m2mLOggER®
remote monitoring eco-system

User Manual

LogPRO TOUCH

Touch based IoT Edge Gateway & Data-Logger

Document #	Issue	Rev	Issue Date	Prepared By	Approved By
UM200002	A	00	Aug 2020	MR	PROP

Preface

The data and illustrations found in this document are not binding. We reserve the right to modify our products in line with our policy of continuous product development. The information in this document is subject to change without notice and should not be considered a commitment by M2MLogger. M2MLogger assumes no responsibility for any errors that may appear in this document.

The document uses following pictures to get the reader's attention:

Symbol	Description
△	Note! Important information to avoid configuration that can cause problems and therefore should be read carefully.
i	Additional information.

Contents

1 Warranty

M2MLogger warrants that, for a period of **12 months** from date of shipment of product, the product shall be free from defects under normal & proper usage or storage. M2MLogger's liability arising out of supplying of material or its use whether on Warranty or otherwise shall not in any case exceed the cost of correcting the defects or replacing the defective material and upon expiration of the period mentioned above all such liability shall terminate. The warranties do not include damage due to negligence, improper installation or operation, accident, tampering with warranty seal or other conditions other than normal use which might cause the Products to fail.

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2 Support

To obtain fast and simple support for your device, please use our website **http://www.m2mlogger.com**. Here you will find the latest documentation, configuration utilities, drivers etc. You can also contact our support at **support@m2mlogger.com**.

3 Terminology

Term	Extract	Description
TCP/IP	Transmission Control Protocol/Internet Protocol	TCP (Transmission Control Protocol) is a set of rules used along with the Internet Protocol (IP) to send data in the form of message units between computers over the Internet.
HTTP	Hyper Text Transfer Protocol	HTTP is a set of rules for exchanging files (text, graphic images, sound, video and other multimedia files) on the Web.
DHCP	Dynamic Host Configuration Protocol	DHCP is a standard protocol that automates the process of configuring network hosts by allowing hosts to obtain IP addresses and configuration parameters.
ICMP	Internet Control Message Protocol	ICMP is used by network devices, like routers, to send error messages indicating, or to relay query messages.
Gateway		A device that makes it possible to transfer data between networks of different kind, e.g. MODBUS and Internet
Slave		A MODBUS slave unit that is connected to LogPRO device.
Tag		MODBUS register configured in LogPRO device.

4 Theory of Operation

Discharge measurement is important for a wide variety of purposes including flood and pollution control, irrigation, watercourse regulations and broadly as an input data for dimensioning of almost any new structure on the open channel flows.

Discharge is calculated by multiplying mean flow velocity and channel cross-section area. The cross-section area is the area of the slice in the water column made perpendicular to the flow direction.

For ideal case, let us assume the rectangular channel profile, with constant flow velocity at all points, as in Figure 1 Simple Channel Diagram.

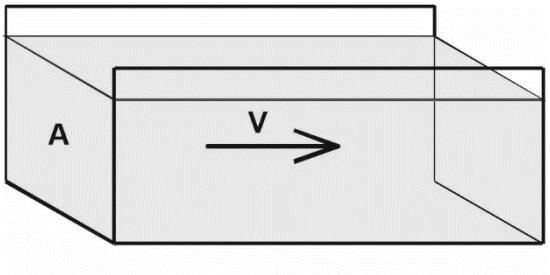


Figure 1 Simple Channel Diagram

The discharge can be calculated according to the formula:

Q = V * A

Where,

- Q is discharge (in m^3/s)
- V is flow velocity (in m/s)
- and A is cross-section area (in m^2).

For real-world measurements it is important to understand that the velocity of the moving water varies both across the stream channel and from the surface to the bottom of the stream due to friction, as in Figure 2 Flow velocity in a typical cross-section.

