

### Description :

RKP-CMU1 is a fully digitalized control / monitoring unit for the RCP-2000 power system. Equipped with USB, RS-232, and ethernet interface, it can be connected locally to PC to execute the control and monitoring tasks. With built-in 4 configurable relay contacts, users can flexibility monitor specific events or alarms and react suitable action accordingly.

### Features :

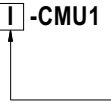
- 1U low profile/19-inch rack mounting
- Control and monitor up to 32 RCP-2000 units
- Front panel LCD and buttons for on-site service without PC
- USB-, RS-232 or Ethernet interface for PC connection locally or remote monitoring and control via GSM modem
- Alarm/event log with time and date
- Windows-based PC communication software
- Easy wire connections on rear side
- 4 user programmable relay outputs for traditional remote monitoring or warning
- 3 years warranty

### SELECTION GUIDE



Single unit: RKP-CMU1

Rack: RKP-1U  -CMU1



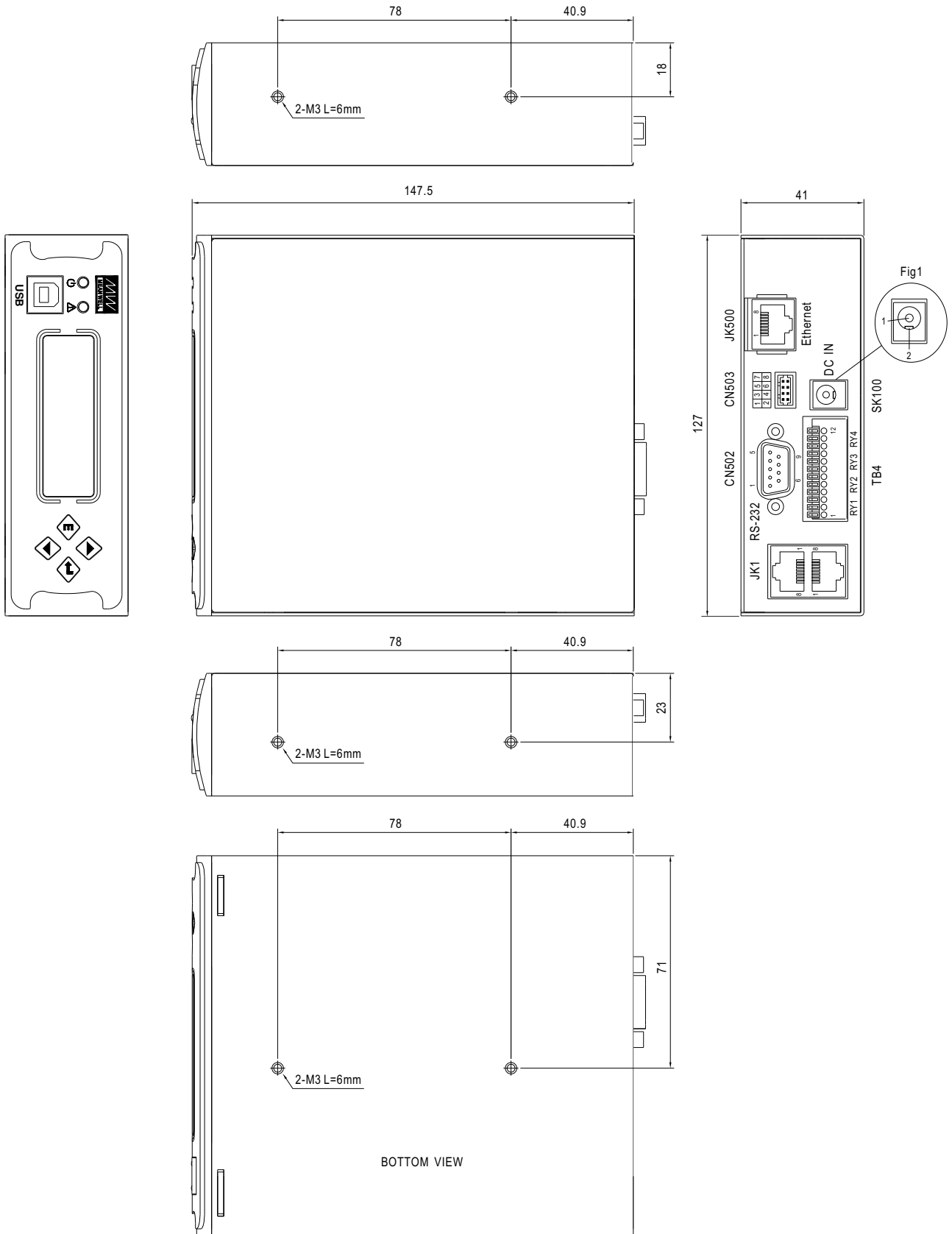
I: AC Inlet (IEC320-C20)  
T: Terminal block

