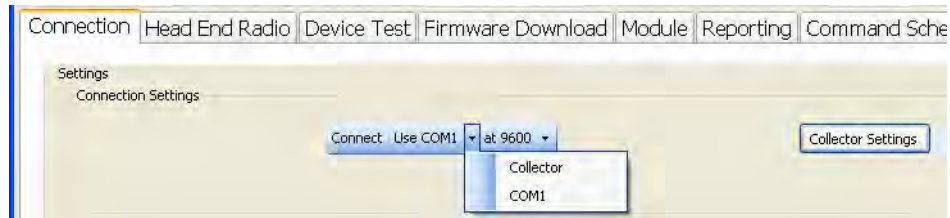


Figure 3 - 17. Connection Selection drop-down

After Collector has been selected, the endpoint drop-down populates with the previous connected endpoint's identifier. To select a different Collector, click the drop-down arrow.

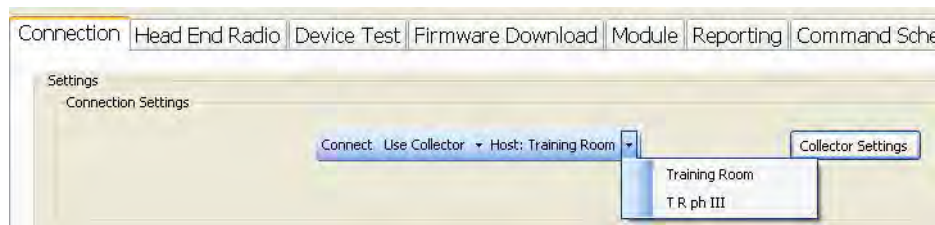


Figure 3 - 18. Choosing a Collector

Head End Radio Tab

The **Head End Radio** tab displays information about the head end radio currently in use. The Head End Radio tab can also be used to configure Head End radio settings..

Table 3 - 3. Head End Radio Tab

Field	Description
Collector / Integrated WAN Radio	
Radio:	Displays radio type.
Encryption:	Displays whether encryption is enabled or disabled.
Head-end	Can be Enabled or Disabled.
Firmware Version:	Firmware version for the head-end radio being tested.
Routing:	Displays whether routing is enabled or disabled.
Operational:	Displays Operational Bit status as enabled or disabled.
LPP Address:	WAN and LAN address for the radio used in the test. After Modify is clicked, clicking in this field opens the Configure WAN Address dialog (Figure 3 - 20) and permits the user to specify radio WAN Address parameters. If the radio is a mobile unit, Routing, Time Keeper, and Collector Bit values cannot be changed.
Network ID:	Network ID for the radio being tested.
Baud Rate:	Displays the baud rate of the communications channel.
Type:	Displays whether Endpoint Testing Manager is connected to a Serial Radio or a Collector.
Time Keeper:	Enables or disables setting the radio as the timekeeper for the network

Table 3 - 3. Head End Radio Tab

Field	Description
Reboot <button>	Clicking this button restarts the radio's main board.
Modify <button>	According to radio type, clicking this button allows the user to edit radio parameters.
<Connection Status>	Displays the connection status. The different statuses are: Connection Successful Not Supported Meter Device Failed Connection
Commands	
Get WAN Nodes List <button>	Queries the radio for a list of neighbors and displays these statistics in a dialog box.
Clear WAN Nodes List <button>	Deletes all entries from the current WAN Nodes List so that the radio can refresh the roster of neighbor radios.
Test Device <button>	Allows users to test the head-end radio (whether it's a serial head-end or Collector head-end radio), after connecting to the head-end using the Connection tab. This button will test the link to the connected head-end. After the connection is confirmed, the user can perform other tasks with it i.e. FW/DCW downloads.
Birth Chirp Information (only available if head-end radio is in field mode)	
Listen for Birth Chirp for <secs> <button>	Allows you to power up a meter and test to see if your head end radio can communicate with the meter. If so, the Network ID and mode will be displayed to ensure accurate testing. Use this button to discover a meter's CRC and operational mode.
Activity Log	
Insert Comment <button>	Allows a user to insert comments into the Activity Log. These time-stamped comments will also list in the Log file.
Status Bar	
Connected to...	Identifies Authentication Server connection and Security Mode.
MAT Certificate Countdown	Displays a time-remaining countdown for the current MAT Certificate.



Figure 3 - 19. Head End Radio Tab

Clicking the **Modify** button activates access to many configuration settings and options on this tab. Entering changes and clicking **Apply** will provision the radio's configuration settings with the entered changes. The radio may also be **Rebooted** after the **Modify** button has been clicked. Clicking the **Cancel** button closes access to these settings without making any changes.

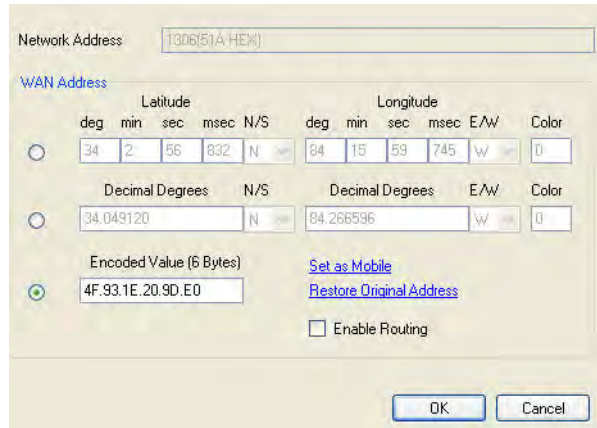


Figure 3 - 20. Configure WAN Address Dialog

Clicking the Get WAN Nodes List button opens a window that lists neighboring endpoints and various parameters of those endpoints.

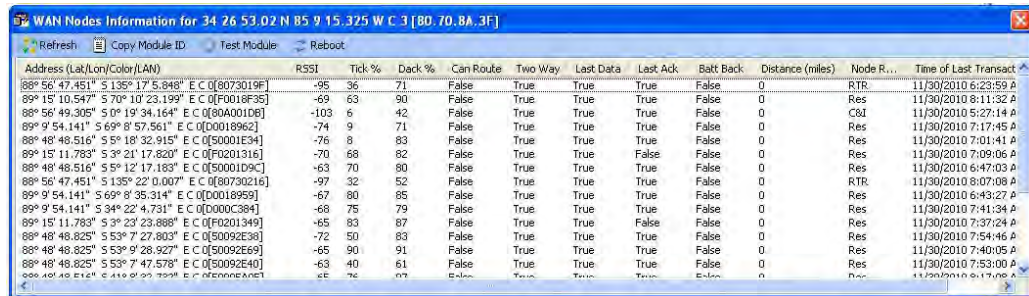


Figure 3 - 21. Get WAN Nodes List

Right-clicking on any radio listed in the WAN Nodes Information table offers the choice of Copy Module ID To Clipboard (for continuing multiple reference), Test This Module (for immediate Device Test launch of that specific radio), or Reboot.

Device Test Tab

The **Device Test** tab provides options for running a test on a meter. The table below describes the fields located in the Device Test tab. Note that many of these fields are not populated until after a test on a meter has successfully concluded.

Table 3 - 4. Device Test tab

Field	Description
Identifiers	
Scan Module ID	Scan or manually enter the module ID of the meter that is to be tested.
Scan Serial Number	Scan or manually enter the serial number of the meter to be tested.

