CR-PGMⅡ programmable control system

Please read the introduction below carefully before use and take care of this handbook.

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1 Description

PGM-II programmable center control system, a new generation control machine, provides accurate centralized control environment in high speed coupled with several programmable control ports by the adoption of cutting-edge centralized technology. Entirely-open program environment for user is to achieve many complicated control port programs.

PGM-II applies to ARM7 CPU, 8M memory, 2M Flash.

There are many internal programmable ports supporting terminal controlled devices for serial ports, IR ports, and digital IO ports. CR-NET control bus provides two expansion slots for high-speed digital IO of CREATOR terminal product to support expansion of function card.

It provides CR-NET control bus system port, high-speed data transmitting. It carries out cascade control for devices with CR-NET control port, forming network-controlled devices.

1.1 Functional Description

FEATURES	DETAILS
CPU	32-bit high-speed 110MHZ
Transmission speed	
Memory	8M SDRAM, 2M FLASH, 256K SRAM
CR-NET control bus	Max 300K/bps
IR port	8 channels isolated output
IO port	8 channels duplex isolated output
Serial port	8 channels duplex, supporting RS232, RS485
level	
PC control	1 channel RS232
Relay	8 channels light electricity control
Software	Programmer CSBuilder
	Debug serial port Manager
	IR code bank managing IR Manager

2 Front panel

PGM-II front panel provides the basic interface to some operations in common use.

2.1 Not comprising LCD front panel

CR-PGMⅡ

2.2 Comprising LCD front panel

CR-PGM-IR
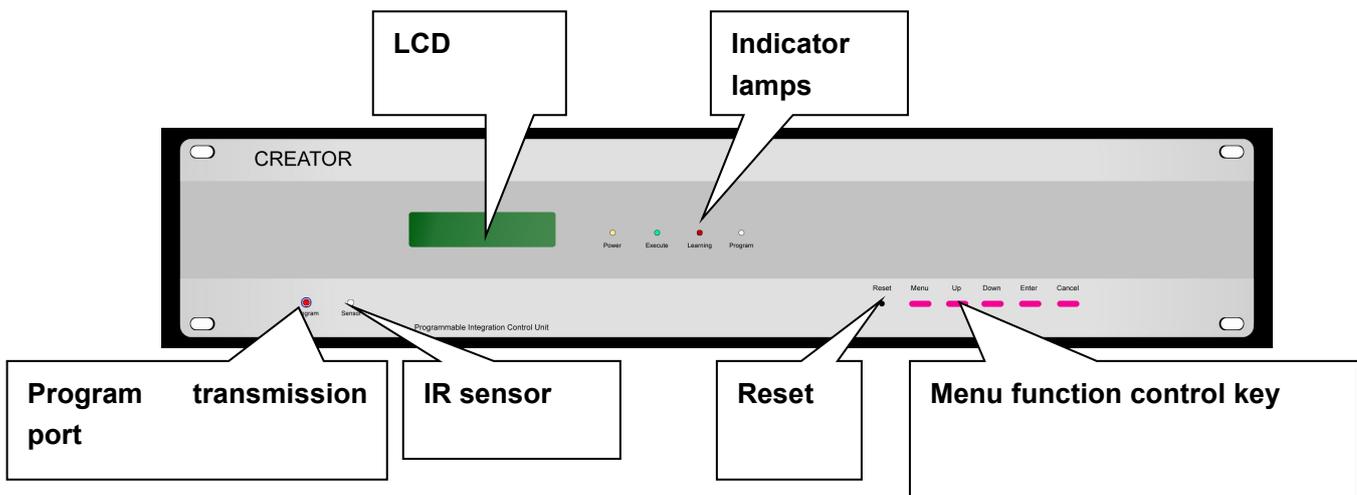
2.3 Function

2.3.1 PROGRAM

（**CR-PGMⅡ**，**CR-PGMⅡ-IR**）

Instead of offloading the machine from machine back, a program downloading port set in front panel can achieve program download through a special communication cable to PC serial port.

The sketch map below shows the connection way. (Panel transmission line fittings is ok):

2.3.2 IR SENSOR：

PGM-II provides IR study function to control different devices by IR with IR sensor receiving IR codes.

IR codes, which are compiled to PGM-II when programming, will be kept in IR code banks of PC as files.

CREATOR Inc provides IR code bank download for various electrical appliances.

2.3.3 Four indicator lamps

1 Power indicator: green.

It is lighting in waiting while blinking in working. The lighting situation indicates that host machine is power on; otherwise, it is power off.

