Multi Pulse Counter

16-Port Smart Monitoring System

Installation &

Operation Manual

Version 1.10

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Global Power Products

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Customer support is available from 8 am to 5 pm, Eastern Standard Time, Monday through Friday. Please have the model, serial number, and detailed problem description available. If the problem concerns a particular reading, please have all readings available. When returning any merchandise to Global Power Products, a return authorization form is required. For customer or technical assistance call(800) 886-3837.

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Global Power Products warrants all products to be free from defects in material and workmanship for one year from the date of shipment. During the warranty period, we will, at our option, either repair or replace any product that proves to be defective.

To exercise the warranty, call our customersupport department. You will receive prompt assistance and return instructions. Send the device, transportation prepaid, to GPP at 225 Arnold Road, Lawrenceville, GA 30044. Repairs will be made, and the device will be returned.

This warranty does not apply to defects resulting from unauthorized modification, misuse, or use for any reason other than pulse input monitoring.

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Table of Contents

List of Figures

List of Tables

About This Guide

This document is a manual designed to help guide you through the installation and operation of your MultiPulse Counter. This manual provides detailed guidelines and instructions on features and operating characteristics of the MultiPulse Counter for installation, programming, communication, and troubleshooting.

Use these instructions to assemble the MultiPulse Counter. Read all instructions before you begin the installation. The MultiPulse Counter is designed for a variety of monitoring situations. It can be used as a stand-alone pulse counter or part of a network of pulse counters. If this meter is to be used with an automated system using WIFI, Ethernet, or RF Communications, refer to the specific instruction of each communication option.

Contents of the Package

The Multi Pulse Counter is shipped from the factory in a kit containing all the hardware needed to assemble the monitoring system.

Each box contains:

Description	Quantity
Multi Pulse Counter with Electronics Installed in a Flush Mount Enclosure	1
9V DC Battery	1
5V 1W DC Power Supply	1
Multi Pulse Management Website Login informationand manual.	1

Table 1: Contents inside the shipped package.

Principle of Operation

The Multi PulseCounter is an electronic pulse counter capable of counting dry(passivecontact open/closed) andwet(active contact up to +24 VDC) pulses. The deviceincorporatesa20Hzlow pass filterto ignore any unintended noise on the input lines. Pulses with width fewerthan 50ms will be disregardedcompletely. The recorded data is displayed viaan8x2 character LCD that is visible from the outside of the enclosure.The Multi PulseCounter can be customized to upload data to the management website wirelessly using Wi-Fi, LTE Cat-M1, or through a wired Ethernet connection. If multiple devices are used together, a wireless RF network can be created where each device communicates with onecentralsmart gateway for seamless supervision of hundreds of counters.If Wi-Fi, LTE Cat-M1, Ethernet, or a smart gateway is used, recorded data is automatically uploaded to the Multi Pulse Counter management website. Naming customization can be made on the website to make understanding the data easy. A 3.6V Non-Rechargeable battery is provided with the device to ensureaccurate operation for a limited period during a power outage.

Technical Specifications

Supply Voltage	3.6 - 5V DC (5V Adapter provided)
Current Consumption	6.5mA (idle mode) 12mA (measurement mode) 250mA (RF Transmit mode) 60mA (RF Receive mode)
Temperature	-40°C to +85°C (Electronics and Battery) *
Humidity	0 to 95% non-condensing
No of Inputs	16
Battery	3.6V Lithium battery (Non-rechargeable) **
Enclosure	NEMA 4X rated Enclosure
Dimensions	10.6 x 8 x 3.3 in.
Weight	2 lbs.

Table 2: Technical Specification of the Multi Pulse counter

* Do not use the battery over permitted temperature. Heat above 100°C can cause fire, explosion, and burnhazards.

** For more information on the battery backup and operation kindly visit Battery Specifications on Page 3.

Pulse Counter Input Specifications

Input Voltage	0 - 24 V_{DC}
Maximum Count	99,999,999
Input Filter	20Hz Low pass Filter (Minimum acceptable Pulse Width - 50ms)
Detection Wires gauge	18-26 AWG
Detection Wires Length	Upto 1000 ft for 22 Gauge Wire*
Input Compatibility	Open Collector NPN Switches (Passive) Mechanical Switches (Passive) 0-24V_{DC} Source (Active)**

Table 3: Input Specifications for the Multi Pulse Counter

* The maximum allowable length will vary depending on the type of the wire and gauge of the wire used.

