Telemetric Rain Gauge (Data Logger with Internal GSM/GPRS Modem and Tipping Bucket Rain Sensor)

Specifications: **Model: VARSHA-TRG**

Data Logger:

- Data logger is an integrated microprocessor-based data acquisition and storage system
- Adequate hardware configuration and software support to serve as an interface between sensors and the communication link
- Stand-alone operation and all functions carried out through system keypad and display independent of a PC/ Laptop
- Multi-tasking OS in data logger with unique station-ID for each site
- Keyboard/Display assisted field calibration facility for rain sensor.
- Remote/Field Configure settings for Unique station identification, Sensor Identification
- Over the air software update facility for remote firmware changes in device

Feature	**Specification**
Site Conditions	
Ambient Temperature	-10 to +55
Humidity	5 to 100 %
Sensor Interface	
Pulse Input	Input for Rain Gauge impulse
I/O Interface	
Port for Telemetry	GSM/GPRS Based Telemetry.
General Features	
Flash memory	16MB
Report Interval	Software Configurable (Standard Interval 15 Min)
Firmware Operating System	Multitasking Operating System (RTOS)
Display	Inbuilt Digital display 16 Characters
Power Supply	Battery backed operation & Solar powered standalone operation
Battery Voltage Monitoring	Battery Voltage monitored and reported
GSM Signal Monitor	Provision to indicate network availability (GSM Signal Strength)
Charge controller	External Charge Controller
Internal clock	Internal Clock with drift less than 2 seconds per year
User Interface	Through LCD Display and Keypad with 6 Buttons
Enclosure	Wall /Poll mountable IP65 Enclosure
Accessories	All accessories for fixing and connectivity

Power Source:

Feature	Specification
Battery	
Operating Temperature	From -20 to +60
Type	Lithium Batteries
Capacity	Suitable choice to achieve the backup requirement for site
Solar Panel	
Size	20W or suitable choice to achieve the backup requirement for site.
Mounts	Corrosion free mount and clamps provided to adjust and fix frames holding solar panels.
Charger	Smart Solar Charge controller included

Communication (GSM/GPRS Modem):

Feature	Specification
Technology	2G/3G/4G
Frequency	900MHz and 1800MHz
Operating Temperature	From -30 to +85
Communication	Two way TCP/IP connection using GPRS
Transmission trigger	Transmission triggered by remote site
Power Saving	Power down mode available for non-Transmission duration
Communication Protocol	Data Transmission by HTTP Post and FTP File upload to Data Centre
Functionality	Multi level Alarm dial out, preprogrammed dial out, remote interrogation facilities
Remote Management	Configurable parameters through SMS
Accessories	GSM Antenna, cable are provided
Antenna Features	
Frequency range	800-960 MHz , 1880-1930 MHz
Impedance	50 ohms
Connector	SMA Male
Cable length	3 meter

Rain Sensor: Specifications

Model : VARSHA-TRG-6

Feature	**Specification**
Sensor Type	Tipping Bucket type with Reed Switch
Capacity/Range	Unlimited, more than 200+ mm/hour
Resolution	0.25mm per tip
Accuracy	Error Margin within Acceptable Limits of Tolerance 2.3% for (Rain between 25 - 50 mm/hr.) 3.8% for (Rain between 50 - 100 mm/hr.) 4.6% for (Rain rate > 100 mm/hr.)
Collector Dia	200 mm
Collector Area	314 cm2
Field Calibration	Facility Available in combination with datalogger
Output Interface	Pulse / Compatible with Data logger
Power Supply	3.3 V DC
Material	Rust proof Housing Industrial Stainless steel of 304 Grade
Drain Level Adjustment Debris protection Accessories Calibration Certificate	The rainwater drains out from the base of the collector Levelling adjustment screws along with spirit level on the base SS grade wire mesh inside collector Sensor Mounting support, cables and other accessories as required IMD-Pune

भारत मौसम विज्ञान विभाग
जलवायु अनुसंधान एवं सेवाएँ का प्रमुख कार्यालय
(सतह उपकरण अनुभाग)
शिवाजीनगर, पुणे - 411005

