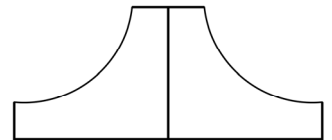




## SM15K - Series 15kW DC POWER SUPPLIES

### Bi-Directional - Constant Power

Models	Voltage range	Current range
SM 70-CP-450	0 - 70 V	-450 - 450 A
SM 210-CP-150	0 - 210 V	-150 - 150 A
SM 500-CP-90	0 - 500 V	-90 - 90 A
SM 1500-CP-30	0 - 1500 V	-30 - 30 A



#### Features

- Bi-Directional power supply, standard 15kW Source & Sink
- Flexible output with constant power characteristic
- Power Regeneration Technology: sink power is not dissipated but fed back into the grid
- Designed for long life at continuous full power
- Excellent dynamic response to load changes, digital controlled with the possibility to adapt to the type of load
- Very low heat dissipation, efficiency 95% or more
- Protected against all overload and short circuit conditions

#### Functionalities

- Operation on a wide range of three phase AC input voltages
- Standard Ethernet & Web interface
- EMC surpasses CE requirements: low emission & high immunity
- Low audible noise: temperature controlled cooling fans
- Durable digital encoders for voltage & current adjustment and menu operation
- Large user display, menu driven operations

		SM70-CP-450	SM210-CP-150	SM500-CP-90	SM1500-CP-30
<b>DC Power terminals</b>					
voltage		0 - 70 V	0 - 210 V	0 - 500 V	0 - 1500 V
current		- 450 - 450 A	- 150 - 150 A	- 90 - 90 A	- 30 - 30 A
<b>AC Input</b>					
3 phase, 48 - 62 Hz				342 - 528 V	
rated voltage range				380 - 480 V	
rated frequency				50 / 60 Hz	
rated current				maximum 27 A	
current (400 V / 3 ph, 15kW)				23 A	
power factor, 15kW, 7.5kW				0.996 / 0.988	
internal fuses				30 AT	
standby input power ( $V_o=I_o=0$ )				96 W	
standby input power ( $V_o=V_{max}$ )				180 W	
<b>Efficiency</b>					
Sink & Source mode:					
400 V AC, 3 ph input,				95 %	
15 kW, $I_{out}=100\%$				96 %	
15 kW, $U_{out}=100\%$					
<b>Regulation</b>					
Load 0 - 100%	<b>CV</b>	6 mV	5 mV	4 mV	10 mV
Line 342 - 528 V AC	<b>CV</b>	< 1 mV	< 1 mV	< 1 mV	< 1 mV
(external voltage sense)					
Load 0 - 100%	<b>CC</b>	35 mA	12 mA	8 mA	2 mA
Line 342 - 528 V AC	<b>CC</b>	4 mA	3 mA	1 mA	1 mA
(internal voltage sense, after warm up)					
<b>Ripple + noise</b>					
Source mode:		33 V / 450 A	100 V / 150 A	167 V / 90 A	500 V / 30 A
rms (BW=300 kHz)	<b>CV</b>	10 mV	30 mV	10 mV	25 mV
p-p (BW=20 MHz)	<b>CV</b>	60 mV	125 mV	55 mV	150 mV
rms (BW=300 kHz)	<b>CC</b>	100 mA	t.b.d.	45 mA	12 mA
p-p (BW=20 MHz)	<b>CC</b>	-	-	200 mA	70 mA
Source mode:		70 V / 215 A	210 V / 71.5 A	500 V / 30 A	1500 V / 10 A
rms (BW=300 kHz)	<b>CV</b>	10 mV	20 mV	25mV	35mV
p-p (BW=20 MHz)	<b>CV</b>	60 mV	100 mV	115mV	250mV
rms (BW=300 kHz)	<b>CC</b>	100 mA	t.b.d.	45 mA	5 mA
p-p (BW=20 MHz)	<b>CC</b>	-	-	200 mA	25 mA
Sink mode:		33 V / 450 A	100 V / 150 A	167 V / 90 A	500 V / 30 A
rms (BW=300 kHz)	<b>CV</b>	8 mV	30 mV	7 mV	15 mV
p-p (BW=20 MHz)	<b>CV</b>	50 mV	125 mV	35 mV	130 mV
rms (BW=300 kHz)	<b>CC</b>	100 mA	t.b.d.	45 mA	10 mA
p-p (BW=20 MHz)	<b>CC</b>	-	-	200 mA	60 mA
Sink mode:		70 V / 215 A	210 V / 71.5 A	500 V / 30 A	1500 V / 10 A
rms (BW=300 kHz)	<b>CV</b>	8 mV	20 mV	10 mV	25 mV
p-p (BW=20 MHz)	<b>CV</b>	50 mV	100 mV	50 mV	200 mV
rms (BW=300 kHz)	<b>CC</b>	100 mA	t.b.d.	90 mA	3 mA
p-p (BW=20 MHz)	<b>CC</b>	-	-	320 mA	12 mA
<i>CC-ripple at full load</i>					
<b>Programming &amp; monitoring accuracy</b> (excluding INT MOD ANA)					
Voltage				± 0.08%	
Current				± 0.15%	
<b>Minimum Sink Voltage</b>					
@ Sink current:		1.2 V @ - 450 A	3.0 V @ - 150 A	5.5 V @ - 90 A	16.0 V @ - 30 A
		0.8 V @ - 215 A	1.5 V @ - 75 A	3.0 V @ - 30 A	7.0 V @ - 10 A
		0.8 V @ - 45 A	1.5 V @ - 15 A	1.0 V @ - 10 A	2.0 V @ - 3 A
<b>Temp. coeff., per °C</b>	<b>CV</b>			20.10 <sup>-6</sup>	
	<b>CC</b>			50.10 <sup>-6</sup>	
<b>Stability</b> <sup>1</sup>					
after 1 hr warm-up				50.10 <sup>-6</sup>	
during 8 hrs	<b>CV</b>			80.10 <sup>-6</sup>	
	<b>CC</b>				
$t_{amb} = 25 \pm 1 \text{ °C}$ , $V_{in} = 400 \text{ VAC}$ (internal voltage sensing for CC-stab.)					

