M B Control &
Systems Pvt. Ltd.

Innovative Electronics For You

AWS PORTFOLIO IN RENEWABLES

M. B. Control & Systems Pvt. Ltd.

Email : enquiry@mbcontrol.com

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COMPANY DETAILS

Private Limited Company formed in 1983

Headquartered in Kolkata, West Bengal

Marketing and Service Presence in Delhi, Mumbai, Hyderabad, Bhopal, Jaipur, Lucknow, Patiala and Shimla

Dealers / Representatives through out India

ISO 9001:2015 Certified

In-house development for Hardware and Software (Industrial)

PRODUCT & SERVICES PORTFOLIO

Automatic Weather Stations (AWS)

Discharge Monitoring Station

Multi-Function Power Meters and Power Quality Meters

Energy Management System (EMS)

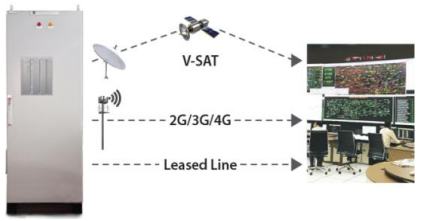
Substation Automation System (SAS)

SCADA Systems

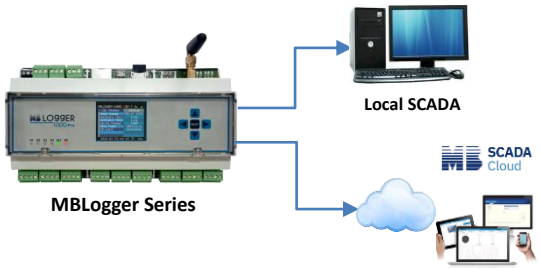
RTU and F-RTU Systems

Telemetry System

To Dispatch Centre in IEC 60870-5-104

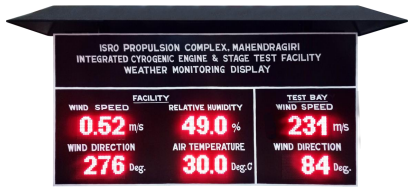


Datalogging System



Exclusive systems for Indian Navy

LED Display System



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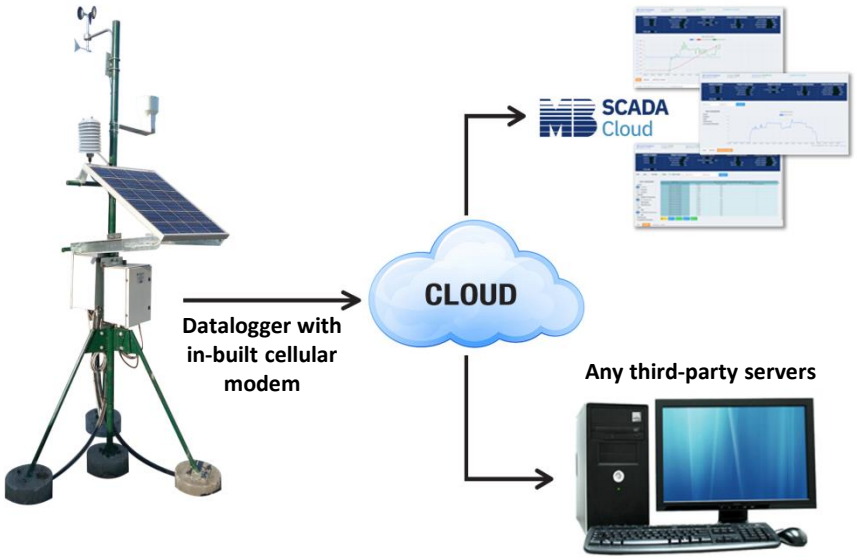
WHY IS WEATHER STATION REQUIRED IN A RENEWABLE PLANT?

- **Pre-feasibility:** Survey of a potential area for setting up a new plant.
- **Pyranometers and Pyrheliometers** are used to measure Irradiance at different angles which is directly correlated to Plant Generation.
- **Air Temperature measurements** are used to estimate the performance of the solar panels.
- **PV Module Temperature sensors** are used to measure differences in temperature across each module and across the array.
- **Wind speed and Wind direction sensors** are used for estimating module temperatures. They can also be used for documenting warranty claims related to wind driven damage.
- **Rainfall measurement sensors** are used to estimate the cleanliness of modules and generation variation.
- **Soiling ratio** is the ratio of the actual power output of the PV array under given soiling conditions to the power that would be expected if the PV array were clean and free of soiling.
- **Calculation of Performance Ratio (PR) for SCADA Systems.**
- **Mandatory requirement for State Load Dispatch Centre (SLDC).**

“SURYA”
WEATHER MONITORING STATIONS (WMS)

- In-house design, manufacturing and testing
- Design and installation as per latest **IEC 61724-1:2017 for Photovoltaic system performance – Monitoring**
- Two years warranty with selected “MBMet” series sensors.
- Optional - Communication via INSAT transmitter to ISRO/IMD stations
- Best in class use of components with high reliability and durability.
- Designed for spare replacement on-site reducing downtime
- Competitive pricing considering the market need.