भारत सरकार
GOVERNMENT OF INDIA

INDIA METEOROLOGICAL DEPARTMENT
Office of the Head Climate Research & Services
(Surface Instruments Division)
Shivajinagar, Pune - 411005

Laboratory test report

No.: 7366

ORIGINAL

Name of the instrument	: Tipping Bucket Rain Gauge
Identification No	: Sr no. 8001-A-05160
Make	: SPATIKA
Model	: VARSHA-TRG-6
Calibrated for	: SPATIKA INFORMATION TECH PVT LTD.
Resolution	: 0.25 mm/tilt
Collector Diameter	: 200 mm
Collector Area	: 314 cm2

Calibration: The above rain gauge sensor has been calibrated against the standards maintained in the Surface Instrument Division, Pune and the calibration results are given below.

Average Intensity of Rain during calibration(mm/hr)	Observed Percentage error in the measurement of Rain	Refrence Table Acceptable Limits of Tolerance for percentage error measurement of rain to IMD
34.7	-2.3%	± 3.0% for rain intensity between 25 mm/hr to 50 mm/hr
59.7	-2.3%	± 4.0% for rain intensity between 50 mm/hr to 100 mm/hr
76.4	-3.8%	± 4.0% for rain intensity between 50 mm/hr to 100 mm/hr
115.8	-4.6%	±5.0% for rain intensity between 100 mm/hr to 150 mm/hr

Remarks: During the calibration, the tilts was observed on data logger submitted by firm.

Validity of calibration: ONE YEAR

Checked by: Mukesh Kumar

23.02.2026

(U K Shende)
Scientist – E
Surface Instruments Division
for Head CR&S

Date: 20.02.2026

Telephone / दूरध्वनी : (020) 25572429 Fax / फैक्स: (20) 25521529 Email: si.slab@imd.gov.in

Varsha-TRG
Data logger

Spatika

General Description

The data logger Varsha-DL-TRG is a product developed by Spatika primarily for Telemetric Rain gauge. It can also be used for applications where more sensors are required to be interfaced.

Features

- User friendly simple menu operation
- 2 Line LCD Display with backlight
- Analog and Digital I/O for sensor Interface
- Large data storage
- Internal GSM/GPRS Modem Interface for data Transfer to cloud/central server
- Key-board and display assisted field calibration procedure for rain gauge sensor
- Ideal for Battery and Solar Powered Operation

The product is designed to operate in extreme weather conditions and is suitable for hydrological and weather monitoring applications.

Basic power source is rechargeable Lithium Batteries with solar panel.

The lower power consumption allows usage of the unit for longer durations in field. With suitable capacity of battery and solar panel the unit can operate for around 3 weeks even in the absence of any solar power.

For field Installations, the unit comes with following setup.

1. Data logger with Industrial Grade/IP-65 Plastic Enclosure
2. Battery Pack
3. Solar Panel
4. IP-65 Protection Housing
5. GSM, GSM Antenna
6. Mounting accessories

Applications

1. Telemetric rain gauge
2. Water/Flood level Monitoring Equipment
3. Any data acquisition and transmission unit with 1-2 sensors.

Features

- Integrated microprocessor-based data acquisition , storage and Transmission System
- Unique Station Identification of device and sensor identification for sensors
- Stand-alone system with keypad and display
- Keyboard and display assisted calibration procedure for Rain gauge sensor.
- Multitasking Real-time OS based
- Simple menu-based operation for the user
- Firmware update via OTA.

Specifications:

Operating Conditions	
Temperature	-10 to +55
Humidity Range	0 to 100%Rh
Inputs	Pulse Input,ADC,I2C,Serial
Data Transmission	GSM/GPRS Based
Real Time Clock	GPS Synchronized
Sample Interval	15 Minutes (Configurable)
Data Storage	Sufficient storage to store data up to 5 years
Display	Alphanumeric Display 16 Characters