Notes: 1. Measured at full load. 2. Signal latency depends on the interface used &amp; data traffic.

3. See "Safety instructions"

Programming speed <sup>2</sup> (resistive load)	SM70-CP-450	SM210-CP-150	SM500-CP-90	SM1500-CP-30
<b>Rise time (10 - 90%)</b> output voltage step time, (load = 15 kW) time, (load = 1500 W)	0 → 33 V 2.2 ms 1.5 ms	0 → 100 V 1.6 ms 1.3 ms	0 → 167 V 1.5 ms 1 ms	0 → 500 V 1.5 ms 1 ms
output voltage step time, (load = 15 kW) time, (load = 1500 W)	0 → 70 V 5.5 ms 3.5 ms	0 → 210 V 3 ms 2.7 ms	0 → 500 V 4.5 ms 3.5 ms	0 → 1500 V 4.5 ms 3.5 ms
<b>Fall time (90 - 10%)</b> output voltage step time, (load = 15 kW) time, (load = 1500 W)	33 → 0 V 1.5 ms 1.5 ms	100 → 0 V 1.3 ms 1.3 ms	167 → 0 V 0.8 ms 0.9 ms	500 → 0 V 0.8 ms 0.9 ms
output voltage step time, (load = 15 kW) time, (load = 1500 W)	70 → 0 V 2.6 ms 3.5 ms	210 → 0 V 2.5 ms 2.5 ms	500 → 0 V 2.5 ms 3.5 ms	1500 → 0 V 2.8 ms 3.5 ms
<b>DC Output Capacitance</b> X-capacitors (typical) Y-capacitors (typical)	22000 µF 950 nF	1170 µF 950 nF	560 µF 145 nF	58 µF 145 nF

	SM70-CP-450	SM210-CP-150	SM500-CP-90	SM1500-CP-30
<b>Recovery time</b> output voltage recovery within di/dt of load step time, @ 50 - 100% load step max. deviation	33 V, 225 → 450 A 100 mV 5 A/µs 100 µs 0.8 V	100 V, 75 → 150 A 500 mV 2.4 A/µs 100 µs 1.4 V	167 V, 45 → 90 A 750 mV 0.8 A/µs 100 µs 2.8 V	500 V, 15 → 30 A 2.8 V 0.25 A/µs 100 µs 9.0 V
output voltage recovery within di/dt of load step time, @ 50 - 100% load step max. deviation	70 V, 112 → 215 A 100 mV 2 A/µs 100 µs 0.3 V	210V, 36 → 72 A 250 mV 1.15 A/µs 100 µs 0.75 V	500 V, 15 → 30 A 500 mV 0.25 A/µs 150 µs 1.2 V	1500 V, 5 → 10 A 1.2 V 0.085 A/µs 150 µs 3.5 V
<b>Pulsating load</b> max. tolerable AC component of load current f > 1 kHz f < 1 kHz	60 Arms 450 Apeak	15 Arms 150 Apeak	15 Arms 90 Apeak	5 Arms 30 Apeak

