



# OTV Supplement: Electric AMI

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On-Ramp Wireless Inc.  
10920 Via Frontera, Suite 200  
San Diego, CA 92127  
U.S.A.

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OTV Supplement: Electric AMI User Guide

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# Revision History

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Revision	Release Date	Change Description
A	September 13, 2013	Initial release.
B	November 14, 2014	Updates for OTV 1.1.
C	November 6, 2015	Updates for OTV 1.2.

# 1 Electric AMI Application Introduction

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This document describes the basic operational functions and capabilities of the On-Ramp Wireless Electric AMI (Advanced Metering Infrastructure) application which consists of the On-Ramp Wireless eMCM (Electric Meter Communication Module) integrated with various electric meters using the On-Ramp Total View (OTV) device monitoring system.

This is a supplemental document to be used in conjunction with the following publications which are available for On-Ramp Wireless RPMA Networks:

- OTV Operator Guide (010-0106-00)
- EMS Operator Guide (010-0107-00)
- HES/OTV AMI Interface Guide (010-0120-00)

The eMCM is a compact, integrated wireless meter communication module designed for use with the energy-only GE I-210+ meter family as well as ANSI C12.19 compliant meters such as the GE I-210+c, GE kV2c, GE SGM3011, and GE SGM3031. The eMCM contains a low power radio, referred to as the Node, which utilizes the On-Ramp Wireless RPMA technology for bidirectional communication with back-office applications on the network.

It is assumed that the user has a basic familiarity with On-Ramp Wireless devices and network concepts, as well as knowledge regarding the operating characteristics of the particular meter type being used. Because of the wide variety of meters that are supported by the AMI application in OTV, some of the OTV capabilities are dependent on whether the meter itself supports the feature in question. Thus the user needs to be aware of the capabilities and limitations of each meter in order to properly use the OTV device monitoring system.

This document applies specifically to OTV version 1.2.6.7.

## 2 AMI Remote Operation

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### 2.1 Prerequisites

This document assumes that the user has a meter with an eMCM—collectively referred to as an AMI device—that is provisioned and ready to join the On-Ramp Wireless RPMA network. Information on provisioning and device pre-configuration is covered in the *Network Security Specification (014-0043-00)*. This document also assumes that the security keys for the AMI device have been imported into the On-Ramp KMS (Key Management Server) and that the Node contained within the eMCM has been added to the On-Ramp Wireless RPMA Network via the On-Ramp Network Element Management System (EMS).

### 2.2 Basic AMI Device Setup and Configuration

In addition to the prerequisite steps outlined above, OTV must be first configured so that it is aware of the relationship between each eMCM (specifically the Node MAC address) and the meter serial number to which it associated. Without this association, the OTV system cannot properly process any uplink messages that may be sent by the AMI device.

#### 2.2.1 Marriage File

The Node to meter association is established by the use of an XML or CSV formatted “marriage file” which contains the Node MAC address and meter serial number for one or more AMI devices. The marriage file is generated by the meter manufacturer as part of the manufacturing process and delivered to the network operator, along with the security keys discussed above, when the meters are shipped to the customer.

The marriage file can be imported into OTV by navigating to **Devices → Meters** and selecting the **Import** link in the upper right portion as illustrated in Figure 1, which causes the **Import File Listing View** to appear. Figure 1 illustrates what a network with

Clicking on **Import File** from this page causes the Import File dialog box to appear as shown in Figure 2.

From the **Import Type** pull down menu, select Meter Marriage File (csv) or Meter Marriage File (xml). Afterwards, browse to the location of the marriage file and select it for importing. Optionally, any comments or additional information can be added to the **Notes** section.

Select the **Submit** button to import the marriage file.

For more information on the marriage file process, refer to the *HES-OTV AMI Interface Guide (010-0120-00)*.



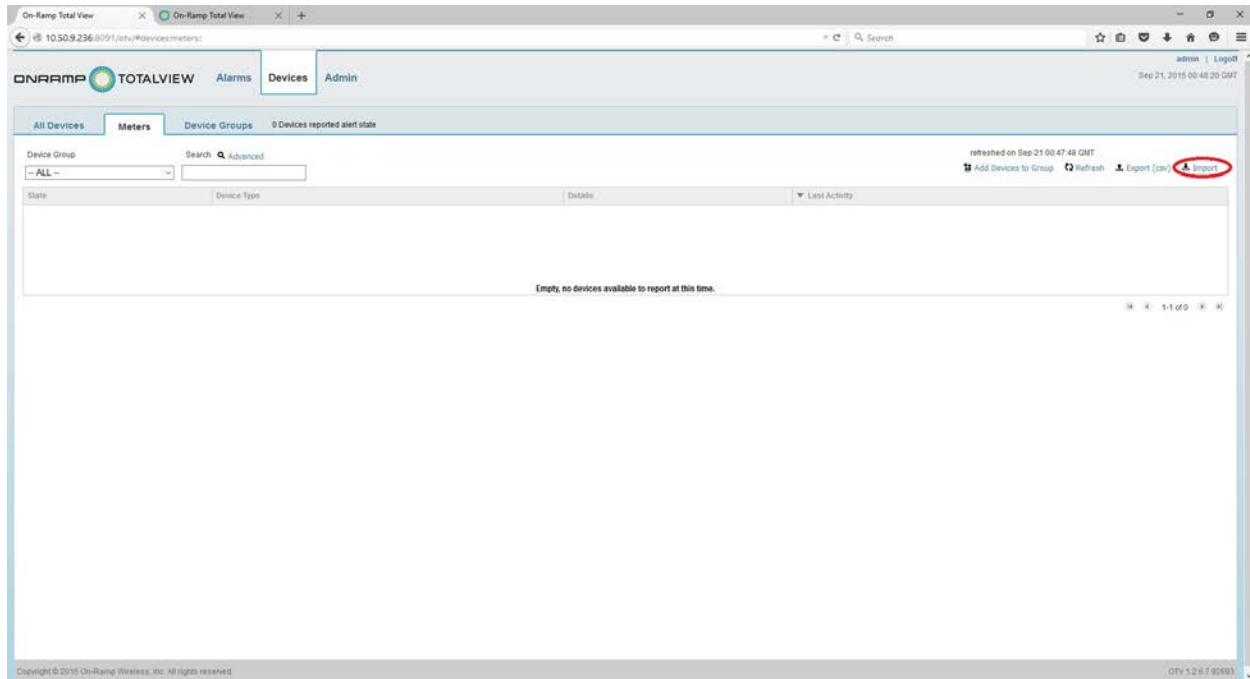


Figure 1. OTV File Import

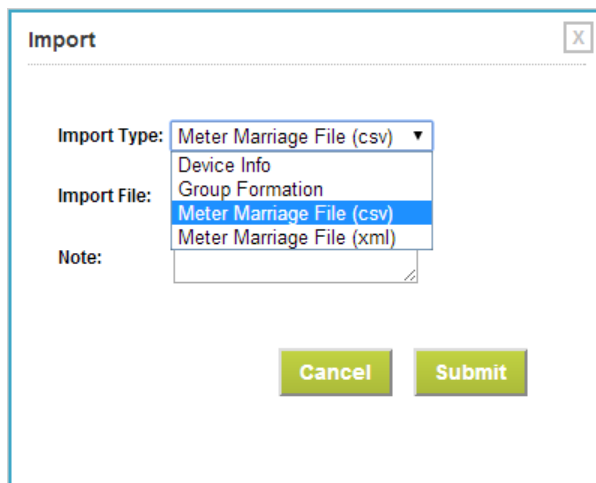


Figure 2. OTV File Import Pop-Up Window - Marriage File

## 2.2.2 Device Info File

In addition to the meter serial number associated with each particular Node MAC address as established by the Marriage File, OTV also maintains other attributes for each AMI device such as a user specifiable description, meter billing cycle, street address including city, state, and ZIP code, and latitude and longitude. These attributes are optional and can be specified manually by the user for each meter by selecting the desired meter under **Devices** → **Meters**, which displays the **Device Detail** window. Select the **Properties** link in the upper right of the window to be taken to the **Properties Page**.

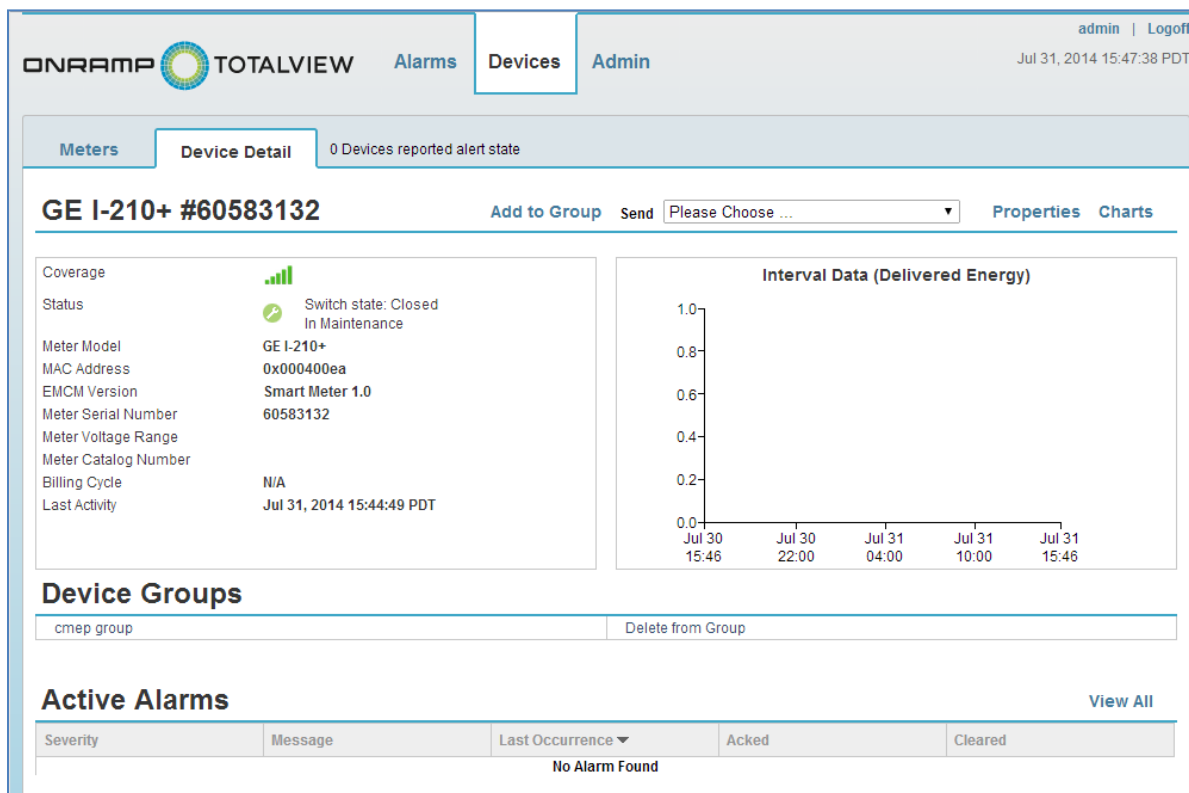


Figure 3. Device Details Window

In the device **Properties** window, the aforementioned device attributes may be entered or edited. To save changes, click on the **Save** button located at the bottom of the page.

The screenshot shows the 'On-Ramp Total View' web application. The 'Devices' tab is selected, and the 'Properties' sub-tab is active for device 'GE I-210+ #54913826'. The form contains the following fields:

- Operation State: Operational (dropdown menu)
- Description: (text input)
- Bill Cycle: (text input)
- State: (text input)
- Data Reporting Config Name: (210\_1hrRept15minRead)
- City: (text input)
- Street Address: (text input)
- Zip: (text input)
- Latitude: (text input)
- Longitude: (text input)

At the bottom, there are 'Delete' and 'Save' buttons. A note at the bottom center states: 'Update device Attributes and click "Save". Use "Delete" to remove the device from display.'

Figure 4. Device Properties Window

In addition to manually entering device attribute information as previously described, OTV also provides the capability of uploading an XML file containing the device attributes for one or more AMI devices. This simplifies the process for large numbers of AMI devices. The process for uploading a device attribute information file is similar to that for the marriage file. Select the same **Import** link which can be found under **Devices** → **Meters** as previously shown in Figure 1 which displays the **Import File Listing** view. From this page, click on **Import File**, however, this time select **Device Info** from the **Import Type** pull-down menu, as shown in the following figure.

The screenshot shows the 'Import' pop-up window. It contains the following elements:

- Import Type:** A dropdown menu with 'Device Info' selected.
- Import File:** A list of options: 'Group Formation', 'Meter Marriage File (csv)', and 'Meter Marriage File (xml)'.
- Note:** A text area for additional information.
- Buttons:** 'Cancel' and 'Submit' buttons at the bottom.

Figure 5. OTV File Import Pop-Up Window - Device Info File

Click on the **Browse** button and navigate to the XML device attribute information file to be imported. Enter any optional comments in the Notes section and then click the **Submit** button to import the file into OTV.

Note that the device attribute file can contain a subset of all the allowed attributes. Furthermore, more than one device attribute file can be used to import different attributes. Only the attributes that are explicitly contained in the device attribute file are updated. Any existing device attribute values in OTV are not affected by a subsequent import if those attributes were not in the subsequently imported file. For example, if a device attribute file is imported that populates the street address, city, state, and ZIP code, but then another device attribute file containing longitude and latitude information is imported at a later time, the existing street address attributes remain intact.

## 2.2.3 AMI Application Configuration

OTV supports an optional email alarm notification engine. Depending on operating procedures, the operator can use the email notification system to supplement day-to-day operations.

The types of alarms are specific to the OTV application type. For the AMI application, OTV currently supports the following alarms:

- AMR Error
- High Temperature
- Meter Config Error
- Meter Info Change
- Metering Problem
- Power Fail
- Reverse Energy Flow
- Service Error
- Tamper Detected
- Timeout Exceeded

The preceding list of AMI application alarms is a superset of the alarms supported by various meter types. Each meter typically supports only a subset of these alarms as enumerated in Appendix A.

OTV can be configured to send notifications to a list of email addresses for each of the alarms listed above. A different email notification list can be used for each alarm. Furthermore, each alarm can be assigned an alarm severity level for the list below:

- Critical
- Major
- Minor
- Info
- None

By default, OTV assigns these severities to the existing alarm types; however, these can be configured as explained in section 2.4. Additionally, Notification Groups must be configured before email notifications are sent out. Please see section 2.4 for a step-by-step process detailing how to create and modify these groups.

For additional information on the general alarm notification setup and behavior, refer to the *OTV Operator Guide (010-0106-00)*.

## 2.3 AMI Device Operation

When an AMI device initially joins a network, one of the first application messages transmitted to the network is a Meter Information message which contains information about the meter as well as its associated eMCM. The specific content of this message depends on the capabilities of the meter. In the case of meters that are capable of reporting their own meter serial number and meter identification string, these attributes are contained in the Meter Information uplink message. Meters that do not support this capability, such as the GE I-210+, do not contain such information.

In AMI 1.1 and AMI 1.2, the join process is divided into sub-messages. A low overhead Boot Indication message is always transmitted (and retransmitted, as necessary) every 30-60 minutes, or every 4-8 hours depending upon the eMCM authorization state. Meter information messages are transmitted only if the meter information has changed since the last successful receipt. This decreases the overhead of joining on a normal device boot.

The information contained within the Meter Information message is stored by OTV upon receipt. This information is accessible for each AMI device via the **Diagnostic Details** link at the bottom left corner of the device **Properties** tab as illustrated below in the following figure.

On-Ramp Total View

10:50:115 / info/#devices/detail/prod/id=22/device/type=530

Search

10 Devices reported alert state

## Properties for GE I-210+ #54913826

Operation Status: Operational Fault notification will be sent if it is configured.

Description:

Bill Cycle:

State:

Data Reporting Config Name:

City:

Street Address:

Zip:

Latitude:

Longitude:

Update device attributes and click 'Save'. Use 'Delete' to remove the device from display.

Delete Save

Save

**Figure 6. Meter Information and Diagnostic Details in Meter Device Properties Window**

## 2.3.1 AMI Device Operational States

When an AMI device is first added to OTV by importing the marriage file, its operational state defaults to 'Not Deployed' mode. OTV supports the following distinct operational states for AMI devices:

- Not Deployed
- Maintenance
- Operational
- Out of Service

The Maintenance state allows OTV to receive and process uplink messages from AMI devices, as well as send downlink messages to devices, but does not generate any active alarms or notifications while in the Maintenance state. However, a device that has an alarm triggered while in Maintenance state will still show up in OTV in an alarmed state. The device will populate on the **Alarms** tab, but any alarms received during this time will not show up under **Active Alarms** or send out notifications. The Maintenance state allows an AMI device to be installed or serviced without generating unnecessary active alarms or notifications. While a device is in Maintenance mode, its status icon includes a wrench symbol to indicate its Maintenance mode status, and if the device triggers any alarms, this wrench symbol will update according to the severity of the alarm.

Once an AMI device has been installed and placed into service, an OTV operator can change its operational state to 'Operational' which is the nominal functional state for devices for day-to-day operations. When a device is in the Operational state, OTV generates all appropriate alarms for the device and, if configured to do so, sends out alarm notifications to registered users.

The Out of Service state can be used by OTV operators to identify and classify AMI devices that are no longer part of the operational network. When an AMI device has been placed into the Out of Service state, OTV does not generate any alarms or notifications for Out of Service devices. The device status in various OTV windows is shown as Out of Service and the status icon is grayed out. OTV also supports a configurable option (via the `electricami.properties` configuration file) to drop all uplink messages from AMI devices that are Out of Service, although this is not enabled by default.

To change the operational state of an AMI device, select the device from the list of devices displayed in the Meters tab to bring up the Device Details tab. Click on the Properties link in the upper right corner (see Figure 3). The operational state can then be selected via the pull-down menu at the top of the Properties page as illustrated in the following figure. For the newly selected operational state to take effect, click on the **Save** button at the bottom of the screen. The modes Operational, Maintenance, and Out of Service are the only options from this screen.

On-Ramp Total View

10.50.9.119/otv/#devices/detailpropcid=28&devicetype=500

ONRRAMP TOTALVIEW Alarms **Devices** Admin

allview | Logoff  
Sep 20, 2015 21:04:08 EDT

All Devices Meters Device Groups Device Detail **Properties** 9 Devices reported alert state

### Properties for GE I-210+ #54913826

Operation State: Operational Fault notification will be sent if it is configured.

