DPS Telecom

"Your Partners in Network Alarm Monitoring"

Modbus to SNMP Converter

USER MANUAL

D-PK-MODBX

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Revision History

August 27, 2019	Updated LAN Security
April 19, 2018	Initial Release

Notice

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Contents

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1 Modbus Converter Overview

Fig. 1.1 *The Modbus-to-SNMP Converter*

The Modbus-to-SNMP Converter Box is a dedicated mediation device. It polls up to 128 Modbus registers and converts that alarm data to SNMP traps. In this way, you can connect your Modbus equipment (like many common generators) to your SNMP manager in a way that would otherwise be impossible.

Because the Modbus Converter is built on the NetGuardian RTU platform, you get many of the same firmware & hardware benefits. Even though the Modbus Converter does not have traditional discrete/ analog inputs, it is a proven industrial design, has a variety of handy firmware features (notifications, analog thresholds...). It also includes a D-wire port, allowing you to daisy-chain up to 16 compact sensors to monitor temperature, humidity, airflow, and other important e/nvironmental levels.

The Modbus-to-SNMP Converter features:

- **Support for up to 128 total registers and Serial Modbus RTU data collection.**
- **1 D-Wire sensor input jack, supporting up to 15 sensors. (sold separately)**
- **Fast, integrated web browser.**

2 Specifications

Protocols:	Modbus, SNMPv1, SNMPv2c, SNMPv3, DCPx, TELNET, HTTP, HTTPS, Email
Dimensions:	1.750" H x 19.000" W x 7.125" D
Weight:	3.133 lbs (1.421 kg)
Mounting:	19" or 23" Rack
Power Input:	–24/48 VDC nominal (–18 to –72 VDC)
Fuse:	Internal Resettable
Current Draw:	140 mA @ 24VDC
Interfaces:	1 RJ45 10/100BaseT Ethernet 2 SFP Fiber Interfaces (1000Base-X) 4-Port 10/100/1000 BaseT Switch 1 USB front-panel craft port 1 RJ11 connector for D-Wire sensor network
Visual Interface:	5 Front Panel LEDs 6 Back Panel LEDs
Operating Temperature:	32° - 140° F (0° - 60° C)
Industrial Temperature Option:	-22° to 158° F (-30° to 70° C)
Operating Humidity:	0% - 95% non-condensing
MTBF:	60 years
Windows Compatibility:	XP, Vista, 7 (32 or 64 bit)
RoHS	5/6
Sensors:	Up to 15 dwire sensors 1 built-in temp sensor

3 Shipping List

Please make sure all of the following items are included with your Modbus Converter. If parts are missing, or if you ever need to order new parts, please refer to the part numbers listed and call DPS Telecom at **1-800-622-3314**.

Modbus Converter Box
D-PK-MODBX

Modbus Converter Resource CD

Modbus Converter User Manual
D-UM-MODBX

6 ft. USB Download Cable
D-PR-046-10A-06

x 2

Lg. Power Connector (Main Power)
2-820-00862-02

14ft. Ethernet Cable
D-PR-932-10B-14

3/4-Amp GMT Accessory Fuses
2-741-00250-00 x 3

3.1 Optional Shipping Items - Available by Request

Temp Sensor Node
D-PK-DSNSR-12001

Temp/Humidity Sensor Node
D-PK-DSNSR-12002

4 Installation

4.1 Tools Needed

To install the NetGuardian, you'll need the following tools:

Phillips No. 2 Screwdriver

Small Standard No. 2 Screwdriver

PC with terminal emulator, such as HyperTerminal

4.2 Mounting

Fig. 4.1 *The Modbus Converter can be flush or rear-mounted*

The Modbus Converter mounts in a 19" or 23" rack and can be mounted in the flush-mount or rear mount locations, as shown in.

The rack ears can be rotated 90° for wall mounting or 180º for other mounting options.

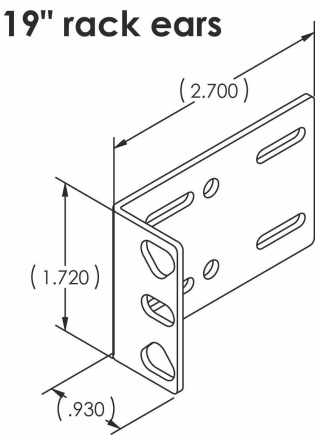


Fig. 4.2

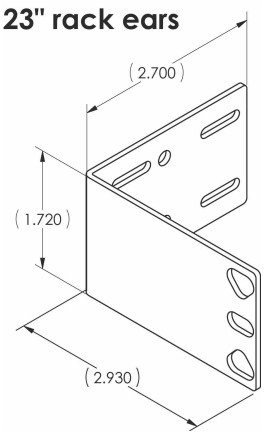


Fig. 4.3

4.3 Power Connection

The Modbus Converter uses single or dual (Optional) power inputs, powered through two barrier plug power connectors.

Fig. 4.3 *Modbus Converter Power Terminal*

To connect the Modbus Converter to a power supply:

1. Locate the metal grounding lug next to the symbol ⏚. Use the grounding lug to connect the unit to earth ground.
2. Insert the eyelet of the earth ground cable between the two nuts on the grounding lug (Ground cable not included).
3. Choose a barrier plug power connector to attach your power cable to. The plug's right terminal is Ground and its left terminal is Battery Lead.
4. Insert a battery ground into the power connector plug's right terminal (GND) and tighten the screw.
5. Insert a battery lead to the plug's left terminal and tighten its screw.
6. Insert fuse into the fuse distribution panel.
7. Check the power status LED.
8. Measure voltage. Connect the black cable onto the ground connector of your Digital Voltage Meter (DVM) and red cable onto the other connector of your DVM. The voltmeter should read between the values listed on the silk screen next to the power connector.
9. The power plug can be inserted into the power connector only one way to ensure the correct polarity.

Note: The battery terminal is on the left and the GND terminal is on the right.

10. Verify that the ☼ LED is lit. To confirm that power is correctly connected, the front panel status LED will flash RED and GREEN, indicating that the firmware is booting up.

4.4 Configuration

To configure the Modbus Converter, you'll need a PC with terminal emulator, such as HyperTerminal.

5 Modbus Converter Front Panel

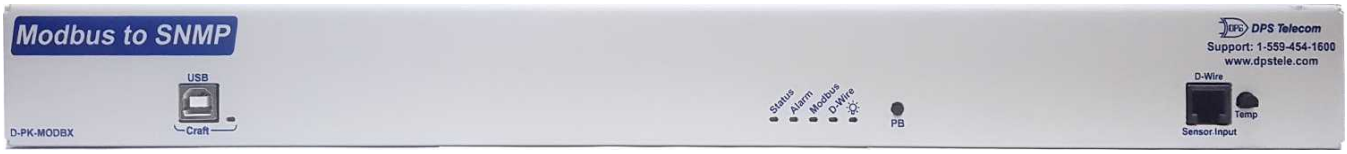


Fig. 5.1 *Modbus Converter Front Panel*

The front panel of the Modbus Converter has a USB craft port for local access to the TTY interface, a push-button reserved for future use ("PB"), a D-Wire sensor input port, and an ambient temperature sensor ("Temp"). It also has several LED indicator lights:

LED	Status	Description
Craft	Flashing Green	Transmit over craft port
	Flashing Red	Receive over craft port
Status	Flashing Green	Application Running
	Flashing Red	Bootloader Running
Alarm	Flashing Red	New Alarm
	Solid Red	Standing Alarm Acknowledged via DCP poll
	Off	No Alarms
Modbus	Flashing Green	Transmit over craft port
	Flashing Red	Receive over craft port
D-Wire	Solid Green	At least 1 D-Wire enabled, no alarm
	Solid Red	New Alarm
	Off	No D-Wire Sensors attached.
Power (A or B)	Solid Green	Has power
	Off	Does not have power or polarity reversed.

Front Panel LED Descriptions

6 Modbus Converter Back Panel

Modbus Converter Back Panel

	LED	Status	Description
Power	Power (A or B)	Solid Green	Has power.
		Off	Does not have power or polarity reversed.
	FA	Solid Red	Fuse failure.
Link	LNK	Solid Green	Ethernet link detected.
LAN	LAN	Blink Red	Receive traffic on LAN interface.
		Blink Green	Transmit traffic on LAN interface.
100BT	100BT	Solid Green	LAN connection speed is 100BaseT.
		Off	LAN connection speed is 10BaseT.
SFP Fiber 1000Base-X	1-2	Solid Red	SFP detected, no link.
		Solid Green	SFP detected, link is up.
		Flashing Red	No SFP detected.
		Off	SFP detected, connection issues.
10/100/1000 BaseT Switch	1-4	Flashing Green	Activity on port detected.
		Solid Green	Link detected.

7 Quick Start: How to Connect to the Modbus Converter

Most users find it easiest to give the unit an IP address, subnet, and gateway through the front craft port (TTY interface) to start. Once these settings are saved and you reboot the unit, you can access it over LAN to do the rest of your databasing via the Web Browser interface.

Alternative option: You can skip the TTY interface by using a LAN crossover cable directly from your PC to the unit and access its Web Browser.

7.1 ...via LAN

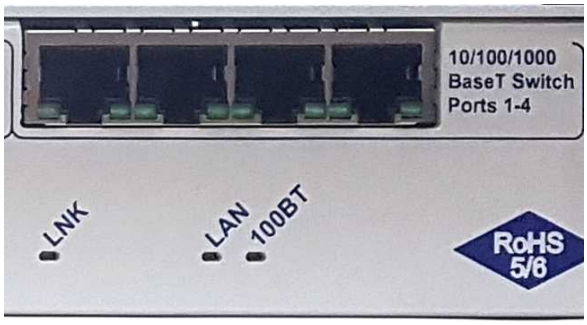


Fig. 6.1 *Modbus Converter Ethernet Ports*

To connect to the Modbus Converter's via LAN, all you need is the unit's IP address (Default IP address is 192.168.1.100).

If you DON'T have LAN, but DO have physical access to the Modbus Converter, connect using a LAN crossover cable. **NOTE:** Newer PCs should be able to use a standard straight-through LAN cable and handle the crossover for you. To do this, you will temporarily change your PC's IP address and subnet mask to match the unit's factory default IP settings. Follow these steps:

1. Get a LAN crossover cable and plug it directly into the Modbus Converter's LAN port.
2. Look up your PC's current IP address and subnet mask, and write this information down.
3. Reset your PC's IP address to **192.168.1.200**. Contact your IT department if you are unsure how to do this.
4. Reset your PC's subnet mask to **255.255.0.0**. You may have to reboot your PC to apply your changes.
5. Once the IP address and subnet mask of your computer coincide with the unit, you can access the unit via a Telnet session or via Web browser by using the unit's default IP address of **192.168.1.100**.
6. Provision the Modbus Converter with the appropriate information, then **change your computer's IP address and subnet mask back to their original settings.**

Now you're ready to do the rest of your configuration via LAN. Plug your LAN cable into the Modbus Converter and enter your username and password.
NOTE: Default username is **admin** and password is **dpstelecom**.

7.2 ...via Craft Port (using TTY Interface)

Fig. 6.2 *Modbus Converter Craft Port*

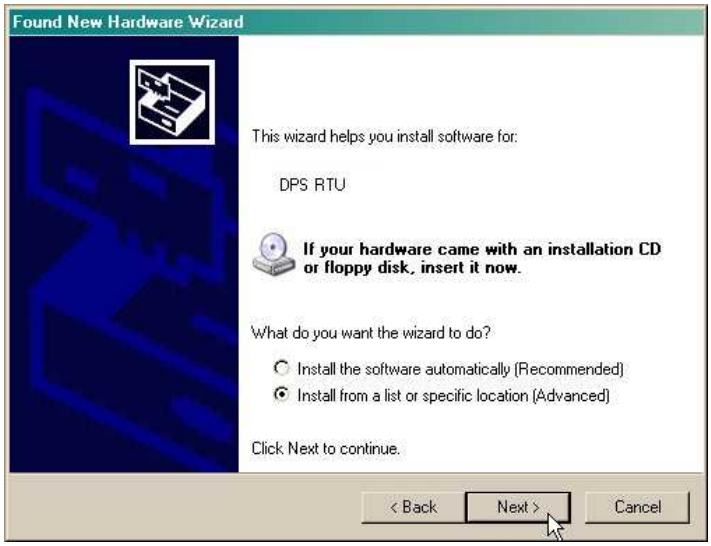
Use the front panel craft port to connect the Modbus Converter to a PC for on-site unit configuration. To
use the craft port, connect the included USB download cable from your PC's USB port to the craft port.

Note: The following images display the setup process done in Windows XP. Other versions are supported.

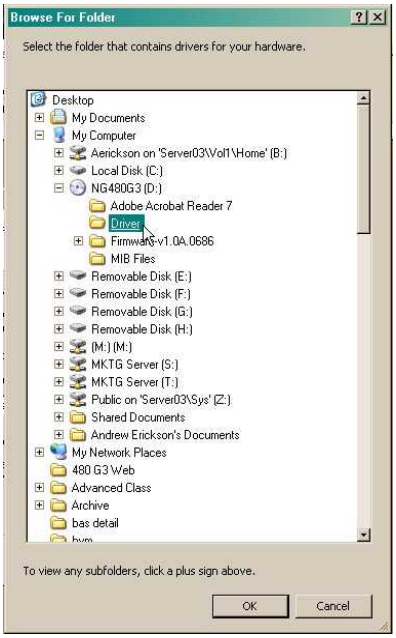
The following steps will occur the first time any DPS USB equipment is used on this PC. If you've used a different DPS USB device before and have installed the DPS USB drivers, then **skip to Step 9**.

When you first connect the Modbus Converter to your PC via USB, a "Found New Hardware" message will appear:

1. Click the "Found New Hardware" message/icon to launch the "Found New Hardware Wizard".



2. Select "Install from a list or specific location (Advanced)"
3. Click "Next >"
4. Select "Search for the best driver in these locations."
5. Insert Modbus Converter Resource Disc (CD) into your PC.
6. Click "Browse"

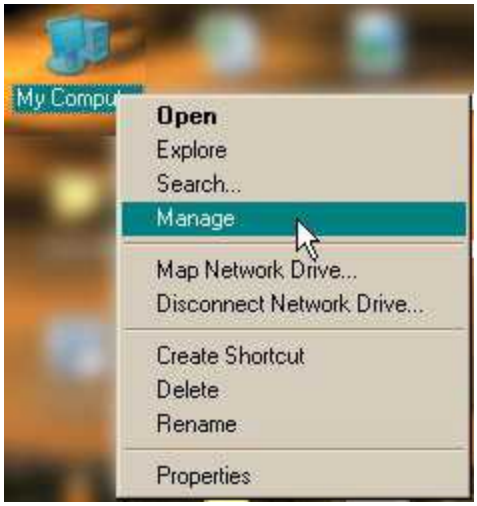


7. Select the "Driver" folder of your Modbus Converter Resource Disc (CD) and click "OK"

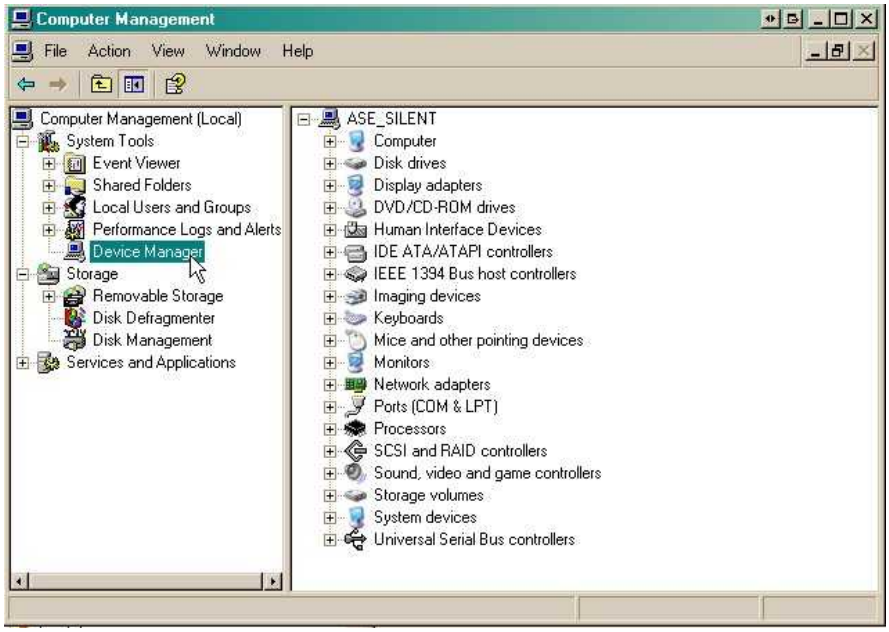
The following message will confirm installation of a new "USB Communications Port"

8. Click "Finish" to close the Wizard.

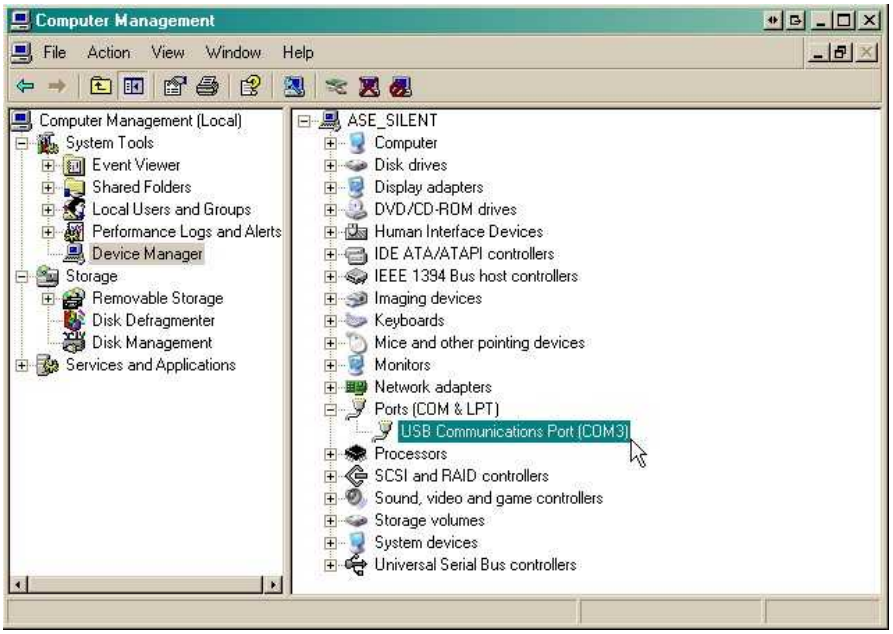
Now that the driver has been installed, a new COM port is being emulated on your PC. Before using hyperterminal, you must confirm the identity of that new COM port (COM1, COM2, COM3...) in the Windows Device Manager.



9. Right-click the "My Computer" icon on your desktop, then click "Manage"



10.Click "Device Manager" in the left pane.



11.Expand the "Ports (COM & LPT)" section in the right pane. Look for "USB Communications Port (COMx)". Note the number of the COM port ("COM3" in the example above).

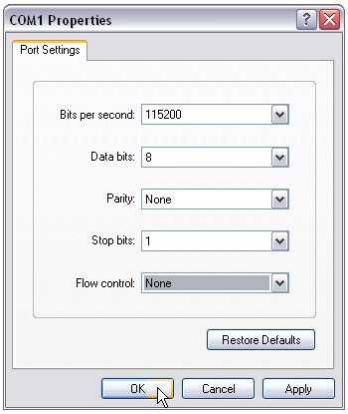
12.Click on the **Start** menu **>** select **Programs** > **Accessories** > **Communications** > **HyperTerminal.**

13. At the Connection Description screen, enter a name for this connection. You may also select an icon. The name and icon do not affect your ability to connect to the unit.

