

# Ethernet Gateway User's Manual Version 1.1





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# Contents

	1
Ethernet Gateway Overview	3
Network Configuration	4
Configuring Network Settings	4
Configuring using the Gateway Web Console	6
Physical Installation	
Placement Guidelines	
Mounting Bracket	11
Power	
Gateway Web Console	
Status	13
Monitoring Data	14
Update images to Hubbell gages	Error! Bookmark not defined.
Data Sources	
Data Destinations	17
System	
Firmware Upgrades	27
SNMP Implementation	
Data Output from SNMP Gateways	
Accessing the Gateway Console	
Accessing the MIB files from Gateway Console	
Accessing active OIDs	
Accessing active OIDs	
Viewing monitoring node readings on the Gateway Console	
Viewing monitoring node readings on the Gateway Console Uploading an SNMP license to the Gateway	
Viewing monitoring node readings on the Gateway Console Uploading an SNMP license to the Gateway Enabling and configuring the SNMP Agent	
Viewing monitoring node readings on the Gateway Console Uploading an SNMP license to the Gateway Enabling and configuring the SNMP Agent Using the iReasoning MIB browser	
Viewing monitoring node readings on the Gateway Console Uploading an SNMP license to the Gateway Enabling and configuring the SNMP Agent Using the iReasoning MIB browser Virtual IP addressing / Assigning Virtual IPs to monitoring nodes	
Viewing monitoring node readings on the Gateway Console Uploading an SNMP license to the Gateway Enabling and configuring the SNMP Agent Using the iReasoning MIB browser Virtual IP addressing / Assigning Virtual IPs to monitoring nodes Modbus TCP/IP Implementation	
Viewing monitoring node readings on the Gateway Console Uploading an SNMP license to the Gateway Enabling and configuring the SNMP Agent Using the iReasoning MIB browser Virtual IP addressing / Assigning Virtual IPs to monitoring nodes Modbus TCP/IP Implementation Modbus Overview	
Viewing monitoring node readings on the Gateway Console Uploading an SNMP license to the Gateway Enabling and configuring the SNMP Agent Using the iReasoning MIB browser Virtual IP addressing / Assigning Virtual IPs to monitoring nodes Modbus TCP/IP Implementation Modbus Overview Peering Gateways and Using a Master Gateway	
Viewing monitoring node readings on the Gateway Console Uploading an SNMP license to the Gateway Enabling and configuring the SNMP Agent Using the iReasoning MIB browser Virtual IP addressing / Assigning Virtual IPs to monitoring nodes Modbus TCP/IP Implementation Modbus Overview Peering Gateways and Using a Master Gateway Enabling Modbus Output	31 32 33 34 35 40 40 45 45 45 45 45 45 45
Viewing monitoring node readings on the Gateway Console Uploading an SNMP license to the Gateway Enabling and configuring the SNMP Agent Using the iReasoning MIB browser Virtual IP addressing / Assigning Virtual IPs to monitoring nodes Modbus TCP/IP Implementation Modbus Overview Peering Gateways and Using a Master Gateway Enabling Modbus Output Enabling Modbus Output	
Viewing monitoring node readings on the Gateway Console Uploading an SNMP license to the Gateway Enabling and configuring the SNMP Agent Using the iReasoning MIB browser Virtual IP addressing / Assigning Virtual IPs to monitoring nodes Modbus TCP/IP Implementation Modbus Overview Peering Gateways and Using a Master Gateway Enabling Modbus Output Enabling and Configuring the Modbus Driver Viewing and Verifying Monitoring Data using the Gateway Console	
Viewing monitoring node readings on the Gateway Console Uploading an SNMP license to the Gateway Enabling and configuring the SNMP Agent Using the iReasoning MIB browser Virtual IP addressing / Assigning Virtual IPs to monitoring nodes Modbus TCP/IP Implementation Modbus Overview Peering Gateways and Using a Master Gateway Enabling Modbus Output Enabling and Configuring the Modbus Driver Viewing and Verifying Monitoring Data using the Gateway Console Register Maps	31 32 33 33 34 35 40 45 45 45 45 45 45 45 45 45 45 45 45 45

Modbus Device IDs	52
Accessing and Verifying Modbus Readings Using the Gateway Console	54
Exporting Modbus Readings	55
MTConnect Implementation	56
EthernetIP Implementation	57
Technical Specifications	59
Regulatory Information and Labels	60
Regulatory Information	60
Regulatory Label	61

# **Ethernet Gateway Overview**

The Ethernet Gateway is a key component of the Hubbell system architecture. It provides an interface between the wireless monitoring devices and the monitoring application. The Gateway automatically detects any new monitoring devices, seamlessly adding them to the network.

All Gateways need to be installed and configured to run on the local Ethernet network. If the monitoring application is gathering data using SNMP or Modbus protocols, some additional steps are needed that are specific to each of those protocols.



#### Gateway Models (US2 models also available)

Model Number	Description	Protocol	Monitoring units
HBLGW04000EUS1	Ethorpot Cotowov V/4		100
HBLGW04000LUS1	Ethemet Galeway V4		30
HBLGW0400MEUS1	Ethomat Catoway )// Madhua	Modbus	100
HBLGW0400MLUS1	Ethemet Gateway v4 Modbus	TCP/IP	30
HBLGW0400SEUS1	Ethomat Cataway )// CNIMD		100
HBLGW0400SLUS1	Ethernet Gateway V4 SNMP	SINIVIP	30
HBLGW040MTEUS1		MTO a rate a at®	100
HBLGW040MTLUS1	Ethernet Gateway V4 MT Connect	IVI I Connect®	30
HBLGW0400EEUS1 HBLGW0400ELUS1	Ethernet Gateway V4 Ethernet/IP	EtherNet/IP™	100 30

# **Network Configuration**

### **Installing the Ethernet Gateway**

Each location in which Smart Power Cables are deployed must have one or more Hubbell Ethernet Gateways to gather data from the Smart Power Cables.

Refer to Hubbell's Ethernet Gateway User's Manual or Quick Start Guide for more information.

# **Configuring Network Settings**

The Gateway requires an IP address prior to being network accessible unless it is being used in DHCP mode.

Before setting the IP address make sure that you have the following data provided to you by your IT administrator.

- 1) IP Address
- 2) Gateway
- 3) Netmask (subnet mask)
- 4) DNS

#### Using the touchpad to navigate

If the Gateway is new and does not have an IP address, you can enter the IP address directly onto the Gateway using the on board "touchpad" and display.

After the Gateway is energized and completes its boot sequence (approximately 30-60 seconds), the Network Status menu will appear.

This will reveal details about the Gateway's version, IP address (if previously programmed), MAC address, and Uptime (duration since last energization).

To navigate the menu, press the touchpad in a corresponding direction and "tap" to enter a selection.



#### Gateway LCD menu

The network status menu will display any configured network parameters.

Version: Gateway's firmware version

**IP Address**: Programmed IP address

MAC Address: Applicable MAC address

System Reboot: Reboots the Gateway

Uptime: Total time since the Gateway was last energized



#### Turning DHCP on/off using the local LCD Menu

The Gateway is provided with DHCP "on" as a default.

DHCP addressing relies on the server to automatically assign the IP information eliminating the need to manually input the IP addressing.

To enable manual IP addressing, as required in most cases, it is necessary to turn DHCP off by following the menu instructions below.

When DHCP is turned off, the configuration menu will reveal options for inputting IP address information.

#### Entering IP address data using the local LCD Menu

With DHCP turned off the *Configure* menu will reveal options for setting the IP address, Netmask and Gateway.

All of these parameters need to be filled in before the Gateway can be operational.

If you do not have this information it can be provided to you by your network administrator.

![](_page_6_Figure_1.jpeg)

### **Configuring using the Gateway Web Console**

Once an IP address is assigned to the Gateway either manually or via DHCP, you can access the Gateway console using a standard web browser and entering the IP address of the Gateway.

This requires that the Gateway be connected via Ethernet network router or switch. Under some circumstances the Gateway can be accessed and configured directly from a PC but many enterprise systems prevent external IP addressing functions on a PC.

![](_page_6_Figure_5.jpeg)

The Gateway console is described in greater detail online at: https://dox.packetpower.com/ Ethernet---Gateway---Version---4---Web---Console.html??? The Gateway Console status screen will appear as shown below.

Search	System status	
Status		
Monitoring Data	General	Data Sources
0 Data Sources	Device version: 1.9.2-alpha.9b-1-g5/2b31e Radio firmware: 27.8-1971A672	<ul> <li>Wireless Mesh</li> <li>View devices communicating to this gateway</li> </ul>
Data Processing	Radio zone: US.1 (201420BF)	Peer Gateways
Data Destinations	System time: 2016-08-31T21:31:45+00:00 Up-time: 03:28:28	Conngure peer gareways
Svetem	Hostname: PacketPower-77E4-0000-0000-005A	Data Processing
System	MAC address: 54/4a:16/14/c1/34	<ul> <li>Virtual Panels</li> <li>Configure and monitor Virtual Panels</li> </ul>
	Licensed Features	Data Destinations
	EMX Enabled Modbus Enabled	EMX Monitoring Data Feed Configure EMX monitoring data feed
	Peer Gateways Enabled	a FWY Connect Data Fred
	Virtual Panels Disabled	Configure EMX support data feed
		Modbus
		View data exposed via Modbus/TCP
		SNMP

To access the network settings, click the "System" tab on the left.

	stem OK
Q. Search	×
Status	
🚳 Monitoring Data	
→ Data Sources	
👂 😂 Data Processing	
Data Destinations	
👻 🗢 System	
Dashboard	
Networking	NETWORKING TAB
Authentication	

In the System tab sub menu, click the "Networking" tab.

If DHCP is "on" you will not be able to access any network setting until it is switched off under the **Network Interface** section.

When DHCP is turned off the network settings will be revealed in the **Network Interface** section. It is now possible to modify the IP address, Netmask, Gateway addresses.

If using DNS (Domain Name Servers), input the server address under the **Domain Name Server** section.

# In order for the Gateway to have a proper time reference, a $\underline{NTP\ server}$ address is needed in the Time Synchronization Section.

The default time servers are <u>0.pool.ntp.org</u> and <u>1.pool.ntp.org</u>. Once a time server is entered confirm the time at the top right of console. For more information on available NTP servers see the <u>NTP server</u> section. The time will be expressed in the top right corner of the Console screen.

P	WEREG System OK			
-	Q Search 🗶 🗙	Network	ing	
	Status		ing c	
	Monitoring Data	Setup your networkin	ng information in order t	o properly communicate within your network.
*	<ul> <li>Data Sources</li> </ul>	Network Interfa	ce	
	Wireless Nodes	DHCP:	On Off	
	Peer Gateways 🛛 🔍	IP Address:	192.168.0.100	IP ADDRESS (revealed only with DNS off)
	C Data Processing	Netmask:	255.255.255.0	
	Virtual Panels	Gateway IP:	192.168.0.1	
	Data Destinations			
	EMX	Domain Name S	Servers	DNS ADDRESS(ES)
	Modbus	Server 1:	192.168.0.0	
	SNMP •			
	System	Server 2:	192:168.0.0	
	Dashboard	Proxy Server		
	Networking	i rong correr		PROAT SERVER(S)
	Authentication	Proxy	On Off	
	Security			
	Radio Zone	Time Synchroni	ization (NTP)	NTP SERVER(S)
	Node Firmware Update	Server 1:	0.pool.ntp.or	g
	System Update		1 pool ptp or	· · ·
	License	Server 2:	1.000.000.00	5

#### **Configuring Data Destinations**

Data Destinations configures how the Gateway delivers data. The Gateway can make monitoring data accessible via three formats:

- 1. EMX Monitoring Portal Note: data can be provided simultaneously to the EMX Portal while serving Modbus TCP/IP or SNMP data.
- 2. Modbus TCP/IP
- 3. SNMP (versions 1,2 and 3)

Configure the data destinations following these steps:

1. Click on the "Data Destinations" tab on the left menu.

- 2. Select how you want to receive your data: EMX, Modbus or SNMP. Note that EMX feeds can be delivered simultaneously with Modbus and SNMP feeds.
- 3. For SNMP and Modbus implementation refer to the <u>SNMP</u> or <u>Modbus</u> support pages
- 4. Select the desired EMX implementation type (cloud is default) for both "Monitoring Data Feed" and "Upgrade and Support Data Feed" sections.
- 5. Ensure that the Gateway's IP address has outbound access to port 80 (HTTP) or 443 (HTPPS) for \*.<u>amazonaws.com</u> when using cloud EMX.
- 6. Confirm that cloud and support data feeds are enabled with the network manager (cloud EMX implementations only).
- 7. For local EMX implementation, enter the IP address of the server.
- 8. Before you can access your data via EMX make sure your Hubbell representative has set up an EMX account. See the <u>EMX</u> support section for additional details.

📕 Status			
Monitoring Data	Setup your EMX	( monitoring da	ata feed and support feed.
Data Sources	Monitoring D	ata Feed	EMX IMPLEMENTATION TYPE
C Data Processing	Mode	Select	Destination
Data Destinations	Cloud EMX	۲	Send monitoring data to cloud EMX. Requires firewall http(s) access to *.amazonaws.com
ЕМХ	Local EMX	0	Send monitoring data to a local EMX host
> Modbus			
> SNMP	Disabled	0	Do not send data anywhere (for use with SNMP or Modbus
System	Upgrade and	d Support D	Data Feed

# **Physical Installation**

### **Placement Guidelines**

- The Gateway must be placed in a location likely to have good radio communication with monitoring nodes.
- Gateways should be located 10-30 meters from one or more monitoring nodes (ideally line of site)
- Place Gateways away from large metallic surfaces (use the mounting bracket for optimal placement)
- Never place a Gateway inside of a fully enclosed metal structure (exterior of the rack is better)
- Always try and locate the Gateway at the highest point that allows an unobstructed (line of sight) path to monitoring nodes
- Redundant Gateways are advised for any critical environment
- One Gateway can support up to 150 Hubbell monitoring devices; additional Gateways will improve polling speeds
- If you are placing multiple Gateways for better coverage or redundancy, try to space them approximately evenly throughout the facility as they will automatically balance network traffic
- In raised floor environments with monitoring nodes below the raised floor, Gateways may have to be placed below the floor or near floor air vents

![](_page_10_Picture_12.jpeg)

Always place Gateways as high as possible within line of site to monitoring nodes.

