



MeterM@il® Internal Email Server Feature

The MeterM@il internal email server feature allows meters to automatically send high-priority alarm notifications or scheduled system status updates as email messages to anyone, anywhere within the facility or around the world. Messages sent via the MeterM@il feature can be received like any email message over a workstation, cell phone, pager, or PDA.

Contact your Power Measurement representative to determine whether your meter supports email alerts, log export or both.

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Applicable Products

ION 8500	✓
ION 8400	✓
ION 8300	✓
ION 7600	✓
ION 7500	✓
ION 7350	✓
ION 7330	✓
ION 7300	
ION 6200	

Additional Information

- ◆ Your meter's technical documentation
- ◆ Online *ION Programmer's Reference*

Introduction

This document addresses three audiences: the recipient of the MeterM@il message, the network administrator, and the ION Enterprise™ software administrator.

Recipient of the MeterM@il Message

The first section is geared towards the user who receives the MeterM@il message, and discusses how to view and interpret email sent by the meter. This section is titled:

- ◆ Viewing the MeterM@il Message

Network Administrator

The second section is geared towards the network administrator, and discusses how meters are added to the corporate network so that the recipient of the MeterM@il message is able to receive the emails that the meter is sending. This section is titled:

- ◆ Setting Up the Network for the MeterM@il Feature

ION Software Administrator

The third section is geared towards the ION software administrator who uses Designer to program the meter to email alerts and data logs. This section is titled:

- ◆ Configuring the Meter for MeterM@il Technology

Viewing the MeterM@il Message

The meter can be configured to email alerts regarding specified events (e.g. power quality disturbances), and email periodic data logs (e.g. kWh del).

Email Alerts

You can specify the type of event that triggers an email alert and have these events programmed on the meter by your ION software administrator.

The alert email shows the following:

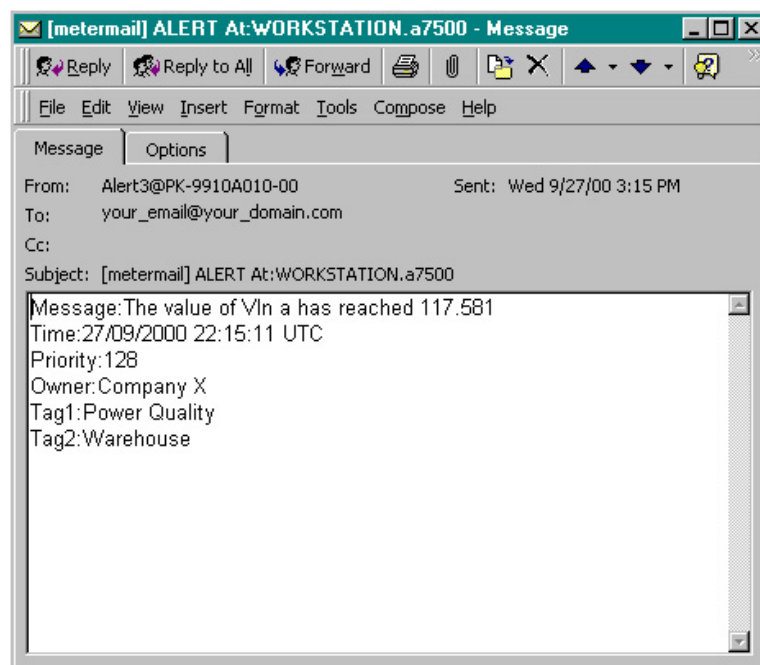
- ◆ the alert message details
- ◆ the event's date and time
- ◆ the event priority level
- ◆ the meter's owner
- ◆ additional user-defined meter identification information labelled "Tag1" and "Tag2"



NOTE

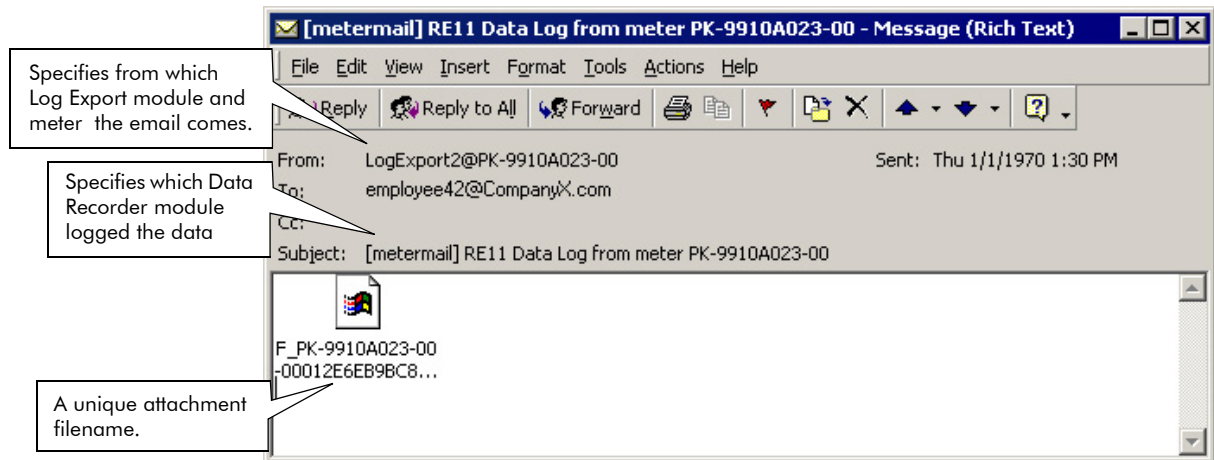
Tag1 and Tag2 are meter settings for information of your choice.

