

5.2. RS-485 I/O Expansion Unit

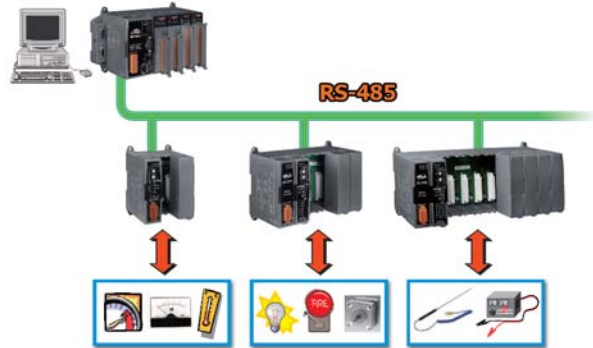
• RU-87Pn Introduction

The RU-87Pn series RS-485 remote I/O expansion unit is designed to acquire and control remote I/O through RS-485 connections. It comprises

- A CPU module with non-volatile memory to backup/restore I/O module configurations; LED indicators to diagnose the I/O module; and a RS-485 port for 1.2 Km long distance communication.
- A power module
- A backplane with a number of I/O slots for flexible I/O configuration.

With its patent-pending technologies, namely auto configuration and hot swap, it saves lots of labor on the set up and maintenance of the automation systems. Reliable 3-piece construction enables users to hot swap modules during operation, without rewiring. All I/O module data are backed up in the non-volatile memory of the RU-87Pn. After hot-swapping a module, all settings are automatically loaded to recover.

Furthermore, with the RS-485 network communication interface and more than 30 I/O modules for choice, users can apply the unit to nearly any automation system.



• Features

1. Hot Swap

Reliable 3-piece construction enables users to hot swap modules during operation, without rewiring. All I/O module data are backed up in the non-volatile memory of the RU-87Pn. After hot-swapping a module, all settings are automatically loaded to recover.

2. Auto Configuration

The I-87K I/O modules can be pre-configured and backed up in the non-volatile memory of the RU-87Pn. When the RU-87Pn is power on or plugged in, the RU-87Pn will automatically checks and restores these configurations to each I-87K I/O modules on it.

3. Easy Duplicate System

Using the DCON Utility, you can easily make a backup of the I-87K module configurations and write to another RU-87Pn. This design can easily and quickly duplicate many RU-87Pn.

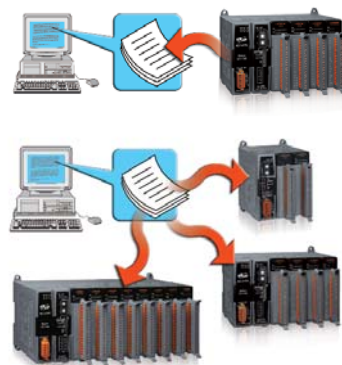
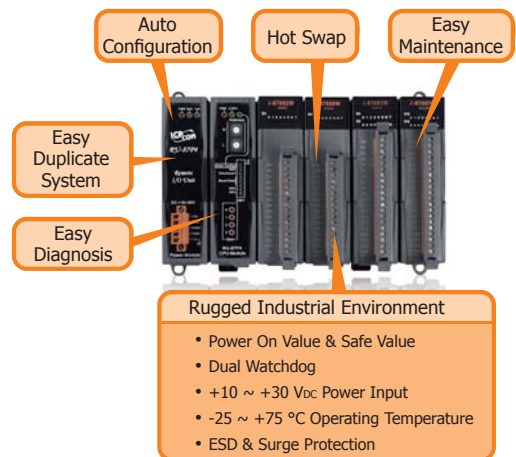
4. Easy Maintenance and Diagnosis

The basic configurations (includes station number, baudrate) are set by the rotary and DIP switches. The operator can use only one screwdriver to set the RU-87Pn. And there are several LED status indicators to show whether I-87K modules are configured and work properly.

If one I-87K module fails, the operator just needs to replace it with one good I-87K module with the same item number. And then checks the LED indicators to know whether the replacement is performed correctly. The switch and LED design makes it easy for maintenance. There is no PC and Notebook needed.

5. Communication

- RS-485 industrial multi-drop network
The RU-87Pn uses the industrial EIA RS-485 communication to transmit and receive data over long distance (1.2 Km).
- DCON protocol
I-87K series I/O modules plugged in a RU-87Pn provides a simple command/response protocol (named DCON protocol) for communication. All command/response are in easy use ASCII format.