14. At the Connect To screen, use the drop-down menu to select the COM port you found earlier in the Device Manager.

15. Select the following COM port options:
- Bits per second: 9600
- Data bits: 8
- Parity: None
- Stop bits: 1
- Flow control: **None**

Once connected, you will see a blank, white HyperTerminal screen. Press Enter to activate the configuration menu.

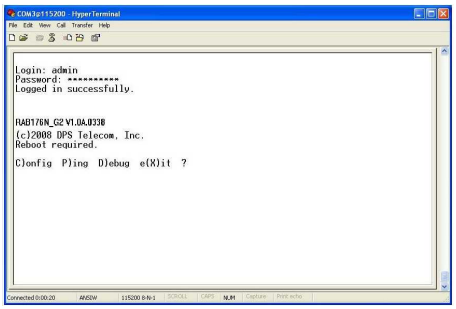


16. When prompted, enter the default user name **admin** and password **dpstelecom**.
NOTE**:** If you don't receive a prompt for your user name and password, check the Com port you are using on your PC and make sure you are using the cable provided. Additional cables can be ordered from DPS Telecom.

17. The Modbus Converter's main menu will

18. ESC to the main menu. When asked if

appear. Type C for C)onfig, then E for E)thernet. Configure the unit's IP address, subnet mask, and default gateway.



you'd like to save your changes, type Y for Y)es. Reboot the Modbus Converter to save its new configuration.

```
Linked        : No
DHCP          : Disabled
Host Name     :
Unit IP       : 126.10.230.127    (126.10.230.127)
Subnet Mask   : 255.255.192.0     (255.255.192.0)
Gateway       : 126.10.255.23     (255.255.255.255
Unit MAC      : 00.10.81.00.53.33 (00.10.81.00.53.

U)nit Addr  S)ubnet  G)ateway  D)HCP  H)ost  (ESC

E)thernet  S)tats  n(V)ram  re(B)oot  (ESC) ?

Do you want to save changes (y/N) : _
```

Now you're ready to do the rest of your configuration via LAN. Please refer to the next section "...via LAN" for instructions on setting up your LAN connection.

8 TTY Interface

The TTY interface is the Modbus Converter's built-in interface for basic configuration. From the TTY interface, you can:

- Edit the IPA, subnet, and gateway
- Configure primary port
- Set unit back to factory defaults
- Set DCP info for T/Mon polling
- Ping other devices on the network
- Debug and troubleshoot

For more advanced configuration tools, please use the Web Browser Interface.

For Telnet, connect to the IP address at port 2002 to access the configuration menus after initial LAN/ WAN setup. **Telnet sessions are established at port 2002, not the standard Telnet port** as an added security measure.

If you're using Windows 7, then you'll need to install Telnet before you can use the TTY interface. To install Telnet, open up your command line (type "cmd" into the search bar in the **Start Menu**). Select **cmd.exe** to run the command line.

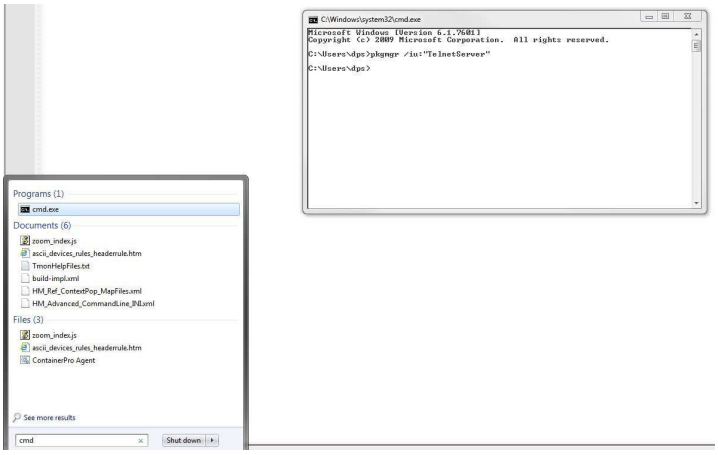


Fig. 7.1

From the command line, type **pkgmgr /iu:"TelnetClient"** then press E**nter**. When the command prompt appears again, the installation is complete.

Menu Shortcut Keys

The letters before or enclosed in parentheses () are menu shortcut keys. Press the shortcut key to access that option. Pressing the ESC key will always bring you back to the previous level. Entries are not case sensitive.

To reset unit to factory default settings:

Connect to the craft port to login to the unit. The user prompt will pop up

Use command options to initialize:

User: init
Password: Init!999

Press (C)onfig > n(V)ram > (I)nitialize > (Y)es

9 Quick Turn Up

The next sections of this manual will walk you through some of the most common tasks for using the Modbus Converter. You will learn how to send email notifications and send SNMP traps to your alarm master - all using the Web browser. For details on entering your settings into each Web browser menu, see the "Provisioning Menu Field Descriptions" section.

9.1 How to Send Email Notifications

1. Click on the **Notifications** button in the **Provisioning** menu. You can setup as many as 8 different notifications. Begin the setup "wizard" by clicking **Edit** for a notification number. In this example, we'll set up Notification 1 to send emails.

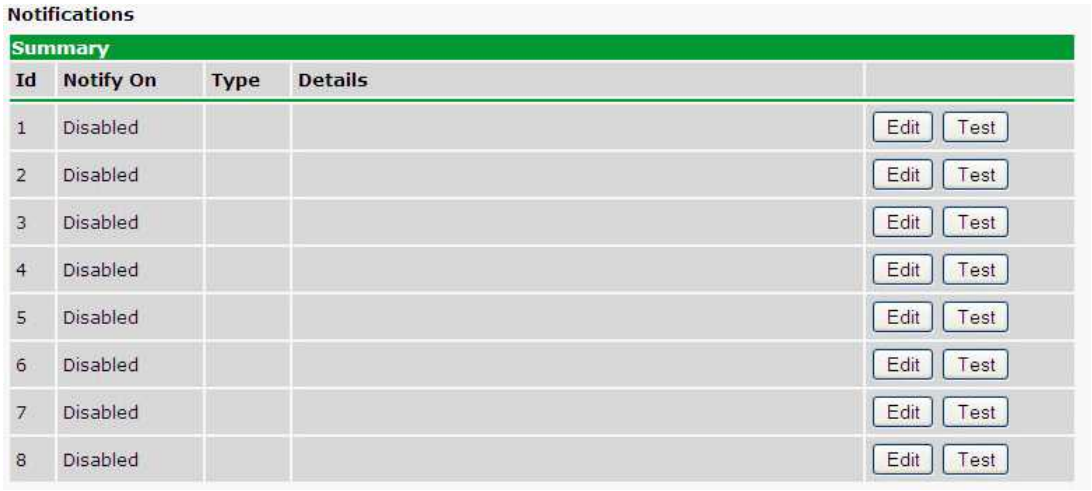


Fig. 8.1

2. At the **Notification Setting** screen, use the drop down box to set what events to use for this notification. Now, select the **Send Email Notification** button and click **Save and Next**.

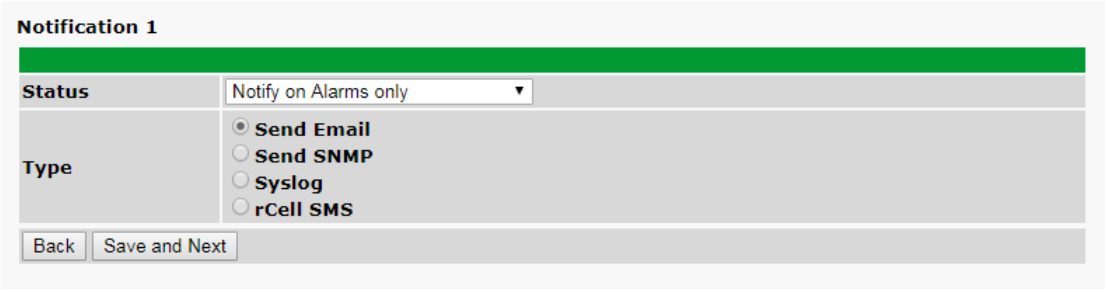


Fig. 8.2

3. At the **Email Notification** screen, you'll enter your email server settings. Enter the **IP address** or **Host Name** of your email server. Enter the **Port Number** (usually 25) and the **"To" Email Address** of the person that will receive these emails. If authentication is required, chose the type and fill in the necessary fields. Click **Next**.

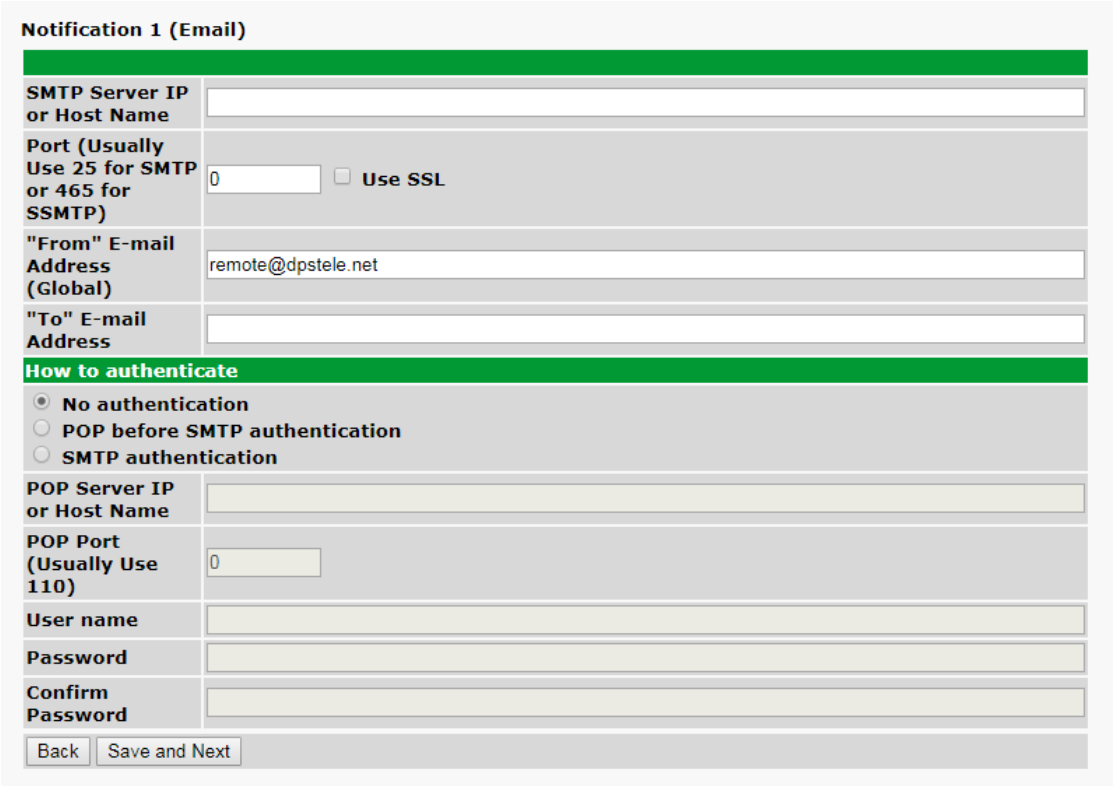

Notification 1 (Email)
SMTP Server IP or Host Name
Port (Usually Use 25 for SMTP or 465 for SSMTP)
0
Use SSL
"From" E-mail Address (Global)
remote@dpstele.net
"To" E-mail Address
How to authenticate
No authentication
POP before SMTP authentication
SMTP authentication
POP Server IP or Host Name
POP Port (Usually Use 110)
0
User name
Password
Confirm Password
Back
Save and Next

Fig. 8.3

4. At the **Schedule** screen, you'll select the exact days/times you want to receive email notifications. You can set 2 schedules per notification. For example, you may want to receive notifications at certain times during the week, and at different hours on the weekend. Use the check boxes to select the days of the week, and select the time from the drop down menus. Click **Finish.** To try a test notification, click the **Test** button (See next step.)

Fig. 8.4

5. If you chose to test the email notification you've just setup, you will be prompted with a pop-up. Click **OK** to send a test email alarm notification. Confirm all your settings by checking your email to see if you've received it. **NOTE:** This test only means that your notification settings are correct, but you still need to assign the notification to an alarm point. See the next step.

6. Now you will associate this notification to an alarm (system, base, analog, etc.) You have 8 notification devices available to use. In the image below, you might assign **Notification Device 1** to **Alarm 1**. This means that you would receive an email notification when an alarm for **Alarm 1** (SERVER ROOM**)** occurs.

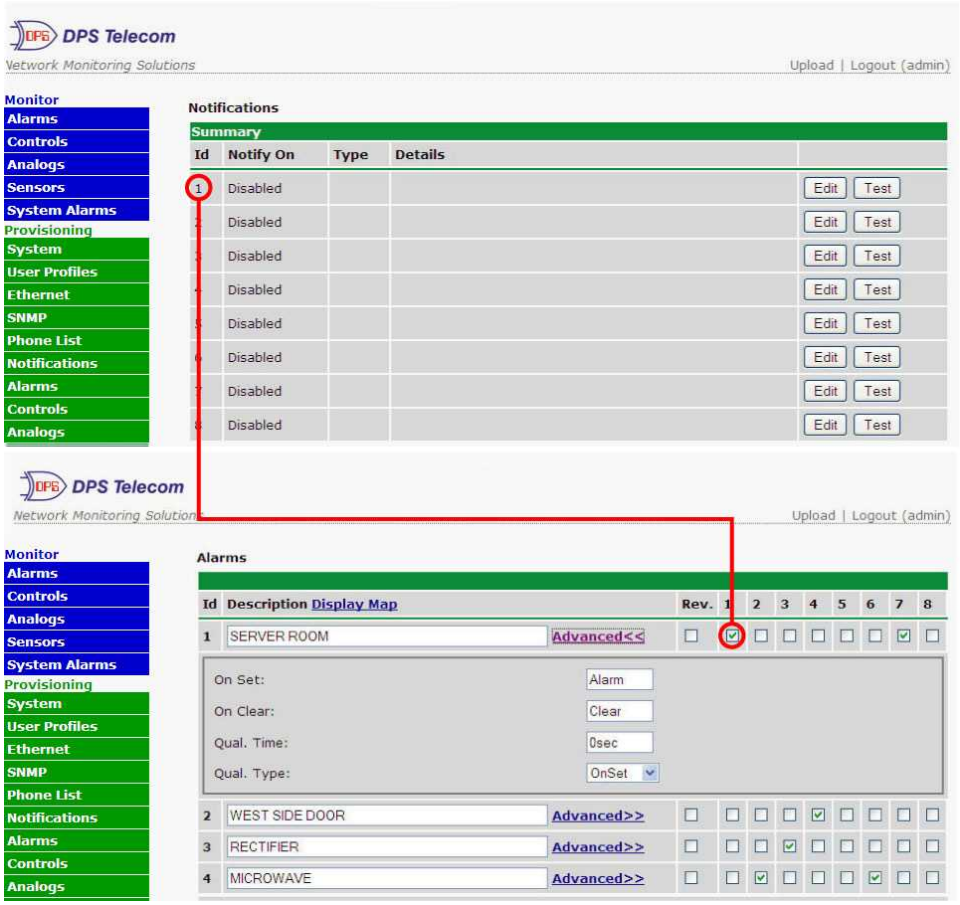

DPS Telecom
Network Monitoring Solutions
Upload | Logout (admin)
Monitor
Alarms
Controls
Analogs
Sensors
System Alarms
Provisioning
System
User Profiles
Ethernet
SNMP
Phone List
Notifications
Alarms
Controls
Analogs
Notifications
Summary
Id
Notify On
Type
Details
1
Disabled
Edit
Test
Alarms
Description
Display Map
Rev.
SERVER ROOM
Advanced<<
On Set:
Alarm
On Clear:
Clear
Qual. Time:
0sec
Qual. Type:
OnSet
WEST SIDE DOOR
Advanced>>
RECTIFIER
MICROWAVE

Fig. 8.5

9.2 How to Send SNMP Traps

1. Click on the **SNMP** button in the **Provisioning** menu. Enter the **SNMP GET** and **SNMP SET** community strings for your network, then click **Save**. The typical SNMP SET and GET community strings for network devices is "public". As an added security measure, we've made our default "dps_public".

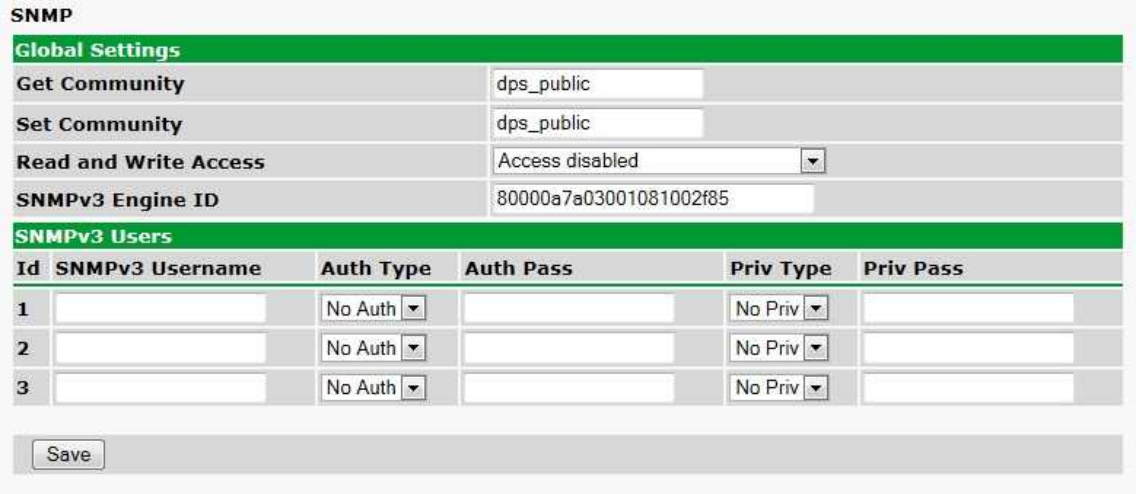


Fig. 8.6

2. Click on the **Notifications** button in the **Provisioning** menu. You can setup as many as 8 different notifications. Begin the setup "wizard" by clicking **Edit** for a notification number. In this example, we'll setup Notification 1 to send SNMP traps to your alarm master.

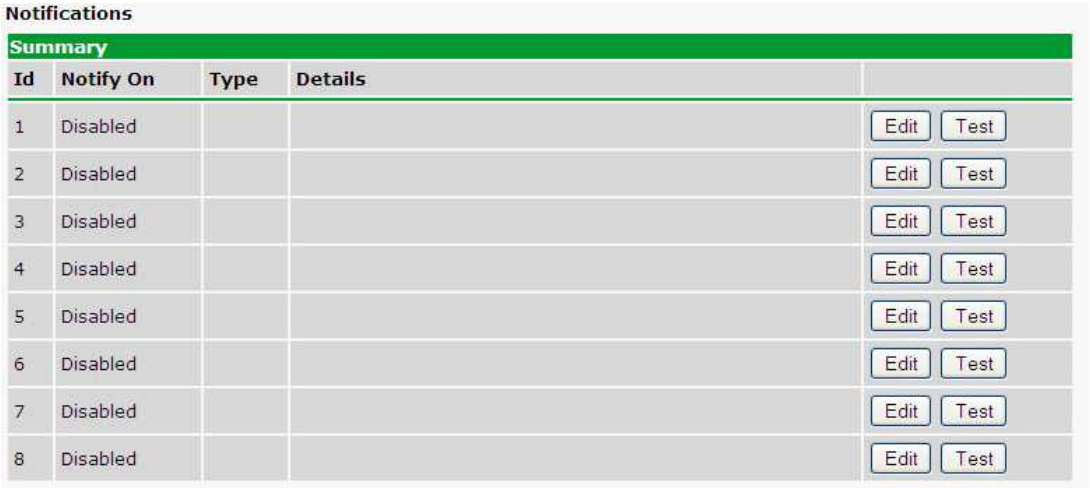


Fig. 8.7

3. At the **Notification Setting** screen, use the drop down box to set what events to use for this notification. Now, select the **Send SNMP Notification** button and click Next.