![](_page_11_Figure_1.jpeg)

Never place Gateways inside metallic cabinets.

![](_page_11_Figure_3.jpeg)

**Mounting Bracket** 

Side View

- The Gateway attaches to the mounting bracket using the DIN rail clip which snaps onto the receiver clip on the back of the Gateway
- The rubber bumpers on the back of the Gateway mount can be removed to expose 0.20" holes which can be used for permanent mounting with mechanical fasteners
- Adhesive tabs allow the Gateway to be wall mounted or surface mounted away from metallic surfaces like server cabinets
- Orientation of the Gateway is not critical

# Power

The Ethernet Gateway uses a standard 5V DC power supply with a 5.5 x 2.1 x 11mm positive-oncenter power jack. The following power supply options are available from Hubbell:

- Universal 100-240V wall-plug power adapters with a full set of international plugs, including C13 connectors for data center installations
- Power-over-Ethernet (PoE) adapters using a PoE splitter that plugs into the DC jack (cannot be powered by PoE in the Ethernet jack)
- USB power adapter cable for powering from any USB port (power-only, no data connection is made)

![](_page_12_Figure_6.jpeg)

#### If powering using PoE (Power-over-Ethernet)

- A PoE splitter is required as the Gateway will not accept a PoE source directly into its Ethernet port
- Be sure that the PoE injector source is 5V DC, not 12, 24 or 48V DC and capable of at least 4W of power
- Splitters with voltage regulators that will drop the voltage to 5V DC are available

![](_page_12_Picture_11.jpeg)

# **Gateway Web Console**

The Console is accessed by entering the IP address of the Gateway into a standard web browser.

#### Web Console contents

<u>Status</u> - provides a general overview of all critical Gateway functions as well as links to key sections required for configuration

<u>Monitoring Data</u> - shows which monitoring units are communicating with a gateway and provides access to real-time readings

Data Sources - indicate from where the Gateway is acquiring its data

Data Processing - provides the ability to manipulate data, including the Panel Editor for defining branch circuit panel maps

<u>Data Destinations</u> - configures the Gateway for data access via Modbus TCP/IP, SNMP and the EMX Portal

System - manage system settings such as IP addresses and firmware versions

# Status

The Status page provides a general overview of all critical Gateway functions as well as links to key sections required for configuration.

![](_page_13_Picture_12.jpeg)

(1) System Status Indicator: Indicates if Gateway is properly communicating with nodes and the network.

Green:	System OK
Yellow:	System problems
Red:	System not operational

(2) Search: Allows searching for any Gateway related item. For example, you can input the last four digits of a Node ID and relevant nodes will appear.

(3) General: Provides all data relating to the Gateway communications settings.

(4) Licensed Features: Indicates which features are licensed for use with this Gateway.

(5) Data Sources: Indicates from where the Gateway is acquiring data. This can be via wireless monitoring nodes or through other Peer Gateways.

(6) Data Processing: This function is used for <u>virtual circuit mapping</u>. It allows users to assign breaker types and locations when using multi-circuit monitoring features such as Branch Circuit Monitoring.

(7) Data Destinations: Configures data for export from the Gateway to Modbus TCP/IP, SNMP and the EMX Portal (cloud or local implementations).

(8) Menu: Provides access to various Gateway settings and tools.

### **Monitoring Data**

The Monitoring Data tab exposes all the nodes (monitors) associated with the Gateway. The sub menu will show associated nodes by type (power or environmental) along with their GUID.

(1) Clicking on a specific node ID will expose the "readings" for that node. Likewise the readings for a specific node can also be exposed by clicking on the "readings" icon.

#### (2) Nodes table headings

Node:	Monitoring node 16 digit user ID (GUID)
<b>F/W</b> :	Firmware version of monitoring node
Туре:	Monitor type (i.e. AC power monitor, environmental monitor)
Product:	Product model name
Age:	Duration online
Time stamp:	Time reported by node
Source:	Where the data is originating from (wireless mesh network, other Gateway or third party device)
VIP:	Virtual IP address (used in SNMP applications)
Readings:	Exposes readings from the device

	Nodes		Y						
E Status	Node	F/W	Type	Product	Age	Timestamp	Source	VIP	Readings
Monitoring Data									_
Power Nades     8000-0000-0000-CABF	8600-0000-0000-CABF	5.34	AC Power	P5T3	00:00	2016-09-13 16:19:0	7 Wireless Mesh	-	n
Data Sources				ec e	Page 1	of 1 > >> 5 >			
C Data Processing									
Data Destinations			-						
System			Node	8600	-0000	0-0000-C/	ABF		
-			Current	A	Power	Power A	Temperature	VA.A	Voltage A
					W			Ca /	
				)((	1		)(( ~ ))(		
			0.000		0.483	0.483	21	1.01	128
				Read	ing Unit	Age Tir	restamp		
			Charmet						
			Channel						
			Current A	0	A 800	00:01 201	6-09-12 21:14:45		

# Data Sources

Data Sources indicate from where the Gateway is acquiring its data. This can originate from wireless nodes connected to the Gateway or from peered Gateways which are connected to the Gateway via the Ethernet network.

#### Wireless Nodes

The Wireless Nodes sub-menu will expose all of the monitoring nodes in radio contact with the Gateway. Nodes may be segregated by "type" in the sub menu i.e. "power" or "environmental monitors". To search for a specific node, input the node ID in part or full in the "Node" column. The data table for nodes is explained below:

Monitoring node 16 digit user ID (GUID)
Firmware version of monitoring node
Indicates the progress of a wireless firmware update of a monitoring node
Monitor type (i.e. AC power monitor, environmental monitor)
Product model name
Readings per minute or the frequency of data reports received from the node each minute. This will vary depending on the strength of the radio signal and ratio of node to Gateways
Duration online Exposes readings from the device

PACKET EG • System OK								@ 201
Q Search X	Wireless Noo	des						
I≣ Status		and the second						
Monitoring Data	Node	F/W	F/W Update %	Туре	Product	RPM	Age	Readings
🔨 🜒 Data Sources	8600-0000-0000-CABE	5.34	1.0e+2%	AC Power	P5T3	146	00.00	æ
Wireless Nodes		0.07	1.00 2.0					
Peer Gateways			<< < Page 1	of 1 > ≫	5 ~			
Data Processing								
Data Destinations								
<ul> <li>System</li> </ul>								

<u>RPM (Readings per Minute) and Reporting Frequency</u>: The reporting frequency of wireless nodes to the Gateway is a function of how many nodes share the Gateway and the strength of the radio connection(s) between the nodes and the Gateway. Nodes take readings up to hundreds of times per second depending on the model. This data will be stored and forwarded with each successful transmission. This means that even in the event of a lower RPM no data is compromised, but the data update rate will be slower.

If an improved RPM rate is required, you can add another Gateway to the network to load balance node traffic. This works best when there are high node counts. Alternatively, place the Gateway in a more central area with better radio visibility to all nodes or identify slow nodes and improve their radio visibility to another node or the Gateway.

#### Peer Gateways

Gateways can be peered (connected) with other Gateways over the network. This allows for retrieving data from multiple Gateways by polling a single Gateway. The peered Gateways do not have to be in similar locations as long as they are permitted to communicate with each other over the network.

To enable Gateway peering on a specific Gateway:

- 1. Select the "Peer Gateways" tab under the "Data Sources" tab on the left menu
- 2. Click on the "+" icon (2) on the Peer Gateways chart
- 3. Complete the data on the "Add New Item" pop up menu (3) making sure the "Enabled" box is checked

Name:	Friendly name description
Туре:	Gateway model (EG3 or EG4) of peer Gateway
IP Address:	IP address of peered Gateway
Port:	Network port; typically port 80

4. Click the green "Add" button to complete the process.

It will now be possible to extract data for the peered Gateway from this Gateway. Note that each Gateway must have peering data completed in order to receive data from other Gateways and act as "master".

<u>Importing and Exporting Peer Gateway Data:</u> For larger networks that contain a large volume of Gateways, peering data can be exported and saved as well as re-imported. This makes it easy to load peering data onto many Gateways without manual data entry.

To import or export peering data click on the utility icon (1) to expose the menu and follow the steps listed below. Note that data will be stored on a JSON file.

WER EU				0	
Search	Peer Gateways	2			
Status					
Monitoring Data	NOTE Peer reteways should be set to port 8	R0 unlace instructor otherwise			
<ul> <li>Data Sources</li> </ul>	The gate and a be set to port				
Wireless Nodes	Enabled Name		Туре	IP Address	Port
Peer Gateways	•				
Data Processing		No data to display	1		
Data Destinations	Y				1
System	+ -	Contraction of the second seco	>> 15 ¥	1 Import Peer Gat	Q -
	2			<ul> <li>Export Peer Gat</li> </ul>	teways
	Add New Item (3)		×		20151
				Remove All Item	15
	Enabled:				
	Name: GW1				
	Type: EG4		•		
	IP Address: 192.168.1.198				

DAGUET

### **Data Destinations**

The Gateway can make monitoring data accessible via five formats:

- EMX Monitoring portal
- Modbus TCP/IP
- SNMP (versions 1, 2 and 3)
- MTConnect
- EthernetIP

Note that data can be provided simultaneously to the EMX Portal while serving Modbus TCP/IP, SNMP, MTConnect or EthernetIP data.

#### EMX Energy Portal

To enable data to flow to the EMX portal: Select the "Data Destinations" tab on the left menu and click on "EMX" in the sub menu. There are two versions of EMX, a cloud based version and in some instances EMX may be installed as a local application. Select the version of EMX to be implemented in the "Monitoring Data Feed" and "Upgrade and Support Data Feed" sections. Note that Cloud EMX is the default selection.

#### Cloud EMX

- Ensure that the Gateway's IP address has outbound access to port 80 (HTTP) or 443 (HTTPS) for \*.amazonaws.com when using cloud EMX
- Confirm that cloud and support data feeds are enabled with the network manager (cloud EMX implementations only)

#### Local EMX

- Select "Local EMX" in the "Monitoring Data Feed" and "Upgrade and Support Data Feed" sections
- Enter the IP address of the local EMX server.

Note: Before you can access your data via EMX make sure your Hubbell representative has set up an EMX account.

Q Search	* EMX	EMX				
Status						
Monitoring Data	Setup your EMX	monitoring da	ata feed and support feed.			
Data Sources	Monitoring C	ata Feed				
Data Processing	Mode	Select	Destination			
🗭 Data Destinations	Cloud EMX	۲	Send monitoring data to cloud EMX. Requires firewall http(s) access to ",amazonaws.com			
EMX	Local EMX	۲	Send monitoring data to a local EMX host:			
> Modbus						
SNMP	Disabled	0	Do not send data anywhere (for use with SNMP or Modbus)			
System	Upgrade and	Upgrade and Support Data Feed				
	Mode	Select	Destination			
	Cloud EMX	۲	Enable upgrade information feed from cloud EMX. Requires firewall http(s) access to ".amazonaws.com			
	Local EMX	0	Enable upgrade information feed from a local EMX host			
	Distant		Do not use the support data feed			

#### Modbus

See Modbus TCP/IP Implementation section

#### SNMP

See SNMP Implementation section

### **System**

The following resources are accessible under the "System" menu.

#### Dashboard

The Dashboard feature is a diagnostic tool for use by Hubbell and authorized partners. It may not be exposed on all Gateways.

PAC	VEREG • System OK			
Q St	earch X	System Das	hboard	
	Status	o yotom Dao	noouru	
• 🐽	Monitoring Data	Module Status		
•	Data Sources			
~	Data Pressaning	Module	State	Header
	Data Processing	EMX Support Queue	Not Running	Disabled
۰ 🗈	Data Destinations	EMX Syslog	ок	
	Sustam	JDR feed	Not Running	Disabled
× •	System	Mesh data processor	ОК	700700 packets processed
	Dashboard	Mesh traffic analyzer	ок	2 GUIDs, 2 NIDs
	Networking	Modbus server	Not Running	
	Authentication	Node reading simulator	Not Running	No nodes enabled
	Security	P5 Mesh	ок	mode gw, zone EC.5 (20185C1A), meshID 1, 1 node, 3 foreign meshes
	Radio Zone	Peer gateway engine	ок	
	Node Firmware Update	Responsiveness	ок	Up 3 d 10:54:16, 60 s avg 1.3 +/- 22 ms [-2.5, 400]; 5261# 3σ avg 7 [-2, 400]
	System Update	S3 Packet Log	ок	
	System Firmware Selection	SNMP Server	Not Running	
	License	Virtual panels	Not Running	
	Logs	4		
	Errors			<< < Page 1 of 1 > >> 15 ¥
	Reboot			

#### Networking

The Networking tab allows for the input of network settings. See the Network Configuration section for a detailed explanation.

#### Hubbell Ethernet Gateway V1.1 User's Manual

Search X	Networking 🕜		
Status			
B Monitoring Data	Setup your networkin	g information in order to properly communicate within your network	
Data Sources	Network Interface		
C Data Processing	DHCP:	🛛 On 🔳 Off	
A Data Doctinations	IP Address:	192.168.0.100	
er Data Desunauons	Netmask:	255.255.255.0	
• System		100.100.0.1	
Dashboard	Gateway IP:	192.108.0.1	
Networking			
Authentication	Domain Name Servers		
Security	Server 1:	192.168.1.1	
Radio Zone	Samuer 2:	192 168.0.0	
Node Firmware Update	Server 2.	100.100.00	
System Update	Brown Conter		
System Firmware Selection	Ploxy Server		
License	Proxy 💿 On 💌 Off		
Logs			
Errors	Time Synchronization (NTP)		
Reboot	Server 1:	192.168.1.1	
	Server 2:	192, 168, 0, 0	

#### Authentication

Configure your desired method of authenticating user access to the Gateway. Several options exist including "None".