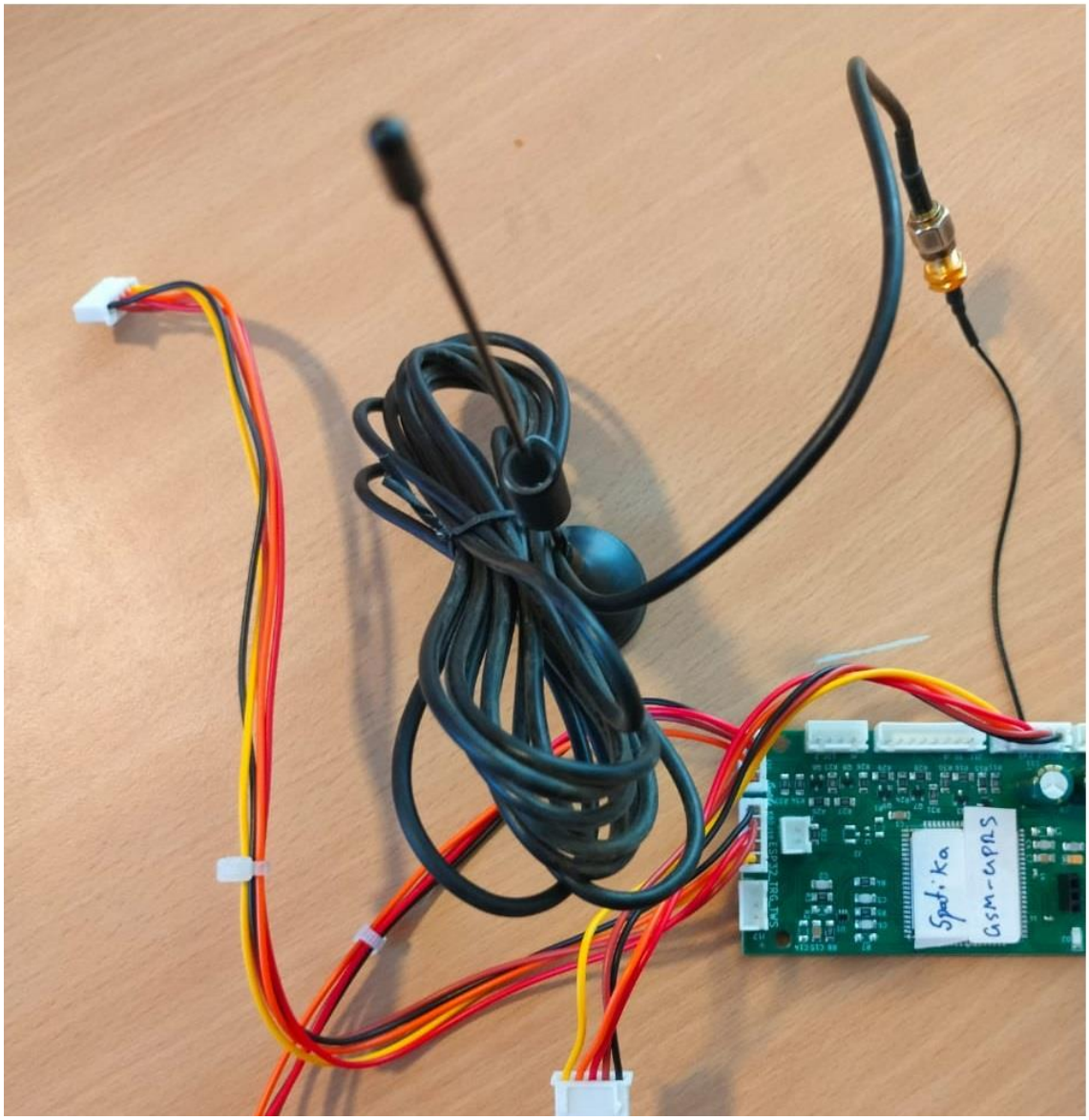
Internal GSM/GPRS Modem

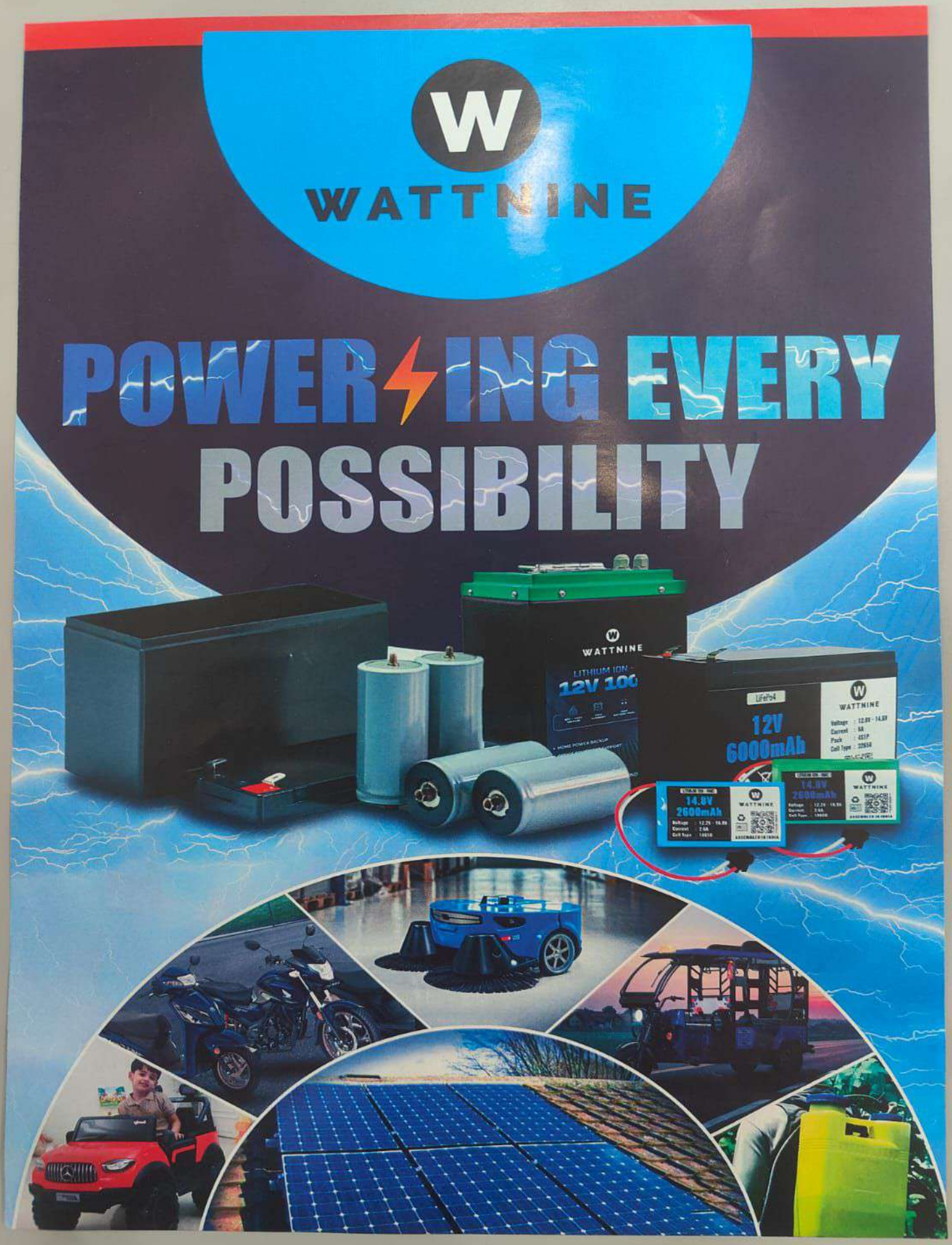
Specifications: **Model: VARSHA-GPRS**

Communication (GSM/GPRS Modem):

Feature	Specification
Technology	2G/3G/4G
Frequency	900MHz and 1800MHz
Operating Temperature	From -30 to +85
Communication	Two way TCP/IP connection using GPRS
Transmission trigger	Transmission triggered by remote site
Power Saving	Power down mode available for non-Transmission duration
Communication Protocol	Data Transmission by HTTP Post and FTP File upload to Data Centre
Functionality	Multi level Alarm dial out, preprogrammed dial out, remote interrogation facilities
Remote Management	Configurable parameters through SMS
Accessories	GSM Antenna, cable are provided
Antenna Features	
Frequency range	800-960 MHz , 1880-1930 MHz
Impedance	50 ohms
Connector	SMA Male
Cable length	3 meter