Notification 1
Status
Notify on both Alarms and Clears
Type
Send Email
Send SNMP
Back
Save and Next

Fig. 8.8

4. At the **SNMP Notification** screen, you'll enter your network's SNMP settings. Enter the **IP address** of your SNMP Trap Server. Enter the **Trap Port Number** (usually 162) and the **Trap Community** password. Click **Save and Next**.

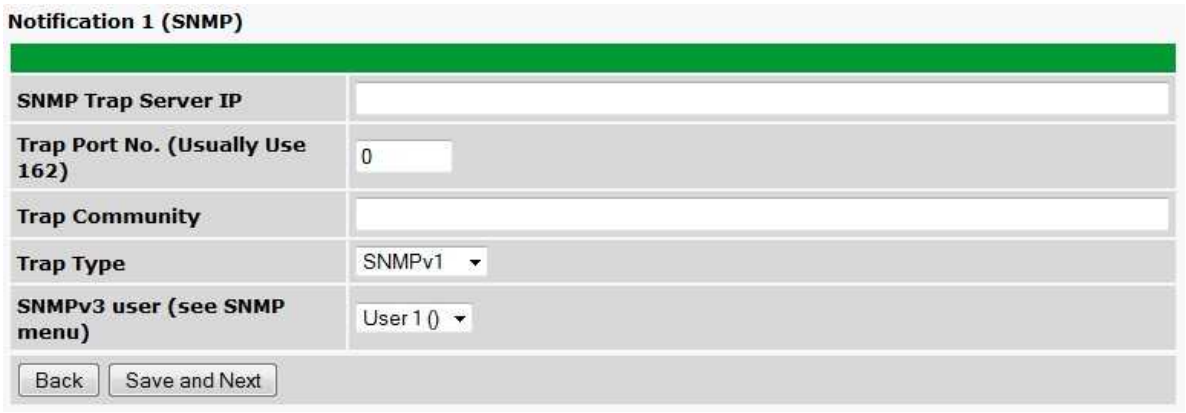


Fig. 8.9

5. At the **Schedule** screen, you'll select the exact days/times you want to receive SNMP notifications. You can set 2 schedules per notification. For example, you may want to receive notifications at certain times during the week, and at different hours on the weekend. Use the checkboxes to select the days of the week, and select the time from the drop down menus. Click **Save and Finish.** To try a test notification, click the **Test** button (See next step.)

Fig. 8.10

6. If you chose to test the email notification you've just set up, you will prompted with a pop-up . Click **OK** to send a test SNMP alarm notification. Confirm all your settings by checking your alarm master to see if the SNMP trap was received.

NOTE: This test only means that your notification settings are correct, but you still need to assign the notification to an alarm point. See Step 6 in "How to Send Email Notifications" for more detail.

9.3 How to Send TRIP Notifications

1. Click on the **Notifications** button in the **Provisioning** menu. You can setup as many as 8 different notifications. Begin the setup "wizard" by clicking on **Edit** for a notification number. In this example, we'll setup Notification 8 to send an voice alert.

2. At the **Notification Setting** screen, select the conditions you want to be notified of from the drop down: **Notify on both Alarms and Clears, Notify on Alarms only, Notify on Clears only.** (Selecting Notification Disabled means you will not receive any type of alerts.) Select **Trip Dialup (T/Mon)** and click Next.

Fig. 8.11

3. At the next screen, you'll select the phone number the NetGuardian should call when this particular alarm is triggered. Enter the T/Mon's phone number and chose if you want the Modbus Converter to dial only if the DCP poller inactive is selected. Then click **Save and Next**.

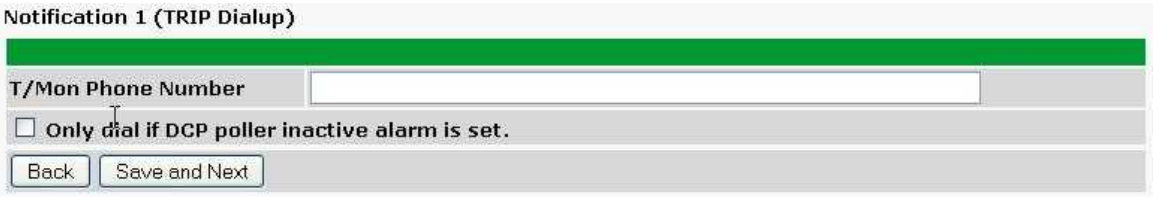


Fig. 8.12

5. At the **Schedule** screen, you'll select the exact days/times you want to receive notifications. You can set 2 schedules per notification. For example, you may want to send after hours or at certain times during the week, and at different hours on the weekend. Use the check boxes to select the days of the week, and select the time from the drop down menus. Click **Save and Finish.** To try a test notification, click the **Test** button (See next step.)

Fig. 8.13

6. Click **Test** to send a test voice notification. **NOTE:** This test only means that your notification

settings are correct, but you still need to assign the notification to an alarm point (See step 6 of the "How to Send Email Notifications" section).

10 LAN Security

The Telnet interface is available on TCP port 2002. It is enabled by default per section ***9.1 LAN Lockdown***.

The web interface is available over ports 80, 443, and 2080. This can be selected from the TTY interface under LAN Lockdown in the edit menu. Selecting 443 enables HTTPS (SSLv3).

All file transfers take place over HTTP/HTTPS; scp, sftp, ftp are not supported.

10.1 LAN Lockdown

Telnet and HTTP can be disabled via the TTY interface. HTTP can be disabled via either Telnet or USB sessions, but Telnet can only be disabled via a USB session.

To lockdown, browse to C)onfig, L)ockdown. This will display the port each service is running on or "LOCKDOWN" if it is locked down. Press T)elnet or H)TTP to toggle lockdown for that service. Note that services are locked down immediately, but changes must be saved by escaping to the top menu to persist a reboot.

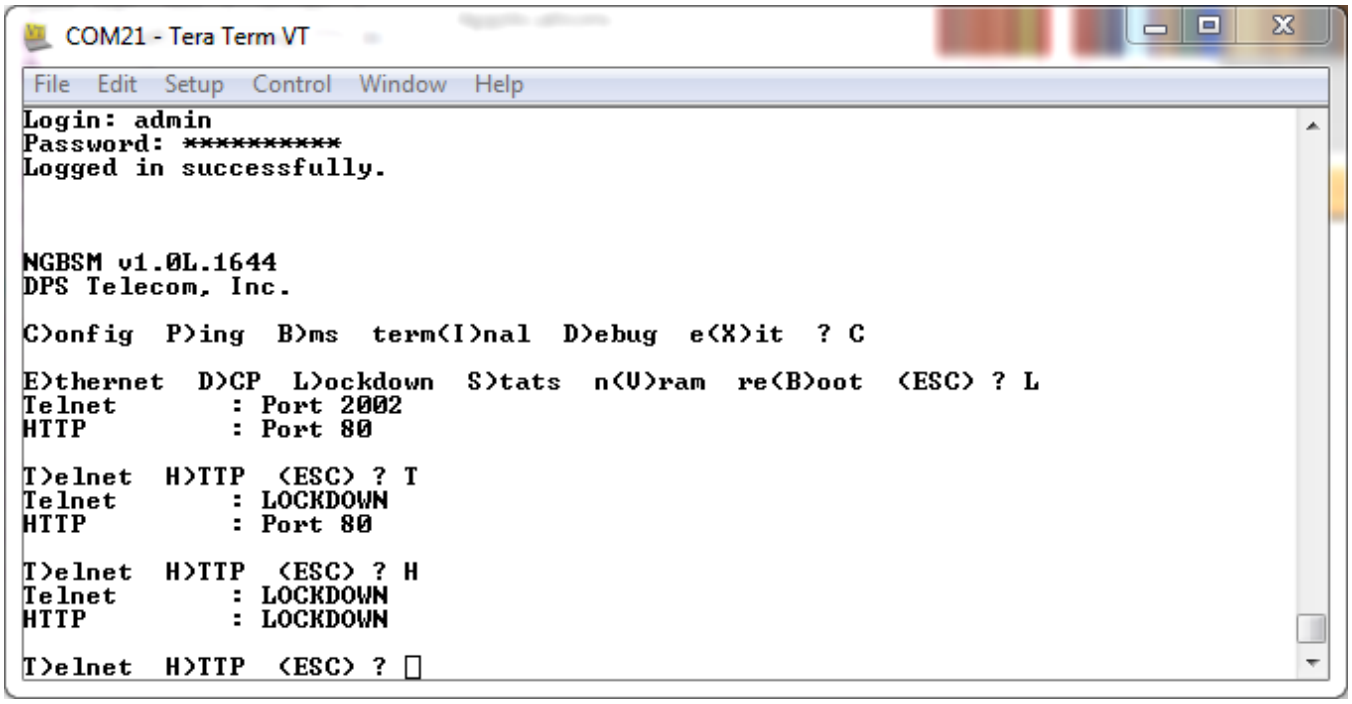


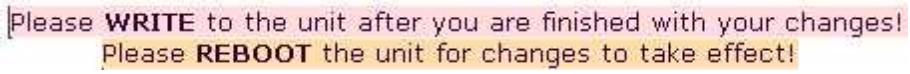
Fig. 9.1

11 Provisioning Menu Field Descriptions

Modbus Converter configuration is performed from the **Provisioning** menus, the menu options in green on the left-side of the web interface. The following pages provide a brief description of the options available in each menu.

Saving Configuration Changes to the Modbus Converter:
At the bottom of each screen you access from the **Provisioning** Menu, you will see a **Save** button. Clicking Save will cache your changes locally. The web interface will then prompt you to either **Write** your changes to the unit or **Reboot** the unit for changes to take effect in the top-left corner of your browser. The relevant options will be highlighted in the **Device Access** options**.**

Note: If the unit prompts you to both Write changes to the unit **and** Reboot, you will Write your changes first. Rebooting without writing to the unit (if a Write is required) will cause you to lose your configuration changes.



Status messages on the NetGuardian DIN Device Access menu, inform you how to implement your changes

Fig. 10.1

Fig. 10.2

The control menu highlights items that must be completed for your changes to take effect

11.1 System

From the **Provisioning** > **System** menu, you will configure and edit the global system, call, T/Mon and control settings for the Modbus Converter.

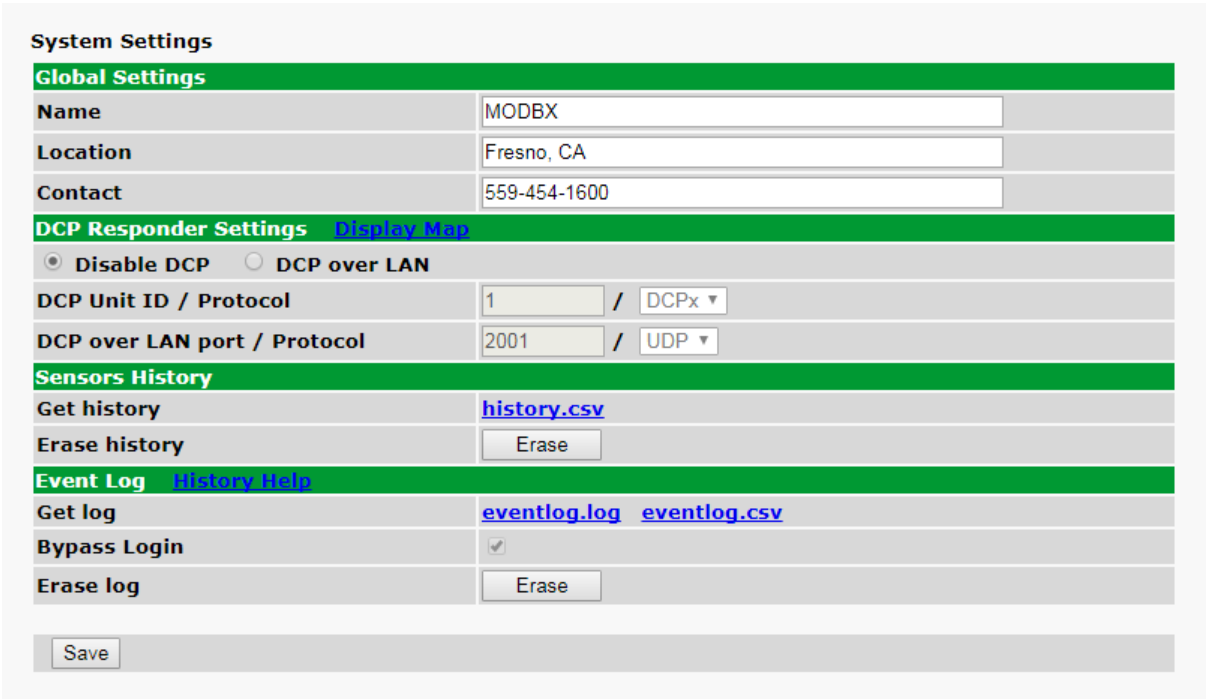


Fig. 10.3 *The Provisioning > System menu*

Global System Settings	
Name	A name for this Modbus Converter unit. {Optional field)
Location	The location of this Modbus Converter unit. {Optional field)
Contact	Contact telephone number for the person responsible for this Modbus Converter unit. {Optional field)
DCP Responder Settings *(For use with T/Mon)*	
DCP Unit ID	User-definable ID number for the target unit (DCP Address)
DCP Unit Protocol	Drop-down menu of available protocols for use with DCP Address
DCP over LAN port	Enter the DCP port for the target unit (UDP/TCP port)
LAN Protocol	Drop-down menu of available protocols for use over LAN
Sensors History	
Get History	Download a log of all configured analog and sensor values.
Erase History	Erase the log of all configured analog and sensor values.

11.1.1 History Log Format and Operation

GET parameters can be used with the history.csv or the eventlog.csv request to filter the returned data. When no GET parameters are supplied, all data will be returned in CSV format.

To add GET parameters:

❑Right-click the **history.csv** link on the *Provisioning > Systems* page.
❑Depending on your browser, select either "Copy link address", "Create link shortcut", or similar option.
❑Paste the link in a new tab on your chosen web browser.
❑Add the desired parameters to the link.

- The string must start with a "?" after the **.csv**
- Enter the parameter, then "=", followed by desired value (described in description in the table below).
- To enter multiple parameters, each should be separated by "&".
- **Example:** http://10.0.6.45/history.csv?st=1397669439&et=1397671119&uk1=userkey1&uk2=userkey2

❑Press enter to return results.

Example Output:

```
systime,utime,chan,romid,description,average,minimum,maximum,units,ukey1,ukey2,ukey3
2011-02-03 11:13:27,1296731607,9,28E5644407000046,test,75.750,75.750,75.750,F,,,
2011-02-03 11:12:27,1296731547,9,28E5644407000046,test,75.750,75.750,75.750,F,,,
2011-02-03 11:11:27,1296731487,9,28E5644407000046,test,75.750,75.750,75.750,F,,,
2011-02-03 11:10:27,1296731427,9,28E5644407000046,test,75.688,75.625,75.750,F,,,
2011-02-03 11:09:27,1296731367,9,28E5644407000046,test,75.625,75.625,75.750,F,,,
```

Parameter	Description	Works With
ch	Channel number 1-40. If present, filters for a particular channel. Analogs are mapped to channels 1-8, sensors are mapped to channels 9-40.	history.csv
cnt	If present, device will return "cnt" latest lines.	history.csv or eventlog.*
st	Start time in unix time format. This will limit number of lines returned.	history.csv or eventlog.*
et	End time in unix time format. This will imit number of lines returned.	history.csv or eventlog.*
uk1	User Key 1. Up to 32 characters. This key will be returned ukey1 column.	history.csv
uk2	User Key 2. Up to 32 characters. This key will be returned ukey2 column.	history.csv
uk3	User Key 3. Up to 32 characters. This key will be returned ukey3 column.	history.csv

NOTE: Total GET parameters string cannot be longer then 100 characters.

11.2 User Profiles

Clicking **User Profiles** gives you access to modify the default username and password, and to edit the administrator profile and create up to 9 additional unique user profiles, each with different access rights, to the Modbus Converter's web interface.

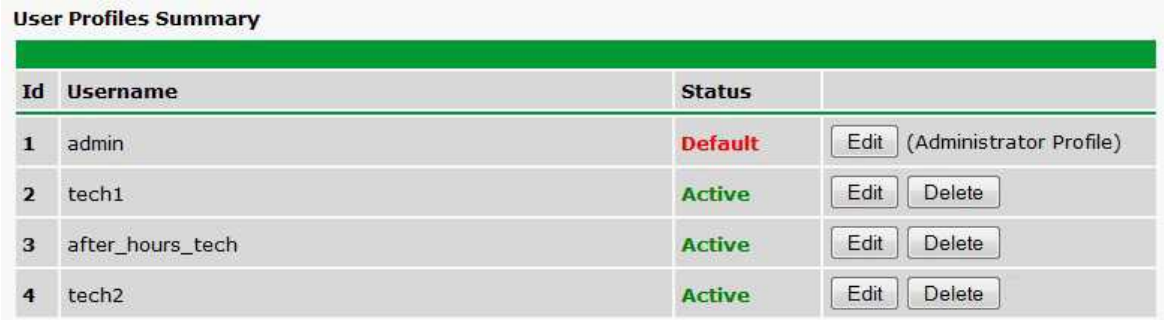


Fig. 10.4 *Configure access privileges for users in the User Profile screen*

To create or edit any of the 10 user profiles (including the Admin), click the **Edit** button. From there, you can change all configurable settings for a user profile.

	User Profile
Suspend this Profile	If this box is checked, the profile will not be able to access the Modbus Converter.
Username	Enter a username or a user description
Password	Enter a unique user password **Note:** All passwords are AES 128 encrypted.
Confirm Password	Re-enter the password.
Access Rights	
Check all	Enables all Access Rights
Edit logon profiles	Enables the user to add/modify user profiles and password information.
Write Config (change unit configuration)	Enables the user to change the unit config by accessing the **Write** feature in the control menu.
View monitor pages	Allows the user to access Monitor menu options.
Send relay commands	Allows the user to send commands to operate the device's control relays.
TTY access (access via Craft port or via Telnet)	Grants the user access to the unit via TTY interface (via craft or telnet).
Initialize config to factory defaults	Allows the user to use the **Initialize** option in the **Device Access** menu, resetting the Modbus Converter to factory default settings. All user settings will be lost.
Upload new firmware, or config	Allows the user to upload firmware or backed-up configuration files.
Get audit log	Allows the user to access the Audit Log (**Get Log** command).
Purge (delete) audit log	Allows the user to deletes the existing audit log.
Get (backup) config	Backs-up all user profile configuration settings.

	User Profile
Get and delete analog history	Allows the user to access and delete the analog and sensor history.

User profile field descriptions

11.3 Ethernet

The **Edit** > **Ethernet** menu allows you to define and configure Ethernet settings.

