# 8.1. µPAC-5000 Series

● Overview

The ICP DAS uPAC-5000 Series is the new generation palm-size PAC (Programmable Automation Controller). It is equipped a 80186 CPU (80 MHz) running a MiniOS7 operating system, various connectivity (Ethernet, RS-232/485) and an I/O expansion bus.

The uPAC-5000 series has many advantages, including hard real-time capability, small core size, fast boot speed, interrupt handling at a deeper level, achievable deterministic control and low cost. Using MiniOS7 gives it the ability to launch programs that developed by Turbo C, Borland C or ISaGRAF (PLC programming). It gives users all of the best features of both traditional PLCs and PCs.

For hardware expansion, it also supports an I/O expansion bus. The I/O expansion bus can be used to implement various I/O functions such as D/I, D/O,A/ D, D/A, Timer/Counter, UART, and other I/O functions. Nearly all kinds of I/O functions can be implemented by this bus. But the bus can support only one board. There are more than 10 boards available for uPAC-5000 series, users can choose one of them to expand hardware features.

● Features

1. MiniOS7 Inside

MiniOS7
80186 CPU
µPAC-5000 Series

- DOS-like real-time OS
- Boot up in 0.4 ~ 0.8 second
- Built-in hardware diagnostic
- Standard version for C language programming
- ISaGRAF version for IEC 61131-3 programming

2. Local I/O and Communication Expansion Board

The µPAC 5000 series equip an I/O expansion bus to support one optional expansion board, called XW-Board. It can be used to implement various I/O functions such as DI, DO, A/D, D/A, Timer/ Counter and various communication interface options, such as RS-232/422/485, CAN, FRnet, etc.
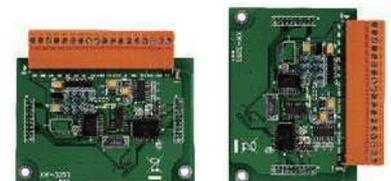
3. Remote I/O Module and Expansion Unit

With the built-in RS-485 and Ethernet ports, the 5000 series can connect RS-485/Ethernet remote I/O units (RU-87Pn/ET-87Pn) or modules (I-7000/M-7000/ET-7000). With an XW-Board, the 5000 series can have more communication ports or different interface to connect to other type of devices, for example, CANOpen devices, DeviceNet devices, or FRnet I/O modules.

4. Multi-Communication Interface Options

There are several of communication interfaces to expand I/O and connect to external devices:

1. Ethernet
2. RS-232/485
3. CAN bus
4. FRnet

5. GPS
6. 2G/3G
7. ZigBee
8. Wi-Fi

GPS

2G/3G

Internet

PC   Cell Phone

5000 Series

Remote I/O

RS-485
RU-87Pn   I-7000   M-7000

Ethernet
ET-87Pn   ET-7000

CAN bus
CAN-8000 Series   CAN-2000 Series
CAN-8124   CAN-8224   CAN-8424   CAN-2018C   CAN-2088C

FRnet
FR-2053iT   FR-2057iT   FR-2054T
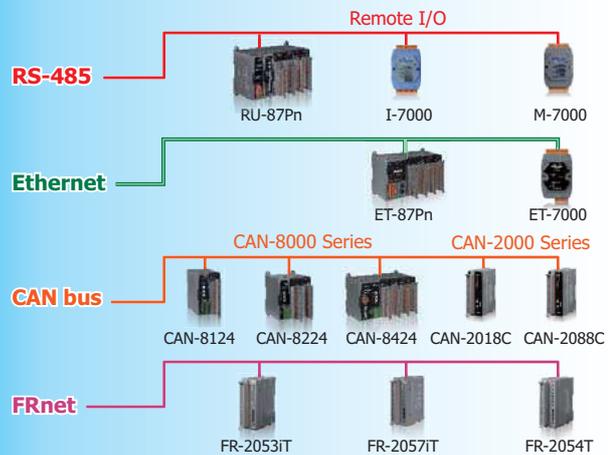
5. Various Memory Storage Options

uPAC-5000 provides various memory storage options. Customers can choose the memory based on their characteristics.

- 16 KB EEPROM: to store not frequently changed parameters.
- microSD: to implement portable data logging applications.
- 256 MB NAND Flash Disk: rugged data storage to resist shock and vibration.
- 512 KB battery backup SRAM: to retain data while power lost for 5 years; no write cycle limitation.

NAND FLASH (256MB)

micro SD
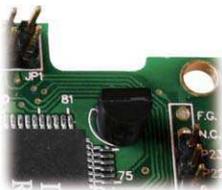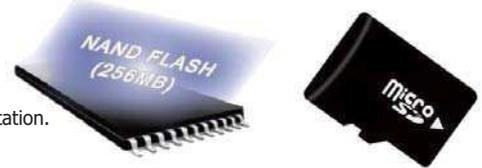
6. Unique 64-bit Hardware Serial Number to Protect Your Program

A unique 64-bit serial number is assigned to each hardware device to protect your software against piracy.

7. Plastic and Metal Casing

The default case is plastic material. Metal casing is also offered to provide extra security.

（鋁殼（待拍照））

## 8. Highly Reliable Under Harsh Environment

Our µPACs operate in a wide range of temperature and humidity.