Here is an example of an email alert:



Email Data Logs

The meter can email logged data daily, hourly, or at any interval your ION software administrator configures. The logged data does not appear in the body of an email; the information is contained in an email attachment instead. The following illustration shows how an email sent by the Log Export module appears in your inbox:



You can gather some information from the email without opening the attachment. The From column displays which Log Export module and meter sent the email (the meter is identified by its serial number). The Subject column tells you which Data Recorder is responsible for logging the data. The attachment has a unique filename which incorporates the meter's serial number.

The email attachment is an eXtensible Markup Language (XML) document. Even though XML is a machine readable format meant to be processed by another program, you can still interpret the information contained within an attachment (see the illustration on page 5). This information can be taken from the XML attachment:

- ◆ the name of the data log
- ◆ the device (meter) type
- ◆ the meter's serial number
- ◆ the meter's owner
- ◆ additional user-defined meter identification information labelled "Tag1" and "Tag2"
- ◆ the record number
- ◆ the UTC (Universal Coordinated Time) that the data was recorded
- ◆ the names of the logged data fields (e.g. Vln a, Vln b, Vln c)
- ◆ the numeric values of the logged data

The XML Attachment

When you open the XML attachment in a browser, you see the following:

The diagram illustrates the structure of an XML attachment, with callouts explaining specific elements:

- Links to the Resource Directory Description Language (RDDL) and XML Schema documents.** Points to the `<?xml version="1.0" encoding="utf-8" ?>` and `<soap:Envelope xmlns="http://rddl.xmlinside.net/PowerMeasurement/data/ion/historical/pushmessaging/1/" xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/">` lines.
- Device which generated the email** Points to the `<Data id="PK-9910A023-00-3D2358555AD26-6FA8" xmlns:ident="http://rddl.xmlinside.net/PowerMeasurement/data/ion/identity/1/">` line.
- The generating device's template, owner, Tag1, and Tag2 information.** Points to the `<ident:GeneratedBy ident:name="MainMeter" ident:namespace="Miami.CompanyX" ident:type="7500" ident:signature=" PK-9910A023-00" ident:dateTime="2002-07-03T20:02:29.373Z" />` and `<ident:Configuration ident:revision="B3352_7500" ident:template="7500_FAC-4WYE_V1.2.0.0.0" ident:owner="CompanyX" ident:tag1="Main" ident:tag2="Headquarters">` lines.
- Meter information** Points to the `<Device ident:name="MainMeter" ident:namespace="Miami.CompanyX" ident:signature=" PK-9910A023-00" ident:type="7500">` line.
- The meter's template, owner, Tag1, and Tag2 information.** Points to the `<ident:Configuration ident:revision="B3352_7500" ident:template="7500_FAC-4WYE_V1.2.0.0.0" ident:owner="CompanyX" ident:tag1="Main" ident:tag2="Headquarters">` line.
- The Data Recorder module that logs the data.** Points to the `<Recorder id="Data Rec 39" label="RE39 Data Log">` line.
- Logged data fields** Points to the `<Channels>` section, which includes `<Channel id="c1" label="VII avg" />`, `<Channel id="c2" label="I avg" />`, and `<Channel id="c3" label="PF sign tot" />`.
- The record number, timestamp, and logged data values (respectively).** Points to the `<Records>` section, which includes `<R pos="52400" ts="2002-07-03T20:02:20.000Z" c1="207.6390" c2="4.3291" c3="-92.1563" />`.

```
<?xml version="1.0" encoding="utf-8" ?>
<soap:Envelope
xmlns="http://rddl.xmlinside.net/PowerMeasurement/data/ion/historical/pushmessaging/1/"
xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/">
  <soap:Header />
  <soap:Body>
    <Data id="PK-9910A023-00-3D2358555AD26-6FA8"
xmlns:ident="http://rddl.xmlinside.net/PowerMeasurement/data/ion/identity/1/">
      <ident:GeneratedBy ident:name="MainMeter" ident:namespace="Miami.CompanyX"
ident:type="7500" ident:signature=" PK-9910A023-00"
ident:dateTime="2002-07-03T20:02:29.373Z" />
      <ident:Configuration ident:revision="B3352_7500"
ident:template="7500_FAC-4WYE_V1.2.0.0.0" ident:owner="CompanyX"
ident:tag1="Main" ident:tag2="Headquarters">
        <ident:Timezone>
          <ident:Bias>480</ident:Bias>
          <ident:DSTBias>-60</ident:DSTBias>
          <ident:DSTStart>1999-04-04T02:00:00.000-08:00</ident:DSTStart>
          <ident:DSTEnd>2018-10-28T02:00:00.000-08:00</ident:DSTEnd>
        </ident:Timezone>
      </ident:Configuration>
      <Device ident:name="MainMeter" ident:namespace="Miami.CompanyX"
ident:signature=" PK-9910A023-00" ident:type="7500">
        <ident:Configuration ident:revision="B3352_7500"
ident:template="7500_FAC-4WYE_V1.2.0.0.0" ident:owner="CompanyX"
ident:tag1="Main" ident:tag2="Headquarters">
          <ident:Timezone>
            <ident:Bias>480</ident:Bias>
            <ident:DSTBias>-60</ident:DSTBias>
            <ident:DSTStart>1999-04-04T02:00:00.000-08:00</ident:DSTStart>
            <ident:DSTEnd>2018-10-28T02:00:00.000-08:00</ident:DSTEnd>
          </ident:Timezone>
        </ident:Configuration>
      <Recorder id="Data Rec 39" label="RE39 Data Log">
        <Channels>
          <Channel id="c1" label="VII avg" />
          <Channel id="c2" label="I avg" />
          <Channel id="c3" label="PF sign tot" />
        </Channels>
        <Records>
          <R pos="52400" ts="2002-07-03T20:02:20.000Z"
c1="207.6390" c2="4.3291" c3="-92.1563" />
        </Records>
      </Recorder>
    </Device>
  </Data>
</soap:Body>
</soap:Envelope>
```

