Ethernet Gateway Data Capturing Guide

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1 Document Overview

This document explains how to use EGW 3.0 enhancements for sensor data harvesting.

1.1 Background

EGW 3.0.x.x has been commissioned to address the needs of Monnit's customers in accessing, or ‘hijacking’ sensor data from the unit.

1.2 Scope

There were no changes to the hardware to realize these enhancements.

EGW 3.0.x.x incorporates the following features:

- Updating the bootloader functionality
- Increasing code space
- Local hosting created for direct access to configuration settings, which no longer requires setup on iMonnit.
- Monnit's Express customers can now use MonnitLink Ethernet gateway, instead of being restricted to just the MonnitLink USB gateway.
- Access to simple MODBUS TCP Interface (Static IP must be set)
- Access to simple SNMP poll and trap Interface (Static IP must be set)
- Access to real time TCP interface (Static IP must be set)

2 Standard Out-of-Box Quick Start on iMonnit

To use the EGW 3.0.x.x with iMonnit, make sure the Gateway ID has been added to an existing network and then:

1. Connect internet-ready Ethernet cable to EGW.
2. Attach the antenna.
3. Connect the power cord.
4. Boot up is successful when all three lights are green.

3 Out-of-Box Quick Start (via iMonnit.com/point)

If it's necessary to bypass logging into iMonnit.com when setting up the Ethernet gateway, follow these simple steps to redirect the Ethernet gateway to another server address.

1. Open a web browser and go to : https://www.imonnit.com/point

2. Enter the Gateway ID and Gateway Code (from the sticker on the bottom) in their respective fields and click "Gateway Server Settings".

3. Edit the settings and click on "Submit Query".

4 Out-of-Box Quick Start (connect to PC)

If it's necessary to bypass iMonnit.com completely when setting up the Ethernet gateway, follow these steps in this section, using Default DHCP Settings connected to a PC:

1. Connect Ethernet cable directly to an Ethernet jack on a PC. Confirm that the PC has no other internet connection (turn off WIFI). Confirm the PC firewall does not prohibit an inbound connection. Plug power cable into EGW.

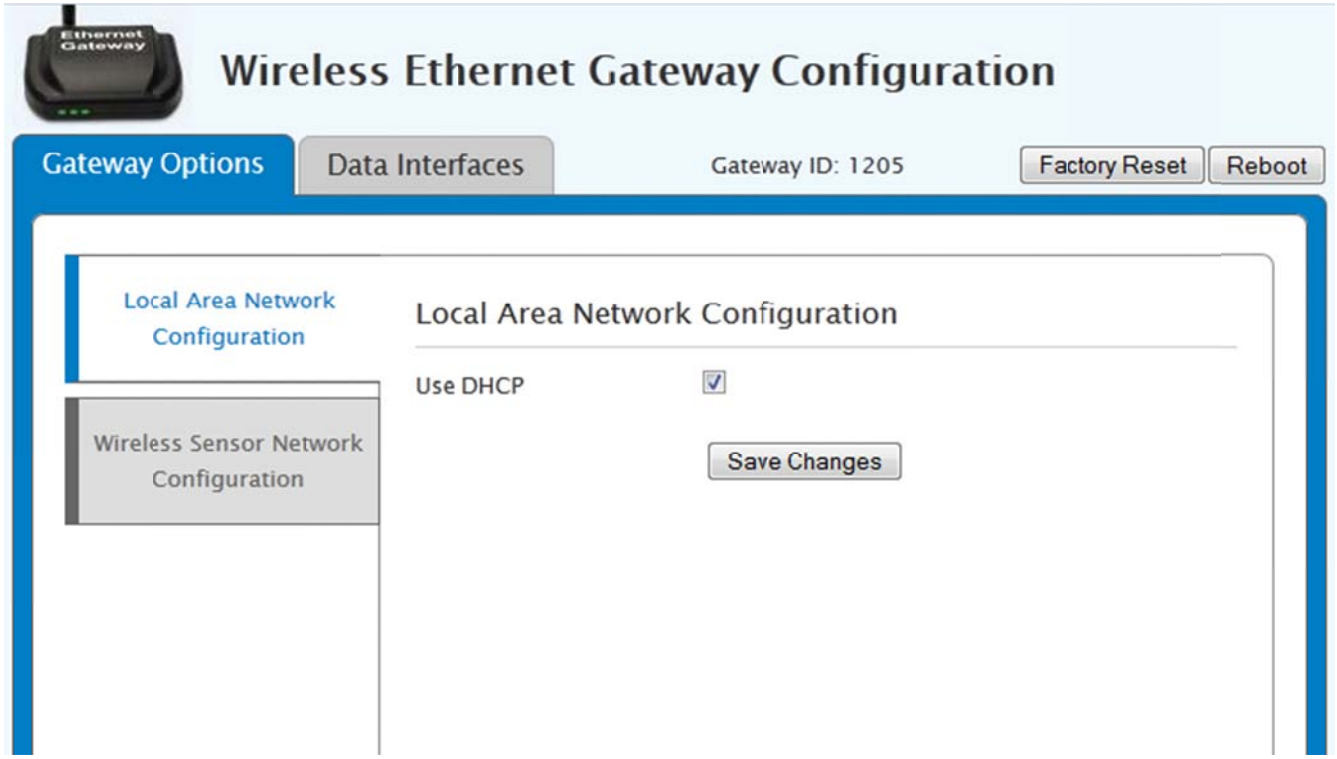
2. While the device is booting (green lights scrolling), press and hold the Reset Button on the back. The button must be held in the down position by the time the third green light illuminates, or else another attempt will need to be made. When the device finishes booting, all three lights will toggle red, green. Release the button and the device is in local configuration mode. Do not hold the Reset button for more than four seconds (that will factory reset the device).

