

Features

- 80186, 80 MHz CPU or 80188, 40 MHz CPU
- MiniOS7 Inside
- Embedded ISaGRAF Ver.3 SoftLogic (IEC 61131-3)
- Ethernet
 - 10/100 Base-TX (for μ PAC-7186EG)
- Support Modbus Master
 - RTU, ASCII, RS-232/485/422
- Support Modbus RTU/TCP Slave
 - Modbus RTU (RS-232/485/422) Slave
 - Modbus TCP Slave (not for I-7188XG)
- Operating Temperature: -25 ~ +75°C

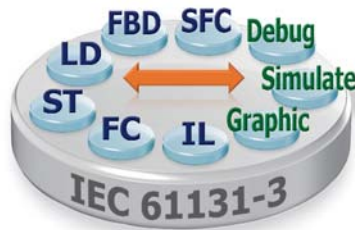
Introduction

The μ PAC-7186EG Series (μ PAC-7186EG, μ PAC-7186EGD) is a palm-size PAC and includes ISaGRAF SoftLogic. It has one 10/100 Base-TX Ethernet port, one RS-232 port and one RS-485 port. The user can choose an I/O expansion board, X-Board, to expand the I/Os or memories of μ PAC. μ PAC-7186EG support Modbus Serial protocol, Modbus TCP/IP protocol, Modbus Master protocol, Remote I/O, Fbus, Ebus, SMS: Short Message Service, modem link, MMICON/LCD, ZigBee wireless communication, GPS application, FRnet, CAN remote I/O connection and user defined protocol.

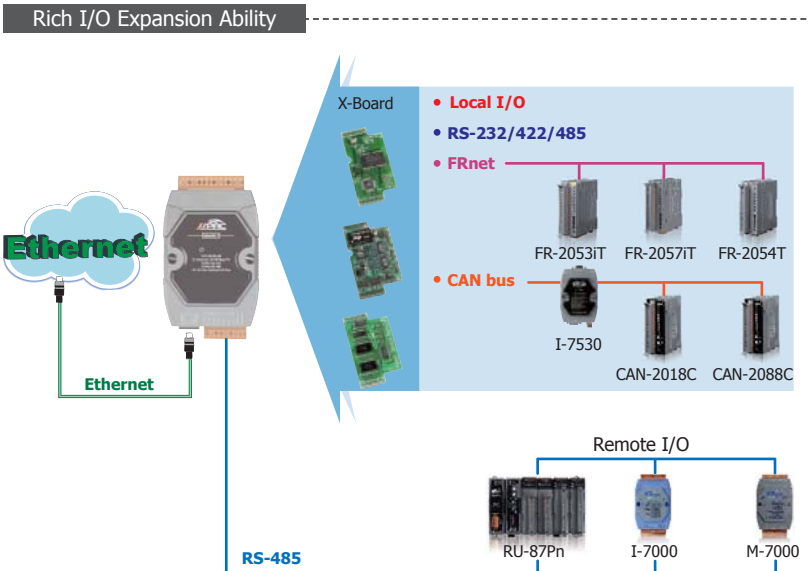
The I-7188XG series (I-7188XG, I-7188XGD) is a palm-size PAC with ISaGRAF SoftLogic. It has 2 Serial ports (COM1:RS-232/RS-485 & COM2:RS-485). The user can choose an I/O expansion board, X-Board, to expand COM Ports, I/Os or memories of I-7188XG and μ PAC-7186EG Series.

The features of the ISaGRAF workbench Ver. 3.x include:

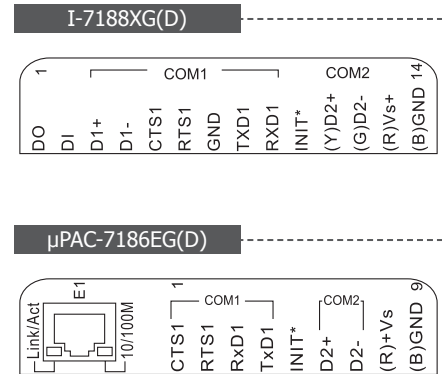
- IEC 61131-3 Standard Open PLC Programming Languages (LD, FBD, SFC, ST, IL) + Flow Chart (FC)
- Auto-scan I/O
- Online Debug/Control/Monitor, Offline Simulation
- Simple Graphic HMI