Description: Maintenance

Bill Cycle:

State:

Data Reporting Config Name:

City:

Street Address:

Zip:

Latitude:

Longitude:

Update device Attributes and click 'Save'. Use 'Delete' to remove the device from display.

**Figure 7. Operational State Selection**

## 2.3.2 AMI Device Operational Mode

After an AMI device has joined the network and has been placed in normal Operational mode, the AMI device begins to autonomously report metrology data obtained from the meter on a regular periodic basis as well as asynchronously reporting certain meter events of potential interest, such as power fail, high temperature warning, tamper detect, and so forth. During normal operation, the AMI device is also capable of receiving downlink requests to perform certain actions.

## 2.3.3 Autonomous Meter Data Reporting

The type of metrology data reported can vary greatly depending on the type of meter as well as how the meter is configured. Please refer to the technical reference manual for your particular meter to determine what metrology capabilities it supports.

As a specific example, the metrology data for the GE I-210+ meter, which is a simple energy-only meter, consists of the following measurements:

- Delivered Energy (kWh)
- Received Energy (kWh)

- Total (Delivered + Received) Energy (kWh)
- Net (Delivered - Received) Energy (kWh)
- Indicating Power (kW)
- Indicating Voltage (V)
- Indicating Temperature (°C)

The GE I-210+ meter does not have a clock and therefore is not capable of performing time based metering, such as load profile or time of use (TOU). The GE I-210+ meter is also not capable of demand metering.

Other meters which are ANSI C12.19 compliant can be capable of collecting load profile data, time of use data, and performing demand metering. However, these meters must be configured to enable these more advanced metering functions. Furthermore, these meters usually require additional configuration to specify what particular physical quantities are to be measured and recorded (e.g., active energy in kWh, reactive energy in kVArh, power factor, etc.). Please refer to the technical reference manual for your particular meter.

The metrology data reported by the AMI device is categorized into two basic types of data. The first is the load profile data which records metrology data on an interval basis. All load profile quantities are measured for a particular interval of time and are reset back to zero at the beginning of the next interval. The interval length for load profile measurements is a meter configuration parameter, whereas the frequency the load profile data is reported to OTV is an eMCM configuration parameter. Typical meter and eMCM load profile configuration parameters are for the meter to record load profile data using 15-minute intervals and for the eMCM to report the load profile data once an hour. As previously mentioned, not all meters are capable of supporting load profile and those that have the capability must also be configured to record load profile data in order for the eMCM to report it to OTV.

The other basic category of metrology data is generically referred to as “usage readings” in OTV but is also sometimes referred to as “billing register” data, “bulk” data, or “summations”. This basic meter reading type includes the metrology data from the energy-only GE I-210+ meter discussed above, plus time of use data as well as demand metering data, if supported and enabled in the meter. The eMCM has the following configuration parameters that allow an operator to adjust how the eMCM reads and reports the usage data (for AMI 1.0):

- Usage Read Period
- Usage Reporting Period

The Usage Read Period determines how frequently the eMCM retrieves the bulk data from the meter, while the Usage Reporting Period determines how frequently the eMCM reports the bulk data to the HES and OTV. For I-210+ meters, typical values for both parameters range from 15 minutes, 30 minutes, or 1 hour, while meters that support load profile are usually configured to perform and report a bulk data meter read once every 24 hours.

If the Usage Reporting Period is specified as more than twice the Usage Read Period on I210+ meters, then two or more meter readings may be expected per report. On all other meter types, at most one reading may be expected in any report. Each eMCM has one reporting attempt randomly distributed within each Usage Reporting Period. If the Usage Reporting Period is less than the Usage Read Period, then the eMCM does not send a meter reading uplink message that



contains a previously reported meter reading. The period offered for random distribution of reporting attempt is merely smaller, and more attempts can be made per reading collected (if any reporting attempts were to fail).

The Usage Read Period and the Usage Reporting Period configuration parameters can be changed over-the-air using OTV as discussed subsequently in section 2.3.5.20.

When a meter is configured in TOU mode, metrology data also contains readings accumulated in various tiers. The times at which tier data is accumulated is determined by calendar table schedules programmed in the meter. This schedule can be overridden if the meter is placed in real-time pricing mode. When real-time pricing is enabled, specific tier data is updated. In GE I210+c and GE kV2c meters, real-time pricing is supported only in the demand-only mode and the readings accumulated in tier A denote readings accumulated when real-time pricing was enabled. GE SGM3000 family of meters can be configured to update a specific tier when real-time pricing (also called critical peak pricing) is enabled.

## 2.3.4 Device Reporting and Status

The device-specific details window defaults to showing multiple panels including device status, default plot, active alarms, meter readings, meter events, received uplink (UL) messages and transmitted downlink (DL) messages as illustrated in the following figures.

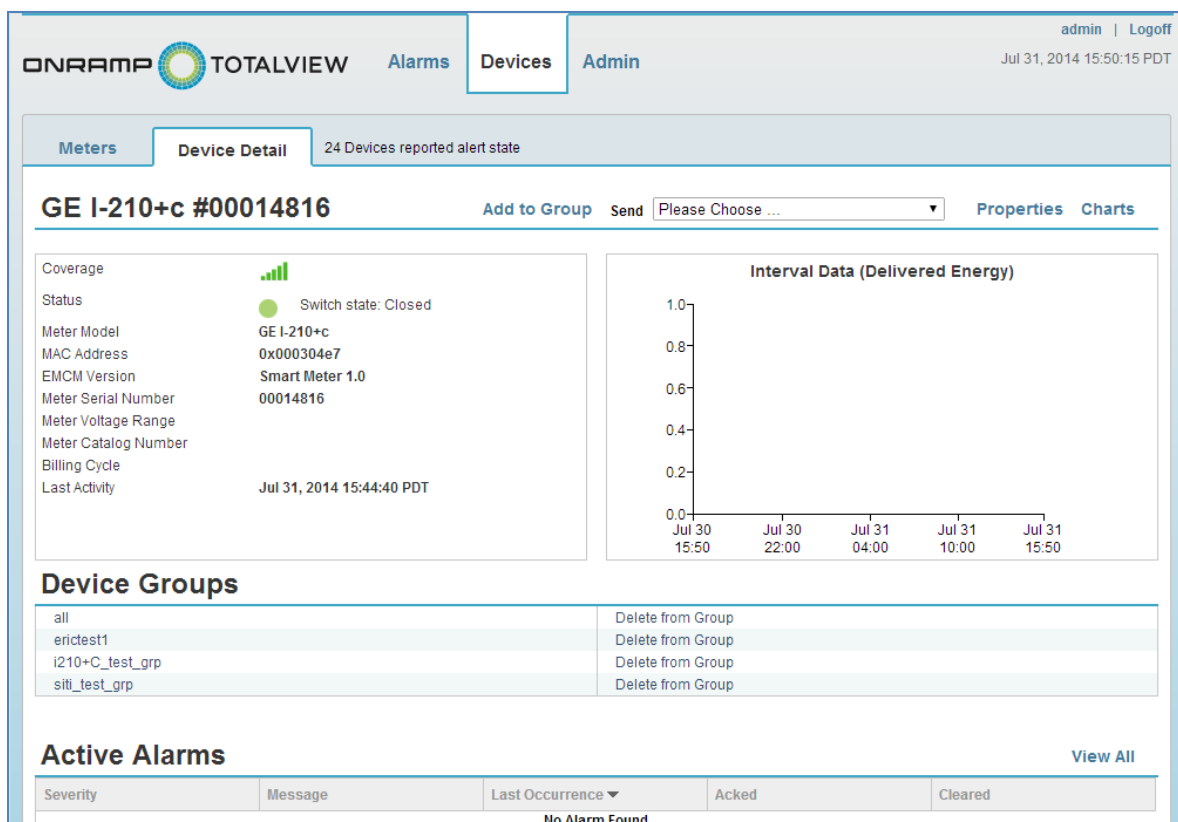


Figure 8. Device Specific Reporting Panels

## Readings View Selected

☐ Bulk/Register Data
 ☐ Summation

Reading Type	CIM Code	Latest Reading	Timestamp	Quality
<input type="checkbox"/> Delivered Bulk Energy kWh	0.0.1.1.0.12.0.0.0.3.72	0.000	Jul 31, 2014 12:00:00 PDT	Data Valid
<input type="checkbox"/> Delivered Bulk Reactive Energy kVAh	0.0.1.1.0.12.0.0.0.3.73	0.000	Jul 31, 2014 12:00:00 PDT	Data Valid

☐ TOU
 ☐ Interval Data

## Meter Events View All

Event Date ▼	Event	CIM Code
Jul 16, 2014 21:57:31 PDT	Relay Switch Closed	3.31.17.42
Jun 25, 2014 05:01:07 PDT	Relay Switch Closed	3.31.17.42
Jun 25, 2014 04:59:53 PDT	Relay Switch Closed	3.31.17.42
Jun 25, 2014 04:58:57 PDT	Relay Switch Open	3.31.17.68
Jun 25, 2014 04:56:38 PDT	Relay Switch Closed	3.31.17.42

## Received Messages View All

Received ▼	Message Type	Summary
Jul 31, 2014 15:44:40 PDT	Meter Interval Reading	Del 15 min Reactive Energy kVAh 0.000@07/31/14 15:30; Del 15 min Reactive Energy kVAh 0.000@07/31/14 15:15; Del 15 min Reactive Energy kVAh 0.000@07/31/14 15:00; Del 15 min Reactive Energy kVAh 0....
Jul 31, 2014 15:44:40 PDT	Meter Interval Reading	Del 15 min Energy kWh 0.000@07/31/14 15:30; Del 15 min Energy kWh 0.000@07/31/14 15:15; Del 15 min Energy kWh 0.000@07/31/14 15:00; Del 15 min Energy kWh 0.000@07/31/14 14:45;
Jul 31, 2014 14:45:03 PDT	Meter Interval Reading	Del 15 min Reactive Energy kVAh 0.000@07/31/14 14:30; Del 15 min Reactive Energy kVAh 0.000@07/31/14 14:15; Del 15 min Reactive Energy kVAh 0.000@07/31/14 14:00; Del 15 min Reactive Energy kVAh 0....
Jul 31, 2014 14:45:03 PDT	Meter Interval Reading	Del 15 min Energy kWh 0.000@07/31/14 14:30; Del 15 min Energy kWh 0.000@07/31/14 14:15; Del 15 min Energy kWh 0.000@07/31/14 14:00; Del 15 min Energy kWh 0.000@07/31/14 13:45;
Jul 31, 2014 13:44:40 PDT	Meter Interval Reading	Del 15 min Reactive Energy kVAh 0.000@07/31/14 13:30; Del 15 min Reactive Energy kVAh 0.000@07/31/14 13:15; Del 15 min Reactive Energy kVAh 0.000@07/31/14 13:00; Del 15 min Reactive Energy kVAh 0....

## Sent Messages View All

Created ▼	Request Type	ACK	Response Message	Response Received	Sent By
Jul 21, 2014 03:51:18 PDT	Meter Connection State Request	Reliable ACK	received response - switch closed	Jul 21, 2014 03:51:55 PDT	admin
Jul 16, 2014 22:00:07 PDT	Meter Connection State Request	Reliable ACK	received response - switch closed	Jul 16, 2014 22:00:46 PDT	admin

Figure 9. Device Specific Reporting Panels (continued)

The **Device Detail** panel displays connection status and associated meter information such as Meter Model, Meter ID, and Meter Serial number along with the timestamp of the last activity for the device in question. The **Device Groups** panel displays groups to which the meter in question belongs, if any. Note these correspond to OTV/HES groups and are not associated with groups used for multicast delivery over-the-air interface.

The **Received Messages** panel displays the time each application message was received, the type of the message, and a summary of the contents of the message for the most recent 5 UL messages received. Different message types can be interspersed in the list of displayed messages in the order they were received by the OTV. To view the complete history of received uplink messages click on the **View All** link at the top of the panel as shown in the following figure. From the **Received Messages** screen that appears after clicking **View All**, the operator has the option to set a date and time range to view the data, to view a quick plot or export data.

admin | Logoff  
Jul 31, 2014 15:52:35 PDT

Alarms Devices Admin

Meters Device Detail Received Messages 24 Devices reported alert state

### Received Messages for GE I-210+c #00014816

refreshed on Jul 31 15:52:35 PDT [Export \(csv\)](#) [Refresh](#) [Date Range](#)

Received ▼	Message Type	Summary
Jul 31, 2014 15:44:40 PDT	Meter Interval Reading	Del 15 min Reactive Energy kVAh 0.000@07/31/14 15:30; Del 15 min Reactive Energy kVAh 0.000@07/31/14 15:15; Del 15 min Reactive Energy kVAh 0.000@07/31/14 15:00; Del 15 min Reactive Energy kVAh 0.000@07/31/14 14:45;
Jul 31, 2014 15:44:40 PDT	Meter Interval Reading	Del 15 min Energy kWh 0.000@07/31/14 15:30; Del 15 min Energy kWh 0.000@07/31/14 15:15; Del 15 min Energy kWh 0.000@07/31/14 15:00; Del 15 min Energy kWh 0.000@07/31/14 14:45;
Jul 31, 2014 14:45:03 PDT	Meter Interval Reading	Del 15 min Reactive Energy kVAh 0.000@07/31/14 14:30; Del 15 min Reactive Energy kVAh 0.000@07/31/14 14:15; Del 15 min Reactive Energy kVAh 0.000@07/31/14 14:00; Del 15 min Reactive Energy kVAh 0.000@07/31/14 13:45;
Jul 31, 2014 14:45:03 PDT	Meter Interval Reading	Del 15 min Energy kWh 0.000@07/31/14 14:30; Del 15 min Energy kWh 0.000@07/31/14 14:15; Del 15 min Energy kWh 0.000@07/31/14 14:00; Del 15 min Energy kWh 0.000@07/31/14 13:45;
Jul 31, 2014 13:44:40 PDT	Meter Interval Reading	Del 15 min Reactive Energy kVAh 0.000@07/31/14 13:30; Del 15 min Reactive Energy kVAh 0.000@07/31/14 13:15; Del 15 min Reactive Energy kVAh 0.000@07/31/14 13:00; Del 15 min Reactive Energy kVAh 0.000@07/31/14 12:45;
Jul 31, 2014 13:44:40 PDT	Meter Interval Reading	Del 15 min Energy kWh 0.000@07/31/14 13:30; Del 15 min Energy kWh 0.000@07/31/14 13:15; Del 15 min Energy kWh 0.000@07/31/14 13:00; Del 15 min Energy kWh 0.000@07/31/14 12:45;
Jul 31, 2014 12:49:19 PDT	Meter Readings	Del Bulk Energy kWh 0.000@07/31/14 12:00; Del Bulk Reactive Energy kVAh 0.000@07/31/14 12:00; Del Energy TOU A kWh 0.000@07/31/14 12:00; Del Reactive Energy TOU A kVAh 0.000@07/31/14 12:00; Del Ener...

**Figure 10. Date Range Selection for Received Messages**

The **Readings** panel shows greater detail regarding the most recent meter reading data reported by the eMCM, for each reading type received by OTV. The readings are grouped by type: Bulk/Register Data, TOU, and Interval Data. Each row shows the reading type, the most recent reported value and associated timestamp of when the reading was taken. On the other hand, the **Received Messages** panel displays the most recently received messages, a summary of the message content, and the time that a message was received. As with the **Received Messages** panel, the portion of the complete history of meter readings can be viewed by clicking on the **'View Selected'** link at the top of the **Readings** panel. The operator also has the option to set a specific date and time range of data to view using the **'Date Range'** link in the upper right corner on the subsequent page. A single or multiple reading types may also be filtered by checking the desired checkbox next to the reading type and clicking the **'View Selected'** link.

The **Meter Events** panel displays the most recent meter events received by OTV. Clicking **'View All'** shows the complete history of meter events and also allows exporting and further filtering by selecting a date range.

The **Alarms** panel displays occurrence, type, and severity for the most recent 5 reported alarms that are active. An associated time at which the alarm was cleared is also displayed. To view the complete history of reported alarms click on the **'View All'** link at the top of the panel.

The **Sent Messages** panel displays the most recent DL messages triggered by the operator. Each row shows the DL Request message type (e.g., meter reading request), the time at which the message was sent and by whom (e.g., admin, user id), whether an acknowledgment associated with delivery of the DL message was received, the response message type from the device (e.g.,

received meter reading response), and the time at which the response was received. The complete history of sent messages can be viewed by clicking on the **'View All'** link at the top of the panel.

## 2.3.5 On-Demand Downlink Requests

The eMCM takes advantage of the bidirectional nature of the RPMA Network wireless communication system, and supports various downlink requests from OTV to perform various actions on demand. Downlink requests can be initiated in OTV for any particular eMCM by selecting the **Send** button (at the upper right of the page) from the Device Details tab for the device in question. A pull down menu allows the operator to select one of several supported on-demand operations, as shown in the following figure. Available downlink messages differ between AMI 1.0, 1.1, and 1.2.



Figure 11. Sending On-Demand Downlink Requests

### 2.3.5.1 Ping Request

To check the status of a Node, select "Send Ping" from the pull-down menu. The operator is prompted to confirm the selected operation.

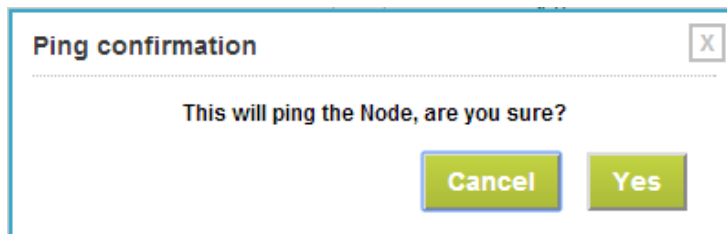
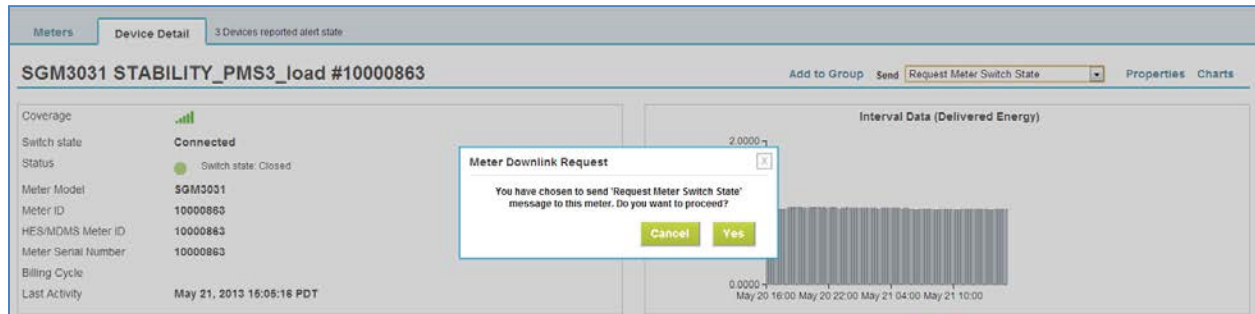


Figure 12. Ping Request Confirmation

Select the **Yes** button to transmit the downlink request to the Node or **Cancel** to abort the request. When the request is sent, a new row is created in the Sent Messages panel. If the Node can be reached and responds, the Ack column displays "Reachable" and the Response Received column displays the time at which the response was received. Other possible return values are "Unreachable" and "Ping not supported."