- Operating Temperature: -25 ~ +75°C
- Storage Temperature: -30 ~ +80°C
- Humidity 10 ~ 90% RH (non-condensing)

+75°C

-25°C

9. Redundant Power Inputs

Power1   Power2

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5000 Series PAC

● Hardware

1. Appearance

| µPAC-5000 Series | µPAC-5100 Series | µPAC-5200/5300 Series | µPAC-5400/5500 Series |

SIM Card

microSD Socket

Connector for Optional XW-Board

Programmable LED

LAN LED

7-Segment LED Display

Rotary Switch

Lock and Init*

LAN   Pin Assigment

COM1   COM2

I/V.A GND CTS RTS RxD TxD GND D+ D- PWR2 P.GND PWR1 P.GND F.G.

2. Dimensions (Units: mm)

113.5   123

91

Top View

52

Bottom View

52

52

| Front View | Rear View | Bottom View | Left Side View | Right Side View |
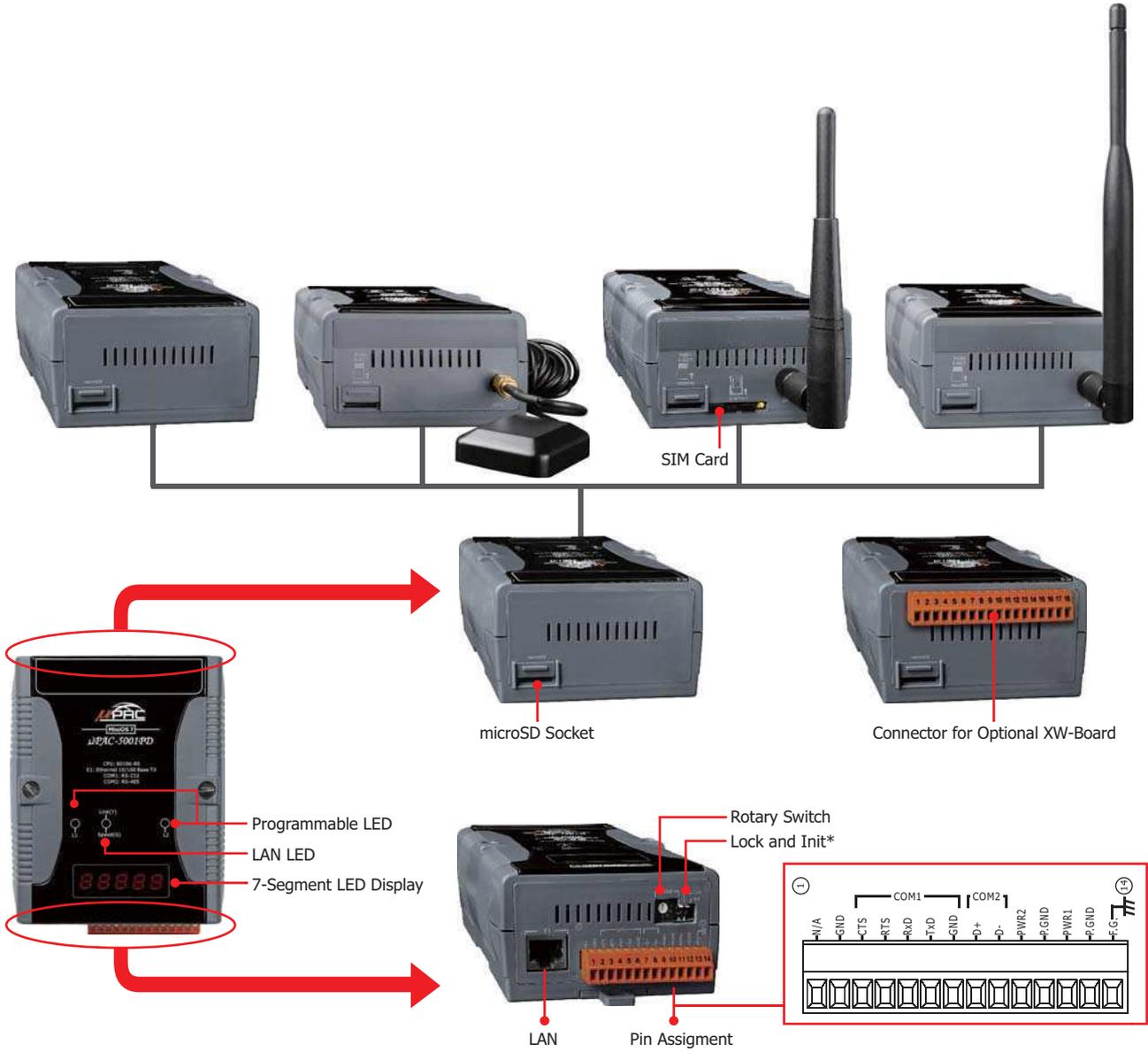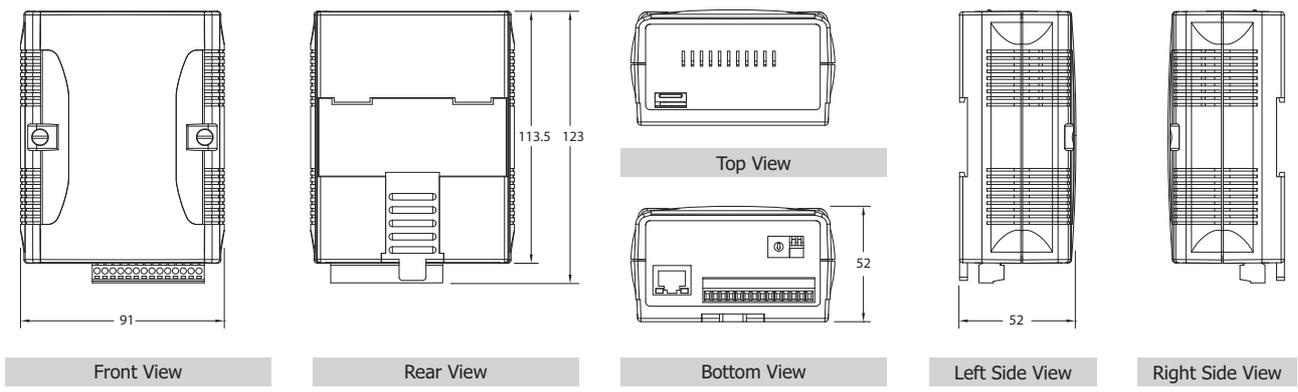
● Selection Guide

