

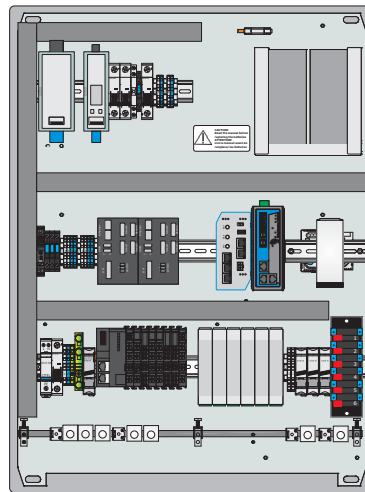
# skycontrol

## Power Plant Controller



skycontrol is an integrated system for PV power plant control and grid stability management. It meets grid operators' requirements for utility-scale PV installations to ensure controlled grid injection, both at the medium and high voltage level, and can be flexibly adjusted to comply with different regional, national and international grid codes. Its distinguishing feature, the genuine closed-loop control principle, ensures high-precision control by measurement of all relevant

physical quantities at the grid connection point and their continuous feedback to the controller input. Combined with adaptable control algorithms and communication sequences, this makes skycontrol a highly efficient tool for fast and stable power plant control, even in large-scale and distributed PV installations comprising several independent PV sections.



skycontrol System Architecture

## KEY FEATURES

- > Closed-loop control of active and reactive power
- > Fast and precise settlement of control functions
- > Highly adaptable to grid operators' requirements
- > Feedback of actual values from grid connection point at medium or high voltage level
- > Compatible with virtually all inverters on the market (see document „Compatible Inverters“ on [www.skytron-energy.com](http://www.skytron-energy.com))
- > Suitable for mixed PV installations, equipped with different makes of inverters
- > Fully integrated in the skytron® monitoring and supervision system

## KEY FUNCTIONS

- > Active power control (curtailment and grid stability management)
- > Reactive power injection
- > Reactive power compensation of passive components
- > Voltage stabilisation
- > Frequency stabilisation
- > Characteristic Curves
- > Balancing Power Reserve
- > Control of Reactive Power Compensation Devices
- > Nightly Grid Support
- > Hierarchical Control
- > Protocols: IEC60870-5-101/104, IEC61850, DNP3, Modbus





## TECHNICAL DATA

OPTIONS	PRODUCT CODE										DESCRIPTION	
skycontrol-	X	X	X	X	-	X	X	X	X	X	X	
Cabinet	1											Cabinet with cable inlets
	2											Cabinet without cable inlets
Embedded Computer	0											-
	1											1 x Embedded computer (System memory 2 GB, internal watchdog, Linux OS, 3x RS485)
	2											2 x Embedded computer (second IPC used as data logger)
Network	0											-
	1											1 x Multimode industrial managed Ethernet switch large [2x 100BaseFX MM optical fiber, 6x 10/100BaseT(X)]
	2											1 x Single-mode industrial managed Ethernet switch large [2x 100BaseFX SM optical fiber, 6x 10/100BaseT(X)]
	3											1 x Multimode industrial managed Ethernet switch small [2x 100BaseFX MM optical fiber, 3x 10/100BaseT(X)]
	4											1 x Single-mode industrial managed Ethernet switch small [2x 100BaseFX SM optical fiber, 3x 10/100BaseT(X)]
Router	5											1x Industrial managed Ethernet switch [8 x 10/100BaseT(X)]
	0											-
	1											Service Access Interface
	2											LTE-Router / VPN Gateway EU
Power Supply	3											LTE-Router / VPN Gateway US
	0											24 V DC
	1											Power supply 85 to 264 V AC / 44 to 66 Hz mains
RS485	2											Power supply 85 to 264 V AC / 44 to 66 Hz mains & UPS with 2 batteries (17 Ah AGM integrated)
	3											Power supply 85 to 264 V AC / 44 to 66 Hz mains & UPS with 2 batteries (40 Ah AGM external enclosure)
Overvoltage Protection	0											-
	1											3 x RS485 fieldbus interfaces, overvoltage protected
	2											5 x RS485 fieldbus interfaces, overvoltage protected (USB-2xRS485 converter necessary)
Ethernet	3											6 x RS485 fieldbus interfaces, overvoltage protected (2nd IPC necessary)
	0											-
Overvoltage Protection	1											1 x Ethernet overvoltage protection
	2											2 x Ethernet overvoltage protection
	3											3 x Ethernet overvoltage protection
Splice Box	0											-
	1											Multimode splice box with SC Connector
Heating/Cooling	2											Single-mode splice box with SC Connector
	0											-
	1											Fan heater, 150 W AC heater incl. 24 V DC fan, 2 x thermostats
Fieldbus Controller	2											Peltier cooling device 70 W, 1 x climate controller
	0											-
	2											Programmable fieldbus controller to connect several I/O modules

ADDITIONAL INTERFACES	I/O MODULES	
Up to seven I/O modules can be connected to the fieldbus coupler / controller in any arrangement	2 channels RTD: PT100, PT1000	2 SO counter channels
	8 digital input channels: 2wire SE 24V input	4 analog output channels: 4-20mA SE output
	4 analog input channels: 4-20mA SE sink	2 analog input channels: 4-20mA differential input
	2 relay channels: NO+NC	4 analog input channels: ±10V SE input

INTERNAL PLANT COMMUNICATION	
Protocol	IP Ethernet, skytron® energy specific communication
Connection	Multimode 50/125 µm, e.g. HITRONIC® HQN outdoor cable with SC connector 4G50/125 multimode up to 4 km / 2.5 miles Single mode 9/125 µm, e.g. HITRONIC® HQN outdoor cable with SC connector 4E9/125 single mode up to 20 km / 12.5 miles

MECHANICAL DATA	CABINET	BATTERY CABINET
Protection Class	IP 66 / Nema 4,4x	
UL listing / Marks	CE / cETLus	
Standards	EN 60950-1, EN 61000-6, UL 62368-1:2014 Ed.2, CSA C22.2 62368-1:2014 Ed.2	
Dimensions h x w x d	865 x 675 x 300 mm / 34.1 x 26.6 x 11.8 in (865 x 679 x 300 mm / 31.5 x 26.7 x 11.8 in with mounting brackets)	535 x 455 x 230 mm / 21.1 x 17.9 x 9.1 in 535 x 495 x 230 mm / 21.1 x 19.5 x 9.1 in
Weight	32 kg / 70.554 lb; 35 kg / 77.16 lb with package	11 kg / 24.25 lb without batteries
Material of Cabinet	UV-resistant, glass-reinforced polyester	UV-resistant, glass-reinforced polyester

AMBIENT CONDITIONS	
Operating Temperature	-20 °C to +50 °C / -4 °F to +122 °F
Operating Temperature with Peltier Cooling Device	-20 °C to +60 °C / -4 °F to +140 °F
Storage Temperature	-20 °C to +70 °C / -4 °F to +158 °F
Relative Air Humidity	up to 95 % non-condensing