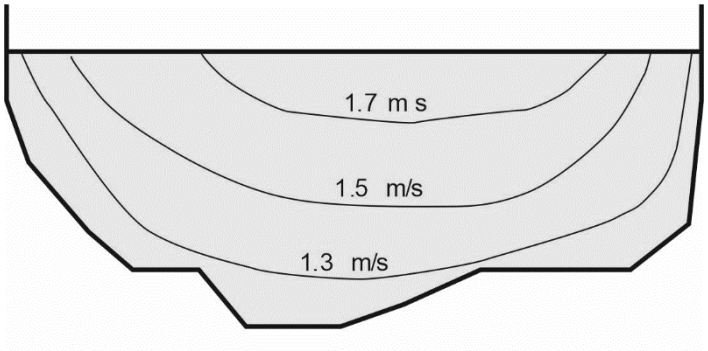


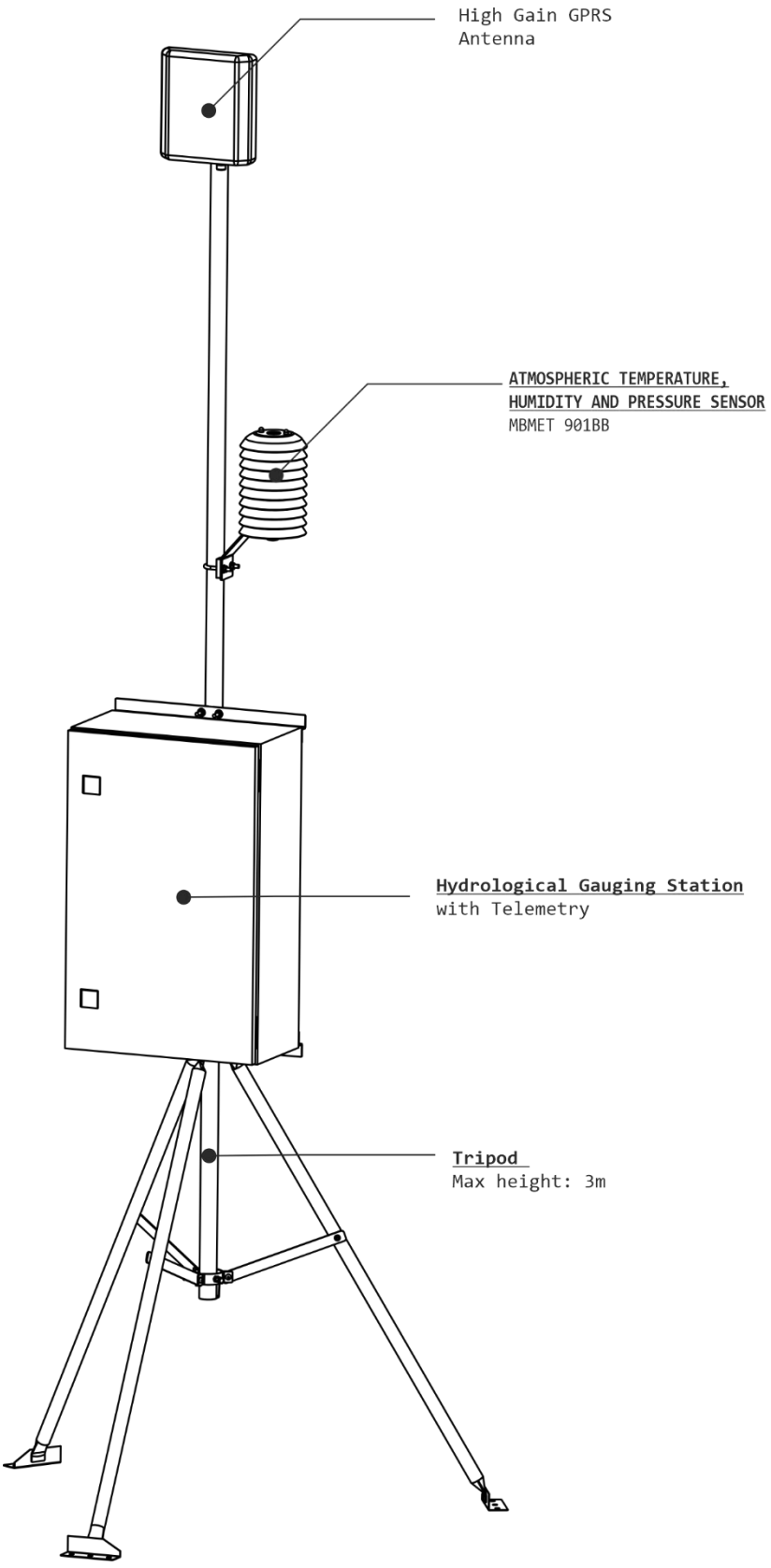
Figure 2 Flow velocity in a typical cross-section

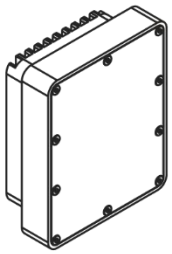
In order to determine the discharge in a realistic channel, the area must be precisely measured by measuring water depths at a series of points across the stream and multiplying by the width of the stream within each segment represented by the depth measurement. The mean cross-section flow velocity needs to be determined from measured surface flow velocity. Studies performed by USGS reveal that, typically, the mean velocity is 80-95% of the surface velocity, the average being 85%

Knowing non-rectangular area of the stream cross-section, and knowing the surface flow velocity, the following formula can be used:

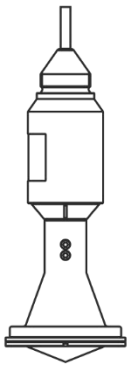
Q = k * V * A

5 Components



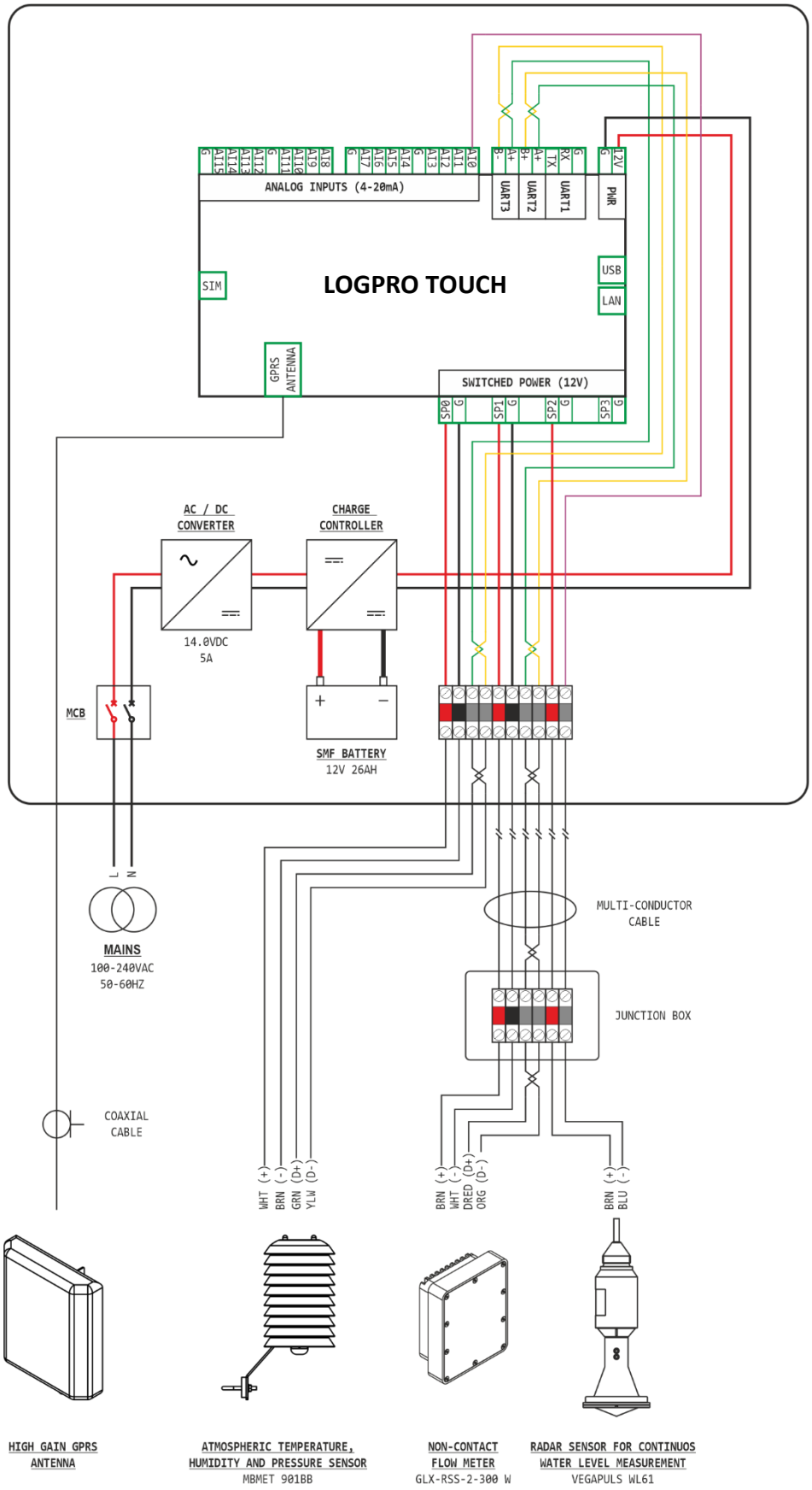


NON-CONTACT
FLOW METER
GLX-RSS-2-300 W



RADAR SENSOR FOR CONTINUOS
WATER LEVEL MEASUREMENT
VEGAPLUS WL61

6 Cable & Wiring Diagram



7 LogPRO TOUCH

LogPRO TOUCH series comprises of advanced data-logging devices for real-time metrological monitoring. They enhance your capability monitor, analyze and control the performance of your process remotely, from any place in world. These gateway devices can be easily interfaced with:

- Existing PLC, DCS or SCADA system with a MODBUS interface.
- 4-20mA output sensors.

7.1 Features

- Real-time data collection.
- IoT Cloud gateway.
- 5” Resistive Touch display with integrated keypad.
- MODBUS RTU RS-485 & MODBUS Ethernet/IP.
- File Transfer Protocol (FTP).
- USB Pen drive data logger.
- Signal Scaling.
- Rugged design for rough Industrial conditions.
- Compact DIN rail mounting.
- Plug-n-play.
- Fail-safe for power failures.
- Over-The-Air (OTA) upgrades.

LogPRO supports MODBUS RS-485 through screw terminals, USB pen drive through USB type A connector, 10/100 Mbps Ethernet through a standard Ethernet connector (RJ-45) and GSM/GPRS.

It can be configured via a user-friendly Web interface (WebUI).