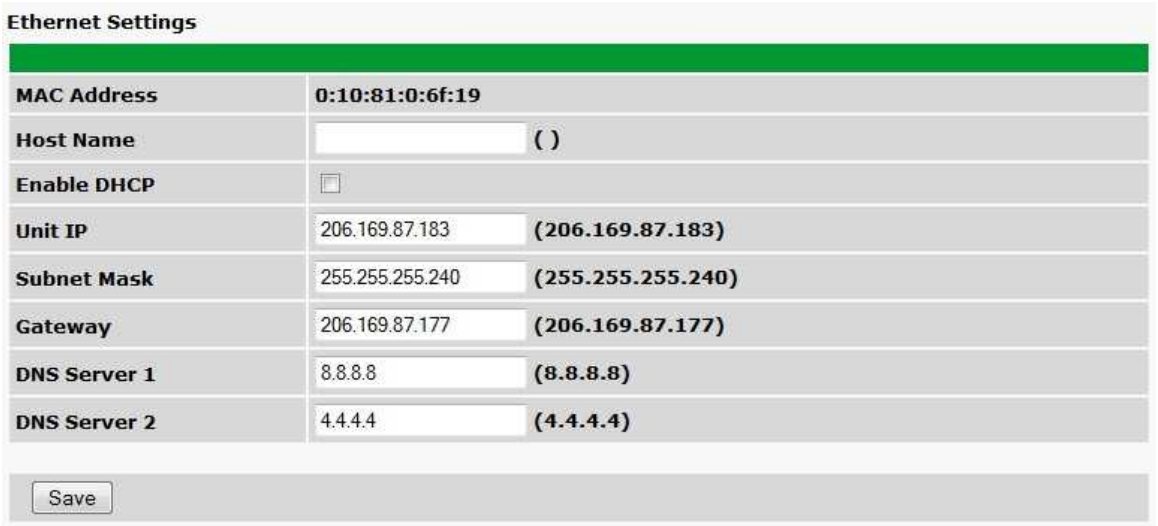


Fig. 10.5 *The Provisioning > Ethernet menu*

Ethernet Settings	
MAC Address	Hardware address of the Modbus Converter. (Not editable - For reference only.)
Host Name	Used only for web browsing. Example: If you don't want to remember this Modbus Converter's IP address, you can type in a name in this field, such as "modconvert". Once you save and reboot the unit, you can now browse to it locally by simply typing in "modconvert" in the address bar. (no "http://" needed).
Enable DHCP	Used to turn on Dynamic Host Connection Protocol. NOT recommended, because the unit is assigned an IP address from your DHCP server. The IP you've already assigned to the unit becomes inactive. Using DHCP means the unit will NOT operate in a T/Mon environment, as the changing IP will make DCP polling over IP impossible.
Unit IP	IP address of the Modbus Converter.
Subnet Mask	A road sign to the Modbus Converter, telling it whether your packets should stay on your local network or be forwarded somewhere else on a wide-area network.
Gateway	An important parameter if you are connected to a wide-area network. It tells the Modbus Converter which machine is the gateway out of your local network. Set to 255.255.255.255 if not using. Contact your network administrator for this info.
DNS Server 1	Primary IP address of the domain name server. Set to 255.255.255.255 if not using.
DNS Server 2	Secondary IP address of the domain name server. Set to 255.255.255.255 is not using.

Advanced TCP Settings	
Force Max TCP Window Size	The defined TCP window size is used.
Maximum TCP Window Size	Sets the TCP receive window size.

Note: DNS Server settings are required if a hostname is being used for ping targets.

11.4 Serial Port

The **Provisioning > Serial Port** menu allows you to change settings depending on the port type of your Modbus Converter. From this menu, you can select a mode of operation and enable reach-through serial port functionality.

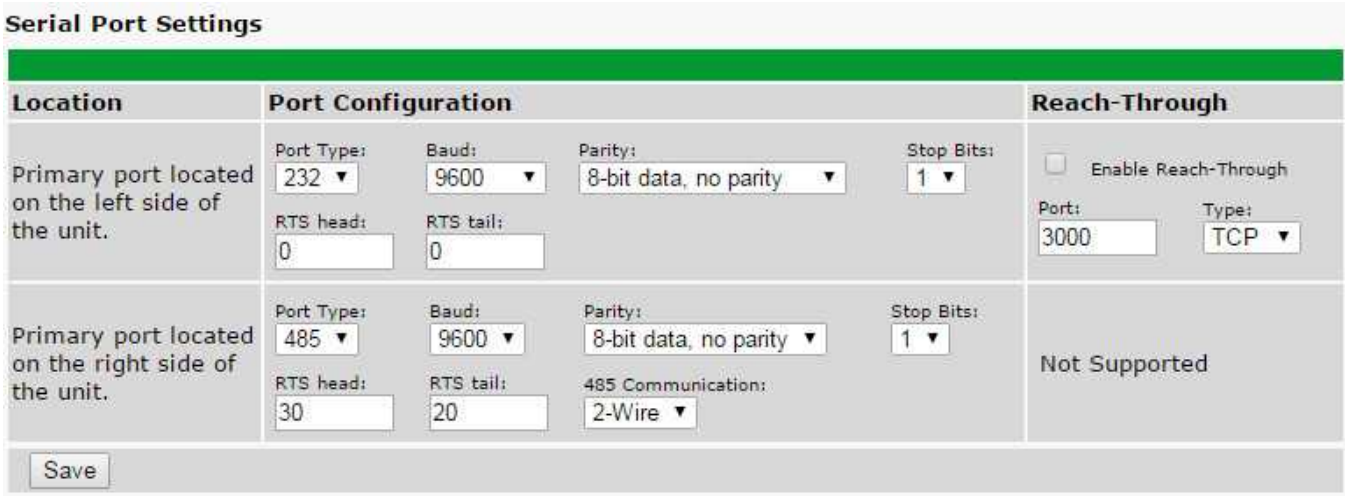


Fig. 10.6 *The Provisioning > Serial Ports menu*

Port Configuration	
Port Type	Select the serial port for your build of the Modbus Converter. Choose from 232, 485...
Baud, Parity, and Stop Bits	Select the appropriate settings from the drop-down menu.
RTS Head	Only used if your Modbus Converter was built with a 202 modem. The most commonly used value is 30.
RTS Tail	Only used if your Modbus Converter was built with a 202 modem. The most commonly used value is 10.
Reach-Through	
Enable Reach-through	Checking this box enables the port to be used as a terminal server. Most commonly used to Telnet through the port over LAN to a hub, switch, or router. From a command prompt, type the following *(note the spaces between each entry)*: telnet [IP address] [port] **Example**: telnet 192.168.1.100 3000
Port	Port number used for reach-through to a serial device.
Type	Select TCP or UDP traffic to be passed through to a serial device.

11.5 SNMP

The **Provisioning** > **SNMP** menu allows you to define and configure the SNMP settings.

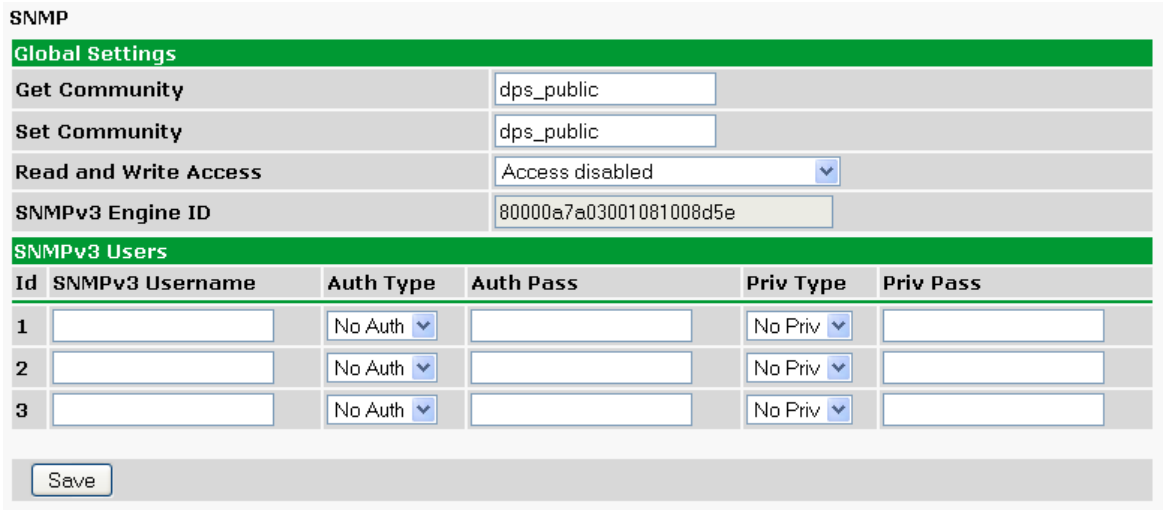


Fig. 10.8 *SNMP Menu*

Global Settings	
Get Community	Community name for SNMP requests.
Set Community	Community name for SNMP SET requests.
Read and Write Access	This field defines how the Modbus Converter unit may be accessed via SNMP. This can be set to the following: • Access Disabled- Restricts all access to unit via SNMP • SNMPv2c only- Allows SNMPv2c access only • SNMPv2c and SNMPv1-Only- Allows SNMPv1 and SNMPv2c access • SNMPv3, SNMPv2c and SNMPv1- Allows SNMPv3, SNMPv2c and SNMPv1 access
SNMPv3 Engine ID	Specifies the v3 Engine ID for your device. DPS recommends using the default ID for the unit, which is automatically generated by the unit.The default ID is generated according to RFC3411 and is based on the unit's unique MAC address and DPS Telecom's SNMP enterprise number. **Note:** To have the unit generate a unique Engine ID, clear the **v3 Engine ID** field and press the **Submit** key.

Fields in the Provisioning > SNMP settings

11.5.1 RADIUS

RADIUS (Remote Authentication Dial In User Service) is an industry-standard way to manage logins to many different types of equipment in one central location. The Modbus Converter connects to your central RADIUS server. Every time a device receives a login attempt (usually a username & password), it requests an authentication from the RADIUS server. If the username & password combination is found in the server's database, an affirmative "access granted" reply is sent back to the unit device, allowing the user to connect.

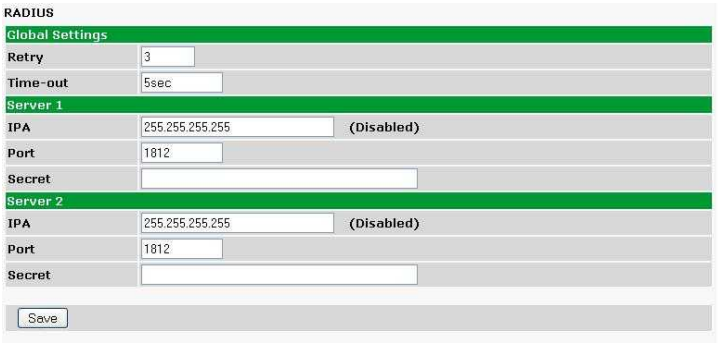


Fig. 10.9 *RADIUS configuration screen*

Fig. 10.10 *RADIUS server prompt for Username **and** Password.*

Global Settings	
Retry	Enter the number of times the RADIUS server should retry a logon attempt
Time-out	Enter in the number of seconds before a logon request is timed out
Servers 1 / 2	
IPA	Enter the IP address of the RADIUS server
Port	Port 1812 is an industry-standard port for using RADIUS
Secret	Enter the RADIUS secret in this field

After successfully entering the settings for the RADIUS server, the unit's Web Browser will prompt the user for both a Username and Password, which will be verified using the information and access rights stored in the RADIUS database.

RADIUS logons **are** case-sensitive. If the RADIUS server is unavailable or access is denied, the master password will work for craft port access only. Also, the "dictionary.dps" files (included on the Resource Disk) needs to be loaded on the RADIUS server for access-right definition. If RADIUS is enabled, the standard local authentication will not be valid.

11.6 Notifications

From the initial **Provisioning** > **Notifications** menu, you will see which of the 8 notifications are enabled, their server, and schedule. Click on the **Edit** link for one of the notifications to begin configuration.

Once you've chosen which notification you want to setup, check the **Enable Notification** to turn it "on." Then choose a notification method, either email, SNMP, voice call, or TRIP Dialup (T/Mon).

11.6.1 Notification Settings

1. Email Notification Fields

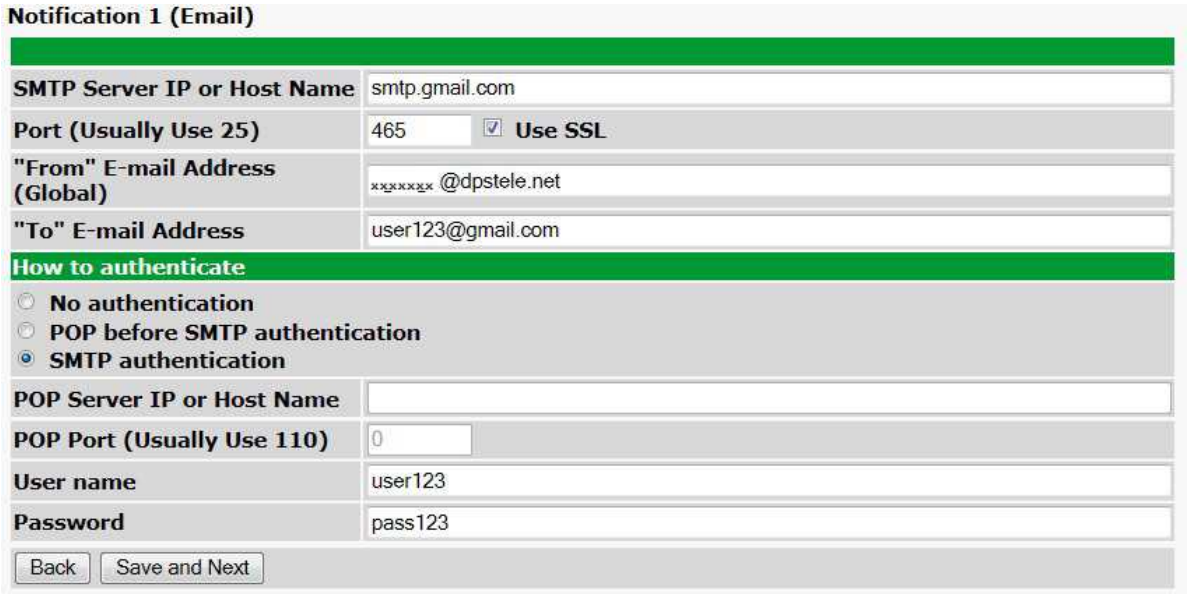


Fig. 10.11 *Editing Email Notification Settings*

Email Notification	
SMTP Server IP or Host Name	The IP address of your email server.
Port Number	The port used by your email server to receive emails, usually set to 25.
Use SSL	Check this box to use SSL encryption. This feature has been tested with Gmail. To send with Gmail SMTP server, do the following: • SMTP Server IP or Host Name should be set to "smtp.gmail.com" • Port number must be set to 465. • SMTP authentication radio button must be selected. • User name and password (below under "How to Authenticate") are the user name and password for the Gmail account in use.
"From" E-mail Address	Displays the email address (defined in the Edit menu > System) that the Modbus Converter will send emails from. Not editable from this screen.
"To" E-mail Address	The email address of the person responsible for this Modbus Converter, who will receive email alarm notifications.
User Name	User name for the Gmail account being used.
Password	Password for the Gmail account being used.

Note: If you want to send authenticated emails, click the appropriate radio button. If you enable POP authentication, you will have to enter the relevant authentication information the fields below.

2. SNMP Notification Fields

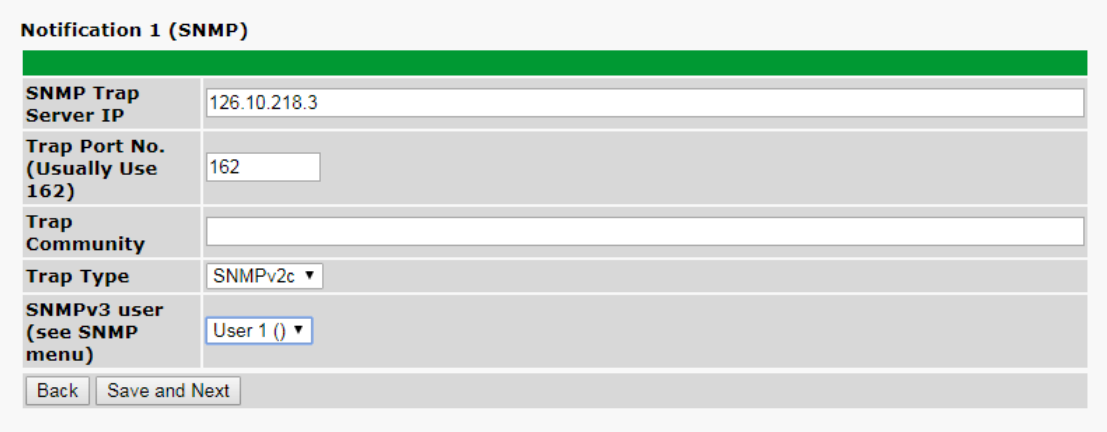


Fig. 10.12 *Editing SNMP notification settings*

SNMP Notification	
SNMP Trap Server IP	The SNMP trap manager's IP address.
Trap Port No.	The SNMP port (UDP port) set by the SNMP trap manager to receive traps, usually set to 162.
Trap Community	Community name for SNMP TRAP requests.
Trap Type	Indicate whether you would like to send SNMP v1, v2c or v3 traps.
SNMPv3 User	Indicate which user profile to authenticate the trap with SNMPv3. Users are configured in SNMP menu.

3. Syslog Notification Fields

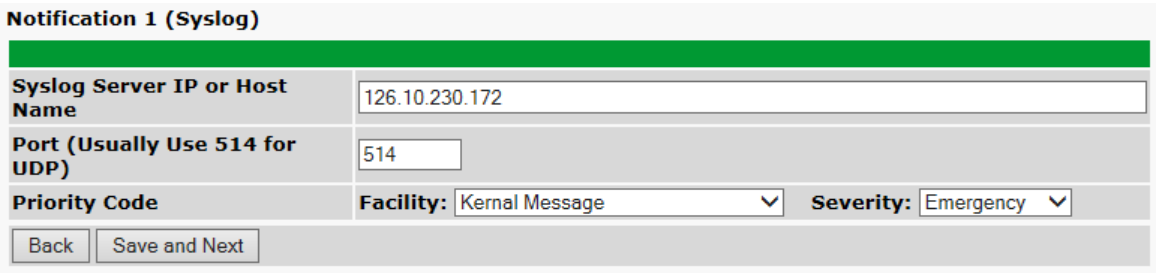


Fig. 10.14 *Editing Syslog Notification Settings*

Syslog Notification	
Syslog Server IP or Host Name	The IP address of your Syslog Server
Port	The port used by your Syslog Server to receive Syslog notifications, usually set to 514
Priority Code	**Facility**: Used to determine the type of program that is logging the message
	Severity: Used to determine the severity of the message being

	logged.

11.6.2 Schedule

The notifications scheduling menu is where you will tell the Modbus Converter exactly which days and times you want to receive alarm notifications. You set 2 different schedules for each.

Fig. 10.18 *The Schedule creation screen*

Notification Scheduling	
Days of the week	From either Schedule 1 or 2, check which days you want to receive notifications.
Any Time	Select this is if you want to receive alarm notifications at any time for the day(s) you've selected.
Notification Time	Tells the unit to only send notifications during certain hours on the day(s) you've selected.

