PM-50 Digital Meter User Manual

LP1147 | August 2024

Firmware Version 1.4.1 or higher

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Table of Contents

Programming the PM-50

Programming Methods

There are several methods to program a PM-50. On first power up, there is a default configuration that allows you to configure using the Initial Setup Wizard (also referred to as Programming Wizard). The Wizard has two options:

Quick Setup - This method allows you to manually configure the basic setup for Screen, Input, Output and Wi-Fi. After the configuration setup, you are directed to the HOME screen of the device.

Import Configuration - This method allows you to import a config.txt file from the microSD card. This file can be exported from another PM-50. Essentially cloning that device.

After the Initial Setup Wizard, additional touch screen programming or changes can be done by touching the Top right corner icon called Configuration. You can also access the device configuration remotely. For remote access, you must first setup the Wi-Fi access. Once Wi-Fi is enabled, you can program remotely using web interface or mobile app (Android and iOS). It is also possible to import a config.txt file saved from another PM-50 using these remote means. An explanation of each of these methods follows.

Note: The device allows programming either using the touchscreen or remotely.

Programming Wizard

The Programming Wizard is the initial Device Setup Wizard which appears automatically:

- when the device boots for the first time or,
- when Factory Reset is enabled

The Programming Wizard can also be manually triggered by following these steps:

1. Login as the Admin user using the touchscreen
2. Go to (Device) → Misc. Configuration → Factory Configuration → Enable Programming Wizard and set the switch to ON.
3. Click the Apply & Exit button, or continue on to the next pages and click the Apply button on the final page.
4. At the next power cycle or reboot, the Programming Wizard will start.
5. After exiting the Programming Wizard, it will automatically disable.

Note: Enable Programming Wizard cannot be enabled remotely using Wi-Fi through a web browser or through the Mobile app.

The complete Programming Wizard setup details can be found here.

Wi-Fi Setup and Remote Access:

The Wi-Fi setup can be done during the Initial Setup Wizard, by importing the configuration from another device, or using the Quick Setup section.

Note: The Admin password must be enabled for Wi-Fi setup to be accessed.

1. If not using the Wizard or importing the configuration then, login to the device as the Admin user using the touchscreen.
2. Go to ⚙ System Configuration → Network Configuration → Wi-Fi Configuration
   a. Set Enable Wi-Fi to ON and click the right navigation arrow.
   b. If the Admin Password is configured already, then the next page will be Wi-Fi Connection Mode. Else "Set Admin Password" page will be loaded to configure the Admin password and proceed.
3. Set the Wi-Fi Connection Mode to Client or Access Point based on the remote connection requirement as follows:

Client Mode:

- In Client Mode, set Enable DHCP Client to ON and the connected running DHCP Server will assign the IP information. Otherwise, set Enable DHCP Client to OFF, then click on the right navigation arrow and setup the IP Address, Subnet Mask and Gateway.
- Enter the SSID and Password (both are case sensitive) to connect to the network for remote access.

Access Point:

- In Access Point mode, set Enable DHCP Server to ON if the user has to get the IP assigned automatically when they connect to the device's Access Point.
- When Enable DHCP Server is ON, the user has to setup the IP Address, Subnet Mask, Gateway, Starting Address, and Ending Address.
- The Starting and Ending Addresses are used by the DHCP Server to assign a range of IP addresses allowed to connect to the PM-50.
- If Enable DHCP Server is OFF, then the user has to setup the IP Address, Subnet Mask and Gateway.
- SSID and Password should not be the same as the local network.

Set the Encryption Mode based on the Access Point encryption requirement

4. Once the Wi-Fi Configuration setup is complete, turn Enable Modbus/TCP over Wi-Fi ON or OFF based on the necessary requirements. (This is not in the Wizard.)
5. Click the Apply button on the final page to configure the Wi-Fi settings.

Wi-Fi Status

The Menu bar should load with the Wi-Fi Icon after returning to the main display. There are two methods to check the status of the Wi-Fi:

1. Return to the configuration mode and click the Wi-Fi Icon in the menu bar. A page will load with the device IP details.
2. Go to Device → Misc. Configuration → About this Device and click the right navigation arrow to go to the Network Configuration section.
   <On Successful configuration>
   IP Info: (AP) https://xxx.xxx.x.xx (your IP address)
   Subnet Mask: 255.255.255.0
   Gateway: 192.168.1.1
   Wi-Fi Status: Cfg Success, AP 1 devices

   <On connection failure with invalid SSID or password>
   IP Info: (No Wi-Fi) 0.0.0.0
   Wi-Fi Status: Cfg Success, Disconnected

   <On configuration failure with Wi-Fi setup>
   IP Info: (No Wi-Fi) 0.0.0.0
   Wi-Fi Status: Configuration Failed

   <On Wi-Fi setup is not initialized>
   IP Info: (No Wi-Fi) 0.0.0.0
   Wi-Fi Status: Cfg not initialized

The Network Configuration section provides the Wi-Fi configuration details with its IP Information or any connection issue.

Once the Wi-Fi Setup is successful with the IP assigned to the device and your PC/Mobile is connected, based on the “Wi-Fi communication mode”, follow the steps below to access the device configuration.

How to connect to the PM-50 Wi-Fi Client

1. Once the PM-50 is configured in Client mode successfully, the Wi-Fi icon will appear. Connect the PC/Mobile to the same network with the SSID and password.
2. To view the Wi-Fi configuration status with the IP details, click the Wi-Fi Icon in the menu bar while in Configuration mode, or go to Device → Misc. Configuration → About this Device. Then click the

right navigation arrow to access the Network Information section.
<On Successful configuration>
IP Info: (AP) https://xxx.xxx.x.xx (your IP address)
Subnet Mask: 255.255.255.0
Gateway: 192.168.1.1
Wi-Fi Status: Cfg Success, Connected

3. Open a web browser (Chrome, FireFox, Safari etc) or the Mobile App and enter “https://xxx.xxx.x.xx (your IP address)” to connect to the PM-50.

Note: You must be logged out of Configuration Mode on the device to log into configuration using Wi-Fi.

How to connect to the PM-50 Wi-Fi Access Point

1. Once the PM-50 has been configured in Access Point mode successfully, enable the Wi-Fi mode on your device and search for the SSID configured in the device.
2. Select the SSID and connect with the given password.
3. To check the connection status with the IP details from the PM-50, click the Wi-Fi Icon in the menu bar, or go to Device → Misc. Configuration → About this Device. Then click the right navigation arrow to go to the Network Information section to view the Wi-Fi configuration status.
<On Successful configuration>
IP Info: (AP) https://xxx.xxx.x.xx (your IP address)
Subnet Mask: 255.255.255.0
Gateway: 192.168.1.1
Wi-Fi Status: Cfg Success, AP 1 devices
4. Open a web browser (Chrome, FireFox, Safari etc) or the Mobile App and enter “https://xxx.xxx.x.xx (your IP address)” to connect to the PM-50.

Note: You must be logged out of Configuration Mode on the device to log into configuration using Wi-Fi.

Push Notification

A push notification is a message that pops up on a user's mobile device having the PM50 App installed and connected to the PM50. The notification is "pushed" from the server to the user even if the app is closed. The PM50 uses push notification to alert the user in case of changes in setpoint (digital output) status.

How Push Notification Works

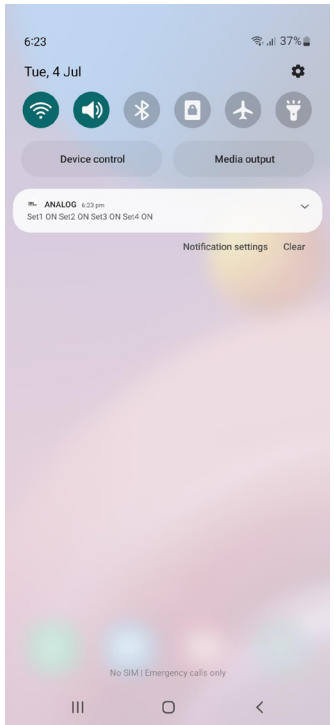
To get push notification from the PM50, at least one setpoint annunciator needs to be enabled. By default, push notification is enabled on the PM50 and the mobile application. Once the mobile application is connected to the PM50, it will start receiving push notifications as soon as the PM50 sends one.

Push notification is sent when the setpoint state is changed on the PM50 and the annunciator is enabled in the setpoint configuration. The PM50 will send push notifications to only one mobile device. However, more then one PM50 can be connected to the same mobile device.

Note: Push notification is sent only to the last connected mobile device.

Push notification can be enabled or disabled only in the mobile application settings. The push notification title and description are static and cannot be modified. Screenshots of the push notifications received on iOS and Android mobile devices are shown below:

Android Screenshot



iOS Screenshot

Pre-Requisites For Push Notifications To Work:

a. The mobile device and the PM50 should always be connected to the internet
b. Only one mobile device should be connected to the PM50.
c. Android OS version should be greater than 9.0
d. iOS version should be greater than 11.0

Note:

a. Push notifications will be sent to the last connected mobile device. The previous connected device will be dropped without notification.
b. Push notifications will be sent even when the App is closed.
c. Push notifications will not work if the PM50 is configured in Access Point Mode.

d. Push notification can be enabled or disabled only in the mobile application settings
e. The content of the push notifications is static, only the IP address and setpoint number are dynamic parts.

Wi-Fi Notes

Presently, Wi-Fi is only for real time viewing and configuration of the PM-50. With DHCP Client enabled (On), it is possible for the IP address to be dynamically changed by the server. There are only a few parameters that you cannot configure through Wi-Fi. There is a small delay to real time data update.

Update Firmware

The PM-50 allows you to update the firmware using the microSD card or remotely from a web browser. It is strongly suggested that the configuration in the PM-50 be saved to a config.txt file using a microSD card or through Wi-Fi before updating to a new firmware version.

Update Firmware Using MicroSD Card

The microSD card can be used to flash (install) new firmware onto the PM-50 by placing an image file (gpmcore.fwb) on the formatted microSD card. The microSD card should be 32 GB or smaller in size and formatted with the FAT16 or FAT32 format for the firmware update from microSD to work. Follow the steps below to flash new firmware onto the device.

1. Ensure the device is powered off and insert the microSD card loaded with the latest firmware into the microSD card slot in the device.
2. Power on the device and click the gear icon to login as the Admin User.
3. If you see the programming wizard, complete the initial setup or click the Exit button and complete the initial setup after the new firmware is installed.
4. Once the programming wizard updates are completed, login to the device with Admin user credentials.
5. Go to  Device → Misc. Configuration → Firmware Upload
6. The Firmware Upload page shows the microSD card status with the version of the firmware on it.

   Note: If it shows “No SD Card”, “No Firmware in SD Card” or “Invalid FW in SD Card”, check the firmware name (gpmcore.fwb) and microSD Card size, then repeat steps 1 through 5.

7. Click the Upload button to upgrade to the new firmware.
    - The next page loads to show the Firmware Upload progress details. At the completion of the upload, the unit will proceed with reboot.
    - After the PM-50 reboots, The PM-50 will momentarily display the upgraded firmware version in the lower left screen area. The firmware version can also be verified at Device → Misc. Configuration → About this Device. User settings from the previous firmware should be retained.

Upgrade Firmware Remotely

The firmware of the PM-50 can be upgraded remotely from a web browser.

1. Login to the device remotely from a web browser.
2. Go to Device → Misc. Configuration → Firmware Upload
3. Click the Select file button, select the firmware file (gpmcore.fwb) to upgrade to and click the Upgrade button.
4. A pop-up window warns that the firmware upgrade will reboot the device. Click on Proceed to start the firmware upgrade procedure and the PM-50 will show the upgrade status and then reboot. User settings from the previous firmware should be retained. You may lose Wi-Fi connection during reboot.
5. The PM-50 will momentarily display the upgraded firmware version in the lower left screen area.

Programming Wizard

The Programming Wizard is not available through Wi-Fi using a web browser or through the Mobile app.

Initial Setup Wizard

Select an Option to Continue
Quick Setup
Import Configuration
Exit

Quick Setup

Programming Wizard
Screen
Input
Output
Wi-Fi
Exit

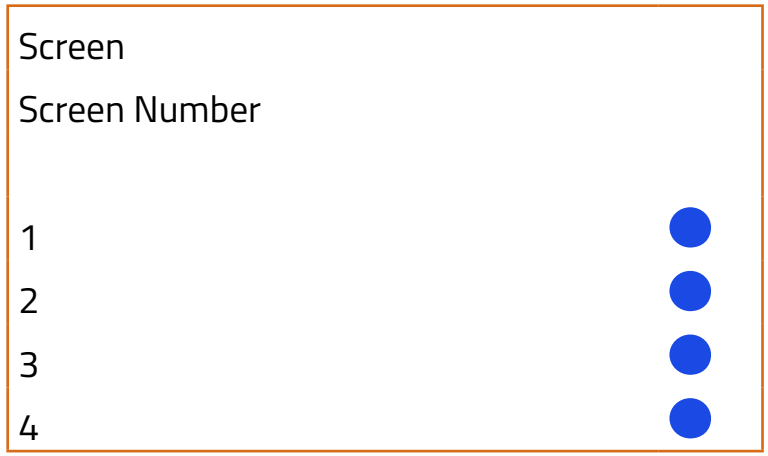
From here, you have access to select the basic parameters you want to program without going through the entire configuration sequence.

For more detailed programming information for the menus, select the menu below:

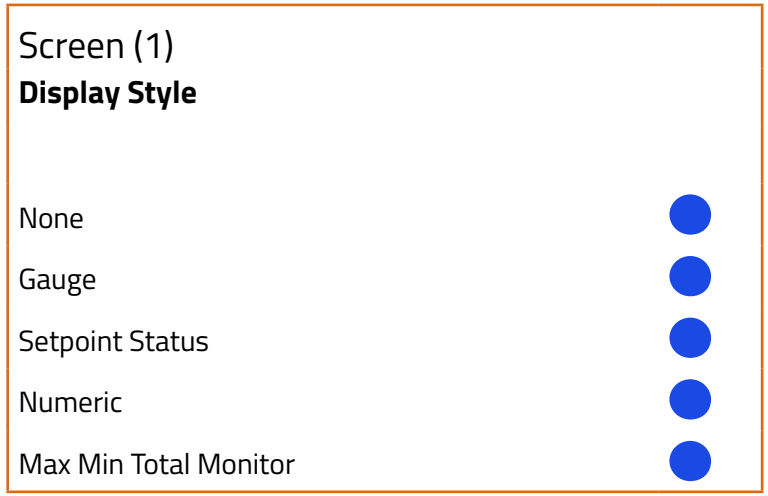
System - Display Configuration, Network Configuration and Account Configuration
Device - Inputs, Outpus, Function Keys and User Inputs, Modbus, and Misc Configurations
Home Screen - Screen Configuration

Items outlined in this color indicate programming wizard.

Programming Wizard
Screen



Select which screen you would like to configure. Screen 1 shown.



Items outlined in this color indicate programming wizard.

If you select Setpoint Status for your display, the next menu you see will be:

Output Type

Setpoint 1

Setpoint 2

If you have a Dual or Quad Relay module installed, you will see additional Setpoints (up to 6). Select which setpoint statuses you want to see on the screen.

Apply settings

Save or cancel changes

Apply Cancel

For Display Styles other than Setpoint Status, you will see a combination of the following menus. Not all parameters are available for each of the different styles.

Signal Type

Counter

Rate

If the Signal Type chosen is Counter:

Counter Type

Select Multiple to Scroll

Counter A

Counter B

Counter C

Items outlined in this color indicate programming wizard.

Unit for Counter A

units

The Unit for Counter selection will repeat for each counter selected in the previous step.

If the Display Style is set for Gauge, the following two selections are shown. These values are for graphical display units and are not the calculated Rate minimum and maximum values.

Minimum Display Value

0

Maximum Display Value

200

Apply settings

Save or cancel changes

Apply Cancel

Items outlined in this color indicate programming wizard.

If the Signal Type chosen is Rate:

Signal Type

Counter

Rate

Rate Type

Select Multiple to Scroll

Rate A
Rate B
Rate C
Hi
Lo

Unit for Rate A

units

The unit for Rate selection will repeat for each Rate Type selected in the previous step.

If the Display Style is set for Gauge, the following two selections are shown. These values are for graphical display units and are not the calculated Rate minimum and maximum values.

Minimum Display Value

0

Items outlined in this color indicate programming wizard.

Maximum Display Value

200

Apply settings

Save or cancel changes

Apply Cancel

Items outlined in this color indicate programming wizard.

Once back at the main Programming Wizard menu, you can choose to setup the Input, Output, Wi-Fi or Exit. All of the options are shown here. The options you see will depend on the selections you make as you step through the programming.

Programming Wizard
Input

Device / Signal Input

Counter Configuration

Rate Configuration

Counter Configuration

Counter

Counter A

Counter B

Counter C

Operating Mode Counter

Counter A selections:
None
Count x1
Count x1 w/ Direction
Dual Count x1 w/ Direction
Dual Count x1 Add/Add

Items outlined in this color indicate programming wizard.

Operating Mode Counter

Counter A selections: (Cont'd)

Dual Count x1 Add/Subtract

Quadrature x1

Quadrature x2

Quadrature x4

Dual Count Quadrature x1

Dual Count Quadrature x2

Count x2

Count x2 w/ Direction

Dual Count x2 w/ Direction

Counter B selections:

None

Batch

Count x1

Dual Count x1 w/ Direction

Dual Count Quadrature x1

Dual Count Quadrature x2

Count x2

Dual Count x2 w/ Direction

Counter C selections:

None

Counter A

Counter B

Counter A + Counter B

Items outlined in this color indicate programming wizard.

Counter C selections: (Cont'd)

Counter A - Counter B

Batch

Serial Slave

If Counter B or Counter C Operating Mode is set for Batch, the Next selection is:

Batch Source

Setpoint 1

Setpoint 2

If you have a Dual or Quad Relay module installed, you will see additional Setpoints (up to 6).

Decimal Point

0

0.0

0.00

0.000

0.0000

0.00000

Scale Factor for List A

Scale Factor Range (0.00001 to 9.99999)

1.00000

Items outlined in this color indicate programming wizard.

Count Load for List A

Range: -999999 to 999999

500

Scale Multiplier

- 0.01
- 0.1
- 1
- 10

Reset Action

- Zero
- Count Load

Reset At Power-Up

- No
- Yes

Apply settings

Save or cancel changes

Apply Cancel

Items outlined in this color indicate programming wizard.

Rate Configuration

Rate Type

Rate A

Rate B

Rate C

Common

In order to access the “Common” selection under Rate Type, you must enable Rate and “Apply” changes. When you reenter Rate Configuration, Common is now a selection.

Enable Rate

If Enable Rate is OFF, then the next page is Apply settings.

Rate A and Rate B

Decimal Point

0

0.0

0.00

0.000

0.0000

Items outlined in this color indicate programming wizard.

Scaling Type

Enter Values

Apply Signal

Scaling Points

2

3

4

5

6

7

8

9

10

Click here for more information on scaling rate inputs.

Scaling Point 1

Range: 0.0 to 99999.9

0.0

If Apply Signal method is chosen, **Read Input** and **Save Input** buttons to read the Input and then save the value will follow each scaling point.

Items outlined in this color indicate programming wizard.

Display Point 1
Range: 0 to 999999

0

Scaling Point 2
Range: 0.0 to 99999.9

1000.0

Display Point 2
Range: 0 to 999999

1000

Repeats for each sucessive pair.

Display Rounding

1

2

5

10

20

50

100

Items outlined in this color indicate programming wizard.

Low Cut Out

Range: 0 to 999999

0

Apply settings

Save or cancel changes

Apply Cancel

Rate C

Rate C Parameters

None

Sum (A+B)

Difference (A-B)

Percent Ratio (A/B)

Percent of Total A/(A+B)

Percent Ratio (A-B)/B

Items outlined in this color indicate programming wizard.

Decimal Point

- 0
- 0.0
- 0.00
- 0.000
- 0.0000

Rate C Multiplier

- 1
- 10
- 100
- 1000

Apply settings

Save or cancel changes

Apply Cancel

Items outlined in this color indicate programming wizard.

Common

Rate Low Update Time
Range: 0.1 to 999.9 Sec
1.0

Rate High Update Time
Range: 0.2 to 999.9 Sec
2.0

Maximum Capture Value Assignment

Rate A

Rate B

Rate C

Maximum Capture Delay Time
Range: 0.0 to 999.9 Sec
1.0

Items outlined in this color indicate programming wizard.

Minimum Capture Value Assignment

Rate A

Rate B

Rate C

Minimum Capture Delay Time

Range: 0.0 to 999.9 Sec

1.0

Apply settings

Save or cancel changes

Apply Cancel

Items outlined in this color indicate programming wizard.

Programming Wizard

Output

Device / Setpoint

Setpoint Number

Setpoint 1

Setpoint 2

Setpoints 3 to 6 will show based on the Dual Relay (Setpoint 3-4) or Quad Relay (Setpoint 3-6) module installed.

Device / Setpoint (1)

Setpoint Assignment

- None
- Counter A
- Counter B
- Counter C
- Rate A
- Rate B
- Rate C

If the Setpoint Assignment is None, then the next page is Apply settings.

Items outlined in this color indicate programming wizard.

Setpoint Action

- No
- Latched
- Timed Out
- Boundary

The following menus will vary depending on the Setpoint Assignment and Setpoint Action selected.

Output Logic

- Normal
- Reverse

Configure List A/B

- List A Config
- List B Config

Setpoint Value for List A

Range: -999999 to 999999

100

Items outlined in this color indicate programming wizard.

Setpoint Tracking

No
Setpoint 1
Setpoint 2
Setpoint 3
Setpoint 4
Setpoint 5
Setpoint 6
CLd A
CLd B
CLd C

Output Power-Up State

Off
On
Save

Counter Auto Reset

None
Zero at Start Activation
Count Load at Start Activation
Zero at End Activation
Count Load at End Activation

Items outlined in this color indicate programming wizard.

Output Reset with Count Reset

- No
- Yes

Output Reset at Sn + 1

- No
- Sn-Str
- Sn-End

Activation Boundary Type

- High Acting
- Low Acting

Setpoint Standby Operation

- No
- Yes

Items outlined in this color indicate programming wizard.

Hysteresis
Range: 0 to 5999

2

Output Timed Out
Range: 0.0 to 599.9 Sec

1.00

Rate Timed Output One-Shot

No

Yes

Apply settings
Save or cancel changes

Apply Cancel

Items outlined in this color indicate programming wizard.

Programming Wizard
Wi-Fi

Network / Wi-Fi

Enable Wi-Fi

OFF

Disables the Wi-Fi/Remote operations

Network / Wi-Fi

Enable Wi-Fi

ON

To use Wi-Fi, Admin Password should be enabled

Caution: There is no default password to unlock your unit if you forget the password you have entered.
Make sure to place a copy of your password in a secure location to ensure you are not locked out.
Once you hit Confirm, you will not be able to see or retrieve the password you entered.

System / Account

Set Admin Password

Enter New Password for Admin

Items outlined in this color indicate programming wizard.

System / Account

Set Admin Password

Enter New Password for Admin

Click to Re-enter and Confirm Password

System / Account

Set Admin Password

Re-Enter New Password for Admin

System / Account

Set Admin Password

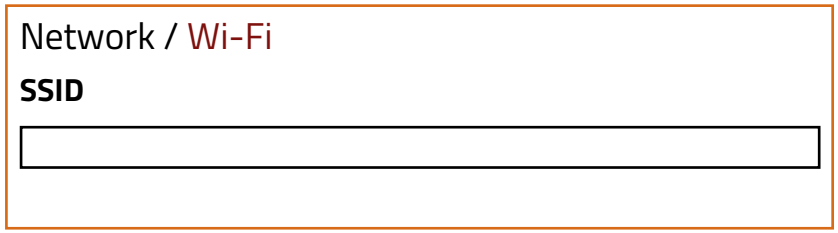
Re-Enter New Password for Admin

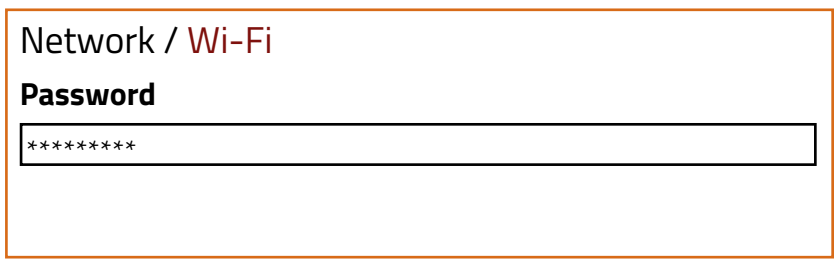
Password Match. Confirm to proceed

Ignore

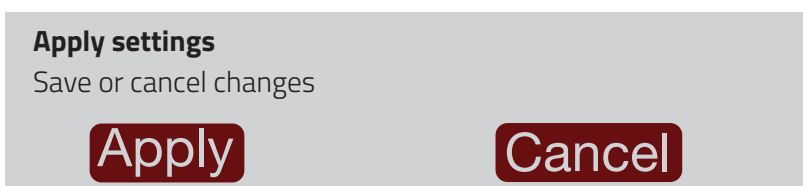
Confirm

Items outlined in this color indicate programming wizard.



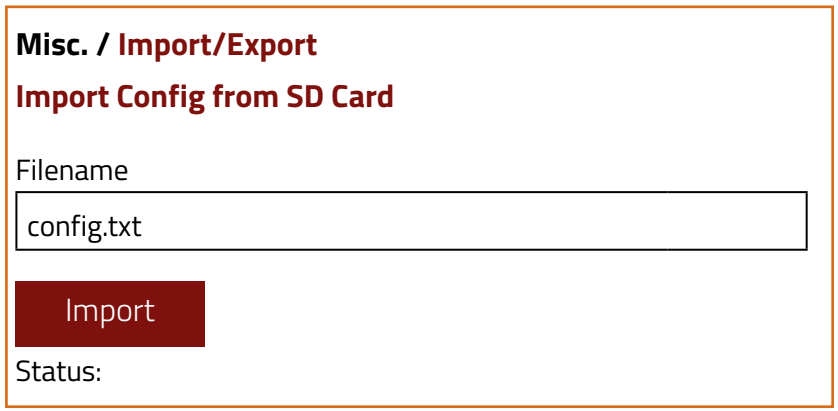


After setting your Wi-Fi password, the following menu will appear. After making your selection it will return you to the Programming Wizard main menu.