### SPECIFICATION

MODEL		RKP-1U <input type="checkbox"/> -CMU1	RKP-CMU1
OUTPUT	DIGITAL METER	Display the DC output voltage, current, and internal temperature of each RCP-2000 unit	
	CONTROL OUTPUT	PM Bus signal for each RCP-2000 unit	
	LED INDICATOR	Green: Power on Red:Alarm	
	RELAY CONTACT	4 user programmable relay, relay contact rating(max.): 30V/1A resistive	
INPUT	VOLTAGE RANGE <small>Note.3</small>	12 ~ 15VDC	
	CURRENT	1A/12VDC 0.8A/15VDC	
	MONITORING INPUTS	PM Bus signal for each RCP-2000 unit	
FUNCTION	DISPLAY	LCD 16x2 Alphanumeric Matrix Display / PC Web Page Display	
	MONITOR	Output Voltage / Load Current / Temperature / Input Voltage	
	CONTROL	Output Voltage, Current Limit, ON/OFF	
	COMM. INTERFACE	USB, RS-232, Ethernet	
ENVIRONMENT	WORKING TEMP. <small>Note.1</small>	-25 ~ +70°C	
	WORKING HUMIDITY	20 ~ 90% RH non-condensing	
	STORAGE TEMP., HUMIDITY	-40 ~ +85°C, 10 ~ 95% RH	
	VIBRATION	10 ~ 500Hz, 2G 10min./1cycle, 60min. each along X, Y, Z axes	
SAFETY & EMC	SAFETY STANDARDS	UL60950-1, TUV EN60950-1 approved	Design refer to TUV EN60950-1
	WITHSTAND VOLTAGE <small>Note.2</small>	I/P-O/P:3KVAC I/P-FG:1.5KVAC O/P-FG:0.7KVDC	O/P-FG:0.7KVDC
	ISOLATION RESISTANCE <small>Note.2</small>	I/P-O/P, I/P-FG, O/P-FG:100M Ohms / 500VDC / 25°C / 70% RH	O/P-FG:100M Ohms / 500VDC / 25°C / 70% RH
	EMC EMISSION	Compliance to EN55022 (CISPR22) Conduction Class B, Radiation Class A; EN61000-3-2,-3	
	EMC IMMUNITY	Compliance to EN61000-4-2,3,4,5,6,8,11, EN61000-6-1(EN50082-2), light industry level, criteria A	
OTHERS	MTBF	110.5K hrs min. MIL-HDBK-217F (25°C)	
	DIMENSION	486.6*350.8*44mm (L*W*H)	147.5*127*41mm (L*W*H)
	PACKING	4.4Kg; 3pcs/14.2Kg/2.67CUFT	0.8Kg; 16pcs/13.8Kg/0.79CUFT
NOTE	1. LCD may freeze under -10°C. 2. SK100 and all of signal connectors (except CN502, CN503, and USB port) are considered as O/P. 3. Recommended use MEAN WELL power adaptor series: GS12, GS15, GS18, GE12, GE18.		

