

Operation Manual EX-9132C-2-MTCP

Modbus TCP to Modbus RTU/ASCII Converter



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We provide new ways of connecting legacy serial devices to a Local Area Network (LAN) or Wide Area Network (WAN). Modbus TCP/IP converters are designed to operate serial ports over 100M bps Ethernet networks. The data is transmitted via Modbus TCP/IP protocol. Therefore, control is available via Ethernet, Intranet and Internet. EX-9132C-2-MTCP converter is packaged in a PVC material case well suited for industrial environments. It provides two serial ports one is a RS-232 and another is RS-232/422/485 (Auto-Detect). All serial ports operate in common industrial configuration.

EX-9132C-2-MTCP converter is a low-cost, high performance design. By carefully selecting high quality with competitive prices components in the world, the products made network connectivity possible with affordable cost for virtually all kinds of devices.

EX-9132C-2-MTCP is a full set converter device with two serial ports as one is a RS-232 port and another is a RS-232/422/485 (Auto-Detect) and it provides one socket connection port. This operation manual will guide you step by step to learn the various functions of the EX-9132C-2-MTCP converter.

The following topics are covered in this chapter:

- ❑ **Overview**
- ❑ **Block Diagram**
- ❑ **Product Features**
- ❑ **Product Specifications**

Overview

EX-9132C-2-MTCP converter is designed to make your industrial serial devices Internet ready instantly. ARM Cortex-M3 CPU of EX-9132C-2-MTCP converters makes them the ideal choice for connecting your RS-232 and RS-422 or RS-485 serial device—such as PLCs, meters, and sensors—to an IP-based Ethernet LAN, making it possible for your software to access serial devices anywhere and anytime over a local LAN or the Internet. ARM Cortex-M3 CPU Series converters ensure the compatibility of network software that uses a standard network API (Winsock or BSD Sockets) by providing TCP Server Mode, TCP Client Mode, and UDP Mode. Model EX-9132C-2-MTCP provides 1 socket connection for remote management. ARM Cortex-M3 CPU Series Virtual COM driver and software that works with COM port can be set up to work over a TCP/IP network in no time. This excellent feature preserves your software investment and let you enjoy the benefit of networking your serial devices instantly.

ARM-Cortex-M3 CPU series converter supports manual configuration via the handy web browser console and many protocols including TCP, IP, UDP, HTTP, DHCP, ICMP, and ARP. They are the best solution to network your serial devices.

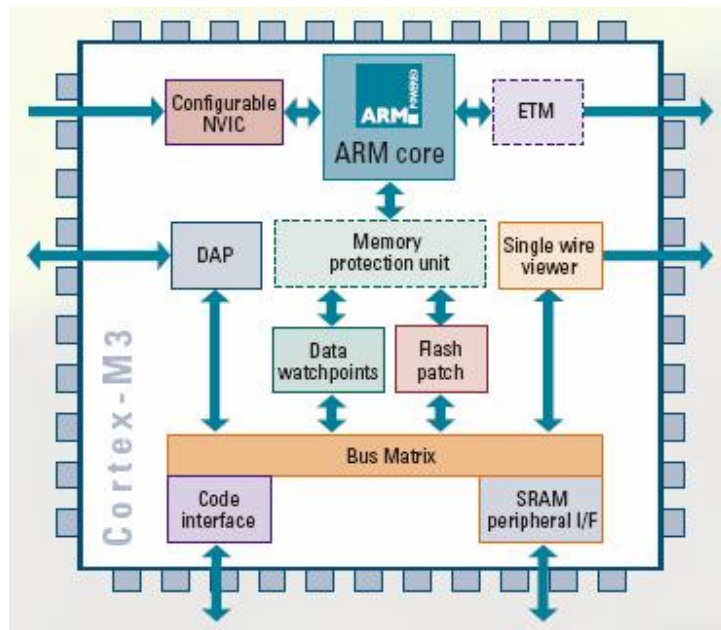
Package Checklist

ARM-Cortex-M3 CPU products are shipped with the following items:

- ❑ 1 unit of EX-9132C-2-MTCP converter
- ❑ 1 unit of Power Adaptor/Supply(9V/12V/24VDC, 500mA) : Optional
- ❑ Din Rail Mounting Kit : Optional
- ❑ Quick Installation Guide in Documentation & Software CD

NOTE: Please notify your sales representative if any of the above items is missing or damaged.