** The Input Pulse should only be positive; the Multi Pulse Counter is not equipped to detect negative Pulse.

Power Specifications

The supply voltage for the Multi Pulse Counter should be between 3.5 – 5 V_{DC}. A 5 V_{DC}(up to 1A) adapter is provided with the package, however, a similarly rated adapter can be used for supplying power if need be. There is provision for a non-rechargeable battery to supply power to the device during a power outage to ensure uninterrupted operation, more information in the following section.

Battery Specifications

A non-rechargeable Lithium Thionyl Chloride Battery is provided with the device for back up during an outage. The C-size battery is rated at 9000 mAH with an output of 3.6V. The Multi Pulse Counter can run upto 30 days on battery backup in an idle state. When the Multi Pulse Counter is running on battery it will continue to count pulses until the battery dies. While running on battery, we estimate the device can countto 1 million pulses before it runs out of charge. The actual battery backup time may vary depending on the input pulse frequency and the remaining charge on the battery. Once the battery is completely drained, the user will receive an alert on the LCD once the device is powered on. The battery can be easily replaced by removing the drained battery replacing it with a new one.

Enclosure Specifications

Global Power Product's Multi Pulse Counter is enclosed in a reliable, weatherproof NEMA 4x-rated enclosure as shown in figure 1. The dimensions of the enclosure are 10.6 x 8 x 3.3 in. The NEMA-rated enclosure works both indoors and outdoorsby protecting against foreign objects like dust and the damaging effects of water. The enclosure will be undamaged by the external formation of ice. However, the opening at the bottom of the enclosure must be sealed by the user to retain the waterproof ability when in use.

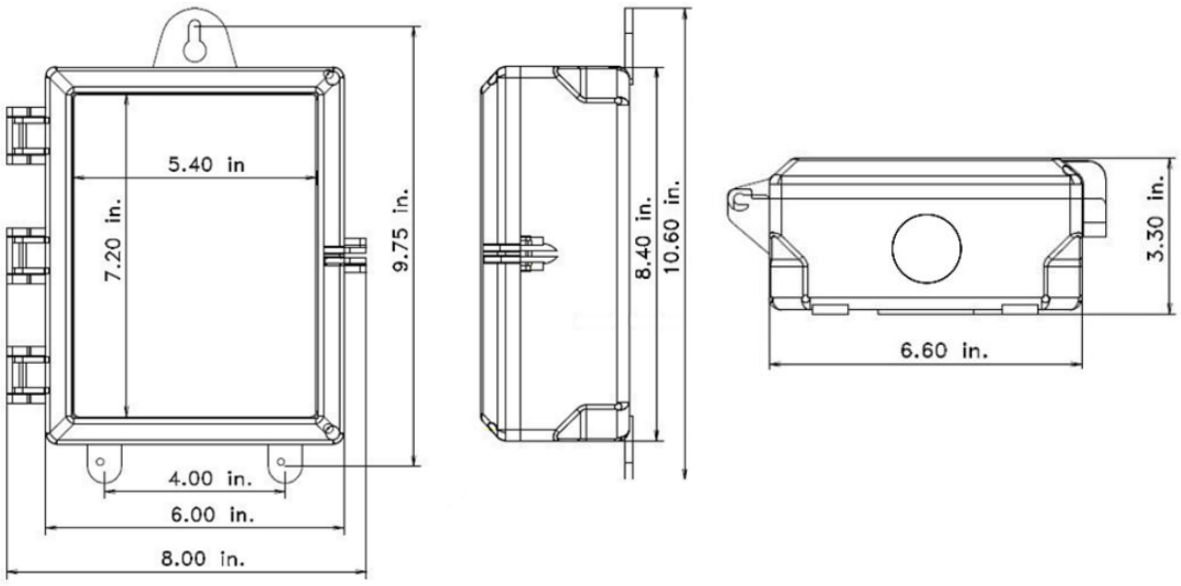


Figure 1: Enclosure Dimensions

Product Code Structure

The typical product code is MPC-XX-XX. Where the two letters (-xx-) after "MPC" represent the type of pulse input with 4 configuration possibilities available. The two letters at the end (-xx) represent the type of communication included on the Multi Pulse Counter. This has been illustrated at length in table 4.

