



# $\mu$ PAC-5001(D)/ $\mu$ PAC-5001(D)-FD

Standard Palm-sized PAC with 80186-80 CPU, MiniOS7 (256 MB Flash and 7-Segment LED Display)

#### **₱** Features

- Built-in High-Performance MiniOS7 from ICP DAS
- Easy-to-use Software Development Tool Kits (Using C language)
- Various Storage Media
  - 512 KB Flash
  - 16 KB EEPROM
  - microSD (Up to 32GB micro SD cards are supported)
- Various Communication Interfaces (Ethernet, RS-232/RS-485)
- 64-bit Hardware Serial Number
- I/O Expansion Bus Interface
- Redundant Power Inputs









#### **■** Introduction

The  $\mu$ PAC-5001(D)/ $\mu$ PAC-5001(D)-FD is a programmable automation controller with RS-232/485 and Ethernet communication interfaces. ICP DAS provides easy-to-use software development tool kits (MiniOS7 framework, 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, the  $\mu$ PAC-5001(D)/ $\mu$ PAC-5001(D)-FD also supports an I/O expansion bus. A cost-effective I/O expansion board with A/D, D/A, D/I, D/O and serial ports is available. Nearly all kinds of I/O functions can be implemented by this bus. There are more than 10 boards available for  $\mu$ PAC-5001(D)/ $\mu$ PAC-5001(D)-FD, you can choose one of them to expand hardware features.

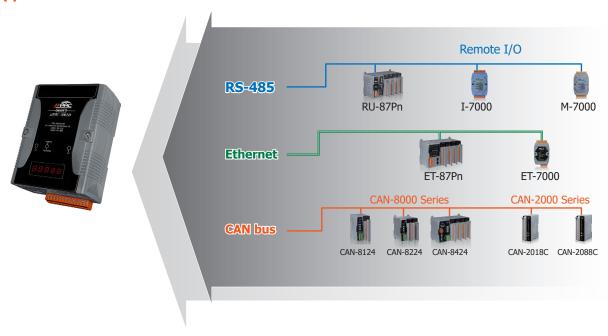
#### **■ Powerful Embedded OS — MiniOS7**



MiniOS7 is the most stable OS used in the last decade. Up to now, several hundred thousand copies with our PACs have been distributed worldwide.

- DOS-like embedded OS
- Antivirus ability
- · Internet connectivity
- Short boot period (<1 Second)
- · Less memory resource required
- Faster watchdog response time
- Libraries & demo programs for various peripherals, devices and remote I/O modules

#### Appications



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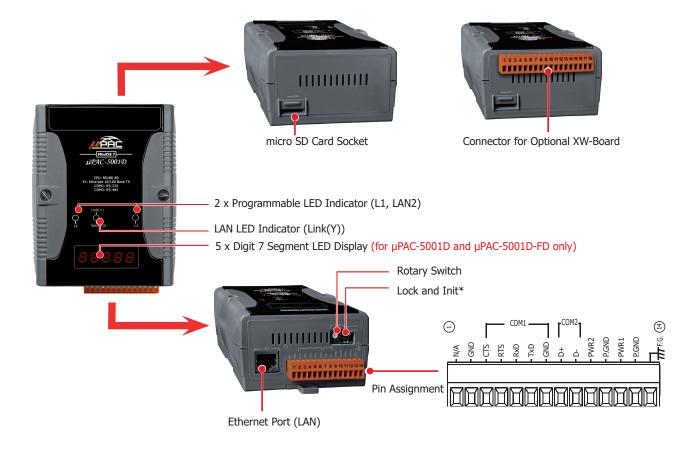
# **■** Specifications