P		
1	Q Search 🗙	Authentication
	Status	
8	Monitoring Data	Configure the authentication method required to access this device. Basic Configuration
>	Data Sources	Authentication Type:
	C Data Processing	None
	Data Destinations	
×	System	Save
	Dashboard	
	Networking	
	Authentication	
	Security	
	Radio Zone	
	Node Firmware Update	
	System Update	
	Lisonso	
	Errors	
	Reboot	

#### Security

The Security tab provides access to additional network security features for the Gateway allowing for the use of HTTPS and SSL protocol with security certificates.

The default exchange protocol is HTTP Only. This can be upgraded to a SSL protocol using one of the three other optional settings by selecting from the "Mode" drop down menu (1)

- HTTP Only (no SSL)
- HTTP + HTTPS
- Redirect HTTP to HTTPS
- HTTPS Only

After selecting an enhanced SSL protocol it is necessary to enter the "Certificate" and "Key" files (2) for the related protocols.

Once the data has been entered click the "Save" button to implement.

Q Search	Security		
🔳 Status	Cocarry		
Monitoring Data	Setup your security preferences.		
Data Sources	Web Server SSL		
Data Processing	Mode HTTP+HT	ITPS	• 1
Data Destinations	Certificate Choose Fil	e No file chosen	
💘 🔷 System	2 Key Choose Fil	e. No file chosen	
Dashboard			
Networking	Save	[	
Authentication		HTTP+HTTPS	<b>*</b>
Security		HTTP Only	
Radio Zone		HTTP+HTTPS Redirect HTTP to HTTPS	
Node Firmware Update		HTTPS Only	

Additional security options are available. Consult Hubbell for details.

#### Radio Zone

**WARNING:** DO NOT update any Radio Zone settings without consulting Hubbell. You may permanently disable your system and/or violate local radio communication licenses!

Hubbell Gateways and monitors are capable of transmitting on both the 900 MHz and 2.4 GHz bands in the ISM spectrum along with segregated channels within these bandwidths. Depending on geographic region or country there are specific bandwidths required. This is defined by the "Region" (1) setting in the Radio Zone configuration.

PACKETEG • System OK					
Q Search X	Radio Zone				
Status					
Monitoring Data	WARNING!	where Dard of Darma Married			
<ul> <li>Data Sources</li> </ul>	Please DO NOT update any settings without cons	lutting Packet Power, You ma	ry permanentry orsable your system	and/or violate local radio communica	non acenses
2 Data Processing	Current Radio Zone: EC 5 (20185C1A)				
Data Destinations	Region		0000		
System	EC (European Union)	*	1		
Dashboard	Isolation Group	Reg	jion		
Networking	5	· 2	C (European Union)	*	
Authentication		A	1 (Hong Kong, Singapore)		
Security	Save	A	2 (India) 3 (Janan)		
Radio Zone		A	4 (Korea)	-	
Node Firmware Update		A	.5 (Lebanon, Egypt, Bahrain) √6 (Australia)		
System Update		A	(Russia)		
System Firmware Selection		A	9 (UAE, Saudi Arabia, Oman)		
License			C (European Union)		
Logs		U	In (Global 2.4 GHz)		
Errors		C	ustom		
Reboot					

#### Radio Isolation / Isolation Group

In many cases there is a requirement to "radio isolate" or segregate specific Gateways and monitors from other Gateways and monitors sharing radio proximity. This is achieved by designating a specific group of Gateway and monitors to an "Isolation Group" (2). Note that both the Gateway and nodes must share the same radio isolation group for successful communication. Modification of radio isolation groups should only be done with guidance from Hubbell.

#### Node Firmware Update

The Node Firmware Update feature allows the Gateway to wirelessly broadcast firmware updates to all monitoring nodes communicating with a given Gateway. This is an inherently safe feature since firmware is transmitted redundantly over time and is not actually deployed until a complete image has been received and verified to be correct. Due to the variability of the radio connections and network load, firmware updates may take from a few hours to a day, depending on the size of the network. During the update process the monitors will continue to function normally. When completed, the monitors will automatically reboot and switch to new firmware.

Note that different monitoring node types use different firmware images. In a firmware version designation the first number (e.g. "5" in 5.28) denotes node type and the second number (i.e. "28") denotes the firmware version. Nodes of a given type will only receive firmware images of the matching type. If multiple firmware images need to be upgraded (e.g. upgrading 5.28 to 5.29 and 23.12 to 23.14), upgrades have to be done sequentially (initiate one upgrade, wait for it to complete, then initiate the next upgrade).

Updating firmware on monitoring nodes:

- 1. Select the appropriate firmware version from the "Firmware" drop down menu (1). A list of firmware updates can be found <u>here</u>.
- 2. Click the "Start Broadcast" button (2)

The progress of the update will be shown on a bar chart (3). The update transmission may be terminated at any time by clicking on the "Stop Broadcast" button.

Note that a node firmware update may take a long time. During the uploading process the node will be fully operational using the existing firmware. Once the upload is complete the node will automatically reboot and revive with the newer firmware version. The node may be offline for a very short time during the reboot process.

In the event that a firmware upload is interrupted, it will resume at its last position without losing the initial data uploads. The upload status can also be viewed on the main Gateway Console screen next to the "System Status" indicator.

Status	oue i innware i	opuate
Monitoring Data	ect a node firmware file to be broadca	st over the mesh network to nodes communicating with this gateway.
) Data Sources	elect a Firmware File	
Data Processing	Firmware: 4.5	•
Data Destinations	tart Broadcast2	
System		Please select a firmware file
Dashboard		Please select a firmware file
Networking		4.5
Authentication		5.19 5.20
Security		5.21 5.24
Radio Zone		5.26 5.28
Node Firmware Update		5.30
System Update		6.34
System Firmware Selection	3	
	Broadcasting firmware	5 24 89764041
	broadcasung inniware	Pass 1-4 5% complete
		r aaa 1. 4.5 % complete

#### System Update (Update Firmware on Gateway)

The System Update feature provides the latest Gateway firmware along with an updated library of monitoring node firmware. After the firmware file is uploaded, the Gateway will automatically detect its content and automatically integrate the new firmware.

![](_page_23_Picture_1.jpeg)

To initiate a system update:

- 1. Select an "Update File" by clicking the "Choose File" button (1). Update files are provided from Hubbell.
- 2. Click the "Upload" button (2).

The system upgrade may take upwards of 30 minutes.

#### System Firmware Selection

The System Firmware Selection tab allows users to implement alternate versions of firmware residing on the Gateway. The firmware must be loaded onto the Gateway using the "System Update" feature.

PACKET EG System OK	
Q Search X	System Firmware Selection
Status	
🔹 🏤 Monitoring Data	Use the menu below to select a specific version of system firmware to run on your device. Active firmware: N/A
Data Sources	Available System Firmware Versions
Data Processing	Select a firmware version V
> 🕩 Data Destinations	
🔹 🖨 System	Use selected firmware
Dashboard	
Networking	
Authentication	
Security	
Radio Zone	
Node Firmware Update	
System Update	
System Firmware Selection	

To change a Gateway firmware operation version:

- 1. Select a firmware version from the "Available System Firmware Versions" drop down menu (1).
- 2. Click on "Use selected firmware" button (2).

Note that the exchange process may require a reboot in some cases.

#### License

Various features of the Gateway will require a separate product license. These licenses can be implemented by uploading the license file provided by Hubbell or an authorized partner. Licensed features include:

- SNMP
- Modbus
- Virtual Panel Mapping
- Gateway Capacity (limited versus standard)
- Monitor Mode

POWEREG • System OK	
Q Search X	Product License
I Status	
Monitoring Data	You may change your product license by selecting an appropriate license file from your file system.
<ul> <li>Data Sources</li> </ul>	Upload
C Data Processing	Select License File
Data Destinations	Choose File No file chosen
System	
Dashboard	Upload
Networking	
Authentication	
Security	
Radio Zone	
Node Firmware Update	
System Update	
System Firmware Selection	
License	

To implement a product license:

- 1. Select the license file by clicking on the "choose file" button under "Select License File" (1).
- 2. Click on the "Upload" button.
- 3. A reboot of the device will be required to make the license effective.

#### Reboot

In some cases the Gateway may require "rebooting". To reboot the Gateway:

- 1. Select the "Reboot" tab from the left menu.
- 2. Click the red "Reboot" button (1).

The Gateway will go offline and will reboot and reconnect to the network and all monitoring nodes once the reboot process is finished. This does not erase any configuration settings.

**WARNING:** Monitoring data will not be gathered from the nodes during a Gateway reboot unless there is a redundant Gateway that can assume the network traffic.

PACKET EG • System OK	
Q, Search X	Reboot
III Status	
Monitoring Data	0 IMPORTANT
Data Sources	If you have recently updated the license of your device, a reboot is necessary for all settings to take affect.
C Data Processing	Reboot the device by pressing the button below.
> 🕞 Data Destinations	Reboot 1
🎽 🏟 System	
Dashboard	
Networking	
Authentication	
Security	
Radio Zone	
Node Firmware Update	
System Update	
System Firmware Selection	
License	
Logs	
Errors	
Reboot	

#### Logs

Logs provide critical operational details relating to the Gateway operation. They are retrieved for debugging purposes and used strictly by Hubbell engineers.

To obtain a log file:

- 1. Select the [Logs] tab from the [System] menu on the right hand task bar.
- 2. Select the log to be accessed under the "View debug log" menu. The log file will then appear in the dialog box where it can be copied and pasted as required. Note that there are six unique logs: Boot, Console, LCD, OCD, P5, and Task Manager.

P	OWEREG	System OK
<	Q Search X	Logs
	Status	
	Monitoring Data	View debug log
>	Data Sources	Select a log Select a log Boot
>	2 Data Processing	Console
>	Data Destinations	OCD P5
*	🔅 System	Task Manager
	Dashboard	
	Preferences	
	Networking	
	Authentication	
	Security	
	Radio Zone	
	Node Firmware Update	
	System Update	
	System Firmware Selection	
	License	
	Logs	
	Errors	
	Reboot	
F		System OK
F		• option of

POWER	• System OK
Q Search ×	Loas
I Status	
Manitaring Data	View debug log
	P5
➤ ➡ Data Sources	Contents
> 3 Data Processing	Logs begin at Mon 2017-10-09 12:17:29 UTC
Data Destinations	Oct 09 12:17:42 PacketPower-11E4-0000-0000-0059 Systemu[1]: Starting E4 P5 SerVice Oct 09 12:17:49 PacketPower-11E4-0000-0000-0059 Systemu[1]: Already at 27.10 Oct 09 12:17:50 PacketPower-11E4-0000-0000-0059 Systemu[1]: Started E4 P5 Service.
👻 🏟 System	
Dashboard	

# **Firmware Upgrades**

The Ethernet Gateway Version 4 provides a means of performing firmware upgrades to both itself and to most Hubbell wireless monitoring units. Upgrades are performed via the "System" page of the web console. Detailed instructions can be found in the <u>Web Console - System</u> section.

# **SNMP** Implementation

The following are step-by-step instructions for implementing SNMP using the Ethernet Gateway Version 4. These instructions are intended for SNMP versions 1 and 2. The Version 4 Gateway does support version 3 SNMP. For details on version 3 implementation please contact techserv@hubbell.com.

**Required Files and Tools** 

MIB Files: MIB files can be downloaded directly on the Gateway or from the links below <u>General MIB File</u> (click to download) <u>MIB file for use with VIPs (Virtual IP addressing)</u> (click to download) **iReasoning Browser**: iREasoning MIB Browser is a utility that allows you to view MIB files.

### Data Output from SNMP Gateways

#### Requirements

Download iREasoning MIB Browser (<u>http://www.ireasoning.com/download.shtml</u>)

REASONING	- Experiencing Innovation
Home Download Support Purchase Compar	ly Search (
We also trial variants of some model to see on test data	er fin solkenen helene van somhene it. Even bisk version is nameholde fan Adir Kansfand, and sum far 90 dem Ub
we offer that versions of every product, so you can lest-driv	re the software before you purchase it, Every that version is completely free, fully functional, and runs for 30 days. We
also offer support for your download versions. Test-drive one I	re the somware denote you purchase it. Every that version is completely tree, tuily functional, and runs for 30 days. vvi loday!
Also offer support for your download versions. Test-drive one t Downloads MIB Browser Personal Edition	re the software denote you purchase it, Every that version is completely free, fully functional, and runs for 30 days, ver Description iReasoning MIB Browser Free Personal Edition
We olier that versions of every product, so you can test-drive one table offer support for your download versions. Test-drive one table offer support for your download versions. Test-drive one table of the support o	The software before you purchase it, Every that version is completely tree, fully functional, and runs for 30 days. w Description iReasoning MIB Browser Free Personal Edition

- The Gateway is configured and communicating with the wireless nodes
- The Gateway has a license for SNMP

# Accessing the Gateway Console

POWEREG	• System OK 3	
Q Search	<ul> <li>System status</li> </ul>	_
Monitoring Data	General	Data Sources
	System firmware: 1.10.0-25-g1aa9e3d-dirty Radio firmware: 27.8-1971A672	4 • Wireless Mesh View devices communicating to this galeway
C Data Processing	GUID: 23E4-0000-0000-0084 Radio zone: EC.5 (20185C1A)	Peer Gateways
Data Destinations	System time: 2016-09-15705:18:46+00:00 Up-time: 5 d 10:15:38	Data Processing
System	Paddress: 192.168.1.131 MAC address: 54:4a:16:14:d5:b0	Virtual Panels Configure and monitor Virtual Panels
	Licensed Features	Data Destinations
	EMX     Modbus     Peer Gateways     SNMP     Virtual Panels     Debug	EMX Monitoring Data Feed Configure EXC monitoring data feed     EMX Support Data Feed Configure EXOX support data feed     Configure EXOX support data feed     View data exposed via Modbus/TCP
		5 SNMP View data exposed via SMMP

Make sure your Gateway is configured with an IP address and accessible on your network. The Gateway must be connected to a switch /router on an accessible network. It may not be accessible directly through a PC Ethernet to Gateway connection. For Gateway network configuration instructions follow this link.

