



SM3300 - Interface modules

Models	Description
INT MOD M/S	Master/Slave interface SM3300
INT MOD SIM	Simulation interface
INT MOD CON	Isolated contacts interface
INT MOD SER	Multi-protocol serial interface
INT MOD DIG	Digital I/O interface
INT MOD ANA	Isolated analog interface

General Features

- Plug and Play for the SM3300 series power supplies
- Multiple interfaces possible per power supply
- Isolated from the output voltage
Working voltage 1000V
- Floating with respect to earth

Features INT MOD M/S

Master Slave interface

- Easy control of series or parallel operation.
- Multiple power supplies behave as one power supply.
- Mixed series and parallel is also possible

Features INT MOD SIM

Simulation interface

- High accuracy simulation
- Simulation of photovoltaic, leadless sense compensation, internal resistance and foldback current
- Custom programmable table, for simulation of complex I-V curves
- Configurable by web and GUI

Features INT MOD CON

Isolated contacts

- 4 relays with make-and-break contacts
- Additional (floating) Interlock with 24V enable system
- Programmable via Ethernet

Features INT MOD SER

Serial controller interface

- Multi protocol RS232, RS485, RS422, USB
- Web based configuration
- Speeds up to 115.2 kbps

Features INT MOD DIG

Digital (user) I/O

- 8 inputs Logic high = 2.5 ... 30V, Logic low = 0V
- 8 Open Drain outputs 0 - 30V, max. 200mA
- Programmable via Ethernet or sequences

Features INT MOD ANA

Analog controller interface

- High accuracy, low drift
- 16 bit AD and DA conversion
- Compatible with other Delta Elektronika 15p analog interfaces
- Factory calibrated for optimum accuracy

SM3300 Interfaces Combinations

Most of the interface types can be combined with others. There are some limitations:

	INT MOD M/S	INT MOD SIM	INT MOD CON	INT MOD SER	INT MOD DIG	INT MOD ANA
INT MOD M/S						
INT MOD SIM						
INT MOD CON						
INT MOD SER						
INT MOD DIG						
INT MOD ANA						



Combination allowed



Multiple interfaces of this type allowed



Combination not allowed

For the total amount per type and the allowed slots, please check the information on the corresponding interface page in this document, under "Assembly".

Master Slave Interface - INT MOD M/S

Typical Applications

- Applications where more current or voltage is required than one power supply can deliver
- Applications where a symmetrical power supply is needed



Specifications

	SM 18-220	SM 66-AR-110	SM 100-AR-75	SM 330-AR-22	SM 660-AR-11
Max. total voltage	1000 V	1000 V	1000 V	1330 V	1330 V
Max. devices in series	8	8	8	4	2
Max. devices in parallel	8	8	8	8	8
Max. devices in system	8				
Typical additional programming time	4 ms				
Programming cable	Modular connector cable 6P6C (1 cable supplied with each interface)				
Max. cable length	0.5 m				

Safety	EN 60950 / EN 61010
Operating Temperature	- 20 to + 50 °C
Humidity	max. 95% RH, non condensing, up to 40 °C max. 75% RH, non condensing, up to 50 °C
Storage temperature	- 40 to + 70 °C

Assembly	Pluggable, SM3300 interface slots 1, 2, 3 or slot 4. See paragraph 'Hardware Installation' in the operating manual. <i>Note 1: max 1pcs INT MOD M/S per unit.</i> <i>Note 2: cannot be combined with INT MOD SIM</i>
Weight	70 g

Simulation Interface - INT MOD SIM

Typical Applications

- Simulation of photovoltaic I-V curve
- Testing dynamic mppt efficiency with EN 50530 standard
- Compensation for the voltage drop in the load leads without sense wires
- Custom I-V curve simulation through custom table
- Simulation of internal resistance
- Simulation of foldback current limit



Specifications

Photovoltaic Simulation	
Required reference parameters	Open circuit voltage ($V_{oc,STC}$), Maximum power point voltage ($V_{mpp,STC}$), Short circuit current ($I_{sc,STC}$), Maximum power point current ($I_{mpp,STC}$), Temperature at STC (T_{STC}), Irradiance at STC (G_{STC}), Temperature coefficient for the current (T_{cISC}), Temperature coefficient for the voltage (T_{cVOC}).
Required panel parameters	Technology (cSi or Thin Film), Temperature of the photovoltaic panel (T_{PV}), Irradiance on the photovoltaic panel (G_{PV}).
Required parameters for dynamic efficiency test	Irradiance high level (G_{high}), Irradiance low level (Glow), Start-up time, Ramp-up time, Dwell-high time, Ramp-down time, Dwell-low time, Number of repetitions.
Programming accuracy	$\pm 0.2\%$