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PRODUCTION AND QC INFRASTRUCTURE

Automated chambers and calibrators allow high quality production and testing/ calibration.

Some of the testing and production instruments are as below.

Environment Controlled Chamber

Temperature Calibrator

Temperature and Humidity Calibrator

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SENSOR RANGE

SENSORS	MAKE
Pyranometers, Pyrheliometer, Shading Ring, Tracker	Kipp & Zonen, Hukseflux
Wind Speed and Direction Sensor – Ultrasonic, Rotating Cup and Wind Vane	MBCS MBMet Barani Design WindSensor
Air Temperature, Relative Humidity, Barometric Pressure, Dew Point and Air Density Sensor	MBCS MBMet
PV Module Temperature Sensor	MBCS MBMet
Rain Fall Sensor	MBCS MBMet
Soiling Station	Kipp & Zonen
Cloud Cover Sensor	Optical Sensors, Campbell Scientific, Eliasson
Datalogger	MBCS MBLogger 900X and 1000X
Monitoring Software	MBCS MBSCADA Cloud

SOLAR RADIATION MEASUREMENT

Unit: W/m2

Secondary Standard Pyranometer

- **Make: Kipp & Zonen**
  - SMP-10 (RS-485 Modbus, 4-20mA/ 0-1V)
  - SMP-11 (RS-485 Modbus, 4-20mA/ 0-1V)
  - CMP-10 (0-20mV)
  - CMP-11 (0-20mV)
- **Make: Hukseflux**
  - SR20-D2 (RS485 Modbus, 4-20mA)
  - SR20-T1 (0-50mV)

Second Class Pyranometer

- **Make: Kipp & Zonen**
  - SMP-3 (RS-485 Modbus, 4-20mA, 0-1V)
  - CMP-3 (0-20mV)
- **Make: Hukseflux**
  - SR-05 (RS485 Modbus, 0-1V)

Reference Cell Irradiance Sensor

Make: I&MT, Model: Si Series
4-20mA/ RS-485 Modbus

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MBMET SERIES SENSORS

Model : MBMet 901 Series

Measuring Air Temperature, Relative Humidity, Barometric Pressure, Dew Point and Air Density Parameters

- Typical Accuracy: Air Temperature ±0.2°C, Humidity ±2%RH, Pressure ±0.4 hPa
- Resolution: Air Temperature 0.1°C, Humidity 0.1%RH, Pressure 0.01 hPa
- Low response time
- Input Voltage: 9-32VDC
- Output signals: Digital RS485 MODBUS / Float and Analog 4-20mA
- Radiation Shield: Double louvred UV stable Polycarbonate Plastic plates with Stainless Steel screws
- Field replaceable filter for easy servicing at site.

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MBMET SERIES SENSORS

Model : MBMet 800 Series

Measuring PV Module Temperature Sensor

- Precision RTD Class-A sensing element
- Accuracy: ±0.2°C (For MBMet-802 and MBMet-803)
- Measuring Range: -40°C to +110°C
- Sensor Transmitter: Powder Coated-Cast Powder Coated-Cast Aluminum, IP67
- Input Voltage: 12-24VDC
- Output signals: Digital RS485 MODBUS and Analog 4-20mA
- Cable length customization as per requirement.

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SMARTBOX – SIGNAL CONVERTER

Model : SmartBox

Inputs :