11.7 Modbus Devices

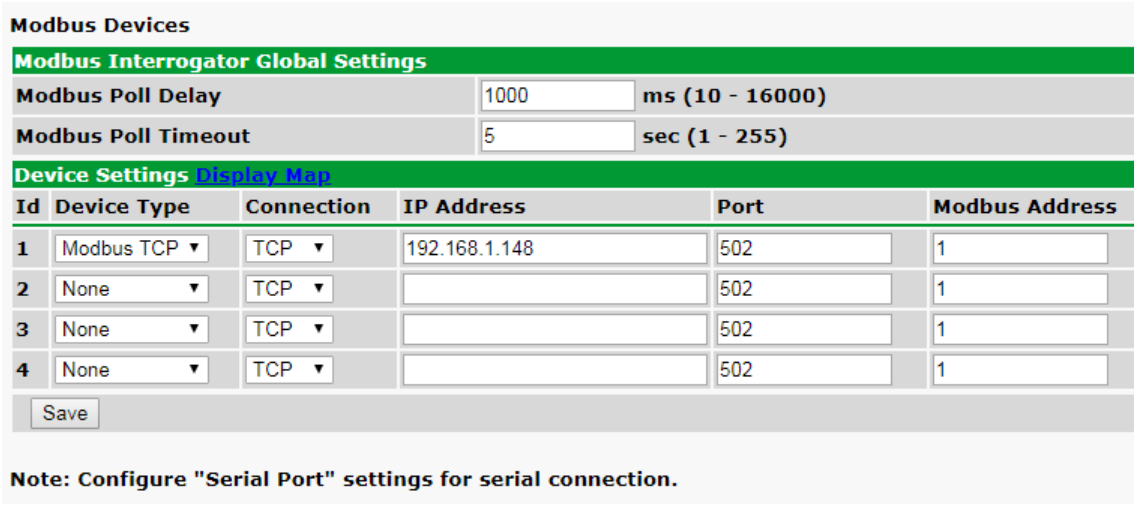


Fig. 10.25 *Provisioning > Modbus Devices*

Global Settings	
Modbus Poll Delay	Delay between Modbus polls in milliseconds.
Modbus Poll Timeout	Time duration before the Modbus response time fails in seconds.
Device Settings	
ID	Modbus device ID.
Device Type	Modbus device type.
Connection	Select "Serial" for using Modbus over serial or "TCP" if using Modbus over LAN.
IP Address	IP used for polling when using TCP Modbus. Unused otherwise.
Port	TCP or physical serial port used when performing Modbus polling.
Modbus Address	Address of Modbus device.

11.8 Modbus Registers

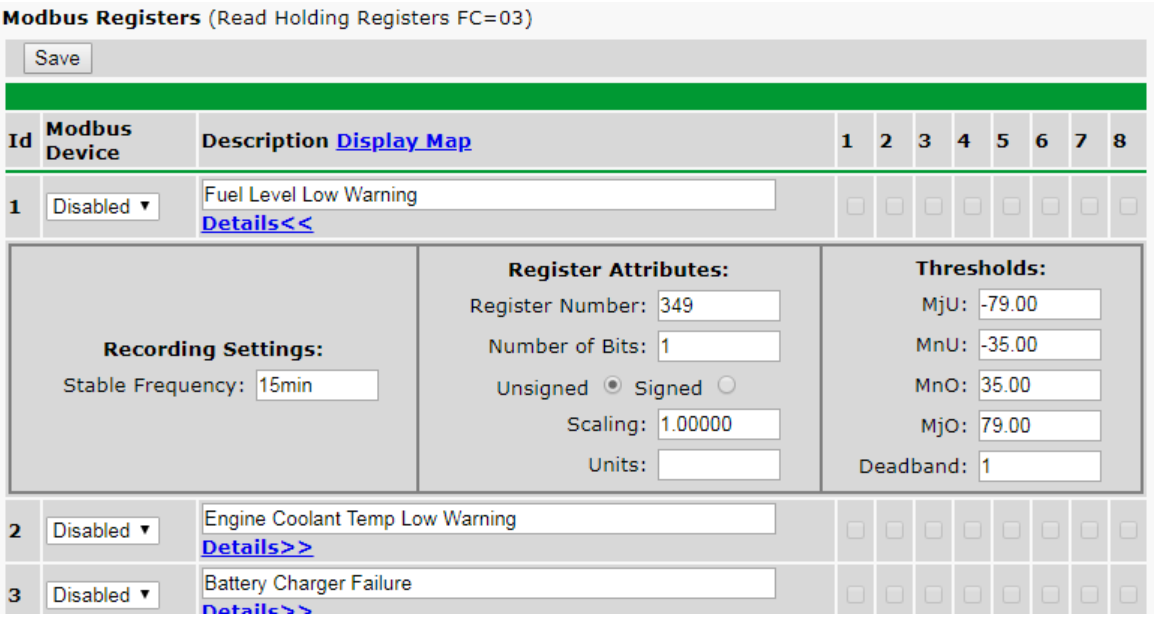


Fig. 10.26 *Provisioning > Modbus Registers*

Basic Configuration	
ID	Modbus register ID
Modbus Device	Modbus device settings used when polling.
Description	User-definable description for the Modbus register.
Notifications	Check which notification device(s), 1 through 8, you want to send alarm notifications for that Modbus register.
Details	
Recording Settings	
Stable Frequency	Frequency used when logging response history.
Register Attributes	
Register Number	Register to be polled.
Number of Bits	Number of bits used to mask the response value.
Unsigned/Signed	Interpret the response value as signed or unsigned.
Scaling	Scaling factor that the response value is multiplied by.
Units	Units displayed with the response value (ex. "%" or "F" or "C" for analogs)
Thresholds	
MjU (Major Under) MnU (Minor Under) MnO (Minor Over) MjO (Major Over)	Threshold settings that, when crossed, will prompt the NetGuardian to set an alarm. Recorded values less than an under value or greater than an over value will cause alarms.
Deadband	The additional qualifying value the Modbus Converter requires above/below your alarm thresholds in order to set an alarm. This prevents alarm "flickering" by requiring a significant change before toggling the threshold's alarm/clear state.

11.9 Sensors

D-Wire Sensors
The Modbus Converter supports up to 32 daisy-chained D-Wire sensors via its D-Wire input. Sensors connected to the Modbus Converter will appear in the web interface. The background color of the ROM field indicates the configuration state of that sensor (detected, configured, not configured, etc.) with a color code.

Also, the Modbus Converter's first D-Wire sensor is a permanent, internal sensor used to monitor the internal temperature. The internal temperature sensor measures a range of -40° F to 180° F (-40° C to 82.2° C) within an accuracy of about ± 2°.

Basic configuration for the Modbus Converter's D-Wire temperature sensors can be accomplished from the **Provisioning** > **Sensors** menu. From this screen, you can configure D-Wire sensors, select notification devices, and set thresholds.

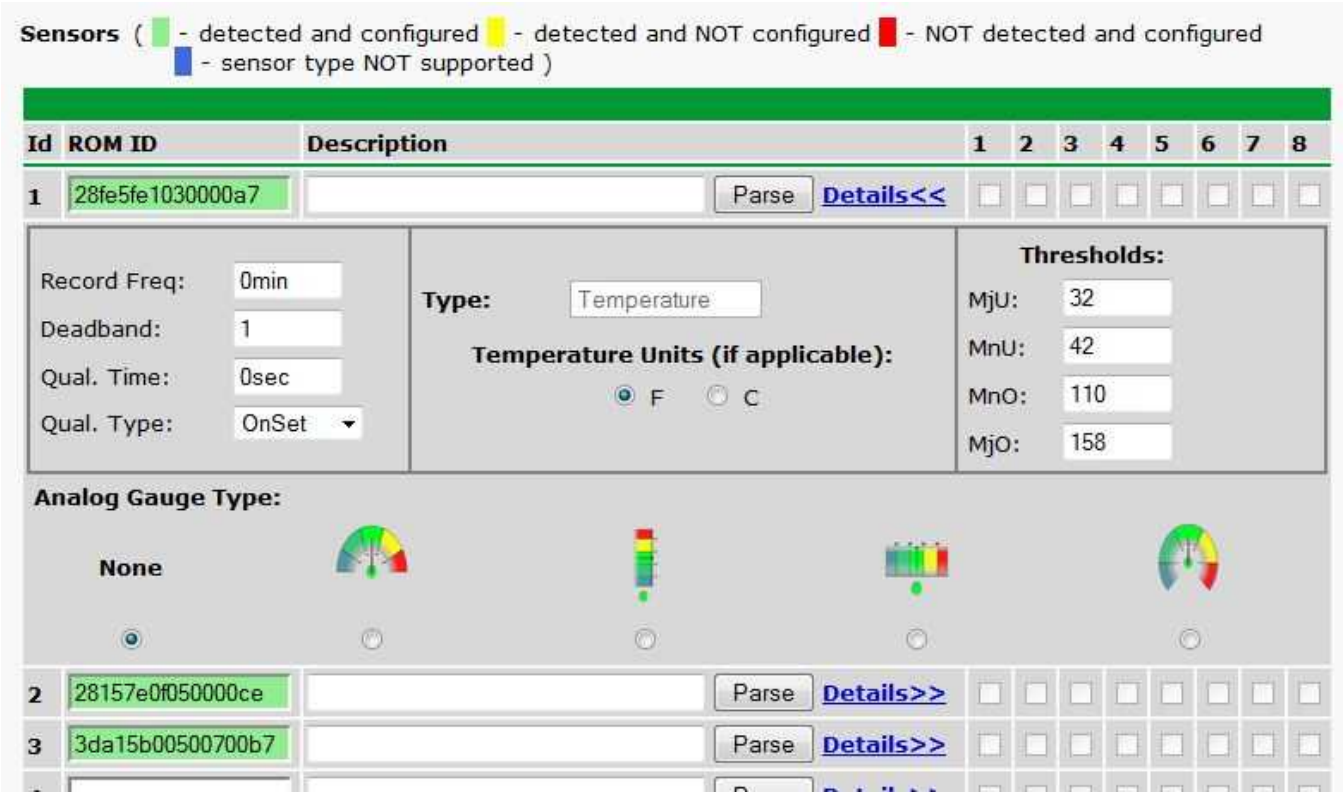


Fig. 10.22 *The Provisioning > Sensors menu*

Basic Sensor Configuration	
ID	Sensor ID number.
ROM ID	The ID number found on the sticker of the temperature sensor node. Your Modbus Converter will automatically detect the sensor ID when you plug a sensor into the unit. The color of the sensor ID field will tell you the status of the connected sensor. **Green** - The sensor is connected and properly configured. **Yellow** - The sensor is connected but has not yet been configured (fill in your configuration fields and click **Save** to configure the sensor).

	Red - The sensor is not detected and configured (i.e. a previous configured sensor is no longer connected). **Blue** - The sensor is not supported by the Modbus Converter. To reconfigure or disable the Sensor ID, simply delete any data in this field and click **Save**. The unit will refresh the sensor ID on that channel.
Description	User-definable description for the sensor channel.
Parse	Checks to see if the **Description** field contains a valid equation.
Notification Devices	Check which notification device(s), 1 through 8, you want to send alarm notifications for that alarm point.
Advanced Sensor Configuration (Details>>)	
Record Freq	The amount of time, in minutes (min) or seconds (s), between each recorded sensor value.
Deadband	The amount (in native units) that the channel needs to go above or below a threshold in order to cause an alarm.
Qual Time (Qualification Time)	The length of time that must pass, without interruption, in order for the condition to be considered an Alarm or a Clear.
Qual. Type (Qualification Type)	Allows you to choose whether you want to apply the Qualification Time to the alarm Set, Clear, or Both.
Thresholds	These settings are set to indicate the severity of the alarm depending on which threshold values have been passed. Enter values for Major Under (MjU), Minor Under (MnU), Minor Over (MnO), and Major Over (MjO).
Analog Gauge Type	Select the color-coded gauge that best represents your data. Selecting **None** will disable the analog gauge and only a numerical representation of the value will be displayed under **Monitor** > **Sensors**.

Note: Before plugging in any additional D-Wire Sensors, set up the internal sensor.

Script Sensors
A Script Sensor can be setup by entering a script type in the sensor ID field. The following types are currently supported:

~count - The equation will be evaluated continuously. If the evaluation changes at any point, the sensor's value increases by an increment of 1. This mode can be useful for counting the number of times a discrete input toggles.

Evaluation Sensor; every tenth of a minute (6 seconds).
~evalMt - The equation is evaluated every 6 seconds and its result becomes the sensor's value.

Evaluation Sensor; every minute.
~evalMn - The equation is evaluated every 60 seconds and its result becomes the sensor's value.

Interval counter.

Interval Sensor
~intCnt - Sensor value will increment when the associated input's pulse length (high or low) is within a set interval. Example: **D5 V1000>V60000<** means the sensor value will increment when a 1ms to 60ms pulse is detected on Discrete Input 5. This is useful for frequency detection/tracking.

A Script Sensor is configured to evaluate Reverse Polish Notation equations. A data token in an equation can represent a discrete alarm, analog reading, sensor reading, relay status, system alarm status, or a constant value. The format for a token in an equation must be a data type followed by an index (for example: Discrete Input 1 in an equation would be represented as "d1", Analog Channel 3 would be "a3", etc.). Each token is typically followed by another token or an operator. The equations are entered in the description field for the Script Sensor.

Valid data types:	
d	Discrete Input
a	Analog Channel
r	Relay State
n	Sensor
v	Positive Integer Constant
s	System Alarm

Valid operations:	
+	Addition
-	Subtraction
*****	Multiplication
/	Division[1]
>	Greater than
<	Less than
|	Conditional Halt[2]

1. Division is NOT executed if the denominator's absolute value is less than 1!
2. An equation is evaluated until it reaches the Conditional Halt. If the running value at that point is zero, then the evaluation stops, otherwise the evaluation continues as a new equation.

How equations are evaluated:
Calculations are performed from left-to-right until the end of the equation is reached. As the equation is parsed, each token's value is pushed onto a stack until an operator is found. When an operator is found, the previous 2 values are popped from the stack and are used to perform the operation (the first item popped is the SECOND operand). The result of the operation is then pushed onto the stack. This repeats until the end of the equation is reached. An equation is valid only if there is exactly ONE item left in the stack when the end of the equation is reached.

Example of how an equation is evaluated:

Equation: a8 a5 a6 + * a4 -

Input	Operation	Stack	Comment
a8	Push value	a8	
a5	Push value	a5 a8	
a6	Push value	a6 a5 a8	
+	Add	(a5+a6) a8	Pop a6 and a5, add them, push result to stack
*****	Multiply	a8*(a5+a6)	Pop (a5+a6) and a8, multiply them, push result to stack
a4	Push value	a4 a8*(a5+a6)	
-	Subtract	a8*(a5+a6) - a4	Pop a4 and a8*(a5+a6), subtract them, push result to stack

In this example, after the subtraction there is only ONE item left in the stack (which is the result of all of the previous computations), making this a valid equation.

11.9.1 HVAC Monitoring

Temperature / Air Flow sensors can be used to monitor HVAC health. Enabling HVAC Monitoring on this sensor type adds the extra fields below.

Sensor with HVAC Monitoring enabled.

HVAC Monitor Mode	
Air Flow Qual Time	The time the HVAC has between starting and reaching operational Air Flow and Vent Temperature
Mate	The ROM ID for the temperate sensor in the same package as the Air Flow sensor
Air Flow Thresholds	Set MjU to -20
	Set MnU to -10
	Set MnO to a small, positive value. Once the air flow gets to that value, the HVAC will be considered starting.
	Set MjO to a higher value. This value will be the minimum amount of airflow required to be considered operational. An alarm will trigger if this threshold is not passed by the Air Flow Qual Time expires.
Temperature Thresholds	For a cooling HVAC, the vent temperature should reach between Cooling Under and Cooling Over.
	For a warming HVAC, the vent temperature should reach between Heating Under and Heating Over.
	An alarm will trigger if one of the above thresholds is not reached before Air Flow Qual

	Time expires.

Note: When in HVAC Monitor Mode, the Temp sensor *Qual Type* is defaulted to *On Clear,* and the Air Flow sensor *Qual Type* is defaulted to *On Both*.

Setting up a Temperature/Air Flow Sensor as an HVAC Monitor:

1. In Provisioning->Sensors, open the Details menu of the airflow sensor that is going to be used as the HVAC Monitor.
2. Check the 'HVAC Monitor' checkbox
3. *Save* and *Write* changes. This will expand menu to display HVAC Monitor Settings.
4. Set Qual Time to allow the HVAC unit adequate time to start up (ex: 10sec).
5. Set the thresholds to the following:
    - MjU = -20
    - MnU = -10
    - MnO = 10
    - MjO = 75

    -Though the values listed above will work in most situations, they can be adjusted as needed.
3. Return to Provisioning-> Sensors->details menu of the airflow sensor being used as the HVAC Monitor and confirm that the new field named 'Mate' that has appeared underneath the HVAC monitor checkbox contains the ROM ID of the temperature sensor that is also being used to monitor HVAC health

11.10 Ping Targets

The **Provisioning** > **Ping Targets** menu allows you to configure the Description, IP Address, and Notification Devices for each of your ping targets.

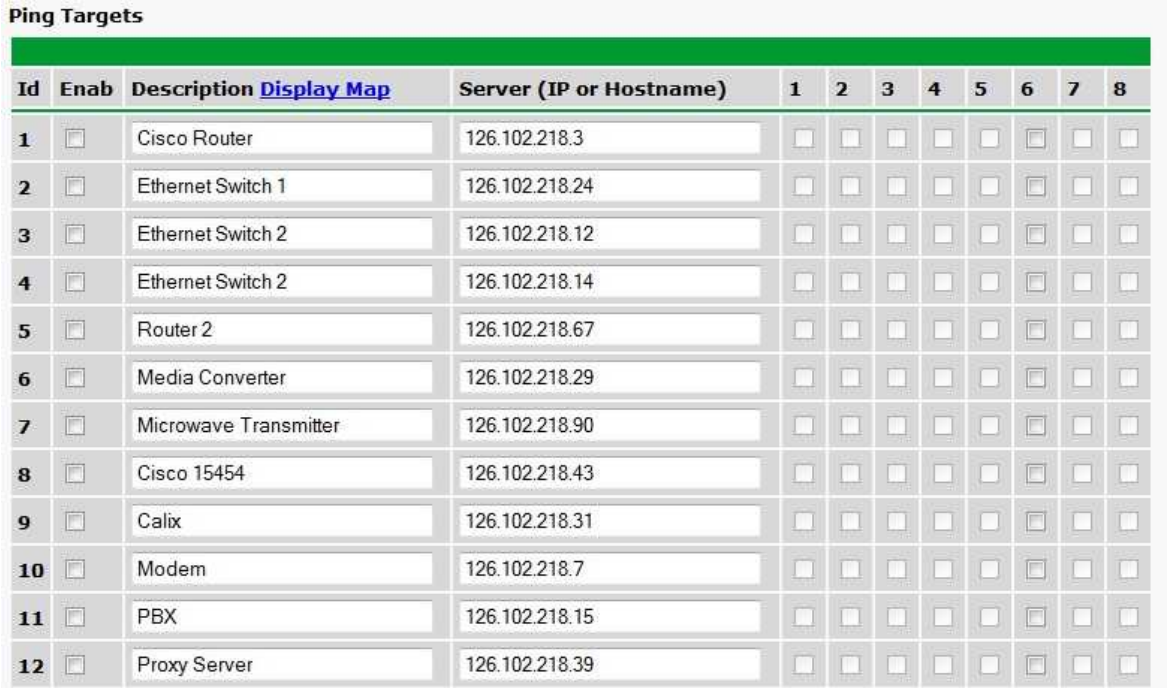


Fig. 10.23 *The Provisioning > Ping Targets menu*

Provisioning Ping Targets	
ID	ID number for the ping target.
Enab	Check this box to enable the ping target.
Description	User-definable description for the ping target.
Server (IP or Hostname)	IP address or hostname of the device you would like to ping.
Notification Devices	Check which notification device(s), 1 through 8, you want to send alarm notifications for ping target.

11.11 System Alarms

See "Display Mapping" in the Reference Section for a complete description of system alarms.

Fig. 10.28 *The Provisioning > System Alarms menu*

Editing System Alarms	
Pnt (Point)	The system alarm point number
Description	Non-editable description for this System (housekeeping) Alarm.
Silence	Check this box to choose to silence this alarm.
Notification Devices	Check which notification device(s), 1 through 8, you want to send alarm notifications for that alarm point.

11.12 Timers

Enter the amount of time in seconds (sec) or minutes (m), in each value field and click **Save**.