2 Execute indicator: red

The lighting situation indicates that host machine is working. It is blinking as long as it carries out actions to see if it is in normal circumstances.

3 IR-Learning: red

In the period of studying, it is red if host is in logging codes. Otherwise, it blinks in 10 seconds, indicating the failure of IR learning. At that time, host that does not work should be reset. In the case that host is in logging, receiving IR codes, indicator lights. It is off as long as study finishes. Furthermore, red indicator lights in sending IR codes and it goes out after finishing. (Reference to operation guide of touch panel and front panel menu for details)

4 Program indicator: red

It lights when burning program.

2.3.4   RESET

Reset key is to reset devices with losing some running parameters but not user program when PGM-II host is out of itself.

3   Rear panel

3.1 System connection

Various ports in rear panel of PGM are to connect different control devices and audio/video signal sources.

Layout

COM (1-8)

There are 8 programmable isolated serial ports, receiving data of RS-232, RS232, RS-422 and RS-485, with the adoption of DB9 in duplex control in communication interface. Each port sends and receives codes separately with 200—115200-baud rate that can connect with 8 interface devices in RS232/485 communication protocol. At most 256 devices can be connected in each ports to control separately or synchronously with different baud rate and code, such as various RS232/485 communication devices: matrix, projector and P&T

COM1-8	Signal	Explanation
1	B （RXD/TXD+）	It is for 485 protocol with 1, 7. 422 is with A.
2	RXD Receiving Data	for 232 protocol
3	TXD Sending data	for 232 protocol
4	Y	for 485 protocol
5	GND logic	for 232 protocol
6	A （RXD/TXD-）	It is for 485 protocol with 1, 7. 422 is with B.
7	Z	for 485 protocol
8	CTS Asking for sending	
9	RTS Clear sending	

Programmable serial communication port is programmed by software to control devices with serial port communication.

3.2 Digital I/O

There are 8 I/Os control ports that are programmed by software in rear panel, supporting digital mode with receiving 0 or 5V level.

3.3 Relay output interface

There are internal light-current control ports of relay, supporting 0.3A/125V-AC, 0.3A/110V-DC, 1A/30-DC to control devices.

8 normally open relays, being able to connect peripheral devices laden current/voltage up to 0.3A/125VAC or 1A/30VDC, achieve laden process with the light current driving the heavy.

Laden types: Whether the appointed laden value of relays is suitable, when

laden devices are electric machines, lamps, solenoids or contactors.

Note: external power supply.

3.4 IR output interface

PGM-II provides 8 isolated IR control output interface to control 8 similar or different devices, outputting 8 channels IR control signals. It sends out convenient setting separately, studying IR remote codes of 38KHZ carrier waves with isolated programming. On the premise that the same launching port is able to control several different IR code devices with up to 999 IR function keys, it freely defines the port to control specific devices as well as defines the quantities of IR codes for each IR launching port.

Host machine IR launching ports adopts 8 channels programmable output interfaces, each of which can be controlled and output separately.

IR codes can be translated in PGM-II host without restudying by transferring irrelative devices when programming.

IR interface that is 3.5mm works with CREATOR IR launching sticks.

Therefore, the control of each device can be operated separately without interfering other devices even if controlling 8 similar devices for one time.

The following connection project is suggested to connect each IR launching sticks with the IR receiving port of corresponding controlled devices.

3.5 CR-NET bus

CR-NET control bus is suitable for terminal devices with CR-NET interface of CREATOR such as power controller, dimmer, wireless receiver, and volume controller.

Controlled devices can be cascade connected with CR-NET control bus, in which the largest cascade connection quantity is up to 256 irrelative devices to extend.

CR-NET control bus supports 300Kbps rate at the most.

3.6 485 Network interface

It connects control devices by 3 uniform 4-pin network interfaces with RS-485 network communication protocol. Peripheral devices such as power

controller, dimmer, hitch network wire easily with 6-core telephone lines and 8-core RJ45 network interface to connect peripheral such as telephone control module and volume card.

Each port with the same function in the form of network ID to control up to 256 devices pertinently by the ID mark when compiling control programs. CR-NET bus is not compatible with devices from other manufactories.

a)   Connect with several CREATOR (shortcut) CRPWR-8 controller to control heavy or light electricity such as power control, lamp switcher control, electrical devices control and P&T control.

b) Connect with several CREATOR (shortcut) CRLITE-4A dimmers.

c) Connect with several CREATOR (shortcut) CRRFA wireless receivers to receiving RF signal from user control platform, for instance, ST-6000C color wireless touch panel, TOUCH-MINI gray scale wireless touch panel.

d) Connect with CREATOR (shortcut) CR-VOL high fidelity volume control module to achieve volume control of video signal transacted by system.

e) Below is the connection mode of 4-core network pin (24, Y, Z, G should match)

Caution:

1. **Each peripheral device has the unique ID code, the only mark for system discriminating.**
2. **Pay more attention to prevent short circuit from burning in the case of parallel connection of 4 core network pins.**
3. **Reference to device guide for RS485 interfaces programming.**

3.7 Program transmission port.

Program interface is for communication between PC and PGM-II under exploitation.

