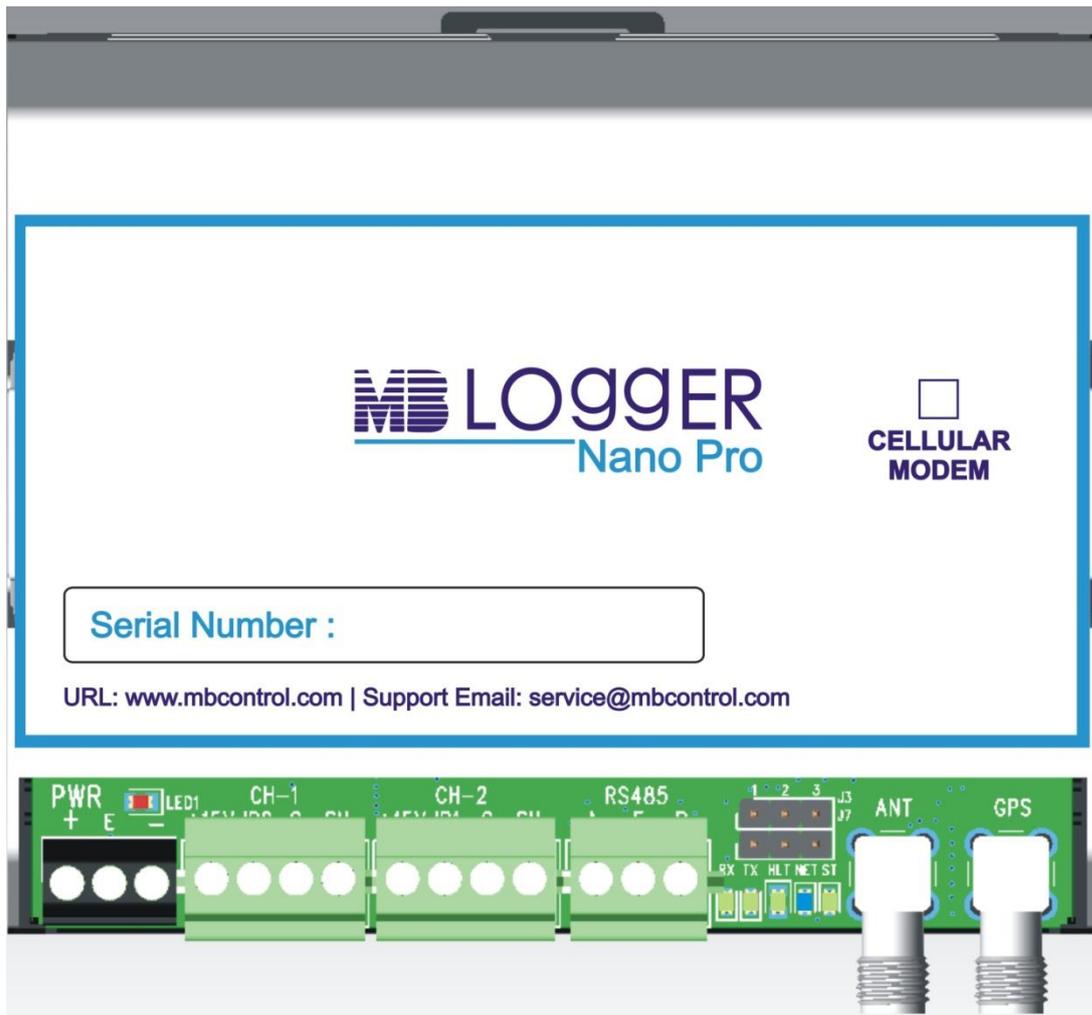


# MLogger NanoPro and NanoProM

## Advanced Datalogger Series

(M4 021 020 010 01)



**Document ID: M4 021 020 010 01 (R3)**

**Revision 1.02 30/12/2022**

**SW 1.66**



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QM 004, EM 016



ISO 9001 : 2015  
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## 1. Warnings

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- Installation at site should be done by skilled and qualified personal after taking required approvals.
- Use proper protection gear and tool while installing the device.
- Be aware of your surroundings while doing the installation work.
- Serious injury can occur if proper safety norms are not followed.
- Compliance with all utility and electrical safety codes regulations are mandatory.
- Read the manual and get acquainted with the datalogger connections and terminals before commencing installation activity.
- Before connecting the datalogger, read its label to confirm power supply requirements.
- All connections should be done only when power to datalogger is switched off.
- Improper installation and connections may damage the device and sensor connected to the same.
- Protect from overvoltage and static electricity.
- To prevent potential fire or shock hazard, do not expose the datalogger to rain or moisture.
- Physically damaged datalogger should not be used or connected to main power.
- Use proper earth connection.

## 2. MBLLogger NanoPro Series

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MBLogger NanoPro series is advanced range of datalogger designed for many applications. The data logger series provides following advanced functions:

- Uses latest ARM 32 bits processor.
- Acquire reliable measurement data from multiple industrial devices eg. PLC, weather sensors, inverters, energy meters.
- Configurable inputs -2. Can be configured at site as digital inputs, analog 4-20mA inputs, voltage 0-10VDC or mV (0-100mV) inputs.
- Provides various communication ports RS485 (isolated) and ETH.
- Modem 4G for communication and GPS location.
- Multiple communication protocols – MODBUS RTU (master and slave), MODBUS TCP (master and slave), SNMP, FTP and DNS.
- All measured and read parameters are available as MODBUS (RTU or TCP) slave parameters.
- External SD memory card (16GB) for data logging.
- Programmable data logging interval.
- Internal device library (for sensors, inverters and MFM) for easy and simple interface of the same.
- Embedded webserver for configuration of datalogger functions and diagnostics (real time view of measured parameters). No programming is required.
- MyPage – to display user selected parameters webserver page.
- Internal battery backed up real time clock (RTC).
- Data file transfer to two file servers.
- Statistical functions – average, minimum, maximum, and standard deviation.
- SD card memory up-to 16GB, MBLLogger series are ideal for datalogging
- Log for user activity and device messages/ faults.
- Power saving operation mode.
- Saving of integrated values.
- Option provided for calculation of following plant parameters-
  - a. Sunshine duration
  - b. Day solar energy (Wh/Mtr<sup>2</sup>)
  - c. Day Rain (mm)
  - d. Sunrise and set time with day sunshine duration.
  - e. Solar Energy generated (WH).
  - f. Albedometer configuration and calculation.
- Features available in datalogger will depend on the model selected.
- **Excellent on-site diagnostic support with datalogger status and value reports.**

### 2.1 MBLLogger Applications

MBLogger can be used in various applications:

- Energy monitoring
- Water resources monitoring
- Metrology parameters collection and transmission
- Agricultural and agricultural research.

- Remote asset monitoring and control.
- Solar plant monitoring

## 2.2 MBLLogger NanoPro Model Variants

Various options and models available MBLLogger series are shown in table 2.2 below:

Sl. No.	Features	Nano	NanoM	NanoPro	NanoProM
1	Port Serial Port -1 RS-485 (MODBUS RTU Master, MODBUS RTU Slave)	•	•	•	•
2	Port ETH (MODBUS TCP Master, MODBUS TCP Slave, Web Server)	•	•	•	•
3	Cellular Modem / GPS	-	•	-	•
4	MMC SD Card (16GB)	•	•	•	•
5	Maximum number of IED per port	10	10	10	10
6	Maximum number of MODBUS TCP Slave clients	4	4	4	4
7	SNTP Client	1	1	1	1
8	File Transfer Clients	2	2	2	2
9	RTC (battery backed up)	•	•	•	•
10	Configurable Inputs. Can be configured individually as Digital Input, mA Input, Voltage Input, or mV Input.	-	-	2	2

Table-2.2: MBLLogger NanoPro variants

Features available in your MBLLogger NanoPro will depend on the model selected and procured.

### 3. MBLLogger NanoPro Connections

MBLogger connections are described in this section. All connections described here may not be available in your datalogger. Features and connections available will depend on the MBLLogger Nano model selected.

#### 3.1 MBLLogger NanoPro Ports and Terminals

Ports and input terminals of MBLLogger Nano are shown in figure 3.1.1 and 3.1.2 below.

Configuration details for each of these are provided in chapter for embedded webserver.

Plug-in terminals are provided for most of the connection for easy installation and maintenance at site.

Communication ports connectors and terminal details (for configurable inputs) are provided in figure – 3.1.1 below.

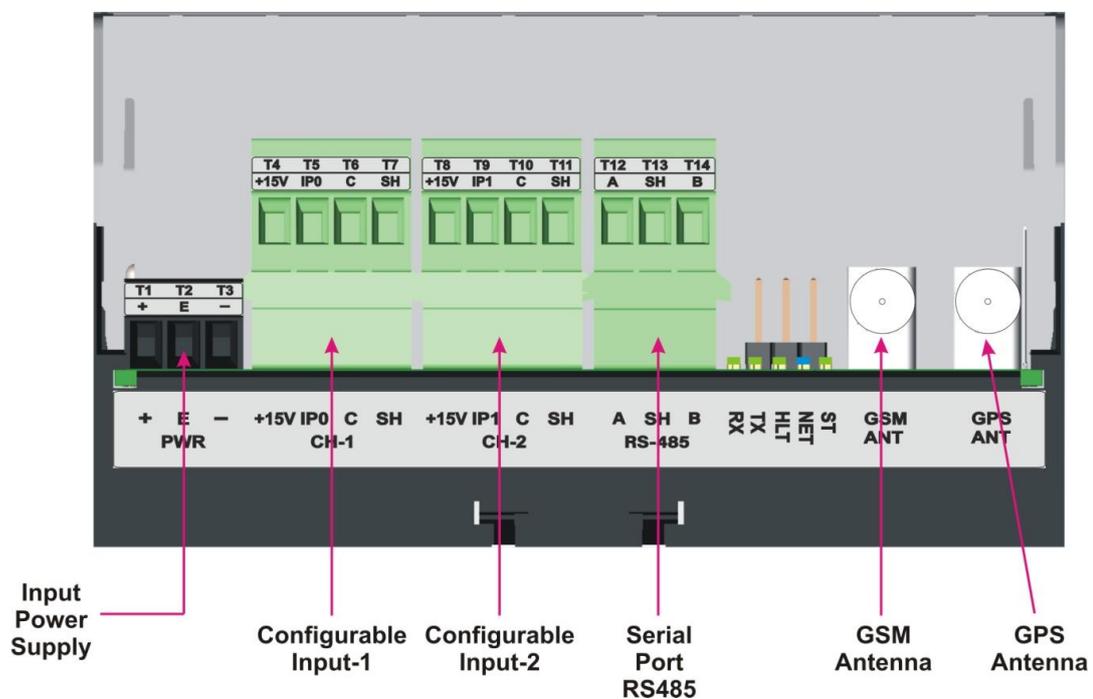


Figure-3.1.1: MBLLogger NanoPro connectors and terminals

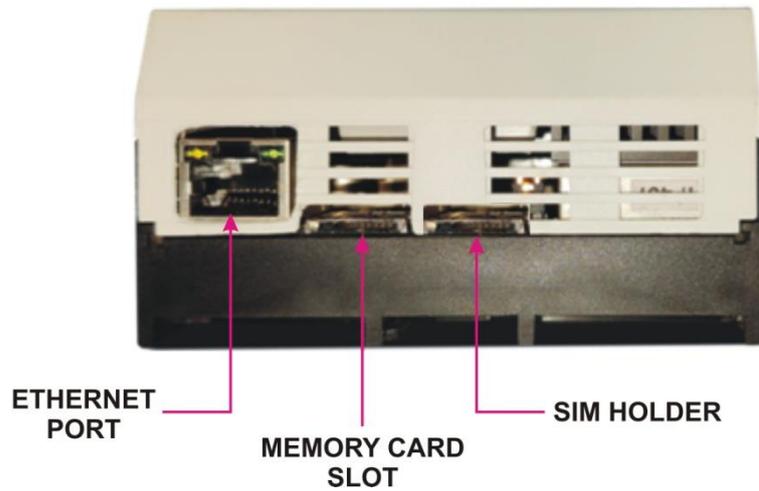


Figure-3.1.2: MLogger Nano ETH port, SD card and SIM holder

### 3.2 MLogger Nano Power Supply Connections

MLogger power supply connections are shown in figure 3.2 below. **These terminals are not plugin type.**

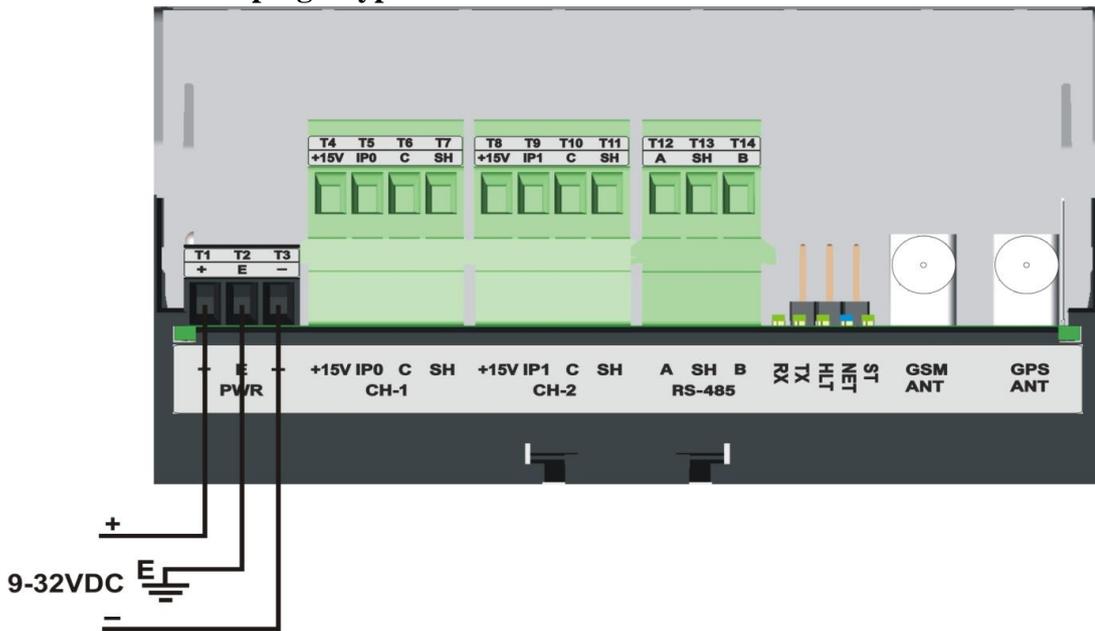


Figure-3.2: MLogger Nano power supply connections.

Power supply connections details are listed in table-3.2 below.

Terminal	Function	Remarks
T1	V+	Voltage Range: DC 9 to 32VDC Power Consumption (Without modem) – 4W Power Consumption (With modem)- 10W
T2	Earth	
T3	V-	

Table 3.2: MLogger Nano power supply connections

Use proper protection MCB for power supply protection.

### 3.3 Serial Port (RS485)

MBLogger serial port- (RS485) are shown in figure 3.3 below.

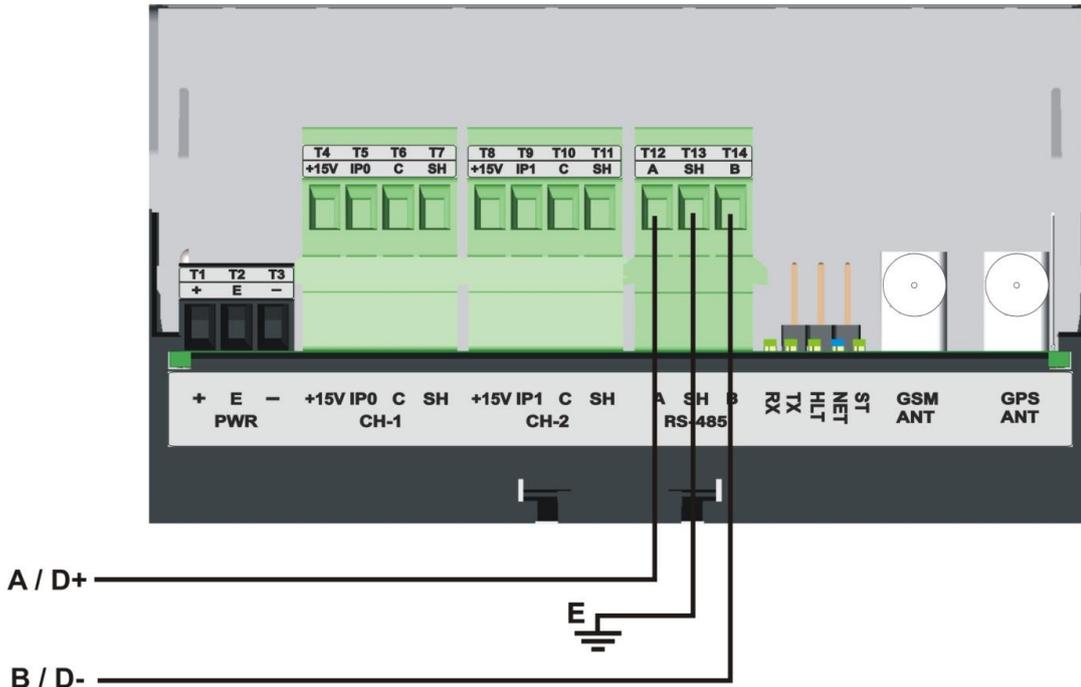


Figure-3.3: MBLLogger Nano serial port (RS485) connections.

Connection details for the serial port are listed in table-3.3 below.

Terminal	Function	Remarks
T12	A	Isolated RS485 port. LED Rx and Tx provide indication for port activity. Can operate as MODBUS RTU master or MODBUS RTU Slave. In MODBUS RTU Master mode, up to five external devices (sensors or other devices) can be interfaced to the port. Configuration details for the port are provided <a href="#">here</a> . Use low capacitance, twisted pair and shielded cable for connecting devices to the port.
T13	Shield	
T14	B	

Table 3.3: MBLLogger Nano serial port (RS485) connections

### 3.4 Port ETH

#### 3.4.1 ETH Port:

This ETH port (base 10MHz) is multi- function port.



Figure-3.4.1: MBLLogger ETH Port.

Use standard LAN cable with RJ 45 connector for connecting to the port.  
Port activity LED are provided on the connector.

Default network configuration for the datalogger is provided in table 3.4.1 below.

S. No.	Description	Value
1	Device IP	192.168.100.226
2	Network Mask	255.255.255.0
3	Network Gateway IP	0.0.0.0
4	Primary DNP IP	8.8.8.8
5	Secondary DNS IP	8.8.4.4

Table-3.4.1: Default datalogger network configuration

These settings can be changed via embedded web server.

This port is used for following operations:

- i) Configuration of data logger via embedded web server.
- ii) Downloading logged file.
- iii) Download reports.
- iv) Interface to MODBUS TCP sensors and devices. Up-to five devices can be connected to the port.
- v) MODBUS TCP slave (multiple masters) to provide measured and collected parameters to other devices and SCADA.
- vi) SNTP Client for time synchronization.
- vii) File transfer client (ftp).

Configuration details for ETH port are provided [here](#).

Status and activity details of ETH port are also provided by embedded web server.

### 3.4.2 Setting Default IP Address:

Procedure for setting default IP address in the datalogger is provided below. This procedure should be followed only if IP address of the datalogger is not known. If datalogger IP address is known, use webserver in the datalogger to set the required IP address.



Figure -3.4.2: Jumpers for setting default IP address in the datalogger.

1. For normal operation jumper DefIP (J7) shall be in open condition.
2. For setting default IP address short jumper DefIP (J7) for about two seconds.
3. Remove the DefIP (J7) jumper.
4. Wait for about five seconds.
5. Datalogger will restart with [default IP](#) address. Only default IP address and Subnet shall be set to default values.
6. Verify default IP address by using ping and / or logging in the datalogger webserver.

### 3.5 SD Memory Card

MLogger supports microSD memory card up-to 16GB.

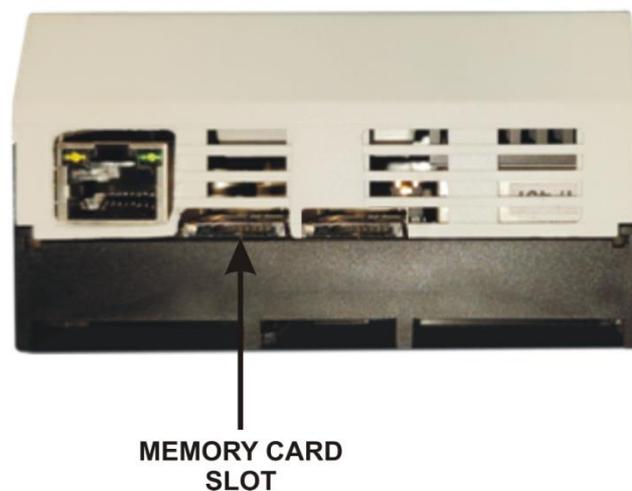


Figure-3.5: MLogger SD card slot.

MicroSD card (16GB) is used for data logging.

### 3.6 Internal Modem and GPS

Availability of internal modem is based on selected model.

High speed 4G modem (CAT-1) is provided.

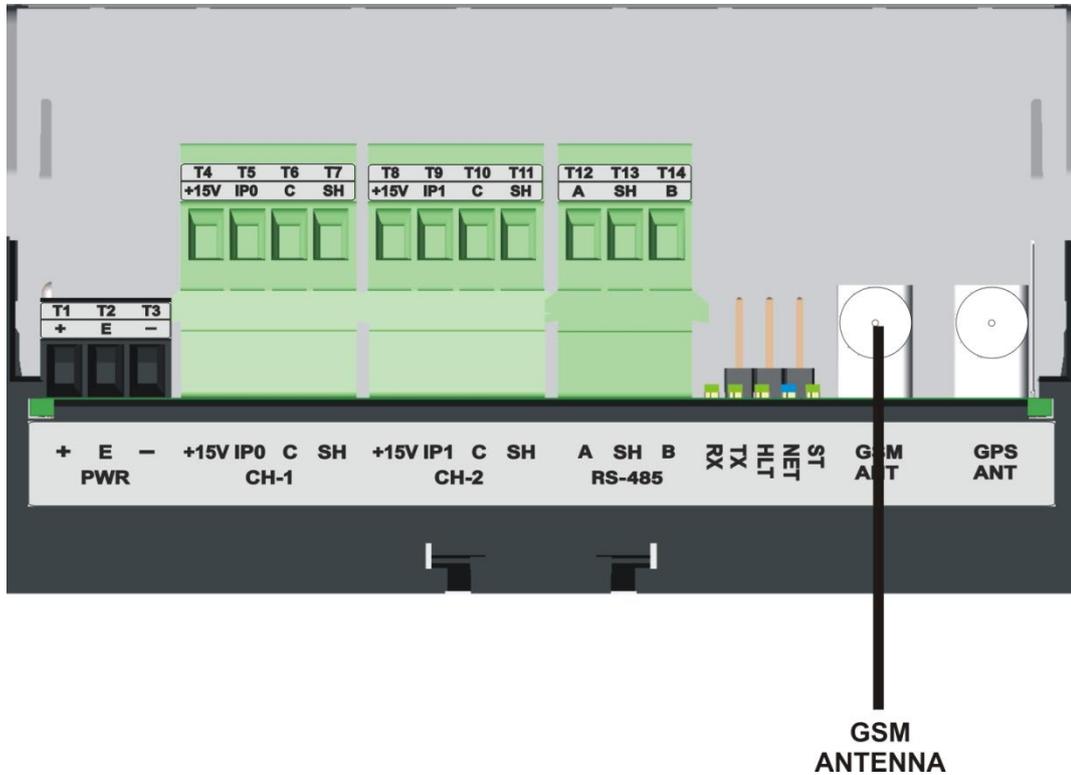


Figure-3.6.1: MBLlogger internal modem.

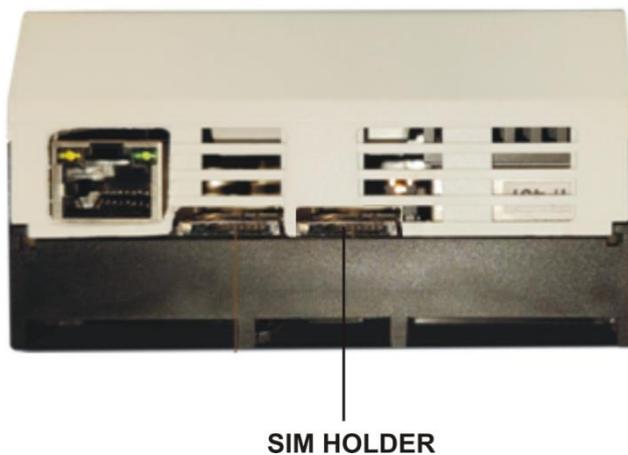


Figure-3.6.2: SIM holder.

Micro SIM slot is provided. Push the SIM inside to lock or un-lock the same.

Use the antenna provided along with the modem.

Contact our sales team if high gain antenna is required.

Modem configuration details are provided [here](#).

Details of modem status LEDs are provided in table-3.6 below.

LED	Colour	Remarks
Modem Status	Green	Always OFF: Modem not ready. Always ON: Modem ready for operation.
Net Status	Blue	Always OFF: Power OFF. Always ON: Searching for network. ON 200mSec and OFF 200mSec: 4G registered. ON 800mSec and OFF 800mSec: 2G/ 3G registered.

Table-3.6: Modem status LED.

Modem status and activity details are also provided by embedded web server.

The modem can be used for following operations:

- i) Time synchronization via network service provider.
- ii) File transfer client (ftp).

Configuration details for the modem are provided here.

### 3.7 GPS Antenna

GPS antenna is provided in models having modem.

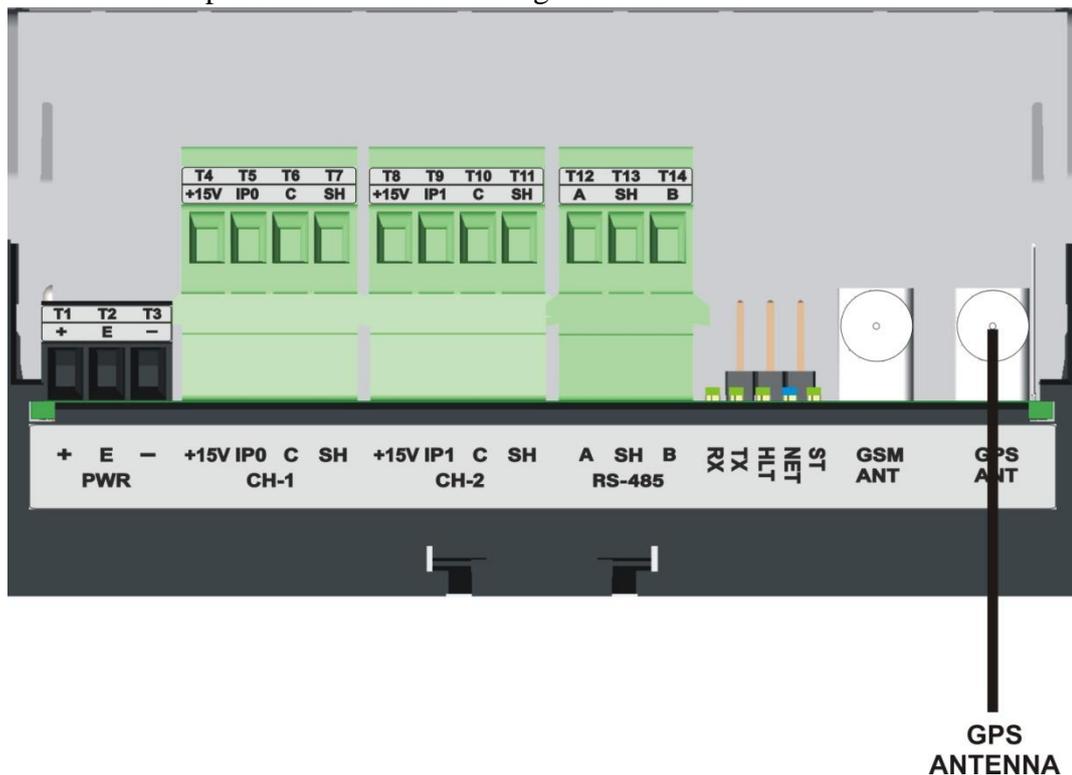


Figure-3.7: MBLLogger NanoPro GPS antenna.

Internal GPS can be used for time synchronization and location finding.

Install and use GSM antenna for GSM services. GSM antenna should be exposed to open sky so that it can track required satellites.

It will take about three to five minutes for GPS to track the satellites and synchronize.

GPS location and time service can be used even if SIM is not installed in the modem.

### 3.8 Configurable Input-1:

Two individually site configurable inputs are available in NanoPro models only.

These are not available Nano models.

These can be configured as following inputs. Required input type can be selected via the webserver.

- i) Digital Input
- ii) Analog Input – mA (4-20mA)
- iii) Analog Input – Voltage (0-10VDC)
- iv) Analog Input – mV (0-100mV)

Option is available for loop powered or external power source for digital and mA inputs.

Terminal details for Configurable Input -1 are listed in table-3.8 below.

Terminal	Function	Remarks
T4	+15V	Power supply for sensor excitation. 15VDC, max 50mA.
T5	IP0	Signal input for the channel
T6	C	Common for the channel
T7	SH	Signal shield terminal

Table-3.8: Terminals for configurable Input -1.

### 3.8.1 Digital Input – Loop Powered:

Digital inputs can be used for following inputs:

- i) Rain Gauge
- ii) Wind Speed
- iii) Status input
- iv) Counting input

Select Loop Powered Digital Input in the webserver configuration.

Connection for loop powered digital input is shown in figure 3.8.1 below.

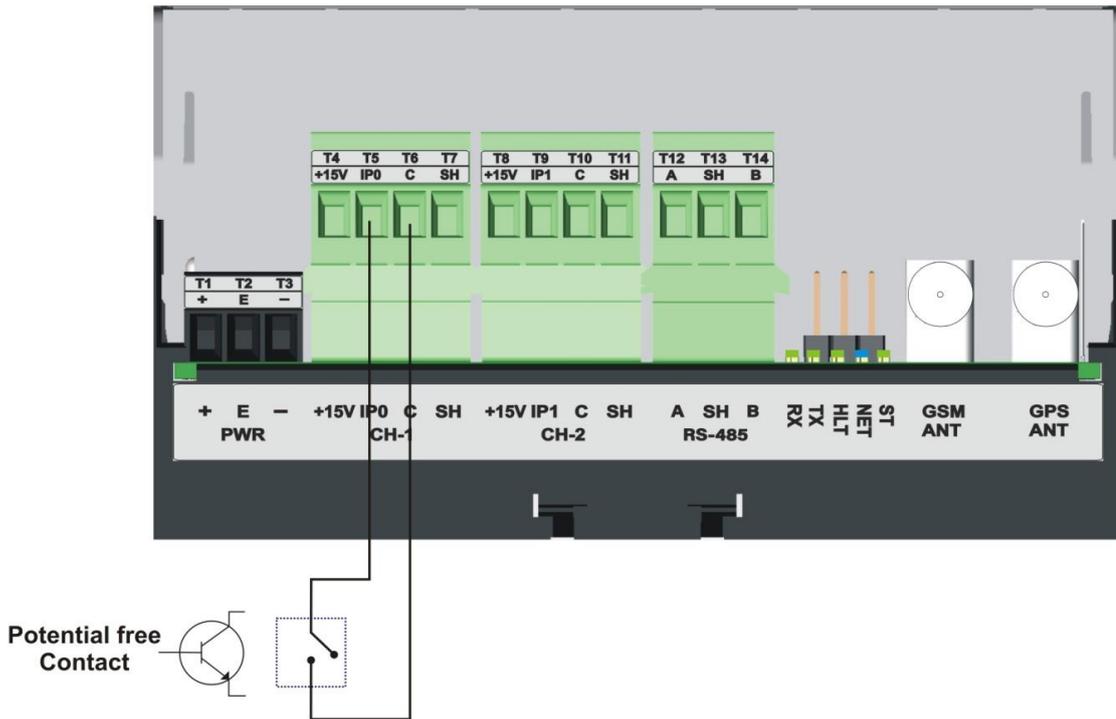


Figure-3.8.1: Connections for loop powered digital input -1.

Connections for the Configurable Input -1 as loop powered Digital Input are listed in table-3.8.1 below.

Terminal	Function	Remarks
T5	+	Potential free input or NPN transistor input.
T6	C	

Table 3.8.1: Connections for loop powered digital input -1.

### 3.8.2 Digital Input – Device Powered:

Select External Powered Digital Input in the webserver configuration.

Digital input can be powered by using 15VDC provided by the datalogger. Connections are shown in figure 3.8.2 below.

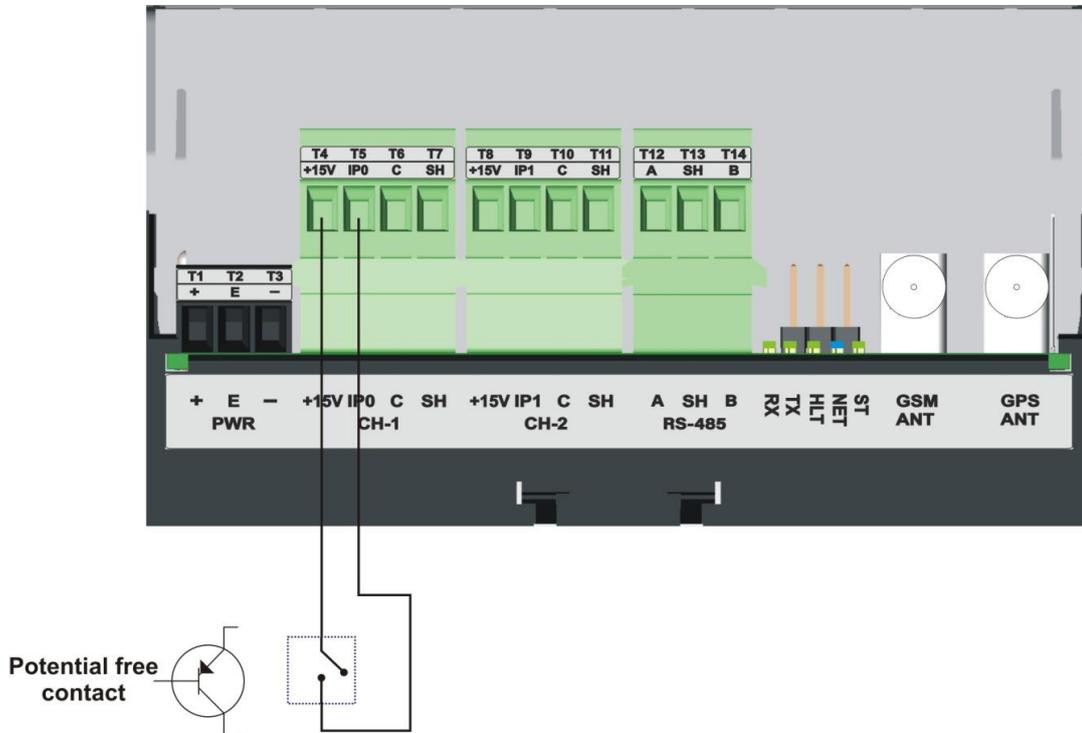


Figure-3.8.2: Connections for as digital input – using device power supply.

Connections details for Configurable Input -1 as device powered Digital Input are listed in table-3.8.2 below.

Terminal	Function	Remarks
T4	+15V	Potential free input or PNP transistor input.
T5	+	

Table 3.8.2: Connections for configurable Input -1 as digital input – using device power

### 3.8.3 Digital Input – External Powered:

Select External Powered Digital Input in the webserver configuration.

Digital input can be powered by external power supply (24VDC max) as per connections shown in figure 3.8.3 below.