3. The lights will flash green once every other second while the device attempts to resolve Ethernet Link State. The lights will flash green once every second while the device attempts to resolve IP addresses with the host PC. Finally, the lights will flash green twice every second when device is waiting for valid web traffic.

4. Once the PC has setup the direct network, use a web browser (e.g. Chrome) and go to "**192.168.100.1**" The EGW Setup screen should now be displayed (see image below). The lights will all turn solid green once this connection has been established.

5. Edit the configuration pages as needed and save.

6. Once settings have been saved, you will need to reboot the device for them to take effect. You can do this by pressing the Reboot button on the screen in your web browser, or by simply unpowering the unit and powering it up again upon deployment.



5 Managing Settings Via A Local Area Network connection:

1. The unit will have to already have functioning static IP settings configured to utilize the following configuration. This can be done through iMonnit.com or via Ethernet connection to a PC, as described in section 3, if it has not been done already.

2. Note the Static IP address of the EGW 3.0.x.x. Plug in the Ethernet cable in the local area network. Plug power cable into the EGW.

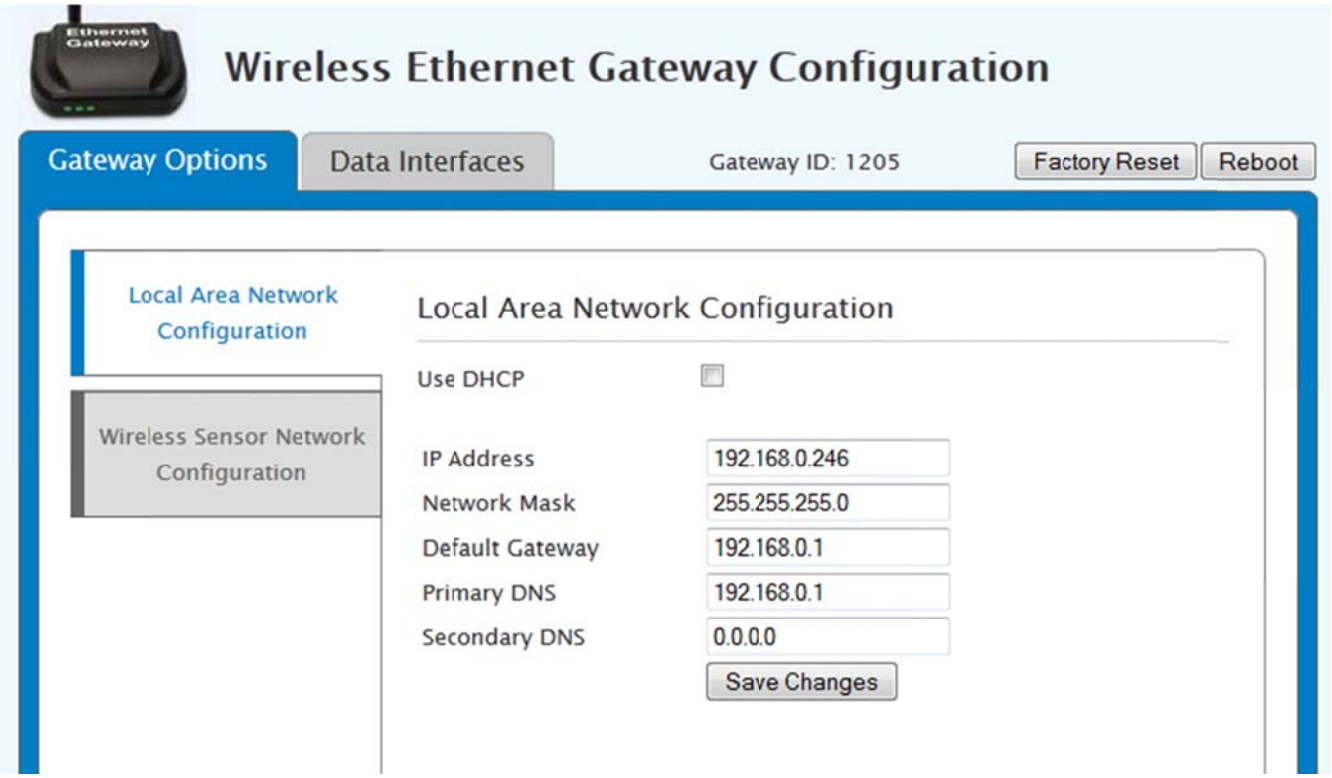
3. While the device is booting (green lights scrolling), press and hold the Reset Button on the back. The button must be held in the down position by the time the third green light illuminates, or else another attempt will need to be made When the device finishes booting, all three lights will toggle red, green. Release the button and the device is in local configuration mode. Do not hold the Reset button for more than four seconds (that will factory reset the device and reset the unit to DHCP).

4. The lights will flash green once every other second while the device attempts to resolve Ethernet Link State. Finally, the lights will flash green twice every second when device is waiting for valid web traffic.

