MBLogger Nano and NanoM

Advanced Datalogger Series

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Table of Contents

1. Warnings

- 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. MBLogger Nano Series

MBLogger Nano 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 e.g. PLC, weather sensors, inverters, energy meters.
- Provides various communication ports RS485 (isolated) and ETH.
- Modem 4G for communication.
- Multiple communication protocols – MODBUS RTU (master and slave), MODBUS TCP (master and slave), SNTP, 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.
- LED display for status and device health.
- 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, MBLogger series are ideal for datalogging
- Log for user activity and device messages/ faults.
- **Excellent on-site diagnostic support with datalogger status and value reports.**

2.1 MBLogger 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.
- Manufacturing measurement

2.2 MBLogger Nano Model Variants

Various options and models available MBLogger series are shown in table 2.1 below:

Sl. No.	Features	Nano	NanoM
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**	-	●
4	**MMC SD Card (16GB)**	●	●
5	**Maximum number of IED per port**	10	10
6	**Maximum number of MODBUS TCP Slave clients**	1	1
7	**SNTP Client**	1	1
8	**File Transfer Clients**	2	2
9	**RTC (battery backed up)**	●	●

Table-2.2: MBLogger Nano variants

Features available in your MBLogger Nano will depend on the model selected and procured.

3. MBLogger Nano 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 MBLogger Nano model selected.

3.1 MBLogger Nano Ports and Terminals

Ports and input terminals of MBLogger 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 are provided in figure – 3.1.1 below.

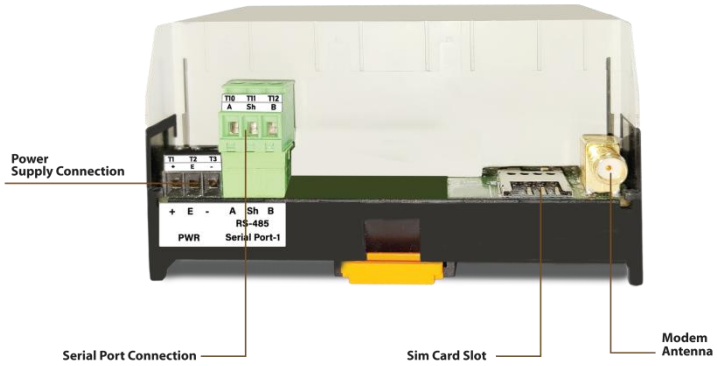

Figure-3.1.1: MBLogger Nano port connectors and terminals

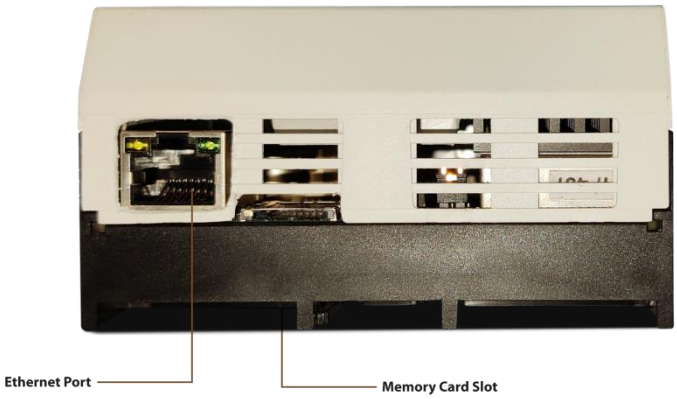

Figure-3.1.2: MBLogger Nano ETH port and SD card

3.2 MBLogger Nano Power Supply Connections

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

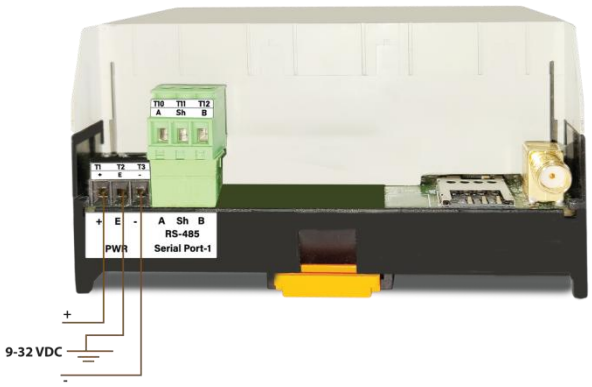

Figure-3.2: MBLogger Nano power supply connections.

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

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

3.2: MBLogger Nano power supply connections

Use proper protection MCB for power connections.

3.3 Serial Port -1 (RS485)

MBLogger serial port-1 (RS485) are shown in figure 3.3 below.

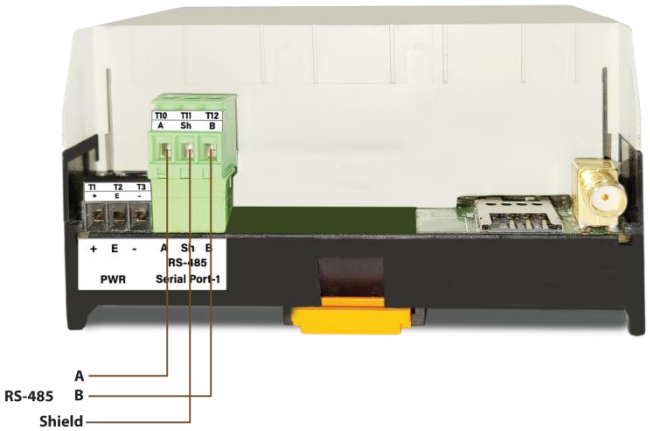

Figure-3.3: MBLogger Nano serial port-1 (RS485) connections.

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

Terminal	Function	Remarks
T10	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 here. Use low capacitance, twisted pair and shielded cable for connecting devices to the port.
T11	Earth	
T12	B	

gger Nano serial port-1 (RS485) connections

3.4 Port ETH

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

Figure-3.4: MBLogger ETH Port.

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

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 and front panel OLED.

3.5 SD Memory Card

MBLogger supports microSD memory card up-to 16GB.

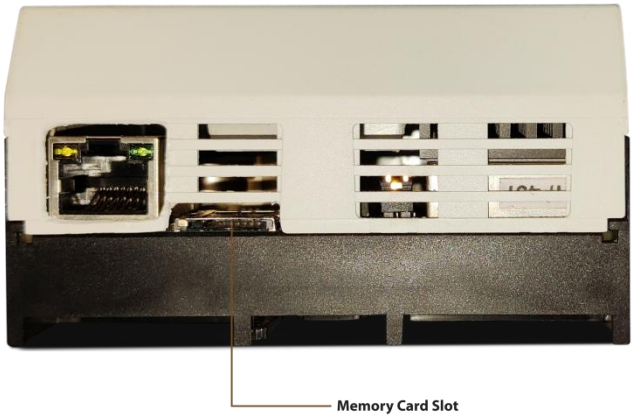

Figure-3.5: MBLogger SD card slot.

MicroSD card is used for data logging.

3.6 Internal Modem

Availability of internal modem is based on selected model.
High speed 4G modem (CAT-1) is provided.

Figure-3.6: MBLogger internal modem.

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 LED's 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.

Modem status LED.

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

The modem can be used for following operations:

i) SNTP Client for time synchronization.
ii) File transfer client (ftp).

Configuration details for the modem are provided here.

4. MBLogger Nano Display

MBLogger Nano provides following LED indications.

i) Power connection status LED – Red near the power terminals.

5. Default Datalogger Network Configuration

Default network configuration for the datalogger are provided in table 5 below.

S. No.	Description	Value
1	Device IP	192.168.100.222
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

: Default datalogger network configuration

These settings can be changed via embedded web server.

6. Embedded Webserver

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 valued 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.

6.1 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.

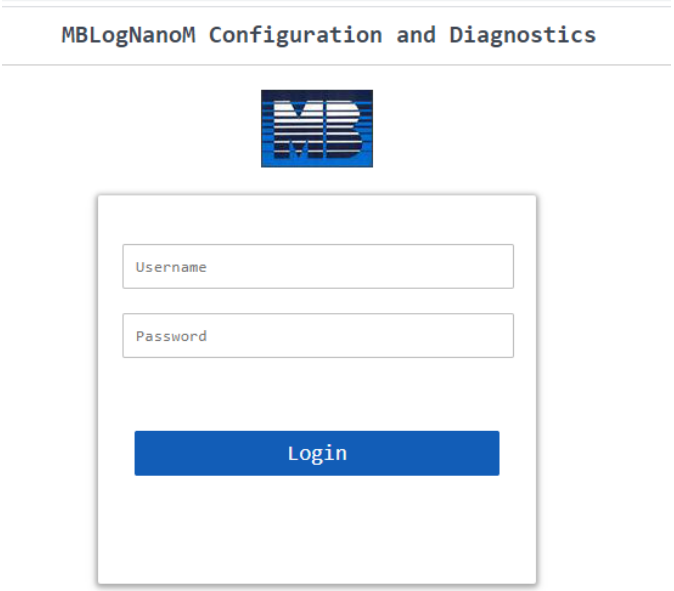

Figure-6.1: Datalogger login screen.

User login details are provided in table 6.1 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-6.1: User login details

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

6.2 Welcome Page

Upon successful user login, welcome page as shown in figure-6.2 is displayed.

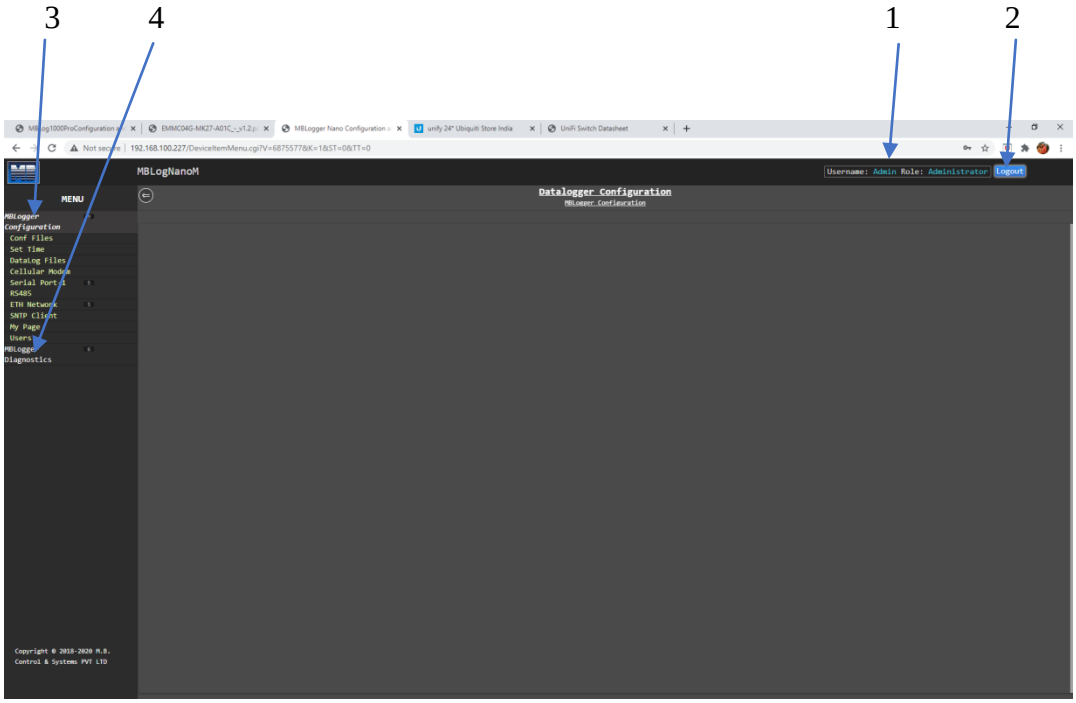

Figure-6.2: User login welcome page.

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 6.2 below.

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

Table-6.2: 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.

6.3 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-6.3 below.