| MiniOS7 Development  C Language  CPU Module  CPU 80186 or compatible, 16-bit and 80 MHz  SRAM 512 KB  NAND Flash - 256 MB - 256 MB  Flash 512 KB  NAND Flash - 16 KB  NAVRAM 31 Bytes  Storage Expansion Yes, support up 32 GB microSD card  RTC (Real Time Clock) Provide seconds, minutes, hours, dates, day of week, month, year  S4-bit Hardware Serial Number Yes  Watchdog Timer Yes  Display  Type - 5 x Digit 7 Segment LED Display  LED Indicator  Status 2 x Programmable  Communication Interface  Ethernet 1 x RJ-45, 10/100 Base-TX (Auto-negotiating, Auto MDI/MDI-X, LED indicators)  COM1 RS-232 (TXD, RXD, RTS, CTS, GND), Non-isolated, Speed: 115200 bps Max.  L/O Expansion  L/O Type XW-board  Mechanical  Dinension (W x H x D) 91 mm x 123 mm x 52 mm  Dinstaliation DIN-Rail Mounting  Environmental  Operating Temperature -25 ~ +75 °C  Storage Temperature  -25 ~ +75 °C  Storage Temperature  -25 ~ +75 °C  Storage Temperature  -25 ~ +75 °C  Storage Temperature  -25 ~ +75 °C   | Model                         | μ <b>PAC-5001</b>   | μ <b>PAC-5001-FD</b> | μ <b>PAC-5001D</b> | μPAC-5001D-FD    |  |
|--|-------------------------------|---|----------------------|--------------------|------------------|--|
| CPU Module  CPU 80186 or compatible, 16-bit and 80 MHz  SRAM 512 KB  NAND Flash - 256 MB - 256 MB  Flash 512 KB  Flash 61 KB  Flas | Software                      |   |                      |                    |                  |  |
| Solition    | OS                            | MiniOS7   |                      |                    |                  |  |
| SRAM   | Development                   | C Language  |                      |                    |                  |  |
| SRAM   S12 KB   NAND Flash   -   256 MB   -   256 MB   | CPU Module                    |   |                      |                    |                  |  |
| NAND Flash - 256 MB - 256 MB - 512 KB  Flash - 512 KB  Storage Expansion - 16 KB  NVRAM - 31 Bytes  Storage Expansion - Yes, support up 32 GB microSD card  RTC (Real Time Clock) - Provide seconds, minutes, hours, dates, day of week, month, year  64-bit Hardware Serial Number - Yes  Watchdog Timer - Yes  Display  Type - 5 x Digit 7 Segment LED Display  LED Indicator  Status - 2 x Programmable  Communication Interface  Ethernet - 1 x RJ-45, 10/100 Base-TX (Auto-negotiating, Auto MDI/MDI-X, LED indicators)  COM1 - RS-232 (TXD, RXD, RTS, CTS, GND), Non-isolated, Speed: 115200 bps Max.  COM2 - RS-485 (Data+, Data-) with internal self-tuner ASIC; Non-isolated, Speed: 115200 bps Max.  L/O Expansion  L/O Type - XW-board  Mechanical  Dimension (W x H x D) - 91 mm x 123 mm x 52 mm  Installation - DIN-Rail Mounting  Environmental  Operating Temperature - 25 ~ +75 °C - 30 ~ +80 °C  Humidity - 10 ~ 90 % RH, Non-condensing   | CPU                           | 80186 or compatible, 16-bit and 80 MHz  |                      |                    |                  |  |
| Flash 512 KB  SEEPROM 16 KB  NVRAM 31 Bytes  Storage Expansion Yes, support up 32 GB microSD card  RTC (Real Time Clock) Provide seconds, minutes, hours, dates, day of week, month, year  Set-bit Hardware Serial Number  Watchdog Timer  Yes  Display  Type - 5 x Digit 7 Segment LED Display  LED Indicator  Status 2 x Programmable  Communication Interface  Ethernet 1 x RJ-45, 10/100 Base-TX (Auto-negotiating, Auto MDI/MDI-X, LED indicators)  COM1 R5-232 (TXD, RXD, RTS, CTS, GND), Non-isolated, Speed: 115200 bps Max.  COM2 R5-485 (Data+, Data-) with internal self-tuner ASIC; Non-isolated, Speed: 115200 bps Max.  L/O Expansion  L/O Type XW-board  Macchanical  Dimension (W x H x D) 91 mm x 123 mm x 52 mm  Installation DIN-Rail Mounting  Environmental  Operating Temperature -25 ~ +75 °C  -30 ~ +80 °C  Humidity 10 ~ 90 % RH, Non-condensing  | SRAM                          | 512 KB  |                      |                    |                  |  |
| The EEPROM 16 KB  NVRAM 31 Bytes  Storage Expansion Yes, support up 32 GB microSD card  NVRAM Provide seconds, minutes, hours, dates, day of week, month, year  Set-bit Hardware Serial Number Yes  Watchdog Timer Yes  Display  Type - 5 x Digit 7 Segment LED Display  LED Indicator  Status 2 x Programmable  Communication Interface  Ethernet 1 x RJ-45, 10/100 Base-TX (Auto-negotiating, Auto MDI/MDI-X, LED indicators)  COM1 RS-232 (TXD, RXD, RTS, CTS, GND), Non-isolated, Speed: 115200 bps Max.  COM2 RS-485 (Data+, Data-) with internal self-tuner ASIC; Non-isolated, Speed: 115200 bps Max.  LI/O Expansion  I/O Type XW-board  Mechanical  Dimension (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  Hemidity 10 ~ 90 % RH, Non-condensing  | NAND Flash                    | -   | 256 MB               | -                  | 256 MB           |  |