	Type of Pulse Inputs	Communication
MPC	**DD** (All Dry Inputs)	**RF** (RF communication card)
	DW (8 dry and 8 Wet Inputs)	**WF** (Wi-Fi)
	WW (All Wet Inputs)	**M1** (Cat M1 LTE)
	CU (Customized)	**ET** (Ethernet)

Table 4: The Product Code Structure

For example, a Multi Pulse Counter that has all 16 inputs configured as dry inputs and utilizes Wi-Fi communication will be labeled as MPC-DD-WF. Along with the model number, each specific Multi Pulse Counter has a unique serial number used for identification purposes.

The configuration (dry/wet) of each input terminal block is indicated on the front overlay of the product. The dry inputs are marked by a Red Dot (●) and the wet inputs are marked by a cross (**x**). Be sure to note this configuration as wiring a wet input to a dry terminal block could damage the device.

IMPORTANT: Be sure to note this configuration as wiring a wet input to a dry terminal block could damage the device.

NOTE: The Product Code and the Serial Number are located on the interior of the Multi Pulse Counter enclosure and the Serial Number is also located on the front overlay and as shown in Figure 2.

Figure 2: Placement of the Model and Serial number on the interior (left)and exterior (right) of the enclosure.

Mounting Instructions

The enclosure can be mounted by using the three mounting tabs found on the back of the enclosure and using appropriate mounting hardware for the intended surface.

Setup Instructions

Once the Multi Pulse Counter is mounted, open the lid and insert the input wires through the provided opening at the bottom of the enclosure. Strip about ¼ inch of the insulation offthe wire before connecting it to the input terminal blocks. Each terminal block contains 2 positions labeled as Red and Black as shown in figure 2. In case of a wet (active) pulse, connect the positive wire to the position marked “Red” and the negative wire to the position marked “Black” for each terminal block. In case of a dry (passive) pulse from a mechanical switch, the wires can be connected either way to each terminal block. In case of a dry (passive) pulse from an open collector NPN switch, the collector side of the device should be connected to the position marked “Red” and the other wire should be connected to the position marked “Black” in the terminal block.

Use a flat head screwdriver to press the push-button clamp of the terminal block and insert the wires into the clamp as showing in figure 2. Release the push button and ensure the wire is securely held in the terminal block.