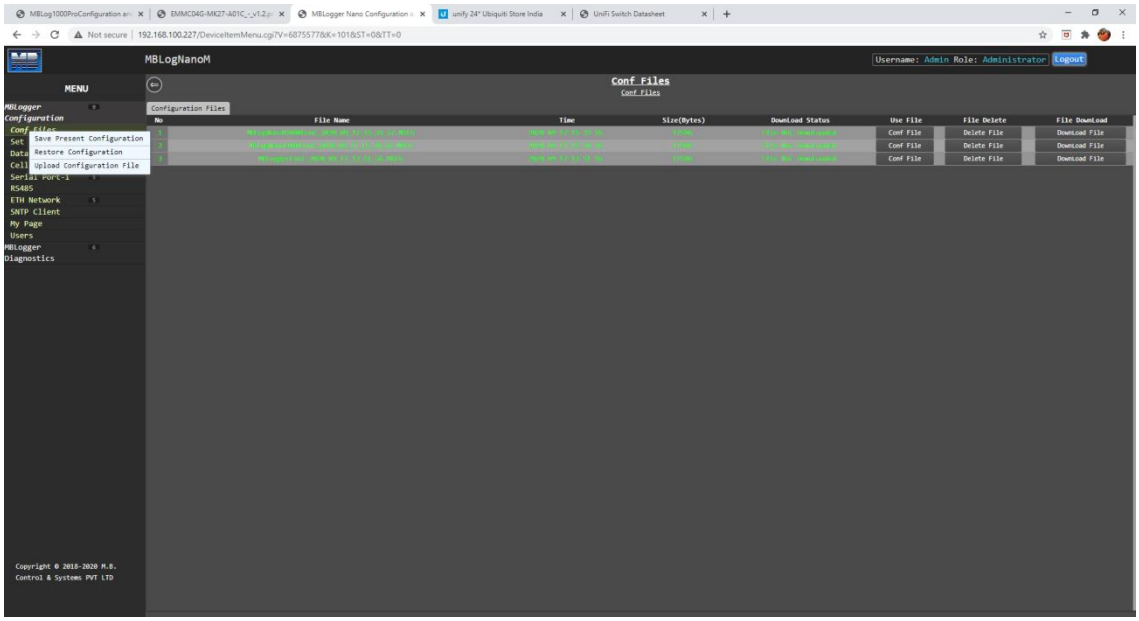

Figure-6.3: Datalogger configuration files.

Selected menu option shall be highlighted.

Operations available for datalogger configuration files are shown in table 6.3.1 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.

Table-6.3.1: Datalogger configuration file operations

Options available for saved datalogger configuration files are shown in table 6.3.2 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-6.3.2: Operations for saved configuration files

6.4 Set Time

Left click on menu option ‘Set Time’ to set time of the datalogger as shown in figure-6.4 below.

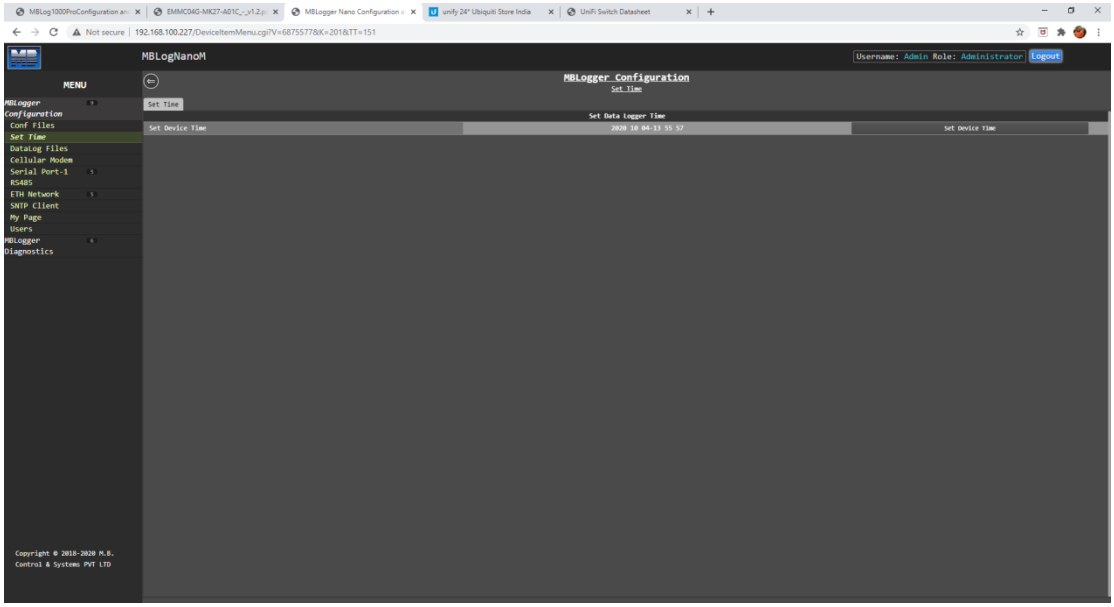

Figure-6.4: Set datalogger time.

Details of the page are provided in table 6.4 below.

Sr. No	Parameter	Description	Remarks
1	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-6.4: Set time

6.5 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 6.5.1 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.

Table-6.5: 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-6.5 below.

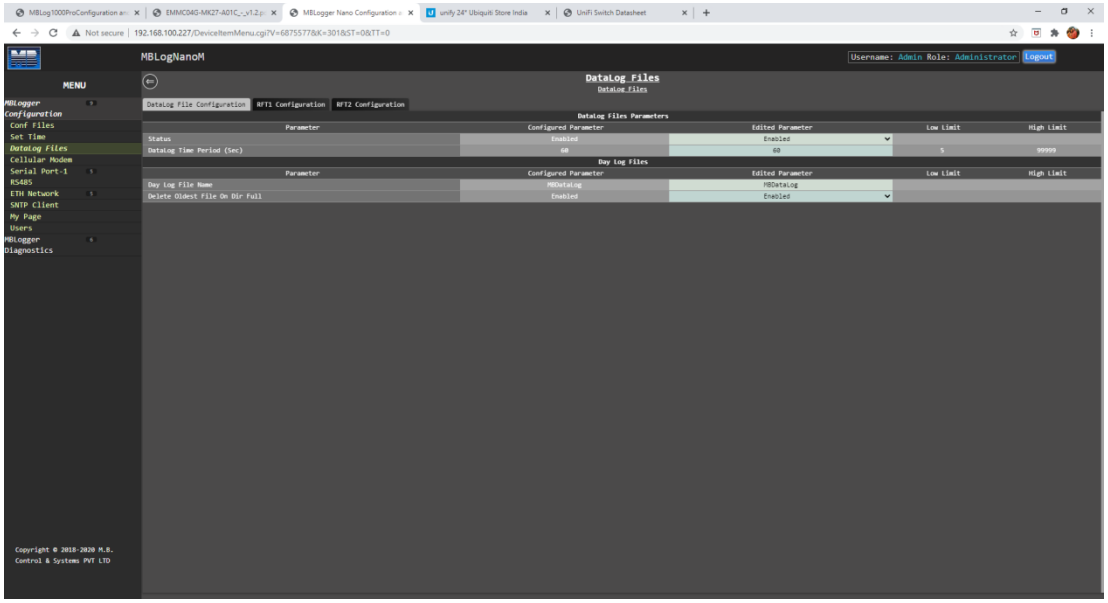

Figure-6.5: Configuration of datalogger file operations.

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

6.5.1 Day Log File Configuration:

Configuration of day log file is shown in figure 6.5.1 below.

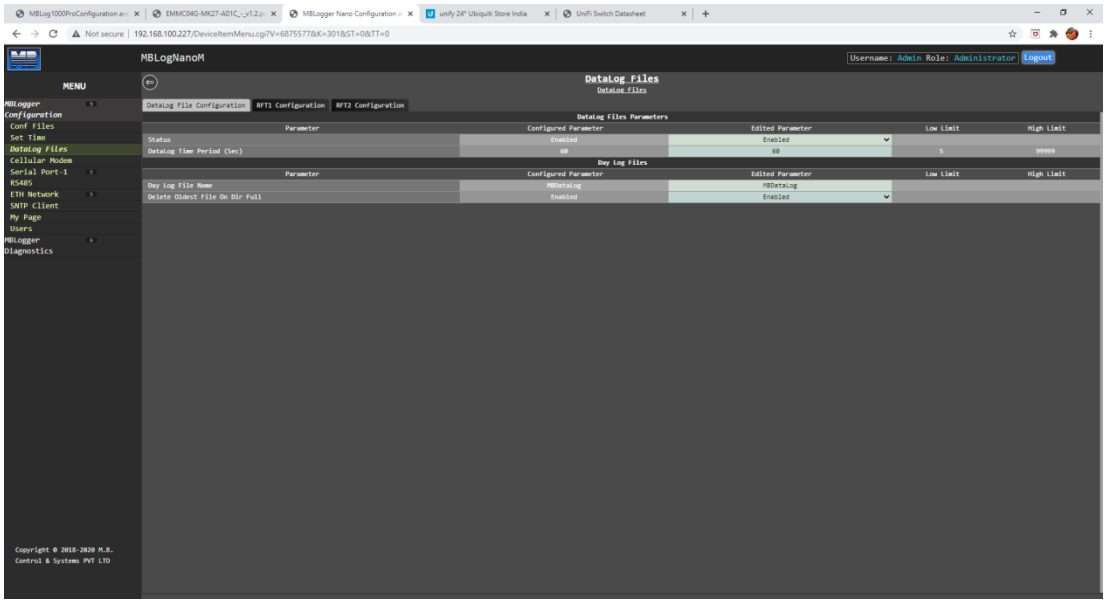

Figure-6.5.1: Day log file Configuration

Details of the parameters on the page are provided in table 6.5.1 below. For details on other parameters use hoover 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.	**Disabled:** Data logging will stop if the directory is full. **Enabled:** Data logging will continue after deleting the oldest file in the directory.

Table-6.5.1: Configuration – day data log file operation

6.5.2 Remote File Transfer Configuration:

Remote file transfer can be configured via tabs – 'RFT1 Configuration' and 'RFT2 Configuration'. Configuration page is shown in figure 6.5.2 below.

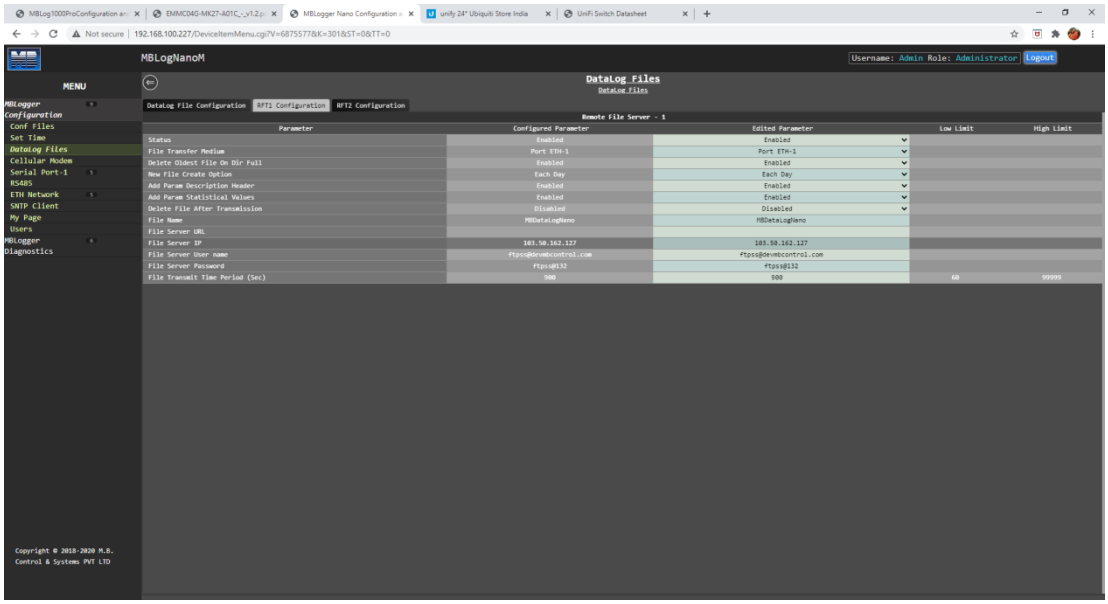

Table-6.5.2: Configuration – remote file transfer operation

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.	**Disabled:** Data logging will stop if the directory is full. **Enabled:** 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'	**Each Day**: New data log file will be created as start of each day. **Each Transmission Period**: New data log file will be created at start of each file transmission time period.