Block Diagram



Low-cost devices usually are equipped with low speed processors and limited memories. In reality, they have neither the capability nor practicality to manage complicated network TCP/IP protocols. The ARM Cortex™-M3 32-bit processor has been specifically developed to provide a high-performance, low-cost platform for a broad range of applications including microcontrollers, automotive body systems, and industrial control systems, networking by converting data stream between network TCP/IP and popular serial port signals.

Instead of processing TCP/IP packets directly, devices need only deal with those interface signals, which greatly simplifies the complexity of TCP/IP network in linkage. The ARM Cortex-M3 processor provides outstanding computational performance and exceptional system response to interrupt while meeting low cost requirements through small core footprint, industry leading code density enabling smaller memories, reducing pin count, and low power consumption.

The central core of ARM Cortex-M3 processor, based on a 3-stage pipeline Harvard bus architecture, incorporates advanced features including single cycle multiply and hardware divide to deliver an outstanding efficiency of 1.25 DMIPS/MHz. The ARM Cortex-M3 processor also implements the new Thumb®-2 instruction set architecture, which combined with features such as unaligned data storage and atomic bit manipulation delivers 32-bit performance at a cost equivalent to modern 8- and 16-bit devices.

Product Features

- ❑ **Data Conversion between RS-232 and RS-422/485 and Ethernet**
EX-9132C-2-MTCP converter device (RS-232 * 1 port , RS-232/422/485 * 1 port) data/signal into the Modbus TCP/IP package data/signal and send them out with the Ethernet Data Stream; or convert the Modbus TCP/IP package data/signal into serial device data/signal.
- ❑ **Socket Communication**
EX-9132C-2-MTCP is provided one socket connection.
- ❑ **Dynamic IP Configuration**
Support DHCP client mode, simplifying network address configuration and management.
- ❑ **Dual LAN Speed**
Support 10/100 Mbps Ethernet, auto-detected.
- ❑ **Server / Client Dual Modes**
EX-9132C-2-MTCP converter device can be configured as network server or network client. In the client mode, it can be installed in network which is protected by NAT router or firewall without a real IP address.
- ❑ **Web-based Setup**
Parameters setup is based on HTTP protocol by using standard browsers (IE and Netscape). No special software would be required.
- ❑ **Built-in Security Control**
Security protect by login password to prevent intruders.
- ❑ **Remote Update**
Firmware can be updated directly via Ethernet network to keep up with latest network standards.

Product Specifications

- CPU : ARM Cortex™-M3 32-bit processor , 50MHz
- RAM : 64K Bytes SRAM
- ROM : 256K Bytes Flash ROM
- Ethernet
 - Port Type : RJ-45 Connector
 - Speed : 10 /100 M bps (Auto Detect)
 - Protocol : HTTP, DHCP, ModbusTCP to Modbus-RTU/ Modbus-ASCII(Slave), Modbus-RTU/ Modbus-ASCII to ModbusTCP(Slave)
 - Mode : Modbus TCP Client/ Server
 - Setup : HTTP Browser Setup (IE & Netscape)
 - Security : Login Password
 - Protection : Built-in 1.5KV Magnetic Isolation
- Serial Port
 - No. of Ports : RS-232*1 Port and RS-232/422/485(Auto-Detect) * 1 Port
 - Port Type : DB9 male * 1 and Terminal Block(7pin) * 1
 - Speed : 300 bps 115.2K bps
 - Parity : None , Odd , Even, Mark, Space
 - Data Bit : 5, 6, 7, 8
 - Stop Bit : 1 , 2
 - Port 1 :
 - One RS-232 Signals Port : Rx , Tx , GND , RTS , CTS , DTR , DSR , DCD
 - Port 2 :
 - One RS-232/422 /485 Port (Auto-Detect)
 - RS-232 Signals : Rx, Tx, GND