<b>Insulation</b> AC power terminals / DC pwr terminals creepage / clearance AC power terminals / case DC power terminals / case	3750 Vrms (1 min.) 8 mm 2500 Vrms 1000 V DC <sup>3</sup>	3750 Vrms (1 min.) 8 mm 2500 Vrms 1500 V DC <sup>3</sup>
<b>Safety</b>	EN 60950 / EN 61010	
<b>EMC</b> Generic Emission Generic Immunity	EN 61000-6-3, residential, light industrial environment (EN 55022 B) EN 61000-6-2, industrial environment	
<b>Operating Temperature at full load</b>	- 20 to + 50 °C derate output to 75% at 60 °C	
<b>Humidity</b>	maximum 95% RH, non condensing, up to 40 °C maximum 75% RH, non condensing, up to 50 °C	
<b>Storage temperature</b>	- 40 to + 85 °C	
<b>Thermal protection</b>	output shuts down in case of insufficient cooling	
<b>MTBF</b>	500 000 hrs	

	SM70-CP-450	SM210-CP-150	SM500-CP-90	SM1500-CP-30
<b>Hold-Up time</b> (@ 400 VAC input) V <sub>out</sub> = 100%, P <sub>out</sub> = 15 kW I <sub>out</sub> = 100%, P <sub>out</sub> = 15 kW V <sub>out</sub> = 100%, P <sub>out</sub> = 7.5 kW	10 ms 10 ms 25 ms	10 ms 10 ms 20 ms	15 ms 15 ms 35 ms	15 ms 15 ms 35 ms
<b>Turn on delay</b> after mains switch on	2.5 s			
Inrush current	23 A			

Notes: 1. Measured at full load. 2. Signal latency depends on the interface used & data traffic.

3. See "Safety instructions"

	SM70-CP-450	SM210-CP-150	SM 500-CP-90	SM 1500-CP-30
<b>Series operation</b> max. total voltage	Not possible	Not possible	750V* 1000V**	Not possible
Master / Slave operation			maximum 6 units <sup>3</sup>  *) units delivered before Q4 / 2018 **) units delivered Q4 / 2018 or newer Contact factory for upgrading to enable 1000V series operation for older units.	
<b>Parallel operation</b> Master / Slave operation	maximum 6 units  contact factory for more units	t.b.d.	maximum 60 units	maximum 60 units
<b>Remote sensing</b> max. voltage drop per load lead	default 1 V, can be set to 10 V			
<b>Limits</b> Voltage adjust range Current adjust range Power adjust range Voltage OverLoad level Voltage Self-Protection level	0 - 101 % 0 - 101 % 0 - 101 % 102.5 % - unit will continue to operate (OL-indication in display) 105 % - output is automatically disabled (PROT-indication in display)			
<b>Potentiometers</b> front panel control with knobs resolution	15 bits			
<b>Meters</b> scale voltage scale current scale power accuracy read output	4 digit 0.00 - 70.00 V - 450.0 - 450.0 A - 15000 - 15000 W 0.2% + 2 digit	4 digit 0.0 - 210.0 V - 150.0 - 150.0 A - 15000 - 15000 W 0.2% + 2 digit	4 digit 0.0 - 500.0 V - 90.0 - 90.00 A - 15000 - 15000 W 0.2% + 2 digit	4 digit 0 - 1500 V - 30.00 - 30.00 A - 15000 - 15000 W 0.2% + 2 digit

<b>Mounting</b>	stacking of units allowed, air flow is from left to right			
<b>AC Terminals (CON A)</b>	screw terminals for wire 4 mm <sup>2</sup> , 3 phase + earth (no neutral)			
<b>DC Terminals (CON B1 &amp; B2)</b>	M12 bolts	M8 bolts		
<b>Programming connectors (LAN)</b>	standard with RJ45-connector for Ethernet at rear panel			
<b>Interlock (CON F)</b>	input for contact at rear panel			
<b>Cooling</b> audio noise level  air flow	low noise blower, fan speed adapts to temperature of internal system ca. 50 dBA at full load, 25 °C ambient temperature, 1 m distance ca. 65 dBA at full load, 50 °C ambient temperature, 1 m distance From left to right			
<b>Enclosure</b> degree of protection	IP20			
<b>Dimensions</b> front panel: h x w behind front panel: h x w x d	132 x 483 mm (19", 3 U) 128 x 448 x 591 mm (excluding feet) no extra depth is required with optional interfaces assembled			
<b>Weight</b>	27 kg			