| Storage Expansion  Yes, support up 32 GB microSD card  Provide seconds, minutes, hours, dates, day of week, month, year  S4-bit Hardware Serial Number  Yes  Watchdog Timer  Provide seconds, minutes, hours, dates, day of week, month, year  Yes  Display  Type  - 5 x Digit 7 Segment LED Display  LED Indicator  Status  2 x Programmable  Communication Interface  Ethernet  1 x RJ-45, 10/100 Base-TX (Auto-negotiating, Auto MDI/MDI-X, LED indicators)  COM1  RS-232 (TXD, RXD, RTS, CTS, GND), Non-isolated, Speed: 115200 bps Max.  COM2  RS-485 (Data+, Data-) with internal self-tuner ASIC; Non-isolated, Speed: 115200 bps Max.  I/O Expansion  I/O Type  XW-board  Mechanical  Dimension (W x H x D)  91 mm x 123 mm x 52 mm  Installation  DIN-Rail Mounting  Environmental  Operating Temperature  -25 ~ +75 °C  -30 ~ +80 °C  Humidity  10 ~ 90 % RH, Non-condensing   | Flash                         | 512 KB  |                      |                    |                  |  |
| Storage Expansion  Yes, support up 32 GB microSD card  Provide seconds, minutes, hours, dates, day of week, month, year  Yes  Watchdog Timer  Provide Seconds, minutes, hours, dates, day of week, month, year  Yes  Watchdog Timer  Provide Seconds, minutes, hours, dates, day of week, month, year  Yes  Display  Type  - 5 x Digit 7 Segment LED Display  LED Indicator  Status  2 x Programmable  Communication Interface  Ethernet  1 x RJ-45, 10/100 Base-TX (Auto-negotiating, Auto MDI/MDI-X, LED indicators)  COM1  RS-232 (TXD, RXD, RTS, CTS, GND), Non-isolated, Speed: 115200 bps Max.  COM2  RS-485 (Data+, Data-) with internal self-tuner ASIC; Non-isolated, Speed: 115200 bps Max.  L/O Expansion  L/O Type  XW-board  Mechanical  Dimension (W x H x D)  Installation  DIN-Rail Mounting  Environmental  Operating Temperature  -25 ~ +75 °C  -30 ~ +80 °C  Humidity  10 ~ 90 % RH, Non-condensing   | EEPROM                        | 16 KB   |                      |                    |                  |  |
| Provide seconds, minutes, hours, dates, day of week, month, year  Yes  Watchdog Timer  Yes  Display  Type  - 5 x Digit 7 Segment LED Display  LED Indicator  Status  2 x Programmable  Communication Interface  Ethernet  1 x RJ-45, 10/100 Base-TX (Auto-negotiating, Auto MDI/MDI-X, LED indicators)  COM1  RS-232 (TXD, RXD, RTS, CTS, GND), Non-isolated, Speed: 115200 bps Max.  COM2  RS-485 (Data+, Data-) with internal self-tuner ASIC; Non-isolated, Speed: 115200 bps Max.  I/O Expansion  I/O Type  XW-board  Mechanical  Dimension (W x H x D)  Installation  DIN-Rail Mounting  Environmental  Operating Temperature  -25 ~ +75 °C  Storage Temperature  -20 ~ +80 °C  Humidity  10 ~ 90 % RH, Non-condensing  | NVRAM                         | 31 Bytes  |                      |                    |                  |  |
| Watchdog Timer  Watchdog Timer  Ves  Display  Type  - 5 x Digit 7 Segment LED Display  LED Indicator  Status  2 x Programmable  Communication Interface  Ethernet  1 x RJ-45, 10/100 Base-TX (Auto-negotiating, Auto MDI/MDI-X, LED indicators)  COM1  RS-232 (TXD, RXD, RTS, CTS, GND), Non-isolated, Speed: 115200 bps Max.  COM2  RS-485 (Data+, Data-) with internal self-tuner ASIC; Non-isolated, Speed: 115200 bps Max.  I/O Expansion  I/O Type  XW-board  Mechanical  Dimension (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  Humidity  10 ~ 90 % RH, Non-condensing   | Storage Expansion             | Yes, support up 32 GB microSD card  |                      |                    |                  |  |
| Display Type - 5 x Digit 7 Segment LED Display  LED Indicator  Status 2 x Programmable  Communication Interface  Ethernet 1 x RJ-45, 10/100 Base-TX (Auto-negotiating, Auto MDI/MDI-X, LED indicators)  COM1 RS-232 (TXD, RXD, RTS, CTS, GND), Non-isolated, Speed: 115200 bps Max.  COM2 RS-485 (Data+, Data-) with internal self-tuner ASIC; Non-isolated, Speed: 115200 bps Max.  I/O Expansion  I/O Type XW-board  Mechanical  Dimension (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  Humidity 10 ~ 90 % RH, Non-condensing  | RTC (Real Time Clock)         | Provide seconds, minutes, hours, dates, day of week, month, year                          |                      |                    |                  |  |