### 2.3.5.2 Request Current Meter Switch State

To request the current state of the meter's remote connect/disconnect (RCDC) switch, if the meter is equipped with one, select the **Request Meter Switch State** option from the pull-down menu. The operator is prompted to confirm the selected on-demand operation as shown in the following figure.



**Figure 13. On-Demand Downlink Request Confirmation Prompt**

Select the **Yes** button to transmit the downlink request to the eMCM or **Cancel** to abort the request. When the request has been enqueued for downlink transmission, a downlink status window is displayed (as illustrated in the following figure) that indicates:

- when the request was generated
- the type of request
- whether the request has been acknowledged by the Node
- what response message, if any, has been received
- the time the response was received

The response message also appears in the **Received Messages** panel.

Meters Device Detail Sent Messages 3 Devices reported alert state					
Sent Messages for SGM3031 STABILITY_PMS3_load #10000863					
May 14 14:04:07 PDT to May 22 14:04:07 PDT Refresh Date Range					
Created	Request Type	ACK	Response Message	Response Received	Sent By
May 21, 2013 16:16:11 PDT	Meter Connection State Request	Reliable ACK	received response - switch closed	May 21, 2013 16:16:48 PDT	admin

**Figure 14. Downlink Request Status Window**

### 2.3.5.3 Request Meter Switch Connect

The OTV operator can send a meter connect request to an individual eMCM by selecting the **Request Meter Switch Connect** option from the downlink request pull-down menu as illustrated below in the following figure. If the meter is not equipped with an RCDC switch, then the response message from the eMCM reports that the feature is not supported. Note that after a meter switch operation has been executed, it may take several minutes before a subsequent

switch operation can be performed by the meter since it requires a capacitor to be fully charged before it can execute another switch operation. The meter keeps track of any requested switch operations during the time that its capacitor is charging and the meter is unable to perform the requested switch operation. When the capacitor has finished charging and the meter can perform a switch operation, it sets the RCDC switch to the final requested state.

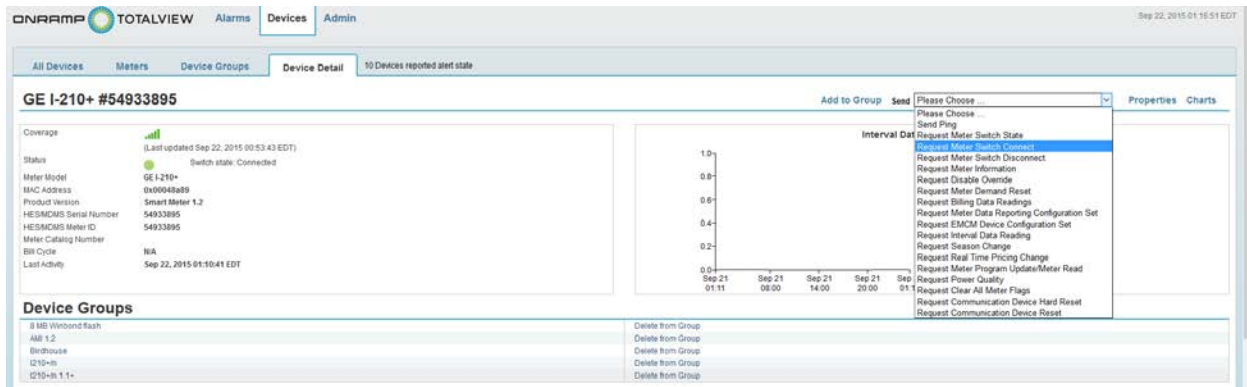


Figure 15. Meter Switch Connect Downlink Request

#### 2.3.5.4 Request Meter Switch Disconnect

The OTV operator can send a meter disconnect request to an individual eMCM by selecting the **Request Meter Switch Disconnect** option from the downlink request pull-down menu as shown in the following figure. If the meter is not equipped with an RCDC switch, then the response message from the eMCM reports that the feature is not supported. Note that after a meter switch operation has been executed, it may take several minutes before a subsequent switch operation can be performed by the meter since it requires a capacitor to be fully charged before it can execute another switch operation. The meter keeps track of any requested switch operations during the time that its capacitor is charging and the meter is unable to perform the requested switch operation. When the capacitor has finished charging and the meter can perform a switch operation, it sets the RCDC switch to the final requested state.

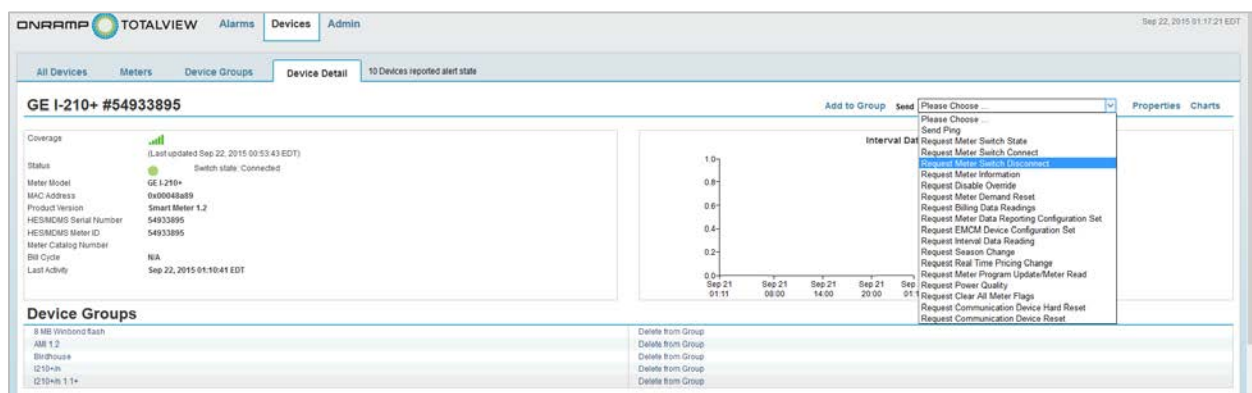


Figure 16. Meter Switch Disconnect Downlink Request



### 2.3.5.5 Request Meter Information

Whenever an eMCM powers up and joins the On-Ramp Wireless RPMA network, it reports to the HES various information about itself and the meter to which it is connected. This uplink message includes items such as the eMCM identification number, the eMCM firmware version, the meter manufacturer and model, the meter firmware and hardware versions, etc. OTV receives this information and displays meter specific information in the **Device Details** panel associated with that meter, and eMCM specific information as part of diagnostic information under the properties page associated with that meter. All of this is done automatically as part of the normal operation of the eMCM. However, the OTV operator can send a **Request Meter Information** downlink message to explicitly retrieve this information by selecting the **Request Meter Information** option from the downlink request pull-down menu as shown in the following figure.

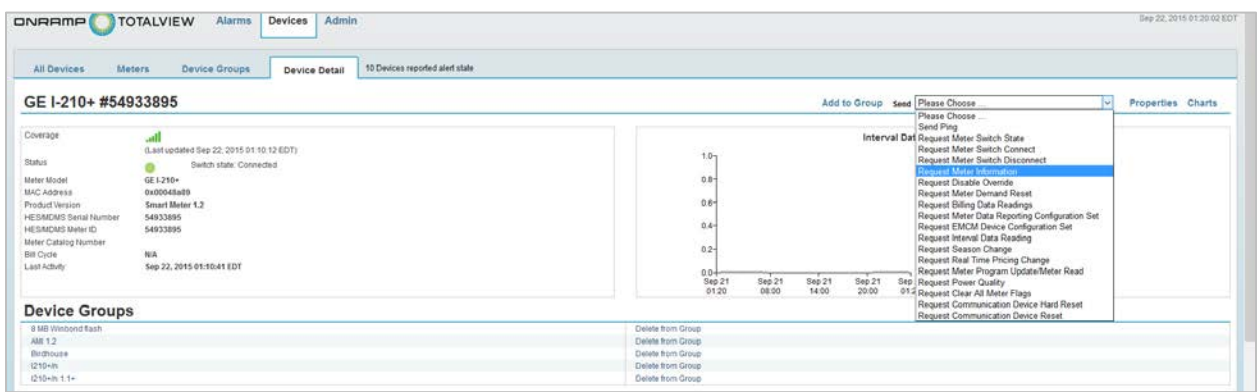


Figure 17. Meter Information Request Downlink

### 2.3.5.6 Request Disable Override (AMI 1.2 on SGM Only)

For SGM meters only that have an override feature on one or more of its relays, operators can remotely disable it via OTV. Selecting the downlink provides operators with the option to select which relay the request will be for. After the desired relay has been specified, clicking on **Disable Override** will enqueue the downlink to be processed by the eMCM.

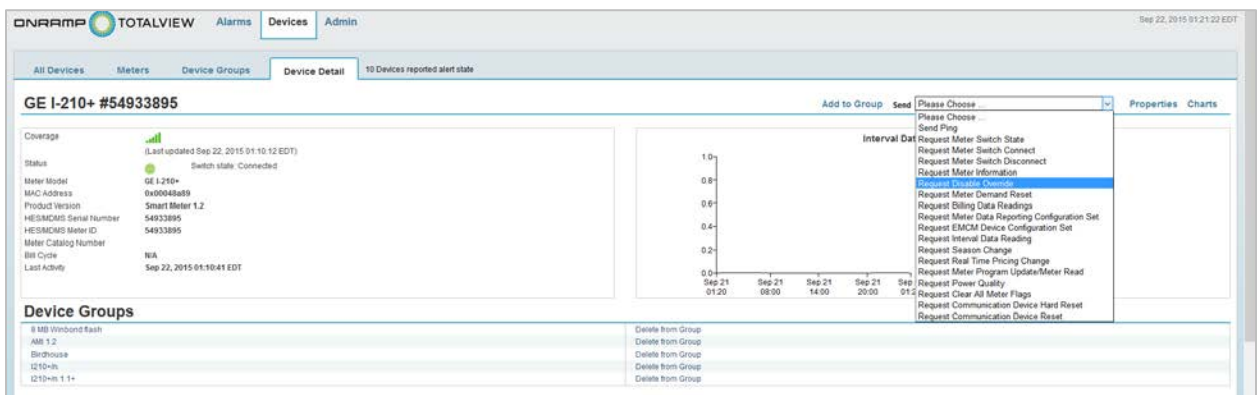


Figure 18. Disable Override Request Downlink

### 2.3.5.7 Request Meter Demand Reset

For meters that support demand reset, the OTV operator can send a meter demand reset request to an individual eMCM by selecting the **Request Meter Demand Reset** option from the downlink request pull-down menu as shown in the following figure.

**NOTE:** Demand Reset occurs when the eMCM *receives* the request and not at the time the request is made via the OTV. Transmission latency of a request is a function of network connectivity and network congestion. Even though typical latencies are small, there is a possibility that a long delay can happen before demand reset is executed

If the meter does not support demand readings, then the response message from the eMCM reports that the feature is not supported. The status of the demand reset request, including any received response message, is displayed in the **Downlink** status window as previously shown in Figure 14.

Demand Reset Response does not contain demand readings but only the status as described above. Demand readings are asynchronously reported as part of Billing Data. Billing Data is read on a schedule that is configured in the meter communication module, stored in persistent memory, and reported OTA at a random offset during the reporting period in order to reduce uplink contention.

Lastly, in the wake of a demand reset, there is a period where the demand values provided for billing data reports are essentially blank (as it takes a meter some time to reliably determine new demand) thereby making it seem as though no demand readings came up with a particular billing data indication message.

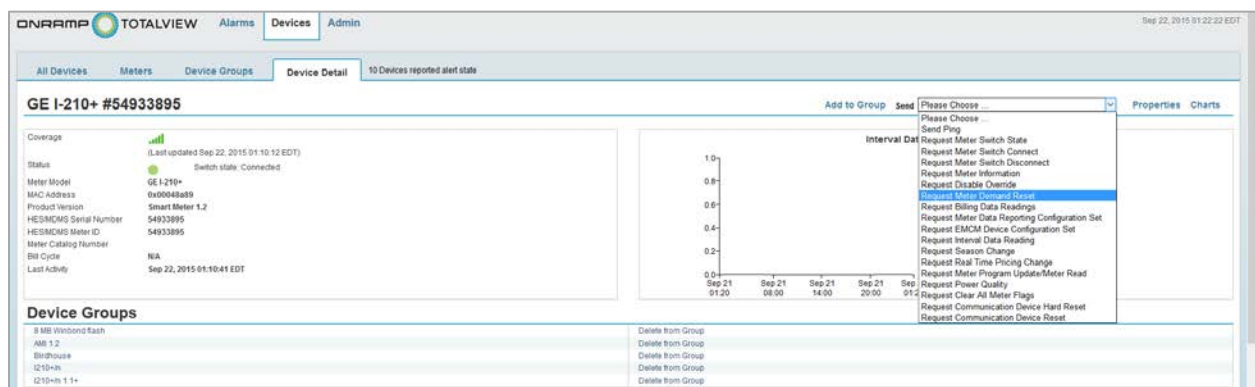


Figure 19. Demand Reset Downlink Request

### 2.3.5.8 On-Demand Billing Data Request

As part of its normal operation, the eMCM autonomously reads from the meter and reports the meter register values (also referred to as “summations,” “billing registers,” or “bulk data”) on a regular, configurable, periodic basis. However, the OTV operator can also request a meter reading on demand at any time by selecting the **Request Billing Data Readings** message from the **'Send'** downlink request pull-down menu as shown in the following figure.



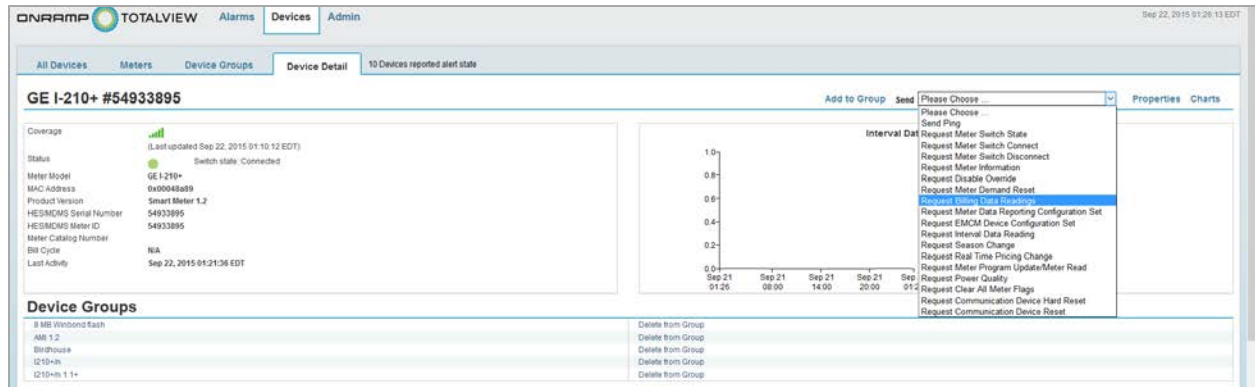


Figure 20. Request Billing Data Readings Downlink

The status of the meter read request downlink message, including any received response message, is displayed in the **Sent Messages** status window, as shown below in Figure 21 through Figure 23. These figures correspond to the different stages of the communication, i.e., waiting for confirmation of the downlink request (as indicated by the lack of reliable ACK status) followed by receipt of the meter reading response. The meter reading response is displayed in both the **Meter Reading** and the **Received Messages** panels, with the more detailed meter reading results displayed in the **Meter Reading** panel.

Meters Device Detail Sent Messages 3 Devices reported alert state					
Sent Messages for SGM3031 STABILITY_PMS3_load #10000863					
May 14 14:04:07 PDT to May 22 14:04:07 PDT Refresh Date Range					
Created	Request Type	ACK	Response Message	Response Received	Sent By
May 21, 2013 16:48:09 PDT	Meter Readings Request				admin
May 21, 2013 16:16:11 PDT	Meter Connection State Request	Reliable ACK	received response - switch closed	May 21, 2013 16:16:11 PDT	admin

Figure 21. Billing Data Readings Request Downlink Status - Request Sent

Meters Device Detail Sent Messages 3 Devices reported alert state					
Sent Messages for SGM3031 STABILITY_PMS3_load #10000863					
May 14 14:04:07 PDT to May 22 14:04:07 PDT Refresh Date Range					
Created	Request Type	ACK	Response Message	Response Received	Sent By
May 21, 2013 16:48:09 PDT	Meter Readings Request	Reliable ACK			admin
May 21, 2013 16:16:11 PDT	Meter Connection State Request	Reliable ACK	received response - switch closed	May 21, 2013 16:16:11 PDT	admin

Figure 22. Billing Data Readings Request Downlink Status - ACK Received

Meters Device Detail Sent Messages 3 Devices reported alert state					
Sent Messages for SGM3031 STABILITY_PMS3_load #10000863					
May 14 14:04:07 PDT to May 22 14:04:07 PDT Refresh Date Range					
Created	Request Type	ACK	Response Message	Response Received	Sent By
May 21, 2013 16:48:09 PDT	Meter Readings Request	Reliable ACK	received meter readings response	May 21, 2013 16:53:41 PDT	admin
May 21, 2013 16:16:11 PDT	Meter Connection State Request	Reliable ACK	received response - switch closed	May 21, 2013 16:16:48 PDT	admin

Figure 23. Billing Data Readings Request Downlink Status - Response Received

### 2.3.5.9 Request Meter Data Reporting Configuration Set (AMI 1.2 Only)

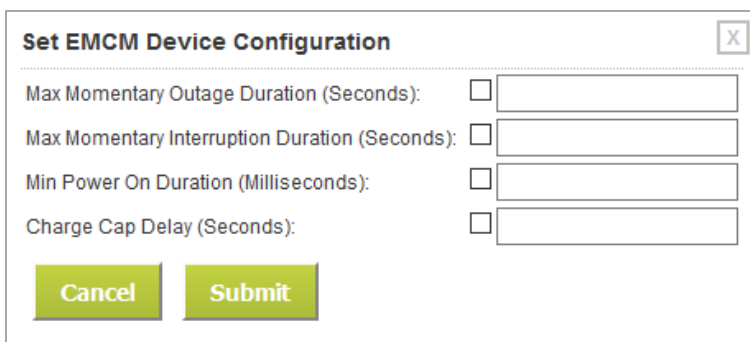
Selecting this downlink will prompt OTV to send down the file data\_orders.properties to the eMCM in order to change the meter's configuration. This file, which is normally located in the same folder that HES was installed in, contains a wide variety of settings such as reporting period, read period, load profile information, power quality settings, and time zone settings. When this file has been received by the eMCM, the eMCM will set these parameters on the meter itself. Editing this file and then sending it down to the meters allows operators to fully customize how meters on the network will operate.