Spot.ka
GSM-GPRS


Spot.ka
GSM-GPRS


WATTNINE
POWERING EVERY
POSSIBILITY
WATTNINE
LITHIUM ION
12V 100
LiFePo4
12V
6000mAh
WATTNINE
14.8V
2600mAh
WATTNINE
14.8V
2600mAh

CURRENT 100A
VOLTAGE 40V - 59.2V
CELL TYPE PRISMATIC

51.2V 100,000 mAh

CURRENT 100A
VOLTAGE 14.6V
CELL TYPE PRISMATIC

12.8V 100,000 mAh

3.7V 1200 mAh

VOLTAGE	CURRENT	CELL TYPE
3V - 4.2V	1.2A	18650

3.7V 5200 mAh

VOLTAGE	CURRENT	CELL TYPE
3V - 4.2V	5.2A	18650

12V 1200 mAh

VOLTAGE	CURRENT	CELL TYPE
9V - 12.6V	1.2A	18650

12.8V 12000 mAh

VOLTAGE	CURRENT	CELL TYPE
10V - 14.6V	12A	32700

12V 4400 mAh

VOLTAGE	CURRENT	CELL TYPE
9V - 12.6V	4.4A	18650

3.2V 6000 mAh

VOLTAGE	CURRENT	CELL TYPE
2.5V - 3.7V	6A	32700

14.8V 2600 mAh

VOLTAGE	CURRENT	CELL TYPE
12.2V - 16.8V	2.6A	18650

6V 6000 mAh

VOLTAGE	CURRENT	CELL TYPE
5V - 7.4V	6A	32700

12V 6000 mAh

VOLTAGE	CURRENT	CELL TYPE
10V - 14.6V	6A	32700

WATTNINE

Wattnine, Plot No. 39, 200 Feet SEZ Road, Near Malot Hospital, Mahapura, Jaipur - 302026

0141-4946677

contact@wattnine.in

Overview

The 3.2V 12000mAh Rechargeable lithium-ion LiFePO4 battery from Wattnine is designed to provide high energy density.

Features

- High Energy Density.
- Equipped with a high quality Smart Battery Management System.
- Long Life Cycle.
- Excellent Safety & Performance.

Battery Specifications

Nominal Characteristics	
Nominal Voltage /V	3.2V
Nominal Capacity /Ah (25°C, 0.5C)	12000mAh
Power	38.4 W
Operating Voltage Range	2.5V-3.65V
Gross Stored Energy	37.45 Wh
Ageing / Safety Margin	1500 Cycle
Pack Characteristics	
Design	1S2P
Cell type / Chemistry	Li-Ion LiFePO4
Mechanical Characteristics	
Weight	**Approx. 250g**
Dimension **(L x W x H)**	**72 x 65 x 34 mm (Can be modified)**
Charging Connector	**As per requirement**
Discharging Connector	**As per requirement**
Charging Characteristics	
Charge voltage	3.7V
Max. Continues Charge current	3A
Charging Duration	240 Min
Discharging Characteristics	
Max. Voltage	3.65
Min. Voltage	2.5
Nominal Discharge current	6A
Maximum Depth of Discharge	90%-95%
Charge-Discharge Efficiency	80% - 90%

BMS – Battery Management System

Protection		**Range**	**Units**
Single Cell Over Charge Voltage Protection	Trigger voltage	3.65 ± 0.05	V
	Release voltage	3.55 ± 0.05	V
	Delay Time	1000	ms
Single Cell Over Discharge Voltage Protection	Trigger voltage	2.5± 0.05	V
	Release voltage	2.7 ± 0.05	V
	Delay Time	1000	ms
Over Current Protection	Trigger Current	7	A
	Delay Time	200	ms
Balancing Function	YES		
Short circuit	Delay Time	250-500	µs
	Manual reset	Disconnect The Load to Reset	
Thermal protection	High Temperature	70°C	
	Low Temperature	-20 °C	
Temperature Derating	-20°C to 70°C		
Derating Factor	0.7		

Overview

The 3.7V 10000mAh Rechargeable lithium-ion NMC battery from Wattnine is designed to provide high energy density.