5	Add Param Description Header	Enabled or Disabled	If Enabled, parameter description header will be added to the file
6	Add Param Statistical Values	Enabled or Disabled	**Enabled**: Calculated statistical values – minimum, maximum, average, standard deviation, and integrated value shall be added to the log (as per parameter configuration). **Disabled**: Only parameter value shall be added to the log.
7	Delete File after Transmission	Enabled or Disabled	**Enabled**: Data log file shall be deleted after successful transmission. **Disabled**: 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. e.g. '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-6.5.2.1: 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 6.5.2.2 below.

Sr. No	Column	Description	Remarks
1	Date	Date of logging	YYYY.MM.DD
2	Time	Time of logging	HH.MM.SS

3	Parameter Quality	Parameter Description_Qua	='0' for bad quality ='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-6.5.2.2: Parameter descriptor header with statistical values

Details for parameter descriptor header without statistical values are provided in table 6.5.2.3 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-6.5.2.3: Parameter descriptor header without statistical values

Parameter description for sensors and IED connected to datalogger communication ports is provided in table 6.5.2.4 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-6.5.2.4: 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

6.6 Configure – Cellular Modem

Use micro SIM with 4G service (preferable, 2G can also be used).

Left click on menu option ‘Cellular Modem’ to configure internal modem operation as shown in figure-6.6 below.

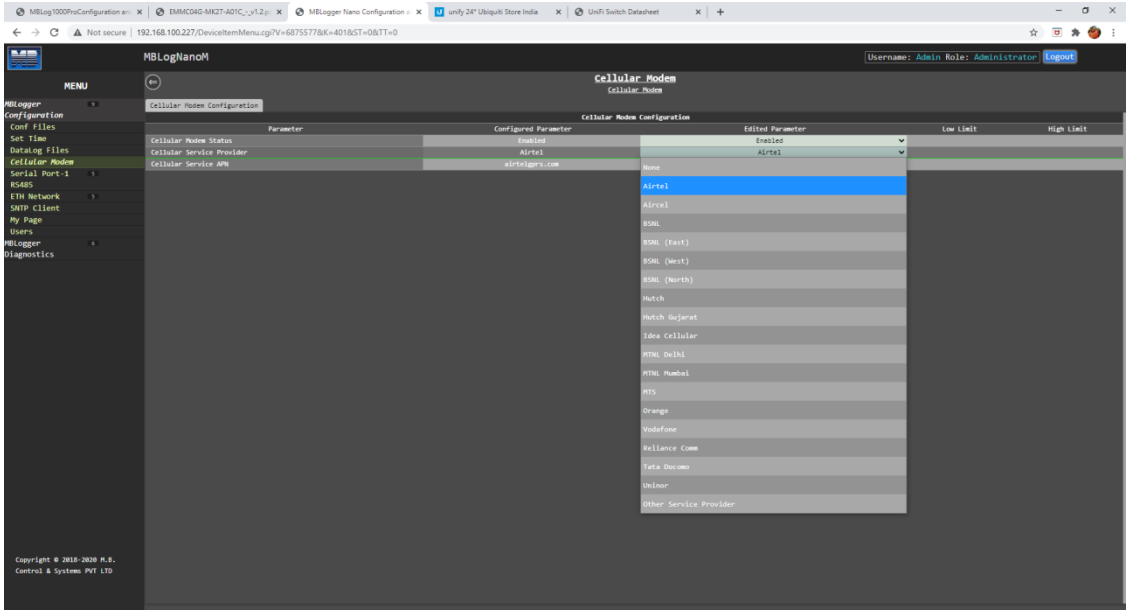

Figure-6.6: Configuration of internal cellular modem.

Configuration details of modem parameters on the page are provided in table 6.6 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.

Table-6.6: Configuration – datalogger modem

6.7 Configure – Serial Port-1 (RS485)

Serial port -1 (RS485) can be used as MODBUS RTU Master or 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-1 RS485' to configure this port as shown in figure-6.7 below.

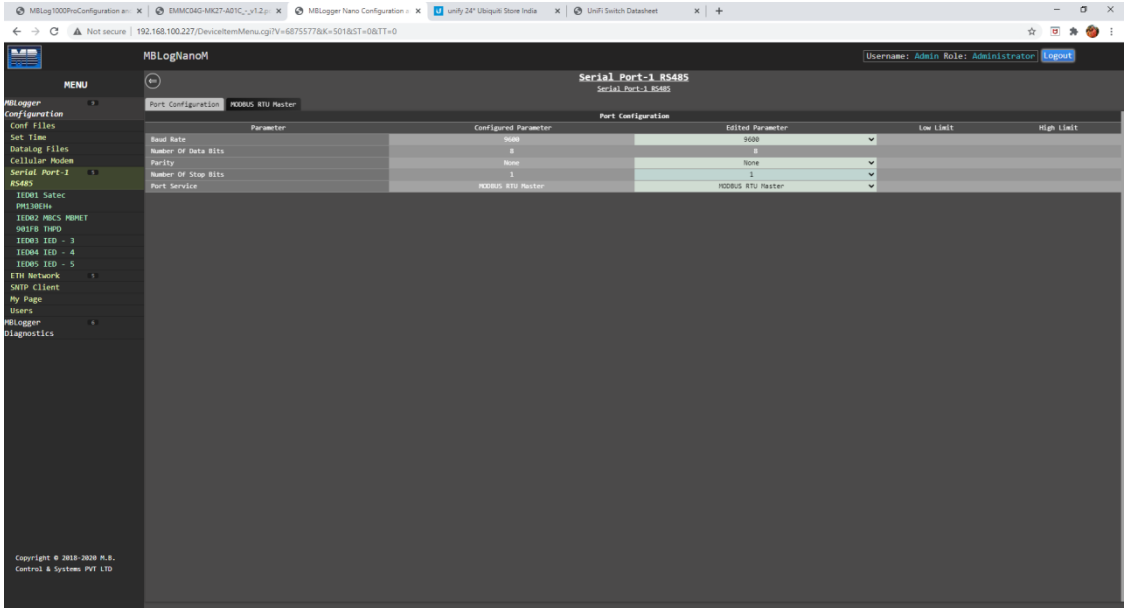

Figure-6.7: Configuration of serial port-1 RS485.

Configuration details of communication parameters for serial port-1 RS485 are provided in table 6.7 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-6.7: Configuration – serial port-1 RS485

6.8 Configure – ETH Network

Left click on menu option ‘ETH Network’ to configure datalogger ETH network and its services as shown in figure-6.8 below.

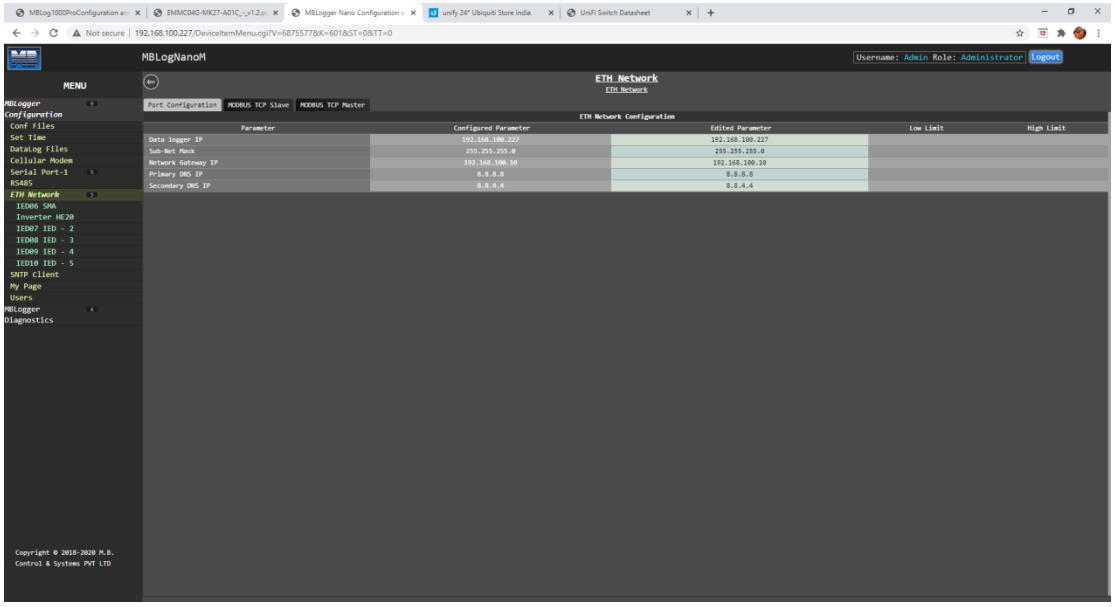

Figure-6.8: Configuration of datalogger ETH network.

Configuration details for ETH port are provided in table 6.8.1 below.

Sr. No	Parameter	Description	Remarks
a 1	Data Logger IP	Data logger IP	
b l 2	Data Logger Subnet mask	Data Logger Subnet mask	
e - 6 3	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

.

1: Configuration – ETH Port parameters

Details for tabs for configuration of services on ETH port are provided in table 6.8.2 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-6.8.2: Configuration – ETH port services

6.9 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 MBLogger 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.

1.10.2 Tab – IED Communication

IED communication parameters can be configured by selecting the tab – 'IED Communication'.
IED communication parameters are shown in figure-6.9.1 below.

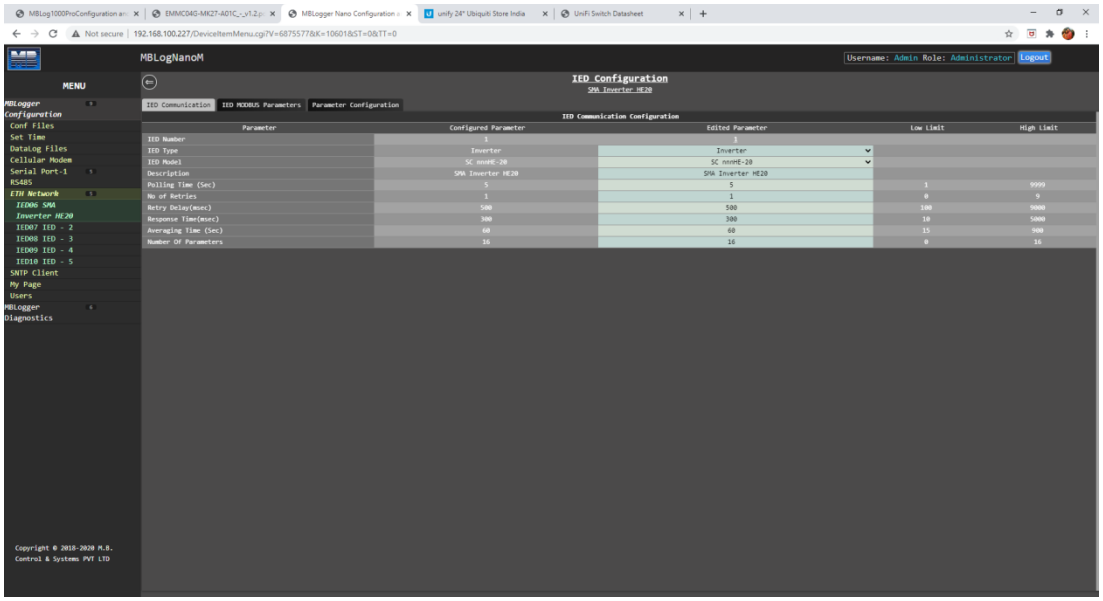

Figure-6.9.1: Configuration of IED communication parameters.