| Type - 5 x Digit 7 Segment LED Display  LED Indicator  Status 2 x Programmable  Communication Interface  Ethernet 1 x RJ-45, 10/100 Base-TX (Auto-negotiating, Auto MDI/MDI-X, LED indicators)  COM1 RS-232 (TXD, RXD, RTS, CTS, GND), Non-isolated, Speed: 115200 bps Max.  COM2 RS-485 (Data+, Data-) with internal self-tuner ASIC; Non-isolated, Speed: 115200 bps Max.  I/O Expansion  I/O Type XW-board  Mechanical  Dimension (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  Humidity 10 ~ 90 % RH, Non-condensing  | 64-bit Hardware Serial Number | Yes   |                      |                    |                  |  |
| Type - 5 x Digit 7 Segment LED Display  LED Indicator  Status 2 x Programmable  Communication Interface  Ethernet 1 x RJ-45, 10/100 Base-TX (Auto-negotiating, Auto MDI/MDI-X, LED indicators)  COM1 RS-232 (TXD, RXD, RTS, CTS, GND), Non-isolated, Speed: 115200 bps Max.  COM2 RS-485 (Data+, Data-) with internal self-tuner ASIC; Non-isolated, Speed: 115200 bps Max.  I/O Expansion  I/O Type XW-board  Mechanical  Dimension (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  Humidity 10 ~ 90 % RH, Non-condensing  | Watchdog Timer                | Yes   |                      |                    |                  |  |
| Status 2 x Programmable  Communication Interface  Ethernet 1 x RJ-45, 10/100 Base-TX (Auto-negotiating, Auto MDI/MDI-X, LED indicators)  COM1 RS-232 (TXD, RXD, RTS, CTS, GND), Non-isolated, Speed: 115200 bps Max.  COM2 RS-485 (Data+, Data-) with internal self-tuner ASIC; Non-isolated, Speed: 115200 bps Max.  I/O Expansion  I/O Type XW-board  Mechanical  Dimension (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  Humidity 10 ~ 90 % RH, Non-condensing   | Display                       |   |                      |                    |                  |  |
| Communication Interface  Ethernet 1 x RJ-45, 10/100 Base-TX (Auto-negotiating, Auto MDI/MDI-X, LED indicators)  COM1 RS-232 (TXD, RXD, RTS, CTS, GND), Non-isolated, Speed: 115200 bps Max.  COM2 RS-485 (Data+, Data-) with internal self-tuner ASIC; Non-isolated, Speed: 115200 bps Max.  I/O Expansion  I/O Type XW-board  Mechanical  Dimension (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  Humidity 10 ~ 90 % RH, Non-condensing  | Туре                          | - 5 x Digit 7 Segment LED Display   |                      |                    | nent LED Display |  |
| Communication Interface  Ethernet 1 x RJ-45, 10/100 Base-TX (Auto-negotiating, Auto MDI/MDI-X, LED indicators)  COM1 RS-232 (TXD, RXD, RTS, CTS, GND), Non-isolated, Speed: 115200 bps Max.  COM2 RS-485 (Data+, Data-) with internal self-tuner ASIC; Non-isolated, Speed: 115200 bps Max.  I/O Expansion  I/O Type XW-board  Mechanical  Dimension (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  Humidity 10 ~ 90 % RH, Non-condensing  | LED Indicator                 |   |                      |                    |                  |  |
| Ethernet 1 x RJ-45, 10/100 Base-TX (Auto-negotiating, Auto MDI/MDI-X, LED indicators)  RS-232 (TXD, RXD, RTS, CTS, GND), Non-isolated, Speed: 115200 bps Max.  RS-485 (Data+, Data-) with internal self-tuner ASIC; Non-isolated, Speed: 115200 bps Max.  I/O Expansion  I/O Type XW-board  Mechanical  Dimension (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  Humidity 10 ~ 90 % RH, Non-condensing   | Status                        | 2 x Programmable  |                      |                    |                  |  |
| RS-232 (TXD, RXD, RTS, CTS, GND), Non-isolated, Speed: 115200 bps Max.  RS-485 (Data+, Data-) with internal self-tuner ASIC; Non-isolated, Speed: 115200 bps Max.  I/O Expansion  I/O Type  XW-board  Mechanical  Dimension (W x H x D)  Installation  DIN-Rail Mounting  Environmental  Operating Temperature  -25 ~ +75 °C  Storage Temperature  -30 ~ +80 °C  Humidity  RS-232 (TXD, RXD, RTS, CTS, GND), Non-isolated, Speed: 115200 bps Max.  RS-485 (Data+, Data-) with internal self-tuner ASIC; Non-isolated, Speed: 115200 bps Max.  RS-485 (Data+, Data-) with internal self-tuner ASIC; Non-isolated, Speed: 115200 bps Max.  RS-485 (Data+, Data-) with internal self-tuner ASIC; Non-isolated, Speed: 115200 bps Max.  I/O Expansion  I/O Type  XW-board  DIN-Rail Mounting  Environmental  Operating Temperature  -25 ~ +75 °C  -30 ~ +80 °C  Humidity   | Communication Interface       |   |                      |                    |                  |  |
