



Effective PV Monitoring requires constant, solid and traceable PV Plant monitoring data in order to determine actual performance and fulfil owner/investor expectations.

Operators are interested to identify errors and losses in a reliable way to trigger appropriate actions for maximizing energy harvest during the total system lifetime.

With the monitoring of PV Module strings, design and production errors will be recognized on the DC side with high resolution down to PV Module level.

Using DC shunts (vs. Hall Effect sensors) the string.bloxx provides current measurements typically 10 times more accurate and not susceptible to temperature variance. This equates to higher accuracy measurements and better understanding of true system performance. In addition, string voltage (up to 1000V) and DC power on every string can be continuously monitored ensuring maximum system productivity.

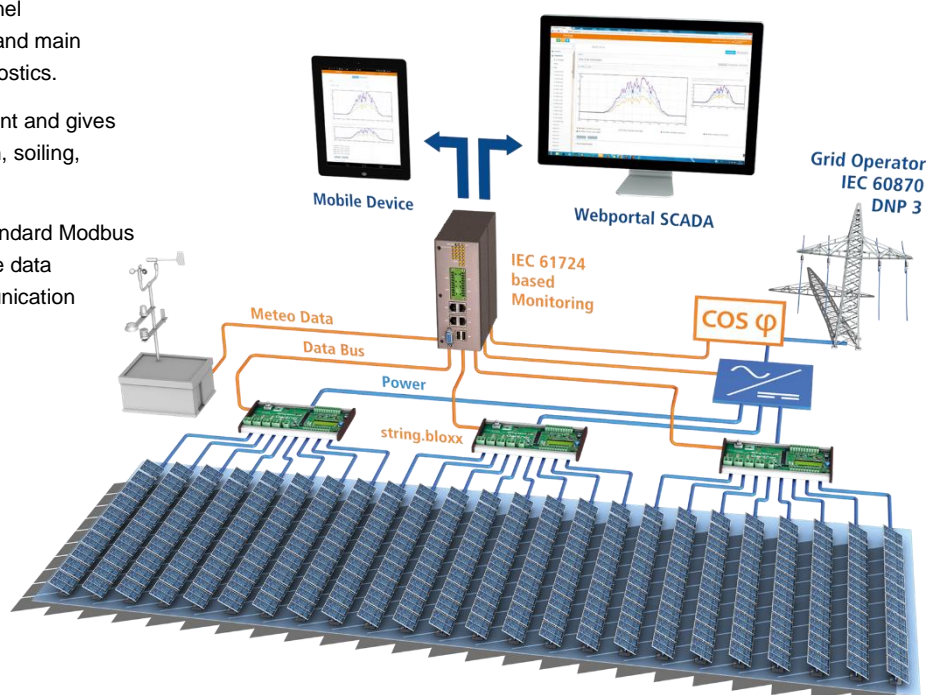
Continuous measurement of both cabinet and panel temperatures, along with overvoltage monitoring and main switch control greatly and improves system diagnostics.

This accurate measurement is inverter independent and gives feedback about losses due to inverter malfunction, soiling, shading, PV Module degradation etc. .

The string.bloxx communication uses industry standard Modbus protocols for easy and fast integration and reliable data exchange with the data logger. For longer communication distances fiber optic technology is used.

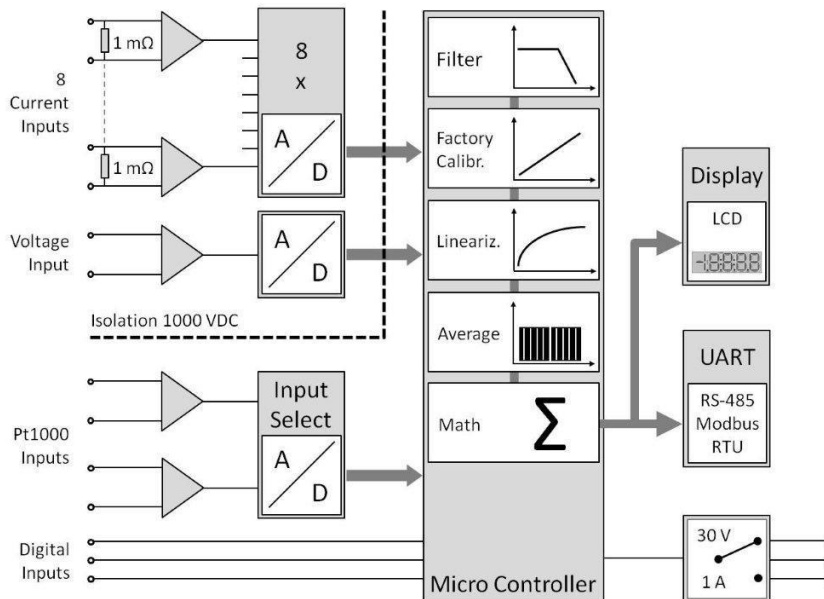
### Key features:

- **16 Analog inputs for current measurements**  
± 26 A string current (calibrated), ± 416 A summary @60°C
- **1 Analog input for voltage measurements**  
0-1000 VDC string voltage
- **2 input channels for temperature**  
Panel and switch cabinet temperature
- **3 Digital inputs**  
Monitoring of overvoltage protection and main switch
- **1 Digital output**  
Actuation of main switch
- **Signal conditioning**  
Calculated DC Power, linearization, mean value, scaling, alarm
- **Integrated LC display**  
Display of all readings, configuration
- **RS485 fieldbus interface**  
up to 115,2 kbps: Modbus-RTU, ASCII (optional OEM protocols)
- **Connectivity**  
Data logger (e. g. Q.reader) and gantner.webportal for worldwide access or other 3<sup>rd</sup> party applications
- **Electromagnetic Compatibility**  
according to EN 61000-4 and EN 55011
- **Power Supply 10 .. 55 VDC**
- **DIN rail or wall mounting according to DIN 50022**





### Block diagram



<b>Input Current</b>	
Max. Number	16
Range	± 26 A
Accuracy	0.25 %
Connection	0.25 mm <sup>2</sup> - 6 mm <sup>2</sup> push-in spring-cage connection
<b>Current measurement</b>	
Max.	416 A
Connection	M8 bolt connector for cable ring terminals
<b>Voltage measurement</b>	
Number	1
Range	0-1000 VDC
Accuracy	0.2 %
Connection	0.25 mm <sup>2</sup> - 6 mm <sup>2</sup> push-in spring-cage connection
<b>Input Temperature</b>	
Number	2
Type	Pt1000, 2- and 4-wire
Range	-40 till +160°C
Accuracy	0.5 %
Connection	0.25 mm <sup>2</sup> - 1.5 mm <sup>2</sup> push-in spring-cage connection
<b>Digital Inputs</b>	
Number	3
Input	State
Connection	0.25 mm <sup>2</sup> - 1.5 mm <sup>2</sup> push-in spring-cage connection



## string.bloxx 116

String Monitoring Solution

<b>Digital Output</b>	
Number	1
Output	State, alarm
Contact	Relay change
Load	30 VDC/1000 mA (ohmic load)
Connection	0.25 mm <sup>2</sup> - 1.5 mm <sup>2</sup> push-in spring-cage connection

<b>Power Supply</b>	
Power supply	10 up to 55 VDC, overvoltage and overload protection
Power consumption	approx. 1.5 W (0.4W at 30 seconds sample rate)
Connection	0.25 mm <sup>2</sup> - 1.5 mm <sup>2</sup> push-in spring-cage connection

<b>Communication Interface</b>	
Standard	RS-485, 2-wire
Data format	8e1
Protocols	Modbus-RTU, ASCII: 19.200 bps up to 115.200 bps
Number of devices on the bus	max. 250
Connection	0.25 mm <sup>2</sup> - 1.5 mm <sup>2</sup> push-in spring-cage connection

<b>Environmental</b>	
Operating temperature	-20°C up to +60°C @ max 384 A current
Operating temperature	-20°C up to +75°C @ max 192 A current
Storage temperature	-40°C up to +85°C
Relative humidity	5 % up to 95 % at 50°C, non-condensing

<b>Mechanical</b>	
Case	Polycarbonate
Dimensions (B x H x D)	(305 x 128 x 55) mm
Weight	approx. 600 g
Mounting	DIN EN-rail or wall mounting

### Warm Up Time

All declarations are valid after a warm up time of 45 minutes.

Valid from January 2015. Specification subject to change without prior notice.

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