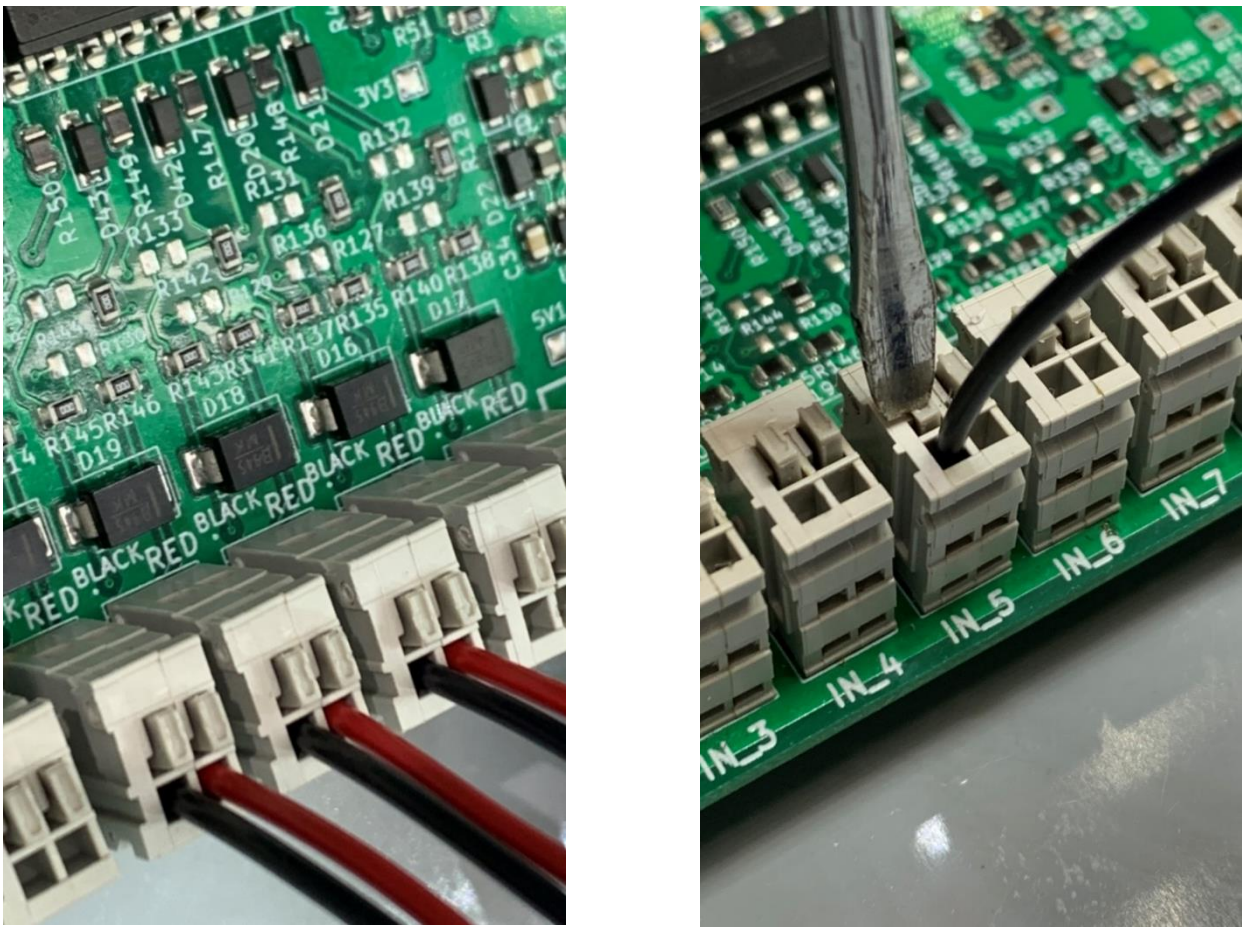


Figure 3: Input wire connected to the terminal block of the device (image on the left) and connection of input wires to the terminals using a screwdriver is shown (image on the right)

Once the Multi Pulse Counter has been mounted in its position, connect the provided 5V adapter to the PCB connector and turn on the supply. Once the board is powered up, the Power LED (Green), Supply LEDs (Red), and LCD will be turned ON. At this point, connect the battery to the board by plugging in the connector fromthe battery holder to the white two-prong connector indicated as BAT shown in figure 3. Make sure to plug the battery into the board with the red wire toward the bottom of the enclosure.