- RS-422 Signals : Rx+ , Rx- , Tx+ , Tx- (Surge & Over Current Protect)
- RS-485 Signals : Data+ , Data- (Surge & Over Current Protection)
- Built-in RS422/RS485 Pull High-Low Resistor
- Socket Port Connection : 1 Connection
- 15KV ESD for all signal
- Watch Dog Function
- Virtual Support Windows 2000 /2003 / XP / Vista / 7
- Firmware On-line Updated Via Ethernet
- Power : DC 9 – 24V , 500mA (DC Jack)
- LED Lamp :
 - PWR (Red)
 - RX (Red: data received indicator)
 - TX (Green: data transmitting indicator)
 - SYS (Green: It is a device statues indicator)
- Environment :
 - Operating Temperature : 0 70
 - Storage Temperature : -10 80
- Dimensions : 115 * 90 * 27 mm (W * D * H)
- WEIGHT : 140 gm
- RoHS : Compliant with RoHS
- Regulatory Approvals : FCC, CE
- WARRANTY : 1 year

EX-9132C-2-MTCP Description & Installation

Product Panel Views

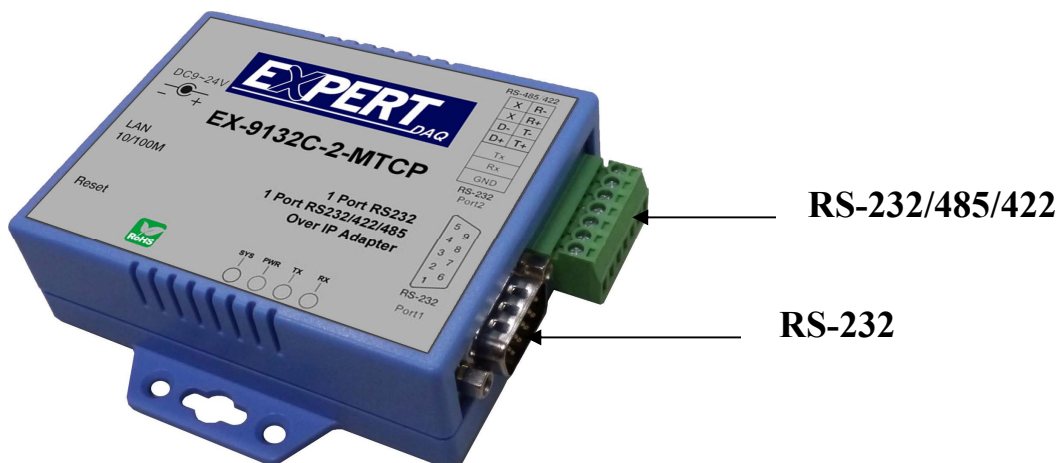
Top Side



Right Side

Serial I/O Port of RS-232 and RS-232/422/485

Connect the serial data cable between the converter device and the serial devices. Follow the parameter setup procedures to configure the converter (see the following chapters).



EX-9132C-2-MTCP Installation

Power Supply(Left Side)

EX-9132C-2-MTCP converter device is powered by a single 9/12/24VDC (inner positive/outer negative) power supply and 500mA of current. A suitable power supply adapter is part of the packaging. Connect the power line to the power jack at the left side of EX-9132C-2-MTCP converter device and put the adapter into the socket.



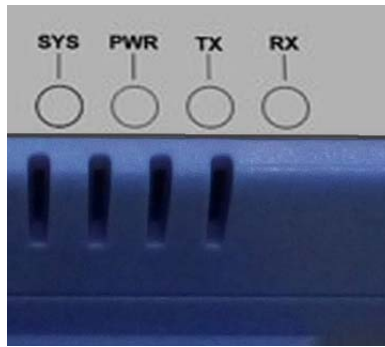
Ethernet LAN Port

The connector for network is the usual RJ45. Simply connect it to your network switch or Hub. When the connection is made, the LAN LED indicator will light up. When data traffic occurs on the network, red DATA LED indicator will blink during data transferring and receiving.

Reset Button

If by any chance, you forget the setup password, or have incorrect settings making EX-9132C-2-MTCP converter inoperable. First, turn on the power. Second, use any point tip to push this button and hold it about 3 seconds All the parameters will be reset to the factory default. But do not over 5 seconds , it will enter update mode

LED Indicators



RX (Red):

RX data received indicator (When data are receiving by the network, the LED will blink.)