Items outlined in this color indicate programming wizard.

Import Configuration



The file name must be config.txt for a successful import.

When you click the import button, one of the following status messages will appear based on the microSD card:

- No SD Card detected - when the microSD card is not available in the slot, or the microSD card is an incompatible size or format
- File not found - If the microSD card is present, but the config.txt file does not exist
- Import successful, Rebooting - When the config.txt file is imported successfully, the device reboots to activate the configuration

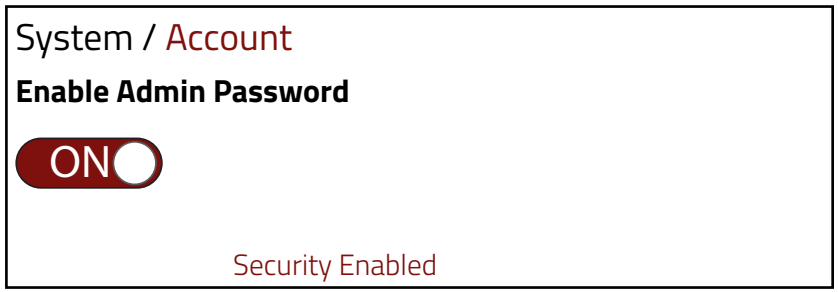
Exit

If you select the Exit option from the Initial Setup Wizard Menu, the following menu appears.

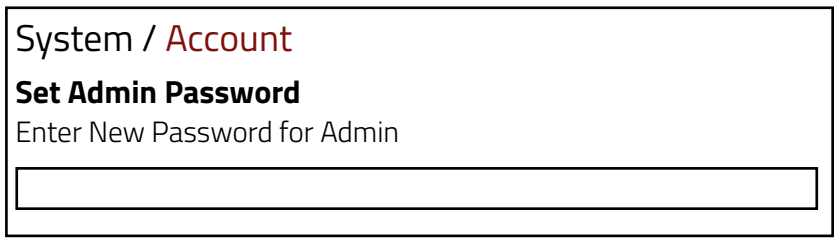
Items outlined in this color indicate programming wizard.

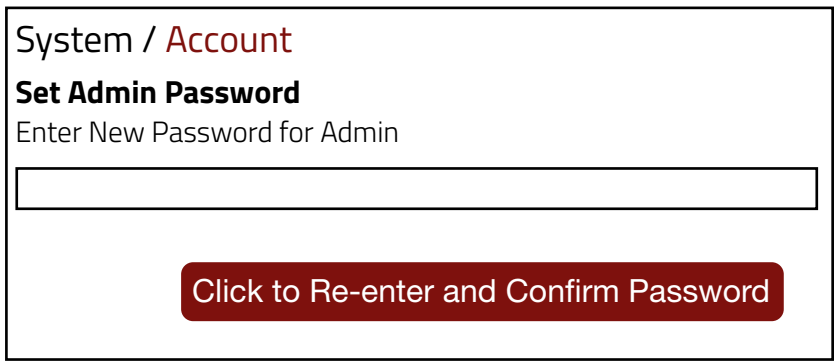
Device Configuration

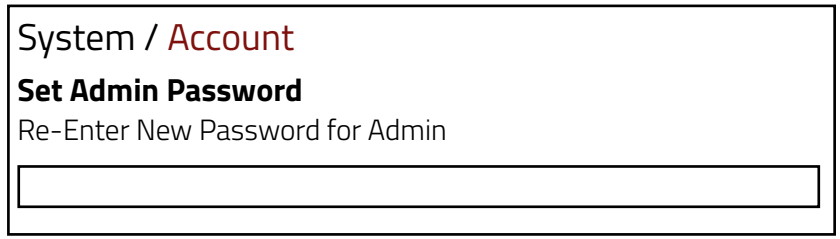
If you choose to skip the Quick Setup Programming Wizard, or did not enter a previous password, then the first time that you press the icon you will see:

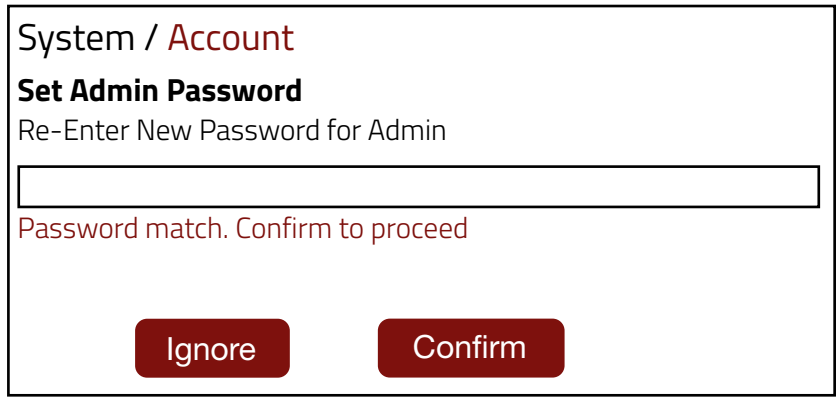


It is recommended to set an admin password to make the configuration secure. To recover your password in case you forget, follow the Password Recovery instructions in Device Configuration.



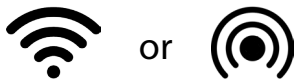
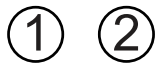






Pressing the confirm button displays the main device configuration menu page. From here you can choose from the System, Device or Home Screen icons to determine the section of the device you would like to configure.

Main Display Icon Descriptions

	Top left company logo returns you to the main display.
	Wi-Fi icons - The left icon indicates connection to network, the right icon indicates access point mode is enabled. Press from the Home screen to check Wi-Fi settings.
	Setpoint 1 & 2 Status. Status of other setpoints must be viewed using the setpoint widget.
	Help Icon - This takes you to the on-line manuals.
	Indicates when the Admin is logged in. The A icon can also indicate that the Configuration mode is not protected with a password. Note: If there is no user action/touch for 10 minutes, the device will automatically logout from Admin mode.
	Top right gear icon takes you into the System Configuration menu page.
	The Home icon returns the user to the main display. This will not log you out of Configuration mode.
	The Configuration icon allows you to access the Display, Network, and Account Configurations.
	The Device icon allows you to access the Signal Input, Setpoint, Function, Modbus, Analog Out, Calibration and Misc. Configurations.
	This icon allows you to access the Home Screen Configuration.

RED LION®

System

Display Configuration

Brightness & Sleep Timer

Update Display

Network Configuration

Wi-Fi

Set up Wireless Network

Account Configuration

User Access

User Account

Display Configuration

System / Display

Display Configuration

Display Brightness

Enable Sleep Timer

Default setting is OFF. This setting is the amount of time before the display goes dim if there is no screen touch.

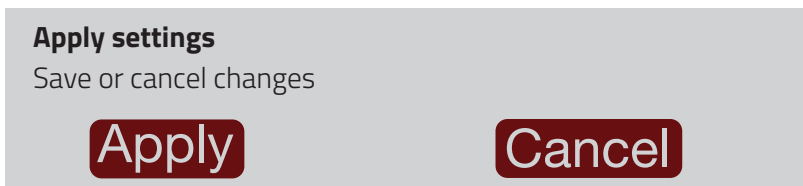
Sleep Timer

Range: 1 to 3600 seconds

200

Display will dim after 200 Sec

Power save mode when turned ON, will turn the background to Black. Off will turn the background to white.



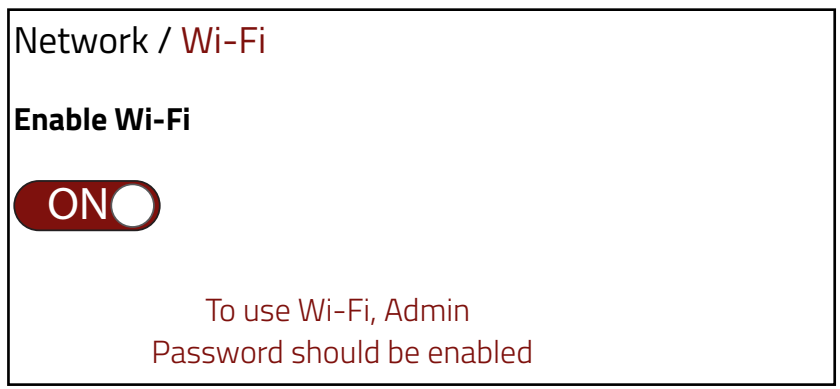
Network Configuration

System / Network

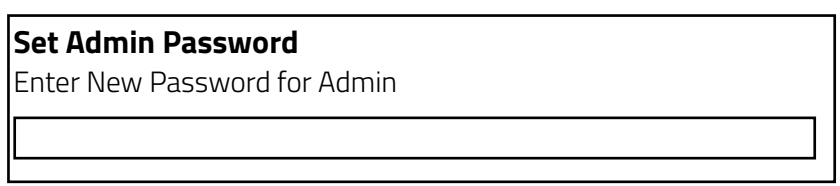
Wi-Fi Configuration

Notification Configuration

Wi-Fi Configuration

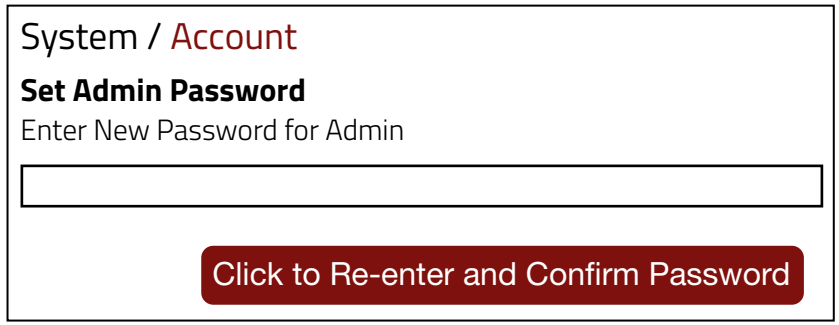


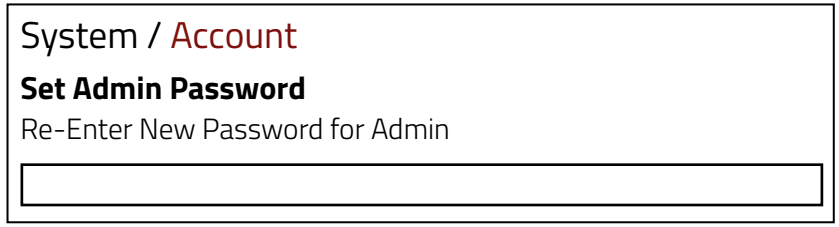
When set to OFF, Wi-Fi and Remote operations are disabled. If switch is set to OFF, the next menu you see will be to apply or cancel changes. The below menus are enabled if the switch is set to ON.



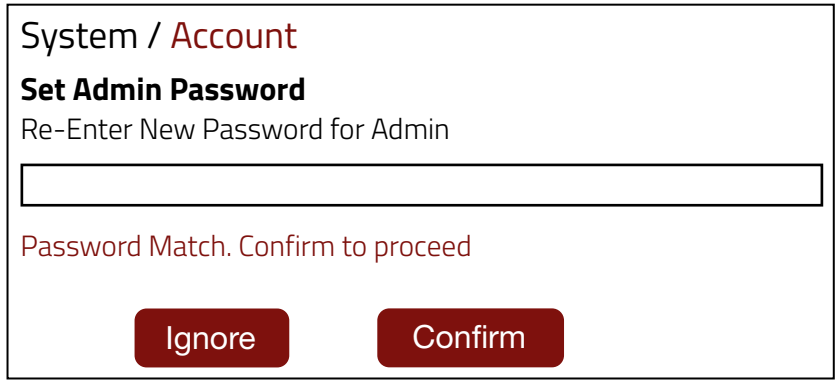
If you previously entered a password, the password parameters will be skipped. You must enter a new password to proceed.

Caution: There is no default password to unlock your unit if you forget the password you have entered. Make sure to place a copy of your password in a secure location to ensure you are not locked out.

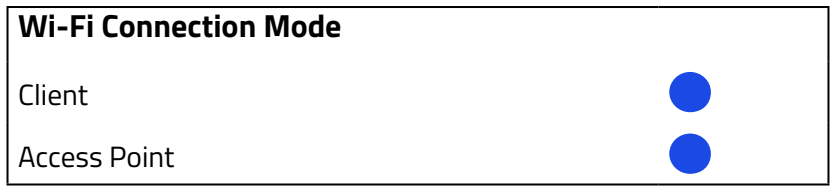




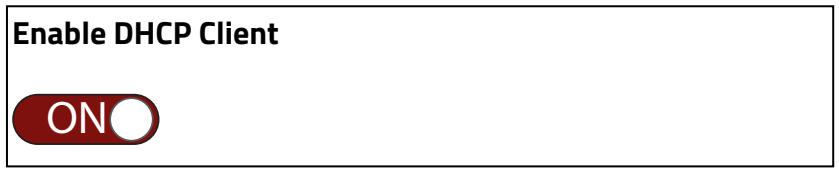
Re-enter password to proceed.

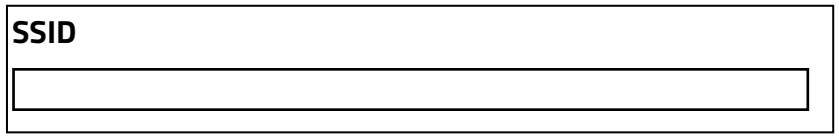


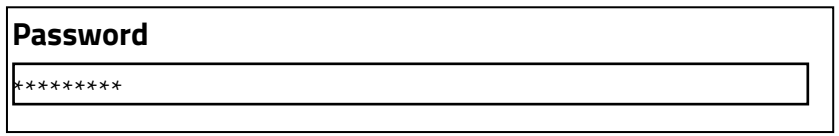
The password that you entered will be displayed. Pressing Ignore will send you back to enter a new admin password. Pressing Confirm takes you to the following menu. Once you hit Confirm, you will not be able to see or retrieve the password you entered.

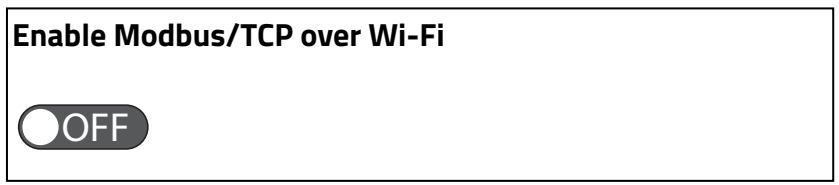


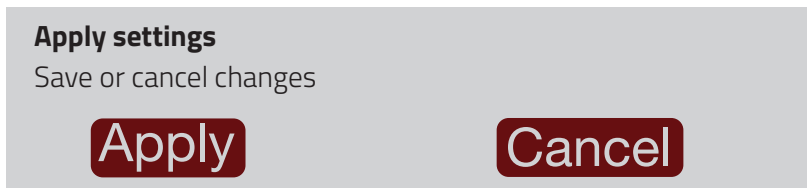
If Client is selected the menus are:





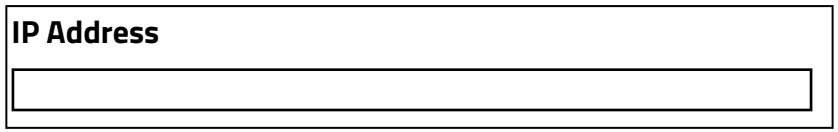


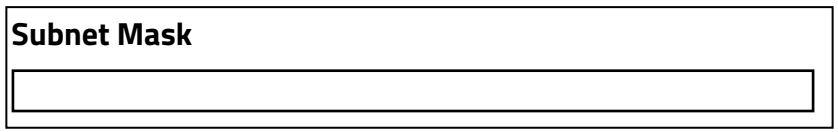


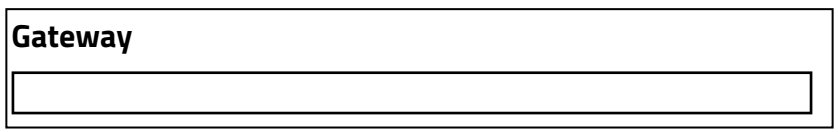


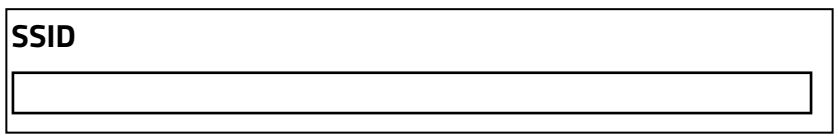
If Client is selected, and DHCP Client is OFF the menus are:

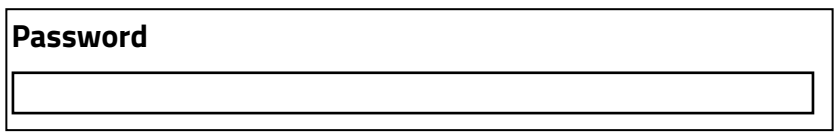
Dynamic Host Configuration Protocol is a network management protocol used to automate the process of configuring devices on IP networks. With it off, it allows the user to configure fixed parameters.











Enable Modbus/TCP over Wi-Fi

OFF

Apply settings

Save or cancel changes

Apply Cancel

If Access Point is selected the menus are:

Enable DHCP Client

OFF

IP Address

Subnet Mask

Gateway

SSID

Password

****

Encryption Mode

WPA PSK

WPA2 PSK

WPA + WPA2 PSK

The next 2 selections only appear if Enable DHCP Client is ON

Starting Address

Ending Address

Enable Modbus/TCP over Wi-Fi

OFF

Apply settings

Save or cancel changes

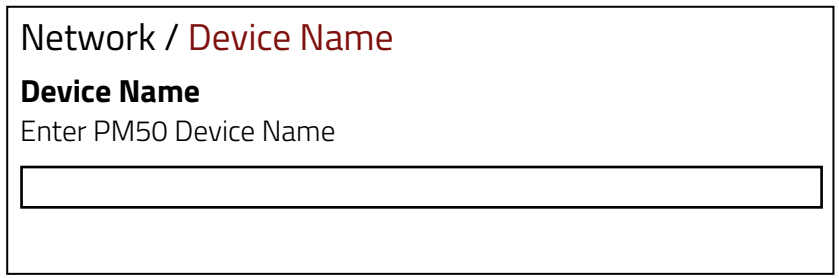
Apply Cancel

Notification Configuration

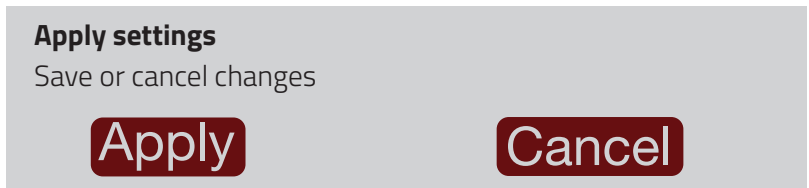
Here we have two menus namely Device Name Configuration and Push Notification Configuration. Device Name Configuration refers to configuring the PM50 device name and Push Notification configuration refers to configuring the push notifications for the PM50 device.

Device Name Configuration

When you tap on Device Name Configuration, the first page displayed is the device name page. This name will be shown as the title of the push notification.



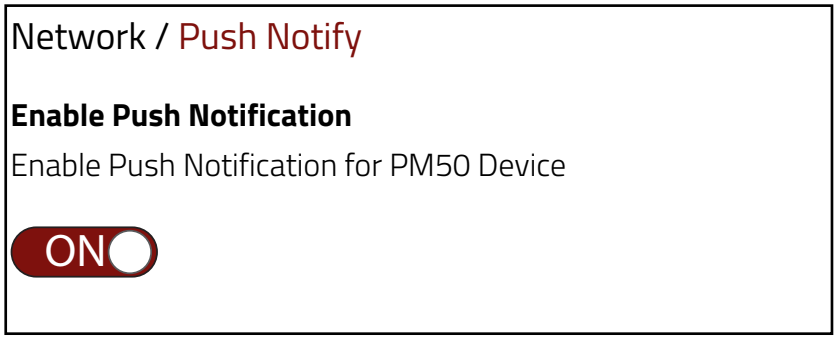
This is the last page of the Device Name Configuration. Here we either click on Apply button which will save the configuration or click on the Cancel button to exit the configuration.



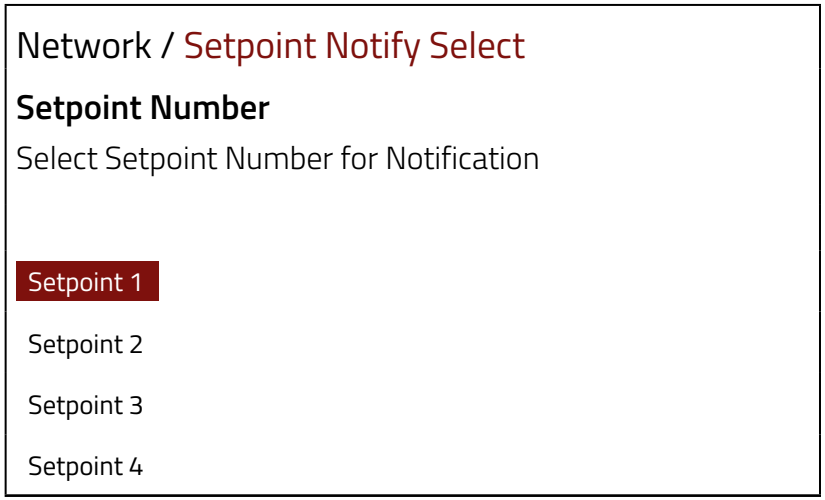
The next menu is Push Notification Configuration. Here we can enable/disable the push notifications for the PM50 device. Also, we can enable push notifications for a specific setpoint.

Push Notification Configuration

The first page is for enabling the push notifications for the PM50 device. Here if we enable the user will receive push notifications and if it is disabled the user will stop receiving the push notifications.

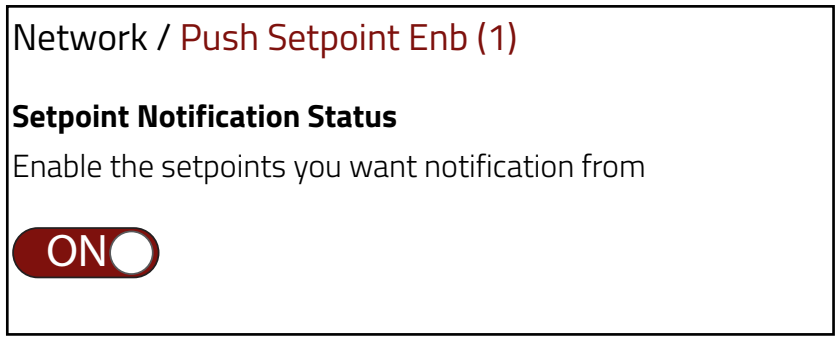


The next page is for selecting the setpoint for which we need to enable the push notifications.



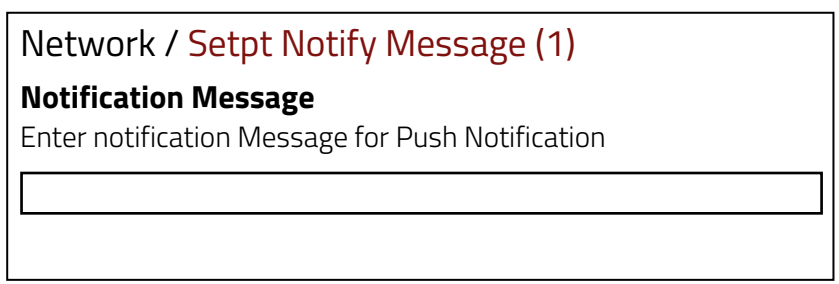
The next page is for enabling the push notifications for the setpoint we selected on the previous page. The number in the round bracket represents the selected setpoint number.

Note: The push notification we enabled on the second page was global and the push notification we enabled now is for a specific setpoint.

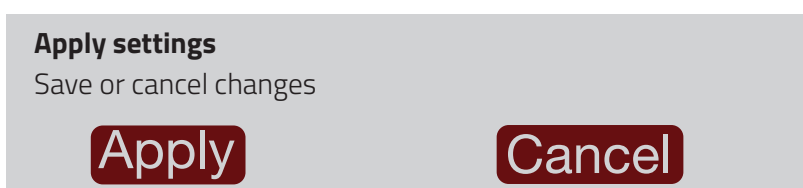


The next page is for adding a description for the setpoint push notification. The content will be visible on the push notification popup when you receive the push notification from the device. The number in the round bracket represents the selected setpoint number.

Note: This description is specific to the setpoint we selected previously.



This is the last page of the configuration. Here we either click on Apply button which will save the configuration or click on the Cancel button which will exit the configuration pages and redirect to the page shown in the first screenshot. The number in the round bracket represents the selected setpoint number.



Note: Another crucial point to note is that configuration for only a single setpoint will be saved at a time.

Check list if Push notification is not received:

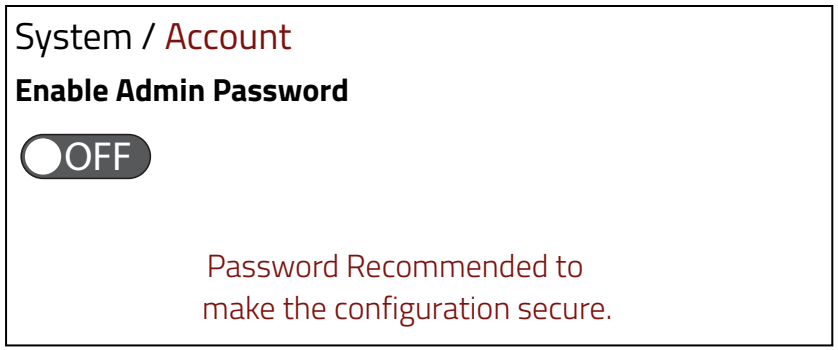
1. Check if the push notification is enabled on the device.
2. Check if internet is available to the device.
3. Check if in app setting notification option is enabled.

Account Configuration

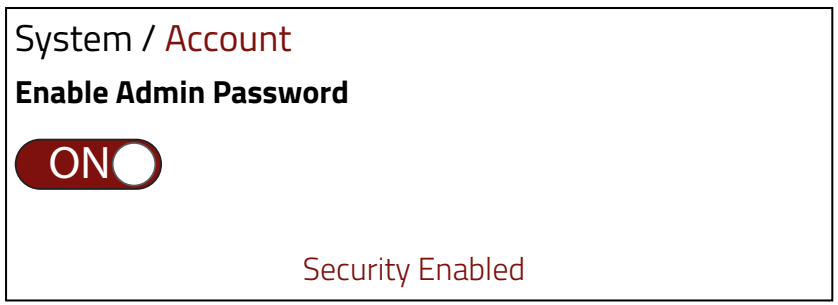
User Access

User Account

If Password is set to OFF, remote operation (Wi-Fi) will be disabled and configurations will be insecure.
If the Admin password was enabled during Quick Start, the following menu will show Supervisor instead of Admin.
Note: The Admin password and Supervisor password MUST be different. Each password length should be 6-10 characters.