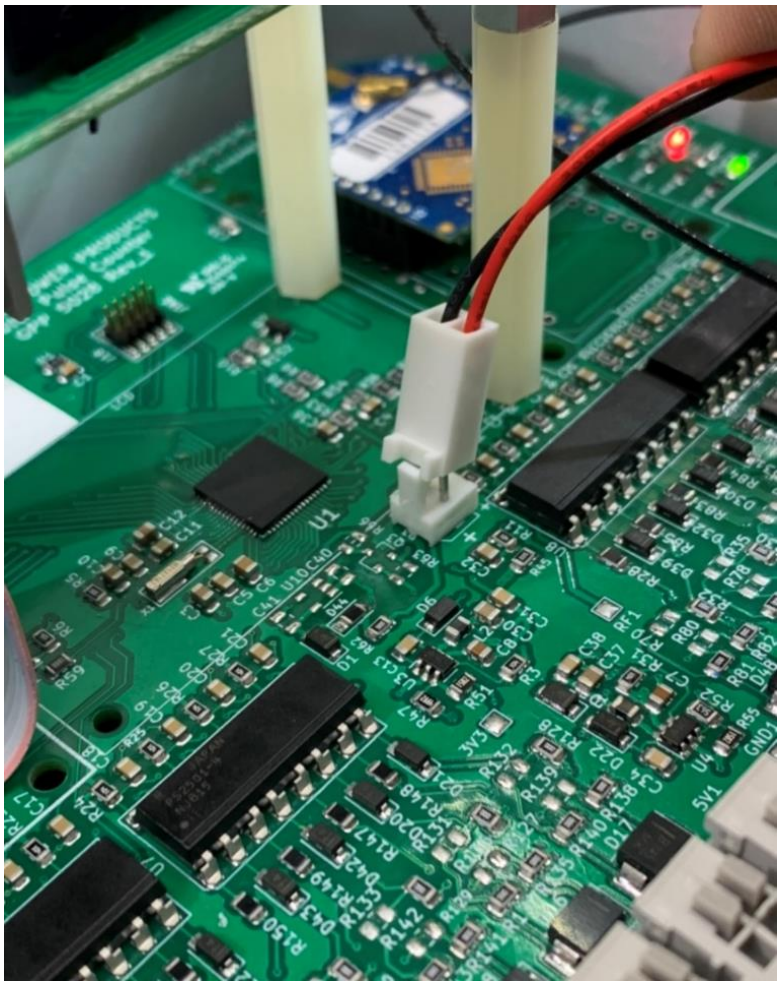


Figure 4:Battery terminals being connected to the battery input pin of board

Operation

Once the board is powered on, the Power LED (Green)will be ON indicating the device is ready to count pulses. The LCD will turn on and cycle through the count of all pulses the device has received. The remaining voltage on the battery will also be displayed to indicate how much charge is left on the battery. If a communication module has been installed on the device, a record of the counts will be uploaded to the Multi Pulse Counter management website every 30 minutes. Once the controller detects an input pulse, the count on that input will be updated. In the event of loss of power, theMulti Pulse Counterenters a low power mode. In this mode of operation, the backlight of the LCD is turned off even though the LCD remains on and the Supply LED (Red)will be turned OFF. Additionally, all forms of communications are disabled during this state meaning there will be no updates to the Multi Pulse Counter management website during a power outage. To reiterate, if the backlight of the LCD is off and only the green LED on the board is on, this indicates that the device is running on battery power. Once supply power is restored, the Multi Pulse Counterreturns to its normal operating mode where the text on the LCD is visible and any communication module present operates properly.

The contrast of the LCD is adjusted in the factory to ensure the user has the best viewing experience. If the user is unsatisfied with the display or has difficulty reading the text, the contrast of the LCD can be adjusted. This can be done by rotating the adjustment screw on top of the trimmer (blue component on the left side of the green board) clockwise or counterclockwise with the help of a flat screwdriveras shown in figure 4.

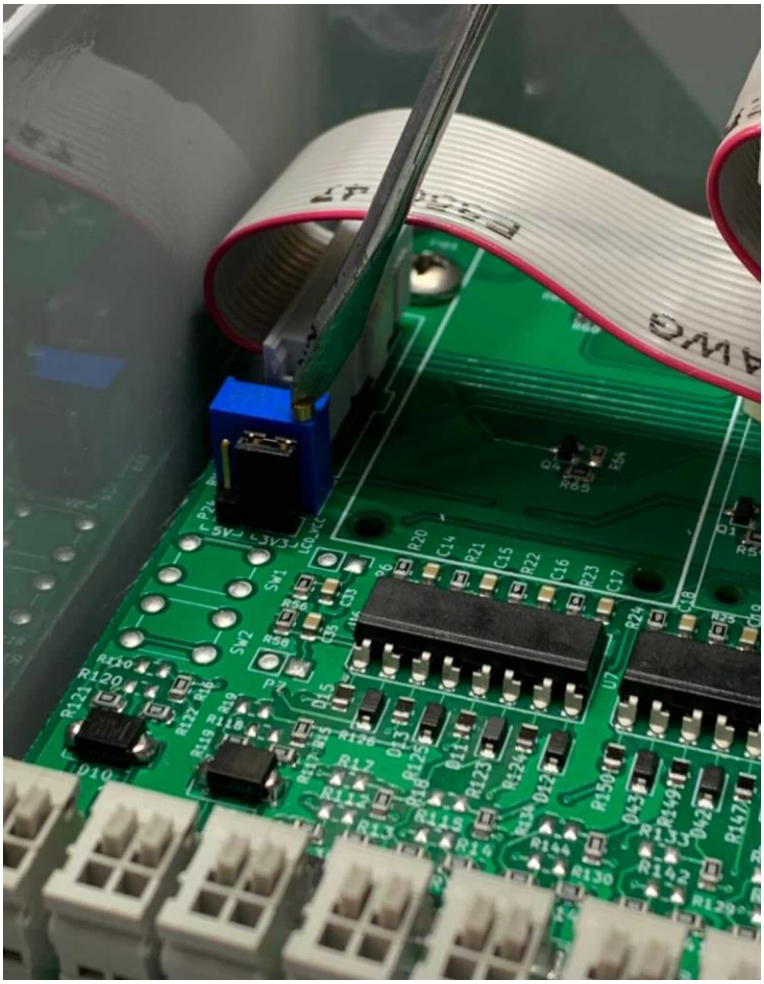


Figure 5: Adjusting the contrast by rotating the adjustment screw.

MultiPulse Counter Management Website Instructions

The data uploaded by the Multi Pulse Counter can be accessed by visiting the website:www.nemeter.com/pulse. This URL takes you to the webpage shown in Figure 7. The login credentials (username and the password) are needed to access your management account. The username and password were provided in the paperwork included in the package. Email us at nemeter@globalpowerprodcuts.com or call us at (800) 886-3837 in case the document is lost or misplaced.