(1) Enter the IP address of the Gateway on any browser to access the Gateway Console

(2) Make sure SNMP is listed as a licensed feature. If not see the licensing section on how to <u>add a</u> <u>license</u>

(3) Make sure that the system is communicating properly with the monitoring nodes as indicated by a green status light

(4) Click the link under Wireless Mesh to see monitoring nodes that are currently communicating with the Gateway

(5) SNMP Data will be able to be viewed through the SNMP data link; this light will be green once the SNMP agent is enabled

### Accessing the MIB files from Gateway Console

MIB files can be downloaded directly from the Gateway Console. There are two MIB files. The standard EG4 file is for use in standard SNMP applications. The VIP MIB file is used when using Virtual IP addresses for each monitoring node instead of the standard 16 digit GUID embedded in the OID.

# If the link is not available on the console this may require that the <u>Gateway firmware be</u> <u>upgraded to version 1.12 or higher</u>.

#### Downloading the standard MIB file

.

On the Gateway console go to Data Destinations>SNMP on the left menu and then click on the standard MIB file.

I Status			
Monitoring Data     SNMP enable	s access to data visible	to this gateway via SNMP.	
Data Sources     Sources			
C Data Processing	SNMP Version:	2c	٣
Data Destinations	Agent Port:	161	
EMX Cor	nmunity read string:	public	
> Modbus •			
SNMP Save			
Data Diode Transmitter			
System Standard M	IB File 🕜		
Click here to o	lownload the standard E	G4 MIB file.	
Export Cust	om File		
Export the da	ta points currently being	received by the gateway to an SNMP-compatible format.	
	Export Format:	OID List CSV	۳
	, ,	A CSV file of OIDs corresponding to the data points currently being received by the gateway. OID lists are used with systems utilizing explicit "tag lists" of monitoring points (e.g. KEPServer) or whenever	

#### Downloading the MIB file for use with virtual IP addressing

On the Gateway console go to Data Destinations>SNMP>Nodes on the left menu and then click to download the MIB file.

WEREG	System OK
Q Search	SNMP Node Map
I≣ Status	
Monitoring Data	Node MIB File 📀
Data Sources	Click here to download the standard Packet Power node MIB file.
Data Processing	Virtual IP Address A Node
Data Destinations	No data to display
ЕМХ	
> Modbus	● · · · · · · · · · · · · · · · · · · ·
✓ SNMP	
Nodes	
Data Diode Transmitter	

### Accessing active OIDs

It is possible to download a CSV file that contains only the active data points being received by the Gateway in an SNMP compatible format. This will vary as nodes are added and removed from the system. OID lists are used with systems utilizing explicit "tag lists" of monitoring points (e.g. KEPServer) or whenever you need SNMP access to a specific set of readings.

To access the file go to the [Data Destinations] tab on the left menu and select [SNMP]. On the main screen select the button [Export OID List CSV]. This will download the OID

PAC	WER EG		System OK					
Q S	earch	×	SNMP					
	Status							
<b>6</b> 3	Monitoring Data		SNMP enables access to data visible	to this gateway via SNMP.				
(ب ا	Data Sources		Enabled					
• 2	Data Processing		Save					
• 🕩	Data Destinations							
	EMX		Standard MIB File 😧					
	Modbus	•	Click here to download the standard EG4 MIB file.					
	SNMP	•						
	Nodes		Export Custom File					
	Data Diode Transmitter	۲	Export the data points currently bein	g received by the gateway to an SNMP-compatible format.				
System		Export Format:	at: OID List CSV					
			Export to OID List CSV	A CSV file of OIDs corresponding to the data points currently bein received by the gateway. OID lists are used with systems utilizing explicit "tag lists" of monitoring points (e.g. KEPServer) or whenev you need SNMP access to a specific set of readings.	a er			

# Viewing monitoring node readings on the Gateway Console

OWEREO	- of an and								
Search	Nodes								
Status	House								
B Monitoring Data	Node	F/W	Туре	Product	Age	Timestamp	Source	VIP	Readings
Power Nodes									00
Env. Nodes	8600-0000-0000-CABF	5.34	AC Power	P5T3	00:02	2016-09-14 22:	54:58 Wireless Mesh	192.168.100.244	(2)
Data Sources	8810-0000-0000-18D9	21.14	Environmental	E312	00:02	2016-09-14 22:	54:58 Wireless Mesh	192.168.1.225	8
C Data Processing									Verwing 1 - 2 of 2
		POWEREC	3	· System CM					
Data Destinations		O. Brench.		Node C	000 00	00 0000 0	ADE		
System		E Sister		Node d	600-00	00-0000-0	ADF	-	
		- Alontoring I	Deste	Current A	Peer	Power A	Temperature VA.A	Voltage A	
		· Power No.	aba						
		enco	0000-0000-CARF	Van F				🥖 🕓 🛄	
		• • • Data Source	m)		-				
		1 2 Onla Proce	mma .	Contraction	-				
		1 Data Destri	ators	Current A	0.012	4 00 00 20	15-09-14 22 56 28		
		n O System		Energy	100	Am 00.00 20	16-09-14 22 56 28		
		- Reviewer	_	Energy A	550	Ath 00.00 20	95-09-14 22 56 28		
				Frequency		-g 0000 20	10-00-14-22-06-28		

(1) Confirm that monitoring nodes are active and returning data to the Gateway by selecting the "Monitoring Data" tab; this will display all connected nodes

(2) Click on the "readings" icon to expose the real time readings for a specific monitoring node

# Uploading an SNMP license to the Gateway

![](_page_33_Picture_2.jpeg)

(1) To activate a product license, select the license file by clicking on the "choose file" button under "Select License File" in the "System" menu

(2) Click on the "Upload" button and point to the location of the license provided by Hubbell

A reboot of the device will be required to make the license effective. The reboot tab can be found under the "System" menu.

In the event that SNMP is not a licensed feature you will need to obtain a license from Hubbell techserv@hubbell.com.

# Enabling and configuring the SNMP Agent

PACKET EG	System OK	
Q Search	* SNMP	
Status		
Monitoring Data	SNMP enables access to data visible to this gateway via SNMP.	
🕨 🔿 Data Sources	2 Z Enabled	
Data Processing	3 SNMP Version: 2c	*
Data Destinations	4 Agent Port: 161	
EMX	5 Community read string: public	
Modbus		
1 SNMP	Save 6	
Nodes		
System		

- (1) Click on the SNMP tab under the Data Destinations tab
- (2) Make sure SNMP is enabled in the check box

(3) Select the correct SNMP version. This guide is for SNMP V1 and V2; for SNMP V3 implementation see the SNMP 3 guide

- (4) Set the Agent port to 161 or as needed
- (5) The Community read string (used for authentication) should be "public"
- (6) Click "Save" to save settings
- (7) The SNMP status light in the left menu will be green indicating the onboard SNMP agent is active

# Using the iReasoning MIB browser

Loading general MIB files on to the iReasoning browser

![](_page_35_Picture_3.jpeg)

(1) Load the MIB for "General SNMP management" using the [Load MIBs] function under the [FILE] menu

(2) This is the "SNMPv2-MIB" file if using SNMP V2. For older SNMP versions use the appropriate MIB file supplied in the MIB directory.

This file will automatically be supplied with iReasoning in the "mibs" directory.

#### Loading Gateway and node MIB files on to the iReasoning browser

![](_page_35_Picture_8.jpeg)

(1) Load the MIB for Gateway and monitoring nodes using the [Load MIBs] function under the [FILE] menu

(2) PACKETPOWER-EG4-MIB is for the Gateway and PACKETPOWER-NODE-MIB is for the monitoring nodes

#### Download these MIB files.

#### Accessing MIB files on the iReasoning Browser

![](_page_36_Picture_3.jpeg)

The SNMP management MIB can be found under the "mgmt." file of the MIB tree

The Gateway MIB file can be found under the "eg4" directory under the "private" directory

The monitoring nodes MIB file can be found under the "monitoringNode" directory under the "private" directory

#### Accessing the Gateway using the iReasoning browser

OID: .1.3.6.1.2.1.11	
S Advanced Properties of SNMP Agent	×
Address 192.168.1.251 Gateway IP address	1
4 Port 161 Port is usually 161	
3 Read Community	
Write Community	
5 SNMP Version 2 Must match SNMP version	Ŷ
(!) Must match properties used on Gateway     Ok   Cancel	
	OID: .1.3.6.1.2.1.11 Advanced Properties of SNMP Agent Address 192.168.1.251 Gateway IP address 4 Port 161 Port is usually 161 3 Read Community Write Community 5 SNMP Version 2 Must match SNMP version (!) Must match properties used on Gateway Ck Cancel

- (1) Enter the IP address of the Gateway in the address bar
- (2) Click on the "Advanced" tab
- (3) Make sure SNMP is configured for the same read community string (public)
- (4) Confirm port is correct (161)
- (5) Confirm that the SNMP version matches the settings used on the Gateway Console SNMP settings (i.e. SNMP version)

Leave "Write Community" blank

#### Confirming communication with the Gateway

Address: 192.168.1.131 ~	Advanced	OID: .1.3.	5. 1. 2. 1. 1. 1.0			
SNMP MIBs			Result Table	192.168.1.	251 - nodesTable	192. 168. 1. 251 - readingsTable
MIB Tree			Name/0	DID	1	
mant			sysDescr.0		Packet Power EG4 Et	hemet Gateway 😗
system	Find in subtree Export to CSV Expand subtree					
sysContact	Graph View	Ctrl+R				
- SvsName 2	Get	Ctrl+G				
- SysLocation	Get Next	Ctrl+N				
svsServices	Get Bulk	Ctrl+B				
sysORLastChange	Get Subtree	Ctrl+E				
e sysORTable	Set	Ctrl+S				
1 1	Walk	Ctrl+W				
	Table View	Ctrl+T				

- Check the system description by clicking on the the "SysDescr" file on the MIB tree mgmt.>mib-2> SysDescr
- (2) Right click on the sysDescr file and and select "Get" from the pop up menu
- (3) The right hand menu should now display "Hubbell EG4 Ethernet Gateway"

#### Performing an SNMP "Walk" to confirm data flow

				Walk			~ 6	•
					(1		- 0	×
1.33688.4.2.1.5.3	34304.0.0.5190	3			~ 0	perations: Walk	~ 6	Go
Result Table	192.168.100	.244 - nodesTable	192.168.100.244 - nodesTable	192.168.100.244 - nodesTable	1			
Name/C	DED			Value		Type /	IP:Port	10
ntNodeIdHex. 3430	4.0.0.51903	86000000000CABF 2				OctetString	192.168.1.131:161	
ntNodeIdHex.3483	32.0.0.6361	88 1000000000 1809				OctetString	192.168.1.131:161	20
ntNodeIdString.34	304.0.0.51903	8600-0000-0000-CABF				OctetString	192.168.1.131:161	10
ntNodeIdString. 34	832.0.0.6361	8810-0000-0000-1809				OctetString	192.168.1.131:161	
ntTime.34304.0.0.	51903	12596-55-51,57:56:49.48	+57			OctetString	192.168.1.131:161	
ntTime.34832.0.0.	6361	12596-55-51, 57:56:49.48	+56			OctetString	192.168.1.131:161	8
ntUnixTime.34304.	0.0.51903	1473981060				Integer	192.168.1.131:161	-
	0.0.6361	1473981060				Integer	192.168.1.131:161	i i i
ntUnixTime.34832.	204.0.0 51002	2016-09-15T23:11:00.000	Z			OctetString	192.168.1.131:161	
ntUnixTime.34832. ntIso8601Time.343	304.0.0.31903		7			OctetString	192.168.1.131:161	6
ntUnixTime . 34832. ntIso860 1Time . 343 ntIso860 1Time . 348	832.0.0.6361	2016-09-15T23:11:00.000	*					
ntUnixTime.34832. ntIso860 ITime.343 ntIso860 ITime.348 ntLinkQuality.3430	832.0.0.6361 4.0.0.51903	2016-09-15T23:11:00.000 100	•			Integer	192.168.1.131:161	

(1) Click "Walk" on the Operations bar and then click "Go"; a table will be generated returning all MIBs

Note that Windows firewall may have to be turned "off" for proper communications

(2) Node "GUIDs" will be displayed in the table; these node IDs will correspond to the Node IDs on the Gateway Console

To see the data in a more structured format use "Table View"

#### Generating readings tables and nodes tables (Table View)

#### Readings Table: readings of all monitoring nodes

#### Nodes Table: a list of all nodes

![](_page_38_Figure_10.jpeg)

(1) (2) To get data in a more structured format select the "readingsTable" or "nodesTable" under the EG4 directory [private>packetPower]

- (3) Right click and select "Table View"
- (4) The table will appear in the right window

Re	sult Table	192.168.100.244 - r	nodesTable	192.168.100.244	+ - nodesTable	192.168.100.244 - noc	lesTable	192.168.100.24	4 - nodesTable	192.16
	De Rotate	🗭 Refresh	Export	Poli St	VMP SET Create	Row Delete Row				
	ntNodeId1	ntNodeId2	ntNodeId3	ntNodeId4	ntNodeIdHex	ntNodeIdString	ntTime	ntUnixTime	ntIso8601Time	ntLinkQu
1	34304	0	0	51903	86000000000CABF		1473984416	1473984416	2016-09-16T00:	0 100
2	34832	0	0	6361	8810000000018D9	as10-0000-0000	1473984417	1473984417	2016-09-16T00:	0 100
Fi Add SN	le Edit Operat ress: 192.168.1.2 MP MIBs	ions Tools Bookmarks	s I Adv	Status Monitoring Data		Virtual IP Address	^ Node			
G Fi	iReasoning MIB E le Edit Operat	irowser ions Tools Bookmarks		Q Search	*	SNMP No	de Map			
-	MIB Tree iso.org.dod.int	ernet	-	> Data Sources			8810	0000-0000-1809		
	enterpr	ises		Data Processing	9		8600	0000-0000-CABF	-3	
		desPower eg4 im readingsTable im nodesTable imnitiangsTable im	1	Data Destination EMX > Modbus > SNMP Nodes	ns	* =	Page 1 of 1	>>> 15 ×	0	

#### Node Tables / Node Map

(1) After performing a "TableView" on "Nodes Table" by selecting the "nodesTable" file, right click and select table view, it will reveal a listing of all nodes associated with the Gateway