The screenshot shows the ONRAMP TOTALVIEW interface. The top navigation bar includes 'Alarms', 'Devices', and 'Admin'. The 'Devices' tab is active, showing 'Device Detail' for 'GE I-210+ #54933895'. The left sidebar lists 'All Devices', 'Meters', and 'Device Groups'. The main content area displays meter details: Coverage (Last updated Sep 27, 2015 21:41:43 PDT), Status (Switch state: Connected), Meter Model (GE I-210+), MAC Address (0x00048a80), Product Version (Smart Meter 1.2), HES/MDMS Serial Number (54933895), HES/MDMS Meter ID (54933895), Meter Catalog Number, Bill Cycle (N/A), and Last Activity (Sep 27, 2015 21:54:43 PDT). A 'Device Groups' table lists '8 MB Winbond Flash', 'AMI 1.2', 'Birdhouse', 'I210+in', and 'I210+in 1.1+'. A dropdown menu is open, showing options like 'Send Ping', 'Request Meter Switch State', 'Request Meter Switch Connect', 'Request Meter Switch Disconnect', 'Request Meter Information', 'Request Disable Override', 'Request Meter Demand Reset', 'Request Billing Data Readings', 'Request Meter Data Reporting Configuration Set' (highlighted), 'Request EMCM Device Configuration Set', 'Request Interval Data Reading', 'Request Season Change', 'Request Real Time Pricing Change', 'Request Meter Program Update/Meter Read', 'Request Power Quality', 'Request Clear All Meter Flags', 'Request Communication Device Hard Reset', and 'Request Communication Device Reset'.

Figure 24. Request Meter Data Reporting Configuration Set

### 2.3.5.10 Request EMCM Device Configuration Set (AMI 1.2 Only)

The eMCM board has several options that can be configured remotely as shown in the following figure. Operators can enter in values for each of these properties and then click **Submit** to send them down to the eMCM. These values allow for operators to specify how long the eMCM will wait before classifying each event as a sustained event rather than a momentary one. Changing these values will affect how the eMCM classifies these events. The check mark next to each field specifies which values will be included in the downlink request.



The dialog box is titled "Set EMCM Device Configuration" and has a close button (X) in the top right corner. It contains four rows of configuration options, each with a checkbox and a text input field:

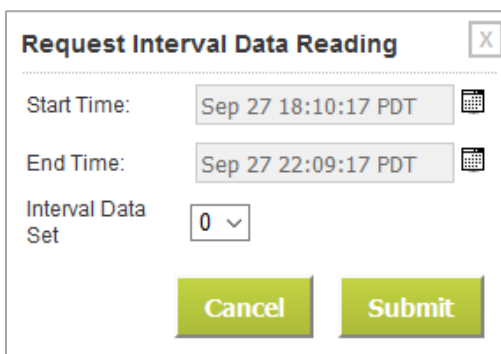
- Max Momentary Outage Duration (Seconds): ☐ [text input]
- Max Momentary Interruption Duration (Seconds): ☐ [text input]
- Min Power On Duration (Milliseconds): ☐ [text input]
- Charge Cap Delay (Seconds): ☐ [text input]

At the bottom of the dialog are two buttons: "Cancel" and "Submit".

Figure 25. Set EMCM Device Configuration

### 2.3.5.11 Request Interval Data Reading (AMI 1.2 Only)

When the Request Interval Data Reading downlink has been selected, users will be prompted with the window shown in Figure 26 to specify a start time, end time, and interval data set value for interval data readings. Currently OTV only supports interval data readings for I-210+c, kV2c, and SGM meters. The start and end times specify the range that OTV will generate the interval data reading from. Supported meters have different sets of interval data readings which are configured separately from OTV. OTV supports 16 intervals during one request, and if the date range includes more than 16 intervals, the request will not be processed correctly. After all information has been set, clicking on **Submit** will send the request down to the meter.



The dialog box is titled "Request Interval Data Reading" and has a close button (X) in the top right corner. It contains three rows of input fields:

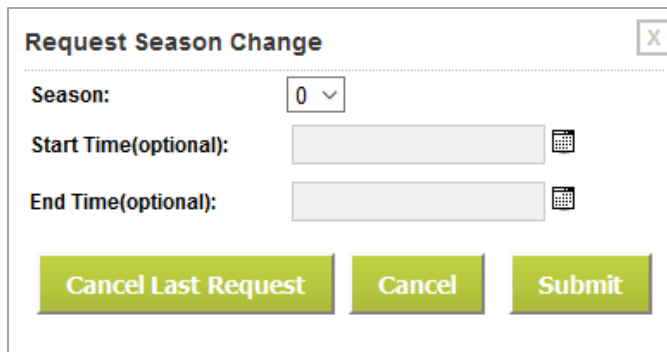
- Start Time: [text input showing "Sep 27 18:10:17 PDT"] [calendar icon]
- End Time: [text input showing "Sep 27 22:09:17 PDT"] [calendar icon]
- Interval Data Set: [dropdown menu showing "0"]

At the bottom of the dialog are two buttons: "Cancel" and "Submit".

Figure 26. Request Interval Data Reading

### 2.3.5.12 Request Season Change (AMI 1.2 Only)

Selecting this downlink allows operators to set one of the four pre-determined seasons for all TOU meters. The start time and end times allow for operators to specify when the newly selected season will apply. If a start time and end time are not specified, the meter will begin reporting with the newly selected season as soon as the downlink is processed by the eMCM. Season changes will be overridden once the next season's pre-determined start occurs.



**Request Season Change** [X]

Season: 0 ▾

Start Time(optional):  [Calendar icon]

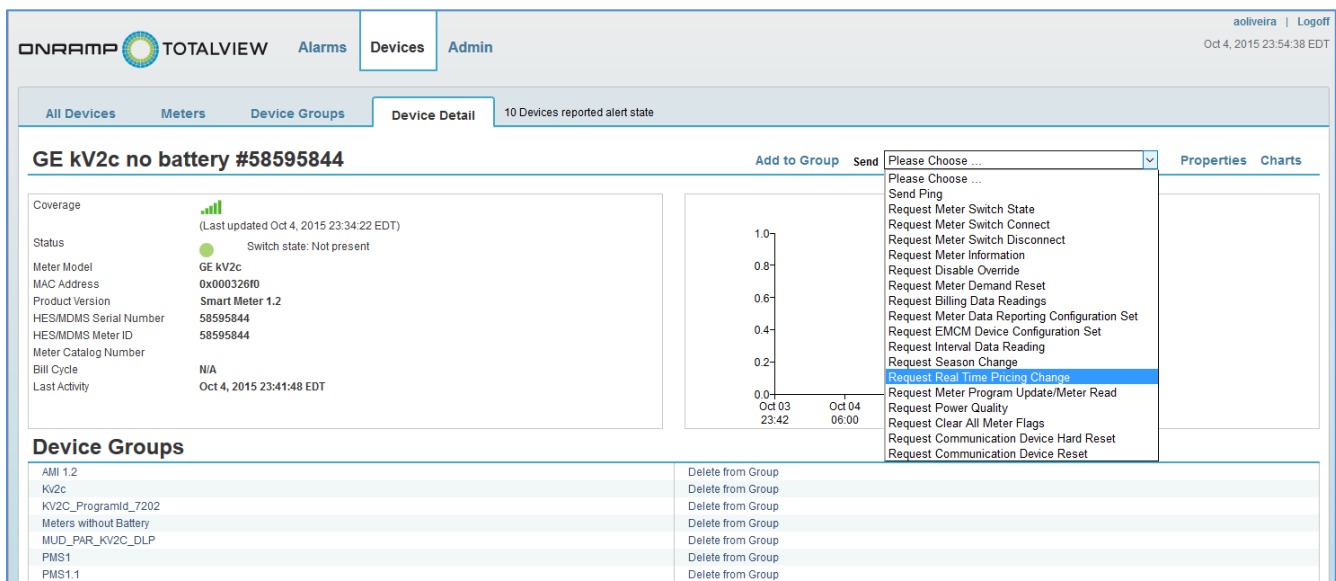
End Time(optional):  [Calendar icon]

Cancel Last Request Cancel Submit

Figure 27. Request Season Change

### 2.3.5.13 Request Real Time Pricing Change (AMI 1.2 Only)

For all TOU meters, operators can request that these meters begin reporting data from a Real Time Pricing (RTP) tier. Selecting this downlink allows for operators to specify a start and end time for when the meter will switch over to this new data tier. If an operator does not specify a start and end time, the meter will make the switch to RTP as soon as the downlink is processed by the eMCM. Additionally, if the request has not yet been processed by the meter, operators can cancel the last request before the change in pricing takes place.



The screenshot shows the ONRAMP TOTALVIEW interface. The top navigation bar includes 'Alarms', 'Devices', and 'Admin'. The 'Devices' tab is active, showing '10 Devices reported alert state'. The main content area displays details for a device named 'GE kV2c no battery #58595844'. On the left, there is a 'Coverage' section with a signal strength indicator and a 'Status' section with a green dot and the text 'Switch state: Not present'. Below these are various meter details like 'Meter Model', 'MAC Address', 'Product Version', 'HESIMDMS Serial Number', 'HESIMDMS Meter ID', 'Meter Catalog Number', 'Bill Cycle', and 'Last Activity'. On the right, there is a 'Send' dropdown menu that is open, showing a list of actions. The action 'Request Real Time Pricing Change' is highlighted in blue. Other actions include 'Request Meter Program Update/Meter Read', 'Request Power Quality', 'Request Clear All Meter Flags', 'Request Communication Device Hard Reset', and 'Request Communication Device Reset'. At the bottom, there is a 'Device Groups' table with columns for group name and actions.

Device Groups	
AMI 1.2	Delete from Group
KV2c	Delete from Group
KV2C_ProgramId_7202	Delete from Group
Meters without Battery	Delete from Group
MUD_PAR_KV2C_DLP	Delete from Group
PMS1	Delete from Group
PMS1.1	Delete from Group

Figure 28. Request Real Time Pricing Change

### 2.3.5.14 Request Meter Program Update / Meter Read (AMI 1.2 Only)

AMI 1.2 equipped eMCMs allow for operators to remotely program the meter using a predetermined set of parameters. When this downlink is selected from the drop-down menu, operators are presented with the options shown in the following figure.

**Figure 29. Request Meter Program Update / Meter Read Options**

The **Operation** menu presents operators with the options Execute Meter Operation, Abort Meter Operation, and Flush Transmission. Execute Meter Operation will begin the Meter Program Update (MPU) process once all other information has been entered. Abort Meter Operation will terminate any currently running MPUs and revert the meter to its previous state before the MPU began. Flush Transmission will clear any enqueued downlinks and prevent them from executing. **NOTE:** Flush transmission will only clear any MPU requests that have not started updating. A file containing all of the necessary information for an MPU must be specified using **Upload File**. The **Start Time** and **Expire Time** allows for operators to set when the MPU will be executed. If an MPU is not successful before the Expire Time occurs, the operation will be terminated and the meter rolled back to its previous state before the MPU was requested.

### 2.3.5.15 Request Power Quality

AMI 1.1 and 1.2 meters have an additional on-demand power quality report request. When Request Power Quality is selected from the pull-down menu, a dialog appears with the following options:

**Figure 30. Request Power Quality Options**

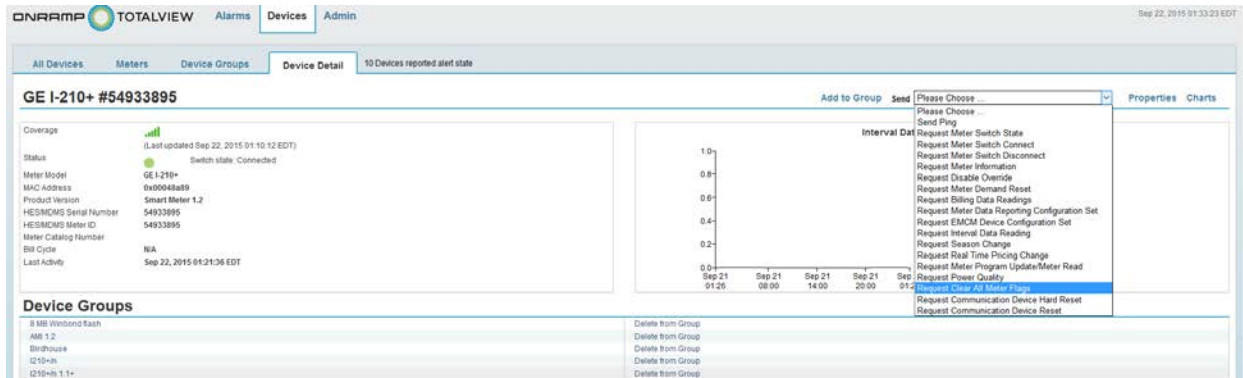
By selecting **All**, the eMCM sends all of the power quality data it has. By selecting **Line Side Diagnostic**, **Instantaneous Demand**, or **Instantaneous Distortion**, a subset of power quality data is sent pertaining to the selected option.

The status of the power quality request downlink message, including any received response message, is displayed in the **Downlink** status window and in the **Meter Readings** and **Received**

**Messages** panels, as discussed in the previous section. Note that if the meter does not support power quality, then the response message reports that the feature is not supported.

### 2.3.5.16 Request Clear All Meter Flags

AMI 1.1 and 1.2 meters support an option to clear all meter status indicators stored by ANSI C12.19 compliant meters in Standard Table 3. Selecting **Request Clear All Meter Flags** sends a request to the eMCM to clear all flags that are set. The status of the **Clear All Meter Flags Request** is displayed in the **Downlink** status window.



**Figure 31. Request Clear All Meter Flags Downlink**

If all flags are being cleared, then the HES looks in the `iec-cim-http.properties` file and sends to the eMCM a bitmap with all bits that correspond to a flag mapping in that `.properties` file. In other words, “all flags” maps to every flag that has a mapping in the `iec-cim-http.properties` file with the exception of “extra mfg flags,” as extra mfg flags are not reported by the meter in Standard Table 3. Extra mfg flags are other status indicators that are cleared automatically when the condition on the meter no longer exists.

No flag change event appears in the HES/OTV until the flag change is sent by the eMCM. In other words, if a bit is high and a clear flags request is sent to the eMCM, the HES/OTV will not show this as being cleared until the eMCM sends a message indicating that specific flag has been cleared. If the eMCM never detects or reports that the bit was cleared, then no clear event occurs in OTV.

### 2.3.5.17 On-Demand Load Profile Request (AMI 1.0 Only)

The eMCM can be configured to autonomously read load profile data (also referred to as “interval data”) from the meter as part of its normal operation and report that data on a regular, configurable, periodic basis. However, the OTV operator can also send an on-demand request to retrieve load profile data from the meter at any time by selecting the **Request Load Profile Data from Meter** message from the ‘Send’ downlink request pull-down menu as shown in the following figure.

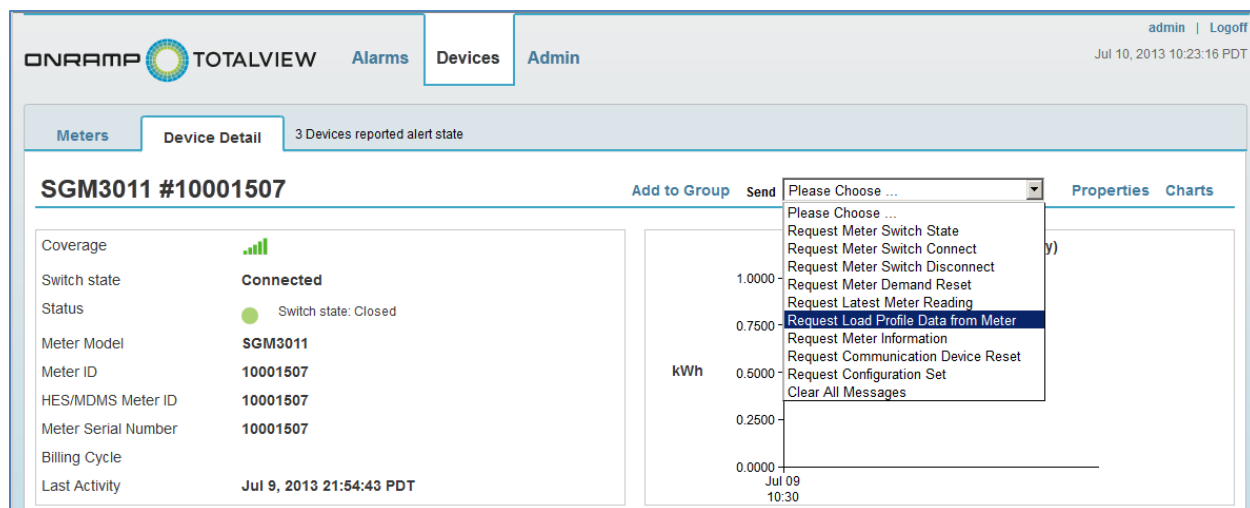


Figure 32. Load Profile Data Downlink Request

The operator is prompted for the date range for which the data is being requested as shown in the following figure. Note that the maximum load profile data size is currently 48 intervals, which corresponds to 12 hours of interval data at 15-minute intervals, 24 hours of data at 30-minute intervals, etc. If the operator specifies a date range that translates to greater than 48 intervals, the meter reading contains the most recent 48 interval readings in the specified date range.