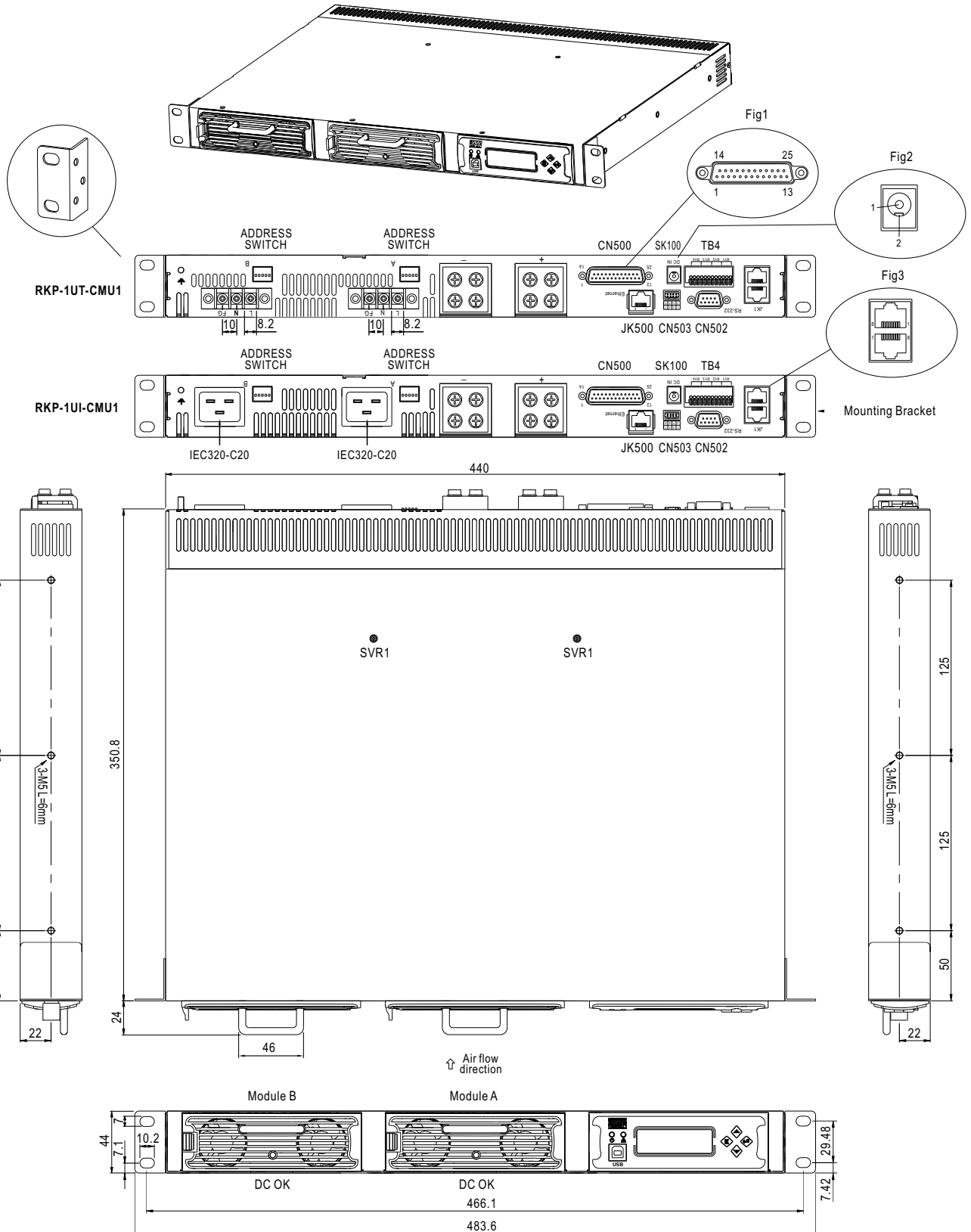
■ Mechanical Specification (Single Unit)

Case No. 959A Unit:mm



**Mechanical Specification (Rack System)**

Case No. 959D Unit:mm



### ■ CN500 Pin No. Assignment

Connector Pin No. Assignment(CN500) : D-Type Right Angle 25 positions

Pin No.	Assignment	Pin No.	Assignment	Pin No.	Assignment	Pin No.	Assignment
1	ON/OFF-A	6	FAN FAIL-A	11	T-ALARM-B	16~21	N.C.
2	AC-OK-A	7	ON/OFF-B	12	FAN FAIL-B	22	+S
3	DC-OK-A	8	AC-OK-B	13	+5V-AUX	23	-S
4	PV-A	9	DC-OK-B	14	+12V-AUX	24	+V
5	T-ALARM-A	10	PV-B	15	GND-AUX	25	-V