µPAC-5 [X] [O] [X] [D] - [F][D]

Wireless Communication
0: None
1: GPS
2: 2G (GPRS)
3: 3G (WCDMA)
4: ZigBee
5: Wi-Fi (802.11 b/g)

Software
1: C language based
7: ISaGRAF

Display or Casing
D: LED Display
M: Metal Casing

Memory
FD: 256 MB Flash
SM: 512 KB Battery
 Backup SRAM

✓ C Language Based uPAC-5000

Model Name	CPU	Flash	SRAM	Memory Expansion	Ethernet	Wireless Communication	RS-232/RS-485
µPAC-5001(D)				microSD			
µPAC-5001(D)-FD	80 MHz	512 KB	512 KB	microSD + 256 MB Flash	10/100 BaseTX	-	1/1
µPAC-5001(D)-SM				microSD + 512 KB Battery Backup SRAM			

The µPAC-5000 has a 16-bit CPU running a DOS like OS (called MiniOS7), communication ports of Ethernet, RS-232, RS-485 and one expansion bus to add one extra I/O board. Users can use C compilers to create 16-bit executable files (*.exe) to develop programs for µPAC-5000.
There are many demo programs for reference. Beside that, for TCP/IP programming, we provide a TCP/IP server template that named XServer. It is a very powerful, easy use and flexible tool that can save 90% developing time.

✓ C Language Based uPAC-5000 with **GPS**

Model Name	CPU	Flash	SRAM	Memory Expansion	Ethernet	Wireless Communication	RS-232/RS-485
µPAC-5101(D)				microSD			
µPAC-5101(D)-FD	80 MHz	512 KB	512 KB	microSD + 256 MB Flash	10/100 BaseTX	GPS	1/1
µPAC-5101(D)-SM				microSD + 512 KB Battery Backup SRAM			

✓ C Language Based uPAC-5000 with **2G (GPRS)**

Model Name	CPU	Flash	SRAM	Memory Expansion	Ethernet	Wireless Communication	RS-232/RS-485
µPAC-5201(D)				microSD			
µPAC-5201(D)-FD	80 MHz	512 KB	512 KB	microSD + 256 MB Flash	10/100 BaseTX	2G (GPRS)	1/1
µPAC-5201(D)-SM				microSD + 512 KB Battery Backup SRAM			

✓ C Language Based uPAC-5000 with **3G (WCDMA)**

Model Name	CPU	Flash	SRAM	Memory Expansion	Ethernet	Wireless Communication	RS-232/RS-485
µPAC-5301(D)				microSD			
µPAC-5301(D)-FD	80 MHz	512 KB	512 KB	microSD + 256 MB Flash	10/100 BaseTX	3G (WCDMA)	1/1
µPAC-5301(D)-SM				microSD + 512 KB Battery Backup SRAM			

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5000 Series PAC

✓ C Language Based uPAC-5000 with ZigBee

Model Name	CPU	Flash	SRAM	Memory Expansion	Ethernet	Wireless Communication	RS-232/RS-485
µPAC-5401(D)	80 MHz	512 KB	512 KB	microSD	10/100 BaseTX	ZigBee (Host, Coordinator)	1/1
µPAC-5411(D)						ZigBee (Slave, Full Function Device)	
µPAC-5401(D)-FD				microSD + 256 MB Flash		ZigBee (Host, Coordinator)	
µPAC-5411(D)-FD						ZigBee (Slave, Full Function Device)	
µPAC-5401(D)-SM				microSD + 512 KB Battery Backup SRAM		ZigBee (Host, Coordinator)	
µPAC-5411(D)-SM						ZigBee (Slave, Full Function Device)	

✓ C Language Based uPAC-5000 with Wi-Fi

Model Name	CPU	Flash	SRAM	Memory Expansion	Ethernet	Wireless Communication	RS-232/RS-485
µPAC-5501(D)	80 MHz	512 KB	512 KB	microSD	10/100 BaseTX	Wi-Fi (802.11 b/g)	1/1
µPAC-5501(D)-FD				microSD + 256 MB Flash			
µPAC-5501(D)-SM				microSD + 512 KB Battery Backup SRAM			