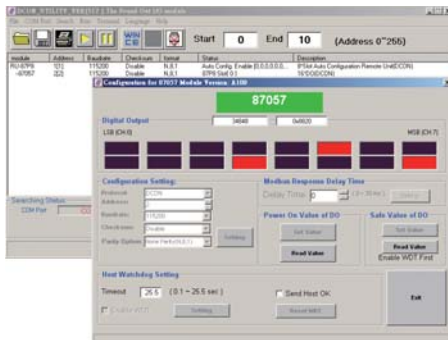
6. Rugged Industrial Environment

- Dual watchdog design
The I-87K series I/O modules provides module watchdog and host watchdog. The module watchdog is a hardware watchdog; the host watchdog is a software watchdog. The module watchdog is designed to automatically reset the microprocessor when the module hangs. The host watchdog monitors the host controller (PC or PLC). The output of module can go to the safe value state when the host fails.
- Programmable Power On Value & Safe Value
The DO and AO type I-87K I/O modules provide programmable Power On Value & Safe Value. When RU-87Pn is power on or plugged in, the DO or AO modules output preconfigured Power On Value. When host watchdog is acted, DO or AO modules output preconfigured Safe Value.
- Wide range power input (10 ~ 30 Vdc)
- Wide range operating temperature (-25 ~ +75°C)

7. Fully Software Support

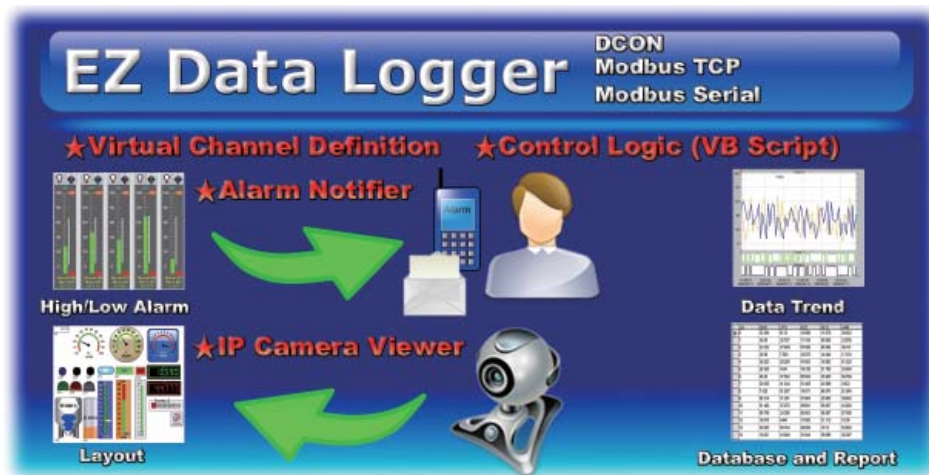
The free charge software utility and development kits include

- DCON Utility: for configuration



- OPC Servers:
OPC is an industrial standard interface based on OLE technology. With the OPC server, I/O modules can be easily integrated to any software that has OPC client capability.

8. EZ Data Logger



EZ Data Logger is a small data logger software. It can be applied to small remote I/O system. With its user-friendly interface, users can quickly and easily build a data logger software without any programming skill.

9. Various Software Develop Toolkits

DLL, ActiveX, Labview driver, Indusoft driver, DasyLab driver, Linux driver



Highlight Information

- One RS-485 Port for Multi-Drop Topology
- Hot Swap Allowed
- Auto Configuration
- LED Indicators for Fault Detection
- Switches to Configure Communication
- DCON Protocol
- 1/2/4/8 I/O Slots for I-87K Modules
- Operating Temperature: -25 ~ +75 °C

