



μPAC-7186EG



μPAC-7186EGD



- ISaGRAF Ver.3
SoftLogic Inside
- Support IEC 61131-3 +
Flow Chart
- MiniOS7 Inside
- 80186-80 MHz CPU
- 10/100 Base-TX
Ethernet



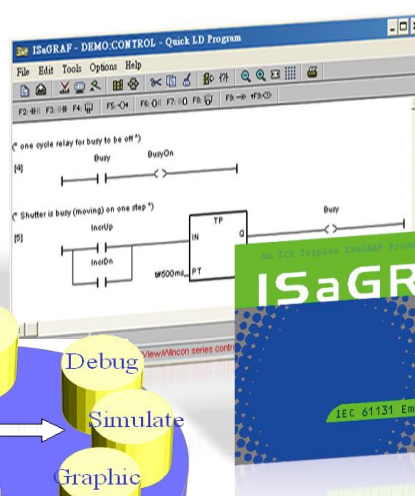
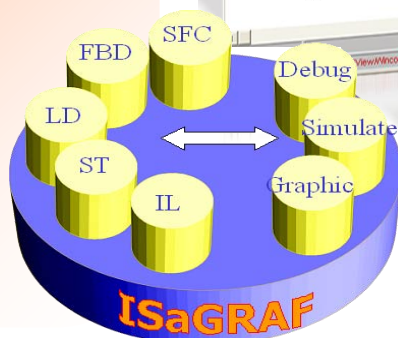
The μPAC-7186EG series is a palm-size PAC and includes ISaGRAF SoftLogic. It has one 10/100M Ethernet port, one RS-232 port and one RS-485 port. The user can choose I/O expansion board, X-board, to expand the I/Os or memories of μPAC-7186EG. Compared to I-7188EG, μPAC-7186 is **2 ~ 4 times faster**. Both μPAC-7186EG and I-7188EG series support Modbus Serial protocol, Modbus TCP/IP protocol, Modbus Master protocol, Remote I/O, Fbus, Ebus, SMS: Short Message Service, modem link, MMICON / LCD and user defined protocol.

The ISaGRAF μPAC supports ISaGRAF Ver.3 Workbench :

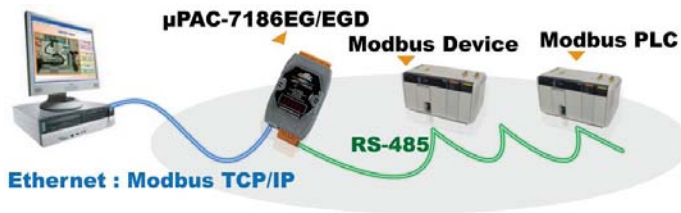
- Support IEC 61131-3 Standard Open PLC Programming Languages + Flow Chart :

1. Ladder
2. Function Block
3. SFC
4. ST
5. IL
6. Flow Chart

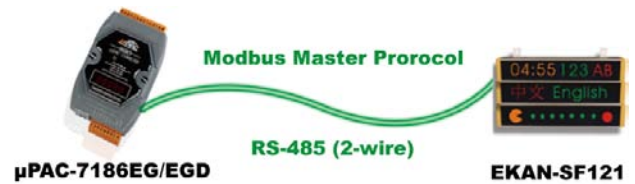
- Simulate program even without controller
- Debug on-line
- Control on-line
- Simple graphic HMI



● Communication



● Support EKAN Modbus LED



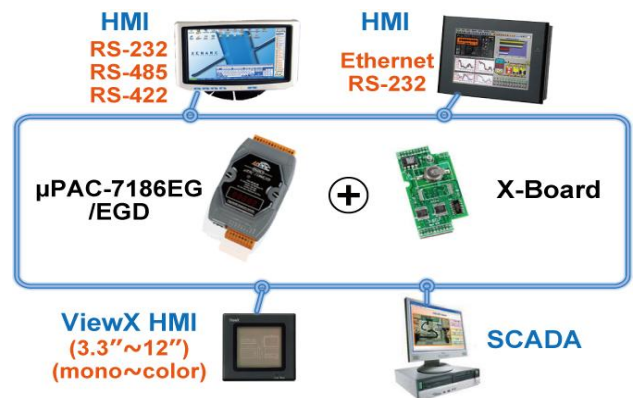
● Modbus Master (RTU, ASCII, RS-232/485/422)

- COM1:RS-232 or COM2:RS-485
- COM3: if X-board is plugged in
- Can link to Modbus PLC or M-7000 I/O or Modbus devices (Power meter, temperature controller, inverter...)