Features

- High Energy Density.
- Equipped with a high quality Smart Battery Management System.
- Long Life Cycle.
- Excellent Safety & Performance.

Battery Specifications

Nominal Characteristics	
Nominal Voltage /V	3.7V
Nominal Capacity /Ah (25°C, 0.5C)	10000mAh
Power	37W
Operating Voltage Range	2.75V-4.2V
Gross Stored Energy	35.89 Wh
Ageing / Safety Margin	1500 Cycle
Pack Characteristics	
Design	1S2P
Cell type / Chemistry	Li-Ion NMC
Mechanical Characteristics	
Weight	**Approx. 150g**
Dimension **(L x W x H)**	**73 x 55 x 27 mm**
Charging Connector	**As per requirement**
Discharging Connector	**As per requirement**
Charging Characteristics	
Charge voltage	4.2V
Max. Continues Charge current	5A
Charging Duration	120 Min
Discharging Characteristics	
Max. Voltage	4.2V
Min. Voltage	2.75V
Nominal Discharge current	3A
Maximum Depth of Discharge	90%-95%
Charge–Discharge Efficiency	80% - 90%

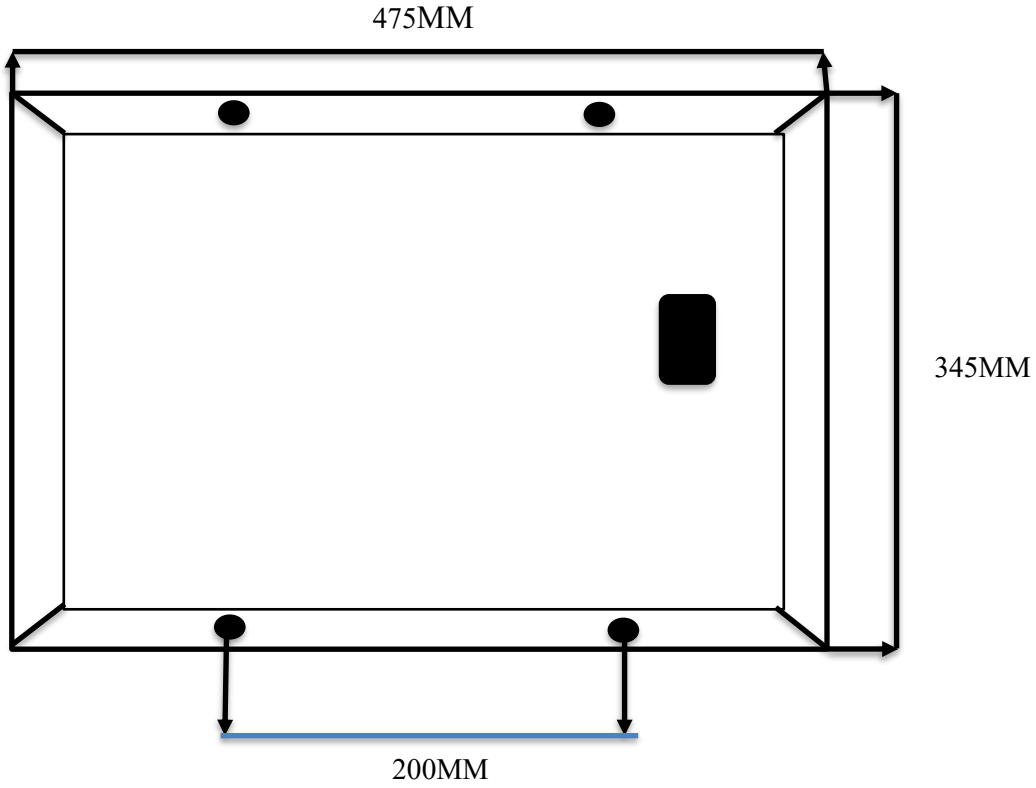
BMS – Battery Management System

Protection		**Range**	**Units**
Single Cell Over Charge Voltage Protection	Trigger voltage	4.2 ± 0.05	V
	Release voltage	4.15 ± 0.05	V
	Delay Time	1000	ms
Single Cell Over Discharge Voltage Protection	Trigger voltage	2.75± 0.05	V
	Release voltage	3.0 ± 0.05	V
	Delay Time	1000	ms
Over Current Protection	Trigger Current	3.5	A