7.2 Technical Specification

Parameters	**Description**
Ethernet	10/100 Mbits
USB Host	1 (USB 2.0)
Real Time Clock	Yes, with internal Battery backup Stability 1ppm/yr
Clock Accuracy	+/-5 Seconds per week
SNTP	Yes
FTP	Yes (Plain FTP)
RS485	2
RS232	1
Analog Inputs	16 Analog Inputs (4-20mA)
Switched Power Outputs	4
Logging Interval	User programmable from 1 min to 24 hours

Storage	MicroSD 256MB or better
Display & Keypad	5” TFT Display with Touch Keypad
Power	+9VDC to 24VDC @ 2.5A (max) Nominal: 12VDC
Protection	Transient Voltage Suppressor, 600W, t=10us

Environmental	
Operating Temperature	-40 to 75 °C
Humidity	0 to 95% RH non-condensing

Physical	
Dimensions	182.2 x 125.4 x 80.29 mm
Weight	540gms

7.3 Mechanical

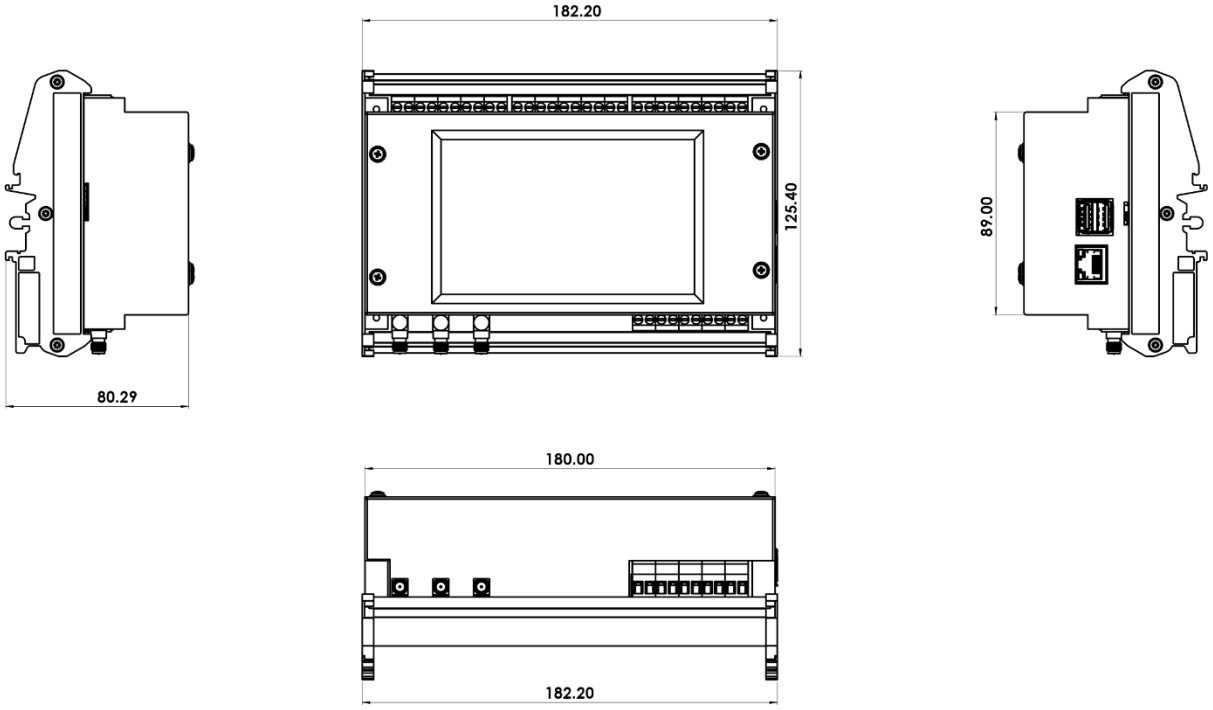


Figure 3 Physical Dimensions (mm)

7.4 Connections

7.4.1 Wiring Plan for Power

Pin	Function
+	+ 9V to 24 VDC
-	Ground

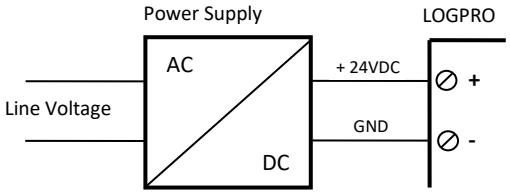


Figure 4 How to connect AC power

7.4.2 Wiring Plan for MODBUS RS-485

Pin	Function
A+	RS-485 Line A / D+
B-	RS-485 Line B / D-
G	RS-458 Shielded Ground

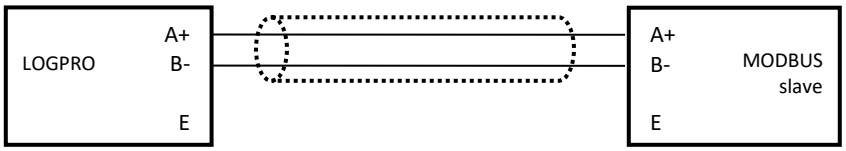


Figure 5 Normal wiring diagram for MODBUS terminal A+, B- and G

7.4.3 Wiring Plan for Analog Inputs (4-20mA)

Pin	Function
SP	Switched Power Output (SP0 – SP3)
AI	Analog Input (AI0 – AI15)
G	Shielded Ground