Configuration details IED communication parameters are provided in table 6.9.1 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’.

Table-6.9.1: Configuration – IED communication parameters

6.9.2 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-6.9.2 below.

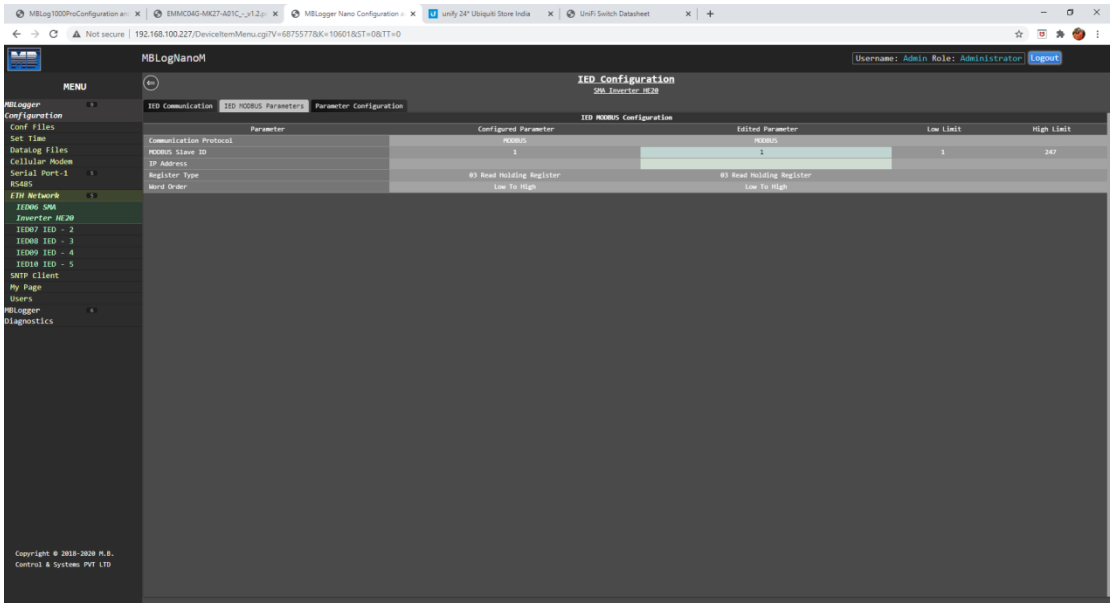

Figure-6.9.2: Configuration of IED MODBUS communication parameters.

Configuration details IED MODBUS parameters are provided in table 6.10.2 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-6.9.2: Configuration – IED MODBUS parameters

6.9.3 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-6.9.3 below.

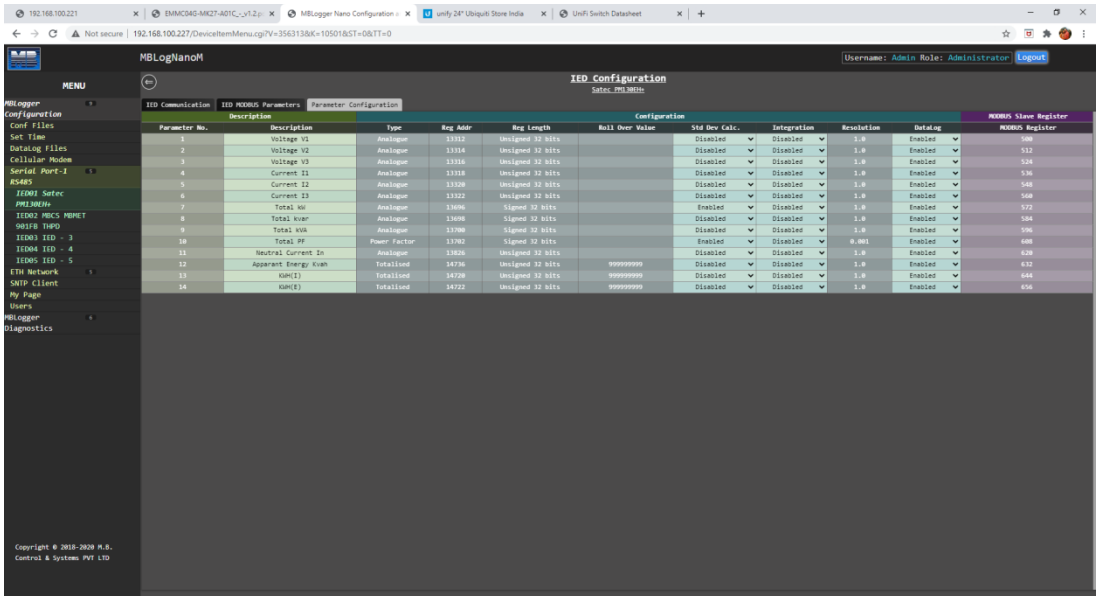

Figure-6.9.3: Configuration of IED read parameters.

Configuration details IED parameters are provided in table 6.9.3.1 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-6.9.3.1: Configuration – IED read parameters

MODBUS Slave register (signed 32 bits) details for IED parameters are provided in table 6.9.3.2 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-6.9.3.2: IED parameters – MODBUS Slave registers

6.10 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 or internal modem.

Up-to 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-6.10 below.

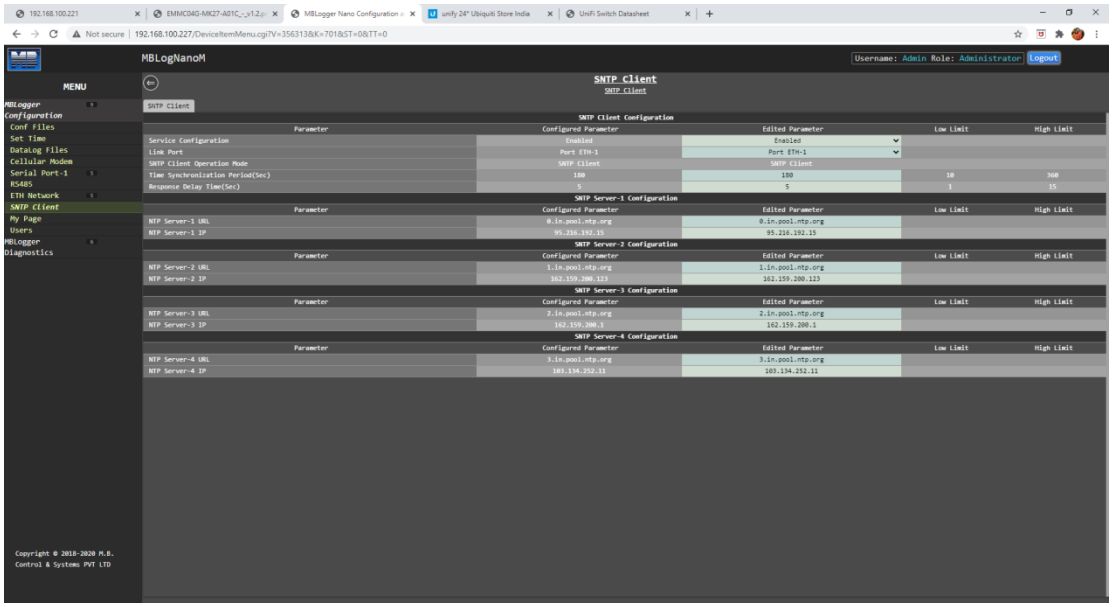

Figure-6.10: Configuration of SNTP client.

SNTP client will operate in 'Client Mode' only.

Configuration details of SNTP clients are provided in table 6.10 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-6.10: 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.

6.11 MyPage Parameters

This unique feature allows user to configure required parameters of interest on one page for viewing on webserver and OLED. Maximum of 12 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-6.11 below.

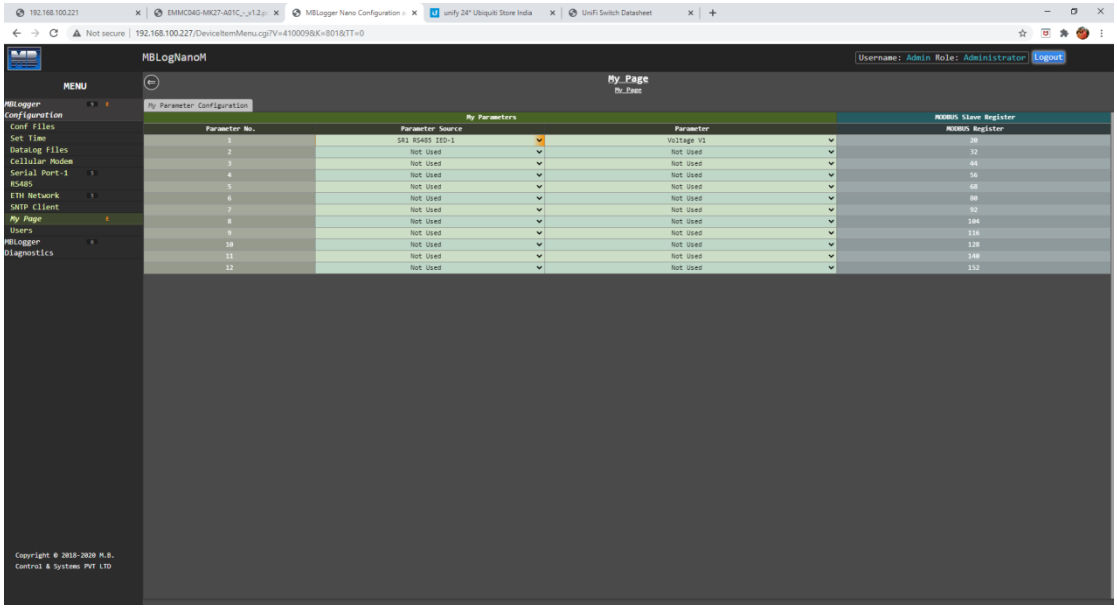

Figure-6.11: Configuration of MyPage.

Select the required tab to configure MyPage parameters.

1.10.2 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-6.11.1.1 below.

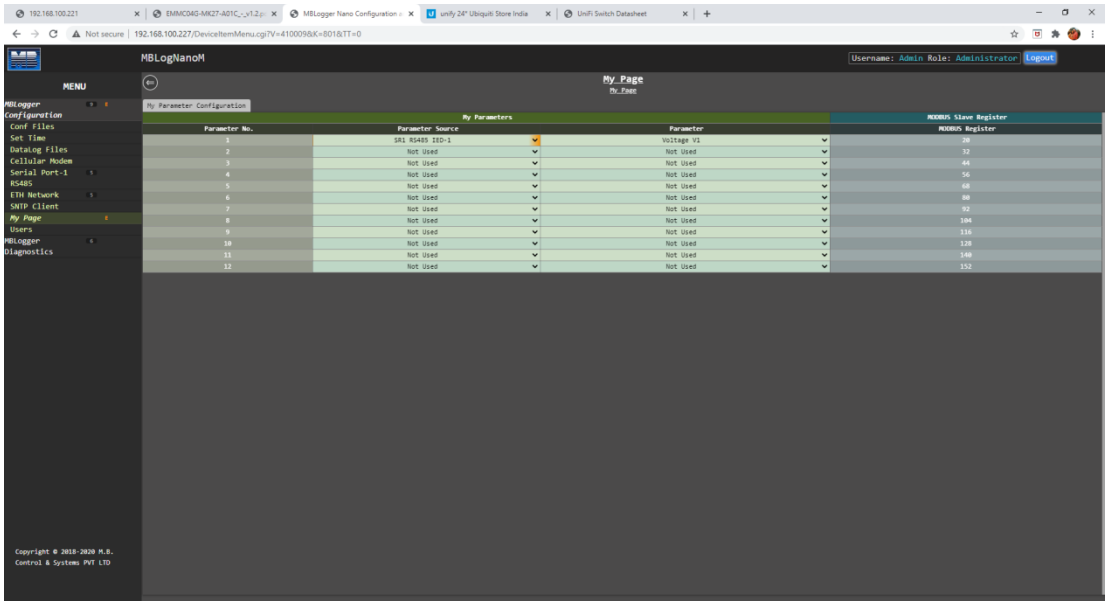

Figure-6.11.1.1: Select Source for MyPage parameters.

