Certification Exhibit

FCC ID: R7PER6R1S4
IC: 5294A-ER6R1S4

FCC Rule Part: 15.247
IC Radio Standards Specification: RSS-247

ACS Project Number: 15-0421

Manufacturer: Landis+Gyr Technology, Inc.
Model: 26-7500

Manual

Gridstream Enhanced Cellular FOCUS AXe User Guide

Publication: 98-1723 Rev AB

Landis+
Gyr+

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Landis+Gyr

1

Gridstream Enhanced Cellular Overview

Overview

Landis+Gyr's Gridstream Enhanced Cellular solution can expand network coverage for unique metering applications, where other AMI communications may not be available.

The Landis+Gyr Cellular meters communicate point-to-point with Command Center's M2M (Machine to Machine) Adapter. The M2M Adapter is a component of Command Center that will interface with the meter directly. This makes Cellular meters ideal for utilities with electric meters in remote areas or areas where there is little to no infrastructure. The following diagram provides a high level overview of a Gridstream Enhanced Cellular network with a Gridstream RF Network. The cellular endpoints are unique in that the SIM card **must** be activated prior to deployment of the endpoints (See Chapter 4 "Deploying Endpoints").
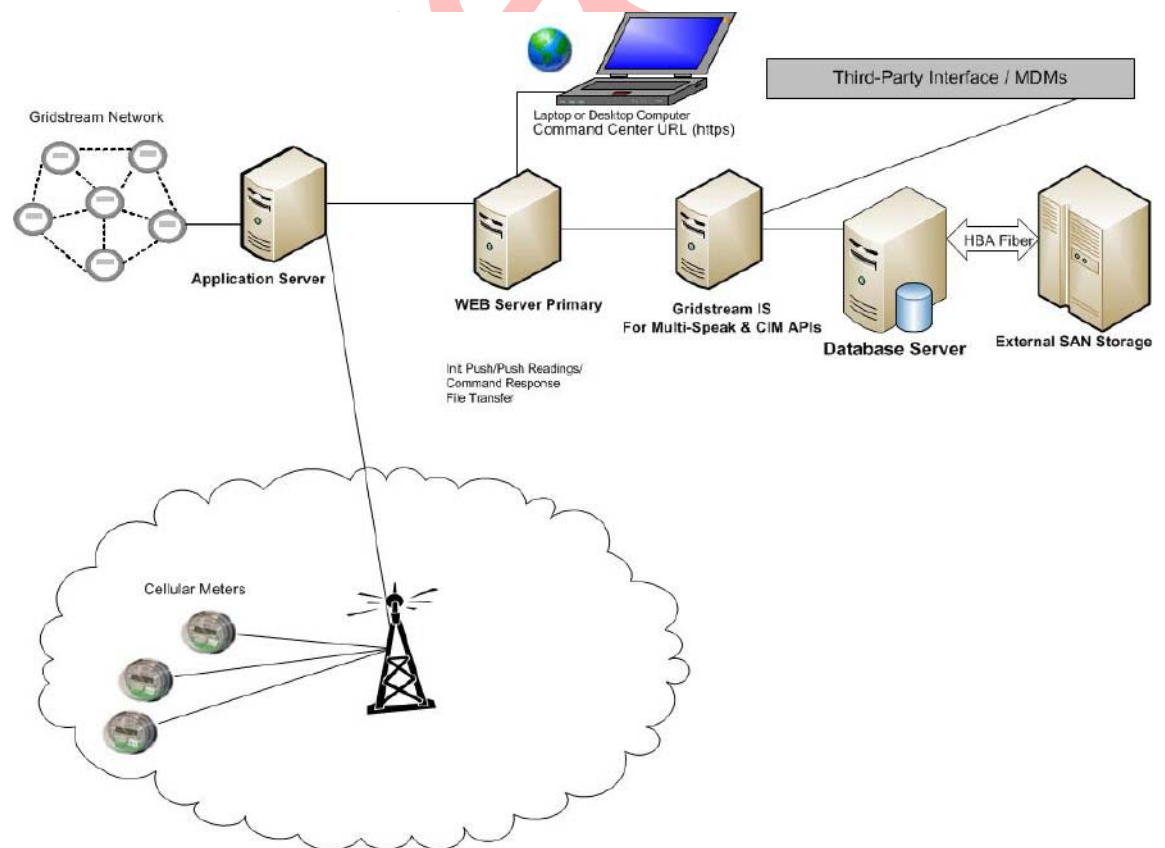
Figure 1 - 1. Cellular Network

Point-to-Point Technology

Cellular meters communicate point to point with Gridstream Command Center. They do not communicate with other meters, routers, or collectors. Although cellular meters do not communicate through a collector, Command Center will automatically assign a virtual collector to the meters. This allows cellular technology to easily integrate into the existing Gridstream solution and simplifies management of cellular meters.

Enhanced Cellular Endpoints perform Self Reads daily at midnight (by default). The reads will then be sent to Command Center. Interval Data is pushed every four hours (by default). Cellular meters can support interval data up to every fifteen minutes.

(i) **NOTE:** Command Center must be installed/upgraded with Cellular functionality active. The Command Center Installer automatically installs cellular functionality unless the user has chosen to exclude. See Landis+Gyr publication 98-1664, Command Center Installation Suite, for more information on Gridstream Enhanced Cellular Installation.

(i) **NOTE:** Meters must have custom attributes programmed at the time of manufacture. The cellular endpoints are unique in that the SIM card must be activated prior to deployment of the endpoints.

Endpoint Overview

The cellular communication module is not available as a stand alone product.

The endpoint assembly contains:

- Meter
- Gridstream Enhanced Cellular communication module
- Interior antenna for Cellular radio
- Built-in antenna for ZigBee

Figure 1 - 2. Landis+Gyr FOCUS AXe

Modem Information

The cellular meter contains a completely "under the cover" module that utilizes the GSM/GPRS/ EDGE/HSPA cellular technology. This allows cellular meters to be supported by multiple wireless providers. (The initial release will support AT&T domestic US versions only.) Furthermore, the AT&T module will be 3G capable, making it a viable solution for real time data transfer. (4G versions will be available in later releases.)

Figure 1 - 3. Cellular Module

Meter Display

The FOCUS AXe is equipped with an LCD display. The display is configurable at the time of ordering or manually through the optic port and the use of 1132 prog/com. A key feature of the display is the GSS Health Indicator screen. The GSS display screen will allow the user to easily identify any issues with the device. This health check information can be used during field installation or troubleshooting activities to validate the radio status and provide key inputs to any communications issues that may be encountered. The figure below illustrates the metrology display panel.

Figure 1 - 4. Metrology Display Panel

The Meter Display will indicate "GSS" and all dashes if cellular communication has not been established. Once cellular communication has been established, the last two indicators on the right side of the display, we'll refer to as A & B, will illustrate the following:

Table 1-1. Communication Hardware Status

Status Slot A	Description
0	No communication failures to report
1	Cellular connection not established
2	Communication with ZigBee module failed
3	Cellular connection not established + communication with ZigBee module failed
4	Communication to NTP server not established
5	Cellular connection not established + Communication to NTP server not established
6	Communication to NTP server not established + Communication with ZigBee module failed
7	Combination of codes 4 + 2 + 1

Table 1-2. Head End Communication Status

Status Slot B	Description
0	Registered with Command Center
1	Has not registered with Command Center

LAN ID

The LAN ID is a unique identifier for each Gridstream Enhanced Cellular endpoint. It is always displayed in hex. Landis+Gyr provides the LAN address. You cannot change the LAN ID of a radio. The LAN ID (Endpoint Serial Number) will be matched to the Meter ID through a Meter Manufacturer File (MMF). The MMF will be provided to you by Landis+Gyr with your meter purchase.

Labels

The endpoint includes the following labels:
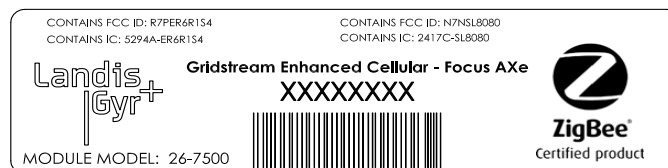
Figure 1 - 5. Label Identification

A. Landis+Gyr Product ID (printed)

B. Landis+Gyr LAN ID, includes programmed module part number (printed and barcoded)

ZigBee Support

The Gridstream Enhanced Cellular communication module supports an integrated ZigBee system on the chip. This enables the endpoint to communicate via Smart Energy Profile with other ZigBee enabled devices.

Retrieving Data

The endpoint is capable of delivering data via an On Request Read (ORR) or autonomously (periodically reported).

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

- Register Data (Standard Table 23) which includes consumption, demand and TOU values
- Load Profile or Interval Data. Multiple Load Profile channels will be available for meters that support it (Standard Table 64 FOCUS AXe)
- 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 periodic 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 the Command Center Host delivers a Demand Reset command, the communication module passes the command to the meter, which performs the Demand Reset on the meter. The endpoint then passes the previous demand data captured by the meter (Standard Table 25) to the Host for processing. Scheduling the demand resets may be performed through the Command Center Host. See the chapter on Demand Resets in this manual for further instructions.

Power Outage/Restoration

When an outage greater than 30 seconds 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 timestamp
- Outage count

When power is restored, the communication module reconnects with the network at a randomly delayed time up to 30 minutes. This is to ensure that too many devices do not connect to the cell tower simultaneously. With network communications restored, the communication module sends a power restoration message that includes details such as:

- LAN ID
- Power Restoration Timestamp
- Power Outage Timestamp
- Sustained Outage Count

The communication module stores a history of power outage and restoration event pairs in the event log. The user may request this data using Command Center.

Downloading Firmware

At times it may be necessary to perform firmware upgrades to enhance or enable functionality. The communication module, meter, and ZigBee firmwares may all be upgraded remotely over the air from Command Center. Command Center will allow the user to perform firmware updates to individual devices. However, updates may also be group addressed, making it easier to upgrade several devices at once. When the endpoint completely receives the new code, it will reboot. After powering back up, the device will load the new firmware and normal operation will resume. The Firmware download can be scheduled in Command Center or done immediately.

Encrypting Data

The Gridstream Cellular network currently supports Standard and Advanced security. For more information on Command Center Security, please refer to the Landis+Gyr Security Administrator's Guide: publication 98-1035.

SIM Activation

The endpoint SIM must be active in order for the endpoint to join AT&T's wireless network and register with Command Center.

ⓘ **NOTE:** Meters must have custom attributes programmed at the time of manufacture. The cellular endpoints are unique in that the SIM card must be activated prior to deployment of the endpoints.

Auto-Registration

Once powered up, the modules will begin the auto-registration process. This will allow installers to walk away and have the meters complete the process on their own. For more information on auto-registration for cellular meters, please refer to"Auto-Registration" on page 26.

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

Cet équipement est conforme aux limites FCC et ISED d'exposition aux radiations définies pour un envi-ronnement non contrôlé. Cet équipement doit être installé et utilisé à une distance minimale de 20cm entre le radiateur et votre corps. Cet émetteur ne doit pas être co-implantés ou exploités en con-jonction avec une autre antenne ou émetteur.

Industry Canada

This device complies with Industry Canada licence-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.

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.

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.

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.
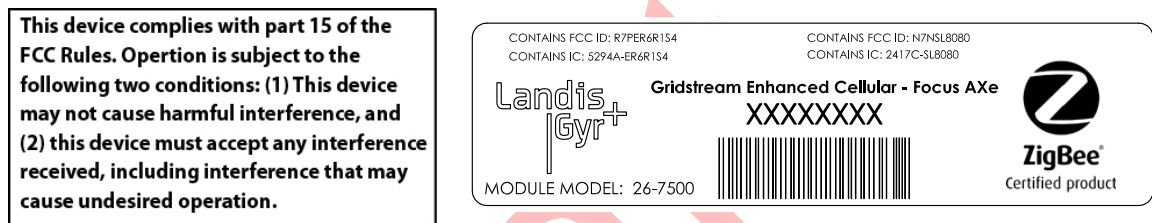
Labels

The endpoint includes the following labels:

Figure 1 - 6. Label Identification

Host FCC Label Requirements

The host label(s) must be clearly visible after the device is installed, and display the module FCC ID in the following format:

Contains FCC ID: R7PER6R1S4	**Contains FCC ID:** N7NSL8080
Contains IC: 5294A-ER6R1S4	**Contains IC:** 2417C-SL8080

The following statement must also be clearly visible:

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.

Documentation Feedback

To provide feedback about this documentation, contact the Technical Documentation team at ustechnicaldocumentation@landisgyr.com.

2
Setting Up Command Center

Setting up Command Center

The following section describes system setup and functionality associated with Gridstream Enhanced Cellular electric meters.

Prerequisites to Enable Gridstream Enhanced Cellular Meter Functionality

There are multiple prerequisites to enable cellular meter functionality.

1. Install/Upgrade Command Center to version 6.4 or higher version with the M2M Adapter installed.

2. In Command Center, activate **Gridstream Enhanced Cellular Command Center** license.

Command Center Installation

Command Center must be installed/upgraded with Cellular functionality active. The Command Center Installer automatically installs cellular functionality unless the user has chosen to exclude. See Landis+Gyr publication 98-1664, Command Center Installation Suite, for more information on Gridstream Enhanced Cellular Installation.

Gridstream Cellular License

A license agreement governs the use of Command Center software. The licensing program allows customers to purchase additional software functionality, such as Cellular.

A **Gridstream Enhanced Cellular Command Center** license is required to enable cellular meter functionality in Command Center, and is required for cellular meter auto-registration.

Figure 2 - 1. Command Center License

Following is the procedure to activate a Command Center License:

1. From Command Center Home, click **Setup > Activate License**. A list of currently licensed software will display.

2. To activate additional software, enter the **Activation Code** provided by Sales Support in the text box.

...or...

Click the **Browse** button to navigate to the location of the license file supplied by Sales Support.

- • Double-click the license file name to add the file to the license file text box.

3. Click the **Activate** button to activate the license.

After successful activation, the Activate License screen will refresh to confirm the items that have been licensed.

Process Settings

The Process Settings function allows the user to control how often several Central Server processes occur. The processes are inherent to the normal operation of the Central Server and are rarely modified.

From Command Center home, select **Setup > Process Settings**. The **Process Settings** window will appear.