● Modbus RTU/TCP Slave Ports

- Modbus RTU (RS-232/485/422) : max. 2 PC/HMI/SCADA connection
- Modbus TCP/IP: max. 4 PC/HMI/SCADA connection

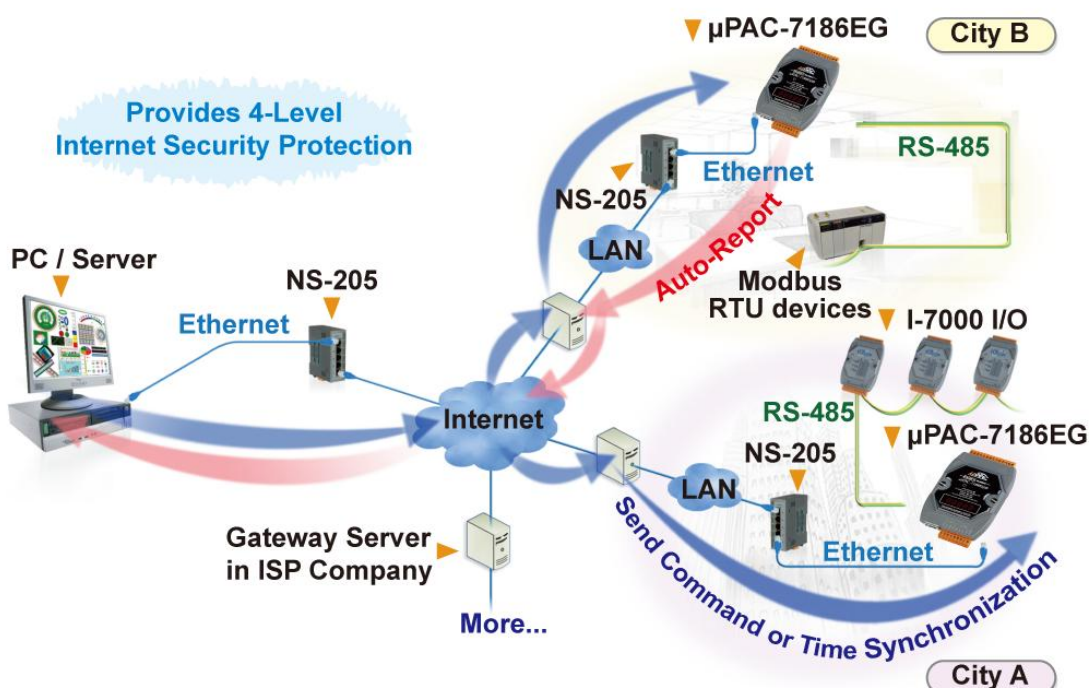


● Auto-report Acquisition Data & Control Data

μ PAC-7186EG/EGD can use UDP IP to auto-report acquisition data & control data to local or remote internet PC/Server.

Advantage: Every μ PAC-7186EG/EGD in the different location doesn't need a fixed Internet IP.