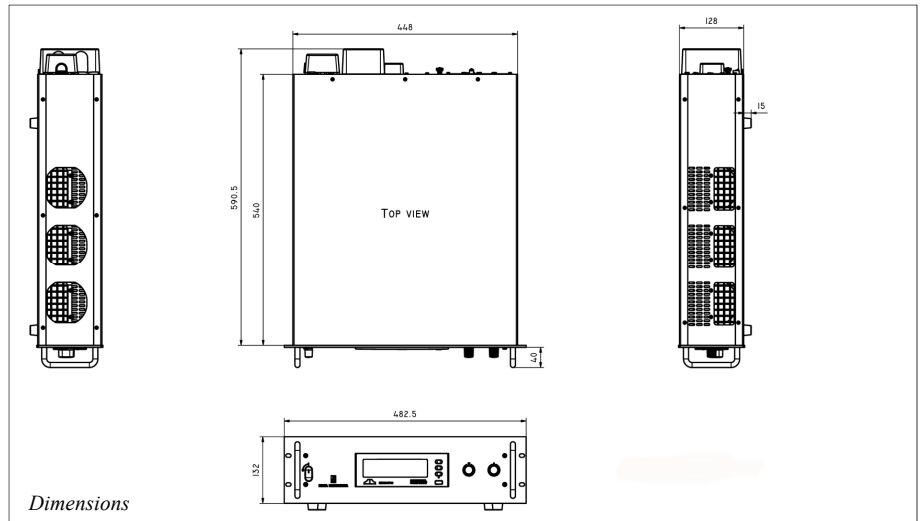
CV = Constant Voltage  
CC = Constant Current  
CP = Constant Power

Specifications measured at  
 $t_{amb} = 25 \pm 5 \text{ }^\circ\text{C}$  and  $V_{in} = 400 \text{ VAC}$ ,  
50 Hz unless otherwise noted.

The information in this document is  
subject to change without notice.

Notes:

1. Measured at full load.
2. Signal latency depends on the interface used and data traffic.
3. See safety Instructions in the operating manual.



## Typical Applications

- Solar inverter testing, PV-Simulation
- Car testing systems
- ATE in industrial production lines
- Plasma chambers
- Automotive battery simulations
- Controlled battery (dis)charging
- Lasers
- Sustainable energy
- Driving PWM-Controlled DC motors
- Accurate current sources
- Aerospace and military equipment

## Standard Features



### Bi-Directional Two-Quadrant Output

Full power Bi-Directional two quadrant operation maintains the DC output voltage constant whether the output power is positive or negative. Ideal for PWM-speed controlled DC-Motors and ATE systems.



### Digital CV-, CC- and CP-Settings

Reliable, long-life digital encoders are implemented at the front panel. Includes total front panel lock (also for CV- / CC-knobs) and a coarse or fine pitch adjustment depending on the turning speed.



### Sequencer

Arbitrary Waveform generator or standalone automation.



### High Voltage Isolation

A high DC output isolation allows floating operation up to 1000 V for SM70-CP-450, SM210-CP-150 and SM500-CP-90, and up to 1500 V for SM1500-CP-30.



### Ethernet Interface

Ethernet interface for programming and monitoring



### USB-Input

Not yet available: Front and rear panel USB-Input for exchange of settings and waveforms (Host / Type-A), or for controlling the unit (Device / Type-B).