CE FC RoHS

Introduction

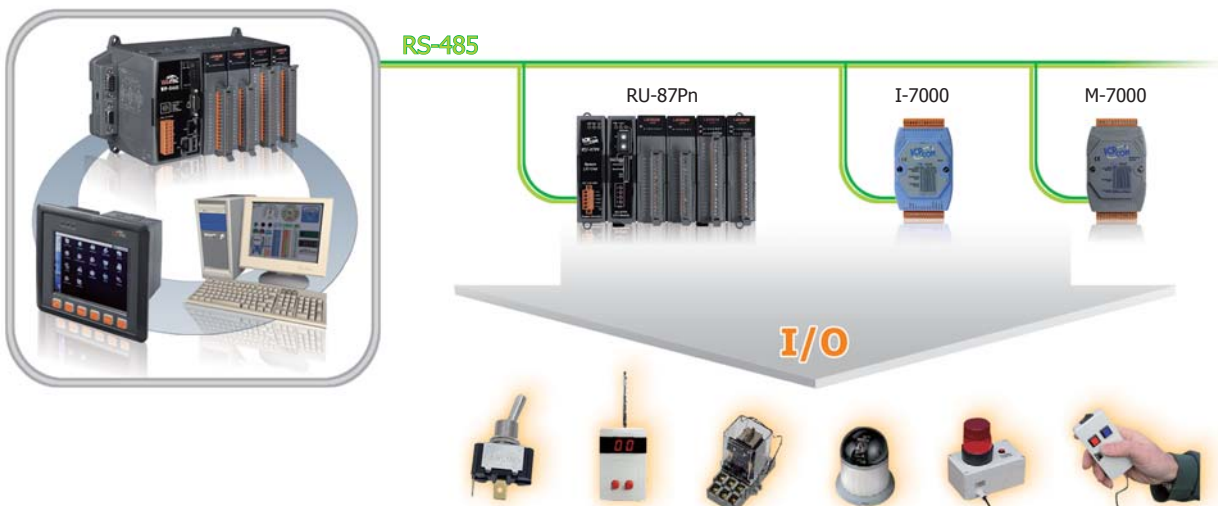
RU-87Pn series is a remote intelligent I/O expansion unit to expand I-87K series I/O modules over the RS-485 for industrial monitoring and controlling applications.

RU-87Pn is designed to be used in harsh and noisy environment, so the hardware is manufactured with wide power input range (10 ~ 30 V_{DC}), isolated power input and can operate under wide temperature (-25 ~ +75 °C). To simplify installation and maintenance of I/O modules, it provides many useful features, such as: hot swap allowed, auto configuration, LED indicators for fault detection, dual watchdog to keep alive, programmable power on and safe values for safety.

There are more than 30 I/O modules supported with the unit, including analog input/output, digital input/output, counter, frequency I/O modules. We provide various software development kits (SDK) and demos, such as DLL, ActiveX, Labview driver, InduSoft driver, Linux driver, OPC server, etc. The I-87K series I/O modules plugged in the RU-87Pn can be easily integrated into variant software system.