Table 3 - 4. Device Test tab(Continued)


Field	Description
Scan Meter ID	Scan or manually enter the meter ID of the meter to be tested.
“Find device” <> 	Opens the Find device dialog for entering the Network Address and used to locate a device that is a neighbor of the head-end. This function looks at the neighboring devices of the head-end radio to see if there is one device that has the same WAN address. If found, the function pulls the module ID of that device and displays it in the Scan Module ID box.
Start Test <button>	Click this button to begin a meter test.
Reset Test <button>	Clicking this button resets the input fields.
Module Test Results <i>(these fields will only be populated after the tested endpoint has passed the test and communicated parameters to ETM)</i>	
Endpoint	Type of meter that is currently under test.
Firmware Version	Module, HAN, and meter firmware versions for the endpoint that has been successfully tested.
LPP Address	The WAN and LAN address for the module of the meter tested.
Encryption	Displays module encryption status as either enabled or disabled.
Routing	Displays whether module routing is enabled or disabled.
Network ID	Network ID for the connected module in both decimal and hexadecimal formats.
Take Out Point	Address for the Take Out Point associated with the tested module.
Mode Settings <Current Mode>	Displays the current mode of the module. Will be displayed as either Shop, Field, or Installation . Shop Mode is a special test mode, used while in manufacturing and diagnostic troubleshooting, that is turned off at the end of the manufacturing line. <i>(not available for Concentrators)</i> Field Mode is for working with installed modules, and sets the module to listen on the Network ID displayed on the Head End radio tab. Installation Mode is a temporary state that initiates the first network synchronization, and the auto registration process.
Meter	
Meter Serial Number	Serial number for the meter tested.
Meter ID	Meter ID for the meter tested.
Disconnect Switch <i>(only visible when the tested meter has an integrated switch)</i>	
Status	Displays the status of the disconnect switch.
Switch	Displays the switch state: either Connected or Disconnected.
Armed Status	Displays the armed state. May also display N/A, according to meter and firmware version.
Utility Voltage	Voltage that the utility is providing to the meter.
Customer Voltage	If service is connected, will be the same as the Utility Voltage. If disconnected, will be near zero.

Table 3 - 4. Device Test tab(Continued)

Field	Description
Mode Settings	
Current Mode	Current mode of the IWR connected to the meter under test. The user may change the mode as needed. <i>(If you are connected through a Collector, your IWR is always in Field Mode.)</i>
Go to <Mode> <button>	Sets the radio to Shop Mode or Field Mode
Set Endpoint to <Mode> <buttons>	Sets the endpoint to either Shop Mode, Field Mode, or Installation Mode (if Firmware version is 421 or above), depending on the current state. <i>With v6.x firmware, Set to Installation is the only enabled mode. Setting an endpoint to Shop mode is only enabled by a key provided by Landis+Gyr.</i>
Endpoint Settings	
Set AMR Password <button>	This button allows you to set the AMR password for endpoints being tested.
Configure Encryption <button>	This button opens a dialog used to enable or disable encryption on the meter tested.
Disable Routing <button>	This button disables routing through the meter being tested.
Service Connect/Disconnect <i>(only visible when the tested meter has an integrated switch)</i>	
Connect <button>	Closes the switch (energizes).
Arm <button>	Prepares the switch to be closed.
Disconnect <button>	Opens the switch (deenergizes).
Get Status <button>	Populates the Disconnect Switch section.
Activity Log	
Insert Comment <button>	Allows a user to insert comments into the Activity Log. These time-stamped comments will also appear in the Log file.

Table 3 - 5. "Find Device" Dialog Parameter Details

Field	Description
Network Address	The ID number, in decimal and hex formats, of the network that the radio under test is currently connected to.
WAN Address	
Latitude	The latitude of the radio, expressed in: deg – Degrees min – Minutes sec – Seconds msec – Milliseconds N/S – North or South
Longitude	The longitude of the radio, expressed in: deg – Degrees min – Minutes sec – Seconds msec – Milliseconds N/S – North or South
Color	The parameter that differentiates multiple radios installed at one location (that is, sharing one WAN address).
Decimal Degrees	The WAN address of the radio, expressed in decimal degrees.
Encoded Value (six bytes)	The same WAN address as that specified by the Latitude, Longitude, and Color values.

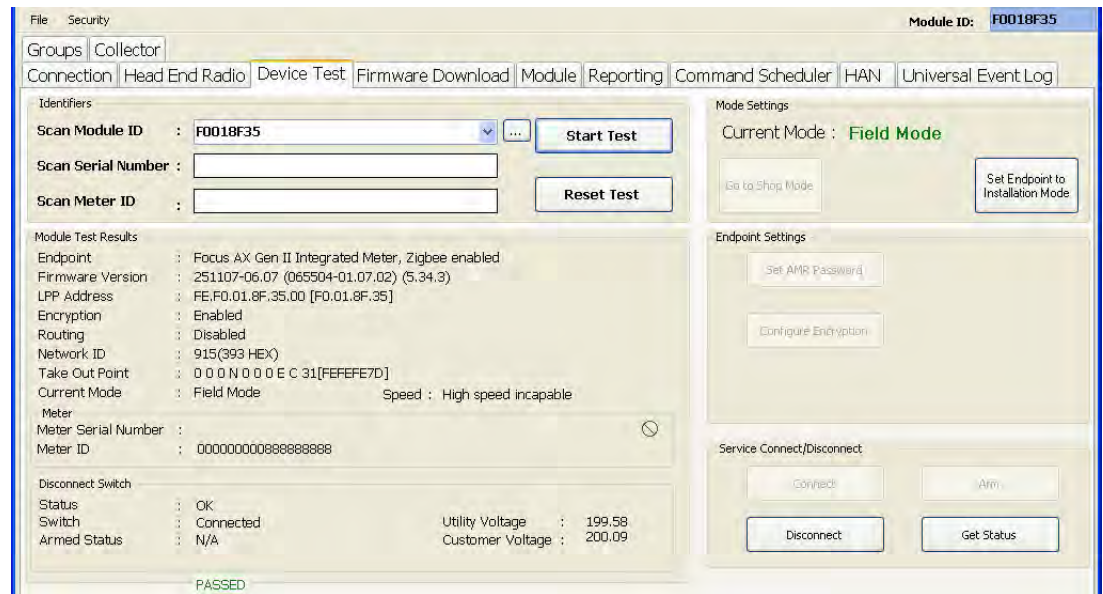


Figure 3 - 22. Device Test Tab with Endpoint and Service Settings active

High Speed (115200 bps) Enable

High Speed operation (also referred to as **Wide Channel Mode**) refers to configuring communications for 115200 bits-per-second data transmission.

For high speed-capable endpoints an indication will appear on ETM's Device Test tab when the endpoint is connected, as seen in the following figure. Endpoints that do not support high speed functionality will display **High speed incapable** in the Speed: call out. The user has the option to enable high speed operation in a compatible endpoint by clicking the Enable High Speed button in the Endpoint Settings section of the Device Test tab.

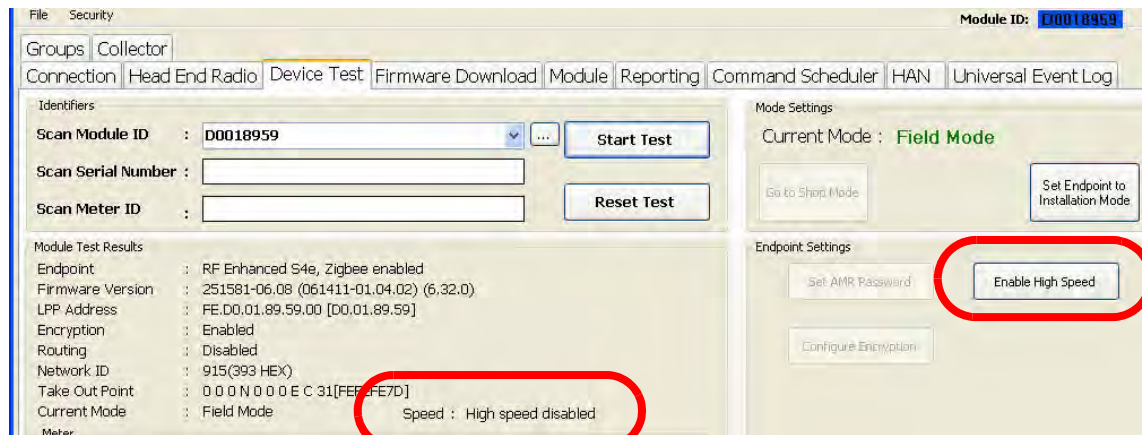


Figure 3 - 23. High Speed Status

After High Speed is enabled, the Speed: call out will display **High speed enabled** and the Enable High Speed button label will change to “Disable High Speed.” Clicking the Disable High Speed button will reset the endpoint to function in standard (“Narrow Channel”) mode.



