



### Features

- MiniOS7 Inside
- C Language Programming
  - TCP/IP Library
  - Modbus Library
- Various Storage Media
  - 512 KB Flash
  - 16 KB EEPROM
  - microSD
  - 1 MB NVRAM
  - 64 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
- PoE (Power over Ethernet)
- Operating Temperature: -25 ~ +75 °C



## Introduction

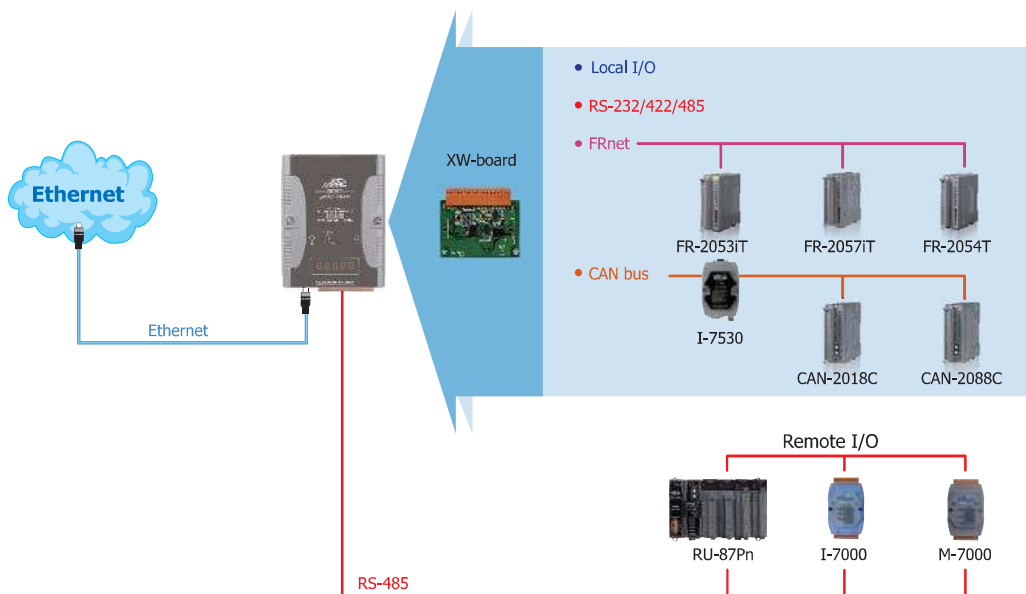
The  $\mu$ PAC-5000 series is a palm-size programmable automation controller. It has a 80186 CPU, SRAM, Flash, Ethernet port, RS-232 and RS-485 port. With a DOS-like OS (MiniOS7) and a developed firmware running inside, it can act like a small PC.

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  $\mu$ PAC-5000 series, you can choose one of them to expand hardware features.

## Applications

Rich I/O Expansion Ability



**Specifications**

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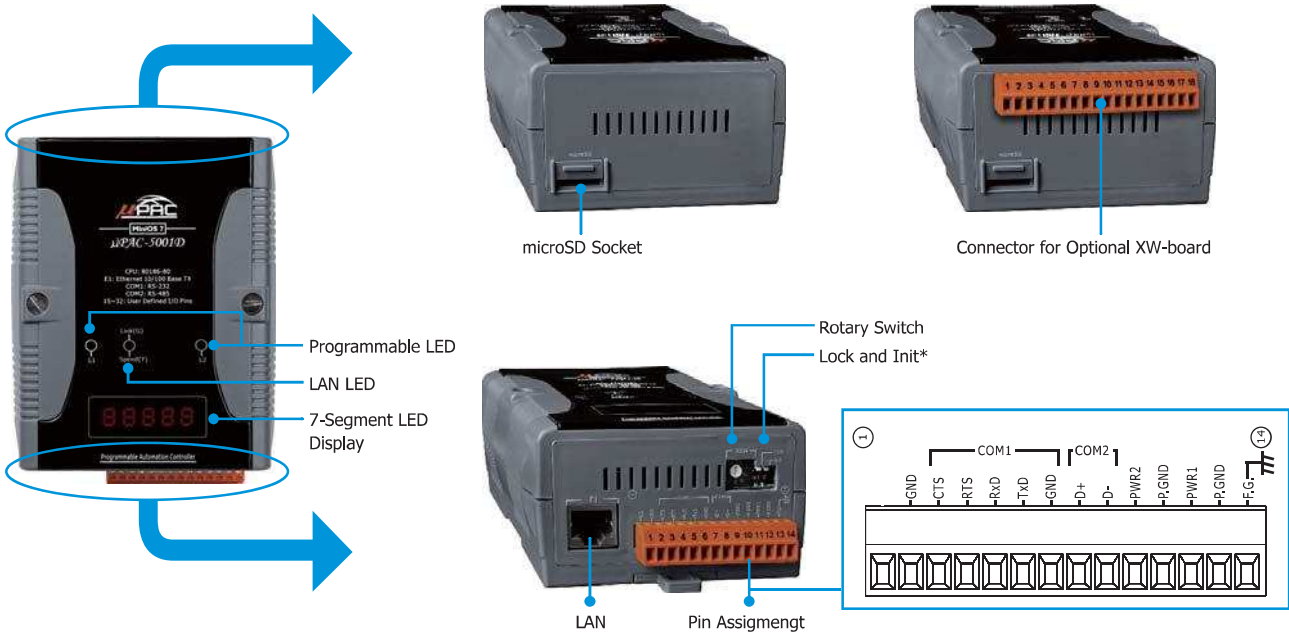
5000 Series μPAC