(2) Node "GUIDs" will be displayed in the table

(3) These node IDs will correspond to the Node IDs on the Gateway Console accessed by selecting Data Destinations > SNMP > Nodes

#### Readings Table / Readings for all Nodes

![](_page_39_Figure_7.jpeg)

(1) Performing a "TableView" on "Readings Table" by selecting the "readingsTable" file, right click and select [Table View] from the pop up menu, it will reveal a listing of all readings for all nodes associated with the Gateway

(2) Node IDs will correspond to the node readings on the Gateway Console accessed by selecting the Monitoring Data menu and highlighting the corresponding node

(3) Values from the Gateway Console will match those on the Readings Table

All readings share a common table until a virtual IP address can be defined per node allowing nodes to be segregated by IP address

reNodeId1	reNode1d2	reNode1d1	Iretisdet44	channelid	IneNodeOdHex	IreNodeEdString	reChargeRiane	IneTime	relinaTime	rebolid01Time	IreValue.	cel kits	Index Value
34304	0	0	\$1903	voltage	860000000000	8600-0000-0000-	Energy		1473922977	2016-09-15707:0	\$50	Wh	34304.0.0.51903.1
34304	0	0	51903	current	860000000000	600 0000-0000-	EnergyA		1473922977	2016-09-15707:0.	550	and a second	34304.0.0.51903.2
34304	0	0	51903	battery	seccocococc	8600 0000-0000-	Power		1473922979	2016-09-15707:0	0	W	34304.0.0.51903.10
34304	0	0	\$1903	pressure	#60000000000	8600-0000-0000-	PowerA		1473922979	2016-09-15707:0	. 0	14	34304.0.0.52903.11
34304	0	0	51903	21	860000000000	8600 0000-0000-	CurrentA		1473922979	2016-09-15707:0	. 12	mA	34304.0.0.51903.2
34304	0	0	51903	31	860000000000	8600-0000-0000-	VoltageA		1473922979	2016-09-15707:0	125620	-	34304.0.0.51903.3
34304	0	0	51903	50	86000000000C	8600-0000-0000-	Frequency		1473922977	2016-09-15707:0	60000	metz	34304.0.0.51903.50
04304	0	0	51903	51	86000000000C	8600-0000-0000-	PhaseAngleA		1473922977	2016-09-15707:0	72	deg	34304.0.0.51903.51
34304	0	0	51903	52	860000000000	8600 0000-0000-	PhaseAngleB		1473922977	2016-09-15707:0	. 0	deg	34304.0.0.52903.52
34304	o	0	\$1903	53	860000000000	8600-0000-0000-	PhaseAngleC		1473922977	2016-09-15707:0	0	deg	34304.0.0.51903.53
34304	0	0	\$1903	60	as000000000000000000000000000000000000	8600-0000-0000-	Temperature		1473922977	2016-09-15707:0	. 293	deegC	34304.0.0.52903.60
34304	0	0	51903	70	86000000000C	8600-0000-0000-	VAR		1473922979	2016-09-15707:0	. 1	WA.	34304.0.0.51903.7
34304	0	0	51903	71	860000000000	8600-0000-0000-	VARA		1473922979	2016-09-15707:0	. 1	NA.	34304.0.0.51903.71
34832	0	0	6361	60	88 100000000 180	9 88 10 0000-0000-	Temperature		1473922981	2016-09-15707:0	273	ddegC	34832.0.0.6361.60
54832	o	0	6361	100	88100000000180	9 88 10 0000 0000	Temperature0		1473922981	2016-09-15707:0	. 273	odegC	34832.0.0.6361,100
34832	P	0	6361	190	88 100000000 180	9 88 10 0000-0000-	VDD	15	1473922981	2016-09-15707:0	3237	-	34832.0.0.6361.190
				_								_	
Value [D	OID: .1.3.6 TEGER32]: 550 (TEGER32]: 550	1.4.1.33688.4.1.1	1.12.34304.0.0.51	903.2	OID:	.1.3.6.1.4	1.33688.4	1.1.12.343	04.0.0.51	903.2			

#### Interpreting Readings Data from Table View

(1) The 16 digit node ID (GUID) that identifies each Hubbell device (node) is encoded within the OID Clicking on a reading will allow you to associate it with a specific node ID via the OID Any reading OID will always correspond to a specific channel for specific node (ie. energy on phase A for a particular node)

# Virtual IP addressing / Assigning Virtual IPs to monitoring nodes

![](_page_40_Figure_5.jpeg)

Monitoring nodes and the Gateway will show up under a single IP address. Many monitoring systems using SNMP require that each device / node have a unique IP address.

It is possible to assign a Virtual IP address to each monitoring node using the Gateway Console. This will segregate the nodes so they can be revealed individually.

#### Assigning Virtual IPs to monitoring nodes

1	Status	SNMP	Node M	ар
• @	Monitoring Data	Virtual IP Addre	ess ^	Node
	<ul> <li>Power Nodes</li> </ul>			
	8600-0000-0000-CABF			
	> Env. Nodes			8810-0000-0000-18D9
5 4	Data Sources			8000-0000-0000-CABP
• 2	C Data Processing		< Page 1 o	of 1 > >> 15 v 🗘
1	Virtual Panels			
v C	Data Destinations	Add New Ite	em	
	EMX	Virtual IP	virtual IP 2	
	> Modbus O	Address:	Contract Contract	
	SNMP O	Node:	node ID	tores.
	Nodes		8600-0000-0000-C	ABF
• •	System		8810-0000-0000-18	8D9

To apply a Virtual IP address to a specific node open the Gateway Console and select "SNMP" under the "Data Destinations" menu, then select the "Nodes" menu. This will expose all of the nodes for the Gateway

- (1) Click on the "+" icon to reveal the Virtual IP addressing pop-up
- (2) Select the Node to be addressed using the drop down "Node" menu (nodes are identified by their 16 digit GUID)

Enter a virtual IP address; this must be valid within the network its being used on Click "Add" to save

Repeat for all nodes.

Search	* Nodes									
Status	Houco									
B Monitoring Data	Node	~ F/M	Туре	Product	Age	Timestamp	Source	VIP	1	Readings
Power Nodes     Env. Nodes	8600-0000-0000-CABF	5.3	AC Power	P5T3	• 00:02	2016-09-15 17:31:38	Wireless Mesh	192.168	8.100.244	B
Data Sources	8810-0000-0000-18D9	21.	14 Environmental	E312	00:02	2016-09-15 17:31:38	Wireless Mesh	192.168	8.1.225	
C Data Provaccing				ec <	Page 1	of 1   >   >>   5 - •			,	newing 1 - 2 of 2
		🕿 Monito	ring Data		Virtual	IP Address 2	Node			
System	_				_					
	<b>B</b>	• Data S	iources		192 164	1 225	8810.0000.0000.1809			
		C Data P	rocessing		192.168	.100.244	8600-0000-0000-CABF		1	
		🗘 Data 🛙	lestinations		+ =	cc c Page 1	of 1 🗇 🔛 15 🛩	0	8	
		EM	X 3bus	•						
		-	up.							

#### Viewing nodes by Virtual IP address on Gateway Console

- (1) Each node will now have a VIP (virtual IP) as well as 16 digit GUID
- (2) These can be found on the "Monitoring Data" tab of the Gateway Console or the "Node" tab under the "SNMP" tab in the "Data Destinations" menu
- IPs will become visible at the same port as the Ethernet Gateway

The Gateway will have a unique IP and agent and each node will have a unique IP and agent

#### Viewing nodes by Virtual IP address on iReasoning Browser

Address: 192.168.100.244 1 ~	Advanced	OID: .1.3.	6.1.2.1.1.1.0			
SNMP MIBs			Result Table			
MIB Tree	Find in subtree		Name/OII	)		3
	Export to CSV Expand subtree		sysDescr.0	Pack	et Power Monitoring Node	86000000000CABF
e- system 2	Graph View	Ctrl+R				
sysDescr	Get	Ctrl+G				
- 🕘 sysObjectID	Get Next	Ctrl+N	1 I I I I I I I I I I I I I I I I I I I			1.1
sysUpTime	Get Bulk	Ctrl+B		1000	SNMP Node	e Map
- SysContact	Get Subtree	Ctrl+E		Status	Metall ID Address	Node
sysName	Set	Ctrl+S	<u> </u>	Monitoring Data	This Provers	
sysLocation	Walk	Ctrl+W	× 48	Data Sources	192 168 1 225	8810-0000-0000-1809
sysservices	Table View	Ctrl+1	0	Data Processing	192 168 100 244	1600-0000-0000 CABF
sysOREasternange			- 6	Data Destinations	+ = ki i Page	1 of 1 2 20 15 4
				EMK		
				Modous	•	
				SNMP	•	
			100 C	Nodes		

- (1) Enter VIP in the address tab
- (2) Go to "SysDescr" file in the MIB tree (under the mgmt.>mib-2>system folders) and right click for a "Get"
- (3) The monitoring node's ID will be returned on the table to the right
- (4) This corresponds with the VIP and GUID in the Gateway Console for the specific node

#### Hubbell Ethernet Gateway V1.1 User's Manual

ddress: 192.168.100.244	GOID: .1.3.6.1.2	. 1. 1. 1.0		
SNMP MIBs		Result Table		
MIB Tree		Name/OID		
∃ iso.org.dod.internet		sysDescr.0	Packet Power Monito	aring Node 86000000000CA
sysOpectID sysUpTime sysContact sysName sysLocation sysServices sysOcLastChange	Address Port Read Community Write Community SNMP Version	192.168.1.251 161 2	Gateway IP address Port is usually 161 PUBLIC Must match SNMP version	
	0	) Must match propertie	es used on Gateway	

(1) and (2) Note that after a new IP address is entered it may be necessary to click on the "Advanced" tab and re-enter the properties of the SNMP agent for each unique IP address.

THIS IS ONLY WHEN USING the iReasoning browser tool to view different IP addresses.

Address: 192.168	.100.244 V A	dvanced OID: .1	.3.6.1.4	.1.33688.5.1								
SNMP MIBs			Re	sult Table	192.168.1	00.244 - nod	esTable	192.168.100.244 -	nodesTable	1	192.168.100.24	44 - noi
MIB Tree	d,internet			Rotate	😨 Refi	esh	Export Export	Pol SNM	SET	ireate Ro	w Dele	te Rov
e mgmt				mnChannelId	mnCh	annelName	mnValue	mnUnits	mnLabel	m	nTimeStamp	mr
(E)	system		1	1	Energ	4	559	Wh		01	07 E0 08 05 00	0 20
÷.	interfaces		2	2	Energ	-	550	116		0	07 50 09 05 00	2 20
œ	at		-	-	cherg	rA .	555	NIT .		0	07 20 08 03 00	20
œ-	ip		3	10	Power		0	W		0)	07 E0 08 05 00	) 20
<b>B</b>	icmp		4	11	Power	A	0	W		0>	07 E0 08 05 00	0 20
	tcp     udp     Find in subtree     egp     Export to CSV			21 31	Cur Volt	2)earth		Node	8600-0	000-	0000-C	AB
	snmp host	Graph View	Ctrl+R	50	Fre	Monitori	ng Data	Curren	A Po	wer	Power A	T
B- private		Get Next	Ctrl+N	51	Pha	Power Nodes			W	~		
B-	packetPower	Get Bulk Get Subtree	Ctrl+B Ctrl+E	53	Pha	0	600-0000-0000-CA				1	
E E	eg4 monitoringNode	Walk	Ctrl+W	60	Ten	-B Data So	urces			~	04	
	En mReadingsTable	Table View	Ctrl+T	70	VAR	C Data Pr	poessing	Channel	Reading	Units	Age 1	limestam
	a mnChannelId		13	71	VAR	Data De	stinations	Energy	600	Wh	00:00 2	2018-09-1
	mnChannenvame mnValue			1				Energy A	569	Wh	00:00 2	2016-09-1
						• oysiem		Power	0.47	w	00:00 2	2016-09-1

#### Viewing node Readings by Virtual IP address on iReasoning Browser

(1) Using the same VIP for the particular node in the IP Address bar, highlight the "mnReadings" Table MIB under "monitoringNode" file.

Right click and select "Table View"; this will expose the readings table for the specific monitoring node in the table view

(2) These readings correspond to those on the Gateway Console; access the "Monitoring Data" menu and select the same node

#### Hubbell Ethernet Gateway V1.1 User's Manual

Re	sult Table	192.168.1.251 - nodes	Table	192.168.1.251 - read	ingsTable	192.168.100.244 -	mnReadingsTable	x	
	Rotate	Refresh	Export Export	Pol SN	MP SET C	reate Row Delete	Row		
	mnChanneltd	mnChannelName	mnValue	mnUnits	mnLabel	mnTimeStamp	mnIso8601Tim	Index Value	
1	1	Energy	549	Wh		0x07 E0 08 04 04	2016-09-15T04:0	1	
2	2	EnergyA	549	Wh		0x07 E0 08 04 04	2016-09-15T04:0	2	
3	10	Power	0	w		0x07 E0 08 04 04	2016-09-15T04:0	10	
4	11	PowerA	0	w		0x07 E0 08 04 04	2016-09-15T04:0	11	
5	21	CurrentA	12	mA		0x07 E0 08 04 04	2016-09-15T04:0	21	
6	31	VoltageA	125234	mV		0x07 E0 08 04 04	2016-09-15T04:0	31	
7	50	Frequency	59950	mitz		0x07 E0 08 04 04	2016-09-15T04:0	50	
8	51	PhaseAngleA	-74	deg		0x07 E0 08 04 04	2016-09-15T04:0	51	
9	52	PhaseAngleB	0	deg		0x07 E0 08 04 04	2016-09-15T04:0	52	
10	53	PhaseAngleC	0	deg		0x07 E0 08 04 04	2016-09-15T04:0	53	
11	60	Temperature	295	ddegC		0x07 E0 08 04 04	2016-09-15704:0	60	
12	70	VAR	1	VA		0x07 E0 08 04 04	2016-09-15T04:0	70	
13	71	VAR	1	VA		0x07 E0 08 04 04	2016-09-15T04:0	71	

Readings Definitions

mnChannel ID: mnChannel Name: mnValue: mnUnits: mnTime Stamp: Identical for all like monitoring devices Describes the function of the channel, i.e., Energy for phase A Measurement value for the channel Units of measurement, i.e., Watt hours Time when the value was received

#### Turning Windows Firewall "off"

![](_page_44_Picture_6.jpeg)

Windows Firewall will block the iReasoning MIB browser from accessing other IP addresses such as virtual IP addresses.