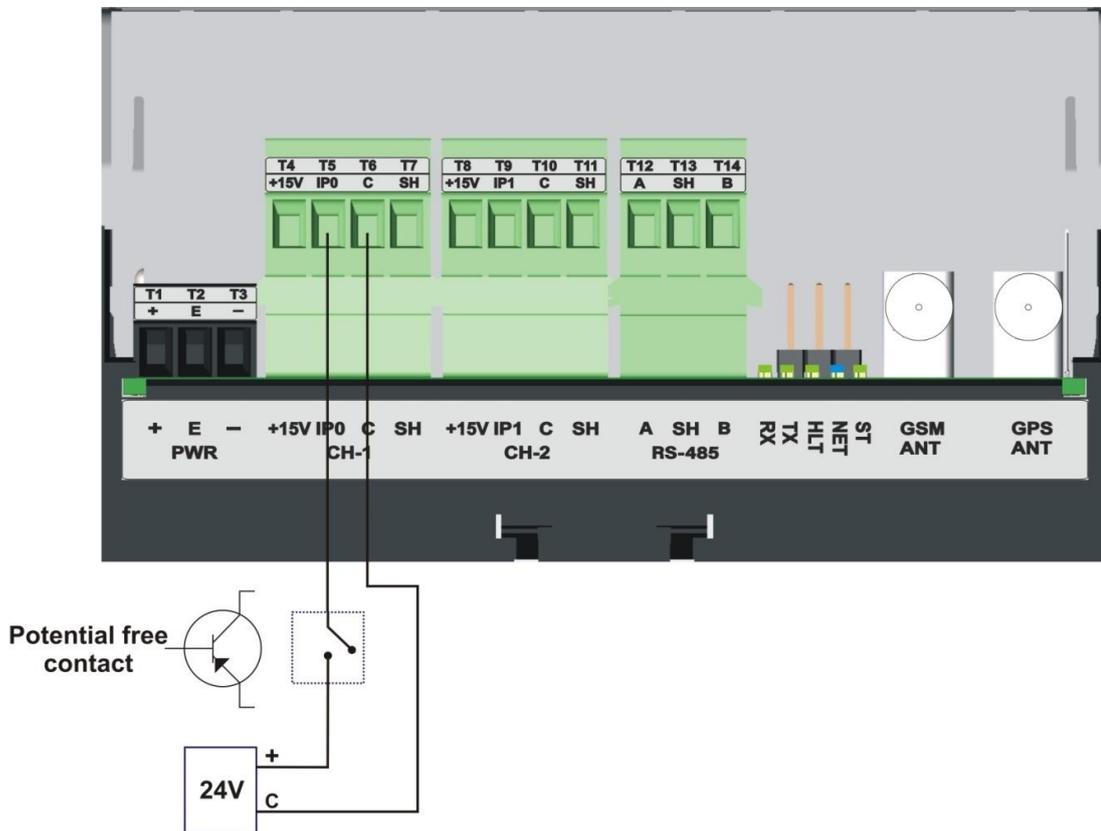


Figure-3.8.3: Connections for digital input using external power supply.

Terminal details for Configurable Input -1 as Digital Input using external power supply are listed in table-3.8.3 below.

Terminal	Function	Remarks
T5	+	Maximum external voltage 24VDC.
T6	C	

Table 3.8.3: Connections for configurable Input -1 as digital input using external power supply

### 3.8.4 Analog mA Input – Loop Powered:

Select Loop Powered mA Input in the webserver configuration.

Connections for loop powered mA input are shown in figure 3.8.4 below.

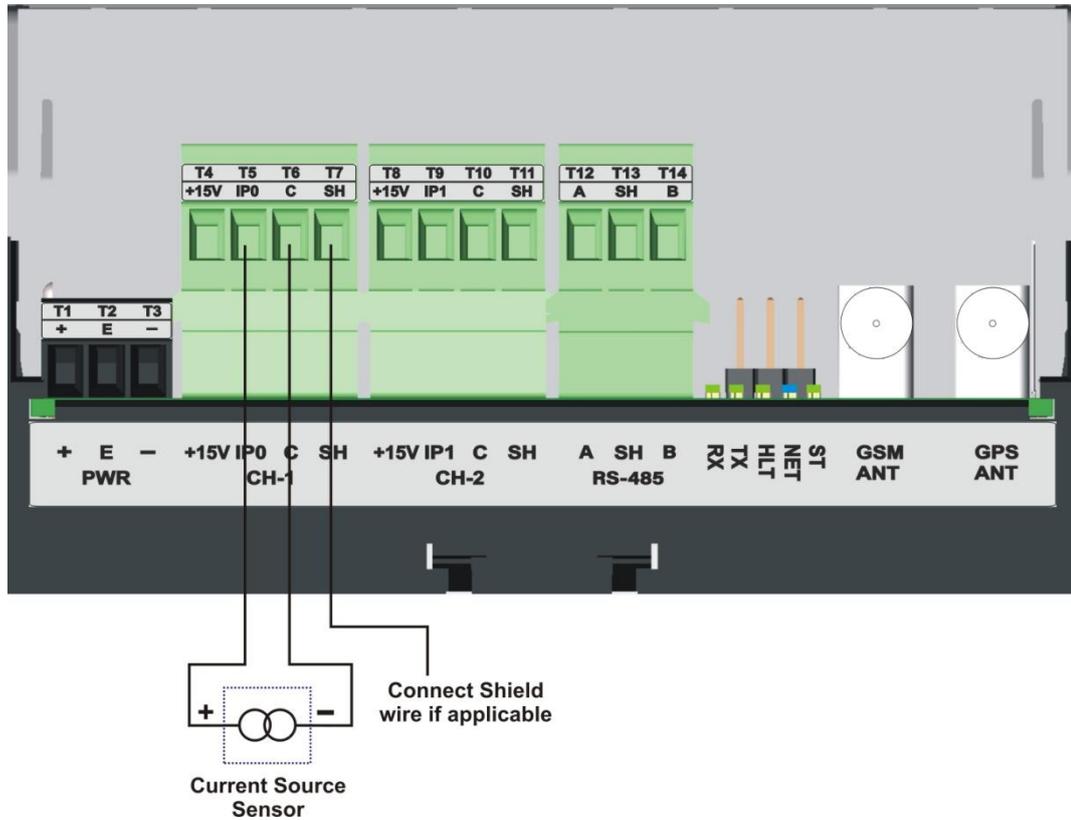


Figure-3.8.4: Connections for configurable Input -1 as mA input – loop powered.

Terminal connections for Configurable Input -1 as loop powered mA Input are listed in table-3.8.4 below.

Terminal	Function	Remarks
T5	+	Current source input +
T6	C	Current source input common
T7	Sh	Shield wire

Table 3.8.4: Connections for configurable Input -1 as loop powered mA input.

### 3.8.5 Analog mA Input – Device Powered:

Select External Powered mA Input in the webserver configuration.

Connections for device powered mA input are shown in figure 3.8.5 below.

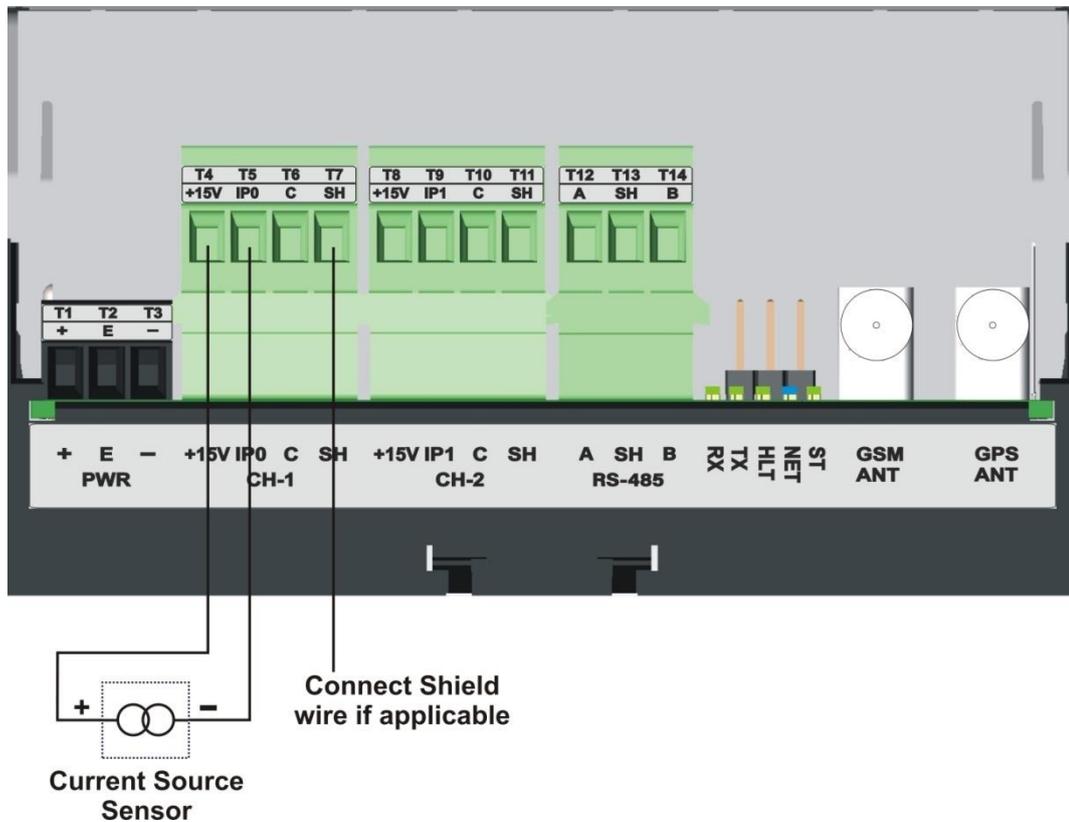


Figure-3.8.5: Connections for configurable Input -1 as device powered mA input.

Terminal connections for Configurable Input -1 as device powered mA Input are listed in table-3.8.5 below.

Terminal	Function	Remarks
T4	+15V	Current sensor power supply (+)
T5	+	Current sensor output (-)
T7	Sh	Shield wire

Table 3.8.5: Connections for configurable Input -1 as device powered mA input.

### 3.8.6 Analog mA Input – External Powered:

Select External Powered mA Input in the webserver configuration.

Connections for external powered mA input are shown in figure 3.8.6 below.

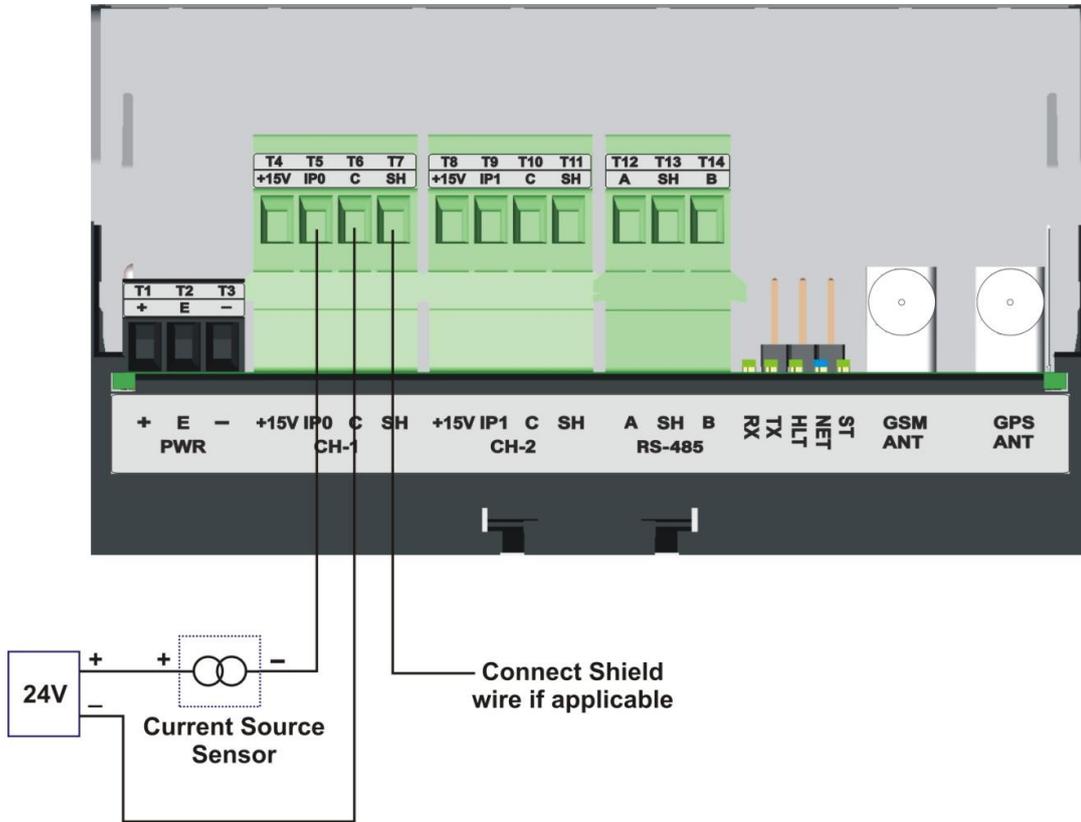


Figure-3.8.6: Connections for configurable Input -1 as external powered mA input.

Terminal connections for Configurable Input -1 as external powered mA Input are listed in table-3.8.6 below.

Terminal	Function	Remarks
T4	+	Current source input +
T5	C	Current source input common
T7	Sh	Shield wire

Table 3.8.6: Connections for configurable Input -1 as external powered mA input.

### 3.8.7 Voltage Input – (0-10V DC):

Select Voltage Input (0-10V) in the webserver configuration.

Connections for Voltage input are shown in figure 3.8.7 below.

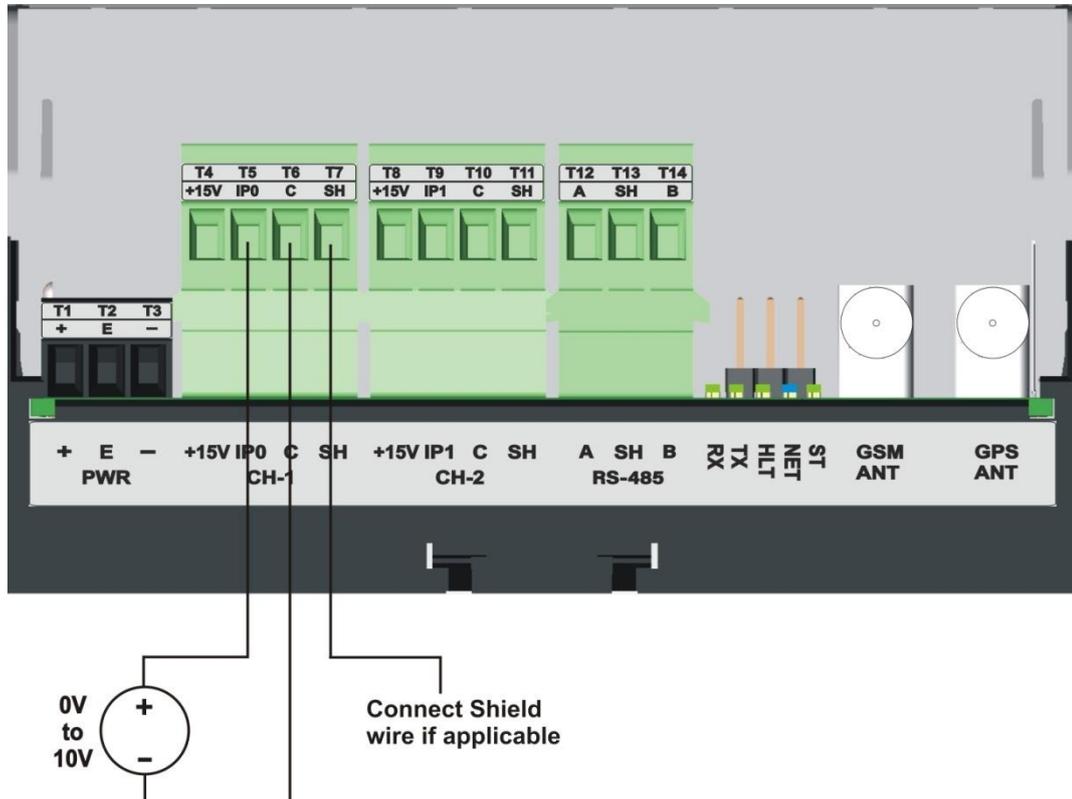


Figure-3.8.7: Connections for configurable Input -1 as Voltage Input (0-10V).

Terminal connections for Configurable Input -1 as voltage Input are listed in table-3.8.7 below.

Terminal	Function	Remarks
T5	+	Voltage source input +
T6	C	Voltage source input common
T7	Sh	Shield wire

Table 3.8.7: Connections for configurable Input -1 as voltage input.

### 3.8.8 Voltage Input – (0-10V DC) – Device Powered:

Select Voltage Input (0-10V) in the webserver configuration.

Connections for Voltage input using device power are shown in figure 3.8.8 below.

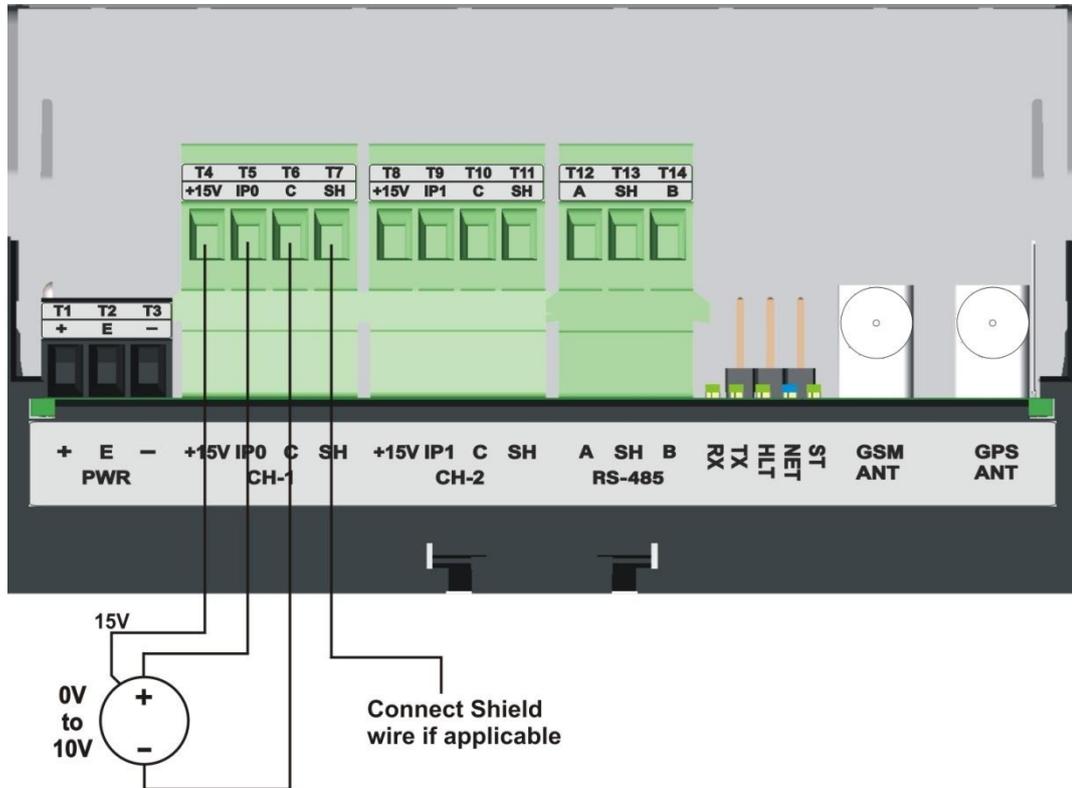


Figure-3.8.8: Connections for configurable Input -1 as Voltage Input (0-10V) – device powered.

Terminal connections for Configurable Input -1 as voltage Input using device power are listed in table-3.8.8 below.

Terminal	Function	Remarks
T4	+15V	Sensor excitation power supply - maximum 50mA
T5	+	Voltage source input +
T6	C	Voltage source input common
T7	Sh	Shield wire

Table 3.8.8: Connections for configurable Input -1 as voltage input using device power.

### 3.8.9 Voltage Input – (0-100 mV):

Select Voltage Input (0-100mV) in the webserver configuration.

Connections for mV input are shown in figure 3.8.9 below.

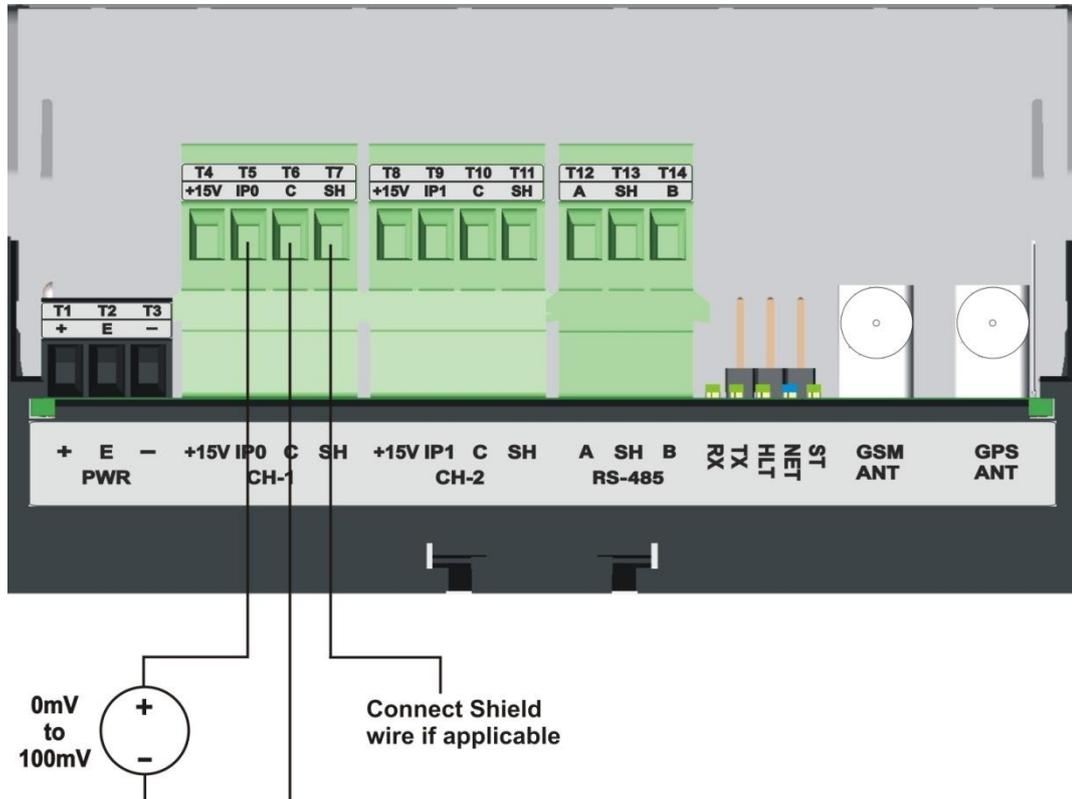


Figure-3.8.9: Connections for configurable Input -1 as mV input (0-100mV).

Terminal connections for Configurable Input -1 as mV Input are listed in table-3.8.9 below.

Terminal	Function	Remarks
T5	+	Voltage source input +
T6	C	Voltage source input common
T7	Sh	Shield wire

Table 3.8.9: Connections for configurable Input -1 as mV input.

### 3.8.10 Voltage Input – (0-100 mV) – Device Powered:

Select Voltage Input (0-100mV) in the webserver configuration.

Connections for mV input using device power are shown in figure 3.8.10 below.

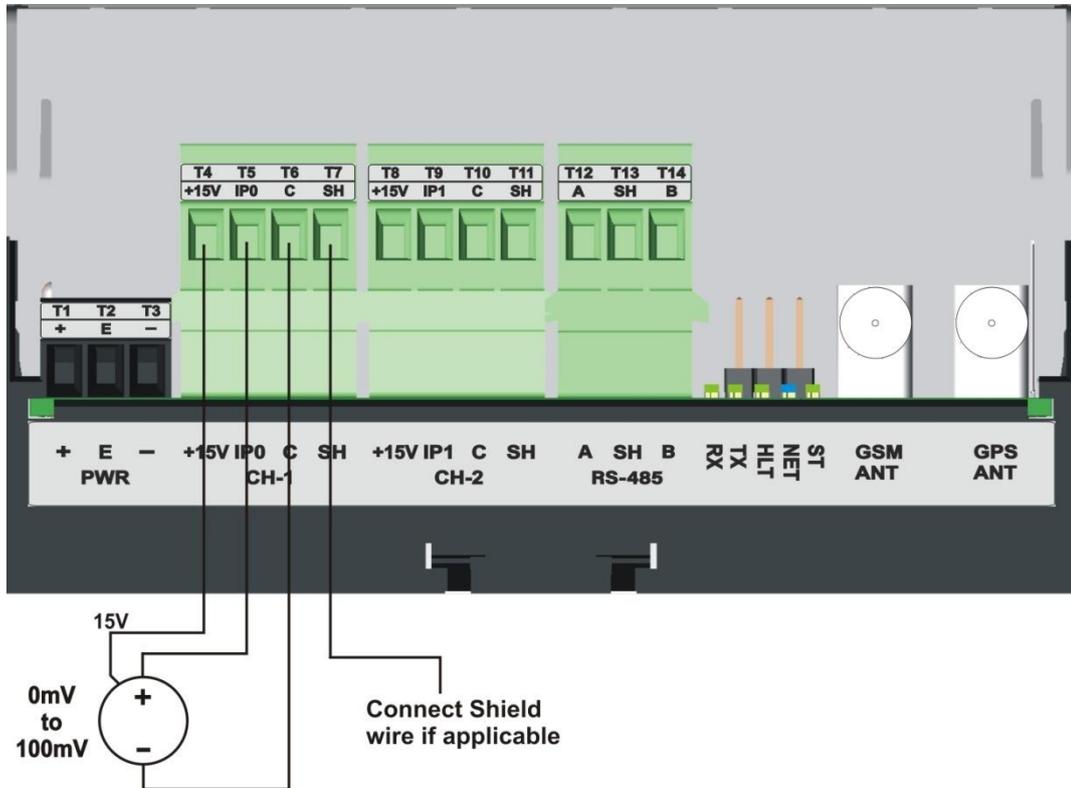


Figure-3.8.10: Connections for configurable Input -1 as mV input (0-100mV) using device power.

Terminal connections for Configurable Input -1 as mV Input using device power are listed in table-3.8.10 below.

Terminal	Function	Remarks
T4	+15V	Sensor excitation power supply - maximum 50mA
T5	+	Voltage source input +
T6	C	Voltage source input common
T7	Sh	Shield wire

Table 3.8.10: Connections for configurable Input -1 as mV input using device power.

### 3.9 Configurable Input-2:

This input can be configured for following types. Required input type can be selected via the webserver.

- v) Digital Input
- vi) Analog Input – mA (4-20mA)
- vii) Analog Input – Voltage (0-10VDC)
- viii) Analog Input – mV (0-100mV)

Option is available for loop powered or external power source for digital and mA inputs.

Terminal details for Configurable Input -2 are listed in table-3.9 below.

Terminal	Function	Remarks
T8	+15V	Power supply for sensor excitation. 15VDC, max 50mA.
T9	IP0	Signal input for the channel
T10	C	Common for the channel
T11	SH	Signal shield terminal

Table-3.9: Terminals for configurable Input -2.

#### 3.9.1 Digital Input – Loop Powered:

Select Loop Powered Digital Input in the webserver configuration.

Connection for loop powered digital input is shown in figure 3.9.1 below.

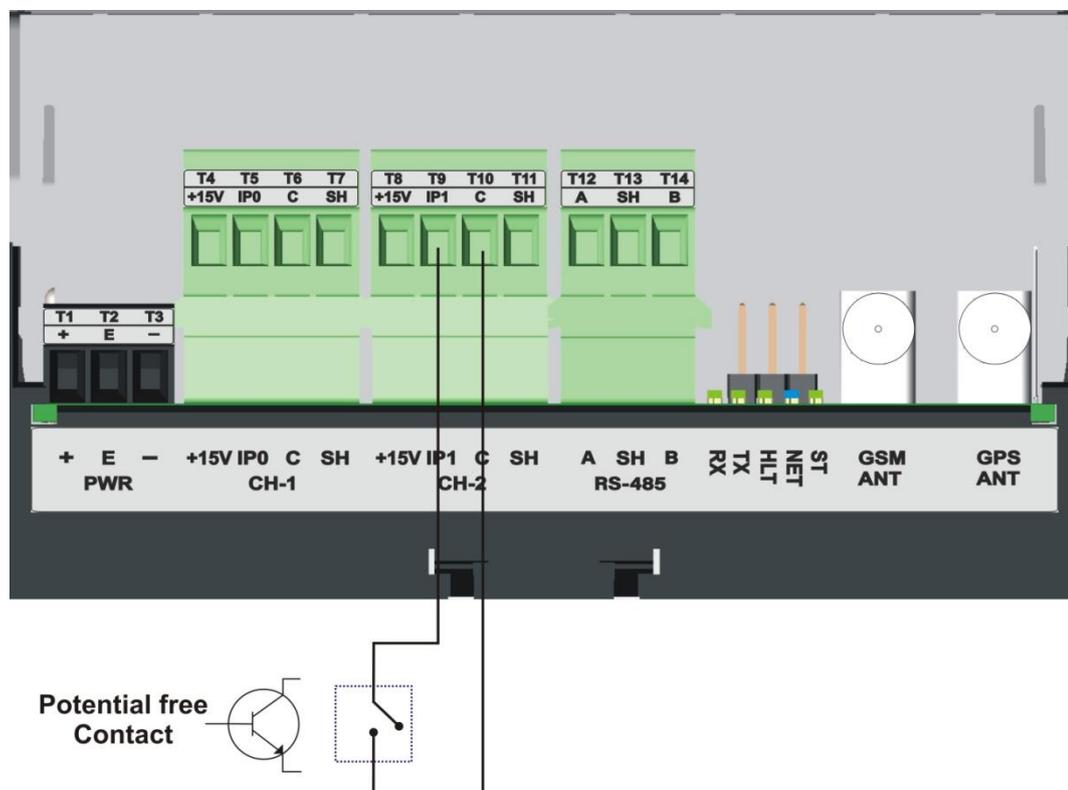


Figure-3.9.1: Connections for configurable Input -2 loop powered digital input.

Connections for the Configurable Input -2 as Digital Input - loop powered are listed in table-3.9.1 below.

Terminal	Function	Remarks
T9	+	Potential free input or NPN transistor input.
T10	C	

Table 3.9.1: Connections for configurable Input -2 loop powered digital input.

### 3.9.2 Digital Input – Device Powered:

Select External Powered Digital Input in the webserver configuration.

Digital input can be powered by using 15VDC provided by the datalogger.

Connections are shown in figure 3.9.2 below.

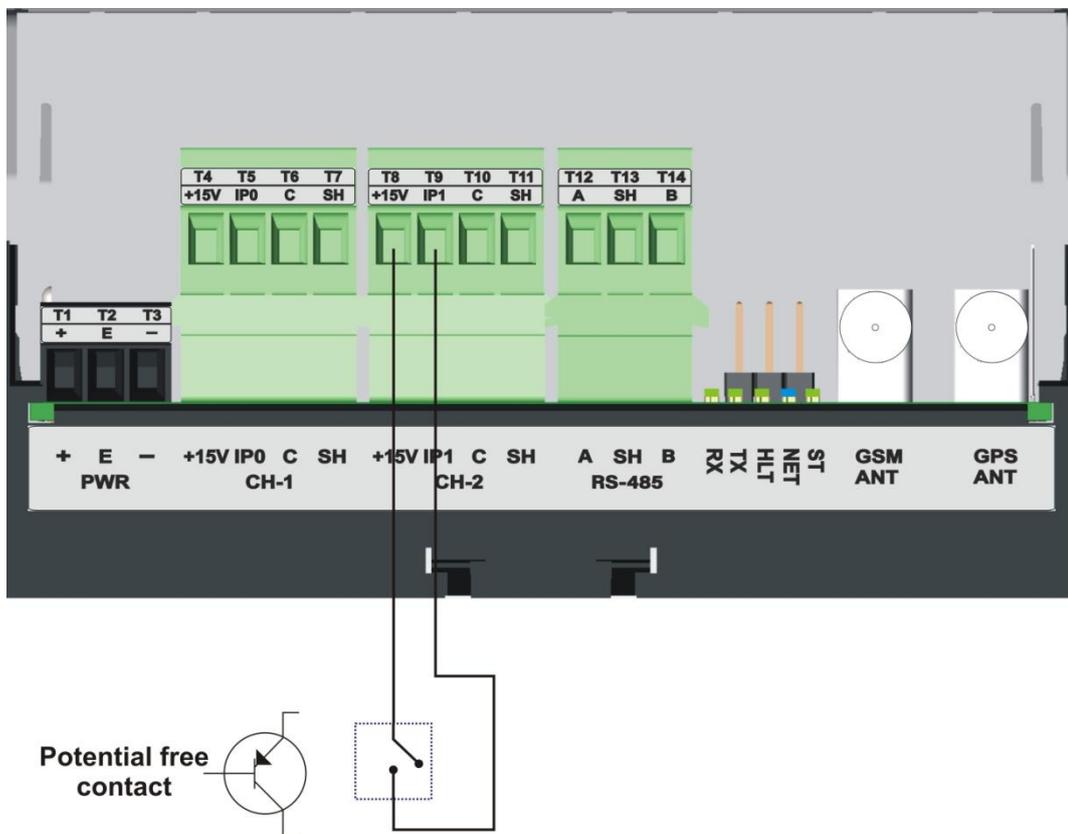


Figure-3.9.2: Connections for configurable Input -2 as digital input – using device power supply.

Connections details for Configurable Input -2 as device powered Digital Input are listed in table-3.9.2 below.

Terminal	Function	Remarks
T8	+15V	Potential free input or PNP transistor input.
T9	+	

Table 3.9.2: Connections for configurable Input -2 as digital input – using device power

### 3.9.3 Digital Input – External Powered:

Select External Powered Digital Input in the webserver configuration.

Digital input can be powered by external power supply (24VDC max) as per connections shown in figure 3.9.3 below.

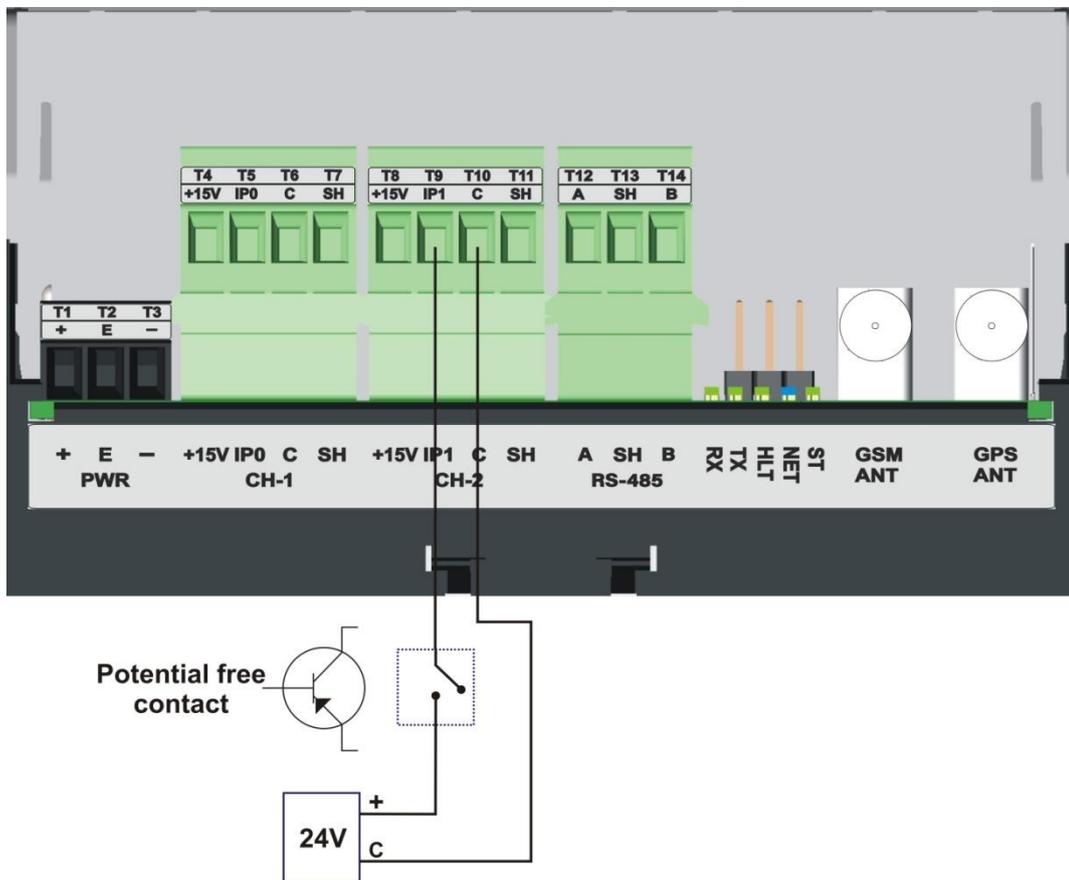


Figure-3.9.3: Connections for configurable Input -2 as digital input using external power supply.

Terminal details for Configurable Input -2 as Digital Input using external power supply are listed in table-3.9.3 below.

Terminal	Function	Remarks
T9	+	Maximum external voltage 24VDC.
T10	C	

Table 3.9.3: Connections for configurable Input -2 as digital input using external power supply

### 3.9.4 Analog mA Input – Loop Powered:

Select Loop Powered mA Input in the webserver configuration.

Connections for loop powered mA input are shown in figure 3.9.4 below.