Enable	Name	Occurs	Time/Interval	Last Run	Next Run	Actions
☑	Abandoned User Session Cleanup	Every	2 hours	5/29/2012 12:54 PM	5/29/2012 2:54 PM	▸
☑	Collector Communication Audit	Every	2 hours	5/29/2012 12:54 PM	5/29/2012 2:54 PM	▸
☑	Commands Workflow	Every	30 minutes	5/29/2012 2:15 PM	5/29/2012 2:45 PM	▸
☑	Confirm RF Demand Reset	Every	15 minutes	5/29/2012 2:04 PM	5/29/2012 2:19 PM	▸
☑	Daily Maintenance	Daily at	6:00 PM	5/28/2012 6:00 PM	5/29/2012 6:00 PM	▸
☑	Daily RF Reads Status Process	Every	1 hour	5/29/2012 1:28 PM	5/29/2012 2:28 PM	▸
☑	Dashboard Data Synchronization	Daily at	6:00 AM	5/24/2012 6:00 AM	5/24/2012 6:00 AM	▸
☐	Deployment Status	Every	6 hours		5/24/2012 12:33 AM	
☐	Gap Reconciliation	Every	1 hour		5/23/2012 7:33 PM	
☑	Get Daily Weather Related Data	Daily at	6:00 AM	5/29/2012 6:00 AM	5/30/2012 6:00 AM	▸
☑	Incremental Daily Reads Extract	Every	1 hour	5/29/2012 1:43 PM	5/29/2012 2:43 PM	▸
☑	Incremental Interval Extract	Every	2 hours	5/29/2012 1:35 PM	5/29/2012 3:35 PM	▸
☑	Publish Site Statistics	Daily at	5:00 AM	5/29/2012 5:00 AM	5/30/2012 5:00 AM	▸
☐	Readings Consolidation	Every	15 minutes		5/23/2012 6:48 PM	
☑	Reconfigure RF Endpoints	Every	15 minutes	5/29/2012 2:11 PM	5/29/2012 2:26 PM	▸
☐	RF Collectors Set Time	Every	4 hours		5/23/2012 10:33 PM	
☑	RF Network Layer Calculation	Every	2 hours	5/29/2012 12:54 PM	5/29/2012 2:54 PM	▸
☐	RF Network Security Reconfiguration	Every	1 hour		5/23/2012 7:33 PM	
☑	RF Registration Verification	Every	2 hours	5/29/2012 12:54 PM	5/29/2012 2:54 PM	▸
☑	RF Scheduled Demand Reset Workflow	Every	30 minutes	5/29/2012 1:53 PM	5/29/2012 2:23 PM	▸
☑	Update Endpoint Ranges	Weekly	Sat 9:00 AM	5/26/2012 9:00 AM	6/2/2012 9:00 AM	▸
☑	Virtual Cellular Collector Assignment	Every	1 hour	5/29/2012 1:57 PM	5/29/2012 2:57 PM	▸
☑	Warehouse Update Process	Daily at	6:00 AM	5/29/2012 6:00 AM	5/30/2012 6:00 AM	▸ 🗎
☑	Weekly Maintenance	Weekly	Sun 9:00 AM	5/27/2012 9:00 AM	6/3/2012 9:00 AM	▸

[Save] [Cancel]

Figure 2 - 2. Process Settings

The Process Settings column heading include the following functions:

- **Enable**. Select the check-box for the appropriate process to enable that function. Clear the check-box to disable the function.

- **Name**. This column displays each function.

- **Occurs**. This column displays the interval at which each function runs.

- **Time/Interval**. This column allows the user to select a time for the appropriate function from the corresponding drop-down menu.

- **Last Run**. This column displays the last date and time that process was run.

- **Next Run**. This column displays the date and time of the next scheduled process.

- **Actions**. This column displays a History icon in the Warehouse Update Process row. Click the History link to view the Process History (last 30 days) screen. IF there are any failed links in the Status column, click the link to view the reason why the task did not run. The Action column also displays a Run Now icon in most rows. Click the icon to immediately run the desired process.

The following process settings on the page apply to cellular meters:

- **Daily RF Reads Status Process**: When readings are received from cellular meters, this process will update the information displayed on the Daily Reads Status report. From the drop down menu, select how frequently the information on the Daily Reads Status report is updated.

- **Dashboard Data Synchronization**: Cellular meters will be included in statistics on the dashboards. This process can be used to keep the dashboard "in sync". It is not enabled by default and will typically be used to process all the data aggregations for the dashboard by force. The default selection is daily at 6 AM.

- **Deployment Status**: Cellular meters will be included in the statistics on the deployment status report. This process updates the deployment status report. The default schedule is

every 6 hours, however, this process may be run more frequently during times of heavy deployment.

- **Event Gap Reconciliation**: Performs gap reconciliations for events.

- **Event Gap Reconciliation Retry**: Retries event gap reconciliation requests, where no response has been received.

- **Incremental Daily Reads Extract**: When self read data has been received from cellular meters, this process will generate the incremental daily reads extract files. This process established the frequency at which the incremental daily reads extract will be performed.

- **Incremental Interval Extract**: When interval data readings are received from cellular meters, this process will generate the incremental interval data extract files. This process established the frequency at which the incremental daily reads extract will be performed.

- **Gap Reconciliation**: A process that requests gap data from the network.

- **Gap Reconciliation Retry**: This process setting allows the user to establish whether gaps retrieval will be re-attempted, and if so, how frequently the process will run.

- **RF Network Security Reconfiguration**: The RF Network Security Reconfiguration process checks for endpoints that require security configuration updates, such as transmission of the network key. This process also enables the retry of security configuration commands until all attempts have been exhausted.

- **Reconfigure RF Endpoints**: Select the desired time from the drop down list box. The Reconfigure Endpoint process is the process in which Command Center communicates with the collectors as to which endpoints need to be re-configured. The reconfigure endpoint settings determines how frequently the system will send commands directing reconfiguration to the endpoints.

ⓘ   **NOTE:** If changes have been made to the process settings, click **Save** to apply the changes.

3

Meter Ordering and Customization

Overview

1. Customer needs to provide Landis+Gyr with an IP address for Command Center (M2M Adapter), IP address for the NTP server, GMT offset for meters, and the Network ID of Command Center at the time they order meters. Modules will be preprogrammed with the customer supplied information and the Cellular IP addresses for auto-registration to occur.

2. Customer will need to setup and activate a cellular account with the carrier prior to deploying meters. (Hosted customers may have this done by Landis+Gyr) Activating the account ensures that the cellular IP addresses will be able to communicate to the Cellular Network Access Point Name (APN). If the account has not been activated, auto-registration will not occur.

4

Deploying Endpoints

Landis+Gyr⁺

SIM Activation

The endpoint SIM must be active in order for the endpoint to join AT&T's wireless network and register with Command Center.

ⓘ **NOTE:** Meters must have custom attributes programmed at the time of manufacture. The cellular endpoints are unique in that the SIM card must be activated prior to deployment of the endpoints.

Auto-Registration

New meters can be installed with no special tools required. The device is plug and play; this means that the installer can plug the meter in, and walk away.

When the meter is powered up it will perform the following:

- **Transmit Init Push packet**. The endpoint will send an Init Push Packet about 1-2 minutes after it acquires a network, then every 12 hours until it receives the **Confirm Registration command**.

- **Transmit Registration packet**. The registration packet identifies the device on the network. Once this packet is received by Command Center, the endpoint will transition to Discovered status.

  The M2M Adapter is responsible for generating and transmitting the registration packet as soon as it receives an Init Push Packet from the endpoint.

The Init Push packet contains configuration information, that allows Command Center to understand the configuration of the meter. This information will vary dependent on the configuration of the meter, but generally includes:

- Reporting for Interval Data
- Reporting for Register Data
- Time Synchronization parameters
- GMT offset
- Meter Configuration information

Adding Endpoints

Meter Manufacturer File Import Process

A Meter Manufacturer File is provided to the utility. The file contains meter number/serial number combinations. The Meter Manufacturer File must be imported into Command Center before meters are deployed.

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.
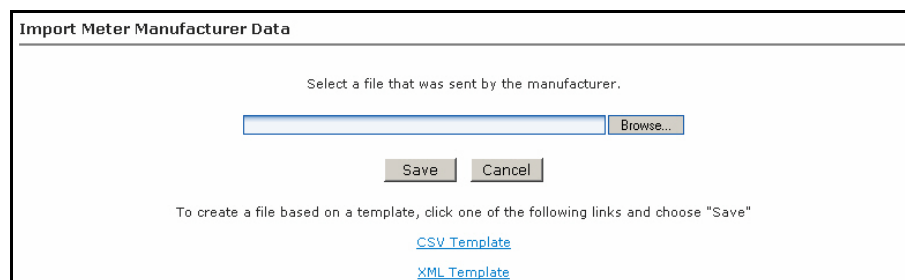
Figure 4 - 1. Import Meter Manufacturer Data

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.
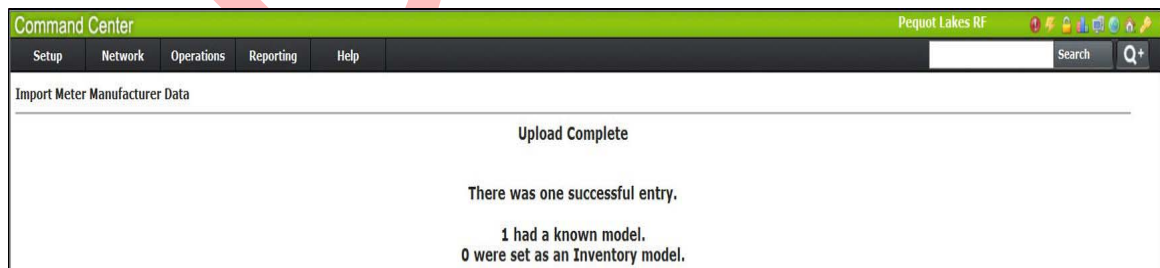
Figure 4 - 2. Upload Complete Window

(i) **NOTE:** 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.

Customer Information File

Customer information must be associated with the Cellular meters via a flat file import, through integration services, or by manually entering the information into Command Center.

(i) **NOTE:** A Customer Information File will be provided to the customer with the Meter Manufacturer File. The CIF is a **required** file, because it contains the Integrated Circuit Card Identifier (ICCID) which is associated with the meter number. This value will be needed in order to activate the cellular account, so that auto-registration can occur. The ICCID will populate the Custom 1 field in the CIF.

Following is the procedure for associating customer information with cellular meter modules through a flat file import:

1. Click **Operations > Import > Customer Information**. The Customer Information window will open, shown in the following figure.
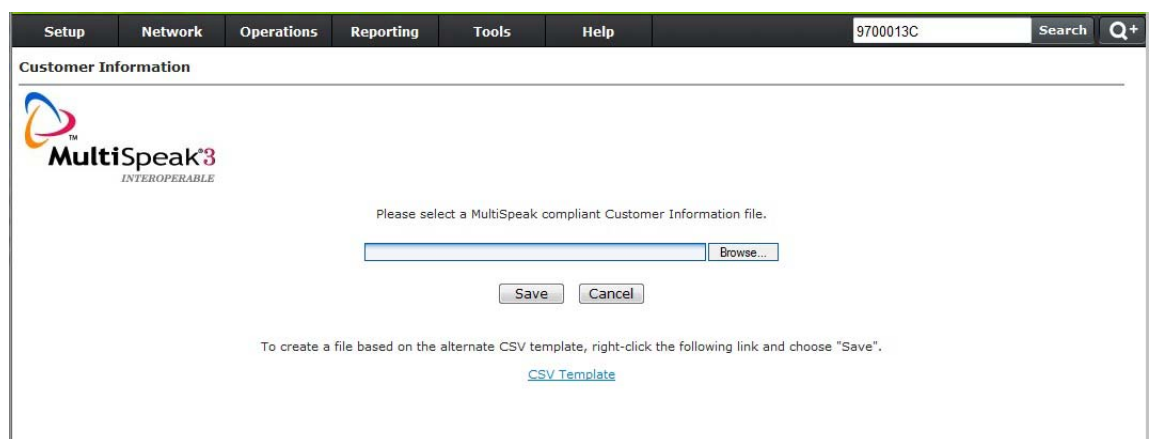
Figure 4 - 3. Customer Information

2. Enter the path to the file that contains the meter modules to be archived, or click the **Browse** button to browse to the file location.

3. Click **Save** to import the file. Customer data provided in the import file will now be associated with the water modules.

The .csv template hyperlink will open a template which can be used for creating the file.

Import Installation File

After the meter manufacturer file has been imported, the installation file can be imported. The installation file includes information about the date and time of the installation, as well as latitude and longitude information for the Center system map.

(i) **NOTE:** NOTE: Importing installation data is not a requirement, however some Command Center deployment tracking and troubleshooting reports will be affected if installation date/time, latitude and longitude are not populated in the Command Center database.

The information imported via the Installation File is shown in Table 4-1, "Import Installation File." An asterisk indicates a required field.

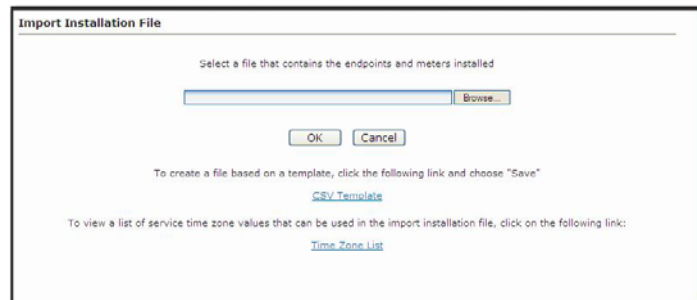### Table 4-1. Import Installation File

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*	Time HHMM AM/ 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.
Service Time Zone	See formatting below	The service time zone may be entered to specify the correct time zone for the service location. This field is required for those utilities where the distribution spans time zones. The GMT offset will be programmed into the module at time of manufacturing.

ⓘ   **NOTE:** NOTE: 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.

Following is the procedure for importing the **Installation File**.

1. Click **Operations > Import > Import Installation File**. The Import Installation File window will open, shown in Figure 4 - 4.

Figure 4 - 4. Import Installation File

The **Import Installation File** window provides a .csv template link, that may be used to create the IIF.

2. Type the file location path into the text box

...or...

Click the **Browse** button to navigate to the appropriate file.

3. Click **OK** to upload the file.

Figure 4 - 5. Import Installation File

If an error occurs in the import of the Installation File, results will be displayed immediately in the browser.

The following status values may be displayed:

- Pending: This is an unused status value and not applicable.
- Pending Init Push: The modules will transition to Normal when the InitPush is received.
- Successful: The Init Push has been received from the modules, and they are in Discovered state.
- Failed: The Import Installation file failed for some modules.

Time Zone
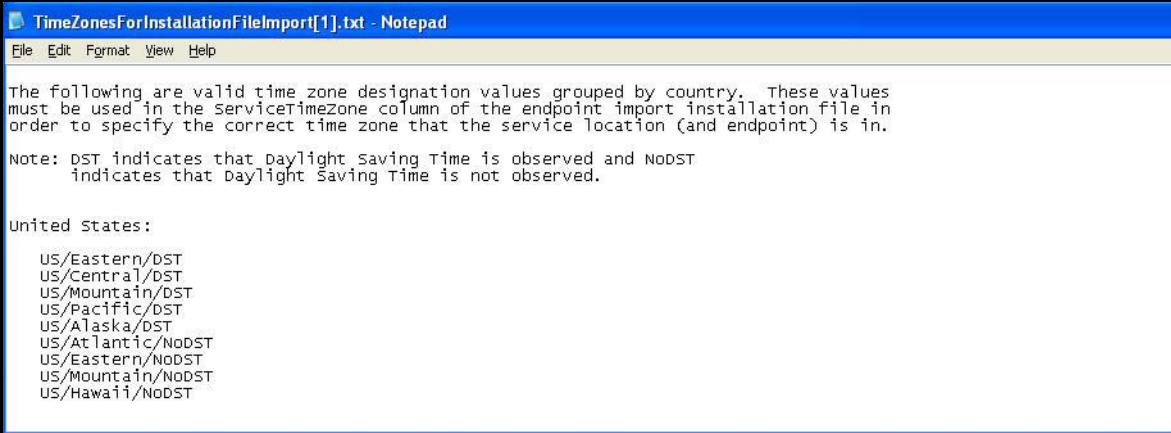
In order for a module to time stamp events, it must be programmed with appropriate time zone settings. If provided with time zone data, Command Center will issue commands that indicate the time zone in which the meter is installed and whether Daylight Savings Time (DST) is observed. For those utilities that span multiple time zones, the installer should include the time zone in the Installation File.