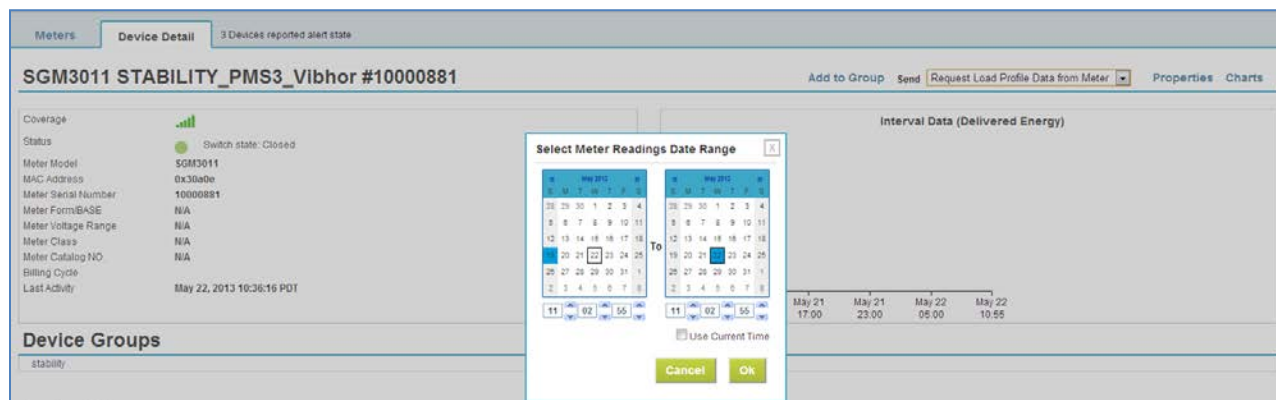


Figure 33. Date Range for Load Profile Data Request

The status of the meter read request downlink message, including any received response message, is displayed in the **Downlink** status window as well as in the **Meter Readings** and **Received Messages** panels, as discussed in the previous section. Note that if the meter does not support load profile, then the response message reports that the feature is not supported.



### 2.3.5.18 Request Communication Device Reset

In addition to sending downlink requests to perform various meter operations, the OTV operator can also send downlink request messages to perform operations to the eMCM, such as requesting the eMCM to reset itself. This is primarily intended for debugging purposes and should be used only when necessary. To send an eMCM reset request, select the **Request Communication Device Reset** option from the downlink request pull-down menu as illustrated in the following figure.

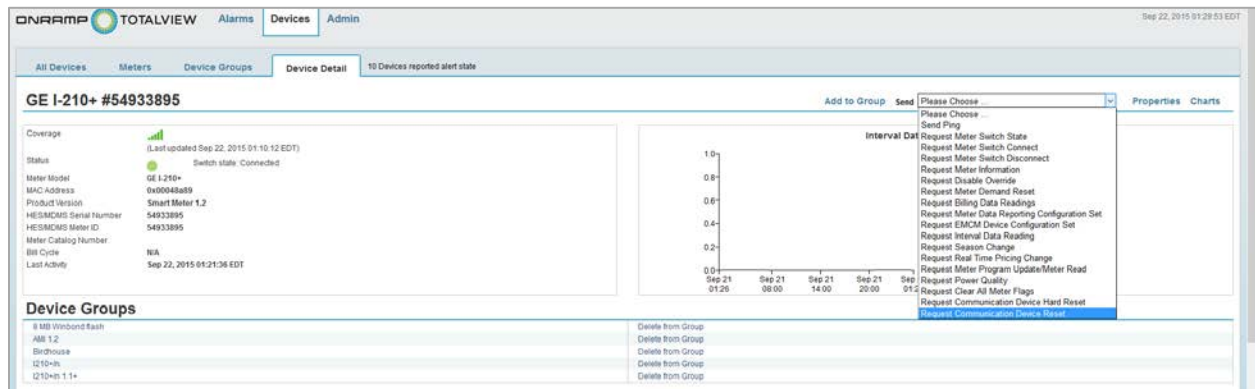


Figure 34. eMCM Reset Downlink Request

Note that resetting the eMCM also results in the Node being reset which causes a subsequent rejoin to the On-Ramp Wireless RPMA network. After sending the eMCM downlink request, OTV is not be able to communicate with the eMCM or meter until the Node has rejoined the network which can take several minutes, if not longer, depending on RF and network conditions at the time. As with all other downlink request messages, the status of the eMCM reset request is displayed in **Sent Messages** panel.

### 2.3.5.19 Request Communication Device Hard Reset

AMI 1.1 and 1.2 meters support an additional hard reset option. When **Communication Device Hard Reset** is selected, the eMCM deletes all billing data order configuration on the eMCM, clears any persistently failing power-on self-test condition, and reboots the device. If the eMCM is exhibiting a persistent failure of the power-on self-test (POST\_FAIL) condition upon boot, a Hard Reset can be used to attempt to clear the persistent failure.

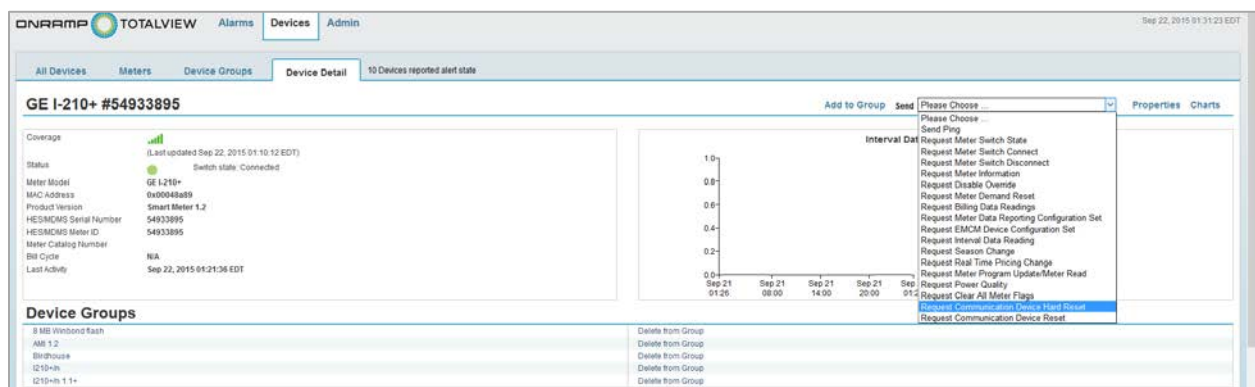
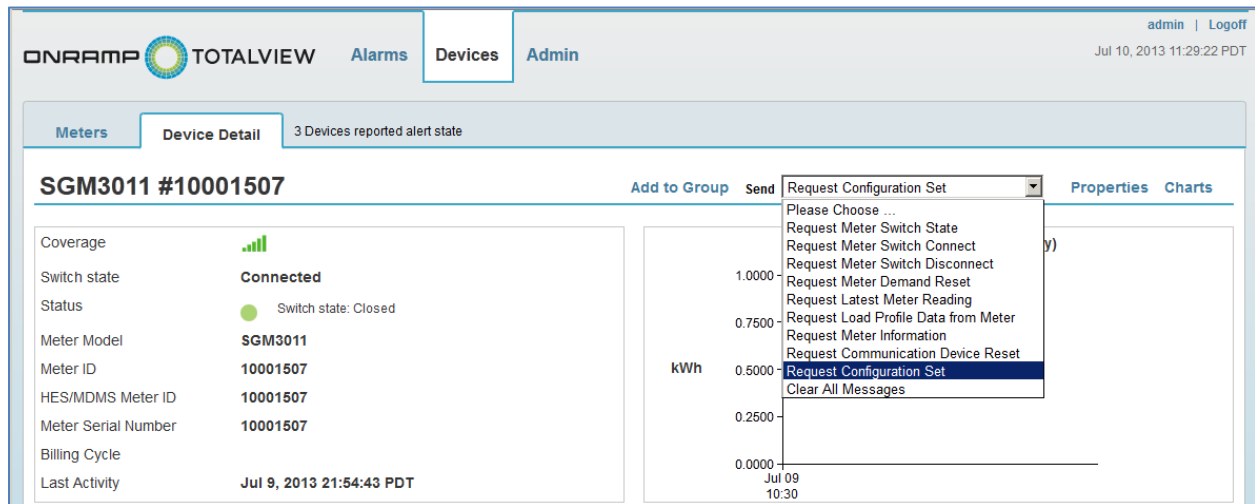


Figure 35. Request Communication Device Hard Reset Downlink



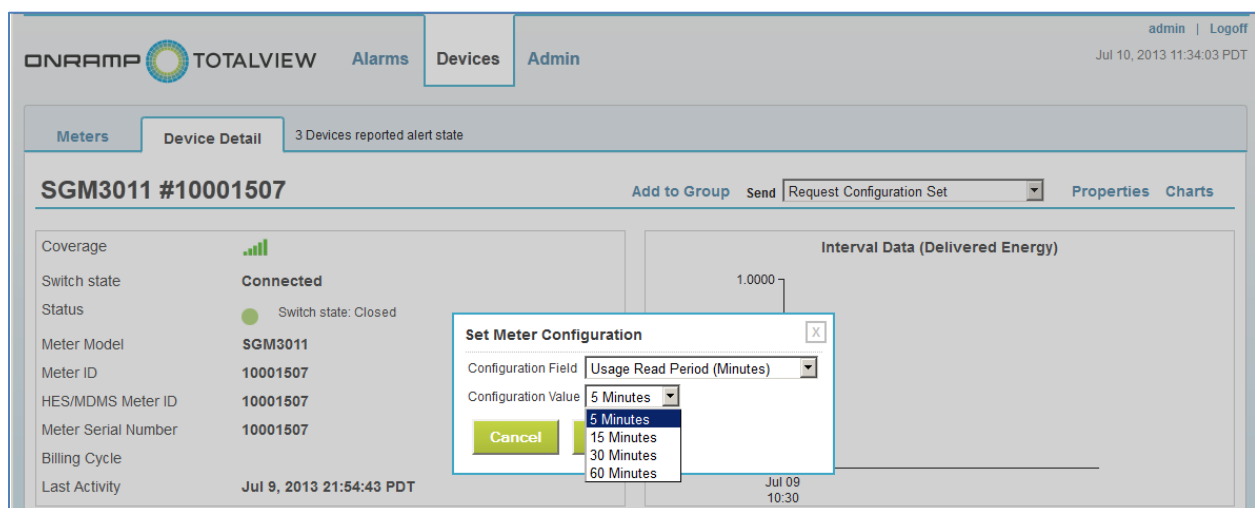
### 2.3.5.20 eMCM Configuration Request (AMI 1.0 Only)

The OTV operator can send a downlink request message to set certain configuration parameters on the eMCM. In particular, the OTV operator can set the “billing register” Usage Read Period and Usage Reporting Period as previously described in section 2.3.3. To send an eMCM configuration downlink request, select the **Request Configuration Set** option from the pull-down menu as illustrated in the following figure.



**Figure 36. Set eMCM Configuration Parameter Downlink Request**

The operator is prompted to select a configuration parameter from the pull-down menu along with a configuration value for the selected parameter as shown in the following figure. Currently, the configuration fields that can be modified are the ‘Usage Read Period’ and the ‘Usage Reporting Period.’ The allowable values for both of these configuration parameters are 5, 15, 30 and 60 minutes and 4, 8, 12, 16, 20, and 24 hours.



**Figure 37. Set eMCM Configuration Parameter and Value**

**NOTE:** The setting the Usage Reporting Period to a small value can result in unintended side effects such as reduced network performance. Furthermore, any changes made to the eMCM configuration parameters do not take effect until the eMCM has been reset (see section 2.3.5.18).

### 2.3.5.21 Clear Downlink Messages (AMI 1.0 Only)

OTV also supports a feature which allows the operator to clear (flush) all downlink requests to a particular eMCM that are still outstanding, that is, downlink requests that have not yet started transmission or those for which an acknowledgement or response has not been received. To send a clear messages command, select the **Clear All Messages** option from the downlink request pull-down menu as shown in the following figure.

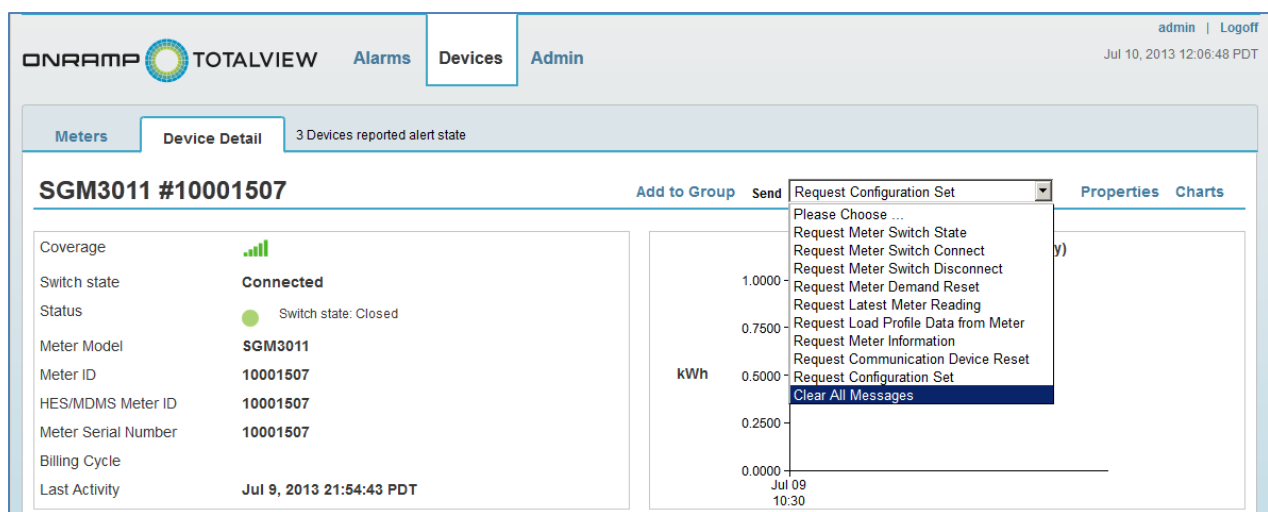


Figure 38. Clear All Messages Downlink Request

## 2.4 Alarm Management

The meter and eMCM send asynchronous alarms as defined by its operational parameters. Meter alarms can include High Temperature, Tamper detection, Reverse Energy Flow, and so forth depending on the capabilities of the meter itself (see section 2.2.3 for additional details). In addition to reporting alarms received from the end device, OTV is also constantly monitoring the received data from operational devices and detects any device that has not communicated within a certain, configured amount of time. For more information on setting up this device timeout value, refer to the *OTV Operator Guide (010-0106-00)*. Furthermore, OTV generates a Meter Info Change alarm if it detects a change in the meter information (e.g., meter serial number, firmware version, hardware version, etc.) reported by the eMCM compared to what is stored in the HES.

OTV provides several places to review and manage alarms coming from the devices. An overview of the basic OTV alarming capabilities for AMI is provided in this section but for more detailed information refer to the *OTV Operator Guide (010-0106-00)*.

## 2.4.1 Alarm Displays

OTV provides a main alarm summary page showing active alarms from all operational devices on the network as shown in the following figure.

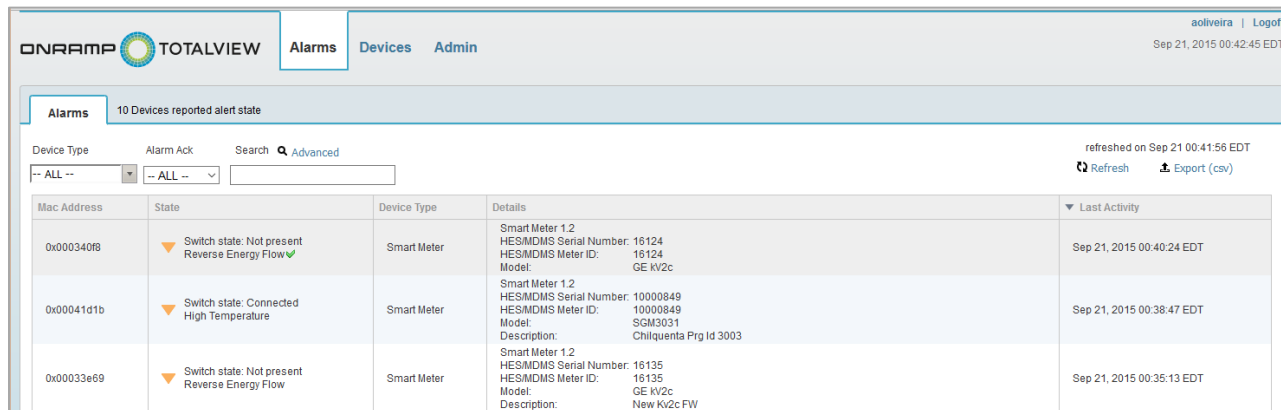


Figure 39. OTV Active Alarms Display Page

When an alarm has self-cleared, the alarm is no longer active and therefore is not shown on the main alarm display page. When viewing many active alarms, the operator may choose to filter this view by device type and the alarm acknowledgement status. The operator may also search this display for alarms of interest using either the basic search feature or the Advanced Search option.

Clicking on a device in the alarm summary page opens the Device Details page for the selected device and displays the five most recent active alarms for the device, as shown in the following figure.