Caution: There is no default password to unlock your unit if you forget the password you have entered. Make sure to place a copy of your password in a secure location to ensure you are not locked out.



Change Admin Password

Enter New Password for Admin

System / Account

Change Admin Password

Enter New Password for Admin

Click to Re-enter and Confirm Password

System / Account

Change Admin Password

Re-Enter New Password for Admin

Re-enter password to proceed.

System / Account

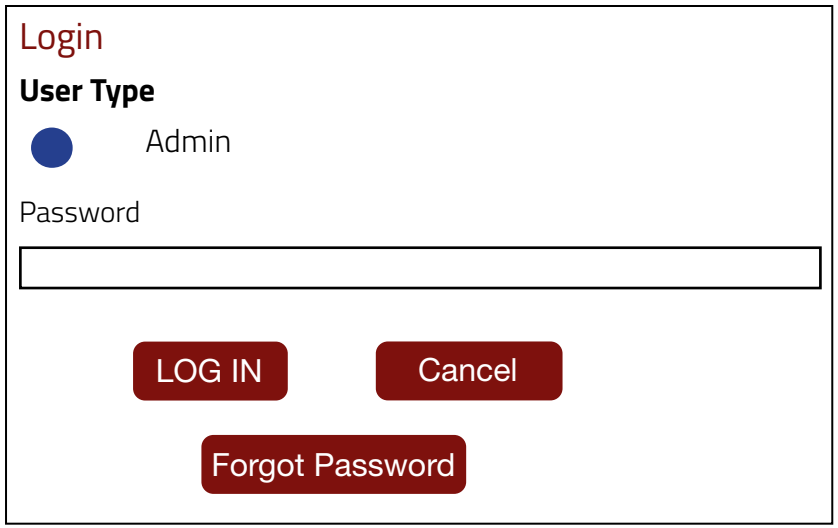
Change Admin Password

Re-Enter New Password for Admin

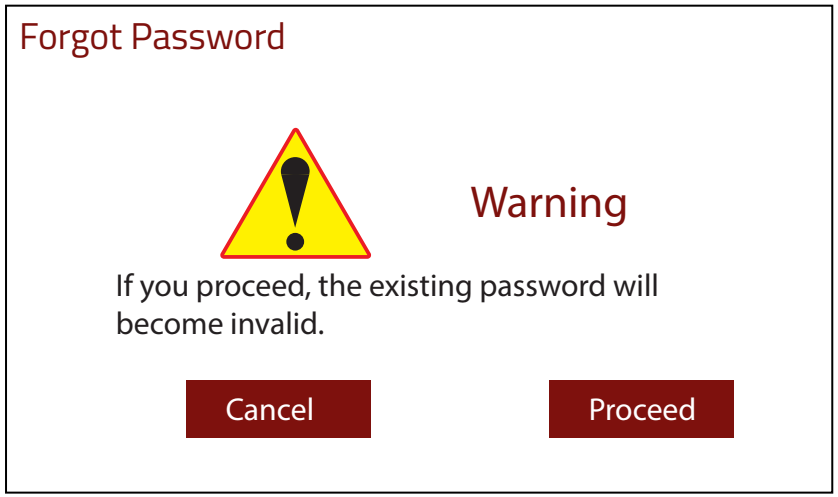
Password Match. Confirm to proceed

Ignore

Confirm

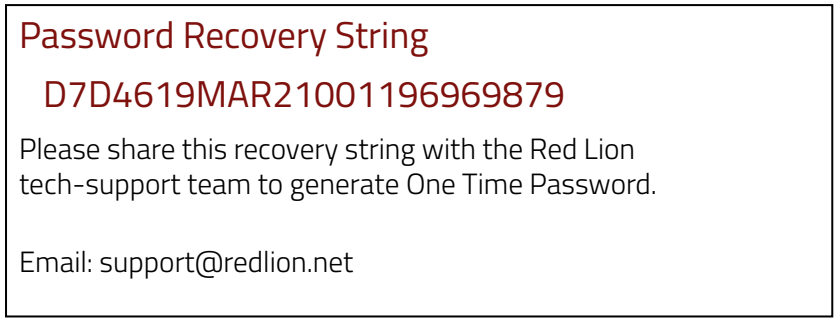


If the user has forgotten their password, they can press the Forgot Password button to reset the password and move on to the warning page. If the user selects the Forgot Password button, the warning message shown below will appear.



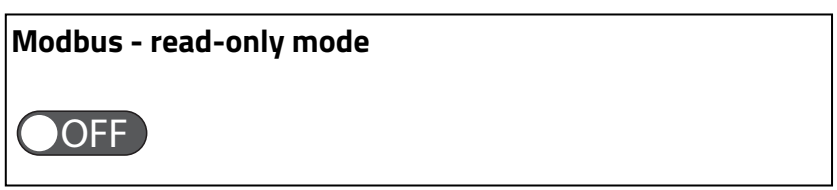
If the user selects Cancel, then they will be returned to the Login page. If the user selects Proceed, a password recovery string will be displayed on the screen.

Note: If you proceed, the existing password will become invalid.

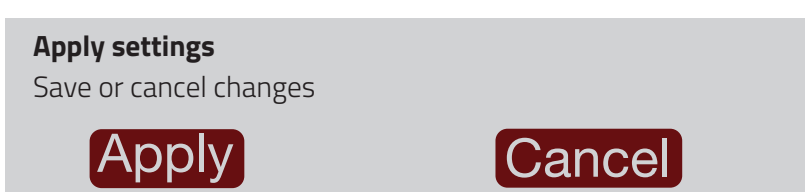


Once the recovery string is generated, it will remain the same until the user generates a new string for the password. Once the recovery string is generated, the user needs to send a password recovery request email along with this string to support@redlion.net. Our tech support team will respond back with a new password. Our tech support can be reached during the hours listed below:

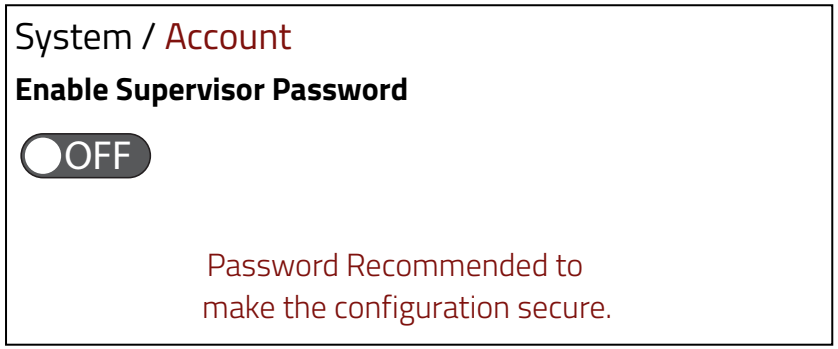
AMERICAS	ASIA-PACIFIC	EUROPE
Hours: 8 am-6 pm Eastern Standard time (UTC/GMT -5 hours)	Hours: 9 am-6 pm China Standard Time (UTC/GMT +8 hours)	Hours: 9 am-5 pm Central European Time (UTC/GMT +1 hour)



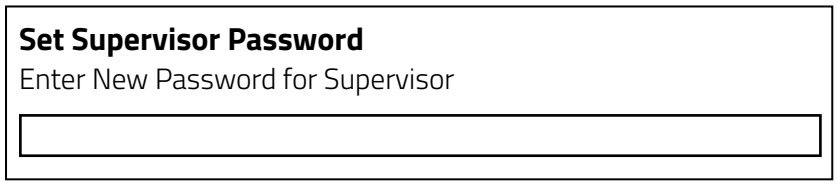
This Modbus read only mode applies only to Modbus protocol and not RLC protocol. Setting this switch ON will let the user do Modbus reads only over the various interfaces (Wi-Fi, User RS485, RS232 and Ethernet modules). No writes are allowed if this read-only mode is turned ON.

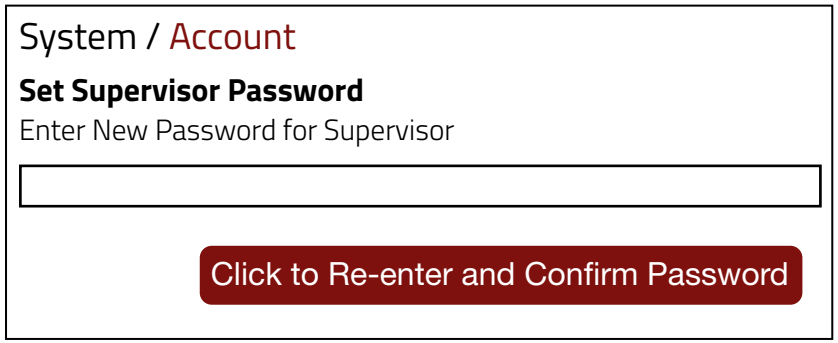


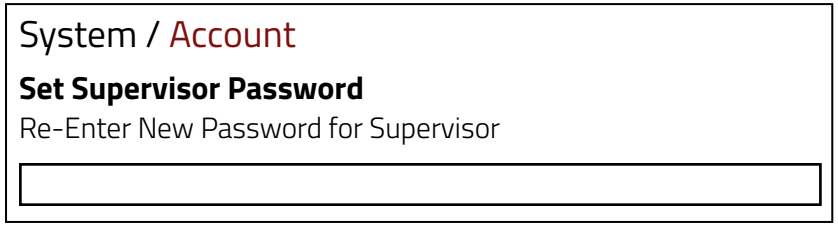
Upon re-entry to System Account Menu, the screen now shows Supervisor instead of Admin. Setting a Supervisor password allows limited access to specific configuration values like setpoint value, reset, etc. Supervisor mode can only be accessed through a function key enabled for Supervisor.



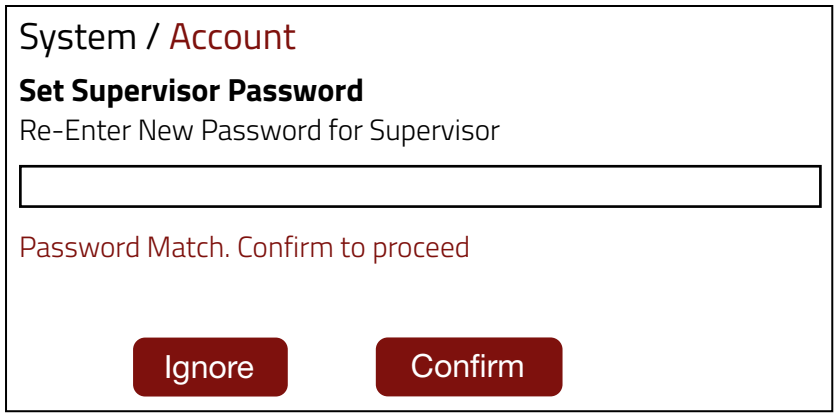
Note: You must be logged in to the PM50 as Admin to set up Supervisor mode. If the password for Supervisor is not set by an Admin, Supervisor mode is not enabled.



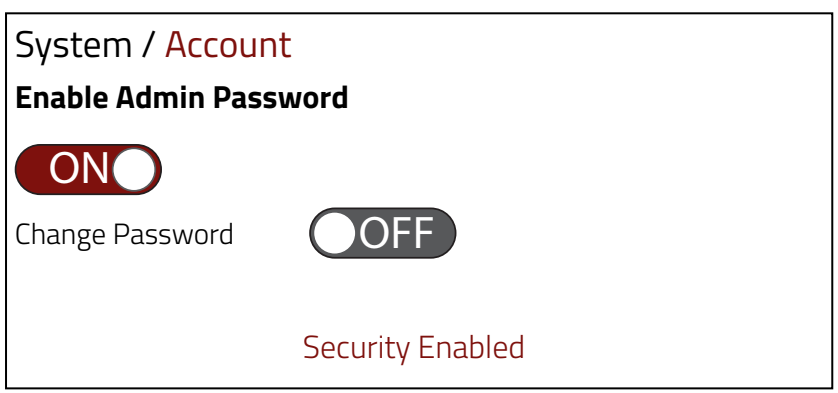




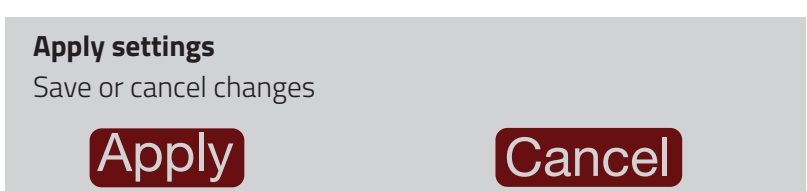
Re-enter password to proceed.



The password that you entered will be displayed. Pressing Ignore will send you back to enter a new admin password. Pressing Confirm takes you to the following menu. Once you hit Confirm, you will not be able to see or retrieve the password you entered.



Selecting Change Password to ON will allow you to change the Admin Password following the exact same sequence as above. This is then followed by Modbus settings and then the Apply settings box.



Device

Signal Input Configuration

Control Input, Counter & Rate

Setup Input parameters

SP & Analog Configuration

Setpoint & Analog (Analog is only available with Analog module attached.)

Setup SP & Analog parameters

Function Configuration

Function Key & User Input

Setup Function

REDLION®

Device

Modbus Configuration

Modbus(ASCII/RTU/TCP) & RLC(ASCII)

Setup Wired Communication

Misc Configuration

Import/Export & Factory

Calibration,Firmware Update..

Signal Input Configuration

Device / Signal Input

Counter Input Configuration

Counter Configuration

Rate Configuration

Counter Input Configuration

This section sets the input configuration hardware type for counter and rate input signals.

Device / Control Input

Input

Input A (Count 1 input)

Input B (Count 2 input)

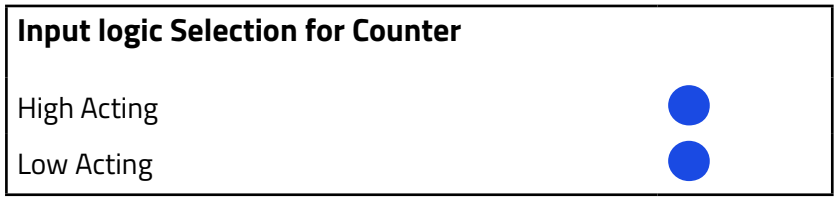
Digital Filter

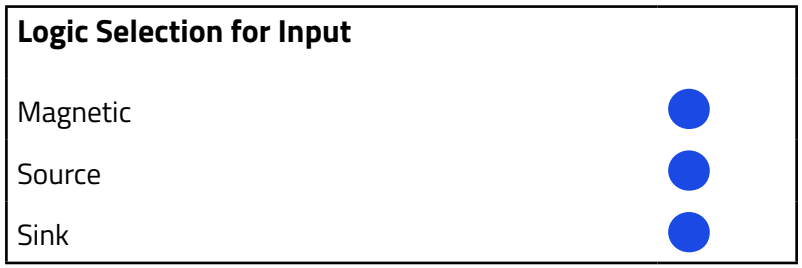
For most applications the Digital Filter should be set to OFF.

Note:

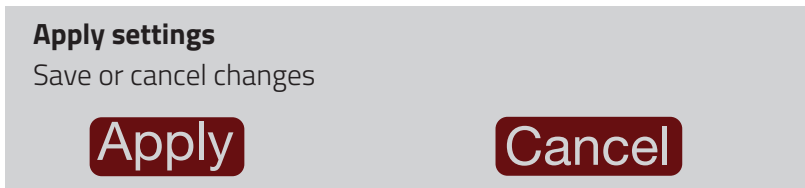
Mode	Input A	Input B	
Dual Input X1 Add/Add	Filter Enabled	Filter Disabled	Not supported
Dual Input X1 Add/Subtract	Filter Enabled	Filter Disabled	Not supported
Quad X4	Filter Enabled	Filter Disabled	Not supported

Note: For 1 Hz input frequency with digital filter enabled, change the low update time to 2 or more and high update time to 4 or more.





Factory setting is Sink (PM50 input terminal is high or at a voltage and the external sensor is taking it low.) See Signal Inputs in specifications for more details.



Counter Configuration

Device / Counter

Counter

Counter A

Counter B

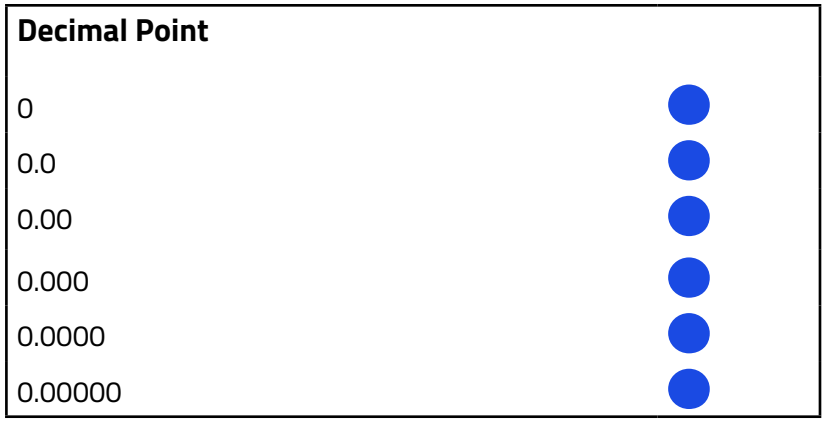
Counter C

Operating Mode Counter **Counter A (Input 1)**	
None	Does not count
Count x1	Adds Input A falling edge
Count x1 w/ Direction	Adds Input A falling edge if Input B is high. Subtracts Input A falling edge if Input B is low.
Dual Count x1 w/ Direction	Adds Input A falling edge if User 1 is high. Subtracts Input A falling edge if User 1 is low.
Dual Count x1 Add/Add	Adds Input A falling edge and Input B falling edge.
Dual Count x1 Add/Subtract	Adds Input A falling edge. Subtracts Input B falling edge.
Quadrature x1	Adds Input A rising edge when Input B is high. Subtracts Input A falling edge when Input B is high
Quadrature x2	Adds Input A rising edge when Input B is high and Input A falling edge when Input B is low. Subtracts Input A falling edge when Input B is high and Input A rising edge when Input B is low.
Quadrature x4	Adds Input A rising edge when Input B is high, Input A falling edge when Input B is low, Input B rising edge when Input A is low, and Input B falling edge when Input A is high. Subtracts Input A falling edge when Input B is high, Input A rising edge when Input B is low, Input B rising edge when Input A is high, and Input B falling edge when Input A is low.

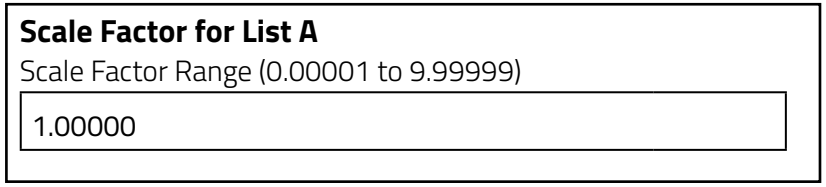
Dual Count Quadrature x1	Adds Input A rising edge when User 1 is high. Subtracts Input A falling edge when User 1 is high.
Dual Count Quadrature x2	Adds Input A rising edge when User 1 is high and Input A falling edge when User 1 is low. Subtracts Input A falling edge when User 1 is high and Input A rising edge when User 1 is low.
Count x2	Adds Input A rising and falling edges.
Count x2 w/ Direction	Adds Input A rising and falling edges if Input B is high. Subtracts Input A rising and falling edge if Input B is low.
Dual Count x2 w/ Direction	Adds Input A rising and falling edges if User 1 is high. Subtracts Input A rising and falling edge if User 1 is low.
Note: When using Dual Count With Direction or Dual Count Quadrature Operating Modes User Input 1 must be programmed for none.	

Counter B (Input 2)	
None	Does not count
Batch	Counter B internally counts the number of output activations of the selected setpoint(s). The count source is selected in the Yes/No sub-menu shown for each setpoint.
Count x1	Adds Input B falling edge.
Dual Count x1 w/ Direction	Adds Input B falling edge if User 2 is high. Subtracts Input B falling edge if User 2 is low.
Dual Count Quadrature x1	Adds Input B rising edge when User 2 is high. Subtracts Input B falling edge when User 2 is high.
Dual Count Quadrature x2	Adds Input B rising edge when User 2 is high and Input B falling edge when User 2 is low. Subtracts Input B falling edge when User 2 is high and Input B rising edge when User 2 is low.
Count x2	Adds Input B rising and falling edges.
Dual Count x2 w/ Direction	Adds Input B rising and falling edges if User 2 is high. Subtracts Input B rising and falling edge if User 2 is low.
Note: When using Dual Count Operating Modes User Input 2 must be programmed for none.	

Counter C	
None	Does not count
Counter A	Counter C counts the incoming pulses from Counter A Input as per Counter A mode of operation. The signal is scaled only according to Counter C parameters.
Counter B	Counter C counts the incoming pulses from Counter B Input as per Counter B mode of operation. The signal is scaled only according to Counter C parameters.
Counter A + Counter B ‡	Counter C counts the incoming pulses from Counter A and B inputs as per Counter A and B modes of operation. The result is scaled only according to Counter C parameters. (Example: If Counter A is set for Count X1 mode and Counter B is set for Count X2 mode, then Counter C will increment by 1 for each pulse received on Input A and increment by 2 for each pulse received on Input B. Counter C scale settings are then applied and the result displayed.)
Counter A - Counter B ‡	Counter C counts the incoming pulses from Counter A and B inputs as per Counter A and B modes of operation and subtracts the B counts from the A counts. The result is scaled only according to Counter C parameters. (Example: If Counter A is set for Count X1 mode and Counter B is set for Count X2 mode, then Counter C will increment by 1 for each pulse received on Input A and decrement by 2 for each pulse received on Input B. Counter C scale settings are then applied and the result displayed.)
‡ **Note: Counter A, B and C must all be reset at the same time for the math to be shown correctly between the display values.**	
Batch	Counter C internally counts the number of output activations of the selected setpoint(s). The count source is selected in the Yes/No sub-menu shown for each setpoint.
Serial Slave	Counter C functions as a serial slave display.



This selects the decimal point position for the selected counter, and any setpoint value assigned to that counter. The selection will also affect that counter's scale factor calculations.



The number of input counts for the selected counter is multiplied by the scale factor and the scale multiplier to obtain the desired process value. A scale factor of 1.00000 will result in the display of the actual number of input counts. For Counter A + Counter B and Counter A - Counter B modes of operation, the math is performed on the input signals and then the result is scaled by Counter C scaling. To achieve correct results, both Input A and Input B must provide the same amount of pulses per unit of measurement.

Count Load for List A

Range: -999999 to 999999

500

When Reset To Count Load action is chosen, the selected counter will reset to this value.

Scale Multiplier

0.01

0.1

1

10

The number of input counts for the selected counter is multiplied by the scale multiplier and the scale factor to obtain the desired process value.

SCALING CALCULATION

Each counter has the ability to scale an input signal to a desired display value. This is accomplished by the counter operating mode, decimal point, scale factor, and scale multiplier. The scale factor is calculated using:

$$\text{Scale Factor} = \frac{\text{DDD}}{\text{(Number of pulses per 'single' unit x CMF x SM}}$$

Where:

Number of pulses per 'single' unit: pulses per unit generated by the process (i.e. # of pulses per foot)
CMF: Counter Mode times factor of the mode 1, 2 or 4.
SM: Scale Multiplier selection of 10, 1, 0.1 or 0.01.
DDD: Desired Display Decimal (1 =1, 1.0 = 10, 1.00 = 100, etc.)

Example:

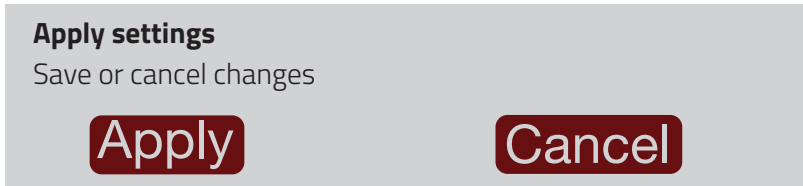
1. Indicate feet to the hundredths (0.00) with 100 pulses per foot:
   Scale Factor would be 100 / (100 x 1 x 1) = 1
   (In this case, the scale multiplier and counter mode factor are 1)
2. Indicate feet with 120 pulses per foot: Scale Factor would be 1 / (120 x 1 x 1) = 0.0083333. (In this case, the scale multiplier of 0.01 could be used: 1 / (120 x 1 x 0.01) = 0.83333 or show to hundredths (0.00): 100 / (120 x 1 x 1) = 0.8333.)

General Rules on Scaling

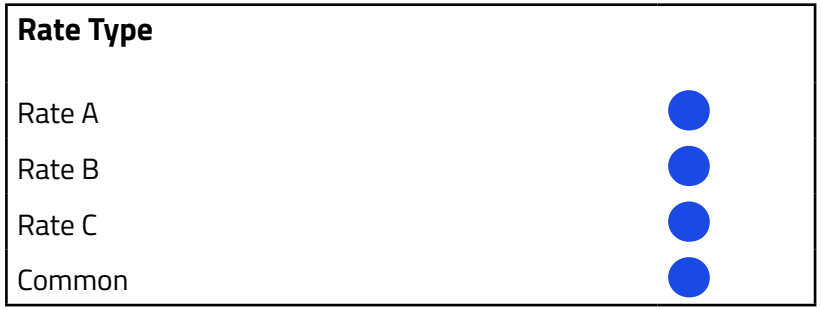
1. It is recommended that, the scale factor be as close as possible to, but not exceeding 1.00000. This can be accomplished by increasing or decreasing the counter decimal point position, using the scale multiplier, or selecting a different count mode.
2. To double the number of pulses per unit, use counter modes direction X2 or quad X2. To increase it by four times, use counter mode quad X4. Using these modes will decrease the allowable maximum input frequency.
3. A scale factor greater than 1.00000 will cause Counter display rounding. In this case, digit jumps could be caused by the internal count register rounding the display. The precision of a counter application cannot be improved by using a scale factor greater than 1. 00000.
4. The number of pulses per single unit must be greater than or equal to the DDD value in order for the scale factor to be less than or equal to one.
5. Lowering the scale factor can be accomplished by lowering the counter decimal position. (Example: 100 (Hundredths)/10 pulses = 10.000 lowering to 10 (Tenths)/10 = 1.000.)