Applications

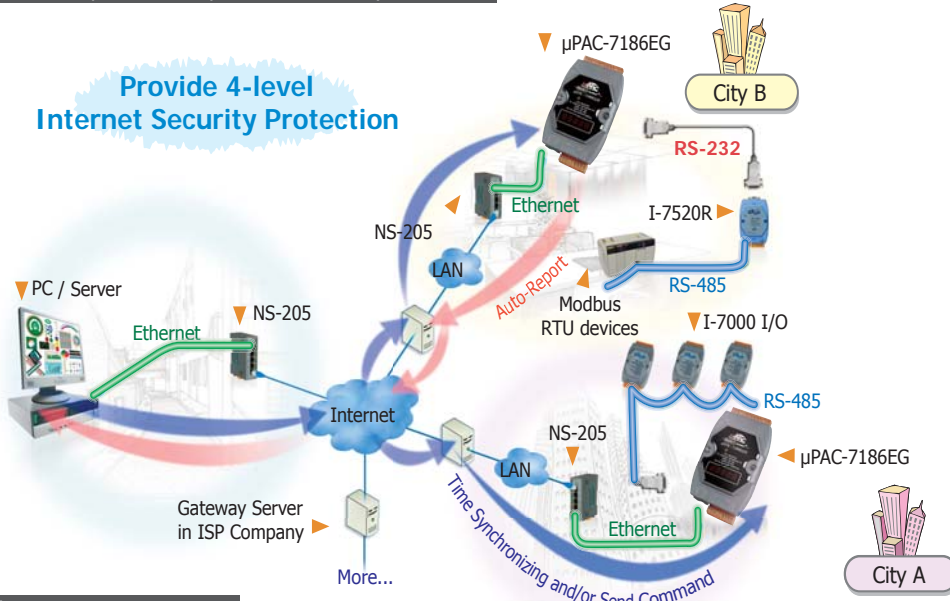


Pin Assignments

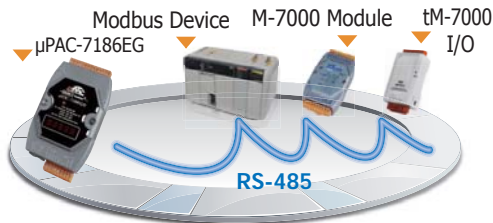


Cost-effective Auto-ReportData Acquisition/Control System

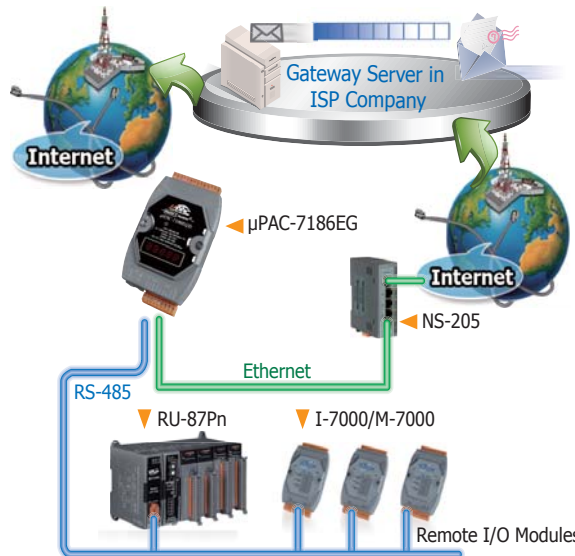
Provide 4-level Internet Security Protection