To disable the Firewall (Windows 10) select control panel > all control panel items > windows firewall and turn the firewall off for both public and private networks. This does not have to be permanent – only during polling on this computer using iReasoning.

# **Modbus TCP/IP Implementation**

NOTE: Modbus register maps are pre-loaded on Gateways with firmware versions 1.12.0 or higher. These register maps have static / pre-assigned register numbers. It is suggested that any Gateway (GW04) be <u>upgraded to firmware version 1.12.0 or higher</u> rather than importing register maps.

Legacy register maps may be download from the below links:

<u>Modbus Register Map Download</u> <u>Modbus Register Map Definitions</u> <u>Modbus Reading Expression</u> <u>Syntax</u>

### **Modbus Overview**

The Ethernet Gateway Modbus interface makes all monitoring data received from Hubbell's wireless monitoring network accessible via standard Modbus TCP/IP protocol via the Ethernet port of the Gateway. The Gateway is capable of providing a Modbus data output and simultaneously serving data to EMX portal. This allows users to take advantage of the EMX portals features while also serving data to the third party monitoring system.

The Ethernet Gateway appears as a standard Modbus device listening on port 502 at the IP address of the Gateway. Individual monitoring nodes have distinct Modbus slave IDs. If more than 254 nodes are present, multiple nodes may report at the same slave ID under different register ranges (see Register Mapping section below). The Modbus protocol requires a single Master connection for all connected nodes.

![](_page_45_Figure_8.jpeg)

# Peering Gateways and Using a Master Gateway

Hubbell Gateways can be deployed in a master / peer relationship. In this approach, the master gateway gathers data from all of its peers. This makes it easier for monitoring applications to access data as the monitoring application only needs to communicate with the master gateway. Note that all peered Gateways must have support for Modbus protocol conversion. Refer to the peering section of the <u>Data Sources</u> guide for instructions on peering Gateways.

# Note that in a network consisting of a mix of V2, V3 and V4 Gateways, a Version 4 Gateway must be designated as the master.

# **Enabling Modbus Output**

To enable Modbus output, access the Gateway Console:

- 1. Make sure your Gateway is configured with an IP address and accessible on your network.
- 2. The Gateway must be connected to a switch /router on an accessible network. It may not be accessible directly through a PC Ethernet to Gateway connection in all cases.
- 3. Enter the IP address of the Gateway on any browser to access the Gateway Console.

![](_page_46_Picture_6.jpeg)

SWITCH

Once the Console appears, it will present a System status screen. Validate:

PACKET EG • System C	<u> </u>	
Q Search	System status	
I Status		
Monitoring Data	General	Data Sources
<ul> <li>Data Sources</li> </ul>	Device version: 1.9.2-alpha.9b-1-g5f2b31e Radio firmware: 27.8-1971A672	<ul> <li>Wireless Mesh</li> <li>View devices communicating to this gateway</li> </ul>
C Data Processing	GUID: 77E4-0000-0000-005A Radio zone: US.1 (201420BF)	Peer Gateways
Data Destinations	System time: 2016-08-31T21:31:45+00:00 Up-time: 03:28:28	Configure peer gateways Data Processing
System	Hostname: PacketPower-77E4-0000-0000-005A IP address: 169.254.170.191 MAC address: 51:41761/34	Virtual Panels     Configure and manifes Virtual Panels
	Licensed Features	Data Destinations
	EMX Enabled2	EMX Monitoring Data Feed Configure EMX monitoring data feed
	Peer Gateways Enabled SNMP Enabled Virtual Panels Disabled	EMX Support Data Feed Configure EMX support data feed
		Modbus     View data exposed via Modbus/TCP
		SNMP View data exposed via SNMP

(1) The system is communicating properly with the monitoring nodes as indicated by a green status light

(2) Modbus is listed as a licensed feature (2). If not, see the licensing section on how to add a license.

# **Enabling and Configuring the Modbus Driver**

Q Search	Modbus 🕜
III Status	
Monitoring Data	Modbus enables access to data visible to this gateway via modbus/TCF
<ul> <li>Data Sources</li> </ul>	✓ Enabled 2
C Data Processing	Server Port: 502 3
Data Destinations	Save
EMX	
V Modbus	
Register Maps	
Node Map	
Readings	
SNMP	

(1) To enable the Modbus driver, select Modbus tab under the Data Destinations menu in the Gateway Console

(2) Make sure that the "Enabled" check box (2) is checked

(3) Enter the port number to be used. This is typically port 502 Click "Save" to enable the selections.

(4) Once enabled, there will be a green light next to the Modbus tab

# Viewing and Verifying Monitoring Data using the Gateway Console

WER EG	System OK								Ø 2016-09-14
Q Search	Nodes								
E Status	Houco								
🕫 Monitoring Data 🤇	1 Node	F/W	Туре	Product	Age	Timestamp	Source	VIP	Readings
Power Nodes     Env. Nodes	8600-0000-0000-CA	BF 5.34	AC Power	P5T3	• 00:02	2016-09-14 2	2:54:58 Wireless Mesh	192.168.100.244	<b>O</b> 2
Data Sources	8810-0000-0000-180	21.14	Environmental	E312	00:02	2016-09-14 2	2:54:58 Wireless Mesh	192.168.1.225	8
C Data Processing									viewing 1 - 2 of 2
Data Destinations		POWER	G	System CK					
<ul> <li>System</li> </ul>		C: Status		Node 8	600-00	000-000-0	CABF	Voltage &	
		- da Montor Pose > En d	ng Cheta Nooles 20 0000 0000 CAUF colles	( Constant					
		🕴 📲 Diala So	ros	Channel	Reading	Units Age	Timestamp		
		· C Date Pro	onsing .		1				
		🔹 😂 Osta Do	Amotions	Current A	0.012	A 00:00	2016-05-14 22:50:20		
		+ O flystom		Erergy	550	Wh 00:00	2018-09-14 22 56 28		
				Energy A Energy A	500	Hz 00:00	2010-09-14 22:00:20		
				Phase Arele A	.714	deg 00:00	2016-08-14 22 50 28		

(1) To view data for monitoring nodes associated with the Gateway and confirm operation of specific nodes select the "Monitoring Data" tab (1) on the Gateway Console.

This will display all connected nodes which are organized by type (power and environmental) in the sub-menu

To search for a specific node enter the GUID (16 digit node ID) in the "Node" tab

(2) To access specific readings for each node click on the "readings" icon to expose the real time readings

# **Register Maps**

#### Accessing Register Maps

a ocarana	Modbus R	Register Maps 😧			
E Status		0			_
Monitoring Data	Map Name	Description	Registers	Save	Status
Data Sources	Env-12	Environmental monitor, 1+12 channels		*	
Data Processing	Power-1P	Single phase power monitor	1	±	-
€ Data Destinations	Power-3P	Three-phase power monitor	1	¥	*
EMX	+ -	<< < Page 1 of 1 > >> 15 ¥			0
🗴 Modbus	•				
V Register Maps	1				
Env-12					
Power-1P					
Power-3P					
i onereat					
Node Map					
Node Map Readings					

Depending on your Gateway, register maps may be pre-loaded on Gateways with firmware versions 1.12.0 or higher and will appear under the Modbus Register Maps table.

There are three main register map sets:

- Environmental monitor
- Single phase power monitor
- Three phase power monitor

Your register maps can be imported if they are not pre-populated.

#### Importing and Exporting Register Maps

Q Search X	Modbus R	Register Maps ?
🔳 Status		
Monitoring Data	Map Name	Description Registers Save Status
Data Sources		
Data Processing		No data to display
Data Destinations	• -	« < Page 1 of 1 > >> 15 ×
EMX		
Modbus O		0
1 Register Maps		🍰 Import Modbus Register Maps
Readings		📩 Export Modbus Register Maps
SNMP		
System		💼 Remove All Items

(1) To import a register map, select the "Register Maps" tab under the Data Destinations > Modbus menu

(2) Click on the utility icon under the Modbus Register Maps table

Highlight the import tab and specify the register file to be imported; the map will appear in the "Modbus Register Maps" table

This process can be used to export register maps for back-up and transfer to other Gateways.

Q, Search	* Modbu	is Register M	ap: Power-3P	0	
🔳 Status	Wiedbe	io regioter m	up. I offer of	·	
Monitoring Data	Register (0 based)	Expression		Mapping	Status
>					
C Data Processing	0	R(VoltageA) * 10		int AB (16b) ⇒ AB (1 register)	~ 2
Court roccourty	1	R(CurrentA) * 10		int AB (16b) => AB (1 register)	~
Data Destinations	2	R(Power)		int AB (16b) => AB (1 register)	~
EMX	3	R(VARA)		int AB (16b) ⇒ AB (1 register)	× .
Y Modbus	0 4	R(EnergyA)		int ABCD (32b) ⇒ AB,CD (2 registers)	~
1 v Register Maps	6	R(PowerFactorA) * 100		int AB (16b) ⇒ AB (1 register)	×
Env-12	10	R(VoltageB) * 10		int AB (16b) ⇒ AB (1 register)	~
Power-1P	11	R(CurrentB) * 10		int AB (16b) ⇒ AB (1 register)	~
Power-3P	12	R(PowerB)		int AB (16b) ⇒ AB (1 register)	-
Node Man	13	R(VARB)		int AB (16b) ⇒ AB (1 register)	*
Dending	14	R(EnergyB)		int ABCD (32b) $\Rightarrow$ AB,CD (2 registers)	*
SNMP	16	R(PowerFactorC) * 100		int AB (16b) ⇒ AB (1 register)	× .
Simil			A C Dana 1 of 1	N 16 W	0

#### Viewing Register Maps

(1) Once a register map is loaded or populated it can be accessed in "Register Maps" under the Data Destinations > Modbus menu

(2) Each register has a status column to indicate the validity of the register; if the register is reading properly it will have a green check mark

# Manually Assigning Registers and Register Maps

#### Creating Register Maps

Individual registers can be added or removed as needed. To create a new register map:

Q, Search X	Modbus Re	gister Maps 🕜		
Status		5		
🦻 🍘 Monitoring Data	Map Name	Description	Registers	Save Status
♦ Data Sources	-			
C Data Processing		No data to display		
🔹 🗈 Data Destinations 🧧	+ -	<< < Page 1 of 1 > >> 15 ×		0
ЕМХ	Add New Item	×		
Modbus O				
1 Register Maps	Map Name:			
Node Map	Description:			
Readings				
SNMP		Add		
System				

(1) Select the "Register Maps" tab from the menu under Data Destinations > Modbus

(2) Select the "+" icon on the Modbus Register Maps table and provide a Map Name and Description for the register map

Click "Add" to save the selection.

PACKET EG System OK -5.	34 (Pass 2: 24.8%)		0	2016-09-	13 23:24:29
Q, Search X	Modbus Red	gister Mans 🛛			
I≣ Status	mousuo rio				_
Monitoring Data	Map Name	Description	Registers	Save	Status
Data Sources	Three Phace Power	Main Power Panal			
C Data Processing			2.	-	0
🕶 🕞 Data Destinations		The second secon			
EMX					
💙 Modbus 🥥					
<ul> <li>Register Maps</li> </ul>					
1 Three Phase Power					
Node Map					
Readings					
SNMP					
System					

#### **Creating Registers**

(1) To access and add registers, select the "Register Maps" menu and highlight the specified register map

(2) Click on the "pencil" icon under the Register Maps table; this will expose the registers.