PT1000 – 1

Analog 4-20mA – 2

Millivolt 0-100mV – 2

ADC : 24 bits

Surge and OV protected inputs

Power supply for sensors

Output : Serial RS-485 Modbus

Power Supply: 110/ 220VAC/DC

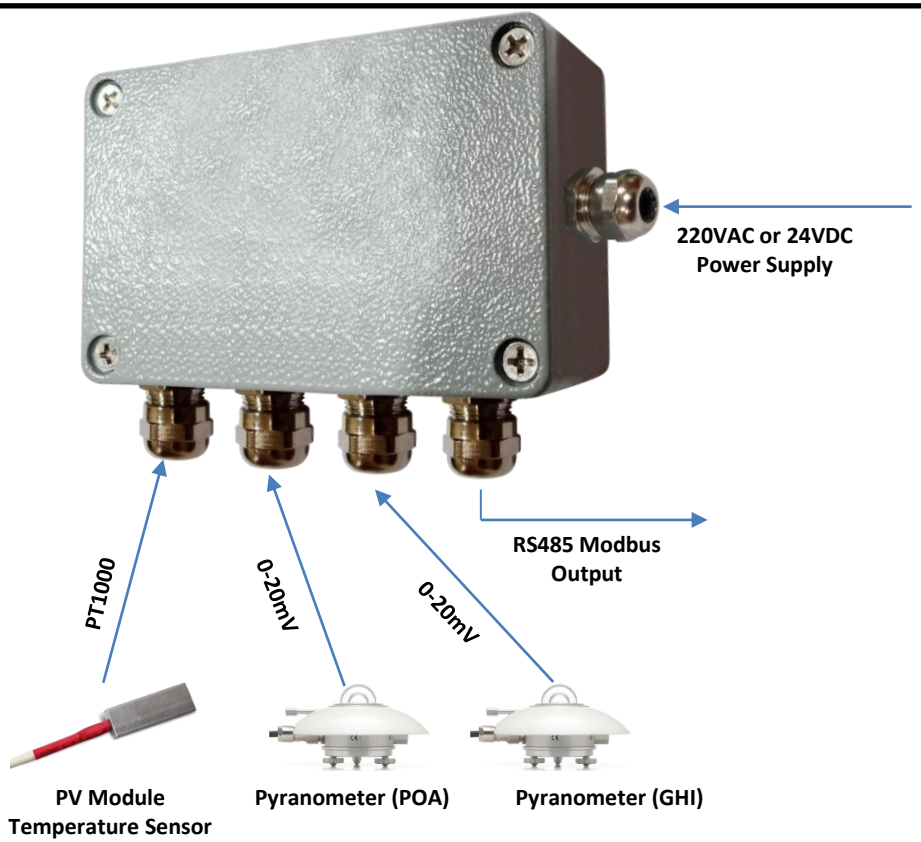
or 9-32VDC

Advantage:

Directly connect standalone Pyranometers, PV Module Temperature Sensors, and other weather sensors to the SCADA System via RS485 MODBUS.

Reduce copper usage.

Increase accuracy.



As shown above, SmartBox fits well for an application where additional Pyranometers and PV Module Temperature sensors are required to be installed at Panel end which are not connected to the Datalogger Junction Box.

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MBMET SERIES SENSORS

Model : MBMet 100

Measuring Wind Speed

- Measuring Range: 0-60 m/s
- Accuracy: ±0.5m/s(<5m/s), ±3%FS (≥5m/s)
- Starting Wind Speed: <0.8m/s
- Input Voltage: 12-24VDC
- Output signals: Digital RS485 MODBUS, Analog 4-20mA, 0 to 5V, 0 to 10V

Model : MBMet 110

Measuring Wind Direction

- Measuring Range: 0 to 360°
- Accuracy: ±3° | Resolution: 1°
- Starting Wind Speed: <0.5m/s
- Input Voltage: 12-24VDC
- Output signals: Digital RS485 MODBUS, Analog 4-20mA, 0 to 5V, 0 to 10V

MBMET SERIES SENSORS

Model : MBMet 130

Measuring Wind Speed and Direction

- Measuring Range: Wind Speed 0-70 m/s | Wind Direction: 0 to 360°
- Accuracy: Wind Speed ±3% | Wind Direction: ≤±3°
- Starting Wind Speed: 0.5m/s
- Input Voltage: 12-24VDC
- Output signals: Digital RS485 MODBUS, Analog 4-20mA

Model : MBMet 140H

Measuring Ultrasonic Wind Speed and Direction

- Measuring Range: Wind Speed 0-60 m/s | Wind Direction: 0 to 359.9°
- Accuracy: Wind Speed ±0.2m/s | Wind Direction: ±2°
- Starting Wind Speed: 0.1m/s
- Input Voltage: 12-24VDC
- Output signals: Digital RS485 MODBUS, Analog 4-20mA

MBMET SERIES SENSORS

Model : MBMet 902

Measuring Indoor Temperature and Humidity

- Class-A RTD PT100 sensor for temperature measurement
- Typical Accuracy: Temperature ±0.2% of FS, Humidity ±2%RH
- Measuring Range: Temperature -20°C to +75°C, Humidity 0-100%RH
- Input Voltage: 10 to 30 VDC
- Output signals: Analog 4-20mA
- Wall Mount

Model : MBMet 200

Measuring Rain Fall

- Principle: Self-Emptying bucket technology
- Accuracy: ±0.2mm
- Orifice Area: Ø200cm2
- Output Signal: Pulse NO/NC
- Comes with bird spikes and leaf mesh

ACCESSORIES

RS-485 Junction Box

Model : MB1356

4-in and 1-out RS-485 Aluminum Junction Box

SPD for RS485 and Power Supply

Advantage:
Reduce multiple communication cable cost for up-to 4 sensors communicating on RS485.