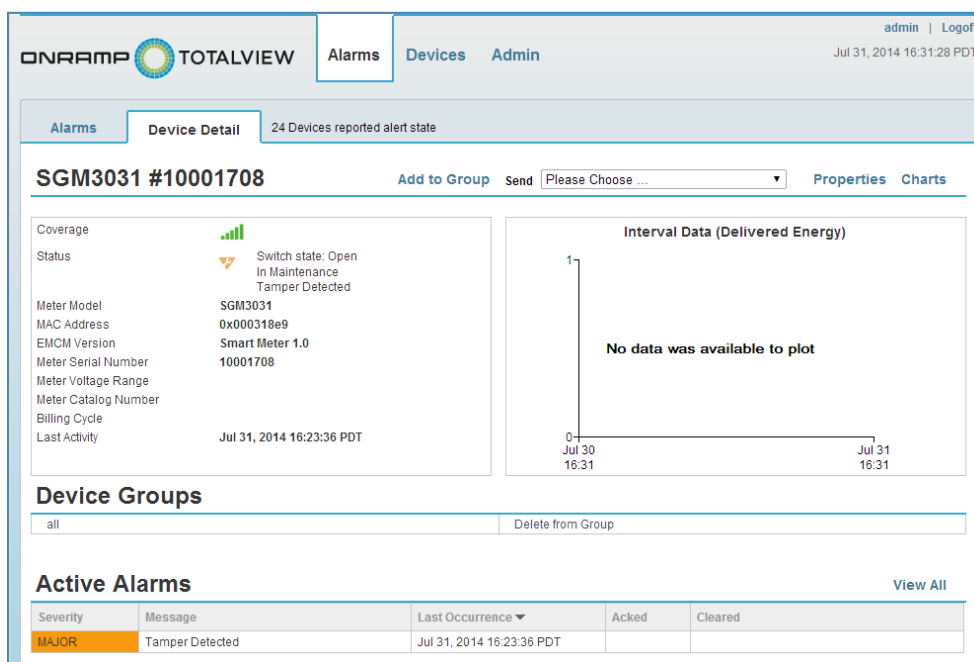


Figure 40. Device Detail Active Alarms

Uplink alarm messages can also be seen in the Meter Events and Received Messages display panels for each device as illustrated in the following figure.

**Active Alarms**
[View All](#)

Severity	Message	Last Occurrence ▼	Acked	Cleared
MAJOR	Tamper Detected	Jul 31, 2014 16:23:36 PDT		






**Readings**
[View Selected](#)

☐ Bulk/Register Data  
☐ TOU

**Meter Events**
[View All](#)

Event Date ▼	Event	CIM Code
Jul 31, 2014 16:23:18 PDT	Meter Communication Error	1.23.14.157
Jul 31, 2014 16:08:17 PDT	Meter Communication Error	1.23.14.157
Jul 31, 2014 16:05:48 PDT	Meter Communication Error	1.23.14.157
Jul 31, 2014 15:53:20 PDT	Meter Communication Error	1.23.14.157
Jul 31, 2014 15:38:19 PDT	Meter Communication Error	1.23.14.157

**Received Messages**
[View All](#)

Received ▼	Message Type	Summary
Jul 31, 2014 16:23:36 PDT	 Meter Event Tamper Detected	Received events messages - ;Meter Comm Err @07/31/14 16:23;
Jul 31, 2014 16:08:37 PDT	 Meter Event Tamper Detected	Received events messages - ;Meter Comm Err @07/31/14 16:08;
Jul 31, 2014 16:06:39 PDT	 Meter Event Tamper Detected	Received events messages - ;Meter Comm Err @07/31/14 16:05;
Jul 31, 2014 15:54:07 PDT	 Meter Event Tamper Detected	Received events messages - ;Meter Comm Err @07/31/14 15:53;
Jul 31, 2014 15:38:34 PDT	 Meter Event Tamper Detected	Received events messages - ;Meter Comm Err @07/31/14 15:38;

**Figure 41. Uplink Alarm Messages in Meter Events and Received Messages Panels**

## 2.4.2 Alarm Acknowledgment

OTV provides a mechanism to “acknowledge” alarms which allows an operator to easily distinguish existing and acknowledged alarms from new alarms that have not been acknowledged.

To “Acknowledge” an alarm the operator can click on the desired alarm in the Active Alarms display panel in the Device Details page which presents an Alarm Detail window as shown in the following figure.

**Alarm Details: Tamper Detected: Mac Address 0x000318e9**

**Alarm:** Tamper Detected

**Additional Information:** Smart Meter 10001708 has the following MAJOR condition: Meter has reported tamper detection. This message was received from this device at 07/01/2014 02:05:42 Pacific Daylight Time (server time) Smart Meter 1.0 Details: Mac Address: 0x000318e9

**Severity:** MAJOR

**First Occurrence:** Jul 1, 2014 02:05:42 PDT

**Last Occurrence:** Jul 31, 2014 16:23:36 PDT

**Acknowledge:** Yes

**Buttons:** Cancel Save

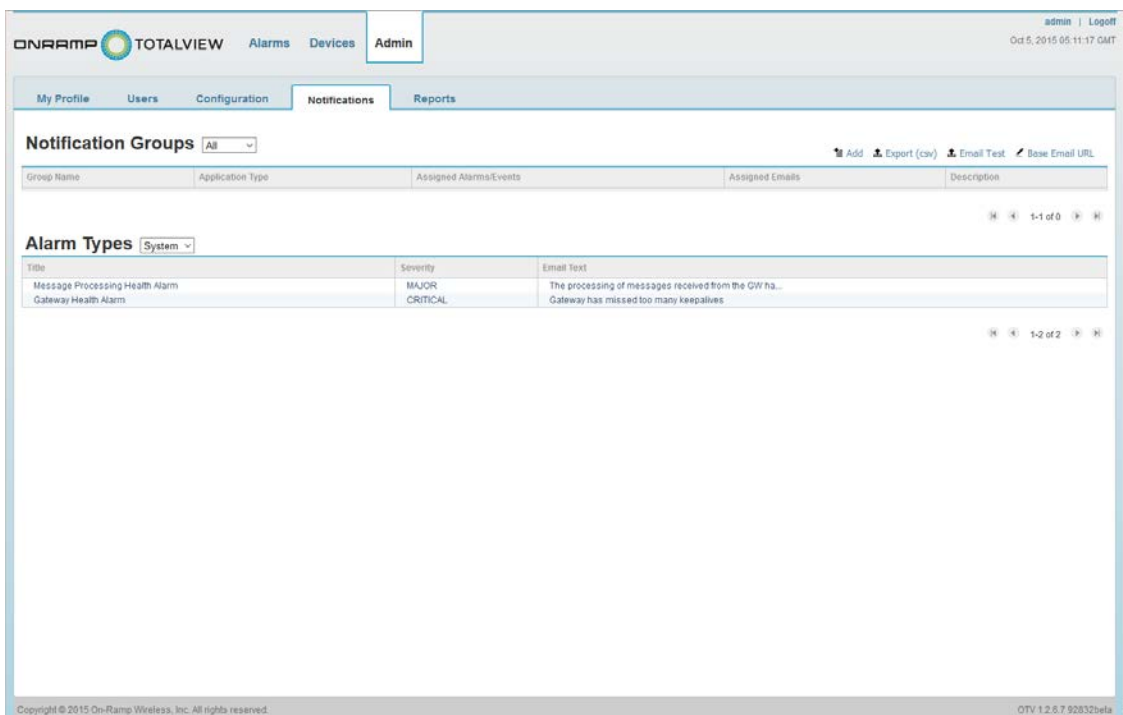
Severity	Message	Last Occurrence	Acked	Cleared
MAJOR	Tamper Detected	Jul 31, 2014 16:23:36 PDT		

**Figure 42. Acknowledging an Alarm in Alarm Details Page**

Simply select 'Yes' from the 'Acknowledge' pull-down menu and click on the Save button. Acknowledged alarms are displayed on the main alarm summary page with a green checkmark. As mentioned previously, alarms on the alarm summary page can be sorted with respect to whether or not they have been acknowledged.

### 2.4.3 Alarm Notification Emails

The OTV administrator can configure OTV so that it sends email notifications for desired alarm or meter events. To access this page, navigate to **Admin → Notifications** to be taken to the screen shown in the following figure. From this screen, users can create notification groups, configure alarm settings, and change the base email URL used in all emails sent from OTV.



**Figure 43. Notification Group Page**

To configure the OTV email alarm notification settings for the AMI application, navigate to the **Admin → Notifications** page. From the screen shown in Figure 43, click on the **Add** button on the top right of the screen. This will open the **Notification Group Editor** window as shown in the following figure.

The screenshot shows the 'Notification Group Editor' window. It has a title bar 'Notification Group Editor' and a subtitle 'New Notification Group'. The form contains the following fields and sections:

- Group Name:** A text input field.
- Application Type:** A dropdown menu with 'Smart Meter' selected.
- Description:** A text area.
- Emails (Comma Separated):** A text area.
- Alarms:** A section with a checkbox 'Alarms:' and a list of checkboxes for various alarm types:
  - ☐ AMR Error
  - ☐ Meter Config Error
  - ☐ Metering Problem
  - ☐ Reverse Energy Flow
  - ☐ Tamper Detected
  - ☐ High Temperature
  - ☐ Meter Info Change
  - ☐ Power Fail
  - ☐ Service Error
  - ☐ Timeout Exceeded
- Events:** A section with a checkbox 'Events:' and a list of checkboxes for various event types:
  - ☐ AMR Error
  - ☐ AMR Error Cleared
  - ☐ Auxiliary Switch 1 Closed
  - ☐ Auxiliary Switch 1 targeted Close
  - ☐ Auxiliary Switch 1 targeted Open
  - ☐ Auxiliary Switch 2 Closed
  - ☐ Auxiliary Switch 2 targeted Close
  - ☐ Auxiliary Switch 2 targeted Open
  - ☐ Auxiliary Switch 3 Closed
  - ☐ Auxiliary Switch 3 targeted Close
  - ☐ Auxiliary Switch 3 targeted Open
  - ☐ Auxiliary Switch 4 Closed
  - ☐ Auxiliary Switch 4 targeted Close
  - ☐ Auxiliary Switch 4 targeted Open
  - ☐ Auxiliary Switch 5 Closed
  - ☐ Auxiliary Switch 5 Open

At the bottom of the window are two buttons: 'Cancel' and 'Create'.

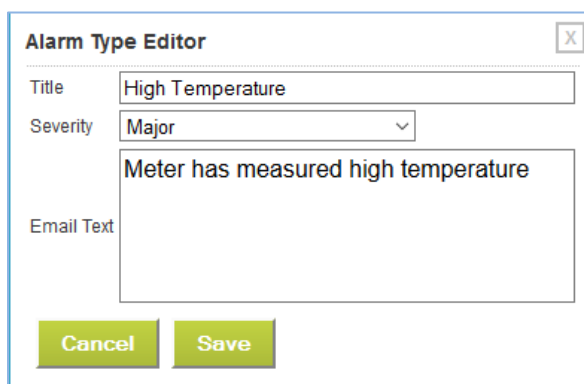
**Figure 44. OTV Notifications Page**

This window contains the following fields:

- **Group Name:** A blank text field allowing users to name the newly created group. This name will appear throughout OTV.
- **Application Type:** A drop down menu allowing for users to select specific application types for different supported devices. In order to see AMI specific alarms, ensure that Smart Meter is selected.
- **Description:** A blank text field allowing users to provide a brief description of the notification group.
- **Emails (Comma Separated):** A blank text field allowing users to enter in the email addresses that the notifications for the group to be sent out to. Multiple email addresses can be entered in so long as they are separated by a comma.
- **Alarms:** A checkbox field allowing users to select which alarms they wish to receive notifications for. Multiple alarms can be selected at a time by checking individual boxes or by checking the box to the far left of the field.
- **Events:** A checkbox field of meter-specific events currently supported by AMI 1.2. Multiple events can be selected at a time by checking individual boxes or by checking the box to the far left of the field.

By entering in information for each of the above fields, users can configure a notification group for multiple alarms and events at a time for a large number of email addresses. Once all the information has been entered, click on **Create** at the bottom of the window to save the notification group to OTV. After this point, OTV will send out notifications if any of the selected alarms or events are triggered for devices that have been set to the **Operational** status.

To configure the severity of an alarm, click on the alarm in question under the **Alarm Types** section of the Notifications page. This will bring up the **Alarm Type Editor** window as shown in the following figure.



The screenshot shows a window titled "Alarm Type Editor" with a close button in the top right corner. Inside the window, there are three input fields. The first is labeled "Title" and contains the text "High Temperature". The second is labeled "Severity" and is a dropdown menu currently showing "Major". The third is labeled "Email Text" and contains the text "Meter has measured high temperature". At the bottom of the window, there are two buttons: "Cancel" and "Save".

**Figure 45. Alarm Type Editor**

The figure above displays an example of what the Alarm Type Editor looks like when the High Temperature Alarm is selected. The **Title** field allows users to edit the name of the alarm. This change will propagate throughout OTV and will change what appears in Notification Emails. The **Severity** section provides a dropdown menu for users to configure the severity of the alarm. This will affect alarm icons in OTV as well as what appears in Notification Emails. The **Email Text** section allows users to input a custom text string that will be displayed in Notification Emails.

After alarm notification emails have been setup, recipients receive email notifications whenever the selected alarms occur. The email notifications contain various information about the alarm including a text description, the device ID that reported the alarm, the time and date that the alarm was received, etc., as displayed in the following figure.



Figure 46. Example Alarm Notification Email (for Non-AMI Applications)

## 2.5 Device Management

### 2.5.1 Group Import

Standard group formation through file import is available for all device types using device Mac Address. For detailed information, refer to the *OTV Operator Guide (010-0106-00)*. OTV 1.1.10 and later, with the AMI adapter installed, supports creating and adding meters to a group via file import using Meter Serial Number or Customer Meter Number. Both values are created in OTV upon marriage file ingest. For detailed information about marriage files, refer to the *HES-OTV AMI Interface Guide (010-0120-00)*.

From the **Devices → Meters** page, select **Import** link on the top right of the page. This takes the user to the **Imported File List** screen, which displays a history of previous file imports. Clicking on **Import File** brings up the Import dialog box as shown below.

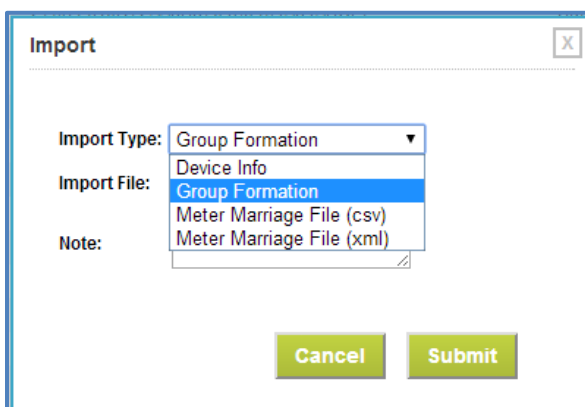
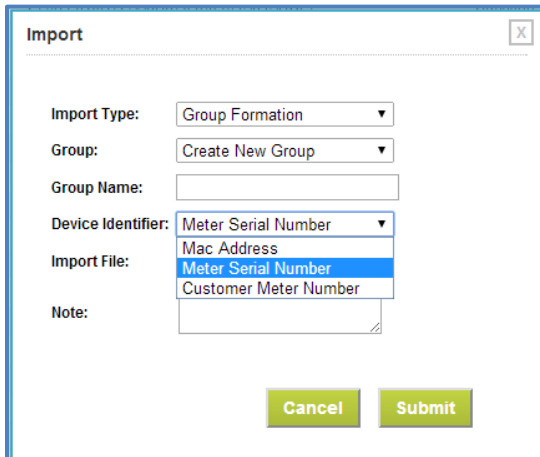


Figure 47. Group Import – Import Type

Select **Group Formation** as the Import Type.



A Device Identifier option is displayed. Clicking on this pull-down menu shows the following options: Mac Address, Meter Serial Number, and Customer Meter Number.



The screenshot shows a web-based 'Import' dialog box. It contains the following fields and controls:

- Import Type:** A dropdown menu currently set to 'Group Formation'.
- Group:** A dropdown menu currently set to 'Create New Group'.
- Group Name:** An empty text input field.
- Device Identifier:** A dropdown menu that is open, showing three options: 'Mac Address', 'Meter Serial Number' (which is highlighted in blue), and 'Customer Meter Number'.
- Import File:** A text input field.
- Note:** A larger text area for additional information.
- Buttons:** 'Cancel' and 'Submit' buttons at the bottom right.

**Figure 48. Group Import – Device Identifier**

Select the desired Device Identifier that is used in the file to import.

Select the file and group options and click **Submit**.

OTV attempts to add the devices found (based on the selected Device Identifier) to the group selected or to a new group depending on what Group option is selected. A progress screen is shown after clicking **Submit**, where the current status of the group formation is displayed.

## 2.5.2 Adding Meters to Groups from the Meters Page

In addition to the method mentioned above, OTV supports creation of groups through the UI itself. This can be accomplished by navigating to **Devices → Meters**. From this screen apply filters from a combination of the **Model** drop-down menu, the **Search** field, or the **Advanced Search** feature as shown in the following figure.

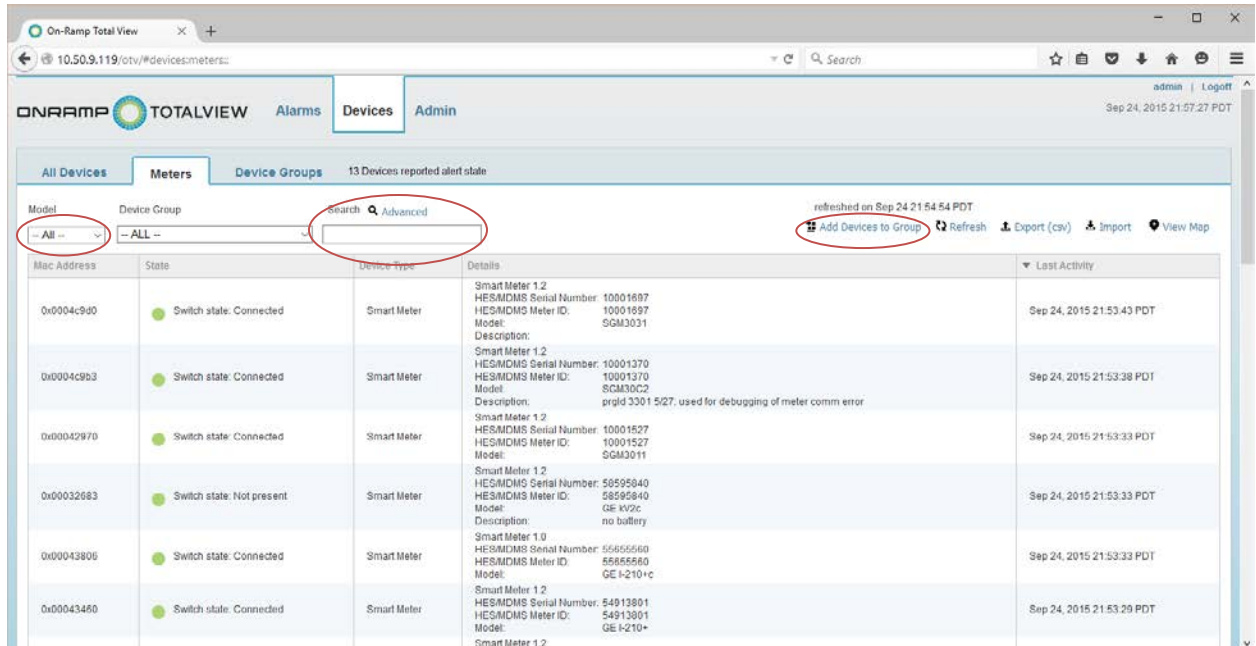


Figure 49. Default Meters Page

The **Model** drop down menu allows operators to filter the page to only include meters of a specific model type. **Search** and **Advanced Search** work similarly by allowing operators to search for specific meter properties such as AMI version, EMCM firmware version, Description, and all other properties found on a device's specific **Properties** page.