#### Adding Registers to Register Maps

2 Monitoring Data (0 based) 2 Data Sources 2 Data Sources 2 Data Destinations (a) Data Destinations (b) Data Destinations (c) Data Destinations (c) Data Destinations (c) Data Destinations (c) System Add New Item (c) System (	Manifester Date	Register Ex	anarcian Ma	unalize .	Crate
<ul> <li>Data Sources</li> <li>Data Processing</li> <li>No data to display</li> <li>Page 1 of 1 &gt;&gt; 15 ▼</li> <li>Add New Item</li> <li>Register Maps</li> <li>Add New Item</li> <li>Register Gobser (0 based):</li> <li>SNMP</li> <li>System</li> </ul>	Monitoring Data	(0 based)	pression	pping	State
C Data Processing       No data to display	Data Sources				
<pre>     Data Destinations</pre>	Data Processing		No data to display	t.	
EMX         Modbus         Three Phase Power         Node Map         Readings         SNMP         System             System             Add New Item             Register         (0 based):         Expression:         System             Add             Add             Add             Mapping:       - Select         - Select       -         Int AB (16b) = AB (1 register)       Int ABC0 (32b) = AB, CD (2 registers)         Int ABC0 (32b) = DC, BA (2 registers)       Int ABC0 (32b) = DC, BA (2 registers)         Int ABCD (32b) = DC, BA (2 registers)       Int ABCD (4b) = AB, CD, EF, GH (4 registers)         Int ABCD (32b) = DC, BA (2 registers)       Int ABCD (32b) = DC, BA (2 registers)         Int ABCD (32b) = DC, BA (2 registers)       Int ABCD (32b) = DC, BA (2 registers)         Int ABCD (32b) = DC, BA (2 registers)       Int ABCD (32b) = DC, BA (2 registers)         Int ABCD (32b) = DC, BA (2 registers)       Int ABCD (32b) = DC, BA (2 registers)         Int ABCD (32b) = DC, BA (2 registers)       Int ABCD (32b) = DC, BA (2 registers)	Data Destinations	+ -	< < Page 1 of 1 >	» 15 v	
<ul> <li>Modbus</li> <li>Register Maps</li> <li>Three Phase Power</li> <li>Node Map</li> <li>Readings</li> <li>SNMP</li> <li>System</li> </ul> Add New Item Kegister (0 based): Expression: <ul> <li>Select</li> <li>Select</li> <li>Select</li> <li>Mapping:</li> <li>Select</li> <li>Select</li> <li>Mapping:</li> <li>Select</li> <li>Mapcontext (16b) =&gt; AB (1 register)</li> <li>Int AB (16b) =&gt; AB (1 register)</li> <li>Int AB (16b) =&gt; AB (1 register)</li> <li>Int AB (16b) =&gt; AB (1 register)</li> <li>Int ABCD (32b) =&gt; CD AB (2 registers)</li> <li>Int ABCD (32b) =&gt; CD. AB (2 registers)</li> <li>Int ABCD (32b) =&gt; AB, CD (2F registers)</li> <li>Int ABCD (32b) =&gt; AB, CD (2 registers)</li> <li>Int ABCD (32b) =&gt; AB, CD (2 registers)</li> <li>Int ABCD (32b) =&gt; CD. AB (2 registers)</li> <li>Int ABCD (32b) =&gt; CD. AB, CD (2 registers)</li> <li>Int ABCD (32b) =&gt; CD. AB, CD (2 registers)</li> <li>Int ABCD (32b) =&gt; CD. AB, CD (2 registers)</li> <li>Int ABCD (32b) =&gt; CD. AB, CD (2 registers)</li> <li>Int ABCD (32b) =&gt; CD. AB, CD (2 registers)</li> <li>Int ABCD (32b) =&gt; CD. AB, CD (2 registers)</li> <li>Int ABCD (32b) =&gt; CD. AB, CD (2 registers)</li> <li>Int ABCD (32b) =&gt; CD. AB, CD (2 registers)</li> <li>Int ABCD (32b) =&gt; CD. AB, CD (2 registers)</li> <li>Int ABCD (32b) =&gt; CD. AB, CD (2 registers)</li> <li>Int ABCD (32b) =&gt; CD. AB, CD (2 registers)</li> <li>Int ABCD (32b) =&gt; CD. AB, CD (2 registers)</li> <li>Int ABCD (32b) =&gt; CD. AB, CD (2 registers)</li> <li>Int ABCD (32b) =&gt; CD. AB, CD (2 registers)</li> <li>Int ABCD (32b) =&gt; CD. AB, CD (2 registers)</li> <li>Int ABCD (32b) =&gt; CD. AB, CD (2 registers)</li> <li>Int ABCD (32b) =&gt; CD. AB, CD (2 registers) Int ABCD (2 registers</li></ul>	EMX 🔶				
Register Maps       Add New Item         Three Phase Power       Node Map         Readings       Register         (0 based):       Expression:         SNMP       • Select         • Solect       • Mapping:         • Solect       int AB (16b) ⇒ AB (1 register)         int AB (16b) ⇒ AB (1 register)       int AB (16b) ⇒ AB (1 register)         int AB (16b) ⇒ AB (1 register)       int AB (16b) ⇒ AB (1 register)         int AB (16b) ⇒ AB (1 register)       int AB (16b) ⇒ AB (1 register)         int AB (16b) ⇒ AB (1 register)       int AB (16b) ⇒ AB (1 register)         int ABCD (32b) ⇒ OC, AB (2 registers)       int ABCD (32b) ⇒ AB, CD (2F, GH (4 registers))         int ABCD (32b) ⇒ OC, AB (2 registers)       int ABCD (32b) ⇒ AB, CD (2F, GH (4 registers))         int ABCD (32b) ⇒ CD, AB, CD (2 registers)       float ABCD (32b) ⇒ CD, AB (2 registers)         int ABCD (32b) ⇒ CD, AB, CD (2 registers)       float ABCD (32b) ⇒ CD, AB (2 registers)         int ABCD (32b) ⇒ CD, AB, CD (2F, GH (4 registers))       float ABCD (32b) ⇒ CD, AB (2 registers)         int ABCD (32b) ⇒ CD, AB, CD (2F, GH (4 registers))       float ABCD (32b) ⇒ CD, AB, CD (2F, GH (4 registers))	Modbus O				
Node Map Readings       Register         SNMP       ●         System       Expression:         Mapping:       ~ Select         · System       · Select         · State       · int AB (16b) ⇒ AB (1 register)         int AB (16b) ⇒ AB (1 register)       int AB (16b) ⇒ AB (1 register)         int AB (16b) ⇒ AB (1 register)       int ABC (32b) ⇒ CD, AB (2 registers)         int ABCD (32b) ⇒ CD, AB (2 registers)       int ABCD (32b) ⇒ CD, AB (2 registers)         int ABCD (32b) ⇒ CD, AB, CD, EF, GH (4 registers)       int ABCD (32b) ⇒ CD, AB, CD, EF, GH (4 registers)         float ABCD (32b) ⇒ CD, AB, CD, EF, GH (4 registers)       float ABCD (32b) ⇒ CD, AB, CD, EF, GH (4 registers)         float ABCD (32b) ⇒ CD, AB, CD, EF, GH (4 registers)       float ABCD (32b) ⇒ CD, AB, CD, EF, GH (4 registers)	Register Maps  Three Phase Power	Add New It	em	×	
Readings       Register (0 based);         SNMP       ■         Image: System       Expression:         Mapping: -Select       •         -Select       •         Imit AB (16b) = AB (1 register)       Imit AB (16b) = AB (1 register)         Imit AB (16b) = AB (1 register)       Imit ABCD (32b) ⇒ CAB (2 registers)         Imit ABCD (32b) ⇒ CD, AB (2 registers)       Imit ABCD (32b) ⇒ CD, BA (2 registers)         Imit ABCD (32b) ⇒ DC, BA (2 registers)       Imit ABCD (32b) ⇒ AB, CD, EF, GH (4 registers)         Imit ABCD (32b) ⇒ AB, CD, EF, GH (4 registers)       Imit ABCD (32b) ⇒ AB, CD, EF, GH (4 registers)         Imit ABCD (32b) ⇒ CD, AB, CD (2 registers)       Imit ABCD (32b) ⇒ CD, AB, CD, EF, GH (4 registers)         Imit ABCD (32b) ⇒ CD, AB, CD, EF, GH (4 registers)       Imit ABCD (32b) ⇒ CD, AB, CD, EF, GH (4 registers)         Imit ABCD (32b) ⇒ CD, AB, CD, EF, GH (4 registers)       Imit ABCD (32b) ⇒ CD, AB, CD, EF, GH (4 registers)         Imit ABCD (32b) ⇒ CD, AB, CD, EF, GH (4 registers)       Imit ABCD (32b) ⇒ CD, AB, CD, EF, GH (4 registers)         Imit ABCD (32b) ⇒ CD, AB, CD, EF, GH (4 registers)       Imit ABCD (32b) ⇒ CD, AB, CD, EF, GH (4 registers)	Node Map				
SNMP       Expression:         C System       Expression:         Mapping:	Readings	Register	·		
O System       Expression:         Mapping:       Select ··································	SNMP	(o based).			
Mapping:       Select       •         Sclect         Select       •         int AB (16b) $\Rightarrow$ AB (1 register)       int AB (16b) $\Rightarrow$ BA (1 register)       Int AB (16b) $\Rightarrow$ BA (1 register)       Add         int AB (16b) $\Rightarrow$ AB (1 register)       int ABCD (32b) $\Rightarrow$ CD, AB (2 registers)       Int ABCD (32b) $\Rightarrow$ CD, CBA (2 registers)       Int ABCD (32b) $\Rightarrow$ AB, CD, EF, GH (4 registers)       Int ABCD (32b) $\Rightarrow$ AB, CD, EF, GH, LJ, KL, MN, OP (8 registers)       Int ABCD (32b) $\Rightarrow$ AB, CD, EF, GH, LJ, KL, MN, OP (8 registers)       Int ABCD (32b) $\Rightarrow$ CD, AB (2 registers)       Int ABCD (32b) $\Rightarrow$ CD, CB (2 registers)       Int ABCD (32b) $\Rightarrow$ CD, AB (2 registers)       Int ABCD (32b) $\Rightarrow$ CD, AB (2 registers)       Int ABCD (32b) $\Rightarrow$ CD, CB (2 registers)       Int ABCD (32b) $\Rightarrow$ CD, CB	System	Expression:			
$ \begin{array}{ c c c c c } \hline \hline & - & Select - \\ \hline & - & Select - \\ \hline & \text{int AB} (16b) \Rightarrow AB (1 register) \\ \hline & \text{int AB} (16b) \Rightarrow AB (1 register) \\ \hline & \text{int AB} (CD (32b) \Rightarrow AB, CD (2 registers) \\ \hline & \text{int ABCD (32b)} \Rightarrow DC, AB (2 registers) \\ \hline & \text{int ABCD (32b)} \Rightarrow DC, BA (2 registers) \\ \hline & \text{int ABCD (32b)} \Rightarrow DC, BA (2 registers) \\ \hline & \text{int ABCD EFGH (64b)} \Rightarrow AB, CD, EF, GH (4 registers) \\ \hline & \text{int ABCD EFGH (64b)} \Rightarrow AB, CD, EF, GH (4 registers) \\ \hline & \text{int ABCD (32b)} \Rightarrow AB, CD (2 registers) \\ \hline & \text{float ABCCD (32b)} \Rightarrow DC, AB (2 registers) \\ \hline & \text{float ABCD (32b)} \Rightarrow CD, AB (2 registers) \\ \hline & \text{float ABCD EFGH (64b)} \Rightarrow AB, CD, EF, GH (4 registers) \\ \hline & \text{float ABCD (52b)} \Rightarrow CD, AB (2 registers) \\ \hline & \text{float ABCD EFGH (64b)} \Rightarrow AB, CD, EF, GH (4 registers) \\ \hline & \text{float ABCD (52b)} \Rightarrow CD, AB (2 registers) \\ \hline & \text{float ABCD EFGH (64b)} \Rightarrow AB, CD, EF, GH (4 registers) \\ \hline & \text{float ABCD EFGH (64b)} \Rightarrow AB, CD, EF, GH (4 registers) \\ \hline & \text{float ABCD (52b)} \Rightarrow CD, AB (2 registers) \\ \hline & \text{float ABCD (52b)} \Rightarrow CD, AB (2 registers) \\ \hline & \text{float ABCD (52b)} \Rightarrow CD, AB (2 registers) \\ \hline & \text{float ABCD (52b)} \Rightarrow CD, AB (2 registers) \\ \hline & \text{float ABCD (52b)} \Rightarrow CD, AB (2 registers) \\ \hline & \text{float ABCD (52b)} \Rightarrow CD, AB (2 registers) \\ \hline & \text{float ABCD (52b)} \Rightarrow CD, AB (2 registers) \\ \hline & \text{float ABCD (52b)} \Rightarrow CD, AB (2 registers) \\ \hline & \text{float ABCD (52b)} \Rightarrow CD, AB (2 registers) \\ \hline & \text{float ABCD (52b)} \Rightarrow CD, AB (2 registers) \\ \hline & \text{float ABCD (52b)} \Rightarrow CD, AB (2 registers) \\ \hline & \text{float ABCD (52b)} \Rightarrow CD, AB (2 registers) \\ \hline & \text{float ABCD (52b)} \Rightarrow CD, AB (2 registers) \\ \hline & \text{float ABCD (52b)} \Rightarrow CD, AB (2 registers) \\ \hline & \text{float ABCD (52b)} \Rightarrow CD, AB (2 registers) \\ \hline & \text{float ABCD (52b)} \Rightarrow CD, B (2 registers) \\ \hline & \text{float ABCD (52b)} \Rightarrow CD, B (2 registers) \\ \hline & \text{float ABCD (52b)} \Rightarrow CD, B (50b) \\ \hline & \text{float ABCD (50b)} \Rightarrow CD, B (50b) \\ \hline & \text{float ABCD (50b)} \hline \\ \hline \hline & \text{float ABCD (50b)} \hline$		Mapping:	- Select	7	
AddInt AB (16b) $\Rightarrow$ BA (1 register)AddInt ABCD (32b) $\Rightarrow$ AB, CD (2 registers)Int ABCD (32b) $\Rightarrow$ CD, AB (2 registers)Int ABCD (32b) $\Rightarrow$ DC, BA (2 registers)Int ABCD (32b) $\Rightarrow$ DC, BA (2 registers)Int ABCD (32b) $\Rightarrow$ DC, BA (2 registers)Int ABCD (32b) $\Rightarrow$ AB, CD, EF, GH (4 registers)Int ABCDEFGH (64b) $\Rightarrow$ AB, CD, EF, GH (4 registers)Int ABCD (32b) $\Rightarrow$ DC, AB (2 registers)Int ABCD (32b) $\Rightarrow$ AB, CD (2 registers)Int ABCD (32b) $\Rightarrow$ CD, AB (2 registers)Int ABCD (32b) $\Rightarrow$ CD, CB (2 registers)Int ABCD (32b) $\Rightarrow$ CD, AB (2 registers)Int ABCD (32b) $\Rightarrow$ CD, CB (3 registers)Int ABCD (32b) $\Rightarrow$ CD, CB (3 registers)Int ABCD (32b)			— Select — int AB (16b) ⇒ AB (1 register)		
int ABCD (32b) $\Rightarrow$ CD,AB (2 registers) int ABCD (32b) $\Rightarrow$ DC,BA (2 registers) int ABCD (32b) $\Rightarrow$ DC,BA (2 registers) int ABCDEFGH (64b) $\Rightarrow$ AB, CD, EF, GH (4 registers) int ABCDEFGH (64b) $\Rightarrow$ AB, CD, EF, GH (4 registers) float ABCD (32b) $\Rightarrow$ CD, AB (2 registers) float ABCD (32b) $\Rightarrow$ DC, AB (2 registers) float ABCD (32b) $\Rightarrow$ DC, AB (2 registers) float ABCD (32b) $\Rightarrow$ DC, BA (2 registers) float ABCD (32b) $\Rightarrow$ DC, BA (2 registers) float ABCD (32b) $\Rightarrow$ DC, BA (2 registers)			int AB (16b) $\Rightarrow$ BA (1 register) int ABCD (32b) $\Rightarrow$ AB CD (2 registers)	Add	
int ABCD (32b) $\Rightarrow$ DC, BA (2 registers) int ABCDEFGH (64b) $\Rightarrow$ AB, CD, EF, GH (4 registers) int ABCDEFGH (64b) $\Rightarrow$ AB, CD, EF, GH, LJ, KL, MN, OP (8 registers) float ABCD (32b) $\Rightarrow$ AB, CD (2 registers) float ABCD (32b) $\Rightarrow$ DC, BA (2 registers)			int ABCD (32b) ⇒ CD,AB (2 registers)		
int ABCDEFGH (64b) $\Rightarrow$ AB, CD, EF, GH, IJ, KL, MN, OP (8 registers) float ABCD (32b) $\Rightarrow$ AB, CD (2 registers) float ABCD (32b) $\Rightarrow$ CD, AB (2 registers) float ABCD (32b) $\Rightarrow$ DC, BA (2 registers) float ABCD (32b) $\Rightarrow$ DC, BA (2 registers)			int ABCD (32b) ⇒ DC,BA (2 registers) int ABCDEFGH (64b) ⇒ AB, CD, EF, GH (4 registers)	5)	
float ABCD (32b) $\Rightarrow$ CD, CD (2 registers) float ABCD (32b) $\Rightarrow$ CD, AB (2 registers) float ABCD (32b) $\Rightarrow$ DC, BA (2 registers) double ABCDEFGH (64b) $\Rightarrow$ AB, CD, EF, GH (4 registers)			int ABCDEFGH (64b) ⇒ AB, CD, EF, GH, IJ, KL, MN,	I, OP (8 registers)	
float ABCD (32b) $\Rightarrow$ DC, BA (2 registers) double ABCDEFGH (64b) $\Rightarrow$ AB. CD. EF, GH (4 registers)			float ABCD (32b) $\Rightarrow$ AB, CD (2 registers) float ABCD (32b) $\Rightarrow$ CD, AB (2 registers)		
GOUDIE ADGUERGIE (040) => AD, GU, EP, GH (4 registers)			float ABCD (32b) $\Rightarrow$ DC, BA (2 registers)	(mark)	
double ABCDEFGH (64b) $\Rightarrow$ GH, EF, CD, AB (4 registers)			double ABCDEFGH (64b) ⇒ AB, CD, EF, GH (4 regis double ABCDEFGH (64b) ⇒ GH, EF, CD, AB (4 regis	sters)	