When the selected counter is reset, it returns to zero or the counter count load value. This reset action applies to all selected counter resets, except a setpoint generated counter auto reset programmed in Setpoint Configuration -> Counter Auto Reset.

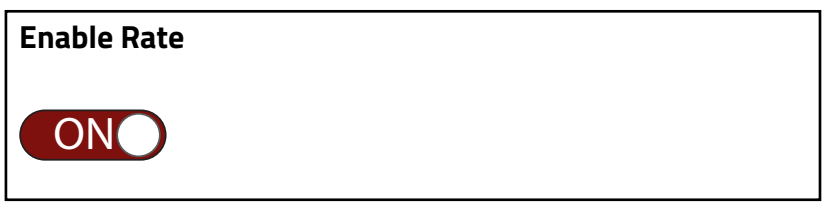
The selected counter may be programmed to reset at each unit power-up.



Rate Configuration

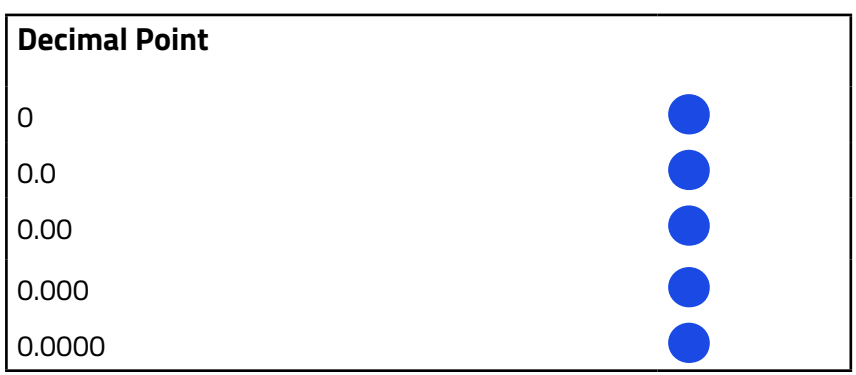


Select the Rate parameters to be programmed. Rate A is Input 1 and Rate B is Input 2. In order to access the “Common” selection under Rate Type, you must enable Rate and “Apply” changes. When you reenter Rate Configuration, Common is now a selection.

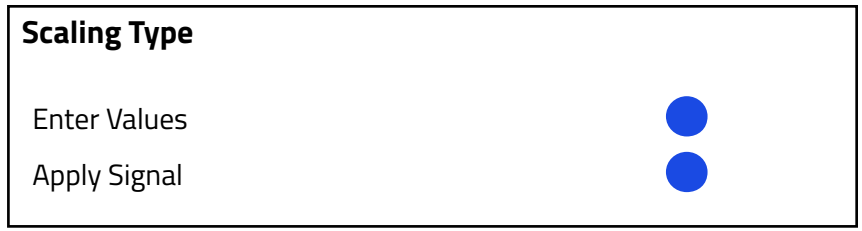


Select ON to measure the rate (speed) of pulses on the corresponding Input. Rate measurement is independent of the corresponding Counter count modes. Default setting is OFF. When Enable Rate is set to ON, the following menus are shown.

Rate A and Rate B



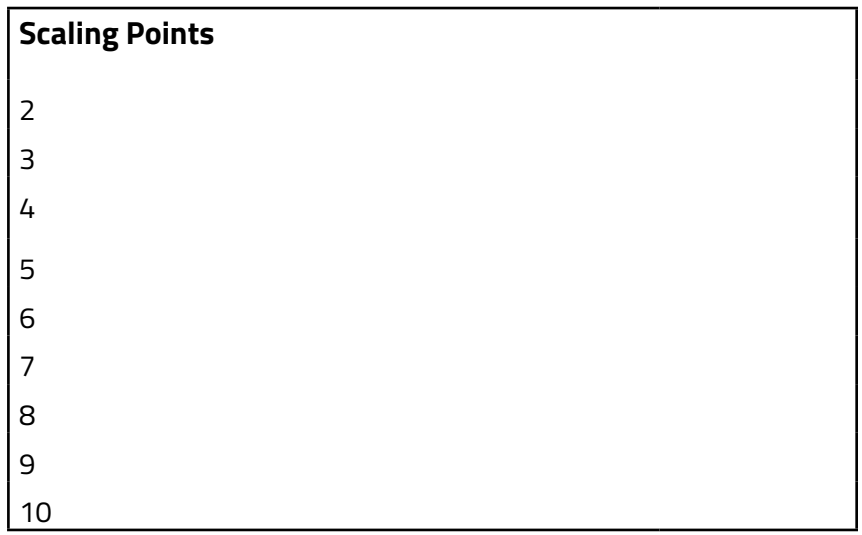
This selects the decimal point position for the selected Rate indicator.



Select whether the rate input values for scaling points will be entered by touchpad or by applying a signal. If Input Values and corresponding Display Values are known, the Enter Values scaling style can be used. This allows scaling without the presence of the input signal. If Input Values have to be derived from the actual input signal source or simulator, the Apply Signal scaling style must be used. If Apply Signal method is chosen, **Read Input** and **Save Input** buttons to read the Input and then save the value will follow each scaling point.

The previous entered value is displayed until Read Input is pressed and then the display shows the applied present value. Save Input saves that value. If you do not want to apply the value, then do not press Save but press the right advance arrow and it keeps the previous entered value.

Apply signal is only available through the PM50 touch screen. If the device is connected through Wi-Fi or any other communication, apply method is disabled.



This parameter sets the number of scaling points for the Rate Scaling function. The number of scaling points used depends on the linearity of the process and the display accuracy required.

Linear processes use two scaling points to provide a linear Rate display from 0 up to the maximum input

frequency. For typical zero based frequency measurements, the lower point is set to display 0 for 0 Hz input (factory setting) and the upper point set to display the desired value for a given input frequency. For non-zero based applications, the lower point is set to the desired display for 0 Hz input.

For **non-linear processes**, up to 10 scaling points may be used to provide a piece-wise linear approximation representing the non-linear function. The Rate Display will be linear between sequential scaling points. Thus, the greater the number of scaling points, the greater the conformity accuracy.

Each scaling point is specified by two programmable parameters: A desired Rate Display Value (Display Point) and a corresponding Rate Input Value (Scaling Point). Scaling points are entered sequentially in ascending order of Rate Input value. Each scaling point defines the upper endpoint of a linear segment, with the lower endpoint being the previous scaling point.

Scaling Point 1
Range: 0.0 to 99999.9
0.0

Scaling Point is the Input signal frequency or Hz (pulses per second) value. For all zero-based applications, Scaling Point 1 must be 0, and the Display Point 1 must be 0. For non-zero based applications, enter or apply the corresponding Rate Input Value for Scaling Point 1.

Display Point 1
Range: 0 to 999999
0

Display Point is the Rate value to be displayed for the corresponding Scaling Point or Input signal value. For all zero-based applications (display value is 0 for 0 Hz), the Display Point 1 is 0. For non-zero based applications, enter the desired Display Point value for Scaling Point 1.

Scaling Point 2

Range: 0.0 to 99999.9

1000.0

Enter or apply the corresponding Rate Input Value for Scaling Point 2. This value must be greater than Scaling Point 1.

Display Point 2

Range: 0 to 999999

1000

Enter the desired Display Point value for Scaling Point 2.

Repeats for each sucessive pair.

Display Rounding

1

2

5

10

20

50

100

Rounding values other than ‘1’ round the Rate display to the nearest increment selected (e.g. rounding of ‘5’ causes 122 to round to 120 and 123 to round to 125). Rounding starts at the least significant digit of the Rate display.

Low Cut Out

Range: 0 to 999999

0

The Low Cut Out value forces the Rate display to zero when the Rate display falls below the value entered.

RATE SCALING

To scale the Rate, enter a Scaling Display value with a corresponding Scaling Input value. (The Display and Input values can be entered by Key-in or Applied Methods.) These values are internally plotted to a Display value of 0 and Input value of 0 Hz. A linear relationship is formed between these points to yield a rate display value that corresponds to the incoming input signal rate.

KEY-IN SCALING METHOD CALCULATION

If a display value versus input signal (in pulses per second) is known, then those values can be entered into Scaling Display and Scaling Input. No further calculations are needed.

If only the number of pulses per 'single' unit (i.e. # of pulses per foot) is known, then it can be entered as the Scaling Input value and the Scaling Display value will be entered as the following:

RATE PER	DISPLAY	INPUT
Second	1	# of pulses per unit
Minute	60	# of pulses per unit
Hour	3600	# of pulses per unit

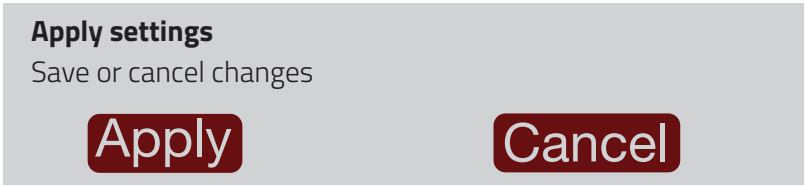
NOTES:

1. If # of pulse per unit is less than 10, then multiply both Input and Display values by 10.
2. If # of pulse per unit is less than 1, then multiply both Input and Display values by 100.
3. If the Display value is raised or lowered, then Input value must be raised or lowered by the same proportion (i.e. Display value for per hour is entered by a third less (1200) then Input value is a third less of # of pulses per unit). The same is true if the Input value is raised or lowered, then Display value must be raised or lowered by the same proportion.

EXAMPLE:

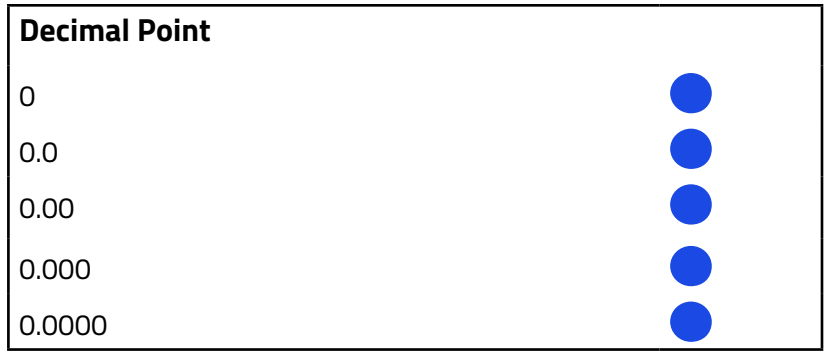
1. With 15.1 pulses per foot, indicate feet per minute in tenths.
   Scaling Display = 60.0 Scaling Input = 15.1.

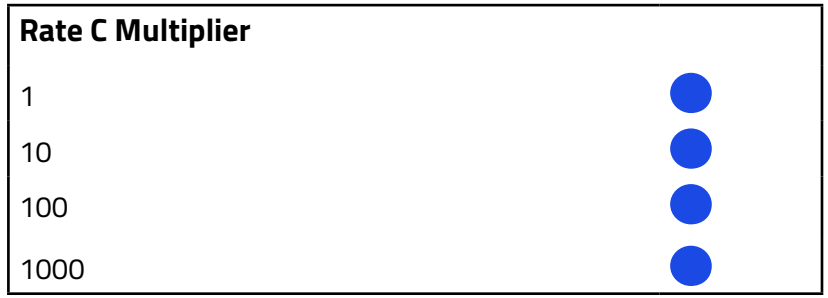
2. With 0.25 pulses per gallon, indicate whole gallons per hour. (To have greater accuracy, multiply both Input and Display values by 10.)
Scaling Display = 36000 Scaling Input = 2.5.



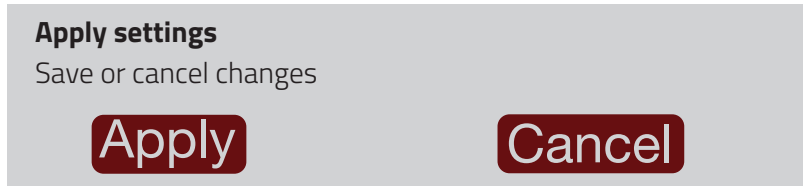
Rate C

Rate C Parameters	
None	Rate C disabled.
Sum (A+B)	Rate C shows the sum of Rate A and Rate B.
Difference (A-B)	Rate C shows the difference of Rate A and Rate B.
Percent Ratio (A/B)	Rate C shows the percentage of Rate A to Rate B.
Percent of Total A/(A+B)	Rate C shows the percentage of Rate A to the total of Rate A and Rate B.
Percent Ratio (A-B)/B	Rate C shows the percent draw between Rate A and Rate B.





Set the Rate C Multiplier to obtain the desired Rate C display resolution. For Rate C percentage calculations, the result is internally multiplied by 100 to show percent as a whole number. By using a Display Multiplier of 10, 100 or 1000, along with the proper decimal point position, percentage can be shown in tenths, hundredths or thousandths respectively.



Common

Rate Low Update Time
Range: 0.1 to 999.9 Sec
1.0

The Low Update Time is the minimum amount of time between display updates for all enabled Rate displays. Small Low Update Time values may increase the possibility of the display indicating an unstable input (jittery display).

Rate High Update Time
Range: 0.2 to 999.9 Sec
2.0

The High Update Time is the maximum amount of time before the enabled Rate displays are forced to zero. The High Update Time must be higher than the Low Update Time and higher than the desired slowest readable speed (one divided by pulses per second). The factory setting of 2.0, will force the display to zero for speeds below 0.5 Hz or a pulse every 2 seconds.

Maximum Capture Value Assignment

Rate A
Rate B
Rate C

Maximum Capture Delay Time

Range: 0.0 to 999.9 Sec

1.0

When the assigned Rate value is above the present Maximum rate value for the entered amount of time, the unit will capture that Rate value as the new Maximum value. A delay time helps to avoid false captures of sudden short spikes.

Minimum Capture Value Assignment

Rate A

Rate B

Rate C

Minimum Capture Delay Time

Range: 0.0 to 999.9 Sec

1.0

When the assigned Rate value is below the present Minimum rate value for the entered amount of time, the unit will capture that Rate value as the new Minimum value. A delay time helps to avoid false captures of sudden short spikes.

Apply settings

Save or cancel changes

Apply Cancel

SP & Analog Configuration

Device / SP & Analog Configuration

Setpoint SSR Logic

Setpoint Configuration

Analog Configuration (If Analog Module is installed)

Setpoint SSR Logic

Device / SSR Logic

SSR Logic for Setpoint 1 and 2

Source

Sink

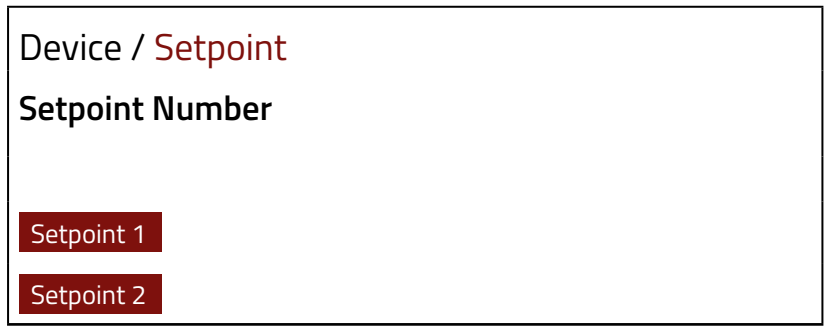
This setting only applies to Setpoints 1 and 2. Setting the SSR Logic for Source requires an external DC supply be connected per the wiring drawing shown in the Installation Guide.

Apply settings

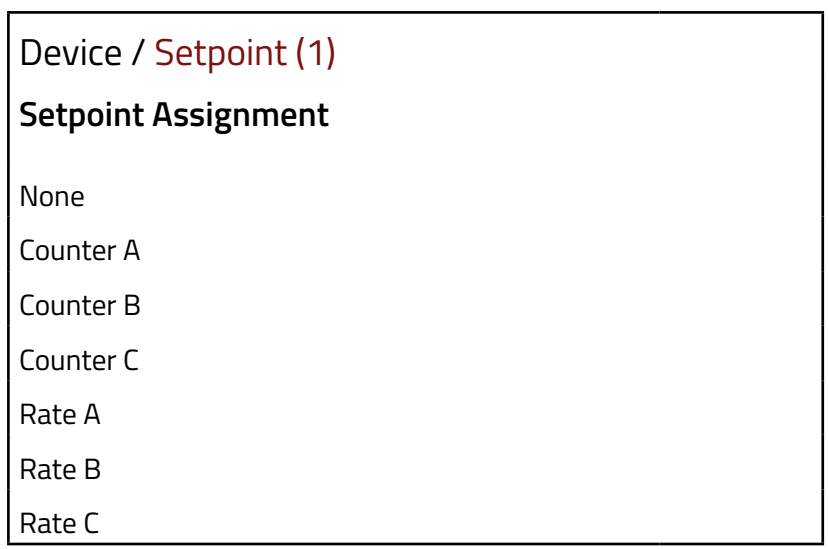
Save or cancel changes

Apply Cancel

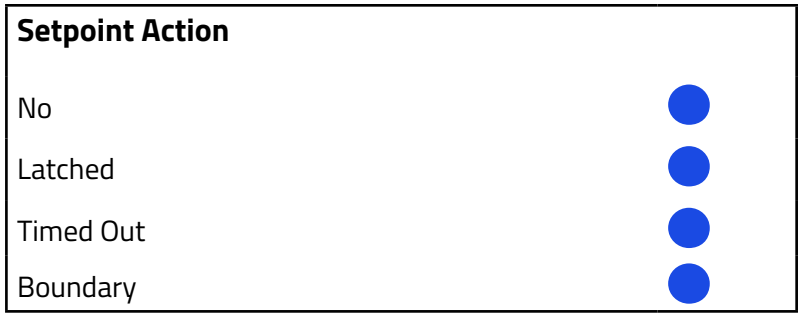
Setpoint Configuration



If Dual Relay Module is installed you will see 4 setpoint selections and if the Quad Relay Module is installed you will see 6 setpoint selections.



Select the display to which the setpoint is assigned.



Select the desired Setpoint Output Action. Choose No (no action) if a setpoint is unused or for manual mode operation. See “Setpoint (Alarm) Figures for Rate” for a visual detail of Rate Assigned setpoint actions.

For Counter Assignments:

Latched	The setpoint output activates when the count value equals the setpoint value. The output remains active until reset.
Timed Out	The setpoint output activates when the count value equals the setpoint value and deactivates after the Time Out value.
Boundary	The setpoint output activates when the count value is greater than or equal to (for High Acting) or less than or equal to (for Low Acting) the setpoint value. The setpoint output will deactivate when the count value is less than (for High Acting) or greater than (for Low Acting) the setpoint value.

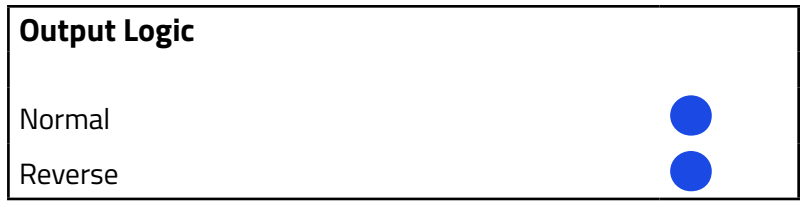
For Rate Assignments:

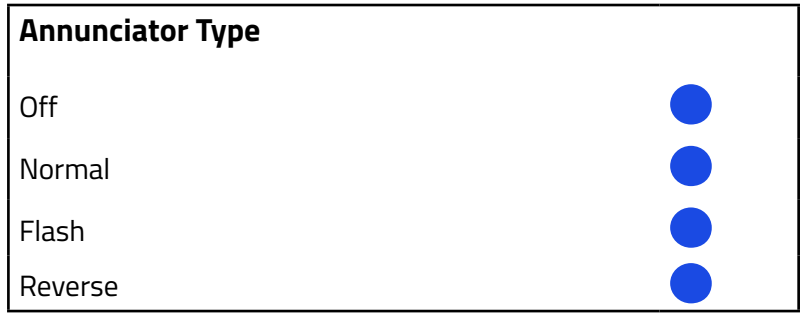
Latched	The setpoint output activates when the rate value is equal to the setpoint value. The setpoint output remains active until reset. If after reset, the rate value is greater than or equal to (for High Acting) or less than or equal to (for Low Acting) the setpoint value, the output will reactivate.
Timed Out	The setpoint output cycles when the rate value is greater than or equal to (for High Acting) or less than or equal to (for Low Acting) the setpoint value. The Setpoint Time Out and Setpoint On Delay values determine the cycling times.
Boundary	The setpoint output activates when the rate value is greater than or equal to (for High Acting) or less than or equal to (for Low Acting) the setpoint value. The setpoint output will deactivate (Auto reset) as determined by the Hysteresis value.

The Setpoint Assignment and Setpoint Output Action determine setpoint feature availability. The Setpoint Parameter Availability chart illustrates this.

SETPOINT PARAMETER AVAILABILITY

DESCRIPTION	COUNTER ASSIGNMENT			RATE ASSIGNMENT		
	TIMED OUT	BOUNDARY	LATCH	TIMED OUT	BOUNDARY	LATCH
Setpoint Output Logic	Yes	Yes	Yes	Yes	Yes	Yes
Setpoint Annunciator Type	Yes	Yes	Yes	Yes	Yes	Yes
Setpoint Color	Yes	Yes	Yes	Yes	Yes	Yes
Setpoint Value	Yes	Yes	Yes	Yes	Yes	Yes
Setpoint Tracking	Yes	Yes	Yes	Yes	Yes	Yes
Setpoint Output Power-up State	No	No	Yes	No	No	Yes
Setpoint Activation Boundary Type	No	Yes	No	Yes	Yes	Yes
Standby Operation	No	Yes	No	Yes	Yes	Yes
Setpoint Hysteresis	No	No	No	Yes	Yes	No
Setpoint On Time Delay	No	No	No	Yes	Yes	Yes
Setpoint Off Time Delay	No	No	No	No	Yes	No
Setpoint Output Time-out Value	Yes	No	No	Yes	No	No
Rate Timed Output One-shot	No	No	No	Yes	No	No
Counter Auto Reset	Yes	No	Yes	No	No	No
Output Reset with Manual Reset	Yes	No	Yes	No	No	No
Setpoint Output Reset at Sn+1	Yes	No	Yes	No	No	No





Off - Disables display setpoint annunciators.

Normal - Displays the corresponding setpoint annunciators of "on" setpoint alarm outputs.

Flash - Flashes the corresponding setpoint annunciators of "on" setpoint alarm outputs. This setting has precedence over normal.

Reverse - Displays the corresponding setpoint annunciators of "off" setpoint alarms outputs.

Setpoint Annunciator is the border around the display. If any setpoint is configured for a type other than Off and is in the corresponding listed active state, the border will be the Annunciator Color. Only if all setpoints configured for a type other than Off are **ALL** not in the corresponding listed active state, the border will be the color green. It is not possible to tell which individual setpoint is in the active state here.

Annunciator Color sets the color of the display border when a setpoint is in the listed active state. Red shall have precedence over Orange.

Setpoint Active Color

Orange ●

Red ●

Setpoint Active Color is the color used in the Setpoint Status Widget and icons to show the active state of the configured setpoint individually. Clear is for not configured. Green is for not active. There are no flash or reverse selections. Red shall have precedence over Orange.

Configure List A/B

List A Config ●

List B Config ●

Two lists of setpoint point and band values are available. If a User Input or Function Key is configured and activated for Select Parameter List, then List B scaling will be used. The display will momentary indicate which list is being used . If List B is being used, then all configured setpoints will be changed to List B values. If a specific setpoint is to remain the same value, then for that setpoint the value must be configured the same for both A and B. All other setpoint parameters will be the same for both lists.

Setpoint Value for List A

Range: -999999 to 999999

100

Enter desired setpoint alarm value. The decimal point position is determined by the Setpoint Assignment value.

Setpoint Tracking

Setpoint 1
Setpoint 2
Setpoint 3
Setpoint 4
Setpoint 5
Setpoint 6
CLd A
CLd B
CLd C

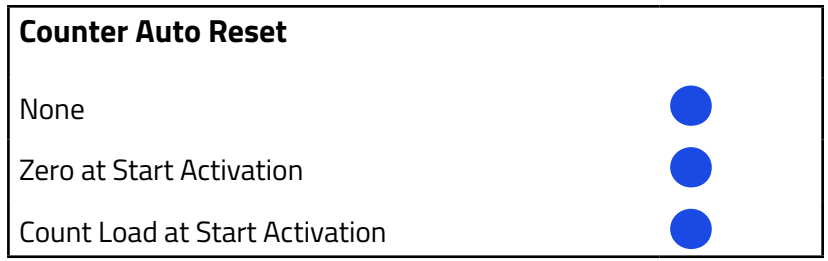
The value of the setpoint being programmed will track the entered selection's value. Tracking means that when the selection's value or Count Load value is changed, the setpoint value will also change (or follow) by the same amount. Setpoint 3-6 only show if a setpoint module is installed.

Note: Do not program a setpoint to track itself.

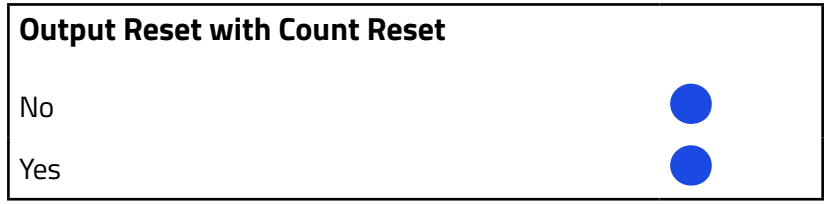
Output Power-Up State

Off
On
Save

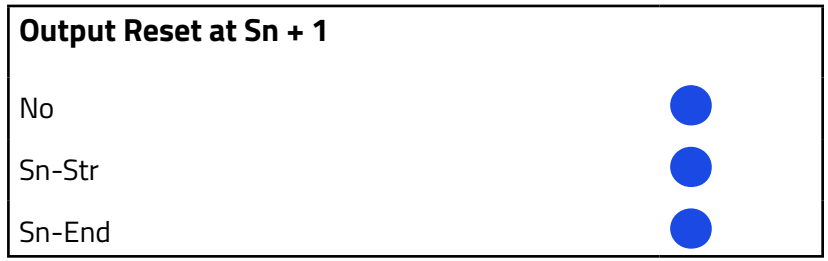
Off will deactivate the output at power up. On will activate the output at power up. Save will restore the output to the same state it was at before the unit was powered down.