5. Once the local area network has setup the direct network, use a web browser (e.g. Chrome) and go to the Static IP address of the device. The EGW Setup should now be displayed (see image below). The lights will all turn solid green once this connection has been established.

6. Edit the configuration pages as needed and save.

7. Once settings have been saved, you will need to reboot the device for them to take effect. You can do this by pressing the Reboot button on the screen in your web browser, or by simply unpowering the unit and powering it up again upon deployment.



6 Interface Details

This section contains details on possible interfaces.

6.1 Web Server Interface

Using a standard web browser, the IP address of the unit (192.168.100.1 for default addressing to a PC) or the static IP setting is used to pull up the web page.

From here, the following major configuration pages are available for display and modification.

- Gateway Options
  - Local Area Network Configuration
    - DHCP
    - Static IP
  - Wireless Sensor Network Configuration
    - Current Wireless Network Settings
      - Active Channel
      - Total Network Devices (only 512 total devices accessible from here)
    - Gateway Device List
      - Total Devices, Slot, Device ID
    - Add Device to Gateway
    - Erase Device List (via Reform Network)
- Data Interfaces
  - Default Server Configuration (iMonnit.com settings)
  - Real Time TCP Configuration
  - MODBUS TCP Configuration
  - SNMP Configuration

6.2 iMonnit Interface – Default

By default, all factory units will have only one interface active, and that is the interface for www.iMonnit.com. Simply plugging in the unit without interfering with the bootup, will allow the gateway to report into iMonnit.com.

When setting other interfaces to active, the connection to iMonnit.com remains live until you deactivate it.

Addtionally, should ALL interfaces become deactivated, the gateway forces a connection to iMonnit.com once again, so that at least one interface is active at all times.

