



## SM3300 - Interface modules

Models	Description
INT MOD M/S	Master/Slave interface
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 trough 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

### 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

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

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

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

## Simulation Interface

### 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

<b>Photovoltaic Simulation</b>	
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 ( $TC_{Isc}$ ), Temperature coefficient for the voltage ( $TC_{Voc}$ ).
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	$\pm 0.2\%$

<b>Internal Resistance</b>	<b>SM 18-220</b>	<b>SM 66-AR-110</b>	<b>SM 100-AR-75</b>	<b>SM 330-AR-22</b>	<b>SM 660-AR-11</b>
Max. configurable $R_i$	13.5 m $\Omega$	54.5 m $\Omega$	115 m $\Omega$	1.35 $\Omega$	5.45 $\Omega$
<b>Response time</b>					
$R_i$	13.5 m $\Omega$	54.5 m $\Omega$	115 m $\Omega$	1.35 $\Omega$	5.45 $\Omega$
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

<b>Leadless sense</b>	<b>SM 18-220</b>	<b>SM 66-AR-110</b>	<b>SM 100-AR-75</b>	<b>SM 330-AR-22</b>	<b>SM 660-AR-11</b>
Max. configurable $R_i$	13.5 m $\Omega$	54.5 m $\Omega$	115 m $\Omega$	1.35 $\Omega$	5.45 $\Omega$
<b>Response time</b>					
$R_i$	13.5 m $\Omega$	54.5 m $\Omega$	115 m $\Omega$	1.35 $\Omega$	5.45 $\Omega$
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

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

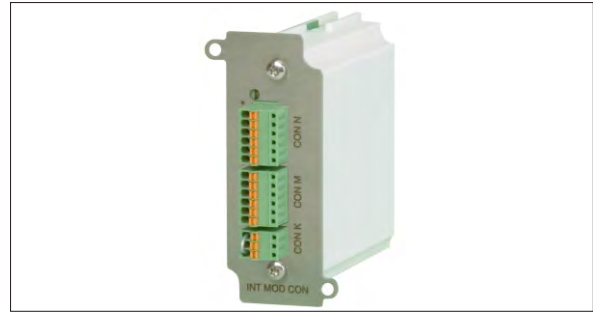
<b>Safety</b>	EN 60950 / EN 61010
<b>Operating Temperature</b>	- 20 to + 50 °C
<b>Humidity</b>	max. 95% RH, non condensing, up to 40 °C max. 75% RH, non condensing, up to 50 °C
<b>Storage temperature</b>	- 40 to + 85 °C

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

## Isolated Contacts

### 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

<b>Relay contacts 1... 4</b> Contact voltage Contact current Maximum switching capacity	60 V 2 A 60 W
<b>Floating Interlock</b> Open circuit voltage	5 V
<b>Floating Enable</b> Nominal input voltage Input voltage range Input impedance	24VDC 15 - 30VDC 12kOhm
<b>Insulation</b> prog. connectors - internal circuits prog. connectors - earth	1000 VDC Reinforced isolation acc. EN60950-1 / EN61010-1 max. 60VDC
<b>Safety</b>	EN 60950 / EN 61010
<b>Operating Temperature</b>	- 20 to + 50 °C
<b>Humidity</b>	max. 95% RH, non condensing, up to 40 °C max. 75% RH, non condensing, up to 50 °C
<b>Storage temperature</b>	- 40 to + 85 °C
<b>Mounting</b>	Pluggable, SM3300 interface slots 1, 2, 3 and 4. See paragraph 'Hardware Installation' in this manual. Maximum 4 per unit.
<b>Programming connector</b>	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.
<b>Weight</b>	0.14 kg

## Serial interface (multi-protocol)

### Typical Applications

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



### Specifications

<b>Communication speeds (bps)</b>	2400, 4800, 9600, 19200, 38400, 57600, 115200
<b>Insulation</b> prog. connectors - internal circuits prog. connectors - earth	1000 VDC Reinforced isolation acc. EN60950-1 / EN61010-1 max. 60VDC
<b>Safety</b>	EN 60950 / EN 61010
<b>Operating Temperature</b>	- 20 to + 50 °C
<b>Humidity</b>	max. 95% RH, non condensing, up to 40 °C max. 75% RH, non condensing, up to 50 °C
<b>Storage temperature</b>	- 40 to + 85 °C