Through this port, program can be downloaded, tested, IR learned by PC after programming control environment.

With PC serial port, DB9 female, which is used by engineers, carries out operation

CONNECTION BETWEEN COMPUTER AND PGM II HOST

3.8 Power

Power jack, 110-240VAC 50/60Hz, provides electricity for PCM-II.

PGM-II power system, with internal over loading security and filter, is to make devices more stable, preventing devices damage from error operations.

Expansion slot

Expansion slot:

PGM-II provides expansion slots for future PGM-II function upgrade.

With expansion slots, PGM-II can be expanded in the function or capability of network, communication, and memory by the way of inserting cards. In order to expand a certain function, users only have to make use of some correlative plug-ins.

- **Expansion Card:**

Network remote control CRNET (TCP/IP)
Wireless receiving card CRRF03
Expansion light electricity relay CRKJ8
Expansion digital I/O CRDIG8
Expansion volume card CRVOL2
Expansion AV4X1 matrix
Expansion remote tele-control CRTEL

4 Install/Setting

4.1 Configuration

4.1.1 Cabinet

PGM-II provides hanger to be installed in the standard 19-inch metal cabinet

4.1.2 Power

Support universal voltage with internal high performance filter.

4.1.3 PC connection

DB9 female
  (Sketch map)

4.2 Device connection

4.2.1 Program port

DB9 female joint is to connect serial ports exploiting PC.

PIN	DESCRIPTION
1	NC
2	RXD receiving data
3	TXD sending data
4	Empty NC
5	GND logic
6	Empty NC
7	Empty NC
8	Empty NC
9	Empty NC

Sketch map of connection

4.2.2 COM1-8

Programmable serial port (COM1-8)

Below is for DB9 male to connect controlled devices:

◆ RS-232 standard: It has been the most popular serial port in the application of PC and communication industry. It, adopting the unbalance transmission mode which is called single-terminal communication, is defines as a single standard to increase communication distance in low-rate serial communication.

◆ RS-422 standard: It defines a balance communication port to allow the connection of up to 10 receivers in a balance bus with 10Mb/s transmission rate and 4000 inches transmission distance. RS-422 is a single-direction, balanced transmission criterion of one-machine transmitting and multi-machine receiving.

◆ RS-485 standard: It increases multiple point and duplex communication ability to allow connection with many transmitters in one single bus. Furthermore, it enhances the driving ability and conflict protection characteristic of transmitted to extend range of common mode. Compared with RS-422, RS-485 is more advanced to connect 32 devices no matter by 4 wires or 2 wires.

Reference to "PGM-II program guide" for irrelative setting of programmable serial ports.

COM1-8 PIN	SIGNAL	DESCRIPTION
1	B	(RXD-) Inverting Received Data for RS-422
2	RXD	(RXD) Received Data for RS-232
3	TXD	(TXD) Transmitted Data for RS-232
4	Y	(TXD+) Noninverting Transmitted Data for RS-422
5	GND	(GND) Signal Common for RS-232 and RS-485
6	A （RXD/TXD-）	(RXD+) Noninverting Received Data for RS-422
7	NC	No Connection
8	NC	No Connection
9	Z	(TXD-) Inverting Transmitted Data for RS-422

4.2.3 IR output jack

Insert the pin of the special IR launching stick for CREATOR to one end of 5mm IR jack, put the other end to the IR sensor of controlled devices within 20 CM distance.

4.2.4 Programmable relay output jack

There are 8 packets, which supports two-wire light electricity control output port, for relay output jack with the connection by special pins.

4.2.5 I/O

8 channels digital port with the connection by special plug-ins.

5 Network Connection

5.1 CR-NET

Below is the explanation of CR-NET four-wire pin.
CR-NET, with the adoption of CREATOR bus as well as not compatible with other manufactories' peripheral, can be connected by the special PGM-II pins. Please see to correlative explanation to set suitable network ID.

5.2 485 NET

Below is the explanation of Port 485 with the adoption of RJ45 pin.
Connect Port 485 of PGM-II with special connecter of CREATOR and amend the other end of pin according to the explanation of controlled devices.