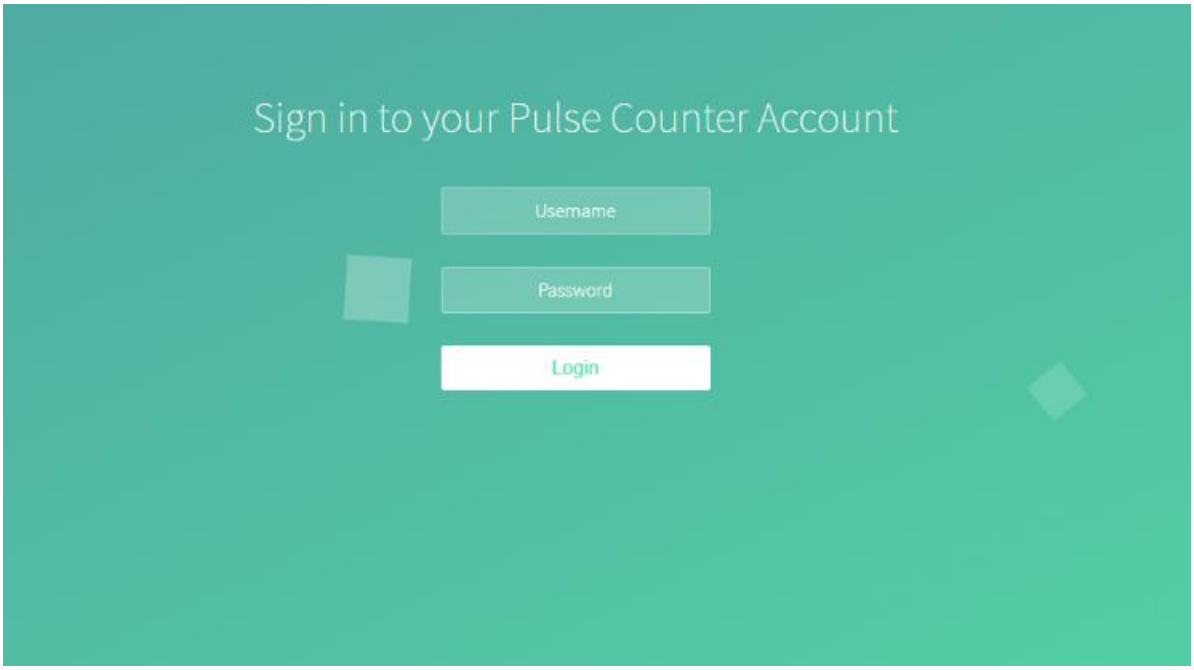
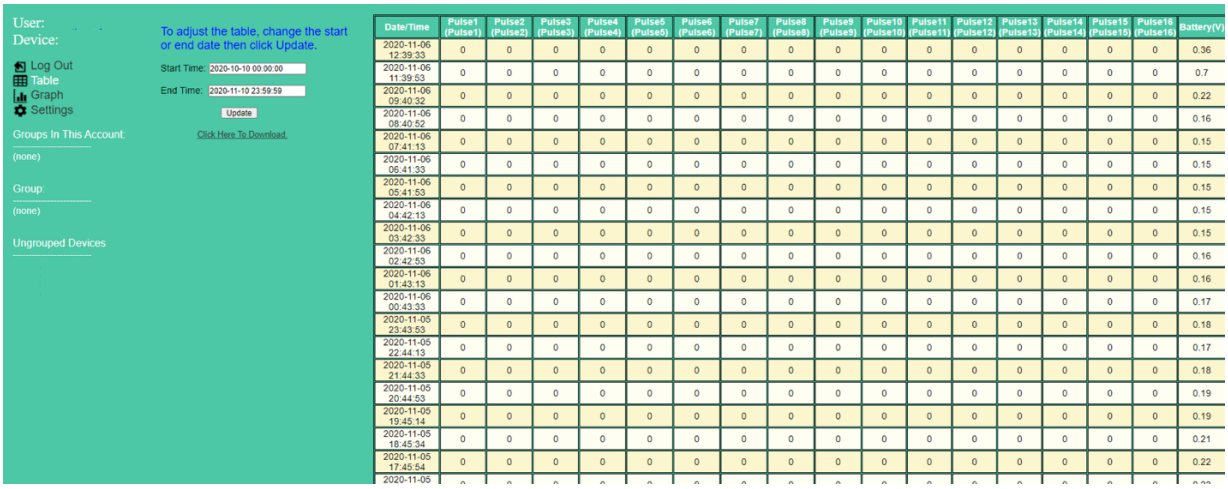


Figure 6: Show the login page of the Multi Pulse Counter data server.