✓ ISaGRAF Based uPAC-5000

Model Name	CPU	Flash	SRAM	Memory Expansion	Ethernet	Wireless Communication	RS-232/RS-485
µPAC-5007(D)	80 MHz	512 KB	768 KB	microSD + 512 KB Battery Backup SRAM	10/100 BaseTX	-	1/1
µPAC-5107(D)						GPS	
µPAC-5207(D)						2G (GPRS)	
µPAC-5307(D)						3G (WCDMA)	
µPAC-5507(D)						Wi-Fi (802.11 b/g)	

ISaGRAF based µPAC-5000. The controller fully supports all five of the IEC61131-3 standard PLC languages:
1. Ladder diagram.
2. Function block diagram.
3. Sequential function chart.
4. Structured text.
5. Instruction List plus flow chart.
It supports DCON and Modbus protocol to link to remote I/O modules via the RS-232/485 or Ethernet.

Features

- MiniOS7 Inside
- C Language Programming
  - □ TCP/IP Library
  - □ Modbus Library
- Various Storage Media
  - □ 512 KB Flash
  - □ 16 KB EEPROM
  - □ microSD
  - □ 256 MB NAND Flash Disk
  - □ 512 KB Battery Backup SRAM
- Various Communication Interfaces
  - □ 10/100 Base-TX Ethernet
  - □ RS-232/485
- 64-bit Hardware Serial Number
- I/O Expansion Bus
- Redundant Power Inputs
- Operating Temperature: -25 ~ +75°C

C Language based µPAC-5000(D) Series

Introduction

The µPAC-5000 series is a palm-size programmable automation controller. It has a 80186 CPU, SRAM , Flash, Ethernet port, RS-232 and RS-485 port. With a DOS-like OS (MiniOS7) and a developed firmware running inside, it can act like a small PC.

ICP DAS provides easy-to-use software development tool kits (Xserver, MiniOS7 framework, VxComm, Modbus libraries). Users can use them to easily integrate serial devices to have Ethernet/Internet communication ability and through the standard Modbus protocol to communicate with SCADA software (Indusoft, ISaGARF, DasyLab, Trace Mode, Citect, iFix, etc.).

For hardware expansion, it also supports an I/O expansion bus. The I/O expansion bus can be used to implement various I/O functions such as D/I, D/O, A/D, D/A, Timer/Counter, UART, and other I/O functions. Nearly all kinds of I/O functions can be implemented by this bus. But the bus can support only one board. There are more than 10 boards available for µPAC-5000 series, you can choose one of them to expand hardware features.

Applications

Rich I/O Expansion Ability

GPS

2G/3G Cell Phone

XW-Board

- Local I/O
- RS-232/422/485
- FRnet
  - FR-2053iT
  - FR-2057iT
  - FR-2054T
- CAN bus
  - I-7530
  - CAN-2018C
  - CAN-2088C

Ethernet

RS-485

Remote I/O
- RU-87Pn
- I-7000
- M-7000

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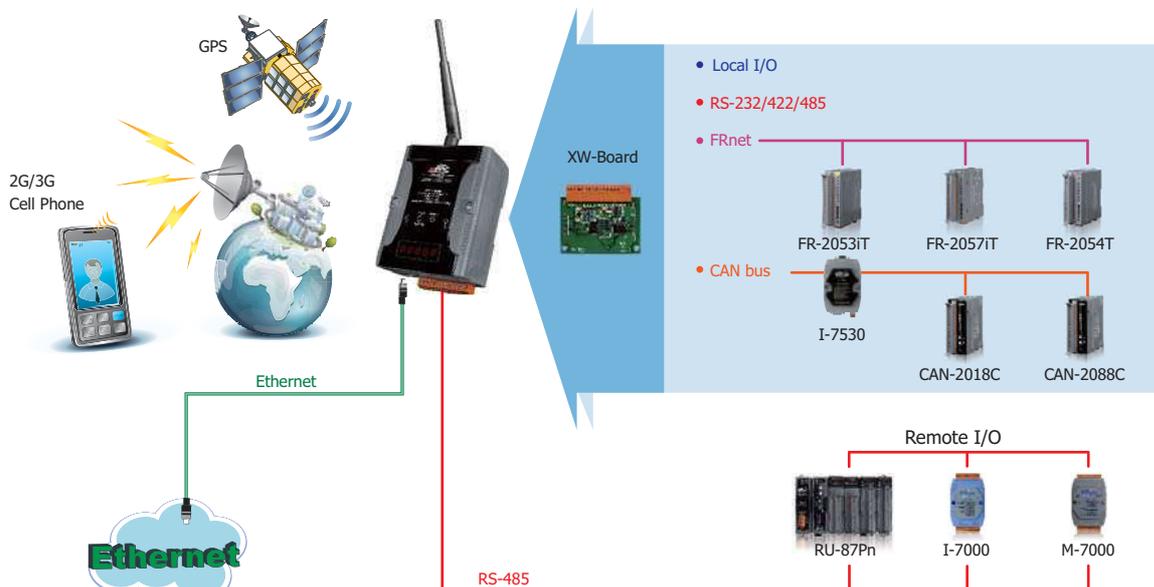
5000 Series PAC