Refer to the Resource Directory Description Language (RDDL) documents at the following location if you require more information:

- ◆ <http://rddl.xmlinside.net/PowerMeasurement/data/ion/historical/pushmessaging/1/>

Setting Up the Network for the MeterM@il Feature

The information contained in this section is geared towards the network administrator who sets up the corporate network for meter email transmission. The required network components for using MeterM@il technology are described here.

Automatically Configuring Meter Network Settings

Meters that are equipped with the MeterM@il feature reside on an Ethernet network. Each meter requires an IP Address and other network settings to define its location on the network, and to interact properly with other network devices. These network settings can be set manually with the meter's front panel, or automatically with a BootP Server.

To learn how to configure meter network settings manually with the meter's front panel, refer to Network Settings in your meter's *Installation and Basic Setup Instructions*. To learn how to configure meter network settings automatically with a BootP Server, follow the instructions below.



NOTE

BootP is not available for ION 8000 Series meters.

BootP Server

BootP (Bootstrap Protocol) is a protocol that automatically configures a device's (e.g. meter's) network settings without user involvement.

The BootP server is managed by the network administrator, who allocates the meter IP address and other network settings to the BootP server. When this is completed, and the meter is booted up, the BootP server automatically assigns the IP address and other network settings to the meter.

When the meter is in BootP mode, it does not need to be manually re-booted for an IP address change. Since most power meters cannot be easily rebooted on demand, the meter has been set up to poll the BootP server every eight hours for an IP address. If the IP address is changed on the BootP server, then the meter obtains the new address at the next polling interval.



NOTE

Depending on your meter and meter firmware version, BootP may be enabled by default; check your meter's *Basic Setup and Installation Instructions*. You can enable BootP through the meter's front panel or with Designer software.

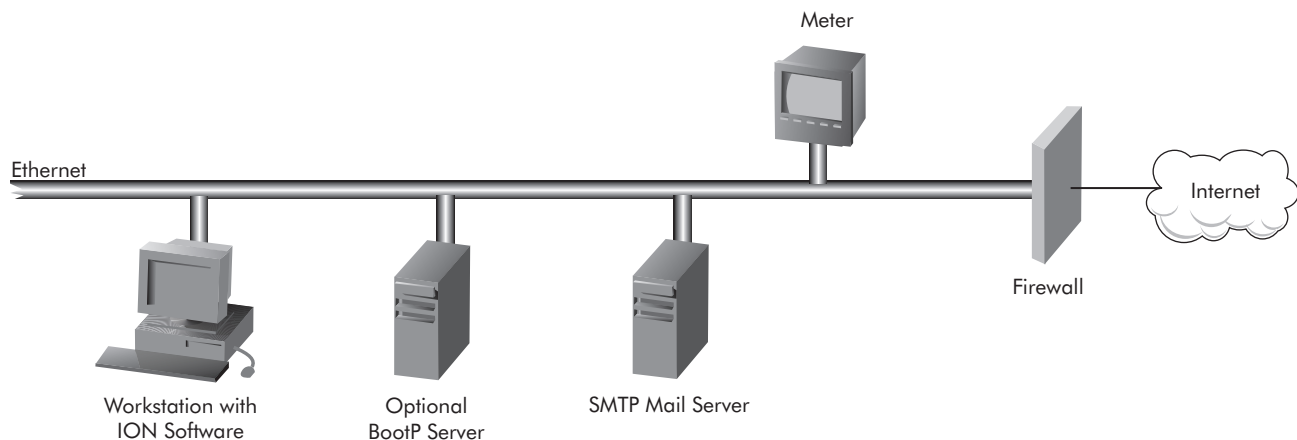
Preparing the BootP Server to automatically configure network settings:

1. Set up the BootP server on the same Ethernet network as the meter you wish to access using a web browser. Follow the documentation packaged with the BootP software for the correct installation.
2. Enter the meter Ethernet MAC address in the BootP database.
3. Allocate these settings to the meter Ethernet MAC address:
 - ◆ IP Address of the meter
 - ◆ Subnet Mask (if the network is subnetted)
 - ◆ Gateway (if the network has a default gateway)
 - ◆ SMTP Mail Server Address (mandatory for using the MeterM@il feature)

**NOTE**

When the meter is in BootP mode, you must configure the network settings in the BootP server. Otherwise, those settings will NOT be updated on the meter. In BootP mode, you are prevented from changing network settings through the meter's front panel, or with ION software.

Setting Up the Network for the MeterM@il Feature



The above illustration shows a network that is set up to take advantage of the MeterM@il feature on the meter. Both the meter and the SMTP mail server reside on the same Ethernet LAN. When the meter has an email to send, the connection between the meter and the SMTP mail server is quickly made over the LAN. The SMTP mail server forwards the MeterM@il message to its final destination.

To see an example of a network where MeterM@il technology accesses the SMTP mail server via a dial-up connection, see "SMTP Connection Timeout" on page 8.

The network components for using MeterM@il technology are described below.

- ◆ **Ethernet network:** Ethernet is the connection medium for the delivery of email from a meter to an SMTP server.
- ◆ **Workstation with ION software:** A computer with ION software is required to set up a meter equipped with the MeterM@il feature. Refer to “Configuring the Meter for MeterM@il Technology” on page 10.
- ◆ **Meter:** The meter can be connected to your LAN like any other network device.
- ◆ **SMTP mail server:** The MeterM@il feature requires an SMTP mail server to be configured to forward email from the meter to the final destination of the email message. The SMTP server may be located on your Ethernet network or accessed via a dial-up modem connection.
- ◆ **BootP server:** A BootP server can be set up to automatically configure meter network settings. See “Automatically Configuring Meter Network Settings” on page 6. (BootP is not available for ION 8000 Series meters.)
- ◆ **Firewall:** If the SMTP server that the meter uses is beyond the corporate network, you must configure the firewall to allow outgoing connections on TCP/IP port 25 from the meter to the SMTP server. If the SMTP server is within the network, no additional configuration is required.