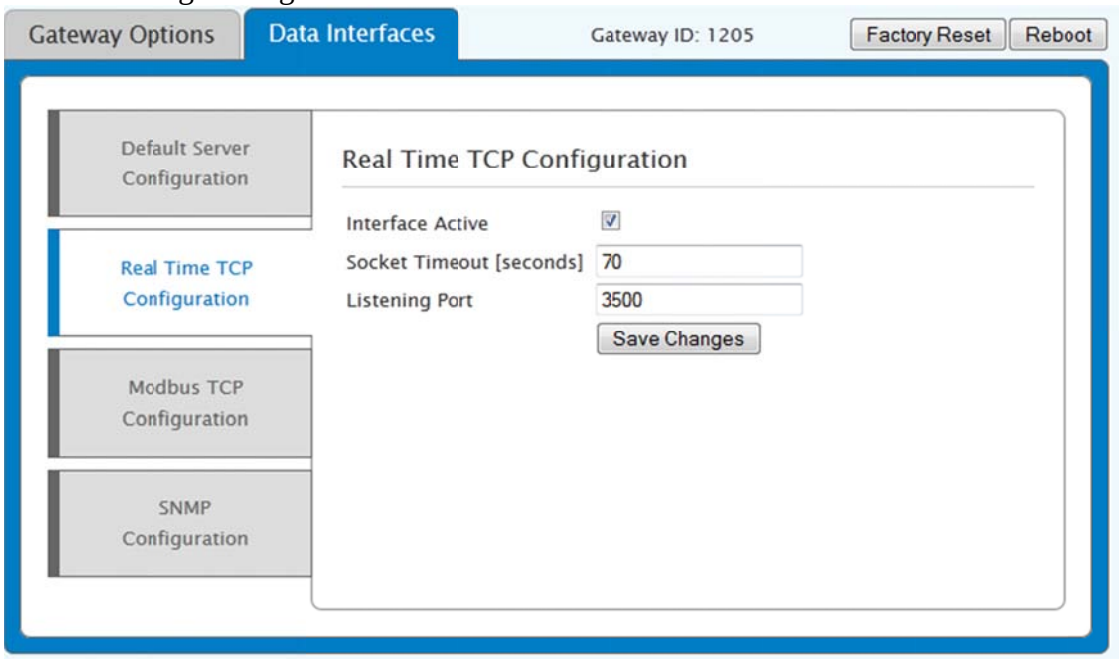
The communication settings have not changed and are set as: sensorsgateway.com, port 3000 (default) or port 80 (backup).

Note that performing a factory reset on the EGW will deactivate all interfaces, except the default interface, which is www.iMonnit.com.

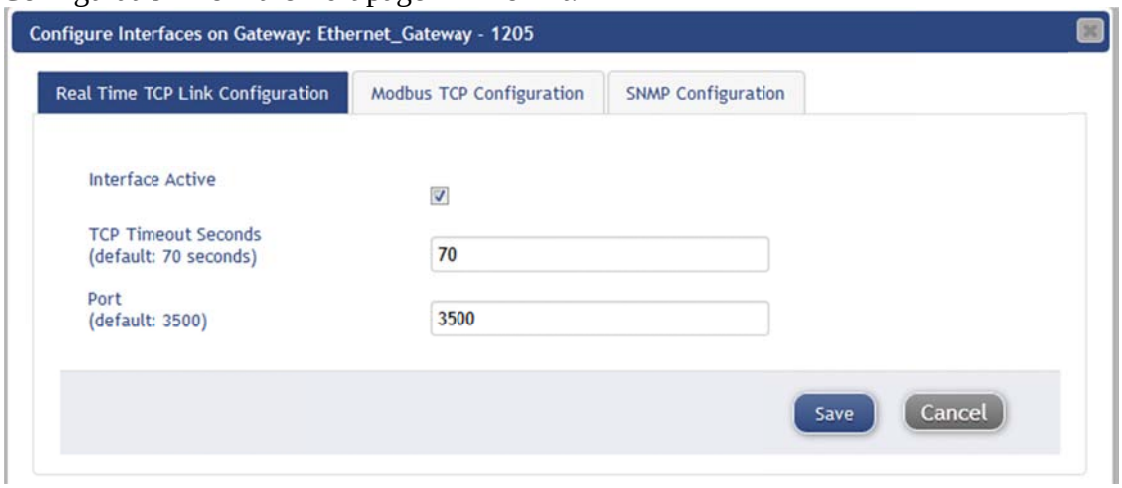
6.3 Real Time TCP Interface

To use the Real Time TCP Interface, a Static IP address will need to have already been assigned to the EGW. To activate the Real Time TCP Interface, mark it active from the configuration page (can be done in iMonnit as well). The default port is 3500, but can be edited. Save the changes. (If needed, don't forget to reboot.)