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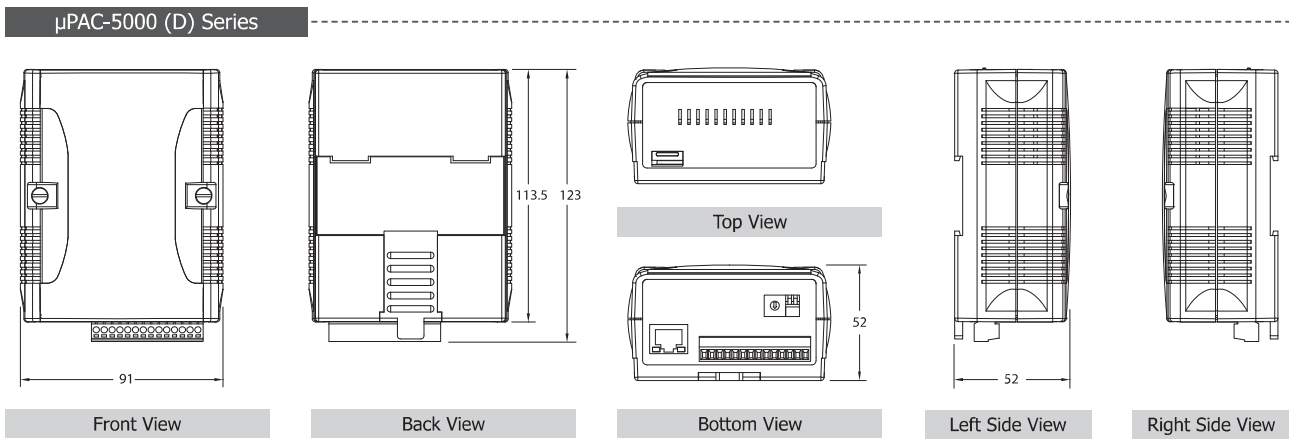
μPAC-5000 Series

Models	Regular version	μPAC-5001 (D)	μPAC-5001-FD (D)	μPAC-5002 (D)	μPAC-5002-FD (D)	μPAC-5002-NV (D)	μPAC-5002-SM (D)
	PoE version	μPAC-5001P (D)	μPAC-5001P-FD (D)	μPAC-5002P (D)	μPAC-5002P-FD (D)	μPAC-5002P-NV (D)	μPAC-5002P-SM (D)
<b>System Software</b>							
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 (Freeware) TC 2.01 (Freeware) BC++3.1 ~ 5.2x MSC 6.0 MSVC++ (before version 1.5.2)						
<b>CPU Module</b>							
CPU	80186 or compatible (16-bit and 80 MHz)						
SRAM	512 KB			768 KB			
Flash	512 KB; Erase unit is one sector (64 K bytes); 100,000 erase/write cycles						
microSD Expansion	Yes, can support 1 or 2 GB microSD						
64 MB NAND Flash Disk	-	Yes	-	Yes	-	-	-
1 MB NVRAM	-	-	-	-	-	Yes	-
512 KB Battery Backup SRAM	-	-	-	-	-	-	Yes
EEPROM	16 KB						
NVRAM	31 Bytes (battery backup, data valid up to 5 year)						
RTC (Real Time Clock)	RTC Provide seconds, minutes, hours, date of week/month; month and year, valid from 1980 to 2079						
64-bit Hardware Serial Number	Yes						
Watchdog Timers	Yes (0.8 second)						
<b>Communication Ports</b>							
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.						
<b>LED Indicator</b>							
Programmable LED Indicators	2						
LED Display	5-digit 7-segment LED display for (D) versions						
<b>Hardware Expansion</b>							
I/O Expansion Bus	Yes						
<b>Mechanical</b>							
Dimensions (W x H x D)	91 mm x 123 mm x 52 mm						
Installation	DIN-Rail						
<b>Environmental</b>							
Operating Temperature	-25 ~ +75 °C						
Storage Temperature	-30 ~ +80 °C						
Ambient Relative Humidity	10 ~ 90% RH (non-condensing)						
<b>Power</b>							
Protection	Power reverse polarity protection						
Frame Ground	Yes (for ESD Protection)						
Input Range	+12 ~ +48 V <sub>DC</sub>						
Isolation	-						
Redundant Power Inputs	Yes						
Power over Ethernet (PoE)	Regular version	-					
	PoE version	IEEE 802.3af Class 1					
Power Consumption	2 W; 2.5 W for (D) version						

