

# MSR 2400W

*Multi purpose Power System for Telecom and Industrial Applications*



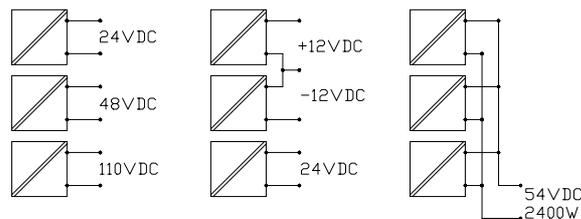
### 2400 W modular system

All voltages available 0...144VDC per module  
 U and I adjustable from 0 to max value  
 Hot-swap plug-in modules  
 Power supply or battery charging applications  
 Module and mains alarm for remote monitoring  
 Solid construction for heavy duty applications  
*Optional Shut Down and input over voltage disconnection*

### Flexible connections

Parallel n+1 connection, up to 90A  
 Series connection, up to 400VDC  
 Multi outputs, ± outputs

### Connection examples



19" SUB-RACK UNITS				
Type	Voltage versions	Modules per rack	Power	Mechanics (w x h x d)
MSR7110/48	24V, 36V, 48V	1...3 pcs	800W...2400W	19" (482mm) / 2U (88mm) / 360mm
MSR7110/96	72V, 96V	1...3 pcs	800W...2400W	19" (482mm) / 2U (88mm) / 360mm
8871100C	Covering plate set for empty module place			
70130753	IEC320 power cord 2.5m, rubber cable			

RECTIFIER MODULES							
Type	Input voltage *)	Nominal Output Voltage	Voltage Setting Range	Max Output Current	Current Limit Setting	Max Power	Mechanics (w x h x d)
ADC7180/24	55-264VAC/78-380VDC	24 VDC	0-36VDC	30 A	0-30A	800W	25TE / 2U / 230mm
ADC7180/36	55-264VAC/78-380VDC	36 VDC	0-54VDC	20 A	0-20A	800W	25TE / 2U / 230mm
ADC7180/48	55-264VAC/78-380VDC	48 VDC	0-72VDC	15 A	0-15A	800W	25TE / 2U / 230mm
ADC7180/72	55-264VAC/78-380VDC	72 VDC	0-108VDC	10 A	0-10A	800W	25TE / 2U / 230mm
ADC7180/96	55-264VAC/78-380VDC	96 VDC	0-144VDC	7.5A	0-7.5A	800W	25TE / 2U / 230mm

\*) Max power 600W at DC input  
 Reduced power 55...200VAC or 78...200VDC



# POWERNET

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**INPUT**

Input voltage	55...264 VAC 78...380 VDC / max 600W	55...200VAC reduced power, see module datasheet 78...200VDC reduced power, see module datasheet
Frequency		45...65Hz
Safety		According to EN60950, Class I
Input current		Max 4.5A per module
Inrush current	Soft start	max 7A 10ms peak, otherwise less than 4.5A
Isolation	Input / ground Input / outputs Output / ground	1500VAC 3750VAC 500VDC
Mains switch	Front panel with light	One per PSU
Mains input connector	Common input for each rectifier	IEC320 C14 male connector

**OUTPUT**

Voltage	Nominal voltages	0...144VDC / max 800W per module
Current	Nominal current per module	0...30A / max 800W per module
Short circuit protection	Rectifier modules	Short circuit protected, electronic current limit
MCBs on front panel	ADC7110/48 sub-rack ADC7110/96 sub-rack	3 x 30A MCB in negative output 3 x 10A MCB in negative output
Output connector	3 terminal groups on rear panel	3-pole 10mm <sup>2</sup> screw terminal for each rectifier (+ , - , PE)
Hot swap	Serial diode in each rectifier	Hot-swap allowed, Input and output switch at OFF position
Serial/parallel operations	All modules can be connected in series or in parallel	

**CONTROLS**

Input	On the front panel	Power switch with ON/OFF light
Output	On the front panel	MCB ON/OFF safety switch