MV to 4-20mA Converter

Model : MB1375

0-20mV to 4-20mA Converter

Cast Aluminum Junction Box

Advantage:
Convert mV to mA for longer cable distances and higher accuracy.

4 Way Junction Box

Model : MB1280

4 wire extension Aluminum Junction Box.

EMC and surge protection

Advantage:
Increase cable length of any sensor at site.

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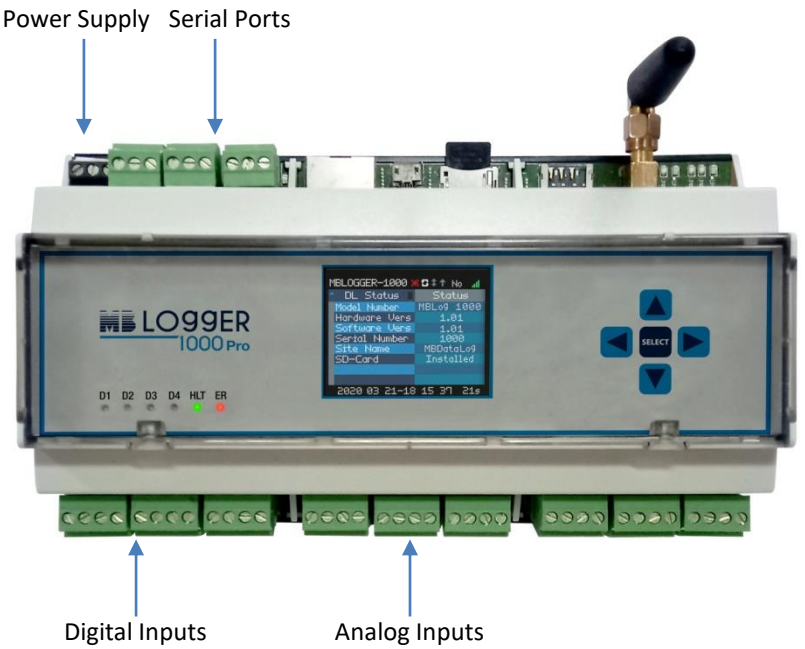
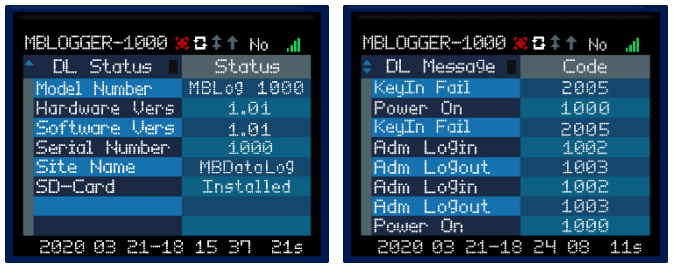
MBLOGGER 900X AND 1000X – HW FEATURES

- ARM 32 bits processor – 240MHz
- 4MB flash memory
- 32MB SRAM
- RTOS operation
- Battery backup RTC
- SD Card up-to 32GB
- Front OLED (160x128)
- Status LED
- Touch keys
- Serial ports – 2 (RS485 & RS232)
- ETH port – 1
- Modem (4G) – 1
- Digital inputs – 4
- Analog inputs – 13
- Power supply – 9-32VDC (4W)