| RS-485 (Data+, Data-) with internal self-tuner ASIC; Non-isolated, Speed: 115200 bps Max.  I/O Expansion  I/O Type  XW-board  Mechanical  Dimension (W x H x D)  Installation  DIN-Rail Mounting  Environmental  Operating Temperature  -25 ~ +75 °C  -30 ~ +80 °C  Humidity  RS-485 (Data+, Data-) with internal self-tuner ASIC; Non-isolated, Speed: 115200 bps Max.  | Ethernet                      | 1 x RJ-45, 10/100 Base-TX (Auto-negotiating, Auto MDI/MDI-X, LED indicators)              |                      |                    |                  |  |
| I/O Type XW-board  Mechanical  Dimension (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  Humidity 10 ~ 90 % RH, Non-condensing  | COM1                          | RS-232 (TXD, RXD, RTS, CTS, GND), Non-isolated, Speed: 115200 bps Max.                    |                      |                    |                  |  |
| Mechanical  Dimension (W x H x D)  Installation  DIN-Rail Mounting  Environmental  Operating Temperature  -25 ~ +75 °C  Storage Temperature  -30 ~ +80 °C  Humidity  XW-board  XW-board  XW-board  XW-board  A W-board  DIN-Rail Mounting  Environmental  -25 ~ +75 °C  -30 ~ +80 °C   | COM2                          | RS-485 (Data+, Data-) with internal self-tuner ASIC; Non-isolated, Speed: 115200 bps Max. |                      |                    |                  |  |
| Mechanical  Dimension (W x H x D)  1. Stallation  DIN-Rail Mounting  Environmental  Operating Temperature  -25 ~ +75 °C  -30 ~ +80 °C  Humidity  10 ~ 90 % RH, Non-condensing  | I/O Expansion                 |   |                      |                    |                  |  |
| Dimension (W x H x D)  91 mm x 123 mm x 52 mm  DIN-Rail Mounting  Environmental  Operating Temperature  -25 ~ +75 °C  Storage Temperature  -30 ~ +80 °C  Humidity  10 ~ 90 % RH, Non-condensing  | I/O Type                      | XW-board  |                      |                    |                  |  |
| Installation DIN-Rail Mounting  Environmental  Operating Temperature -25 ~ +75 °C  Storage Temperature -30 ~ +80 °C  Humidity 10 ~ 90 % RH, Non-condensing   | Mechanical                    |   |                      |                    |                  |  |
| Environmental  Operating Temperature  -25 ~ +75 °C  Storage Temperature  -30 ~ +80 °C  Humidity  10 ~ 90 % RH, Non-condensing  | Dimension (W x H x D)         | 91 mm x 123 mm x 52 mm  |                      |                    |                  |  |
| Operating Temperature $-25 \sim +75  ^{\circ}\text{C}$ Storage Temperature $-30 \sim +80  ^{\circ}\text{C}$ Humidity $10 \sim 90  ^{\circ}\text{RH}$ , Non-condensing  | Installation                  | DIN-Rail Mounting   |                      |                    |                  |  |
| Storage Temperature  -30 ~ +80 °C  Humidity  10 ~ 90 % RH, Non-condensing  | Environmental                 |   |                      |                    |                  |  |
| Humidity 10 ~ 90 % RH, Non-condensing  | Operating Temperature         | -25 ~ +75 °C  |                      |                    |                  |  |
|  | Storage Temperature           | -30 ∼ +80 °C  |                      |                    |                  |  |
| Power  | Humidity                      | 10 ~ 90 % RH, Non-condensing  |                      |                    |                  |  |
|  |                               |   |                      |                    |                  |  |
| Input Range +12 ~ +48 VDC  | Input Range                   | +12 ~ +48 VDC   |                      |                    |                  |  |
| Redundant Power Inputs Yes   | Redundant Power Inputs        | Yes   |                      |                    |                  |  |
| Consumption 2.0 W 2.5 W  | Consumption                   | 2.0   | W                    | 2.5                | W                |  |