Selection of My parameter is show in figure-6.11.1.2 below.

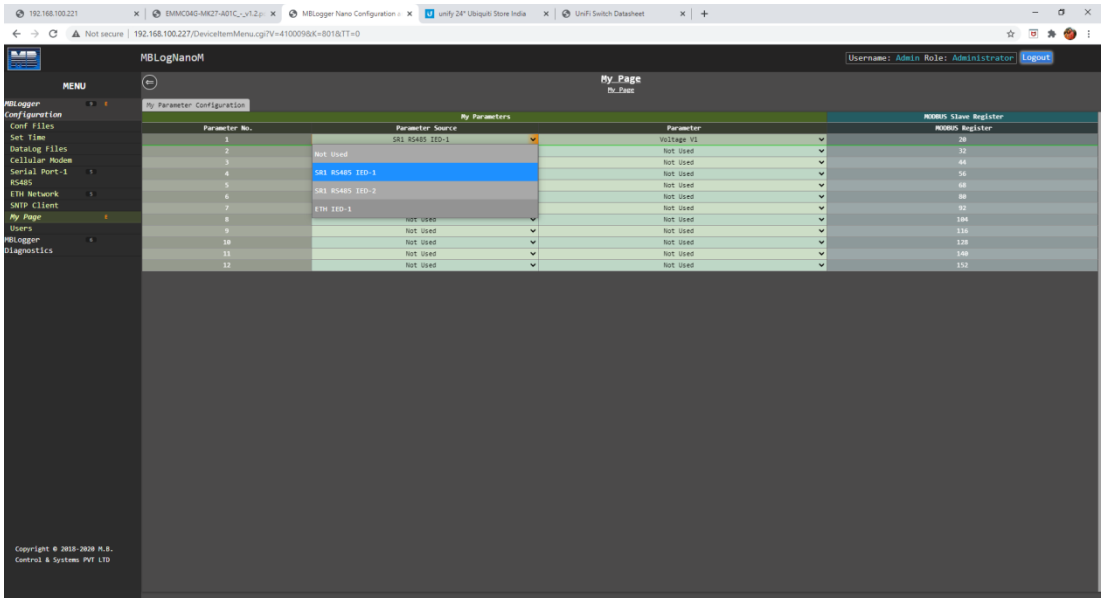

Figure-6.11.1.2: Select MyPage parameter.

Configuration details for MyPage parameters are provided in table 6.11.1.1 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	Select 'Not Used' if parameter configuration is not required.

		be provided.	
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 register as per the protocol selected for MyPage parameters. This field in not editable.

Table-6.11.1.1: MyPage parameters configuration

MODBUS Slave register for MyPage parameters is provided in table 6.11.1.2 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
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-6.11.12.2: MyPage parameters – MODBUS slave register details

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

6.12 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-6.12 below. Only 'Administrator' can configure usernames and their passwords.

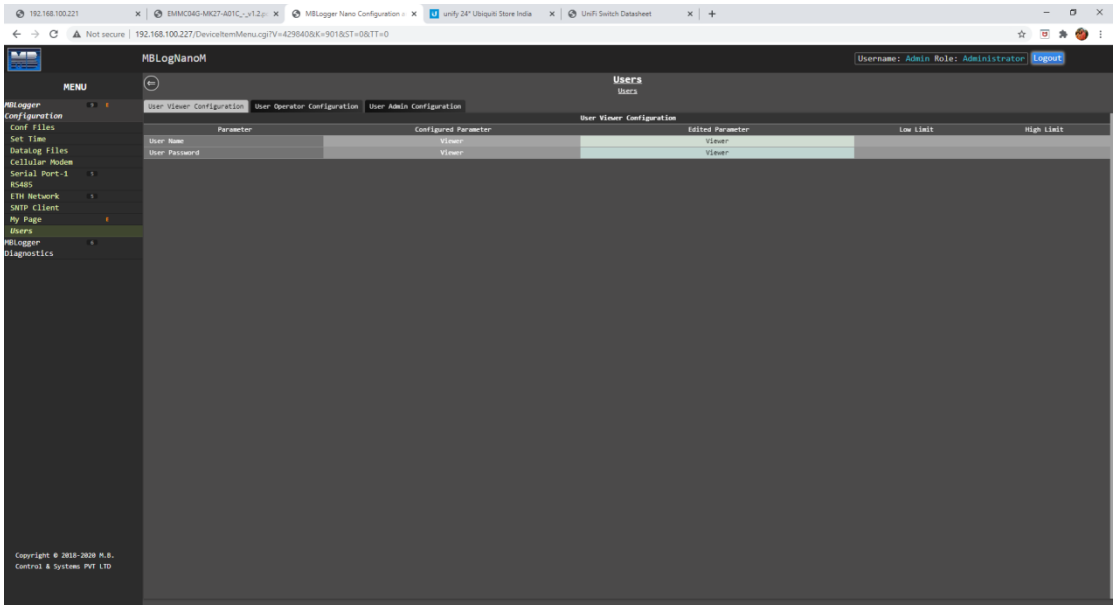

Figure-6.12: User configuration.

Use tabs provided to configure the required user.

Configuration details of user configuration are provided in table 6.15 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-6.12: User configuration

6.13 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 'MBLogger Configuration' to select the same. Right click on MBLogger Configuration' to see the submenu option to commit the configuration as shown in figure-6.13 below.

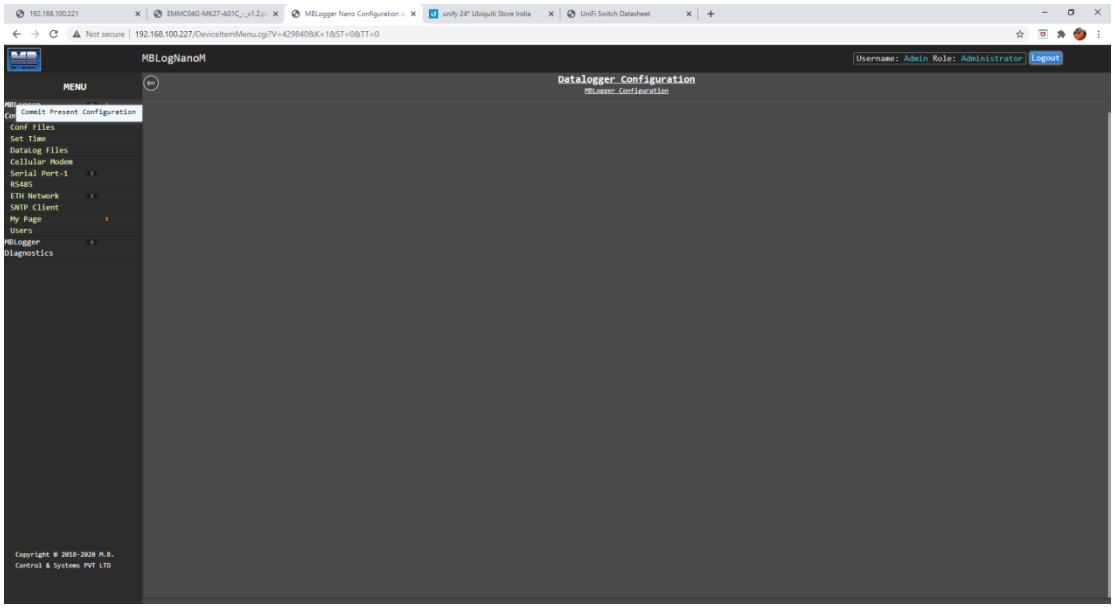

Figure-6.13: Configuration Commit operation.

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

7. 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 7 below.

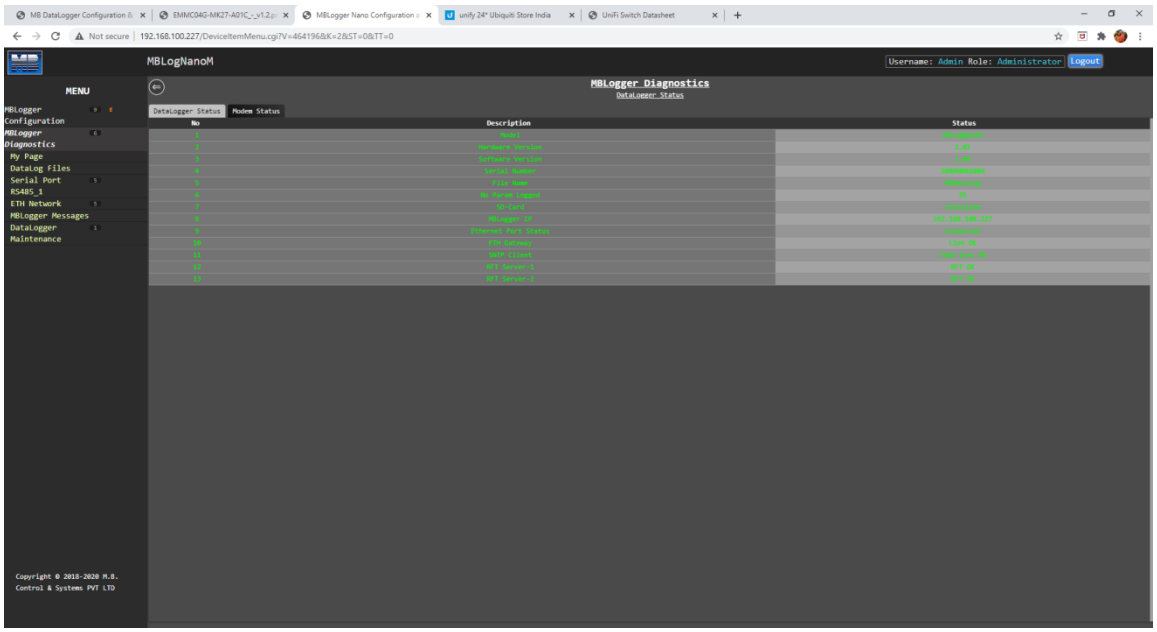

Figure-7: MBLogger diagnostic page.

7.1 MBLogger Status

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

1.10.2 MBLogger Status

Select tab ‘MBLogger Status’ to view details of the datalogger and status of services as shown in figure-7.1.1 below.

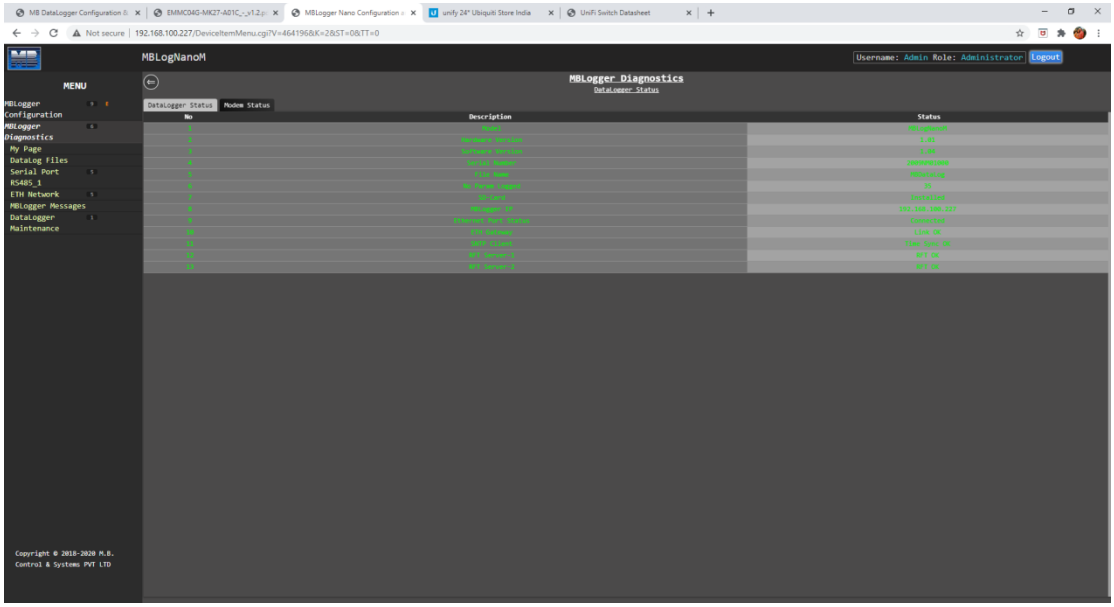

Figure-7.1.1: Datalogger status.