TX (Green):

TX data transmitting indicator (When data are sending to the network, the LED will blink.)

PWR (Red):

Power indicator (When the power is on, the LED will be on.)

SYS (Green):

It is a device status indicator (When EX-9132C-2-MTCP is operated in normal status, the LED will blink once per second.)

Wiring Architecture

RS-232 Wiring Architecture

RS-232 Wiring



RS-232(RTS/CTS) Wiring



RS-232(RTS/CTS , DTR/DSR) Wiring



RS-422/RS-485 Wiring Architecture

RS-422 Wiring



RS-485 Wiring



When you finish the steps mentioned above and the LED indicators are as shown in above diagram, the converter is installed correctly. You can use the Setup Tool “EXBrowser.exe” to setup the IP Address.

To proceed the advanced parameter setup, please use a web browser (IE or Netscape) to continue the detailed settings.

EX-9132C-2-MTCP Converter Configuration

Initial IP Configuration

When set up your converter for the first time, the first thing you should do is to configure the IP address. This chapter introduces the method to configure the device server's IP address. For more details about network settings, please see the Network Settings section in Chapter 4, "Web Browser Configuration".

The following topics are covered in this chapter:

- **Device Management Utility of EXBrowser**
- **EXBrowser "View"**
- **EXBrowser "Modify IP"**
- **EXBrowser "Modify MAC"**

Device Management Utility of EXBrowser

On PC we provide a Device Management Utility named "**EXBrowser.exe**" which is an executable program in Windows 32-bit environments. EXBrowser setup tool is used to detect and setup the installed converters. It uses UDP broadcast packets to query and configure converters on the network.

When you activate the tool, it will detect the existence of the installed converters and depict the converters' status such as IP address, Subnet Mask, MAC Address, and Device ID (see Figure 4.1). The Setup Tool only can setup one converter at a time. Thus if there are more than one converter on the network, please shut down or disconnect other converters. Otherwise the EXBrowser.exe can not detect the converter.

Due to the nature of broadcast UDP packets, EXBrowser has following characteristics:

- Broadcast packets are not limited by subnet. Even if the IP address of the converters and the computer running EXBrowser that do not belong to the same subnet, it still works fine.

- Broadcast packets can not pass routers. EXBrowser can only be used to monitor devices with computer running EXBrowser in the same segment of local area network.



(Figure 4.1)

EXBrowser “View”

- View -> Refresh

There are two ways for refreshing the status of existing devices. You may select the item “**View**” to refresh the status of existing devices on LAN. Another is to click the icon as red color remark as below. EXBrowser will send another query to get updated information. (see Figure 4.2).

Note: Always run the “**Refresh**” after any data change.



(Figure 4.2)

- File -> Exit Alt+F4

Exit from the program (see Figure 4.3).

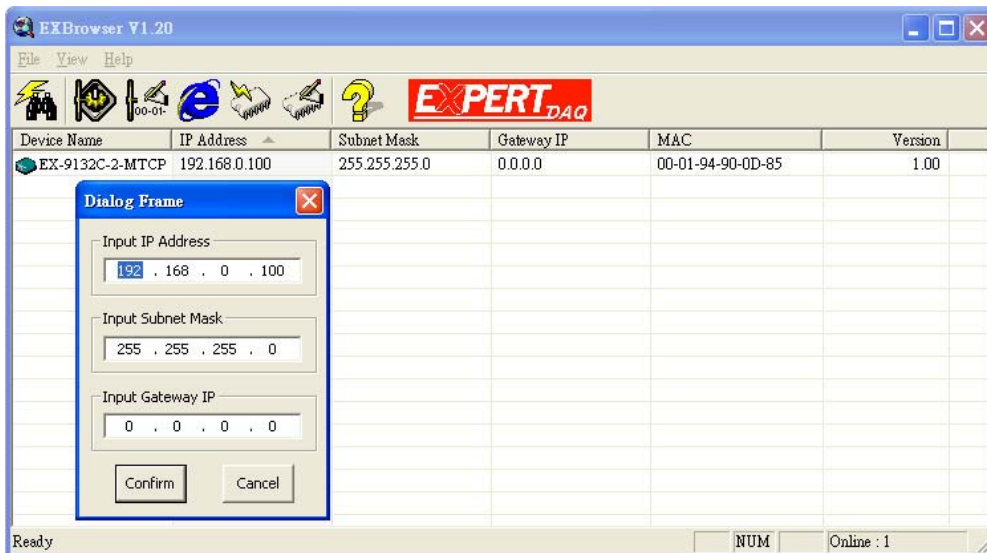


(Figure 4.3)

