RemoteMaster User Manual

Version 1.2

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1 Safety Precautions

Please observe these general safety rules when using this product.

1. Do not remotely start the generator attached to the module if there is a possibilty that someone might be working on it. Instruct all personnel with physical access to the generator to remove the battery cable before working on moving parts, electrical conductors or other areas of danger should the unit attempt to start.

2 Overview

The RemoteMaster is a multi-purpose communications add-on module for the DisplayMaster4 generator set controller. It adds remote control and monitoring capability through a web browser as well as several methods of notifying personnel of alarm events or status changes.

2.1 Features

- Control and monitor the generator set using a standard web browser.
- View event history from a web browser.
- Turn relays on and off using a web browser.
- Send email notifications for shutdown, alarm, status change and other events.
- Complete SNMP agent with all instrumentation and status values available for polling.
- Control the generator and turn relays on and off using SNMP SET commands.
- Configurable SNMP trap notifications for shutdown, alarm, status change and other events.

2.2 Connectors and Indicators

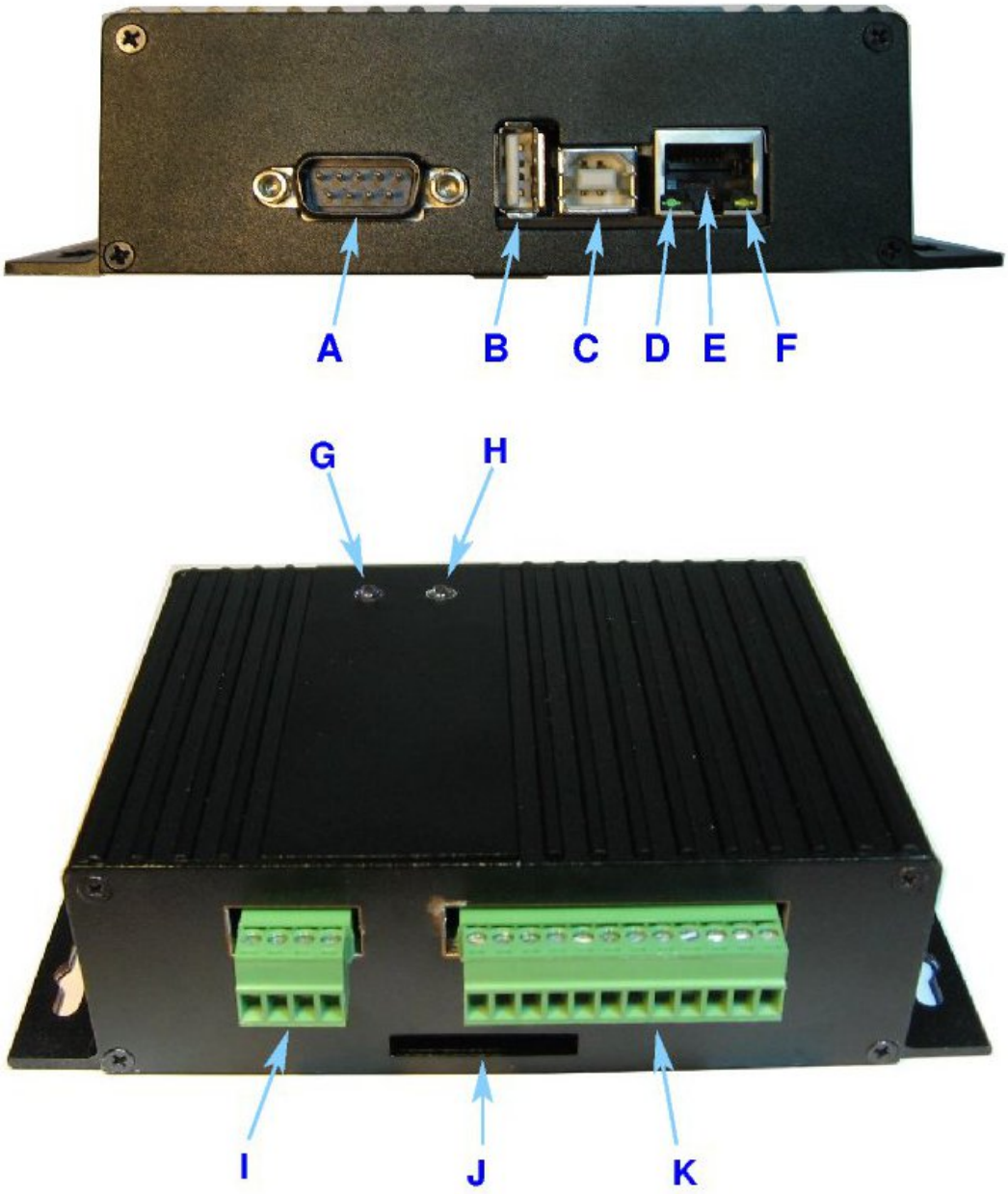


Figure 1: Connectors and Indicators

A RS232 serial port

B USB host port

C USB device port

D Ethernet activity indicator LED

E 10/100Mbps Ethernet port

F Ethernet link status indicator LED

G Blue heartbeat indicator LED

Unlit: No power
Solid: Booting
Blinking: Running normally

H Green RS485 traffic indicator LED

Unlit: No power
Fast Blink (twice per second): Communicating normally
Slow Blink (every 3 seconds): Communication failure

I Power and RS485 bus connector

J SD card slot

K Relay contacts connector

2.3 Browser requirements

The RemoteMaster web interface uses standards compliant web pages and technologies. Recent versions of most popular web browsers should work, however the following features must be turned on for proper operation. Most browsers will have these enabled by default and will work without any setting changes.

- JavaScript
- Cookies

The following popular web browsers have been tested and found to work:

- Google Chrome®
- Mozilla Firefox®
- Microsoft Internet Explorer® (reduced performance below version 10)

3 Installation and Configuration

3.1 Mounting

The RemoteMaster should be mounted in a clean and dry location, without excessive vibration or heat. It is not recommended to mount it outdoors in the weather, or directly onto the generator or engine. Mounting inside a control panel that has rubber vibration isolators is acceptable. It can be mounted in any orientation.

3.2 Wiring

It is highly recommended to use multi stranded wire as it has greater flexibility and is less prone to breakage due to vibration than solid wire. All wiring must be rated for the maximum voltage and amperage passing through it, and wiring loom should be used on external engine wiring to protect it from sharp edges and heat.

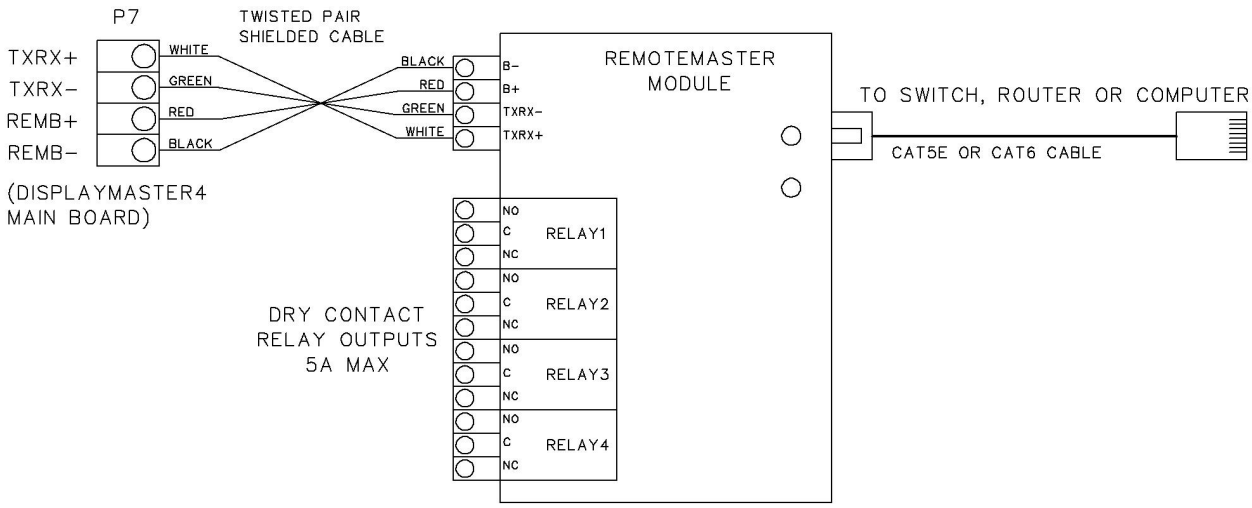


Figure 2: Wiring Diagram

3.3 Configuring DisplayMaster

In order to communicate with the RemoteMaster over RS485, the REMOTE MODULE COMMS setting must be set to ENABLED in the DisplayMaster. This setting is located under the SYSTEM SETTINGS menu and an *installer* level or higher password is required to change it. Refer to the DisplayMaster 4 user manual for details on how to access the settings menu, enter a password, and make changes to parameters.

3.4 Configuring IP Settings

IP address settings for the RemoteMaster must be performed from the front panel of the DisplayMaster 4 controller that is wired to it. The settings are stored in the DisplayMaster 4 nonvolatile memory and are retrieved and applied by the RemoteMaster every time upon power-up, or upon exit of the menu after making changes. These are located under the NETWORK SETTINGS menu and an *installer* level or higher password is required to change them. Refer to the DisplayMaster 4 user manual for details on how to access the settings menu, enter a password, and make changes to parameters. Following is a list of the parameters under this menu. If you do not know how to configure IP network device addresses, please consult an IT professional.

NETWORK MODE:

- STATIC IP - this will allow manual entry of all the IP settings in the subsequent menu items. This is the recommended setting.
- DHCP - this will cause the RemoteMaster to request IP information using the DHCP protocol. A valid DHCP server must exist on the network, most network routers provide this by default. This setting is not recommended as the address provided by the DHCP server may change between reboots. The following menu items will not show if this is selected here.

SET IP ADDRESS:

Enter the desired IPV4 address using the arrow keys to move the → cursor beside the number to change then press Select. Use the arrow keys to modify the value and press Select again to save it. This is the address you will use to access the web interface from the local network.

SET SUBNET MASK:

Enter the desired IPV4 subnet mask using the arrow keys to move the → cursor beside the number to change then press Select. Use the arrow keys to modify the value and press Select again to save it.

SET GATEWAY:

Enter the desired IPV4 gateway address using the arrow keys to move the → cursor beside the number to change then press Select. Use the arrow keys to modify the value and press Select again to save it.

SET DNS SERVER:

Enter the desired IPV4 DNS server address using the arrow keys to move the → cursor beside the number to change then press Select. Use the arrow keys to modify the value and press Select again to save it. A valid DNS server is required if host names are used under the RemoteMaster settings for time servers, email servers etc. If IP addresses are used throughout then this setting is not required to be valid.

3.5 Communication Methods

The RemoteMaster must be part of a properly configured IP network to be functional. This section explains some possible ways that a network may be set up. When performing this phase of the installation, it is highly recommended to consult with an IT professional that has experience in setting up IP networks.