To make it easy for installers to specify a time zone, the **Time Zone List** link will open a document that displays a list of valid time zone designations by country, shown in Figure 4 - 6.

NOTE: The cellular modules will have the time zone programmed at the time of manufacturing. It is

possible, however not preferred, to order batches of meters with separate time zones.

Figure 4 - 6. Time Zones

Auto-Registration

After importing the necessary files and activating the SIM card with AT&T, installers may deploy meters in the field. Once powered up, the modules will begin the auto-registration process. For auto-registration to be successful, the following steps need to be performed:

1. A Meter Manufacturer File (MMF) will be provided to the customer with their meter order. This must be imported into Command Center prior to deployment for auto-registration to occur.

2. A Customer Information File (CIF) will also be provided to the customer with their meter order. This file will contain the Integrated Circuit Card Identifier (ICCID) associated with the meter number. These numbers need to be imported into Command Center before auto-registration can complete.

3. An Import Installation File (IIF) may be used to import other installation details such as: Installation Date, Installation Time, Lat/Lon coordinates, and service locations. This is an optional file and is not required for auto-registration to complete.

With the Command Center setup, MMF and CIF files uploaded, and SIM activation complete, the installer may deploy the meter.

-   When the meter first powers up, it will attempt to connect to the nearest cell tower and acquire time from the NTP server.

-   When the module has time, it will generate and send an Init Push through the APN to the M2M adapter.

-   The M2M adapter will generate a virtual collector in Command Center. (The ID of the collector will be a location area code or the cell tower ID.)

-   The M2M adapter will then generate a registration packet, associating the module to that collector. At this point the module will transition to **Discovered** in Command Center.

-   The Init Push will then be sent to Command Center from the M2M adapter.

-   Command Center will respond immediately to the Init Push by sending out a **Confirm Registration** command to the endpoint.

-   A response to the **Confirm Registration** command will transition the meter to **Normal**.

- If the endpoint configuration sent in with the Init Push is not recognized, Command Center will transition it to **Configure**.

- A **Reconfiguration** command will be sent from Command Center to set the endpoint configuration group. (If the meter is ZigBee enabled, a HAN Initialization command will be sent, also setting it to **Configure**.)

- A response to the reconfiguration command (or HAN Initialization) will transition the endpoint to **Normal** in Command Center.

Monitoring the Dashboard

The Dashboard provides notification of system events and the status of system processes in a timely manner without user interaction. The dashboard should be monitored by the administrator on a regular basis, throughout the day.

Click **Network > AMI Dashboard**. The dashboard will open.

The dashboard will show filtering options depending on the technologies that the utility is licensed for. Selecting the filtering tabs will display just the devices associated with that technology.

- **ALL**. Select All to display every endpoint in the system.

- **RF**. Select RF to display only RF endpoints in the system.

- **Cellular**. Select Cellular to display only Cellular endpoints in the system.
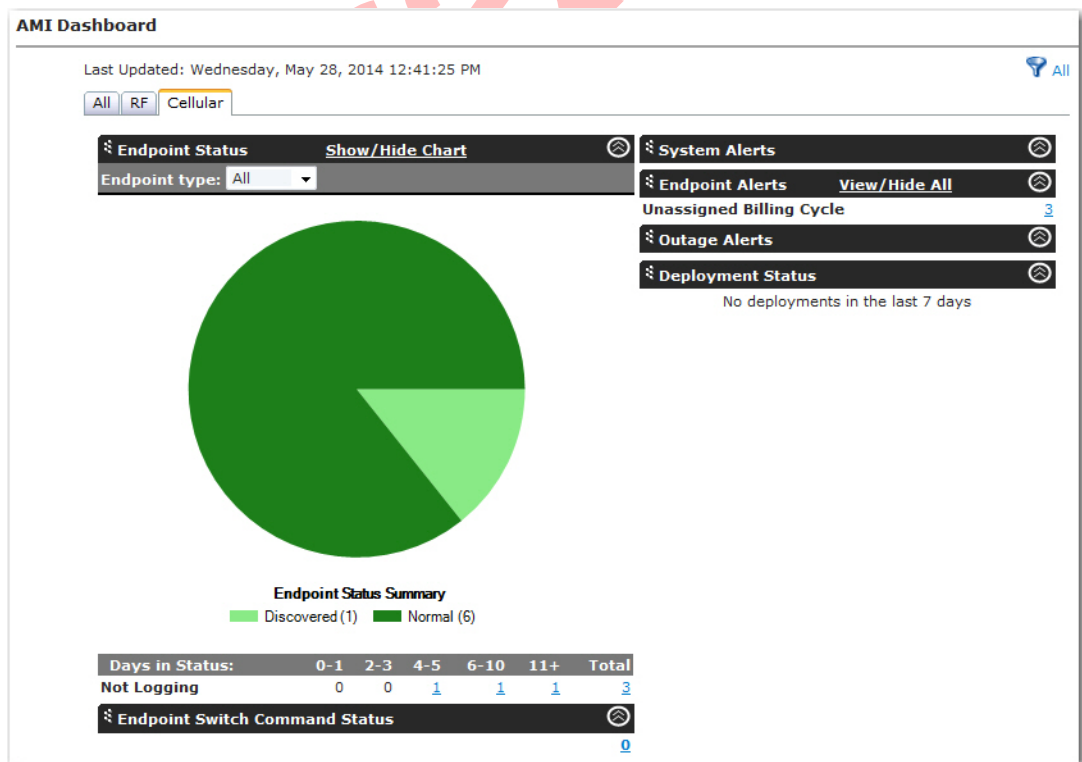
Figure 4 - 7. AMI Dashboard - Cellular Tab

Endpoint Status

The Endpoint Switch Command Status section will display all endpoints in the system and their associated status. The endpoint status may be filtered by endpoint type. Available endpoint types depend on the type of meters for which Command Center has been licensed.

Cellular meters support the following endpoint status values:

- **Inventory**: The cellular meter will transition to Inventory status during the following scenarios:

    - When a cellular meter is imported via the meter manufacturer file, the meter will transition to Inventory status.

    - A meter is removed from service

    - A meter is removed from Archive

- **Installed**: The cellular meter will transition to Installed status during the following scenarios:

    - When a cellular meter is imported via the installation file, the meter will transition to Installed status.

- **Discovered**. The cellular meter will transition to Discovered status during the following scenarios:

    - RF Registration is received

    - Init Push is received

- **Normal**: The cellular meter will transition to Normal status during the following scenarios:

    - Confirm Registration Response event is received during meter registration

    - Configuration is complete

    - Reconfiguration is complete

    - Init Push event is received after meter program changed

- **Sec Configure**: The meter may transition to Sec Configure during the following scenarios:

    - Security Configuration is received

    - Any packet received

- **Configure**: When a read is processed and the packet's last meter program date is different than the value stored in Command Center, the meter will transition to Configure status. The packet last meter program date will change when the meter program has changed. The meter may transition to Configure during the following scenarios:

    - Changed meter configuration group

    - Meter program is changed

    - HAN initialization

    - CRC from Init Push does not match/Create new config

    - Ping response is received

    - Event is received from endpoint

    - User chooses to reconfigure

- **Failed**: The meter may transition to Failed during the following scenario:

- Reconfigure retries have been exhausted

- **Archive Flag = Yes**: The meter may transition to Archive Flag = Yes during the following scenarios:

  - A meter is permanently removed from service

  - Archive Endpoint command is received

- **Endpoint Physically Deleted**: The meter may transition to Endpoint Physically Deleted during the following scenario:

  - Delete endpoint command is received (if no meter data or billable reads exist)

Alerts

The Endpoints Alerts section summarizes several different endpoint related errors that could pose a problem with obtaining the proper billing data.

For a list of Alerts that will be triggered on the Dashboard, refer to the table in the Alarm Definitions section of this manual.

Managing Change Outs

During normal operation, field personnel may need to replace Cellular Meters from the field. If the utility's CIS software is integrated with Command Center, these types of changes will be initiated from the CIS software.

The following procedures should be used if CIS is not initiating the changes in Command Center.

Remove meter from Service

Following is the procedure for removing a Cellular meter from service:

1. Click **Operations > Endpoints**. The **Endpoint/Meter Selection** window will open.

2. Enter the meter number and click **Go**.

3. The **Endpoint/Meter Selection** window will refresh and display **Available Enhanced Cellular Tasks** as shown below.

Enter a meter number or an endpoint serial number.

Endpoint: 34448948   Meter: 332   Go

This endpoint's status is SecConfig. [Details]

Available Enhanced Cellular FOCUS AXe Tasks

Edit Enhanced Cellular FOCUS AXe Properties
View Enhanced Cellular FOCUS AXe Service History
Remove Enhanced Cellular FOCUS AXe Endpoint from Service

Figure 4 - 8. Endpoint/Meter Selection

4. Select the **Remove Enhanced Cellular Endpoint from Service** link. The **Remove Endpoint From Service** window will appear as shown below.

Removed Electric Meter Information	
*Meter Number	332
Final kWh Reading	
Final Reading Date	
Removed Endpoint Information	
*Endpoint Serial #	34448948
Reason	Awaiting Re-Deployment
Remote Service Switch State	
Last Known Switch State	Connected

Save   Cancel

Figure 4 - 9. Endpoint/Meter Selection

5. Fill in the **Removed Meter Information** data fields.

6. Enter the **Final Reading** (optional).

7. Enter the **Final Reading Date** (optional).

8. Enter the **Removed Endpoint Information** data. Select a reason for the removal from the drop-down list box.

9. **Awaiting Re-deployment** status will appear. This option will transition the endpoint to Inventory status.

10. **Permanently Remove From Service**. This option will archive the endpoint. An endpoint in Archived status will not be included in any Command Center reports.

Click **Save** to activate the changes that were just made. A message indicating the success or failure of the removal will be displayed.

Monitoring Deployment

Cellular Meter deployment may be monitored via the **Deployment Status Report** or the **Installation Report**.

Deployment Status Report

The **Deployment Status Report** can be used to track the progress of Cellular meter deployments for a selected period of time. It provides a graphical overview of the deployment process for deployments not exceeding seven days, by default. The default number of deployment days aggregated can be configured in **Organization Information** settings. Some of the data required for the Deployment Status Report is provided via the Import Installation file.

Following is the procedure for generating the Deployment Status report:

1. Click **Network > Deployment Status**. The **Deployment Status** window will open.

2. **Selection Criteria**. Select the **Collector** radio button and select the desired collector from the drop-down box to view statistics for a specific collector. Select **All Collectors** to see all collectors/endpoint in the system.

3. **Date Range**. Enter a **Start Date** and **End Date**. Click the **Calendar** icon to view and use the calendar for date selection.

4. Click **OK**. The Deployment Status Report will open, as shown in Figure 4 - 10.
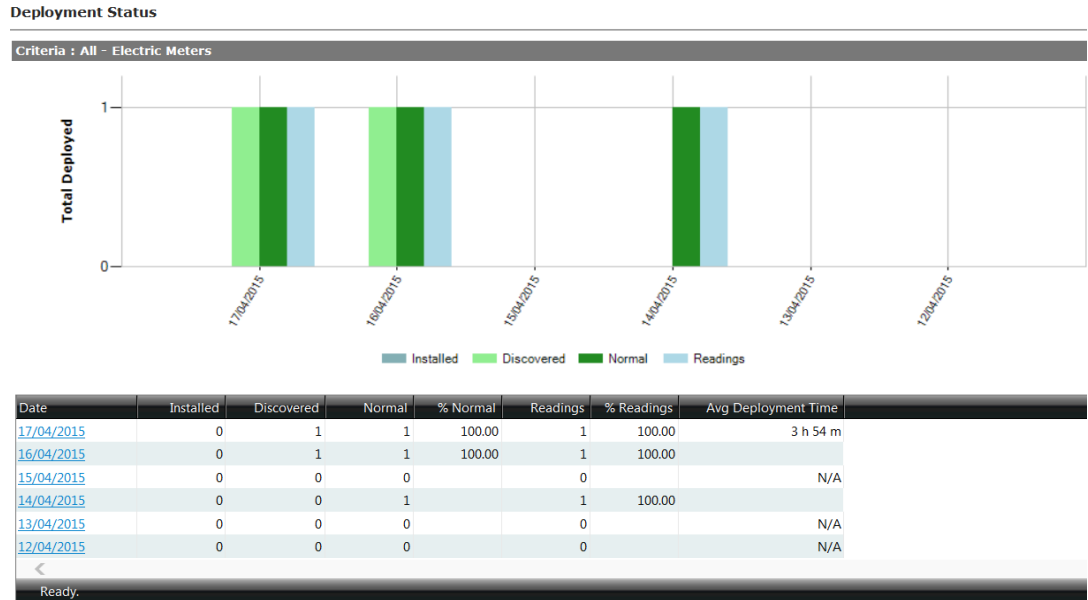
Deployment Status

Figure 4 - 10. Deployment Status Report

The following information is displayed in the **Deployment Status Report**:

- **Date**. The Date column lists the dates used to generate the report.

- **Installed**. The Installed column indicates the number of meter modules installed on the given date.

- **Discovered**. The Discovered column lists the total number of endpoints with initialDiscovered status on the summary date.

- **Normal**. The Normal column lists the total number of endpoints with initial Normal status on the summary date.

- **%Normal**. The %Normal column lists the percentage of Discovered endpoints which transitioned to Normal status on the given day (Normal divided by Discovered).

- **Readings**. The Readings column lists the total number of readings received on the summary date.

- **%Readings**. The %Readings column lists the percentage of Normal endpoints from which readings were received on the summary date.

- **Average Deployment Time**. The Average Deployment Time column lists the average amount of time taken for an endpoint to transition from initial Discovered state to Normal state.

Click on a specific date to generate the **Meters Deployed by Day Report**, shown in the following figure. This report provides a list of all meter modules included in the Deployment Status Report with additional deployment details.

Meters Deployed By Day

Deployment Status on 17/04/2015 for All Collectors - Electric Meters								
Meter #	Map Loc	Collector	Install Date	Discovered Date	Normal Date	Last Reading Date	Status	Deployment Time
332		32506		16/04/2015 6:14:00 AM	17/04/2015 7:18:00 AM	20/07/2015 7:51:00 PM	SecConfig	1 days 1 h 4 m

Figure 4 - 11. Meters Deployed by Day

Installation Status

The **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 meter modules have been installed over a specified time frame and, of those meter modules, how many:

- have been discovered.

- have moved to normal status.

- are sending readings.

- have sent readings in the past 24 hours.

Some of the data required for the Installation Status Report is provided via the Import Installation file.

Following is the procedure for viewing the Installation Status report:

1. Click **Network > Installation Status**. The **Installation Status** window will open.

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 or select **All** to see all collectors/endpoints in the system.

3. **Date Range**. Enter a Start Date and End Date. Click the Calendar icon to view a calendar and make date selections, if needed.

