Product Description

CRD Series is a bus control intelligent two channel voltage regulator module with 0-10VDC or RS 485 bus control input voltage, and adopts Modbus RTU Communication Protocol. This module can real-time detect the supply voltage and load current, and then transfer the message to the host computer through the RS485 bus control. This product is stablized voltage control output, when the SCR or load anomaly happens, it can ouput alarm signal. Its load voltage is 240VAC and rated current is 40A.

- 0-10VDC or RS 485 bus control
- Modbus RTU Communication Protocol
- Dielectric Strength: 4000Vrms
- LED Indicator
- Real-time Current/Voltage Detection
- Stablized Voltage Output
- Anomoly Alert Function

Ordering Information

CRD	240	D	40	-C
CRD Series	Load Voltage 240:150~280VAC	Control Tpye D:0-10VDC/ RS 485(2 Connections)	Load Current 40:40A	Function C:Current Detection Function

Technical Specification

Input Circuit(Ta=25°C)		
Auxiliary Power Supply Voltage Range		15-32VDC
Auxiliary Power Supply Current		100mA max.@24VDC
Input Control	Analog	0-10VDC
	Bus	RS 485 (2 Connections)
Module Output Switching Port Level	High Level	15-32VDC
	Low Level	0-5VDC
Module Output Switching Port Current		5mA max.@24VDC
Alert Interface Rated Current		50mA max.

Output Circuit(Ta=25°C)	
Output power supply voltage range	150-280VAC
Load Current	40A(1)
Maximum Surge Current (@10ms)	400A
Maximum I^2t	800A^{2}S
Transient Overvoltage	600Vpk
Maximum Off-State Leakage Current (@240VAC)	5mA
Maximum On-State Voltage Drop (@40A)	1.6Vrms

(1)Note: The current detection range is 0-20A.

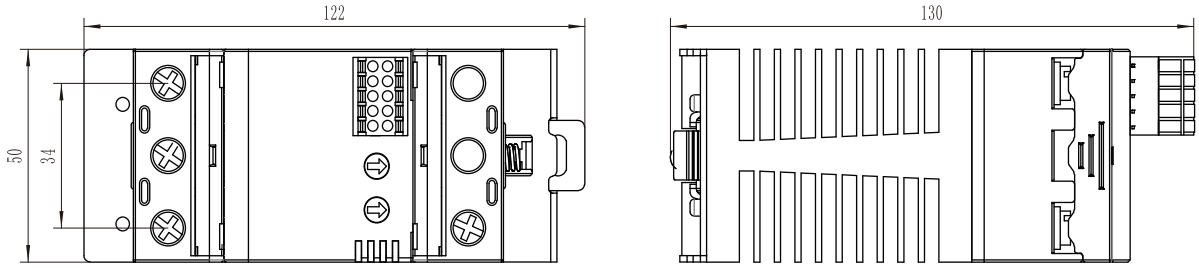
General Information(Ta=25℃)		
Slave Station Address Range		1 ~ 99
Max. Station Point		99
Data Bit Rate		9600，19200，38400，57600，115200
Communication Agreement		Modbus RTU
Dielectric Strength	Input/Output	4000Vrms
	Input, Output/Base	2500Vrms
Insulation Resistance (@500VDC)		1000MΩ
Ambient Operating Temperature Range		-30°C ~ +70°C
Ambient Storage Temperature Range		-30°C ~ +100°C
Weight (Typical)		700g

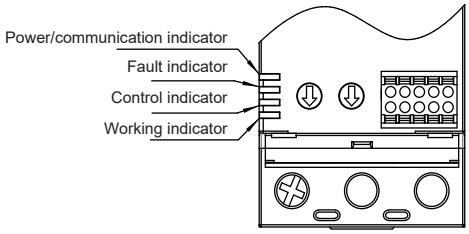
Application

Suitable for multi-channels temperature control applications, such as series welding machinery.