3.5.1 Wired Ethernet Direct to Computer

This method will provide access from one local computer to one RemoteMaster. Connect an Ethernet cable directly from the Ethernet port on the computer to the Ethernet port on the RemoteMaster. The maximum length of the cable is 100 meters (328 feet). This method requires that the computer and the RemoteMaster both be configured with static IP addresses that have the same first 3 numbers, and the last number must be different. See Section 3.4 on the preceding page to configure the RemoteMaster IP address, and refer to the computer operating system documentation for configuring the computer IP address. In the example given in Figure 3, the URL for accessing the RemoteMaster from a web browser on the computer would be http://192.168.0.4

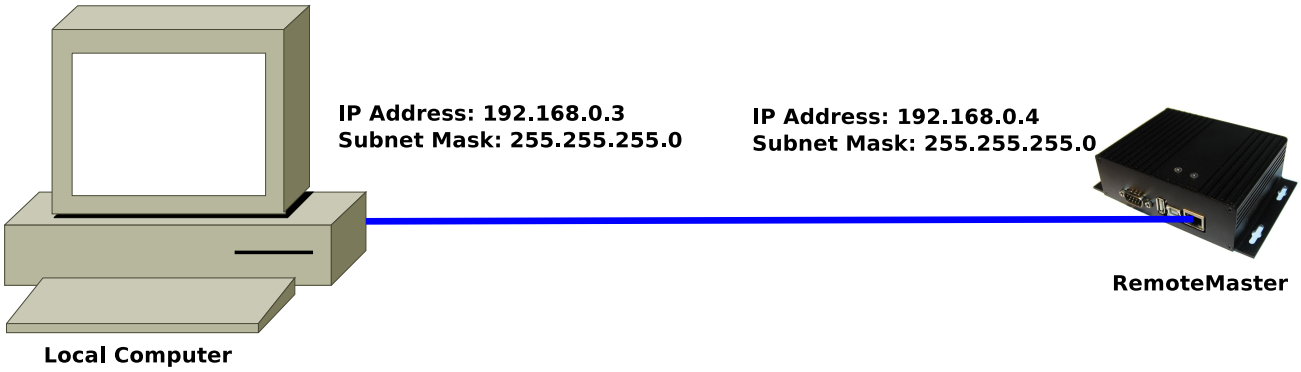


Figure 3: Direct wired Ethernet diagram, with examples of IP configuration

3.5.2 Wired Ethernet to Switch or Router

This method will provide access from one or more local computers to one or more RemoteMaster units. Connect an Ethernet cable from each computer's Ethernet port, and from each RemoteMaster's Ethernet port, to a free LAN port on the switch or router. The maximum length of each cable segment is 100 meters (328 feet). This method requires that each computer and each RemoteMaster be configured with IP addresses that have the same first 3 numbers, and the last number must be different.

Most routers come with a built in DHCP server to assign IP addresses automatically from a specified range, and the computers may be configured to use this feature. In this case the RemoteMaster should be configured with a static IP address outside this range to prevent a conflict with devices that get an IP from DHCP. Refer to the router documentation to determine what it's DHCP address range is. See Section 3.4 on the preceding page to configure the RemoteMaster IP address, and refer to the computer operating system documentation for configuring the computer IP addresses.

If only a switch is used, each computer and RemoteMaster must be configured with a static IP because a switch will not provide DHCP. In the example provided in Figure 4, the URL for connecting to the RemoteMaster from either computer would be http://192.168.0.4

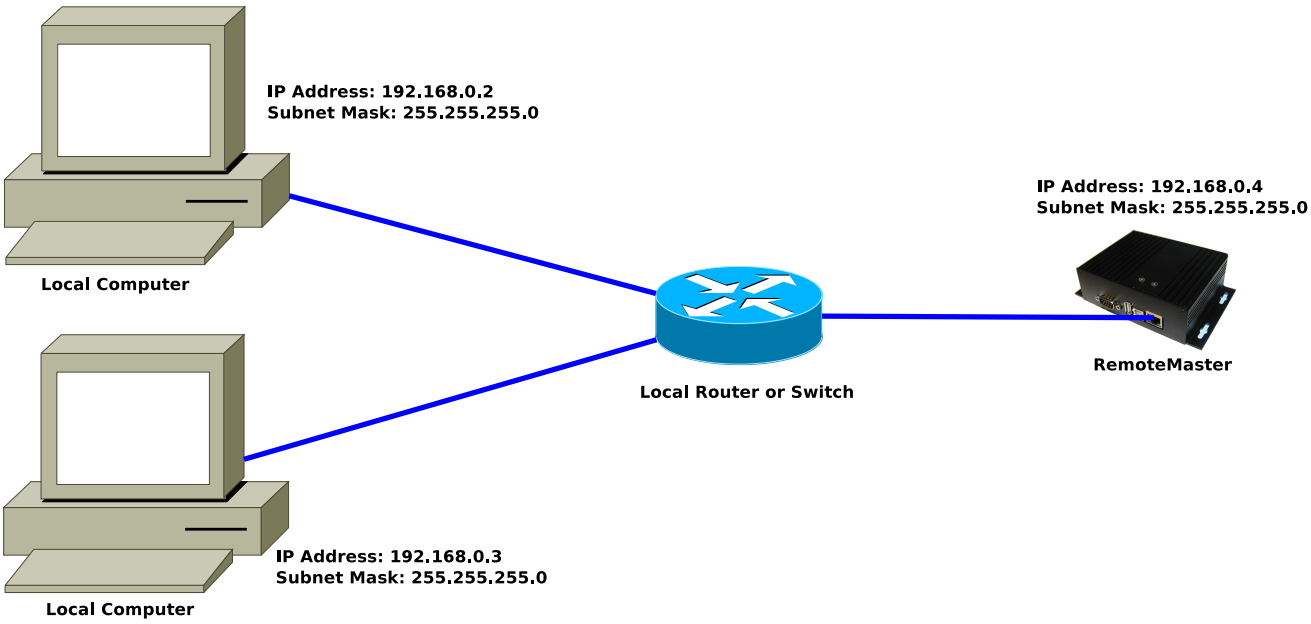


Figure 4: Wired Ethernet to Switch or Router, with examples of IP configuration

3.5.3 Wired Ethernet with Access from Internet

This method will provide access from one or more local computers to one or more RemoteMaster units. It will also allow access from one or more remote computers over the Internet. Connect an Ethernet cable from each local computer's Ethernet port, and from each RemoteMaster's Ethernet port, to a free LAN port on the switch or router. The maximum length of each cable segment is 100 meters (328 feet). This method requires that each local computer and each RemoteMaster be configured with IP addresses that have the same first 3 numbers, and the last number must be different.

Most routers come with a built in DHCP server to assign IP addresses automatically from a specified range, and the local computers may be configured to use this feature. In this case the RemoteMaster should be configured with a static IP address outside this range to prevent a conflict with devices that get an IP from DHCP. Refer to the router documentation to determine what it's DHCP address range is. See Section 3.4 on page 7 to configure the RemoteMaster IP address, and refer to the computer operating system documentation for configuring the computer IP addresses.

Accessing the RemoteMaster web pages from the Internet requires an external port on the router to be forwarded to port 80 on the RemoteMaster's IP address. Refer to the owner's manual of the router for port forwarding instructions, or consult an IT professional.

This method requires either a public Static IP from the Internet Service Provider (ISP), or optionally a Dynamic DNS service may be used. Otherwise you will not be able to access the RemoteMaster when the internet IP address changes. Note that some ISPs do IP address sharing, meaning they share one internet address with many of their customers. This is common on Internet services that use cellular networks. To determine if this is the case, log into the router and look for a status page with an "Internet" or "WAN" IP address. If the leftmost number in this IP address is 10, 172, or 192 then the ISP is doing this and port forwarding will not work. You will need to contact the ISP to provide a Static IP or Public IP, and in some cases the ISP might forward a port on their equipment to accommodate. Consult with an IT professional if you are unsure how to proceed.

URL for Accessing Locally

In the example provided in Figure 5 on the next page, the proper URL to access the RemoteMaster from any of the local computers would be http://192.168.0.4

URL For Accessing Remotely over Internet

Using an IP address

The proper URL in the web browser address bar would be http://<internet IP address>:<forwarded port>

In the example provided in Figure 5, the URL would be http://101.102.103.104:8080

Tip: To find out what the external internet IP address is, perform a Google search with the phrase "What's my IP" from a local computer on the same LAN as the RemoteMaster.

Using Dynamic DNS

The proper URL in the web browser address bar would be http://<dynamic DNS hostname>:<forwarded port>

For example, if the hostname that was configured with a Dynamic DNS provider was "myhostname.changeip.net", and the external port that was forwarded was 8080, then the URL would be http://myhostname.changeip.net:8080

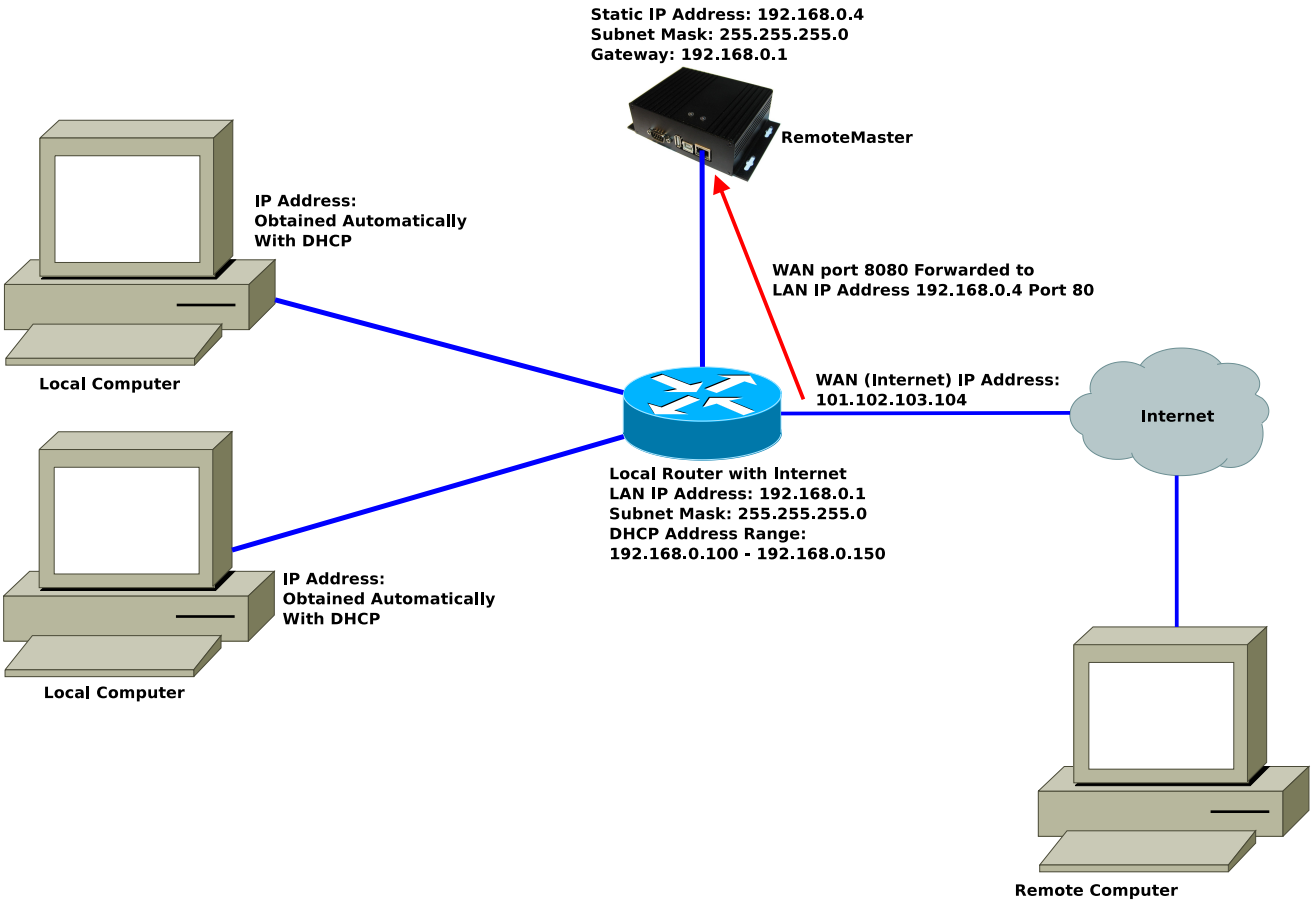


Figure 5: Wired Ethernet with access from Internet, with examples of IP configuration

4 User Login

The RemoteMaster has 5 levels of user access. The following table lists these levels in ascending order, along with a description of the functionality they provide access to and the default passwords. The levels are inclusive, all of the features in lower levels are also accessible from the current level. To switch levels, a user must first logout then log back in with the password for the new level.