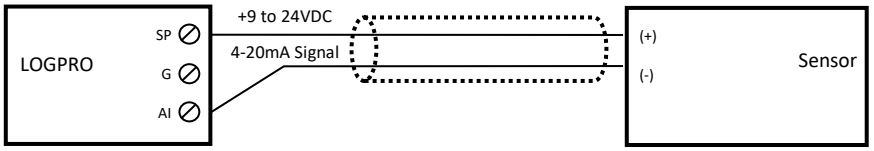


Figure 6 Wiring plan for Analog Inputs

7.5 User interface

7.5.1 Home

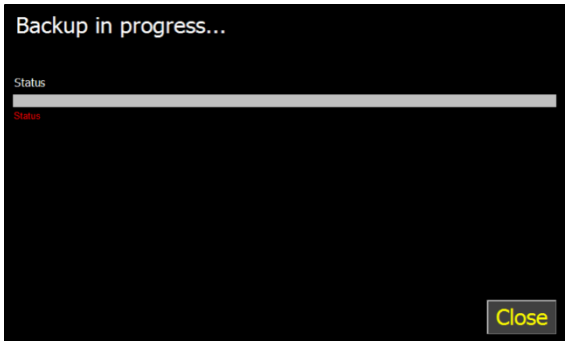
Home screen is the default landing screen for the device.

7.5.1.1 *Status Bar*

Icon	Description
01/01/2020	Date in dd/MM/yyyy format
⚠	RTC Status Gray: No Error Red: RTC Error
11:59 PM	Time in 12-hour format
	Signal Strength Modem is Powered Off or No Service Signal Quality: Poor Signal Quality: Marginal Signal Quality: OK Signal Quality: Good Signal Quality: Exceptional
4G	Network Status **G** GSM **2G** GPRS (2G) **3G** WCDMA, UMTS **E** EDGE **H** HSDPA, HSUPA, TDSCDMA, HSPA **H+** HSPA+ **4G** LTE, LTE-A, TDD LTE, FDD LTE
airtel	Carrier
14.4V	Battery Voltage
	Battery Charging Status No Icon: Functionality not supported Gray: Battery not charging Green: Battery charging
	Battery Status Critical Battery < 10.5V Low Battery < 11.5V Battery < 12.5V Battery < 13.5V Full Battery >13.5V
	Modem Dialup Status Gray: No Dialup Green: Dialup Connected
	WAN Status Gray: No Connection Yellow: Internet Connected Green: Cloud Connected
FTP	FTP Status Gray: No Connection Yellow: FTP Connection in progress Green: FTP Connection successful Red: FTP failed.
	IO Status Gray: No Status Green: IO Operation Successful Red: IO failed
	Memory Card Status Gray: No error Red: Memory Card Error

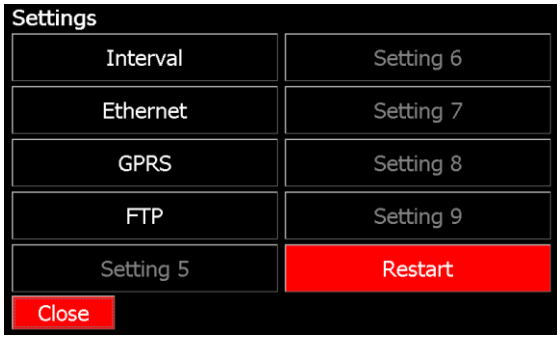
7.5.2 Backup

Backup data from data-logger to a USB pen drive.



7.5.3 Settings

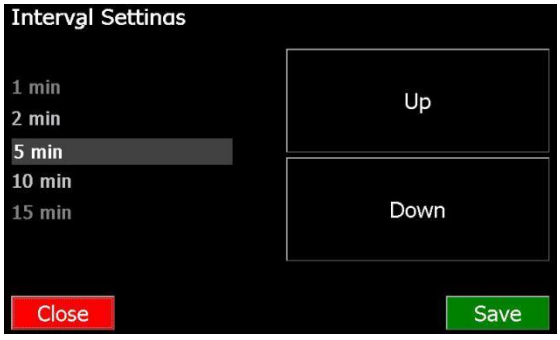
At device settings screens you can make configuration changes to device.



Option	Description
Interval	Sets the loop Interval (scan internal).
Ethernet	Ethernet settings.
GPRS	GPRS settings.
FTP	FTP settings.
Restart	Restart the device

7.5.4 Interval

This tab shows the loop interval or scan interval of device.



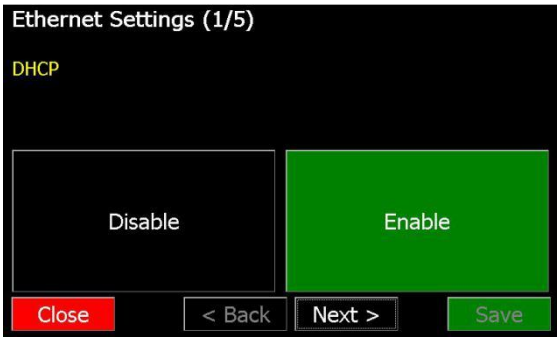
Option	Description
1 min	record every 1 minute.
2 min	record every 2 minutes.
5 min	record every 5 minutes.
10 min	record every 10 minutes.
15 min	record every 15 minutes.