**ALARMS**

Input failure	$U_{in\ nom} < \text{appr. } 150\text{VAC}$	Normally open and closed relay contacts
Output failure	Module failure or output switch off	Relay contact and MCB auxiliary relay
Alarm connector	Rear panel Pin configurations	Removable 12-pole 2.5mm <sup>2</sup> screw terminal
	1	Mains alarm COMMON
	2	Mains alarm NO
	3	Mains alarm NC
	4	Parallel output alarm COMMON
	5	Parallel output alarm NO *)
	6	Series output alarm PSU1 COMMON
	7	Series output alarm PSU1 NC *)
	8	Series output alarm PSU2 COMMON
	9	Series output alarm PSU2 NC *)
	10	Series output alarm PSU3 COMMON
	11	Series output alarm PSU3 NC *)
	12	Not in use

\*) Normally = Mains / PSU OK

**MECHANICAL**

Power Rack	19" sub-rack	Positions for 3 pcs of ADC7180 euro modules
Dimensions	Height	2U (88mm)
	Width	19" (482mm)
	Depth	360mm
Weight	Rack without rectifiers	5.5 kg
	Rectifier	1.35kg
Enclosure	Steel	IP20

**ENVIRONMENTAL**

Temperature range	Operating	-25°C...+50 °C (full power typically) +50°C...+70 °C (derating)
	Storage	-40°C...+85 °C
Cooling	Temperature controlled fan	Front panel, air flow front to rear
Grounding	M6 screw	On the rear panel

# Operating and connecting the sub-rack and modules

## *General*

MSR7110 sub-racks can be used to supply several output voltages from 0V up to 400VDC in series connection. Modules can be connected in parallel, series or to have multi output voltages from the same sub-rack. Units are hot swappable, but the sub-rack also have both input and output switch to make the change without power. 1...3 pcs of modules can be installed in the sub-rack. Empty module places are covered by the cover plate.

## *Mounting the sub-rack*

Sub-rack is installed in 19" cabinet and mounted by 4pcs of M6 screws from the front panel.

## *Mounting the plug-in module*

The plug-in module is installed by pushing it to the bottom of sub-rack as long as the connector in the rear panel have the contact with the mating connector in sub-rack. Mounting screws in modules front panel are fastened. Removing the module is made in opposite order.

## *Mains connection*

The mains is supplied by IEC320 C14 male connector. Use 1-phase power cords cross-section 3 x 0,75mm<sup>2</sup>. The minimum mains fuse is 16A. Make sure that both input and output are switched off in the front panel of sub-rack before connecting the mains. Turn the mains switch to up position. The switch light indicates that mains is connected. The unit is starting about 4 seconds. The unit's output led in front panel is lightning green.

## *Output connection*

Use minimum 4mm<sup>2</sup> output cable, 6mm<sup>2</sup> preferred. Connect cables to the screw terminal in the sub-rack's rear panel via the cable clamp. Output MCBs can be turned to the ON position after module's output led in front panel is green.

Outputs can be in stand-alone, parallel or series use.

### **1. Stand alone use**

Connect minimum 4mm<sup>2</sup> cables from modules + and - screw terminal to load.

### **2. Parallel use**

Connect each module to the load by minimum 4mm<sup>2</sup> cables. To ensure proper load sharing the length and cross section of each output cable need to be the same and the output adjustment at each module should be equal.

### **3. Serial use**

The serial connection is made by connecting the positive output of module 1 to the negative output of module 2 and connecting the load between the positive output of module 2 and negative output of module 1. Use minimum 4mm<sup>2</sup> cables.

## *Output voltage adjustment*

The factory setting for the output is the nominal voltage (for example 48VDC). Output of each module can be adjusted by turning **Uadj** trimmer. The adjustment is made by small screw driver. To make small and accurate voltage settings use **Uadj fine** adjustment trimmer.

## *Output current limit adjustment*

The factory setting for the current limit is the nominal output current . Output current limit (max current) can be adjusted from the **Iadj** trimmer.

## *Alarms*

Potential free change over relay contacts (NO, NC, COM) are included in system.