### ■ JK1 Pin No. Assignment

Connector Pin No. Assignment(JK1) : RJ45 8 positions

Pin No.	Assignment	Pin No.	Assignment	Pin No.	Assignment
1	DA	4	CONTROL	7	SCL
2	DB	5	NC	8	GND-AUX
3	-V	6	SDA		

### ■ CN502 Pin No. Assignment

Connector Pin No. Assignment(CN502) : D-type Male 9 positions

Pin No.	Assignment	Pin No.	Assignment
1,4,6,7,8,9	NC	3	TXD
2	RXD	5	GND-FG

### ■ CN503 Pin No. Assignment

Connector Pin No. Assignment(CN503) : HRS DF11-8DP-2DS or equivalent

Pin No.	Assignment	Pin No.	Assignment
1	D-IN1	5	D-IN3
2,4,6,8	GND-FG	7	D-IN4
3	D-IN2		

### ■ JK500 Pin No. Assignment

Connector Pin No. Assignment(JK500) : RJ45 8 position

Pin No.	Assignment	Pin No.	Assignment
1	TX+	4,5,7,8	NC
2	TX-	6	RX-
3	RX+		

### ■ TB4 Pin No. Assignment

Connector Pin No. Assignment(TB4) : DECA MX422-25412 or equivalent

Pin No.	Assignment	Pin No.	Assignment	Pin No.	Assignment	Pin No.	Assignment
1	Relay1-NO	4	Relay2-NO	7	Relay3-NO	10	Relay4-NO
2	Relay1-NC	5	Relay2-NC	8	Relay3-NC	11	Relay4-NC
3	Relay1-COM	6	Relay2-COM	9	Relay3-COM	12	Relay4-COM

### ■ SK100 Pin No. Assignment

Connector Pin No. Assignment(SK100): Schurter 4840.2201 or equivalent

Pin No.	Assignment	Pin No.	Assignment
1	+VIN	2	-VIN

### ■ CN500 IN/OUT Connector pins function description

Pin No.	Function	Description
1,7	ON/OFF	Each unit can separately turn the output on and off by electrical signal or dry contact between ON/OFF A,B(pin 1,7) and +5V-AUX(pin 13). Short: ON, Open:OFF. (Note.2)
2,8	AC-OK	Low : When the input voltage is $\geq 87V_{rms}$ . High : when the input voltage in $\leq 75V_{rms}$ . (Note.2)
3,9	DC-OK	High : When the Vout $\leq 80\pm 5\%$ . Low : When Vout $\geq 80\pm 5\%$ . (Note.2)
4,10	PV	Connection for output voltage trimming. The voltage can be trimmed within its defined range. (Note.1)
5,11	T-ALARM	High : When the internal temperature (TSW1 or TSW2 open) exceeds the limit of temperature alarm. Low : When the internal temperature (TSW1 or TSW2 short) under the limit temperature. (Note.2)
6,12	FAN FAIL	High : When the internal fan fail. Low : When the internal fan is normal. (Note.2)
13	+5V-AUX	Auxiliary voltage output, 4.5 ~ 5.5V, referenced to GND-AUX (pin 15). The maximum load current is 0.3A. This output has the built-in "Oring diodes" and is not controlled by the remote ON/OFF control.
14	+12V-AUX	Auxiliary voltage output, 10.8 ~ 13.2V, referenced to GND-AUX (pin 15). The maximum load current is 0.8A. This output has the built-in "Oring diodes" and is not controlled by the remote ON/OFF control.
15	GND-AUX	Auxiliary voltage output GND. The signal return is isolated from the output terminals (+V & -V).
16~21	N.C.	Not used.
22	+S	Positive sensing. The +S signal should be connected to the positive terminal of the load. The +S and -S leads should be twisted in pair to minimize noise pick-up effect. The maximum line drop compensation is 0.5V.
23	-S	Negative sensing. The -S signal should be connected to the negative terminal of the load. The -S and +S leads should be twisted in pair to minimize noise pick-up effect. The maximum line drop compensation is 0.5V.
24	+V	Positive output voltage. For local sense use only, can't be connected directly to the load.
25	-V	Negative output voltage. For local sense use only, can't be connected directly to the load.