7.5.5 Ethernet

This window shows device Ethernet settings.

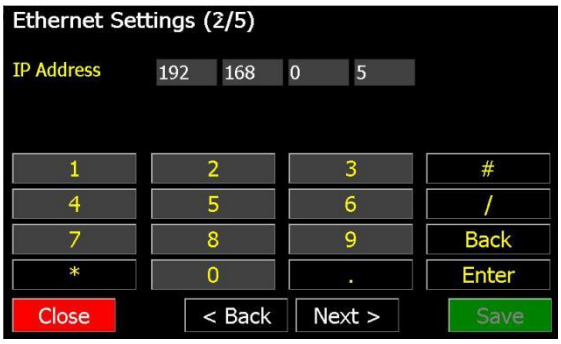
7.5.5.1 *DHCP*

This screen is used to enable or disable the DHCP for Ethernet interface.



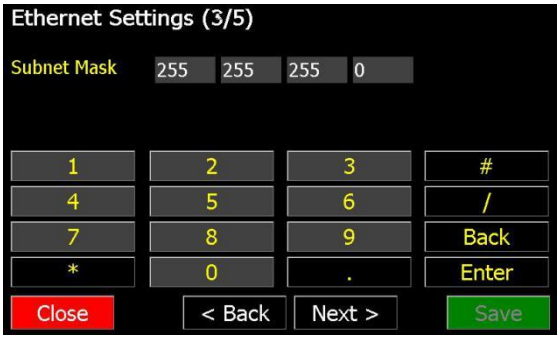
7.5.5.2 *IP Address*

This screen is used to configure the IP Address for Ethernet Interface.



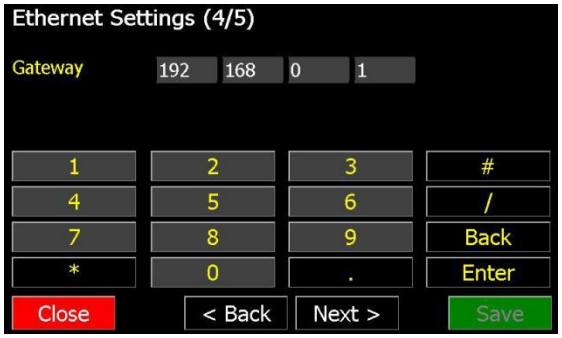
7.5.5.3 *Subnet Mask*

This screen is used to configure the Subnet Mask for Ethernet Interface.



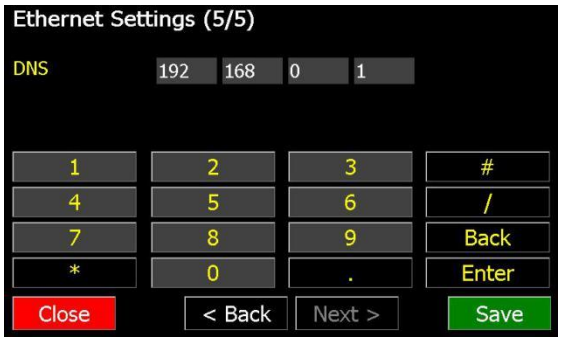
7.5.5.4 *Gateway*

This screen is used to configure the Gateway for Ethernet interface.



7.5.5.5 DNS

This screen is used to configure the DNS for Ethernet interface.



7.5.6 GPRS

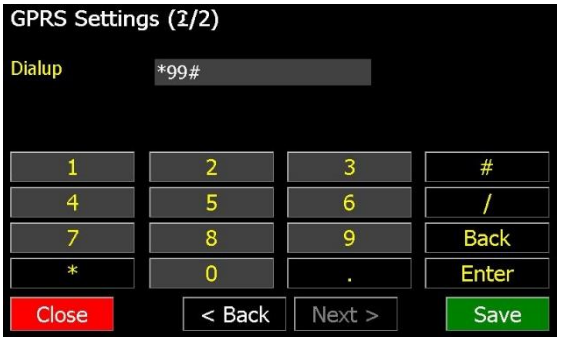
This window shows device GPRS settings.

7.5.6.1 APN

This screen is used to configure the APN for Internet access.

7.5.6.2 Dialup

This screen is used to configure the Dialup number for internet connection.



7.5.7 FTP

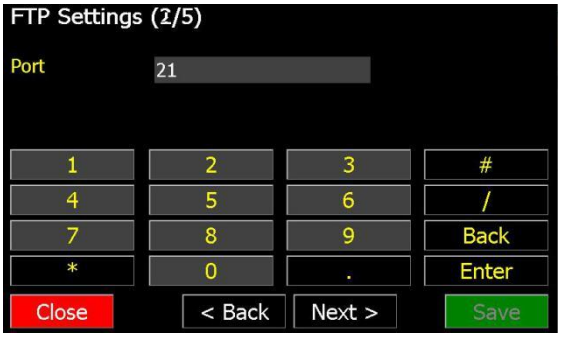
This window shows device FTP settings.

7.5.7.1 URL

This screen is used to configure the URL of FTP server.