SMTP Connection Timeout

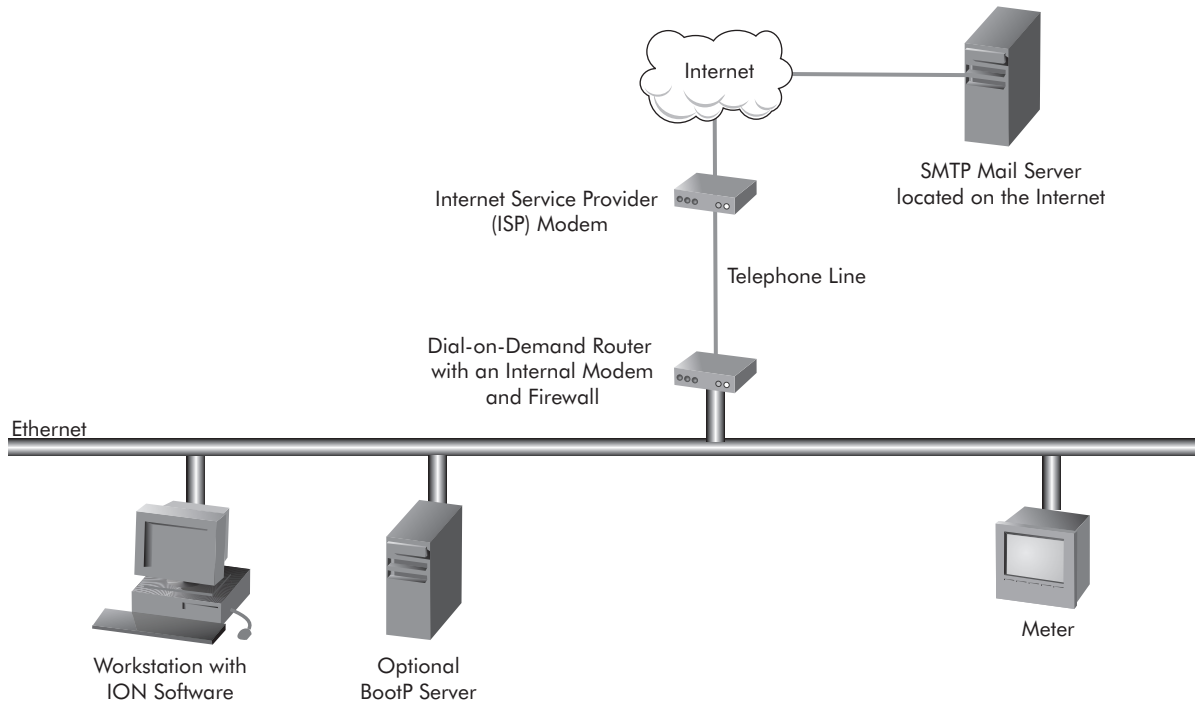
For meter email transmission, an SMTP mail server which is configured to forward email from that meter to the final destination is required. The SMTP mail server may be located on your Ethernet network (as illustrated above), or accessed via a dial-up modem connection (as illustrated below). If the SMTP mail server is located on your Ethernet network, the connection between the meter and the SMTP server is usually made quickly. If the SMTP mail server is accessed via a dial-up modem the connection can take longer, and can cause the meter to terminate the attempted connection to the SMTP server because the server takes too long to respond.

You can extend the SMTP Connection Timeout interval on your meter using the *SMTP Connection Timeout* setup register in the Ethernet Communications module:

- ◆ If the SMTP server is on your local network, you can most likely leave the *SMTP Connection Timeout* setting to its default of 60 seconds.
- ◆ If the SMTP server is accessed via a dial-up connection, the *SMTP Connection Timeout* should be extended to allow for extra time to establish a connection. The exact time setting depends on the speed of your dial-up process.

The *SMTP Connection Timeout* register can be set through the meter’s front panel or with Designer software. See “Setting Up the Meter for the SMTP Server” on page 10.

In the illustration below, the SMTP mail server does not reside on the same local network as the meter, so an SMTP mail server connection may not always be made quickly. When the meter has an email to send, the following process occurs. First, the meter contacts the dial-on-demand router that contains an internal modem. Second, the router modem contacts the Internet Service Provider (ISP) modem to connect to the Internet and initiate a connection to the specified SMTP mail server. Connecting to the SMTP mail server can take longer than the *SMTP Connection Timeout* register default of 60 seconds. In such a case, the interval should be extended.



Configuring the Meter for MeterM@il Technology

This section presents information geared to the ION software administrator who, using Designer software, creates frameworks which program the meter to email alerts and data logs. For assistance using Designer, refer to the online help.

Setting Up the Meter for the SMTP Server

Before you program the meter to email alerts and data logs, you must set up the meter with your SMTP mail server address and, if required, extend the SMTP connection timeout.

The SMTP mail server settings can be set manually with ION software or the meter's front panel, or automatically with a BootP Server.

To learn how to program SMTP mail server settings to the meter with:

- ◆ BootP, see "Automatically Configuring Meter Network Settings" on page 6
- ◆ the meter's front panel, see Network Settings in your meter's *Installation and Basic Setup Instructions*
- ◆ Designer software, see the instructions below

Setting Up the Meter for your SMTP Server:

1. Open the meter in Designer and double-click on the **Communications Setup** folder.
2. Right-click on the icon in the center of the Ethernet module. The ION Module Setup screen appears.
3. Double-click the **SMTP Server** setup register and type in the IP address of your SMTP server.
4. If required, double-click the **SMTP Connection Timeout** setup register and increase the timeout period.



NOTE

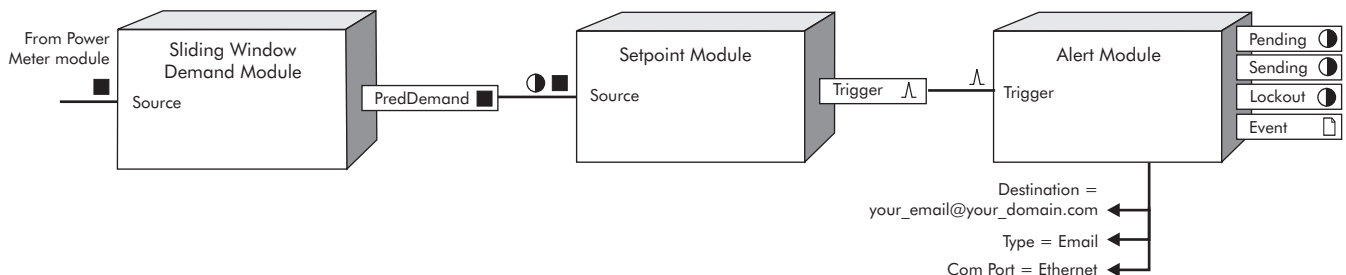
The SMTP Connection Timeout sets the amount of time the meter waits when establishing a connection to an SMTP mail server. This setting is intended to compensate for situations where it takes some time to negotiate a connection, such as dial-up access. See the previous section "SMTP Connection Timeout" on page 8 for more information.