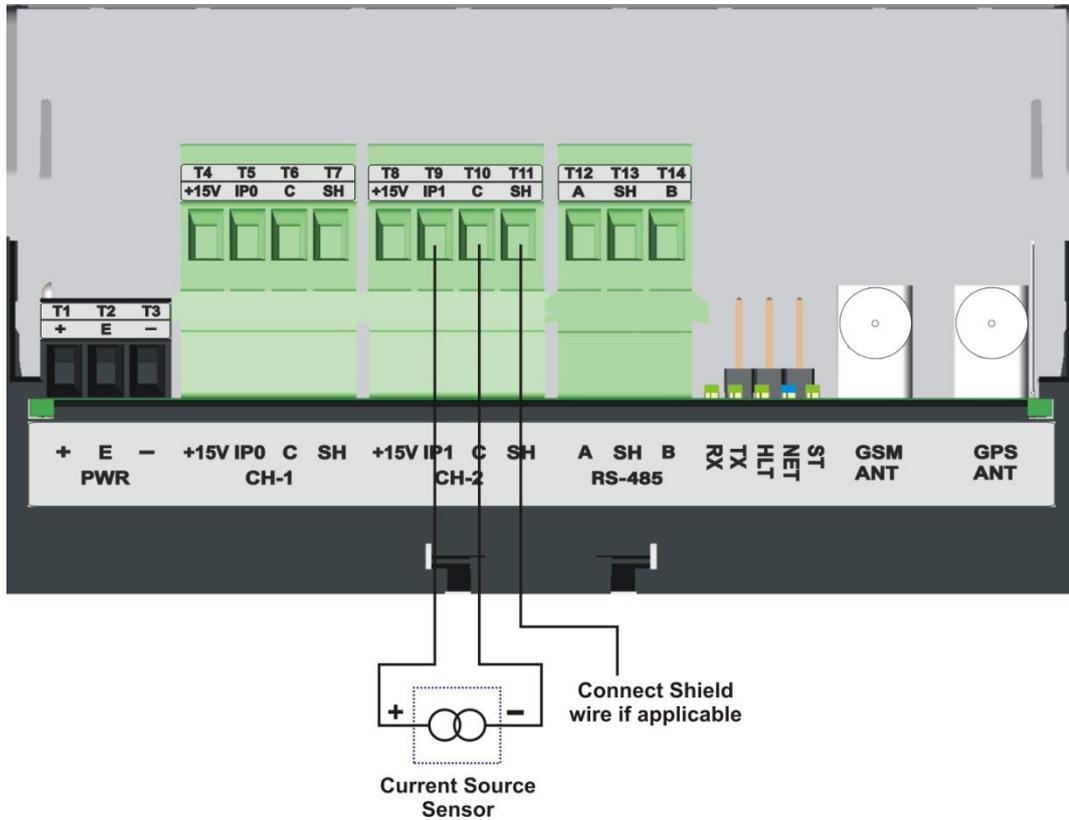


Figure-3.9.4: Connections for configurable Input -2 as mA input – loop powered.

Terminal connections for Configurable Input -2 as loop powered mA Input are listed in table-3.9.4 below.

Terminal	Function	Remarks
T9	+	Current source input +
T10	C	Current source input common
T11	Sh	Shield wire

Table 3.9.4: Connections for configurable Input -2 as loop powered mA input.

### 3.9.5 Analog mA Input – Device Powered:

Select External Powered mA Input in the webserver configuration.

Connections for device powered mA input are shown in figure 3.9.5 below.

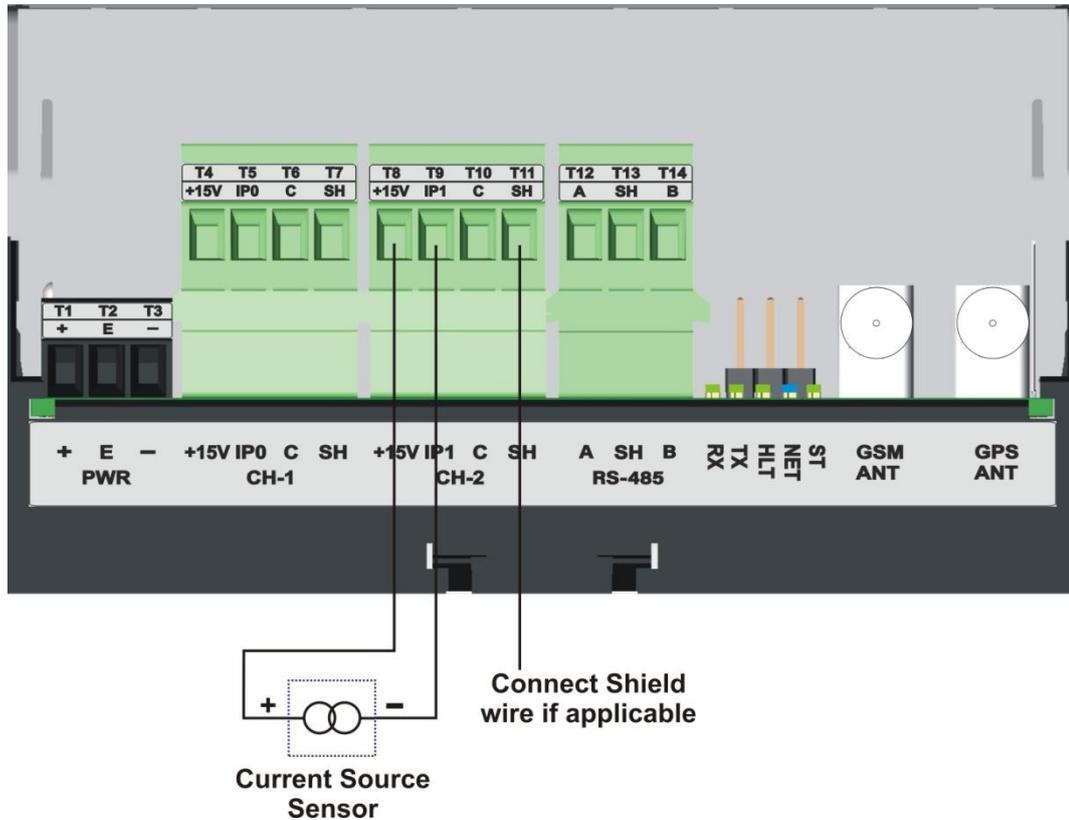


Figure-3.9.5: Connections for configurable Input -2 as device powered mA input.

Terminal connections for Configurable Input -2 as device powered mA Input are listed in table-3.9.5 below.

Terminal	Function	Remarks
T8	+15V	Current sensor power supply (+)
T9	+	Current sensor output(-)
T11	Sh	Shield wire

Table 3.9.5: Connections for configurable Input -2 as device powered mA input.

### 3.9.6 Analog mA Input – External Powered:

Select External Powered mA Input in the webserver configuration.

Connections for external powered mA input are shown in figure 3.9.6 below.

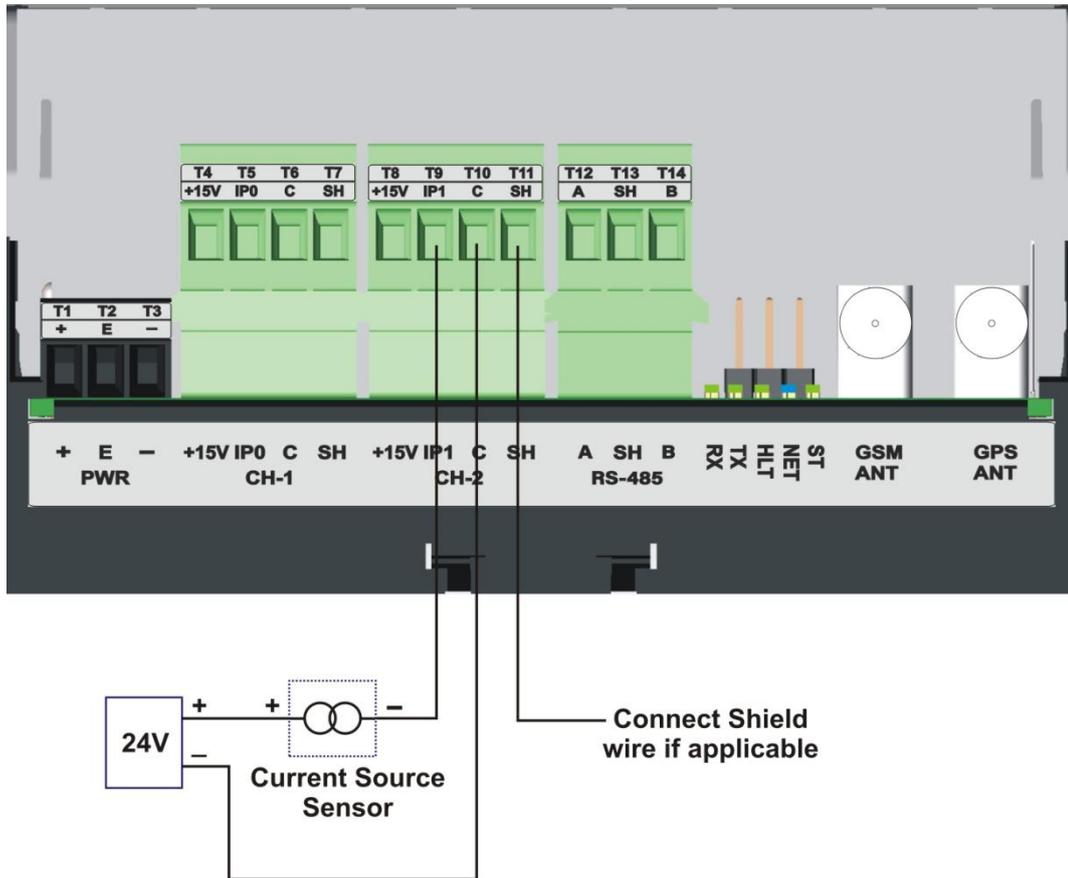


Figure-3.9.6: Connections for configurable Input -2 as external powered mA input.

Terminal connections for Configurable Input -2 as external powered mA Input are listed in table-3.9.6 below.

Terminal	Function	Remarks
T9	+	Current source input +
T10	C	Current source input common
T11	Sh	Shield wire

Table 3.9.6: Connections for configurable Input -2 as external powered mA input.

### 3.9.7 Voltage Input – (0-10V DC):

Select Voltage Input (0-10V) in the webserver configuration.

Connections for Voltage input are shown in figure 3.9.7 below.

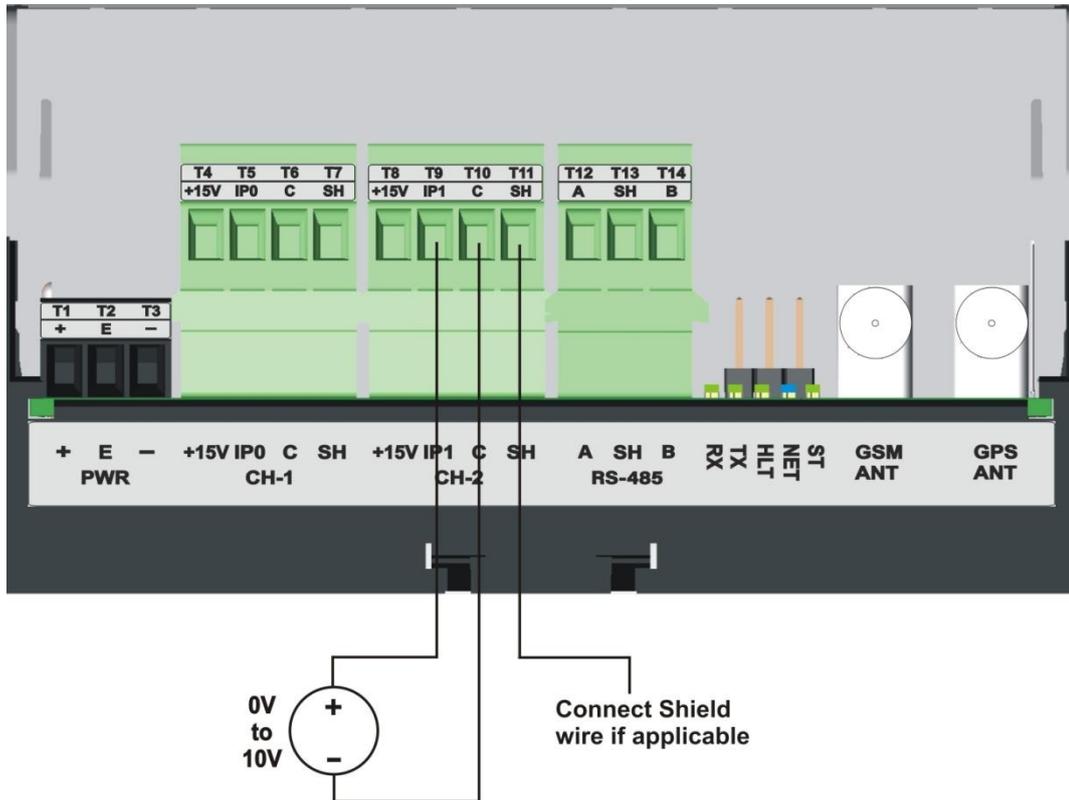


Figure-3.9.7: Connections for configurable Input -2 as Voltage Input (0-10V).

Terminal connections for Configurable Input -2 as voltage Input are listed in table-3.9.7 below.

Terminal	Function	Remarks
T9	+	Voltage source input +
T10	C	Voltage source input common
T11	Sh	Shield wire

Table 3.9.7: Connections for configurable Input -2 as voltage input.

### 3.9.8 Voltage Input – (0-10V DC) – Device Powered:

Select Voltage Input (0-10V) in the webserver configuration.

Connections for Voltage input using device power are shown in figure 3.9.8 below.

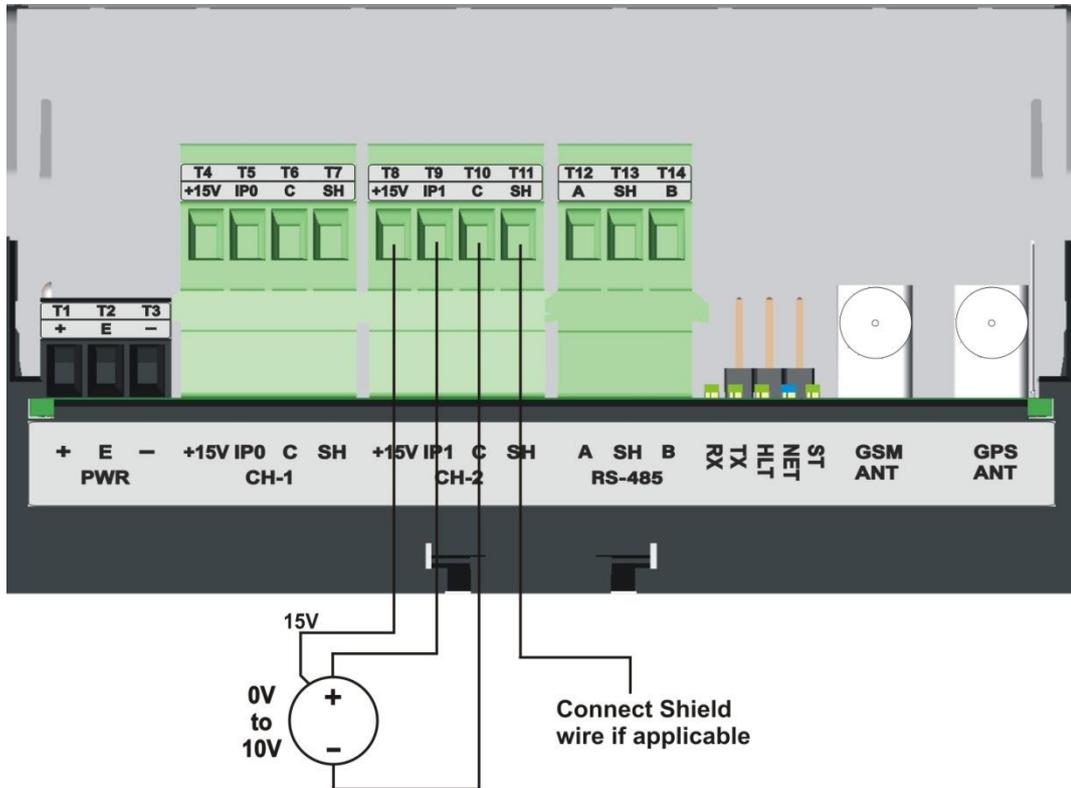


Figure-3.9.8: Connections for configurable Input -2 as Voltage Input (0-10V) – device powered.

Terminal connections for Configurable Input -2 as voltage Input using device power are listed in table-3.9.8 below.

Terminal	Function	Remarks
T8	+15V	Sensor excitation power supply - maximum 50mA
T9	+	Voltage source input +
T10	C	Voltage source input common
T11	Sh	Shield wire

Table 3.9.8: Connections for configurable Input -2 as voltage input using device power.

### 3.9.9 Voltage Input – (0-100mV):

Select Voltage Input (0-100mV) in the webserver configuration.

Connections for mV input are shown in figure 3.9.9 below.

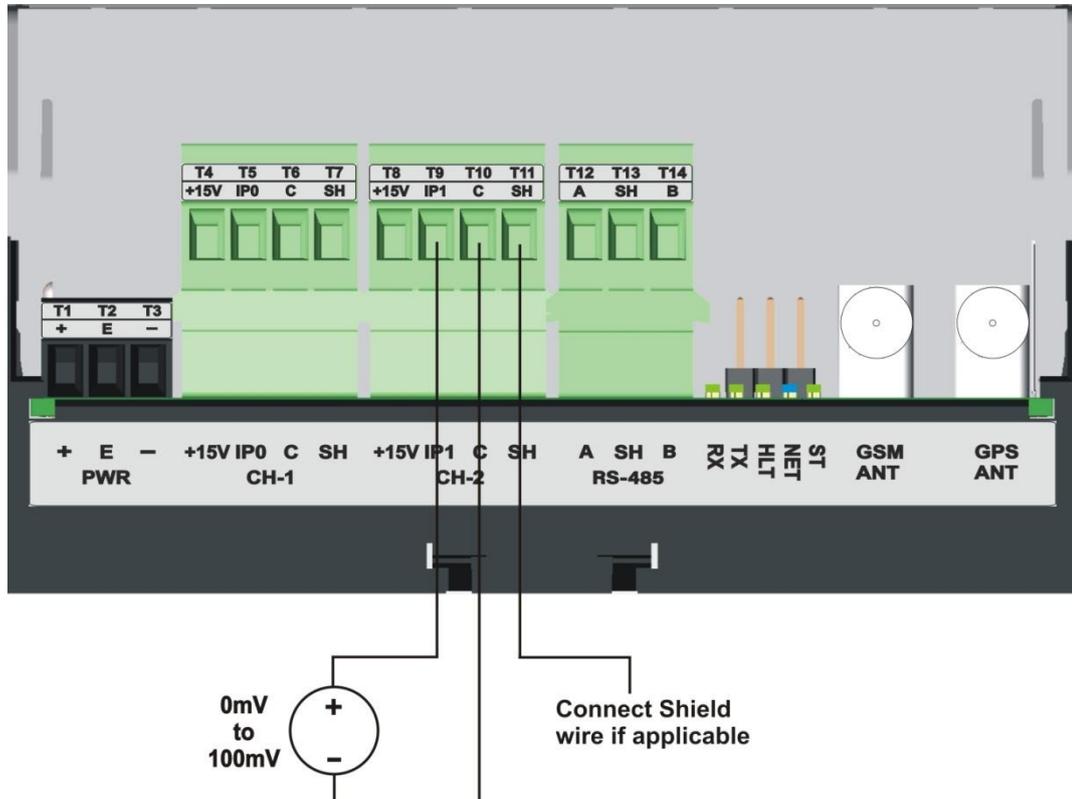


Figure-3.9.9: Connections for configurable Input -2 as mV input (0-100mV).

Terminal connections for Configurable Input -2 as mV Input are listed in table-3.9.9 below.

Terminal	Function	Remarks
T9	+	Voltage source input +
T10	C	Voltage source input common
T11	Sh	Shield wire

Table 3.9.9: Connections for configurable Input -2 as mV input.

### 3.9.10 Voltage Input – (0-100 mV) – Device Powered:

Select Voltage Input (0-100mV) in the webserver configuration.

Connections for mV input using device power are shown in figure 3.9.10 below.

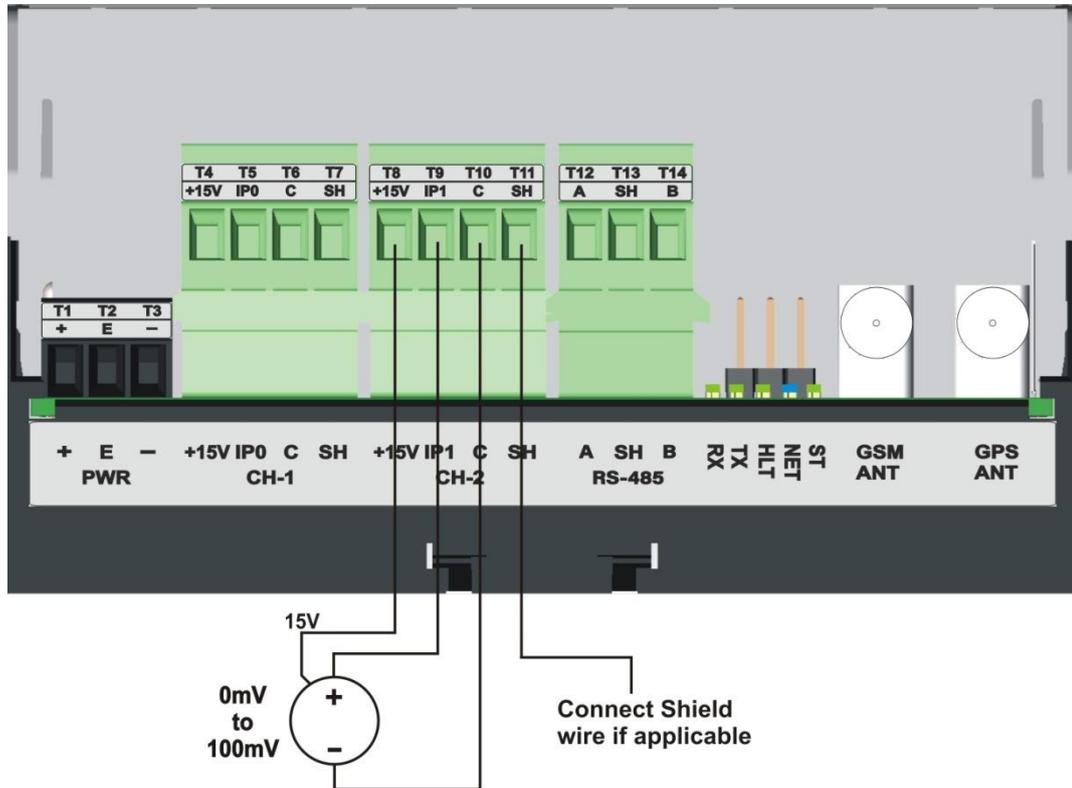


Figure-3.9.10: Connections for configurable Input -2 as mV input (0-100mV) using device power.

Terminal connections for Configurable Input -2 as mV Input using device power are listed in table-3.9.10 below.

Terminal	Function	Remarks
T8	+15V	Sensor excitation power supply - maximum 50mA
T9	+	Voltage source input +
T10	C	Voltage source input common
T11	Sh	Shield wire

Table 3.9.10: Connections for configurable Input -2 as mV input using device

## 4. MBLogger NanoPro LED's

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MBLogger Nano provides following LED indications.

- i) Power connection status LED (Red) are provided near the power terminals.

## 5. Embedded Webserver

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MBLogger provides embedded webserver for configuration and diagnostics.

Following functionality is provided via the embedded webserver.

- i) Datalogger configuration.
- ii) Monitor measured parameters.
- iii) Download and delete logged files
- iv) User configuration.
- v) Datalogger diagnostic messages and reports.
- vi) Dropdown list for section of pre-selected options.
- vii) Limit validation for configured parameter values.
- viii) Hoover (take cursor) over the parameter to get further details on the same.
- ix) Details of not all parameters have been provided in this manual (to reduce the size). Further details can be obtained by using hoover over the parameter.
- x) Auto configured parameters will not have editable configuration field.
- xi) Configuration of parameters not applicable will be disabled.
- xii) Limits are displayed for parameters with limits (allowed minimum and maximum values). Default values are provided for most of the parameters.
- xiii) After editing any parameter click the cursor on any part of the screen. The parameter value checked for errors and will be saved if there no error. If any error is found, same will be indicated on right hand top corner of the screen. Wrong values will not be saved and menu option for the parameter will turn **red** till the wrong value is corrected.
- xiv) All edited parameters will be **marked** till the same has not been committed.
- xv) Page menu option for the parameter will be marked with '**E**'. This mark will be provided at all hierarchy levels (up wards) till "MBLogger Configuration".
- xvi) All configuration of parameters will be saved on 'Commit' operation. Edit marks will also be removed from all edited parameters on 'Commit' operation being successful.

### 5.1 User Login

Use 'Chrome' to login to datalogger embedded web server.

Use datalogger IP (for first login – use datalogger default IP) to login. Following login screen shall be displayed as shown in figure-6.1 below with datalogger assigned name.

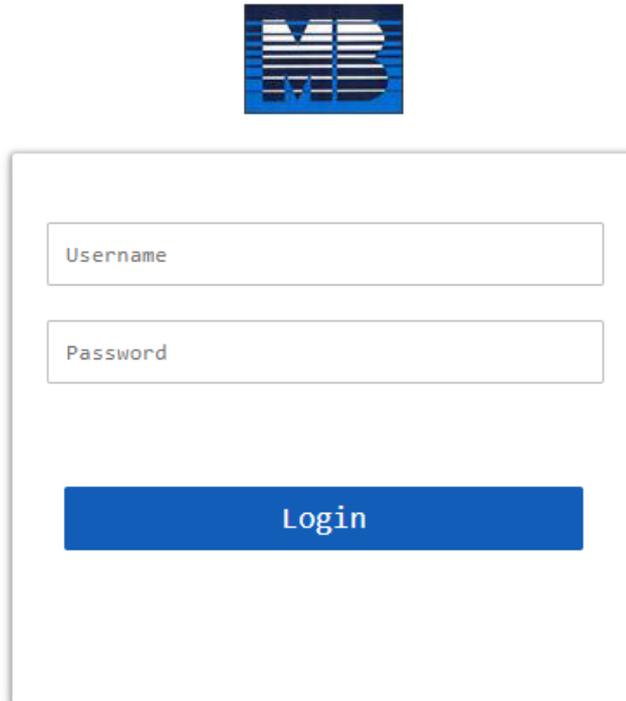


Figure-6.1: Datalogger login screen.

User login details are provided in table 5.1 below.

User Type	Default Password	User Rights
Viewer	'Viewer'	Rights to view configuration and view diagnostic information.
Operator	'Operator'	All rights for configuration, operation, and diagnostics.
Admin	'Admin'	All rights for configuration, operation, diagnostics, and user configuration.
Maint	Not allowed	Maintenance user is used during manufacturing only.

Table-5.1: User login details

It advisable that first login should be done by 'Admin' and then other users and their passwords should be configured.

## 5.2 Welcome Page

Upon successful user login, welcome page as shown in figure-5.2 is displayed.

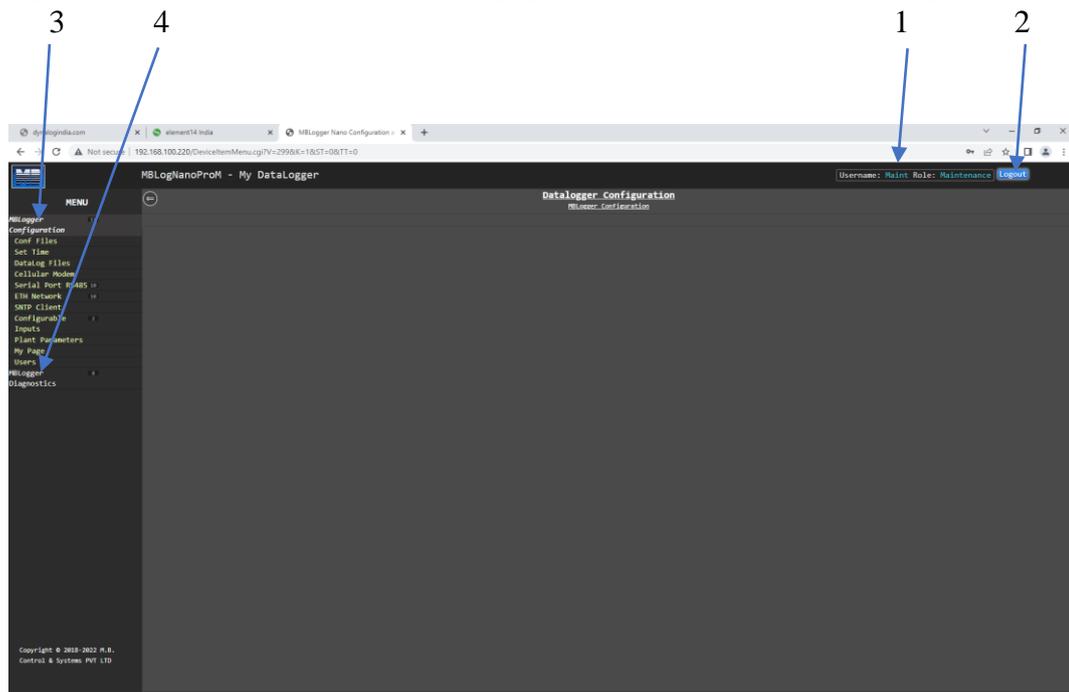


Figure-5.2: User login welcome page.

The welcome page is self-explanatory, all the information required for configuration of the datalogger is provided on the page.

Details of welcome page are provided in table 5.2 below.

Object No	Description	Remarks
1	Username and role	Displays logged username and role.
2	'Logout'	<p>Button for user logout.</p> <p>User will be automatically logged out if there is no keyboard or mouse activity for three minutes.</p> <p>User will be warned about this by warning sign on right hand top corner of the page.</p> <p>User can do any keyboard or mouse activity to reset the logout timer.</p>
3	MBDataLogger Configuration	<p>Left click on this menu option to configure the datalogger.</p> <p>Menu options below will enable configuration all features of the datalogger.</p> <p>Left click on any menu option to configure the same.</p>
4	Datalogger Diagnostics	Left click on this menu option to view datalogger diagnostics menu.

Table-5.2: Datalogger welcome page

**Note:**

If the user closes the webpage without logging out, user will have to wait for about three minutes prior to next login.

### 5.3 Datalogger Configuration Files

Datalogger configuration files can be saved in the datalogger SD card. Left click on menu option ‘Configuration Files’ to view the datalogger configuration files saved in the SD card shown in figure-5.3 below.

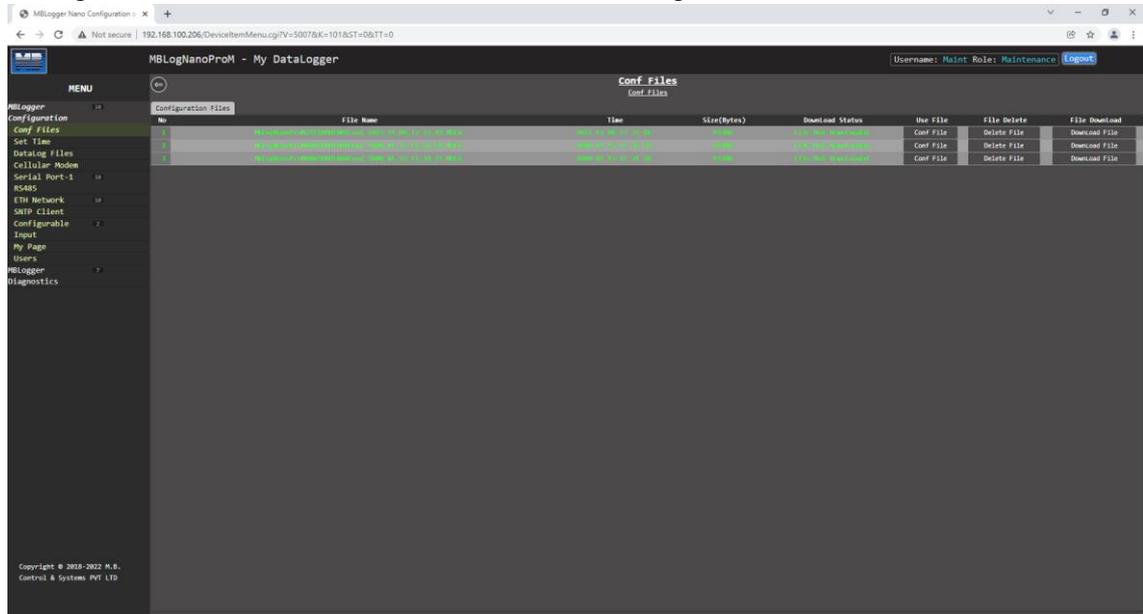


Figure-5.3: Datalogger configuration files.

Selected menu option shall be highlighted.

Operations available for datalogger configuration files are shown in table 5.3.1 below.

Sr. No	Operation	Action	Remarks
1	Save present datalogger configuration file	Right Click menu “Configuration Files” and select option “Save Present Configuration File” by left clicking on the option.	Datalogger configuration file will be saved in the SD Card and will be displayed in the list of configuration files saved. File name will model and serial number details.
2	Restore configuration	Right Click menu “Configuration Files” and select option “Restore Configuration” by left clicking on the option.	Datalogger configuration shall be restored in webserver. All edited ‘E’ parameters will be reverted to values and status as per current configuration of datalogger. This will be confirmed by removal of ‘E’ mark from all edited parameters.
3	Upload Configuration File	Right Click menu “Configuration Files” and select	Datalogger configuration file shall be uploaded from the selected directory in PC.

		option “Upload Configuration File” by left clicking on the option.	Selected file shall be verified and will be uploaded only if the file all verification procedures.
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Table-5.3.1: Datalogger configuration file operations

Options available for saved datalogger configuration files are shown in table 5.3.2 below.

Sr. No	Operation	Action	Remarks
1	Download File	Click on button “Download File” for the file to be downloaded.	Selected file will be downloaded on connect PC/ Laptop. File “Download Status” will show “File Downloaded”
2	Delete File	Click on button “Delete File” for the file to be deleted.	The file will be deleted and removed from the list. Deleted files cannot be restored.
3	Use file for configuration	Click on button “Conf File” for using the file for configuration.	The file will be validated. If validation is OK, datalogger configuration parameters will be displayed as edited parameters. Parameters which do not match with present configuration shall be marked with ‘E’. Use ‘Device Commit’ operation to configure the datalogger with the selected file.

Table-5.3.2: Operations for saved configuration files

## 5.4 Set Time

Left click on menu option ‘Set Time’ to set time of the datalogger as shown in figure-5.4 below.

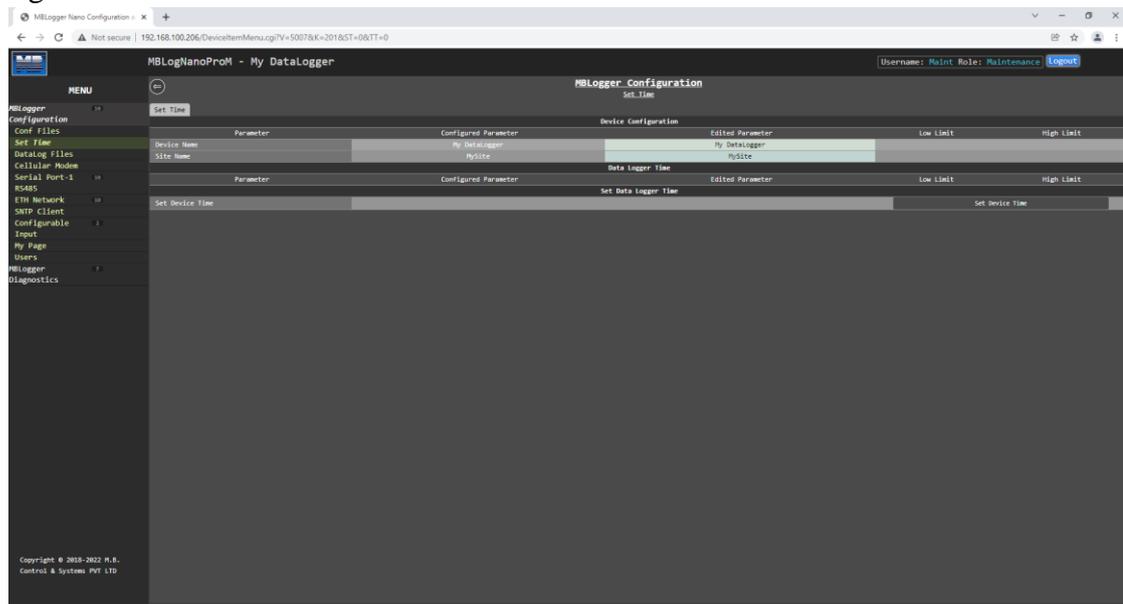


Figure-5.4: Set datalogger time.

Details of the page are provided in table 5.4 below.