Upon entering the login credentials,you will be taken to the home page of the sitethat displays all the devices connected to theiraccountshown in figure6.This page displays the number of pulses present in each input counter and the time at which the reading was uploaded.You can filter by start and end time to view just the data uploaded during a specific daterange.You can export this data as an Excel sheet(*.csv file) by simply clicking on the “Click Here to Download” icon. The data can also be viewed in a graphical format by clicking on the “Graph” button on the left side of the webpage. You can select any input from the drop-down menu along with the time interval and the time duration. The data will be displayed in the form of a line graph as shown in figure7 and you can download the image (*.png file) for reference. This will provide a better visual representation of the data to help you recognize usage patterns easily.



Date/Time	Pulse1 (Pulse1)	Pulse2 (Pulse2)	Pulse3 (Pulse3)	Pulse4 (Pulse4)	Pulse5 (Pulse5)	Pulse6 (Pulse6)	Pulse7 (Pulse7)	Pulse8 (Pulse8)	Pulse9 (Pulse9)	Pulse10 (Pulse10)	Pulse11 (Pulse11)	Pulse12 (Pulse12)	Pulse13 (Pulse13)	Pulse14 (Pulse14)	Pulse15 (Pulse15)	Pulse16 (Pulse16)	Battery(V)
2020-11-06 12:39:33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.36
2020-11-06 11:39:53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.7
2020-11-06 09:40:32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.22
2020-11-06 08:40:52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.16
2020-11-06 07:41:13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.15
2020-11-06 06:41:33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.15
2020-11-06 05:41:53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.15
2020-11-06 04:42:13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.15
2020-11-06 03:42:33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.15
2020-11-06 02:42:53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.16
2020-11-06 01:43:13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.16
2020-11-06 00:43:33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.17
2020-11-05 23:43:53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.18
2020-11-05 22:44:13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.17
2020-11-05 21:44:33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.18
2020-11-05 20:44:53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.19
2020-11-05 19:45:14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.19
2020-11-05 18:45:34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.21
2020-11-05 17:45:54	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.22
2020-11-05																	

Figure 7: Multi Pulse Counter data webpage showing the number of pulses in each input counter

