Model: I-7188EX-MTCP

Model: I-7188EXD-MTCP-G

I-7188EX-MTCP / I-7188EXD-MTCP

Modbus/TCP Embedded Controller
(Ethernet enables Modbus commands to run over TCP/IP)

Features

Features of default Modbus firmware

When you buy an I-7188E -MTCP controller, it already has the default Modbus firmware installed in Flash memory. The default firmware has the follows features:

- Converters single Modbus/TCP to multi Modbus/RTU
  The I-7188E -MTCP is a Modbus/TCP gateway. It can easily upgrade many Modbus/RTU devices to have Ethernet communication ability.
- Supports VxComm technique for every COM port of controllers
  If serial devices don't support Modbus/RTU, you can still access these devices. But need to install VxComm driver on host PCs and assign a COM port number to link to the remote COM port (of I-7188E -MTCP). After that, serial clients can access these remote serial devices via standard RS-232 functions.
- Allowed multi-client (or master) access simultaneously
  Different I-7188E -MTCP controller supports different client numbers connect to. Please refer to our FAQ on web for more detail.
  http://www.icpdas.com/faq/7188e/hardware/003.htm
- Firmware modifiable
  We provide the Modbus SDK allowing users to develop their custom Modbus firmware.

back

Modbus SDK (in C language)

If the default firmware doesn't totally suit your requirement. You can use Modbus SDK to modify the default firmware to add extra functions. The Modbus SDK has below features:

- Supports extra user-defined command protocol (TCP/IP)
  Modbus/TCP protocol supports 2 basic data format (bit and 2-byte integer). It means if clients (or called masters) don't support Modbus/TCP or you need other format data (for example: string of floating value), I-7188Es (with default firmware) cannot communicate with them. Using this feature, you can develop your special command protocol to transfer any format of data.
- Register based programming method (easy to use)
  Modbus library supports 4 internal register tables (iMemory_AI, iMemory_AO, iMemory_DI, iMemory_DO), you can use these to store specific information. When Modbus/TCP clients request to I-7188E, Modbus kernel will response information from these 4 tables.
- Provides user-defined registers
  The 4 internal register tables are all open to users. You need to assign these tables by yourself.
- Can link to Modbus/TCP slave devices
  By using function ModbusTCP_Master2Slave(declared in MBTCP_7E.h),the 7188EX-MTCP can link 8 max . Modbus/TCP device.
- Can link to Modbus/RTU slave devices

By using function ModbusMaster2Slave (declared in MBTCP_7E.h), Modbus/RTU devices can be easily integrated to internal registers of I-7188Es. An I-7188E polling every Modbus/RTU devices and put every necessary information to internal registers. Clients only ask the I-7188E to get all information of Modbus/RTU devices. That reduces loading of Clients.

- Can link to non-Modbus/RTU serial devices
  Some serial devices don't support Modbus/RTU. We provide functions to let I-7188E -MTCP access serial devices. You can put information to internal registers of it. Thus, the non-Modbus serial devices can also support Modbus/TCP.
- Supports X boards
  You can choose one suitable Xboard to add on an I-7188EX to be on board I/Os.
- Xserver SDK compatible
  Modbus SDK is based on Xserver SDK. To lear more programming skills, you can refer demos of Xserver. To get information of demos of Xserver, please refer to CD:\Napdso\7188e\TCP\Xserver\Xserver.htm

Modbus Utility

We provide Modbus tools for Windows 98/SE/NT/2K/XP, it includes:

1. Modbus Utility
   - On-line configuration via Ethernet
   - On-line help
   - Automatically generate register mapping tables
   - Configuration export/imp
2. MBRTU
   Modbus/RTU client (with source code in VB6) to diagnostic Modbus/RTU slave devices.
3. MBTCP
   Modbus/TCP client (with source code in VB6) to diagnostic Modbus/TCP slave devices.

Applications

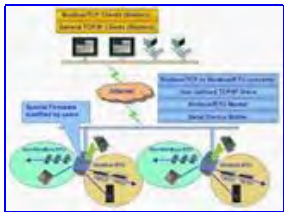
- Basic application 1: protocol converter

An I-7188E -MTCP runs a default firmware to become a single Modbus/TCP to multi-Modbus/RTU converter. You can simply use the Modbus Utility to configure the device and then set connection between SCADA , HMI software and the I-7188E.

- Basic application 2: protocol converter with VxComm technique

An I-7188E -MTCP is also be able to link to serial devices that don't support Modbus/RTU. To use this function, you will need to install VxComm driver on host PCs. After installation, you will be able to access the remote COM ports via the standard serial driver.

- Advanced application 1: Modbus/TCP controller



Using the Modbus SDK, users can develop their own custom Modbus firmware, allowing extra functions, integration of serial devices and a Xboard to the Modbus/TCP kernel. Thus an I-7188E can become a powerful controller.

- Advanced application 2: Modbus/TCP controller with VxComm technique

When an I-7188E -MTCP links same hardware devices as Advanced application 1 link to, if any devices connected to certain COM ports are not integrated into your custom firmware, you are still able to access the COM ports via the standard serial driver. In order to do this, you must install the VxComm driver on the host PCs.

Specifications

CPU	
CPU	80188, 40MHz or compatible
SRAM	512K bytes
Flash Memory	512K bytes
EEPROM	2K Bytes
NVRAM	31 Bytes (battery backup, data valid up to 10 year)
RTC (Real Time Clock)	Yes
64-bit Hardware Serial Number	Yes
Built-in Watchdog Timer	Yes
Communication Interface	
COM1	RS-232 (TXD, RXD, RTS, CTS, GND)
COM2	RS-485 (D2+, D2-)
Ethernet Port	10BASE-T NE2000 compatible Ethernet Controller
COM Port Formats	
Data bit	7, 8
Parity	Even, Odd, None
Stop bit	1
LED Display	
5-Digit 7 Segment LED Display	Yes (for I-7188EXD-MTCP only)
System LED Indicator	Yes
Hardware Expansion	
I/O expansion bus	Yes
User defined I/O pins	14 pins
Dimensions	
I-7188EX(D)-MTCP	123mm x 72mm x 33mm
Operating Environment	
Operating Temperature	-25°C to +75°C
Storage Temperature	-40°C to +80°C
Power	
Protection	Power reverse polarity protection
Required Supply Voltage	+10 to +30V/DC (non-regulated)
Power consumption	2W for I-7188EX-MTCP 3W for I-7188EXD-MTCP

Ordering information

I-7188EX-MTCP CR	I-7188EX with default Modbus/TCP firmware (RoHS)	Art. No. 115983
I-7188EXD-MTCP CR	I-7188EXD with default Modbus/TCP firmware (RoHS)	Art. No. 114152

Note1:
The Modbus firmware can only run under 512K SRAM hardware. If you need more COM ports, you can buy an X board to expand the COM port number. Usage:
Step1. Open the cover of the I-7188EX or I-7188EXD.
Step2. Plug the X board to the I-7188EX or I-7188EXD.
Step3. Close the cover.