▣ Common Specifications

Models	µPAC-5000 Series	µPAC-5000-FD Series	µPAC-5000-SM Series
OS	MiniOS7 (DOS-like embedded operating system)		
Program Download Interface	RS-232 (COM1) or Ethernet		
Programming Language	C language		
Compilers to create.exe Files	TC++ 1.01 TC 2.01 BC++3.1 ~ 5.2x MSC 6.0 MSVC++ (before version 1.5.2)		
CPU Module			
CPU	80186 or compatible (16-bit and 80 MHz)		
SRAM	512 KB		
Flash	512 KB		
microSD Expansion	Yes, can support 1 or 2 GB microSD		
NAND Flash Disk	-	256 MB	-
Battery Backup SRAM	-		512 KB; data valid up to years
EEPROM	16 KB		
NVRAM	31 Bytes (battery backup, data valid up to 10 years)		31 Bytes (battery backup, data valid up to 5 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 (Auto-negotiating, Auto MDI/MDI-X, LED indicators)		
COM 1	RS-232 (TxD, RxD, RTS, CTS, GND), non-isolated, Speed: 115200 bps max.		
COM 2	RS-485 (D2+, D2-), self-tuner ASIC inside, non-isolated, Speed: 115200 bps max.		
LED Indicator			
Programmable LED Indicators	2		
LED Display	5-digit 7-segment LED display for (D) versions		
Hardware Expansion			
I/O Expansion Bus	Yes (for one XW-Board only)		
Mechanical			
Dimensions (W x H x D)	91 mm x 123 mm x 52 mm		
Installation	DIN-Rail Mounting		
Environmental			
Operating Temperature	-25 ~ +75°C		
Storage Temperature	-30 ~ +80°C		
Ambient Relative Humidity	10 ~ 90% RH (non-condensing)		
Power			
Input Range	+12 ~ +48 V_{DC}		
Isolation	-		
Redundant Power Inputs	Yes		
Protection	Power reverse polarity protection		
Frame Ground	Yes (for ESD Protection)		
Power Consumption	2 W; 2.5 W for (D) version		

Ordering Information	
Models	**Description**
µPAC-5001(D)	uPAC-5000 with LAN
uPAC-5001(D)-FD	uPAC-5000 with LAN and 256 MB flash
uPAC-5001(D)-SM	uPAC-5000 with LAN and 512 KB battery backup SRAM
Note: (D) means with 7-Segment LED Display.	

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5000 Series PAC

GPS Specifications of µPAC-51xx series

GPS	
Channels	32 channels all-in-view tracking
Sensitivity	-159 dBm
Acquisition Rate	Cold start: 42 seconds; warm start: 35 seconds; reacquisition rate: 0.1 second
Accuracy	Position: 25 m CEP (S/A off); Velocity: 0.1 second (S/A off); Time: ±1 ms
Protocol	NMEA

Ordering Information	
Models	**Description**
uPAC-5101(D)	uPAC-5000 with LAN and GPS
uPAC-5101(D)-FD	uPAC-5000 with LAN, GPS and 256 MB flash
uPAC-5101(D)-SM	uPAC-5000 with LAN, GPS and 512 KB battery backup SRAM
Note: (D) means with 7-Segment LED Display.	

2G (GPRS) Specifications of uPAC-52xx series

GSM/GPRS	
Band	850/900/1800/1900 MHz
GPRS Multi-slot	Class 10/8
GPRS Mobile Station	Class B
GPRS Class 10	Max. 85.6 kbps
CSD	Up to 14.4 kbps
Compliant to GSM phase 2/2+	Class 4 (2 W @ 850/900 MHz); Class 1(1W @ 1800/1900 MHz)
Coding Schemes	CS 1, CS 2, CS 3, CS 4
SMS	Text and PDU mode

Ordering Information	
Models	**Description**
uPAC-5201(D)	uPAC-5000 with LAN and 2G (GPRS)
uPAC-5201(D)-FD	uPAC-5000 with LAN, 2G (GPRS) and 256 MB flash
uPAC-5201(D)-SM	uPAC-5000 with LAN, 2G (GPRS) and 512 KB battery backup SRAM
Note: (D) means with 7-Segment LED Display.	

3G (WCDMA) Specifications of uPAC-53xx series

3G (WCDMA)	
Band	UMTS : 2100/1900/850 MHz
Data Transfer	UMTS / HSDPA / HSUPA Upload: Max. 5.76 Mbps; Download: Max. 7.2 Mbps
2G (GPRS)	
Band	850/900/1800/1900 MHz
GPRS Multi-slot	Class 10/8
GPRS Mobile Station	Class B
GPRS Class 10	Max. 85.6 kbps
CSD	Up to 14.4 kbps
Compliant to GSM phase 2/2+	Class 4 (2 W @ 850/900 MHz); Class 1(1W @ 1800/1900 MHz)
Coding Schemes	CS 1, CS 2, CS 3, CS 4
SMS	Text and PDU mode

Ordering Information	
Models	**Description**
uPAC-5301(D)	uPAC-5000 with LAN and 3G (WCDMA)
uPAC-5301(D)-FD	uPAC-5000 with LAN, 3G (WCDMA) and 256 MB flash
uPAC-5301(D)-SM	uPAC-5000 with LAN, 3G (WCDMA) and 512 KB battery backup SRAM
Note: (D) means with 7-Segment LED Display.	