4. Click **OK**. The Installation Status Report will be displayed as shown in the next figure.
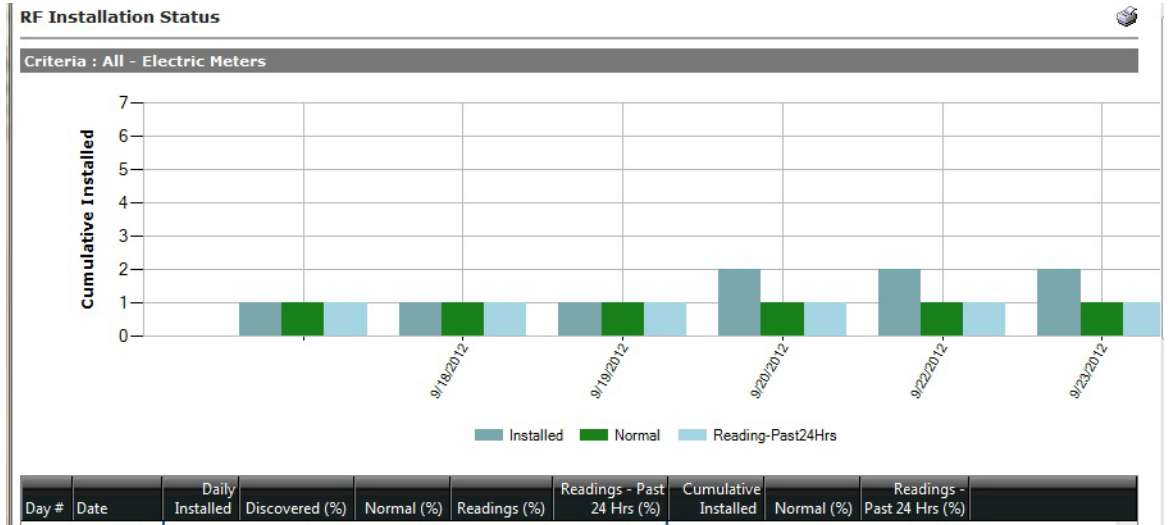
Figure 4 - 12. Installation Status

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 meter modules 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 meter modules installed on the summary date, the total number of those that have transitioned into a Discovered state and the percentage (Discovered meter modules/installed meter modules).

- **Normal**. Of the number of meter modules installed on the summary date, the total of those meter modules that have transitioned to a normal state at that point in time and the percentage (Normal meter modules/installed meter modules).

- **Readings**. Of the total number of meter modules installed on that day, the number of those meter modules that have sent in a billable reading packet, and the percentage (meter modules that have sent a billable reading packet/total meter modules installed on that day).

- **Readings Past 24 Hours**. Of the meter modules that were installed on that day, the total number of meter modules that sent in a billable readings packet in the last 24 hours (from the point the report was generated) and the percentage (meter modules that sent in a billable readings packet in the last 24 hours/total meter modules installed on that day).

- **Cumulative Installed**. The total number of meter modules that have been installed up to that date.

- **Normal**. The total cumulative number of meter modules that have transitioned to Normal status up to that date.

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

- Cumulative number of meter modules installed for each date (**Grey**).

- Current number of meter modules that have transitioned to Normal status (**Green**).

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

Module Alarms

In addition to displaying events associated with electric meter modules, the Meter Alarms section of the AMI Dashboard, shown in the next figure, will display alarms reported by the modules.

Figure 4 - 13. Meter Alarms

Refer to "Module Events" later in this document for details of alarms reported to Command Center by cellular modules.

Meter Exceptions Report

The Meter Exceptions Report allows the user to view all endpoints that have not logged in a user-defined number of days or endpoints that are logging, but are showing no usage. In addition, the Meter Exceptions Report will provide a list of meter modules that have triggered the leak detection event, in a user defined number of days.

Following is the procedure for generating the Meter Exceptions report:

1. Click **Network > Meter Exceptions**. The Meter Exceptions window will open, shown in the next figure.

Figure 4 - 14. Meter Exceptions

2. Select from the following filtering options:

   A. **that have not logged for at least X days**. This filter is useful in identifying the endpoints that have stopped reporting potentially due to connectivity issues, faulty endpoint, etc.

   B. **that only had a billable packet X percent of the time during the past X days**. This filter is useful in identifying endpoints that are not consistently reporting valid readings, indicating potential issue with either the module or the meter.

   C. **that have reported no usage for at least X days**. This filter is useful in identifying locations that have not shown consumption. If consumption is expected, troubleshooting efforts should begin as this may indicate a faulty meter, module, or potential tampering.

   D. **that have never reported usage**. This filter will identify meter modules that are in Normal status but have not reported consumption since installation. If consumptions is expected,

troubleshooting efforts should begin as this may indicate an issue with the endpoint, a faulty meter, or potential tampering.

E. **that have not reported usage X % of the time in X days**. This filter will identify meter modules that are in Normal status but have been intermittently reporting consumption. If consistent consumptions is expected, troubleshooting efforts should begin as this may indicate an issue with the endpoint, a faulty meter, or potential tampering.

F. **that are not communicating**. This report is intended to identify devices that have not reported daily reads or load profile data over the most recent 24 hours.

3. Click **OK** to generate the report. A sample report is shown in the following figure.

Meter Exceptions

Endpoint Actions

Exclude from Not Logging list ▾   for 2 ▾ day(s) from today [Go]

◂ ▸
Meters that have not logged for at least 3 days

0- Electric Meters   **Total Meters: 14**

☐ Meter #	Type	Map Loc	Service Location	Days In	Status	Last Reading	Signal	Ø	Status Groups
☐ EMP_1	Cellular			201	Lost	18/12/2014			
☐ EMP_10	Cellular			202	Lost	17/12/2014			
☐ EMP_11	Cellular			215	Lost	16/12/2014			
☐ EMP_16	Cellular			227	Lost	5/12/2014			
☐ EMP_17	Cellular			201	Lost	16/12/2014			
☐ EMP_2	Cellular			201	Lost	18/12/2014			
☐ EMP_20	Cellular			184	Lost	17/01/2015			

Figure 4 - 15. Meter Exceptions

5
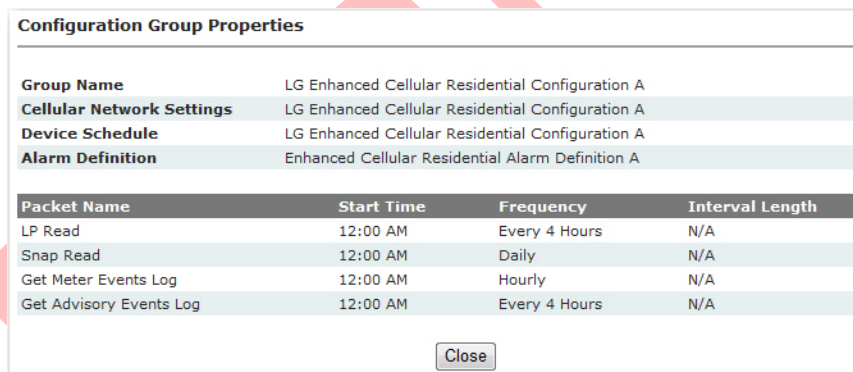
Managing Endpoints

Cellular Endpoint Configuration

Configuration Groups

Cellular meters are automatically placed in the LG Enhanced Cellular Residential Configuration Group A.

To view the configuration group, from Command Center home, select **Setup > Groups > Cellular Residential Meters**.

Configuration Group Properties

Group Name	LG Enhanced Cellular Residential Configuration A
Cellular Network Settings	LG Enhanced Cellular Residential Configuration A
Device Schedule	LG Enhanced Cellular Residential Configuration A
Alarm Definition	Enhanced Cellular Residential Alarm Definition A

Packet Name	Start Time	Frequency	Interval Length
LP Read	12:00 AM	Every 4 Hours	N/A
Snap Read	12:00 AM	Daily	N/A
Get Meter Events Log	12:00 AM	Hourly	N/A
Get Advisory Events Log	12:00 AM	Every 4 Hours	N/A

Close

Figure 5 - 1. Configuration Group Properties

Packet Definitions

Packet Definitions are used to determine what data elements the endpoint will transmit. Endpoints arrive from the factory in operational state with default packet definitions. There are multiple cellular packet definitions that are automatically seeded during the Command Center installation. These packet definitions can be used for On Demand Read commands. New packet definitions can also be created for On Demand Read commands.

To view the packet definition, from Command Center home, select **Setup > Packet Definitions > Cellular Residential**.

Packet Definitions

Name	Type	Notes	Actions
Instantaneous Values (1:N)	On Demand	AverageCurrentValueL1, AverageCurrentValueL3, AverageVoltageValueL1, AverageVoltageValueL3	
LG Cellular FocusAX Default MultiSpeak OnDemand Read	On Demand	Default packet for FocusAX On Demand reads requested through MultiSpeak	
LG Cellular Meter Status Flags	On Demand	Packet to Retrieve Meter Status Flags	
LG Cellular Phase Voltage Report Packet Definition	On Demand	Special packet for use with on-demand function of the Phase Voltage Report	
LG Cellular Residential Packet Definition A	On Demand	kWh, Received kWh, Voltage Phase A	
LG Cellular RIS Read Packet Definition	On Demand	Voltage and phase angle data	
LG Residential Packet Definition A (1:N)	On Demand	kWh, Received kWh, Voltage Phase A	

Figure 5 - 2. Enhanced Cellular Residential Packet Definitions

The following actions may be performed:

- **View**. Select the View icon to open the selected Packet Definition and view its settings.

- **Copy**. Select the Copy icon to open a new Packet Definition window and duplicate the settings from the selected packet definition.

- **Edit**. Select the Edit icon to open the Packet Definitions window and edit the description of the selected packet definition.

- **Delete**. Select the Delete icon to delete the selected packet definition. This option will only be available to user created Packet Definitions.

- **Archive**. Select the Archive icon to archive the selected packet definition. This will remove the packet definition from all packet definition lists. This option is only available to user created Packet Definitions.

New packet definitions can be created for use with On Demand Read and/or Endpoint Configuration. Following is the procedure for creating a custom packet definition:

1. From Command Center home, select **Setup > Packet Definitions > Cellular Residential**. The cellular residential packet definition window will open.

2. Click the **New** button. The Packet Definitions screen will open.

Figure 5 - 3. Packet Definition

3. **Packet Name**. Enter a name for the new packet definition that is unique to the organization.

4. **Edit Description**. Click the link (optional) to enter any desired notes for the packet definition. If any notes were entered, click the OK button to save.

5. **Packet Type**. Select On-Demand.

6. **Select Meter Type**. Select the desired meter type from the drop down menu. Available data options will vary based on the selected meter type.

7. **Available Data Options**. Double click the name of the items to be included in the packet. The items will appear in the Selected Items data window. A packet may contain up to 6 data elements and/or up to a packet size of 96.

8. Click **Save** to save the new packet definition. The Packet Definition window will open and the newly created packet definition will appear in the list.

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 > Cellular Residential** to display the Alarm Definitions screen.
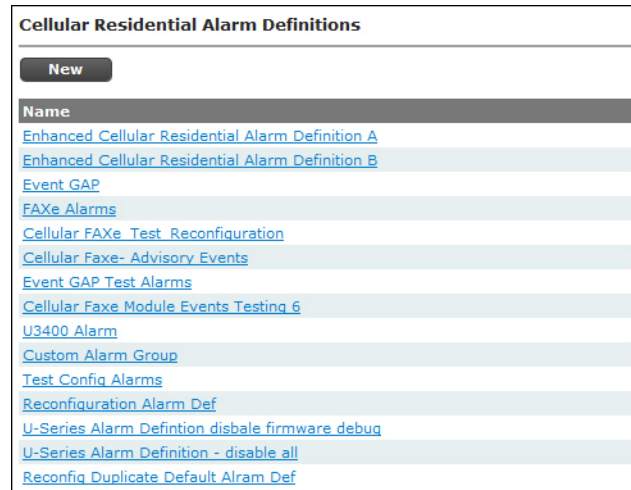
Figure 5 - 4. Cellular Residential Alarm Definitions

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

Figure 5 - 5. 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.

Table 5-1.

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

ⓘ **NOTE:** 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.

Cellular Residential Network Settings

The **Cellular Residential Network Settings**, shown in Figure 5 - 6, establish organization level settings for outage wait values, time synchronization, etc. The Cellular Residential Network Settings are a part of the endpoint configuration and may be modified.


Figure 5 - 6. Cellular Residential Network Settings

Customizing Cellular Configuration

Following is the procedure for creating a new Cellular Configuration Group

1. From Command Center home, select **Setup > Groups > Configuration Groups > Cellular Residential**. The **Cellular Residential Configuration Groups** window will open, shown below in Figure 5 - 7.

Figure 5 - 7. Cellular Residential Configuration Groups

2. Click **New**. The Cellular Residential Configuration Group Properties window will open, shown in Figure 5 - 8.

Figure 5 - 8. Cellular Residential Configuration Group Properties

3. **Group Name**. Provide a name for the new cellular configuration group. This name must be unique to the organization, and should indicate to the user how the group will be used.

4. **Group Notes**. (optional). Enter any relevant notes to describe this configuration group.

5. Available Commands:

   • **Command**. Select the desired packet definition from the drop down list box.

   • **Time**. Select the time that the command (reading) should occur.

   • **Frequency**. Select how often the command should occur.

   • **N**. If frequency "every n minutes" or "every n hours" was selected; enter the value of n.

   • Select the + sign to schedule the RFS event. The event will appear under the **Schedule Commands**.

- **Delay**. Select the Delay check box to allow the endpoint to take a reading, but cache the result for transmission at a different time.

Repeat step 5 for any additional commands. The endpoint has the ability to store twelve scheduled commands.

6. **Network Setting**. Select the desired Network Settings group from the drop down box. Refer to Network Settings for Network Settings configuration.

7. **Alarm Definition**. Select the desired alarm definition from the drop down list box. Refer to Alarm Definitions for Alarm Definitions configuration.

8. Click **Save** to save the new configuration group.

Add Meters to Configuration Group

The **Add Meters to Group** screen allows a user to add a meter, or group of meters, by entering the meter number(s) or importing a formatted meter file.

Following is the procedure for adding meters to a configuration group:

1. From Command Center Home, select **Setup > Groups > Endpoint Configuration Groups > Cellular Residential**. The **Cellular Meter Configuration Groups** window will open.

2. Select the **Add Meters** icon for the desired configuration group. The **Add Meters to Group** window opens, shown in Figure 5 - 9.

Figure 5 - 9. Add Meters to Group window

3. Select the **Meter Number** radio button and enter the appropriate meter number(s). Meter numbers should be separated by commas, spaces or semi-colons.

...or...

Select the **Meter File** radio button and enter the path to the meter file or select browse to navigate to the file.

4. Select **Add** to save changes.

Cellular Reconfiguration Process

The Cellular Reconfiguration process is the process by which Command Center issues reconfiguration commands to modules that have recently been added to a new Configuration Group or User

Defined Addressing Group. By default, this process runs once an hour. This schedule can be changed in the **Process Settings**.

A cellular module will transition to Configure during reconfiguration. When the cellular module responds to the configuration request, the module status will transition back to Normal.

Enhanced Cellular Set Network Configuration Command

The Modify Network Program command allows the user to modify the cellular endpoint's communication parameters from Command Center. Changing any of these values to invalid values will break the cellular endpoint's communication with the HES and there's currently no other way fix it over the air. The meter will need to be configured in diag. mode.

As shown below, the same ports are used on both module and HES. Inbound for module will be outbound for HES and vice versa. So if the user changes the ports, the following M2M Adapter config files will also need to be modified to use the new ports:

- ..\Landis+Gyr\M2MAdapter\M2MListener\LandisGyr.CellularNMS.Listener.exe.config - this config file has HES and firmware download ports.
- ..\Landis+Gyr\M2MAdapter\HeartBeatListener\LandisGyr.CellularNMS.HeartbeatCommunication.exe.config - this config file has the heart beat ports.