5.3   About expansion slot

Expansion slots put up function expansion by the way of inserting card. For example, CRNET (TCP/IP) Network card is to increase network communication function for PGM-II

PGM II FRONT PANEL

PGM II-IR FRONT PANEL

Installment ways:

1) **Close power of PGM-II**
2) **Offload the shelves of rear panel expansion slot in an empty expansion groove.**
3) **Insert an expansion card in the groove and screw the screw.**
4) **Connect expansion card and extend board by connection wire.**

5) **Short circuit slip stitch SOLT1 when the card is inserted to the upper expansion groove. To the bottom groove, slip stitch SOLT2 should be short circuit.**
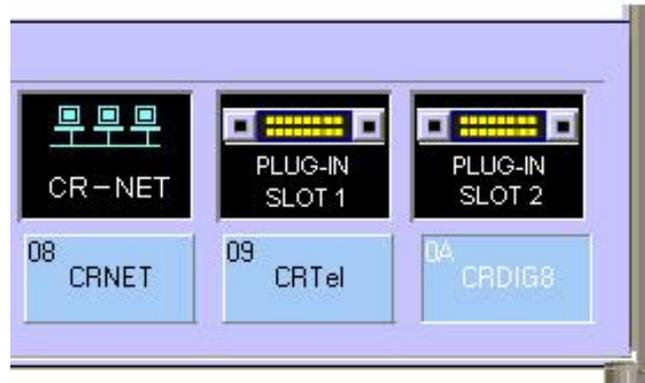
Connect a jumper for SLOT1/SOLT2

- **Confirm the configuration**
- **Put the jumper in the appointed stitch carefully**
- **Push it to have the same level as the bottom of jumper.**

Expansion Card

Jumper SOLT1 is for PLUQ-IN SLOT1.

Jumper SOLT2 is for PLUQ-IN SLOT2

There are only two expansion cards for a PGM host with jumper 1 and jumper 2 when both of cards are connected.

Host computer programmed soft ware

6 Application

6.1 Software

6.1.1 Program software

All control interfaces and control modes of PGM-II provides open setting environment, under which each control port can be programmed to set various control protocol as well as communicate with different controlled devices.

ControlSystem, the visible program environment of PGM-II, provides flexible programming mode including different correlative instructions to program PGM-II in the way of chart.

6.1.2   Download tools

MoniforManager

6.1.3   IR code bank management.

IR Manager is software for IR code management, working either with embedded PGM-II program software or separately.

IR Manager provides some IR code management function: IR code catch (study), preservation, management, production, IR codes of a certain device function management, the production of this certain device IR code bank kept as files.

IR code bank can be transferred by PGM-II program software through "Rebuilt User IR Database" leading program software.

6.1.4   Program compiling

PGM-II makes use of the visible exploiting environment with the special program software ControlSystem to program for PGM-II coupled with controlling devices by corresponding control protocols and instructions.

Reference to "PGM-II program guide" for program compiling.

6.1.5   Program download

Download the program to PGM-II after programming PGM-II under the exploiting environment.

Reference to "setting and operation->download of user program"

6.1.6   Firmware renew

Firmware is the basic cause for PGM-II running. For that reason, PGM-II firmware program version will be improved.

Reference to "Setting and operation->download of system program"

6.1.7   Setting and operation

Serial port Monitor software guide.

Control:

Files sending:
Plug-in Inquiry: inquire host plug-in and expansion card type.
Network device inquiry: inquire network devices as well as CR-NET connection types.
System information display: display system information such as Bios program version
User information display: display version number of user program.
Reset user program: software reset for user program
System hardware reset: resume the initial state of system, which is the default start-up state
Present time of host setting: amend time
Get the preset time: read the present time of PGM host
Auto-search baud rate: search baud rate between host and serial port
Speed display: display transmission speed of 485-network port display (only for Chinese version)
Close the speed display: Close the display (only for Chinese version)

Setting:

System program path: Set system Bios program path
User program path: Set user program path that is the user files path produced by Control System.EXE
Touch panel program path: Set file path compiled by touch panel program software.
Port setting: Choose COM and baud rate of PC serial port (usually 9600)
Chinese/English interface conversion:
      Chinese->English mode: setting-> Change To English Version;
      English->Chinese mode: setting-> Change To Chinese Version

Operation of commonly used tool bar

Open/close serial port: open serial port to inquire and control host machine.
System program download: Press this button to carry out files download according to the setting path of system program to host machine.
User program download: Press this button to carry out files download according to the setting path of user program to host machine.