



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
INT MOD SIM-2	Simulation interface SM15K

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 300kW

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

Features INT MOD SIM-2

Simulation Interface SM15K

- Under development.

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

	SM 500-CP-90	SM 1500-CP-30
M/S Parallel Operation		
Max. devices	maximum 20 units	maximum 20 units
Recovery time	2x the values of a single unit	
Ripple + noise	Values of a single unit	
Programming speed	2x the values of a single unit	
Typical additional programming time	20 µs	
Programming Cable	Modular connector cable 6P6C (1 cable supplied with each interface)	
Max. cable length	2m	

	SM 500-CP-90	SM 1500-CP-30
M/S Series Operation		
Max. voltage	750V*	Not possible
	1000V**	
Max. devices	maximum 6 units	
	<i>*) units delivered before quarter Q4 / 2018</i>	
	<i>**) units delivered Q4 / 2018 or newer</i>	
	<i>Contact factory for upgrading to enable 1000V series operation for older units.</i>	
Typical additional programming time	20 μs	
Programming Cable	Modular connector cable 6P6C (1 cable supplied with each interface)	
Max. cable length	2m	

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, SM15K interface slot 3 or slot 4. See paragraph 'Hardware Installation' in this manual. Note 1: max 1pcs INT MOD M/S-2 per unit.
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 Contact current Maximum switching capacity	60 V 2 A 60 W
Floating Interlock Open circuit voltage	5 V
Floating Enable Nominal input voltage Input voltage range Input impedance	24VDC 15 - 30VDC 12kOhm

Insulation 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. 60VDC
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, SM15K interface slots 1, 2, 3 and 4. See paragraph 'Hardware Installation' in this manual. Maximum 4 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	1000 VDC Reinforced isolation acc. EN60950-1 / EN61010-1 with the exception of 1500 VDC for SM1500-CP-30
prog. connectors - earth	max. 60VDC
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, SM15K interface slots 1, 2, 3 and 4. See paragraph 'Hardware Installation' in this manual. Maximum 4 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 with the exception of 1500 VDC for SM1500-CP-30 max. 60VDC
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, SM15K interface slots 1, 2, 3 and 4. See paragraph 'Hardware Installation' in this manual. Maximum 4 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

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
Programming inputs			
input range		0 - 5 V / 0 - 10 V	0 - 5 V / 0 - 10 V
accuracy		$\pm 0.2\%$	$\pm 0.2\%$
offset		- 1 ... +1 mV (on 5V)	- 1 ... +1 mV (on 5V)
temp. coeff. offset		10 $\mu\text{V} / ^\circ\text{C}$	10 $\mu\text{V} / ^\circ\text{C}$
input impedance		10 MOhm	10 MOhm
Monitoring output			
output range		0 - 5 V / 0 - 10 V	- 5 V to + 5 V / - 10 to + 10 V
accuracy		$\pm 0.2\%$	$\pm 0.2\%$
offset		- 1... 1 mV (on 5V)	- 1... 1 mV (on 5V)
temp. coeff. offset		3 $\mu\text{V} / ^\circ\text{C}$	60 $\mu\text{V} / ^\circ\text{C}$
output impedance		2 Ohm / max. 4 mA	2 Ohm / max. 4 mA
Reference voltage		5.114 V $\pm$ 15 mV (Ro = 2 Ohm, max. 4 mA)	
on prog. connector		20 ppm	
+12 V output		12 V $\pm$ 0.2 V	
on prog. Connector		0.2 A	
		5 Ohm	
Status outputs			
CC - status		CC - operation	5 V = logic 1 (Ro = 500 Ohm)
LIM - status		CV or CC limit	5 V = logic 1 (Ro = 500 Ohm)
OT - status		Over Temperature	5 V = logic 1 (Ro = 500 Ohm)
ACF - status		AC - Fail	5 V = logic 1 (Ro = 500 Ohm)
DCF - status		DC - Fail ²⁾	5 V = logic 1 (Ro = 500 Ohm) ²⁾ output voltage $\pm$ 5% beyond set point
Remote ShutDown		with + 5V, 1 mA or relay contact	
Insulation		1000 VDC Reinforced isolation acc. EN60950-1 / EN61010-1	
prog. connector - internal circuits		with the exception of 1500 VDC for SM1500-CP-30	
prog. connector - earth		max. 60VDC	
Safety		EN 60950 / EN 61010	
Operating Temperature		- 20 to + 50 $^\circ\text{C}$	
Humidity		max. 95% RH, non condensing, up to 40 $^\circ\text{C}$ max. 75% RH, non condensing, up to 50 $^\circ\text{C}$	
Storage temperature		- 40 to + 85 $^\circ\text{C}$	
Mounting		Pluggable, SM15K interface slots 1, 2, 3 and 4. See paragraph 'Hardware Installation' in this manual. Note: max 1pcs MOD INT ANA per unit.	
Programming connector		15 pole D-connector (female)	
Weight		0.14 kg	