To add individual registers to a register map:

- (1) Select the "+" icon from the Register Map
- (2) Enter the Register, Expression and Mapping

# **Modbus Device IDs**

Node Maps serve to assign "device IDs" and register maps to specific monitoring nodes. Modbus is limited to 255 unique device IDs (0-254) per master. To allow more than 255 devices to serve under one master i.e. Gateways, different nodes can share a device ID but utilize register offset mapping.

#### Register Offset Node mapping

The Hubbell system supports large numbers of devices reporting through a single gateway. Up to 2000 nodes are supported in the Modbus Enterprise version.

In order to accommodate such large numbers of devices and maintain a simple, common register map for each node, the Hubbell Modbus interface uses multiple Modbus slave IDs and, if necessary, register offsets. Automatically assigning different host IDs to each nodes allows each node to have an identical register map. The number of host IDs is limited to 254 (1-254). For installations larger than 254 nodes register offsets are used.

Each register map is contained within a 200 register window (0-199). The register map, however, can be offset: the first 254 nodes use host IDs 1-254 with the register window located at address 0 (registers 0-199); the second 254 nodes also use host IDs 1-254, but with the register window located at address 200 (registers 200-399). This way 2000 nodes can be accommodated with at most 8 register windows using the following mapping:

Nodes	Slave IDs	Register range
1-254	1-254	0-199
255-508	1-254	200-399
509-762	1-254	400-599
763-1016	1-254	600-799
1017-1270	1-254	800-999
1271-1524	1-254	1000-1199
1525-1778	1-254	1200-1399
1779-2000	1-254	1400-1599

The image on the following page illustrates the mapping process.

![](_page_53_Figure_1.jpeg)

The gateway Modbus node to slave ID and register offset mapping can be automatically generated and customized if necessary.

Note: the "Map all nodes" button will remove all existing Slave ID mappings and re-assign them in the order of Node ID. If you want to preserve your existing Slave ID assignments (e.g. when you add more monitoring nodes to the system), you should edit the node mapping table directly, using the edit function at the bottom of the node mapping table.

POWEREG System warning	→ 5.34 (Pass 2: 39.1%	9				Ø 2016-09-13 23:31
Q, Search X	Modbus	Node Map 🛛				
🔳 Status						
Monitoring Data	Node	Slave ID (0	-254)	Modbus Map	Register Offset	Register window
Data Sources						
C Data Processing				No data to display		
Data Destinations	+ -	*	<	Page 1 of 1 > >> 15 🗸		0
EMX						
🗙 Modbus 🥥	-					
<ul> <li>Register Maps</li> </ul>	Add New Ite	m		N		0
Three Phase Power	Node:				1 Import Node 1	Лар
Node Map	Size ID /0-				La Export Node I	Map
Readings	254):					
SNMP O	Modbus Map:	- Select		*	Remove All Ite	ms
🗴 🏟 System	Register Offset:					
	Register window:	Numeric value between 1 and 1000				
				and the second se		

# Accessing and Verifying Modbus Readings Using the Gateway Console

Q Search X	Modh		adings O				
E Status	NOUD	us itea	adings				
Monitoring Data	Slave ID	Register (0 based)	Node	Register Map	Expression	Mapping	Register Value
Power Nodes							
8600-0000-0000-CABF	1	11	8600-0000-0000-CABF		R(VoltageB) * 10	int AB (16b) → AB (1 register)	0
Data Sources	1	1	8600-0000-0000-CABF		R(VoltageA) * 10	Int AB (16b) ⇒ AB (1 register)	1264
<b>A</b> Data Data state	1	3	8600-0000-0000-CABF		R(Power)	int AB (16b) → AB (1 register)	0
C Data Processing	1	4	8600-0000-0000-CABF		R(VARA)	int AB (16b) → AB (1 register)	1
😔 Data Destinations	1	5	8600-0000-0000-CABF		R(EnergyA)	int ABCD (32b) ⇒ AB,CD (2 registers)	0
ЕМХ	1	6	8600-0000-0000-CABF		R(EnergyA)	int ABCD (32b) ⇒ AB,CD (2 registers)	539
🗸 Modbus 🧿	1	7	8600-0000-0000-CABF		R(PowerFactorA) * 100	int AB (16b) ⇒ AB (1 register)	29
<ul> <li>Register Maps</li> </ul>	1	2	8600-0000-0000-CABF		R(CurrentA) * 10	int AB (16b) ⇒ AB (1 register)	0
Env-12	1	12	8600-0000-0000-CABF		R(CurrentB) * 10	int AB (16b) ⇒ AB (1 register)	0
Power-1P	1	13	8600-0000-0000-CABF		R(PowerB)	int AB (16b) → AB (1 register)	0
Power-3P	1	14	8600-0000-0000-CABF		R(VARB)	int AB (16b) ⇒ AB (1 register)	0
Note Man	1	15	8600-0000-0000-CABF		R(EnergyB)	int ABCD (32b) → AB,CD (2 registers)	0
Destinat	1	16	8600-0000-0000-CABF		R(EnergyB)	int ABCD (32b) ⇒ AB,CD (2 registers)	0
Readings	1	17	8600-0000-0000-CABF		R(PowerFactorC) * 100	int AB (16b) = AB (1 register)	0

To access and verify Modbus readings:

Select the "Readings" tab under Data Destinations>Modbus>Register Maps>Readings. A table containing all Modbus readings will be displayed allowing for easy verification.

# **Exporting Modbus Readings**

							Q 2016-09-13 23:35:30
Q, Search 🗶	Modb	us Rea	adings				
Status							
> 🝙 Monitoring Data	Slave ID	Register (0 based)	Node	Register Map	Expression	Mapping	Register Value
<ul> <li>Data Sources</li> </ul>		1	1		1		1
C Data Processing				N	lo data to display		
Data Destinations				<c <="" pase<="" td=""><td>1 of 1 &gt; 30 15 ¥</td><td></td><td></td></c>	1 of 1 > 30 15 ¥		
EMX							A Export Modbus Readings
Modbus O							(
<ul> <li>Register Maps</li> </ul>							
Three Phase Power							
Node Map							
Readings							
SNMP O							
) O System							

(1) Readings can also be exported by selecting the utility icon and selecting export all readings. The files are exported in .CSV format and can be viewed in a standard spread sheet.

Note that readings should match the readings shown in the Monitoring Data tab.

# **MTConnect Implementation**

Monitoring Data	Configure the MTConnect protocol.			
Data Sources	C Enabled			
Data Dioces	Server Port:	5000		
	Node #1	C Enabled		
Data Destinations		440000000006D32		
System	Node #2	Enabled		
		Not set		
	Node #3	Enabled		
		Not set		
	Node #4	Enabled		
		Not set		

# **EthernetIP Implementation**

Q. Search ×	EtherNet/IP					
E Status	and a second sec					
Monitoring Data	mingure the Etherneone protocol.					
> 🔹 Data Sources	Power node assembly, 4 nodes					
> 2 Data Processing	Senable this assembly					
💌 🕩 Data Destinations	Node #1 C Enabled					
EMX	440000000000000000000000000000000000000					
Modbus	Node #2 C Enabled					
SNMP O	02FF015F020D01EF					
Data Diode Transmitter	Node #3 Enabled					
	Note # C Facility					
V System	Node #4Enabled					
	Environmental node assembly, 4 nodes					
	2 Enable this assembly					
	Node #1 💟 Enabled					
	3200000000ED73					
	Node #2 Enabled					
	Not set					
	Node #3 Enabled					
	Not set					
	Node #4 Enabled					
	Not set					

Q Search	EtherNe	et/IP					
I≣ Status	Configure the Eth	arNet/IP protocol					
> 🚳 Monitoring Data	Configure the Edit						
Data Sources	Power node a	Power node assembly, 4 nodes					
> C Data Processing	C Enable this a	Enable this assembly					
V Թ Data Destinations	Node #	1 Senabled					
		44000000006D32					
EMX	Node #	2 🕑 Enabled					
Nodbus		82FF019F020D81EF					
Data Diode Transmitter	Node #	3 Enabled					
EtherNet/IP	•	Not set					
> O System	Node #	4 Denabled					
		Not set					
	Environmenta	I node assembly, 4 nodes					
	C Enable this a	issembly					
	Mixed node a	Mixed node assembly, 2 power + 2 environmental nodes					
	Enable this a	assembly					
	Save						

# **Technical Specifications**

#### Communications

Operating frequency	860 to 930 MHz and 2.4 GHz (frequency used varies by region)	
Wireless protocol	Frequency hopping self-configuring load-balancing mesh	
Wired network protocol	Ethernet with SNMP and Modbus TCP/IP optional	
Firmware updates	Wireless	
Typical transmission range	10 to 30 meters indoors between any two devices in mesh network	
Antenna	Fully enclosed, fixed configuration	
Monitoring unit to gateway ratio	Up to 150 monitoring units per gateway	
Gateways per site	Unlimited	
Multi-site support	Yes	
Encryption	AES 128-bit	
Compatible devices	All Packet Power monitoring units	
Local display	LCD for status and configuration; LED for general device status	

### Environmental & Mechanical

Operating temperature	0° to 40°C (32° to 104°F)	
Operating humidity	10% to 90% non-condensing	
Environmental rating	Indoor use / NEMA 1	
Gateway size	Dimensions: 76mm x 94mm x 31mm; Weight: 136g (4.8 oz)	
Placement	Top of server cabinet, under cable raceway, under raised floor	
Mounting options	DIN rail, screw, cable tie	
External power supply	100 to 240V AC input; 50/60 Hz (5V DC) output	
Plug types	C14, NEMA 5-15, CEE-7 Schuko, AS/NZS 3112 2000, BS 1363A, BS 546A, China CPCS-CCC	
Power consumption	3W	
Power over Ethernet	Available, requires an external PoE splitter	
Certifications	FCC, IC, CE; consult Packet Power for additional certifications	

# **Regulatory Information and Labels**

# **Regulatory Information**

This product has been certified to meet the following requirements: UL / ANSI standards 61010-1,Second Edition, Dated July 12, 2004 with revisions through and including October 28,2008 CAN/CSA-C22.2 No. 61010-1, second edition, including Amendment 1, or a later version of the same standard incorporating the same level of testing requirements. Council Directive 2006/95/EC (December 12, 2006) on Low Voltage Equipment Safety; IEC 61010-1:2001 (Second Edition) and EN 61010-1:2001 (Second Edition) Council Directive 1999/05/EC - European Union (EU) Radio & Telecommunications Terminal Equipment Directive(R&TTE) ETSI EN 300 220-2, Issued:2006/04/01 and ETSI EN 301 489-3, Issued:2002/08/01 V1.4.1 Council Directive 2004/108/EC (December 15, 2004) on Electromagnetic Compatibility CENELEC EN 61326-1 Issued:2006/05/01; IEC 61326-1:2005;:1997 – AS/NZS 4268: 2008

#### **Class B Device Statement / FCC Regulations**

Section 15.105(a) of the FCC Rules: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Section 15.19 of the FCC Rules: This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Pursuant to Part 15.21 of the FCC Rules, any changes or modifications to this product not expressly approved by Hubbell LLC might cause harmful interference and void the FCC authorization to operate this product.

Pursuant to part 2.1091c of the FCC rules device is categorically excluded from routine RF Exposure regulations.

#### Industry Canada (IC) Compliance Statement

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions:(1) This device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser)gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.Per section RSS-102, 2.5 of Industry Canada regulations, this device is categorically excluded from Routine Evaluation Limits.

#### Industrie Canada (IC) Déclaration de conformité

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit

pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillageradioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

### **Regulatory Label**

<b>Ethernet Gateway</b>	FC & C.CE
Model: EG4	
FCC ID: WCGEG4	✓ SEE MANUAL
IC: 8751A-P5EG4	For indoor use in dry locations
INPUT: 5 VDC 3W	
www.packetpower.com	Made in the USA –