This automatically resets the display value of the Setpoint Assigned Counter each time the setpoint value is reached. The automatic reset can occur at output start or output end if the setpoint output action is programmed for timed output mode. The counter may be reset to zero or the count load value. This reset may be different from the counter reset action programmed in Counter Configuration -> Reset Action.



Selecting Yes causes the Setpoint output to deactivate (reset) when the Setpoint Assigned Counter is reset. The only exception is when the assigned counter is reset by a setpoint generated counter auto reset.



Selecting Sn-Str causes the setpoint output to deactivate (reset) when setpoint Sn + 1 activates. (Example: S1 deactivates when S2 activates, and S4 when S1 activates.) The last setpoint will wrap around to the first.

Selecting Sn-End causes the setpoint output to deactivate (reset) when setpoint Sn + 1 activates and then times out (deactivates). This selection only applies if the Sn + 1 setpoint action is Timed Out.

(Example: S1 deactivates when S2 is activated and then times out.) The last setpoint will wrap around to the first. This parameter is only available for Counter assigned setpoints.

Output Timed Out
Range: 0.0 to 599.99 Sec
1.00

If the setpoint action is Timed Out and the setpoint is assigned to Counter, then this is the amount of time the output will activate once the count value equals the setpoint value. If the setpoint action is Timed Out and the setpoint is assigned to Rate, then this is the amount of time the output is ON during the ON / OFF output cycling. If Rate Timed Output One-Shot mode is enabled, then this is the time duration for the one-shot output pulse.

Activation Boundary Type

High Acting
Low Acting

High Acting activates the output when the assigned display value equals or exceeds the setpoint value. Low Acting activates the output when the assigned display value is less than or equal to the setpoint.

Setpoint Standby Operation

No
Yes

This parameter only applies to low acting setpoint activation (boundary) type setpoints. Select Yes to disable a low acting setpoint at power-up, until the assigned display value crosses into the output “off”

area. Once in the output “off” area, the setpoint will function per the description for low acting activation (boundary) type.

The next menus are for Rate Outputs only

Hysteresis
Range: 0 to 59999
2

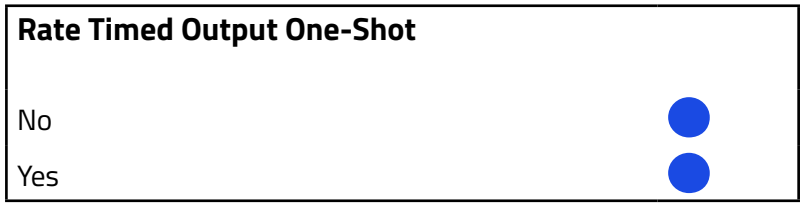
The hysteresis value is added to (for low acting), or subtracted from (for high acting), the setpoint value to determine at what value to deactivate the associated setpoint output. Hysteresis is only available for Rate assigned setpoints.

On Time Delay
Range: 0.0 to 599.99 Sec
0.00

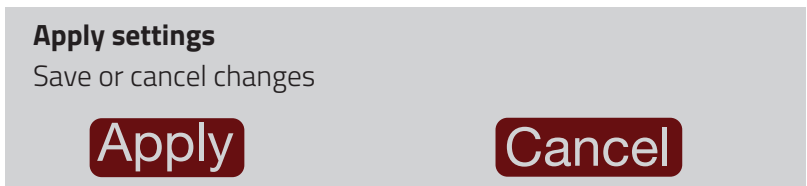
This is the amount of time the assigned Rate display must meet the setpoint activation requirements (below setpoint for Low Acting and above setpoint for High Acting), before the setpoint output activates. If the Rate Setpoint Action is Timed-Out, this is the amount of time the output is OFF during the ON/OFF output cycling. This parameter is only available for Rate assigned setpoints.

Off Time Delay
Range: 0.0 to 599.99 Sec
0.00

This is the amount of time the assigned Rate display must meet the setpoint deactivation requirements (below hysteresis for High Acting and above hysteresis for Low Acting), before the setpoint output deactivates. This parameter is only available for Rate assigned setpoints.



If the setpoint action is Timed Out and the setpoint is assigned to Rate, select Yes to have the output activate for a single pulse (one-shot) when the assigned Rate display meets the setpoint activation requirements. Select No for ON / OFF output cycling per the “Setpoint (Alarm) Figures For Rate” diagram.

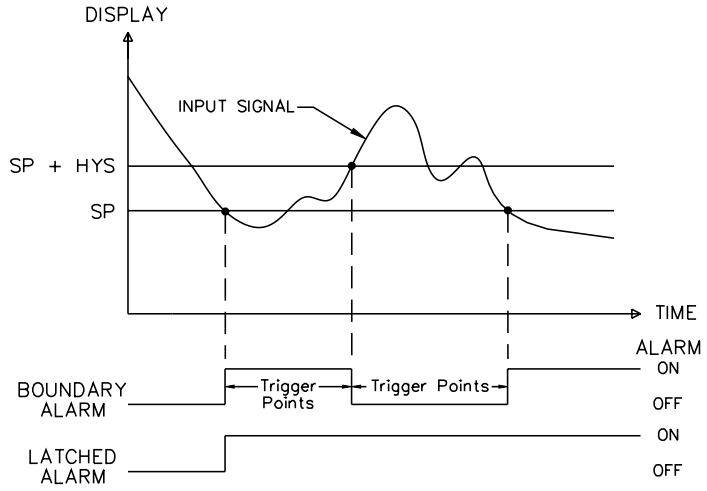


Repeat the above section for each setpoint to be used. Each setpoint corresponds to the output with the same identifier number.

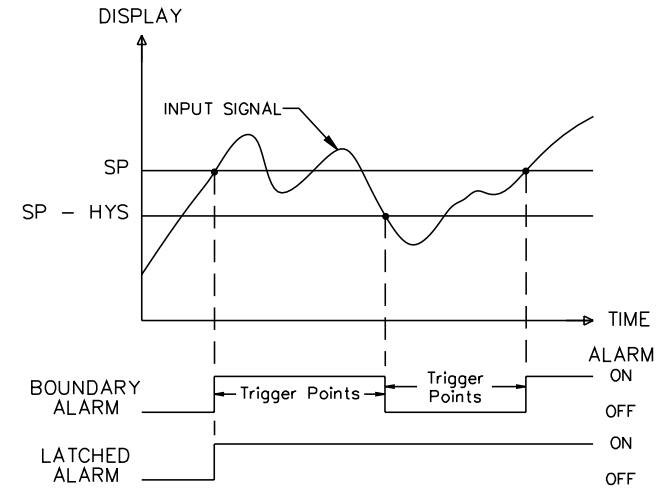
Setpoint (Alarm) Figures for Rate

(For Reverse Logic, The Alarm state is opposite.)

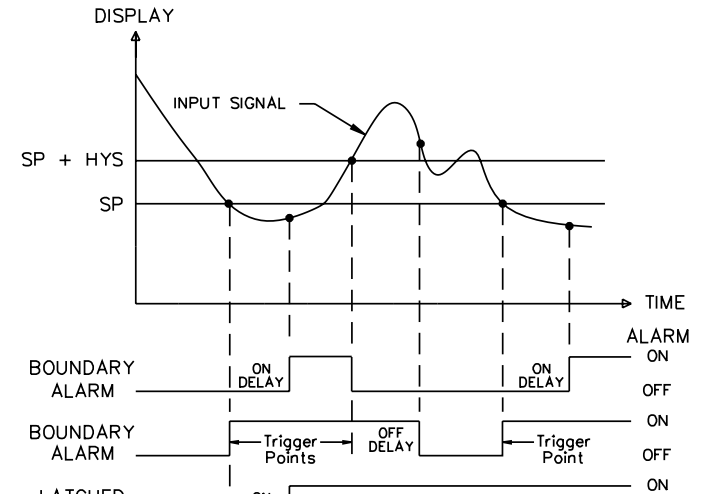
LOW ACTING WITH NO DELAY



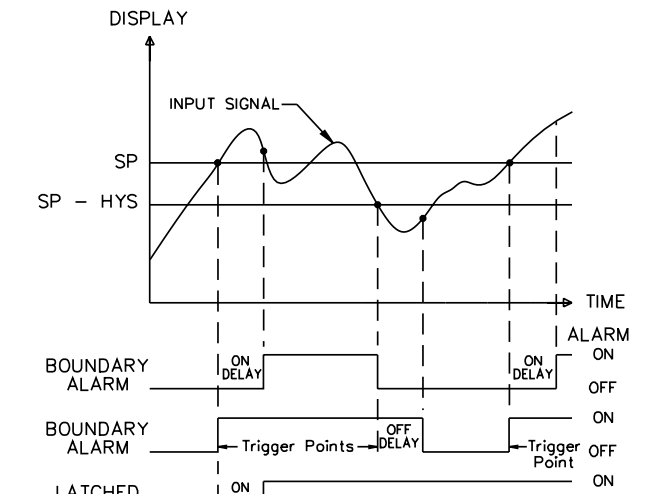
HIGH ACTING WITH NO DELAY



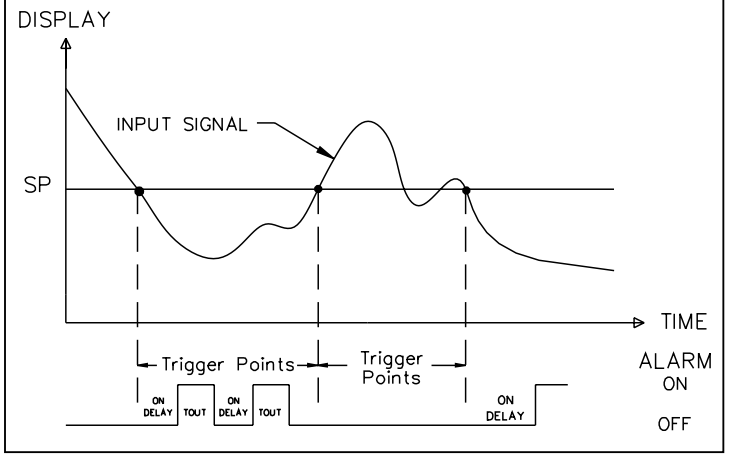
LOW ACTING WITH DELAY



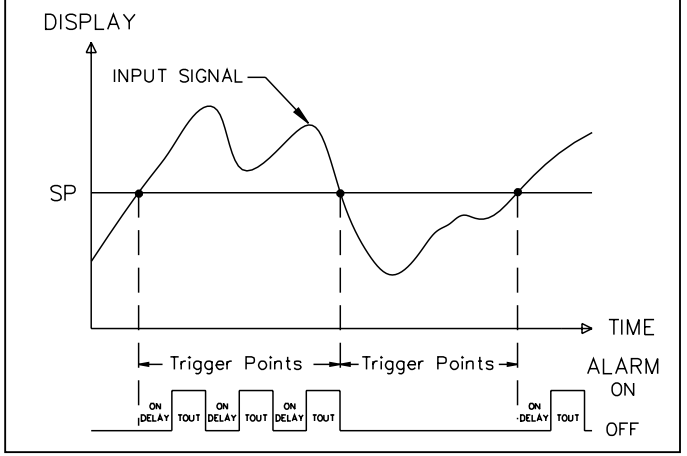
HIGH ACTING WITH DELAY



LOW ACTING WITH TIMEOUT



HIGH ACTING WITH TIMEOUT



Analog Configuration

This menu is only available with the Analog Output Module installed.

Device / Analog

Analog Output Type

- 4 to 20 mA
- 0 to 20 mA
- 0 to 10 VDC
- -10 to +10 VDC

Analog Output Assignment

- None
- Counter A
- Counter B
- Counter C
- Rate A
- Rate B
- Rate C
- Max
- Min

Select the source that the analog output will retransmit.

Analog Low Scale

Range: -199999 to 999999

0

Enter the Analog Output Assignment display value that corresponds to the lowest output signal of the selected Analog Output Type.

Analog High Scale

Range: -199999 to 999999

10000

Enter the Analog Output Assignment display value that will corresponds to the highest output signal of the selected Analog Output Type.

Apply settings

Save or cancel changes

Apply Cancel

Function Configuration

Device / Function

Function Key Configuration

User Input Configuration

Function Key Configuration

Enable Function Key

The function keys can perform their function through Wi-Fi. To show or hide the function keys, press the bottom left arrow while in the Display mode.

Function Key

F1

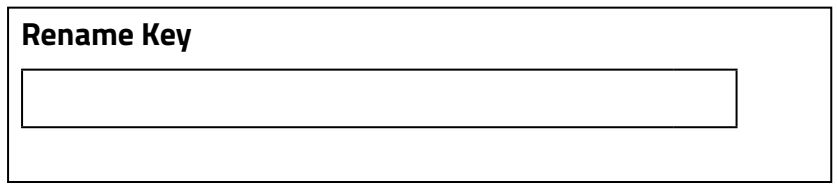
F2

F3

F4

There are only two Function keys on the 3.5 inch PM-50.

The Access option selects whether the Function Key is accessible in supervisor mode through use of a password, or to all users without a password.



Rename Key lets you create your own 5 character label for the Function Key you are configuring.

Select Function

A function key can be assigned to perform more than one function at the same time. Momentary actions take place after the release of the key.

If Supervisor is selected as the access option, the available functions are limited to:

None
Setpoint Value
Momentary Reset
Display Brightness
Count Load

None	No function is performed if activated. This is the factory setting for all function keys.
Setpoint Value	The unit displays the current setpoint value of the active list and allows the operator to change that value.
Maintained Reset and Inhibit	The unit performs a reset and inhibits the displays selected, as long as activated (maintained action). This is independent of the display being shown and, unless selected, will not affect Counter C value.
Momentary Reset	When activated (momentary action), the unit resets the displays selected. This is independent of the display being shown and, unless selected, will not affect Counter C value.
Store and Reset Display	The unit holds (freezes) the displays and then performs a reset of the displays selected, as long as activated (maintained action). This is independent of the display being shown and, unless selected, will not affect Counter C value.

Maintained Output Reset	The unit deactivates (resets) the setpoint outputs selected, as long as activated (maintained action). This can also prevent a setpoint output from activating.
Momentary Output Reset	When activated (momentary action), the unit resets the setpoint outputs selected.
Display Brightness	When activated (momentary action), the display brightness changes to the next level.
Select Parameter List	Two lists of input scaling points and setpoint values (including band and deviation) are available. The display will momentarily indicate which list is active when the List B scaling is changed. Scaling List B must be enabled for this function to be performed. Scaling points can be disabled from changing to List B. However, this will always enable all configured setpoints to their List B values. If you do not want a value to change then you must make that setpoint List A and List B value the same. Scaling of rate display is not affected by the list parameter.
Print and Reset	This Function Key issues a single block print through the serial port when activated, and the serial type is set to RLC Protocol. In addition, when activated (momentary action), the unit performs a reset of the displays selected. This is independent of the display being shown and, unless selected, will not affect Counter C value.
Print	This Function Key issues a single block print through the serial port when activated, and the serial type is set to RLC Protocol. The data transmitted during a print request and the serial type is programmed in Modbus Configuration → RS485 Configuration → Communication Type → RLC Protocol.
Inhibit	The unit inhibits the displays selected, as long as activated (maintained action).
Store	The unit holds (freezes) the displays selected, as long as activated (maintained action). Internally, the counters and max and min values continue to update. Inhibiting Counter A or Counter B may affect Counter C. When released, the displays will update to their background accumulated value.
Maintained Output Active	The unit activates (sets) the setpoint outputs selected, as long as activated (maintained action).
Momentary Output Active	When activated (momentary action), the unit activates (sets) the setpoint outputs selected.
Setpoint Hold	The unit holds the state of the setpoint outputs selected, as long as activated (maintained action).
Count Load	The unit displays the current count load value of the active list and allows the operator to change that value.

Reset Selections

Counter A

Counter B

Counter C

Min Display

Max Display

Apply settings

Save or cancel changes

Apply Cancel

Repeat the above section for each function key to be configured.

User Input Configuration

Device / User Input

SNK/SRC

User Input

Functions / SSR

Active Status

Sink

Source

Sink refers to active state when user voltage is low.
Source refers to active state when user voltage is high.

Apply settings

Save or cancel changes

Apply Cancel

User Input / Functions

Hardware Input

User Input 1

User Input 2

Note: User Inputs must be configured as none when Counters are programmed for Dual Quad or Dual Count with Direction.

Function

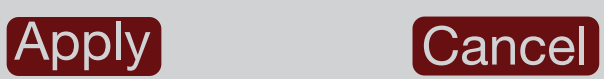
The user input can be assigned to perform more than one function at the same time.

None	No function is performed if activated. This is the factory setting for all user inputs.
Program Lockout	Configuration Mode is locked-out, as long as activated (maintained action). The password will not override this.
Print and Reset	The unit issues a single block print through the serial port when activated, and the serial type is set to RLC Protocol. In addition, when activated (momentary action), the unit performs a reset of the displays selected. This is independent of the display being shown and, unless selected, will not affect Counter C value.
Maintained Reset and Inhibit	The unit performs a reset and inhibits the displays selected, as long as activated (maintained action). This is independent of the display being shown and, unless selected, will not affect Counter C value.
Momentary Reset	When activated (momentary action), the unit resets the displays selected. This is independent of the display being shown and, unless selected, will not affect Counter C value.
Store and Reset Display	The unit holds (freezes) the displays and then performs a reset of the displays selected, as long as activated (maintained action). This is independent of the display being shown and, unless selected, will not affect Counter C value.
Maintained Output Reset	The unit deactivates (resets) the setpoint outputs selected, as long as activated (maintained action). This can also prevent a setpoint output from activating.
Momentary Output Reset	When activated (momentary action), the unit resets the setpoint outputs selected.

Display Brightness	When activated (momentary action), the display brightness changes to the next level.
Select Parameter List	Two lists of input scaling points and setpoint values (including band and deviation) are available. The display will momentarily indicate which list is active when the List B scaling is changed. Scaling List B must be enabled for this function to be performed. Scaling points can be disabled from changing to List B. However, this will always enable all configured setpoints to their List B values. If you do not want a value to change then you must make that counter scale factor, count load value and setpoint List A and List B value the same.
Print	The unit issues a block print through the serial port when activated, and the serial type is set to RLC Protocol. The data transmitted during a print request and the serial type is programmed in Modbus Configuration → RS485 Configuration → Communication Type → RLC Protocol. If the user input is still active after the transmission is complete (about 100 msec), an additional transmission occurs.
Inhibit	The unit inhibits the displays selected, as long as activated (maintained action).
Store	The unit holds (freezes) the displays selected, as long as activated (maintained action). Internally, the counters and max and min values continue to update. Inhibiting Counter A or Counter B may affect Counter C. When released, the displays will update to their background accumulated value.
Maintained Output Active	The unit activates (sets) the setpoint outputs selected, as long as activated (maintained action).
Momentary Output Active	When activated (momentary action), the unit activates (sets) the setpoint outputs selected.
Setpoint Hold	The unit holds the state of the setpoint outputs selected, as long as activated (maintained action).

Apply settings

Save or cancel changes



Repeat the above section for each user input to be configured.

Modbus Configuration

Device / Communication

RS485 Configuration

RS232 Configuration (With Module installed)

Ethernet Configuration (With Module installed)

RS485 or RS232 Configuration

The menus for RS485 and RS232 Configuration are the same.

Communication Type

Modbus ASCII	●
Modbus RTU	●
RLC Protocol (ASCII)	●
None	●

Baud Rate

1200
2400
4800
9600
19200
38400
57600
115200

Data Bit

7

8

Parity Bit

None

Even

Odd

Stop Bits

1

2

Modbus Station Number

Range: 1 to 247

247

If RLC Protocol is selected, the following menus appear instead of Modbus Station:

RLC Station Number
Range: 0 to 99

0

If the station number is 00, it will not be sent during a full transmission.

Enable Abbreviated Transmission

Select OFF for full print or Command T transmissions (station number, mnemonics and parameter data) or ON for abbreviated print transmissions (parameter data only). This will affect all the parameters selected in the print options.

Transmit Delay
Range: 0 to 250 ms

10

Following a transmit value ("*" or ($) terminator) or Modbus command, the PM-50 will wait this minimum amount of time in seconds before issuing a serial response.

Print Options

Counter A

Counter B

Counter C

Rate A

Rate B

Rate C

Maximum

Minimum

Scale Factor

Counter Load Values

Setpoint Values

Apply settings

Save or cancel changes

Apply Cancel

For more information on serial protocols see “Serial RLC Protocol Communications”.

Ethernet Configuration

Enable DHCP Client

IP Address

The IP Address for Ethernet and Wi-Fi should be different addresses. To view Ethernet IP address with Enable DHCP Client ON, you must go to About this Device and advance to the Ethernet module.

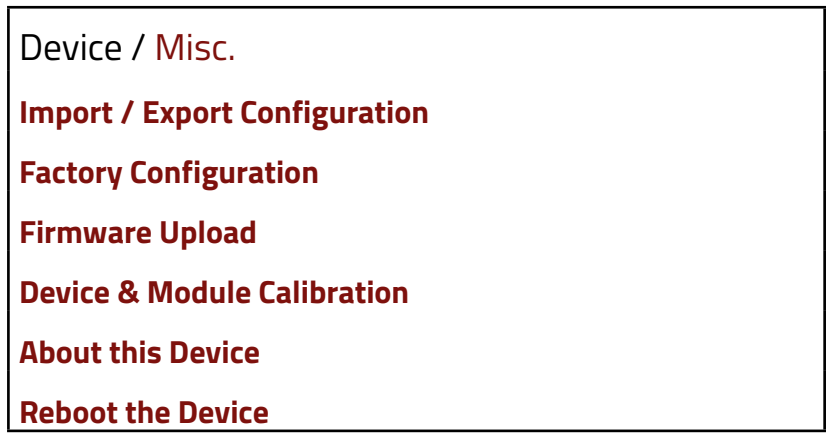
Subnet Mask

Apply settings

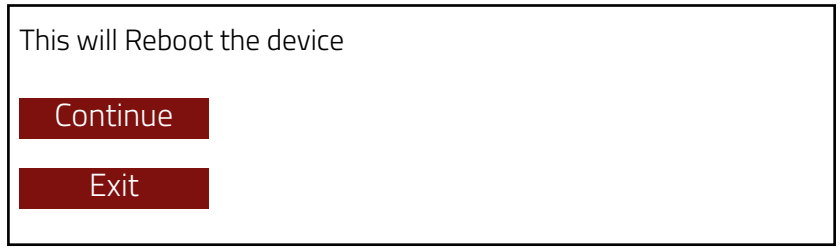
Save or cancel changes

Apply Cancel

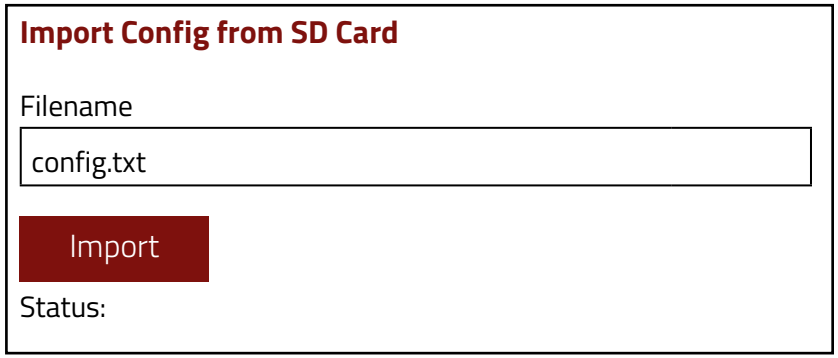
Misc. Configuration



Selecting either import option will bring up the following warning:



Pressing continue brings up the Import screen, while Exit will return you to the main Misc. Configuration menu.



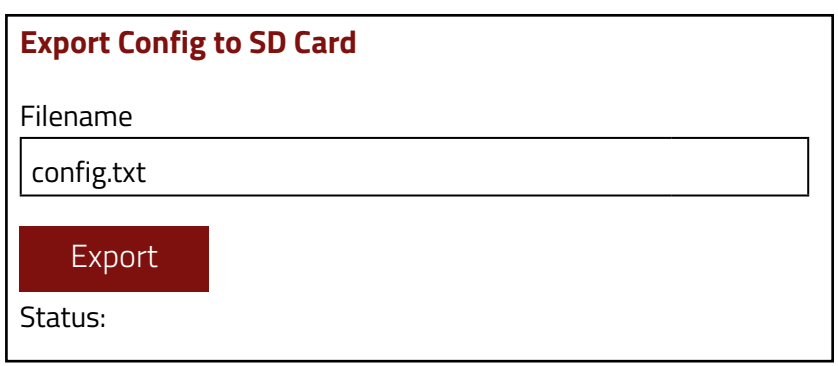
The file name must be config.txt for a successful import. You can change the file name after exporting, however, before you import the file into a PM-50 you must change the name back to config.txt.

When using the microSD Card and you click the import button, one of the following status messages will appear based on the microSD card:

No microSD Card detected - when the microSD card is not available in the slot, or the microSD card is an incompatible size or format

File not found - If the microSD card is present, but the config.txt file does not exist

Import successful, Rebooting - When the config.txt file is imported successfully, the device reboots to activate the configuration



Exporting a new file to the microSD Card will overwrite the existing config.txt file on the card. You can change the file name after exporting to store more than one configuration program on a separate electronic device. The config.txt file can be viewed and edited using a text editor. However, caution must be taken because one wrong space, entry, or deletion can cause the file to be not readable by the PM-50.

Use this with caution.

Import ScalePoint from SD Card

Filename

scaling.txt

Import

Status:

Export ScalePoint to SD Card

Filename

scaling.txt

Export

Status:

After completing the import / export operation, press the left arrow twice to return to the main Misc Configuration Menu.

Factory Configuration
Misc. / Factory

Enable Screen Calibration

This is the Factory Default setting.