Login Level	Features Allowed	Default Password
None	Info Page Only	
View	View All Live Data, Alarms and Logs	view
Control	Front Panel control keys and Remote I/O control	control7530
Setup	Change System and Notification Settings	setup4721
Master	Update Firmware, Reset Passwords, Force Reboot	master5684

The web interface is divided into several tabbed pages. Depending on the current access level, some of these tabs will be greyed out and clicking on them will have no effect. The following table lists all of the tab names and the access level required to browse into them.

Page Tab	Minimum Access Level
Info	None
Front Panel	View
Engine	View
Generator	View
Inputs/Outputs	View
Alarms	View
Logs	View
Settings	Setup
Firmware Update	Master

Some of the tabbed pages also contain control buttons, text input fields, or other elements that require a higher access level than the tab containing them. These components will remain greyed out or hidden if the current access level is not high enough to access them. The following table lists these actions, the containing tab, and their minimum access level.

Action	Page Tab	Minimum Access Level
Front Panel Arrow Keys	Front Panel	View
Front Panel Control Keys	Front Panel	Control
Remote Control I/O	Inputs/Outputs	Control
Reset Log	Logs	Setup

4.1 Password Entry

Follow these steps to enter a password and log in:

1. Open the RemoteMaster's URL in a web browser.
2. Type the password into the text box near the top left corner of the page (see Figure 6).
3. Click the Login button.

Figure 6: Login Password Entry Field

If a valid password is entered, the password entry field will be replaced with a label giving the access level provided by the password and the Login button becomes a Logout button (see Figure 7 on the following page). Clicking on Logout will terminate the session and the page will return to the Login state in Figure 6.

Figure 7: Login Area after successful login

4.2 Session Timeout

After a successful login, if no user activity is detected for 5 minutes, the login session will be terminated and the user will be automatically logged out. If the user attempts further action after this timeout, a notification will pop up and the user will need to log in again.

4.3 Change Password

Follow these steps to change a password:

1. Log in using an old password.
2. Click on the Change Password link that appears beside the access level label.
3. The Change Password dialog box should pop up, as in Figure 8.
4. Type the password you wish to change into the Old Password field.
5. Type the desired new password into the New Password field.
6. Type the new password again into the Confirm Password field.
7. Click on the Change Password button.

If the new passwords entered do not match, or are shorter than 6 characters, no changes will be made and error messages will be shown. After correcting the error click Change Password button again. To cancel, click the X to close the dialog box.

Figure 8: Change Password Dialog

5 User Interface

5.1 Top Bar

The top section of the web interface in Figure 9 is always visible. Along with the login fields described in Section 4.1 on page 11, it contains all of the tabs for accessing the other sections of the interface, some of which may be grayed out depending on the user access level. It also contains several other information blocks:

Site Name: An identifier string which can be modified under the Settings tab. This is typically set to a description of the genset location.

Users: The number of users that are currently logged into the web interface.

Unit State: The current operating state of the generator set. This block will a different background colour for each state.

Mode: The current operating mode of the generator control panel, with a different background colour for each.

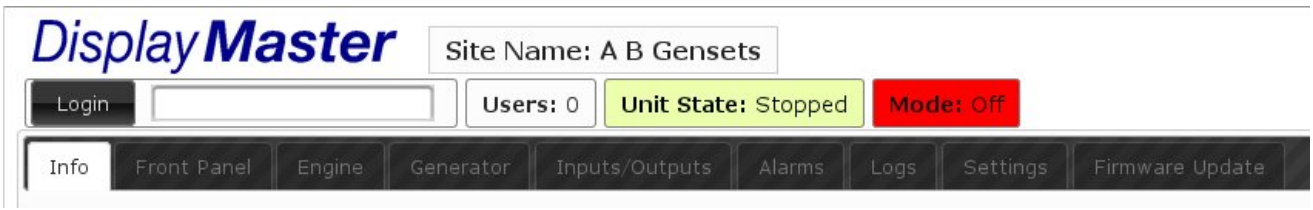


Figure 9: Top Bar

5.2 Info Tab

This tab contains view-only general information on the generator set and control system. It is divided into several sections which can be collapsed and expanded by clicking on their header bars. See Figure 10 on the next page for an example screen shot of this page.

Figure 10: Info Tab

5.3 Front Panel Tab

This tab contains a live replica of the control panel faceplate. The LCD display will stay updated in real time. All of the buttons can be operated the same as if physically present in front of the panel, unless the access level is View, in which case all of the buttons except for up and down scroll will be disabled and greyed out. See Figure 11 for an example screen shot .

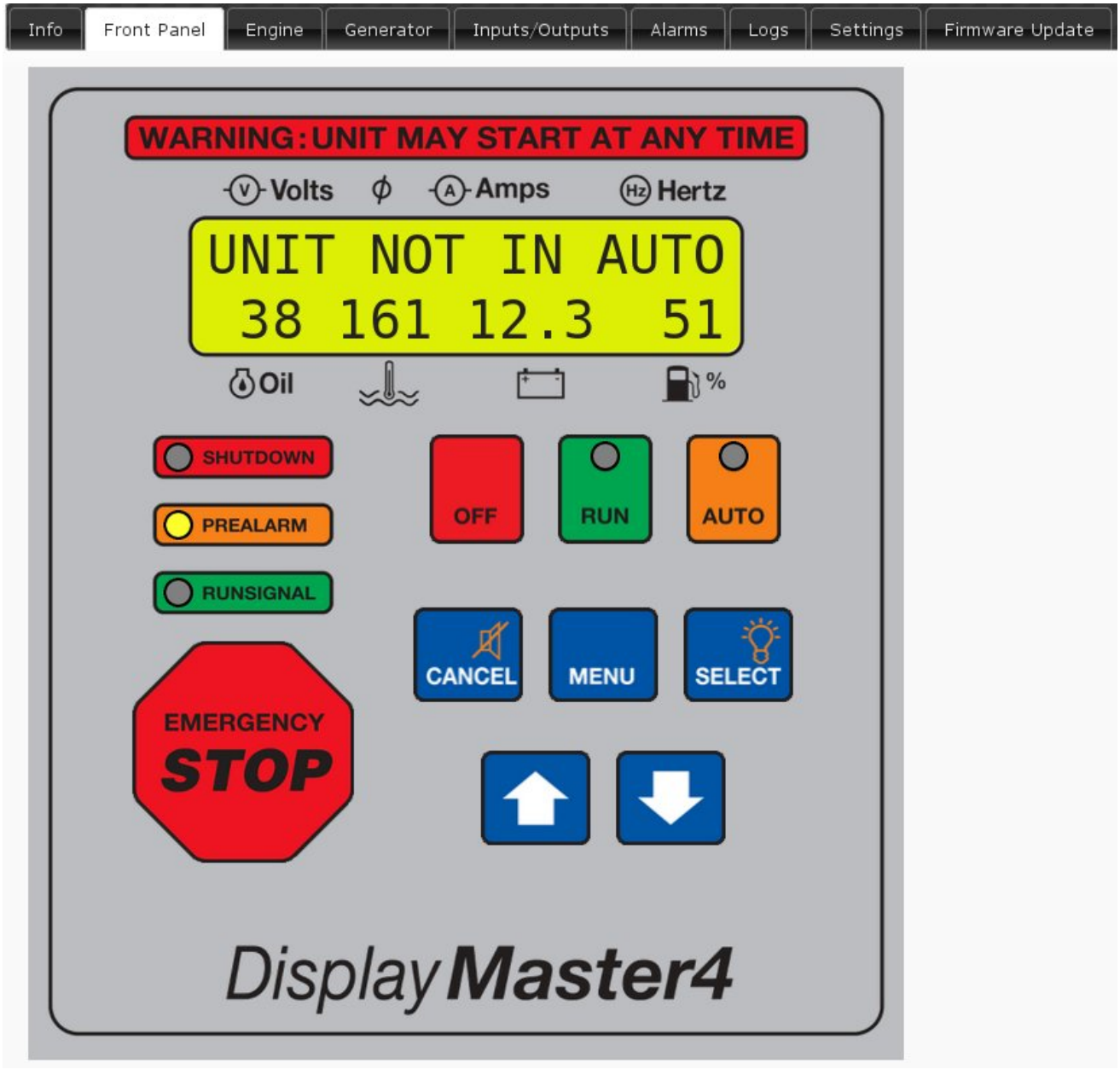


Figure 11: Front Panel Tab

5.4 Engine Tab

The Engine tab contains digital readout display blocks of the engine parameters. These displays stay updated in real time with live data from the engine sensors. Note that some display blocks will be hidden if the required sensor or hardware is not installed on the generator set. See Figure 12 on the next page for an example screen shot of this tab.

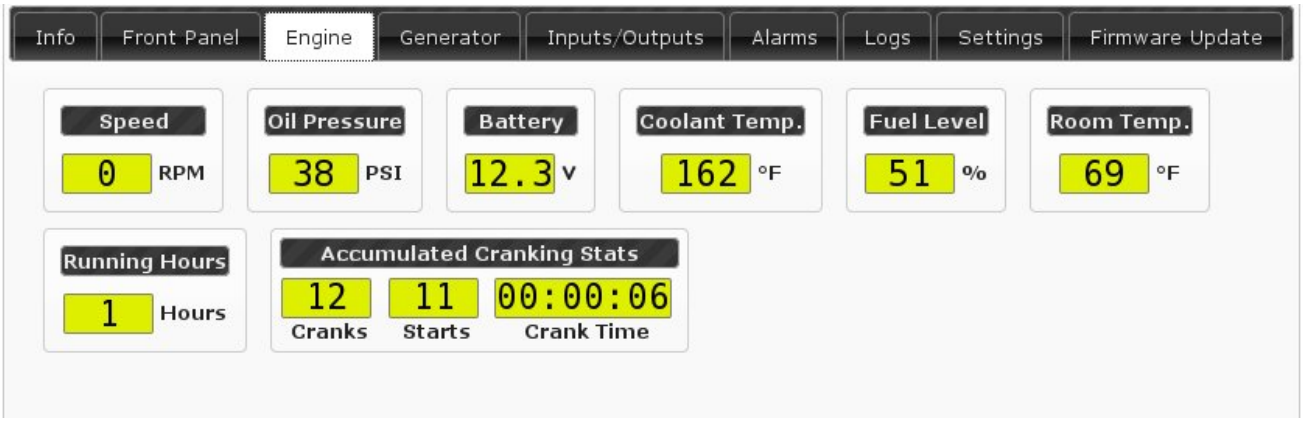


Figure 12: Engine tab

5.5 Generator Tab

The Generator tab contains digital readout display blocks of the generator parameters. These displays stay updated in real time with live data from the generator. Note that some display blocks will appear different depending on whether the generator is single phase or three phase. See Figure 12 for an example screen shot of this tab.