NOTE: If an endpoint is put into high speed (or “wide channel”) mode, then any other radios that are running firmware earlier than v5.56 will not be able to communicate with the high speed endpoint directly. Endpoints that function in standard (“narrow channel”) mode can only communicate with radios operating in high speed mode as long as the standard mode radios are running firmware v5.56 or higher.

Multiple Meter Test Mode

Once enabled, the Multiple Meter Test Mode supports a single ETM instance testing a large number of meters in one session.

Enabling Multiple Meter Test Mode

To enable Multiple Meter Test Mode, you must use Windows Notepad (or your preferred text editor) to add a special key (provided by your Landis+Gyr Program Advisor) to the Settings.XML file located at:

- C:\ProgramData\Landis+Gyr\Gridstream\Tool Settings\Settings.XML on Vista or Win7 systems.
- C:\Documents and Settings\All Users\Application Data\Landis+Gyr\Gridstream\Tool Settings\Settings.XML on WinXP systems.



NOTE: The Landis+Gyr program advisor can provide the key required to activate the Multiple Meter Test Mode feature.

```
<boolean>false</boolean>
<boolean>false</boolean>
<boolean>false</boolean>
<boolean>false</boolean>
<boolean>false</boolean>
<boolean>false</boolean>
<boolean>false</boolean>
</ManufacturingTables>
<EnableFieldUsage>false</EnableFieldUsage>
<PasswordIndex>Default</PasswordIndex>
<TimeoutInSecs>120</TimeoutInSecs>
<LocalRadioTimeoutInSecs>30</LocalRadioTimeoutInSecs>
<UseBirthChirp>Y</UseBirthChirp>
<AMRTimeout>120</AMRTimeout>
<ExportFilePath>C:\Cellnet\2-Way Testing Manager\Export Files</ExportFilePath>
<UseSingleChannel>true</UseSingleChannel>
<DCWPath>./PrivateDCWs</DCWPath>
<TraceLevelSetting>Error</TraceLevelSetting>
<KeyFilename>.\MasterEncryptionKey.xml</KeyFilename>
<Password>XXXXXXXX</Password>
<UseDefaultMobileDeviceAddress>false</UseDefaultMobileDeviceAddress>
<BirthChirpSleepSecs>45</BirthChirpSleepSecs>
<IsTOP>false</IsTOP>
<LogFileSizeLimit>1000</LogFileSizeLimit>
<KeyName>Default</KeyName>
<UseComputedSingleChannel>true</UseComputedSingleChannel>
<UseStaticSingleChannel>true</UseStaticSingleChannel>
<DemandResetKey>XXXXXXXX-XXXX-XXXX-XXXX-XXXXXXXXXXXX</DemandResetKey>
<MultipleMeterTestModeKey>XXXXXXXX-XXXX-XXXX-XXXX-XXXXXXXXXXXX</MultipleMeterTestModeKey>
<BEPKey>XXXX</BEPKey>
</Settings>
```

Figure 3 - 24. Settings.XML File Detail

Editing Multiple Meter Test Configuration



Figure 3 - 25. Accessing Multiple Meter Test Configuration

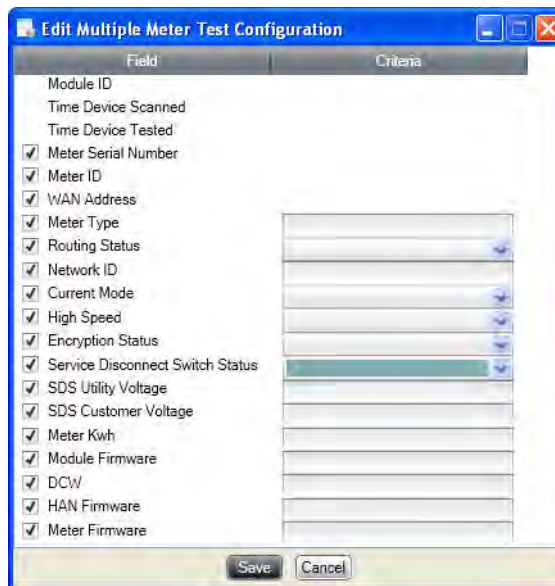
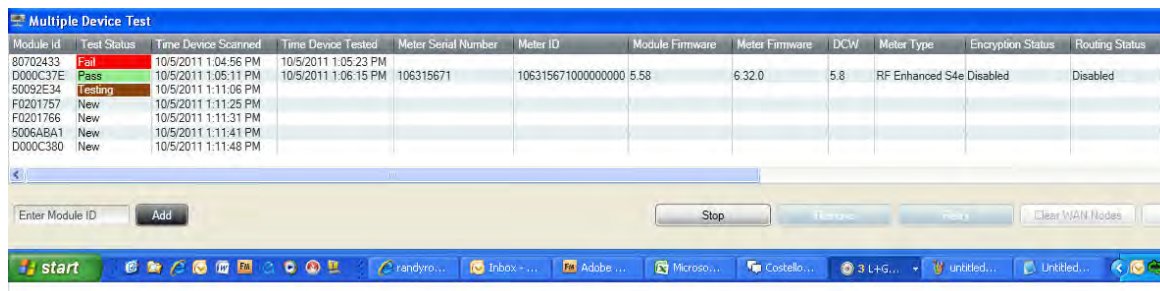


Figure 3 - 26. Edit Multiple Meter Test Configuration Dialog

The **Edit Multiple Meter Mode Test Configuration** dialog allows users to select the fields that will appear on the **Multiple Device Test Results** screen. The Edit Multiple Meter Mode Test Configuration dialog also supports data filtering by allowing users to specify values to test against for a selected field.

For example, if the user wants testing to confirm that the module firmware version is 07.06, this parameter can be specified in the **Module Firmware** field of the Edit Multiple Meter Mode Test Configuration dialog. When the test is run, ETM will read the module firmware version from the meter and compare it with the user-specified value. If these values do not match, an error will display.

Clicking **File | Multiple Meter Mode | Run Test** will open the **Multiple Device Test Results** screen. Meters to be tested are entered using the **Add** button at the lower left of that screen.



Module ID	Test Status	Time Device Scanned	Time Device Tested	Meter Serial Number	Meter ID	Module Firmware	Meter Firmware	DCW	Meter Type	Encryption Status	Routing Status
80702433	Fail	10/5/2011 1:04:56 PM	10/5/2011 1:05:23 PM								
D000C37E	Pass	10/5/2011 1:05:11 PM	10/5/2011 1:06:15 PM	106315671	106315671000000000	5.58	6.32.0	5.8	RF Enhanced S4e	Disabled	Disabled
50092E34	Testing	10/5/2011 1:11:06 PM									
F0201757	New	10/5/2011 1:11:25 PM									
F0201766	New	10/5/2011 1:11:31 PM									
5006ABA1	New	10/5/2011 1:11:41 PM									
D000C380	New	10/5/2011 1:11:48 PM									

Figure 3 - 27. Multiple Device Test Results Screen

When the Multiple Device Test screen opens, ETM waits for a device ID to be entered so that it can begin testing. Testing can be halted by clicking the Stop button. After a Module ID is added, testing begins on the first device in the list, continuing through the entire list.