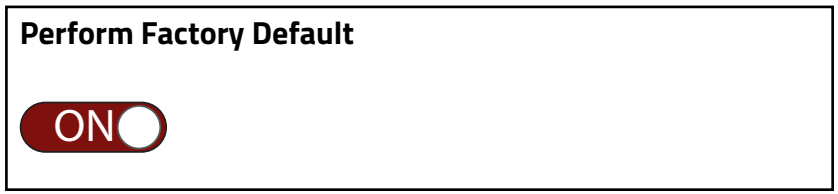
Enable Screen Calibration

Device Requires Reboot

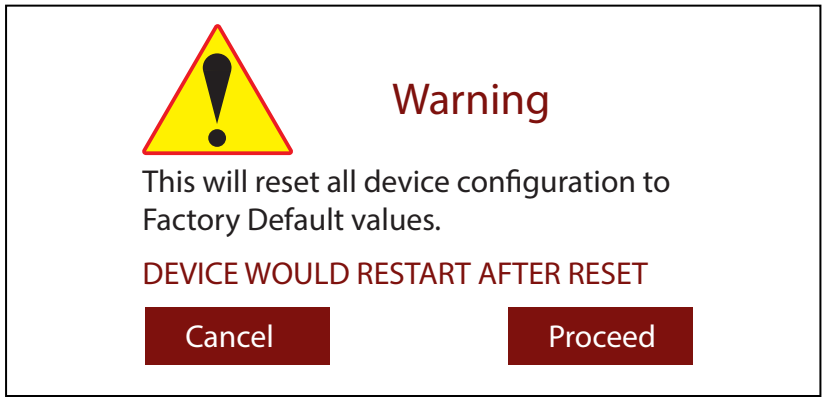
This setting will allow calibration of the Touch screen upon reboot of the device. If calibration of the screen is done incorrectly, a reboot will allow the calibration to be done again. Remember to turn off after successful calibration.

Perform Factory Default

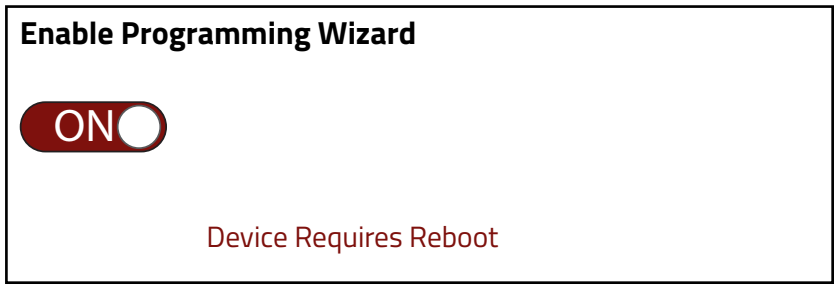
This is the Factory Default setting.



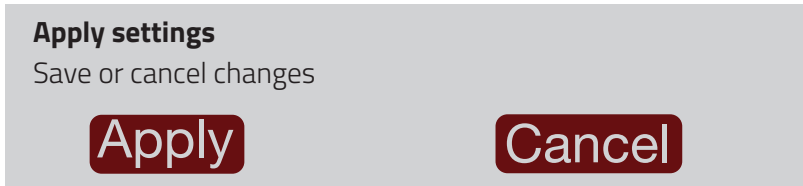
Setting this switch to ON brings up the following warning screen. Pressing the **Proceed** button immediately resets and restarts the device. All user settings are returned to Factory Default, including the Admin password. This will also restart the Programming Wizard.



This will automatically go back to off after reboot. The Wizard will have the previous programmed configurations.

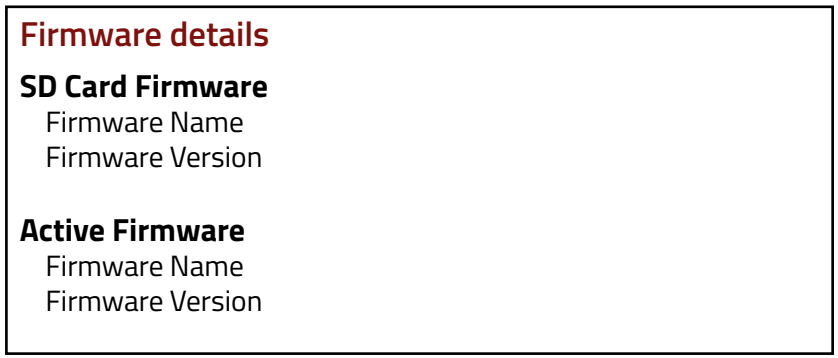


This will automatically go back to off after reboot. The Wizard will have the previous programmed configurations.

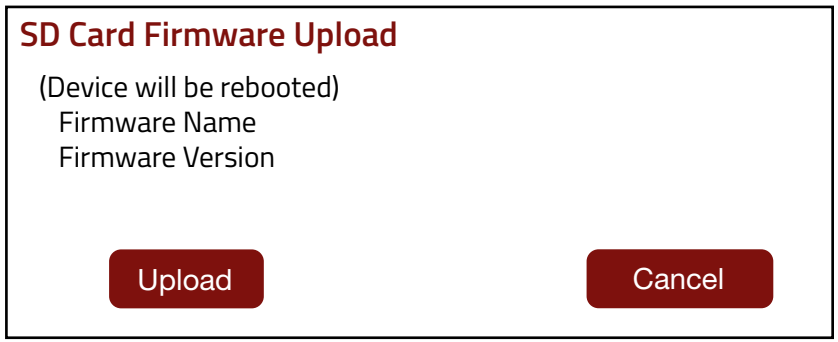


Firmware Upload

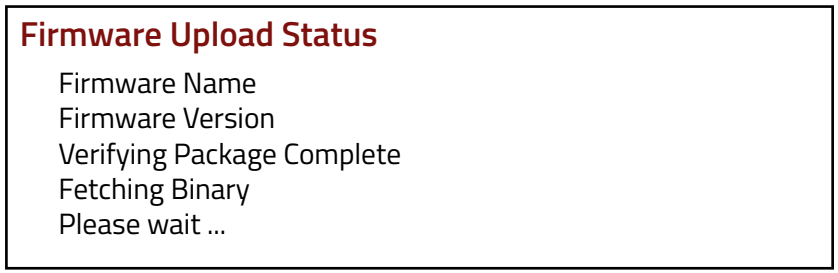
Misc. / Firmware Upload



Firmware details are displayed with an Upload button. It will show the SD card firmware version and the firmware version presently in the PM50. The gpmcore.fwb file will auto detect the PM50 model. It is strongly suggested that the configuration in the PM50 (config.txt file) be saved to a separate SD card before updating to a new firmware version.



Press the Upload button at the bottom of the screen to perform the upload of firmware from the SD card.



During the upload of the firmware, a screen appears showing the status of the upload. Once the upload is complete the unit resets to the main menu. User settings from the previous firmware are retained.

Note: Do not disconnect power during the upload process. Loss of power could result in unit failure.

Device & Module Calibration

Device / Calibration
Device Calibration
AO Module Calibration

Device Calibration

The unit has been fully calibrated at the factory. Scaling to convert the input signal to a desired display value is performed in Signal Input Configuration. If the unit appears to be indicating incorrectly or inaccurately, refer to Troubleshooting before attempting to calibrate the unit. When recalibration is required (generally every 2 years), it should only be performed by qualified technicians using appropriate equipment. Calibration does not change any user programmed parameters. However, it will affect the accuracy of the input signal and the values previously stored using the Apply Scaling Style.

Enter Access Code

0

Access Code for calibration is 48.

Calibration Rate A: 0 Hz

Enter Offset (-0.0100% to 0.0100%)

0.0000

Apply settings

Save or cancel changes

Apply Cancel

AO Module Calibration

Enter Access Code

0

Access Code for calibration is 48.

Input Range

- 4 to 20 mA
- 0 to 20 mA
- 0 to 10 VDC
- -10 to +10 VDC

Select the Input Range for the Analog Output that you want to calibrate.

Zero-offset ‡

Enter Value shown on Meter

0

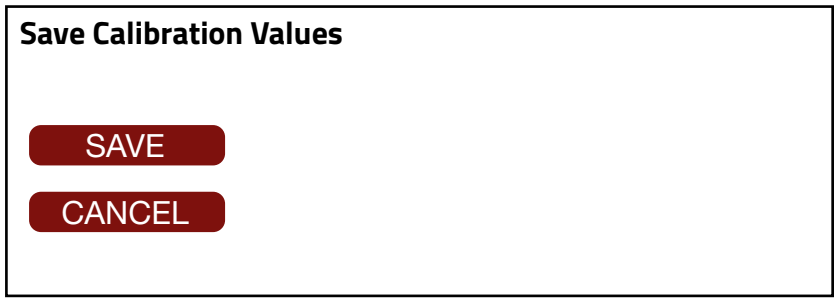
‡ The Range being calibrated will be shown here.

Gain ‡

Enter Value shown on Meter

0

‡ The Range being calibrated will be shown here.



If you choose to CANCEL Calibration, the following menu appears.

About this Device

Misc. / About

About this Device

General Information
Size:
Type:
Firmware Version:
Secure Boot:
Serial Number:
Part Number:

All of the General Information about this device will be displayed on this screen. Pressing the next arrow will advance through the screens showing the information about Network and module information (MAC ID, IP address etc). This is followed by a screen listing the Part Numbers of all installed modules. To exit this menu, press Misc. / About menu header or one of the Configuration icons.

The following screen is an example of the Network information that will be displayed.

About this Device

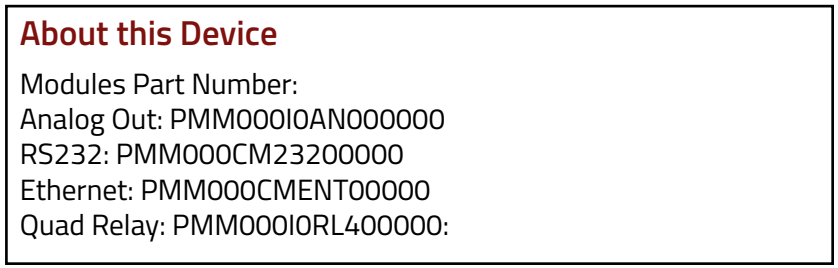
Network Information
Wi-Fi MAC:
IP Info:
Wi-Fi Status:

The following screen is an example of the Ethernet module information that will be displayed. The information displayed will be module dependent.

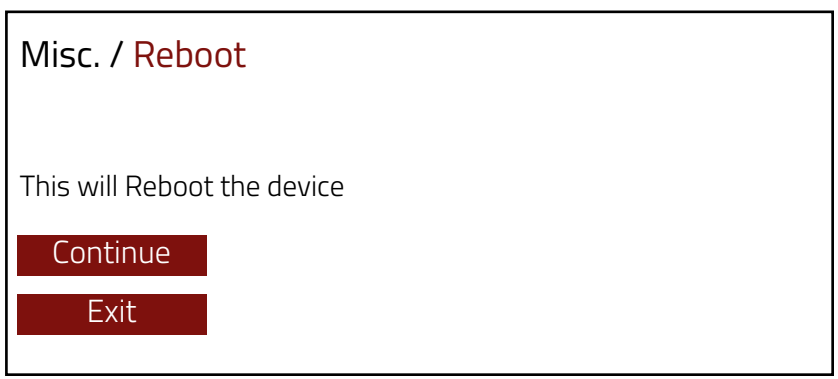
About this Device

Ethernet Module Information
Part Number:
IP Info (Static):
Subnet Mask:
Ethernet Module MAC::
Ethernet Status:

The following is an example of what will be displayed depending on the modules you have installed.



Reboot the Device



Pressing continue immediately reboots (power cycles) the unit and returns you to the main display, while Exit will return you to the main Misc. Configuration menu.

Home Screen

Screen Configuration

Screen Set-up

Update screen

Home Screen

This section allows the user to configure the 4 screens to display the device status and statistics based on the display size. These additional page views can be accessed from the Main Display by swiping either left or right.

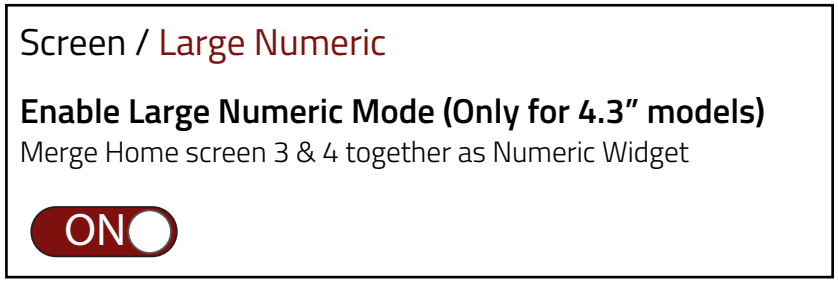
1. For 3.5" display size, one screen/widget per page view.
2. For 4.3" display size, two screens/ widgets per page view. The 4.3 will also support combining two screens to create a large numberic widget for displaying status and statistics.

System / Home Screen

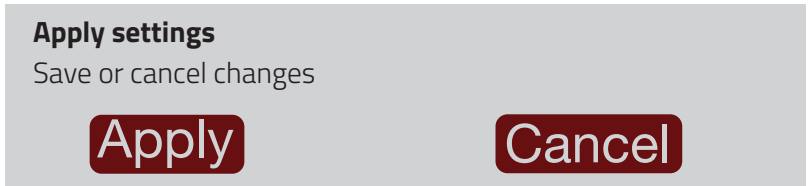
Large Numeric Widget

Widget Selection

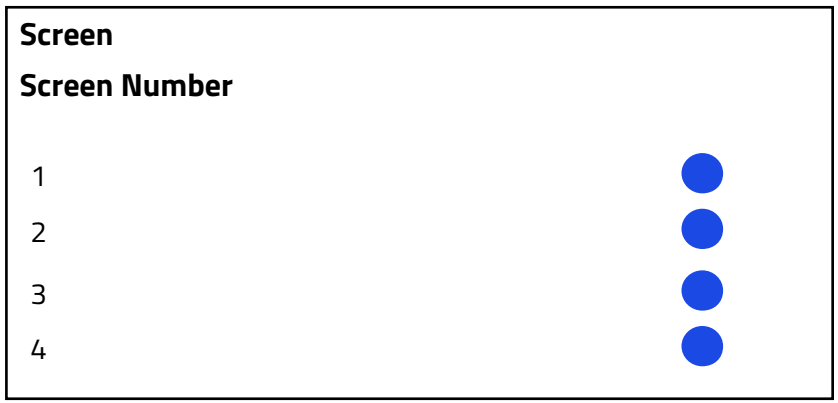
Display Limit



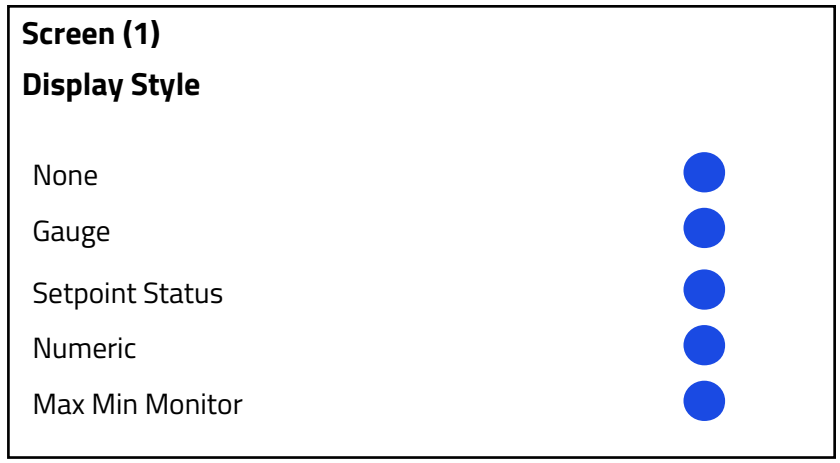
Your choices are either ON to merge screens 3 & 4, or OFF which disables the large numeric.



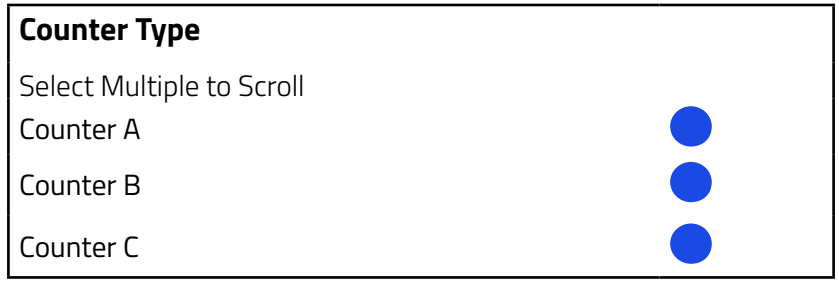
Widget Selection



If Large Numeric Mode was enabled, 3 and 4 are replaced with Large Numeric selection.



The Input value shown will be based on the active scaling List A or B and the active Absolute or Relative selection.



Rate Type

Select Multiple to Scroll

- Rate A
- Rate B
- Rate C
- Hi
- Lo

Unit for Counter/Rate A

units

Display Units is a 10 digit title that can be used to describe the numbers being shown. This title will remain the same when switching between lists and Absolute and Relative.

Scroll Update Time

Range: 3 to 15 Seconds

5

The Maximum and Minimum Display Values are only applicable for Gauge. The valid range for Gauge widget inputs is -199999 to 999999. The min values must be lower than the max values. These values are for graphical display units and are not the calculated Rate minimum and maximum values.

Minimum Display Value

0

Maximum Display Value

200

Color Band 1

Red

Blue

Green

Yellow

Percentage Band 1

20

Color Band 2

Red

Blue

Green

Yellow

Percentage Band 2

60

Color Band 3

Red

Blue

Green

Yellow

Percentage Band 3

100

Setpoint Status

Setpoint Status will display the independent status of the setpoint using a colored circle. It will not show the value for the setpoint. Setpoint 1 and 2 are always shown as part of the main icons.

Max Min Total Monitor

The Max and Min displays will always show with this selection even though they may not be activated. To keep one or more of the displays from showing a value, you must activate a User Input or Function Key for maintain reset of that display.

Apply settings

Save or cancel changes

Apply Cancel

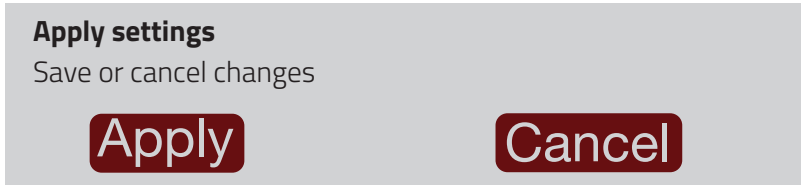
Display Limit

Max Display Limit

Maximum digit to be displayed

7 digit display

9 digit display



Note: 7 Digit Display appears bigger than 9 Digit Display

Supervisor/Quick Access Mode

In Supervisor/Quick Access Mode, function keys have different characteristics. The function keys are shown at the bottom of the home screen. If the Supervisor mode is disabled key programmed for All Users), the function key is red. When a function key is configured as a Supervisor key, the function key is green. The function key is yellow to indicate that the assigned function is maintained active.

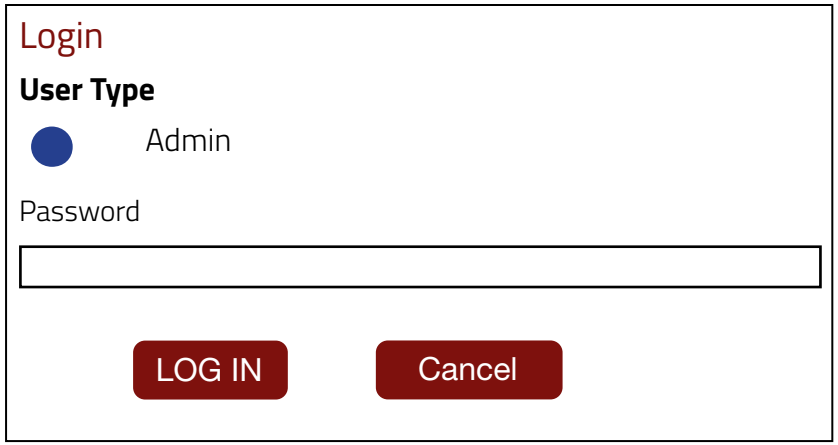
Admin Mode

When logged in as admin and a function key is pressed, it directly triggers the event it is assigned to, or it redirects to the configuration page to adjust the value it is assigned to. When the configuration is saved, the PM50 automatically redirects to the home page. If the user stays idle on the configuration page for 10 minutes, the user gets logged out and automatically redirected to the home page.

Supervisor Mode

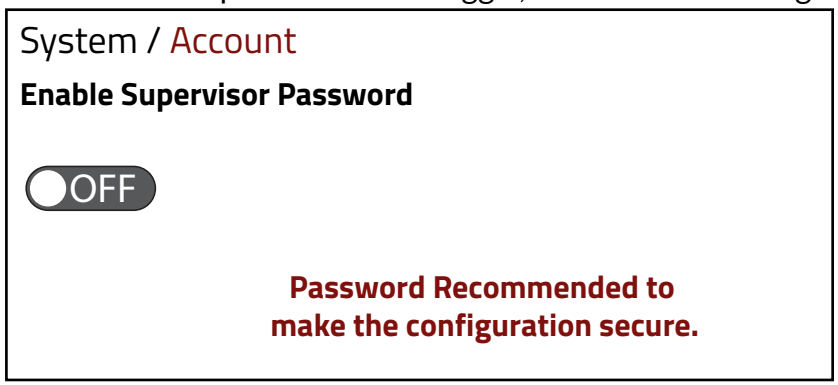
Supervisor mode should be enabled from the PM50 device only and by default, it is off. To enable Supervisor mode follow the steps listed below:

Login as Admin on the PM50 device

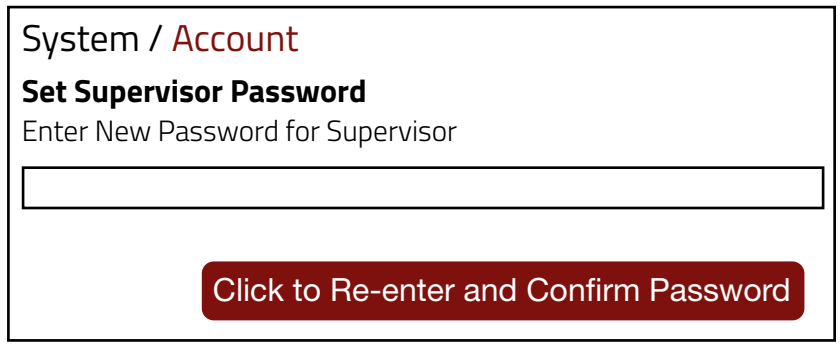


Tap on the System tab and navigate to Account Configurations

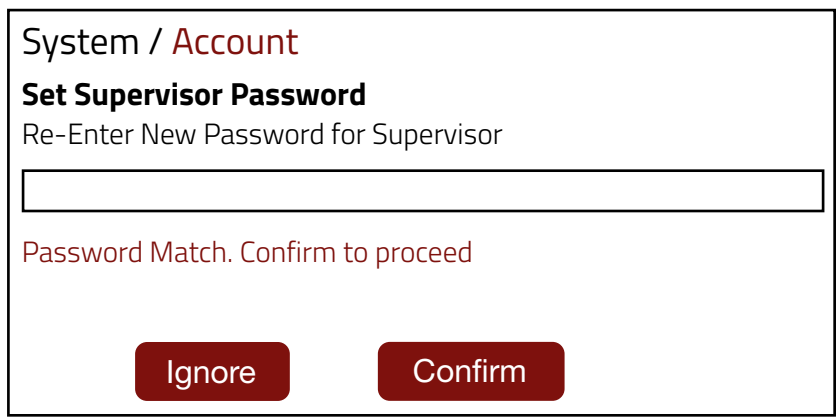
Enable the Supervisor Mode toggle, then click on the right arrow.

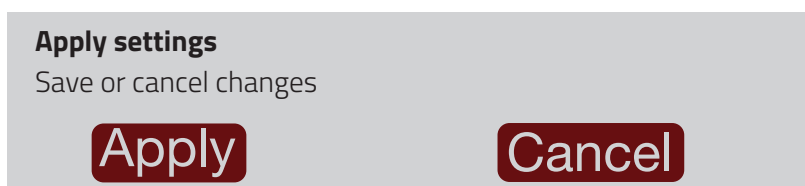


Enter the Supervisor password, then click on the right arrow.



Re-enter the previously entered password. If the password matches, click on the confirm button.





Note: Only the Admin can set up Supervisor mode on the PM50 device. If the password is not set by the Admin for Supervisor, then Supervisor mode is not enabled.

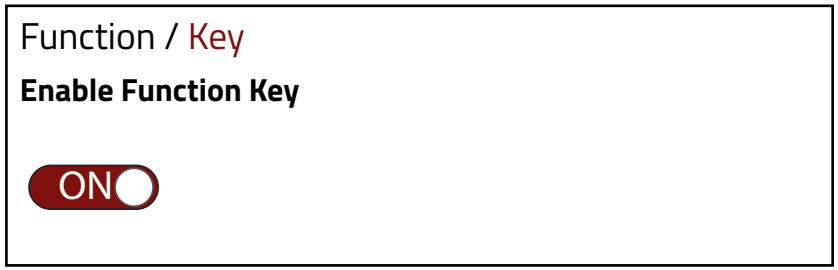
Function Key Configurations

The Function Key configuration is used for assigning function keys to the Supervisor mode. When the user enables Supervisor mode an added Access option is seen on the function key configuration page. It has two options: Supervisor and All Users. Here one can enable the Supervisor mode for that specific function key. When the user selects the Supervisor in the access option, the available functions are changed. The following options are available on the PM50 Digital: None, Setpoint Value, Momentary Reset, Display Brightness, Count Load

Device / Function

Function Key Configuration

User Input Configuration



Function / Key

Function Key

F1

F2

F3

F4

Functions / Key (1)

Function Key

Supervisor

All User

Functions / Key (1)

Rename Key

Functions / Key (1)

Select Function

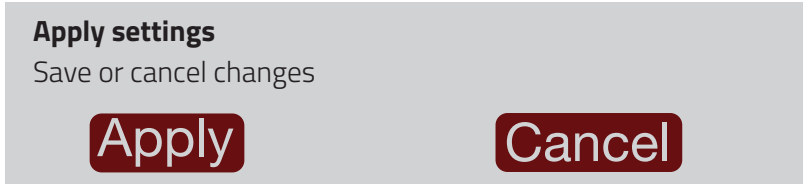
None

Setpoint Value

Momentary Reset

Display Brightness

Count Load



Home Screen

The home screen has function keys shown at the bottom of the screen. If the Supervisor mode is disabled, the function key takes red color. When a function key is configured as a Supervisor key, the function key takes green color.