5. Click **Send and save**.

Configuring the MeterM@il Feature to Send Alerts

The Alert module can be configured to send an email alert message to your workstation – this keeps you informed about certain alarm conditions so you can act on them.

The Alert module sends an alert whenever its *Trigger* input is pulsed. You can connect this input to any module that produces a pulse output. You can use modules that monitor alarm conditions such as changes in relay status and power quality problems (surges, sags, swells, outages).



In the example framework above, a Sliding Window Demand module's output is monitored so that an alert is sent when the predicted demand value goes above a certain limit. A Setpoint module is required to determine when the high limit condition is met, and to send a pulse to trigger the Alert module. When the pulse is received, the message is sent according to the Alert module's setup register values. The example above shows the setup registers that must be configured in the Alert module for email alerts (see step 4 below for additional setup register configuration).

NOTE

The SMTP Server address must be configured correctly before the MeterM@il feature can operate. In addition, the SMTP Connection Timeout period may need to be extended (e.g. if the SMTP mail server does not reside on the Ethernet network).

Setting up the meter to send alerts:

1. Create an Alert module.
2. Create an ION module that produces a pulse on one of its output registers when the exceptional event occurs (in the example above, a Setpoint module pulses its *Trigger* output when the setpoint condition is reached).
3. Link the Alert module's *Trigger* input register to a pulse output register on the module created in step 2.
4. Configure the following Alert module setup registers as follows:
 - ◆ **Message** – this string register contains the text of the alert to be emailed. You can use up to 120 alphanumeric characters in your message string. Values and names from registers linked to the module's *Source* inputs can be included in the message by referencing them in the message string.

- ◆ **Destination** – this string register identifies the alert’s destination email address. You can use a maximum of 50 characters.
 - ◆ **Type** – this register specifies the type of destination you wish to alert; select “Email.”
 - ◆ **Com Port** – this register allows you to specify the communications port that is used to email the alert; select “Ethernet.”
 - ◆ **Location** – this string register identifies the meter that is sending the alert, and defaults to the network meter name. You can change the default; use 60 characters maximum.
 - ◆ **Email From** – this string register specifies the email address that will appear in the “From” field on the email. The default value of this register is ALERT<ALERT MODULE NUMBER> @ <METER SERIAL NUMBER> — for example, Alert3@PK-9910A010-00. This register will have to be altered in cases where the receiving SMTP server only accepts emails from valid Internet domains (i.e. SomeName.COM). This string may be up to 80 characters long.
5. Click **Send and save**. When the *Trigger* input is pulsed, the Alert module establishes communications with the SMTP mail server, and emails the alert message.

Configuring the MeterM@il Feature to Send Data Logs

The Log Export module can send data logs in different ways, though only email is currently implemented. This section discusses the ION modules involved in a “data push” framework, plus the corresponding setup registers that you need to configure in order to utilize the MeterM@il feature in the framework. The term “data push” refers to the action of the Log Export module sending data logs. A complete description of the Log Export module and the other ION modules involved in the framework can be found in the online *ION Programmer’s Reference* at www.pwrm.com.

The MeterM@il feature requires that an additional framework be created in Designer before you can configure your meter to use the Log Export feature. Each “data push” framework includes the following:

- ◆ A Data Recorder module that records the values in its *Source* inputs each time it is pulsed and stores these values in its *Data Log* output register.
- ◆ A Log Export module that retrieves information from the Data Recorder module’s *Data Log* register and sends the data to a specified destination.
- ◆ A module that sends values to the Data Recorder module (e.g. Power Meter module or a Modbus Import module).
- ◆ A Periodic Timer module that triggers the Data Recorder module to record the values it is sent.
- ◆ A module that triggers the Log Export module to send the logged data (e.g. a Clock or Periodic Timer module). This module is optional, because the Data Recorder module’s *Record Complete* output register can be configured to trigger the Log Export module to send data logs. When this is the case, the data logs are emailed at the same interval that the Data Recorder module records new data.

Additional ION Module Configurations

In addition to the “data push” framework, you need to configure certain setup registers in the Factory module and the Ethernet (Communications) module. If these registers are not configured, the Log Export module cannot go online.