Sr. No	Parameter	Description	Remarks
1	Device Name	Set device name	Device identification
2	Site Name	Set site name	Site identification
3	Set Time	Left click on the button ‘Set Device Time’ to synchronize the datalogger time with PC time	On successful operation, current time will be displayed.

Table-5.4: Set time

## 5.5 Configure – Datalogging Files

All logged files are saved in SD memory card. The card should be formatted with ‘FAT32’ format before being inserted in SD card holder.

SD card should not be removed or inserted while the datalogger is powered On and in operation. Disconnect power to data logger prior to inserting or removing the SD card.

Files are saved with .csv extension with date and time.

Details of data log directories are provided in table 5.5.1 below:

Sr. No	Directory Name	Description	Remarks
1	‘DirDataLogDay’	Stores day log files	Configure operation of day log files.
2	‘DirDataLogRFT1’	Stores files for remote file server 1	Configure operation of files for remote file server 1.

3	'DirDataLogRFT2'	Stores files for remote file server 2	Configure operation of files for remote file server 2.
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Table-5.5: Data log file directories

Datalogger will automatically create missing directories on the SD card.

Parameter values and its attributes will be saved in the data log files if the parameter is configured for datalogging (refer to configuration of individual parameter for more details).

Left click on menu option 'Datalogger Files' to configure file operation as shown in figure-5.5 below.

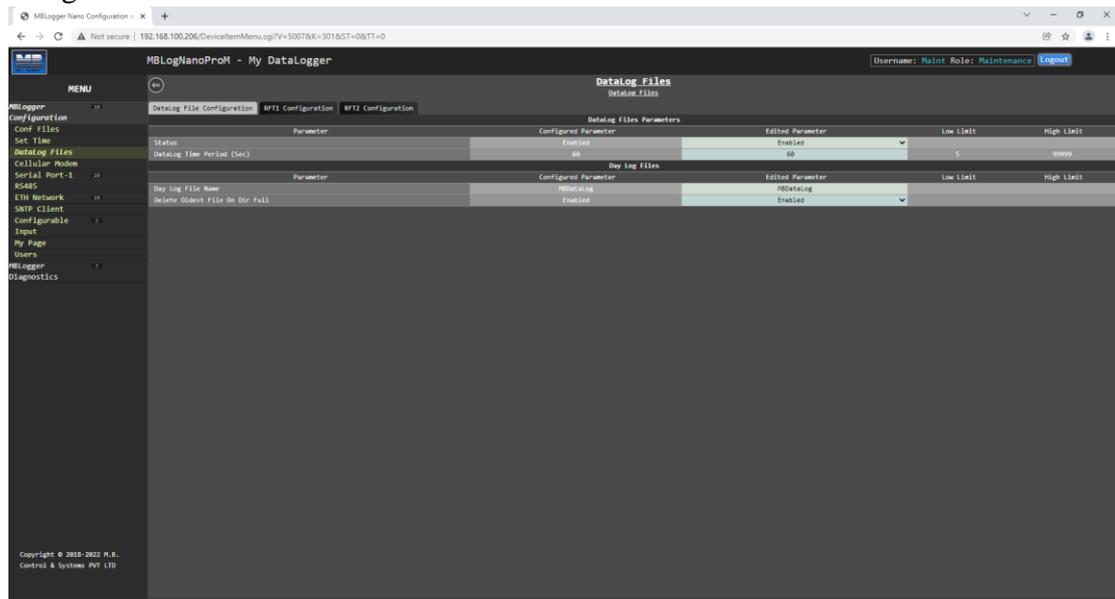


Figure-5.5: Configuration of datalogger file operations.

For parameters having pre-selected options, available options are provided as drop-down list.

Following log files can be configured:

- i) 'Day Log File Configuration': Day data log file.
- ii) 'RFT1 Configuration': Remote file transfer-1 configuration
- iii) 'RFT2 Configuration': Remote file transfer-2 configuration

## 5.5.1 Day Log File Configuration:

Configuration of day log file is shown in figure 5.5.1 below.

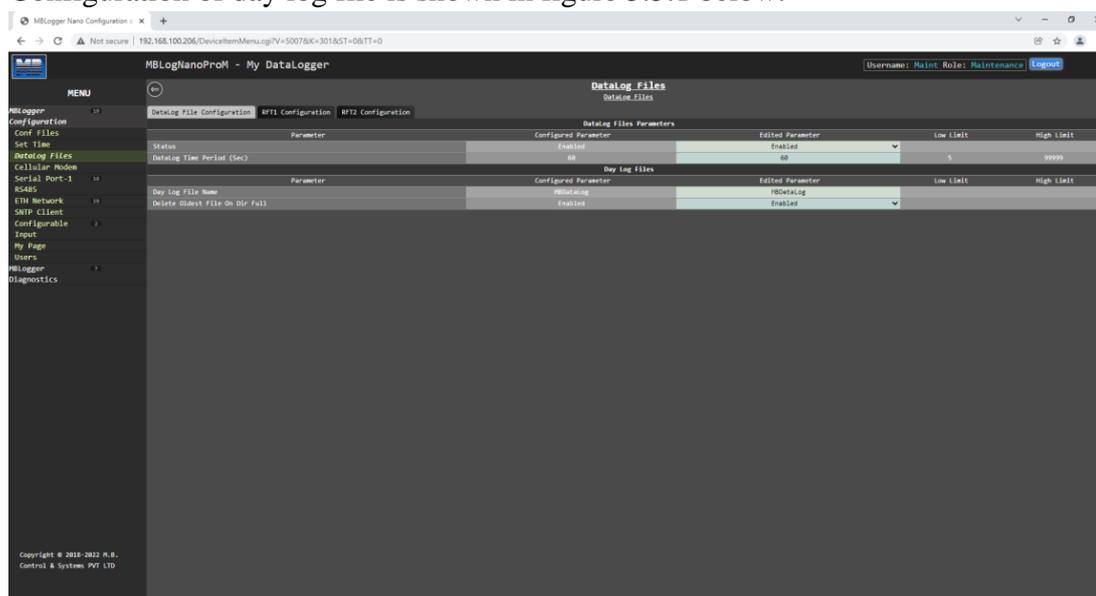


Figure-5.5.1: Day log file Configuration

Details of the parameters on the page are provided in table 5.5.1 below. For details on other parameters use hover feature of the webpage. Take cursor on the parameter object on the page and further information will be provided for the parameter.

Sr. No	Parameter	Description	Remarks
1	Status	Enable / Disable data log operation	If disabled, data log operation will be disabled
2	Data Log Time Period (sec)	Time period for logging data	
3	Day Log File Name	Provide required data log file name	Day data log files will be saved with this name suffixed by ‘_Day’. Time in ‘YYY_MM_DD_HH_MM’ format will be added to the file name. e.g., ‘MBDataLog_Day_2020_03_15_15_15’
4	Delete Oldest File on Directory Full	If the directory is full – oldest file is deleted so that new file can be added.	<b>Disabled:</b> Data logging will stop if the directory is full. <b>Enabled:</b> Data logging will continue after deleting the oldest file in the directory.

Table-6.5.1: Configuration – day data log file operation

## 5.5.2 Remote File Transfer Configuration:

Remote file transfer can be configured via tabs – ‘RFT1 Configuration’ and ‘RFT2 Configuration’. Configuration page is shown in figure 5.5.2 below.

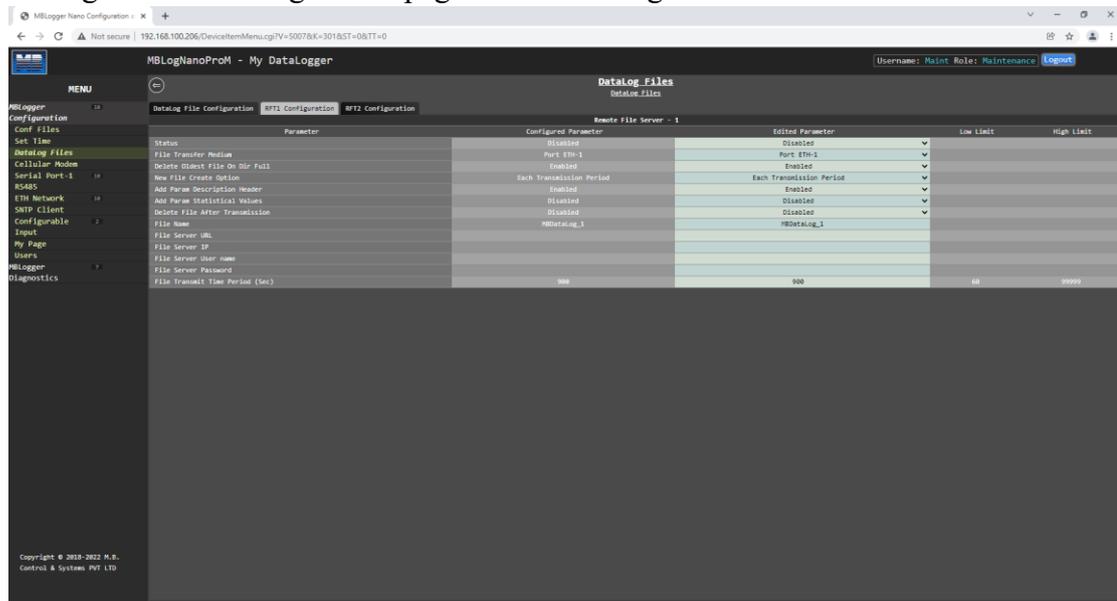


Table-6.5.2: Configuration – remote file transfer operation

Details on file parameters on the are provided in table 6.5.2.1 below.

Sr. No	Parameter	Description	Remarks
1	Status	Enabled / Disabled data log operation	If disabled, data log operation will be disabled
2	File Transfer Medium	Select Port ETH or Cellular Modem	Logged files will be transmitted via the selected medium. Note: If cellular modem is selected as medium and the modem operation fails – file transfer will be attempted via ETH port (if the port is connected and the gateway connection is OK).
3	Delete Oldest File on Directory Full	If the directory is full – oldest file is deleted so that new file can be added.	<b>Disabled:</b> Data logging will stop if the directory is full. <b>Enabled:</b> Data logging will continue after deleting the oldest file in the directory.
4	New File Create Option	Select from ‘Each Day’ or ‘Each Transmission Period’	<b>Each Day:</b> New data log file will be created as start of each day. <b>Each Transmission Period:</b> New data log file will be created at start of each file transmission time period.
5	Add Param	Enabled or Disabled	If Enabled, parameter

	Description Header		description header will be added to the file
6	Add Param Statistical Values	Enabled or Disabled	<b>Enabled:</b> Calculated statistical values – minimum, maximum, average, standard deviation, and integrated value shall be added to the log (as per parameter configuration). <b>Disabled:</b> Only parameter value shall be added to the log.
7	Delete File after Transmission	Enabled or Disabled	<b>Enabled:</b> Data log file shall be deleted after successful transmission. <b>Disabled:</b> Data log file will not be deleted after transmission.
8	File Name	Provide required data log file name	Data log files will be saved with this name. Time in ‘YYYY_MM_DD’ format will be added to the file name. eg. ‘MBDataLog_2020_03_15’
9	File Server URL	URL for the file server	Data logger shall resolve the URL to get the file server IP address.
10	File server IP	IP address for the file server	
11	File server Username	Username for the client	
12	File server Password	Password for the client	FTP client will use the configured username and password to connect to the file server.
13	File Transmit Time Period (sec)	File transmit time in seconds	Logged file will be transmitted after this time.

Table-5.5.2.1: Configuration – remote file transfer operation

**Notes:**

- i) If ‘Modem; is selected media for file transfer, and it fails, file transfer shall be tried via ETH port (if the link to configured gateway is OK).

Details for parameter descriptor header with statistical values are provided in table 5.5.2.2 below.

Sr. No	Column	Description	Remarks
1	Date	Date of logging	YYYY.MM.DD
2	Time	Time of logging	HH.MM.SS
3	Parameter	Parameter	=’0’ for bad quality

	Quality	Description_Qua	= '1' for good quality
4	Parameter Value	Parameter Description_Val. For sensors and IED connected to datalogger ports refer to table – 6.5.2.3.	Value in float
5	Parameter minimum Value	Parameter Description_Min	Minimum value in float
6	Parameter maximum Value	Parameter Description_Max	Maximum value in float
7	Parameter average Value	Parameter Description_Avg	Average value in float
8	Parameter standard deviation Value	Parameter Description_SD	Standard Deviation value in float. This value shall be provided if its calculation is enabled.
9	Parameter Integrated Value	Parameter Description_Int	Integrated value in float. This value shall be provided if its calculation is enabled.
10	Next parameter quality		

Table-5.5.2.2: Parameter descriptor header with statistical values

Details for parameter descriptor header without statistical values are provided in table 5.5.2.3 below.

Sr. No	Column	Description	Remarks
1	Date	Date of logging	YYYY.MM.DD
2	Time	Time of logging	HH.MM.SS
3	Parameter Value	Parameter Description_Val. For sensors and IED connected to datalogger ports refer to table – 6.5.2.3.	Value in float
4	Next parameter value		

Table-5.5.2.3: Parameter descriptor header without statistical values

Parameter description for sensors and IED connected to datalogger communication ports is provided in table 5.5.2.4 below.

Sr. No	Parameter	Header
1	Sensor / IED description	First ten characters of Sensor or IED description
2	Parameter description	First ten characters of parameters description
3	Parameter Attribute	_Qua, _Val, _Min, _Max, _Avg, _SD or _Int

Table-5.5.2.4: Parameter descriptor for sensor and IED connected to datalogger communication ports.

**Example:**

IED Description: Satec PM130EH  
 Parameter Description: Voltage V1  
 Parameter Attribute: Value

Header for the parameter: Satec PM13\_ Voltage V1\_Val

**5.6 Configure – Cellular Modem**

This option will be displayed only if Cellular Modem is installed.

Use microSIM with 4G service.

Left click on menu option ‘Cellular Modem Configuration’ to configure internal modem and GPS operation as shown in figure-5.6 below.

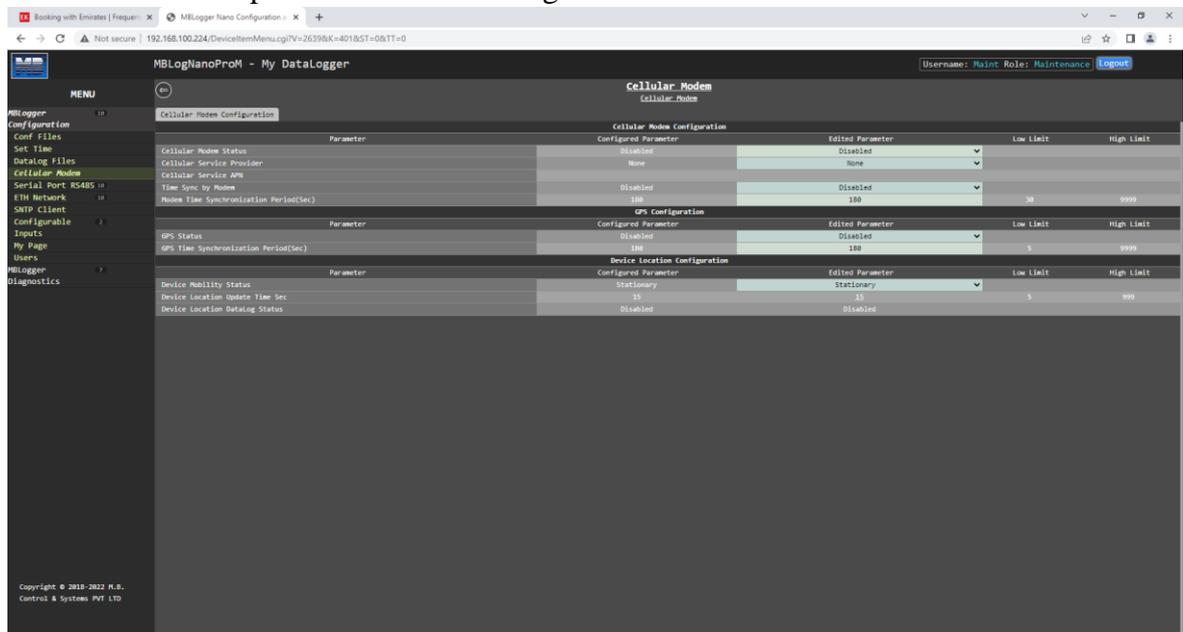


Figure-5.6: Configuration of internal cellular modem and GPS.

Configuration details of modem parameters on the page are provided in table 5.6.1 below.

Sr. No	Parameter	Description	Remarks
1	Cellular Service Provider	Select cellular service provider	Select the service provider from the dropdown list. If 'None' is selected, modem operation will be disabled.
2	Cellular service APN	APN for the service provider	APN will be auto configured based on the selected service provider.
3	Time Sync by Modem	Enable/ Disable	Device time shall be synchronised via network service provider.
4	Modem time Synchronisation Period (sec)	Time period for time synchronisation via modem	

Table-5.6.1: Configuration – datalogger modem

Configuration details for GPS configuration are provided in table 5.6.2 below.

Sr. No	Parameter	Description	Remarks
1	GPS Status	Enable/ Disable	GPS can be enabled only if modem is installed and enabled
2	GPS Time Synchronization Period (Sec)	APN for the service provider	APN will be auto configured based on the selected service provider.

Table-5.6.2: Configuration – GPS

GPS service can be used even without SIM installed in the modem.

Configuration details of Device Location parameters on the page are provided in table 5.6.3 below.

Sr. No	Parameter	Description	Remarks
1	Device Mobility Status	Stationary of Mobile	Select type of device installation
2	Device Location Update Time Period (Sec)	Set time-period for updating device location.	Should be enabled only for Mobile devices.
3	Device Location Data Log Status	Enable/ Disable	Enable if device location is to be logged.

Table-5.6.3: Configuration – Device location

## 5.7 Configure – Serial Port (RS485)

Serial port (RS485) can be used as MODBUS RTU Slave.

MODBUS slave devices can be connected to this port. See here configuration details for MODBUS slave devices.

Use low capacitance, twisted pair and shielded cable for connection of sensors and IED's to this port.

Left click on menu option 'Serial Port RS485' to configure this port as shown in figure-5.7 below.

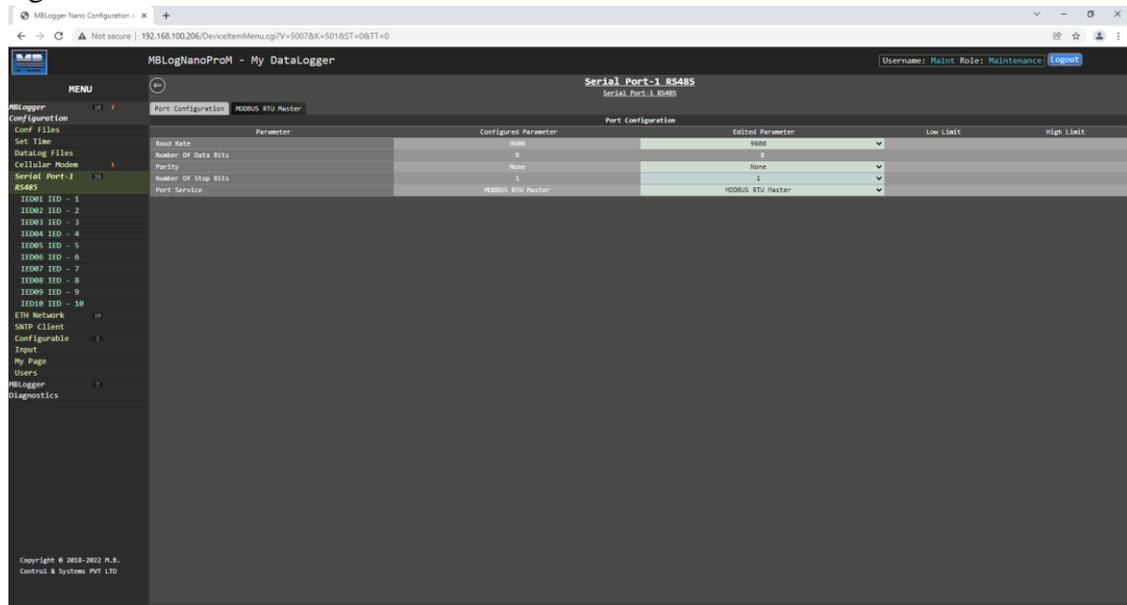


Figure-5.7: Configuration of serial port RS485.

Configuration details of communication parameters for serial port RS485 are provided in table 5.7 below.

Sr. No	Parameter	Description	Remarks
1	Port Service	Select service for the port: MODBUS master or MODBUS slave	Tab will be displayed as per the service selected on the port. MODBUS RTU Master or MODBUS RTU Slave. Configure the service parameters by selecting the service tab

Table-5.7: Configuration – serial port RS485

## 5.8 Configure – ETH Network

Left click on menu option ‘ETH Network’ to configure datalogger ETH network and its services as shown in figure-5.8 below.

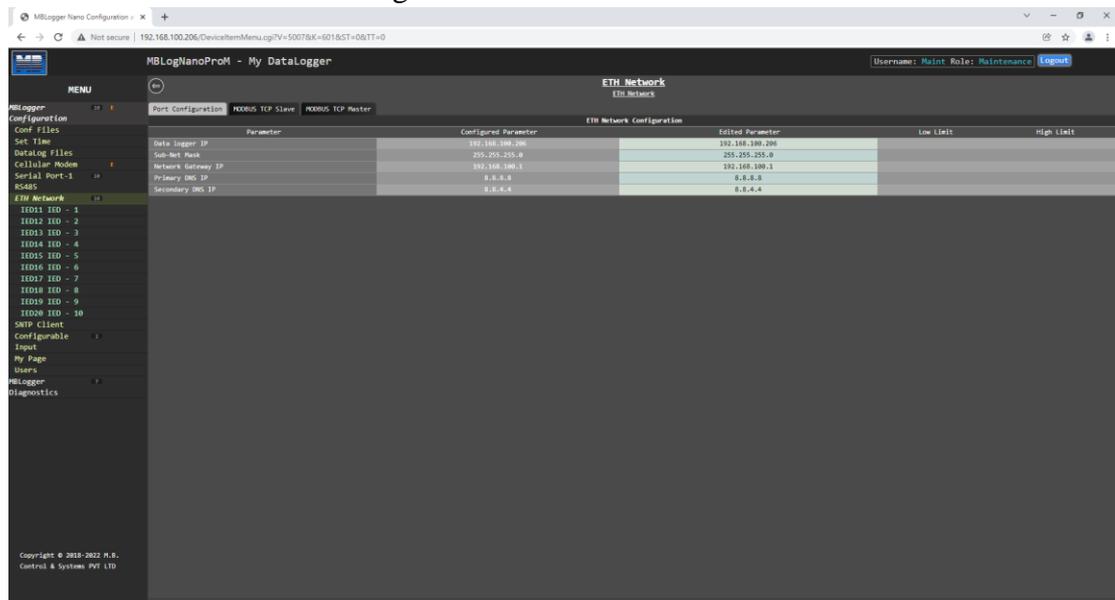


Figure-5.8: Configuration of datalogger ETH network.

Configuration details for ETH port are provided in table 5.8.1 below.

Sr. No	Parameter	Description	Remarks
a 1	Data Logger IP	Data logger IP	
b 2	Data Logger Subnet mask	Data Logger Subnet mask	
e - 3 6	Network Gateway IP	Network Gateway IP	This IP shall be used for internet access via ETH port
. 4	Primary DNS IP		Set primary DNS
8 5	Secondary DNS IP		Set secondary DNS

Table -5.8.1: Configuration – ETH Port parameters

Details for tabs for configuration of services on ETH port are provided in table 5.8.2 below.

Sr. No	Tab	Description	Remarks
1	MODBUS TCP Slave	Configure MODBUS TCP slave service	
2	MODBUS TCP Master	Configure MODBUS TCP Master service	

Table-5.8.2: Configuration – ETH port services

## 5.9 Configure – Sensors and IED on MODBUS Ports

Various sensors and IED can be interfaced to ports having MODBUS RTU Master (serial) or MODBUS TCP Master (ETH) services.

Extensive library (for sensors, inverters and MFM) has been provided in the MBLLogger to make their selection and configuration quite easy. This configuration can be completed in few steps.

Left click on menu option for the port to which the sensor or IED is to be added.

Menu option will display five IED's already added to the port.

Select the IED to configure by left click on the menu option.

Configure the selected IED by selecting the configuration tabs.

### 5.9.1 Tab – IED Communication

IED communication parameters can be configured by selecting the tab – ‘IED Communication’.

IED communication parameters are shown in figure-5.9.1 below.

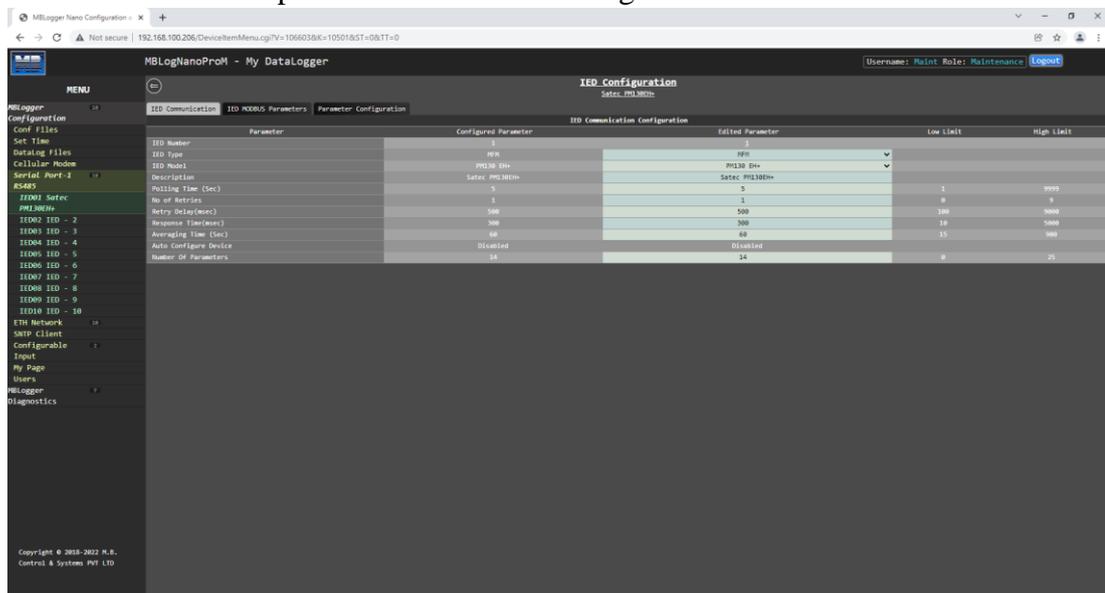


Figure-5.9.1: Configuration of IED communication parameters.

Configuration details IED communication parameters are provided in table 5.9.1 below.

Sr. No	Parameter	Description	Remarks
1	IED Type	Select IED type from the drop-down list provided.	The IED shall be disabled if ‘Input Not Used’ is selected. Select ‘Other IED’ none of the library selection is required.
2	IED Model	Select IED model number from drop-down list provided.	List of IED model numbers shall be provided based on the ‘IED Type’ selected above. For configuring custom IED, use option ‘Other IED’.
3	Averaging Time (sec)	Parameter value averaging time	Statistical calculations will be based on this time for the IED

			parameters. - ‘Minimum value’, ‘Maximum value’, ‘Average value’ and ‘Standard Deviation’.
4	Auto Configure Device	This feature is not available at present.	

Table-5.9.1: Configuration – IED communication parameters

### 5.9.2 Tab – IED MODBUS Parameters

IED MODBUS communication parameters can be configured by selecting the tab – ‘IED MODBUS Parameters’.

IED MODBUS parameters are shown in figure-5.9.2 below.

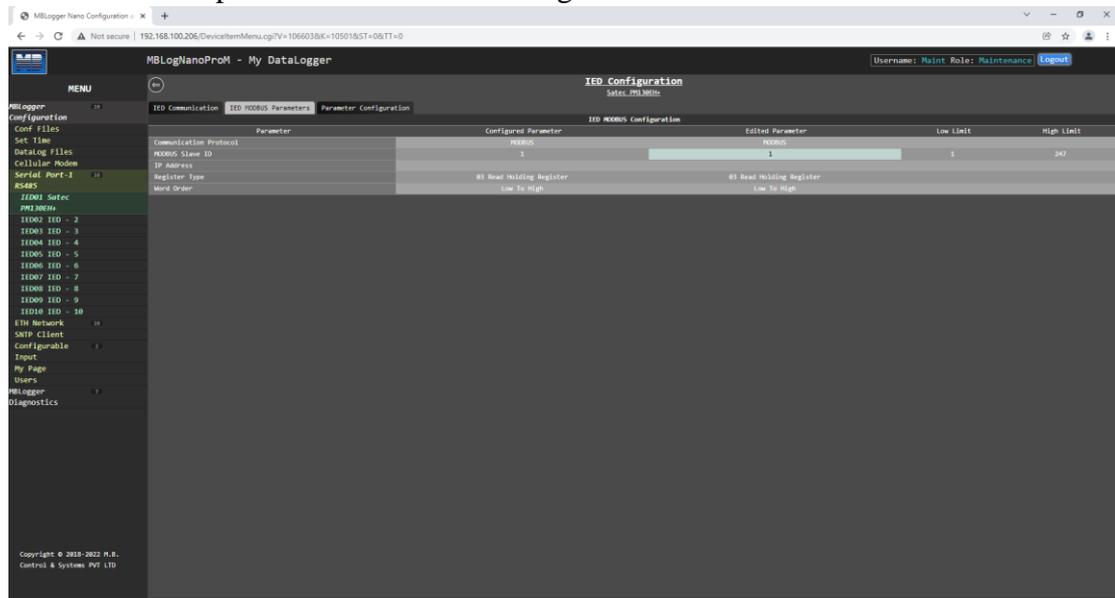


Figure-5.9.2: Configuration of IED MODBUS communication parameters.

Configuration details IED MODBUS parameters are provided in table 5.9.2 below.

Sr. No	Parameter	Description	Remarks
1	IP Address	Provide IED IP address	IP address needs to be configured only if the IED is interface to datalogger ETH port.

Table-5.9.2: Configuration – IED MODBUS parameters

### 5.9.3 Tab – IED Parameter Configuration

Parameters to be read from IED can be configured by selecting the tab – ‘Parameter Configuration’.

List of parameters to be read from the IED will be displayed.

For IED’s selected from the library, pre-configured parameters will be listed on this page.

Configuration details for IED parameters are shown in figure-5.9.3 below.

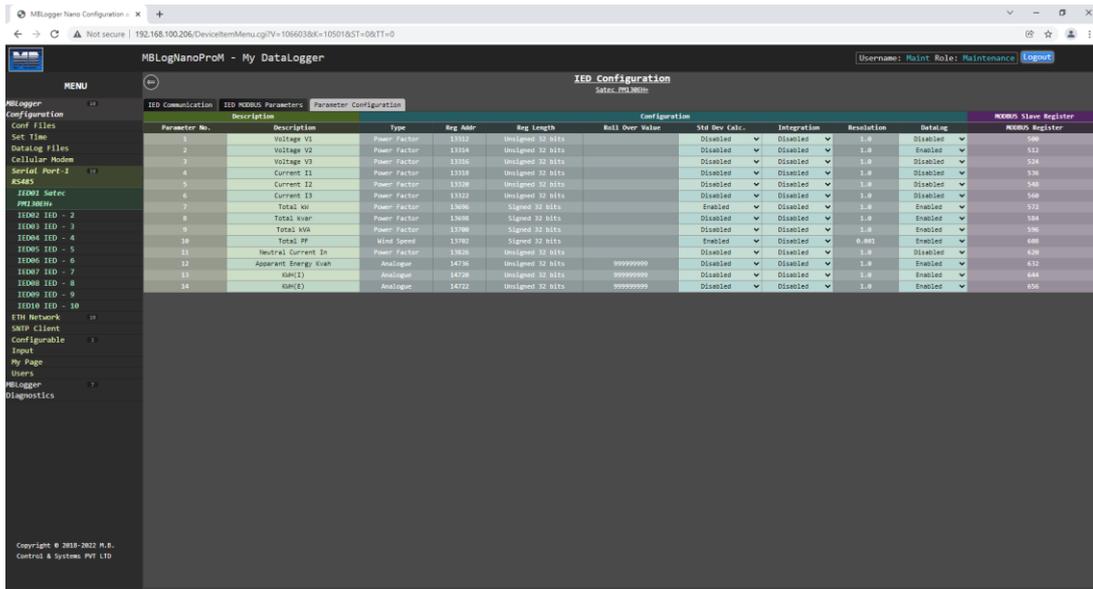


Figure-5.9.3: Configuration of IED read parameters.

Configuration details IED parameters are provided in table 5.9.3.1 below.

Sr. No	Parameter	Description	Remarks
1	Standard Deviation Calculation	Enable or Disable calculation of standard deviation for the parameter.	If enabled, this parameter attribute will be available for display and on datalogger MODBUS slave
2	Integration	Enable or Disable integration of the parameter.	Integration can be used to calculated totalised parameter from instantaneous parameter value. e.g. calculate solar radiation energy from solar irradiance
3	Data log	Enable or Disable logging of the parameter.	If enabled parameter will be logged the log files. Parameter will be logged with all its attributes – ‘Min Value’, ‘Average Vale’, ‘Max Value’, ‘Instantaneous Value’, ‘SD Value’ and ‘Integrated Value’
4	MODBUS Slave Register	MODBUS register address for the parameter for datalogger MODBUS slave service	External devices or SCADA can read value of the parameter and its attributed from this MODBUS slave register address.

Table-5.9.3.1: Configuration – IED read parameters

MODBUS Slave register (signed 32 bits) details for IED parameters are provided in table 5.9.3.2 below.

Sr. No	Datalogger MODBUS Slave Register	Parameter
1	MODBUS Slave Starting Register Address	Parameter Value
2	+2	Parameter minimum Value
3	+4	Parameter maximum Value
4	+6	Parameter average value
5	+8	Parameter standard deviation. This value will be available if it is enabled in configuration. Else this will be '0'.
6	+10	Parameter integrated value. This value will be available if it is enabled in configuration. Else this will be '0'.

Table-5.9.3.2: IED parameters – MODBUS Slave registers

## 5.10 Configure – SNTP Client

SNTP client can be used to synchronize internal clock of the datalogger. The client can be used to operate via datalogger network using only ETH port.

Up-to four NTP time servers can be configured. SNTP client will switch over to next time server if any server fails to respond.

Left click on menu option 'SNTP Client' for configuration as shown in figure-5.10 below.

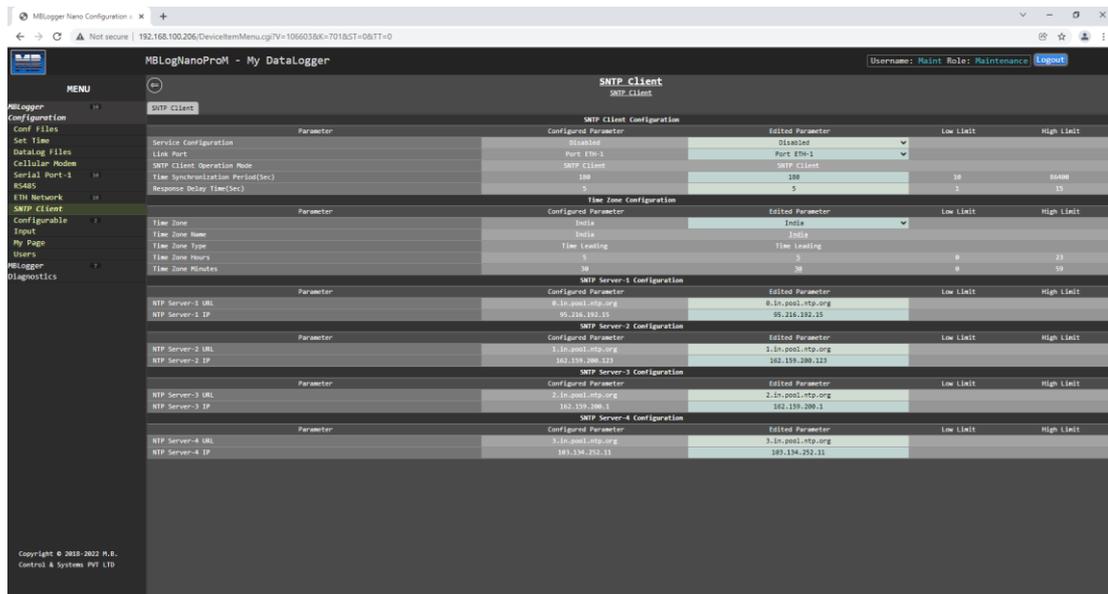


Figure-5.10: Configuration of SNTP client.

SNTP client will operate in 'Client Mode' only.

Configuration details of SNTP clients are provided in table 5.10 below.