Local Web Page Coniguration:



Configuration from the Edit page in iMonnit:



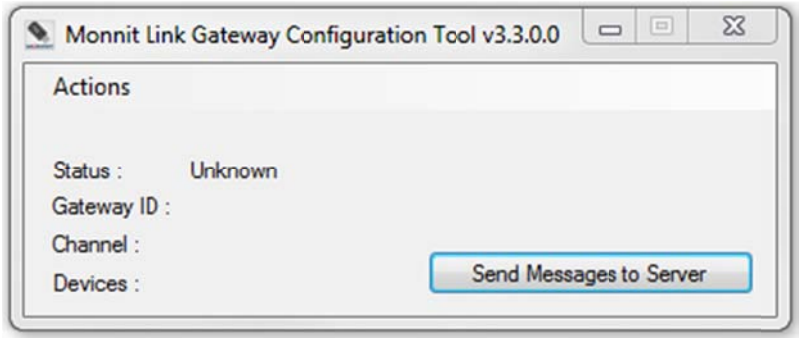
Test the TCP connection on your own server. If there is a problem, or if you would like to test the

connection using Monnit's tools, see below.

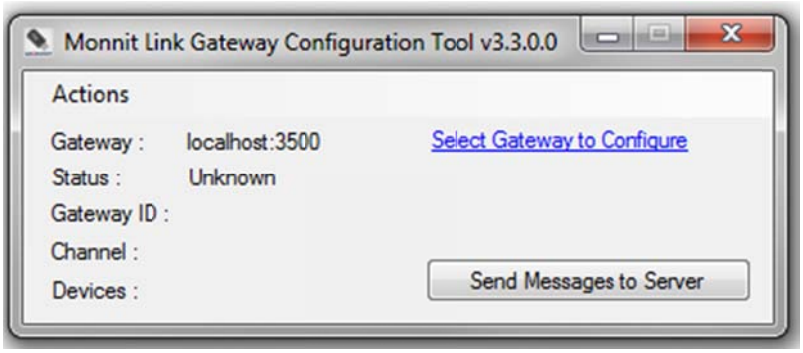
To test the TCP connection using Monnit tools, follow these steps:

Download the Monnit Gateway Application Service and Status Installer from the Support page at: http://www.monnit.com/support/downloads.

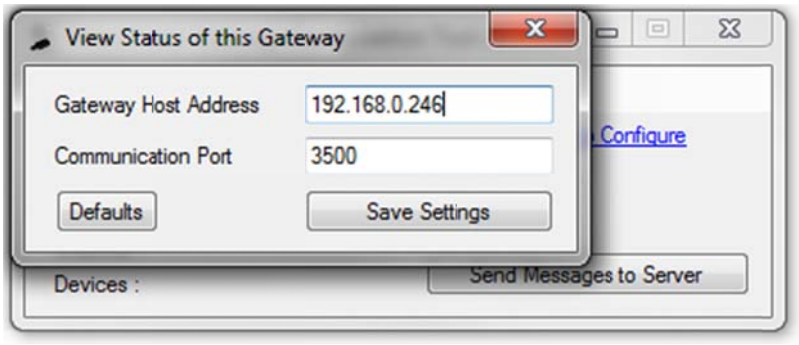
Once installed, open the Monnit Link Gateway Configuration Tool.



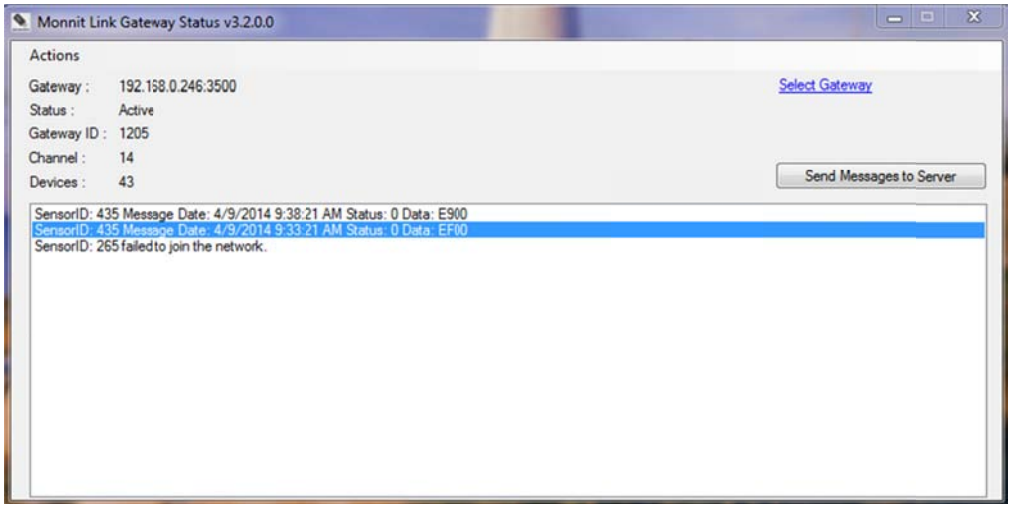
Begin by double clicking a hidden link on the text "Gateway ID". A blue link to the left will appear, "Select Gateway to Configure".