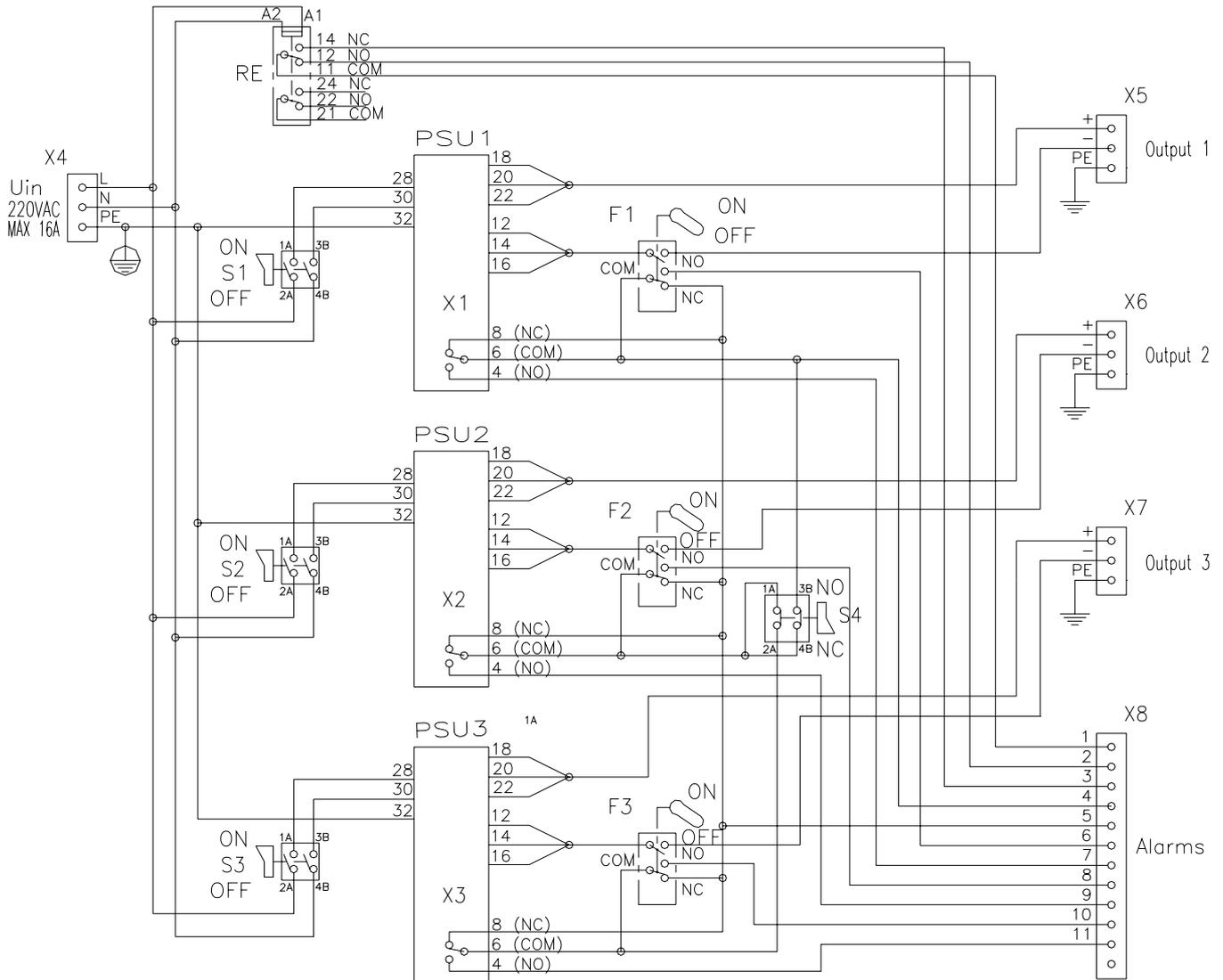
### **Input alarm**

Input alarm is indicated when mains reduce below 150V. Both normally open contact between pins 1-2 and normally closed contact between pins 1-3 are available.

## Module fail or output MCB fail

Each rectifier have module fail relay alarm NO and NC contact. Standard sub-rack includes NC contacts from each rectifier and parallel connected common alarm from whole system with NO contacts. Parallel connected NO contacts are in use when switch S4 is in NO position. Common alarm can be now connected between pins 4-5. If the switch S4 is in NC-position (serial alarm), output alarms of each PSU can be used individually from pins 6-7, 8-9 and 10-11 or to these individual alarms can be connected in series and the common NC output can be taken out between pins 6 – 11. The status normal means the normal operating condition for the power supply. The cross section of alarm cable can be 0,22 ... 0,75mm<sup>2</sup>.

## Electrical connections in the sub-rack



## Pin Configuration in rear panel

Lead through position for analog control cable

