

# Greenstring

## PV String Monitoring System

In order to guarantee long term power performance in mid and large scale PV installations it is mandatory to properly monitor the production of the installation over time, at the string level. String level monitoring is guaranteed to maximize energy production, optimize facility management and decrease operations and maintenance costs. Mersen, latest innovation is a line of string monitoring products that can be customized to the target installation.

### Features Benefits

- Modularity: 1 to 30 PV strings supported
- Self-powered: power supply directly from PV strings
- Standard MODBUS RTU on isolated RS485
- DC voltage and current measurement per string
- High accuracy measurement:  $\pm 0.5\%$
- Programmable sampling rate: max. every 2 seconds
- Up to 8 external sensors (anemometer, sun sensor ...)
- Self-diagnostic function: temperature, fuse, DC switch and SPD status
- LED indicator: operating status

### Applications

- Mid-size PV installations (over 50 kW)
- Large PV farms (over 200 kW)

### Technical data overview

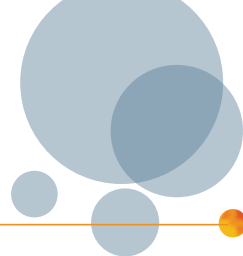
Voltage DC	1000 VDC
Amper (A)	25 A
Input number	Up to 30 PV strings
Working Temperature	-30°C to +70°C



### Standards

CEM: IEC 61326-1  
Security: IEC 61010-1  
UL 1741  
CSA-C22.2  
Installation: IEC 61439-3  
IEC 62103





## Product range



HMMC6B

### MAIN card

Catalog number	Reference number	Description
HMMC6B	V1042309A	The MAIN card provides RS-485 communication interface (Modbus RTU), system power supply and PV monitoring functions. It can be used as a standalone solution to monitor up to 6 PV strings.



HMAC6A

### AUX card

Catalog number	Reference number	Description
HMAC6A	A1034632A	The AUX card monitors up to 6 PV strings individually capturing the DC voltage and current. Connecting up to 4 AUX cards, in addition to the MAIN card, allows to monitor up to 30 PV strings.



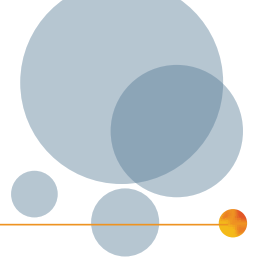
HMPC8A

### PROBE card

Catalog number	Reference number	Description
HMPC8A	B1034633A	The PROBE card allows the connection of up to 7 external analog and 1 digital sensors to collect a variety of environmental data.

### Kits

Catalog number	Reference number	Description
HMKCGA	D1034635A	Configuration kit: the configuration software and 1 RS485 to USB cable
HMKCNA	C1034634A	Connection kit: 1 RS485 shielded cable and 1 connection card



## Technical Data

	MAIN card	AUX card	PROBE card
<b>Electrical Features</b>			
Number of inputs	6	6	8
Maximum rated voltage	1000 VDC	1000 VDC	-
Maximum current per input	25 A	25 A	-
Maximum current per output	150 A	150 A	-
<b>String Voltage measurement</b>			
Measurement range	± 1000 VDC	± 1000 VDC	-
Accuracy	± 0.5% (± 5V)	± 0.5% (± 5V)	-
<b>String Current measurement</b>			
Measurement range	± 20 A	± 20A	-
Accuracy	± 0.5% (± 100mA)	± 0.5% (±100 mA)	-
<b>Measurement inputs</b>			
Digital inputs	-	-	1 potential-free or pulse input, 0 Hz to 100 Hz
Analog inputs	-	-	7 inputs, individually configurable: - 4-20 mA: precision ± 1%, impedance 100 Ω - 0-10V: precision ± 1%
<b>Temperature measurement</b>			
Measurement range	-40°C to +100°C	-40°C to +100°C	-
Accuracy	± 2°C	± 2°C	-
<b>Communication</b>			
Protocol	Modbus RTU	-	-
Interface	RS-485 isolated	-	-
<b>External Relay Control</b>			
Number of outputs	3	-	-
Relay coil voltage	Max. 20 mA, 24 VDC	-	-
<b>Monitoring and Signaling inputs</b>			
SPD end-of-life-status	1, potential-free input	-	-
DC breaker status	1, potential-free input	-	-
Auxiliary 1 & 2	2, potential-free inputs	-	-
<b>Power Supply from PV strings</b>			
Voltage range	250 VDC to 1000 VDC	-	-
Power consumption	2.5 W to 1000 VDC	0.5 W	-
<b>External Power Supply</b>			
Voltage range	24 VDC ± 10%	-	24 VDC ±10%
Power consumption	1.5 W	-	0.5 W + sensors consumption
Insulation type	Double insulation 1000 VDC	-	Double insulation 230 VAC
<b>Mechanics</b>			
Input connection type	Cage Clamp (max. 6mm <sup>2</sup> )	Cage Clamp (max. 6mm <sup>2</sup> )	Cage Clamp (max. 2.5mm <sup>2</sup> )
Dimensions (L x W x H) in mm	227 x 167 x 45	227 x 167 x 45	227 x 167 x 45
<b>Environmental Conditions</b>			
Operating & Storage temperature	-30°C to +70°C	-30°C to +70°C	-30°C to +70°C
Relative humidity	10% to 95% non-condensing	10% to 95% non-condensing	10% to 95% non-condensing