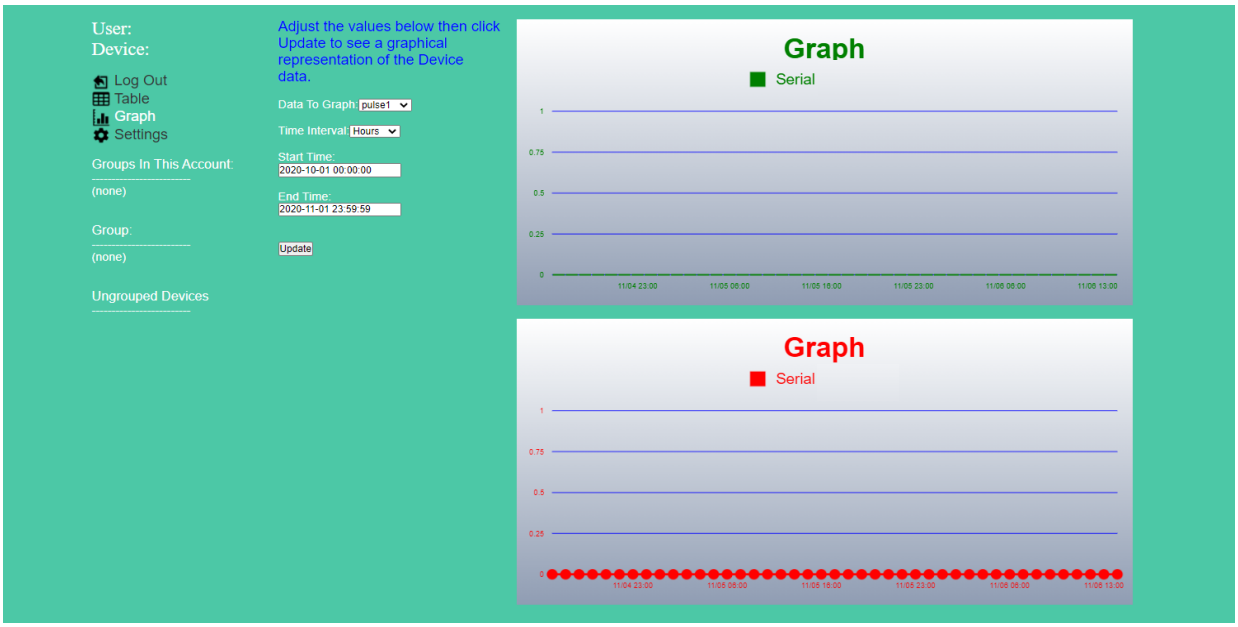


Figure 8: Multi Pulse Counterdata webpage showing the data in graphical form

You canalso rename each pulse input to make understanding the data easy. Click the settings tab on the left side of the page then select“Rename Pulse Input” as shown in figure8. You will then be taken to a page where you can personalize the name of each input so that tracking each device is simple.

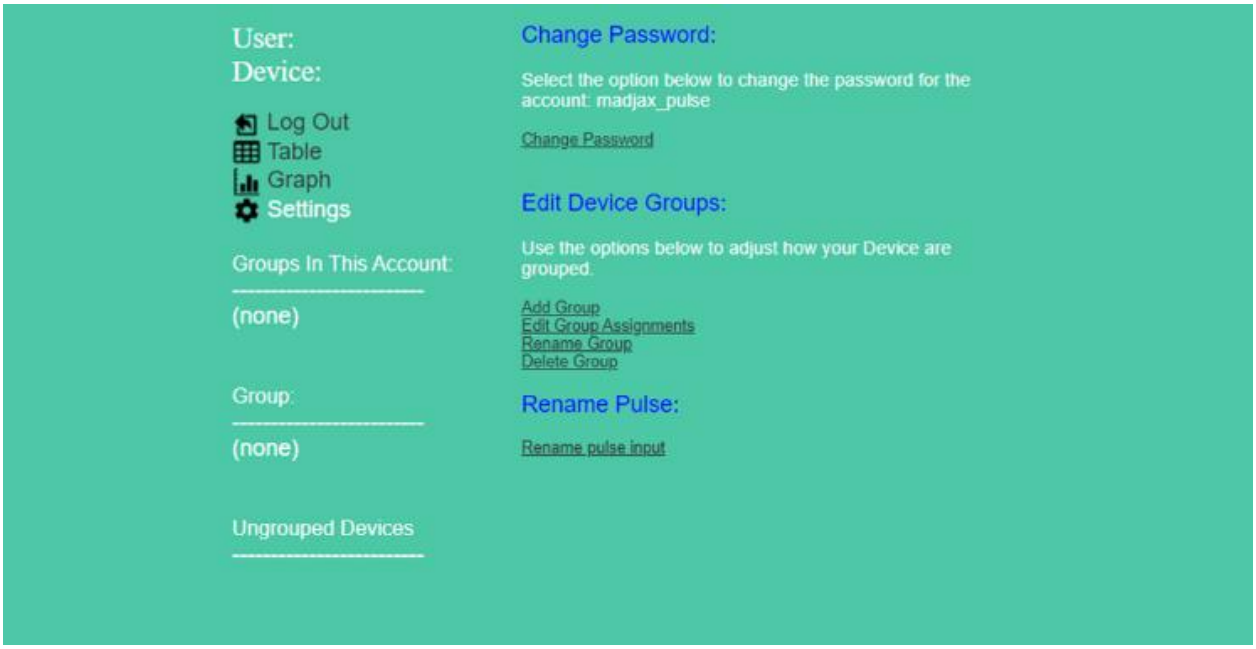


Figure 9: Multi Pulse Counter webpage with the available customizable options for the users

Finally, all the groups in this account will be displayed on the left side of every page as shown in figure 8. You can create, edit, and even delete groups in your account by clicking on the Settings tab and looking at the section called “Edit Device Groups”. Feel free to customize the groups in your account and modify how the information is visible on the webpage.

Regulatory Compliance

NOTICE FOR FCC

Type of equipment: Multi Pulse Counter

Product Identification number: MPC-XX-XX and S/N

Country of origin: USA

Contains Transmitter Module FCC ID: MCQ-XB900HP(Only for RF)

Contains Transmitter Module FCC ID: MCQ-XB3M1 (Only for CAT 1)

Contains Transmitter Module FCC ID: 2AEMI-PHOTON (Only for Wi-Fi)

The responsible party that assembled the product:

Name: Global Power Products

Address: 225 Arnold Road, GA, 30096

Telephone: (800) 886-3837

COMPLIANCE STATEMENT:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

The RF Module has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC CAUTION: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

CAUTION: Antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.