Admin Mode

When tapped on the function key, it directly triggers the event it is assigned or redirects to the configuration page I.e., in case it is assigned a setpoint value, count load, display, or adjust brightness. When the configuration is saved, it automatically redirects to the home page. If the user stays idle on this page for 10 minutes the user gets logged out and automatically redirected to the home page.

Logged Out Mode (Supervisor)

When tapped on the function key it redirects to the login page. There it shows two options for login as Admin or Supervisor. The Supervisor is the default option. When the user logs in the event get triggered, and the user is logged out and redirected to the home page, this is in the case of the reset function, else it redirects to the respective configuration page. When the configuration is saved, the device automatically logs out and redirects to the home page. If the user stays idle for 30 seconds the user gets logged out and automatically redirected to the home page.

Logged Out Mode (Admin)

When the user presses the function key it redirects to the login page. On the login page, we have two options Admin & Supervisor. The Supervisor is the default selected option user can also select Admin if the user wants to log in as Admin. After password authentication for reset functionality, the reset action gets triggered & the page returns to the home page. For configuration functionality like setpoint value then the page is directed to the setpoint selection page & after configuration when the user saves the configuration Admin is logged out & the user is directed to the home page.

Function Key Scenarios

Listed below are a few of the scenarios you may observe when a website and/or mobile device is connected to your PM50.

Admin User Logged In On The Website

If a user is logged in on the website as admin and a function key is pressed, the PM50 display shows a popup message saying “Remote user is logged in. Please try again later.” When the Supervisor-enabled function key is pressed, the device screen navigates to the login page, and it shows the message “Remote user is logged in. Please try again later.”

Admin User Logged In On Device:

If a user is logged in on the PM50 as admin and a function key is pressed, the website shows a popup message saying “Admin/Supervisor user is logged in on the device.” When the Supervisor enabled function key is pressed, the website screen navigates to the login page, and it shows the message “Admin/Supervisor user is logged in on the device. Supervisor functions cannot be triggered. Please try again later.”

Active State On Device And Website:

On the PM50, this scenario is observed when the Supervisor function key is pressed, and the user has logged in and is on the configuration page on the website. Now, the function key on the device turns yellow to indicate that the remote user is on the configuration screen on the website. Once the remote user saves or redirects to the home page, the PM50 reverts the function key color to its previous state i.e., red, or green. This change in function key colors will be observed on the website as well.

Page Timeout for Each Login

PM50 DEVICE			
Logged In	Supervisor (Disabled)	Supervisor (Enabled)	
		Supervisor	All Users
Admin	10 mins	30 secs	10 mins
Supervisor	N/A	30 secs	N/A

WEBSITE / MOBILE APPLICATION			
Logged In	Supervisor (Disabled)	Supervisor (Enabled)	
		Supervisor	All Users
Admin	30 secs	10 mins	30 secs
Supervisor	N/A	30 secs	N/A

Serial RLC Protocol Communications

Command Chart

COMMAND	DESCRIPTION	NOTES
N	Note (unit) Address Specifier	Address a specific unit. Must be followed by a one or two digit node address. Not required when address = 0.
T	Transmit Value (read)	Read a register from the unit. Must be followed by register ID character.
V	Value Change (write)	Write to register or output. Must be followed by register ID character and numeric data.
R	Reset	Reset a register or output. Must be followed by register ID character.
P	Block Print Request	Initiates a block print output. Registers are defined in programming.

Command String Construction

The command string must be constructed in a specific sequence. The unit does not respond with an error message to invalid commands. The following procedure details construction of a command string:

1. The first characters consist of the Node Address Specifier (N) followed by a 1 or 2 character address number. The address number of the unit is programmable. If the node address is 0, this command and the node address itself may be omitted. For node address 1 through 9, a leading zero character is not required. (The only exception is a numeric transmission when Counter C is set for slave mode.) This is the only command that may be used in conjunction with other commands.
2. After the optional address specifier, the next character is the command character.
3. The next character is the Register ID. This identifies the register that the command affects. The P command does not require a Register ID character. It prints according to the selections made in print options.
4. If constructing a value change command (writing data), the numeric data is sent next.
5. All command strings must be terminated with the string termination characters *, $ or when Counter C is set for slave mode <CR>. The unit does not begin processing the command string until this character is received. See Timing Diagram figure for differences between terminating characters.

Sending Numeric Data

Numeric data sent to the unit must be limited to the digit range shown under transmit details in the Register Identification Chart. Leading zeros are ignored. Negative numbers must have a minus sign. The unit ignores any decimal point and conforms the number to the scaled resolution. (For example: the unit's scaled decimal point position = 0.0 and 25 is written to a register. The value of the register is now 2.5. Note: Since the unit does not issue a reply to value change commands, follow with a transmit value command for readback verification.

Register Identification Chart

DIGITAL MODEL				
ID	VALUE DESCRIPTION	MNEMONIC APPLICABLE	COMMANDS	TRANSMIT DETAILS
A	Count A	CTA	T, V, R	9 digit, 8 ½ negative
B	Count B	CTB	T, V, R	9 digit, 8 ½ negative
C	Count C	CTC	T, V, R	9 digit, 8 ½ negative
D	Rate A	RTA	T	6 positive, positive only
E	Rate B	RTB	T	6 positive, positive only
F	Rate C	RTC	T	6 positive, positive only
G	Max (Hi) Value	MAX	T, V, R	6 positive, 5 ½ negative
H	Min (Lo) Value	MIN	T, V, R	6 positive, 5 ½ negative
I	Scale Factor A	SFA	T, V	6 positive, positive only
J	Scale Factor B	SFB	T, V	6 positive, positive only
K	Counter Load A	CLA	T, V	6 positive, 5 ½ negative
L	Counter Load B	CLB	T, V	6 positive, 5 ½ negative
M	Setpoint 1	SP1	T, P, V, R	6 positive, 5 ½ negative
O	Setpoint 2	SP2	T, P, V, R	6 positive, 5 ½ negative
P				
Q	Setpoint 3	SP3	T, P, V, R	6 positive, 5 ½ negative
S	Setpoint 4	SP4	T, P, V, R	6 positive, 5 ½ negative
U	Auto/Manual Register	MMR	T, V	0 - auto; 1 - manual
W	Analog Output Register	AOR	T, V	0 - 65536 normalized
X	Setpoint Register	SOR	T, V	0 - not active; 1 - active
Y	Setpoint 5	SP5	T, P, V, R (Reset command resets the setpoint output)	6 positive, 5 ½ negative
Z	Setpoint 6	SP6		6 positive, 5 ½ negative

Command String Examples

1. Node address = 17, Write 350 to Setpoint 1.
   String: N17VM350$
2. Node address = 5, Read Count A value.
   String: N5TA*

3. Node address = 0, Reset Setpoint 4 output.
String: RS*

Receiving Data From the Unit

Data is transmitted by the unit in response to either a transmit command (T), a print block command (P) or User Function print request. The response from the unit is either a full field transmission or an abbreviated transmission. The unit response mode is selected in Serial Port Parameters (Abrv).

Full Field Transmission (Address, Mnemonic, Numeric data)

Byte	Description
1, 2	2 byte Node Address field [00-99]
3	<SP> (Space)
4-6	3 byte Register Mnemonic field
7-18	12 byte data field, 10 bytes for number, one byte for sign, one byte for decimal point
19	<CR> carriage return
20	<LF> line feed
21	<SP>* (Space)
22	<CR>* carriage return
23	<LF>* line feed

* These characters only appear in the last line of a block print.

The first two characters transmitted are the node address, unless the node address assigned = 0, in which case spaces are substituted. A space follows the node address field. The next three characters are the register mnemonic.

The numeric data is transmitted next. The numeric field is 12 characters long (to accommodate the 10 digit totalizer), with the decimal point position floating within the data field. Negative values have a leading minus sign. The data field is right justified with leading spaces.

The end of the response string is terminated with a carriage return <CR> and <LF>. When block print is finished, an extra <SP><CR> <LF> is used to provide separation between the blocks.

Abbreviated Transmission (Numeric data only)

Byte	Description
1-12	12 byte data field, 10 bytes for number, one byte for sign, one byte for decimal point
13	<CR> carriage return
14	<LF> line feed
15	<SP>* (Space)
16	<CR>* carriage return
17	<LF>* line feed

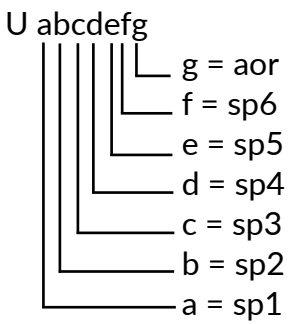
* These characters only appear in the last line of a block print.

Unit Response Examples:

1. Node address = 17, full field response, Count A = 875
   17 CTA 875 <CR><LF>
2. Node address = 0, full field response, Setpoint 2 = -250.5
   SP2 -250.5<CR><LF>
3. Node address = 0, abbreviated response, Setpoint 2 = 250, last line of block print
   250<CR><LF><SP><CR><LF>

Auto/Manual Mode Register (MMR) ID: U

This register sets the controlling mode for the outputs. In Auto Mode (0) the unit controls the setpoint and analog output. In Manual Mode (1) the outputs are defined by the registers SOR and AOR. When transferring from auto mode to manual mode, the unit holds the last output value (until the register is changed by a write). Each output may be independently changed to auto or manual. In a write command string (VU), any character besides 0 or 1 in a field will not change the corresponding output mode.



Analog Output Register (AOR) ID: W

This register stores the present signal value of the analog output. The range of values of this register is 0 to 32767, which corresponds to the analog output range per the following chart:

REGISTER VALUE	OUTPUT SIGNAL*		
	0-20 mA	4-20 mA	0-10 V
0	0.000	4.000	0.000
8192	5.000	8.000	2.500
16384	10.000	12.000	5.000
32767	20.000	20.000	10.000

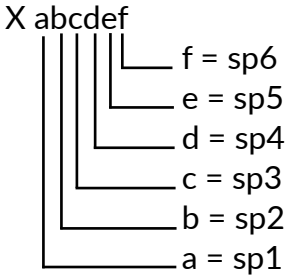
* Due to the absolute accuracy rating and resolution of the output card, the actual output signal may differ 0.15% FS from the table values. The output signal corresponds to the range selected (0-20 mA, 4-20 mA or 0-10 V).

Writing to this register (VW) while the analog output is in the Manual Mode causes the output signal level to update immediately to the value sent. While in the Automatic Mode, this register may be written to, but it has no effect until the analog output is placed in the manual mode. When in the Automatic Mode, the unit controls the analog output signal level. Reading from this register (TW) will show the present value of the analog output signal.

Example: VW16384* will result in an output of 10.000 mA, 12.000 mA or 5.000V depending on the range selected.

Setpoint Output Register (SOR) ID: X

This register stores the states of the setpoint outputs. Reading from this register (TX) will show the present state of all the setpoint outputs. A “0” in the setpoint location means the output is off and a “1” means the output is on.



In Automatic Mode, the unit controls the setpoint output state. In Manual Mode, writing to this register

(VX) will change the output state. Sending any character besides 0 or 1 in a field or if the corresponding output was not first in manual mode, the corresponding output value will not change. (It is not necessary to send least significant 0s.)

Example: VX10* will result in output 1 on and output 2 off.

Counter C Serial Display

Counter C programmed for SLAVE to act as a serial slave display.

In this mode, the carriage return <CR> is added as a valid command terminator character for all serial command strings. The <CR> as a terminator may be very useful for standard serial commands, even if Counter C is never displayed or sent a slave message. The <*> and <$> are also recognized as valid terminators for the serial slave.

The Counter C slave display is center aligned and has the capacity of displaying nine characters. When less than the full display of characters is received, blank spaces are placed in front of the characters. If more than the full display of characters is received, only the last nine characters are displayed. The unit has an internal 30-character buffer for the slave display. If more than 30 characters are received, the additional characters are discarded until a <CR> is received. At that point, the last nine characters in the buffer are displayed.

Counter C processes Numeric and Literal slave transmissions as follows.

Numeric Transmissions

When a string that does not begin with #, T, V, P or R is received, the unit processes it as a Numeric transmission. In this case, only numbers and a minus sign can be displayed. All other characters in the string are discarded. If a minus sign appears anywhere in the string, the resulting number will be negative. If a decimal point is desired, it is programmed in Counter C setup and is ignored in the serial string. If no numerical characters are received, then the numeric value will be zero.

The numeric display can be used for setpoint (boundary action only) and analog output functions. The numeric value is retained in Counter C memory until another Numeric transmission is received. If a numeric value is not to be saved to non-volatile memory, send the value as a literal transmission.

Note: Numeric transmissions sent to unit addresses 1 through 9 must have a leading zero character sent with the address (i.e., N01 through N09).

Literal Transmissions

When a string that begins with # is received, the unit processes it as a Literal transmission. In this case, numeric and alphabetic characters will be processed. A Literal display overrides any Units Mnemonics characters. A Literal display will replace a Numeric value in the Counter C display. However, it will not remove a previous Numeric value from Counter C memory or prevent the Counter C assigned outputs from functioning with the previous Numeric value.

Both upper case & lower case are accepted.
Downloading Data from a G3 to a PM50D
Communications:
Port: RS232 Comms Raw Serial Port
Port Driver: <system> Raw Serial Port
Programming:
PortPrint(2, “N01” + IntToText(Var1, 10, 6) + “\r”);
This program is called from the Global On Tick. It sends “N01” (the unit address), followed by the ASCII equivalent of Var1, then a carriage return.

Hardware Setup

For the most up to date specifications refer to the Installation Guide for your specific model. Found here. Specification information for specific modules can be found at the same location.

Specifications

Note: The PM-50 4.3 inch host accepts a maximum of 5 modules while the 3.5 inch host accepts a maximum of 3 modules. Only one module from each function type (i.e. communication, relay, analog output) can be installed.

POWER: The meter is intended to be powered by NEC/CEC class 2, IEC/EN/UL 60950-1 LPS or UL/CSA 601010-1 Limited Energy power source.

MODEL	4.3-INCH	3.5-INCH
Input Voltage (Volts)	10-30 VDC	10-30 VDC
Max Power PM-50 only	4.6 W	4.6 W
Max Power PM-50, with modules	12 W	12 W

Host Isolation: 500 Vrms for 1 min. to all inputs and outputs.

DISPLAY: 4.3" or 3.5" Color TFT display with resistive analog touch screen

SIZE	4.3-INCH	3.5-INCH
TYPE	TFT	TFT
COLORS	262,144 K	262,144 K
PIXELS	480 X 272	320 X 240
BRIGHTNESS	420 cd/m^2	540 cd/m^2
LED BACKLIGHT LIFE*	30,000 HR TYP.	30,000 HR TYP.

* Lifetime at room temperature (25°C)

SENSOR POWER:

+24 VDC, ±5% @ 50 mA max.

COUNTER DISPLAYS: 9 digits available

Display Range: -99,999,999 to 999,999,999
Over Range Display: Overrange
Under Range Display: Underrange
Display Designators: Cnt-A, Cnt-B, Cnt-C
Maximum Count Rates: 50% duty cycle
If Setpoints Disabled: 35 KHz for all modes except Quadrature x4 (32 KHz)

If Setpoint(S) Enabled: 20 KHz for any mode except Quadrature x1 (19 KHz), Quadrature x2 (17 KHz) and Quadrature x4 (10 KHz)

RATE DISPLAYS: 6-digit

Maximum Frequency: 50 KHz

Minimum Frequency: 0.001 Hz

Display Update Time: 0.1 to 999.9 seconds

Accuracy: ±0.01%

SIGNAL INPUTS (INPUT A and INPUT B):

Software configurable input types including switch contacts, TTL outputs, magnetic pickups and all standard RLC sensors. Inputs are configurable for current sinking or current sourcing outputs with input filtering for low frequency signals or switch contact debounce. Not isolated from the sensor input common.

Logic: Input trigger levels V_{IL} = 1.2 V max.; V_{IH} = 3.75 V min.

Sink: Adds internal 7.8 KΩ pull-up resistor to +5 VDC, 0.7 mA max

Source: Adds internal 3.9 KΩ pull-down resistor, 7.3 mA max. at 28 VDC, V_{MAX} = 30 VDC

Magnetic Pickup:

V_{IN_PK} = 200 mV; V_{IN_HSYS} = 100 mV; Must also have SRC selection turned on through software

V_{MAX} = ± 40 V_{PEAK} or 28 Vrms

Dual Count Modes:

When any dual count mode is used, then User Inputs 1 and/or 2 will accept the second signal of each signal pair. The user inputs do not have the Logic/Mag, HI/LO Freq, and Sink/Source software selections. The user inputs are inherently a logic input with no low frequency filtering implemented in software. The user input may only be selected for sink/source by the User Input Active parameter.

USER INPUTS: Two programmable user inputs

Max. Continuous Input: 30 VDC

Isolation to Sensor Input Common: Not isolated.

Logic State: User programmable for sink/source (Lo/Hi)

INPUT STATE	LO/SINK	HI/SOURCE
	20 KΩ pull-up to +3.3 V	20 KΩ pull-down
Active	V_{IN} < 0.9 VDC	V_{IN} > 2.4 VDC
Inactive	V_{IN} > 2.4 VDC	V_{IN} < 0.9 VDC

MEMORY: Nonvolatile memory retains all programmable parameters and display values.

Memory Card: microSD slot accepts up to 32 GB capacity cards in FAT16/FAT32 format.

RS485 SERIAL PORT: Uses Modbus protocol

Baud Rate: Up to 115,200

Data Format: 7/8 bit; odd, even, or no parity; 1 or 2 stop bits

Isolation: 500 Vrms to sensor, user power and digital inputs. Not isolated to solid state outputs

Wi-Fi CAPABILITIES:

Wi-Fi: Power output up to 20.5 dBm

Frequency:

TECHNOLOGY	CHANNELS	FREQUENCIES
Wi-Fi	1-13	2412-2484 MHz

Note: Channel/frequency limitation is enforced based on configured country/region code.

Wi-Fi Compliance: TCP/IP; 802.11 b/g/n

ON-BOARD DUAL SSR OUTPUTS: Both outputs must be used either in SINKING or in SOURCING mode together.

Sinking Mode:

Type: Switched DC, N-channel open drain MOSFET

Max Sink Current: 100 mA

V_{DS} ON: 0.3 V @ 100 mA

V_{DS} MAX: 30 VDC

Offstate Leakage Current: 0.5 mA max

Sourcing Mode:

Type: Switched DC, P-channel open source MOSFET

Max Source Current: 100 mA

V_{DS} ON: 0.3 V @ 100 mA

V_{DS} MAX: 30 VDC

Offstate Leakage Current: 0.5 mA max

ENVIRONMENTAL CONDITIONS:

Operating Temperature Range: -10 to 55 °C

Storage Temperature Range: -20 to 60 °C

Operating and Storage Humidity: 0 to 85% max. RH non-condensing

Vibration to IEC 68-2-6: Operational 5-500 Hz, 2 g

Shock to IEC 68-2-27: Operational 20 g (10 g relay)

Altitude: Up to 2000 meters

Installation Category II, Pollution Degree 2 as defined in IEC/EN 60664-1.

CERTIFICATIONS AND COMPLIANCES:

CE Approved

EN 61326-1 Immunity to Industrial Locations

Emission CISPR 11 Class A

IEC/EN 61010-1

RoHS Compliant

FCC ID #: 2AC7Z-ESP32WROOM32U

UL Hazardous: File # E317425

Type 4X Indoor/IP65 Enclosure rating (Face only) for all models

IP20 Enclosure rating (Rear of unit)

CONNECTIONS: High compression spring-clamp terminal block

Wire Strip Length: 0.32-0.35" (8-9 mm)

Wire Gauge Capacity: Four 28 AWG (0.32 mm) solid,
two 20 AWG (0.61 mm) or one 16 AWG (2.55 mm)

CONSTRUCTION: This unit is rated NEMA 4X/IP65 for indoor use only. IP20 Touch safe. One piece bezel/case. Flame resistant. Panel gasket, module locks, and mounting panel latch included.

MOUNTING REQUIREMENTS: Maximum panel thickness is 0.25" (6.35 mm). For NEMA 4X/IP65 sealing, a steel panel with a minimum thickness of 0.04" (1.02 mm) is recommended.

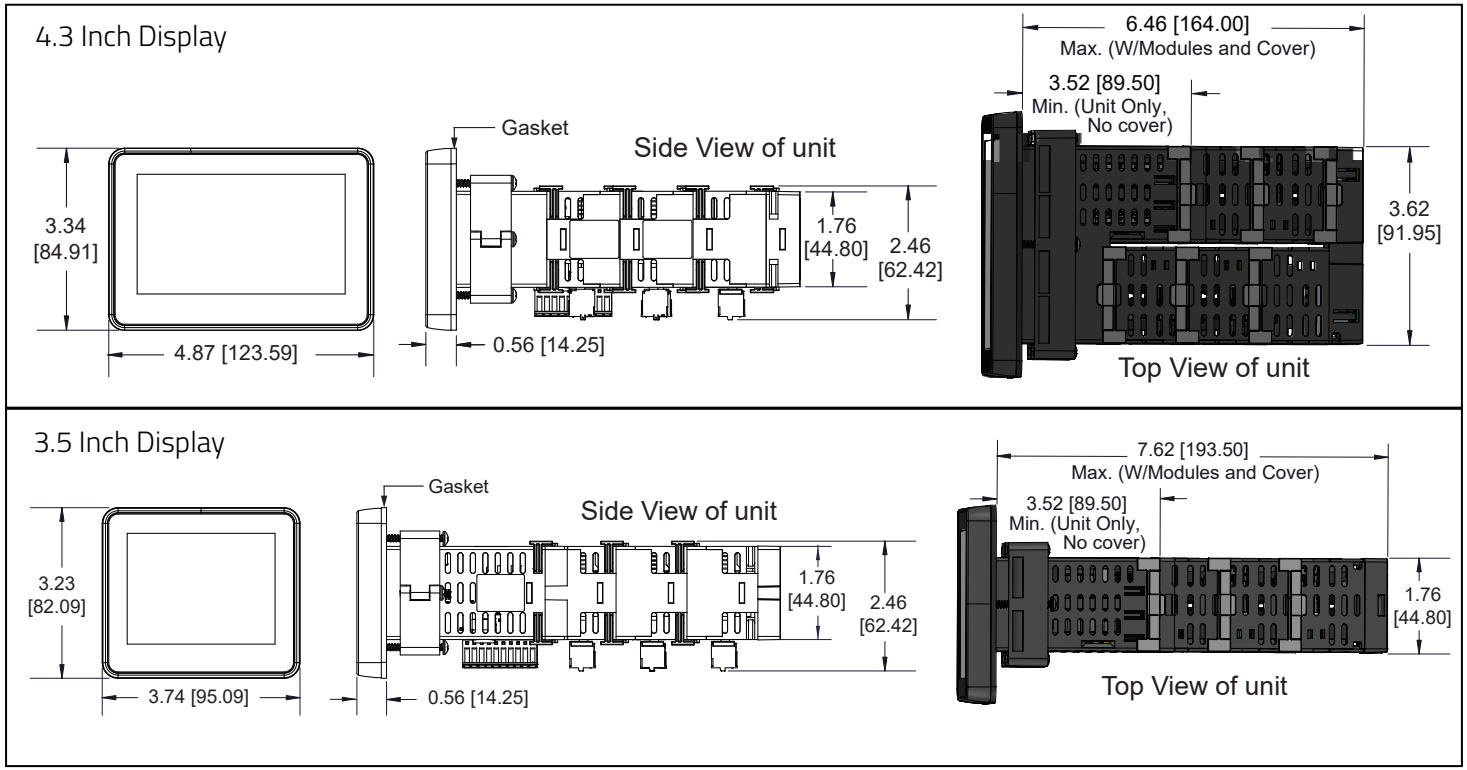
Panel Latch Screw Torque: 5.0 lbf-in (0.56 Nm) **CAUTION: DO NOT OVERTIGHTEN**

WEIGHT:

4.3: 11.3 oz (321 g)

3.5: 7.9 oz (224 g)

DIMENSIONS In inches [mm]

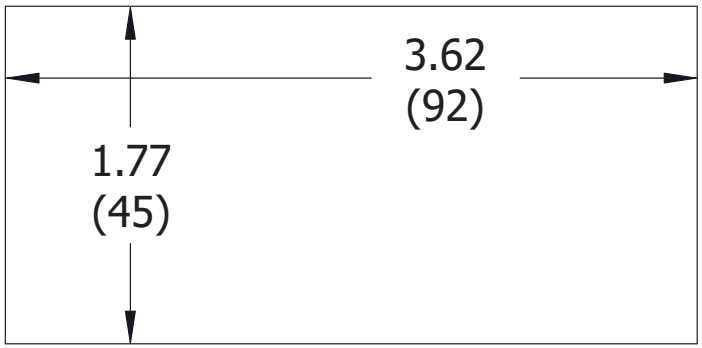


INSTALLATION ENVIRONMENT

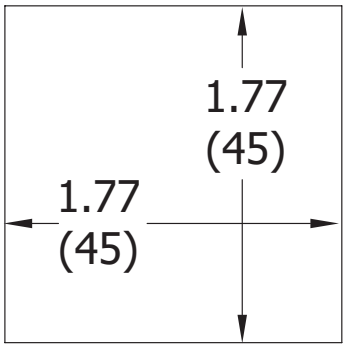
The unit should be installed in a location that does not exceed its own operating temperature and provides good air circulation. Placing the unit near devices that generate excessive heat should be avoided.

The PM-50 4.3 and 3.5 inch models meet NEMA 4X/IP65 requirements when properly installed. This unit is designed for through-panel mounting. The mounting surface should have a minimum thickness of 0.04" (1.02 mm) and maximum thickness of 0.25" (6.35 mm). Cut the mounting hole per the dimensions shown in the diagram. Care should be taken to remove any loose material from the mounting cut-out to prevent that material from falling into the unit during installation. Prepare the panel cutout to the dimensions shown.

4.3 Inch Meter (1/8 DIN Cut Out)



3.5 Inch Meter (1/16 DIN Cut Out)



For hazardous location installation the following shall be taken into consideration:

- The device shall be panel mounted in a tool accessible enclosure with a minimum ingress protection rating of at least IP64 as defined in IEC/EN 60529.
- This device is open-type and must be mounted in a suitable dust-tight end-enclosure in accordance with articles 500 and 502 of the NEC and positioned so only the face of the display is exposed.
- Must be wired using Division 2 wiring methods as specified in article 501-4(b), 502-4(b), and 503-3(b) of the National Electric Code, NFPA 70 for installation within the United States, or as specified in section 19-152 of Canadian Electrical Code for installation in Canada.