## Options



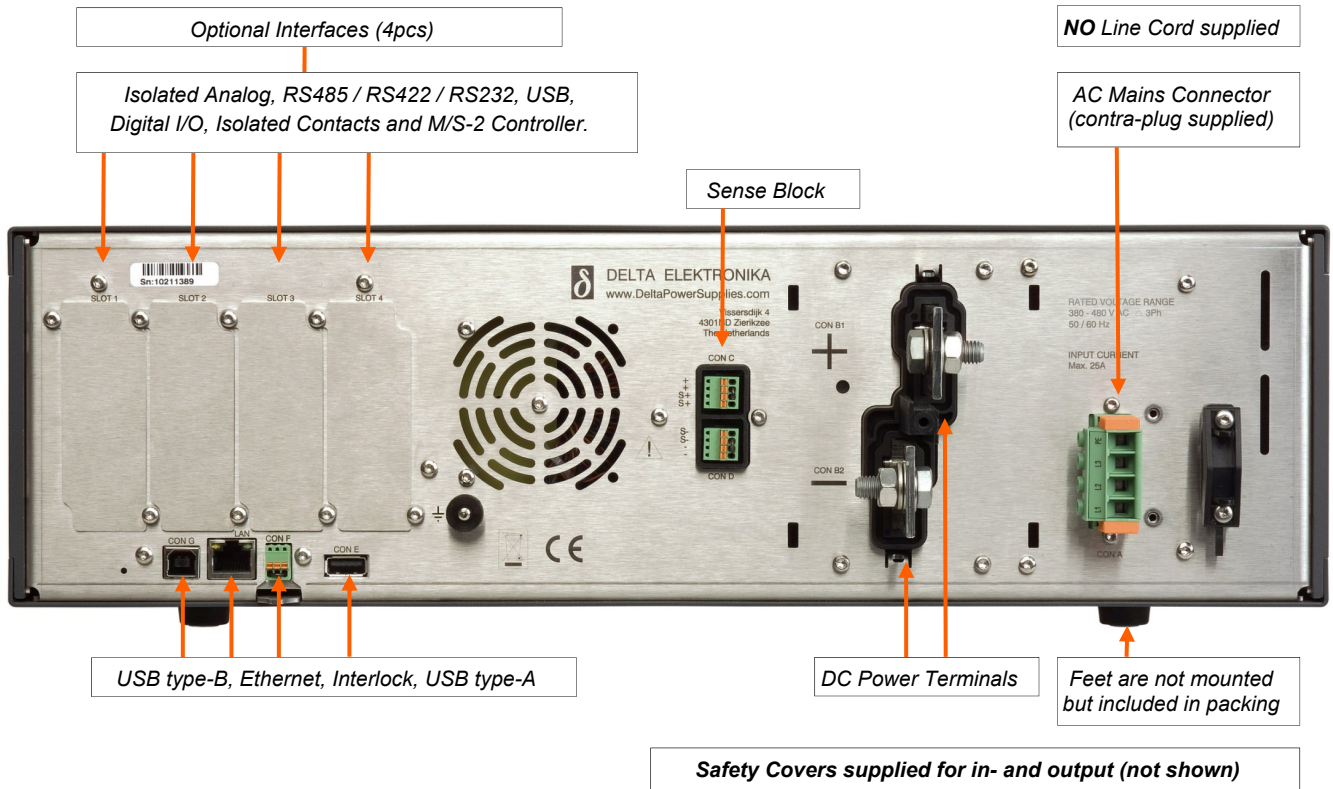
### Software control and Interfaces

Field installable interfaces:

- Master / Slave controller
- Isolated Contacts
- Serial controller with multiple protocols: RS 232, RS 485, RS 422 and USB (Device)
- Digital I/O
- Isolated Analog Programming

Order Codes :

- INT MOD M/S-2
- INT MOD CON
- INT MOD SER
- INT MOD DIG
- INT MOD ANA



# 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 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 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	SM500-CP-90	SM1500-CP-30
<b>M/S Parallel operation</b>			
Max. devices	maximum 6 units	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 µs		
Programming cable	Modular connector calbe S/FTP CAT6 8P8C		
Max. cable length	2m		

	SM70-CP-450	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            **) units delivered Q4 / 2018 or newer            Contact factory for upgrading to enable 1000V series operation for older units.</i>	
Typical additional programming time		20 µs	
Programming cable		Modular connector calbe S/FTP CAT6 8P8C	
Max. cable length		2m	

<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> progr.connectors - internal circuits	1000 VDC Reinforced isolation acc. EN60950-1 / EN61010-1 with the exception of 1500 VDC for SM1500-CP-30
progr.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 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> progr.connectors - internal circuits	1000 VDC Reinforced isolation acc. EN60950-1 / EN61010-1 with the exception of 1500 VDC for SM1500-CP-30
progr.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 (Ro = 2 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° = 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)
ACF - status	AC - Fail	5 V = logic 1 (R° = 500 Ohm)
DCF - status	DC - Fail <sup>2)</sup>	5 V = logic 1 (R° = 500 Ohm) <sup>2)</sup> V <sub>out</sub> ±5% beyond set point
PSOL - status		<i>Although present on the interface, for SM15K the PSOL-status is not used, it is only for SM3300.</i>
<b>Remote Shutdown</b>		with +5 V, 1 mA or relay contact

<b>Insulation</b> progr.connectors - internal circuits	1000 VDC Reinforced isolation acc. EN60950-1 / EN61010-1 with the exception of 1500 VDC for SM1500-CP-30
progr.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