

## 3.7. $\mu$ PAC-7186EX(D)-MTCP Modbus to Ethernet Gateway



### $\mu$ PAC-7186EX(D)-MTCP

Modbus/RTU to Modbus/TCP Gateway

#### Features

- Incorporate Serial Devices in an Ethernet network
- Supports Modbus/TCP and Modbus/RTU
- "Virtual COM" extends PC COM ports
- Virtual COM for 32-bit and 64-bit Windows XP/2003/Vista/7
- Programmable Internet/Ethernet Controller
- Watchdog Timer suitable for use in harsh environments
- 10/100 Base-TX (Auto-negotiating, auto MDI/MDI-X, LED indicator)
- Power Reverse Polarity Protection Circuit
- RS-485 Port ESD Protection Circuit
- Self-Tuner ASIC Controller on the RS-485 Port
- 5-digit LED Display (for versions with a display)
- RoHS Compliant with no Halogen
- Built-in High Performance MiniOS7 from ICP DAS
- Low power consumption
- Made from fire retardant materials (UL94-V0 Level)



#### Introduction

The Modbus communications protocol has become the de facto industry standard, and is now the most commonly available means of connecting industrial electronic devices.

Modbus allows for communication between many devices connected to the same network, for example a system that measures temperature and humidity and communicates the results to a computer. Modbus is often used to connect a supervisory computer with a remote terminal unit (RTU) in supervisory control and data acquisition (SCADA) systems.

The  $\mu$ PAC-7186EX(D)-MTCP uses a default firmware to become a single Modbus/RTU to multiple Modbus/RTU converter. You can simply use the Modbus Utility to configure the device and then set the connection between the SCADA or HMI software and the  $\mu$ PAC-7186EX(D)-MTCP.

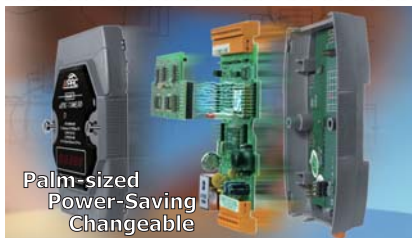
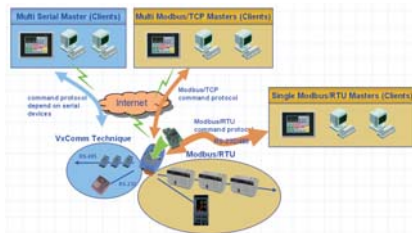
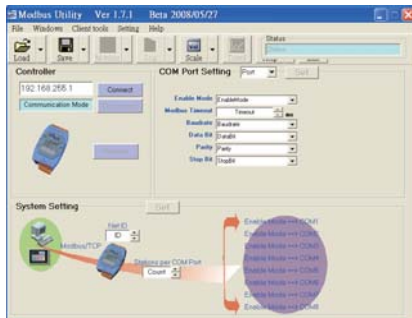
The  $\mu$ PAC-7186EX(D)-MTCP can also link to legacy serial devices that don't support Modbus/RTU. To use this function, you need to install the VxComm driver on the host PCs and create virtual COM ports for the remote serial ports on the  $\mu$ PAC-7186EX(D)-MTCP. You can then directly access the remote serial devices via the virtual COM ports.

Using the Modbus SDK, users can develop their own custom Modbus firmware, allowing extra functions and integration of serial devices. In this way, the  $\mu$ PAC-7186EX(D)-MTCP becomes a powerful controller.

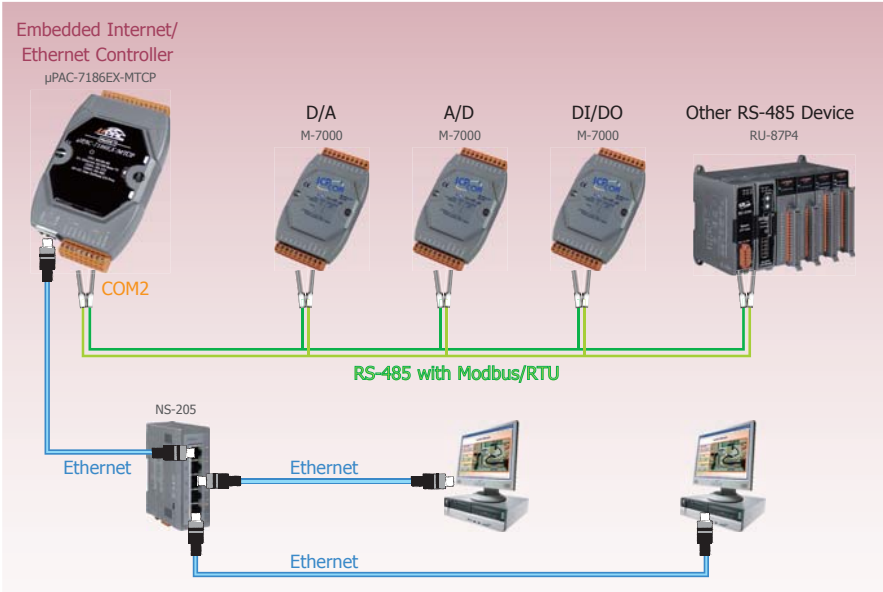
The  $\mu$ PAC-7186EX(D)-MTCP contains a built-in operating system, the MiniOS7, which offers a stable and high performance environment that is similar to DOS. The MiniOS7 can boot up the  $\mu$ PAC-7186EX(D)-MTCP within just one second, with the added benefit of no virus problems and a small footprint. Furthermore, the  $\mu$ PAC-7186EX(D)-MTCP is designed for low power consumption, maintenance elimination (no hard disk and no fan), and is constructed from fire retardant materials (UL94-V0 level) with a robust case.