Ordering Information

DESCRIPTION	PART NUMBER
4.3" Digital Input Graphical Panel Meter	PM500D0400800F00
3.5" Digital Input Graphical Panel Meter	PM500D0301600F00

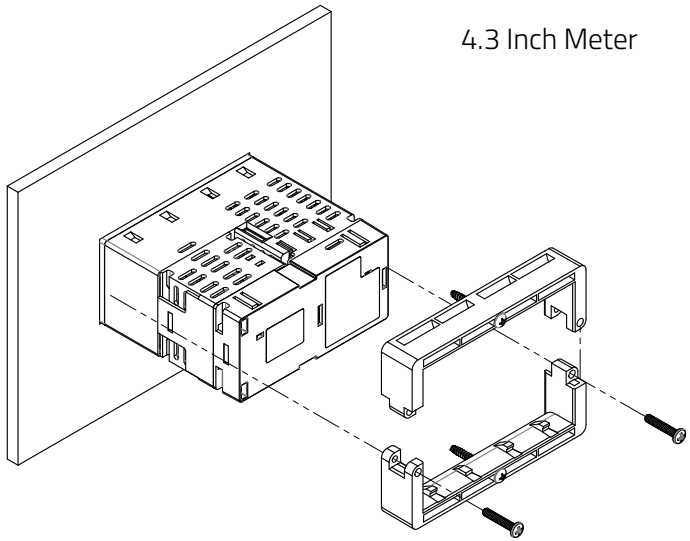
Accessories

TYPE	DESCRIPTION	PART NUMBER
Modules	RS232 Serial Communications Module	PMM000CM23200000
	Ethernet Communications Module	PMM000CMENT00000
	Analog Output Module	PMM000I0AN000000
	Dual Setpoint Relay Output Module	PMM000I0RL200000
	Quad Setpoint Relay Output Module	PMM000I0RL400000
	AC to DC Power Module	PMM000PWACP00000
Misc.	Replacement Rear Cover/Bus Board with Spacer Module (4.3" model only)	PMA000CP00800000
	Conversion Panel 92 mm x 75 mm to 1/8 DIN	PMA000MK00800000
	Conversion Panel 68 mm x 68 mm to 1/16 DIN	PMA000MK01600000
	Replacement Module Lock Pins	PMA000MKLP00000
	4.3" Protective Screen Overlay	PMA000SP00800000
	3.5" Protective Screen Overlay	PMA000SP01600000
	MicroSD Card	SD032G00

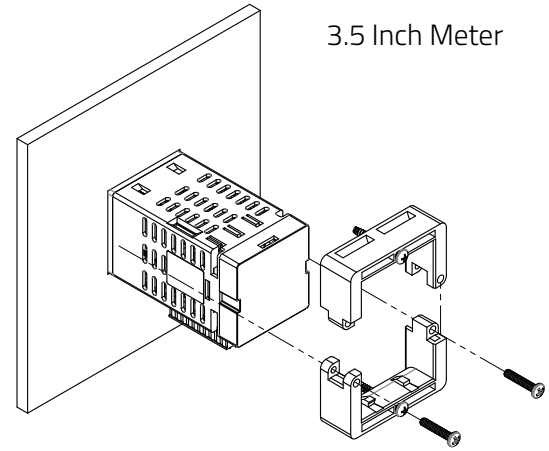
METER INSTALLATION

Slide the panel gasket over the rear of the unit to the back of the bezel. The unit should be installed fully assembled. Insert the unit into the panel cutout.

4.3 Inch Meter



3.5 Inch Meter



While holding the unit in place, place either the top or bottom panel latch on the rear of the unit closest to the panel cutout so that the tabs of the panel latch engage in the slots on the case. Repeat this process with the other half of the panel latch. Secure the latch with the panel mounting screws provided. To achieve a proper seal, tighten the latch screws evenly until the unit is snug in the panel (Torque to approximately 5 in-lbs [56 N-cm]). Do not over-tighten the screws.

Adding Modules

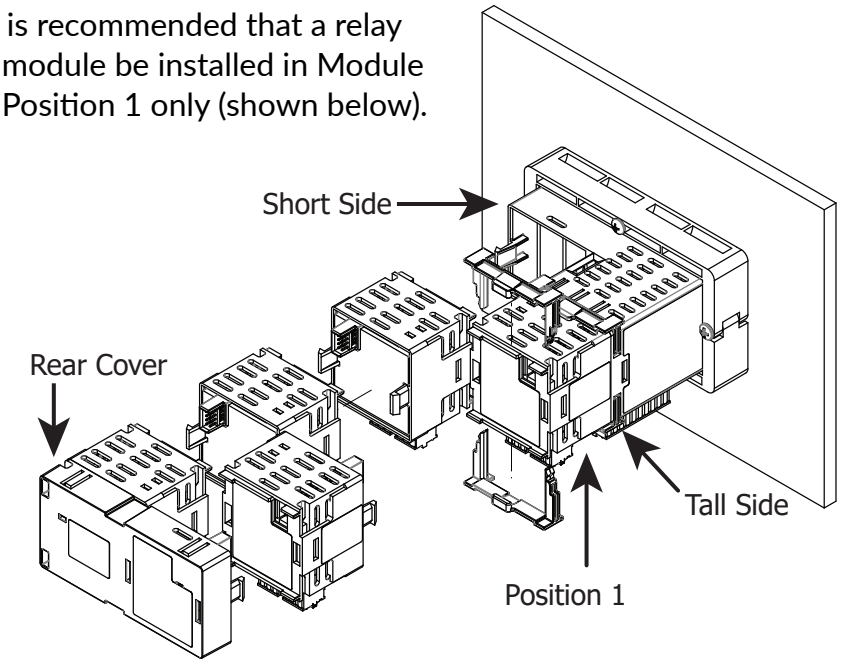
WARNING - Disconnect all power to the unit before installing or removing modules.

AVERTISSEMENT - Débranchez l'alimentation électrique de l'appareil avant d'installer ou de retirer des modules.

Installation of the product must comply with National Electrical Code (NEC), NFPA-70 or Canadian Electrical Code (CED) or any local regulation Authority.

To a 4.3 inch Host

⚠ It is recommended that a relay module be installed in Module Position 1 only (shown below).



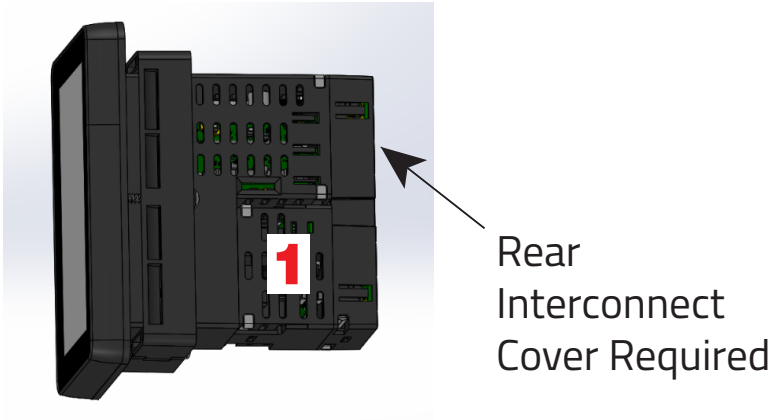
1. To install a module on the tall side of a 4.3 inch host, align the latches of the module with the host case such that the backplane connector shroud on the module cover aligns with the backplane connector opening in the host case.
2. To install a module on the short side of a 4.3 inch host, rotate the module 180 degrees and align the latches on the host with the module case so that the I/O connector is facing downward.
3. Insert the host latches into the openings in the module case by slightly deflecting the latches inward.
4. Press the module into the host case evenly until the latches engage.
5. Install Module Locks between each module as shown by fully inserting the legs of the Module Locks into the slots in the case until the button on the Module Lock aligns with the hole provided in the case. Press fit the button into the hole. Repeat this installation between each module in your system to provide the most secure installation.
6. When you have finished adding modules, the rear cover should be installed in the same manner as the modules.

Note: When using the AC/DC module or the Spacer Module, they must be in the last position.

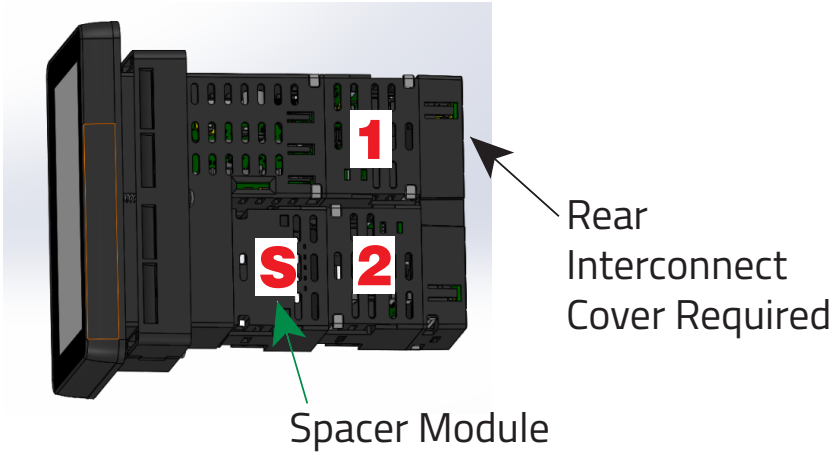
Module Installation Variations for 4.3 Inch (1/8 DIN) PM-50

The modules can be installed in various locations as shown below. Some installations require the Rear Interconnect Cover and Spacer Module (P/N – PMM000CP00800000). The cover connects the communication to the modules and may shorten the depth of the overall installation. A maximum of 5 modules may be connected.

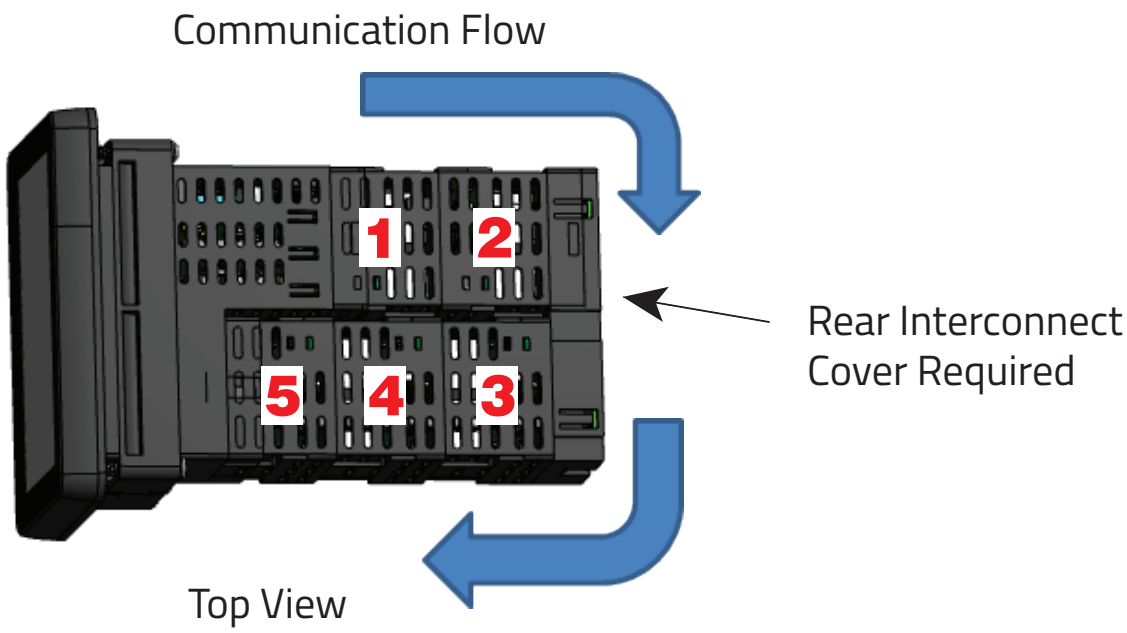
Single Module Installation - Top View



Dual Module Installation - Top View



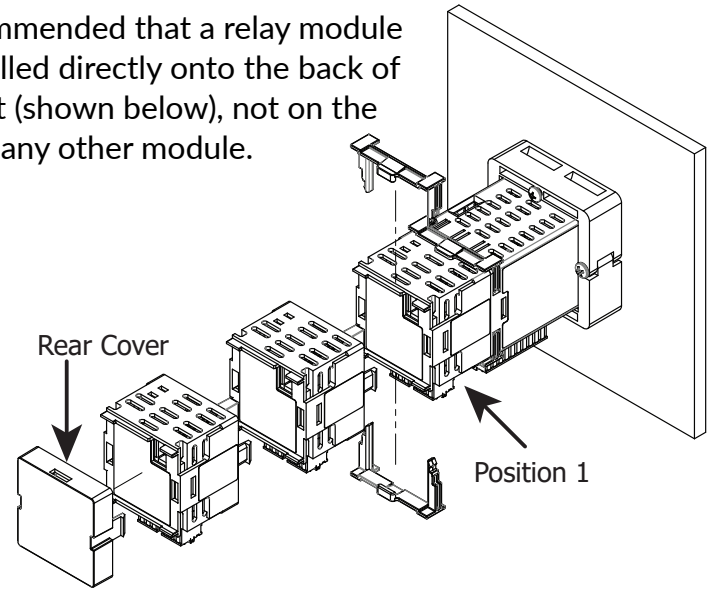
Five Module Installation - Top View



To a 3.5 inch Host

1. Align the latches of the module with the host case such that the backplane connector shroud on the module cover aligns with the backplane connector opening in the host case.
2. Insert the module latches into the openings in the host case by slightly deflecting the latches inward.
3. Press the module into the host case evenly until the latches engage.
4. Install Module Locks between each module as shown by fully inserting the legs of the Module Locks into the slots in the case until the button on the Module Lock aligns with the hole provided in the case. Press fit the button into the hole. Repeat this installation between each module in your system to provide the most secure installation.
5. When you have finished adding modules, the rear cover should be installed in the same manner as the modules.

⚠ It is recommended that a relay module be installed directly onto the back of the host (shown below), not on the back of any other module.



Note: When using the AC/DC module, it must be in the last position.

Wiring

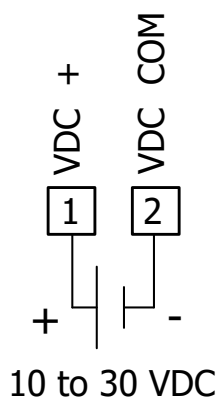
All power, input and output (I/O) wiring must be in accordance with Class I, Division 2 wiring methods and in accordance with the authority having jurisdiction. Electrical connections are made via pluggable spring terminal blocks. It is recommended that the power supplied to the meter be protected by a fuse or circuit breaker.

When wiring the meter, refer to the label on the unit for pin-out numbering against those shown in the wiring drawings for proper wire position. Strip and connect the wire according to the terminal block specifications. Use a small screwdriver to press down on tab next to the terminal position to open the spring clamp. Insert the wire into the terminal position and then remove the screwdriver to engage the spring-clamp.

Power Wiring

Must use a Class 2 circuit according to National Electrical Code (NEC), NFPA-70 or Canadian Electrical Code (CEC), Part I, C22.1 or a Limited Power Supply (LPS) according to IEC/EN 60950-1 or Limited-energy circuit according to IEC/EN 61010-1.

DC Power

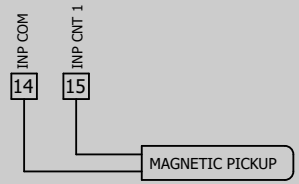


10 to 30 VDC

Ensure software configuration is set to correspond with your required application wiring.

Magnetic Pickup

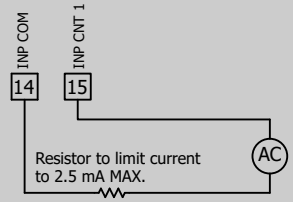
Input A



Software Configuration - Select Mag Mode

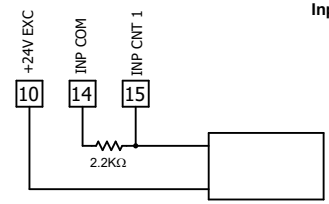
AC Inputs From Tach Generators, Etc.

Input A



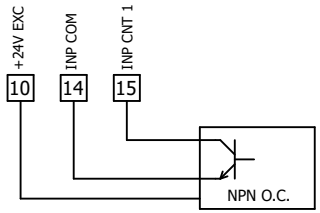
Two Wire Proximity, Current Source

Input A



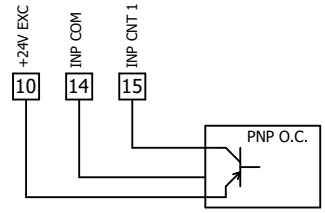
Current Sinking Output

Input A



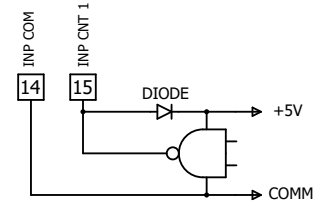
Current Sourcing Output

Input A



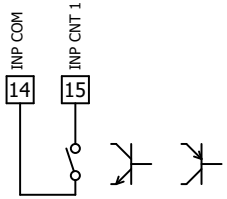
Interfacing With TTL

Input A



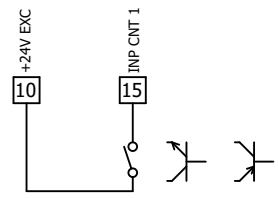
Switch or Isolated Transistor; Current Sink

Input A



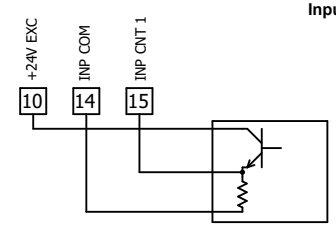
Switch or Isolated Transistor; Current Source

Input A



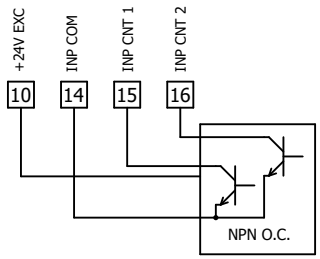
Emitter Follower; Current Source

Input A



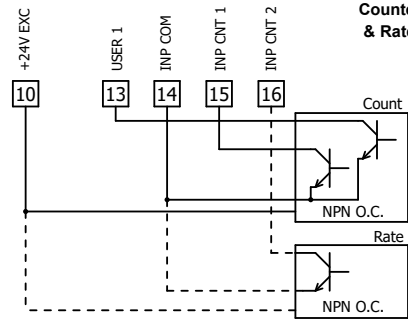
Current Sink Output; Quad/Direction

Single Counter A



Current Sink Output; Quad/Direction

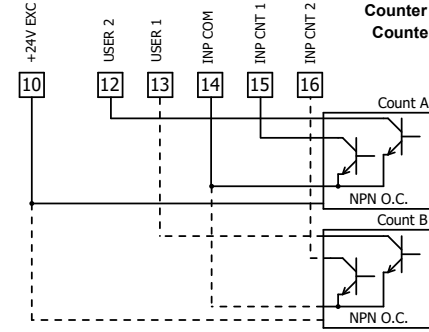
Counter A & Rate B



User Input Configured in Sink Position in Software

Current Sink Output; Quad/Direction

Counter A & Counter B



User Input Configured in Sink Position in Software

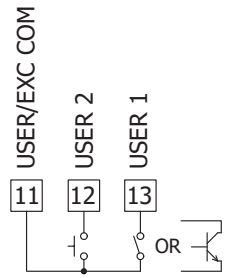
Shaded areas not recommended for counting applications.

USER INPUT WIRING

User Input terminal does not need to be wired in order to remain in the inactive state.

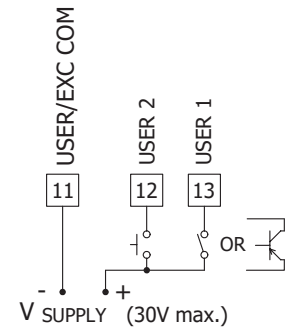
Sinking Logic

When the parameter is programmed to Low, check with device GUI option. The user inputs of the controller are internally pulled up to +3.3 V with 20 KΩ resistance. The input is active when it is pulled low (<0.9 V).



Sourcing Logic

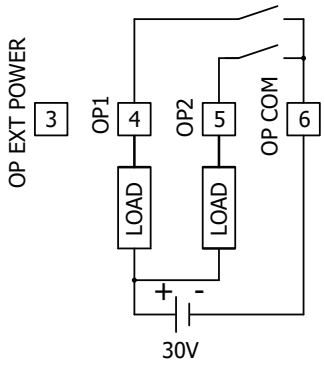
When the parameter is programmed to High, check with device GUI option. The user inputs of the controller are internally pulled down to 0 V with 20 KΩ resistance. The input is active when a voltage greater than 2.4 VDC is applied.



ON-BOARD DUAL SSR WIRING

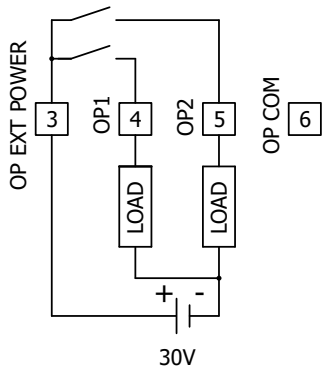
The SSR outputs require meter configuration to address their functionality. The drawings below illustrate the wiring for each option.

Sinking Mode



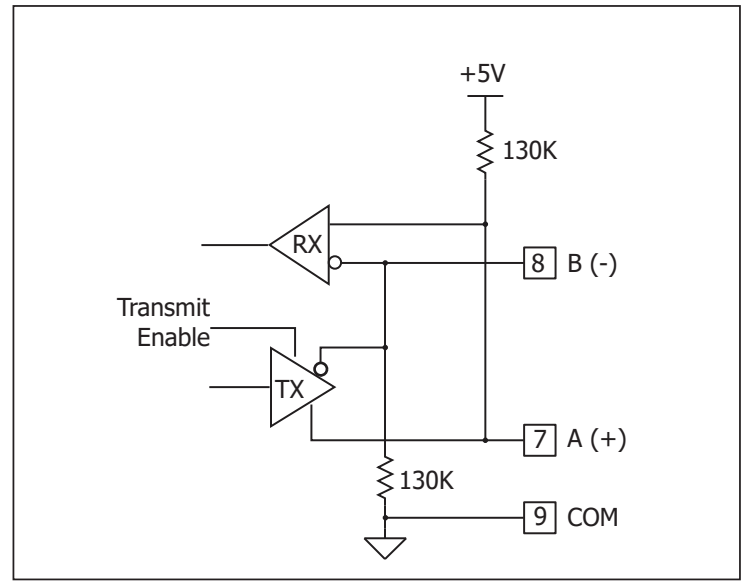
100 mA PER OUTPUT
SSR OUTPUTS SINKING MODE

Sourcing Mode



100 mA PER OUTPUT
SSR OUTPUTS SOURCING MODE

RS485/MODBUS



Service and Support Information

Service Information

We sincerely hope that you never experience a problem with any of our products. If you do need service, call Red Lion at 1-877-432-9908 for Technical Support. A trained specialist will help you determine the source of the problem. Many problems are easily resolved with a single phone call. If it is necessary to return a unit to us, an RO (Repair Order) can be obtained on the Red Lion website.

Red Lion tracks the flow of returned material with our RO system to ensure speedy service. You must include this RO number on the outside of the box so that your return can be processed immediately.

Be sure to have your original purchase order number and date purchased available.

We suggest that you give us a repair purchase order number in case the repair is not covered under our warranty. You will not be billed if the repair is covered under warranty.

Please supply us with as many details about the problem as you can. The information you supply will be written on the RO form and supplied to the repair department before your unit arrives. This helps us to provide you with the best service, in the fastest manner. Repairs are completed as soon as possible. If you need a quicker turnaround, ship the unit to us by air freight. We give priority service to equipment that arrives by overnight delivery.

We apologize for any inconvenience that the need for repair may cause you. We hope that our rapid service meets your needs. If you have any suggestions to help us improve our service, please give us a call. We appreciate your ideas and will respond to them.

Product Support

Technical Support:
Inside US: +1 (877) 432-9908
Outside US: +1 (717) 767-6511
Support: support.redlion.net
Hours: 8:00 am to 6:00 pm EST

Corporate Headquarters
Red Lion Controls
1750 5th Avenue
York, PA 17403
Website: www.redlion.net

LIMITED WARRANTY

(a) Red Lion Controls Inc. (the "Company") warrants that all Products shall be free from defects in material and workmanship under normal use for the period of time provided in "Statement of Warranty Periods" (available at www.redlion.net) current at the time of shipment of the Products (the "Warranty Period"). **EXCEPT FOR THE ABOVE-STATED WARRANTY, COMPANY MAKES NO WARRANTY WHATSOEVER WITH RESPECT TO THE PRODUCTS, INCLUDING ANY (A) WARRANTY OF MERCHANTABILITY; (B) WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE; OR (C) WARRANTY AGAINST INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS OF A THIRD PARTY; WHETHER EXPRESS OR IMPLIED BY LAW, COURSE OF DEALING, COURSE OF PERFORMANCE, USAGE OF TRADE OR OTHERWISE.** Customer shall be responsible for determining that a Product is suitable for Customer's use and that such use complies with any applicable local, state or federal law.

(b) The Company shall not be liable for a breach of the warranty set forth in paragraph (a) if (i) the defect is a result of Customer's failure to store, install, commission or maintain the Product according to specifications; (ii) Customer alters or repairs such Product without the prior written consent of Company.

(c) Subject to paragraph (b), with respect to any such Product during the Warranty Period, Company shall, in its sole discretion, either (i) repair or replace the Product; or (ii) credit or refund the price of Product provided that, if Company so requests, Customer shall, at Company's expense, return such Product to Company.

(d) **THE REMEDIES SET FORTH IN PARAGRAPH (c) SHALL BE THE CUSTOMER'S SOLE AND EXCLUSIVE REMEDY AND COMPANY'S ENTIRE LIABILITY FOR ANY BREACH OF THE LIMITED WARRANTY SET FORTH IN PARAGRAPH (a)**.

BY INSTALLING THIS PRODUCT, YOU AGREE TO THE TERMS OF THIS WARRANTY, AS WELL AS ALL OTHER DISCLAIMERS AND WARRANTIES IN THIS DOCUMENT.