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5000 Series PAC

ZigBee Specifications of uPAC-54xx series

	ZigBee (Host, Coordinator)	ZigBee (Slave, Full Function Device)
RF channels	16	
Receive sensitivity	-102 dBm	
Data encryption	AES-CRT/AES-128	-
Transmit power	9 dBm	
Network topology support	Star, Mesh and Cluster Tree	
Antenna (2.4 GHz)	5 dBi Omni-Directional antenna	
Transmission range (LOS)	?? m	

Ordering Information	
Models	Description
uPAC-5401(D)	uPAC-5000 with LAN and ZigBee (Host, Coordinator)
uPAC-5411(D)	uPAC-5000 with LAN and ZigBee (Slave, Full Function Device)
uPAC-5401(D)-FD	uPAC-5000 with LAN, ZigBee (Host, Coordinator) and 256 MB flash
uPAC-5411(D)-FD	uPAC-5000 with LAN, ZigBee (Slave, Full Function Device) and 256 MB flash
uPAC-5401(D)-SM	uPAC-5000 with LAN, ZigBee (Host, Coordinator) and 512 KB battery backup SRAM
uPAC-5411(D)-SM	uPAC-5000 with LAN, ZigBee (Slave, Full Function Device) and 512 KB battery backup SRAM
Note: (D) means with 7-Segment LED Display.	

Wi-Fi Specifications of uPAC-55xx series

Wi-Fi	
Protocol	IEEE 802.11 b/g
Frequency Range	2.412GHz ~ 2.484GHz
Channel	13 channels
Security	WEP-64/ WEP-128/WPA-TKIP/WPA-AES
Receive sensitivity	-87 dBm(IEEE 802.11b) / -72 dBm (IEEE 802.11g)
Transmit Power	12 dBm(IEEE 802.11b) / 14 dBm(IEEE 802.11g)

Ordering Information	
Models	Description
uPAC-5501(D)	uPAC-5000 with LAN and Wi-Fi (802.11 b/g)
uPAC-5501(D)-FD	uPAC-5000 with LAN, Wi-Fi (802.11 b/g) and 256 MB flash
uPAC-5501(D)-SM	uPAC-5000 with LAN, Wi-Fi (802.11 b/g) and 512 KB battery backup SRAM
Note: (D) means with 7-Segment LED Display.	

Standard Antenna for GPS

ANT-115-03	
Connector	SMA Male
Radiation	Directional
Band	1575.42 ±1.023MHz
Gain(dBi)	2~3
Cable Length	5 m
Installation	Magnetic mount base

Optional Antenna for 2G and 3G

ANT-421-01	
Connector	SMA Male
Radiation	Omni-Directional
Band	824 ~ 960 MHz 1710 ~ 2170 MHz
Gain(dBi)	1.0 ±0.7 @ 830 MHz 0.5 ±0.7 @ 1730 MHz
Cable Length	5 m
Installation	Magnetic mount base

Standard Antenna for ZigBee and Wi-Fi

ANT-124-05	
Connector	RP SMA Male
Radiation	Omni-Directional
Band	2.4 ~ 2.5 GHz
Gain (dBi)	5
Cable Length	20 cm

Standard Antenna for 2G and 3G

ANT-421-02	
Connector	SMA Male
Radiation	Omni-Directional
Band	824 ~ 960 MHz 1710 ~ 2170 MHz
Gain(dBi)	-0.9 ±0.7 @ 890 MHz +1.7 ±0.7 @ 1930 MHz
Cable Length	14 cm

Option Accessories

NS-205 CR	Unmanaged Industrial 5-Port Ethernet Switch
MDR-20-24	24V / 1A, 24 W Power Supply with DIN-Rail Mounting

DIN-KA52F	24V / 1.04A, 25 W Power Supply with DIN-Rail Mounting
3LMSD-2000	2 GB microSD card

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5000 Series PAC

ISaGRAF based µPAC-5000(D) Series

Features

- MiniOS7 Inside
- ISaGRAF Ver.3 SoftLogic: Five IEC 61131-3 Standard Open PLC Languages + Flow Chart
- Various Storage Media
  - □ 512 KB Flash
  - □ 16 KB EEPROM
  - □ 512 KB Battery Backup SRAM
- Various Communication Interface Options
  - □ 10/100 Base-TX Ethernet
  - □ RS-232/485
  - □ GPS
  - □ 2G (GPRS) / 3G (WCDMA)
  - □ Wi-Fi
- 64-bit Hardware Serial Number
- I/O Expansion Bus
- Redundant Power Inputs
- Operating Temperature: -25 ~ +75°C

Introduction

The µPAC-5x07 series is a palm-size programmable automation controller. It has a 80186 CPU, SRAM, Flash, Ethernet port, RS-232 and RS-485 port. With a DOS-like OS (MiniOS7) and a developed firmware running inside, it can act like a small PC.

For hardware expansion, it also supports an I/O expansion bus. The I/O expansion bus can be used to implement various I/O functions such as DI, DO, A/D, D/A, Timer/Counter, UART, and other I/O functions. Nearly all kinds of I/O functions can be implemented by this bus. But the bus can support only one board. There are more than 10 boards available for µPAC-5x07 series, you can choose one of them to expand hardware features.