Outline Dimensions & LED Indication

Unit：mm





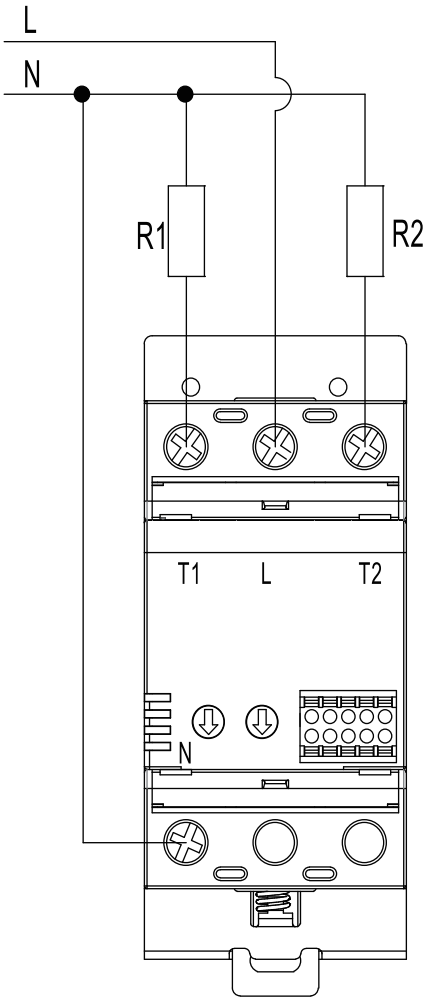
Power/communication indicator:
LED lights up when there is bias power, and will be brighter when the module is communicating.

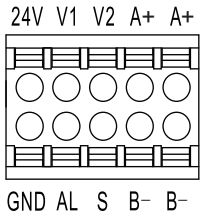
Fault indicator: LED lights up when anomaly happens.

Control indicator: light up when the product is turned on.

Working indicator: LED flashes every 1.5s when the module is operating normal.

Wiring Diagram





24V: connect the positive end of the 24VDC supply power to power the module.

GND: connect the negative end of the 24VDC supply power;

V1: connect the 0-10VDC analog to control the channel 1;

V2: connect the 0-10VDC analog to control the channel 2;

A+: connect the positive end of RS 485.

B- : connect the negative end of RS 485.

AL:module alert output port

S: Module output switching port

Interface function description
V1 control voltage range is 0-10VDC, so the corresponding T1 output voltage is 0-100%.
V2 control voltage range is 0-10VDC, so the corresponding T2 output voltage is 0-100%.

Alert output
When the module is operating normal, the alert output is on high resistance state to the floor. But when any channel of the module has following question, the alert output to the floor will turn on.

A) SCR channel through: no control signal, but there has current in the loop.
B) SCR disconnection: having control signal, but there has not current in the loop.
C) Load connection break.
D) No load supply power.

Module output switching port
Used to switch the output state of module:
When the port level switches from low voltage (voltage less than 5VDC) to high voltage (voltage greater than 15VDC), the module enters the welding state and outputs three welding voltages in sequence: welding voltage 1 (maintenance time 1), welding voltage 2 (maintenance time 2), welding voltage 3 (maintenance time 3), and then re-enters the standby state.

RS 485 A+ & B-
Used for 485 communication, write or read the corresponding control values.

Address set
Set the address encoder to the corresponding location. Each time the address is reset, the module needs power off and then restarts with 24VDC before switching new address. When the address is set 99, the communication parameter of module is fixed to 9600 8BIT parity check 1 stop bit.

Register Description

CRD has input and holding registers, their definition and address shown as below:

Address	Definition	Unit	Value Range	Whether to save when power is off
Input Register				
0	Alert register	-		No
1	Channel 1 current register	0.1A		No
2	Channel 2 current register	0.1A		No
3	Power half cycle time register	μs		
4	Load voltage register	V		No
5	Analog input V1 register	-	0-1000	No
6	Analog input V2 register	-	0-1000	No
Holding Register				
50	Channel 1 standby voltage register	-	0-1000	Yes
51	Channel 1 welding voltage 1 register	-	0-1000	Yes
52	Channel 1 welding voltage 2 register	-	0-1000	Yes
53	Channel 1 welding voltage 3 register	-	0-1000	Yes
54	Channel 2 standby voltage register	-	0-1000	Yes
55	Channel 2 standby voltage 1 register	-	0-1000	Yes
56	Channel 2 standby voltage 2 register	-	0-1000	Yes
57	Channel 2 standby voltage 3 register	-	0-1000	Yes
58	Welding maintenance time 1 register	ms	0-60000	Yes
59	Welding maintenance time 2 register	ms	0-60000	Yes
60	Welding maintenance time 3 register	ms	0-60000	Yes
61	Communication anomaly turn off register	s	0-100	Yes
62	Communication parameters setting register	-	-	Yes
63	Standby on/off control register	-	0-3	No
64	Soft start setting register	-	0-60	Yes
65	Load voltage setting register	-	220	Yes
66	Output switching register	-	0-1	No
68	Channel 1 over-current setting register	0.1A	0-200	Yes
69	Channel 2 over-current setting register	0.1A	0-200	Yes