Click on the blue link. In the field for Gateway Host Address, put in the static IP address of the Monnit Link Ethernet Gateway 3.0.



The Communication Port here must match the port you saved in the interface settings. Once finished, save your settings. The Status should indicate that there is an "Active" gateway.



Open the Message Viewer from the Actions menu to see messages and events as they occur on the gateway. Now your TCP connection is live.

6.4 MODBUS TCP Interface

To activate the MODBUS TCP Interface, mark it active from the configuration page. This interface does require that a Static IP address is set. The MODBUS TCP Interface will store all data values in 16-bit registers. The registers and their data fields are mapped below:

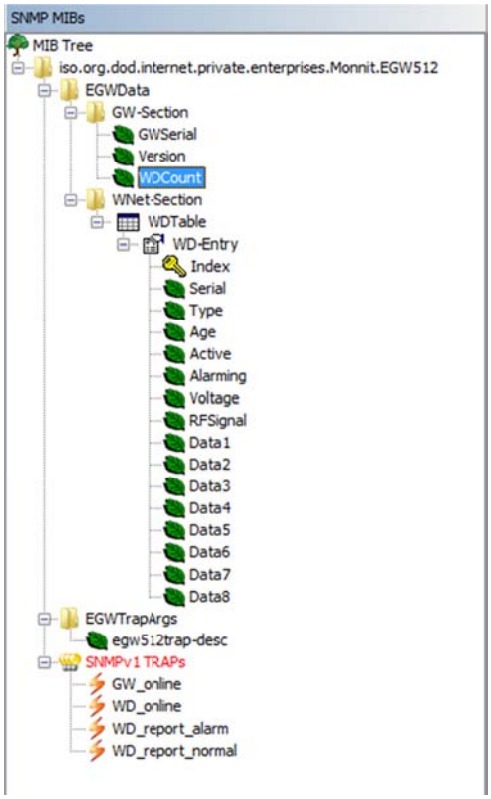
	Field	Description	Register	Data Address
GATEWAY	Gateway ID_High	The first 16 bytes of a 32 byte serial ID number	40001	0
REGISTERS	Gateway ID_Low	The last 16 bytes of a 32 bytes serial ID number	40002	1
	Gateway Version	The version of gateway firmware on the device	40003	2
	Gateway Device Count	The number of devices (sensors & gateways) in its network	40004	3
SENSOR	Sensor ID_High	The first 16 bytes of a 32 byte serial ID number	40101	100
REGISTERS	Sensor ID_Low	The last 16 bytes of a 32 bytes serial ID number	40102	101
	Device Type	The unique type identifier for the sensor profile	40103	102
	Data Age	The number of seconds that have elapsed since the last data was retrieved	40104	103
	Is Device Active	0 indicates no data for this slot	40105	104
	Is Aware	Becomes aware when a sensor threshold has been breached	40106	105
	Voltage	Battery voltage	40107	106
	RSSI	Signal Strength indicator… 0-100%	40108	107
	Data 1	Sensor Data Field 1	40109	108
	Data 2	Sensor Data Field 2	40110	109
	Data 3	Sensor Data Field 3	40111	110
	Data 4	Sensor Data Field 4	40112	111
	Data 5	Sensor Data Field 5	40113	112
	Data 6	Sensor Data Field 6	40114	113
	Data 7	Sensor Data Field 7	40115	114
	Data 8	Sensor Data Field 8	40116	115

6.5 SNMP Interface

To use the SNMP Interface, a Static IP address will need to have been assigned to the EGW. To activate the SNMP Interface, mark it active from either the iMonnit Edit page or the local web page. There are four available Interfaces. You will need to set the SNMP Interface Address (the IP address of the device sending the SNMP request).