When the desired filters have been applied, click on **Add Devices to Group** to bring up the window shown in the following figure. Select the desired pre-existing group from the drop-down menu and then click **Submit** to add the meters to the selected group.

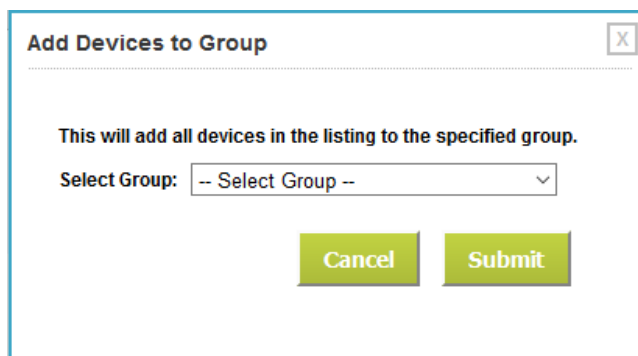


Figure 49. Add Devices to Group Menu

## 2.6 Scheduled Tasks

### 2.6.1 Demand Reset

To set up a Demand Reset task for a group of meters in OTV, navigate to **Devices** → **Device Groups** and select the group of meters that will have the demand reset task assigned to it. On

the next screen that displays, select **Manage Tasks** at the top right of the screen. This displays the **Task Editor** window as shown below. Click on **Add Task** at the upper right of the **Task Editor** window.

The Task Editor window displays a table with the following columns: Enabled, Task, Description, Frequency, Status, Last Run, and Next Run. The table is currently empty, showing the message "There is no data to display". An "Add Task" button is located at the top right of the table area and is circled in red. At the bottom right of the window, there are "Cancel" and "Save" buttons.

**Figure 50. Task Editor Window**

For the **Task** field, select **Demand Reset** from the dropdown menu. The **Task Editor** window is populated with fields relevant to **Demand Reset** as shown in the following figure.

The Task Editor window is populated for the "Demand Reset" task. The fields and their values are as follows:

- Task:** Demand Reset
- Description:** (Empty text area)
- Enabled:** ☐ This task is not enabled and will not execute.
- Email Notification:** (Empty text field) [Send Test Email](#)
- Time Zone:** Africa/Abidjan (Dropdown menu)
- Start Time:** (Empty text field) HH:mm format, 24 hour clock
- Reset Dates:** (Empty text area) [Validate](#)  
 Dates should be in YYYY-MM-DD format (separated by new lines or commas)  
 Form must be valid before saving. Click Validate to check reset dates.

At the bottom right of the window, there are "Cancel" and "Save" buttons.

**Figure 51. Demand Reset – Task Editor**

- **Description** – Allows operators to enter a simple description for the task to be displayed on the **Task Editor** window.
- **Enabled** – This checkbox must be ticked in order for the demand reset to execute. This allows users to prevent demand resets from occurring without deleting the task itself.
- **Email Notification** – An email address entered into this field will receive a notification whenever a scheduled **Demand Reset** is successful. Operators can send out a test email by clicking on **Send Test Email** to ensure that OTV has been configured correctly for email notifications.
- **Time Zone** – Allows operators to specify the time zone that these scheduled tasks will execute in. Changing this setting will affect when the **Start Time** applies.
- **Start Time** – The time that the **Demand Reset** begins executing. Please note that times entered in this field must be in a 24-hour clock format.
- **Reset Dates** – Allows for operators to specify the specific dates that demand resets will occur on. Before the **Demand Reset** can be scheduled, the formats for these dates must be validated by clicking on **Validate** to the right of this field.

After start time, time zone, and date have been specified, clicking on **Save** creates the scheduled task, and OTV executes the task at the specified times.

## 2.6.2 Export CMEP File

To set up an **Export CMEP File** task for a group of meters in OTV, navigate to **Devices** → **Device Groups** and select the group of meters that will have the export task assigned to it. On the next screen that displays, select **Manage Tasks** at the top right of the screen. This displays the **Task Editor** window. Click on **Add Task** at the right of the Task Editor window.

For the **Task** field, select **Demand Reset** from the dropdown menu. The **Task Editor** window is populated with fields relevant to **Demand Reset** as shown in the following figure.

The screenshot shows the 'Task Editor' window with the following fields and values:

- Task:** Export CMEP File
- Description:** (Empty text box)
- Enabled:** ☐ This task is not enabled and will not execute.
- Email Notification:** (Empty text box) with a [Send Test Email](#) link below it.
- Record Type:** MEPMD01 (interval) (Dropdown menu)
- Use Virtual Metering:** ☐
- Time Zone:** America/Los\_Angeles (Dropdown menu)
- Execute every:** 2 Hours (Dropdown menu) with a note: (Reading window for next execution: Sep 24 22:00:00 PDT - Sep 25 00:00:00 PDT)
- Delay (hours):** 0 (Dropdown menu) with a note: (Next execution date: Sep 25 00:00:00 PDT)
- HTTP URL:** (Empty text box)
- Username:** (Empty text box)
- Password:** (Empty text box) with a [Test Connection](#) link below it.
- Max File Size (MB):** 5 (Text box)

At the bottom right, there are 'Cancel' and 'Save' buttons.

**Figure 52. Export CMEP File – Task Editor**

- **Description** – Allows operators to enter a simple description for the task to be displayed on the **Task Editor** window.
- **Enabled** – This checkbox must be ticked in order for the demand reset to execute. This allows users to prevent demand resets from occurring without deleting the task itself.
- **Email Notification** – An email address entered into this field will receive a notification whenever a scheduled **Demand Reset** is successful. Operators can send out a test email by clicking on **Send Test Email** to ensure that OTV has been configured correctly for email notifications.
- **Record Type** – Allows for operators to select between MEPMD01, MEPMD02, and MLA01 for the different export types.
- **Use Virtual Metering** – Allows for operators to implement features not natively supported on energy only meters such as calculating Peak Demand.
- **Time Zone** – Allows operators to specify the time zone that these scheduled tasks will execute in. Changing this setting will affect when the **Start Time** will apply.
- **Execute Every** – Allows for operators to specify how frequently the CMEP file will be generated.
- **Delay (hours)** – Allows for operators to specify a set amount of time that OTV will delay the file generation to ensure that all data has been received.
- **HTTP URL** – Allows operators to specify a URL that the CMEP file will be exported to

- **Username** – If the URL mentioned above requires a username, operators can enter the information here.
- **Password** – If the URL mentioned above requires a password, operators can enter the information here.
- **Test Connection** – Allows operators to test that the information they entered for the HTTP URL, username, and password are correct before setting up the export. It is strongly recommended that operators test their connection before proceeding.
- **Max File Size (MB)** – Allows for operators to specify how large these files are allowed to become before being cut off

When all the information has been entered, clicking on **Save** creates the CMEP export task. From this point on, OTV automatically generates CMEP files and sends them to the URL specified during the creation of the task.

## 2.7 Advanced Features

### 2.7.1 CSV Export of Meter Readings

Meter Readings can be exported on an individual device basis or for multiple meters.

#### 2.7.1.1 Individual Device

Meter readings can be exported to a CSV file that can be used in Microsoft Excel or other tools for more advanced charting or calculations on the data. This feature is found in the **Meter Readings** page which can be accessed by clicking on the **View Selected/All** link in the Readings display panel on the **Device Details** page as shown in the following figure.

Readings

View Selected/All

Bulk/Register Data

Summation

Delivered Bulk Energy kWh

0.0.1.1.0.12.0.0.0.3.72

0.000

Sep 24, 2015 20:00:00 PDT

Data Valid

Delivered Bulk Reactive Energy kWh

0.0.1.1.0.12.0.0.0.3.73

0.000

Sep 24, 2015 20:00:00 PDT

Data Valid

Net Bulk Energy kWh

0.0.1.4.0.12.0.0.0.3.72

0.000

Sep 24, 2015 20:00:00 PDT

Data Valid

Received Bulk Energy kWh

0.0.1.19.0.12.0.0.0.3.72

0.000

Sep 24, 2015 20:00:00 PDT

Data Valid

Received Bulk Reactive Energy kWh

0.0.1.19.0.12.0.0.0.3.73

0.000

Sep 24, 2015 20:00:00 PDT

Data Valid

Season

0.0.0.0.2.54.0.0.0.1.11

0

Sep 24, 2015 20:00:00 PDT

Data Valid

Total Bulk Energy kWh

0.0.1.20.0.12.0.0.0.3.72

0.000

Sep 24, 2015 20:00:00 PDT

Data Valid

Lag Delivered Bulk Energy kWh

0.0.1.15.0.12.0.0.0.3.72

0.000

Jun 25, 2015 09:00:00 PDT

Data Valid

Lag Delivered Bulk Reactive Energy kWh

0.0.1.15.0.12.0.0.0.3.73

0.000

Jun 25, 2015 09:00:00 PDT

Data Valid

Lead Delivered Bulk Reactive Energy kWh

0.0.1.16.0.12.0.0.0.3.73

0.000

Jun 25, 2015 09:00:00 PDT

Data Valid

Lead Received Bulk Energy kWh

0.0.1.16.0.12.0.0.0.3.72

0.000

Jun 25, 2015 09:00:00 PDT

Data Valid

Demand

TOU

Interval Data

Power Quality Data

Meter Events

View All

Event Date	Event	CIM Code
Aug 20, 2015 14:33:51 PDT	Meter Metrology Configuration Changed	3.21.7.24
Aug 20, 2015 14:29:35 PDT	Meter Metrology Configuration Changed	3.21.7.24

Figure 53. Meter Readings Display Panel on Device Details Page

In the **Meter Readings** page, select the **Export (csv)** option as illustrated in the following figure.

ONRAMP TOTALVIEW Alarms Devices Admin admin | Logoff Sep 25, 2015 00:04:18 PDT

All Devices Meters Device Groups Device Detail **Meter Readings** 13 Devices reported alert state

**Meter Readings for SGM3031 #10001623: All**

Go Back refreshed on Sep 25 00:03:56 PDT **Export (csv)** Refresh Date Range

Reading Date	Reading Type	CIM Code	Value	Reading Quality
Sep 24, 2015 23:33:10 PDT	Apparent Power Phase-C KVA	0.0.6.0.0.12.0.0.32.3.61	0.000	Data Valid
Sep 24, 2015 23:33:10 PDT	Apparent Power Phase-B KVA	0.0.6.0.0.12.0.0.64.3.61	0.000	Data Valid
Sep 24, 2015 23:33:10 PDT	Apparent Power Phase-A KVA	0.0.6.0.0.12.0.0.128.3.61	0.000	Data Valid
Sep 24, 2015 23:33:10 PDT	Reactive Power Phase-C KVA	0.0.6.0.0.37.0.0.32.3.63	0.000	Data Valid
Sep 24, 2015 23:33:10 PDT	Reactive Power Phase-B KVA	0.0.6.0.0.37.0.0.64.3.63	0.000	Data Valid
Sep 24, 2015 23:33:10 PDT	Reactive Power Phase-A KVA	0.0.6.0.0.37.0.0.128.3.63	0.000	Data Valid
Sep 24, 2015 23:33:10 PDT	Active Power Phase-C KW	0.0.6.0.0.37.0.0.32.3.38	0.000	Data Valid
Sep 24, 2015 23:33:10 PDT	Active Power Phase-B KW	0.0.6.0.0.37.0.0.64.3.38	0.000	Data Valid
Sep 24, 2015 23:33:10 PDT	Active Power Phase-A KW	0.0.6.0.0.37.0.0.128.3.38	0.000	Data Valid
Sep 24, 2015 23:33:10 PDT	Temperature C	0.0.6.0.0.46.0.0.0.0.23	32.00	Data Valid
Sep 24, 2015 23:33:10 PDT	Power Factor Phase-C	0.0.6.0.0.38.0.0.32.0.65	0.00	Data Valid
Sep 24, 2015 23:33:10 PDT	Power Factor Phase-B	0.0.6.0.0.38.0.0.64.0.65	0.00	Data Valid
Sep 24, 2015 23:33:10 PDT	Power Factor Phase-A	0.0.6.0.0.38.0.0.128.0.65	0.00	Data Valid
Sep 24, 2015 23:33:10 PDT	RMS Current Phase-C A	0.15.6.0.0.4.0.0.32.0.5	0.00	Data Valid
Sep 24, 2015 23:33:10 PDT	RMS Current Phase-B A	0.15.6.0.0.4.0.0.64.0.5	0.00	Data Valid
Sep 24, 2015 23:33:10 PDT	RMS Current Phase-A A	0.15.6.0.0.4.0.0.128.0.5	0.00	Data Valid
Sep 24, 2015 23:33:10 PDT	RMS Line-to-Neutral Voltage Phase-C V	0.15.6.0.0.54.0.0.32.0.29	255.70	Data Valid
Sep 24, 2015 23:33:10 PDT	RMS Line-to-Neutral Voltage Phase-B V	0.15.6.0.0.54.0.0.64.0.29	257.70	Data Valid
Sep 24, 2015 23:33:10 PDT	RMS Line-to-Neutral Voltage Phase-A V	0.15.6.0.0.54.0.0.128.0.29	257.30	Data Valid
Sep 24, 2015 23:30:00 PDT	15 min Average Voltage Phase-C V	2.2.4.0.0.54.0.0.32.0.29	256.30	Data Valid
Sep 24, 2015 23:30:00 PDT	15 min Average Voltage Phase-B V	2.2.4.0.0.54.0.0.64.0.29	257.80	Data Valid
Sep 24, 2015 23:30:00 PDT	15 min Average Voltage Phase-A V	2.2.4.0.0.54.0.0.128.0.29	256.40	Data Valid
Sep 24, 2015 23:30:00 PDT	Received 15 min Reactive Energy kWh	2.0.4.19.0.12.0.0.0.3.73	0.000	Data Valid
Sep 24, 2015 23:30:00 PDT	Delivered 15 min Reactive Energy kWh	2.0.4.1.0.12.0.0.0.3.73	0.000	Data Valid
Sep 24, 2015 23:30:00 PDT	Delivered 15 min Energy kWh	2.0.4.1.0.12.0.0.0.3.72	0.000	Data Valid
Sep 24, 2015 23:30:00 PDT	15 min Instantaneous Harmonic Distortion (Voltage) Phas	2.0.4.0.0.47.0.0.64.0.29	0.00	Data Valid
Sep 24, 2015 23:30:00 PDT	15 min Instantaneous Harmonic Distortion (Voltage) Phas	2.0.4.0.0.47.0.0.128.0.29	0.00	Data Valid
Sep 24, 2015 23:30:00 PDT	15 min Max Current Phase-C A	2.8.0.0.0.4.0.0.32.0.5	0.00	Data Valid
Sep 24, 2015 23:30:00 PDT	15 min Max Current Phase-B A	2.8.0.0.0.4.0.0.64.0.5	0.00	Data Valid

**Figure 54. CSV Export of Meter Readings**

**NOTE:** The **Date Range** option can be used to restrict the interval of data that is to be exported to a CSV file.

### 2.7.1.2 Multiple Devices

To export readings for multiple meters, navigate to the **Meters** listing page. Filter the view of meters by selecting a group from the **Device Group** drop-down menu, by selecting a meter model from the **Model** drop-down menu, or perform a search. When the set of meters desired for export has been filtered, click on the **Export (csv)** link.

In the dialog box that appears, select **Meter Readings**.

**Extract Options**

Export Type: **Meter Readings**

- Device Listing
- iVUE TWAC
- iVUE CMEP
- Meter Events
- Meter Readings**

**Figure 55. Extract Options Dialog Box for Export Type: Meter Readings**

The dialog box expands to allow selection of specific reading types to export.

Reading Type	CIM Code
<input type="checkbox"/> Lag Delivered Bulk Reactive Energy kVarh	0.0.1.15.0.12.0.0.0.3.73
<input type="checkbox"/> Lag Delivered Bulk Energy kWh	0.0.1.15.0.12.0.0.0.3.72
<input type="checkbox"/> Season	0.0.0.0.2.54.0.0.0.0.111
<input type="checkbox"/> Bulk Voltage square Phase-CA V2h	0.0.1.0.0.54.0.0.40.0.104
<input type="checkbox"/> Net Bulk Energy kWh	0.0.1.4.0.12.0.0.0.3.72
<input type="checkbox"/> Instantaneous Voltage Phase-A V	0.0.1.0.0.54.0.0.128.0.29
<input type="checkbox"/> Lead Received Bulk Reactive Energy kVarh	0.0.1.18.0.12.0.0.0.3.73
<input type="checkbox"/> Lead Delivered Bulk Energy kWh	0.0.1.18.0.12.0.0.0.3.72
<input type="checkbox"/> Bulk Quantity Qh	0.0.1.6.0.40.0.0.0.0.101
<input type="checkbox"/> Lead Delivered Bulk Reactive Energy kVarh	0.0.1.16.0.12.0.0.0.3.73
<input type="checkbox"/> Lead Received Bulk Energy kWh	0.0.1.16.0.12.0.0.0.3.72
<input type="checkbox"/> Delivered Bulk Reactive Energy kVarh	0.0.1.1.0.12.0.0.0.3.73

**Figure 56. Expanded Extract Options Dialog Box for Export Type: Meter Readings**

Click one or more reading types.

**NOTE:** Not selecting any of the available types of readings exports all available reading types. Set the **Date Range** for the reading period in which you would like to export.