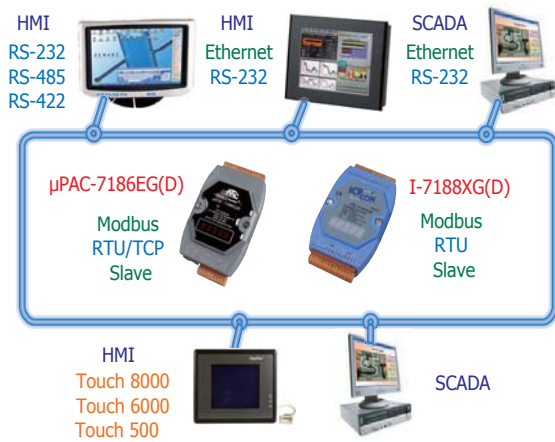
Modbus RTU/ASCII Master Ports



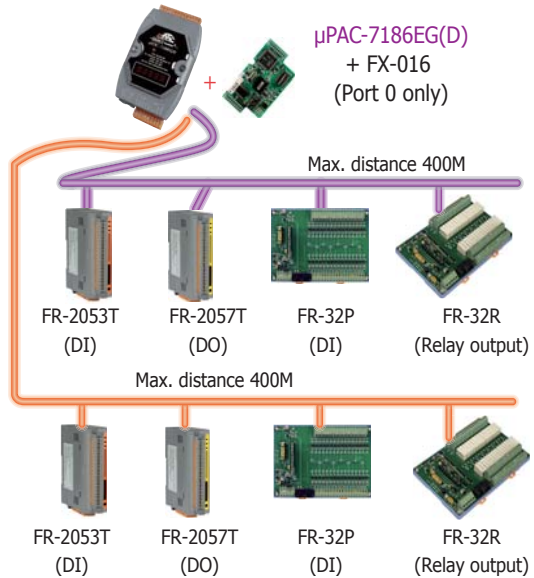
Send Email with one Attached File



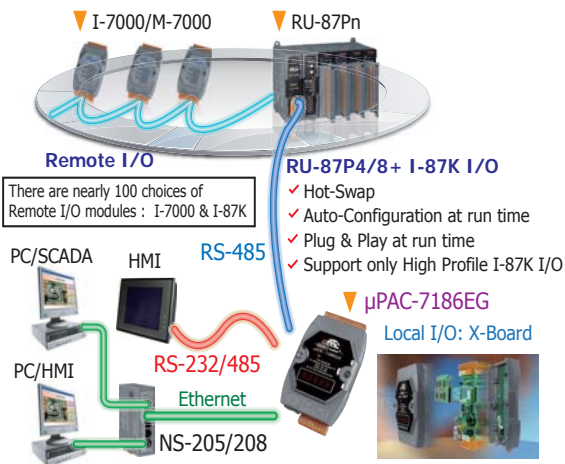
Modbus RTU/TCP Slave Ports



FRnet I/O Application



Local/Remote I/O Expansion & Multi-HMI



μPAC Specifications

Models		I-7188XG(D)	μPAC-7186EG (D)
System Software			
OS	MiniOS7 (DOS-like embedded operating system)		
Development Software			
ISaGRAF Software	ISaGRAF Version 3	IEC 61131-3 standard	
	Languages	LD, ST, FBD, SFC, IL & FC	
	Max. Code Size	64 KB	
	Scan Time	5 ~ 100 ms for normal program 25 ~ 500 ms (or more) for complex or large program	2 ~ 5 ms for normal program 10 ~ 125 ms (or more) for complex or large program
CPU Module			
CPU	80188, 40 MHz		80186, 80 MHz
SRAM	512 KB		640 KB
Flash	512 KB		
EEPROM	2 KB		16 KB
NVRAM	31 Bytes (battery backup, data valid up to 10 years)		
RTC (Real Time Clock)	Provide second, minute, hour, date, day of week, month, year		
64-bit Hardware Serial Number	Yes, for Software Copy Protection		
Watchdog Timers	Yes (0.8 second)		
Communication Ports			
Ethernet	-		RJ-45 x 1, 10/100 Base-TX
COM 1	RS-232 or RS-485 with internal self-tuner ASIC; non-isolated		RS-232 (TxD, RxD, RTS, CTS, GND), non-isolated
COM 2	RS-485 with internal self-tuner ASIC; non-isolated		
LED Indicator			
System LED	Yes		
LED Display	5-digit 7-segment LED display for (D) version		
Digital Input			
Channels	1		-
Contact	Dry		-
On Voltage Level	Connect to GND		-
Off Voltage Level	Open		-
Digital Output			
Channels	1		-
Output Type	Open Collector		-
Load Current	100 mA		-
Load Voltage	30 VDC Max.		-
Hardware Expansion			
I/O Expansion Bus	Yes, 1 (14 Pins)		
Mechanical			
Dimensions (W x L x H)	72 mm x 123 mm x 33 mm		72 mm x 123 mm x 35 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 VDC		
Protection	Power reverse polarity protection		
Power Consumption	2 W; 3 W for (D) version		1.5 W; 2.5 W for (D) version