Device Namespace (Factory module)

The value in this register is used as the namespace attribute in the Device element of XML messages generated by the Log Export module. The value range for this string value is up to 80 characters; these characters must be alphanumeric but can also include a dash (hyphen) or a dot (period). If this register is not configured, the Log Export module cannot go online.

NOTE

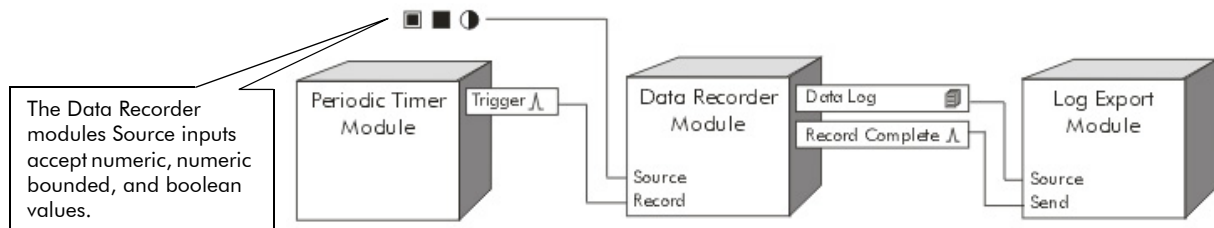
A namespace uniquely identifies a set of names so that there is no ambiguity when objects with different origins but the same names are mixed together. A namespace is commonly given the name of a Uniform Resource Identifier (URI) - such as a web site address - both because the namespace may be associated with the site or page of that URI (for example, a company name) and because a URI is likely to be a unique name.

Device Name (Factory module)

The value in this register is used as the name attribute in the Device element of XML messages generated by the Log Export module. The value range for this string is up to 80 characters; these characters must be alphanumeric but can also include a dash (hyphen) or a dot (period). If this register is not configured, the Log Export module cannot go online.

SMTP Server (Ethernet module)

This setup register contains the IP Address of the email server to which the meter sends outgoing email. If this register is not configured correctly, the Log Export module fails to send any emails.



Configuring the meter to send data logs:

1. Configure the Factory module's *Device Namespace* and *Device Name* setup registers with appropriate values.
2. Configure the Ethernet (Communications) module's *SMTP Server* setup register with the correct IP address.
3. Link the Data Recorder module's *Source* inputs to the values you want to log. For example, you could use the Power Meter module's outputs Vln a, Vln b, and Vln c as the *Source* inputs.
4. Link the Data Recorder module's *Record* input to the Periodic Timer module's *Trigger* output. (Adjust the *Period* setup register in the Periodic Timer module.)

5. Link the Log Export module's *Source* input to the Data Recorder module's *Data Log* output.
6. Link the Log Export module's *Send* input to the Data Recorder module's *Record Complete* output.
7. Configure these Log Export module setup registers appropriately:
 - ◆ *Destination* – This is the destination's Uniform Resource Identifier (URI). Current support is limited to email URIs (e.g. `mailto:john.doe@anywhere.com`). You must include **mailto:** as a prefix to the email address string in order to send records via email. The default value is "Enter Destination Address," which means you must specify a destination in order for the module to go online. The destination string can be anywhere between 0 and 80 characters.
 - ◆ *Maximum Send Records* – This register determines the maximum number of records that are emailed at once. The default value is set to 0, essentially disabling the module. This register must be changed to a non-zero value for the Log Export module to go online.
 - ◆ *Email From* - This register contains the address that appears in the From: field of the email sent by the Log Export module. This register only applies to messages sent via email. The default value depends on which Log Export module you are using and the meter's serial number. Email arriving from a meter have a default format like `LogExport<module number>@<serial number>`.