### ■ JK1 IN/OUT Connector pins function description

Pin No.	Function	Description
1,2	DA,DB	Differential digital signal for parallel control. (Note.1)
3	-V	Negative output voltage. For parallel control, can't be connected directly to the load.
4	CONTROL	Remote ON/OFF control pin used in the PMBus interface. (Note.2)
5	NC	Not use.
6	SDA	Serial Data used in the PMBus interface. (Note.2)
7	SCL	Serial Clock used in the PMBus interface. (Note.2)
8	GND-AUX	Auxiliary voltage output GND. The signal return is isolated from the output terminals (+V & -V).

Note.1: Non-isolated signal, referenced to the output terminals (-V).

Note.2: Isolated signal, referenced to GND-AUX.

### ■ CN502 IN/OUT Connector pins function description

Pin No.	Function	Description
1,4,6,7,8,9	NC	Not used.
2	RXD	Receive data used in the RS-232 interface.
3	TXD	Transmit data used in the RS-232 interface.
4	GND-FG	RS-232 common GND. This signal connects to FG and isolated from -V and GND-AUX.

### ■ CN503 IN/OUT Connector pins function description

Pin No.	Function	Description
1,3,5,7	D-IN1 D-IN2 D-IN3 D-IN4	The isolated digital input signal and referenced to GND-FG. Open form GND-FG or +5V : Logic "1" input to RKP-CMU1 short to GND-FG or 0V : Logic "0" input to RKP-CMU1
2,4,6,8	GND-FG	Common GND for D-IN. This signal connects to FG and isolated from -V and GND-AUX.

### ■ JK500 IN/OUT Connector pins function description

Pin No.	Function	Description
1,2	TX+/TX-	Transmit data used in the Ethernet interface.
3,6	RX+/RX-	Receive data used in the Ethernet interface.
4,5,7,8	NC	Not used.

### ■ TB4 IN/OUT Connector pins function description

Pin No.	Function	Description
1,4,7,10	Relay-NO	Normal-open contact of programmable relay.
2,5,8,11	Relay-NC	Normal-close contact of programmable relay.
3,6,9,12	Relay-COM	Common for NO/NC contact.

Note: Relay contact rating (max.) : 30V/1A resistive.

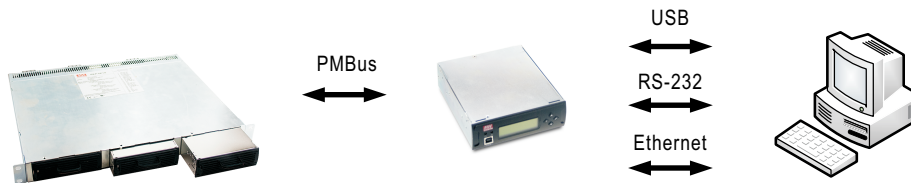
### ■ SK100 IN/OUT Connector pins function description

Pin No.	Function	Description
1	+VIN	Positive input voltage for RKP-CMU1.
2	-VIN	Negative input voltage for RKP-CMU1.

### ■ Function Manual

#### 1.Communication interface

RKP-CMU1 can control and monitor RCP-2000 parameter via PMBus communication, and PC can manage the whole system by using USB, RS232, or Ethernet to connect to RKP-CMU1.



#### 2.RCP-2000 Monitoring and control

RKP-CMU1 can monitor parameter of RCP-2000 such as output voltage, output current, internal temperature, status, serial number, and firmware version. It also can turn RCP-2000 on/off together or separately by using "ON/OFF" pin in CN500 or PMBus "CONTROL" pin in JK1 or PMBus "OPERATION" command, shows below. By using PMBus, output voltage and over load protection of RCP-2000 are adjustable.