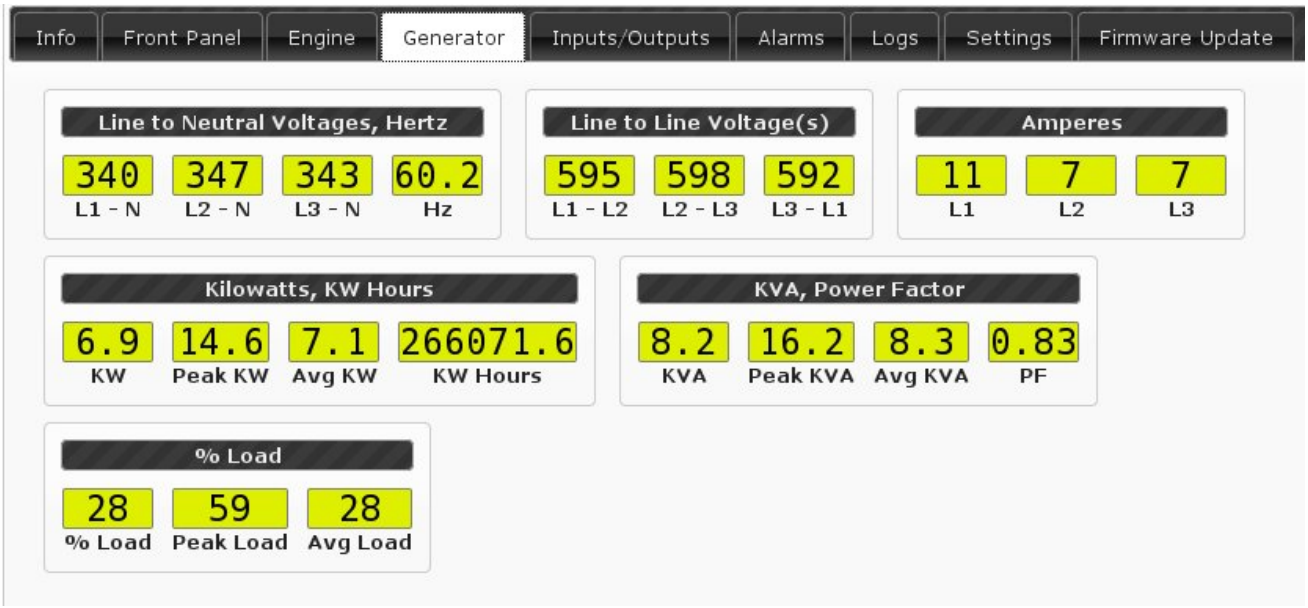


Figure 13: Generator Tab

5.6 Inputs/Outputs Tab

The Inputs/Outputs tab contains the configuration and current status of the inputs and outputs on both the DisplayMaster and RemoteMaster. The page is divided into several sections which can be collapsed and expanded by clicking on their header bars. Following is a description of each of these sections.

5.6.1 Remote Control I/O

These are functions which can be controlled remotely from the web interface. The user's access level must be Control or higher to show the buttons and timeout entry fields. Otherwise only the status will be displayed. See Figure 14 on the next page for an example of this section.

- Clicking the *On* button with the *New Timeout* fields empty will turn the function on indefinitely with no timeout.
- Clicking the *On* button with a value in any of the timeout fields will turn the function on for that amount of time. The values from each of the 3 fields will be added together. A live countdown timer will be displayed in the *Timeout* column.
- Clicking the *Off* button will turn the function off immediately.
- Note that clicking *On* for a function that is already active will terminate the previous activation and start the new without interrupting the relay.

Remote Autostart Run: Sends an auto start request. The control panel must be in Auto mode for this to have any effect.

Remote Control Relay [1-4]: Turns relays on and off which are mapped to these functions. If no relays are mapped then the funtion will not be shown in the table.

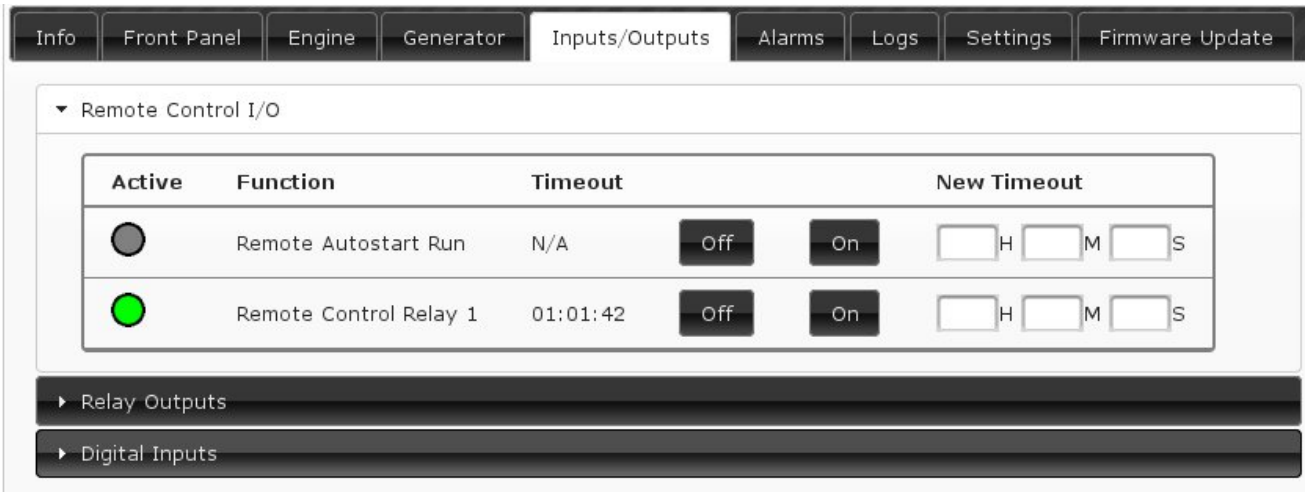


Figure 14: Inputs/Outputs Tab, Remote Control I/O Section

5.6.2 Relay Outputs

This section of the page contains two tables describing the outputs on the DisplayMaster and RemoteMaster. See Figure 15 on the following page for an example screen shot. Following is a description of each table column:

ID: The name of the output, as labelled on the silkscreen on top of the board.

Function: The configured function of the output.

Active: The indicator lamp icons in this column will turn green or gray in real time when the output turns on or off respectively.

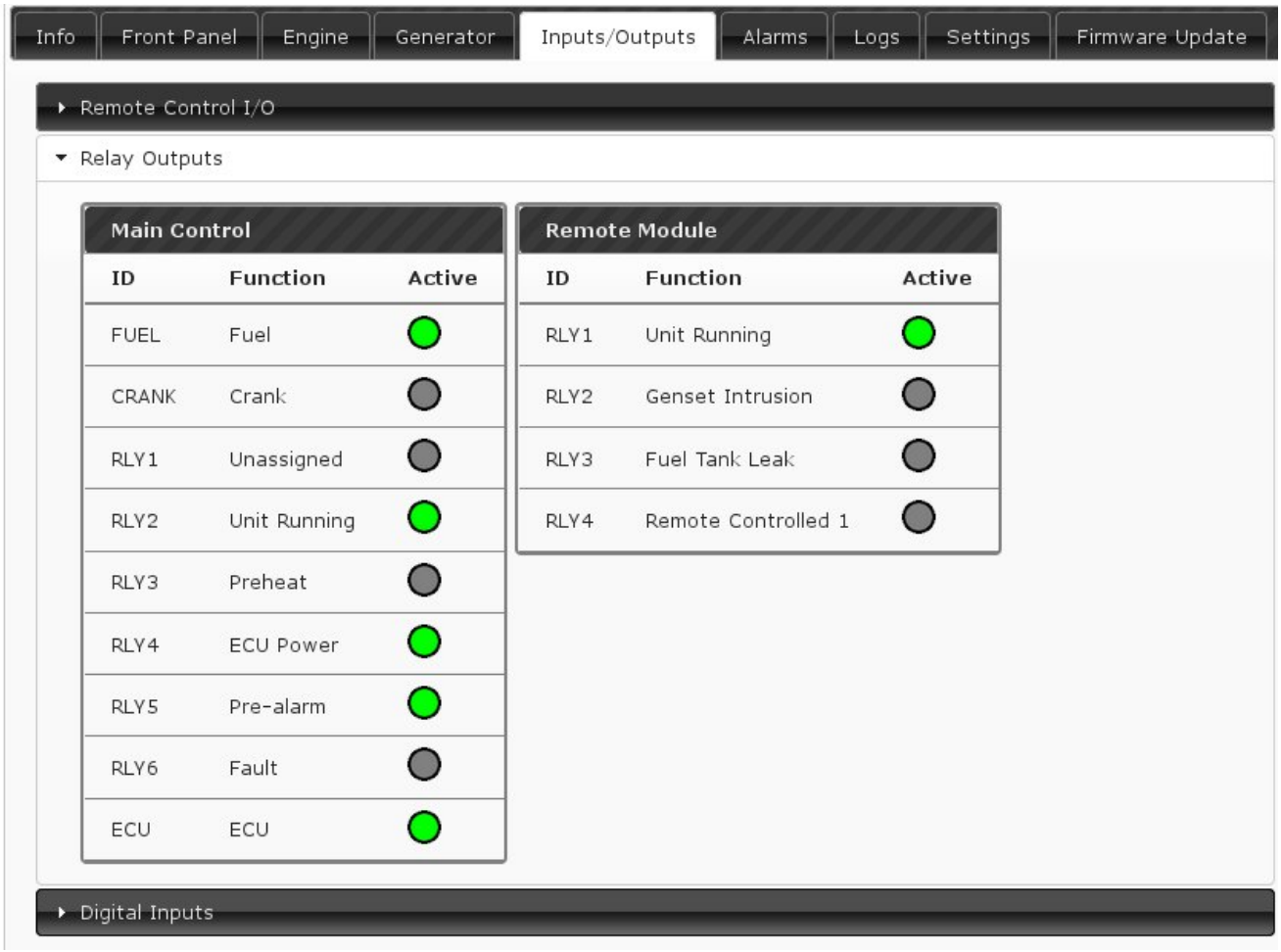


Figure 15: Inputs/Outputs Tab, Relay Outputs Section

5.6.3 Digital Inputs

This section of the page contains a table describing the configuration and status of the digital inputs on the DisplayMaster. See Figure 16 on the next page for an example screen shot. Following is a description of each table column:

ID: The name of the input, as labelled on the silkscreen on top of the board behind the terminals.