7.5.7.2 Port

This screen is used to configure the Port of FTP server.



7.5.7.3 Username

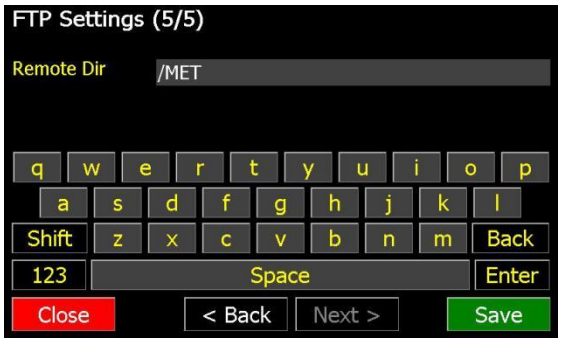
This screen is used to configure the Username FTP server.

7.5.7.4 *Password*

This screen is used to configure the Password FTP server.

7.5.7.5 *Remote Dir*

This screen is used to configure the Remote Directory of FTP server where files will be uploaded from data-logger.



⚠	Only simple FTP supported. SSL is NOT supported.

7.6 Discharge Table Configuration

In order to calculate discharge, we must first configure the Discharge table in LogPRO TOUCH device. Discharge table can be easily configured following the steps below:

1. Create a text file discharge-config.xml and open it in any simple text editor like Notepad.

```
<discharge-config>
  <levelTag>Level</levelTag>
  <surfaceVelocityTag>Velocity
  </surfaceVelocityTag>
  <map>
    <add>0.00,0.00,0.89</add>
    <add>0.48,1.76,0.89</add>
    <add>0.48,1.76,0.89</add>
    <add>0.49,1.82,0.89</add>
    <add>0.50,1.87,0.89</add>
    <add>0.51,1.92,0.89</add>
    <add>0.52,1.97,0.89</add>
    <add>0.69,2.87,0.89</add>
    <add>0.70,2.93,0.89</add>
    <add>0.71,2.98,0.89</add>
    <add>0.72,3.03,0.89</add>
    <add>0.75,3.19,0.89</add>
    <add>0.77,3.30,0.89</add>
    <add>0.79,3.43,0.89</add>
    <add>0.80,3.49,0.89</add>
    <add>0.82,3.62,0.89</add>
    <add>0.83,3.69,0.89</add>
    <add>0.84,3.76,0.89</add>
    <add>0.85,3.84,0.89</add>
    <add>0.86,3.92,0.89</add>
    <add>0.87,4.00,0.89</add>
    <add>0.88,4.07,0.89</add>
    <add>0.89,4.15,0.89</add>
  </map>
</discharge-config>
```

Here:

Option	Description
levelTag	Name of Tag that measures Water Column Level
surfaceVelocityTag	Name of Tag that measures Surface Velocity of Water
map	Cross-section and K factor mapping for metered water column. NOTE: The table has to be in increasing order of water column. `<add>0.48,1.76,0.89</add>` • First value 0.48 represents the water column height (in meters) • Second Value 1.76 represents the cross-section area at the water column (in m^2) • Third Value 0.89 represents the K factor at water column

2. Prepare to transfer the file in LogPRO TOUCH.
   a. Arrange an empty USB pen drive. Create following folders in USB Pen drive.

      AutoCopy > Flashdisk > Firmware > 1.1.0.0 > Configs

   b. Inside Config folder, save the discharge-config.xml and safely eject USB pen drive.
3. Apply the new discharge table
   a. Insert the USB pen drive in LogPRO TOUCH. Ensure that device is powered ON.
   b. Wait for 5 seconds and eject the USB pen drive.
   c. Restart the LogPRO TOUCH.

8 Appendix

8.1 Power Supply

- Make: Meanwell
- Model: LRS-75-15
- Specification: 15V @ 5A

8.2 Battery

- Make: Exide
- Model: EP 26-12
- Battery Type: Lead Acid Battery
- Capacity: 26AH
- Dimension: 180 x 125 x 175 cm
- Weight: 8.780KG

8.3 Charge Controller

Make: Generic
12V/24V 10A Digital Charge Controller Module with Dual 5V USB & 12/24V DC Load Connection, with Solar & Mains Charging Feature.

8.3.1 Features

- Build-In industrial microcontroller.
- Big LCD Display, All adjustable parameters.
- Fully 4 stage PWM charge management.
- Build-in short circuit protection, open-circuit protection, reverse protection, over load protection.
- Dual MOSFET reverse current protection, low heat production.

