



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

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 + 85 °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 (G_{low}), 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				

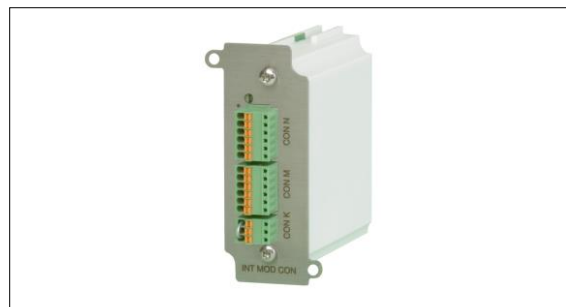
Safety	EN 60950 / EN 61010
Operating Temperature	- 20 to + 50 °C
Humidity	max. 95% RH, non condensing, up to 40 °C max. 75% RH, non condensing, up to 50 °C
Storage temperature	- 40 to + 85 °C

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 + 85 °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 + 85 °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 + 85 °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 accuracy offset temp. coeff. offset input impedance	0 - 5 / 0 - 10 V $\pm 0.2\%$ $-1 \dots +1 \text{ mV (on 5 V)}$ $10 \mu\text{V} / ^\circ\text{C}$ 10 MOhm	0 - 5 / 0 - 10 V * $\pm 0.2\%$ $-1 \dots +1 \text{ mV (on 5 V)}$ $10 \mu\text{V} / ^\circ\text{C}$ 10 MOhm <i>* CC-prog input (pin3) sets both CC+ and CC- with 1 signal.</i>
Monitoring output output range accuracy offset temp. coeff. offset output impedance	0 - 5 / 0 - 10 V $\pm 0.2\%$ $-1 \dots +1 \text{ mV (on 5 V)}$ $3 \mu\text{V} / ^\circ\text{C}$ 2 Ohm / max. 4 mA	$-5 \text{ to } +5 \text{ V} / -10 \text{ to } +10 \text{ V}$ $\pm 0.2\%$ $-1 \dots +1 \text{ mV (on 5 V)}$ $60 \mu\text{V} / ^\circ\text{C}$ 2 Ohm / max. 4 mA

Reference voltage on prog. connector V_{ref} TC	$5.114 \pm 15 \text{ mV}$ ($R_o = 2 \text{ Ohm}$, max. 4 mA) 20 ppm
+12 V output on prog. Connector V_o I_{max} R_o	$12 \text{ V} \pm 0.2 \text{ V}$ 0.2 A 5 Ohm
Status outputs CC - status LIM - status OT - status PSOL - status ACF - status DCF - status	CC - operation CV or CC limit Over Temperature Power Sink OverLoad AC - Fail DC - Fail ²⁾
	$5 \text{ V} = \text{logic 1}$ ($R^o = 500 \text{ Ohm}$) $5 \text{ V} = \text{logic 1}$ ($R^o = 500 \text{ Ohm}$) $5 \text{ V} = \text{logic 1}$ ($R^o = 500 \text{ Ohm}$) $5 \text{ V} = \text{logic 1}$ ($R^o = 500 \text{ Ohm}$) $5 \text{ V} = \text{logic 1}$ ($R^o = 500 \text{ Ohm}$) $5 \text{ V} = \text{logic 1}$ ($R^o = 500 \text{ Ohm}$) $5 \text{ V} = \text{logic 1}$ ($R^o = 500 \text{ Ohm}$) ²⁾ $V_{\text{out}} \pm 5\%$ beyond set point
Remote Shutdown	with +5 V, 1 mA or relay contact

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	$-20 \text{ to } +50 \text{ } ^\circ\text{C}$
Humidity	max. 95% RH, non condensing, up to $40 \text{ } ^\circ\text{C}$ max. 75% RH, non condensing, up to $50 \text{ } ^\circ\text{C}$
Storage temperature	$-40 \text{ to } +85 \text{ } ^\circ\text{C}$

Mounting	Pluggable, SM3300 interface slots 2, 3 and slot 4. See paragraph 'Hardware Installation' in the operating manual. <i>Note1: cannot be plugged in slot1</i> <i>Note2: Maximum 1pcs INT MOD ANA per unit.</i> <i>Note3: cannot be combined with INT MOD SIM</i>
Programming connector	15 pole D-connector (female)
Weight	0.14 kg