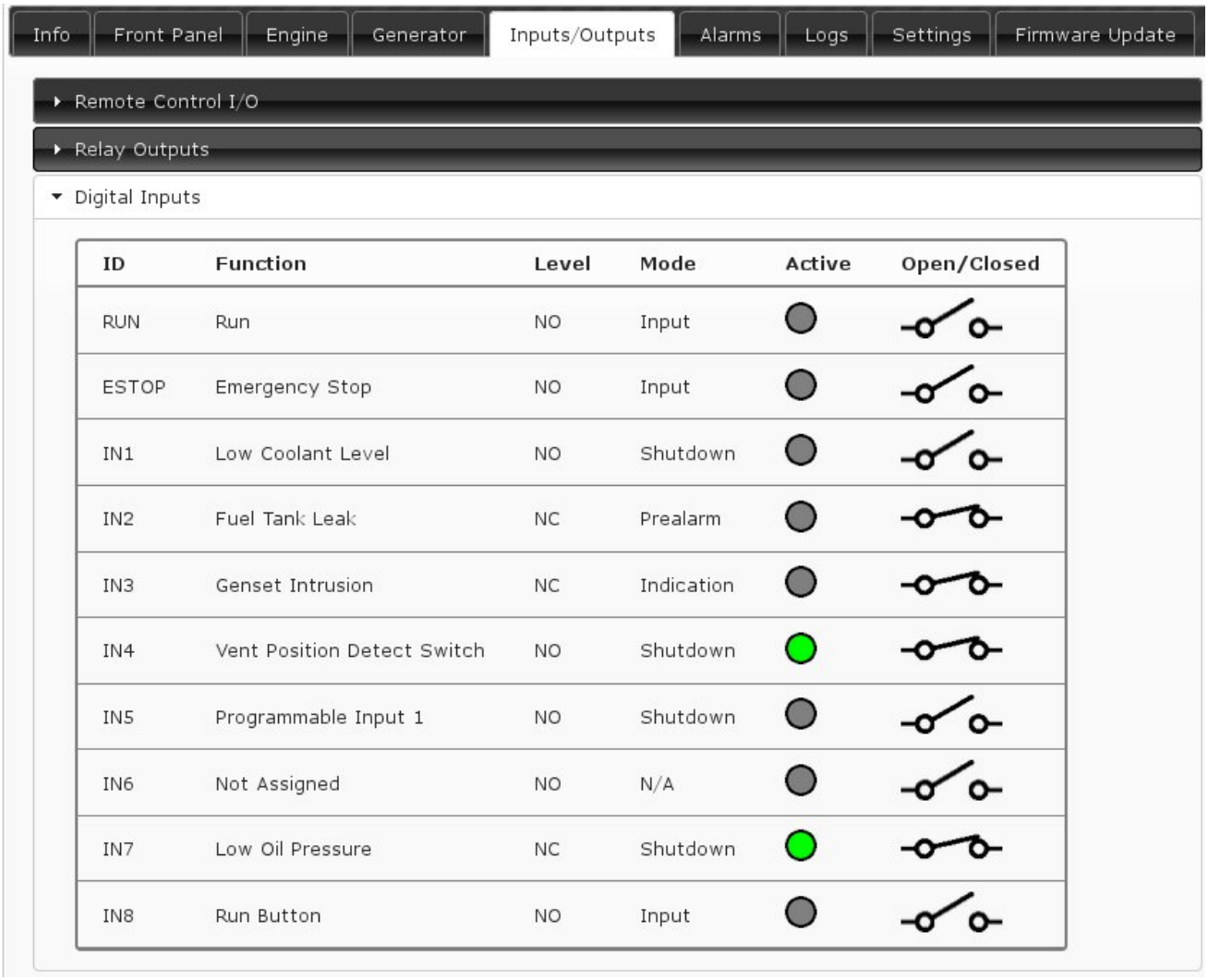
Function: The configured function of the digital input.

Level: Indicates whether the input is configured for Normally Open (NO) or Normally Closed (NC) operation.

Mode: The configured mode of the digital input.

Active: The indicator lamp icons in the *Active* column will turn green or gray in real time when the output turns on or off respectively.

Open/Closed: This column contains a graphic showing whether the circuit is open or closed, updated in real time.



ID	Function	Level	Mode	Active	Open/Closed
RUN	Run	NO	Input		
ESTOP	Emergency Stop	NO	Input		
IN1	Low Coolant Level	NO	Shutdown		
IN2	Fuel Tank Leak	NC	Prealarm		
IN3	Genset Intrusion	NC	Indication		
IN4	Vent Position Detect Switch	NO	Shutdown		
IN5	Programmable Input 1	NO	Shutdown		
IN6	Not Assigned	NO	N/A		
IN7	Low Oil Pressure	NC	Shutdown		
IN8	Run Button	NO	Input		

Figure 16: Inputs/Outputs Tab, Digital Inputs Section

5.7 Alarms Tab

The Alarms tab displays the status of all the different types of alarms on the DisplayMaster controller, updated in real time. The page is divided into several sections which can be collapsed and expanded by clicking on their header bars. See Figure 17 on the following page for an example screen shot of this page. Following is a description of each of these sections.

Shutdown: Shows the active shutdown cause, or "No Active Shutdown" if none is active. Shutdowns are latched, so this will only have one entry at any time.

Prealarms: Shows a yellow bar with a description for each active Prealarm cause, or "No Active Prelarms" if none are active. There may be multiple Prealarms active simultaneously and they will all be displayed in a list.

Active CAN Service Codes: Shows a table with rows describing each active CAN Service Code, or "No Active CAN Service Codes" if none are active. There may be multiple service codes active simultaneously and they will all be displayed in the table. This section will only appear if the engine supports J1939 CAN Bus communication, and the DisplayMaster is configured to use it.

Stored CAN Service Codes: Shows a table with rows describing each stored CAN Service Code in the engine ECM, or "No Stored CAN Service Codes" if none are stored. This section will only appear if the engine supports J1939 CAN Bus communication, and the DisplayMaster is configured to use it.

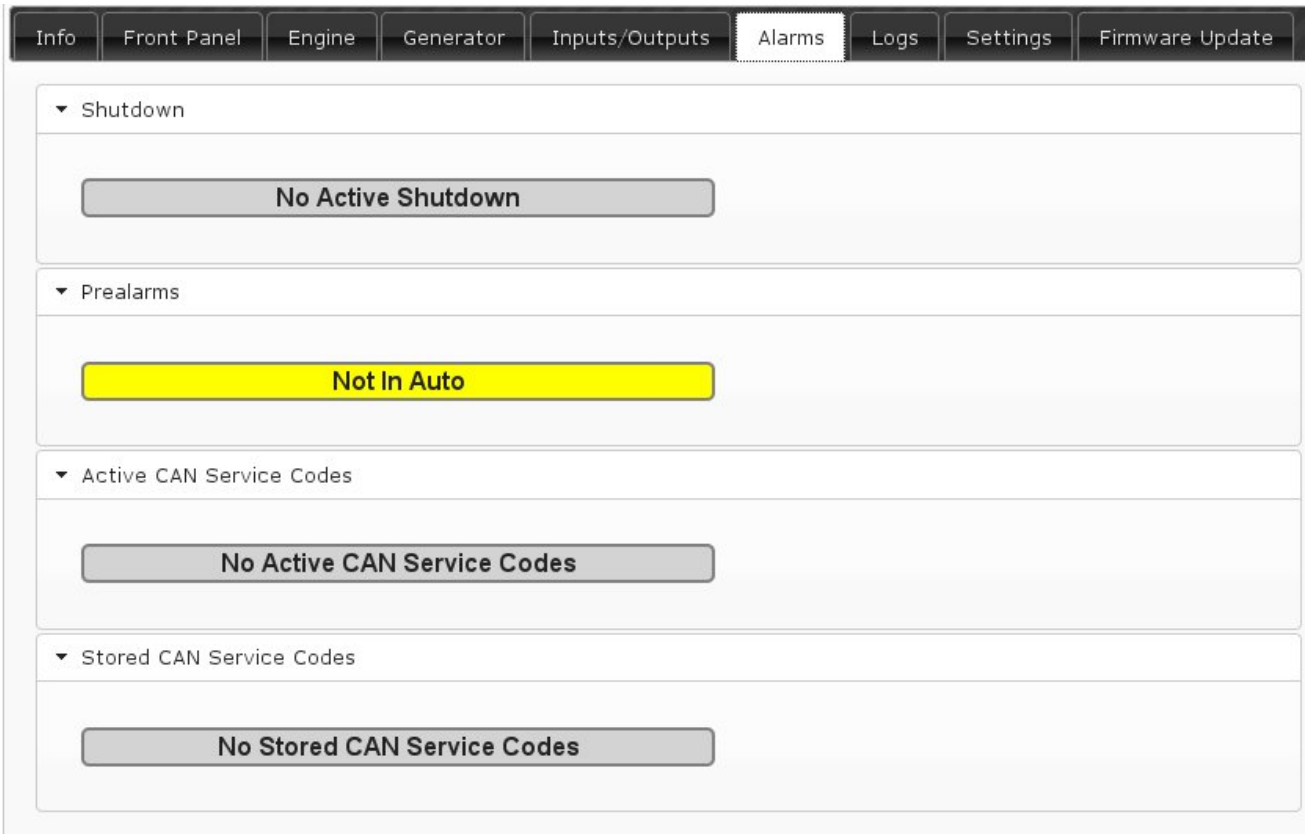


Figure 17: Alarms Tab

5.8 Logs Tab

The Logs tab contains a table with up to 255 of the most recent logged events from the DisplayMaster. The entries are colour coded according to Event Type. See Figure 18 on the next page for an example screen shot. Following is a description of each table column:

Event ID: The sequence number of the event. This number starts at 1 upon reboot of the RemoteMaster and increments with each new event.

Event Type: The type of event. Refer to Section 5.9.4.1 on page 29 for details on the various event types.

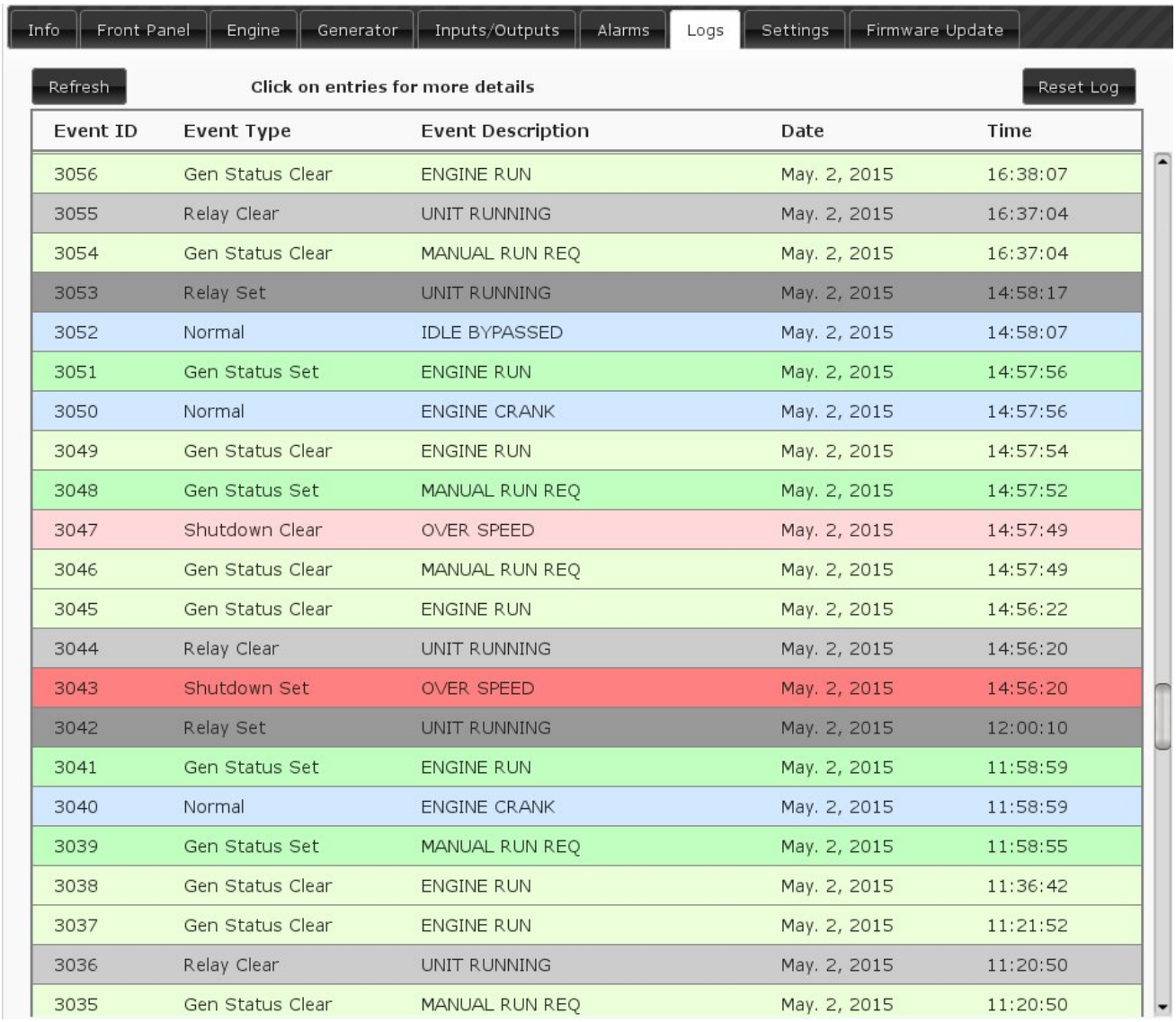
Event Description: Description of the event. This text is user configurable for all events, under the Settings tab.