Applications

Rich I/O Expansion Ability



Specifications

5

I/O Expansion Units

2

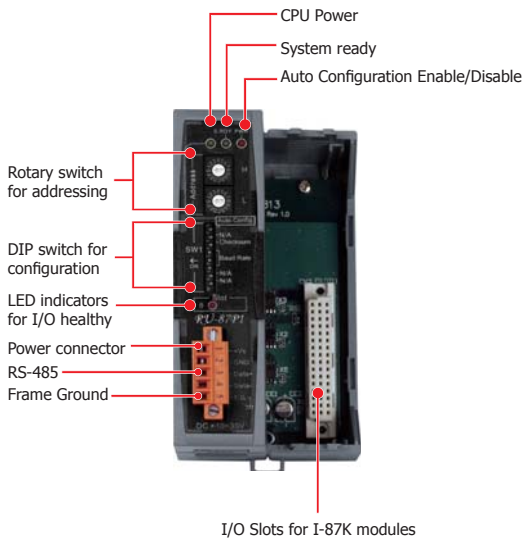
RS-485 I/O Expansion Unit

RU-87P1/87P2/87P4/87P8

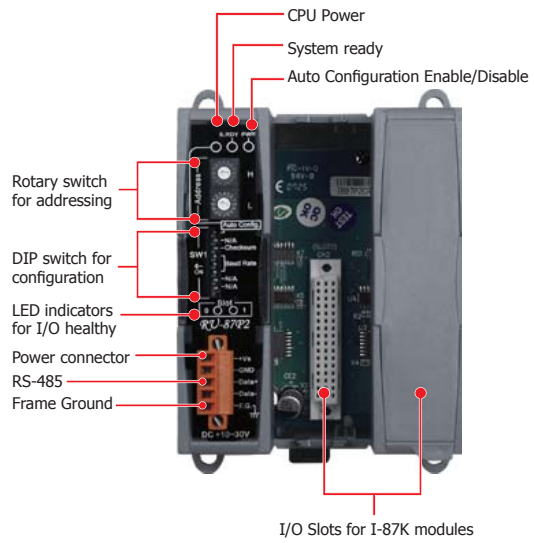
Models	RU-87P1	RU-87P2	RU-87P4	RU-87P8
Interface Type (RS-485)				
Baud Rate	115200 bps maximum			
Distance	1.2 km (4000 ft) maximum			
Isolation	3000 V _{DC}			
ESD Protection	+/-4 K Contact Discharge and +/-8 K Air Discharge			
Communication Protocol	DCON Protocol (ASCII Format)			
Switch				
Rotary Switch	x2, For RS-485 address			
DIP Switch	8-bit × 1, For auto configuration, check sum and baud rate			
LED Indicators				
Power	Yes			
System Ready	Yes			
Auto Configuration	Yes			
Slot Status	Yes			
I/O Expansion Slots				
Hot Swap	Yes			
Auto Configuration	Yes			
Support Module Type	High profile I-87K module only			
Slots Numbers	1	2	4	8
Mechanical				
Dimensions (W x L x H)	64 mm x 120 mm x 110 mm	95 mm x 132 mm x 111 mm	188 mm x 132 mm x 111 mm	312 mm x 132 mm x 111 mm
Installation	DIN-Rail or Wall Mounting			
Environmental				
Operating Temperature	-25 ~ +75 °C			
Storage Temperature	-30 ~ +80 °C			
Ambient Relative Humidity	10 ~ 90% RH (non-condensing)			
Power				
Input Range	+10 ~ +30 V _{DC}			
Reverse Polarity Protection	Yes			
Isolation	1000 V _{DC}			
Frame Ground	Yes			
Consumption	1 W	1 W	2 W	2.4 W
Power Board Driving	5 W	8 W	30 W	30 W