Details for datalogger status are provided in table 7.1.1 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’
8	MBLogger IP	IP address for the datalogger	
9	ETH Port Status	Status of ETH port	Connected or not connected.
10	Network Gateway	Status of network gateway	Display ‘Link Fail’ if link to gateway fails.

			Display ‘Link OK’ if link to gateway is OK.
11	SNTP Client	Status of SNTP client	Display status of SNTP client.
12	RFT Server-1 and -2	Status of remote file transfer servers	

Table-7.1.1: Datalogger status

7.1.2 MBLogger Modem Status

Select tab ‘Modem Status’ to view status of datalogger internal modem as shown in figure-7.1.2 below (This page will be available only for model NanoM).

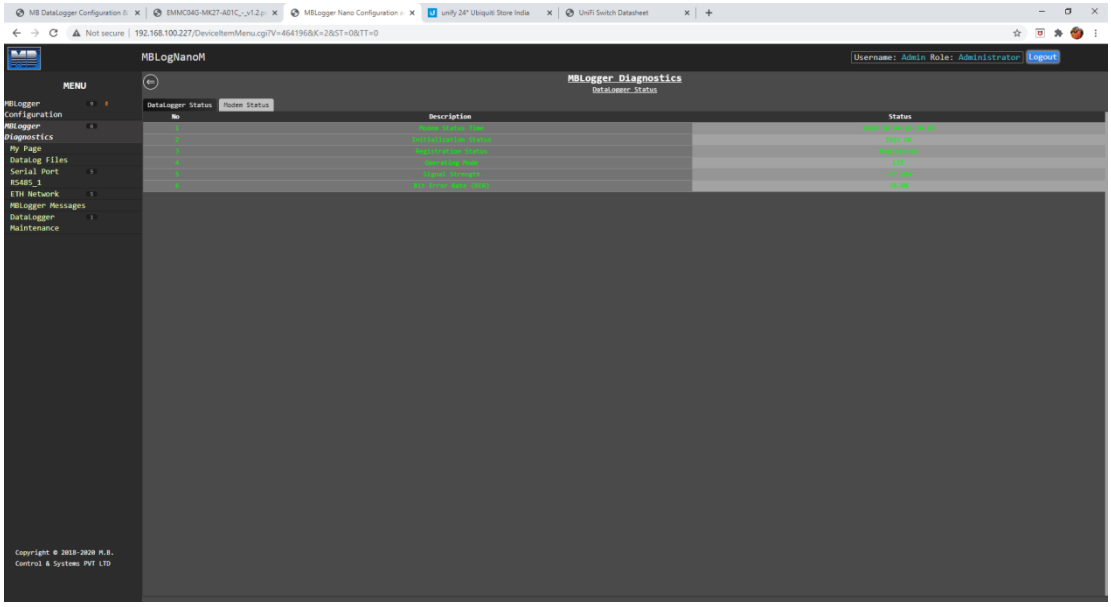

Figure-7.1.2: Datalogger modem status.

Details for datalogger modem are provided in table 7.1.2 below.

Sr. No	Parameter	Description	Remarks
1	Initialisation Status	Modem initialisation status	
2	Registration status	Modem registration status	
3	Operating mode	Modem operation mode	Modem network operation mode – ‘None’, ‘GSM’, ‘GPRS’, ‘EDGE, or ‘LTE’
4	Signal Strength	Cellular signal strength	Signal strength in dBm
5	Bit error rate (BER)	Bit error rate	

Table-7.1.2: Datalogger modem status

7.2 MyPage Parameters

Left click on diagnostic menu option ‘MyPage Parameters’ to view MyPage parameters as shown in figure 7.2 below.

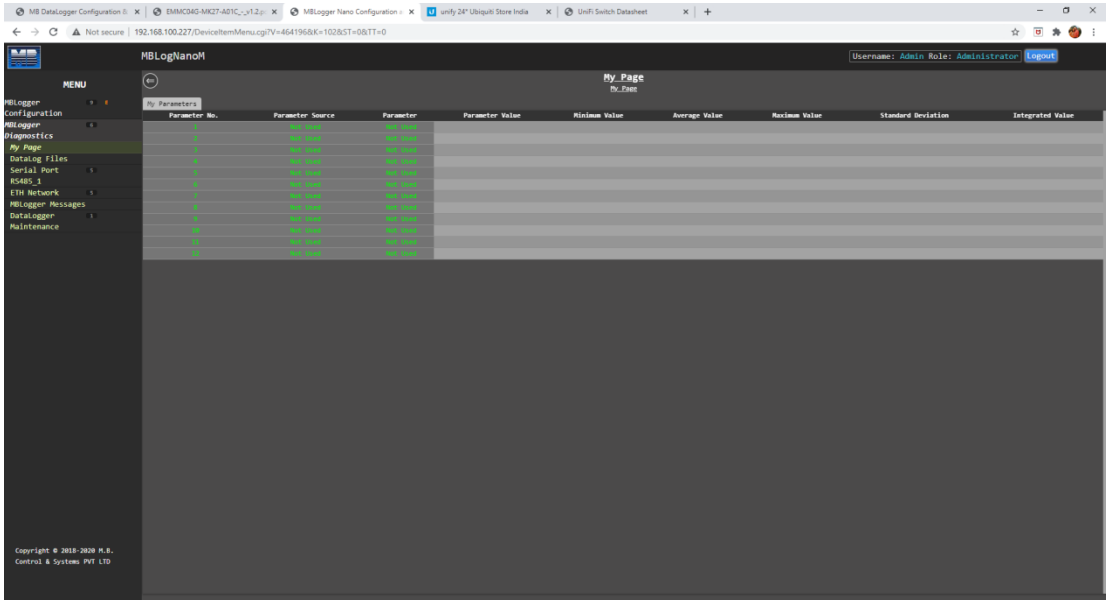

Figure-7.2: MyPage parameters.

Values (and their calculated statistical values) of all parameters configured as MyPage Parameters will be displayed on the page.

7.3 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.

1.10.2 Data Log Files Day

Day log file status is shown in figure 7.3.1 below.

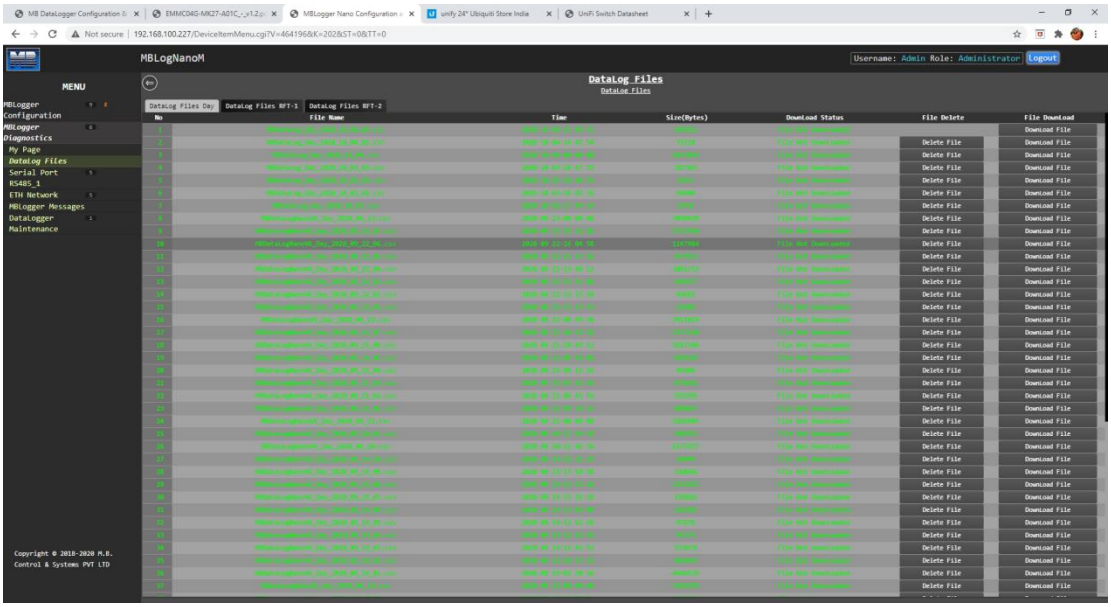

Figure-7.3.1: Day Data log files

Details file status and operation are provided in table 7.3.1 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-7.3.1: Day data log files

7.3.2 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 7.3.2 below.

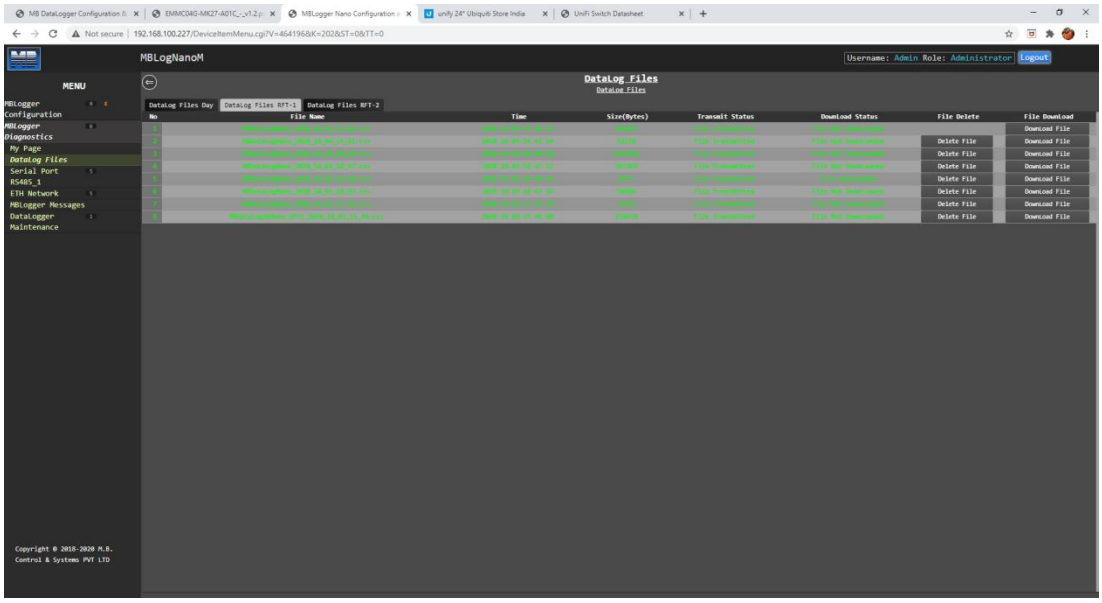

Figure-7.3.2: Remote transfer data log file status

Details file status and operation are provided in table 7.3.2 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-7.3.2: Remote transfer data log files

7.4 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.

1.10.2 Sensor/ IED Communication Status

Select tab 'IED Communication Status' to view IED communication status as shown in figure-7.4.1 below.