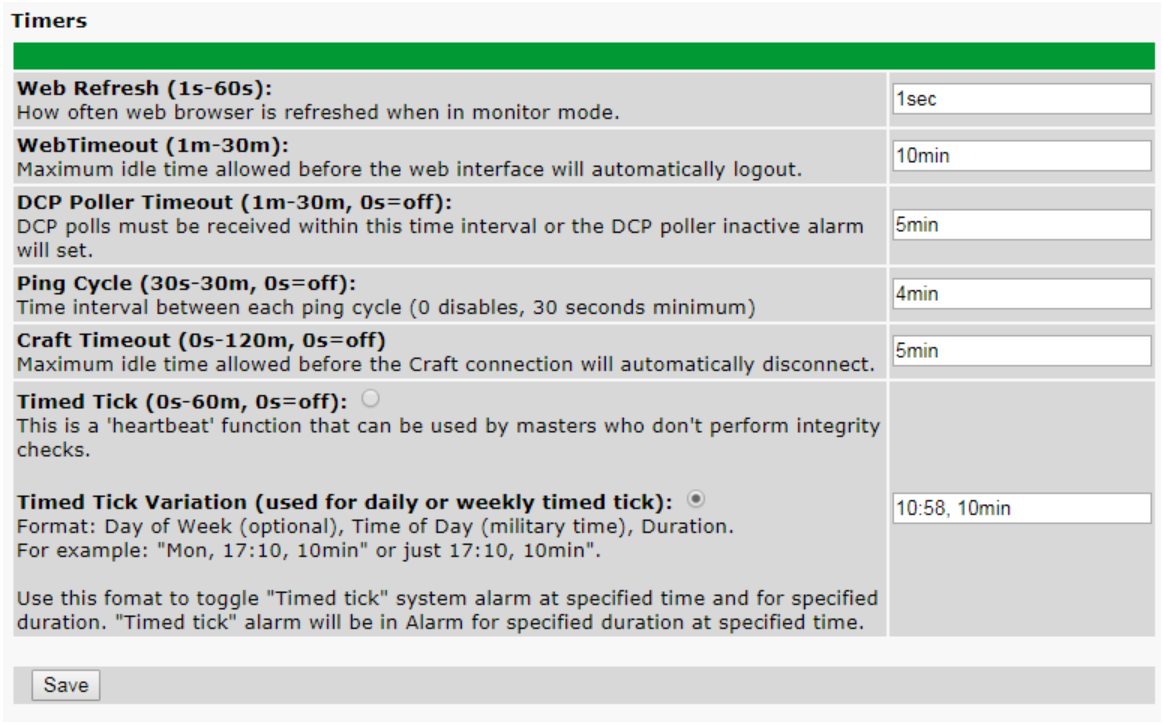


Fig. 10.29 *The Provisioning > Timers menu*

11.13 Date and Time

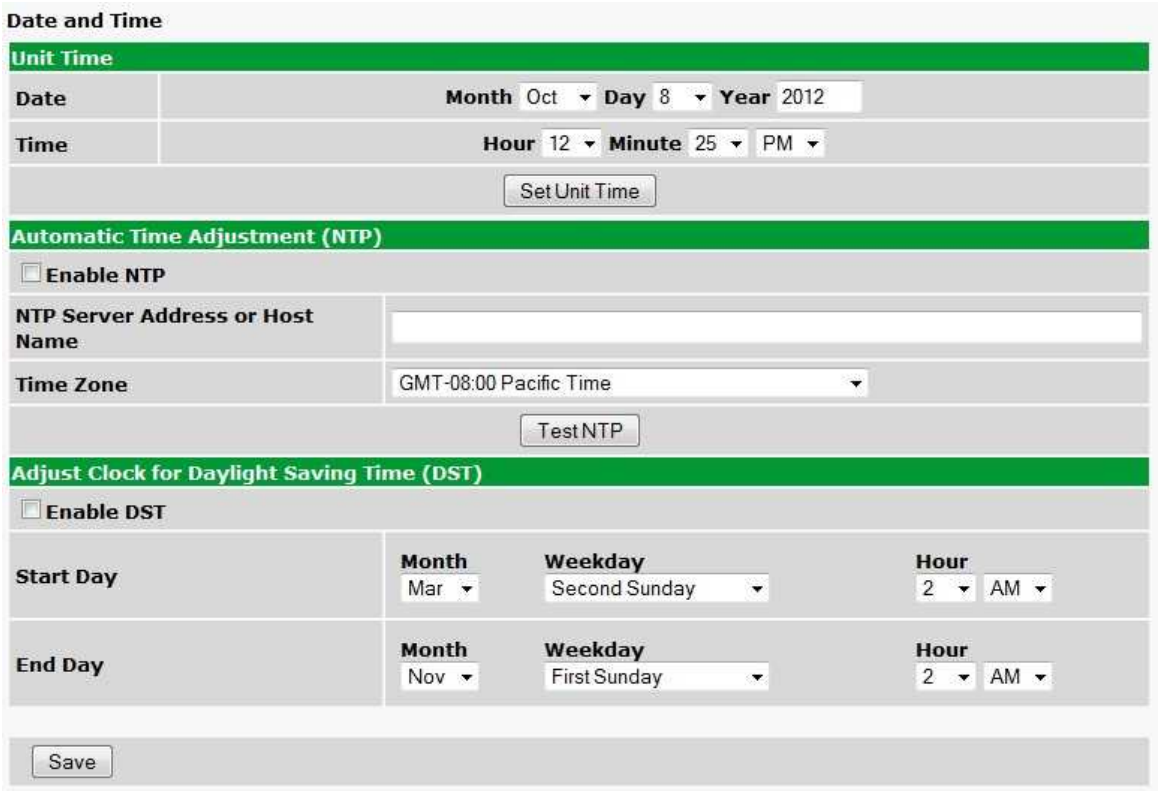
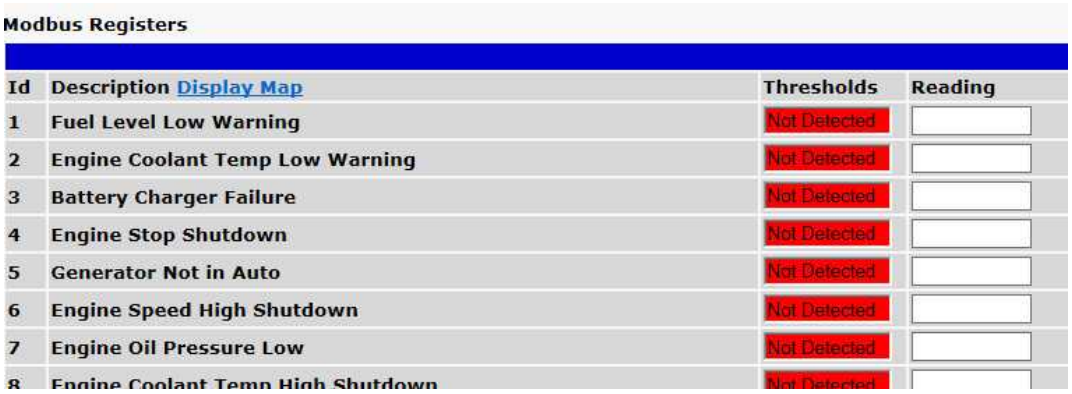


Fig. 10.30 *The Provisioning > Date and Time menu*

Unit Time	
Date	Set today's date.
Time	Set the current time.
Automatic Time Adjustment (NTP)	
Enable NTP	Check this box to enable Network Time Protocol.
NTP Server Address or Host Name	Enter the NTP server's IP address or host name, then click **Sync**. Example: us.pool.ntp.org. **Note**: Make sure to configure DNS before using host name instead of IP address.
Time Zone	Select your time zone from the drop-down menu.
Adjust Clock for Daylight Savings Time (DST)	
Enable DST	Check this box to have the Modbus Converter observe Daylight Savings.
Start Day	Select the month, weekday, and time when Daylight Savings will begin.
End Day	Select the month, weekday, and time when Daylight Savings will end.

12 Monitoring via the Web Browser

12.1 Modbus Registers

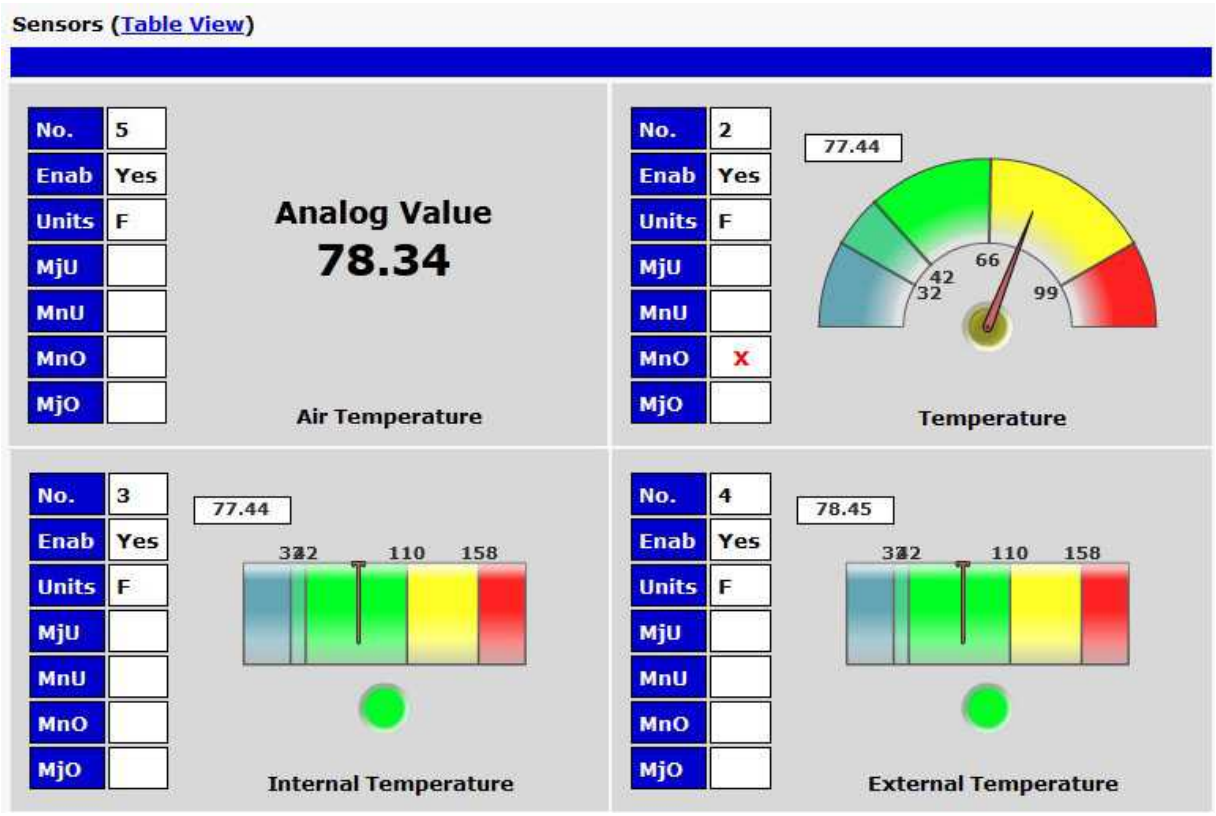


Monitor > Modbus Registers

This selection provides the status of the Modbus registers being polled by the unit. The Monitor > Modbus Registers screen provides a description of each Modbus register, the current response value along with the units, and alarm conditions (major under, minor under, minor over, major over) according to your settings.

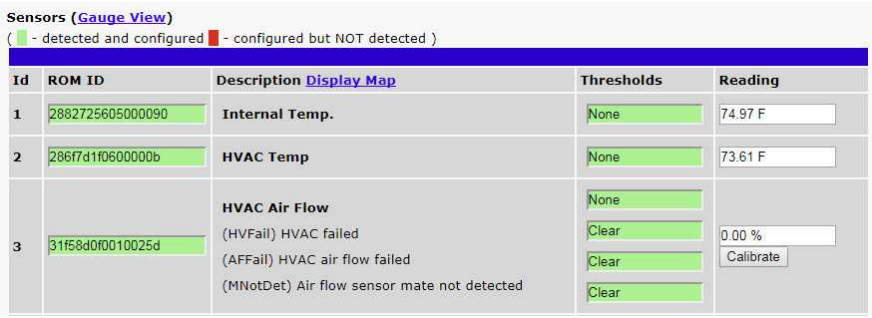
12.2 Sensors

This selection provides the status of the system's analog channels by indicating if an alarm has been triggered. The **Monitor** > **Sensors** screen provides a description of each analog channel, the current reading, the units being read, and alarm conditions (major under, minor under, major over, minor over) according to your temperature settings. If configured under **Provisioning** > **Sensors**, your analog values will be displayed as a graphical gauge. Selecting **Table View** will display a non-graphical interface of your values.



The Monitor > Sensors menu

12.2.1 HVAC Monitoring



When using a Temp/Air Flow sensor for HVAC Monitoring, the HVAC Air Flow sensor monitor section will display 4 thresholds instead of one.

Alarm Descriptions	
HVAC Air Flow	This alarm will tell you if there is air flow coming from the HVAC unit.
(HVFail) HVAC Failed	This alarm will trigger if the temperature is not within Heating or Cooling range by the time Air Flow Qual Time expires, or if during operation Temperature goes out of Heating or Cooling range.
(AFFail) HVAC Air Flow Failed	This alarm will trigger if air flow gets to Minor Over but doesn't reach Major Over by Air Flow Qual Time.
(MNotDet) Air Flow Sensor Mate Not Detected	This alarm will trigger if the mated Temp sensor is not detected.

12.3 Ping Targets

Ping Targets can be viewed by going to **Monitor** > **Ping Targets**. Here you can view the state (either **Clear** or **Alarm**) for each of your configured Ping Targets.

Ping Targets

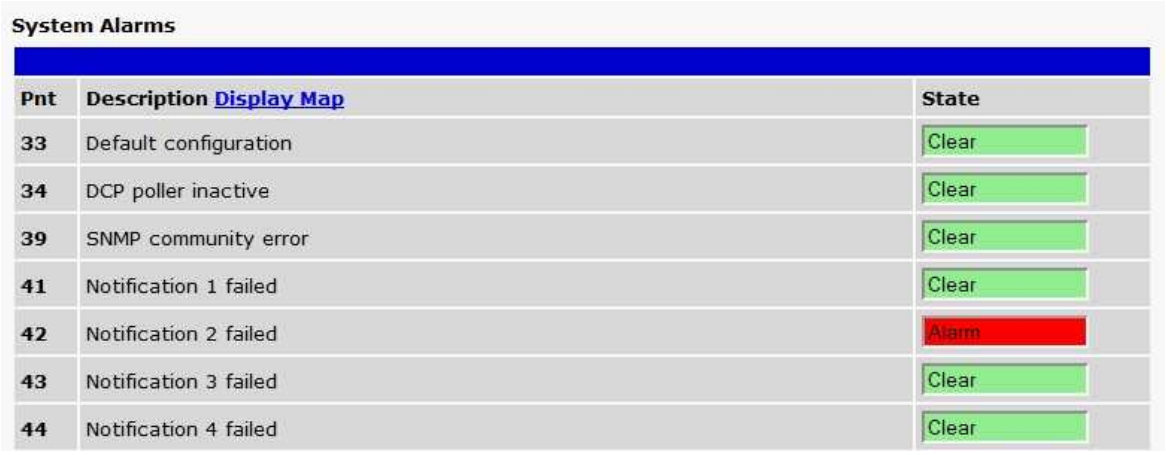
Id	Description Display Map	State
1	Cisco Router	Clear
2	Ethernet Switch 1	Clear
3	Ethernet Switch 2	Clear
4	Ethernet Switch 2	Clear
5	Router 2	Clear
6	Media Converter	Clear
7	Microwave Transmitter	Clear
8	Cisco 15454	Clear
9	Calix	Clear
10	Modem	Clear
11	PBX	Clear
12	Proxy Server	Clear

View the status of Ping Targets from the Monitor > Ping Targets menu.

12.4 System Alarms

System alarms are not-editable, housekeeping alarms that are programmed into Modbus Converter. The **Monitor** > **System Alarms** screen provides the status of the system alarms by indicating if an alarm has been triggered. Under the **State** column, the status will appear in red if an alarm has been activated. The status will be displayed in green when the alarm condition is not present.

See "Display Mapping" in the Reference Section for a complete description of system alarms.



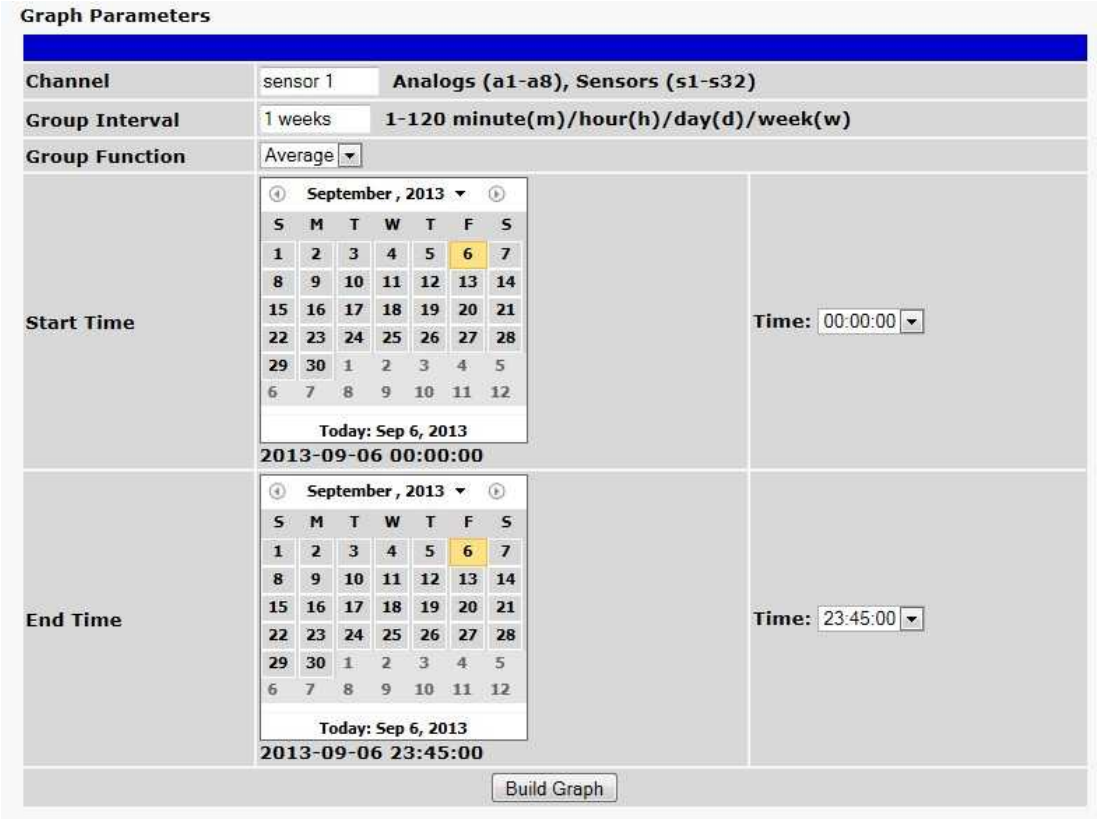
System Alarms

Pnt	Description Display Map	State
33	Default configuration	Clear
34	DCP poller inactive	Clear
39	SNMP community error	Clear
41	Notification 1 failed	Clear
42	Notification 2 failed	Alarm
43	Notification 3 failed	Clear
44	Notification 4 failed	Clear

View the status of System Alarms from the Monitor > System Alarms menu.