Stable and Cost-effective Data Acquisition Auto-Report System



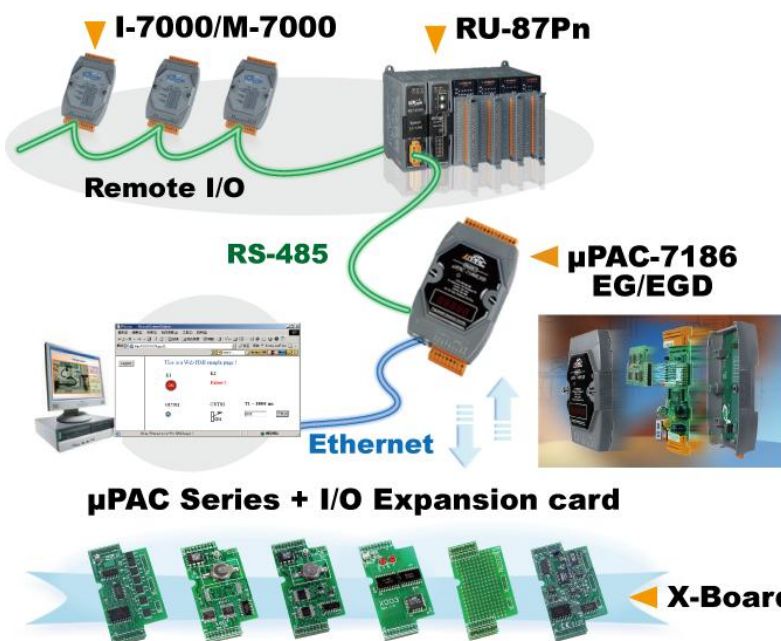
● Local & Remote I/O Application

Advantage of using RU-87P4 / P8 + I-87K I/O modules :

- Hot-Swap.
- Auto-Configuration at run time
- Plug & Play at run time

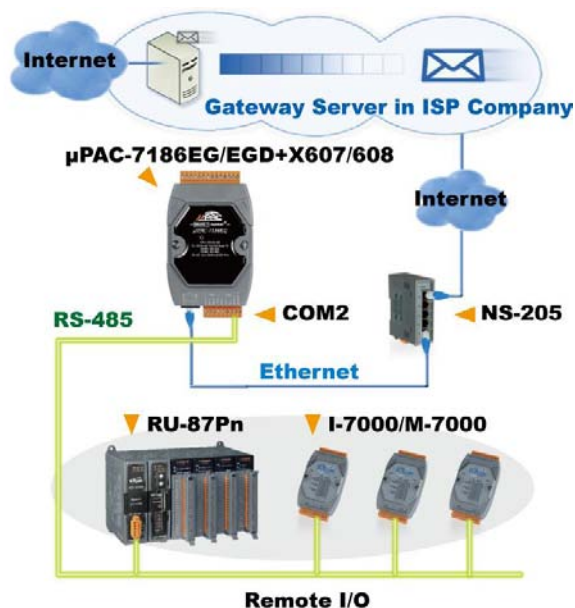
NOTE : RU-87Pn support only High profile I-87K I/O module

There are nearly 100 choices of Remote I/O modules : I-7000 & I-87K.



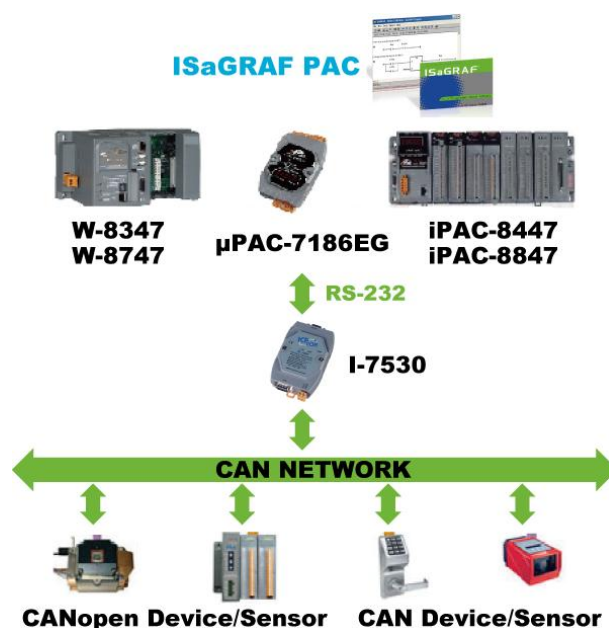
● Send E-mail with One Attached File

- Send email to maximum 10 receivers each time via internet.
- If applying with an X607/608 X-board, it could send email with one attached file and the maximum file size is about 488K bytes for using X608 or about 112K bytes for using X607.
- Please refer to www.icpdas.com > FAQ > Software > ISaGRAF Ver.3 (English) > 067 & 077