Date: The date when the event occurred.

Time: The time of day when the event occurred.

Clicking on the *Refresh* button will update the table with the latest entries.

The *Reset Log* button is only shown if the user access level is *Setup* or higher, and will delete all entries from the log.



Event ID	Event Type	Event Description	Date	Time
3056	Gen Status Clear	ENGINE RUN	May. 2, 2015	16:38:07
3055	Relay Clear	UNIT RUNNING	May. 2, 2015	16:37:04
3054	Gen Status Clear	MANUAL RUN REQ	May. 2, 2015	16:37:04
3053	Relay Set	UNIT RUNNING	May. 2, 2015	14:58:17
3052	Normal	IDLE BYPASSED	May. 2, 2015	14:58:07
3051	Gen Status Set	ENGINE RUN	May. 2, 2015	14:57:56
3050	Normal	ENGINE CRANK	May. 2, 2015	14:57:56
3049	Gen Status Clear	ENGINE RUN	May. 2, 2015	14:57:54
3048	Gen Status Set	MANUAL RUN REQ	May. 2, 2015	14:57:52
3047	Shutdown Clear	OVER SPEED	May. 2, 2015	14:57:49
3046	Gen Status Clear	MANUAL RUN REQ	May. 2, 2015	14:57:49
3045	Gen Status Clear	ENGINE RUN	May. 2, 2015	14:56:22
3044	Relay Clear	UNIT RUNNING	May. 2, 2015	14:56:20
3043	Shutdown Set	OVER SPEED	May. 2, 2015	14:56:20
3042	Relay Set	UNIT RUNNING	May. 2, 2015	12:00:10
3041	Gen Status Set	ENGINE RUN	May. 2, 2015	11:58:59
3040	Normal	ENGINE CRANK	May. 2, 2015	11:58:59
3039	Gen Status Set	MANUAL RUN REQ	May. 2, 2015	11:58:55
3038	Gen Status Clear	ENGINE RUN	May. 2, 2015	11:36:42
3037	Gen Status Clear	ENGINE RUN	May. 2, 2015	11:21:52
3036	Relay Clear	UNIT RUNNING	May. 2, 2015	11:20:50
3035	Gen Status Clear	MANUAL RUN REQ	May. 2, 2015	11:20:50

Figure 18: Logs Tab

5.8.1 View Log Entry Details

Clicking on an entry inside the logged event table will expand that row and display a list of parameter values that were captured and stored when the event occurred. This is often very useful information for troubleshooting generator set problems. Clicking on the expanded row's header will collapse the row again. See Figure 19 on the next page for an example screen shot.

Figure 19: Expanded Log Entry

5.9 Settings Tab

The Settings tab provides an interface for editing the configuration of the RemoteMaster. See Figure 20 on the following page for an example screen shot. The following list describes the general functionality of this interface:

Load from File: Click the *Browse* button and pick the configuration xml file you wish to load in, then click the *Load from File* button. A dialog will pop up to either confirm success, or an error message if the file was the wrong type or had formatting errors.

Save to File: Clicking this button will download an xml file to the computer containing the current configuration of the RemoteMaster. This file can be loaded in using the *Load from File* function described above. Note that no DisplayMaster settings are included in this file.

Menu: The left hand column of the page contains a collapsing menu system for quickly navigating through the configuration pages.

The settings from the configuration category that is currently selected from the menu will display in the main area of the page.

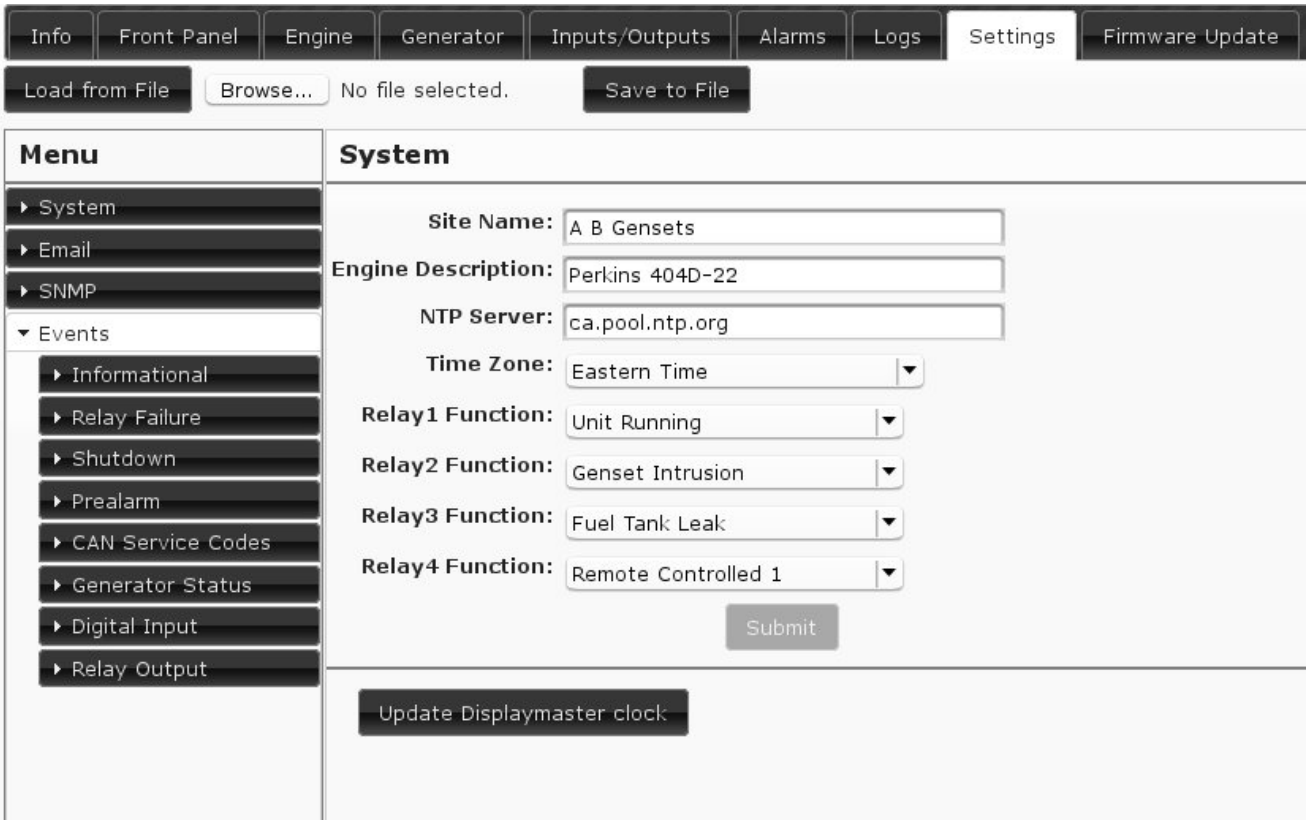


Figure 20: Settings Tab

After any configuration change has been submitted, a yellow action bar will appear at the top of the page as shown in Figure 21.
Clicking the *Discard* button will discard all changes that were made and the settings will remain as they were.
Clicking the *Apply* button will send the new values to the RemoteMaster. A confirmation dialog will pop up to report whether they were successfully applied or if there were any errors.

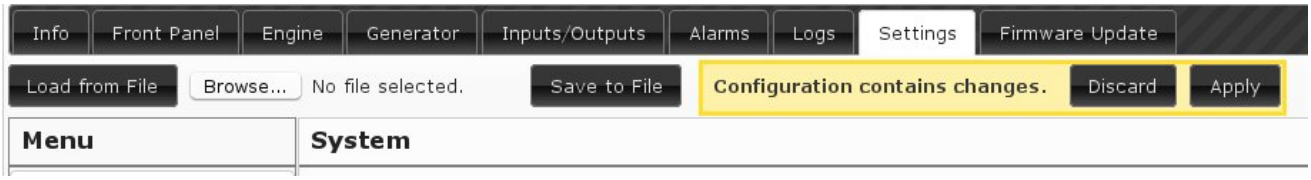


Figure 21: Unsaved Settings Action Bar

5.9.1 System

The System page contains general system settings. See Figure 22 on the following page for an example screen shot. The following list describes each setting on this page:

Site Name: An identifier string which will display at the top of the page. This is typically set to a description of the genset location.

Engine Description: A description of the engine model on the genset. Will only be used to display on the Info tab or SNMP requests.

NTP Server: Should be set to a valid NTP server hostname or IP address that is accessible from the Remotemaster's network.

Time Zone: Should be set to the time zone that the unit is located in.

Relay[1-4] Function: Each of the relay outputs on the RemoteMaster can be configured here by selecting a function from their drop-down menus.

Submit Button: Click this button to submit any changes made to the previous fields. Will be grayed out if no changes have been made.

Update DisplayMaster Clock: Clicking this button will update the clock on the DisplayMaster board with the date and time from the RemoteMaster.

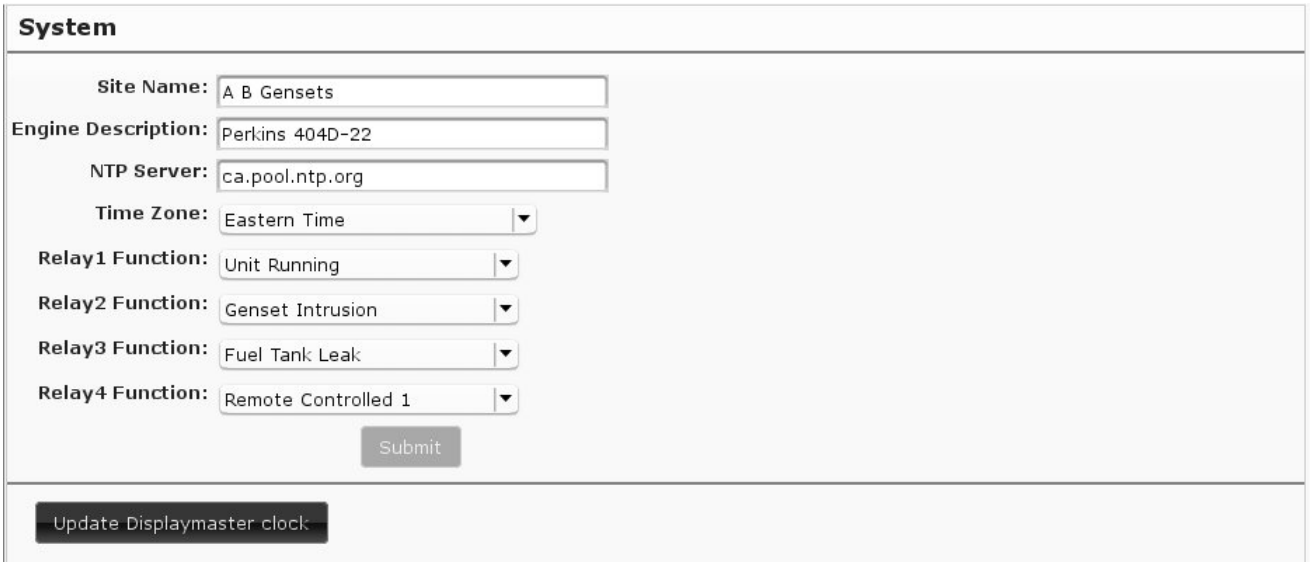


Figure 22: System Settings

5.9.2 Email

The Email page contains settings for sending notification emails through an external SMTP server. See Figure 23 on the next page for an example screen shot. The following list describes each setting on this page:

Enable Email: Uncheck this box to disable all email functionality. If this is disabled, none of the remaining settings on this page will have any effect.