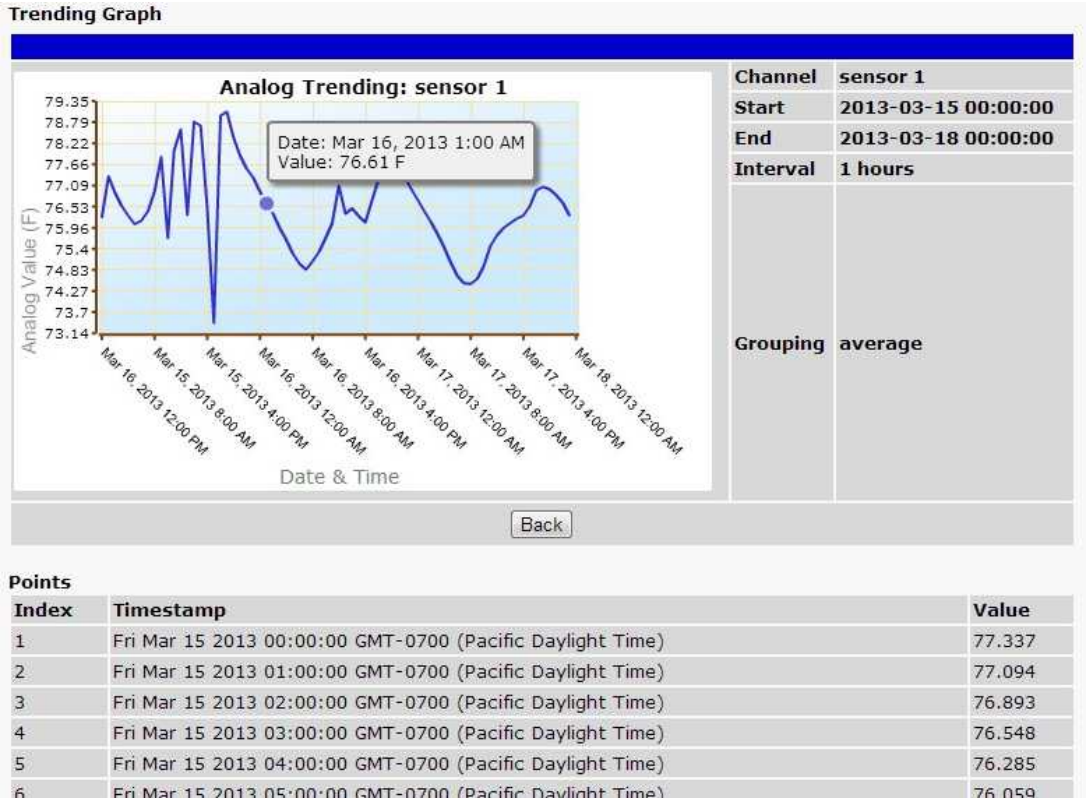
12.5 Graph

The Graph section of the monitor menu lets you build a graph of past analog and sensor measurements, which gives you a visual indication of data over time and points out trending values. To create your Graph, specify the Channel (Analogs 1-8 or Sensors 1-32), Group Interval (1-120 minutes, hours, days, or weeks), the Group Function (Average, Min, Max), and Start & End Times. Once you have entered all of the desired values, click "Build Graph."



Provision the Channels, Group Interval, Group Function and more - all from the Graph Parameters section of the web browser interface.

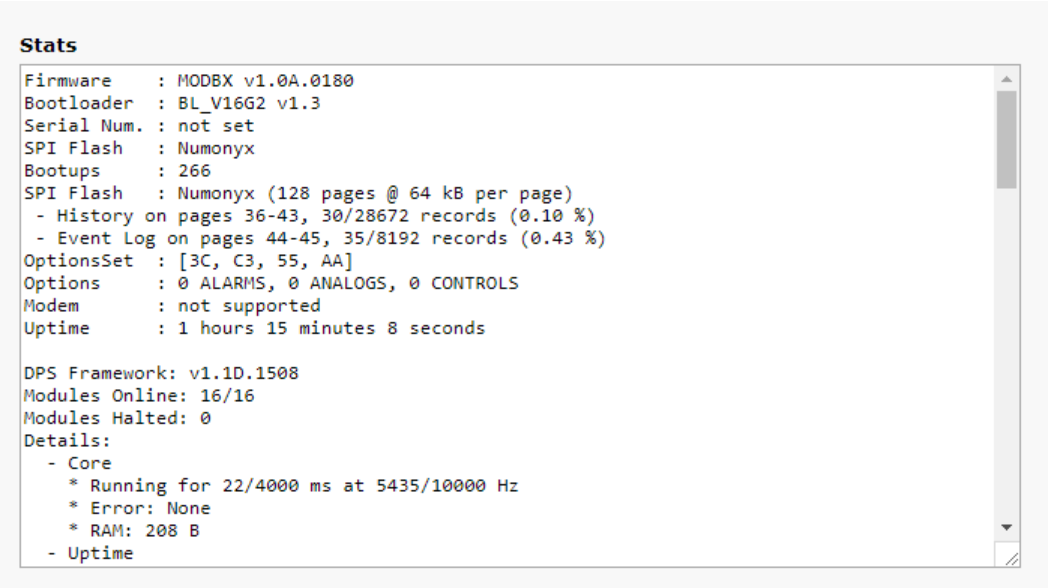
Your graph will appear on the next screen. This graph is Adobe Flash-based and allows you to mouse over the lines to quickly view measurements (date, time, and value) within their context of the overall graphing trend. Below the graph is a full textual list of all indexed points with their dates and values.



Specify your parameter values and build an interactive graph based on the alarm point history.

12.6 Stats

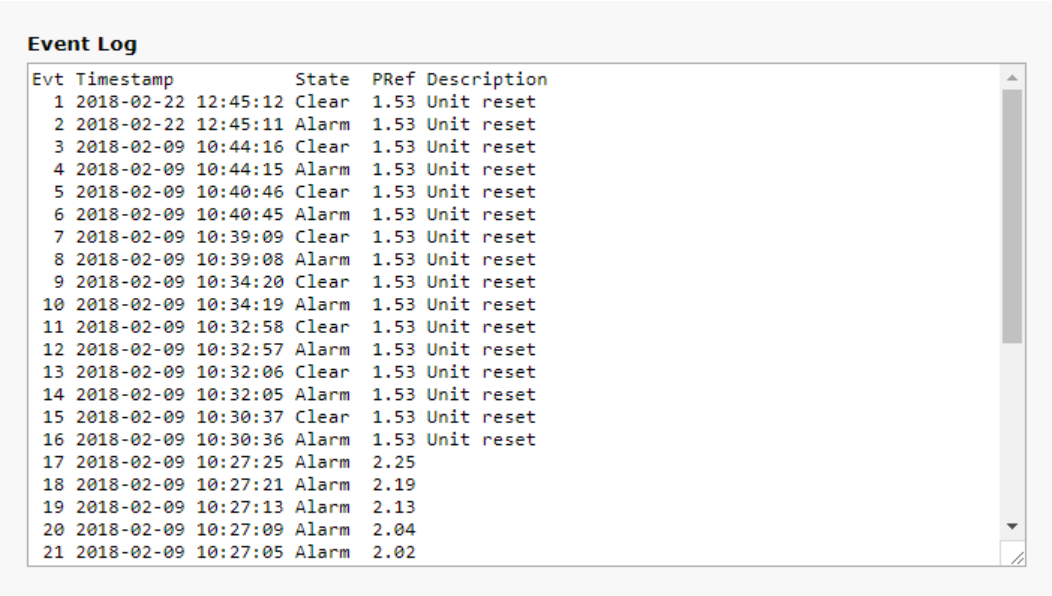
The Stats screen shows various information about your device and its firmware, hardware, and configuration. Much of this data will only be useful when you are working with DPS Tech Support. It allows us to serve you more quickly by understanding your exact situation.



Device Stats Screen

12.7 Event Log

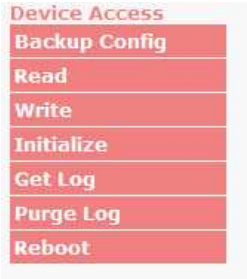
The Event Log is a built-in history record of events that are detected by your device. These can include events like discrete alarms, discrete clears, system alarms, and sensor/analog threshold crossings. You can view the event log in the web interface and export it (ex. CSV) for long-term storage or analysis (ex. SQL database import).



Event Log Screen

13 Device Access Descriptions

The **Device Access** options, listed in pink on the left side of the web interface, provide options for generating reports, updating the Modbus Converter's firmware, and rebooting the unit. Click any of the options under **Device Access** to perform the desired action.



The control menu is located in the bottom left of the web interface

Device Access Option	Description
Backup Config	Backs up the units configuration settings
Read	Reads a configuration file from the unit
Write	Commits all changes made in the web interface to the Modbus Converter's non-volatile memory
Initialize	Sets the unit's configuration to factory default values
Get Log	Opens the Modbus Converter's event log in Notepad (or another plain text editor).
Purge Log	Deletes the Modbus Converter's event log history.
Reboot	Reboots the Modbus Converter.

14 Backup Configuration

With the Modbus Converter you can backup your current configuration from the Web Interface. These configuration files can then be uploaded later, or uploaded to other Modbus Converter units.

The Backup Config tab is located in the Device Access menu shown above.

How to backup your current configuration:

1. Click the Backup Config tab from the Device Access menu.
2. When prompted by your web browser, download the file to your desktop or other location on your computer.
3. Now your configuration should be saved. If you need to upload a configuration, follow the steps below.

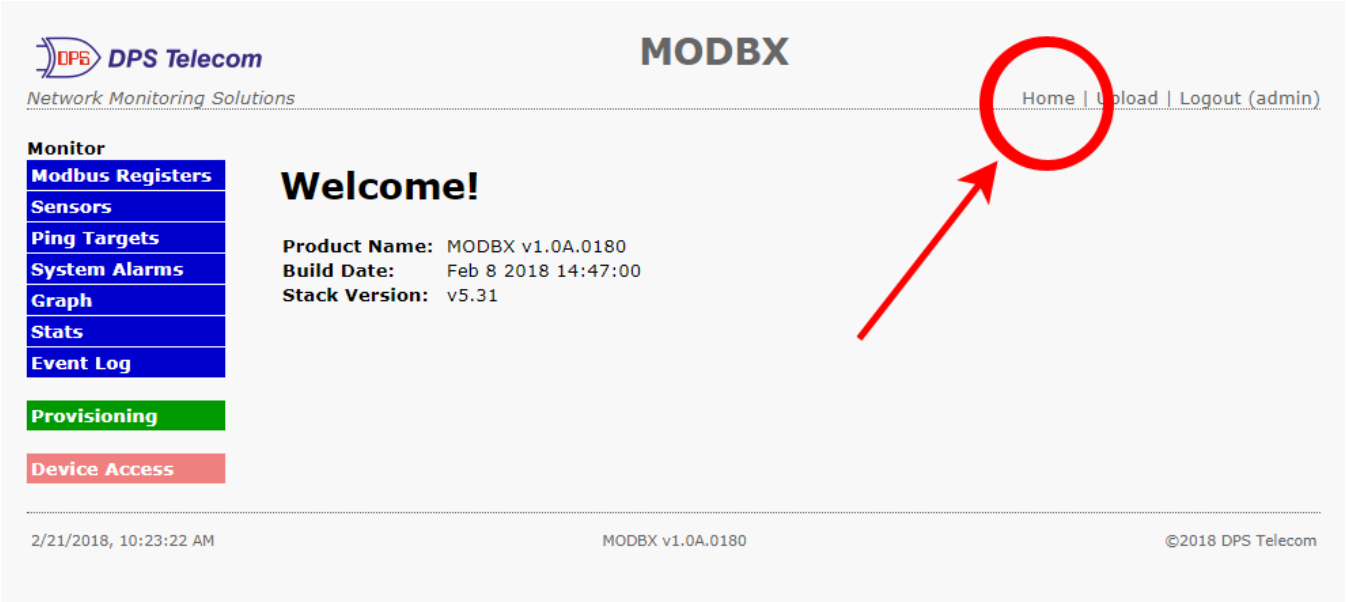


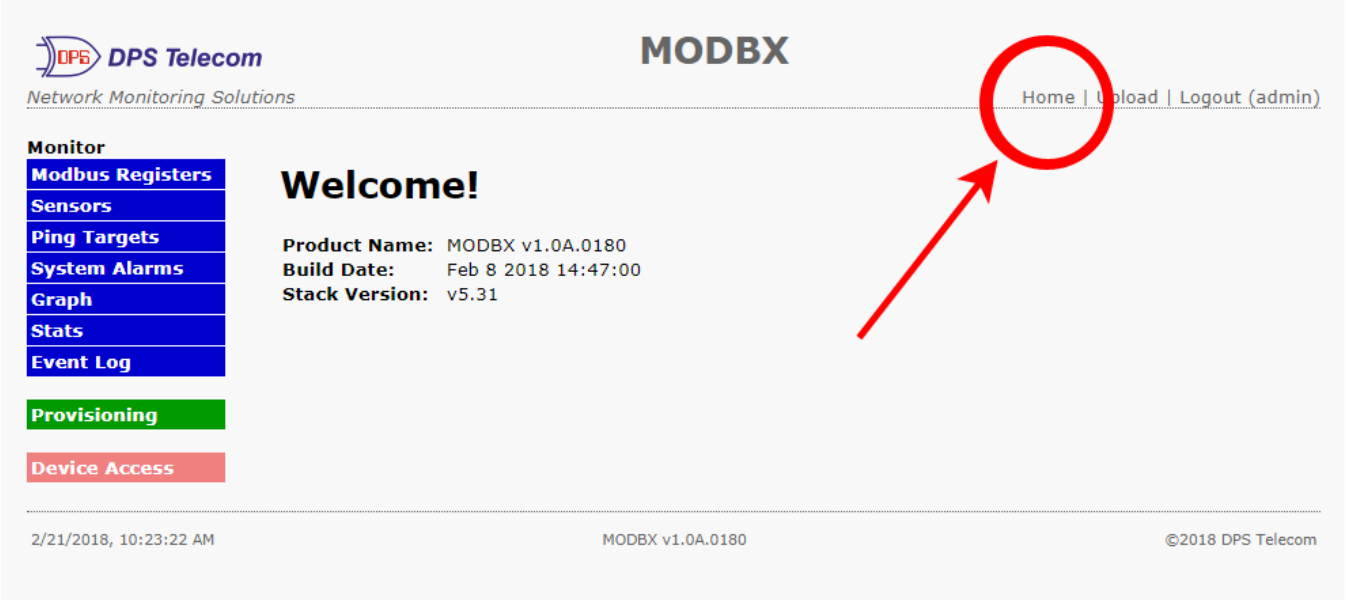
Fig. 13.2 *To upload your configuration file, click on* ***Upload*** *on the top right corner of the web interface*

How to upload a saved configuration:

1. Click the upload button at the top right corner of the Welcome screen.
2. Click the Browse... button
3. Browse to the location of the .bin file from the steps above.
4. Select that .bin file and press the Upload button.
5. You should now have the same configuration settings loaded from when you saved the .bin file above.

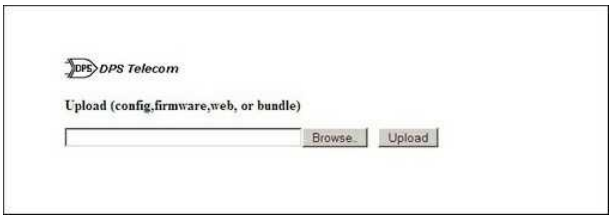
15 Firmware Upgrade

To access the **Firmware Load** screen, click on the **Provisioning** > **System** menu. At the bottom of this screen, click the **Restore Configuration** link located in the **System Controls** section.



*To upload firmware, click on **Upload** on the top right corner of the web interface*

At the **Firmware Load** screen, simply browse for the firmware update you've downloaded from www.dpstele.com and click **Load**.



Browse for downloaded firmware upgrade

16 Reference Section

16.1 Display Mapping

Display Mapping

Display	Point	Description
Display 1	1-8	Discrete Alarms 1-8
	9-16	Undefined
	17-22	Controls 1-6
	23-32	Undefined
	33	Default configuration
	34	DIP Switch Config
	35	MAC Address Not Set
	36	IP Address Not Set
	37	LAN Hardware Error
	38	SNMP Processing Error
	39	SNMP community error
	40	LAN TX packet drop
	41	Notification 1 failed
	42	Notification 2 failed
	43	Notification 3 failed
	44	Notification 4 failed
	45	Notification 5 failed
	46	Notification 6 failed
	47	Notification 7 failed
	48	Notification 8 failed
	49	NTP failed
	50	Timed tick
	51	Serial RCV Q
	52	Dynamic Mem Full
	53	Unit Reset
	54	DCP Poll Inactive
	55	Reserved
	56	Reserved
	57	Reserved
	58	Reserved
	59	Reserved
	60	Reserved
	61	Reserved
	62	Reserved
	63	Reserved
	64	Reserved
Display	Point	Description
Display 2	1-32	Ping Alarms 1 - 32
	33-64	Generator Alarms 1-32
Display	Point	Description
Display 3	1	Analog 1 Minor Under
	2	Analog 1 Minor Over

	3	Analog 1 Major Under
	4	Analog 1 Major Over
	9-16	Control
	17-32	Value
	33	Analog 2 Minor Under
	34	Analog 2 Minor Over
	35	Analog 2 Major Under
	36	Analog 2 Major Over
	41-48	Control
	49-64	Value
Display	Point	Description
Display 4	1	Analog 3 Minor Under
	2	Analog 3 Minor Over
	3	Analog 3 Major Under
	4	Analog 3 Major Over
	9-16	Control
	17-32	Value
	33	Analog 4 Minor Under
	34	Analog 4 Minor Over
	35	Analog 4 Major Under
	36	Analog 4 Major Over
	41-48	Control
	49-64	Value
Display	Point	Description
Display 5	1	Analog 5 Minor Under
	2	Analog 5 Minor Over
	3	Analog 5 Major Under
	4	Analog 5 Major Over
	9-16	Control
	17-32	Value
	33	Analog 6 Minor Under
	34	Analog 6 Minor Over
	35	Analog 6 Major Under
	36	Analog 6 Major Over
	41-48	Control
	49-64	Value
Display	Point	Description
Display 6	1	Analog 7 Minor Under
	2	Analog 7 Minor Over
	3	Analog 7 Major Under
	4	Analog 7 Major Over
	9-16	Control
	17-32	Value
	33	Analog 8 Minor Under
	34	Analog 8 Minor Over
	35	Analog 8 Major Under
	36	Analog 8 Major Over
	41-48	Control
	49-64	Value

Display	Point	Description
Display 7	1	Digital sensor 1 Minor Under
	2	Digital sensor 1 Minor Over
	3	Digital sensor 1 Major Under
	4	Digital sensor 1 Major Over
	5	Digital sensor 1 Sensor not detected
	9-16	Control
	17-32	Value
	33	Digital sensor 2 Minor Under
	34	Digital sensor 2 Minor Over
	35	Digital sensor 2 Major Under
	36	Digital sensor 2 Major Over
	37	Digital sensor 2 Sensor not detected
	41-48	Control
	49-64	Value
Display	Point	Description
Display 8	1	Digital sensor 3 Minor Under
	2	Digital sensor 3 Minor Over
	3	Digital sensor 3 Major Under
	4	Digital sensor 3 Major Over
	5	Digital sensor 3 Sensor not detected
	9-16	Control
	17-32	Value
	33	Digital sensor 4 Minor Under
	34	Digital sensor 4 Minor Over
	35	Digital sensor 4 Major Under
	36	Digital sensor 4 Major Over
	37	Digital sensor 4 Sensor not detected
	41-48	Control
	49-64	Value
Display	Point	Description
Display 9	1	Digital sensor 5 Minor Under
	2	Digital sensor 5 Minor Over
	3	Digital sensor 5 Major Under
	4	Digital sensor 5 Major Over
	5	Digital sensor 5 Sensor not detected
	9-16	Control
	17-32	Value
	33	Digital sensor 6 Minor Under
	34	Digital sensor 6 Minor Over
	35	Digital sensor 6 Major Under
	36	Digital sensor 6 Major Over
	37	Digital sensor 6 Sensor not detected
	41-48	Control
	49-64	Value
Display	Point	Description
Display 10	1	Digital sensor 7 Minor Under
	2	Digital sensor 7 Minor Over
	3	Digital sensor 7 Major Under
	4	Digital sensor 7 Major Over