Appearance



Dimensions (Unit: mm)



Ordering Information

Models						Description
μPAC-5001 (D)	μPAC-5001-FD (D)	μPAC-5002 (D)	μPAC-5002-FD (D)	μPAC-5002-NV (D)	μPAC-5002-SM (D)	MiniOS7 based Ethernet μPAC
μPAC-5001P (D)	μPAC-5001P-FD (D)	μPAC-5002P (D)	μPAC-5002P-FD (D)	μPAC-5002P-NV (D)	μPAC-5002P-SM (D)	MiniOS7 based PoE μPAC

Note: (D) means with 7-Segment LED Display.

Option Accessories for Regular Version

NS-205 CR	Unmanaged 5-Port Industrial Ethernet Switch
MDR-20-24	24V/1A, 24W Power Supply with DIN-Rail Mounting
DIN-KA52F	24V/1.04A, 25W Power Supply with DIN-Rail Mounting
3LMSD-2000	2 GB microSD card

Option Accessories for PoE Version

NS-205PSE CR	Industrial 5-Port PoE Ethernet Switch
NS-208PSE CR	Industrial 8-port 10/100Mbps Ethernet with 8-port PoE Switch
NS-208PSE-4 CR	Industrial 8-port 10/100Mbps Ethernet with 4-port PoE Switch
NS-205PSE-24V CR	Industrial 5-port 10/100Mbps Ethernet with 4-port PoE Switch; 24 Vdc Input
MDR-60-48	48 V/1.25 A, 60 W Power Supply with DIN-Rail Mounting
DIN-KA52F-48	48 V/0.52 A, 25 W Power Supply with DIN-Rail Mounting



$\mu$ PAC-5201(D)     $\mu$ PAC-5201(D)-FD     $\mu$ PAC-5202(D)  
 $\mu$ PAC-5202(D)-FD     $\mu$ PAC-5202(D)-NV     $\mu$ PAC-5202(D)-SM

### Features

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



### Introduction

The  $\mu$ PAC-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  $\mu$ PAC-5000 series, you can choose one of them to expand hardware features.