Devices that pass testing will populate the columns with data selected on the Edit Multiple Meter Test Configuration dialog. Modules that fail testing will display Fail in a red-highlighted cell in the Test Status column. If the user hovers their cursor over the Fail indication, the reason for the failure will appear.

The user can Retry testing on the selected module by clicking that button. Pressing the Ctrl+A keys selects all modules in the list.

When testing is not active, the user can use the buttons at lower right to Clear WAN Nodes in the test, and Close the Multiple Device Test screen.

After testing concludes, a log file is created and placed under the Multiple Meter Testing folder in the ETM installation directory.

Firmware Download Tab

The **Firmware Download** tab allows you to view the current firmware on the module and download a new firmware.

For Modular Focus AX meters running 5.13 module firmware and above, ETM now supports metrology firmware download over the air. This action functions in a manner similar to Module/HAN firmware download.

For Integrated Focus AX meters, only the **Module Firmware** option appears. The metrology firmware upgrade occurs automatically within the build.

The table below describes the fields on the Firmware Download tab.

Table 3 - 6. Firmware Download Tab

Field	Description
Download Status	
Firmware Download Progress	Displays the percentage status of a firmware download after the Start Download button is clicked.
Module: Version <Firmware Version Number>	
Upgrade To: Drop Down Box	Displays the module firmware upgrade versions that are available to and supported by the endpoint tested. The current firmware version is displayed in the title of the field. For example, Module: Version 251581-06.08
Download Delay Rate (In Secs) Drop Down Box	Specifies the delay (in seconds) between sending firmware packets. For large files, you can break up the firmware information that is sent between the radio and the module and ensure that network bandwidth is not overwhelmed.
Start Download <button>	Clicking this button will begin downloading the firmware version specified in the Upgrade To: drop down box to the module.
Meter: Version <Firmware Version Number>	
Upgrade To: Drop Down Box	Displays the meter upgrade firmware versions that are supported by the endpoint tested, and a list of the minimum and maximum meter firmware versions that the connected meter must be running in order to download the metrology firmware. The current firmware version is displayed in the title of the field. For example, Meter: Version 5.34.3
Download Delay Rate (In Secs) Drop Down Box	Specifies the delay (in seconds) between sending firmware packets as described in Module <F/W Version #> above.
Start Download <button>	Clicking this button will begin downloading the firmware version specified in the Upgrade To: drop down box.
ZigBee: Version <Version Number> (displays when connected to a ZigBee-capable meter)	
Upgrade To: Drop Down Box	Displays the module ZigBee versions that are supported by the endpoint tested. The current version is displayed in the title of the field. For example, ZigBee: Version 061411-01.04.02
Activity Log	
Insert Comment <button>	Allows a user to insert comments into the Activity Log. These time-stamped comments will also post to the Log file.



NOTE: Field visibility on the Firmware Download tab will vary according to current module firmware version. There may be limits on firmware administration access with endpoints running module firmware previous to v6.x.

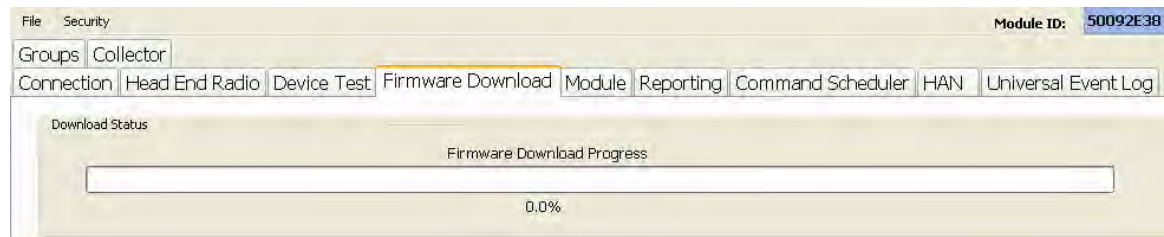


Figure 3 - 28. Firmware Download Tab Connected to an Endpoint with v6.x Firmware

Battery End Point Firmware Download

No meter specifics will be displayed on this tab when ETM is connected to a battery end point. Module version will be displayed, and firmware unique to the connected (battery end point) module will be found on the drop-down menu.

Select the firmware for download by highlighting and click the Start Download button to launch the event.

Module Tab



NOTE: Due to the differences in meter setup with integrated Focus AX meters, only the **Module Firmware** option appears on the **Module** tab when ETM connects to an integrated Focus AX meter. Metrology firmware upgrades occur automatically within the build; other fields on this screen are not necessary for endpoint configuration.

The **Module** tab is comprised of the DCW Information, Timing, Current Time, Set Time, and Command fields. The fields on this tab are only enabled if a meter has been run with a status of Passed.

The table below describes the fields on the Module tab.

Table 3 - 7. Module Tab

Field	Description
DCW Information	
Get DCW Information <button>	Provides the most current DCW information of the endpoint tested.
Install DCW <button>	Allows you to load a DCW on the endpoint tested. The DCW available for download will be limited to the latest specified DCW for the firmware version on the meter.
Timing	
Module Time (GMT)	Displays the current module time.
Meter Time (GMT)	Displays the current meter time.
Get Time Delta <button>	Generates a report that displays the difference between the module time and the meter time. Closing the report enables the Sync Meter and Module button

Table 3 - 7. Module Tab(Continued)

Field	Description
Set Time	
Sync Meter and Module Time <button>	On connected meters with applicable firmware, this button is enabled after the Get Time Delta button is clicked and the resulting report is closed. Once enabled, clicking this button synchronizes meter time with module time. After Meter and Module Time are synchronized, "Time Sync Completed" will display in the Set Time box.
Command	
Optical Lockout	When connected to compatible meters with applicable firmware, allows the user/tester to configure the meter's Optical Lockout parameter. This setting includes options to: Get current status Lock the port indefinitely Unlock the port for <user-specified> minutes Unlock the port indefinitely There is also a button to Send the command to the connected meter. When the time parameter command is used, a data entry field appears for entering the Minutes parameter.
Activity Log	
Insert Comment <button>	Allows a user to insert comments into the Activity Log. These time-stamped comments will also post to the Log file.

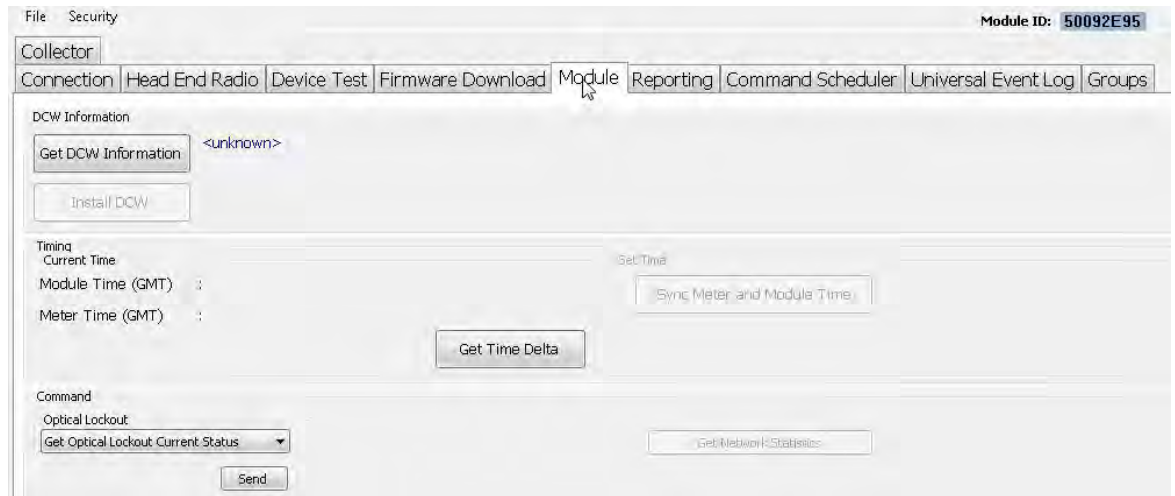


Figure 3 - 29. Module Tab

Optical Lockout

For compatible endpoints, a section that appears on ETM's Module tab is active, as seen in the previous figure. (Endpoints that do not support this feature will display this function, but it will be "grayed out" to represent connection to an incompatible endpoint).