Definition and instruction of input register:

1)Output alert register REG_ALARM（Address：0）
Data format: 16 bits unsigned integer
This is output alert register.When the module is operating normal, the register is 0 with corresponding location is 1. But when the module has following question, we judge the channel is abnormal with corresponding location is 1.
A)SCR channel through: no control signal, but there has current in the loop.
B)SCR disconnection: having control signal, but there has not current in the loop.
CC)Load connection break.

Definition of output alert register:

BIT7	BIT6	BIT5	BIT4	BIT3	BIT2	BIT1	BIT0
-	-	Over temperature	Channel 2 over current	Channel 1 over current	Channel 2 anomaly	Channel 1 anomaly	Load supply power anomaly

2)Current register REG_CURR_n（Address：1~2）
Data format: 16 bits unsigned integer
This register stores the current in the load loop, its unit is 0.1A.

Register Description

3) Power half cycle time register REG_CYCLE（Address：3）
Data format: 16 bits unsigned integer
This register stores the power half cycle time of load, its unit is μs.

4) Load voltage register （Address：4）
Data format: 16 bits unsigned integer
This register stores the power voltage of load, its unit is V.

5) Analog input register （Address：5~6）
This register shows the input analog value in real-time, the corresponding input voltage of 0-1000 is 0-10V.

Definition and instruction of holding register:

1)Standby voltage register（Address：50, 54）
Data format: 16 bits unsigned integer
This register used to set the output voltage during standby, its value range is 0-1000.

2)Welding voltage register（Address：51~53, 55~57）
Data format: 16 bits unsigned integer
This register used to set the output voltage during welding, its value range is 0-1000.

3)Welding time register（Address：58~60）
Data format: 16 bits unsigned integer
This register used to set the maintenance time for 3 welding phases,its unit is ms and the value range is 0-60000.

4)Communication anomaly turn off register REG_OFF（Address：61）
Data format: 16 bits unsigned integer
This register used to set the turn-off output time automatically when the communication is cut off, it unit is s . The value of the register range from 0 to 100, with o indicating that the function is turned off and the default value is 0. The rest valves indicate that the output will be turned off when the module doesn't receive the communication information with the local address within the time.
Example: when the register value is 8, then the output will be turned off if the module doesn't receive the communication information with the local address within 8s.

5)Communication parameters setting register REG_TX（Address：62）
Data format: 16 bits unsigned integer
This register used to set the communication parameters, the default value is 300, the value definition shown as below:

Register value	Baud rate	Data bit	Check bit	Stop bit
300	9600	8 Bit data bits	No check	2 stop bits
301	19200	8 Bit data bits	No check	2 stop bits
302	38400	8 Bit data bits	No check	2 stop bits
303	57600	8 Bit data bits	No check	2 stop bits
304	115200	8 Bit data bits	No check	2 stop bits
310	9600	8 Bit data bits	even parity check	1 stop bit
311	19200	8 Bit data bits	even parity check	1 stop bit
312	38400	8 Bit data bits	even parity check	1 stop bit
313	57600	8 Bit data bits	even parity check	1 stop bit
314	115200	8 Bit data bits	even parity check	1 stop bit
320	9600	8 Bit data bits	odd parity check	1 stop bit
321	19200	8 Bit data bits	odd parity check	1 stop bit
322	38400	8 Bit data bits	odd parity check	1 stop bit
323	57600	8 Bit data bits	odd parity check	1 stop bit
324	115200	8 Bit data bits	odd parity check	1 stop bit

Register Description

6)Standby on/off control register REG_ST_ON_OFF（Address：63）
Data format: 16 bits unsigned integer
This register used to control the corresponding on/off channel.

BIT7	BIT6	BIT5	BIT4	BIT3	BIT2	BIT1	BIT0
-	-	-	-	-	-	Channel 2	Channel 1

7)Soft start setting register（Address：64）
Data format: 16 bits unsigned integer
This register used to control the slope of soft start (standby control only), the value range is 0-60 and the default value is 0. When the value is 0, the soft start is turned off. When this value is n, the output control rises at a rate of 8/(n×50ms).