	Delay Time	200	ms
Balancing Function	YES		
Short circuit	Delay Time	250-500	µs
	Manual reset	Disconnect The Load to Reset	
Thermal protection	High Temperature	60°C	
	Low Temperature	-20 °C	
Temperature Derating	-20°C to 60°C		
Derating Factor	0.9		

No,952/8,8th Main Road, Prakashnagar, Bangalore-560021 Ph no: 080 23523365/ +91 9886596565/+91 9886343365
Mail id : info@nksolar.in, nksolarblr@gmail.com0
GSTN: 29AGZPN7927L1Z4

N KSOLAR
AN ISO 9001:2015

20W SOLAR MODULE DRAWING



1. Wattage: 20WP/12V
2. Module size: 475X345X18MM
3. Cell wattage, cut cell size and pattern may vary depending on the cell size.
4. Gap Between cells and cell edge to frame Edge may vary depending on the cell size.

5. **Characteristics:Model No NK-20-WP**
No of cells: 36cells
Peak power (W) 20±3%
Open circuit voltage (V):21.1V
Short circuit current (A):1.56A
Max. Power voltage (V):18.1V
Max. Power current (A):1.11A
STC: Irradiance 1000W/ m², Cell temperature 25° C, AM 1.5,

6.Temperature and coefficient: NOCT 45±2°C Limits, Coefficient current TK 0.1%/ °C Operating temperature limits -40°C to +85°C Coefficient

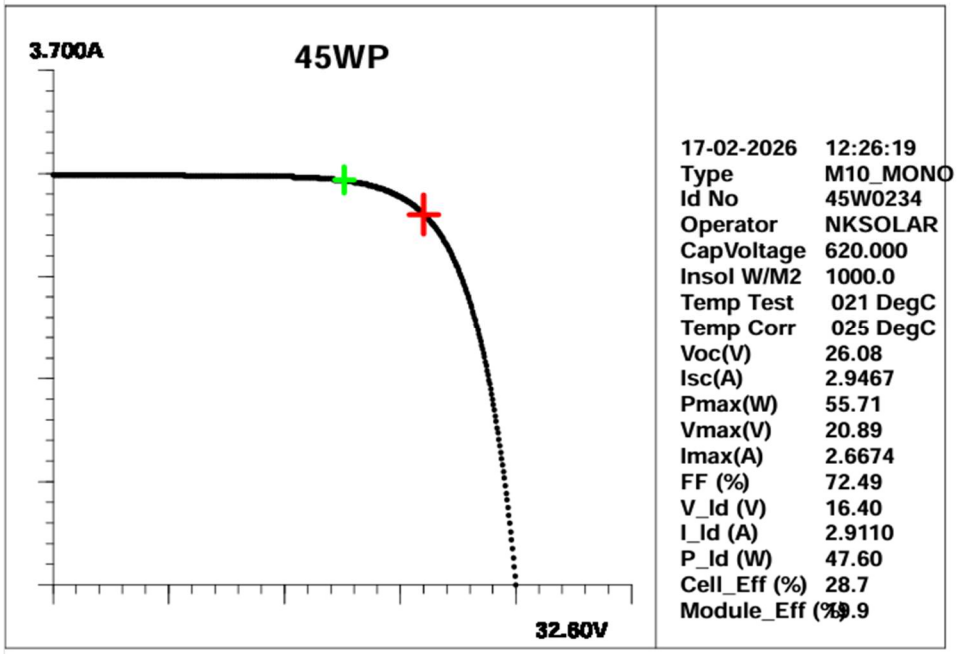
7. Due to continuous development and Product improvement, Company reserves the right to change / Alter without prior notice.