SMTP Server: Must be set to a valid SMTP server for outgoing mail. The ISP will often have one available, or a free online service such as gmail.com may be used.

Port: The port to use on the SMTP server for outgoing mail. If left blank, port 25 will be used. Refer to your provider's outgoing email setup instructions for the correct port.

Encryption: The type of encryption to use with the SMTP server. Can be *None, TLS, or SSL*. Refer to your provider's outgoing email setup instructions for the proper setting.

Authentication: Check this box if your provider requires authentication for outgoing emails.

Username: The username for outgoing email authentication. Has no effect if *Authentication* is unchecked.

Password: The password for outgoing email authentication. Has no effect if *Authentication* is unchecked.

From Address: The email address where notification emails will appear to be sent from.

Submit Button: Click this button to submit any changes made to the previous fields. Will be grayed out if no changes have been made.

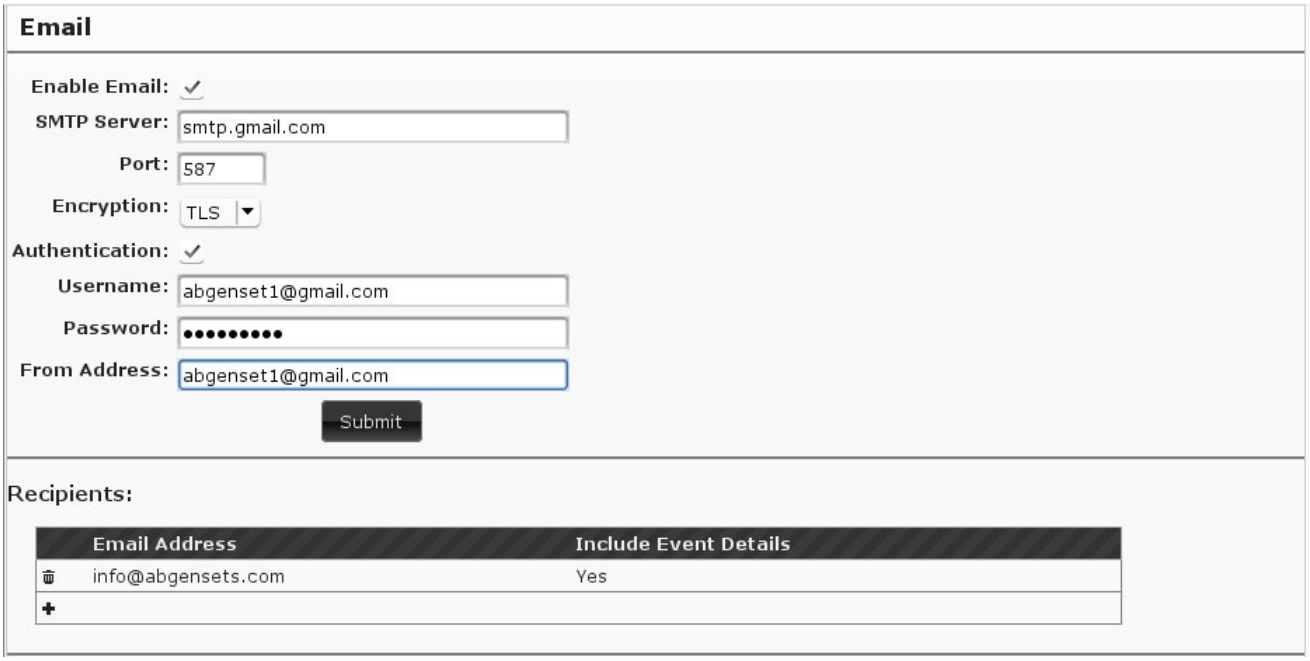


Figure 23: Email Settings

5.9.2.1 Email Recipients The *Recipients* table can contain multiple email addresses where to send event notifications to. The following describes how to manipulate this table:

Add Recipient: Click on the bottom row of the table with the + icon. The *Edit Email Recipient* dialog will pop up as shown in Figure 24 on the following page.

Edit Recipient: Click on the row in the table that you wish to change. The *Edit Email Recipient* dialog will pop up as shown in Figure 24 on the next page.

Delete Recipient: Click on the trash can icon at the front of the table row, or click on the row to open the *Edit Email Recipient* dialog as shown in Figure 24 on the following page and click on the *Delete* button.

The following list describes the fields and buttons in the *Edit Email Recipient* dialog:

Email Address: The destination email address to send notification emails to.

Include Event Details: Checking this box will include all of the event details shown in Figure 19 on page 22 in the notification email. If unchecked, only the basic details will be included. May be used to keep the messages compact when using an email-to-text service to send the notifications as an SMS to a cell phone.

Delete Button: Click this button to remove this recipient from the table.

Submit Button: Click this button to submit all changes to the values in the dialog. Will be grayed out if no changes have been made.

Cancel Button: Click this button to cancel all changes and return to the previous values.

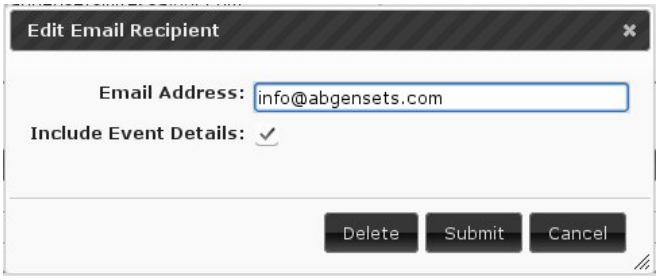


Figure 24: Edit Email Recipient

5.9.3 SNMP

The SNMP page contains configuration settings for the SNMP agent. See Figure 25 on the following page for an example screen shot. The following list describes each setting on this page:

Enable SNMP: Uncheck this box to disable all SNMP functionality. If this is disabled, none of the remaining settings on this page will have any effect.

Listen Port: The port where the SNMP agent will listen for GET requests. If left blank, port 161 will be used.

sysLocation: Sets the *sysLocation* value in in SNMP MIB-2.

sysContact: Sets the *sysContact* value in in SNMP MIB-2.

sysName: Sets the *sysName* value in in SNMP MIB-2.

sysDescr: Sets the *sysDescr* value in in SNMP MIB-2.

Submit Button: Click this button to submit any changes made to the previous fields. Will be grayed out if no changes have been made.

Figure 25: SNMP Settings

5.9.3.1 SNMP Communities The *Communities* table can contain multiple SNMP community names which allow access to the SNMP agent. The following describes how to manipulate this table:

Add Community: Click on the bottom row of the table with the + icon. The *Edit SNMP Community* dialog will pop up as shown in Figure 26 on the next page.

Edit Community: Click on the row in the table that you wish to change. The dialog *Edit SNMP Community* will pop up as shown in Figure 26 on the following page.

Delete Community: Click on the trash can icon at the front of the table row, or click on the row to open the *Edit SNMP Community* dialog as shown in Figure 26 on the next page and click on the *Delete* button.

The following list describes the fields and buttons in the *Edit SNMP Community* dialog:

Community Name: The name of the community.

Writeable: Checking this box will allow SNMP SET requests using this community.

Restrict To Source: Can optionally be used to restrict SNMP requests to a specific hostname, IP address, or subnet. (i.e. 192.168.2.0/255.255.255.0 or 192.168.2.0/24). If left blank, access will be allowed from all source addresses.

Restrict To Root OID: Can optionally be used to restrict access for this community to the subtree rooted at the given SNMP OID. Must be dotted numeric format. If left blank, all OID requests will be accepted.

Delete Button: Click this button to remove this community from the table.

Submit Button: Click this button to submit all changes to the values in the dialog. Will be grayed out if no changes have been made.

Cancel Button: Click this button to cancel all changes and return to the previous values.

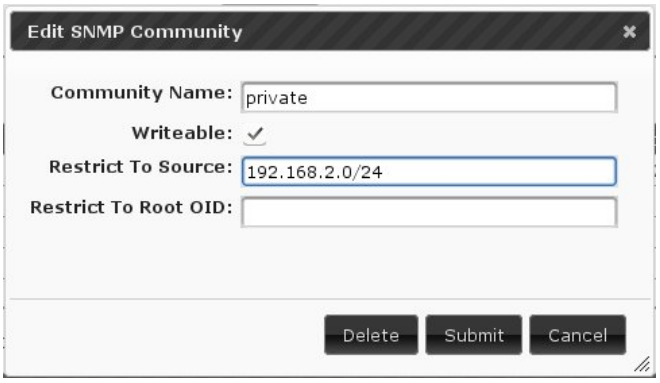


Figure 26: Edit SNMP Community

5.9.3.2 SNMP Trap Destinations The *Trap Destinations* table can contain multiple destinations where SNMP Trap notifications will be sent to. The following describes how to manipulate this table:

Add Destination: Click on the bottom row of the table with the + icon. The *Edit SNMP Trap Destination* dialog will pop up as shown in Figure 27 on the following page.

Edit Destination: Click on the row in the table that you wish to change. The *Edit SNMP Trap Destination* dialog will pop up as shown in Figure 27 on the next page.

Delete Destination: Click on the trash can icon at the front of the table row, or click on the row to open the The *Edit SNMP Trap Destination* dialog as shown in Figure 27 on the following page and click on the *Delete* button.

The following list describes the fields and buttons in the *Edit SNMP Trap Destination* dialog:

Address/Hostname: The destination IP address or hostname, optionally followed by :port. If no port is specified, then port 162 will be used.

Community: The community string to send with the trap.

SNMP Version: The SNMP version of the trap. Can be either version 1 or version 2c.

Inform: Check this box to enable Inform (acknowledged trap). The *SNMP Version* setting above must be *2c* for this setting to have any effect.

Inform Retries: Maximum trap retries if no Inform acknowledgement is received. Defaults to 5 if left blank. Has no effect if *Inform* setting above is unchecked.

Retry Interval: Trap retry interval if no Inform acknowledgement is received. Defaults to 1 if left blank. Has no effect if *Inform* setting above is unchecked.

Delete Button: Click this button to remove this trap destination from the table.

Submit Button: Click this button to submit all changes to the values in the dialog. Will be grayed out if no changes have been made.

Cancel Button: Click this button to cancel all changes and return to the previous values.