To use the command the user has to do the following:

1. Create a network program using the menu option **Setup > Network Program**.
2. Issue **Set Network Configuration** command from EIS screen > Manage tab or from the group commands page.

The functionality listing/adding/editing/deleting a network program is similar to that of other config pages like configuration groups.

Figure 5 - 10. Network Program Details Page

⚠ **WARNING: Changing any of these values to invalid values will break the cellular endpoint's communication with the HES and there's currently no other way fix it over the air. The meter will need to be configured in diag. mode.**

Values that will cause communication to break are designated in ***Bold Italic***.

A network program allows the user to modify the following parameters:

Program Information

- **Name**. Name of the program.

- **Notes**. Any notes you would like to add.

Command Center Listener

- ***Primary IP Address***. This is the Head End System's IP address. For Command Center, this should be the M2M Adapter's IP address. Changing this IP address will cause the endpoints to send all traffic to the new address. There's currently no way to fix the endpoints without putting them in diag. mode.

- **Secondary IP Address**. This is a secondary HES IP address. This is currently not being used by firmware.

- ***Port***. This is the udp port used by the cellular endpoints to send outbound packets. The M2M adapter listens on this port (default 8083).

Firmware Download

- ***Server Port***. The udp port used by the cellular endpoints to send firmware download packets. The M2M Adapter listens on this port.

- ***Client Server Port***. The udp port the cellular endpoints use to receive firmware download packets. The M2M Adapter sends on this port.

Heart Beat

- ***Server Port***. The udp port used by the endpoints to send heart beat packets. The M2M Adapter listens on this port.

- ***Client Server Port***. The udp port used by the cellular endpoints to receive heart beat packets. The M2M Adapter sends on this port.

- **Interval Rate**. The heart beat rate expressed in seconds (default is 300 seconds).

- **Retry Rate**. The heart beat failover threshold (default is 3 times).

NTP Server

- ***Primary IP Address***. The IP address of the NTP server used by the cellular endpoints to get time.

- **Secondary IP Address**. Secondary NTP server. This is currently not being used by the firmware.

Other

- **Cellular Modem random wait before start (min)**. Random wait in minutes before cell modem is started up. This means the modem will wait a random number of minutes between 0 and this number (default 30 minutes).

- *Access Point Name*. Name of the APN server used for communication between mobile network carrier and M2M Adapter.

- *Module Listener Port*. The udp port used by the endpoint to receive packets. The M2M Adapter sends on this port (default 8084).

To send command from EIS Manage tab or Group command page:

1. Select **Set Network Configuration**, and select a network program from the drop down as shown in Figure 5 - 11.

Figure 5 - 11. Manage Tab

2. To read current configuration on the meter, issue the **Get Network Configuration** command as shown in Figure 5 - 12.
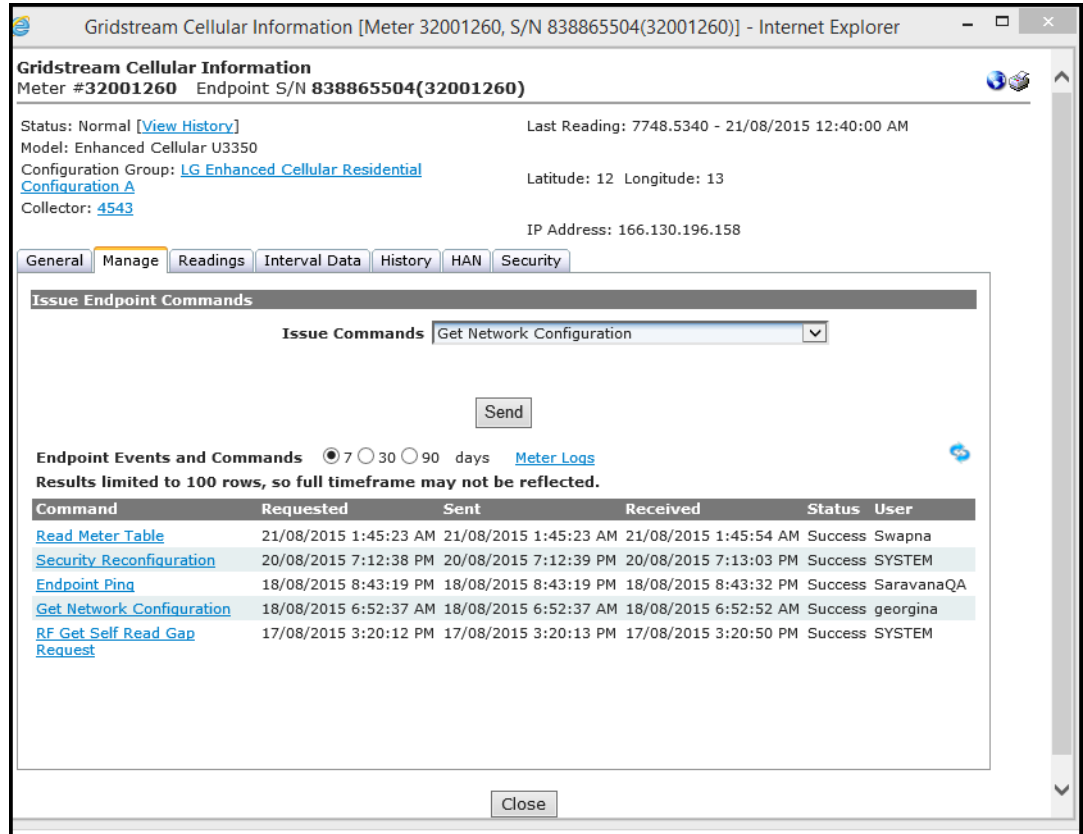
Figure 5 - 12. Manage Tab

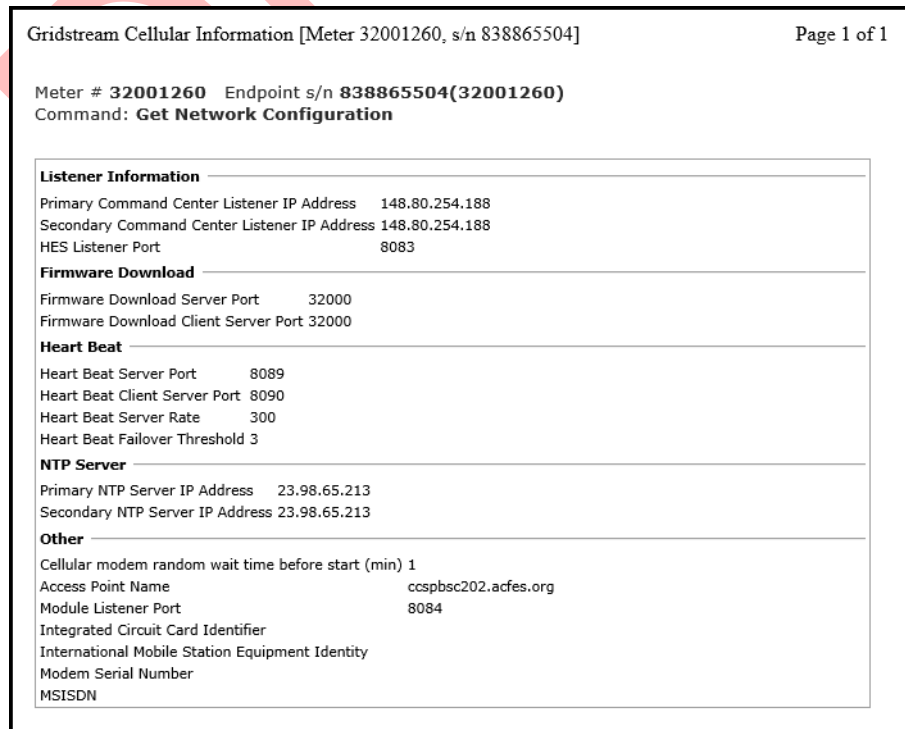3. See the Network Configuration command response as shown in Figure 5 - 13.

Figure 5 - 13. Network Configuration Command Response
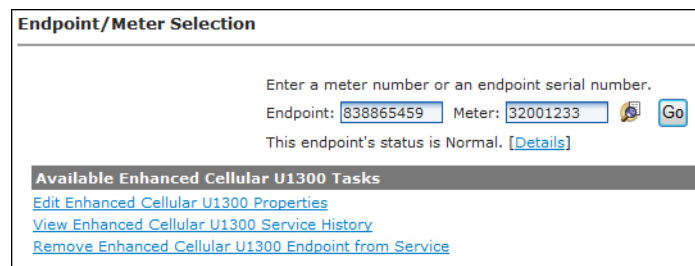
Managing Cellular Endpoints

Gridstream Cellular Information Window

1. Click **Operations > Endpoints**.

   The Endpoint/Meter Selection window will open.

2. To edit existing meter or endpoint information, enter the desired endpoint or meter number in the corresponding field or click the **Find a Meter** icon to search for a meter and click the **Go** button.

   The current status of the endpoint and the list of Available Tasks for the selected Endpoint/Meter Selection are displayed.

   Endpoint/Meter Selection

   Enter a meter number or an endpoint serial number.
   Endpoint: 838865459   Meter: 32001233   [Go]
   This endpoint's status is Normal. [Details]

   Available Enhanced Cellular U1300 Tasks
   Edit Enhanced Cellular U1300 Properties
   View Enhanced Cellular U1300 Service History
   Remove Enhanced Cellular U1300 Endpoint from Service

   Figure 5 - 14. Available Tasks

3. Click the **Details** link to display the Gridstream Cellular Information window.

Figure 5 - 15. Endpoint Information Window

In the top section of the Endpoint Information window the following information will be displayed:

- **Meter #**. Displays the number associated with the selected endpoint.

- **Endpoint S/N**. Displays the Landis+Gyr - assigned serial number of the endpoint in the selected meter.

- **Status**. Displays the current system status of the endpoint. Click the **View History** link to view the status changes for the selected meter.

- **Last Reading**. Displays the last kWh reading and the date and time it was received.

- **Model**. Displays the meter model.

- **Configuration Group**. Click the Configuration Group link to view the Configuration Group Properties menu.

- **Collector**. Displays the name of the virtual collector identifier.

- **Latitude/Longitude**. Displays the latitude and longitude of the endpoint.

- **IP Address**. Shows the selected endpoint's Wide Area Network address.

General Tab

Figure 5 - 16. General Tab

The General Tab displays the following information:

- **Switch State**. The switch state indicates whether the meter is connected or disconnected.

- **Multiplier**. N/A

- **Demand Multiplier**. N/A

- **Meter Dial Digits/Kh**. Displays the number of dials in the meter and the meter's Kh.

- **Initial/Latest kWh**. Displays the original kWh of the endpoint and the latest reported kWh.

- **Module Firmware Version**. Displays the current firmware version of the endpoint/module.

- **Meter Firmware Version**. Displays the current firmware version of the meter.

- **ZigBee Firmware Version**. Displays the current Zigbee firmware version.

- **DCW Version**. Displays the current DCW version.

- **Initial Programming**. Displays the original endpoint programming date.

- **Last Programming**. Displays the most recent programming date.

- **Meter Program ID**. Displays the Meter Program ID for all electric meters.

- **Last Good Packet**. Displays the date and time the last good packet was received.

- Pending Firmware Version. Shows the pending firmware version when a firmware download is in progress.

- **Firmware Download Status**. Displays the status of the current Endpoint Firmware Download command.

- **Will Be Activated On**. Displays the date that a scheduled firmware will be activated.

- **Grid Location**. Displays the meter's grid location (if applicable).

- **Custom #1**. Displays the ICCID associated with this meter.

- **Pole Number**. Displays the meter's pole number.

- **Custom #2**. User defined data field.

- **Meter Position**. Displays the endpoint's meter position (if applicable).

- **Map Location**. Displays the endpoint's map location (if applicable).

- **Customer ID**. Displays the customer's identification number (if applicable).

- **Billing Cycle**. Displays the current billing cycle.

- **Account Number**. Displays the customer's account number (if applicable).

- **Revenue Class**. Displays the revenue class. (if applicable).

- **Service Location**. Displays the customer's service location (if applicable).

- **Command Groups**. Displays any Command Addressing Groups to which the module belongs.

- **Status groups**. Allows the user to add endpoints to a available status groups

  To add the endpoint to a status group:

  - Select a **status group** from the drop-down list box.

  - Click the **Add Group** icon.

- **Notes**. Displays any notes entered into the system previously. Select the Add Note plus (+) sign to add a new note.

Manage Tab

The Gridstream Cellular Information – Manage tab allows the user to issue commands to the current endpoint and view commands previously sent to the endpoint.
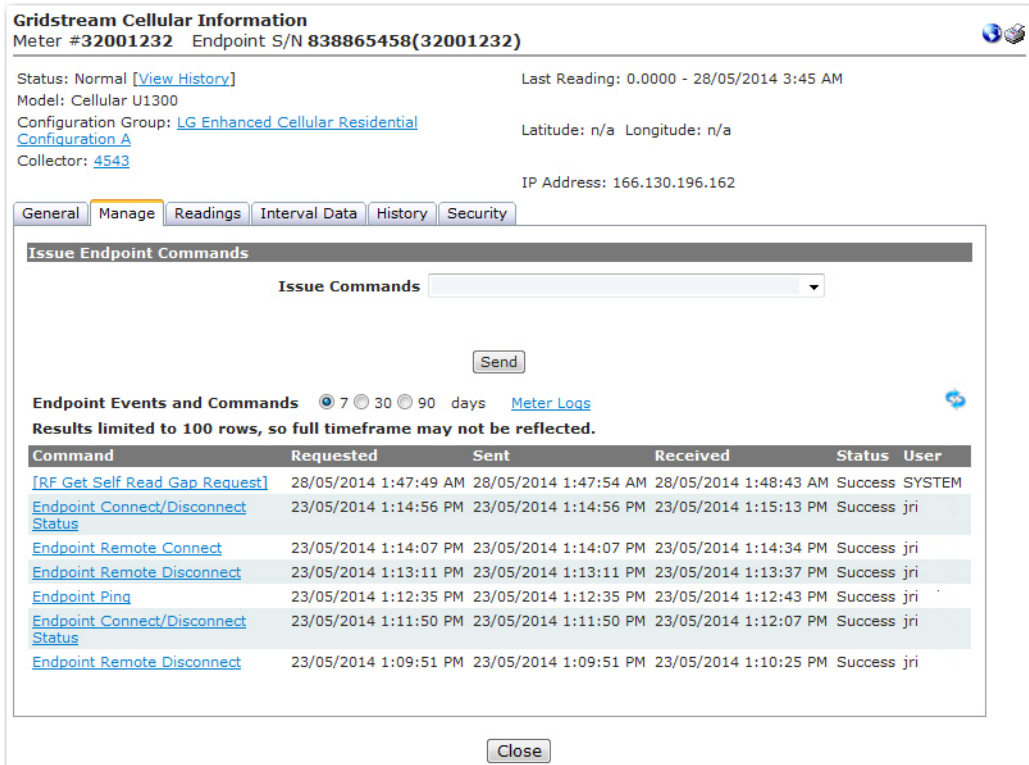
Figure 5 - 17. Gridstream Cellular Information Window

For group commands, cellular meters can be added to Virtual Addressing Groups.