ISaGRAF is the most powerful SoftLogic package on the market. ISaGRAF is a PLC-like software and it supports IEC 61131-3 standard PLC programming languages (LD, FBD, SFC, ST, IL, FC), and can run the application generated by the workbench on any ISaGRAF PACs. The ISaGRAF workbench Ver. 3.x features

- IEC 61131-3 Standard Open PLC Programming Languages (LD, FBD, SFC, ST, IL, FC) + Flow Chart (FC)
- Auto-Scan I/O
- On-Line Debug/Control/Monitor, Off-Line Simulation
- Simple Graphic HMI
- Support Soft-GRAF HMI
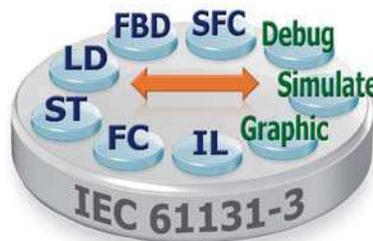
Applications

Rich I/O Expansion Ability

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5000 Series PAC

◢ Common Specifications

Models	µPAC-5xx7 Series	
System Software		
OS	MiniOS7 (DOS-like embedded operating system)	
System Software		
ISaGRAF Software — ISaGRAF Version 3	IEC 61131-3 standard	
ISaGRAF Software — Languages	LD, ST, FBD, SFC, IL & FC	
ISaGRAF Software — Max. Code Size	Accepts max. 64 KB ISaGRAF code size (Appli.x8m must < 64 KB)	
ISaGRAF Software — Scan Time	2 ~ 25 ms for normal program; 10 ~ 125 ms (or more) for complex or large program	
CPU Module		
CPU	80186 or compatible (16-bit and 80 MHz)	
SRAM	768 KB	
Flash	512 KB	
microSD Expansion	Yes (but ISaGRAF doesn't support)	
Battery Backup SRAM	-	512KB ; data valid up to 5 years
EEPROM	16 KB	
NVRAM	31 Bytes (battery backup, data valid up to 5 year)	
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 (Auto-negotiating, Auto MDI/MDI-X, LED indicators)	
COM 1	RS-232 (TxD, RxD, RTS, CTS, GND), non-isolated, Speed: 115200 bps max.	
COM 2	RS-485 (D2+, D2-), self-tuner ASIC inside, non-isolated, Speed: 115200 bps max.	
LED Indicator		
Programmable LED Indicators	2	
LED Display	5-digit 7-segment LED display for (D) versions	
Hardware Expansion		
I/O Expansion Bus	Yes (for one XW-Board only)	
Mechanical		
Dimensions (W x H x D)	91 mm x 123 mm x 52 mm	
Installation	DIN-Rail Mounting	
Environmental		
Operating Temperature	-25 ~ +75°C	
Storage Temperature	-30 ~ +80°C	
Ambient Relative Humidity	10 ~ 90% RH (non-condensing)	
Power		
Input Range	+12 ~ +48 V$_{DC}$	
Isolation	-	
Redundant Power Inputs	Yes	
Protection	Power reverse polarity protection	
Frame Ground	Yes (for ESD Protection)	
Power Consumption	2 W; 2.5 W for (D) version	

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5000 Series PAC

◪ GPS Specifications of µPAC-5107 series

GPS	
Channels	32 channels all-in-view tracking
Sensitivity	-159 dBm
Acquisition Rate	Cold start: 42 seconds; warm start: 35 seconds; reacquisition rate: 0.1 second
Accuracy	Position: 25 m CEP (S/A off); Velocity: 0.1 second (S/A off); Time: ±1 ms
Protocol	NMEA

◪ 2G (GPRS) Specifications of uPAC-5207 series

GSM/GPRS	
Band	850/900/1800/1900 MHz
GPRS Multi-slot	Class 10/8
GPRS Mobile Station	Class B
GPRS Class 10	Max. 85.6 kbps
CSD	Up to 14.4 kbps
Compliant to GSM phase 2/2+	Class 4 (2 W @ 850/900 MHz); Class 1(1W @ 1800/1900 MHz)
Coding Schemes	CS 1, CS 2, CS 3, CS 4
SMS	Text and PDU mode

◪ 3G (WCDMA) Specifications of uPAC-5307 series

3G (WCDMA)	
Band	UMTS : 2100/1900/850 MHz
Data Transfer	UMTS / HSDPA / HSUPA Upload: Max. 5.76 Mbps; Download: Max. 7.2 Mbps
2G (GPRS)	
Band	850/900/1800/1900 MHz
GPRS Multi-slot	Class 10/8
GPRS Mobile Station	Class B
GPRS Class 10	Max. 85.6 kbps
CSD	Up to 14.4 kbps
Compliant to GSM phase 2/2+	Class 4 (2 W @ 850/900 MHz); Class 1(1W @ 1800/1900 MHz)
Coding Schemes	CS 1, CS 2, CS 3, CS 4
SMS	Text and PDU mode

◪ Wi-Fi Specifications of uPAC-5507 series

Wi-Fi	
Protocol	IEEE 802.11 b/g
Frequency Range	2.412GHz ~ 2.484GHz
Channel	13 channels
Security	WEP-64/ WEP-128/WPA-TKIP/WPA-AES
Receive sensitivity	-87 dBm(IEEE 802.11b) / -72 dBm (IEEE 802.11g)
Transmit Power	12 dBm(IEEE 802.11b) / 14 dBm(IEEE 802.11g)