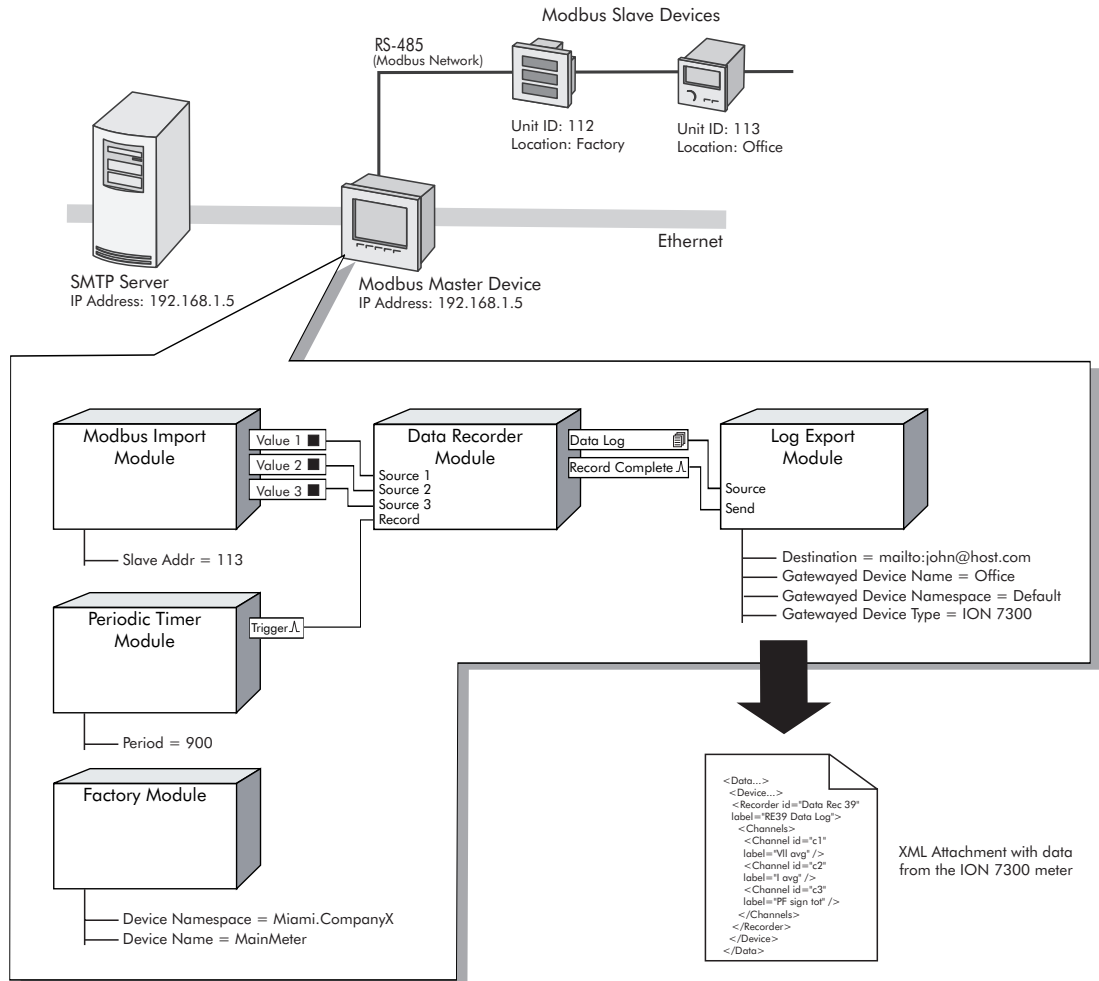
Configure the following Log Export module setup registers when using the MeterM@il feature in a gateway scenario. These registers differentiate the gatewayed device (which logs the data) from the gateway meter (which sends the data).

- ◆ *Gatewayed Device Namespace* - The string value in this register is used as the namespace attribute in the Device element of XML messages generated by the module. The default value is Default. When it is set to Default, the namespace attribute of the Device element inherits the value from the Factory module's Device Namespace setup register.
- ◆ *Gatewayed Device Name* - The string value in this register is used as the name attribute in the Device element of XML messages generated by the module. The default value is Default. When it is set to Default, the name attribute of the Device element inherits the value from the Factory module's Device Name setup register.
- ◆ *Gatewayed Device Type* - This value is used as the type attribute in the Device element of XML messages generated by the module. The default value is Default. When set to Default, the type attribute of the Device element inherits the value from the Factory module's *DeviceType* register.

Click **Send and save**. When the *Send* input is pulsed, the Log Export module establishes communications with the SMTP mail server and sends the data log via email.

MeterM@il Technology in a Modbus Network

The following example illustrates just one of the many uses for the Log Export module. This Modbus network includes the ION 7500 as the Modbus Master and the ION 6200 and ION 7300 meters as Modbus slave devices. Configuration is performed on the framework where the Modbus Master is located for systems that utilize MeterM@il technology.



Notice that the Modbus Import module supplies values to the Data Recorder module's *Source* inputs. The Modbus Import module's *Slave Addr* (slave address) is set to 113, indicating that the values come from the ION 7300. The Periodic Timer module's *Period* register is set to 900, so the Data Recorder module is pulsed every fifteen minutes (900 seconds). When it is pulsed the Data Recorder module records the values in its *Source 1-3* inputs. Once the values are successfully recorded, the Data Recorder module's *Record Complete* output pulses the Log Export module's *Send* input. The Log Export module then sends all its *Source* data records that have not previously been sent to the email specified in the *Destination* setup register (john@host.com).

The *Gatewayed Device Name* register in the Log Export module is configured with a value other than Default. This identifies the data as belonging to the meter known as "Office," which in this case is the ION 7300. If this register were to remain as Default, the data would appear to come from the ION 7500, because the value for the *Gatewayed Device Name* would come from the Factory module's *Device Name* setup register.