Issue Endpoint Commands

ⓘ **NOTE:** NOTE: The commands displayed will be dependent upon the permissions granted to the user, the selected endpoint and the activated Command Center license(s).
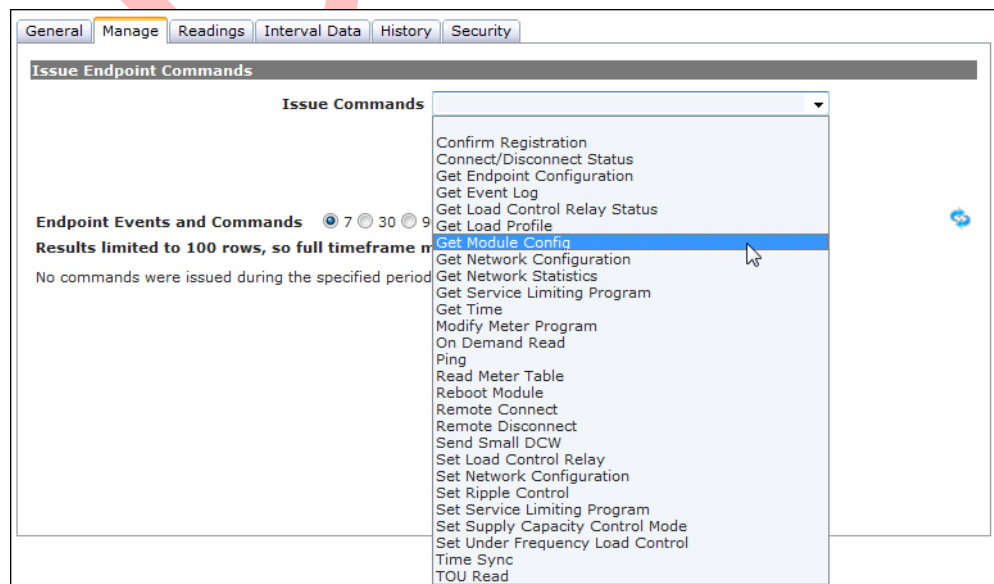
Figure 5 - 18. Issue Commands Selections Vary for Different Endpoint Types

The following commands are supported in Command Center 6.3 MR1 for the Gridstream Enhanced Cellular

Table 5-2. Supported Commands

Name	Description
Confirm Registration	This command will manually send a confirm registration request to the endpoint
Connect/Disconnect Status	This command returns the current connection status of the FOCUS AX/SD meter, as well as load side and line side voltage data
Demand Reset	This command resets the peak registers in the meter and will return the Demand Reset Data.
Demand Reset/Cancel Scheduled Demand Reset	This command allows the user to reset demand and cancel any future scheduled demand resets already sent to the meters. When selected, the user will be able to choose whether to cancel demand reset and reset the demand, or simply cancel demand reset.
Endpoint Firmware Download	This command allows the user to select from a drop down box the desired module firmware. The user may choose to download the firmware immediately, or select a firmware activation date/time. Downloads both the module firmware and the DCW.
Get Endpoint Configuration	This command returns Init push information for electric meters/routers and mesh extenders.
Get Event Log	This command allows the user to select from a drop down list of event logs (HAN Events, Standard Meter Events, Manufacturer Meter Events, All Events) logged over a selected number of days.
Get Load Profile	This command retrieves and displays an on request read of load profile date. The user is able to enter the desired date/time range.
Get Module Config	This command returns information that is not related to the meter, but key configuration of the module associated with the meter. It will return the confirmation that the AMR password is valid, the endpoint's CRC, and time validation information.
Get Network Configuration	Allows the user to view the Command Center Listener address list associated with the endpoint and other modem settings.
Get Network Statistics	Allows the user to view IP and UDP statistics for the cellular radio.
Get Service Limiting Program	This command will display any service limiting program currently loaded in the meter.
Get Time	The Get Time command response returns the meter date and time and the endpoint date and time.
HAN: Clear Devices	This command clears all of the HAN devices associated with meter.
HAN: Commission Network	This command will create the HAN network for the meter.
HAN: Decommission Network	This command may be issued to disable a HAN network in the case of a customer move out.
HAN: Delete Device	This command removes a HAN device from an endpoint.
HAN: Firmware Download	This command downloads the HAN firmware to the meter.
HAN: Get All Devices Info	This command will return information about all of the HAN devices

Table 5-2. Supported Commands (Continued)

Name	Description
HAN: Get Device Info	This command returns device information for a single device by MAC address and Short ID.
HAN: Get Firmware	This command will return the firmware version of the HAN device associated with this endpoint.
HAN: Get Network Info	Returns HAN Channel ID and HAN Personal Area Network ID. This information is useful in determining whether a HAN network has been commissioned.
HAN: Initialization	This command initializes of the HAN device registers to properly display the TOU registers on the HAN device.
HAN: Ping Device	This command will issue a ping to the HAN device.
HAN: Register Device	This command will join a HAN device to the meter.
HAN: Send Message	Allows the user to transmit a message to be displayed on the consumers HAN device.
Meter Firmware Download	Allows the user to push out new meter firmware over the air.
Modify Meter Program	Allow for selecting from a predefined list of meter programs for transmission to the meter.
On Demand Read	This command will return the specified packet working in conjunction with a pre-defined packet definition.
Optic Lockout	This command allows the user to enable/disable/view status of optical probe access.
Ping	This command returns a basic response from the endpoint. This command is useful in determining if communication is available to the endpoint via the mesh network.
Read Demand Reset Data	This command will return from the meter the data captured upon the last demand reset.
Read Meter Table	This command provides the ability to read ANSI C12.19 table from meter. The response is a list of table, offset, length, and data. When the data is returned from the meter it can be displayed in two formats, one is the RAW format as returned by the meter and the other is the interpreted format. A simple check box allows the user to choose which format is displayed.
Reboot Module	Requests the module to perform a reboot.
Remote Connect	This command instructs the meter to connect power at the consumer location. This process automates the connect process, the consumer does not have to activate the service.
Remote Disconnect	This command instructs the meter to disconnect power at the consumer location.
Send Small DCW	Command allows user to send a small DCW to an endpoint.
Reset Meter Data	Allows the user to zero out the meter readings.
Set Network Configuration	Allows the user to change the Command Center Listener address list associated with the endpoint among other modem settings.
Set Service Limiting	Allows the user to set a service limiting program to the meter.

Table 5-2. Supported Commands (Continued)

Name	Description
Time Sync	This command request the endpoint synchronize its time within established boundaries.

Endpoint Events and Commands

- Select the 7, 30, or 90 days radio buttons for expanded data.

- Select the Meter Logs link to open the Log Viewer for the meter.

...or...

- View the events and commands in the manage window.

The Commands section displays the following information:

- **Command**. Displays the command that was issued.

- **Requested**. Displays the date requested.

- **Sent**. Displays the date sent.

- **Received**. Displays the date received.

- **Status**. Displays the status of the command.

- **User**. Displays the user that sent the command.

Import Meter Program

The Import functionality, **Setup > Firmware > Meter Program** is used to import Cellular endpoint models when a meter program file has been imported.

Meter Program						
Endpoint Model	**Program Version**	**Meter FW Version**	**Checksum**	**Description**	**Import Date**	**Imported By**
Enhanced Cellular U3400	0000000-000	S00261-05.05.R42	54DC	Display	21/01/2015 11:31:43 PM	pallavi
Enhanced Cellular U1300	2110040-008	S00244-05.05.R22	6B55	Display	21/01/2015 1:28:52 PM	biswajit
RF U1300	PingCommandForFaxe	1.0		Ping Command For Cellular Faxe	8/01/2015 6:13:23 PM	Manual Script
Enhanced Cellular FOCUS AXe	Ping It	1.0		Ping Command	17/04/2014 10:10:03 AM	Manual Script

[Import] [Delete] [Cancel]

Figure 5 - 19. Import Meter Program

Interval Data Tab

The **Interval Data** tab displays a graph and chart of interval data received from the endpoints for the last day by default.
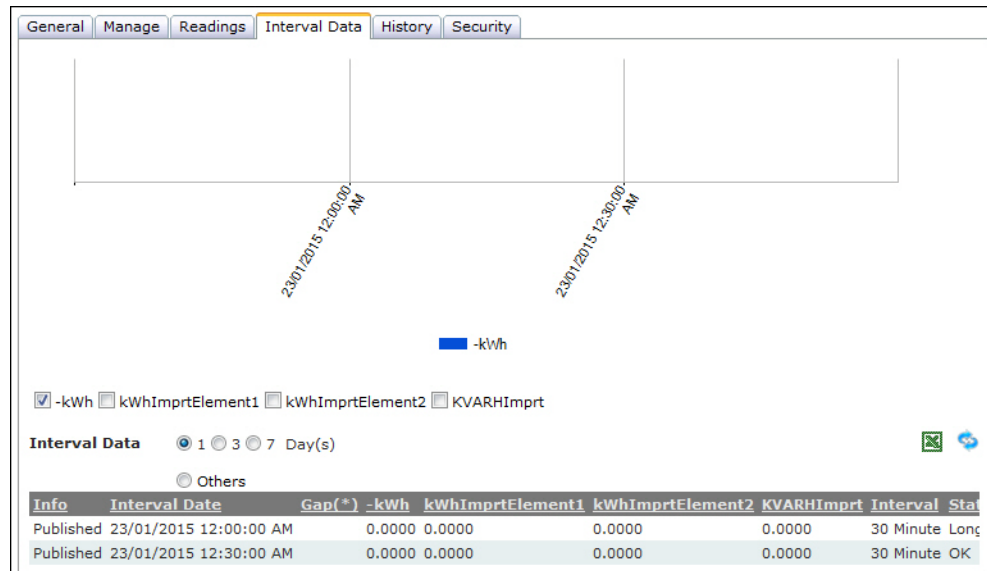
Figure 5 - 20. Interval Data Tab

(i) **NOTE:** NOTE: Filter graph view by selecting any available filer or all.

The **Interval Data** screen provides the following information, columns displayed will vary by meter program:

- **Info**. The Info column lists the method in which the data was provided. A Published Packet refers to a packet that was transmitted by the endpoint.

- **Interval date**. The Interval date column lists the time and date the interval data was measured.

- **Gap (*)**. An asterisk in this column indicates that there are gaps between readings. The missing intervals will be listed in the Interval Data Gaps section of the Interval tab.

- **Interval**. The Interval column lists the interval over which usage was measured.

- **Status**. Indicates the quality of the interval data (OK, short, etc.)

The data can be filtered to display the last 1, 3, or 7 days or by a specific date by selecting the Others option and choosing the date.

History Tab

The History tab provides a list of the events and errors associated with the endpoint.

Figure 5 - 21. History Tab

The following data is provided in the History screen:

- **Events**. Provides description of the event generated.

    - **Received**. The received column lists the date and time the event occurred.

    - **Description**. The description column describes the event.

    - **Event**. The event column provides the name of the event.

    - **Collector**. The collector column lists the virtual collector identifier the endpoint is associated with.

- **Errors**.

    - **Category**. The category column lists the type of event, command or error that has occurred.

    - **Received**. The received column lists the date and time the event, command or error occurred.

    - **Collector**. The collector column lists the virtual collector identifier the endpoint is associated with.

Security Tab

The Security tab provides a place for the security administrator to send endpoint commands related to security settings.
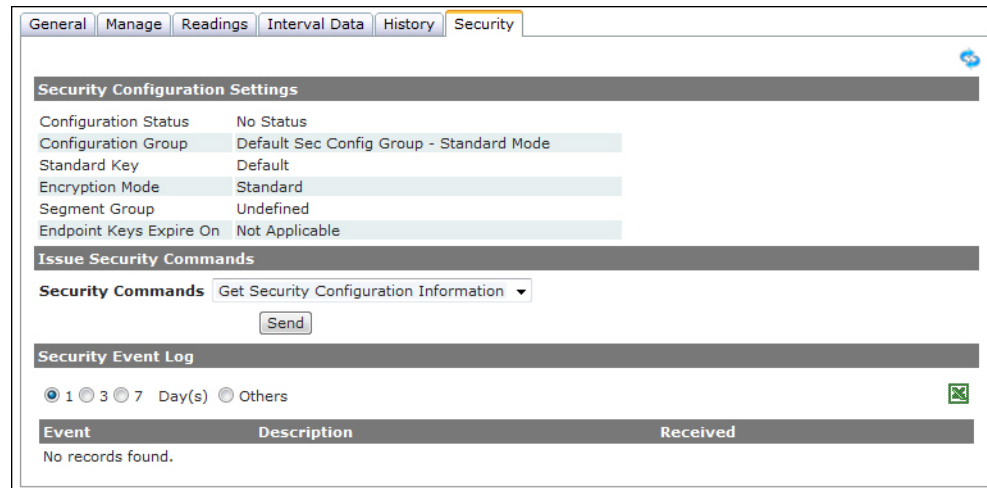
Figure 5 - 22. Security Tab

Security Configuration Settings

The **Security Configuration** settings are displayed:

- **Configuration Status**. The endpoint's security configuration status.

  Valid values are Normal, Processing Keys, Distributing Keys, Failed and No Status. See Endpoint Security Status section for further information.

- **Configuration Group**. The endpoint's current Security Configuration Group.

- **Standard Key**. The endpoint's standard security key.

  Valid values are: Default, Endpoint, Current System Key, and No Standard Key.

- **Encryption Mode**. Valid values are: Open, Standard, Advanced.

- **Segment Group**. N/A

- **Endpoint Key Expires On**. N/A

Security Event Log

To view the **Security Event Log**.

1. Select either the 1, 3 or 7 Day(s) radio button or select Others and select from a date range.

2. Click the **Go** button to view the events. Events may be also be viewed by selecting the Excel icon.
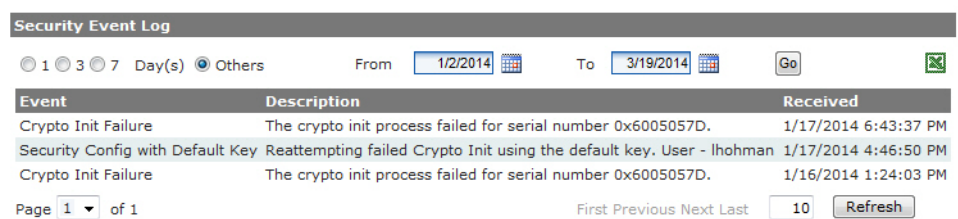
Figure 5 - 23. Security Event Log

Group Addressing

Commands may be issued to endpoints point to point, as described previously, or by group. Group addressing may be use to efficiently communicate with endpoints in the field.

Virtual Addressing Groups

Virtual Addressing Groups may be created for efficiently transmitting commands to specific endpoints. Commands issued to members of virtual addressing groups are not broadcast, each command is sent individually to the endpoint.

Virtual addressing group membership is NOT part of the endpoint configuration, and will not require a reconfiguration.

(i) **NOTE:** Broadcast commands are not supported with Cellular Meters.