<b>Mounting</b>	Pluggable, SM3300 interface slots 1, 2, 3 and 4. See paragraph 'Hardware Installation' in this manual. Maximum 4 per unit.
<b>Programming connector</b>	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.
<b>Weight</b>	0.14 kg

## Digital User I/O

### Typical Applications

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



### Specifications

<b>Logic inputs 1... 8</b> Input range Input impedance Load current +5V	2 - 30V Rin = 22kOhm 100mA
<b>Logic outputs 1 ... 8</b> Output type Output impedance	Open Drain (True = 0V, False = open) 7 Ohm (max 30V/200mA)
<b>Insulation</b> prog. connectors - internal circuits prog. connectors - earth	1000 VDC Reinforced isolation acc. EN60950-1 / EN61010-1 max. 60VDC
<b>Safety</b>	EN 60950 / EN 61010
<b>Operating Temperature</b>	- 20 to + 50 °C
<b>Humidity</b>	max. 95% RH, non condensing, up to 40 °C max. 75% RH, non condensing, up to 50 °C
<b>Storage temperature</b>	- 40 to + 85 °C
<b>Mounting</b>	Pluggable, SM3300 interface slots 1, 2, 3 and 4. See paragraph 'Hardware Installation' in this manual. Maximum 4 per unit.
<b>Programming connector</b>	User Outputs via 15 pole D-connector High Density (female), User Inputs via 15 pole D-connector High Density (female).
<b>Weight</b>	0.14 kg

## Isolated Analog Controller interface

### 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
<b>Programming inputs</b>			
input range		0 - 5 V / 0 - 10 V	0 - 5 V / 0 - 10 V
accuracy		± 0.2%	± 0.2%
offset		- 1 ... +1 mV (on 5V)	- 1 ... + 1 mV (on 5V)
temp. coeff. offset		10 µV / °C	10 µV / °C
input impedance		10 MOhm	10 MOhm
<b>Monitoring output</b>			
output range		0 - 5 V / 0 - 10 V	- 5 V to + 5 V / - 10 to + 10 V
accuracy		± 0.2%	± 0.2%
offset		- 1... 1 mV (on 5V)	- 1... 1 mV (on 5V)
temp. coeff. offset		3 µV / °C	60 µV / °C
output impedance		2 Ohm / max. 4 mA	2 Ohm / max. 4 mA
<b>Reference voltage</b>		5.114 V ± 15 mV (Ro = 2 Ohm, max. 4 mA)	
on prog. connector	V <sub>ref</sub> TC	20 ppm	
<b>+12 V output</b>		12 V ± 0.2 V	
on prog. Connector	V <sub>o</sub> I <sub>max</sub> R <sub>o</sub>	0.2 A 5 Ohm	
<b>Status outputs</b>			
CC - status	CC - operation	5 V = logic 1 (R <sub>o</sub> = 500 Ohm)	
LIM- status	CV or CC limit	5 V = logic 1 (R <sub>o</sub> = 500 Ohm)	
OT - status	Over Temperature	5 V = logic 1 (R <sub>o</sub> = 500 Ohm)	
PSOL - status	Power Sink Overload	5 V = logic 1 (R <sub>o</sub> = 500 Ohm)	
ACF - status	AC - Fail	5 V = logic 1 (R <sub>o</sub> = 500 Ohm)	
DCF - status	DC - Fail <sup>2)</sup>	5 V = logic 1 (R <sub>o</sub> = 500 Ohm)	<sup>2)</sup> output voltage ± 5% beyond set point
<b>Remote ShutDown</b>		with + 5V, 1 mA or relay contact	
<b>Insulation</b>		1000 VDC Reinforced isolation acc. EN60950-1 / EN61010-1	
prog. connector - internal circuits		max. 60VDC	
prog. connector - earth			
<b>Safety</b>		EN 60950 / EN 61010	
<b>Operating Temperature</b>		- 20 to + 50 °C	
<b>Humidity</b>		max. 95% RH, non condensing, up to 40 °C max. 75% RH, non condensing, up to 50 °C	
<b>Storage temperature</b>		- 40 to + 85 °C	
<b>Mounting</b>		Pluggable, SM3300 interface slots 2, 3, 4. See paragraph 'Hardware Installation' in this manual. Note1: cannot be plugged in slot1 Note2: max 1pcs MOD INT ANA per unit.	
<b>Programming connector</b>		15 pole D-connector (female)	
<b>Weight</b>		0.14 kg	