This setting includes options to:

- Get current status

- Lock the port indefinitely
- Unlock the port for <user-specified> minutes
- Unlock the port indefinitely

After a choice has been selected from the drop-down menu, the Send button executes the command. An illustration for the available Optical Lockout functions appears below.

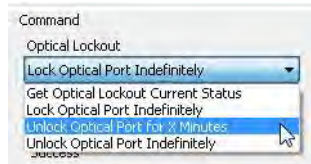


Figure 3 - 30. Optical Lockout Drop-down Menu

For the “**X Minutes**” selection, a data entry field appears for the user to enter the desired value, after which pressing the Send button, as with the other options, executes the command.

Reporting Tab

The **Reporting** tab is comprised of the Meter Information, ANSI Tables and Reports fields. The fields on this tab are only enabled if a meter test has been run and has a status of Passed.

The table below describes the fields on the Reporting tab.

Table 3 - 8. Reporting Tab

Field	Description
Meter Information	
Meter Configuration Check-box	Loads tables to display meter specific configuration parameters (e.g. load profile, interval length, channel selection).
“Landis+Gyr Meter Configuration” Check-box	Loads information about proprietary configuration parameters (time sync configuration, etc.).
LP Data Check-box	Loads tables that display the last two blocks of load profile data (interval data).
Energy and Demand / TOU Check-box	Loads Time-Of-Use tables for meter register data.
Demand Reset Data / TOU Check-box	Loads Time-Of-Use tables for meter demand data.
Meter History Log Data Check-box	Loads tables that displays the meter history.
Latest Snap Read Check-box	Loads tables for meter time-of-use data.
Vector Data Check-box	Loads tables containing instantaneous meter data.
Meter Event Log Data Check-box	Loads tables that display the meter events that have occurred.
Status Summary Check-box	Loads a table that displays disconnect switch status and meter time sync information.

Table 3 - 8. Reporting Tab

Field	Description
ANSI Tables	
Standard 000 - 099	Selecting specific check-boxes will load the corresponding ANSI Standard tables.
Manufacturing 000 - 099	Selecting specific check-boxes will load the corresponding ANSI Manufacturing tables.
Reports	
Load Required Tables <button>	Loads the tables that are required to run a report.
Load Defaults <button>	Loads any tables that have been saved as default.
Save As Defaults <button>	Clicking this button will save currently selected tables as defaults that will be brought up at a later time by clicking the Load Defaults button.
Clear All <button>	Clears any check-boxes that are selected.
Demand Reset <button>	Launches the function. See details in the Demand Reset heading below.
Generate Reports <button>	Generates reports for the tables selected.
Activity Log	
Insert Comment <button>	Allows a user to insert comments into the Activity Log. These time-stamped comments will also post to the Log file.

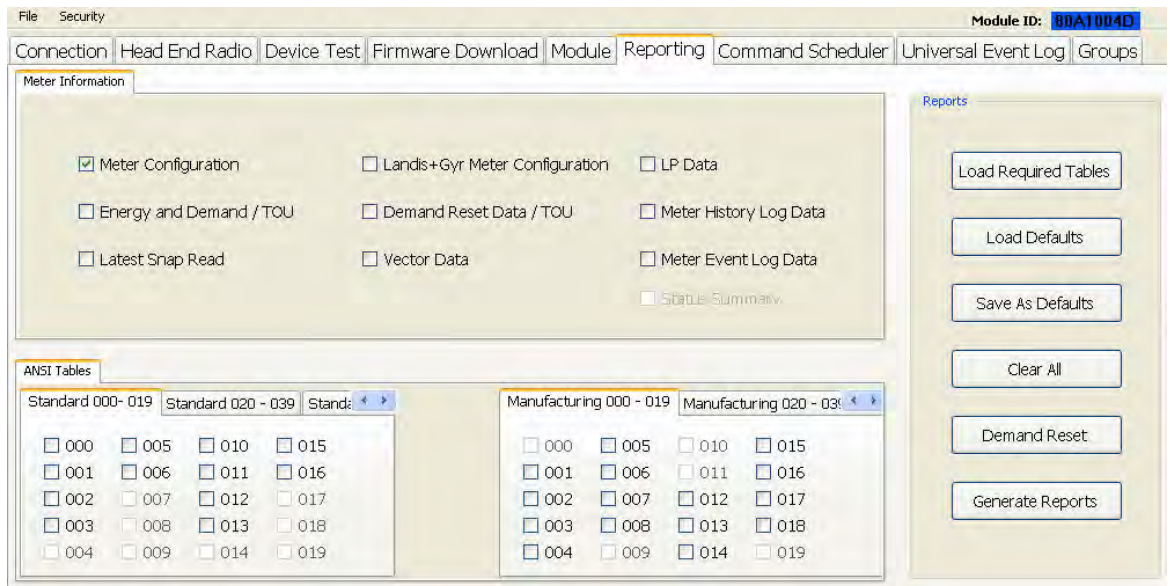


Figure 3 - 31. Reporting Tab

Demand Reset

Demand Reset is a function performed on the meter. The meter stores peak demand information. A demand peak is determined by taking the kWh (kilo-watt hours) used over a configured demand window and converting it to kW (kilo-watts). This is done by multiplying the kWh by 60 and dividing that number by the window length. This information is used to bill the utility customer.

Demand Reset is determined by taking the difference of the peak demand value between the current time and the time of the last Demand Reset.

The purpose of the Demand Reset is to capture peak demand values and the times at which those values were recorded since the last time the Demand Reset procedure was executed. The Demand Reset takes a snapshot of the current instantaneous values, along with the demand readings, and stores that information in a holding place on the endpoint. As part of this process, the five highest demand readings are reset to zero.



NOTE: The program administrator can provide the key required to enable and configure Demand Reset features.

The Demand Reset action can only be activated after the Meter Configuration report has been retrieved. Select (click the checkbox beside) the Meter Configuration report option and click the Generate Report button. Once this report is obtained, the Demand Reset button will be enabled.

Enabling Demand Reset

To enable the Demand Reset feature, you must use Windows Notepad (or your preferred text editor) to add a special key (provided by your Landis+Gyr Program Advisor) to the Settings.XML file located at:

- C:\ProgramData\Landis+Gyr\Gridstream\Tool Settings\Settings.XML on computers using either the Vista or Win7 operating systems.
- C:\Documents and Settings\All Users\Application Data\Landis+Gyr\Gridstream\Tool Settings\Settings.XML on computers using the WinXP operating system.

Demand Reset Lockout

The Demand Reset feature is limited by the lockout window parameter. The lockout window is a safety feature to ensure that Demand Reset data will not be lost by accidentally executing too many demand resets.

Some meters have a meter-enforced lockout period. During this lockout period, the meter will return an error code and no Demand Reset will be performed.

By default, the Demand Reset lockout window is set to 24 hours. If a different value is preferred, locate the Demand Reset Lockout parameter in the Settings file mentioned above and change the number to set the hour value for the desired Demand Reset lockout window parameter.

Performing a Demand Reset

Clicking the Demand Reset button on the Reports tab launches a Demand Reset action. The Activity Log will display **Waiting for Demand Reset Response**, followed by progressive communication events.

For a successful action, **Demand Reset response received** and then **Demand Reset Status: Success** will display in the ETM Activity Log.