Appearance

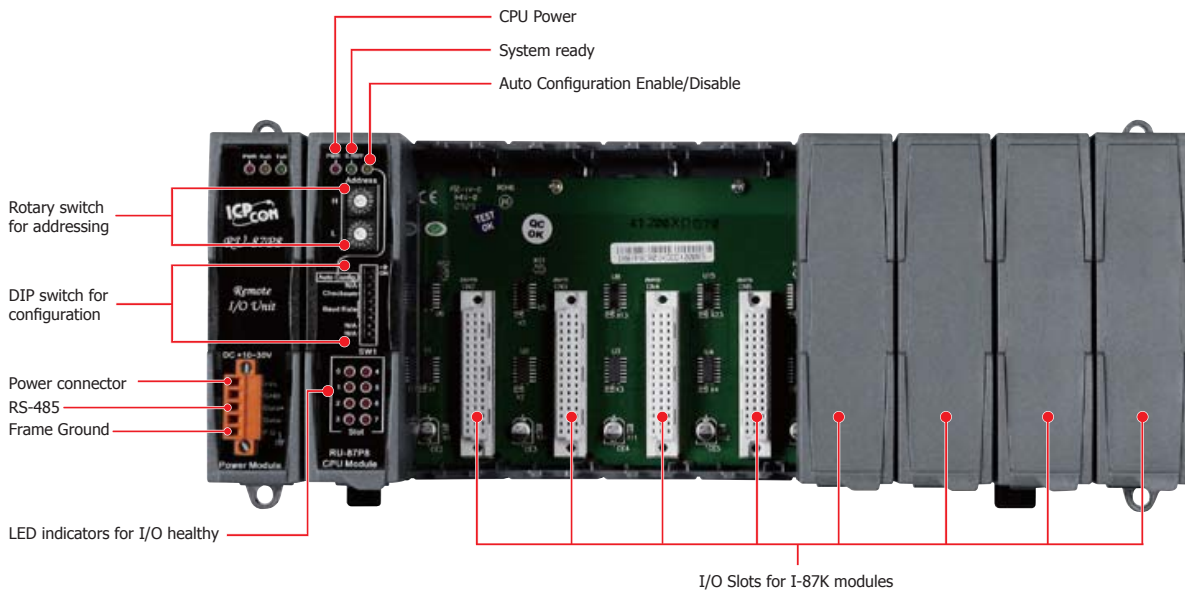
RU-87P1



RU-87P2

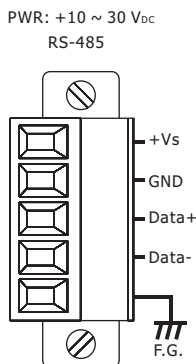


RU-87P8



Pin Assignments

RU-87Px Terminal Block

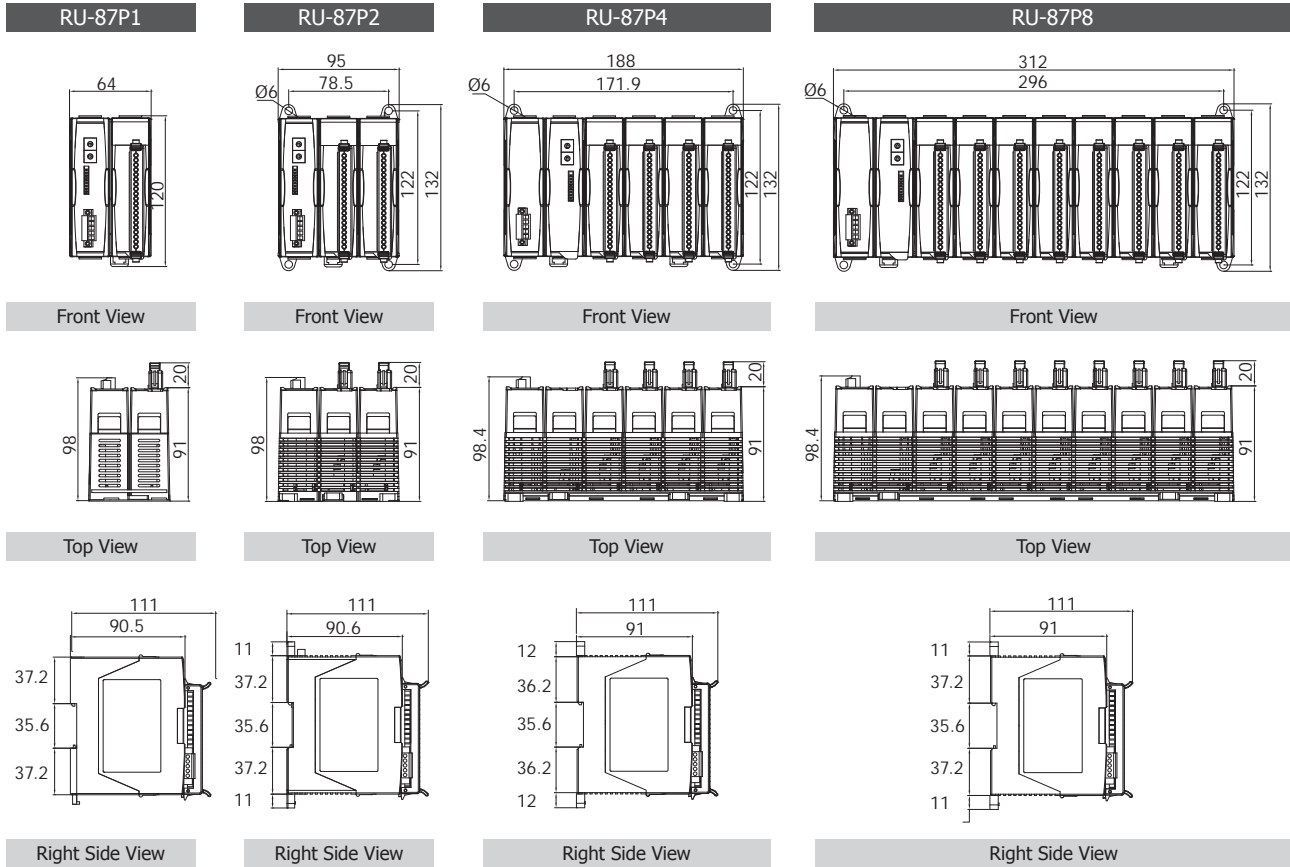


5 I/O Expansion Units

2 RS-485 I/O Expansion Unit

RU-87P1/87P2/87P4/87P8

Dimensions (Units: mm)



Ordering Information

RU-87P1 CR	1 slot I/O Expansion Unit (RoHS)
RU-87P2 CR	2 slots I/O Expansion Unit (RoHS)
RU-87P4 CR	4 slots I/O Expansion Unit (RoHS)
RU-87P8 CR	8 slots I/O Expansion Unit (RoHS)

Accessories

DP-660	24 V _{DC} /2.5 A, 60 W and 5 V _{DC} /0.5 A, 2.5 W Power Supply with DIN-Rail Mounting
DP-665	24 V _{DC} /2.7 A, 65 W Power Supply with DIN-Rail Mounting
DP-1200 CR	24 V _{DC} /5.0 A, 120 W Power Supply with DIN-Rail Mounting (RoHS)
MDR-20-24 CR	24 V _{DC} /1.0 A, 24 W Power Supply with DIN-Rail Mounting (RoHS)
I-7560 CR	USB to RS-232 Converter (RoHS)