Sr. No	Parameter	Description	Remarks
1	NTP Server IP and URL	Configure NTP server IP or URL. Either of the two can be configured.	SNTP client will get time from any of the configured and working NTP servers. URL will be resolved if DNS are configured.

Table-5.10: Configuration – SNTP Client

**Notes:**

- i) If SNTP client fails to get time via the configured media. It will try to change the media (if alternate media is available) and get time.

### 5.11 Configure – Configurable Inputs

The two configurable inputs can be configured individually at site as per application requirement.

These inputs can be configured as following input types:

- i) Digital Input
- ii) mA Input (4-20mA)
- iii) Voltage input (0-10VDC)
- iv) mV Input (0-100mV)

Procedure for configuration these two inputs is explained below.

Select the input to be configured by clicking on the menu option for the input as shown in figure 5.11 below.

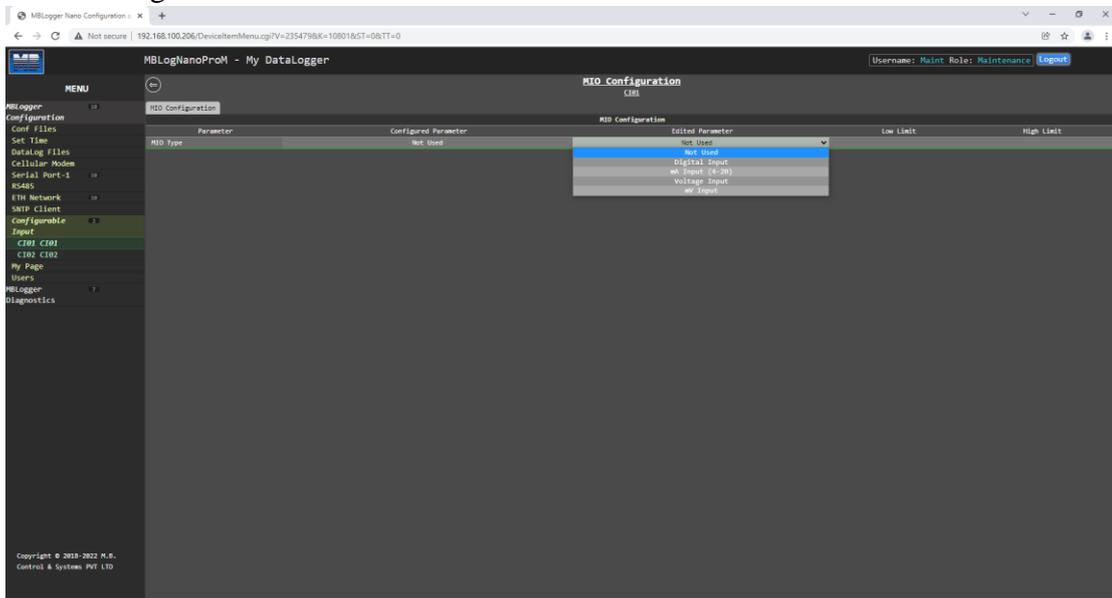


Figure-5.11: Configuration – configurable inputs.

Inputs not being used should be configured as ‘Not Used’.

### 5.11.1 Configurable Input – Digital Input

Select tab ‘MIO Configuration’ and select ‘Digital Input’ as input as shown in figure 5.11.1.1 below.

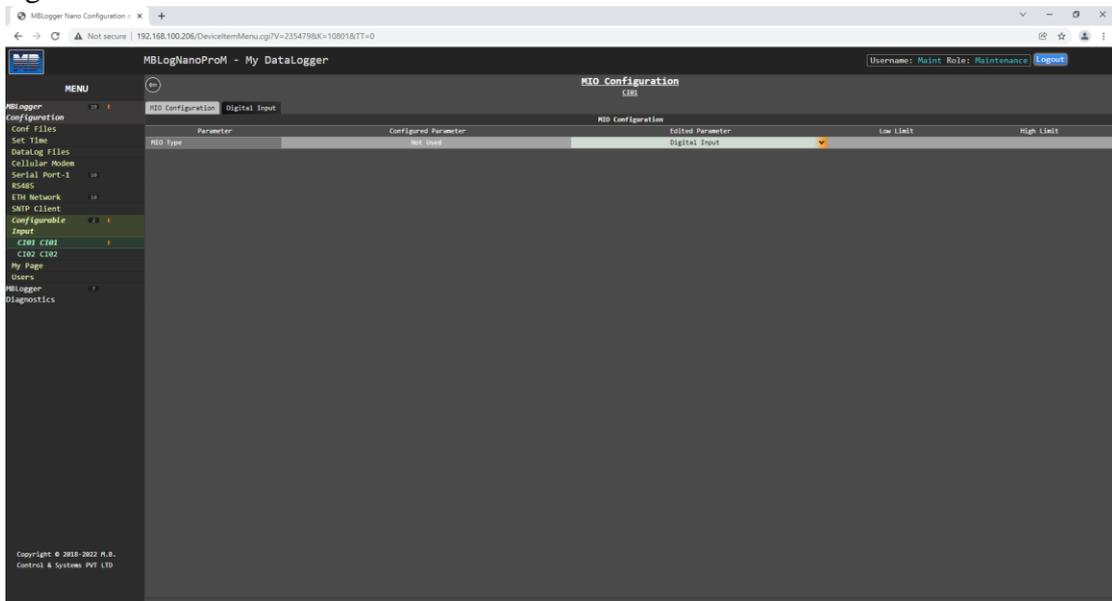


Figure-5.11.1.1: Configuration- Digital Input.

Select tab ‘Digital Input’ to configure digital input properties as shown in figure 5.11.1.2 below.

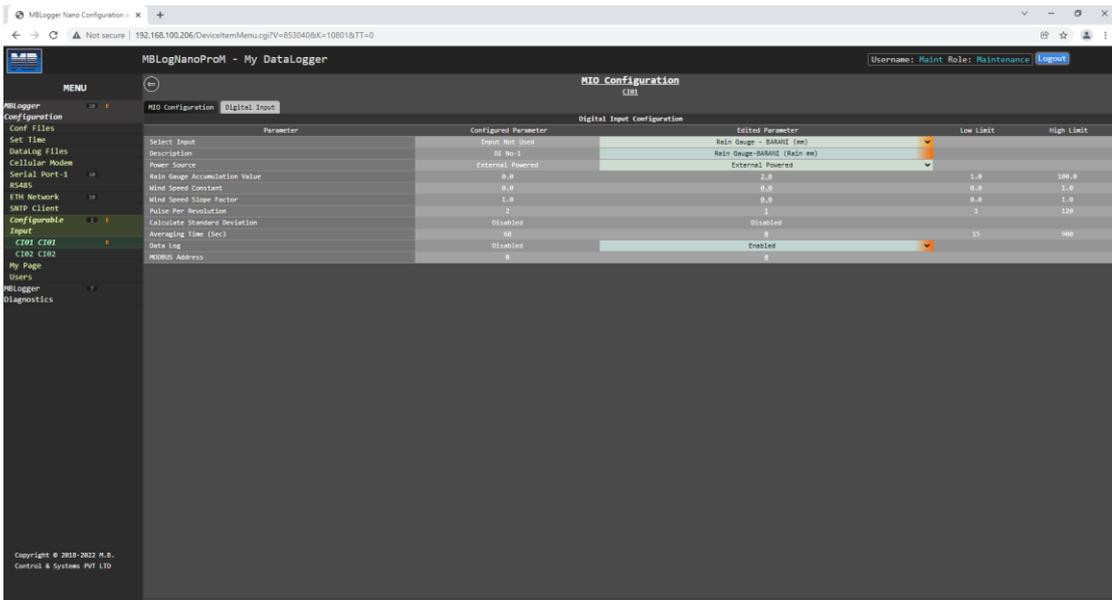


Figure-5.11.1.2: Configuration- Digital Input properties.

Configuration details of digital inputs are provided in table 5.11.1.1 below.

Sr. No	Parameter	Description	Remarks
1	Select Input	Select digital input sensor connected to the input.	Select from library of sensors provided in the dropdown list. Select ‘Input Not Used’ if the input is not used.

2	Description	Description of input	User editable.
3	Power Source	Select power excitation for the digital sensor input.	Select from: i) 'External Powered': if the sensor is externally powered. ii) 'Loop Powered': If the sensor is loop powered. Refer to connection diagrams provided.
4	Rain Gauge Accumulated Value	Rain gauge constant.	This field will be enabled if 'Rain Gauge' sensor input is selected.
5	Wind Speed Constant	Wind speed measurement constants	These fields will be enabled if 'Wind Speed' sensor input is selected.
6	Wind Speed Slope Factor		
7	Pulse Per Revolution	Pulse per revolution for calculation of speed (RPM)	These fields will be enabled if 'Speed RPM' sensor input is selected.
8	Calculate Standard Deviation	Enabled or Disabled.	These fields will be enabled if this calculation is allowed for the selected input sensor.
9	Averaging Time	Input signal averaging time	
10	Data Log	Enabled or Disabled	Enable if datalogging is required
11	MODBUS Address	MODBUS Slave address for the sensor input values	

Table-5.11.1.1: Configuration – Digital input parameters

MODBUS Slave register (32 bits float) details for digital inputs is provided in table 5.11.1.2 below.

Sr. No	Datalogger MODBUS Slave Register	Parameter	Length
1	MODBUS Slave Starting Register Address	Digital Input Status for channels configured as status input. Input parameter value (eg. wind speed or Rain Gauge) as per input configuration.	32 bits float
2	+2	Status change time (epoch second)	32 bits float
3	+4	Input value minimum value	32 bits float
4	+6	Input value maximum value	32 bits float
5	+8	Input value average value	32 bits float
6	+10	Input value standard deviation	32 bits float

Table-5.11.1.2: Digital input– MODBUS slave registers

### 5.11.2 Configurable Input – Analog Input (4-20mA)

Select tab ‘MIO Configuration’ and select ‘mA Input (4-20)’ as input as shown in figure 5.11.2.1 below.

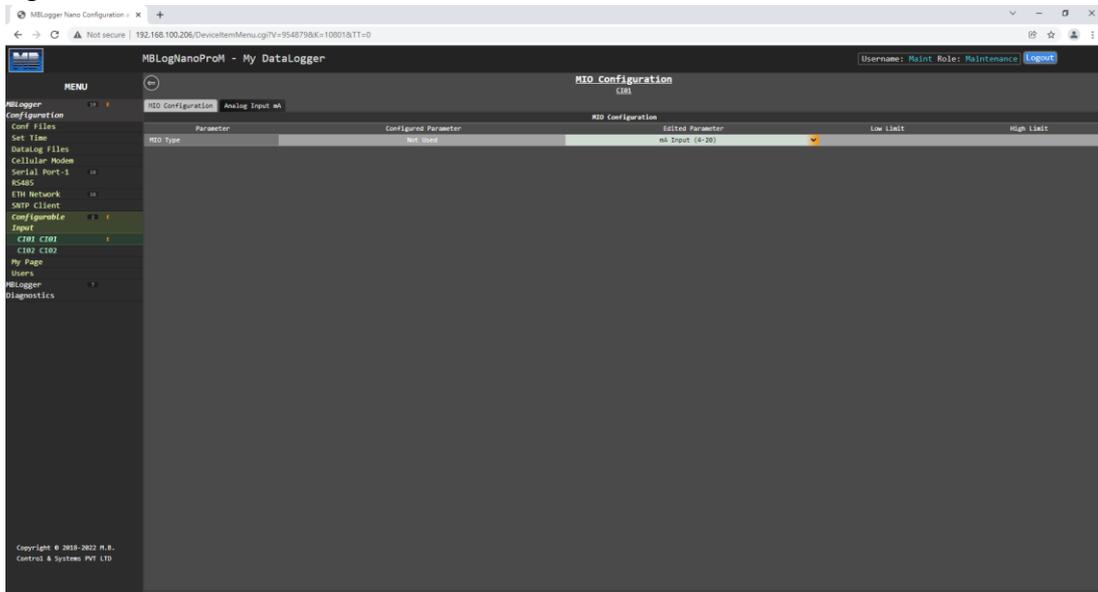


Figure-5.11.2.1: Configuration- mA Input (4-20).

Select tab ‘Analog Input mA’ to configure the input properties as shown in figure 5.11.2.2 below.

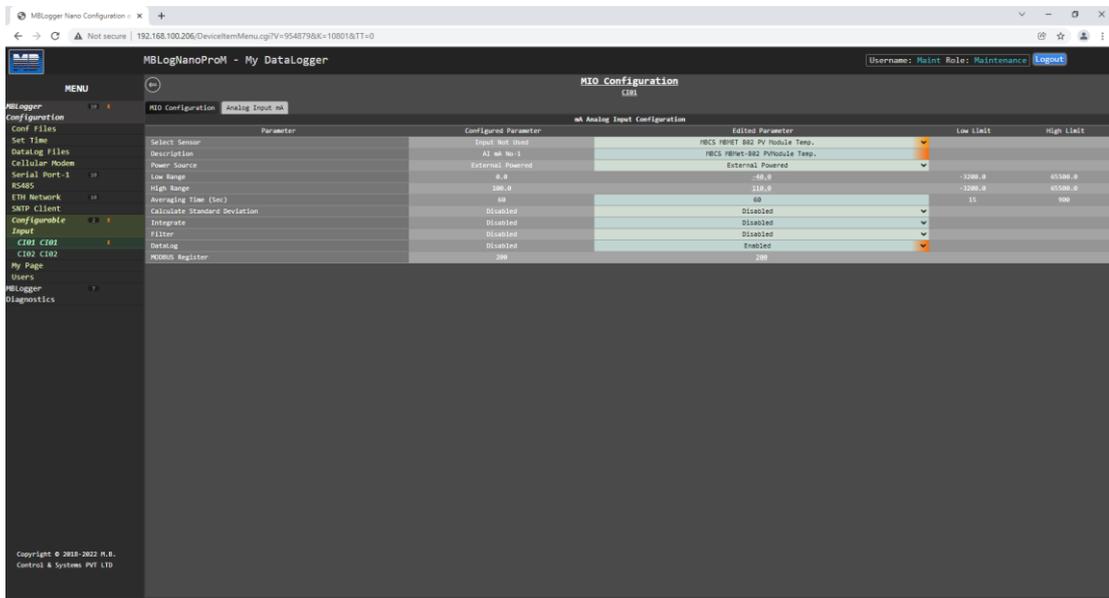


Figure-5.11.2.2: Configuration- mA Input (4-20) input properties.

Configuration details of mA Input are provided in table 5.11.2.1 below.

Sr. No	Parameter	Description	Remarks
1	Select Sensor	Select sensor connected to the input.	Select from library of sensors provided in the dropdown list. Select ‘Input Not Used’ if the

			input is not used.
2	Description	Description of input	User editable.
3	Power Source	Select power excitation for the digital sensor input.	Select from: iii) 'External Powered': if the sensor is externally powered. iv) 'Loop Powered': If the sensor is loop powered. Refer to connection diagrams provided.
4	Low Range	Input signal low range	Input signal calibration range.
5	High Range	Input signal high range	
6	Averaging Time	Input signal averaging time	
7	Calculate Standard Deviation	Enabled or Disabled.	These fields will be enabled if this calculation is allowed for the selected input sensor.
8	Integrate	Enabled or Disabled.	These fields will be enabled if this calculation is allowed for the selected input type.
9	Filter	Enabled or Disabled	
10	Data Log	Enabled or Disabled	Enable if datalogging is required
11	MODBUS Address	MODBUS Slave address for the sensor input values	

Table-5.11.2.1: Configuration – mA Input (4-20mA) input parameters

MODBUS Slave register (32 bits float) details for mA Input is provided in table 5.11.2.2 below.

Sr. No	Datalogger MODBUS Slave Register	Parameter	Length
1	MODBUS Slave Starting Register Address	Parameter Value	32 bits float
2	+2	Parameter minimum Value	32 bits float
3	+4	Parameter maximum Value	32 bits float
4	+6	Parameter average value	32 bits float
5	+8	Parameter standard deviation. This value will be available if it is enabled in configuration. Else this will be '0'.	32 bits float
6	+10	Parameter integrated value. This value will be available if it is enabled in configuration. Else this will be '0'.	32 bits float

Table-5.11.2.2: Configuration – mA Input (4-20mA) – MODBUS slave registers

### 5.11.3 Configurable Input – Voltage Input (0-10V)

Select tab ‘MIO Configuration’ and select ‘Voltage Input’ as input as shown in figure 5.11.3.1 below.

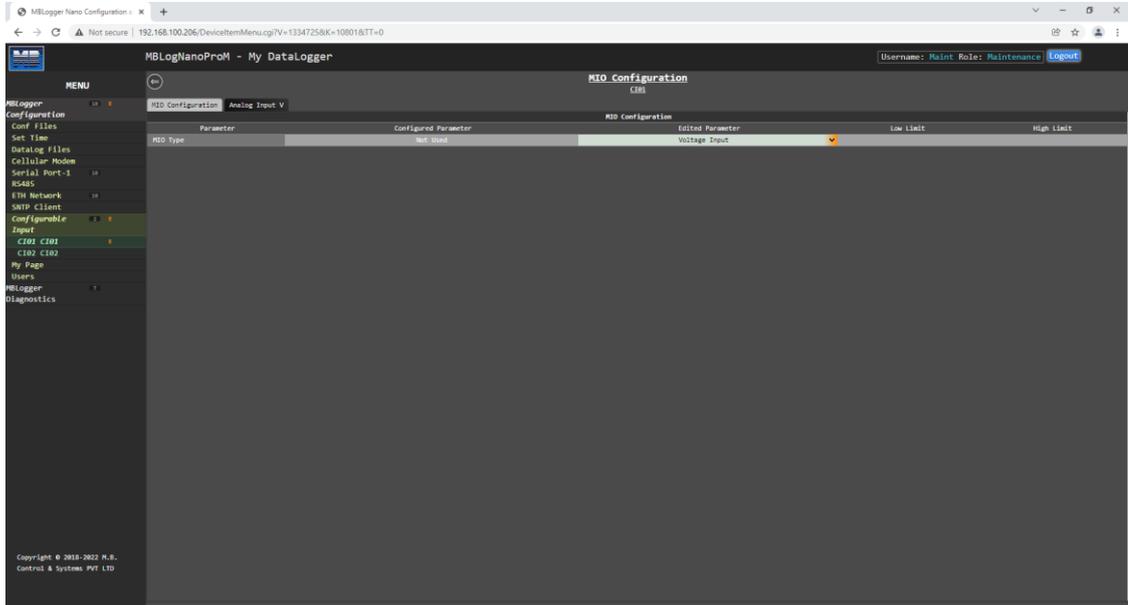


Figure-5.11.3.1: Configuration- Voltage Input

Select tab ‘Analog Input V’ to configure the input properties as shown in figure 5.11.3.2 below.

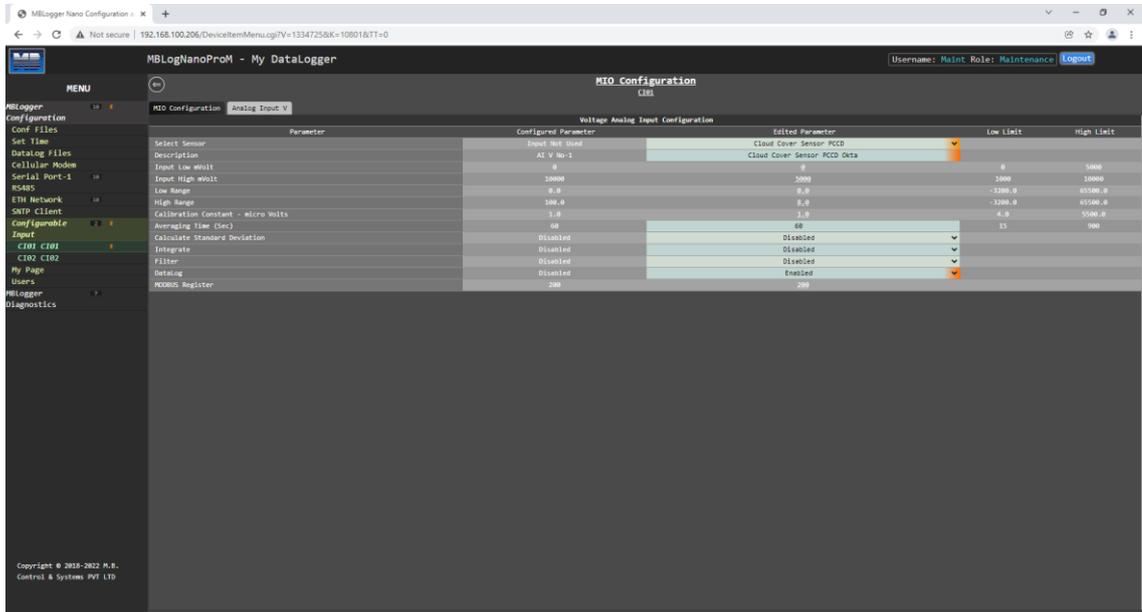


Figure-5.11.3.2: Configuration- Voltage Input properties.

Configuration details of voltage inputs are provided in table 5.11.3.1 below.

Sr. No	Parameter	Description	Remarks
1	Select Sensor	Select sensor connected to the input.	Select from library of sensors provided in the dropdown list. Select 'Input Not Used' if the input is not used.
2	Description	Description of input	User editable.
3	Input Low mV	Input signal low value in mV	Input signal value range in mV. Parameter value shall be calculated for this input range.
4	Input High mV	Input signal high value in mV	
5	Low Range	Input signal low range	Input signal calibration range.
6	High Range	Input signal high range	
7	Averaging Time (sec)	Input signal averaging time	Averaging time in seconds
8	Calculate Standard Deviation	Enabled or Disabled.	These fields will be enabled if this calculation is allowed for the selected input type.
9	Integrate	Enabled or Disabled.	These fields will be enabled if this calculation is allowed for the selected input type.
10	Filter	Enabled or Disabled	
11	Data Log	Enabled or Disabled	Enable if datalogging is required
12	MODBUS Address	MODBUS Slave address for the sensor input values	

Table-5.11.3.1: Configuration – Voltage Input (0-10V) input parameters

MODBUS Slave register (32 bits float) details for voltage input channels is provided in table 5.11.3.2 below.

Sr. No	Datalogger MODBUS Slave Register	Parameter	Length
1	MODBUS Slave Starting Register Address	Parameter Value	32 bits float
2	+2	Parameter minimum Value	32 bits float
3	+4	Parameter maximum Value	32 bits float
4	+6	Parameter average value	32 bits float
5	+8	Parameter standard deviation. This value will be available if it is enabled in configuration. Else this will be '0'.	32 bits float
6	+10	Parameter integrated value. This value will be available if it	32 bits float

	is enabled in configuration. Else this will be '0'.	
--	--	--

Table-5.11.3.2: Configuration – Voltage Input (0-10V) – MODBUS slave registers

#### 5.11.4 Configurable Input – mV Input (0-100mV)

Select tab 'MIO Configuration' and select 'mV Input' as input as shown in figure 5.11.4.1 below.

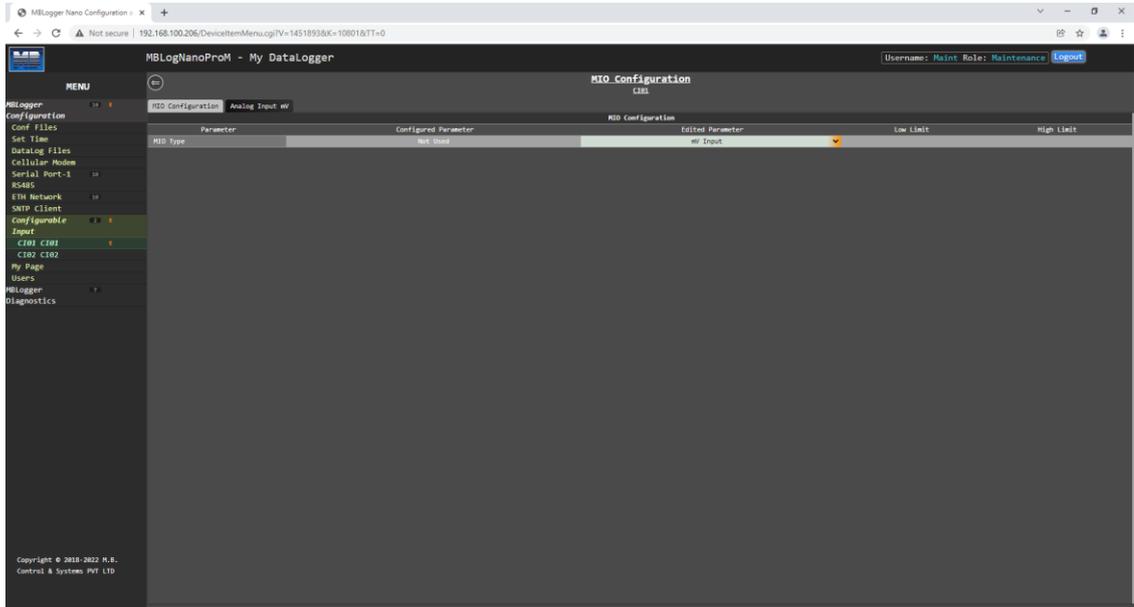


Figure-5.11.4.1: Configuration- mV Input

Select tab 'Analog Input mV' to configure the input properties as shown in figure 5.11.4.2 below.

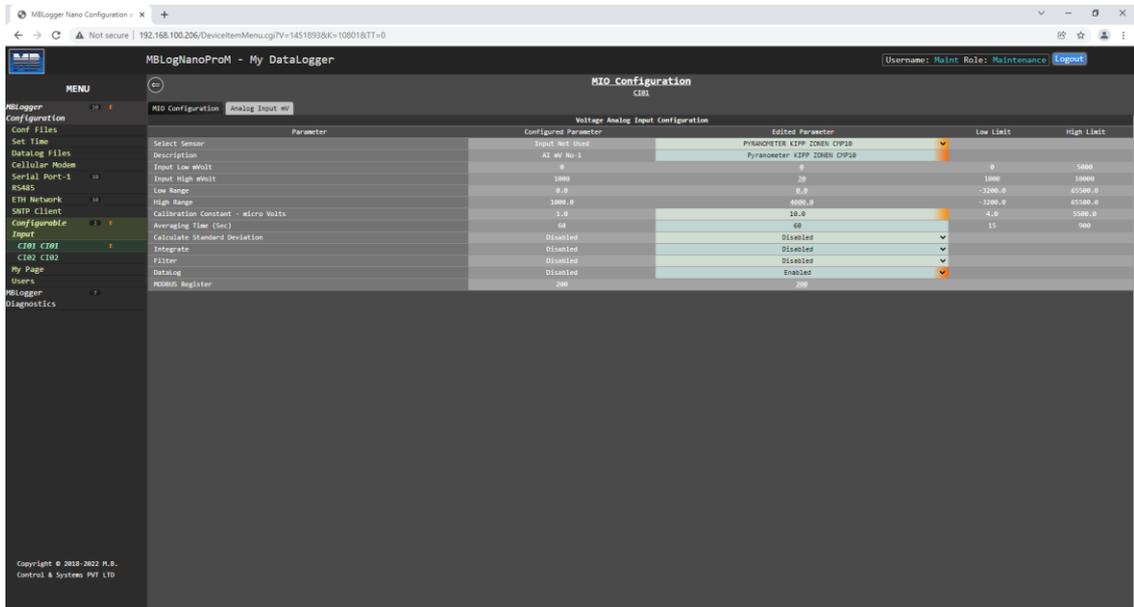


Figure-5.11.4.2: Configuration- mV Input properties.

Configuration details of mV inputs are provided in table 5.11.4.1 below.

Sr. No	Parameter	Description	Remarks
1	Select Sensor	Select sensor connected to the input.	Select from library of sensors provided in the dropdown list. Select 'Input Not Used' if the input is not used.
2	Description	Description of input	User editable.
3	Input Low mV	Input signal low value in mV	Input signal value range in mV. Parameter value shall be calculated for this input range.
4	Input High mV	Input signal high value in mV	
5	Low Range	Input signal low range	Input signal calibration range.
6	High Range	Input signal high range	
7	Calibration Constant – micro volts	Calibration constant for pyranometers with micro- volts output	These fields will be enabled if this calculation is allowed for the selected input type.
8	Averaging Time (sec)	Input signal averaging time	Averaging time in seconds
9	Calculate Standard Deviation	Enabled or Disabled.	These fields will be enabled if this calculation is allowed for the selected input sensor.
10	Integrate	Enabled or Disabled.	These fields will be enabled if this calculation is allowed for the selected input type.
11	Filter	Enabled or Disabled	
12	Data Log	Enabled or Disabled	Enable if datalogging is required
13	MODBUS Address	MODBUS Slave address for the sensor input values	

Table-5.11.4.1: Configuration – Voltage Input (0-100 mV) input parameters

MODBUS Slave register (32 bits float) details for mV input channels is provided in table 5.11.4.2 below.

Sr. No	Datalogger MODBUS Slave Register	Parameter	Length
1	MODBUS Slave Starting Register Address	Parameter Value	32 bits float
2	+2	Parameter minimum Value	32 bits float
3	+4	Parameter maximum Value	32 bits float
4	+6	Parameter average value	32 bits float
5	+8	Parameter standard deviation. This value will be available if it	32 bits float

		is enabled in configuration. Else this will be '0'.	
6	+10	Parameter integrated value. This value will be available if it is enabled in configuration. Else this will be '0'.	32 bits float

Table-5.11.4.2: Configuration – mV Input (0-100mV) – MODBUS slave registers

## 5.12 Plant Parameters – Special Function

Special functions are added to datalogger to enhance its operational capability. These special functions should be added while the datalogger is purchased.

This special function adds following calculated parameters to the datalogger:

- i) Sunshine duration (requires installation of at least one pyranometer).
- ii) Sunrise and sun set time (requires access to internet via datalogger modem or ETH port).
- iii) Sunrise and set civil time.
- iv) Day duration
- v) Solar noon time
- vi) Day – solar Energy
- vii) Day – rain measurement

Left click on menu option 'Plant Parameters' to configure these parameter as shown in figure-5.12 below. This option will be available only if this special function has been added to the datalogger.

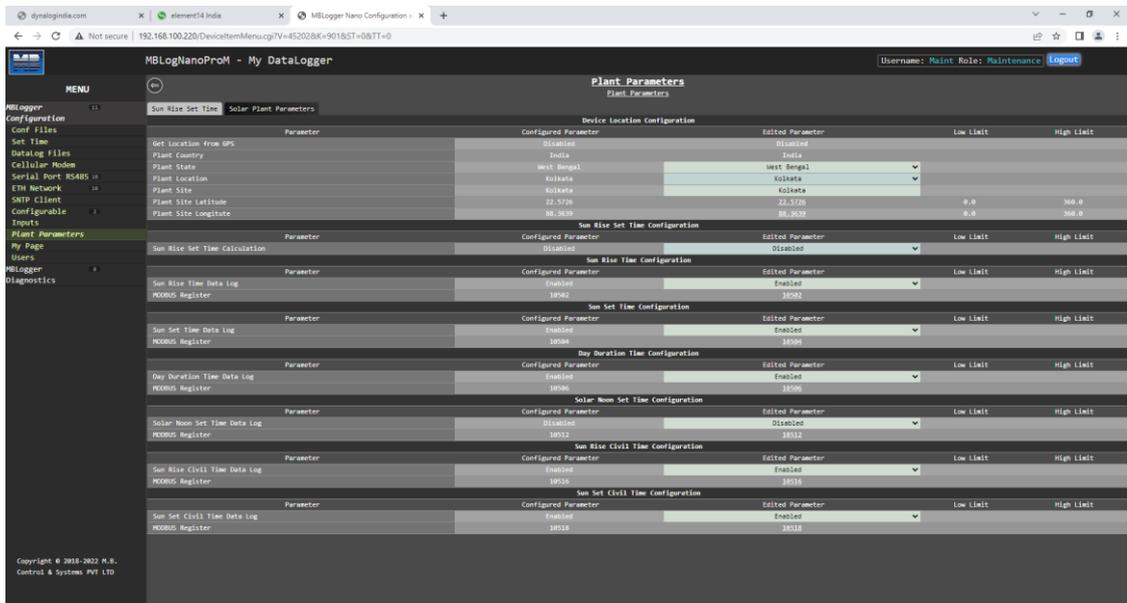


Figure-5.12: Configuration of Plant Parameters (special function).

### 5.12.1 Device Location

Select tab ‘Sun Rise Set Time’ to configure location of the device as shown in figure-5.12.1 below.

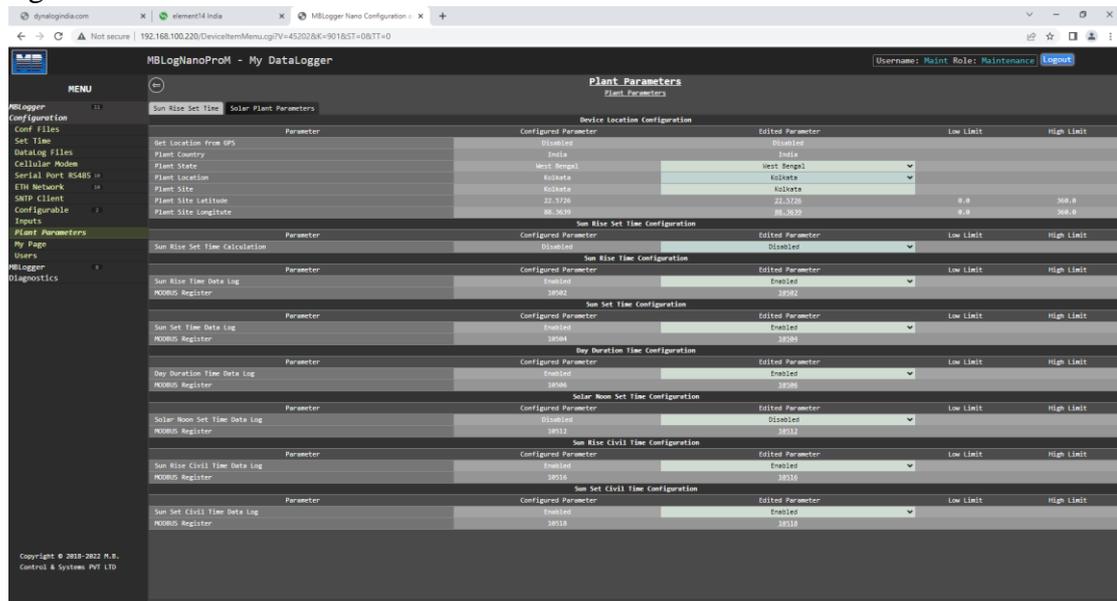


Figure-5.12.1: Configure- device location.

Configuration details for device location are provided in table 5.12.1 below.

Sr. No	Parameter	Description	Remarks
1	Get Location from GPS	Enable or disable	If enabled, device location will be obtained via GPS
2	Plant Country	Set plant country	Only India is allowed
3	Plant State	Select plant state	Disabled if GPS location is enabled.
4	Plant Location	Select / set plant location city	
5	Plant Site	Set plant site name	
6	Plant Site Latitude	Plant longitude	
7	Plant Site longitude	Plant Latitude	

Table-5.12.1: Device location parameters

### 5.12.2 Sun Rise Set Time Configuration

Configuration details for sun rise and set time parameter is provided in table 5.12.2 below.

Sr. No	Parameter	Description	Remarks
1	Calculate Sun Rise Set time	Enable or disable	

Table-5.12.2: Sun rise and set time calculation configuration

### 5.12.3 Sun Rise Time Configuration

Configuration details for sun rise time parameter is provided in table 5.12.3 below.

Sr. No	Parameter	Description	Remarks
1	Sun Rise Time Data log	Enable or disable	

Table-5.12.3: Sun rise time configuration

### 5.12.4 Sun Set Time Configuration

Configuration details for sun set time parameter is provided in table 5.12.4 below.

Sr. No	Parameter	Description	Remarks
1	Sun Set Time Data log	Enable or disable	

Table-5.12.4: Sun set time configuration

### 5.12.5 Day Duration Time Configuration

Configuration details for day duration time parameter is provided in table 5.12.5 below.

Sr. No	Parameter	Description	Remarks
1	Day Duration Time Data log	Enable or disable	

Table-5.12.5: Day duration time configuration

### 5.12.6 Solar Noon Time Configuration

Configuration details for solar noon time parameter is provided in table 5.12.6 below.

Sr. No	Parameter	Description	Remarks
1	Solar Noon Time Data log	Enable or disable	

Table-5.12.6: Solar noon time configuration

### 5.12.7 Sun Rise Civil Time Configuration

Configuration details for sun rise civil time parameter is provided in table 5.12.7 below.

Sr. No	Parameter	Description	Remarks
1	Sun Rise Time Data log	Enable or disable	

Table-5.12.7: Sunrise civil time configuration

### 5.12.8 Sun Set Civil Time Configuration

Configuration details for sun set civil time parameter is provided in table 5.12.8 below.