Click **Submit**. A CSV file of selected reading types for the date range selected is generated. The output of the CSV file contains the following fields on each line:

Reading Date,CIM Code,Reading Type Description,Value,Reading Quality  
Code,Received Date,Mac Address,Meter Serial

A sample line is shown below:

08/08/2014 09:15:00 PDT,2.0.4.19.0.12.0.0.0.3.73,Received 15 min Reactive  
Energy kVarh,0.001,Data Valid,08/08/2014 09:17:12 PDT,0x31747,202567

## 2.7.2 CSV Export of Meter Events

OTV also allows export of individual meter events or events for a group of meters.

### 2.7.2.1 Individual Device

Meter events can be exported to a CSV file that can be used in Microsoft Excel or other tools for more advanced charting or calculations on the data. This feature is found in the **Meter Events** page which can be accessed by clicking on the **View All** link in the **Meter Events** display panel on the **Device Details** page as shown in the following figure.



Meter Events <span style="float: right;">View All</span>		
Event Date ▼	Event	CIM Code
Jun 30, 2014 12:12:18 PDT	Voltage Swell has occurred	6.38.17.248
Jun 29, 2014 14:21:53 PDT	Voltage Swell has occurred	6.38.17.248
Jun 29, 2014 11:12:11 PDT	Voltage Swell has occurred	6.38.17.248
Jun 28, 2014 18:01:25 PDT	Voltage Swell has occurred	6.38.17.248
Jun 28, 2014 10:11:31 PDT	Voltage Swell has occurred	6.38.17.248

Figure 57. Meter Events Display Panel on Device Details Page

In the Meter Events page, select the **Export (csv)** option as illustrated in the following figure.

Alarms

Devices

Admin

admin | Logoff  
Aug 8, 2014 09:48:48 PDT

All DevicesMetersGrid AutomationDevice DetailMeter Events7 Devices reported alert state

Meter Events for GE kV2c #56809129

Go Back

refreshed on Aug 8 09:48:48 PDT

Export (csv)

Refresh

Date Range

Event Date ▼	Event	CIM Code
Jun 30, 2014 12:12:18 PDT	Voltage Swell has occurred	6.38.17.248
Jun 29, 2014 14:21:53 PDT	Voltage Swell has occurred	6.38.17.248
Jun 29, 2014 11:12:11 PDT	Voltage Swell has occurred	6.38.17.248
Jun 28, 2014 18:01:25 PDT	Voltage Swell has occurred	6.38.17.248
Jun 28, 2014 10:11:31 PDT	Voltage Swell has occurred	6.38.17.248
Jun 28, 2014 10:10:32 PDT	Voltage Swell has occurred	6.38.17.248
Jun 25, 2014 23:20:54 PDT	Tamper Detection clear	3.33.9.257
Jun 25, 2014 22:45:54 PDT	Tamper Detection has been triggered	3.33.1.257
Jun 25, 2014 22:19:44 PDT	Momentary Outage on grid side occurred	6.26.13.165
Jun 25, 2014 22:19:40 PDT	Voltage Sag has occurred	6.38.17.223

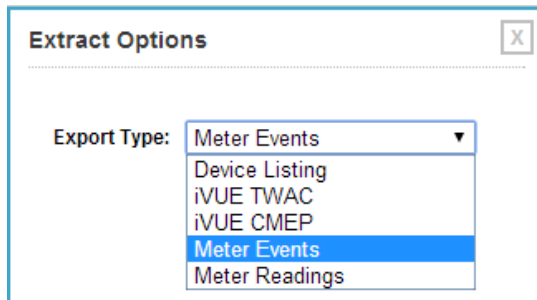
1-10 of 10

Figure 58. CSV Export of Meter Events

The **Date Range** option can be used to restrict the interval of data that is to be exported to a CSV file.

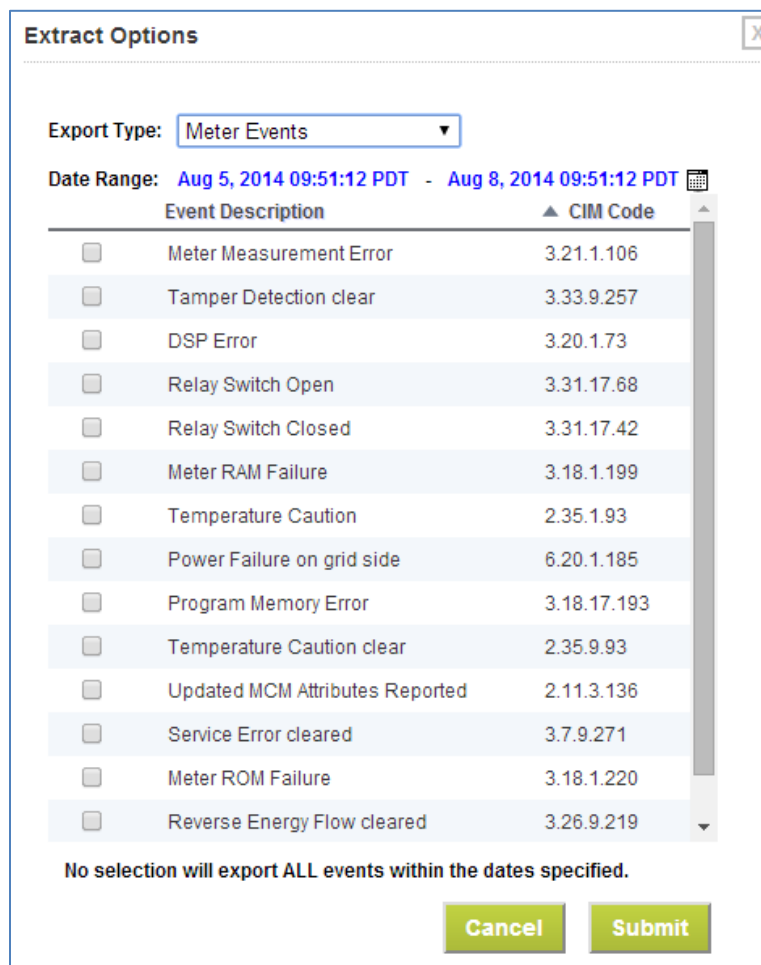
### 2.7.2.2 Multiple Devices

To export events for multiple meters, go to the **Devices** or **Meters** listing page. Filter your view of meters by selecting a group or meter model or perform a search. When you have the set of meters desired for export, click the **Export (csv)** link. In the dialog box that appears, select **Meter Events**.



**Figure 59. Extract Options Dialog Box for Export Type: Meter Events**

The dialog box expands to allow selection of specific events to export.



**Figure 60. Expanded Extract Options Dialog Box for Export Type: Meter Readings**

Click one or more events.

**NOTE:** Not specifying the type of meter event exports all available events.

Set the **Energy Date Range** for the event period in which you would like to export.

Click **Submit**. A CSV file of selected events for the date range selected is generated. The output of the csv file contains the following fields on each line:

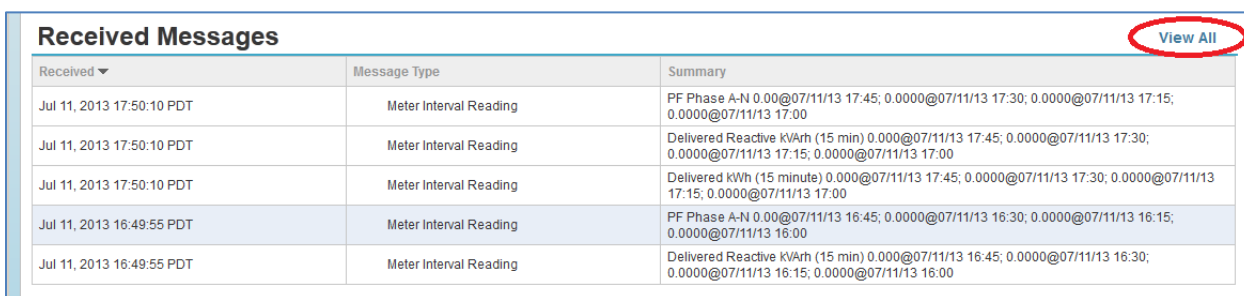
Event Date,CIM Code,Event Description,Mac Address,Meter Serial

A sample line is shown here:

08/06/2014 02:21:18 PDT,3.31.17.42,Relay Switch Closed,0x31747,202567

## 2.7.3 CSV Export of Received Messages

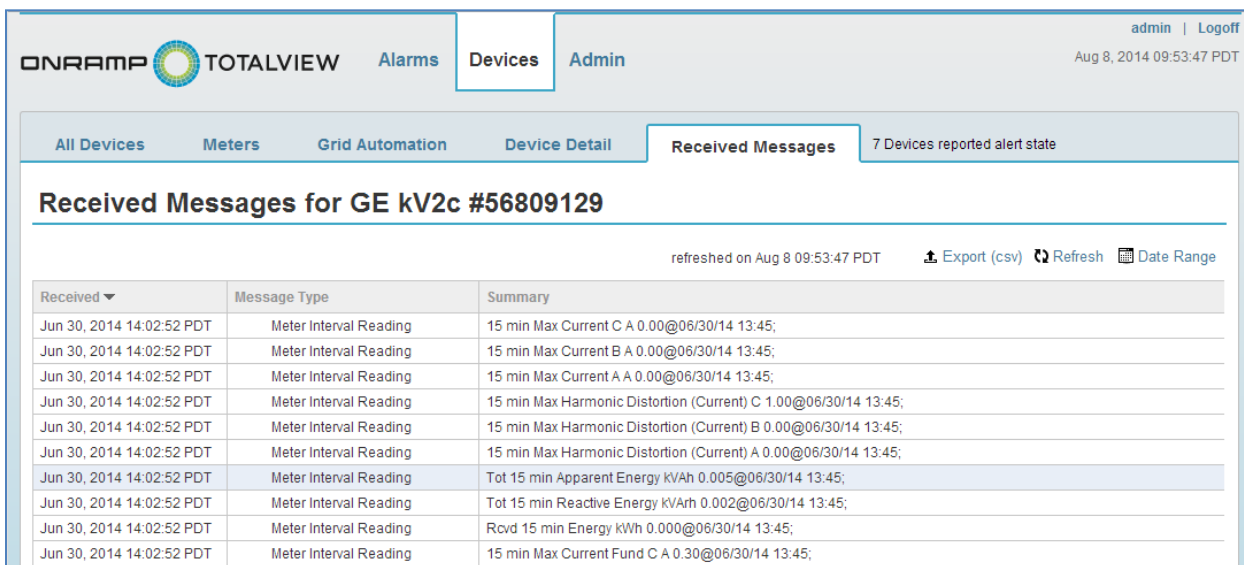
Received messages can be exported to a CSV file that can be used in Microsoft Excel or other tools for more advanced analysis of the data. This feature is found in the **Received Messages** page which can be accessed by clicking on the **View All** link in the **Received Messages** display panel on the **Device Details** page as shown in the following figure.



Received Messages			<a href="#">View All</a>
Received ▼	Message Type	Summary	
Jul 11, 2013 17:50:10 PDT	Meter Interval Reading	PF Phase A-N 0.00@07/11/13 17:45; 0.0000@07/11/13 17:30; 0.0000@07/11/13 17:15; 0.0000@07/11/13 17:00	
Jul 11, 2013 17:50:10 PDT	Meter Interval Reading	Delivered Reactive KVAh (15 min) 0.000@07/11/13 17:45; 0.0000@07/11/13 17:30; 0.0000@07/11/13 17:15; 0.0000@07/11/13 17:00	
Jul 11, 2013 17:50:10 PDT	Meter Interval Reading	Delivered kWh (15 minute) 0.000@07/11/13 17:45; 0.0000@07/11/13 17:30; 0.0000@07/11/13 17:15; 0.0000@07/11/13 17:00	
Jul 11, 2013 16:49:55 PDT	Meter Interval Reading	PF Phase A-N 0.00@07/11/13 16:45; 0.0000@07/11/13 16:30; 0.0000@07/11/13 16:15; 0.0000@07/11/13 16:00	
Jul 11, 2013 16:49:55 PDT	Meter Interval Reading	Delivered Reactive KVAh (15 min) 0.000@07/11/13 16:45; 0.0000@07/11/13 16:30; 0.0000@07/11/13 16:15; 0.0000@07/11/13 16:00	

Figure 61. Received Messages Display Panel on Device Details Page

In the **Received Messages** page, select the **Export (csv)** option as illustrated in the following figure.



Received Messages for GE kV2c #56809129			refreshed on Aug 8 09:53:47 PDT	<a href="#">Export (csv)</a>	<a href="#">Refresh</a>	<a href="#">Date Range</a>
Received ▼	Message Type	Summary				
Jun 30, 2014 14:02:52 PDT	Meter Interval Reading	15 min Max Current C A 0.00@06/30/14 13:45;				
Jun 30, 2014 14:02:52 PDT	Meter Interval Reading	15 min Max Current B A 0.00@06/30/14 13:45;				
Jun 30, 2014 14:02:52 PDT	Meter Interval Reading	15 min Max Current A A 0.00@06/30/14 13:45;				
Jun 30, 2014 14:02:52 PDT	Meter Interval Reading	15 min Max Harmonic Distortion (Current) C 1.00@06/30/14 13:45;				
Jun 30, 2014 14:02:52 PDT	Meter Interval Reading	15 min Max Harmonic Distortion (Current) B 0.00@06/30/14 13:45;				
Jun 30, 2014 14:02:52 PDT	Meter Interval Reading	15 min Max Harmonic Distortion (Current) A 0.00@06/30/14 13:45;				
Jun 30, 2014 14:02:52 PDT	Meter Interval Reading	Tot 15 min Apparent Energy KVAh 0.005@06/30/14 13:45;				
Jun 30, 2014 14:02:52 PDT	Meter Interval Reading	Tot 15 min Reactive Energy KVAh 0.002@06/30/14 13:45;				
Jun 30, 2014 14:02:52 PDT	Meter Interval Reading	Rcvd 15 min Energy kWh 0.000@06/30/14 13:45;				
Jun 30, 2014 14:02:52 PDT	Meter Interval Reading	15 min Max Current Fund C A 0.30@06/30/14 13:45;				

Figure 62. CSV Export of Received Messages

The **Date Range** option can be used to restrict the interval of data that is exported to a CSV file.

# Appendix A OTV Feature Mapping to Meter Type

## A.1 OTV Electric AMI Features for AMI 1.0 Meters

OTV Electric AMI Feature	I-210+	I-210+c	kV2c	SGM3000
Send Ping	Yes	Yes	Yes	Yes
Request Meter Switch State	Yes	Yes	Yes	Yes
Meter Connect/Disconnect	Yes	Yes	Yes	Yes
Demand Reset	N/A	Yes	Yes	Yes
Periodic Load Profile Indications	N/A	Yes	Yes	Yes
On-Demand Load Profile	N/A	Yes	Yes	Yes
Periodic Bulk Read Indications	Yes	Yes	Yes	Yes
On-Demand Bulk Read	Yes	Yes	Yes	Yes
Time Of Use	N/A	Yes	Yes	Yes
Demand Measure	N/A	Yes	Yes	Yes
Coincident Measure	N/A	Yes	Yes	N/A
Request Meter Information	Yes	Yes	Yes	Yes
Communication Device Reset	Yes	Yes	Yes	Yes
OTA eMCM Configuration	Yes	Yes	Yes	Yes
Clear Messages	Yes	Yes	Yes	Yes
High Temperature Alarm	Yes	Yes	Yes	Yes
Meter Config Error Alarm	No	N/A	N/A	N/A
Meter Info Change Alarm	Yes	Yes	Yes	Yes
Metering Problem Alarm	Yes	Yes	Yes	Yes
Power Fail Alarm	Yes	Yes	Yes	Yes
Reverse Energy Flow Alarm	N/A	Yes	Yes	No
Service Error Alarm	Yes	Yes	Yes	No
Tamper Detected Alarm	Yes	Yes	Yes	Yes
Timeout Exceeded Alarm	Yes	Yes	Yes	Yes

## A.2 OTV Electric AMI Features for AMI 1.1 Meters

OTV Electric AMI Feature	I-210+	I-210+c	kV2c	SGM3000
Request Power Quality	N/A	NA	Yes	NA
Request Clear All Meter Flags	Yes	NA	Yes	NA
Communication Device Hard Reset	Yes	NA	Yes	NA
On-Demand Load Profile	N/A	NA	No	NA

## Appendix B Switch State Matrix

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This table describes what should be displayed for Switch State for supported meters.

**NOTE:** If a relay switch is installed, then whatever the state of the relay is when it boots up is what will be displayed for the Switch State.

Meter	Before Any Messages	After Boot	After Connect	After eMCM Poll & Uplink (If Applicable)	After Relay State Query
I-210+ AMI 1.0 (No Relay)	N/A	Not Present	Not Present		Not Present
I-210+ AMI 1.0 (1 Relay)	N/A	Open	Closed		Closed
I-210+ AMI 1.1 (No Relay)	N/A	Not Present	Remote Connect Request Successfully Executed	Not Present	Not Present
I-210+ AMI 1.1 (1 Relay)	N/A	Open	Remote Connect Request Successfully Executed	Closed	Closed
kV2c AMI 1.0 (No Relay)	N/A	Not Present	Not Present		Not Present
KV2C AMI 1.1 (No Relay)	N/A	Not Present	Not Present		Not Present
SGM 3000 AMI 1.0 (with Relay)	N/A	Open	Closed		Closed
I-210+c AMI 1.0 (No Relay)	N/A	Not Present	Not Present		Not Present
I-210+c AMI 1.0 (with Relay)	N/A	Open	Closed		Closed

## Appendix C Abbreviations and Terms

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Abbreviation/Term	Definition
ACK	Acknowledgement
AMI	Advanced Metering Infrastructure
ANSI	American National Standards Institute
°C	Celsius (unit of temperature)
CSV	Comma Separated Values
DL	Downlink
eMCM	Electric Meter Communication Module
EMS	Element Management System
°F	Fahrenheit (unit of temperature)
GE	General Electric
HES	Head End System
kVArh	kilovolt-amp-reactive-hour (unit of reactive energy)
kW	kilowatt (unit of power)
kWh	kilowatt-hour (unit of energy)
MAC	Media Access Control
MDMS	Meter Data Management System
OTA	Over-the-Air
OTV	On-Ramp Total View Application
RCDC	Remote Connect/Disconnect Switch
RF	Radio Frequency
TOU	Time of Use
UL	Uplink
URL	Uniform Resource Locator
V	Volts (units of electric potential)
XML	Extensible Markup Language