● Integrate with CAN / CANopen Devices and Sensors

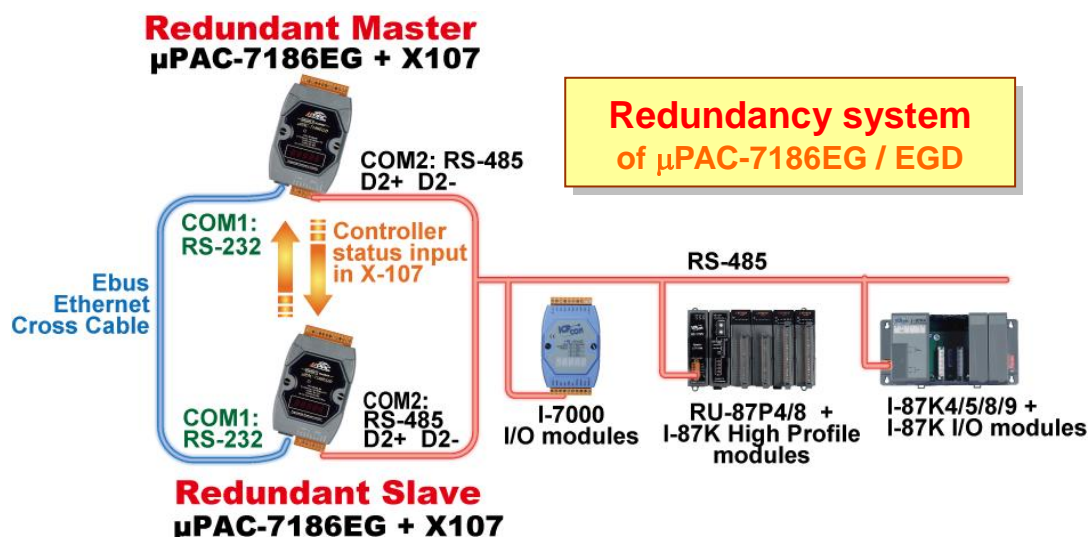
- μPAC-7186EG Supports max. 3 I-7530 (RS-232 to CAN Converter)
- Please refer to www.icpdas.com > FAQ > Software > ISaGRAF Ver.3 (English) > 086



● Cost Effective Redundancy Solution

- This is the most cost effective redundancy solution.
- If using RU-87P4/8 I/O expansion unit with I-87K high profile Remote I/O modules, it supports I-87K I/O run-time hot-swap and run-time plug & play.
- The Redundant Master is in charge of the system. If Redundant Master is damaged, the Redundant Slave will take over the control to make sure the whole system is alive.
- Please refer to www.icpdas.com > FAQ > Software > ISaGRAF Ver.3 (English) > 084