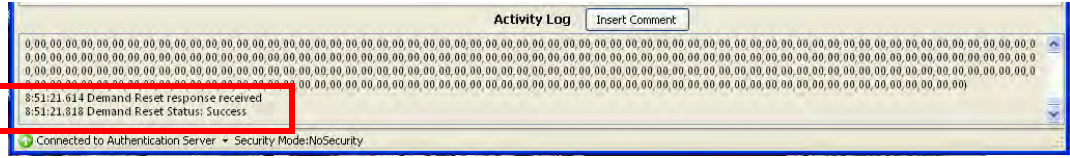


Figure 3 - 32. Demand Reset Status: Success

Simultaneously, a Demand Reset report will display. This report is similar to the Demand Reset Data/TOU report output, except that it shows the status of the Demand Reset operation as highlighted below. The Demand Reset report also lists the previous number of demand resets reported by the meter. A portion of that report is shown below.

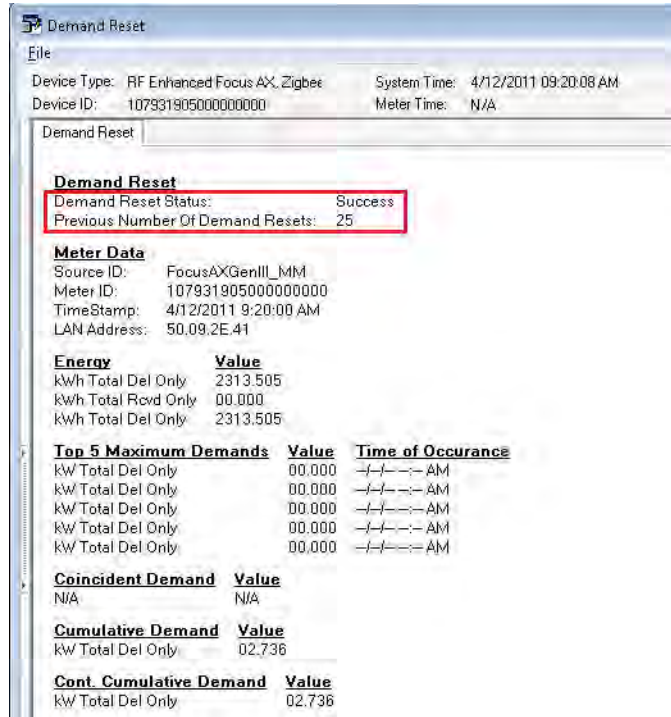


Figure 3 - 33. Demand Reset Report

The Demand Reset Report’s File menu offers options to Print a hard copy or to Save the report in XML or HTML formats, along with a Page Setup choice.

Demand Reset Restriction

A Demand Reset Action may only be performed once every 24 hours.

Command Scheduler Tab

The Command Scheduler tab, as shown in Figure 3 - 34, is comprised of the Event Mask, Command Schedule, and Activity Log fields.



CAUTION: When an endpoint is hosted by Command Center, all schedules are managed by Command Center. Endpoint Testing Manager should not be used to make changes to this command schedule.

The table below describes the fields on the Command Scheduler tab.

Table 3 - 9. Command Scheduler Tab

Field	Description
Event Mask: over 100 choices are available for notification scheduling. Choices for event masking include: Disabled, Log Only, Advisory, and Alarm.	
Erase Control	
EraseZero	Always the best choice for this screen. This option makes no changes to existing parameters.
EraseAll	Never to be used unless a start-from-zero meter commissioning action is in-process.
EraseCommands	Clears commands that have been entered into the Command section of the Command Scheduler tab.
Command Schedule	
<Command Type> Cached Reads / Passthru PDU command / Interval Data Pump / Snap Read Pump / Advisory Events / Init Push Message / Meter Events / Radio Virtual Memory Read (Short) / WAN Node Information Read / Predefined Memory Read	Command chosen by the user for implementation and notification.
Start Time	Displays the user-selected date and time for launching the specified command.
<Period Type> Run Minute based / Run Day based	User-programmed test parameter types for command launch intervals.
<Test Interval Setting> Cached Read / Run Randomized / Normal	User-programmed test parameter intervals for command launch.
Period display	The user-defined data field that displays the test interval.
Accept / Cancel	Clicking this button sets the changed parameter for the command being configured or cancels the change.
<Buttons>	
Get Scheduled Commands	Polls the meter to refresh the scheduled commands.
Display Scheduled Commands Report	Displays a report of the scheduled commands.
Set Scheduled Commands	Loads all new commands into the meter. The user MUST click Get Scheduled Commands to verify that the new commands have loaded. Confirmation does not appear in the Activity Log.

Table 3 - 9. Command Scheduler Tab(Continued)

Field	Description
Activity Log	
Insert Comment <button>	Allows a user to insert comments into the Activity Log. These time-stamped comments will also post to the Log file.

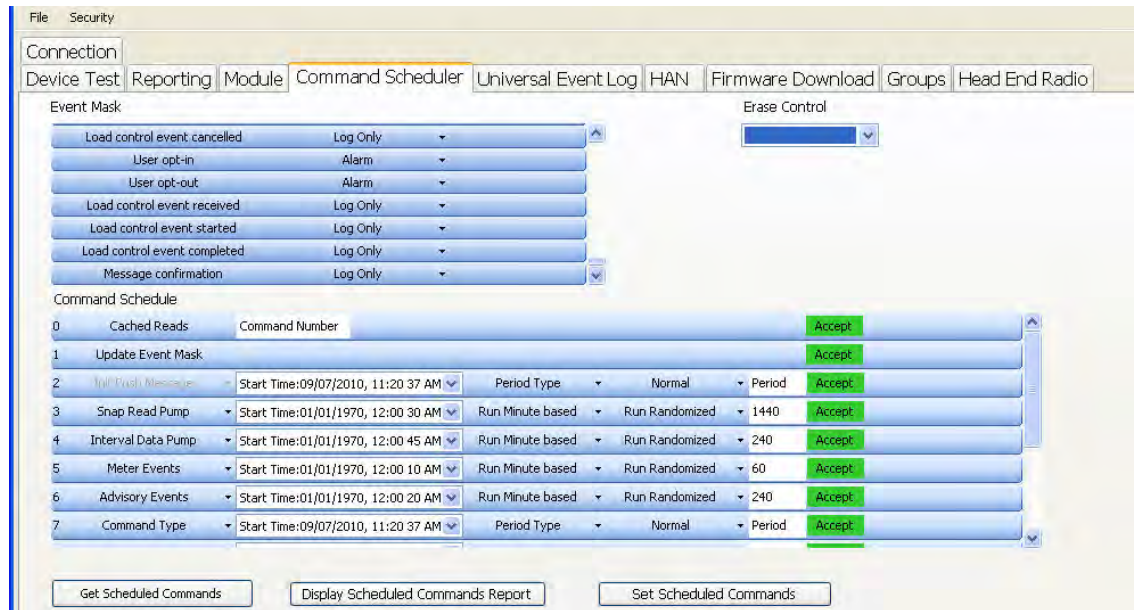


Figure 3 - 34. Command Scheduler Tab

Event Mask

The Event Mask interface of the **Command Scheduler** tab supports user notification for specified events. These events include Primary Power Down, Primary Power Up, Procedure invoked, Table Written To, Event log cleared, Rate Change, and many others. There are over 90 Event Mask choices available for notification. To view currently-loaded meter commands and their status, click the **Get Scheduled Commands** button.