Create Virtual Addressing Group

Following is the procedure for creating **Virtual Addressing Groups**:

1. Select **Setup > Groups > Virtual Addressing Groups**. The **RF Virtual Addressing Groups** window will open, shown in Figure 5 - 24.
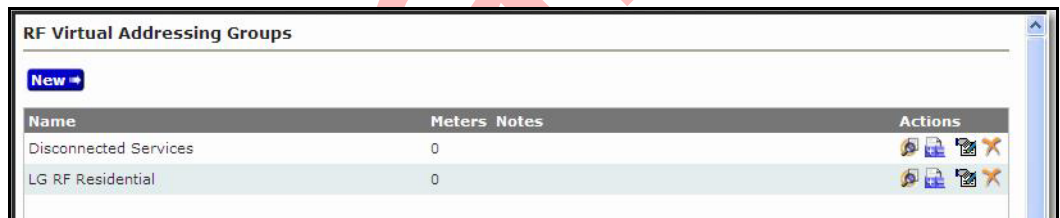
Figure 5 - 24. RF Virtual Addressing Groups

2. Select **New**. The **RF Virtual Addressing Groups Properties** window will open, shown in Figure 5 - 25.
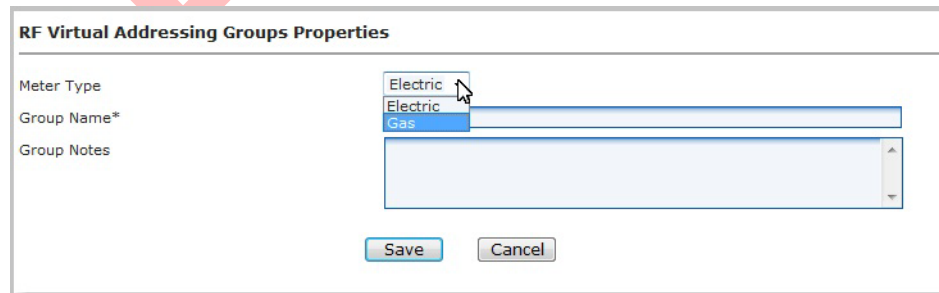
Figure 5 - 25. RF Virtual Addressing Groups Properties

3. **Meter Type**. Select Electric or Gas from the drop down list.

4. **Group Name**. Enter a name for the new addressing group. The name must be unique to the organization.

5. **Group Notes** (Optional). Entered any desired notes.

6. Click **Save**. The newly created group is now displayed in the User Defined Addressing Group window.

Add Meters to Virtual Addressing Group

Following is the procedure for adding meters to a **Virtual Addressing Group**:

1. From Command Center home, select **Setup > Groups > Virtual Addressing Groups**. The **Virtual Addressing Groups** window will open, as shown previously in Figure 5 - 25.

2. Select the **Add/Remove Meters** icon for the desired group. The **Add Meters to Group** window will open, as shown in Figure 5 - 26.

Figure 5 - 26. Add Meters to Group

3. Enter the desired meter numbers separated by colons, semi-colons, or spaces in the **Meter Number** text box.

...or...

   Select **Meter File** and enter the path to a file that contains the meters to be added to the group. Click the **Browse** button to navigate to the appropriate file is necessary.

4. Click **Add** to add meters to the group.

Issuing Virtually Addressed Commands

Following is the procedure to issue a command to a Virtual Addressing Group:

1. Select **Network > Endpoints > Cellular Residential**. The **Manage RF Electric Endpoints** window will open, shown in Figure 5 - 27.

Figure 5 - 27. Manage RF Endpoints

2. **Addressing**. Select **Virtual Addressing Group**, then click the **Select** button to view a list of addressing groups.

...or...

Select Meters, then enter desired meters separated by space, commas or semi-colons.

3. **Command to Issue**. Select the desired command from the drop down list box.

4. Click **Send**. The Manage endpoints screen will display a message confirming the success or failure of the command issued.

The results of virtually addressed commands can be viewed on the **Endpoint Information** screen **Manage** tab, in the **Log Viewer Commands**.
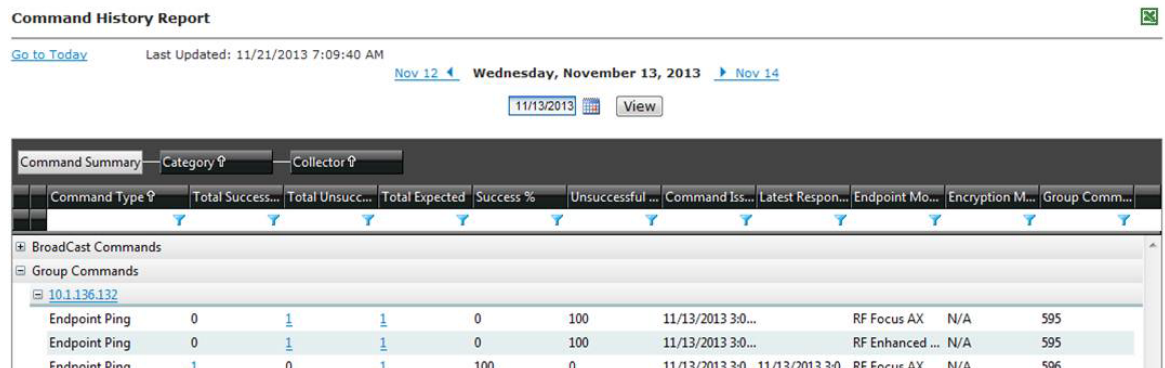
Command History Report

When a command request is initiated, Command Center will retrieve all of the endpoints that match the selection criteria (based on data stored in Command Center). The count will be stored in the Expected total on the **Command History Report**.

Following is the procedure for generating the **Command History Report**:

1. Select **Reports > Command History Report**. The **Command Summary** window will open displaying all group commands on the current date, shown in Figure 5 - 28.

   The **Command Summary** features the Webgrid interface which allows for many sorting and export options.

Figure 5 - 28. Command Summary

2. Click the **plus (+) sign** adjacent to any collector to expand and view commands issued to endpoints on the selected collector.

3. Click the **plus (+) sign** adjacent to **Group Commands**.

   The following information is displayed:

   • **Command Type**. Name of the command.

   • **Total Successful**. Indicates endpoints that successfully responded to the command.

   • **Total Unsuccessful**. Indicated endpoints that were expected to respond successfully but did not.

   • **Total Expected**. Indicates the total number of endpoints that are expected to respond to the command.

   • **Success %**. The percentage of successful responses, when compared to the total expected.

   • **Unsuccessful %**. The percentage of unsuccessful responses, when compared to the total expected.

- **Command Issued**. Indicated the time and date the command was issued.

- **Latest Response**. Indicates the time the last response was received to the command from an endpoint.

- **Endpoint Model**. Indicates the type of endpoint the command was issued for.

- **Encryption Mode**. Indicates the encryption mode that was used to send out the command.

Select the numbered link of **Total or Expected** to view a list of meters. The results to a **Ping** are shown in Figure 5 - 29.

Figure 5 - 29. View Commands

ⓘ   **NOTE: Process Setting:** The **Command History Report Batch Process** must be enabled in the Process Settings for the report to work. The process is defaulted to enabled and to run every 4 hours.

Reports

Command Center 6.3 MR1 and later supports the following reports for the Gridstream Enhanced Cellular. For more information on these reports, please refer to the Command Center Users guide. publication 98-9108.

Table 5-3. Supported Command Center Reports

Report Name	Path in Command Center
Assign Meters to Billing Cycles	Reporting > Billing
Billing Cycles	Reporting > Billing
Billing Progress Report	Reporting > Billing
Data Extract -> Conventional	Reporting > Billing
Data Extract -> Interval	Reporting > Billing
Interval Data Extract	Reporting > Billing
Incremental Daily Reads Extract	Reporting > Billing
Endpoint Data Extract	Reporting > Endpoint Data Extract
Scheduled Endpoint Data Extract	Reporting > Endpoint Data Extract
Meter Change Out	Reporting > Meter Change Out
Meter Program Status Report	Reporting > Meter Program Status Report

Table 5-3. Supported Command Center Reports (Continued)

Report Name	Path in Command Center
Endpoint Information	Reporting > Endpoint Information
Service History	Reporting > Service History
Usage Report > Electric	Reporting > Usage Report
Usage Report > Electric Overall	Reporting > Usage Report
Usage Report > High Usage/High Demand	Reporting > Usage Report
Log Viewer > Commands	Reporting > LogViewer Commands
Log Viewer > Errors	Reporting > LogViewer Errors
Log Viewer > Events	Reporting > Events
Log Viewer > Security Events	Reporting > Security Events
Log Viewer > Meter Logs	Reporting > Meter Logs
Log Viewer > Security Events	Reporting > Security Events
Service History	Reporting > Service History
Log Viewer > Meter Logs	Reporting > Meter Logs
Command History Report	Reporting > Command History Report
Virtual Disconnect Report	Reporting > Virtual Disconnect Report
Momentary Interruptions Alert	Reporting > Validation Group Report
Monthly Usage Threshold Alert	Reporting > Validation Group Report
Sustained Interruptions Alert	Reporting > Validation Group Report
Total Usage Threshold Alert	Reporting > Validation Group Report
Unexpected Demand Alert	Reporting > Validation Group Report
Voltage Threshold Alert	Reporting > Validation Group Report
Daily Usage Alert	Reporting > Validation Group Report
Full Register Reads Alert	Reporting > Validation Group Report
Residential Interval Threshold Alert	Reporting > Validation Group Report
Unexpected Load Side Voltage Alert	Reporting > Validation Group Report
Daily Reads Status Report	Reporting > Daily Reads Status Report

6
Scheduled Demand Reset

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Scheduled Demand Resets

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 reset procedure was executed. **Scheduled Demand Resets** may be performed based on **Billing Cycle** membership, or based on **Virtual Addressing Group** membership. Only endpoints in **Normal** status will be sent the scheduled **Demand Reset** command.

Demand Reset Process

A **Demand Reset** can be set up as a **Scheduled Read** in Command Center.   Once the demand reset date is scheduled, X days prior to the demand reset date Command Center will send 2 scheduled tasks to the endpoints included in the demand reset. The value X is a configurable System Setting in Command Center called the **Scheduled Demand Reset Window to send Commands** and must be between 2-21 days. The two scheduled tasks sent to the endpoints at this time are:

- A temporary task to perform the Demand Reset (snapshot)
- A task to read the Demand Reset data (from S25 table) and transmit it to Command Center.

Then at 12:00 AM on the day the demand reset is scheduled, for each endpoint included in the demand reset:

- The meter creates a snapshot
- The endpoint radio reads and transmits the Demand Reset data

Demand Reset Business Decisions

There are a number of business decisions that the utility must make in regards to how the Demand Reset process is managed. These include:

1. Will demand resets be performed based on Billing Cycle or Virtual Addressing Group?

2. What are the Demand Reset dates?

3. When should the Demand Reset scheduled tasks be sent to the meters?

4. What does the utility do if the Demand Reset fails?

Billing Cycle or Virtual Addressing Group

Basing Demand Resets on either Billing Cycle Membership or Virtual Addressing Group membership will have different consequences when it comes to making changes in group membership:
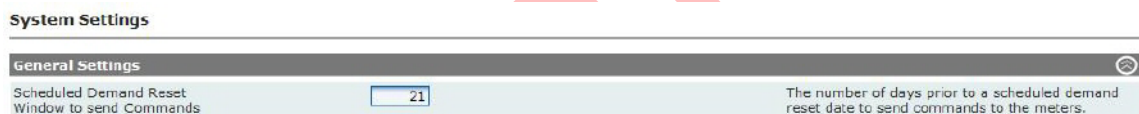
Billing Cycle

- This approach is recommended when all meters in a billing cycle are required to reset demand.

- Billing Cycle membership changes will NOT automatically be reflected in the next demand resets.

Virtual Addressing Group

- This approach is recommended when not all meters in a billing cycle require a demand reset.

- Virtual Addressing Group membership changes will automatically be reflected in next demand resets.

- This approach requires additional management (creating of virtual addressing groups, manually adding meters to virtual addressing groups).

Sending the Demand Reset Commands

The System Setting **Scheduled Demand Reset Window to send Commands** (Figure 6 - 1) determines when the Demand Reset Schedule will be sent to endpoints. This value must be between 2-21 days and has a default value of 21 days. The value used for this setting is business decision made by the utility to help ensure that meters are included in upcoming demand resets.

System Settings

General Settings		⊗
Scheduled Demand Reset Window to send Commands	21	The number of days prior to a scheduled demand reset date to send commands to the meters.

Figure 6 - 1. Scheduled Demand Reset Window to Send Commands

Whether or not newly added meters receive this schedule may depend on what type of group was used for membership:

Billing Cycle Membership

- Meters added to the billing cycle after the commands have been sent to the meter will NOT be included in the upcoming demand reset.

- Meters removed from the billing cycle after the commands have been sent to the meters will still be included in the upcoming demand reset.

For example, if the **Scheduled Demand Reset Window to send Commands** is 5 days and:

The Demand Reset date for Billing Cycle 1 is scheduled for 11/10.

Scheduled Commands are sent on 11/5 to all meters in Billing Cycle 1.

A meter added to Billing Cycle 1 on 11/8 will not receive the schedule for 11/10.

Virtual Addressing Group

- Meters added to the Virtual Addressing Group after the commands have been sent to the meter **will** be included in the upcoming demand reset.

- Meters removed from the Virtual Addressing Group after the commands have been sent to the meters **will not** be included in the upcoming demand reset.

For example, if the **Scheduled Demand Reset Window to send Commands** is 5 days and:

The Demand Reset date for the Virtual Addressing Group is scheduled for 11/10.

Scheduled Commands are sent on 11/5 to all meters in the Virtual Addressing Group.

A meter added to the Virtual Addressing Group on 11/8 will receive the schedule for 11/10.

Scheduled Read with Demand Reset

Following is the procedure for creating a **Scheduled Read with Demand Reset**.

1. Select **Operations > Scheduled Reads > Cellular Residential**. The **Scheduled RF Residential Reads** window will open, displaying any future **Scheduled Reads**.

2. Click **New**. The **Scheduled Residential Read** window will open, shown in Figure 6 - 2.

Figure 6 - 2. Scheduled Residential Read

3. **Name**. Enter a name for the new scheduled read. The name must be unique to the organization.

4. **Reset Demand**. The Reset Demand check box must be selected to initiate the demand reset process at the scheduled time. Once the **Reset Demand** check box is selected the **On Demand Packet** drop down list will be grayed out. It is not necessary to select a packet to be transmitted.

5. **Address Type**. Select the desired **Command Addressing Group(s)** or select the desired **Billing Cycle**.

6. **Request Packet**. Click **On Specified dates** to schedule the on-demand request for specific dates in the future. Enter the specific date(s) in the text box separated by spaces, commas, or semi-colons.

...or...

Click the **Recurring** radio button and enter a **Start Date**. If needed, click the **Calendar** icon to generate a calendar from which to select a start date.

Click the **Show Recurrence Options** radio button to display recurrence choices.

- **Do not repeat**. The Scheduled Read will occur once.

- **Repeat every [1-2-3-4] week(s) on Sunday through Saturday**. The Scheduled Read can be set to repeat every 1, 2, 3, or 4 weeks on any, or all, of the days of the week.

- **Repeat on day [] of each month**. The Scheduled Read can be set to repeat on the same date of each month. Enter a number from 1 to 31.

- **Repeat [] day(s) before the end of each month**. The Scheduled Read can be set to repeat every month on a specified number of days before the last day of the month.

If repeating...

- **Repeat until []**. The Scheduled Read can be set to repeat until the user specified date by clicking the calendar icon and selecting the end date for the Scheduled Read.

7. Click **Save**, to save the new **Scheduled Read**. The **Scheduled RFU FocusAX Reads** scheduled will open, displaying the new scheduled read.