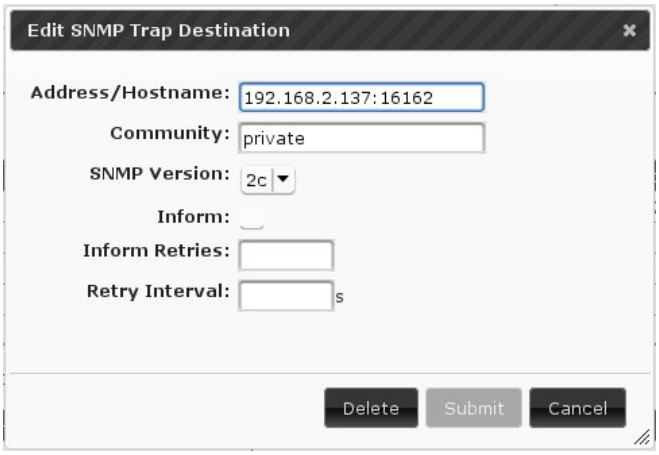


Figure 27: Edit SNMP Trap Destination

5.9.4 Events

The Events section contains configuration options for each individual event that the DisplayMaster controller is capable of. It is divided into several sub-menus (see Figure 20 on page 23). These coincide with the *Event Type* column in the event logs under the Logs tab and are described in the following list.

5.9.4.1 Event Types

Informational: One-shot general informational events.

Relay Failure: Fuel, Crank, and RLY1 have sensing on their contacts which are monitored by the controller. These one-shot events notify if a problem has been detected.

Shutdown: Events which will cause a latched shutdown requiring a manual reset. A *Shutdown Set* event will occur when the shutdown happens, and a *Shutdown Clear* event when it is reset.

Prealarm: Events which will cause a prealarm warning. A *Prealarm Set* event will occur when the alarm is raised, and a *Prealarm Clear* event when the alarm condition is no longer active.

CAN Service Codes: Service code events which are generated by the engine ECM over the J1939 CAN bus. A *CAN Code Set* event will occur when the alarm is raised, and a *CAN Code Clear* event when the condition is no longer active.

Generator Status: Normal start, stop, and other operational events. *Set* and *Clear* events will be generated for each of these events.

Digital Input: Events generated when a digital input changes state. *Set* and *Clear* events will occur as the digital input becomes active or inactive. Only applies to inputs that are set to 'Indication' mode in the DisplayMaster configuration.

Relay Output: Events generated when a relay output changes state. *Set* and *Clear* events will occur as the relay is enaged or released. Only applies to certain relay functions which are not related to shutdowns, prealarms, or operational functions.

5.9.4.2 Event Notification Each sub-menu contains a table with each event listed of that type. Figure 28 on the following page shows an example screen shot. The fields and buttons located along the top of the table are described in the following list:

Text Prefix: An optional prefix that will be prepended to the string in the *Text* column when the event is logged or notification sent over email or SNMP trap. This applies globally for each event in the current table.

Set All Button: By setting any or all of the 3 fields to the right of this button and clicking it, it is possible to set each row in the entire table to the same values for that column. A field which has no value selected or filled in will leave it's column untouched.

Events - Shutdown Text Prefix: Set All

Code	Description	Text	Email	SNMP	Severity
1	EMERGENCY STOP	EMERGENCY STOP	Yes	Yes	2
2	1PH OVERCURRENT	1PH OVERCURRENT	No	Yes	2
3	3PH OVERCURRENT	3PH OVERCURRENT	No	Yes	2
4	OVER SPEED	OVER SPEED	No	Yes	2
5	LOW OIL PRESSURE	LOW OIL PRESSURE	No	Yes	2
6	HI COOLANT TEMP	HI COOLANT TEMP	No	Yes	2
7	LOW COOLANT TEMP	LOW COOLANT TEMP	No	Yes	2
8	LOW FUEL LEVEL	LOW FUEL LEVEL	No	Yes	2
9	OVER CRANK	OVER CRANK	No	Yes	2
10	NO SPEED SIGNAL	NO SPEED SIGNAL	No	Yes	2
11	WEAK BATTERY	WEAK BATTERY	No	Yes	2
12	HI EXHAUST TEMP	HI EXHAUST TEMP	No	Yes	2
13	BREAKER TRIP	BREAKER TRIP	No	Yes	2
14	GROUND FAULT	GROUND FAULT	No	Yes	2
15	HI BEARING TEMP	HI BEARING TEMP	No	Yes	2
16	HI VIBRATION	HI VIBRATION	No	Yes	2
17	HI WINDING TEMP	HI WINDING TEMP	No	Yes	2
18	LOW OIL LEVEL	LOW OIL LEVEL	No	Yes	2
19	HI OIL LEVEL	HI OIL LEVEL	No	Yes	2

Figure 28: Events Settings

It is also possible to edit the settings for a row individually by clicking on it. An *Edit Event Settings* dialog like Figure 29 on the next page will pop up. The following list describes it's fields and buttons:

Text: The Event Description which will be sent with the event notification over Email and/or SNMP traps. If the *Text Prefix* field at the top of the table is not blank, it's contents will be prepended to this value.

Email: Check this box to enable sending this event as an email notification to all configured recipients.

SNMP: Check this box to enable sending this event as an SNMP trap to all configured trap destinations.

Severity: A user configurable severity number which will be sent with the event notification over Email and/or SNMP traps.

Submit Button: Click this button to submit all changes to the values in the dialog. Will be grayed out if no changes have been made.

Cancel Button: Click this button to cancel all changes and return to the previous values.

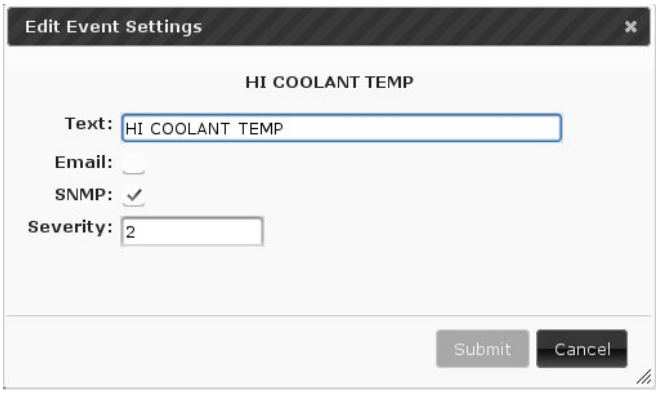


Figure 29: Edit Event Settings

5.10 Firmware Update Tab

The Firmware Update tab contains a form for updating the firmware in the RemoteMaster and the DisplayMaster attached to it, as well as some other administrative functions. The update is supplied in a single .zip file which contains the required files for both. As with all such devices it is very important that power is not interrupted during the update, or else the device memory may become corrupted and prevent it from booting.

Figure 30: Firmware Update Tab

5.10.1 Upgrade with File Upload

To upgrade the RemoteMaster firmware using file upload:

1. If *File Upload* is not highlighted, click on it to select it.
2. Click on the *Browse* button.

3. A file selection dialog will pop up. Browse to the location of the update .zip file and open it.
4. Click the *Submit* button.
5. A dialog box like in Figure 31 will pop up, with messages scrolling down as the update progresses.
6. Wait until the progress dialog shows Done.
7. Wait 30 seconds, then click OK button.

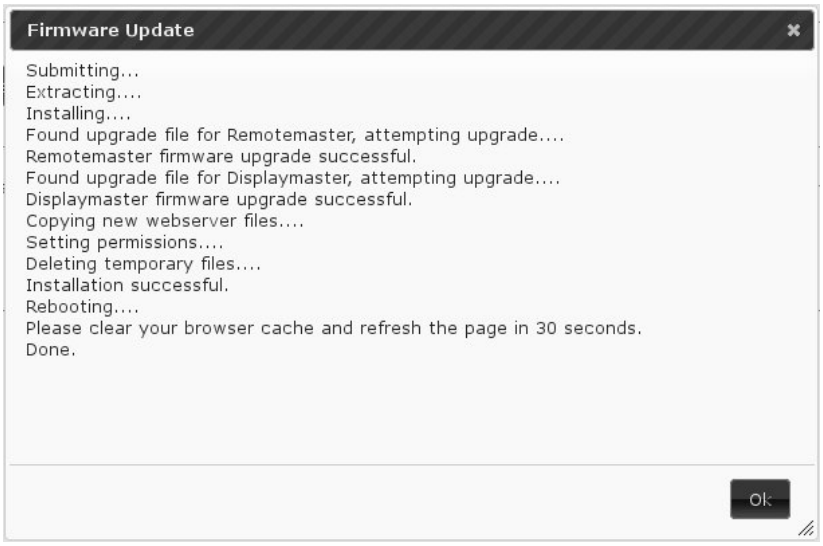


Figure 31: Firmware Update Progress Dialog

5.10.2 Upgrade with TFTP Download

To upgrade the RemoteMaster firmware using TFTP, refer to Figure 32 on the next page and follow these steps:

1. Place the update .zip file on a TFTP server which is accessible from the same network as the RemoteMaster.
2. Click on *TFTP Download*.
3. Type in the file path on the server in the appropriate field. If the file is located in the root folder then this would be just the filename.
4. Type in the hostname or IP address of the TFTP server in the appropriate field.
5. Optionally type in the port number. If left blank port 69 will be used.
6. Click the *Submit* button.
7. A dialog box like in Figure 31 will pop up, with messages scrolling down as the update progresses.
8. Wait until the progress dialog shows Done.
9. Wait 30 seconds, then click OK button.

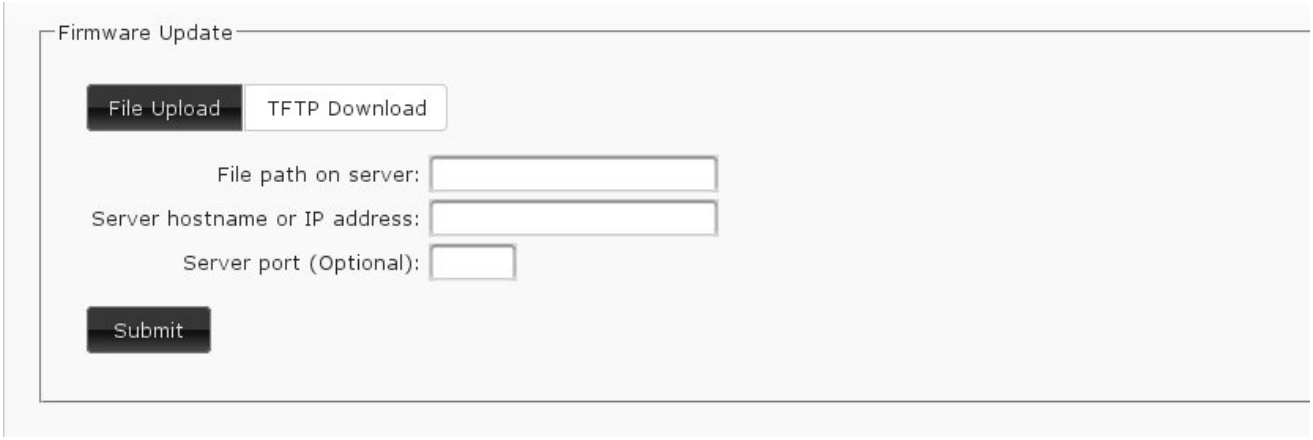


Figure 32: TFTP Firmware Update

5.10.3 Password Reset

To reset all of the web interface passwords to the defaults listed in Section 4 on page 10, click on the *Reset Passwords* button as shown in Figure 30 on page 31. A dialog will pop up asking to confirm before proceeding with the reset.

5.10.4 Force Reboot

To reboot the RemoteMaster unit, click on the *Force Reboot* button as shown in Figure 30 on page 31. A dialog will pop up asking to confirm before proceeding with the reboot. Note that this only reboots the RemoteMaster and not the DisplayMaster. A running generator set will not be interrupted by this.