	5	Digital sensor 7 Sensor not detected
	9-16	Control
	17-32	Value
	33	Digital sensor 8 Minor Under
	34	Digital sensor 8 Minor Over
	35	Digital sensor 8 Major Under
	36	Digital sensor 8 Major Over
	37	Digital sensor 8 Sensor not detected
	41-48	Control
	49-64	Value
Display	Point	Description
Display 11	1	Digital sensor 9 Minor Under
	2	Digital sensor 9 Minor Over
	3	Digital sensor 9 Major Under
	4	Digital sensor 9 Major Over
	5	Digital sensor 9 Sensor not detected
	9-16	Control
	17-32	Value
	33	Digital sensor 10 Minor Under
	34	Digital sensor 10 Minor Over
	35	Digital sensor 10 Major Under
	36	Digital sensor 10 Major Over
	37	Digital sensor 10 Sensor not detected
	41-48	Control
	49-64	Value
Display	Point	Description
Display 12	1	Digital sensor 11 Minor Under
	2	Digital sensor 11 Minor Over
	3	Digital sensor 11 Major Under
	4	Digital sensor 11 Major Over
	5	Digital sensor 11 Sensor not detected
	9-16	Control
	17-32	Value
	33	Digital sensor 12 Minor Under
	34	Digital sensor 12 Minor Over
	35	Digital sensor 12 Major Under
	36	Digital sensor 12 Major Over
	37	Digital sensor 12 Sensor not detected
	41-48	Control
	49-64	Value
Display	Point	Description
Display 13	1	Digital sensor 13 Minor Under
	2	Digital sensor 13 Minor Over
	3	Digital sensor 13 Major Under
	4	Digital sensor 13 Major Over
	5	Digital sensor 13 Sensor not detected
	9-16	Control
	17-32	Value
	33	Digital sensor 14 Minor Under
	34	Digital sensor 14 Minor Over

	35	Digital sensor 14 Major Under
	36	Digital sensor 14 Major Over
	37	Digital sensor 14 Sensor not detected
	41-48	Control
	49-64	Value
Display	Point	Description
Display 14	1	Digital sensor 15 Minor Under
	2	Digital sensor 15 Minor Over
	3	Digital sensor 15 Major Under
	4	Digital sensor 15 Major Over
	5	Digital sensor 15 Sensor not detected
	9-16	Control
	17-32	Value
	33	Digital sensor 16 Minor Under
	34	Digital sensor 16 Minor Over
	35	Digital sensor 16 Major Under
	36	Digital sensor 16 Major Over
	37	Digital sensor 16 Sensor not detected
	41-48	Control
	49-64	Value
Display	Point	Description
Display 15	1	Digital sensor 17 Minor Under
	2	Digital sensor 17 Minor Over
	3	Digital sensor 17 Major Under
	4	Digital sensor 17 Major Over
	5	Digital sensor 17 Sensor not detected
	9-16	Control
	17-32	Value
	33	Digital sensor 18 Minor Under
	34	Digital sensor 18 Minor Over
	35	Digital sensor 18 Major Under
	36	Digital sensor 18 Major Over
	37	Digital sensor 18 Sensor not detected
	41-48	Control
	49-64	Value
Display	Point	Description
Display 16	1	Digital sensor 19 Minor Under
	2	Digital sensor 19 Minor Over
	3	Digital sensor 19 Major Under
	4	Digital sensor 19 Major Over
	5	Digital sensor 19 Sensor not detected
	9-16	Control
	17-32	Value
	33	Digital sensor 20 Minor Under
	34	Digital sensor 20 Minor Over
	35	Digital sensor 20 Major Under
	36	Digital sensor 20 Major Over
	37	Digital sensor 20 Sensor not detected
	41-48	Control
	49-64	Value

Display	Point	Description
Display 17	1	Digital sensor 21 Minor Under
	2	Digital sensor 21 Minor Over
	3	Digital sensor 21 Major Under
	4	Digital sensor 21 Major Over
	5	Digital sensor 21 Sensor not detected
	9-16	Control
	17-32	Value
	33	Digital sensor 22 Minor Under
	34	Digital sensor 22 Minor Over
	35	Digital sensor 22 Major Under
	36	Digital sensor 22 Major Over
	37	Digital sensor 22 Sensor not detected
	41-48	Control
	49-64	Value

Display	Point	Description
Display 18	1	Digital sensor 23 Minor Under
	2	Digital sensor 23 Minor Over
	3	Digital sensor 23 Major Under
	4	Digital sensor 23 Major Over
	5	Digital sensor 23 Sensor not detected
	9-16	Control
	17-32	Value
	33	Digital sensor 24 Minor Under
	34	Digital sensor 24 Minor Over
	35	Digital sensor 24 Major Under
	36	Digital sensor 24 Major Over
	37	Digital sensor 24 Sensor not detected
	41-48	Control
	49-64	Value

Display	Point	Description
Display 19	1	Digital sensor 25 Minor Under
	2	Digital sensor 25 Minor Over
	3	Digital sensor 25 Major Under
	4	Digital sensor 25 Major Over
	5	Digital sensor 25 Sensor not detected
	9-16	Control
	17-32	Value
	33	Digital sensor 26 Minor Under
	34	Digital sensor 26 Minor Over
	35	Digital sensor 26 Major Under
	36	Digital sensor 26 Major Over
	37	Digital sensor 26 Sensor not detected
	41-48	Control
	49-64	Value

Display	Point	Description
Display 20	1	Digital sensor 27 Minor Under
	2	Digital sensor 27 Minor Over
	3	Digital sensor 27 Major Under

	4	Digital sensor 27 Major Over
	5	Digital sensor 27 Sensor not detected
	9-16	Control
	17-32	Value
	33	Digital sensor 28 Minor Under
	34	Digital sensor 28 Minor Over
	35	Digital sensor 28 Major Under
	36	Digital sensor 28 Major Over
	37	Digital sensor 28 Sensor not detected
	41-48	Control
	49-64	Value
Display	Point	Description
Display 21	1	Digital sensor 29 Minor Under
	2	Digital sensor 29 Minor Over
	3	Digital sensor 29 Major Under
	4	Digital sensor 29 Major Over
	5	Digital sensor 29 Sensor not detected
	9-16	Control
	17-32	Value
	33	Digital sensor 30 Minor Under
	34	Digital sensor 30 Minor Over
	35	Digital sensor 30 Major Under
	36	Digital sensor 30 Major Over
	37	Digital sensor 30 Sensor not detected
	41-48	Control
	49-64	Value
Display	Point	Description
Display 22	1	Digital sensor 31 Minor Under
	2	Digital sensor 31 Minor Over
	3	Digital sensor 31 Major Under
	4	Digital sensor 31 Major Over
	5	Digital sensor 31 Sensor not detected
	9-16	Control
	17-32	Value
	33	Digital sensor 32 Minor Under
	34	Digital sensor 32 Minor Over
	35	Digital sensor 32 Major Under
	36	Digital sensor 32 Major Over
	37	Digital sensor 32 Sensor not detected
	41-48	Control
	49-64	Value

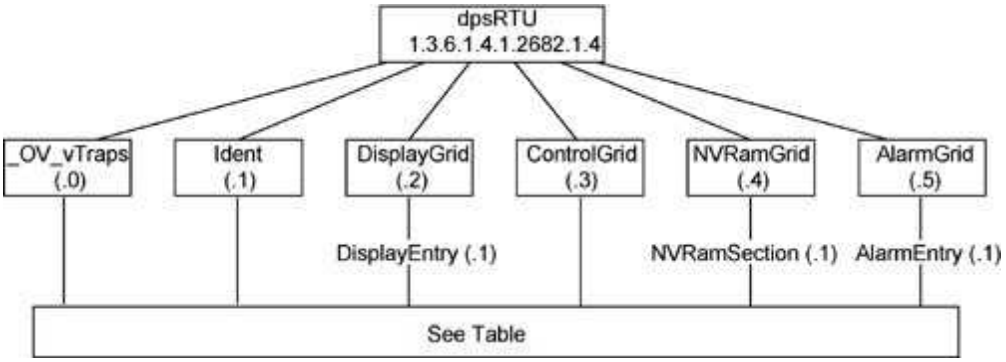
16.2 System Alarms

Display	Point	Description
1	33	Default Configuration
	34	DIP Switch Configuration
	35	MAC Address Not Set
	36	IP Address Not Set
	37	LAN hardware error
	38	SNMP Process Error
	39	SNMP Community Error
	40	LAN TX packet drop
	41	Notification 1 Failed
	42	Notification 2 Failed
	43	Notification 3 Failed
	44	Notification 4 Failed
	45	Notification 5 Failed
	46	Notification 6 Failed
	47	Notification 7 Failed
	48	Notification 8 failed
	49	NTP Failed
	50	Timed Tick
	51	Serial 1 RcvQ full
	52	Dynamic Memory Full
	53	Unit Reset
	54	DCP Poller inactive

System Alarms

16.3 SNMP Manager Functions

The SNMP Manager allows the user to view alarm status, set date/time, issue controls, and perform a resync. The display and tables below outline the MIB object identifiers. The table below begins with dpsRTU; however, the MIB object identifier tree has several levels above it. The full English name is as follows: root.iso.org.dod.internet.private.enterprises.dps-Inc.dpsAlarmControl.dpsRTU. Therefore, dpsRTU's full object identifier is 1.3.6.1.4.1.2682.1.2. Each level beyond dpsRTU adds another object identifying number. For example, the object identifier of the Display portion of the Control Grid is 1.3.6.1.4.1.2682.1.2.3.3 because the object identifier of dpsRTU is 1.3.6.1.4.1.2682.1.4 + the Control Grid (.3) + the Display (.3).



Tbl. B1 (O.)_OV_Traps points
_OV_vTraps (1.3.6.1.4.1.2682.1.2.0)
PointSet (.20)
PointClr (.21)
SumPSet (.101)
SumPClr (.102)
ComFailed (.103)
ComRestored (.014)
P0001Set (.10001) through P0064Set (.10064)
P0001Clr (.20001) through P0064Clr (.20064)

Tbl. B2 (.1) Identity points
Ident (1.3.6.1.4.1.2682.1.2.1)
Manufacturer (.1)
Model (.2)
Firmware Version (.3)
DateTime (.4)
ResyncReq (.5)*
* Must be set to "1" to perform the resync request which will resend TRAPs for any standing alarm.

Tbl. B3 (.2) DisplayGrid points
DisplayEntry (1.3.6.1.4.1.2682.1.2.2.1)
Port (.1)
Address (.2)
Display (.3)
DispDesc (.4)*
PntMap (.5)*

Tbl. B3 (.3) ControlGrid points
ControlGrid (1.3.6.1.4.1.2682.1.2.3)
Port (.1)
Address (.2)
Display (.3)
Point (.4)

Tbl. B6 (.6) Analog Channels
Channel Entry (1.3.6.1.4.1.2682.1.4.6.1)
Channel Number (.1)
Enabled (.2)
Description (.3)
Value (.4)

Tbl. B5 (.5) AlarmEntry points
AlarmEntry (1.3.6.4.1.2682.1.2.5.1)
Aport (.1)
AAddress (.2)
ADisplay (.3)
APoint (.4)

Action (.5)

Thresholds (.5)*
*If Mj, Mn is assumed

APntDesc (.5)*
AState (.6)
* For specific alarm points, see Table B6

16.4 SNMP Granular Trap Packets

The tables below provide a list of the information contained in the SNMP Trap packets sent by the Modbus Converter.

SNMP Trap managers can use one of two methods to get alarm information:

1. Granular traps (not necessary to define point descriptions for the Modbus Converter) **OR**
2. The SNMP manager reads the description from the Trap.

UDP Header	Description
1238	Source port
162	Destination port
303	Length
0xBAB0	Checksum

UDP Headers and descriptions

SNMP Header	Description
0	Version
Public	Request
Trap	Request
1.3.6.1.4.1.2682.1.4	Enterprise
126.10.230.181	Agent address
Enterprise Specific	Generic Trap
8001	Specific Trap
617077	Time stamp
1.3.7.1.2.1.1.1.0	Object
NetGuardian DIN v1.0K	Value
1.3.6.1.2.1.1.6.0	Object
1-800-622-3314	Value
1.3.6.1.4.1.2682.1.4.4.1.0	Object
01-02-1995 05:08:27.760	Value
1.3.6.1.4.1.2682.1.4.5.1.1.99.1.1.1	Object
99	Value
1.3.6.1.4.1.2682.1.4.5.1.2.99.1.1.1	Object
1	Value
1.3.6.1.4.1.2682.1.4.5.1.3.99.1.1.1	Object
1	Value
1.3.6.1.4.1.2682.1.4.5.1.4.99.1.1.1	Object
1	Value
1.3.6.1.4.1.2682.1.4.5.1.5.99.1.1.1	Object
Rectifier Failure	Value
1.3.6.1.4.1.2682.1.4.5.1.6.99.1.1.1	Object
Alarm	Value

SNMP Headers and descriptions

17 Frequently Asked Questions

Here are answers to some common questions from Modbus Converter users. The latest support information can be found in MyDPS, **http://www.dpstele.com/mydps/**

If you have a question about the Modbus Converter, please call us at **(559) 454-1600** or e-mail us at **support@dpstele.com.**

17.1 General FAQs

Q. How do I telnet to the Modbus Converter?

A. You must use **Port 2002** to connect to the Modbus Converter. Configure your Telnet client to connect using TCP/IP (**not** "Telnet," or any other port options). For connection information, enter the IP address of the Modbus Converter and Port 2002. For example, to connect to the Modbus Converter using the standard Windows Telnet client, click Start, click Run, and type "telnet <Modbus Converter IP address> 2002."

Q. How do I connect my Modbus Converter to the LAN?

A. To connect your Modbus Converter to your LAN, you need to configure the unit IP address, the subnet mask and the default gateway. A sample configuration could look like this:
Unit Address: 192.168.1.100
subnet mask: 255.255.255.0
Default Gateway: 192.168.1.1
Save your changes by writing to NVRAM and reboot. Any change to the unit's IP configuration requires a reboot.

Q. When I connect to the Modbus Converter through the craft port on the front panel it either doesn't work right or it doesn't work at all. What's going on?

A. Make sure your using the right COM port settings. Your COM port settings should read:
Bits per second: 9600 (9600 baud)
Data bits: 8
Parity: None
Stop bits: 1
Flow control: None
Important! Flow control **must** be set to **none**. Flow control normally defaults to hardware in most terminal programs, and this will not work correctly with the Modbus Converter.

Q. The LAN link LED is green on my Modbus Converter, but I can't poll it from my T/Mon.

A. Some routers will not forward packets to an IP address until the MAC address of the destination device has been registered on the router's Address Resolution Protocol (ARP) table. Enter the IP address of your gateway and your T/Mon system to the ARP table.

17.2 SNMP FAQs

Q. Which version of SNMP is supported by the SNMP agent on the Modbus Converter?
A. SNMP v1, SNMPv2 and SNMPv3.

Q. How do I configure the Modbus Converter to send traps to an SNMP manager? Is there a separate MIB for the Modbus Converter? How many SNMP managers can the agent send traps to? And how do I set the IP address of the SNMP manager and the community string to be used when sending traps?
A. The Modbus Converter begins sending traps as soon as the SNMP notification type is set up. The Modbus Converter MIB can be found on the DPS Telecom website. The MIB should be compiled on your SNMP manager. (**Note:** MIB versions may change in the future.) For step-by-step instructions, refer back to the "How to Send SNMP Traps" section of the user manual.

Q. Does the Modbus Converter support MIB-2 and/or any other standard MIBs?
A. The Modbus Converter supports the bulk of MIB-2.

Q. Does the Modbus Converter SNMP agent support both Modbus Converter and T/MonXM variables?
A. The Modbus Converter SNMP agent manages an embedded MIB that supports only the Modbus Converter's RTU variables. The T/MonXM variables are included in the distributed MIB only to provide SNMP managers with a single MIB for all DPS Telecom products.

Q. How many traps are triggered when a single point is set or cleared? The MIB defines traps like "major alarm set/cleared," "RTU point set," and a lot of granular traps, which could imply that more than one trap is sent when a change of state occurs on one point.
A. Generally, a single change of state generates a single trap.

Q. What does "point map" mean?
A. A point map is a single MIB leaf that presents the current status of a 64-alarm-point display in an ASCII-readable form, where a "." represents a clear and an "x" represents an alarm.

Q. The Modbus Converter manual talks about control relay outputs. How do I control these from my SNMP manager?
A. The control relays are operated by issuing the appropriate set commands, which are contained in the DPS Telecom MIB.

Q. How can I associate descriptive information with a point for the RTU granular traps?
A. The Modbus Converter alarm point descriptions are individually defined using the Web Browser.

Q. My SNMP traps aren't getting through. What should I try?
A. Try these three steps:

1. Make sure that the Trap Address (IP address of the SNMP manager) is defined. (If you changed the Trap Address, make sure you saved the change to NVRAM and rebooted.)
2. Make sure all alarm points are configured to send SNMP traps.
3. Make sure the Modbus Converter and the SNMP manager are both on the network. Use the unit's ping command to ping the SNMP manager.

18 Technical Support

DPS Telecom products are backed by our courteous, friendly Technical Support representatives, who will give you the best in fast and accurate customer service. To help us help you better, please take the following steps before calling Technical Support:

1. Check the DPS Telecom website.
You will find answers to many common questions on the DPS Telecom website, at **http://www.dpstele.com/support/**. Look here first for a fast solution to your problem.

2. Prepare relevant information.
Having important information about your DPS Telecom product in hand when you call will greatly reduce the time it takes to answer your questions. If you do not have all of the information when you call, our Technical Support representatives can assist you in gathering it. Please write the information down for easy access. Please have your user manual and hardware serial number ready.

3. Have access to troubled equipment.
Please be at or near your equipment when you call DPS Telecom Technical Support. This will help us solve your problem more efficiently.

4. Call during Customer Support hours.
Customer support hours are Monday through Friday, from 7 A.M. to 6 P.M., Pacific Time. The DPS Telecom Technical Support phone number is **(559) 454-1600**.

Emergency Assistance: *Emergency assistance is available 24 hours a day, 7 days a week. For emergency assistance after hours, allow the phone to ring until it is answered with a paging message. You will be asked to enter your phone number. An on-call technical support representative will return your call as soon as possible.*

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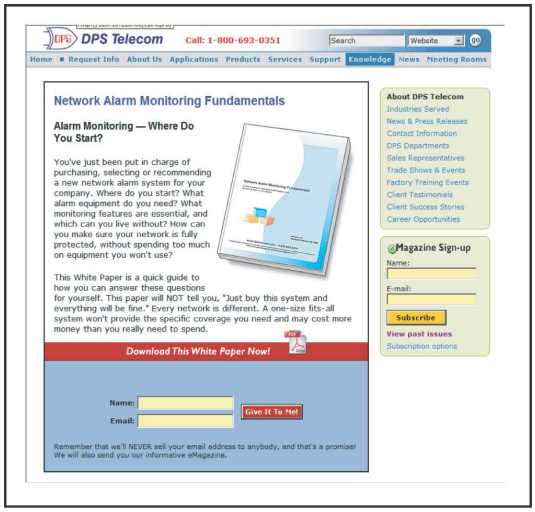

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