8)Load voltage setting register（Address：65）
Data format: 16 bits unsigned integer
This register default value is 220, when the load voltage is 220VAC, it is set to 220.

9)Output switching register（Address：66）
Data format: 16 bits unsigned integer
This register used to switch the output voltage. When the register value changes from 0 to 1, the module output switches from standby state to welding sate.

10)Over-current setting register（Address：68~69）
Data format: 16 bits unsigned integer
This register used to set the max. Value of the output current. When the load current is over this value, the product will output alarm signal and keep the alert in the corresponding position 1. Once the register is set to 0, the alert function will be closed.

Output Control Mode

Mode 1: Adopt analog port control

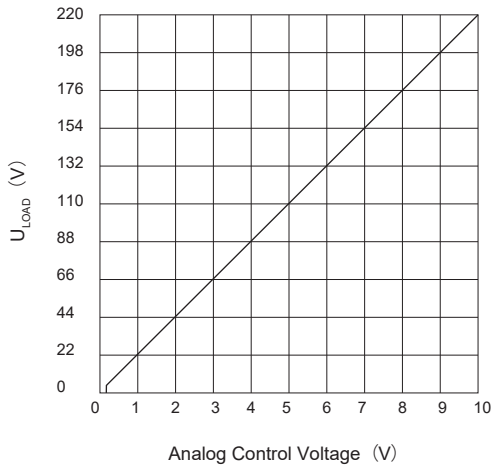
Apply the corresponding voltage value(0~10VDC) to the control terminal as required,then the module outputs corresponding voltage.

Mode 2: Adopt RS 485 control

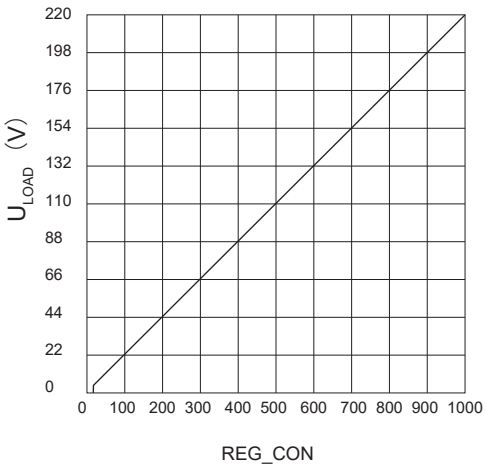
Sending the standby voltage, welding voltage 1,welding voltage 2, welding voltage 3, welding maintenance time 1, welding maintenance 2, welding maintenance 3 to the module through 485, and opening the corresponding channel (register address:63), let the module enter in standby state at the moment. When welding required, apply a rising edge to the module output switching port (from low voltage to high voltage), then the module enter the welding state: output welding voltage 1, welding voltage 2 and welding voltage 3 in turn, it will return to standby state automatically when welding finished.

Output/Proportional Control Features

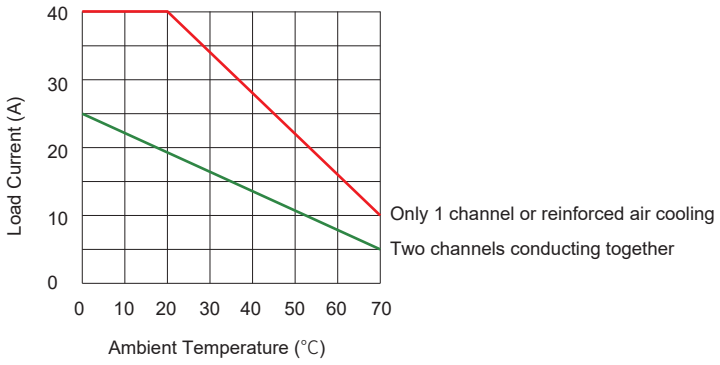
Analog Control



Bus Control



Thermal Derating Curve



General Notes

1..When connection wiring to SSR please ensure screws are torqued down properly.The recommended installation torque for the M4 terminal is (0.98~1.37) N·m.

2.When ambient temperature is above 25°C see thermal derating curve.

! Warnings

1. The product's side panels and heatsink may be hot, allow the product to cool before touching.
2. Disconnect all power before installing or working with this equipment.
3. Verify all connections and replace all covers before turning on power.