The MIB file is available through here:
resources.monnit.com/content/downloads/MonnitEGW-MIB_v1

The MIB Tree looks like this:



Here is the tree with a short description of each field:

EGW Data				Description
	*GW Section			Gateway Section
		*GW Serial		Gateway Serial ID
		*Version		Gateway Firmware Version
		*WD Count		Wireless Device Count
	*WNetSection			Wireless Network Seciont
		*WD Entry		Wireless Device Entry
			*Index	Index Number
			*Serial	Wireless Device Serial ID
			*Type	Device Type (eg temp, water, motion sensor, etc)
			*Age	Number of seconds since last data recording
			*Active	Indicates if the wireless device is reporting in as expected
			*Alarming	Indicates if the wireless device has detected data that is urgent or breaches a threshold
			*Voltage	Battery voltage recorded at the time of data reading
			*RFSignal	Signal Strength recorded on data reading delivery
			*Data1	Data recorded by wireless device (eg temperature, water detected, motion detected, etc)
			*Data2	Data recorded by wireless device (eg temperature, water detected, motion detected, etc)
			*Data3	Data recorded by wireless device (eg temperature, water detected, motion detected, etc)
			*Data4	Data recorded by wireless device (eg temperature, water detected, motion detected, etc)
			*Data5	Data recorded by wireless device (eg temperature, water detected, motion detected, etc)
			*Data6	Data recorded by wireless device (eg temperature, water detected, motion detected, etc)
			*Data7	Data recorded by wireless device (eg temperature, water detected, motion detected, etc)
			*Data8	Data recorded by wireless device (eg temperature, water detected, motion detected, etc)

6.6 Using with Monnit Express

Connecting through your wireless router:

Make sure you have added the gateway to your network in Monnit Express.

If the gateway was added successfully, it will appear in your Gateway list:

While in Express:

- click on About menu, then Local IP Addresses
  - This menu option will give the computer's IP Address. Make note of the IP address.

(If, for some reason it does not come up see Note 1.)

Follow Steps 1 - 4 in Section 1.4 Out-of-the-Box Quick Start. (If you are proficient in iMonnit.com, you could edit the server configurations there if you prefer.**)**

In your web browser, select the tab "**Data Interfaces**".

Find the Primary Server [URL/IP] and enter the IP Address that you noted. Include the IP address in the primary and secondary, unless you would like the secondary to remain iMonnit.com for a back up:

Click the Save button. In order for the gateway to switch over, you will need to then press the "**Reboot**" button in the upper right of the web browser screen.

Once the gateway resets, the first light will flash red. Unplug it from the computer. Before leaving the computer, turn your internet connection back on.

Plug your Ethernet gateway into your Wi-Fi router, (make sure you have turned on your internet connection on your PC), and power up the Ethernet gateway. All three lights should go green now, and your gateway should report into Monnit Express.

If it does not, check that the PC has the internet connection turned on, recheck your IP Address, repower your gateway, and make sure the gateway is added into Monnit Express. (If you left your secondary set to point to sensorsgateway.com, which is iMonnit, and the lights on your EGW are green, check iMonnit to see if the gateway is reporting in there. If so, power cycle the gateway and try again.)

NOTE 1:
If the IP Address cannot be found, use the command line of the computer to find the IP Address.

For Windows XP
While at the computer that is running express

- *Click start*
- *Click accessory's*
- *Click system tools*
- *Click Command prompt*
  - *While in command prompt type ipconfig*
    - *This will give you a list of information one of them being the ip address of the computer that is what you will want to set the EGW to so that it can talk*
    - *You may need to make sure that the ports are open on the fire wall so that communication is possible.*

For Windows Vista/7
While at the computer that is running express

- *Click the start ORB*
- *Type cmd press enter*
  - *While in command prompt type ipconfig*
    - *This will give you a list of information one of them being the ip address of the computer that is what you will want to set the EGW to so that it can talk*
    - *You may need to make sure that the ports are open on the fire wall so that communication is possible.*

For Windows 8/8.1
While at the computer that is running express

- *Press the windows key*
- *Type cmd press enter*
  - *While in command prompt type ipconfig*
    - *This will give you a list of information one of them being the ip address of the computer that is what you will want to set the EGW to so that it can talk*
    - *You may need to make sure that the ports are open on the fire wall so that communication is possible.*