Internal Resistance	SM 18-220	SM 66-AR-110	SM 100-AR-75	SM 330-AR-22	SM 660-AR-11
Max. configurable R_i	13.5 m Ω	327 m Ω	115 m Ω	1.35 Ω	5.45 Ω
Response time					
R_i	13.5 m Ω	54.5 m Ω	115 m Ω	1.35 Ω	5.45 Ω
Output Voltage (load = 0W)	16.5 V	33 / 66 V	50 / 100 V	165 / 330 V	330 / 660 V
Output Current step	20-200 A	10-100 / 5-50 A	6.6-66 / 3.3-33 A	2-20 / 1-10 A	1-10 / 0.5-5 A
Rise time (10 - 90%)	3 ms	1.25 / 1.25 ms	2.25 / 2.25 ms	2.25 / 2.25 ms	2.5 / 2.25 ms
Fall time (90 - 10%)	3 ms	1.25 / 1.25 ms	2.25 / 2.25 ms	2.25 / 2.25 ms	2.5 / 2.25 ms

Leadless Sense	SM 18-220	SM 66-AR-110	SM 100-AR-75	SM 330-AR-22	SM 660-AR-11
Max. configurable R_i	13.5 m Ω	54.5 m Ω	115 m Ω	1.35 Ω	5.45 Ω
Response time					
R_i	13.5 m Ω	54.5 m Ω	115 m Ω	1.35 Ω	5.45 Ω
Output Voltage (load = 0W)	16.5 V	33 / 66 V	50 / 100 V	165 / 330 V	330 / 660 V
Output Current step	20-200 A	10-100 / 5-50 A	6.6-66 / 3.3-33 A	2-20 / 1-10 A	1-10 / 0.5-5 A
Rise time (10 - 90%)	5.5 ms	4 / 4 ms	4.25 / 4 ms	5 / 5.25 ms	5 / 4.5 ms
Fall time (90 - 10%)	5.5 ms	4 / 4 ms	4.25 / 4 ms	5 / 5.25 ms	5 / 4.5 ms

Foldback current	SM 18-220	SM 66-AR-110	SM 100-AR-75	SM 330-AR-22	SM 660-AR-11
Parameter range					
I_{fold}			0 - 101 %		
Fold time			0 - 100 s		

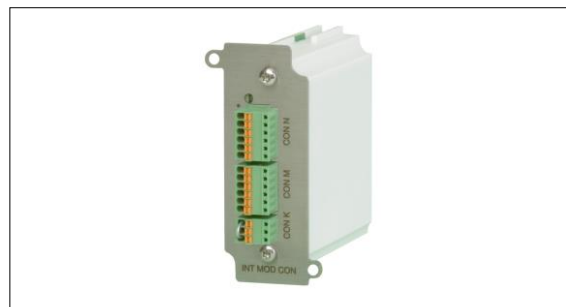
Safety	EN 60950 / EN 61010
Operating Temperature	- 20 to + 50 °C
Humidity	max. 95% RH, non condensing, up to 40 °C max. 75% RH, non condensing, up to 50 °C
Storage temperature	- 40 to + 70 °C

Assembly	Pluggable, SM3300 interface slots 2, 3 or slot 4. See paragraph 'Hardware Installation' in the operating manual. <i>Note 1: cannot be plugged in slot 1.</i> <i>Note 2: max 1pcs INT MOD SIM per unit.</i> <i>Note 3: cannot be combined with INT MOD M/S or INT MOD ANA.</i>
Weight	70 g

Isolated Contacts - INT MOD CON

Typical Applications

- Trigger an external safety alarm
- Interact in automated processes
- Switch the output On/Off with a remote 24Vdc signal
- Using a floating signal for triggering the Interlock function



Specifications

Relay contacts 1... 4	
Contact voltage	60 V
Contact current	2 A
Maximum switching capacity	60 W
Floating Interlock	
Open circuit voltage	5 V
Floating Enable	
Nominal input voltage	24 VDC
Input voltage range	15 - 30 VDC
Input impedance	12kOhm
Insulation	
prog. connectors - internal circuits	1000 VDC Reinforced isolation acc. EN60950-1 / EN61010-1
prog. connectors - earth	max. 60 VDC
Safety	EN 60950 / EN 61010
Operating Temperature	- 20 to + 50 °C
Humidity	max. 95% RH, non condensing, up to 40 °C max. 75% RH, non condensing, up to 50 °C
Storage temperature	- 40 to + 70 °C
Mounting	Pluggable, SM3300 interface slots 1, 2, 3 and slot 4. See paragraph 'Hardware Installation' in the operating manual. Maximum 4pcs per unit.
Programming connector	Relay 1 & 2, via a 6 pole push wire or so-called push in connector. Relay 3 & 4, via a 6 pole push wire / push in connector. Interlock and Enable via a 3 pole push wire / push in connector. For all 3 connectors there's a contra header supplied.
Weight	0.14 kg

Serial Interface (multi-protocol) - INT MOD SER

Typical Applications

- RS232 Programming
- Balanced RS422 Programming
- USB Programming
- Balanced RS485 Bi-directional Programming