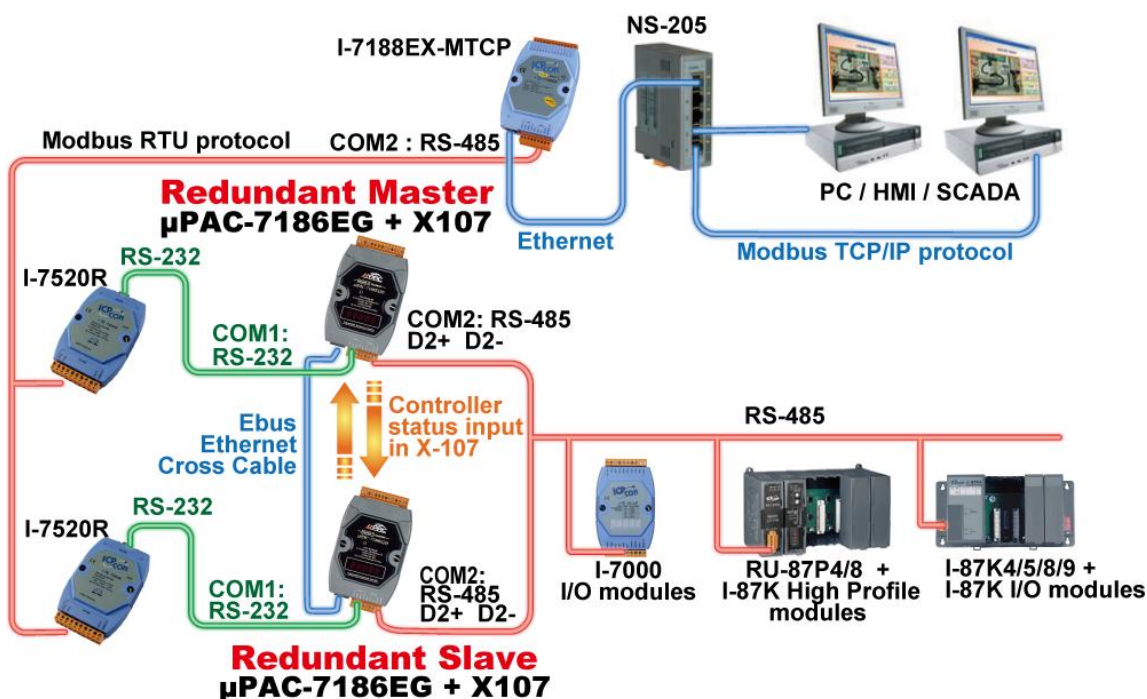
Limitation: Supports only max. 20 pcs. of (I-7000 + I-87K) I/O modules.



● Cost Effective Redundancy Solution with PC / HMI / SCADA

- PC / HMI / SCADA can connect to the redundancy system with only one IP of the I-7188EX-MTCP.
- Please assign these two μ PAC-7186EG PACs to have the same Net-ID and assign their IP number to be different from each other but in the same domain.
- Please refer to www.icpdas.com > FAQ > Software > ISaGRAF Ver.3 (English) > 084

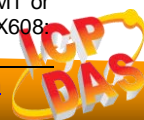
Limitation: Supports only max. 20 pcs. of (I-7000 + I-87K) I/O modules.