Changing/Deleting Schedules

A future schedule can be changed, deleted or copied on the main Scheduled Reads page.

Schedule Changes.

- If the temporary commands have already been sent down to the meter, Command Center will issue commands to remove the original schedule from the endpoint.

- If the new schedule dates are within the next **Scheduled Demand Reset Window to send Commands** (default 21 days), Command Center will send the schedule to the endpoint.

Schedule Deletes.

- If the temporary commands have already been sent, Command Center will issue commands to remove the original schedule from the meter.

Scheduled Command Workflow Process

Once the Demand Reset is scheduled, X days before the Demand Reset date (X = Window to Send Scheduled Commands) Command Center will issue a **Send Scheduled Command** command. The Process Setting **RF Scheduled Demand Reset Workflow** dictates how frequently Command Center will re-issue the Demand Reset commands to endpoints that have not acknowledged receipt of the schedule. By default, this process runs every 30 minutes with a maximum number of retries equal to 5.

Monitoring Demand Resets

Command Center monitors two aspects of the demand reset process:

- Did the schedule reach the meters?
- Did the demand reset occur as scheduled?

Verifying Receipt of the Schedule

Individual verification that the **Send Scheduled Command** was issued and reached a designated meter is visible on the individual **Gridstream RF Endpoint Information - Manage tab**. Group verification of the receipt of the scheduled commands by designated meters can be done via the **Endpoint Report for Scheduled Reads with Demand Reset**.

Endpoint Report for Scheduled Reads with Demand Resets

The **Endpoint Report for Scheduled Reads with Demand Resets** provides a list of all endpoints scheduled for reset and the current status of the reset.

Following is the procedure for generating the **Endpoint Report with Scheduled Demand Resets**.

1. Select **Operations > Scheduled Reads > RF Residential**. The **Scheduled Reads** window will open.

2. Click the **Scheduled Demand Reset Status** link. The **Endpoint Report for Scheduled Reads with Demand Resets** window will open, shown in Figure 6 - 3.
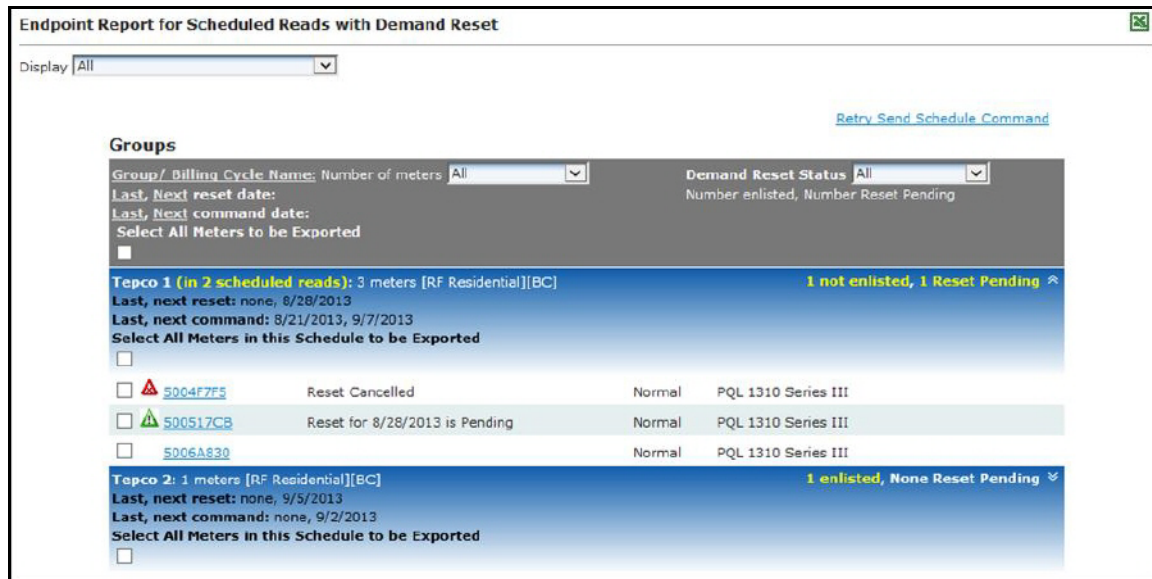
Figure 6 - 3. Endpoint Report for Scheduled Reads with Demand Reset

The user can filter the report, by selecting a status from the **Demand Reset Status** drop down list.

The following information is displayed:

- **User Defined Addressing Group**. The report is filtered by User Defined Addressing Group.

- **Number Enlisted**. This number indicates the total number of endpoints that are included in the demand reset. Only those meters in Normal or Configure status can be enlisted.

- **Last, Next Reset**. This indicates the last time the endpoints were scheduled to be reset, and when the next time the endpoints are scheduled to be reset.

- **Last, Next Command**. The last value indicates the last date the command was sent to the meter. The next value indicates the next date the reset will be sent to the meter.

- **Meter Number**. Lists the meter numbers of those endpoints scheduled for rest. Click the meter number hyper link to open the Endpoint Information screen.

- **Reset Status**. See Table 6-1, "Demand Reset Status - Legend." for description of Demand Reset Status

- **Meter Status**. Meter status shows the current status of the endpoint (Installed, Discovered, Normal, Lost).

Table 6-1. Demand Reset Status - Legend

Symbol	Description
⚠	**Green Caution Sign** - Pending - The endpoint has successfully heard the demand reset commands. Includes all endpoints that are in the process of being reset, but have not yet successfully returned a confirmation event and are within the 24 hour window.
⚠	**Yellow Caution Sign** - Command Center is in the process of sending the demand reset schedule to devices
⚠	**Red Caution Sign** - Demand reset schedule failed to reach the meter

The meters displayed in the **Endpoint Report for Scheduled Reads with Demand Reset** may be exported:

3. Select the **Select Meters to be Exported** check box.

4. Select the check box next to the meters to be exported, as shown in Figure 6 - 4.

Figure 6 - 4. Endpoint Report for Scheduled Reads with Demand Reset

Retrying a Scheduled Command

In the event that network connectivity issues prevented the schedule from reaching the meter and the connectivity issues have been resolved, the schedule may be reissued from this report. The user may easily resend the demand reset schedule command to meters that have not received it by selecting the **Retry Scheduled Command** link.

The **Endpoint Report for Scheduled Demand Resets** report will refresh to display only those meters that have failed to receive the command with check boxes, to allow the user to select those meters that the command should be sent to.

If the meter is reachable, the meter's scheduled demand reset status would transition to **Pending**. If the meter is still unreachable, the status will be unchanged

Verifying the Demand Reset

Process Setting: The **Confirm RF Demand Reset** Process Setting monitors the meters that are expected to reset demand. The default frequency is every 4 hours.

If the Demand Reset packet has not been received within the first four hours of the demand reset day, Command Center will send a request for the Demand Reset Data packet. At the end of the day, if Command Center has not received the demand reset data, an **RF Demand Reset Failure** event will be displayed on the AMI Dashboard as shown in Figure 6 - 5.

Figure 6 - 5. AMI Dashboard - Endpoints

This alert will remain on the AMI Dashboard until the next successful scheduled demand reset.

The **Endpoint Report for Scheduled Reads with Demand Resets** report may also be used to monitor the success or failure of demand resets. See Table 6-2, the color-coded icons provide an indication of the status of demand resets.

Table 6-2. Demand Reset Status - Legend

Symbol	Description
	Red Stop Sign - Demand reset failed to occur as scheduled. Includes all endpoints that did not successfully reset their demand within the 24 hour window.
	White Yield Sign - Demand Reset occurred as scheduled.
	Yellow Sign with Clock - The endpoint has not successfully reported demand reset data and is within the 24 hour window. This will be displayed only after a device has transitioned to Pending, and will precede either a Scheduled Demand Reset Success or a Scheduled Demand Reset Failure status.
	No Symbol - Indicates the endpoint has successfully reset demand

Failure to get a Demand Reset event may result from the following conditions:

- The endpoint did not receive the command. Command Center will attempt to send the schedule demand reset command to the endpoint five times by default. If unsuccessful, the endpoint demand reset status will be changed to failed.

- The endpoint received the command but the reset failed

- The demand reset occurred and the data was sent but the data was not received by Command Center.

After a failure has been recorded, the user must manually retry the demand reset. The manual retry may be performed point to point for an individual endpoint, or may be group addressed.

ⓘ **NOTE:** If there are future Demand Reset dates scheduled for the meter, Command Center will

schedule the next reset (during its normal process), regardless of a past Demand Reset failure.

Canceling a Demand Reset

A **Scheduled Demand Reset** may be canceled point to point or group based. Following is the procedure to cancel a Scheduled Demand Reset, point to point:

1. From the **Gridstream RF Endpoint Information** screen, select the **Manage** tab.

2. From the **Command to Issue** drop down box, select **Demand Reset/Cancel Demand Reset**. The screen will refresh to display demand reset options check box, as shown in shown in Figure 6 - 6.
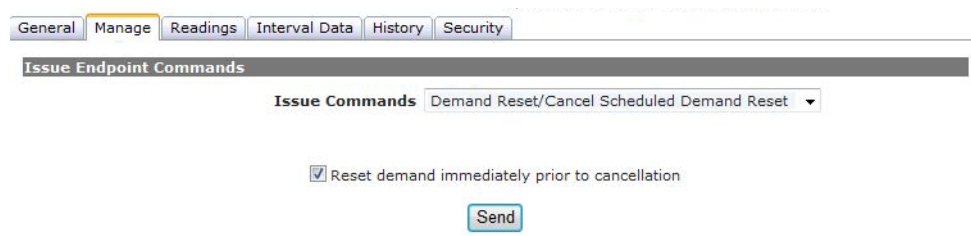
Figure 6 - 6. Gridstream RF Endpoint Information - Manage Tab

3. Select the **Reset demand immediately prior to cancellation** to perform a demand reset, and cancel the scheduled demand reset. De-select the check-box to simply cancel the demand reset.

4. Click the **Send** button to issue the command.

The **Demand Reset/Cancel Demand Reset** command may also be issued to **Virtual Addressing Groups** via **Network > Endpoints > RF Electric Grp Cmds**.

Unexpected Demand Reset

When demand is reset at a meter in the field, an **Unexpected Demand Reset** event occurs and is sent to Command Center. An AMI Dashboard alert of the same name will reflect the number of events that have occurred.

SystemSetting: The System Setting **Automatically Retrieve Manual Demand Reset Data** allows the utility to read demand reset data from the meter when Command Center receives an Unexpected Demand Reset.

Figure 6 - 7. Unexpected Demand Reset

7
Specifications

LANDIS+GYR

Specifications

Radio

Table 7-1. Cellular

Cellular			
Max Output Power	3G*	24dBm +1/-3	
Transmit Frequency	3G	Band II Band V	1850-1910 MHz 824-849 MHz
Receive Sensitivity	3G	Band II Band V	-107dBm -108dBm
*Meets requirement of 3GPP release 5			

Table 7-2. Electrical

Electrical	
Voltage	12 - 24V (From meter power supply)
Power	Max 2.0W Typical 0.8W

3G

- 3G meets the requirements of 3GPP release 5

ZigBee Transmit Power and Receive Sensitivity

Table 7-3. ZigBee Radio General

Parameter	Value			Units	Comments
	Min	Typ	Max		
RF Frequency Range	2.405		2.475	GHz	
No. of Channels		15			
Modulation Type		O-QPSK			Comply with IEEE 802.15.4
Data rate		250		kbps	
IEEE Specification		802.15.4			
On air Tx time (duty cycle)		66		%	66ms per 100ms max (per Ember)
Memory RAM Flash		12 192		KB	
Antenna type		Inverted F			Printed
Peak antenna gain		-3.07		dBi	Peak gain
Antenna polarization		vertical			

Table 7-4. ZigBee Transmitter

Parameter	Value			Units	Comments
	Min	Typ	Max		
Output power (conducted)			19	dBm	Measured at room temp.
Frequency stability	-40		+40	ppm	
Error vector magnitude		5	30	%	
Power Spectral Density/3kHz BW		6		dBm	
6 dB Bandwidth		1.59		MHz	Modulated

Table 7-5. ZigBee Receiver

Parameter	Value			Units	Comments
	Min	Typ	Max		
Sensitivity		-104	-101	dBm	At 35% PER
Adjacent Channel Rejection		40		dBc	
Image Rejection		30		dB	Per Ember

Environmental

Table 7-6. Environmental Specifications

Parameter	Min	Max	Units	Notes
Storage temperature	-40	85	°C	
Operating Temperature	-40	70	°C	
Relative Humidity	0	95	%	Non-condensing

Mechanical

Table 7-7.

Parameter	Value
Size	2.6 W x 5.6 L x 1.16 H inches, typical (excluding antenna)
Weight	2.4 ounces typical

Regulatory Compliance

Table 7-8. Regulatory Compliance

Parameter	Comments
Cellular Radio	Meets Sierra Wireless design criteria in order to use the FCC ID of their existing modular approval.
ZigBee Radio	FCC CFR Title 47, part 15.247
Conducted Emissions	ANSI C12.1-2008 section 4.7.3.13 Test 27 FCC CFR Title 47, part 15 subpart A and B, class B
Radiated Emissions	ANSI C12.1-2008 section 4.7.3.13 Test 27 FCC CFR Title 47, part 15 subpart A and B, class B
Electrostatic Discharge Immunity	ANSI C12.1-2008 section 4.7.3.14 Test 28 IEC 61000-4-2 Level 4
Radiated RF Electromagnetic Field Immunity	ANSI C12.1-2008 section 4.7.3.12 Test 26 IEC 61000-4-3 Level x (15V/m)
Electrical Fast Transient/Burst Immunity	ANSI C12.1-2008 section 4.7.3.11 Test 25 IEC 61000-4-4 Level 4 Additional requirement of 4.4kV test voltage
Surge Immunity (Combination Wave)	ANSI C12.1-2008 section 4.7.3.3 Test 17 IEEE C62.41.2-2002 Category B IEC 61000-4-5 Level x (6kV)
Surge Immunity (100 kHz Ring Wave)	ANSI C12.1-2008 section 4.7.3.3 Test 17 IEEE C62.41.2-2002 Category B IEC 61000-4-12 Level x (6kV)
Surge Immunity (1 MHz Oscillatory)	ANSI C12.1-2008 section 4.7.3.11a Test 25a IEEE C37.90.1-2002 IEC 61000-4-18 Level 3

Table 7-8. Regulatory Compliance (Continued)

Parameter	Comments
10 kV Surge Immunity	±10kV Combination Wave, 10 strikes @ 90° from L1 to L2
Voltage Dips and Interrupts Immunity	ANSI C12.1-2008 section 4.7.3.2 Test 16 IEC 61000-4-11 Level 0, 40, and 70
Mechanical shock	ANSI C12.1-2008 section 4.7.3.18 Test 32 IEC 60068-2-27: 1987
Mechanical Vibration	ANSI C12.1-2008 section 4.7.3.20 Test 34 IEC 60068-2-6: 1987
Accelerated Life Test	For expected life of 10 years: 82°C with 85% Relative Humidity 650 Hours - Fully functional
IPC A-610D:2005	Acceptability of Electronic Assemblies

Environmental, Health and Safety

This product is designed and constructed so that no safety hazard will occur to people or the environment when correctly installed and with normal use.

Customer Service

Contact Landis+Gyr Customer Support at solutionsupport.na@landisgyr.com or call 888-390-5733 with any questions or problems, and they will guide you through the troubleshooting process.