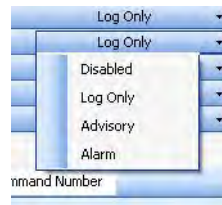


Figure 3 - 35. Command Scheduler Event Mask Notification Options

Table 3 - 10. Event Mask Events

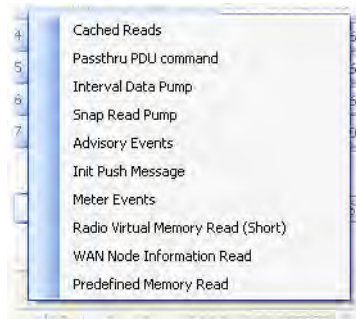
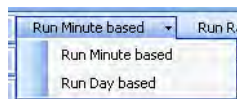
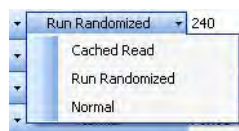
Event Mask Field	Description
Disabled	No notification when the specified event occurs; the event is not stored and will not be reported.

Table 3 - 10. Event Mask Events (Continued)

Event Mask Field	Description
Log Only	The event will be stored in the event log; it will not be reported in alarm/alert messages; only an on-request read of the event log will retrieve these events.
Advisory	An advisory message is generated when the specified event occurs; the event will be stored in the event log and will only be reported the next time a periodic push is transmitted; the periodic push will track the last event pushed to the host and will only send events that have not yet been pushed.
Alarm	The event will be stored in the event log and an immediate alert message will be transmitted.

Command Schedule

The Command Schedule interface provides the user with the ability to schedule up to 12 specific commands, stipulate parameters for the scheduled commands, and set the Erase Control (this value must be set before sending any command). Drop-down arrows next to each parameter allow these commands to be programmed for specific dates and times and set to function in varying ways.

**Figure 3 - 36. Some Command Scheduler Command Types****Figure 3 - 37. Command Scheduler Calendar****Figure 3 - 38. Command Scheduler Test Interval Types****Figure 3 - 39. Command Scheduler Test Interval Settings**



NOTE: Some test interval options do not apply to all command choices

HAN Tab

The HAN (Home Area Network) tab makes use of ZigBee protocols to enable home user interaction with power managing and monitoring devices. When connected to a compatible endpoint, Endpoint Testing Manager accesses the following ZigBee functions:

- Access and display ZigBee network information
- Enable registration into an active Home Area Network
- Remove an active Home Area Network

Additional associated functions and data are available on this screen, including displays for Zigbee Network Channel and HAN ID. A data field on this screen displays the HAN Device List. Near this data field are buttons to Get Device Details and Delete HAN Device.

Sub-tabs on the HAN tab provide options for the user to check Device Provisioning, supervise Load Control, view Event History, manage Messaging, coordinate Troubleshooting, and run a FAT Test.

The MAC Address of the HAN (Home Area Network) module is displayed on the HAN tab, along with a button immediately adjoining the display that provides a means to Get Device Details.

Table 3 - 11. HAN Tab

Field	Description
Zigbee Network Details	
Channel:	Displays the channel that ZigBee is currently using. This number will be between 11 and 25.
HAN ID:	Displays the Network ID that ZigBee is currently using. The number will be between 1 and 65334.
Commands and Displays	
Network Info <button>	Sends a request to the network for ZigBee Network Information.
Commission HAN <button>	Creates the ZigBee (HAN) network.
Decommission HAN <button>	Closes the active ZigBee (HAN) network.
Refresh HAN Device List <button>	Displays an updated list of ZigBee devices that currently exist on the HAN network.
Get Device Details <button>	Queries the highlighted HAN device for configuration parameters and displays the information in the Activity Log window.
Delete HAN Device <button>	Deletes the highlighted HAN device.
MAC Address	Displays the MAC address of the Home Area Network module.
Device Class	Defined in the ZigBee Smart Energy Profile Specification and refers to particular devices, e.g. Range Extenders, Metering Devices, Smart Appliances, etc.

Table 3 - 11. HAN Tab(Continued)

Field	Description
Client Cluster	A bitmap that indicates which clusters are supported as clients on the HAN device. This Landis+Gyr proprietary design optimizes HAN communication.
HAN sub-tabs	
Device Provisioning	Use this tab to associate (pair, or marry) a HAN device to the meter. This step is required to enable communication exchanges between HAN devices.
Load Control	Use this tab to send load adjustment commands to HAN devices, including thermostats, other energy-consuming appliances, or load control devices. (load control devices adjust temperature, or cycle devices on and off).
Event History	Displays HAN settings that have been made or changed.
Publish Price (this tab only appears for meters running HAN firmware v1.5.x and higher)	This Gridstream command (defined by Landis+Gyr, not the ZigBee Smart Energy Profile Specification) is the proprietary method by which Gridstream makes pricing information available to the customer.
Messaging	Enables sending a text message to the remote HAN device.
Troubleshooting	Provides simple testing options, including configuration queries, for the internal ZigBee module. Also provides for custom HAN settings.
FAT Test	As a quick way to test a ZigBee module, this test is used for meter shop sample testing to verify proper RF and HAN communication capability. The First Article Test can only be run without an active HAN. This function is used in combination with either “black box” equipment or by using a ZigBee-enabled device (such as the ecoMeter) to test the communications channel via the “join and un-join” action. In order to use the HAN functionality within ETM, a HAN Initialization Command must be successfully completed via Command Center before ETM can be used to operate and manage the HAN. Please see Customer Service Update 98-1217 for more details.
Activity Log	
Insert Comment <button>	Allows a user to insert comments into the Activity Log. These time-stamped comments will also post to the Log file.

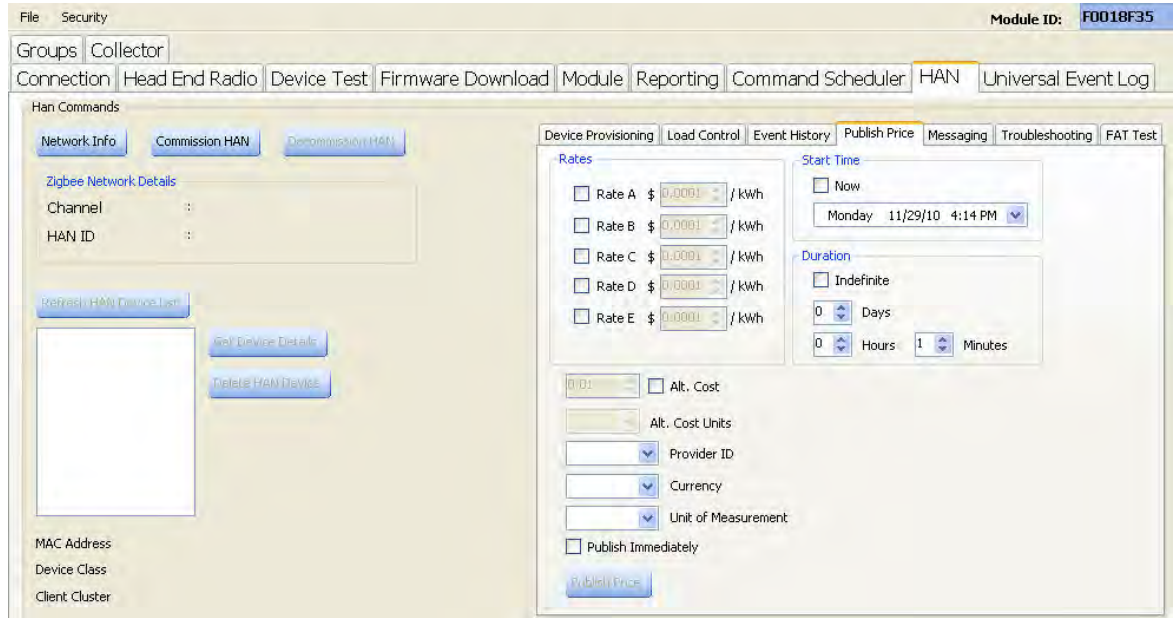


Figure 3 - 40. Fully-Populated HAN Tab - "Publish Price" sub-tab displayed



CAUTION: View the Connection tab. Click the check-boxes for both Enable Field Mode and Display Scrolling Status. Click Save Settings. These settings will continue to be the default setting each time ETM is launched.