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5000 Series PAC

☑ ISaGRAF Specifications

Protocols (some protocols need optional devices)	
NET ID	User-assigned by software, 1 ~ 255
Modbus RTU/ASCII Master Protocol	Max. 2 COM Ports: COM1, COM2 and COM3 (*). (To connect to other Modbus Slave devices) Max. Modbus_xxx Function Block amount for 2 ports: 128.
Modbus RTU Slave Protocol	Max. 2 COM Ports, COM1 and one of (COM2, COM3) (*). For connecting ISaGRAF, PC/HMI/OPC Server & MMI panels.
Modbus TCP/IP Protocol	Max. 6 connections, Ethernet ports support Modbus TCP/IP Slave Protocol for connecting ISaGRAF & PC/HMI.
User-defined Protocol	COM1, COM2 & COM3 ~ COM8 (*) by serial communication function blocks.
Remote I/O	One of COM2 or COM3 (RS-485) (*) supports I-7000 I/O modules & (I-87Kn or RU-87Pn + I-87K High Profile I/O boards) as Remote I/O. Max. 64 I/O modules for one PAC.
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	Actively or passively sending E-mail via Ethernet port through internet. Max.10 receivers for each sending and can send E-mail with an attached file. (Max. file size is about 488 KB)
SMS: Short Message Service	One of COM1 or COM3 or COM4 (RS-232) (*) 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 modem: GTM-201-RS232 (GSM/GPRS 850/900/1800/1900) Note: µPAC-5207, 5307 has built-in GPRS, no external GSM/GPRS modem required.
Redundancy Solution	Two PACs plug with XW107 in slot0. One is Master, one is Slave. Master handles all inputs & outputs at run time. If Master is damaged (or power off), Slave will take over 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 require any Ethernet Switch). All I/O should be RS-485 I/O except the status I/O in the slot 0: XW107.
CAN/CANopen	Use COM1 or COM3 ~ COM8 (*) to connect one I-7530 (RS-232 to CAN converter) to support CAN/CANopen devices and sensors. One PAC supports max. 3 RS-232 ports to connect max. 3 I-7530 modules. (FAQ - 086)
FTP Client	Support FTP client to upload files in the PAC to a remote FTP server on PC. (FAQ-151)
Optional I/O Functions	
PWM Output	
Pulse Width Modulation Output	All XW-Board series support PWM output. Max. 8 channels for one controller. 500 Hz max. for Off = 1 & On = 1 ms Output square wave: Off: 1 ~ 32767 ms, On: 1 ~ 32767 ms
Counters	
Parallel DI Counter	All XW-Board series support DI counter. Max. 8 channels for one controller. Counter value: 32-bit 500 Hz max. Min. ON & OFF width must > 1 ms
Remote DI Counter	All remote I-7000 & I-87K DI modules support counters. 100 Hz max. value: 0 ~ 65535
Remote High Speed Counter	Optional I-87082: 100 kHz max. ,32-bit

* Note: COM3 ~ COM8 are resided at the optional XW-Board series if it is plugged inside the µPAC-5x07.
* ISaGRAF FAQ: http://www.icpdas.com/faq/isagraf.htm

☑ Standard Antenna for GPS

ANT-115-03	
Connector	SMA Male
Radiation	Directional
Band	1575.42 ±1.023MHz
Gain(dBi)	2~3
Cable Length	5 m
Installation	Magnetic mount base

☑ Optional Antenna for 2G and 3G

ANT-421-01	
Connector	SMA Male
Radiation	Omni-Directional
Band	824 ~ 960 MHz 1710 ~ 2170 MHz
Gain(dBi)	1.0 ±0.7 @ 830 MHz 0.5 ±0.7 @ 1730 MHz
Cable Length	5 m
Installation	Magnetic mount base

☑ Standard Antenna for ZigBee and Wi-Fi

ANT-124-05	
Connector	RP SMA Male
Radiation	Omni-Directional
Band	2.4 ~ 2.5 GHz
Gain (dBi)	5
Cable Length	20 cm

☑ Standard Antenna for 2G and 3G

ANT-421-02	
Connector	SMA Male
Radiation	Omni-Directional
Band	824 ~ 960 MHz 1710 ~ 2170 MHz
Gain(dBi)	-0.9 ±0.7 @ 890 MHz +1.7 ±0.7 @ 1930 MHz
Cable Length	14 cm

☑ Ordering Information

Models	Description
uPAC-5007(D)	ISaGRAF based uPAC-5000 with LAN
uPAC-5107(D)-FD	ISaGRAF based uPAC-5000 with LAN and GPS
uPAC-5207(D)-SM	ISaGRAF based uPAC-5000 with LAN and 2G (GPRS)
uPAC-5307(D)-FD	ISaGRAF based uPAC-5000 with LAN and 3G (WCDMA)
uPAC-5507(D)-FD	ISaGRAF based uPAC-5000 with LAN and Wi-Fi (802.11 b/g)
Note: (D) means with 7-Segment LED Display.	

☑ Option Accessories

NS-205 CR	Unmanaged Industrial 5-Port Ethernet Switch
MDR-20-24	24V / 1A, 24 W Power Supply with DIN-Rail Mounting
DIN-KA52F	24V / 1.04A, 25 W Power Supply with DIN-Rail Mounting

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5000 Series PAC