Specifications

Communication speeds (bps)	2400, 4800, 9600, 19200, 38400, 57600, 115200
Insulation prog. connectors - internal circuits prog. connectors - earth	1000 VDC Reinforced isolation acc. EN60950-1 / EN61010-1 max. 60 VDC
Safety	EN 60950 / EN 61010
Operating Temperature	- 20 to + 50 °C
Humidity	max. 95% RH, non condensing, up to 40 °C max. 75% RH, non condensing, up to 50 °C
Storage temperature	- 40 to + 70 °C
Mounting	Pluggable, SM3300 interface slots 1, 2, 3 and slot 4. See paragraph 'Hardware Installation' in the operating manual. Maximum 4pcs per unit.
Programming connector	RS422 & RS485 wires via push wire or so-called push in connector (contra header supplied) RS232 via 9 pole D-connector (female), USB socket type B.
Weight	0.14 kg

Digital User I/O - INT MOD DIG

Typical Applications

- Hardware triggering of sequences
- Interaction with other equipment
- Stand-alone automation
- Safety or Alarm indications



Specifications

Logic inputs 1... 8 Input range Input impedance Load current +5V	2 - 30V Rin = 22kOhm 100mA
Logic outputs 1 ... 8 Output type Output impedance	Open Drain (True = 0V, False = open) 7 Ohm (max 30V/200mA)
Insulation prog. connectors - internal circuits prog. connectors - earth	1000 VDC Reinforced isolation acc. EN60950-1 / EN61010-1 max. 60 VDC
Safety	EN 60950 / EN 61010
Operating Temperature	- 20 to + 50 °C
Humidity	max. 95% RH, non condensing, up to 40 °C max. 75% RH, non condensing, up to 50 °C
Storage temperature	- 40 to + 70 °C
Mounting	Pluggable, SM3300 interface slots 1, 2, 3 and slot 4. See paragraph 'Hardware Installation' in the operating manual. Maximum 4pcs per unit.
Programming connector	User Outputs via 15 pole D-connector High Density (female), User Inputs via 15 pole D-connector High Density (female).
Weight	0.14 kg

Isolated Analog Controller Interface - INT MOD ANA

Typical Applications

- Analog programming of voltage and current
- Analog monitoring of voltage and current
- Remote monitoring of the status signals: OverTemp, Limit, PowerSink OverLoad
- Remote Shut down of the power output using a 5V signal



Specifications

Analog Programming		CV	CC
Programming inputs			
input range (Low)		0 - 5 V	0 - 5 V *
input range (High)		0 - 10 V	0 - 10 V *
accuracy		± 0.2%	± 0.2%
offset (in low range)		- 1 ... + 1 mV	- 1 ... + 1 mV
offset (in high range)		- 2 ... + 2 mV	- 2 ... + 2 mV
temp. coeff. offset		10 µV / °C	10 µV / °C
input impedance		10 MOhm	10 MOhm
			* CC-prog input (pin3) sets both CC+ and CC- with 1 signal.
Monitoring output			
output range (Low)		0 - 5 V	- 5 to + 5 V
output range (High)		0 - 10 V	- 10 to + 10 V
accuracy		± 0.2%	± 0.2%
offset (in low range)		- 1 ... + 1 mV	- 1 ... + 1 mV
offset (in high range)		- 2 ... + 2 mV	- 2 ... + 2 mV
temp. coeff. offset		3 µV / °C	60 µV / °C
output impedance		2 Ohm / max. 4 mA	2 Ohm / max. 4 mA
Reference voltage		5.114 ±15 mV (Ro = 2 Ohm, max. 4 mA)	
on prog. connector	V _{ref} TC	20 ppm	
+12 V output		12 V ± 0.2 V	
on prog. Connector	V _o I _{max} R _o	0.2 A	
		5 Ohm	
Status outputs			
CC - status		CC - operation	5 V = logic 1 (R° = 500 Ohm)
LIM - status		CV or CC limit	5 V = logic 1 (R° = 500 Ohm)
OT - status		Over Temperature	5 V = logic 1 (R° = 500 Ohm)
PSOL - status		Power Sink OverLoad	5 V = logic 1 (R° = 500 Ohm)
ACF - status		AC - Fail	5 V = logic 1 (R° = 500 Ohm)
DCF - status		DC - Fail ²⁾	5 V = logic 1 (R° = 500 Ohm)
			²⁾ V _{out} ±5% beyond set point
Remote Shutdown		with +5 V, 1 mA or relay contact	
Insulation		1000 VDC Reinforced isolation acc. EN60950-1 / EN61010-1	
prog. connectors - internal circuits		max. 60 VDC	
prog. connectors - earth			
Safety		EN 60950 / EN 61010	
Operating Temperature		- 20 to + 50 °C	
Humidity		max. 95% RH, non condensing, up to 40 °C	
		max. 75% RH, non condensing, up to 50 °C	
Storage temperature		- 40 to + 70 °C	
Mounting		Pluggable, SM3300 interface slots 2, 3 and slot 4. See paragraph 'Hardware Installation' in the operating manual.	
		Note1: cannot be plugged in slot1	
		Note2: Maximum 1pcs INT MOD ANA per unit.	
		Note3: cannot be combined with INT MOD SIM or INT MOD ANY	
Programming connector		15 pole D-connector (female)	
Weight		0.14 kg	