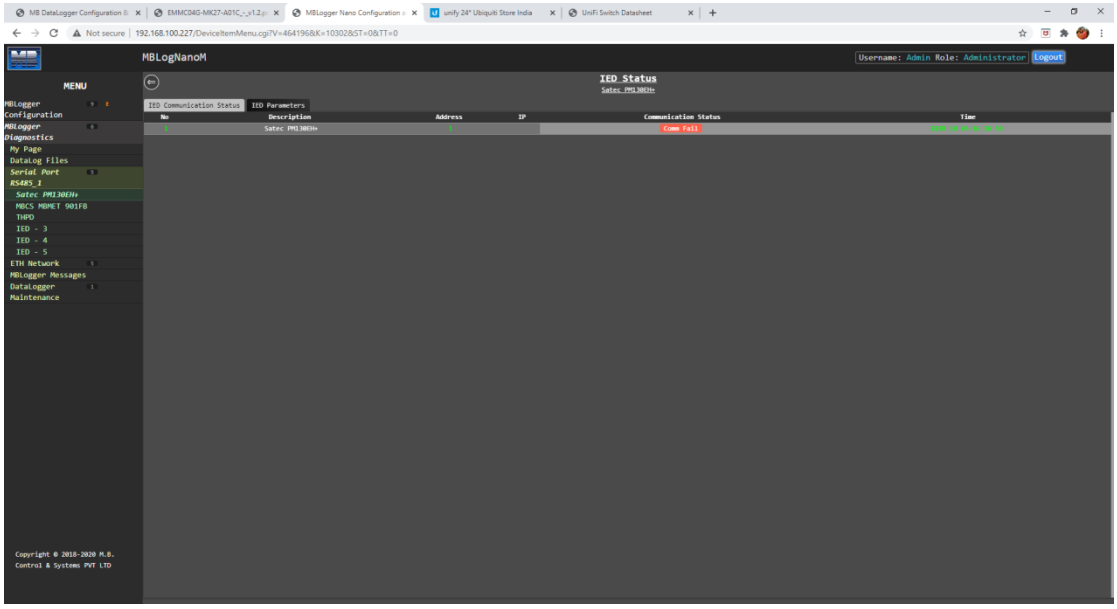

Figure-7.4.1: Sensor/ IED communication status

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

Communication details are provided in table 7.4.1 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.	

Table-7.4.1: Communication status

7.4.2 Sensor/ IED Parameter Values

Select tab ‘IED Parameters’ to view sensor/ IED parameter values as shown in figure-7.4.2 below.

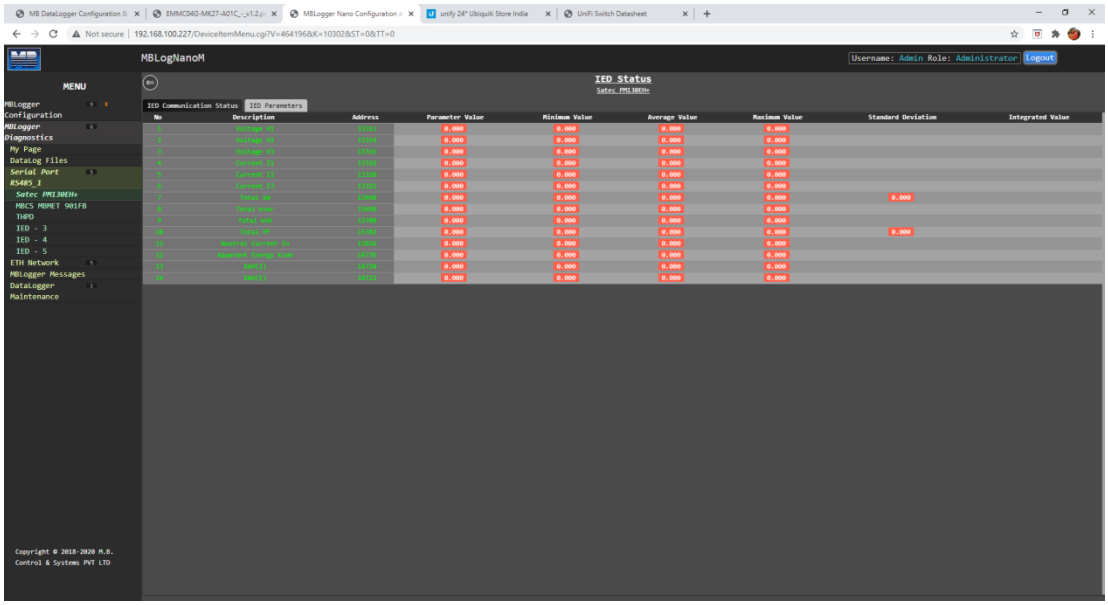

Figure-7.4.2: Sensor/ IED parameter values

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

Parameter details are provided in table 7.4.2 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-7.4.2: Sensor/ IED parameter values

7.5 MBLogger Messages

Left click on diagnostic menu option ‘Datalogger Messages’ to view messages from datalogger as shown in figure 7.5 below.

Logged messages shall be displayed on the page. MBLogger message details are provided in this chapter.

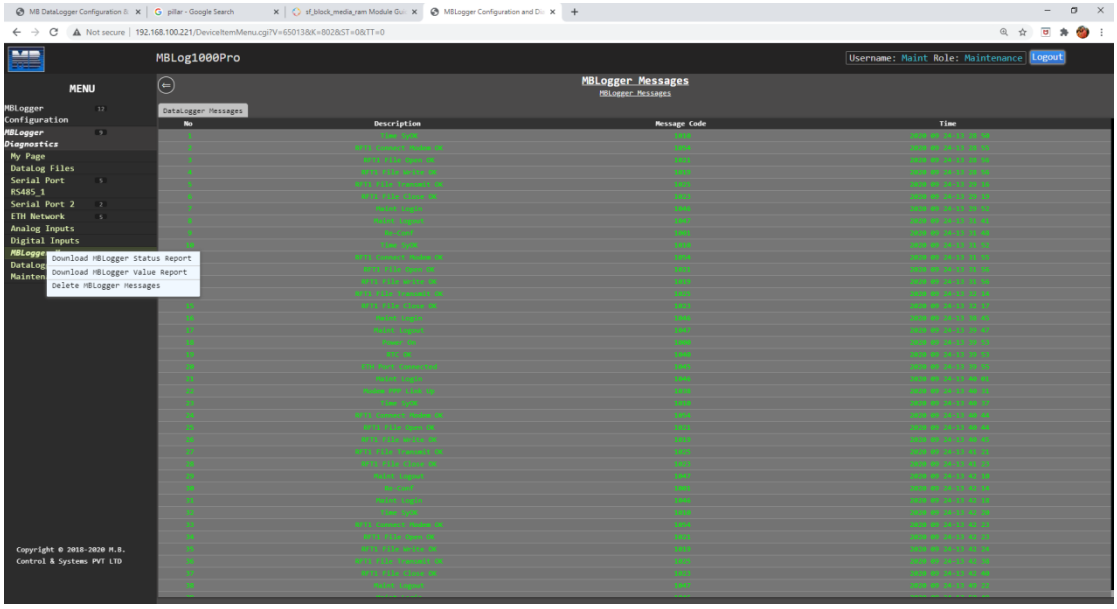

Figure-7.5: Datalogger messages

Details of datalogger messages are provided in table 7.5 below.

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

Table-7.5: Datalogger messages

Following operation are possible:

i) Download MBLogger Status Report
ii) Download MBLogger Value Report
iii) Delete MBLogger Message

Click on the option required.

1.10.2 Download MBLogger 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) Status of all IED and sensors connected on various communication ports of the datalogger.
v) Details of sensors and sensors connected to analog inputs (not available for Nano model).
vi) List of all the messages logged.

7.5.2 Download MBLogger 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.

7.5.3 Delete MBLogger Messages

This option is not available.

8. MBLogger Messages

MBLogger 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-8.1 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. Red Led 'ER' on front panel will flash.	Contact service@mbcontrol.com

Table-8: Datalogger message types

8.1 MBLogger Information Messages

MBLogger 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 synchronisation fail
12	1012	DL Msg Deleted	Information	Data logger messages have been deleted.
13	1013	OLED Error	Information	OLED Error
14	1014	RFT1 Comm Media Fail	Information	Communication media for remote file transfer -1 has failed
15	1015	RFT1 Comm Media OK	Information	Communication media for remote file transfer -1 is OK
16	1016	RFT1 Connect ETH	Information	Connection to remote file server -1 has failed via ETH

		Fail		port
17	1017	RFT1 Connect ETH OK	Information	Connection to remote file server -1 is OK via ETH port
18	1018	RFT1 File Write Fail	Information	File write operation for remote file server -1 has failed
19	1019	RFT1 File Write OK	Information	File write operation for remote file server -1 is OK
20	1020	RFT1 File Open Fail	Information	File open operation for remote file server -1 has failed
21	1021	RFT1 File Open OK	Information	File open operation for remote file server -1 is OK
22	1022	RFT1 File Close Fail	Information	File close operation for remote file server -1 has failed
23	1023	RFT1 File Close OK	Information	File close operation for remote file server -1 is OK
24	1024	RFT1 File Transmit Fail	Information	File transmit operation for remote file server -1 has failed
25	1025	RFT1 File Transmit OK	Information	File transmit operation for remote file server -1 is OK
26	1026	RFT2 Comm Media Fail	Information	Communication media for remote file transfer -2 has failed
27	1027	RFT2 Comm Media OK	Information	Communication media for remote file transfer -2 is OK
28	1028	RFT2 Connect ETH Fail	Information	Connection to remote file server -2 has failed via ETH port
29	1029	RFT2 Connect ETH OK	Information	Connection to remote file server -2 is OK via ETH port
30	1030	RFT2 File Write Fail	Information	File write operation for remote file server -2 has failed
31	1031	RFT2 File Write OK	Information	File write operation for remote file server -2 is OK
32	1032	RFT2 File Open Fail	Information	File open operation for remote file server -2 has failed
33	1033	RFT2 File Open OK	Information	File open operation for remote file server -2 is OK
34	1034	RFT2 File Close Fail	Information	File close operation for remote file server -2 has

				failed
35	1035	RFT21 File Close OK	Information	File close operation for remote file server -2 is OK
36	1036	RFT2 File Transmit Fail	Information	File transmit operation for remote file server -2 has failed
37	1037	RFT2 File Transmit OK	Information	File transmit operation for remote file server -2 is OK
38	1038	Modem PPP Link Up	Information	Modem PP Link is OK
39	1039	Modem PPP Link Down	Information	Modem PP Link has failed. All communication via modem will be stopped.
40	1040	RTC OK	Information	RTC is operating OK
41	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.
42	1042	Modem File Transfer Modem	Information	File transmission via Modem has been restored.
43	1042	Modem File Transfer Modem	Information	File transmission via Modem has been restored.
44	1043	Modem Fail Recovery	Information	Modem failure has been recovered
45	1044	ETH Port Not Connected	Information	ETH port is not connected to any network
46	1045	ETH Port Connected	Information	ETH port is connected to network
47	1046	Maint Login	Information	Maintenance user login and logout
48	1047	Maint Logout	Information	
49	1048	Calibration Mode Start	Information	Datalogger is in calibration mode
50	1049	Calibration Mode End	Information	Datalogger is in normal mode of operation
51	1050	Datalogger Restart	Information	Datalogger has re-started itself.
52	1051	Task Termination Fail	Information	System message for tasks operation
53	1052	Messages Deleted	Information	Logged messages have been deleted.
54	1053	RFT1	Information	Connection to remote file

		Connect Modem Fail		server -1 has failed via Modem
55	1054	RFT1 Connect Modem OK	Information	Connection to remote file server -1 is OK via Modem
56	1055	RFT2 Connect Modem Fail	Information	Connection to remote file server -2 has failed via Modem
57	1056	RFT2 Connect Modem OK	Information	Connection to remote file server -2 is OK via Modem
58	1057	SNTP Media Change Modem	Information	SNTP client media has been changed from ETH to Modem. This will happen if SNTP client fails to connect to time server via ETH network and modem is working OK.
59	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.