EXBrowser “Modify IP”

- Modify IP -> Dialog Frame

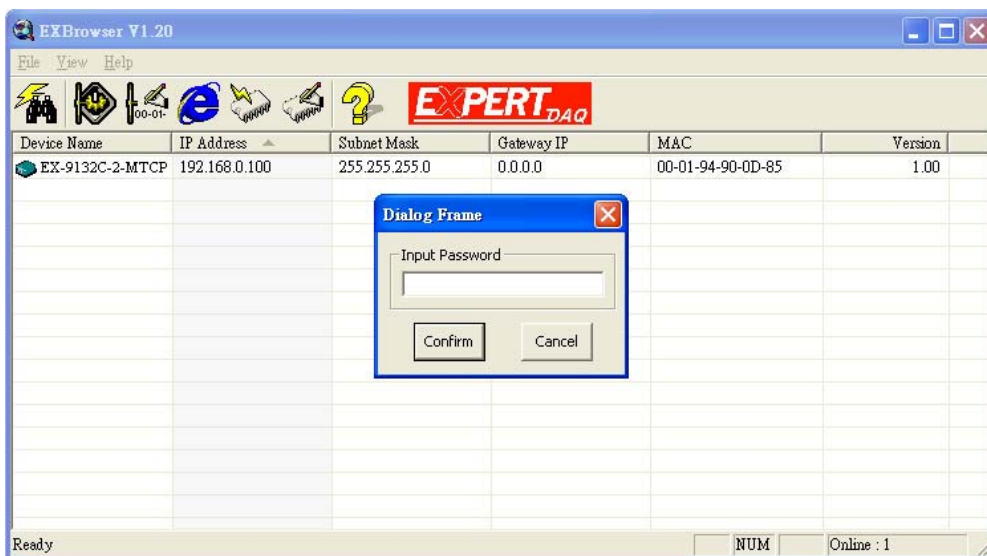
To click the device on the existing devices list in the EXBrowser table and then the function bar will be enable. To press second icon of “**Modify IP**” on function bar and a dialog frame table will be shown (see Figure 4.4).



(Figure 4.4)

Assign an IP Address with the same Subnet Mask of your computer, avoiding any IP conflict with other network devices.

When you press “**Confirm**” button, the IP address will be refreshed in 2~3 seconds.



(Figure 4.5)

After click “**Confirm**” button and then “**Input Password**” request will be pop-up on screen (see Figure 4.5). Please simply press “**Confirm**” button and the new device’s IP will be changed and save in table, if you changed it.