Sr. No	Parameter	Description	Remarks
1	Sun Set Time Data log	Enable or disable	

Table-5.12.8: Sun set civil time configuration

### 5.12.9 Sunshine Duration

Select tab ‘Solar Plant Parameters’ to configure its parameters as shown in figure-5.12.9 below.

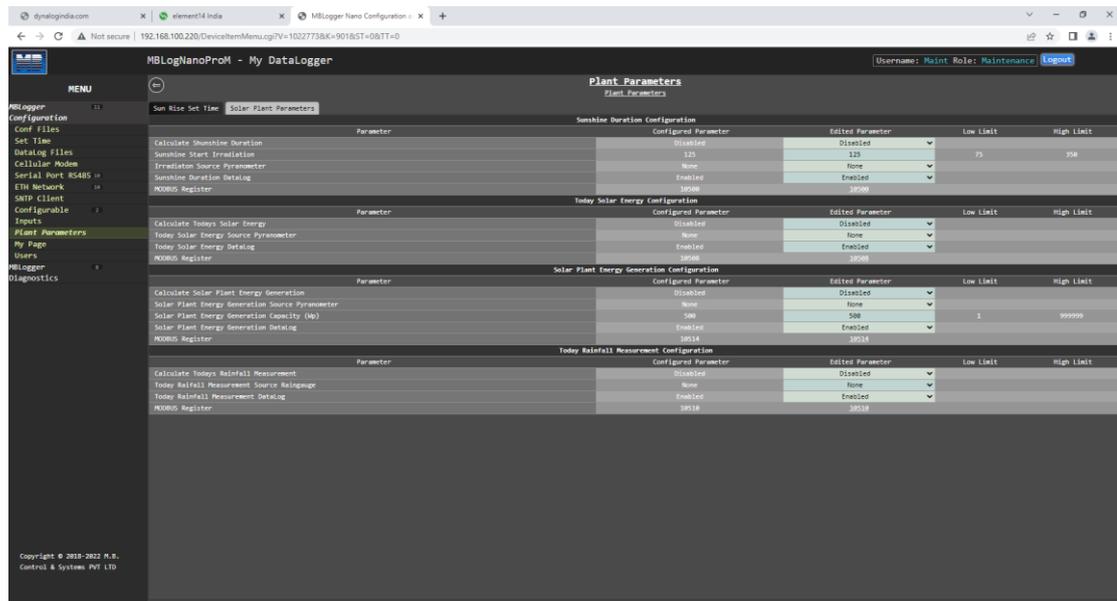


Figure-5.12.9: Configure Sunshine duration parameters.

Configuration details for sunshine duration parameters are provided in table 5.12.9 below.

Sr. No	Parameter	Description	Remarks
1	Calculate Sunshine Duration	Enable or disable	Select enable to calculate sunshine duration.
2	Sunshine start irradiation	Limit of solar irradiation. If the irradiation is more than this limit, it will be assumed that sunshine is present.	
3	Irradiation source Pyranometer	Select from list of pyranometers installed and interfaced with the datalogger.	Sunshine duration will not be calculated if no pyranometer is installed or not selected.
4	Sunshine Duration data log	Enable or disable to log this parameter	
3	MODBUS Register	MODBUS register address is provided for external device or SCADA to read value of the parameter.	All parameter values are provided as 32 bits float register.

Table-5.12.9: Sunshine duration parameters configuration

### 5.12.10 Today Solar Energy

Configuration details for day solar energy parameters are provided in table 5.12.10 below.

Sr. No	Parameter	Description	Remarks
1	Calculate Day Solar Energy	Enable or disable	Select enable to calculate day solar energy (W/m2).
2	Today Solar Energy Source Pyranometer	Select from list of pyranometers installed and interfaced with the datalogger.	Day solar energy will not be calculated if no pyranometer is installed or not selected.
4	Today Solar Energy Data Log	Enable or disable to log this parameter	
3	MODBUS Register	MODBUS register address is provided for external device or SCADA to read value of the parameter.	All parameter values are provided as 32 bits float register.

Table-5.12.10: Day Solar Energy parameters configuration

### 5.12.11 Solar Plant Energy Generation

Total solar plant energy generated is calculated based plant capacity and solar energy received.

Configuration details for day plant solar energy calculation parameters are provided in table 5.12.11 below.

Sr. No	Parameter	Description	Remarks
1	Calculate Solar Plant Energy	Enable or disable	Select enable to calculate plant solar energy (WH).
2	Solar Plant Energy Generation Source Pyranometer	Select from list of pyranometers installed and interfaced with the datalogger.	Plant solar energy will not be calculated if no pyranometer is installed or not selected.
3	Solar Plant Generation Capacity (Wp)	Enter solar plant capacity (Wp).	Plant solar energy will be calculated based on plant generation capacity and solar irradiation measurement received from selected pyranometer.
4	Plant Solar Energy Generation Data Log	Enable or disable to log this parameter	
5	MODBUS Register	MODBUS register address is provided for	All parameter values are provided as 32 bits float

		external device or SCADA to read value of the parameter.	register.
--	--	--	-----------

Table-5.12.11: Plant Solar Energy Calculation parameters configuration

### 5.12.12 Day Rain Measurement

Configuration details for day rain measurement parameters are provided in table 5.12.12 below.

Sr. No	Parameter	Description	Remarks
1	Calculate Day Rain Measurement	Enable or disable	Select enable to calculate day rain (mm).
2	Today Rain Measurement Source Rain Gauge	Select from list of rain gauges installed and interfaced with the datalogger.	Day rain will not be calculated if no rain gauge is installed or not selected.
4	Today Rain Measurement Data Log	Enable or disable to log this parameter	
3	MODBUS Register	MODBUS register address is provided for external device or SCADA to read value of the parameter.	All parameter values are provided as 32 bits float register.

Table-5.12.12: Day Rain Measurement parameters configuration

### 5.12.13 Albedo Meter

Up-to four albedo meters can be configured.

Select tab 'Albedo Meter' to configure albedo meter parameters as shown in figure-5.12.13 below.

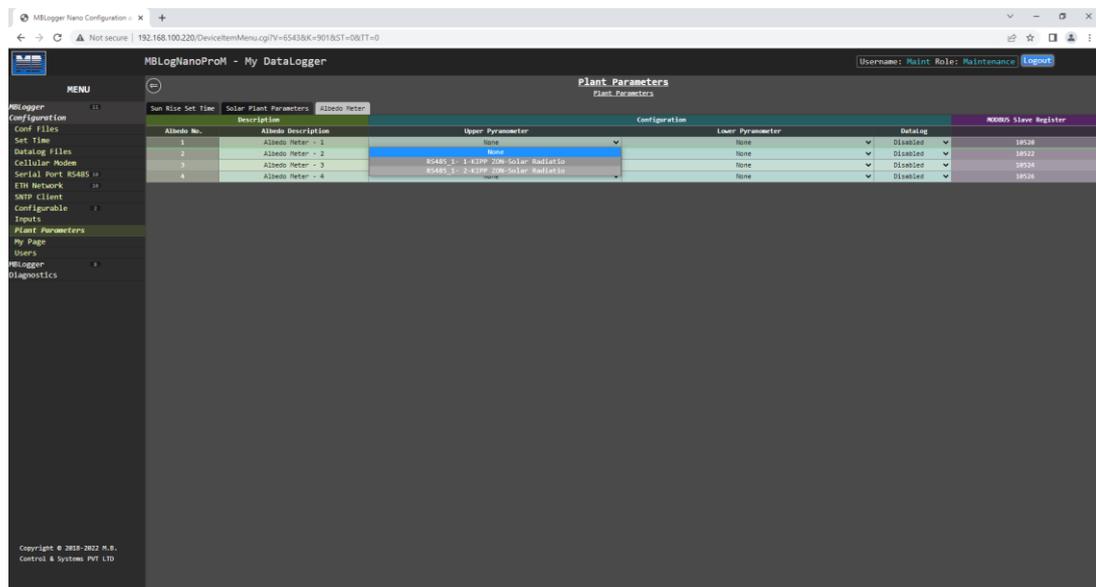


Figure-5.12.13: Albedo meter configuration

Configuration details for albedo meter parameters are provided in table 5.12.13 below.

Sr. No	Parameter	Description	Remarks
1	Albedometer Description	Description of the albedometer	
2	Upper Pyranometer	Select from the from down list of pyranometers installed	Albedo ratio shall be calculated based on readings from these two selected pyranometers.
3	Lower Pyranometer	Select from the from down list of pyranometers installed	

Table-5.12.13: Albedo Meter configuration

### 5.13 MyPage Parameters

This unique feature allows user to configure required parameters of interest on one page for viewing on webserver and OLED. Maximum of 24 parameters can be configured. These parameters can also be accessed on MODBUS Slave port in sequential register addresses.

Left click on menu option ‘MyPage’ to configure analog input channels as shown in figure-5.13 below.

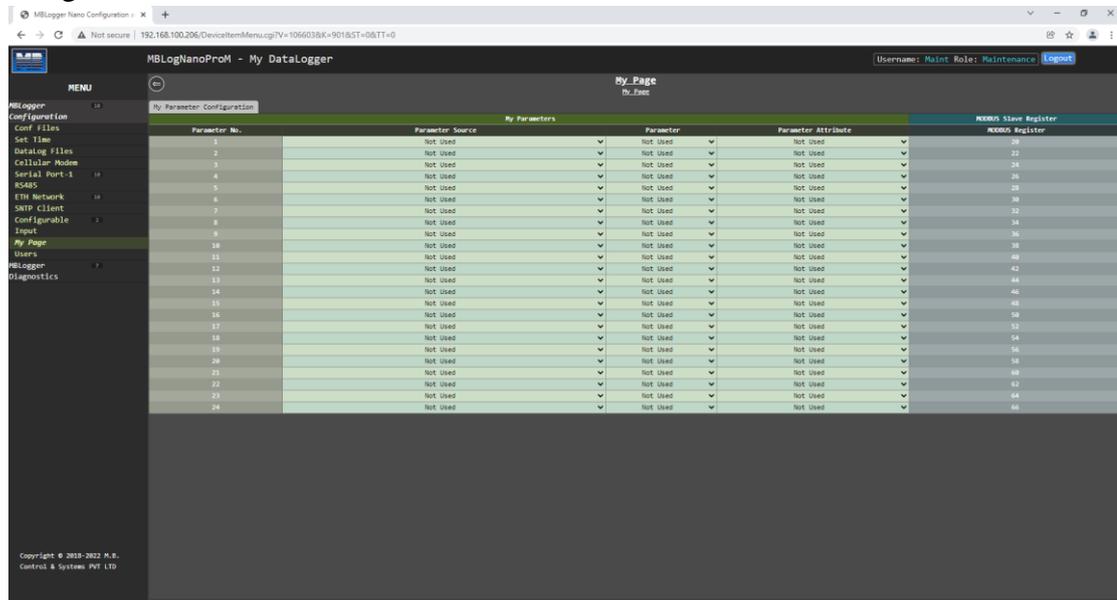


Figure-5.13: Configuration of MyPage.

Select the required tab to configure MyPage parameters.

#### 5.13.1 My Page – Parameter Configuration

Parameter can be selected from configured sensors/ IED and parameter in the same. Select tab ‘My Parameters’ to configure MyPage parameters.

Selection of parameter source is show in figure-5.13.1.1 below.

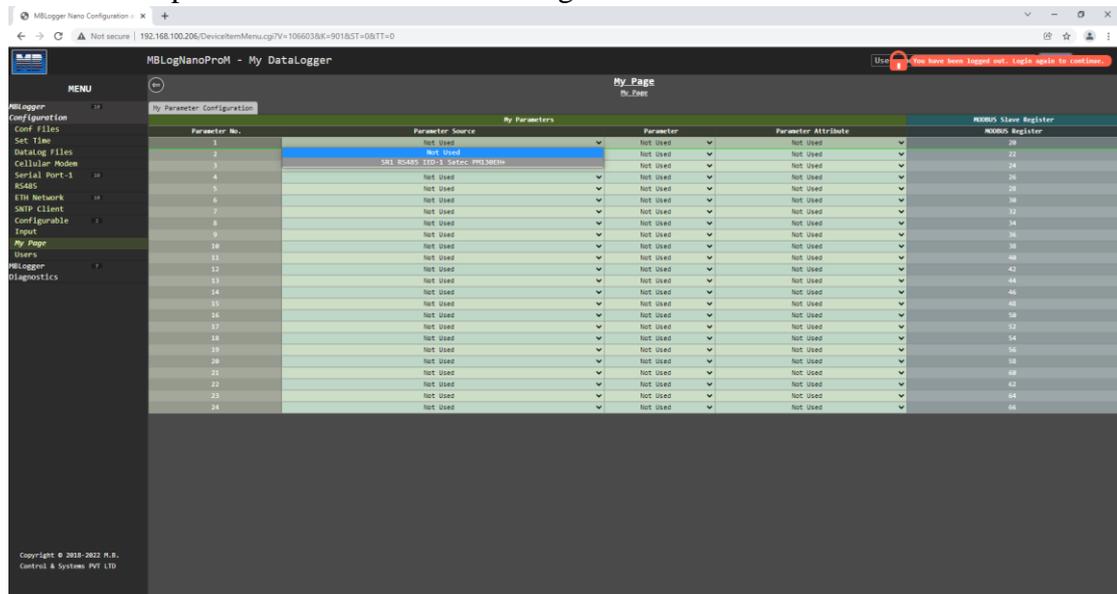


Figure-5.13.1.1: Select Source for MyPage parameters.

Configuration details for MyPage parameters are provided in table 5.13.1.1 below.

Sr. No	Parameter	Description	Remarks
1	Parameter Source	Select source for the parameter. Dropdown list of configured and enabled sensors and IED's shall be provided.	Select 'Not Used' if parameter configuration is not required. Sensor not enabled will not be listed.
2	Parameter	Select the parameter of interest. Dropdown list of parameters configured in the selected source shall be provided.	Select 'Not Used' if parameter configuration is not required.
3	Parameter Attribute	Select parameter attribute required. Dropdown list of parameter attributes shall be provided based on type the selected parameter.	Select required parameter attribute eg. Value, Value_Maximum, Value_Minimum etc.
4	MODBUS Register	MODBUS register address is provided for external device or SCADA to read value of the parameter.	All parameter values are provided as 32 bits register as per the protocol selected for MyPage parameters. This field in not editable.

Table-5.13.1.1: MyPage parameters configuration

MODBUS Slave register for MyPage parameters is provided in table 5.13.1.2 below. These parameters can be read via MODBUS Float protocol.

Sr. No	Datalogger MODBUS Slave Register	Parameter
1	MODBUS Slave Starting Register Address	Parameter Value

Table-5.13.1.2: MyPage parameters – MODBUS slave register details

Note: Parameter values which are not configured will be read as '0'.

## 5.14 User Configuration

Following types of users can be configured for datalogger operation:

- i) Administrator
- ii) Operator
- iii) Viewer

Left click on menu option ‘User Configuration’ to configure users shown in figure-5.14 below. Only ‘Administrator’ can configure usernames and their passwords.

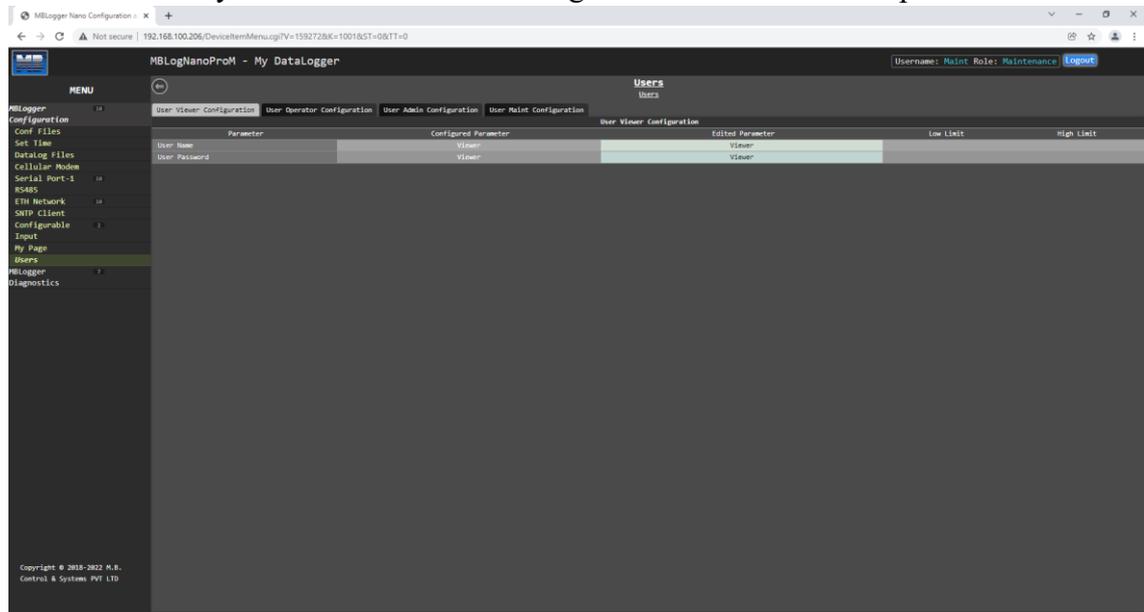


Figure-5.14: User configuration.

Use tabs provided to configure the required user.

Configuration details of user configuration are provided in table 5.14 below.

Sr. No	Parameter	Description	Remarks
1	Username	Set username	Users with configured username and passwords will be allowed to operate the datalogger
2	User Password	Set user password	

Table-5.14: User configuration

## 5.15 Commit Configuration

All edited parameter values must be saved in the datalogger – this is called ‘Commit Operation’. This will be allowed only if configuration of any parameter has been edited (marked by ‘E’).

Following actions will happen (in the listed sequence) once ‘Commit’ is initiated.

- i) All logged in users will be logged out.
- ii) All operations of the datalogger will be stopped. This may take some time.
- iii) New configured valued will be saved in internal non-volatile memory of the datalogger.
- iv) All operations of datalogger will resume with new configuration. This may take some time.
- v) User can login again (if required) with assigned credentials.

Left click on menu option ‘MLogger Configuration’ to select the same. Right click on MLogger Configuration’ to see the submenu option to commit the configuration as shown in figure-5.15 below.

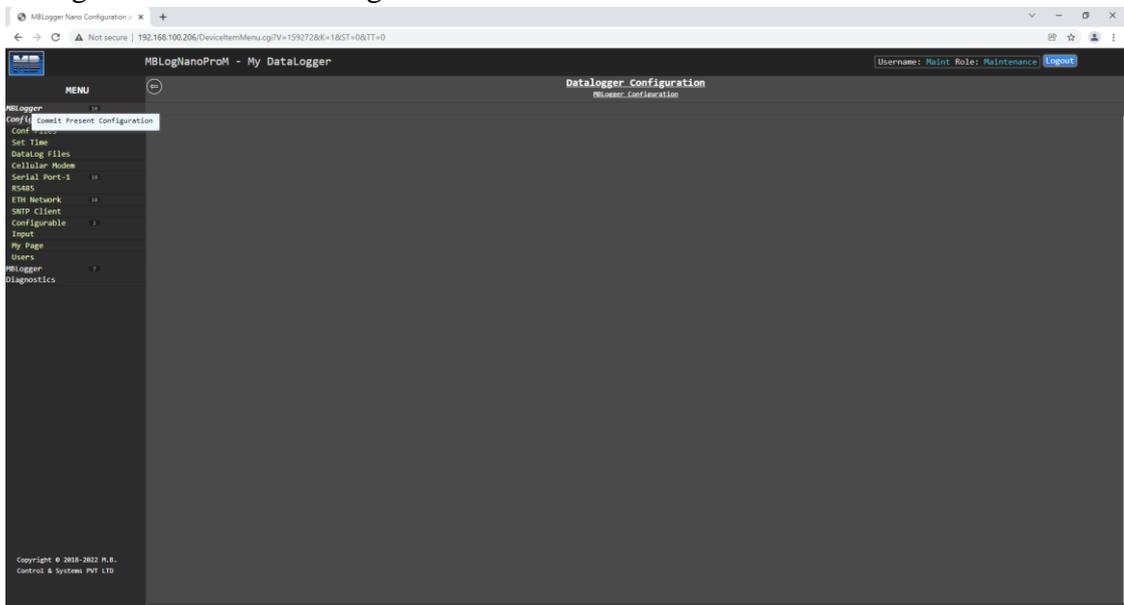


Figure-5.15: Configuration Commit operation.

**Note: Once committed, the configuration cannot be reverted. It is irreversible operation. The datalogger must be re-configured if any change is required.**

## 6. Embedded Webserver – Diagnostics

MBLogger provides extensive diagnostics and monitoring functionality via webserver.

Following diagnostic features are provided:

- i) Monitor real time values from all inputs.
- ii) Monitor real time values and communication status of sensors and IED.
- iii) Monitor MyPage parameters
- iv) Status of datalogger resources
- v) Messages from datalogger for user login history, operations, and hardware faults.
- vi) All parameter values, their calculated statistical values and status will be updated in real time (at preset time interval). Animation is provided when the values are updated.
- vii) Parameter values will be updated with their quality. Bad quality values will be shown in red.

Left click on menu option ‘MBLogger Diagnostic’ to open the diagnostic menu as shown in figure-6 below.

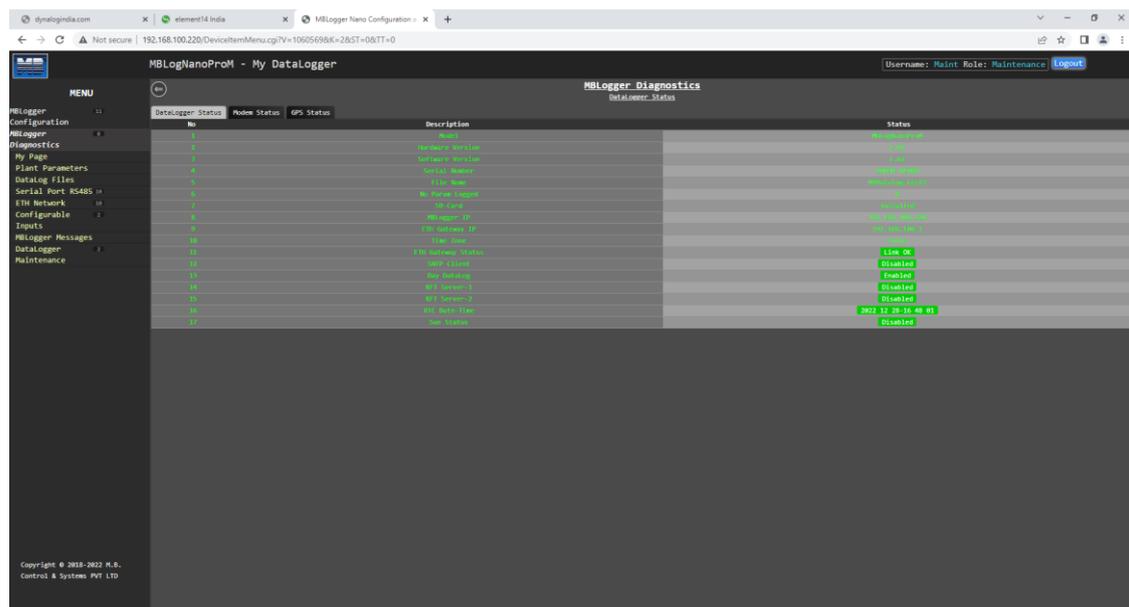


Figure-6: MBLogger diagnostic page.

## 6.1 MBLLogger Status

This status page displays status of datalogger services and modem status:

### 6.1.1 MBLLogger Status

Select tab ‘MBLogger Status’ to view details of the datalogger and status of services as shown in figure-6.1.1 below.

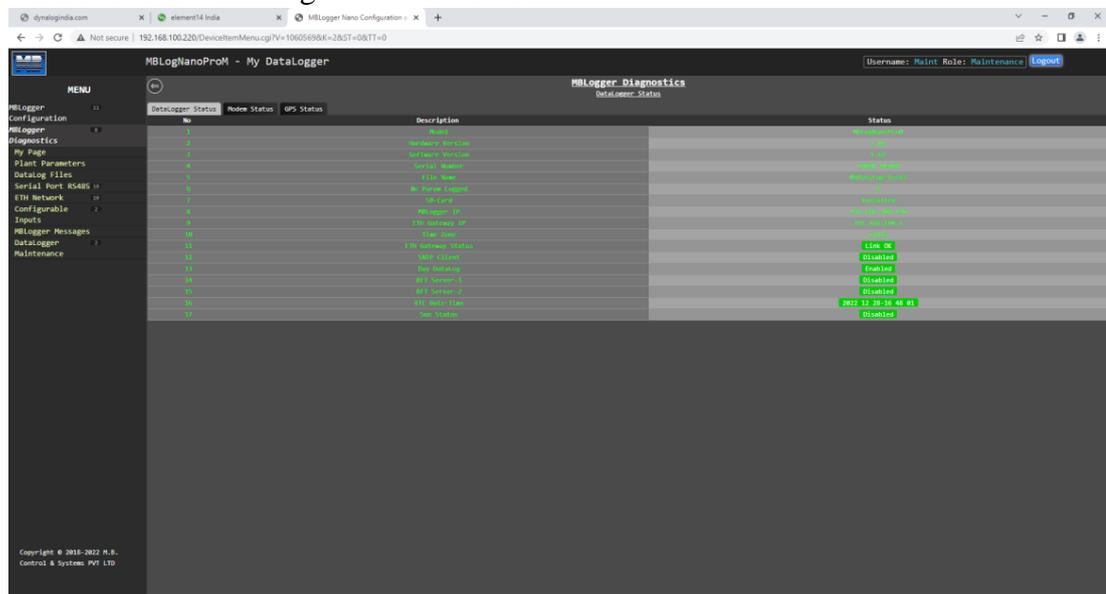


Figure-6.1.1: Datalogger status.

Details for datalogger status are provided in table 6.1.1 below.

Sr. No	Parameter	Description	Remarks
1	Model	Model details of the data logger	
2	Hardware Version	Hardware version for the model	
3	Software Version	Software version for the model	
4	Serial Number	Unique alphanumeric serial number for the datalogger	
5	File Name	Names of data log files	Data log files will be created with this name and will be suffixed by date and time
6	No Param Logged		Number of parameters configured for logging
7	SD Card	Status of SD card	Display –‘Installed’ or ‘Not Installed’ or ‘Not Working’
8	MBLogger IP	IP address for the datalogger	
9	ETH gateway IP	IP address for the ETH gateway	
10	Time Zone	Selected time zone	

11	ETH Port Status	Status of ETH port	Connected or not connected.
12	ETH gateway Status	Status of network gateway	Display 'Link Fail' if link to gateway fails. Display 'Link OK' if link to gateway is OK.
13	SNTP Client	Status of SNTP client	Display status of SNTP client.
14	Day Data log	Status of day data logging	
15	RFT Server-1 and -2	Status of remote file transfer servers	
16	RTC Date and Time	Datalogger date and time	
17	Sun Status	Disabled Sun Present Sun Not Present	Status of sun based on location date and time

Table-6.1.1: Datalogger status

### 6.1.2 Modem Status

Select tab 'Modem Status' to view status of datalogger internal modem as shown in figure-6.1.2 below (This page will be available only for model NanoProM).

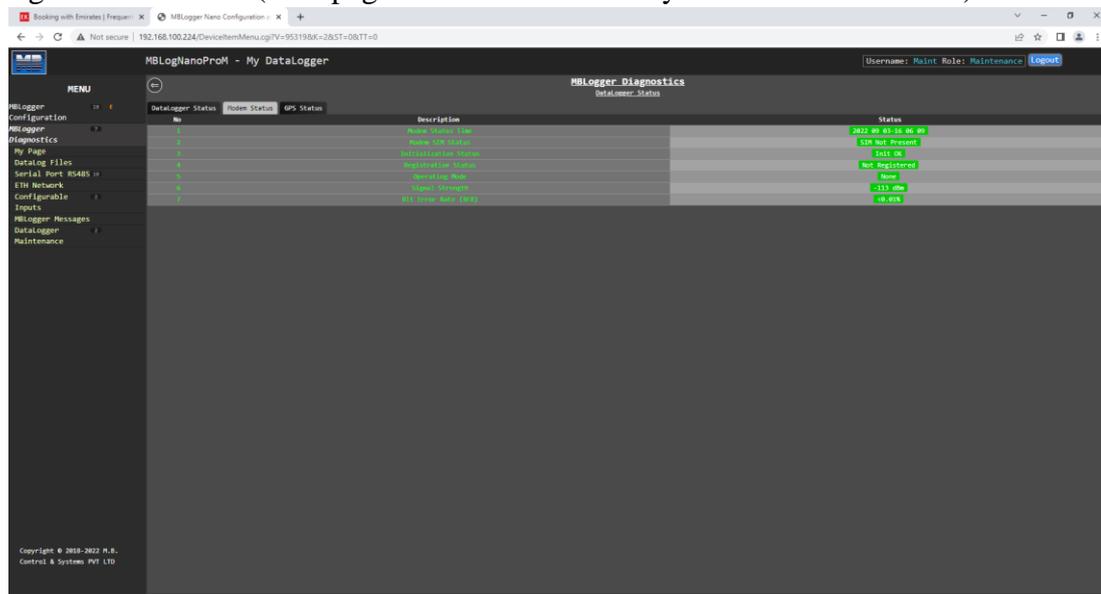


Figure-6.1.2: Datalogger modem status.

Details for datalogger modem are provided in table 6.1.2 below.

Sr. No	Parameter	Description	Remarks
1	Modem Status Time		Modem status update time
2	Modem SIM Status	SIM status	Installed or not installed
3	Initialisation Status	Modem initialisation status	
4	Registration	Modem registration	

	status	status	
5	Operating mode	Modem operation mode	Modem network operation mode – ‘None’, ‘GSM’, ‘GPRS’, ‘EDGE, or ‘LTE’
6	Signal Strength	Cellular signal strength	Signal strength in dBm
7	Bit error rate (BER)	Bit error rate	

Table-6.1.2: Datalogger modem status

### 6.1.3 GPS Status

Select tab ‘GPS Status’ to view status of datalogger internal modem as shown in figure-6.1.3 below (This page will be available only for model NanoProM).

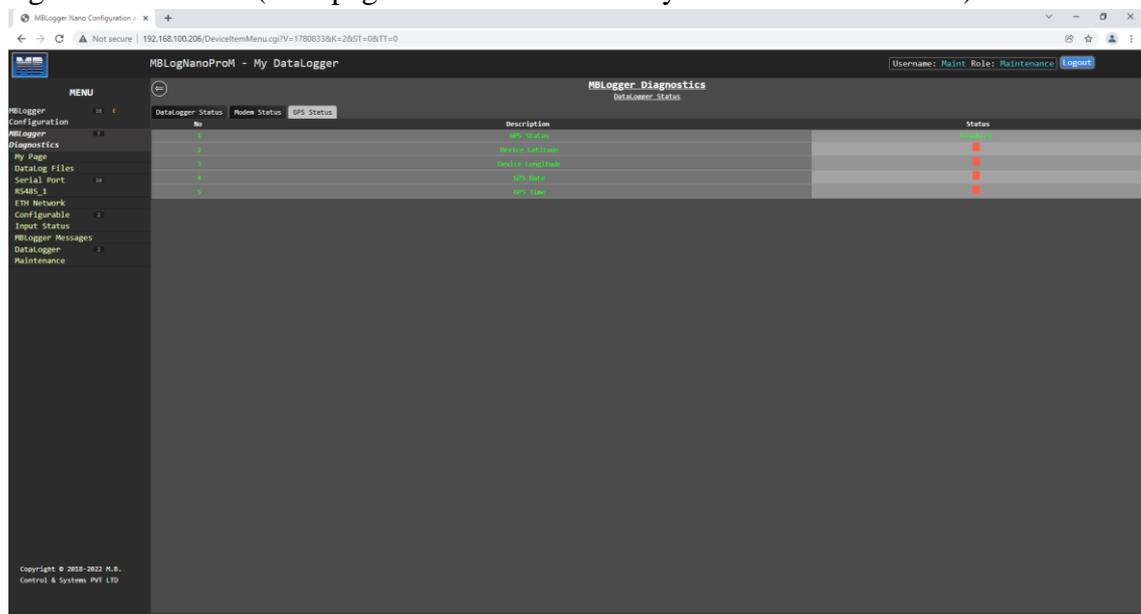


Figure-6.1.3: Datalogger GPS status.

Details for datalogger GPS are provided in table 6.1.3 below.

Sr. No	Parameter	Description	Remarks
1	GPS Status	Enabled or Disabled	Will be enabled only if GPS is enabled
2	Device Latitude	Location latitude	
3	Device Longitude	Location Longitude	
4	GPS Date	Date received from GPS	
5	GPS Time	Time received from GPS	

Table-6.1.3: Datalogger GPS status

## 6.2 MyPage Parameters

Left click on diagnostic menu option 'MyPage Parameters' to view MyPage parameters as shown in figure 6.2 below.

Parameter No.	Parameter Source	Parameter	Parameter Attribute	Parameter Value
1	MBLLogger	MBLLogger	MBLLogger	MBLLogger
2	MBLLogger	MBLLogger	MBLLogger	MBLLogger
3	MBLLogger	MBLLogger	MBLLogger	MBLLogger
4	MBLLogger	MBLLogger	MBLLogger	MBLLogger
5	MBLLogger	MBLLogger	MBLLogger	MBLLogger
6	MBLLogger	MBLLogger	MBLLogger	MBLLogger
7	MBLLogger	MBLLogger	MBLLogger	MBLLogger
8	MBLLogger	MBLLogger	MBLLogger	MBLLogger
9	MBLLogger	MBLLogger	MBLLogger	MBLLogger
10	MBLLogger	MBLLogger	MBLLogger	MBLLogger
11	MBLLogger	MBLLogger	MBLLogger	MBLLogger
12	MBLLogger	MBLLogger	MBLLogger	MBLLogger
13	MBLLogger	MBLLogger	MBLLogger	MBLLogger
14	MBLLogger	MBLLogger	MBLLogger	MBLLogger
15	MBLLogger	MBLLogger	MBLLogger	MBLLogger
16	MBLLogger	MBLLogger	MBLLogger	MBLLogger
17	MBLLogger	MBLLogger	MBLLogger	MBLLogger
18	MBLLogger	MBLLogger	MBLLogger	MBLLogger
19	MBLLogger	MBLLogger	MBLLogger	MBLLogger
20	MBLLogger	MBLLogger	MBLLogger	MBLLogger
21	MBLLogger	MBLLogger	MBLLogger	MBLLogger
22	MBLLogger	MBLLogger	MBLLogger	MBLLogger
23	MBLLogger	MBLLogger	MBLLogger	MBLLogger
24	MBLLogger	MBLLogger	MBLLogger	MBLLogger
25	MBLLogger	MBLLogger	MBLLogger	MBLLogger
26	MBLLogger	MBLLogger	MBLLogger	MBLLogger
27	MBLLogger	MBLLogger	MBLLogger	MBLLogger
28	MBLLogger	MBLLogger	MBLLogger	MBLLogger
29	MBLLogger	MBLLogger	MBLLogger	MBLLogger
30	MBLLogger	MBLLogger	MBLLogger	MBLLogger

Figure-6.2: MyPage parameters.

Values with selected attribute of all parameters configured as MyPage Parameters will be displayed on the page.

## 6.3 Plant Parameters – Special Functions

Left click on diagnostic menu option 'Plant Parameters' to monitor these in real time. This option will be provided if license for the function is installed in the datalogger.

### 6.3.1 Plant Parameters

Select tab- 'Plant Parameters' to monitor plant parameters in real time as shown in figure – 6.3.1 below.

Parameter No.	Parameter	Value
1	Plant Parameters	Plant Parameters
2	Plant Parameters	Plant Parameters
3	Plant Parameters	Plant Parameters
4	Plant Parameters	Plant Parameters
5	Plant Parameters	Plant Parameters
6	Plant Parameters	Plant Parameters
7	Plant Parameters	Plant Parameters
8	Plant Parameters	Plant Parameters
9	Plant Parameters	Plant Parameters
10	Plant Parameters	Plant Parameters
11	Plant Parameters	Plant Parameters
12	Plant Parameters	Plant Parameters
13	Plant Parameters	Plant Parameters
14	Plant Parameters	Plant Parameters
15	Plant Parameters	Plant Parameters
16	Plant Parameters	Plant Parameters
17	Plant Parameters	Plant Parameters
18	Plant Parameters	Plant Parameters
19	Plant Parameters	Plant Parameters
20	Plant Parameters	Plant Parameters
21	Plant Parameters	Plant Parameters
22	Plant Parameters	Plant Parameters
23	Plant Parameters	Plant Parameters
24	Plant Parameters	Plant Parameters
25	Plant Parameters	Plant Parameters
26	Plant Parameters	Plant Parameters
27	Plant Parameters	Plant Parameters
28	Plant Parameters	Plant Parameters
29	Plant Parameters	Plant Parameters
30	Plant Parameters	Plant Parameters

Figure-6.3.1: Plant parameter values

### 6.3.2 Albedo Meter Values

Select tab- ‘Albedo Meter Values’ to monitor albedo meter values in real time as shown in figure – 6.3.2 below.