ISaGRAF Specifications

Protocols (Note that certain protocols require optional devices)		
NET ID		1 ~ 255, user-assigned by software
Modbus RTU/ASCII Master Protocol		A max. of 2 COM ports: I-7188XG COM 2 ~3, μPAC-7186EG COM 1~3 (*). (To connect to other Modbus Slave I/O devices.) A max. of Mbus_xxx Function Block amount for 2 ports : μPAC-7186EG: 128; I-7188XG: 64.
Modbus RTU Slave Protocol		A max. of 2 COM ports: COM1, one of COM2 or COM3 (*). (For connecting ISaGRAF, PC/HMI/OPC Server and HMI panels.)
Modbus TCP/IP Slave Protocol		Ethernet port supports Modbus TCP/IP Slave Protocol for connecting ISaGRAF & PC/HMI. μPAC-7186EG: up to 6 connections; I-7188XG: 0 connection.
User-defined Protocol		Custom protocols can be applied at μPAC-7186EG: COM1~8 or I-7188XG: COM2~8 using Serial communication function blocks. (*)
Remote I/O		One of COM2 or COM3:RS-485 supports I-7000 I/O modules, I-87K base + I-87K Serial I/O boards, or RU-87Pn + I-87K High Profile I/O boards as remote I/O. A max. of 64 I-7000/87K remote I/O modules can connect to one PAC. (*)
Fbus		Built-in COM2 Port to exchange data between ICP DAS's ISaGRAF controllers.
Ebus		Used to exchange data between ICP DAS ISaGRAF Ethernet PACs via the Ethernet port. (Not for I-7188XG)
Send Email		Provide functions to send email to a max. of 10 receivers with a single attached file via the Ethernet port through internet. If applying with an X607/608 X-Board, it could send Email with a single attached file and the maximum of file size is about X608:488 KB or X607:112 KB. (Not for I-7188XG)
SMS: Short Message Service		One COM port (μPAC-7186EG: one of COM1 or COM3 or COM4; I-7188XG: one of COM3 or COM4) can link to a GSM modem to support SMS. The user can request data/control the controller via a cellular phone. The controller can also send data and alarms to the user's cellular phone. (*) Optional GSM Modem: GTM-201-RS232 (850/900/1800/1900 GSM/GPRS External Modem)
Modem Link		Support PC remotely download & monitor the controller through COM4 of X504. (*)
MMICON/LCD		COM3: RS-232 (*) 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.
Redundant 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 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, there is no need of any Ethernet switch). All I/O should be RS-485 I/O except the status I/O in the slot 0: X107. (for μPAC-7186EG series only)
CAN/CANopen		COM1 or COM3~8 can connect to one I-7530 (converter: RS-232 to CAN) to support CAN/CANopen devices and sensors. One iP-8xx7 supports a max. of 3 RS-232 ports to connect a max. of 3 I-7530. (*) (for μPAC-7186EG only) (FAQ-086)
Optional I/O Functions (Refer to ISaGRAF PAC I/O Selection Guide for I/O Module list)		
PWM Output	Pulse Width Modulation Output	All X-Board series DO boards support PWM output. 8 channels Max. for one controller. 500 Hz Max. for Off=1 & On=1 ms, Output square curve: Off: 1 ~ 32767 ms, On: 1 ~ 32767 ms
Counters	Parallel DI Counter	All X-Board series DI boards support DI counter. 8 channels. Max. for one controller. Counter value: 32 bit, 500 Hz Max. Min. ON & OFF width must > 1 ms
	Remote DI Counter	All remote I-7K/I-87K DI modules support counters. 100 Hz Max. value: 0 ~ 65535 (16-bit)
	Remote High Speed Counter	I-87082: 100 kHz Max., 32-bit
SRAM Expansion	Battery Backup SRAM	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. (for retain variables) Optional: X607: 128 KB, X608: 512 KB
* Note: The COM3 ~ COM8 port are located in the optional X-board series if it is installed inside the μPAC-7186EG & I-7188XG. * ISaGRAF FAQ: www.icpdas.com > Support > FAQ > ISaGRAF Soft-Logic PAC * ICP DAS recommends using NS-205/208 or RS-405/408 (Ring Switch) Industrial Ethernet Switches.		

Ordering Information

μPAC-7186EG CR	ISaGRAF based μPAC with 10/100M Ethernet (RoHS)
μPAC-7186EGD CR	μPAC-7186EG with display (RoHS)
I-7188XG CR	ISaGRAF based μPAC with 1 DI, 1 DO (RoHS)
I-7188XG CR	I-7188XG with display (RoHS)

Accessories

ISaGRAF Development Software	
ISaGRAF-256	ISaGRAF Workbench Software Ver.3 (256 I/O Tags) with One USB Dongle
ISaGRAF-32	ISaGRAF Workbench Software Ver.3 (32 I/O Tags)
Note: No upgrade service from ISaGRAF-32 to ISaGRAF-256 is available. (ISaGRAF-32 can be used to control more than 32 I/O tags. Please refer to Ch. 3.4 of the ISaGRAF User Manual.)	
Accessories	
MDR-20-24 CR	24 VDC/1.0 A, 24 W Power Supply with DIN-Rail Mounting (RoHS)
GPSU06U-6 CR	24 VDC/0.25 A, 6 W Power Supply (RoHS)
DIN-KA52F CR	24 VDC/1.04 A, 25 W Power Supply with DIN-Rail Mounting (RoHS)
I/O Expansion Boards	Other add-on expansion boards refer to expansion board selection guide
NS-205 CR / NS-208 CR	5-port / 8-port Unmanaged Industrial 10/100 Ethernet Switch with Plastic Case (RoHS)