Universal Event Log Tab

The **Universal Event Log** tab, shown in Figure 3 - 41, enables user-programmable log activities that result from meter events.

Table 3 - 12. Universal Event Log Tab

Field	Description
Start Date	The user-programmable start date parameter.
Start Event ID	This parameter can be set from 1 to 254.
End Date	The user-programmable end date parameter.
End Event ID	This parameter can be set from 1 to 254.
Event Report Type	Set by the user to specify either Log Only, Advisory Only, or Alarm Only Report Types for meter events.
Generate Report <button>	Generates a report based on meter events, with options for setting up report appearance and saving these reports.
Activity Log	
Insert Comment <button>	Allows a user to insert comments into the Activity Log. These time-stamped comments will also list in the Log file.

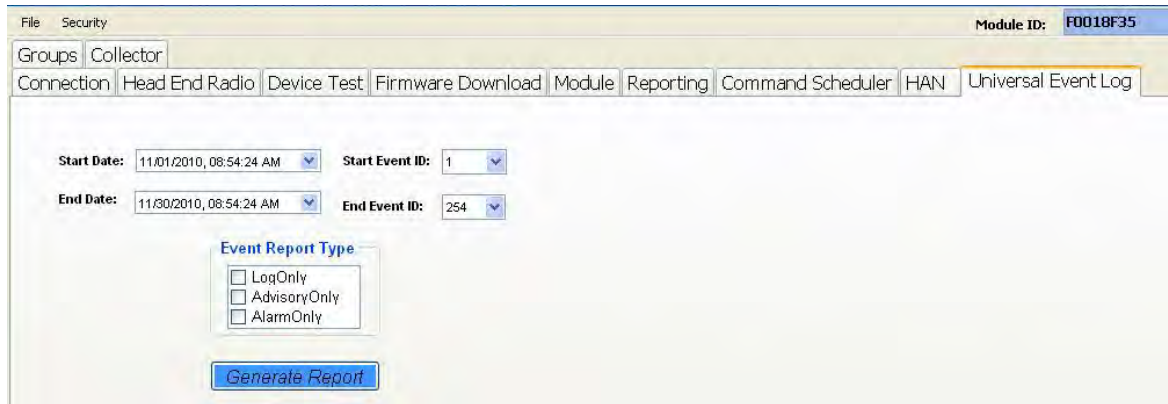


Figure 3 - 41. Universal Event Log Tab

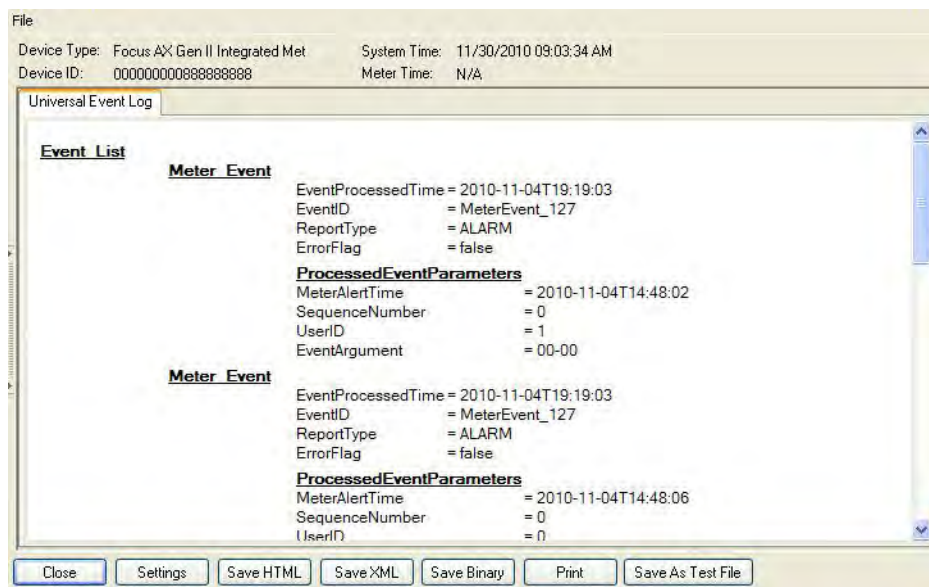


Figure 3 - 42. Generate Report Data View

Groups Tab

The **Groups** tab is only enabled on meters with version 422 or higher firmware. This tab allows organizing meters into groups so as to enable actions and activities that are group-based.



NOTE: A meter can belong to no more than eight groups.

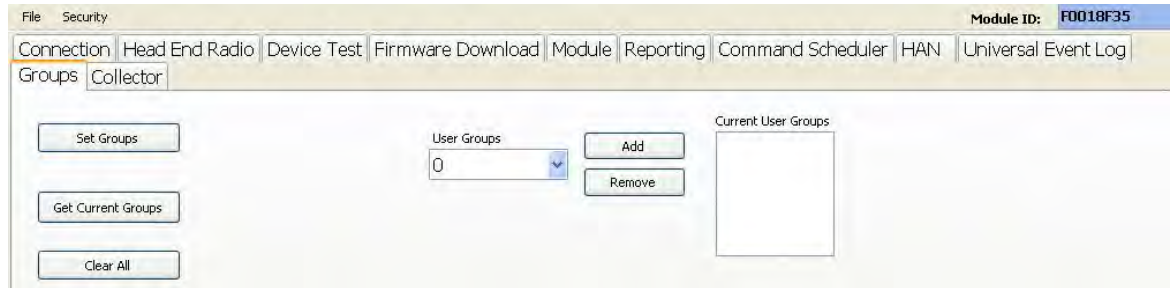


Figure 3 - 43. Groups Tab

4

Specifications

Enhanced Series IV Elster A3 Specs

Table 4 - 1. Specifications

Category	Specification	Value or Range		
Compatible Meters	Elster Supported Meter Forms	Form	Voltage	Class
		3S	-	-
		16S	-	-
		10A	-	-
Electrical	Voltage	11.0-14.0V (from the meter's power supply)		
	Power	Max: 2.5W Typical: 0.5W		
RF 900 MHz	Output Power	+26 dBm +/-1 dBm		
	Adjacent Channel Power	39 dBc Nominal (9600 bps)		
	Transmit Frequency	902.2 to 927.9 MHz ISM unlicensed (FCC Part 15)		
	Communication Protocol	Gridstream Protocol for Command Center		
	Receive Sensitivity	-108 dBm minimum		
RF ZigBee	Output Power	19 dBm Max		
	Adjacent Channel Power	40 dBc Minimum		
	Transmit Frequency	2405 to 2475 MHz		
	Communication Protocol	ZigBee Protocol		
	Receive Sensitivity	-101 dBm minimum, -104dBm typical		

Table 4 - 1. Specifications (Continued)

Category	Specification	Value or Range
Standards Compliance	FCC Title 47 CFR Part 15	Radiated and Conducted Emissions (incl. intentional radiators)
	IEC 61000 4-2,3,4,5,11,12	Electromagnetic Compatibility
	ANSI C12.19	Compatible with Utility Industry End Device Tables
	ANSI C12.20	National Standard for Electricity Meters - 0.2 and 0.5 Accuracy Classes
	ANSI C12.1	Code for Electricity Metering
	ANSI C37.90.1 (1989)	Standard Surge Withstand Capability (SWC) Tests
	ANSI C12.22	Transport of ANSI C12.19 Over Network Transmissions
Environmental	General Environmental	Outdoor, rain-protected, sunlight-exposed
	Operating Temperature Range	-40 to +85 C (under meter cover)
	Humidity	0 to 85% relative humidity, non-condensing