OLED Screen Displays

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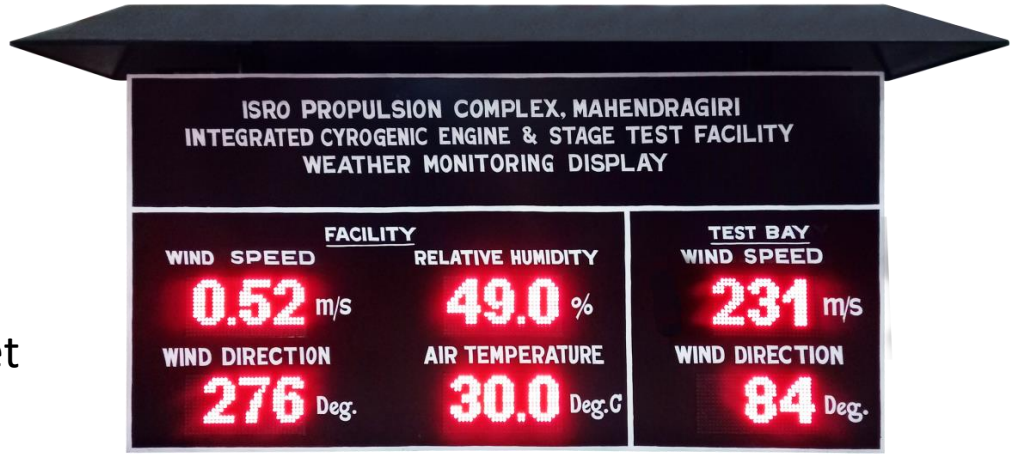
Sl. No.	Features	900 Nano	900 Lite	900 Adv	1000 Lite	1000 Adv	1000 Pro
1	Serial Port -1 RS-485 (MODBUS RTU Master, MODBUS RTU Slave)	✓	✓	✓	✓	✓	✓
2	Serial Port-2 RS-485 and RS232 (Can be used as RS485 or RS232) (MODBUS RTU Master, MODBUS RTU Slave, ASCII Master)	×	×	×	×	✓	✓
3	ETH Port (MODBUS TCP Master, MODBUS TCP Slave, Web Server)	✓	✓	✓	✓	✓	✓
4	Cellular Modem	✓	×	✓	×	✓	✓
5	OLED Display	×	×	×	×	✓	✓
6	MMC SD Card (32GB)	✓	✓	✓	✓	✓	✓
7	Maximum number of IED's per port	5	5	5	5	5	5
8	Maximum number of MODBUS TCP Slave clients	1	2	2	2	4	4
9	SNTP Client	1	1	1	1	1	1
10	File Transfer Clients	1	1	1	2	2	2
11	RTC (battery back up)	✓	✓	✓	✓	✓	✓
12	Number of Digital Inputs (optically isolated)	×	2	2	4	4	4
13	Number of mA inputs (4-20mA) (24 bits)	×	×	4	4	4	4
14	Number of mV inputs (0-1,000mV) (24 bits)	×	×	×	4	4	4
15	Number of mV inputs (0-10,000mV) (24 bits)	×	×	×	×	×	4
16	Battery Voltage Input	×	×	×	×	1	1
17	Add on Expansion Modules	×	×	×	×	✓	✓

LED DISPLAY

Model : MBP 200

- Transfer visual information for Mass Communication
- Based on DOT Matrix Display Technology
- Red Hi-bright display color
- Communication Ports: Serial RS485, Ethernet TCP/IP and SMS service using Cellular Modem
- MS Powder Coated fabricated Cabinet
- Indoor or Outdoor Waterproof Cabinet as per requirement
- Wall mounting, Sideways wall mounting, Vertical Pole Mounting, Chain Mounted for Horizontal



LED Display System installation at ISRO Facility

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HOW WE ARE IEC IEC 61724-1:2017 COMPLIED?

- Irradiance – Thermopile Pyranometers and PV reference sensor specification followed as per the standard.
- Installation and Measurement uncertainty of all the sensors followed as per the standard.
- Statistical calculations from Datalogger as per the standard.
- Commissioning engineers are trained on sensor installation as per the standard.

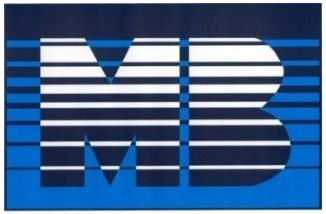
UPCOMING DEVELOPMENTS

- Silicon Cell Based Irradiation Sensor with built-in PV Module Temperature and Air Temperature Measurement **– Best suited for Rooftop Solar Plants.**
- Charge Controller Module for Datalogger **– Best suited for standalone AWS with Solar Power Supply**
- Add-on I/O Modules for Datalogger **– Making the datalogger powerful and customizable for multiple applications.**

WHY US?

- Single vendor for all solutions.
- Expertise in providing Industrial Automation solution since 1983.
- Hardware and software engineering, testing, commissioning & after sales service provided by us.
- In house manufacturing
- Channel Partners to industry leaders GEOLUX, SATEC, SIEMENS, Schneider Electric, WAGO and MOTOROLA.
- After-sales team stationed in different parts of India for timely servicing.
- Proven system- Already installed and operational in multiple sites.

THANK YOU



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