8. This Drawing is Property of N K SOLAR and may not be copied (in Whole or in Part Used for manufacturing Part) or Disclosed without Prior Consent of NK SOLAR.

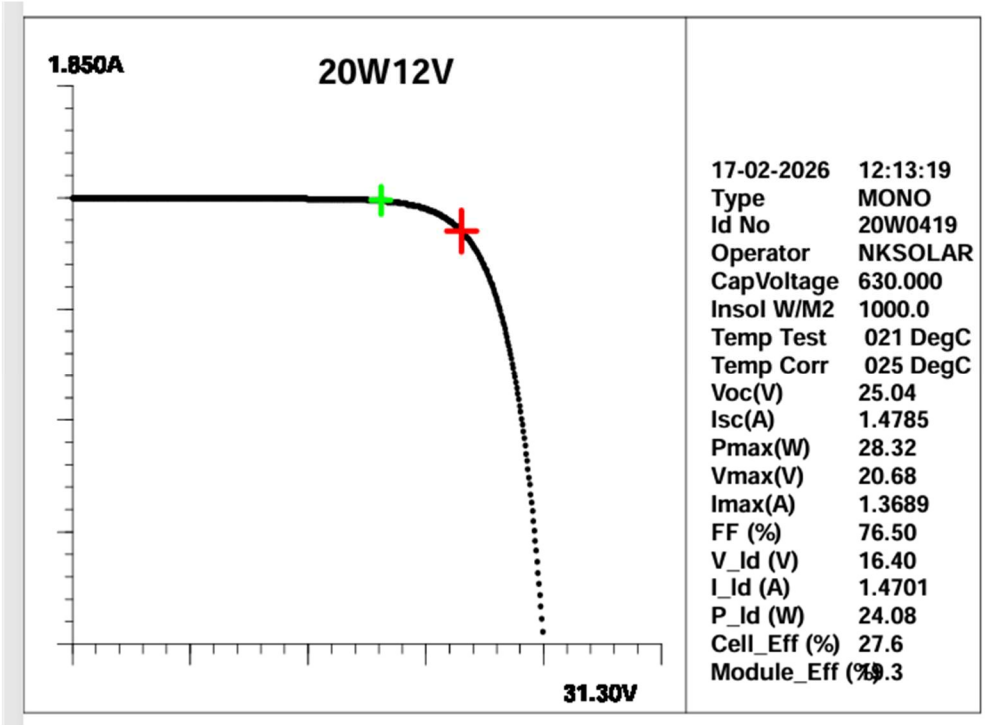
N K SOLAR BANGALORE

No,952/8,8th Main Road, Prakashnagar, Bangalore-560021 Ph no: 080 23523365/ +91 9886596565/+91 9886343365
Mail id : info@nksolar.in, nksolarblr@gmail.com0
GSTN: 29AGZPN7927L1Z4

N KSOLAR
AN ISO 9001:2015



17-02-2026	12:26:19
Type	M10_MONO
Id No	45W0234
Operator	NKSOLAR
CapVoltage	620.000
Insol W/M2	1000.0
Temp Test	021 DegC
Temp Corr	025 DegC
Voc(V)	26.08
Isc(A)	2.9467
Pmax(W)	55.71
Vmax(V)	20.89
Imax(A)	2.6674
FF (%)	72.49
V_Id (V)	16.40
I_Id (A)	2.9110
P_Id (W)	47.60
Cell_Eff (%)	28.7
Module_Eff (%)	19.9



17-02-2026	12:13:19
Type	MONO
Id No	20W0419
Operator	NKSOLAR
CapVoltage	630.000
Insol W/M2	1000.0
Temp Test	021 DegC
Temp Corr	025 DegC
Voc(V)	25.04
Isc(A)	1.4785
Pmax(W)	28.32
Vmax(V)	20.68
Imax(A)	1.3689
FF (%)	76.50
V_Id (V)	16.40
I_Id (A)	1.4701
P_Id (W)	24.08
Cell_Eff (%)	27.6
Module_Eff (%)	19.3

Authorised signatory

NK SOLAR BANGALORE