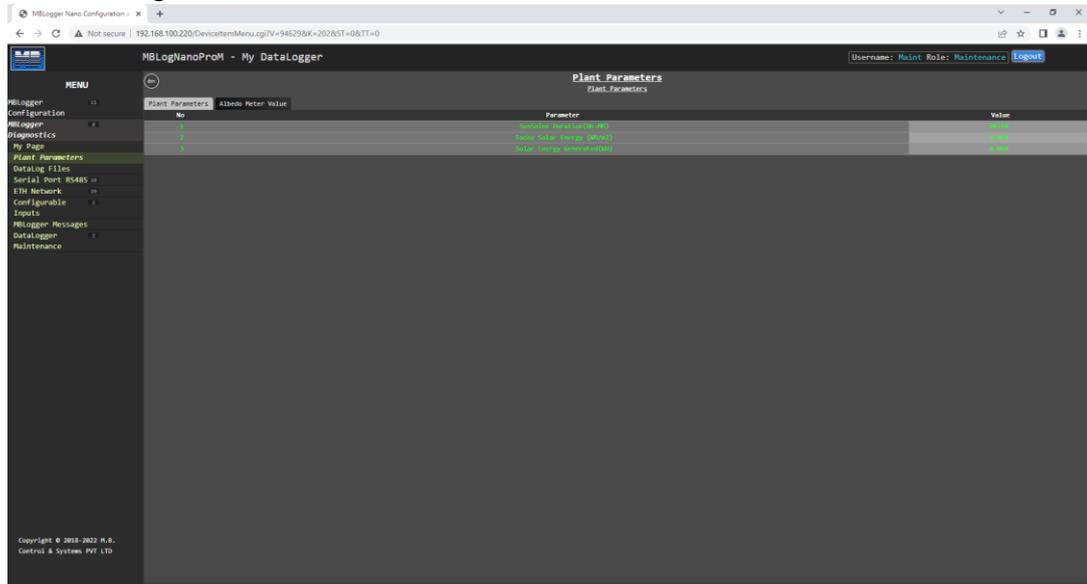


Figure-6.3.2: Albedo meter values

Real time values of source pyranometers and albedo ration shall be displayed in real time.

### 6.4 Data Log Files

Status of all data log files can be viewed via this page. Files can also be deleted or downloaded via click buttons provided.

Left click on diagnostic menu option ‘Data log Files’ to view details of logged files.

Three tabs are provided for data log files:

- i) ‘Data log Files Day’: Day data log files.
- ii) ‘Data log Files RFT-1’: Data log files for remote file server-1.
- iii) ‘Data log Files RFT-2’: Data log files for remote file server-2.

## 6.4.1 Data Log Files Day

Day log file status is shown in figure 6.4.1 below.

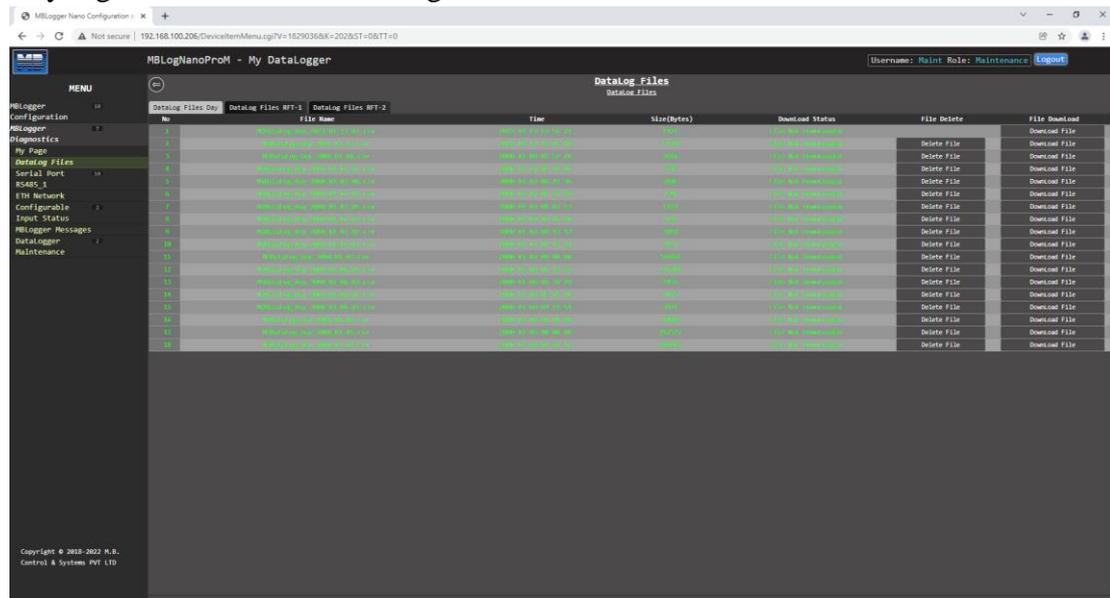


Figure-6.4.1: Day Data log files

Details file status and operation are provided in table 6.4.1 below.

Sr. No	Parameter	Description	Remarks
1	File name	Logged file name	
2	Time	File log time	
3	Size	File size in Bytes	
4	Download Status	Download status of the file	File not downloaded – ‘File Not Downloaded’. File downloaded – ‘Downloaded’
4	Delete File	Left click on the button to delete the file.	File delete operation is irreversible. Active file – file that is being logged cannot be deleted. ‘Delete Button’ shall be disabled for this file.
5	Download File	Left click on the button to download the file.	The file will be downloaded to PC or Laptop. Status of the file will be changed to ‘Downloaded’. This button will not be available if the file is being logged.

Table-6.4.1: Day data log files

## 6.4.2 DataLog Files RFT-1 and RFT-2

Select the required tab for viewing status of remote file transfer operation. Remote Transfer log file status is shown in figure 6.4.2 below.



Figure-6.4.2: Remote transfer data log file status

Details file status and operation are provided in table 6.4.2 below.

Sr. No	Parameter	Description	Remarks
1	File name	Logged file name	
2	Time	File log time	
3	Size	File size in Bytes	
4	Transmit status	Transmit status of the file	File not transmitted – ‘Not Transmitted’. File not transmitted – ‘Transmitted’
5	Download Status	Download status of the file	File not downloaded – ‘File Not Downloaded’. File downloaded – ‘Downloaded’
6	Delete File	Left click on the button to delete the file.	File delete operation is irreversible. Active file – file that is being logged cannot be deleted. ‘Delete Button’ shall be disabled for this file.
7	Download File	Left click on the button to download the file.	The file will be downloaded to PC or Laptop. Status of the file will be changed to ‘Downloaded’. This button will not be available if the file is being transmitted or being logged.

Table-6.4.2: Remote transfer data log files

### 6.5 Sensor / IED Parameters

Real time communication status and parameter values can be viewed from all the configured sensors and IED.

Follow the steps below to view the IED parameters.

- i) Left click on the port (diagnostic menu) to which the Sensor/ IED is connected. A list of IED will be provided below the port.
- ii) Left click on the sensor/ IED to view communication status and parameters.

Use tabs provided to view communication status or parameters.

#### 6.5.1 Sensor/ IED Communication Status

Select tab 'IED Communication Status' to view IED communication status as shown in figure-6.5.1 below.

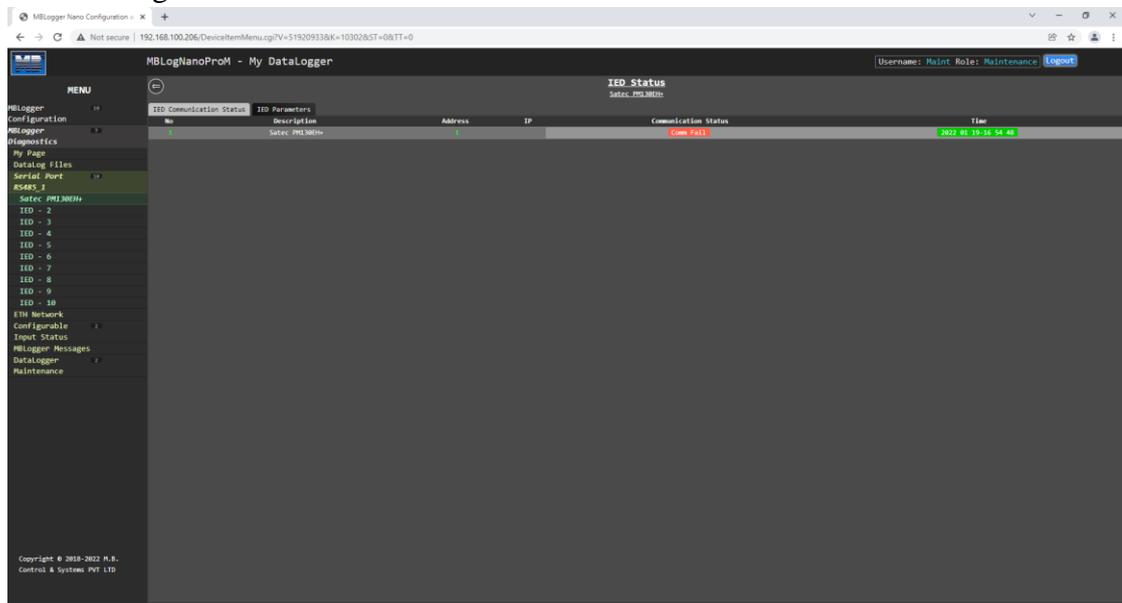


Figure-6.5.1: Sensor/ IED communication status

Communication status of sensor/ IED will be displayed in real time.

Communication details are provided in table 6.5.1 below.

Sr. No	Parameter	Description	Remarks
1	Address	MODBUS address of the sensor/ IED	
2	IP	IP address of sensor / IED shall be provided if these are connected to ETH port.	Only for IEDs connected to ETH port

Table-6.5.1: Communication status

## 6.5.2 Sensor/ IED Parameter Values

Select tab 'IED Parameters' to view sensor/ IED parameter values as shown in figure-6.5.2 below.

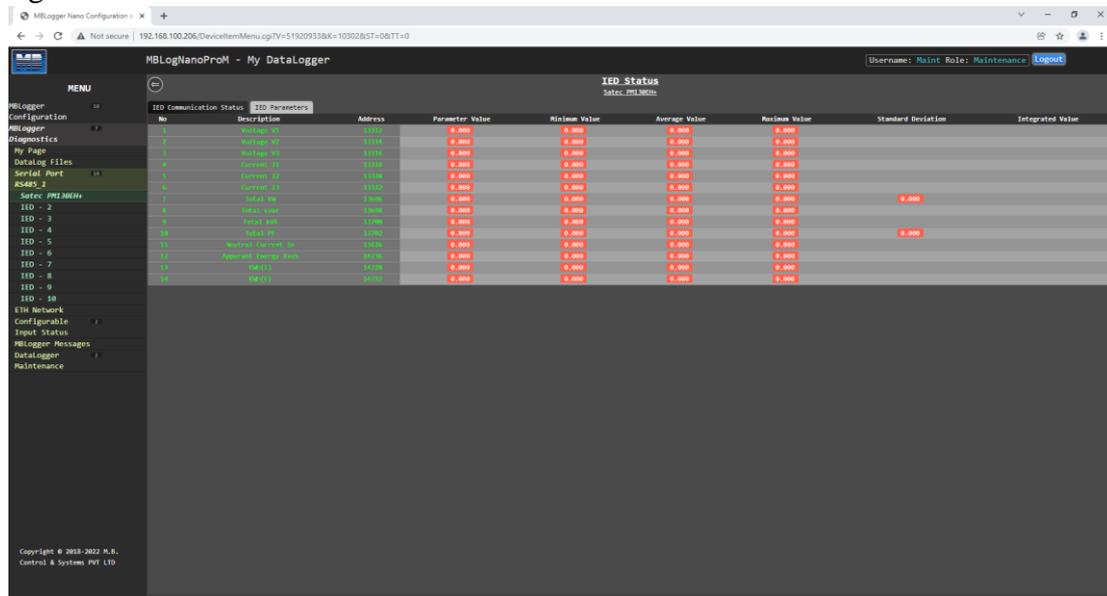


Figure-6.5.2: Sensor/ IED parameter values

Parameter values read from sensor/ IED will be displayed in real time.

Parameter details are provided in table 6.5.2 below.

Sr. No	Parameter	Description	Remarks
1	Address	MODBUS register address of the parameters	
2	Value	Value read from the sensor/ IED	Parameter values and calculated statistical parameters will be updated in real time. Bad quality parameter valued will be in red.

Table-6.5.2: Sensor/ IED parameter values

## 6.6 Configurable Inputs Status

Real time status and values configurable inputs can be viewed by the required configurable inputs as shown in figure 6.6 below.

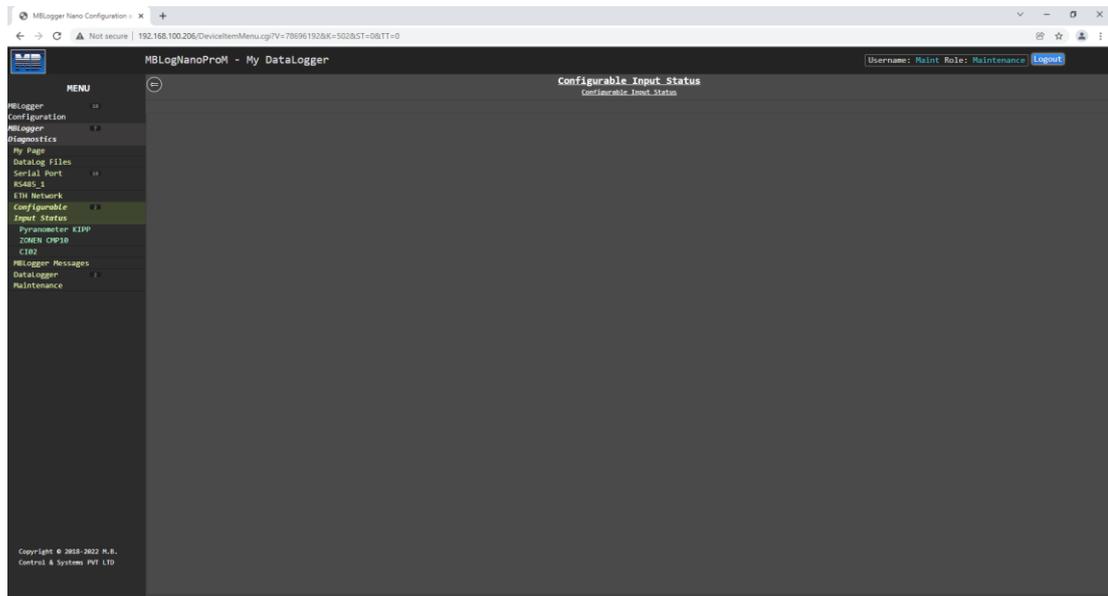


Figure-6.6: Configurable input status/ value

### 6.6.1 Input Configured as mV Input

Tab 'Input mV Value' will be displayed to view measured values from the input if it has been configured as mV input as shown in figure-6.6.1 below.

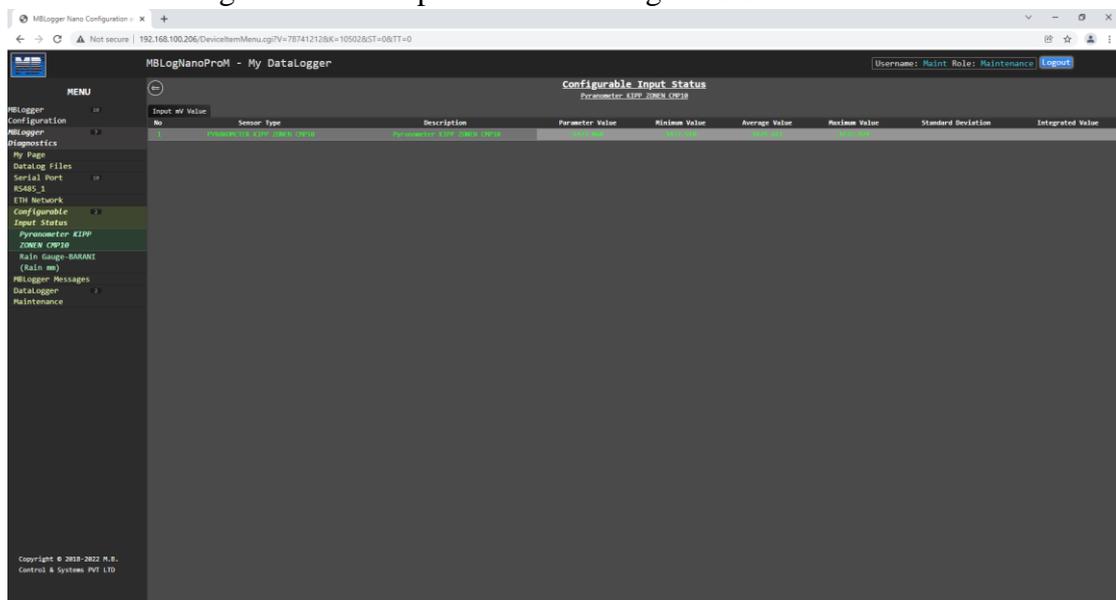


Figure-6.6.1: Measure values from mV configured channels

### 6.6.2 Input Configured as Voltage Input

Tab 'Input V Value' will be displayed to view input parameters if the input has been configured as voltage input as shown in figure-6.6.2 below.

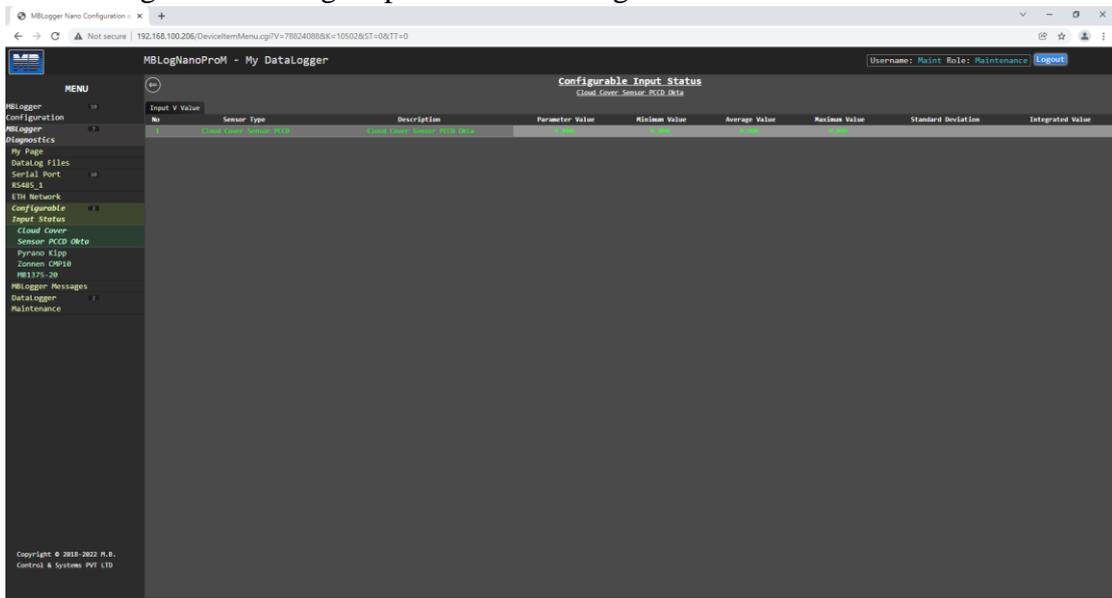


Figure-6.6.2: Voltage input channel values

### 6.6.3 Input Configured as mA Input

Tab 'Input mA Value' will be displayed to view input parameters if the input has been configured as mA input as shown in figure-6.6.3 below.

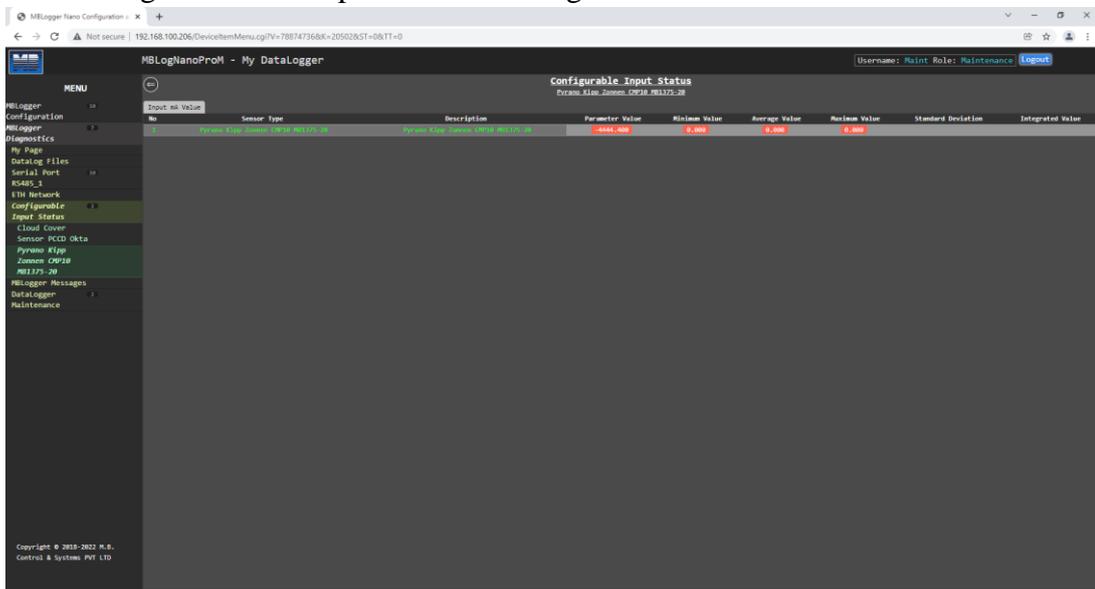


Figure-6.6.3: mA input channel values

### 6.6.4 Input Configured as Digital Input

Tab ‘Digital Input’ will be displayed to view digital input parameters if the input has been configured as digital input as shown in figure-6.6.4 below.

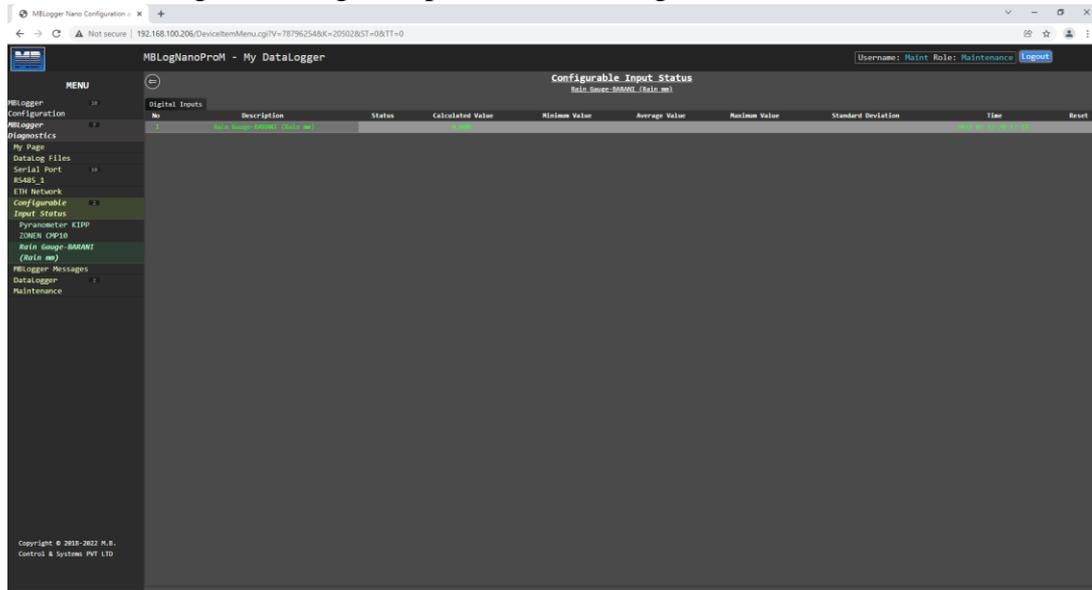


Figure-6.6.4: Digital input channel status and values

### 6.7 MBLLogger Operation Messages

Left click on diagnostic menu option ‘Datalogger Messages’ to view messages from datalogger as shown in figure 6.7 below.

Logged messages shall be displayed on the page. MBLLogger message details are provided in [this chapter](#).

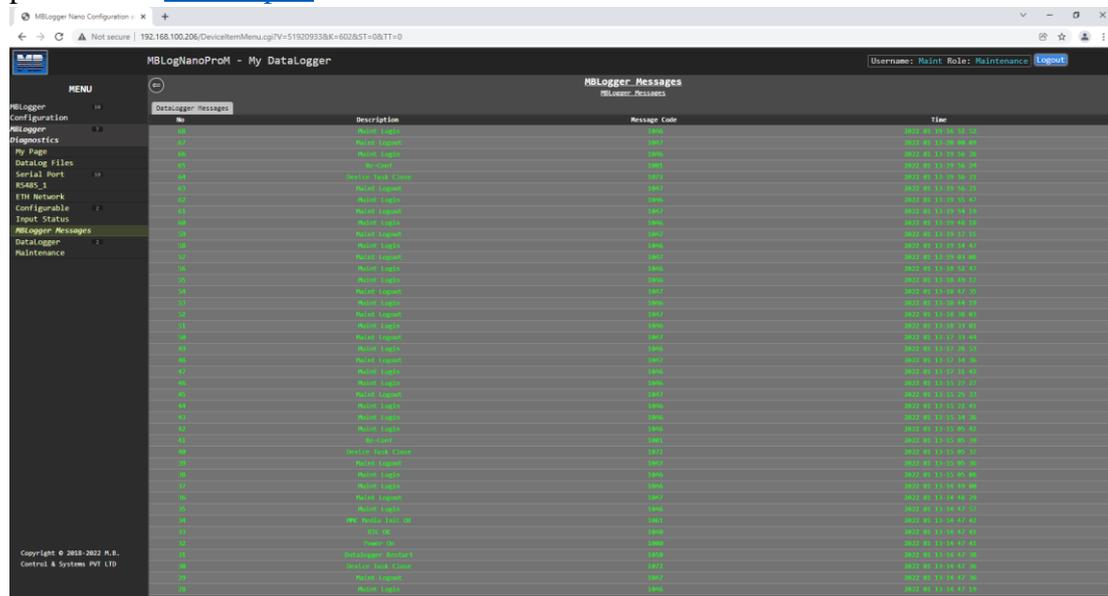


Figure-6.7: Datalogger messages

Details of datalogger messages are provided in table 6.7 below.

Sr. No	Parameter	Description	Remarks
1	Description	Message description	Hardware faults will be displayed in <b>red</b> .
2	Message Code	Message code	

Table-6.7: Datalogger messages

Following operation are possible:

- i) Download MBLLogger Status Report
- ii) Download MBLLogger Value Report
- iii) Delete MBLLogger Message

Click on the option required.

#### 6.7.1 Download MBLLogger Status Report

Click on this option to download status of datalogger and connected IED in .txt file. It will also download logged messages.

Downloaded file will have following information:

- i) Date and time of report
- ii) Model and serial number details.
- iii) Status of services on the datalogger.
- iv) Calibration report of inputs.
- v) Status of all IED and sensors connected on various communication ports of the datalogger.
- vi) Details of sensors and sensors connected to analog inputs (not available for Nano model).
- vii) List of all the messages logged.

#### 6.7.2 Download MBLLogger Value Report

Click on this option to download values of all parameters from all inputs and connected IED in .txt file.

Downloaded file will have following information:

- i) Model and serial number details.
- ii) Values from all analog inputs (not available for Nano model).
- iii) Values from all digital inputs (not available for Nano model).
- iv) Values from all sensors and IED connected to serial and ETH ports of the datalogger.

Following information is provided in this report:

- i) Date and time of report
- ii) Description of sensors and IED connected to analog, digital and communication ports.
- iii) **'Qual'**: quality of parameter value. Good quality values will be marked as 'GD'. Bad quality values will be marked as 'IV'.
- iv) **'Value'**: parameter value in float format.
- v) **'Value\_Min'**: minimum value of the parameter for the block time.
- vi) **'Value\_Man'**: maximum value of the parameter for the block time.
- vii) **'Value\_Avg'**: average value of the parameter for the block time.
- viii) **'Value\_SD'**: Standard deviation for the parameter. It will be displayed only if the same is enabled in parameter configuration.
- ix) **'Value\_Int'**: Integrated value for the parameter. It will be displayed only if integration is enabled in parameter configuration.

- x) For digital inputs configured as status input, its state and state change time will be displayed.
- xi) **'MODBUS ID' or 'IP Address'**: shall be provided for communicable sensors and IED.
- xii) **'Comm Status'**: communication status shall be provided for communicable sensors and IED.
- xiii) List of parameters along with register addresses shall be provided for communication sensors and IED.

### 6.7.3 Delete MBLogger Messages

This option is not available.

## 7. MLogger Messages

MLogger provides messages for the following events:

- i) User login and logout
- ii) Datalogger re-configuration
- iii) Hardware faults

Details of message types are provided in table-7 below.

Sr. No	Message Type	Remarks	Action Required
1	Information	Information message. No effect on operation of the datalogger.	None
2	Fault	Hardware fault. Operation of the datalogger will be affected. <b>Red Led</b> 'ER' on front panel will flash.	Contact <a href="mailto:service@mbcontrol.com">service@mbcontrol.com</a>

Table-7: Datalogger message types

### 7.1 MLogger Information Messages

MLogger operation information messages are listed in table-8.1 below.

Sr. No	Code	Message	Message Type	Remarks
1	1000	Power On	Information	
2	1001	Re-Conf	Information	Datalogger has been re-configured
3	1002	Adm Login	Information	Administrator login and logout
4	1003	Adm Logout	Information	
5	1004	Opr Login	Information	Operator login and logout
6	1005	Opr Logout	Information	
7	1006	Viw Login	Information	Viewer login and logout
8	1007	Viw Logout	Information	
9	1008	Login Fail	Information	Invalid login attempt
10	1010	Time SyOK	Information	Time synchronisation OK after fail
11	1011	Time SyFail	Information	Time synchronisations fail
12	1012	DL Msg Deleted	Information	Data logger messages have been deleted.
13	1014	RFT1 Comm Media Fail	Information	Communication media for remote file transfer -1 has failed
14	1015	RFT1 Comm Media OK	Information	Communication media for remote file transfer -1 is OK
15	1016	RFT1 Connect ETH Fail	Information	Connection to remote file server -1 has failed via ETH port

16	1017	RFT1 Connect ETH OK	Information	Connection to remote file server -1 is OK via ETH port
17	1018	RFT1 File Write Fail	Information	File write operation for remote file server -1 has failed
18	1019	RFT1 File Write OK	Information	File write operation for remote file server -1 is OK
19	1020	RFT1 File Open Fail	Information	File open operation for remote file server -1 has failed
20	1021	RFT1 File Open OK	Information	File open operation for remote file server -1 is OK
21	1022	RFT1 File Close Fail	Information	File close operation for remote file server -1 has failed
22	1023	RFT1 File Close OK	Information	File close operation for remote file server -1 is OK
23	1024	RFT1 File Transmit Fail	Information	File transmit operation for remote file server -1 has failed
24	1025	RFT1 File Transmit OK	Information	File transmit operation for remote file server -1 is OK
25	1026	RFT2 Comm Media Fail	Information	Communication media for remote file transfer -2 has failed
26	1027	RFT2 Comm Media OK	Information	Communication media for remote file transfer -2 is OK
27	1028	RFT2 Connect ETH Fail	Information	Connection to remote file server -2 has failed via ETH port
28	1029	RFT2 Connect ETH OK	Information	Connection to remote file server -2 is OK via ETH port
29	1030	RFT2 File Write Fail	Information	File write operation for remote file server -2 has failed
30	1031	RFT2 File Write OK	Information	File write operation for remote file server -2 is OK
31	1032	RFT2 File Open Fail	Information	File open operation for remote file server -2 has failed
32	1033	RFT2 File Open OK	Information	File open operation for remote file server -2 is OK
33	1034	RFT2 File Close Fail	Information	File close operation for remote file server -2 has failed

34	1035	RFT21 File Close OK	Information	File close operation for remote file server -2 is OK
35	1036	RFT2 File Transmit Fail	Information	File transmit operation for remote file server -2 has failed
36	1037	RFT2 File Transmit OK	Information	File transmit operation for remote file server -2 is OK
37	1038	Modem PPP Link Up	Information	Modem PP Link is OK
38	1039	Modem PPP Link Down	Information	Modem PP Link has failed. All communication via modem will be stopped.
39	1040	RTC OK	Information	RTC is operating OK
40	1041	Modem File Transfer ETH	Information	File is being transmitted via ETH port instead of Modem. This can happen if the modem has failed and file transfer via ETH port is possible.
41	1042	Modem File Transfer Modem	Information	File transmission via Modem has been restored.
42	1043	Modem Fail Recovery	Information	Modem failure has been recovered
43	1044	ETH Port Not Connected	Information	ETH port is not connected to any network
44	1045	ETH Port Connected	Information	ETH port is connected to network
45	1046	Maint Login	Information	Maintenance user login and logout
46	1047	Maint Logout	Information	
47	1048	Calibration Mode Start	Information	Datalogger is in calibration mode
48	1049	Calibration Mode End	Information	Datalogger is in normal mode of operation
49	1050	Datalogger Restart	Information	Datalogger has re-started itself.
50	1051	Task Termination Fail	Information	System message for tasks operation
51	1052	Messages Deleted	Information	Logged messages have been deleted.
52	1053	RFT1 Connect Modem Fail	Information	Connection to remote file server -1 has failed via Modem
53	1054	RFT1 Connect	Information	Connection to remote file server -1 is OK via Modem

		Modem OK		
54	1055	RFT2 Connect Modem Fail	Information	Connection to remote file server -2 has failed via Modem
55	1056	RFT2 Connect Modem OK	Information	Connection to remote file server -2 is OK via Modem
56	1058	SNTP Media Change ETH	Information	SNTP client media has been changed from Modem to ETH. This will happen if SNTP client fails to connect to time server via modem and ETH network is working OK.
57	1066	DayLog File Write fail	Information	Error in writing to data log file
58	1967	RFT1Log File Write Fail	Information	Error in writing to remote file server-1 data log file
59	1068	RFT2Log File Write Fail	Information	Error in writing to remote file server-2 data log file
60	1069	Config File Write Fail	Information	Error in writing to device configuration file
61	1070	File Write size mismatch	Information	Mismatch in size of file being written
62	1071	MMC Media Init OK	Information	MMC media (SD Card) interface initialisation is OK
63	1072	Device Task Close	Information	All tasks in the device have been closed
64	1073	RFT1 Disconnect Modem Fail	Information	Disconnection with RFT server-1 via modem has failed.
65	1074	RFT1 Disconnect Modem OK	Information	Disconnection with RFT server-1 via modem is successful.
66	1075	RFT2 Disconnect Modem Fail	Information	Disconnection with RFT server-2 via modem has failed.
67	1076	RFT2 Disconnect Modem OK	Information	Disconnection with RFT server-2 via modem is successful.
68	1077	RFT1 Disconnect ETH Fail	Information	Disconnection with RFT server-1 via ETH has failed.
69	1078	RFT1	Information	Disconnection with RFT

		Disconnect ETH OK		server-1 via ETH is successful.
70	1079	RFT2 Disconnect ETH Fail	Information	Disconnection with RFT server-2 via ETH has failed.
71	1080	RFT2 Disconnect ETH OK	Information	Disconnection with RFT server-2 via ETH is successful.
72	1081	Modem Registered	Information	Modem Registration is OK
73	1082	Modem Registration Failed	Information	Modem Registration Failed
74	1083	Cellular Signal Low	Information	Cellular signal strength is low. Relocate the antenna to get required signal strength
75	1084	Cellular Signal Ok	Information	Cellular signal strength is ok.
76	1093	MB Slave Socket Not Free	Information	No more sockets are available for MODBUS Slave client. Number of MODBUS clients have exceeded the allowed limit. Disconnect one MODBUS Slave client and try again.
77	1094	GPS Connected	Information	GPS is connected to satellites.
78	1095	GPS Fail	Information	GPS has failed. GPS functionality will not be available. Try re-locating the GPS antenna for better sky view.
79	1096	GPS Not Connected	Information	GPS is not connected to satellites.
80	1097	Device IP Set to Default	Information	Device IP has been set to default IP.
81	1098	PPP Link Restore Command	Information	Command has been issued for re-storing the PPP link
82	1099	PPP Link Restore Comd Fail	Information	PPP link restore command has failed
83	1100	RTC Open Fail	Information	RTC device open has failed
84	1101	RTC Start Fail	Information	RTC device has failed to start

85	1102	Modem FTP Stop Fail	Information	Modem FTP stop command has failed
86	1103	Modem FTP Change Directory Fail	Information	Modem FTP change directory command has failed
87	1104	Modem FTP CD fail	Information	Modem FTP CD command has failed
88	1105	Modem FTP Del fail	Information	Modem FTP Delete File command has failed
89	1106	Modem FTP Logout fail	Information	Modem FTP Logout command has failed
90	1107	Modem FTP Abort fail	Information	Modem FTP Abort command has failed
91	1108	Modem Com Restore Fail	Information	Modem communication restore has failed
92	1109	Modem FTP Stop OK	Information	Modem FTP Stop command is OK
93	1110	Modem FTP Start OK	Information	Modem FTP Start command is OK
94	1111	Modem FTP Abort OK	Information	Modem FTP Abort command is OK
95	1112	FTP StFail Log Stop	Information	Modem communication message has been stopped due Modem Stop Command Fail
96	1113	Modem FTP Login Fail	Information	Modem FTP Login failed
97	1114	Modem Message Log Enabled	Information	Modem Message Log in enabled
98	1115	Modem Message Log Disabled	Information	Modem Message Log in disabled
99	1116	Modem Restart Success	Information	Modem Restart is successful
100	1117	Modem Reset Fail	Information	Modem Reset has failed
101	1118	Modem SIM Present	Information	SIM is installed in modem
102	1119	Modem SIM Not Present	Information	SIM is not installed in modem. Cellular communication will not be available.
103	1120	Sun Present	Information	Sun present – Day time
104	1121	Sun Not	Information	Sun Not present – Night-

		Present		time
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Table-7.1: Datalogger operation information messages

## 7.2 MBLLogger Fault Messages

MBLogger operation fault messages are listed in table-8.2 below.