RKP-1U ON/OFF pin	PMBus CONTROL pin	PMBus OPERATION command	RCP-2000 Output status
Connect to +5V-AUX	Open	80h (ON)	ON
Connect to +5V-AUX	Connect to +5V-AUX	80h (ON)	ON
Open	Open	80h (ON)	OFF
Open	Connect to +5V-AUX	80h (ON)	ON
Don't care	Don't care	00h (OFF)	OFF

#### 3.Real time clock, Data Log and Event Log

RKP-CMU1 has a build-in real time clock data to display actual date/time and for log time stamp. The data logger is designed to store operating data when the systems works. It has 1000 recodes and the interval of log is programmable from 1 to 60 minutes. The event log store system condition when alarm occur and remove. There are 600 records in event log.

#### 4.Programmable relay

There are 4 relays and each relay has normal open, normal close and common contact in terminal block. Their active conditions are programmable for flexible application, like charger and generator control, shows below.

Function	Sub-function	PSU	Parameter
Alarm	1.Any alarm 2.OVP 3.OLP 4.Short circuit 5.OTP 6.High Temperature 7.AC fail 8.Fan lock 9.PMBus error	N/A	N/A

Function	Sub-function	PSU	Parameter
PSU ON	1.Immediately	PSU0~ 31	0 sec.
	2.Delay		1 ~ 600 sec.
PSU OFF	1.Immediately	PSU0~ 31	0 sec.
	2.Delay		1 ~ 600 sec.
Digital input	D-IN1 ~ D-IN4	N/A	N/A

### 5.PMBus communication interface

RKP-CMU1 integrates PMBus into RCP-2000 control. The supported PMBus commands are shown below.

Command Code	Command Name	Transaction Type	# of data Bytes	Description
01h	OPERATION	R/W Byte	1	Remote ON/OFF control
02h	ON_OFF_CONFIG	Read Byte	1	ON/OFF function configuration
19h	CAPABILITY	Read Byte	1	Capabilities of a PMBus device
20h	VOUT_MODE	R Byte	1	Define data format for output voltage (format: Linear, N= -9)
21h	VOUT_COMMAND	R Word	2	Output voltage setting value (format: Linear, N= -9)
22h	VOUT_TRIM	R/W Word	2	Output voltage trimming value (format: Linear, N= -9)
46h	IOUT_OC_FAULT_LIMIT	R/W Word	2	Output overcurrent setting value
47h	IOUT_OC_FAULT_RESPONSE	R Byte	1	Define protection and response when an output overcurrent fault occurred
79h	STATUS_WORD	R Word	2	Summary status reporting
7Ah	STATUS_VOUT	R Byte	1	Output voltage status reporting
7Bh	STATUS_IOUT	R Byte	1	Output current status reporting
7Ch	STATUS_INPUT	R Byte	1	AC inpit voltage status reporting
7Dh	STATUS_TEMPERATURE	R Byte	1	Temperature status reporting
80h	STATUS_MFR_SPECIFIC	R Byte	1	Manufacture specific status reporting
81h	STATUS_FANS_1_2	R Byte	1	Fan1 and 2 status reporting
88h	READ_VIN	R Word	2	AC input voltage reading value (format: Linear, N=-1)
8Bh	READ_VOUT	R Word	2	Output voltage reading value (format: Linear, N= -9)
8Ch	READ_IOUT	R Word	2	Output current reading value (format: Linear, N= -3)
8Dh	READ_TEMPERATURE_1	R Word	2	Temperature 1 reading value (format: Linear, N= -3)
90h	READ_FAN_SPEED_1	R Word	2	Fan speed 1 reading value (format: Linear, N= 4)
91h	READ_FAN_SPEED_2	R Word	2	Fan speed 2 reading value (format: Linear, N= 4)
98h	PMBUS_REVISION	R Byte	1	The compliant revision of the PMBus (default: 11h for Rev. 1.1)
99h	MFR_ID	Block Read	12	Manufacturer's name
9Ah	MFR_MODEL	Block Read	12	Manufacturer's model name
9Bh	MFR_REVISION	Block Read	6	Firmware revision
9Ch	MFR_LOCATION	Block R/W	3	Manufacturer's factory location
9Dh	MFR_DATE	Block R/W	6	Manufacture date. (format: YYMMDD)
9Eh	MFR_SERIAL	Block R/W	12	Product serial number