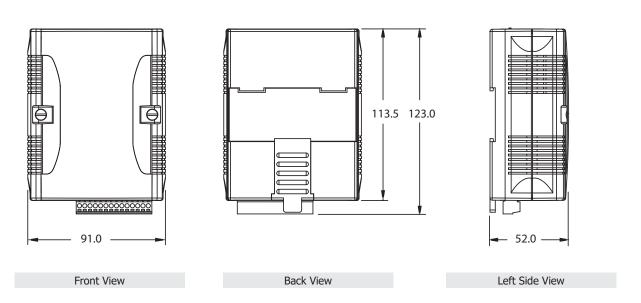
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### **Appearances**



## **■** Dimensions (Units: mm)



## **■** Ordering Information

| μPAC-5001 CR     | Standard Palm-sized PAC with 80186-80 CPU and MiniOS7 (RoHS)                                      |  |  |
|------------------|---|--|--|
| μPAC-5001D CR    | Standard Palm-sized PAC with 80186-80 CPU, MiniOS7 and 7-Segment LED Display (RoHS)               |  |  |
| μPAC-5001-FD CR  | Standard Palm-sized PAC with 80186-80 CPU, MiniOS7 and 256 MB Flash (RoHS)                        |  |  |
| μPAC-5001D-FD CR | Standard Palm-sized PAC with 80186-80 CPU, MiniOS7, 256 MB Flash and 7-Segment LED Display (RoHS) |  |  |

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