### Applications

#### Rich I/O Expansion Ability



**Specifications**

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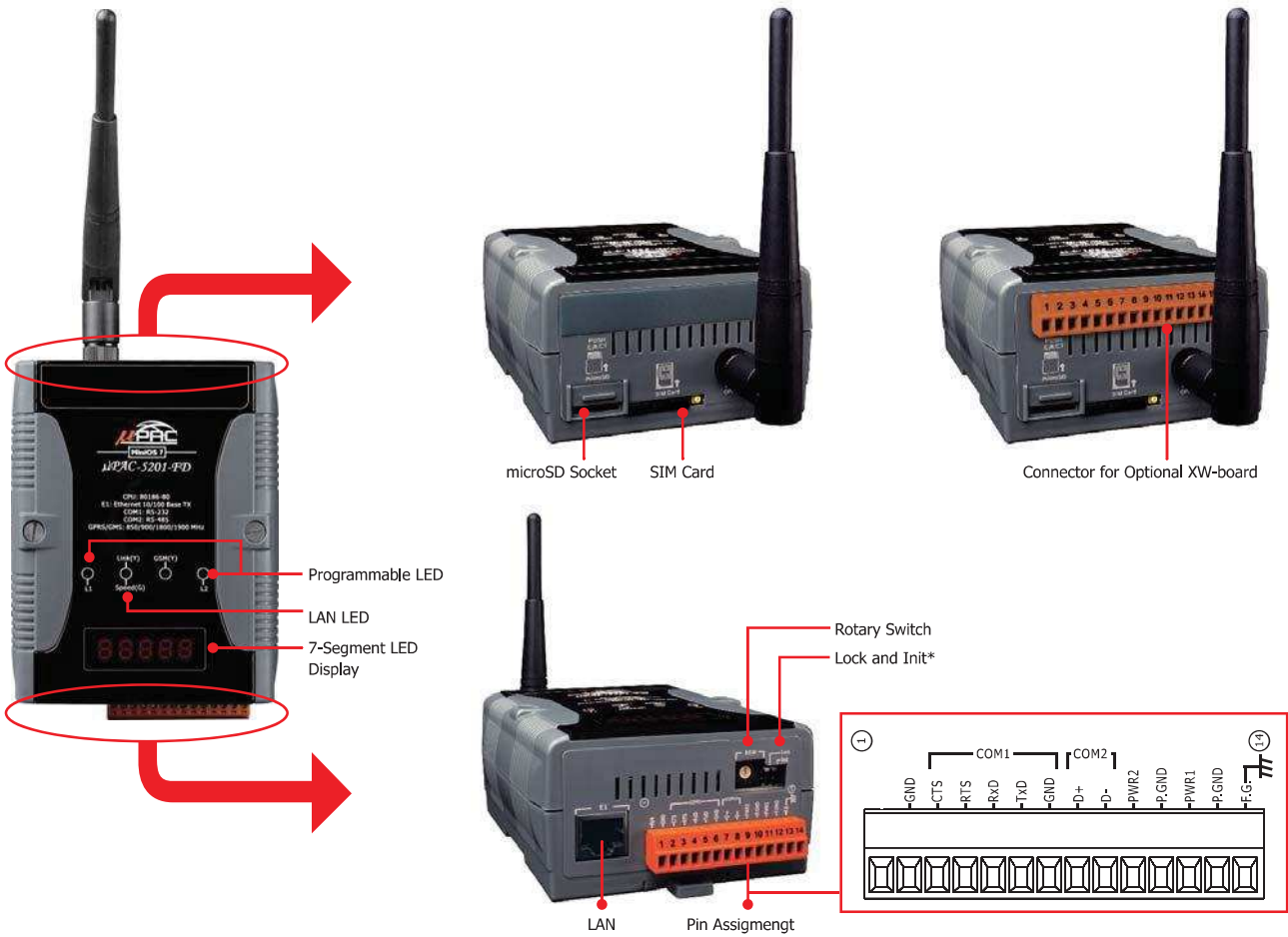
5000 Series μPAC

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μPAC-5000 Series

Models	μPAC-5201(D)	μPAC-5201(D)-FD	μPAC-5202(D)	μPAC-5202(D)-FD	μPAC-5202(D)-NV	μPAC-5202(D)-SM
<b>System Software</b>						
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 (Freeware) TC 2.01 (Freeware) BC++3.1 ~ 5.2x MSC 6.0 MSVC++ (before version 1,5,2)					
<b>CPU Module</b>						
CPU	80186 or compatible (16-bit and 80 MHz)					
SRAM	512 KB		768 KB			
Flash	512 KB; Erase unit is one sector (64 K bytes); 100,000 erase/write cycles					
microSD Expansion	Yes, can support 1 or 2 GB microSD					
256 MB NAND Flash Disk	-	Yes	-	Yes	-	-
1 MB NVRAM	-		-		Yes	-
512 KB Battery Backup SRAM	-		-		-	Yes
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)					
<b>Communication Ports</b>						
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.					
<b>LED Indicator</b>						
Programmable LED Indicators	2					
LED Display	5-digit 7-segment LED display for (D) versions					
<b>Hardware Expansion</b>						
I/O Expansion Bus	Yes					
<b>GSM/GPRS</b>						
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					
<b>Mechanical</b>						
Dimensions (W x H x D)	91 mm x 123 mm x 52 mm					
Installation	DIN-Rail					
<b>Environmental</b>						
Operating Temperature	-25 ~ +75°C					
Storage Temperature	-30 ~ +80°C					
Ambient Relative Humidity	10 ~ 90% RH (non-condensing)					
<b>Power</b>						
Protection	Power reverse polarity protection					
Frame Ground	Yes (for ESD Protection)					
Input Range	+12 ~ +48 V <sub>bc</sub>					
Isolation	-					
Redundant Power Inputs	Yes					
Power Consumption	2 W; 2.5 W for (D) version					


Appearance



Ordering Information

Models	Description
μPAC-5201(D)   μPAC-5201(D)-FD   μPAC-5202(D)   μPAC-5202(D)-FD   μPAC-5202(D)-NV   μPAC-5202(D)-SM	MiniOS7 based Ethernet μPAC With GSM/GPS function


Standard External GSM/GPRS Antenna

	<b>ANT-421-02</b>	
	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	15 cm

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

Optional GSM/GPRS Antenna

	<b>ANT-421-01</b>	
	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