Specifications of μ PAC-7186EG & μ PAC-7186EGD



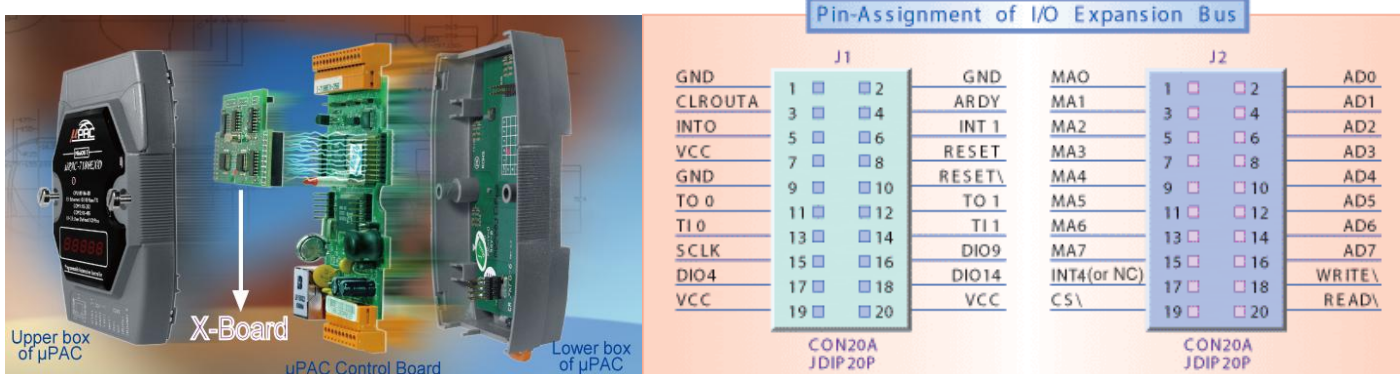
Power Supply	
Power Requirements	10 to 30VDC (unregulated), μ PAC-7186EG:2W , μ PAC-7186EGD:3W
Protection	Built-in power protection & network protection circuit
General Environment	
Temperature	Operating: -25°C to +75°C (-13° F to +167° F) , Storage : -30°C to +85°C (-40° F to +176° F)
Humidity	5% to 95 % (non-condensed)
System	
CPU	80186 80MHz, or compatible
Watchdog Timer	Yes, default 0.8 second
Real Time Clock	Gives hour, minute, sec, date of week, date of month, month & year (1980 to 2079)
SRAM	640K bytes
FLASH Memory	512K bytes, Erase unit is 64K bytes, 100,000 erase/write cycles
NVRAM	31 bytes, battery backup, data valid up to 10 years
EEPROM	16K bytes, retention > 100 years. 1,000,000 erase/write cycles
Display for μ PAC-7188EGD	5-digit 7-Segment LED display on the front. It can display message & value.
Expansion I/O Bus	One optional Xxxx series I/O board can be plugged inside the μ PAC-7186EG / 7186EGD.
NET ID	Set by software, 1 to 255
Serial Ports	
COM1	RS-232: TXD, RXD, GND, Speed: 115200 bps max. Program downloads port.
COM2	RS-485: D+, D-, 115200 bps max. Self-tuner ASIC inside. Program downloads port.
Ethernet	10/100M bps, NE2000 compatible, 10/100 Base-TX. Program download port
Development Software	
ISaGRAF Version 3	IEC 61131-3 standard. Languages: LD, ST, FBD, SFC, IL & FC
Max. Code Size	μ PAC-7186EG/EGD accepts max. 64K byte ISaGRAF code size (Appli.x8m must < 64K)
PWM Output	
Pulse Width Modulation Output	All Xxxx series D/O boards support PWM output. 8 channels max. for one controller. 500Hz max. for Off=1 & On=1 ms Output square curve: Off: 1 to 32767 ms, On: 1 to 32767 ms
Counters	
Parallel D/I Counter	All Xxxx series D/I boards support D/I counter. 8 ch. max. for one controller. Counter value: 32 bit 500Hz max. Min. ON & OFF width must > 1ms
Remote D/I Counter	All remote I-7000 & I-87K D/I modules support counters. 100Hz max. value: 0 to 65535
Remote High Speed Counter	Optional I-87082:100KHz max. , 32 bit
Protocols	
Modbus Serial Protocol	Up to 2 COM Ports (COM1 and COM3-in-X-board) can support Modbus RTU Slave protocol for connecting ISaGRAF, PC/HMI/OPC Server & MMI panels.
Modbus TCP/IP Protocol	Ethernet port supports Modbus TCP/IP Slave protocol for connecting ISaGRAF & PC/HMI.
Remote I/O	One of COM2 (or COM3:RS-485 if found) supports I-7000 I/O modules & (I-87K base or RU-87P4/8 + I-87K serial I/O boards) as Remote I/O. Max. 64 I/O modules for one controller
Modbus Master Protocol	Up to 2 COM Ports (COM1 ,COM2 and COM3-in-X-board) support Modbus RTU / ASCII Master protocol to connect to other Modbus Slave I/O devices
Fbus	Built-in COM2 Port to exchange data between ICP DAS's ISaGRAF PACs.
Ebus	To exchange data between ICP DAS's ISaGRAF Ethernet PACs via Ethernet port.
Send Email	Send email to maximum 10 receivers each time via internet. If applying with an X607/608 X-board, it could send email with one attached file and the maximum file size is about 488K bytes for using X608 or about 112K bytes for using X607.
SMS: Short Message Service	One of (COM3:RS-232 or COM4:RS-232 if found) can link to a GSM modem to support SMS. User can request data/control the controller by cellular phone. The controller can also send data & alarms to user's cellular phone. Optional GSM modems: GSM modem: Supreme (GSM 850/900/1800/1900)
User Defined Protocol	User can write his own protocol applied at COM1, COM2 & (COM3 to COM8 if found) by serial communication function blocks.
Modem Link	Supports PC remotely download & monitor the controller through COM4 of X504.
MMICON / LCD	One of (COM3:RS-232 if found) supports ICP DAS's MMICON. The MMICON is featured with a 240 x 64 dot LCD and a 4 x 4 Keyboard. User can use it to display picture, string, integer, float, and input a character, string, integer and float.
Redundancy Solution	One is Master, one is Slave. Master handles all inputs & outputs at run time. If Master is damaged (or power off), Slave takes the control of Bus7000b. If Master is alive from damaged (or power up again), it takes the control of Bus7000b again. The change over time is about 5 seconds. Control data is exchanging via Ebus (if using a cross cable, no need any Ethernet Switch). All I/O should be RS-485 I/O except the status I/O in the slot 0: X-107.
CAN / CANopen	μ PAC-7186EG can use it's COM1 or COM3 to COM8 (resides at the X-5xx RS-232 expansion board) to connect one I-7530 : the RS-232 to CAN converter to support CAN and CANopen devices and sensors. One μ PAC-7186EG supports max. 3 RS-232 ports to connect max. 3 I-7530. Please refer to www.icpdas.com > FAQ > Software > ISaGRAF Ver.3 (English) > 086
Battery Backup SRAM	
	μ PAC-7186EG / EGD can support up to 1024 retain variables with an X607 / X608 plug in the only expansion I/O slot. Data can be stored in X607/X608, and then PC can load these data via COM1 or Ethernet. PC can also download pre-defined data to the X607/X608. Optional: X607: 128K bytes, X608: 512K bytes