Table-8.1: Datalogger operation information messages

8.2 MBLogger 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	2002	ADC-1 Fail	Fault	Analog input channels – Voltage inputs and mA input will not operate.
4	2003	ADC-2 Fail	Fault	Analog input channels –mV input will not operate.
5	2004	Modem Fail	Fault	Internal modem will not function. This will affect functions working via modem.
6	2005	Key Operation	Fault	Will affect key operation

		Fail		
7	2006	RTC Fail	Fault	RTC operation has failed. It will affect all time-based operations
8	2007	RTC backup Fail	Fault	RTC time was not backed up. Change the RTC backup battery
9	2008	ADC-1 SPI initialisation Fail	Fault	Fault in ADC-1
10	2009	ADC-1 Reset Fail	Fault	Fault in ADC-1
11	2010	ADC-1 ID read Fail	Fault	Fault in ADC-1
12	2011	ADC-1 read Reg Fail	Fault	Fault in ADC-1
13	2012	ADC-2 SPI initialisation Fail	Fault	Fault in ADC-2
14	2013	ADC-2 Reset Fail	Fault	Fault in ADC-1
15	2014	ADC-2 ID read Fail	Fault	Fault in ADC-1
16	2015	ADC-2 read Reg Fail	Fault	Fault in ADC-1
17	2016	ADC-2 Calibration Fail	Fault	Fault in ADC-1

Table-8.2: Datalogger operation fault messages

9. Technical Specifications

9.1 General Specifications:

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

Table-9.1: Datalogger general specifications

9.2 Status LED:

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

Table-9.2: MBLogger status LED

9.3 Communication Serial Port-1 (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	6 (i)

Table-9.3: Serial Port-1 (RS485)

9.4 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	6 (i)

Table-9.4: Port ETH

Note:

i) Maximum number of parameters for each sensor/ IED is limited to 20.

ii) Total number of parameters for all sensors / IED's is 150.

9.5 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-9.5: Internal Modem

9.6 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-9.6: Datalogging operation

9.7 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-9.7: Electrical specifications

9.8 Environmental

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

Table-9.8: Environmental specifications

9.9 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 (54pprox..)
4	Mounting	DIN Rail
5	Housing material	Polycarbonate

Table-9.9: Physical specifications

10. MBLogger Nano 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.

10.1 Data Logger Time

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

Table-10.1: Datalogger RTC time

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

10.2 My Parameters

Sr. No	Parameter	Attribute	Register Address	Type	Read/ Write
1	My Parameter-1	Value	20	32 bits float	Read only
2		Value-minimum	22	32 bits float	Read only
3		Value-maximum	24	32 bits float	Read only
4		Value- average	26	32 bits float	Read only
5		Value-Standard Deviation	28	32 bits float	Read only
6		Value-Integrated	30	32 bits float	Read only
7	My Parameter-2	Value	32	32 bits float	Read only
8	My Parameter-3	Value	44	32 bits float	Read only
9	My Parameter-4	Value	56	32 bits float	Read only
10	My Parameter-5	Value	68	32 bits float	Read only
11	My Parameter-6	Value	80	32 bits float	Read only
12	My Parameter-7	Value	92	32 bits float	Read only
13	My Parameter-8	Value	104	32 bits float	Read only
14	My Parameter-9	Value	116	32 bits float	Read only
15	My Parameter-10	Value	128	32 bits float	Read only
16	My Parameter-11	Value	140	32 bits float	Read only
17	My Parameter-12	Value	152	32 bits float	Read only

Table-10.2: My Parameters

10.3 Sensors and IED Connected to Serial and ETH Ports

1.10.2 Serial Port RS485-1

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

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	IED-2	Parameter -1	Value	740	32 bits float	Read only
27	IED-3	Parameter -1	Value	980	32 bits float	Read only
28	IED-4	Parameter -1	Value	1220	32 bits float	Read only
29	IED-5	Parameter -1	Value	1460	32 bits float	Read only
30	IED-6	Parameter -1	Value	1700	32 bits float	Read only

Table-10.3.1: Register details for sensors and IED connected to serial port RS485-1.

10.3.2 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	1940	32 bits float	Read only
2			Value-minimum	1942	32 bits float	Read only
3			Value-maximum	1944	32 bits float	Read only
4			Value-average	1946	32 bits float	Read only
5			Value-Standard Deviation	1948	32 bits float	Read only
6			Value-Integrated	1950	32 bits float	Read only
7		Parameter -2	Value	1952	32 bits float	Read only
8		Parameter -3	Value	1964	32 bits float	Read only
9		Parameter -4	Value	1976	32 bits float	Read only
10		Parameter -5	Value	1988	32 bits float	Read only
11		Parameter -6	Value	2000	32 bits float	Read only
12		Parameter -7	Value	2012	32 bits float	Read only
13		Parameter -8	Value	2024	32 bits float	Read only
13		Parameter -9	Value	2036	32 bits float	Read only
15		Parameter -10	Value	2048	32 bits float	Read only
16		Parameter -11	Value	2060	32 bits float	Read only
17		Parameter -12	Value	2072	32 bits float	Read only
18		Parameter -13	Value	2084	32 bits float	Read only
19		Parameter -14	Value	2096	32 bits float	Read only
20		Parameter -15	Value	2108	32 bits float	Read only
21		Parameter -16	Value	2120	32 bits float	Read only
22		Parameter -17	Value	2132	32 bits float	Read only
23		Parameter -18	Value	2144	32 bits float	Read only
24		Parameter -19	Value	2156	32 bits float	Read only
25		Parameter -20	Value	2168	32 bits float	Read only
26	IED-2	Parameter -1	Value	2180	32 bits float	Read only
27	IED-3	Parameter -1	Value	1844	32 bits float	Read only
28	IED-4	Parameter -1	Value	2420	32 bits float	Read only
29	IED-5	Parameter -1	Value	2660	32 bits float	Read only
30	IED-6	Parameter -1	Value	3140	32 bits float	Read only

Table-10.3.2: Register details for sensors and IED connected to serial port ETH.

11. 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.

11.1 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.

11.2 Embedded Webserver

Sr. No.	Problem	Solutions
1	Unable to login to MBLogger	i) Check that proper IP set in the datalogger is being used. ii) Try default datalogger IP. iii) Confirm that there is no IP clash in the network. iv) Check that IP set is as per network class. v) If user has closed the webpage without logout – wait for **about three minutes** before attempting next login.
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-11.2: Embedded webserver problems

11.3 ETH Network

Sr. No.	Problem	Solutions
1	SNTP client not able to update time.	i) Check that network gateway has been configured properly and connected to the LAN. Check gateway status on OLED or webserver diagnostics. ii) Check availability of internet. iii) Verify NTP server IP set in the MBLogger. vi) Verify operation of the NTP server via ping.

Table-11.3: ETH Network problems

11.4 Datalogger Modem

Sr. No.	Problem	Solutions
1	Modem is unable to register to network.	i) Check cellular signal strength via OLED or webserver diagnostic. ii) Connect the antenna securely and place

		the antenna to get best signal strength. iii) Verify that SIM is inserted properly. iv) Verify correct selection of cellular service provider. v) Check that there is enough balance in the SIM for data communication

Table-11.4: Datalogger Modem

11.5 Sensor and IED Interfaced to Serial Ports (RS485)

Sr. No.	Problem	Solutions
1	Not able to read parameters from sensor/ IED.	i) Check communication status with IED on OLED or webserver. ii) Confirm that proper RS485 cable (twisted pair cable, shielded and low capacitance) has been used. iii) Verify that one end of the communication cable shield is earthed. iv) Check for proper RS485 communication loop connection. v) Verify MODBUS ID of the IED has been configured properly. vi) Check that all IED on the RS485 communication loop have unique MODBUS ID.
2	Wrong values read from the sensor/ IED	i) Check for sensor/ IED type selection and its proper range selection ii) Verify parameter register addresses has been configured. iii) Verify proper register length (16 or 32 bits) and types (signed or unsigned) has been configured.

Table-11.5: Sensor and IED interfaced to serial ports (RS485 or RS232)

11.6 Sensor and IED Interfaced to ETH Port

Sr. No.	Problem	Solutions
1	Not able to read parameters from sensor/ IED.	i) Verify that IP Address of the IED is configured properly. ii) Check network link with IED via ping. iii) Check for other problems as mentioned in 10.5 above.

Table-11.6: Sensor and IED interfaced to ETH port

11.7 File Transfer Operation

Sr. No.	Problem	Solutions
1	File transfer not OK.	i) Check the media for file transfer Modem of ETH. ii) If modem is selected – check that no problem exists with modem. iii) If ETH is selected – check problems with ETH network. iv) Verify configuration of IP, username and passwords for remote file servers. v) Check file servers with ping

Table-11.7: File transfer Operation

11.8 Datalogging Operation

Sr. No.	Problem	Solutions
1	SD Card problem	i) Check SD Card status on OLED or webserver. ii) Check that SD card is inserted properly. iii) Put Off the datalogger, remove the SD card. Verify operation of SD card on PC or laptop. iv) If required format the SD card. Remember to save the logger files prior to formatting the SD card.
2	Parameter values are not being logged	i) Verify that datalogging operation is enabled for the remote server. ii) Check if the data log file directory is full. iii) Check configuration for file directory. iv) Verify that the parameter has been configured for logging.

Table-11.8: Datalogging Operation

For other problems please contact service@mbcontrol.com .

12. 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.

12.1 Library for Sensors/ IED for RS485 Ports MODBUS – RTU Protocol

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

12.1.1 Ambient Parameter Sensors

List of ambient parameters sensors for RS485 ports is provided in table-12.1.1 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
	Ambient Pressure	MBCS MBMet 901EB

Table-12.1.1: Library of ambient parameter sensors for RS485 ports

1.10.2 PV Module Sensors

List of PV module sensors for RS485 ports is provided in table-12.1.2 below.

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

Table-12.1.2: Library of PV module sensors for RS485 ports

1.10.2 Wind Speed and Direction Sensors

List of wind speed and direction sensors for RS485 ports is provided in table-12.1.3 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-12.1.3: Library of wind speed and direction sensors for RS485 ports

12.1.4 Pyranometers

List of pyranometer for RS485 ports is provided in table-12.1.4 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-500BBand MBMet-500CB_DB

Table-12.1.4: Library of pyranometers for RS485 ports

12.1.5 Inverters

List of inverters for RS485 ports is provided in table-12.1.5 below.

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

Table-12.1.5: Library of inverters for RS485 ports

12.1.6 MFM

List of MFM for RS485 ports is provided in table-12.1.6 below.

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

Table-12.1.6: Library of MFM for RS485 ports

12.1.7 Rain Gauge

List of Rain Gauges for RS485 ports is provided in table-12.1.7 below.

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

Table-12.1.7: Library of Rain Gauge for RS485 ports

12.1.8 Smart Box

List of Smart Boxes for RS485 ports is provided in table-12.1.8 below.

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

Table-12.1.7: Library of Smart Box for RS485 ports

12.1.9 Soil Sensors

List of Soil Sensors for RS485 ports is provided in table-12.1.9 below.

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

Table-12.1.9: Library of Soil Sensors

12.2 Library for Sensors/ IED for ETH Ports – MODBUS TCP Protocol

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

1.10.2 MFM

List of MFM for ETH port is provided in table-12.2.1 below.

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

Table-12.7.1: Library of MFM for ETH port

12.2.2 Inverters

List of inverters for ETH port is provided in table-12.1.2 below.

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

Table-12.1.2: Library of inverters for ETH port

13. Revision History

Revision	Date	Description
1.04	2020-10-04	Document created.
1.05	2020_10_10	Number of IED per port increased to 6. Number of parameters per IED increased to 20
1.06	2020_10_23	Soil moisture sensor added to library
1.12	2021_03_26	Software version changed. IED added for pyranometers and wind speed and direction.

Table-13: Revision History