#### I/O Expansion Bus and Expansion Board

The  $\mu$ PAC-7186EX(D)-MTCP supports a single I/O expansion bus for plugging with a X-board. ICP DAS provides many optional X-boards for the  $\mu$ PAC-7186EX(D)-MTCP, which offers various I/O functions, such as D/I, D/O, A/D, D/A, Timer/Counter, UART, flash memory, battery backup SRAM and AsicKey... etc.



## Applications



## Specifications

Models	µPAC-7186EX-MTCP	µPAC-7186EXD-MTCP
<b>CPU</b>		
CPU	80186, 80 MHz or compatible	
SRAM	512 KB	
Flash Memory	512 KB	
EEPROM	16 KB	
NVRAM	31 Bytes (battery backup, data valid for up to 10 years)	
RTC (Real Time Clock)	Yes	
Hardware Serial Number	Yes (64-bit)	
Built-in Watchdog Timer	Yes	
<b>Communication Interface</b>		
COM1	RS-232 (TxD, RxD, RTS, CTS, GND)	
COM2	RS-485 (D2+, D2-, GND)	
Ethernet	10/100 Base-TX, RJ-45 port (Auto-negotiating, auto MDI/MDI-X, LED indicator)	
<b>COM Port Formats</b>		
Speed	115200 bps max.	
Data Bit	7, 8	
Parity	None, Even, Odd	
Stop Bit	1	
<b>LED Indicators</b>		
5-Digit 7 Segment	-	Yes
System	Yes	
<b>Power</b>		
ESD Protection	Yes (with Frame Ground)	
Protection	Power Reverse Polarity Protection	
Required Supply Voltage	+10 V <sub>oc</sub> ~ +30 V <sub>oc</sub> (non-regulated)	
Power Consumption	1.5 W	2.5 W
<b>Mechanical</b>		
Flammability	Fire Retardant Materials (UL94-V0 Level)	
Dimension (W x H x D)	72 mm x 123 mm x 35 mm	
Installation	DIN-Rail or Wall mounting	
<b>Environment</b>		
Operating Temperature	-25 °C ~ +75 °C	
Storage Temperature	-40 °C ~ +80 °C	
Humidity	5 ~ 95% RH, non-condensing	

## Pin Assignments

### μPAC-7186EX(D)-MTCP

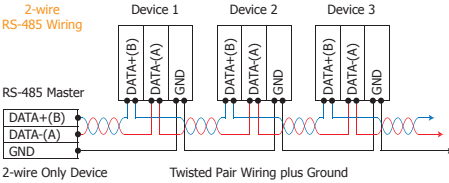
Terminal No.	Pin Assignment
E1	Link/Act 10/100M
COM1	01 CTS1
	02 RTS1
	03 RxD1
	04 TxD1
05	INIT*
COM2	06 D2+
	07 D2-
	08 (R)+Vs
	09 (B)GND

### I/O Expansion Bus

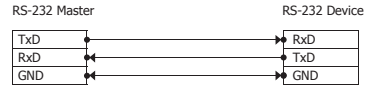
J1				J2			
GND	01	02	GND	MA0	01	02	AD0
CLKOUTA	03	04	ARDY	MA1	03	04	AD1
INTO	05	06	INT1	MA2	05	06	AD2
VCC	07	08	RESET	MA3	07	08	AD3
GND	09	10	RESET\	MA4	09	10	AD4
TO0	11	12	TO1	MA5	11	12	AD5
TI0	13	14	TI1	MA6	13	14	AD6
SCLK	15	16	DIO9	MA7 (or NC)	15	16	AD7
DIO4	17	18	DIO14	INT4 (or NC)	17	18	WRITE\
VCC	19	20	VCC	CS\	19	20	READ\
CON20A JDIP20P				CON20A JDIP20P			

## Wiring

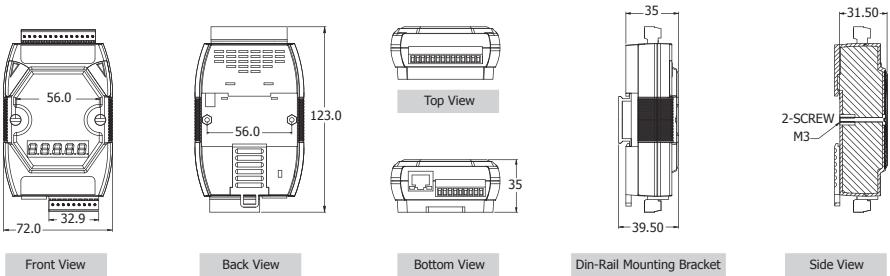
### 2-wire RS-485 Wiring



### 3-wire RS-232 Wiring



## Dimensions (Unit: mm)



## Ordering Information

μPAC-7186EX-MTCP CR	μPAC-7186EX with Default Modbus/TCP Firmware (RoHS)
μPAC-7186EXD-MTCP CR	μPAC-7186EXD with Default Modbus/TCP Firmware (RoHS)

## Accessories

GPSU06U-6	24 V <sub>DC</sub> /0.25 A, 6 W Power Supply
MDR-20-24	24 V <sub>DC</sub> /1 A, 24 W Power Supply with DIN-Rail Mounting
CA-0903	9-Pin Female D-Sub and RS-232 Connector Cable, 30 cm Cable
CA-0910	9-Pin Female D-Sub and 3-wire RS-232 Cable, 1 m Cable
NS-205 CR	Unmanaged 5-port Industrial Ethernet Switch (RoHS)