



## SM15K - Interface modules

Models	Description
INT MOD M/S-2	Master/Slave interface SM15K
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 SM15K series power supplies
- Multiple interfaces possible per power supply
- Isolated from the output voltage  
Working voltage 1000V or 1500V depending on type of unit
- Floating with respect to earth

### Features INT MOD M/S-2

#### Master Slave interface SM15K

- Easy control of series or parallel operation.
- Multiple power supplies behave as one power supply.
- Large systems, up to 900kW

### 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 SM15K

- 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-2

### 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

	SM70-CP-450	SM210-CP-150	SM500-CP-90	SM1500-CP-30
<b>M/S Parallel operation</b>				
Max. devices	maximum 60 units			
Recovery time	3x the values of a single unit		2x the values of a single unit	
Ripple + noise	Values of a single unit			
Programming Speed	Values of a single unit			
Typical additional programming time	20 $\mu$ s			
Programming cable	Modular connector cable S/FTP CAT6 8P8C			
Max. cable length	2m			

	SM70-CP-450	SM210-CP-150	SM500-CP-90	SM1500-CP-30
<b>M/S Series operation</b>				
Max. voltage	Not possible		750V* 1000V**	Not possible
Max. devices			maximum 6 units	
			<i>*) units delivered before Q4 / 2018</i> <i>**) units delivered Q4 / 2018 or newer</i> <i>Contact factory for upgrading to enable</i> <i>1000V series operation for older units.</i>	
Typical additional programming time	n.a.		20 $\mu$ s	n.a.
Programming cable	n.a.		Modular connector cable S/FTP CAT6 8P8C	n.a.
Max. cable length	n.a.		2m	n.a.

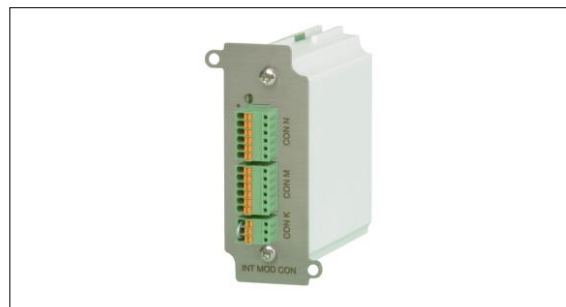
<b>Safety</b>	EN 60950 / EN 61010
<b>Operating Temperature</b>	- 20 to + 50 °C
<b>Humidity</b>	max. 95% RH, non condensing, up to 40 °C max. 75% RH, non condensing, up to 50 °C
<b>Storage temperature</b>	- 40 to + 85 °C

<b>Assembly</b>	Pluggable, SM15K interface slot 3 or slot 4. See paragraph 'Hardware Installation' in the operating manual. Note 1: max 1pcs INT MOD M/S-2 per unit.
<b>Weight</b>	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

<b>Relay contacts 1... 4</b>	
Contact voltage	60 V
Contact current	2 A
Maximum switching capacity	60 W
<b>Floating Interlock</b>	
Open circuit voltage	5 V
<b>Floating Enable</b>	
Nominal input voltage	24 VDC
Input voltage range	15 - 30 VDC
Input impedance	12kOhm

<b>Insulation</b>	
prog.connectors - internal circuits	1000 VDC Reinforced isolation acc. EN60950-1 / EN61010-1 with the exception of 1500 VDC for SM1500-CP-30
prog.connectors - earth	max. 60 VDC
<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, SM15K interface slots 1, 2, 3 and slot 4. See paragraph 'Hardware Installation' in the operating manual. Maximum 4pcs 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) - INT MOD SER

### Typical Applications

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



### Specifications

<b>Communication speeds</b> (bps)	2400, 4800, 9600, 19200, 38400, 57600, 115200
<b>Insulation</b> prog.connectors - internal circuits	1000 VDC Reinforced isolation acc. EN60950-1 / EN61010-1 with the exception of 1500 VDC for SM1500-CP-30
prog.connectors - earth	max. 60 VDC
<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, SM15K interface slots 1, 2, 3 and slot 4. See paragraph 'Hardware Installation' in the operating manual. Maximum 4pcs 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 - INT MOD DIG

### 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 $R_{in} = 22k\Omega$ 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	1000 VDC Reinforced isolation acc. EN60950-1 / EN61010-1 with the exception of 1500 VDC for SM1500-CP-30
prog.connectors - earth	max. 60 VDC
<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, SM15K interface slots 1, 2, 3 and slot 4. See paragraph 'Hardware Installation' in the operating manual. Maximum 4pcs 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 - 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
- Remote Shut down of the power output using a 5V signal



### Specifications

Analog Programming	CV	CC
<b>Programming inputs</b>		
input range	0 - 5 / 0 - 10 V	0 - 5 / 0 - 10 V *
accuracy	± 0.2%	± 0.2%
offset	- 1 ... + 1 mV (on 5 V)	- 1 ... + 1 mV (on 5 V)
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.
<b>Monitoring output</b>		
output range	0 - 5 / 0 - 10 V	- 5 to + 5 V / - 10 to + 10 V
accuracy	± 0.2%	± 0.2%
offset	- 1 ... + 1 mV (on 5 V)	- 1 ... + 1 mV (on 5 V)
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> on prog. connector	$V_{ref}$ TC	5.114 ±15 mV ( $R_o = 2 \text{ Ohm}$ , max. 4 mA) 20 ppm
<b>+12 V output</b> on prog. Connector	$V_o$ $I_{max}$ $R_o$	12 V ± 0.2 V 0.2 A 5 Ohm
<b>Status outputs</b>		
CC - status	CC - operation	5 V = logic 1 ( $R^o = 500 \text{ Ohm}$ )
LIM - status	CV or CC limit	5 V = logic 1 ( $R^o = 500 \text{ Ohm}$ )
OT - status	Over Temperature	5 V = logic 1 ( $R^o = 500 \text{ Ohm}$ )
ACF - status	AC - Fail	5 V = logic 1 ( $R^o = 500 \text{ Ohm}$ )
DCF - status	DC - Fail <sup>2)</sup>	5 V = logic 1 ( $R^o = 500 \text{ Ohm}$ ) <sup>2)</sup> $V_{out} \pm 5\%$ beyond set point
PSOL - status		Although present on the interface, for SM15K the PSOL-status is not used, it is only for SM3300.
<b>Remote Shutdown</b>		with +5 V, 1 mA or relay contact

<b>Insulation</b> prog.connectors - internal circuits	1000 VDC Reinforced isolation acc. EN60950-1 / EN61010-1 with the exception of 1500 VDC for SM1500-CP-30
prog.connectors - earth	max. 60 VDC
<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, SM15K interface slots 1, 2, 3 and slot 4. See paragraph 'Hardware Installation' in the operating manual. Maximum 1pcs INT MOD ANA per unit.
<b>Programming connector</b>	15 pole D-connector (female)
<b>Weight</b>	0.14 kg