Sr. No	Code	Message	Message Type	Remarks
1	2000	QSPI Fail	Fault	Internal non-volatile memory fail. Datalogger will not function.
2	2001	SDRAM Fail	Fault	Internal memory fail. Datalogger will not function.
3	2004	Modem Fail	Fault	Internal modem will not function. This will affect functions working via modem.
4	2006	RTC Fail	Fault	RTC operation has failed. It will affect all time-based operations
5	2007	RTC backup Fail	Fault	RTC time was not backed up. Change the RTC backup battery
6	2008	ADC-1 SPI initialisation Fail	Fault	Fault in ADC-1
7	2009	ADC-1 Reset Fail	Fault	Fault in ADC-1
8	2010	ADC-1 ID read Fail	Fault	Fault in ADC-1
9	2011	ADC-1 read Reg Fail	Fault	Fault in ADC-1
10	2026	MMC Media Init Fail	Fault	MMC media (SD Card) interface initialisation has failed. SD card will not function properly.
11	2028	SD Card Fail	Fault	SD Card has failed. Replace the same. Datalogging operations will be stopped.

Table-7.2: Datalogger operation fault messages

## 8. Technical Specifications

### 8.1 General Specifications:

Sr. No	Parameter	Specification
1	Micro-Processor	32 bits ARM Processor
2	RTC	Temperature compensated RTC

Table-8.1: Datalogger general specifications

### 8.2 Configurable Inputs:

Sr. No	Parameter	Specification
1	Configurable Inputs	2
2	Input Configuration options	Voltage Input (0-10V), Voltage Input (0-100mV), Digital Input (Loop and External Powered), mA Input (4-20mV) (Loop and External Powered)
3	ADC Resolution	16 bits
4	Sampling Rate	10Hz
5	Accuracy	0.1%
6	Noise filter	Notch at 50Hz and 60Hz
7	Statistical Calculations (configurable) – for analog inputs	Average, Minimum, Maximum, Standard Deviation, and Integration

Table-8.2: Configurable Inputs

#### 8.2.1 Digital Input:

Sr. No	Parameter	Specification
1	Input Signal	Potential free or Open collector
2	Isolation	None
3	Power supply	Loop powered or externally powered
4	Input Low level voltage	<1.5V
5	Input High level voltage	>8.0V
6	Input current	<2.5mA
7	Maximum Input Pulse Rate	<100 Hz
8	Calculations	Totalisation, Windspeed, Rain calculation etc.

Table-8.2.1: Digital Input

#### 8.2.2 Sensor Power Supply:

Sr. No	Parameter	Specification
1	Voltage	15 ±0.25 VDC
2	Load	50mA Maximum each channel

Table-8.2.2: Sensor Power Supply

### 8.3 Status LED:

Sr. No	Parameter	Marking	Remarks
1	Power	PS	Red power supply LED

Table-8.3: MBLogger status LED

### 8.4 Communication Serial Port (RS485):

Sr. No	Parameter	Specification
1	Baud rate	4,800, 9,600 and 19,200 bps
2	Isolation	2.5KV
3	Protocols	MODBUS RTU Master MODBUS RTU Slave
4	Maximum number of sensor/ IED that can be connected	10 (i)

Table-8.4: Serial Port (RS485)

### 8.5 Communication Port ETH

Sr. No	Parameter	Specification
1	Speed	100MHz
2	Protocols	MODBUS TCP Master MODBUS TCP Slave SNTP client, FTP, HTTP, Embedded web server
3	Maximum number of sensor/ IED that can be connected	10 (i)

Table-8.5: Port ETH

Note:

- i) Maximum number of parameters for each sensor/ IED is limited to 25.
- ii) Total number of parameters for all sensors / IED's is 400.

### 8.6 Internal Modem

Sr. No	Parameter	Specification
1	Modem Type	Quad band 4G (CAT-1) modem with antenna. Fallback to 2G.
2	Frequency band	TDD LTE: B40/B41 GSM: 900/1800Mhz

Table-8.6: Internal Modem

## 8.7 Datalogging

Sr. No	Parameter	Specification
1	Datalogging time (periodical time)	Site configurable
2	SD Card	Up-to 16GB (FAT32)
3	Protocol	FTP via ETH port or inbuilt Modem

Table-8.7: Datalogging operation

## 8.8 Electrical

Sr. No	Parameter	Specification
1	Power supply voltage input	9-32 VDC
2	Power Consumption	With cellular modem: 9 W
		Without cellular modem: 4 W

Table-8.8: Electrical specifications

## 8.9 Environmental

Sr. No	Parameter	Specification
1	Operating Temperature range	-5°C to +60°C
2	Storage Temperature	-20°C to +80°C
3	Operating Humidity	Maximum 95% - noncondensing

Table-8.9: Environmental specifications

## 8.10 Physical

Sr. No	Parameter	Specification
1	Protection	IP20
2	Dimensions (W x H x L)	75 x 62 x 90 mm
3	Weight	0.3 Kg (Approx.)
4	Mounting	DIN Rail
5	Housing material	Polycarbonate

Table-8.10: Physical specifications

## 9. MLogger NanoPro MODBUS Slave Registers

All parameters measured and read from sensors and IED are available via MODBUS slave registers.

Details of these registers are provided in this section.

Note:

- i) Standard deviation value and Integrated values shall be provided if these are configured for the parameter.

### 9.1 Data Logger Time

Sr. No	Parameter	Register Address	Type	Read/ Write
1	Data logger epoch second	10	32 bits unsigned integer	Read/ Write

Table-9.1: Datalogger RTC time

Note: For writing time to datalogger – 32 bits should be written with write command.

### 9.2 My Page Parameters

Sr. No	Parameter	Attribute	Register Address	Type	Read/ Write
1	My Parameter-1	Value	20	32 bits float	Read only
2	My Parameter-2	Value	22	32 bits float	Read only
3	My Parameter-3	Value	24	32 bits float	Read only
4	My Parameter-4	Value	26	32 bits float	Read only
5	My Parameter-5	Value	28	32 bits float	Read only
6	My Parameter-6	Value	30	32 bits float	Read only
7	My Parameter-7	Value	32	32 bits float	Read only
8	My Parameter-8	Value	34	32 bits float	Read only
9	My Parameter-9	Value	36	32 bits float	Read only
10	My Parameter-10	Value	38	32 bits float	Read only
11	My Parameter-11	Value	40	32 bits float	Read only
12	My Parameter-12	Value	42	32 bits float	Read only
13	My Parameter-13	Value	44	32 bits float	Read only
14	My Parameter-14	Value	46	32 bits float	Read only
15	My Parameter-15	Value	48	32 bits float	Read only
16	My Parameter-16	Value	50	32 bits float	Read only
17	My Parameter-17	Value	52	32 bits float	Read only
18	My Parameter-18	Value	54	32 bits float	Read only
19	My Parameter-19	Value	56	32 bits float	Read only
20	My Parameter-20	Value	58	32 bits float	Read only
21	My Parameter-21	Value	60	32 bits float	Read only
22	My Parameter-22	Value	62	32 bits float	Read only
23	My Parameter-23	Value	64	32 bits float	Read only

24	My Parameter-24	Value	66	32 bits float	Read only
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Table-9.2: My Page Parameters

Note: My Page parameters shall be updated each 500 msec.

### 9.3 Configurable Inputs

#### 9.3.1 Analog Inputs (Voltage and mA Inputs)

MODBUS slave registers for inputs configured as Voltage (0-10VDC), Voltage (0-100mV) or mA (4-20mA) inputs are provided in table 9.3.1 below.

Sr. No	Parameter	Attribute	Register Address	Type	Read/ Write
1	Configurable Input-1	Value	200	32 bits float	Read only
2		Value-minimum	202	32 bits float	Read only
3		Value-maximum	204	32 bits float	Read only
4		Value-average	206	32 bits float	Read only
5		Value-Standard Deviation	208	32 bits float	Read only
6		Value-Integrated	210	32 bits float	Read only
7	Configurable Input-2	Value	212	32 bits float	Read only
8		Value-minimum	214	32 bits float	Read only
9		Value-maximum	216	32 bits float	Read only
10		Value-average	218	32 bits float	Read only
11		Value-Standard Deviation	220	32 bits float	Read only
12		Value-Integrated	222	32 bits float	Read only

Table-9.3.1: MODBUS Registers for inputs configured as Voltage and mA inputs

### 9.3.2 Digital Inputs

MODBUS slave registers for inputs configured as digital inputs are provided in table 9.3.2 below.

Sr. No	Parameter	Attribute	Register Address	Type	Read/ Write
1	Configurable Input-1	DI Status, Value, Wind Speed, Speed - Value	200	32 bits float	Read only
2		Value-minimum	202	32 bits float	Read only
3		Value-maximum	204	32 bits float	Read only
4		Value- average	206	32 bits float	Read only
5		Value-Standard Deviation	208	32 bits float	Read only
6		Status Time	210	32 bits float	Read only
7	Configurable Input-2	DI Status, Value, Wind Speed, Speed - Value	212	32 bits float	Read only
8		Value-minimum	214	32 bits float	Read only
9		Value-maximum	216	32 bits float	Read only
10		Value- average	218	32 bits float	Read only
11		Value-Standard Deviation	220	32 bits float	Read only
12		Status Time	222	32 bits float	Read only

Table-9.3.2: MODBUS Registers for inputs configured as digital inputs

### 9.4 Sensors and IED Connected to Serial and ETH Ports

#### 9.4.1 Serial Port RS485

Register details for sensors and IED connected to serial port RS485.

Sr. No	Sensor/ IED	Parameter	Attribute	Register Address	Type	Read/ Write
1	IED-1	Parameter -1	Value	500	32 bits float	Read only
2			Value-minimum	502	32 bits float	Read only
3			Value-maximum	504	32 bits float	Read only
4			Value-average	506	32 bits float	Read only
5			Value-Standard Deviation	508	32 bits float	Read only
6			Value-Integrated	510	32 bits float	Read only
7		Parameter -2	Value	512	32 bits float	Read only

8		Parameter -3	Value	524	32 bits float	Read only
9		Parameter -4	Value	536	32 bits float	Read only
10		Parameter -5	Value	548	32 bits float	Read only
11		Parameter -6	Value	560	32 bits float	Read only
12		Parameter -7	Value	572	32 bits float	Read only
13		Parameter -8	Value	584	32 bits float	Read only
13		Parameter -9	Value	596	32 bits float	Read only
15		Parameter -10	Value	608	32 bits float	Read only
16		Parameter -11	Value	620	32 bits float	Read only
17		Parameter -12	Value	632	32 bits float	Read only
18		Parameter -13	Value	644	32 bits float	Read only
19		Parameter -14	Value	656	32 bits float	Read only
20		Parameter -15	Value	668	32 bits float	Read only
21		Parameter -16	Value	680	32 bits float	Read only
22		Parameter -17	Value	692	32 bits float	Read only
23		Parameter -18	Value	704	32 bits float	Read only
24		Parameter -19	Value	716	32 bits float	Read only
25		Parameter -20	Value	728	32 bits float	Read only
26		Parameter -21	Value	740	32 bits float	Read only
27		Parameter -22	Value	752	32 bits float	Read only
28		Parameter -23	Value	764	32 bits float	Read only
29		Parameter -24	Value	776	32 bits float	Read only
30		Parameter -25	Value	788	32 bits float	Read only
31	IED-2	Parameter -1	Value	800	32 bits float	Read only
32	IED-3	Parameter -1	Value	1100	32 bits float	Read only
33	IED-4	Parameter -1	Value	1400	32 bits float	Read only
34	IED-5	Parameter -1	Value	1700	32 bits float	Read only
35	IED-6	Parameter -1	Value	2000	32 bits float	Read only
36	IED-7	Parameter -1	Value	2300	32 bits float	Read only
37	IED-8	Parameter -1	Value	2600	32 bits float	Read only
38	IED-9	Parameter -1	Value	2900	32 bits float	Read only
39	IED-10	Parameter -1	Value	3200	32 bits float	Read only

Table-9.4.1: Register details for sensors and IED connected to serial port RS485-1.

#### 9.4.2 ETH Port

Register details for sensors and IED connected to serial port ETH.

Sr. No	Sensor/ IED	Parameter	Attribute	Register Address	Type	Read/ Write
1	IED-1	Parameter -1	Value	6800	32 bits float	Read only
2			Value-minimum	6802	32 bits float	Read only
3			Value-maximum	6804	32 bits float	Read only
4			Value-average	6806	32 bits float	Read only

5			Value-Standard Deviation	6808	32 bits float	Read only
6			Value-Integrated	6810	32 bits float	Read only
7		Parameter -2	Value	6812	32 bits float	Read only
8		Parameter -3	Value	6824	32 bits float	Read only
9		Parameter -4	Value	6836	32 bits float	Read only
10		Parameter -5	Value	6848	32 bits float	Read only
11		Parameter -6	Value	6860	32 bits float	Read only
12		Parameter -7	Value	6872	32 bits float	Read only
13		Parameter -8	Value	6884	32 bits float	Read only
13		Parameter -9	Value	6896	32 bits float	Read only
15		Parameter -10	Value	6908	32 bits float	Read only
16		Parameter -11	Value	6920	32 bits float	Read only
17		Parameter -12	Value	6932	32 bits float	Read only
18		Parameter -13	Value	6944	32 bits float	Read only
19		Parameter -14	Value	6956	32 bits float	Read only
20		Parameter -15	Value	6968	32 bits float	Read only
21		Parameter -16	Value	6980	32 bits float	Read only
22		Parameter -17	Value	6992	32 bits float	Read only
23		Parameter -18	Value	7004	32 bits float	Read only
24		Parameter -19	Value	7016	32 bits float	Read only
25		Parameter -20	Value	7028	32 bits float	Read only
26		Parameter -21	Value	7040	32 bits float	Read only
27		Parameter -22	Value	7052	32 bits float	Read only
28		Parameter -23	Value	7064	32 bits float	Read only
29		Parameter -24	Value	7076	32 bits float	Read only
30		Parameter -25	Value	7088	32 bits float	Read only
31	IED-2	Parameter -1	Value	7100	32 bits float	Read only
32	IED-3	Parameter -1	Value	7400	32 bits float	Read only
33	IED-4	Parameter -1	Value	7700	32 bits float	Read only
34	IED-5	Parameter -1	Value	8000	32 bits float	Read only
35	IED-6	Parameter -1	Value	8300	32 bits float	Read only
36	IED-7	Parameter -1	Value	8600	32 bits float	Read only
37	IED-8	Parameter -1	Value	8900	32 bits float	Read only
38	IED-9	Parameter -1	Value	9200	32 bits float	Read only
39	IED-10	Parameter -1	Value	9500	32 bits float	Read only

Table-9.4.2: Register details for sensors and IED connected to serial port ETH.

### 9.5 Measured Parameters and IED Communication Status

Sr. No	Parameter	Register Address	Type	Read/ Write
1	Analog inputs Quality - mA	10450	16 bits Unsigned Integer	Read only
2	Analog inputs Quality - mV	10451	16 bits Unsigned Integer	Read only
3	Analog inputs Quality - V	10452	16 bits Unsigned Integer	Read only
4	Digital Inputs	10453	16 bits Unsigned Integer	Read only
5	GPS	10454	16 bits Unsigned Integer	Read only
6	IED Communication Status – Serial Port RS485	10455	16 bits Unsigned Integer	Read only
7	IED Communication Status – Port ETH	10456	16 bits Unsigned Integer	Read only

Table-9.5: Inputs and IED Communication status MODBUS registers

### 9.6 Plant Parameters

Sr. No	Parameter	Attribute	Register Address	Type	Read/ Write
1	Sunshine duration for the day	Total time in seconds	10500	32 bits float	Read only
2	Sun Rise time for the day	Sun rise time	10502	32 bits float	Read only
3	Sun Set time for the day	Sun set time	10504	32 bits float	Read only
4	Day duration	Hours	10506	32 bits float	Read only
5	Today solar Energy	Wh/Mtr2	10508	32 bits float	Read only
6	Today Rainfall	mm	10510	32 bits float	Read only
7	Solar Noon Time	Time in seconds	10512	32 bits float	Read only
8	Solar Plant Energy Generation	Energy generated by the plant	10514	32 bits float	Read only
9	Sun Rise civil time for the day	Sun rise civil time	10516	32 bits float	Read only
10	Sun Set civil time for the day	Sun set civil time	10518	32 bits float	Read only

Table-9.6: Plant Parameters

9.7 Albedo Meter Values

Sr. No	Parameter	Attribute	Register Address	Type	Read/ Write
1	Albedo Meter-1	Ratio	10520	32 bits float	Read only
2	Albedo Meter-1		10522	32 bits float	Read only
3	Albedo Meter-1		10524	32 bits float	Read only
4	Albedo Meter-1		10526	32 bits float	Read only

Table-9.7: Albedo meter vale

## 10. MBLogger Diagnostics

Configuration and operation of MBLogger is quite simple. It can be easily configured using the default settings and sensor/ IED library.

Some of the probable problems and solutions are listed below.

### 10.1 Download Datalogger Status and Values Report:

Download status report and logged messages as shown in sec. 7.7.1. and sec. 7.7.2. This report will enable better understanding of the problem.

### 10.2 Embedded Webserver

Sr. No.	Problem	Solutions
1	Unable to login to MBLogger	<ul style="list-style-type: none"> <li>i) Check that proper IP set in the datalogger is being used.</li> <li>ii) Try default datalogger IP.</li> <li>iii) Confirm that there is no IP clash in the network.</li> <li>iv) Check that IP set is as per network class.</li> <li>v) If user has closed the webpage without logout – wait for <b>about three minutes</b> before attempting next login.</li> </ul>
2	Unbale to login. Message ‘Datalogger is being configured. Login after some time’.	This message is generated if user tries to login while the datalogger is being configured. Try to login after 10 to 15 seconds.

Table-10.2: Embedded webserver problems

### 10.3 ETH Network

Sr. No.	Problem	Solutions
1	SNTP client not able to update time.	<ul style="list-style-type: none"> <li>i) Check that network gateway has been configured properly and connected to the LAN. Check gateway status on OLED or webserver diagnostics.</li> <li>ii) Check availability of internet.</li> <li>iii) Verify NTP server IP set in the MBLogger.</li> <li>vi) Verify operation of the NTP server via ping.</li> </ul>
2	MODBUS Slave does not respond	i) Check that MODBUS slave has been enabled – ETH port configuration.
3	MODBUS Slave becomes inactive after some time.	i) Check polling time of MODBUS TCP master. Polling time should be more than 300 msec. Reply delay should be more than 300 msec.

Table-10.3: ETH Network problems

## 10.4 Datalogger Modem

Sr. No.	Problem	Solutions
1	Modem is unable to register to network.	<ul style="list-style-type: none"> <li>i) Check cellular signal strength via OLED or webserver diagnostic.</li> <li>ii) Connect the antenna securely and place the antenna to get best signal strength.</li> <li>iii) Verify that SIM is inserted properly.</li> <li>iv) Check that SIM is operational and not blocked.</li> <li>v) Verify correct selection of cellular service provider.</li> <li>vi) Check that there is enough balance in the SIM for data communication</li> </ul>

Table-10.4: Datalogger Modem

## 10.5 Datalogger GPS

Sr. No.	Problem	Solutions
1	Modem is unable to register to network.	<ul style="list-style-type: none"> <li>i) Check that GPS is enabled in the device.</li> <li>ii) Check that GPS antenna is exposed to sky.</li> <li>iii) Allow three to five minutes for GPS to synchronise to satellites.</li> </ul>
2	GPS time is not updated	<ul style="list-style-type: none"> <li>i) GPS takes three to five minutes to detect satellites and synchronise.</li> </ul>

Table-10.5: Datalogger GPS

## 10.6 Analog Input Channels

Sr. No.	Problem	Solutions
1	Analog input channel is showing wrong value	<ul style="list-style-type: none"> <li>i) Verify that the analog signal is connected to proper terminal of the datalogger.</li> <li>ii) Verify polarity of the signal connected to the terminals.</li> <li>iii) Check for sensor/ IED type selection and its proper range selection</li> </ul>
2	Analog input 4-20mA channel is showing values with <b>bad quality</b> .	<ul style="list-style-type: none"> <li>i) Verify that proper signal is present on the terminals. The mA signal input should be within 4 to mA.</li> </ul>
3	Analog input 4-20mA channel is showing value -4444.4 with <b>bad quality</b> .	<ul style="list-style-type: none"> <li>i) Sensor is not connected, or the sensor wire is broken. The mA signal input is less than 4 mA.</li> </ul>
4	Analog input 4-20mA channel is showing value 8888.8 with <b>bad quality</b> .	<ul style="list-style-type: none"> <li>i) The mA signal input is more than 20 mA.</li> </ul>

Table-10.6: Analog input channels

## 10.7 Digital Input Channels

Sr. No.	Problem	Solutions
1	Digital input channel is not being detected	<ul style="list-style-type: none"> <li>i) Verify that the digital signal is connected to proper terminal of the datalogger.</li> <li>ii) Verify polarity of the signal connected to the terminals.</li> <li>iii) Check that input signal frequency is within the specified range.</li> <li>iv) Confirm that digital signal source is of open collector or potential free contact type.</li> </ul>
2	Digital input channel is showing values with <b>bad quality</b> .	<ul style="list-style-type: none"> <li>i) Check for sensor/ IED type selection and its proper range selection</li> </ul>
3	Multiple pulses are detected on each operation of digital input	<ul style="list-style-type: none"> <li>i) This happens due to contact chattering of the digital input signal source.</li> <li>ii) Check the digital signal source relay.</li> </ul>

Table-10.7: Digital input channels

## 10.8 Sensor and IED Interfaced to Serial Ports (RS485)

Sr. No.	Problem	Solutions
1	Not able to read parameters from sensor/ IED.	<ul style="list-style-type: none"> <li>i) Check communication status with IED on OLED or webserver.</li> <li>ii) Confirm that proper RS485 cable (twisted pair cable, shielded and low capacitance) has been used.</li> <li>iii) Verify that one end of the communication cable shield is earthed.</li> <li>iv) Check for proper RS485 communication loop connection.</li> <li>v) Verify MODBUS ID of the IED has been configured properly.</li> <li>vi) Check that all IED on the RS485 communication loop have unique MODBUS ID.</li> </ul>
2	Wrong values read from the sensor/ IED	<ul style="list-style-type: none"> <li>i) Check for sensor/ IED type selection and its proper range selection</li> <li>ii) Verify parameter register addresses has been configured.</li> <li>iii) Verify proper register length (16 or 32 bits) and types (signed or unsigned) has been configured.</li> </ul>

Table-10.8: Sensor and IED interfaced to serial ports (RS485 or RS232)

## 10.9 Sensor and IED Interfaced to ETH Port

Sr. No.	Problem	Solutions
1	Not able to read parameters from sensor/ IED.	<ul style="list-style-type: none"> <li>i) Verify that IP Address of the IED is configured properly.</li> <li>ii) Check network link with IED via ping.</li> <li>iii) Check for other problems as <a href="#">mentioned in 10.3 above</a>.</li> <li>iv) Check MODBUS TCP Master communication messages</li> </ul>

Table-10.9: Sensor and IED interfaced to ETH port

## 10.10 File Transfer Operation

Sr. No.	Problem	Solutions
1	File transfer not OK.	<ul style="list-style-type: none"> <li>i) Check the media for file transfer Modem of ETH.</li> <li>ii) If modem is selected – check that no problem exists <a href="#">with modem</a>.</li> <li>iii) If ETH is selected – check problems with <a href="#">ETH network</a>.</li> <li>iv) Verify configuration of IP, username and passwords for remote file servers.</li> <li>v) Check file servers with ping</li> </ul>

Table-10.10: File transfer Operation

## 10.11 Datalogging Operation

Sr. No.	Problem	Solutions
1	SD Card problem	<ul style="list-style-type: none"> <li>i) Check SD Card status on OLED or webserver.</li> <li>ii) Check that SD card is inserted properly.</li> <li>iii) Put Off the datalogger, remove the SD card. Verify operation of SD card on PC or laptop.</li> <li>iv) If required format the SD card. Remember to save the logger files prior to formatting the SD card.</li> <li>v) Confirm that SD card id not defective.</li> </ul>
2	SD Card present but data log files are not being created.	<ul style="list-style-type: none"> <li>i) Put off power to datalogger.</li> <li>ii) Remove SD card.</li> <li>iii) Re-insert the SD card properly.</li> </ul>
3	Parameter values are not being logged	<ul style="list-style-type: none"> <li>i) Verify that datalogging operation is <a href="#">enabled for the remote server</a>.</li> <li>ii) Check if the data log file directory is full.</li> <li>iii) Check configuration for <a href="#">file directory</a>.</li> <li>iv) Verify that the parameter has been</li> </ul>

		<a href="#">configured for logging.</a>
4	File Download option button – not being displayed	<ul style="list-style-type: none"> <li>i) The file is being used for logging.</li> <li>ii) Try again after some time.</li> </ul>

Table-10.11: Datalogging Operation

For other problems please contact [service@mbcontrol.com](mailto:service@mbcontrol.com) .

## 11. MBLogger Library

List of libraries of sensors and IED provided in MBLogger is provided below.

Option of 'Input Not Used' is provided for all inputs, if the same is not used.

### 11.1 Library for Digital Input Channels

List of sensors for digital input is provided in table-11.1 below.

Sr. No.	Sensor Type	Make and Model Number
1	Status Input	
2	Rain Gauge	Barani Design
3		Lufft
4		Campbell TB4_MML4
5		Campbell TE525WS_L5
6		Davis 6466
7		Another rain gauge
8		Wind Speed
9	MeteoWind Compact Wind Speed Sensor	
10	Davis Vantage Pro2	
11	LSI DNA-202	
12	Another wind speed sensor	
13	Speed RPM	

Table-11.1: Library of Sensors for digital input channels

### 11.2 Library for Analog mA Input Channels

List of sensors for analog input (mA) is provided in table-11.2 below.

Sr. No.	Sensor Type	Make and Model Number
1	Other Sensor	Sensor of any other make.
2	PV Module Temperature	MBCS MBMet 802
3		HS MSPT100S
4	Ambient Temperature	MBCS MBMet 901BA – temperature
5		MBCS MBMet 901CA – temperature
6		MBCS MBMet 902AW – temperature
7		MBCS MBMet 902BW – temperature
8		HS TSSR-01
9	Ambient Humidity	MBCS MBMet 901BA – humidity
10		MBCS MBMet 901DA – humidity
11		MBCS MBMet 902AW – humidity
12	Wind Speed	MBCS MBMet 120A Wind Speed
13		MBCS MBMet 100AA Wind Speed
14		MBCS MBMet 100AB Wind Speed
15		MBCS MBMet 140A Ultra Sonic Wind Speed
16		Theis Wind Speed Vwind420
17		Wind Direction
18	MBCS MBMet 110AA Wind direction	

19		MBCS MBMet 110AB Wind direction
20		MBCS MBMet 140A Ultra Sonic Wind Direction
21		Theis Wind Direction Rwind420
22		Rika RK110-1
23		Other Wind Direction Sensor
24	Pyranometer	Kipp & Zonnen SMP10
25		Kipp & Zonnen SMP11
26		Huskeflux SR2002
27		Huskeflux SR05
28		Igenierburo SI420
29		DeltaOhm LPPYRA03AC
30		Eko MS80SA
31		MBCS MBMet-500AA, MBCS MBMet-500BA and MBCS MBMet-500CA_DA
32		Eko MS80 using MB1375-20
33	Kipp Zonnen CMP10 using MB1375-20	
34	Test Input 4-20mA	Used for testing the channel. Value is displayed in range 400 to 2000 based on input mA.

Table-11.2: Library of Sensors for analog input mA channels

### 11.3 Library for Analog mV Input Channels

List of sensors for analog input (mV) is provided in table-11.3 below.

Sr. No.	Sensor Type	Make and Model Number
1	Other Sensor	Sensor of any other make.
2	Pyranometer	Kipp & Zonnen SMP10V
3		Kipp & Zonnen SMP11V
4		Kipp & Zonnen SMP3
5		Kipp & Zonnen CMP10(i)
6		Huskeflux SR20T1
7		Huskeflux SR05DA1
8		Epogee SP-110 SS. Calibration constant is 200 micro volt /w/mtr <sup>2</sup>
9		DeltaOhm LPPYRA03AV (0-1000mV)
10		DeltaOhm LPPYRA03(i)
11		EKO MS80(i)
12	Test Input 0-100 mV	Used for testing and calibration the channel. Value is displayed in range 0 to 10000 based on input mV.

Table-11.3: Library of Sensors for analog input mV channels

Note:

- 1) Calibration constant is provided for each pyranometer by the manufacturer.  
Micro volts /watt/mtr<sup>2</sup>

#### 11.4 Library for Analog Voltage Input Channels

List of sensors for analog input (voltage) is provided in table-11.4 below.

Sr. No.	Sensor Type	Make and Model Number
1	Other Sensor	Sensor of any other make.
2	Wind Speed	MBCS MBMet 100CA Wind Speed
3		MBCS MBMet 100CB Wind Speed
4		MBCS MBMet 100DA Wind Speed
5		MBCS MBMet 100DB Wind Speed
6		Theis Vwind 10
7		Davis Vantage Pro2
8		Wind Direction
9	MBCS MBMet 110CA Wind direction	
10	MBCS MBMet 110CB Wind direction	
11	MBCS MBMet 110DA Wind direction	
12	MBCS MBMet 110DB Wind direction	
13	Barani MeteoWind Compact Wind Direction	
14	Theis Rwind 10	
15	Other Wind Direction Sensor	
16	Pyranometer	Igenieurburo SIV10T
17		DeltaOhm LPPYRA03AV: 0-5V
18		DeltaOhm LPPYRA03AV: 0-10V
19	Cloud Cover Sensor	PCCD Okta
20	Test Input 0-10V	Used for testing the channel. Value is displayed in range 0 to 10000 based on input V.

Table-11.4: Library of Sensors for analog input voltage channels

#### 11.5 Library for Sensors/ IED for RS485 Ports MODBUS – RTU Protocol

List of sensors/IED for RS485 ports having MODBUS RTU protocol is provided here.

##### 11.5.1 Ambient Parameter Sensors

List of ambient parameters sensors for RS485 ports is provided in table-11.5.1 below.

Sr. No.	Senor Type	Make and Model Number
1	Other Sensor	Sensor of any other make.
2	Ambient Temperature, Humidity and Pressure	MBCS MBMet 901AB
3	Ambient Temperature and Humidity	MBCS MBMet 901BB

4	Ambient Temperature	MBCS MBMet 901CB
5	Ambient Humidity	MBCS MBMet 901DB
6	Ambient Pressure	MBCS MBMet 901EB

Table-11.5.1: Library of ambient parameter sensors for RS485 ports

### 11.5.2 Inverters

List of inverters for RS485 ports is provided in table-11.5.5 below.

Sr. No.	Senor Type	Make and Model Number
1	Inverter	SMA Devices ScnnHE20

Table-11.5.2: Library of inverters for RS485 ports

### 11.5.3 MFM

List of MFM for RS485 ports is provided in table-11.5.6 below.

Sr. No.	Senor Type	Make and Model Number
1	MFM	Satec PM130EHP
2		Satec EM133

Table-11.5.3: Library of MFM for RS485 ports

### 11.5.4 PV Module Sensors

List of PV module sensors for RS485 ports is provided in table-11.5.4 below.

Sr. No.	Senor Type	Make and Model Number
1	PV Module Temperature	MBCS MBMet 803

Table-11.5.4: Library of PV module sensors for RS485 ports

### 11.5.5 Pyranometers

List of pyranometer for RS485 ports is provided in table-11.5.5 below.

Sr. No.	Senor Type	Make and Model Number
1	Pyranometer	Kipp & Zonnen SMP3
2		Kipp & Zonnen SMP10
3		Kipp & Zonnen SMP11
4		Huskeflux SR20D2
5		Huskeflux SR05
6		Igenierburo ST RS485
7		EKO MS80S
8		MBCS MBMet-500AB, MBMet-500B and MBMet-500CB_DB
9		EKO MS80S

Table-11.5.5: Library of pyranometers for RS485 ports

### 11.5.6 Wind Speed and Direction Sensors

List of wind speed and direction sensors for RS485 ports is provided in table-11.5.6 below.

Sr. No.	Senor Type	Make and Model Number
1	Wind Speed	MBCS MBMet 100BA
2		MBCS MBMet 100BB
3		MBCS MBMet 140B US – ultra sonic
4	Wind Direction	MBCS MBMet 110BA
5		MBCS MBMet 110BB
6	Wind Speed and Direction	MBCS MBMet 120B
7		MBCS MBMet 130B
8		MBCS MBMet 140HB
9		MBCS MBMet 140B Ultrasonic
10		MBCS MBMet 140B Ultrasonic V2
11		Barani Wind Speed and Direction

Table-11.5.6: Library of wind speed and direction sensors for RS485 ports

### 11.5.7 Rain Gauge

List of Rain Gauges for RS485 ports is provided in table-11.5.7 below.

Sr. No.	Senor Type	Make and Model Number
1	Rain Gauge	Model ZRG10

Table-11.5.7: Library of Rain Gauge for RS485 ports

### 11.5.8 Smart Box

List of Smart Boxes for RS485 ports is provided in table-11.5.8 below.

Sr. No.	Senor Type	Make and Model Number
1	Smart Box	Model Smart Box – 1448

Table-11.5.8: Library of Smart Box for RS485 ports

### 11.5.9 Soil Sensors

List of Soil Sensors for RS485 ports is provided in table-11.5.9 below.

Sr. No.	Senor Type	Make and Model Number
1	Soil Sensors	MB-RK-520-1

Table-11.5.9: Library of Soil Sensors

### 11.5.10 Solar Monitoring System

List of solar monitoring system for RS485 ports is provided in table-11.5.10 below.

Sr. No.	Senor Type	Make and Model Number
1	Solar Monitoring System	Kipp & Zonnen Razon Plus

Table-11.5.10: Library of solar monitoring system for RS485 ports

## 11.6 Library for Sensors/ IED for ETH Ports – MODBUS TCP Protocol

List of sensors/IED for ETH port having MODBUS TCP protocol is provided here.

### 11.6.1 MFM

List of MFM for ETH port is provided in table-11.6.1 below.

Sr. No.	Senor Type	Make and Model Number
1	MFM	Satec PM130EHP

Table-11.6.1: Library of MFM for ETH port

### 11.6.2 Inverters

List of inverters for ETH port is provided in table-11.6.2 below.

Sr. No.	Senor Type	Make and Model Number
1	Inverter	SMA Devices ScnnHE20

Table-11.6.2: Library of inverters for ETH port

### 11.6.3 Solar Monitoring System

List of solar monitoring system for ETH port is provided in table-11.6.3 below.

Sr. No.	Senor Type	Make and Model Number
1	Solar Monitoring System	Kipp & Zonnen Razon Plus

Table-11.6.3: Library of solar monitoring system for ETH port

## 12 Revision History

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<b>Revision</b>	<b>Date</b>	<b>Description</b>
1.01	2022-01-22	Document created.
1.02	2022-12-30	Albedometer added Library updated Plant Parameters added

Table-12: Revision History