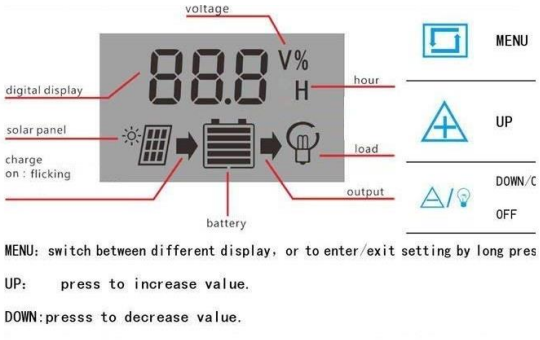
8.3.2 Specifications

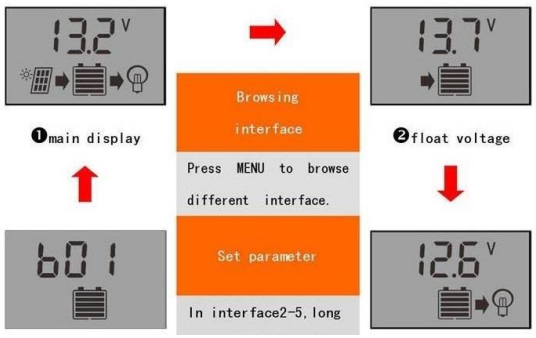
- Rated Voltage: 12V / 24V
- Max. PV Voltage: 50V
- Max PV Input Power: 130W (12V) / 260V (24V)
- Dimension: 148mm x 78mm x 35mm

8.3.3 System Connections

- Connect the battery to the charge regulator – plus and minus
- Connect the photovoltaic module to the regulator – plus and minus.
- Connect the load to the regulator – plus and minus.

8.3.4 Display Settings





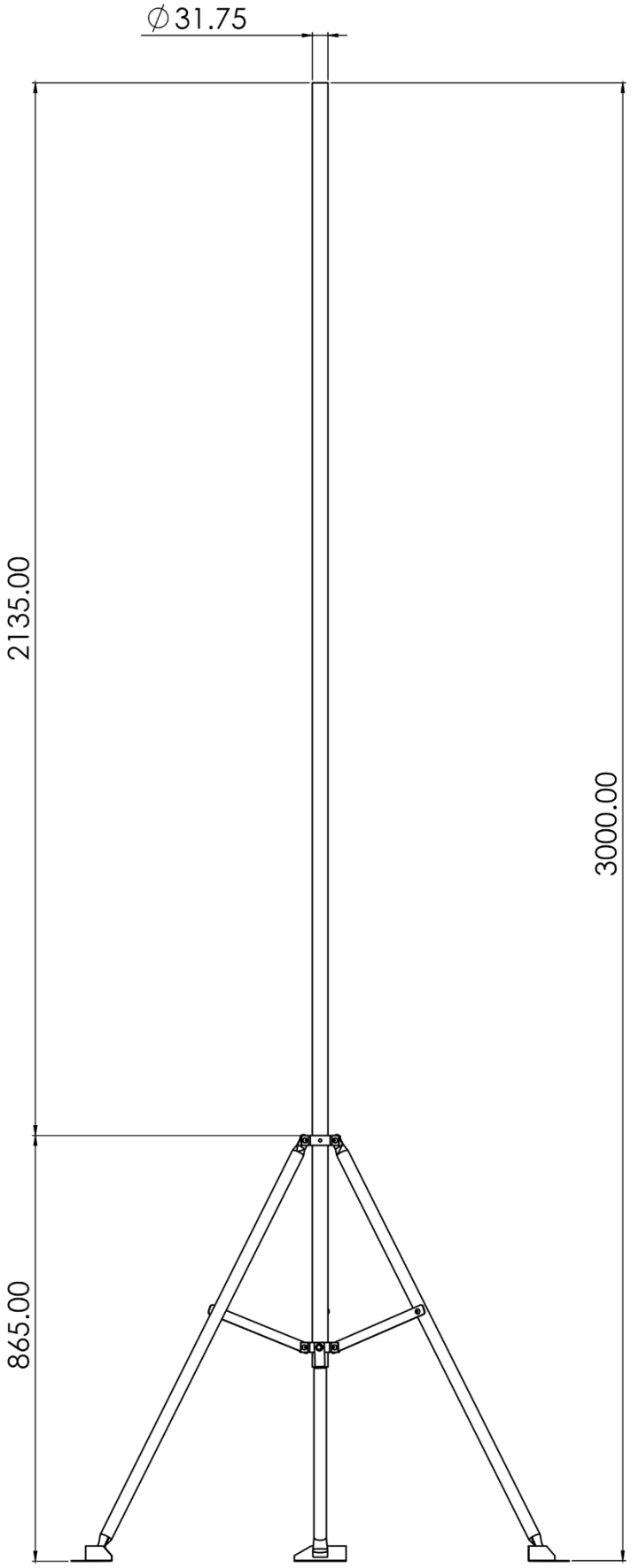
8.3.5 Mechanical

8.3.6 Troubleshooting

8.3.6.1 *Charge icon not ON when sunny*

Power Supply not connected or reversed. Please reconnect.

8.4 Tripod Dimensions



M2MLogger

HEAD OFFICE
Plot 67, Street 1-B ,
Friends Colony Industrial Area,
Shahdara,
Delhi – 110095, India
Telephone: +91-11-22112232

WORKS
B-8
First Floor,
FIE, Patparganj Industrial Area
Delhi – 110092, India
Telephone: +91-11-22582090

email: sales@m2mlogger.com
Website: www.m2mlogger.com