I/O Modules Selection Guide



Add-on Expansion Boards- X-Boards : More at www.icpdas.com > Products > PAC – I/O Expansion Boards

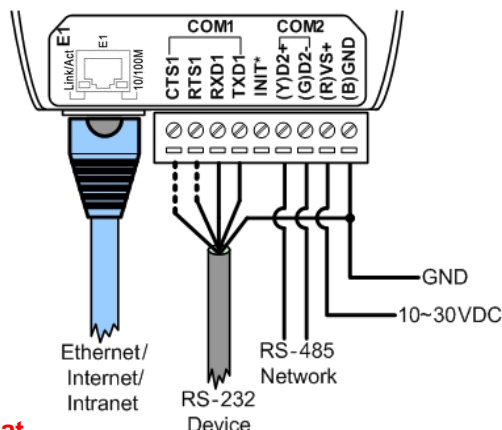


Expansion Boards for DI, DO, Counter Boards	
X107 CR	6-channel D/I & 7-channel D/O (RoHS)
X109	7-channel PhotoMos relay
X110 CR	14-channel D/I (RoHS)
X111	13-channel D/O
X116	6-channel relay output and 4-channel isolated D/I (Without Case)
X119	7-channel D/O and 7-channel D/I (Without Case)
Expansion Boards for A/D, D/A, DI, DO Boards	
X202	7-channel A/D (0~20mA)
X203	2-channel A/D (0~20mA), add 2-channel D/I, 6-channel D/O
X303	1-channel A/D (+/-5V), 1-channel D/A (+/-5V) add 4-channel D/I, 6-channel D/O
X304	3-channel A/D (+/-5V), 1-channel D/A (+/-5V) add 4-channel D/I, 4-channel D/O
X305	7-channel A/D (+/-5V), 1-channel D/A (+/-5V) add 2-channel D/I, 2-channel D/O
X308	4-channel A/D (0~10V) add 6-channel D/O
X310	1-channel A/D (0~10V), 1-channel A/D (0~20mA), 2-channel D/A (0~10V) add 3-channel D/I, 3-channel D/O
Expansion Boards for RS-232/422/485, DI, DO Boards	
X503	1-Port RS-232 (5-Pin)
X504 CR	2-Port RS-232 (5-Pin) and (9-Pin) (RoHS)
X505 CR	3-Port RS-232 (5-Pin) (RoHS)
X506 CR	6-Port RS-232 (3-Pin) (RoHS)
X507 CR	1-Port RS-422/485 add 4-channel D/I, 4-channel D/O (RoHS)
X508 CR	1-Port RS-232 (5-Pin) add 4-channel D/I, 4-channel D/O (RoHS)
X509 CR	2-Port RS-232 (3-Pin) add 4-channel D/I, 4-channel D/O (RoHS)
X510	1-Port RS-232 (3-Pin) add 5-channel D/I, 5-channel D/O (μPAC-7186EG does not support EEPROM of X510)
X510-128	1-Port RS-232 (3-Pin) add 5-channel D/I, 5-channel D/O (μPAC-7186EG does not support EEPROM of X510-128)
X511 CR	3-Port RS-485 (RoHS)
X518 CR	1-Port RS-232 (5-Pin) add 8-channel D/O (RoHS)
Expansion Boards for SRAM Boards	
X607	128KB NVRAM (Battery Backup SRAM)
X608 CR	512KB NVRAM (Battery Backup SRAM)
Expansion Boards for Motion Control Boards	
X702	2-axis Encoder Module (24 bit)
X703	3-axis Encoder Module (24 bit)



Remote I/O Modules Selection Guide ISaGRAF[®] μ PAC

Wiring Connection:



More RS-485 Remote I/O Modules at

I-7000 : www.icpdas.com > Products > Remote I/O Modules/Units > I-7000 Modules > Selection Guide

M-7000 : www.icpdas.com > Products > Remote I/O Modules/Units > M-7000 Modules > Selection Guide

More FRnet Distributed Remote I/O Modules at

FRnet I/O: www.icpdas.com > Products > Remote I/O Modules/Units > FRnet Remote I/O Modules > Selection Guide

More RS-485 Remote Hot-Swap Expansion Unit + I-87K High Profile I/O Modules at

RU-87P1/2/4/8 : www.icpdas.com > Products > Remote I/O Modules/Units > RS-485 Remote I/O Unit > Selection Guide

High Profile I-87K I/O Modules : www.icpdas.com > Products > PAC - 8K & 87K I/O Modules

More RS-485 Remote Expansion Unit + I-87K I/O Modules at

I-87K1/4/5/8/9: www.icpdas.com > Products > Remote I/O Modules/Units > RS-485 Remote I/O Unit > Selection Guide

I-87K I/O Modules: www.icpdas.com > Products > PAC - 8K & 87K I/O Modules

Ordering Information

Ethernet ISaGRAF μPAC	μPAC-7186EG-G CR	Advanced Ethernet ISaGRAF Palm-size PAC (RoHS) 80186-80MHz, 10/100M Base-TX
	μPAC-7186EGD-G CR	Advanced Ethernet ISaGRAF Palm-size PAC with Display (RoHS) 80186-80MHz, 10/100M Base-TX

Optional Accessories

X-Board SRAM	X607 CR / X608 CR	128K / 512K bytes battery backup SRAM (RoHS)
Application Software	ISaGRAF-256-E ISaGRAF-256-C	ISaGRAF Workbench Software Ver.3 (256 I/O Tags) with application book (E: English book; C: Chinese book)
	ISaGRAF-32-E ISaGRAF-32-C	ISaGRAF Workbench Software Ver.3 (32 I/O Tags) with application book (E: English book; C: Chinese book) * Cannot upgrade to 256 I/O Tags anymore.
Application Book	ISaGRAF Book-E	ISaGRAF application book (English)
	ISaGRAF Book-C	ISaGRAF application book (Traditional Chinese)
Ethernet Switch	NS-205 CR NS-208 CR	Unmanaged 5-port / 8-port Industrial 10/100 Base-T Ethernet Switch with plastic case (RoHS)
LED Display	EKAN-ME122M	16x96 pixel, 64x384mm, 48W@24VDC, char size: 8x6 or 16x8 pixel
	EKAN-ME124M	16x192 pixel, 64x768mm, 90W@24VDC, char size: 8x6 or 16x8 pixel