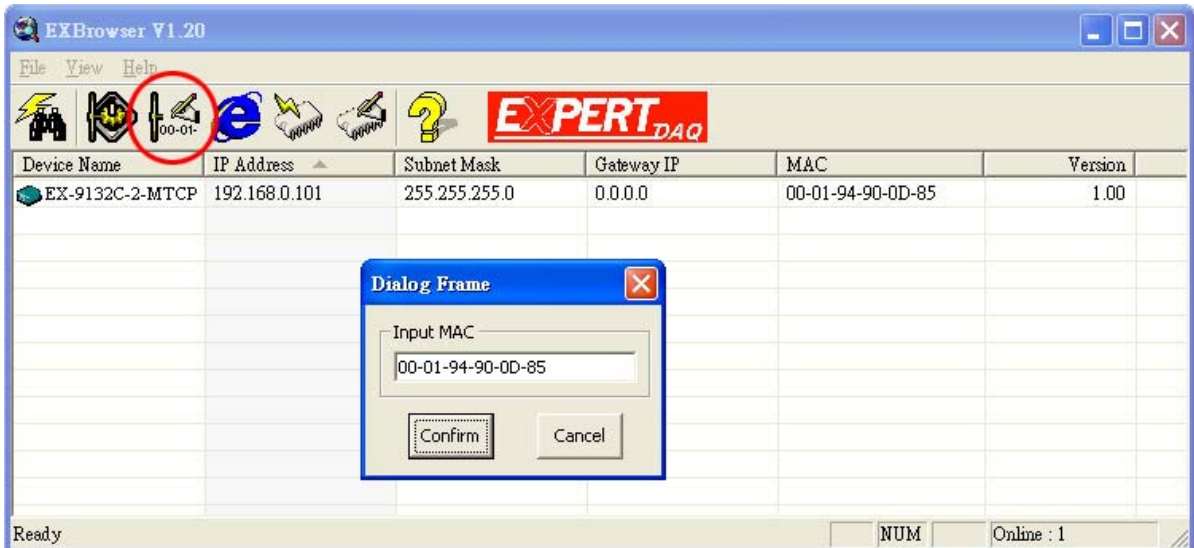


(Figure 4.6)

EXBrowser “Modify MAC”

- Modify MAC -> Dialog Frame

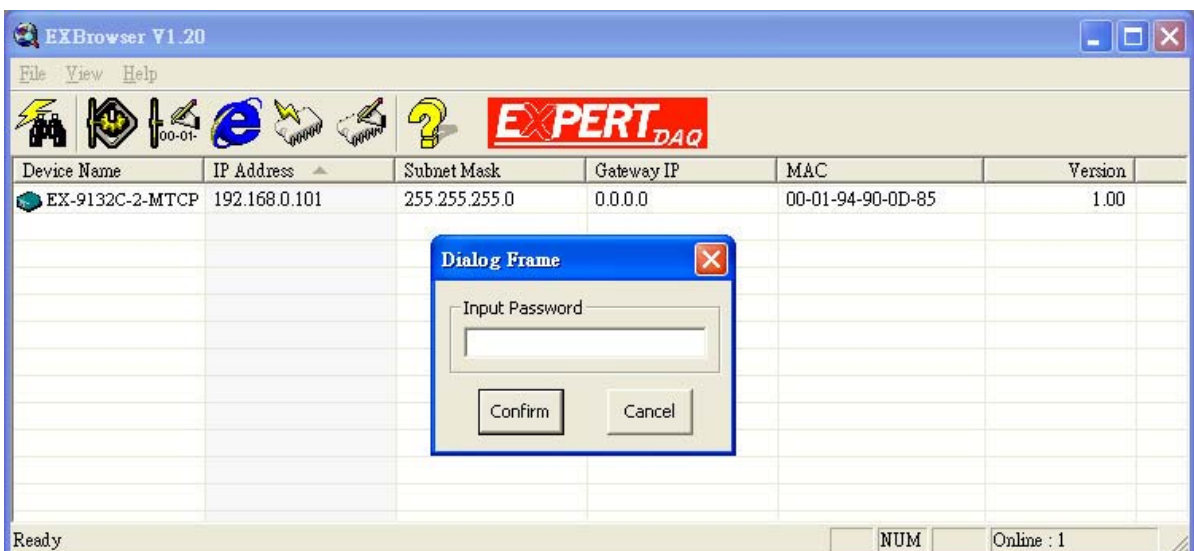
To click the device on the existing devices list in the EXBrowser table and then the function bar will be enabled. To press Third icon of “**Modify MAC**” on function bar and a dialog frame table will be shown (see Figure 4.7).



(Figure 4.7)

- Input Password -> Dialog Frame

After click “Confirm” button and then “**Input Password**” request will be pop-up on screen (see Figure 4.8). Please simply press “**Confirm**” button and the new device’s MAC will be changed and save in table, if you changed it.



(Figure 4.8)

Web Browser Configuration

The following topics are covered in this chapter:

- **Serial To Ethernet Converter Setup**
 - **Login Setting**
 - **Login Setting Page Field Description**
 - **Parameter Setting**
 - **Parameter Setting Page Field Description**

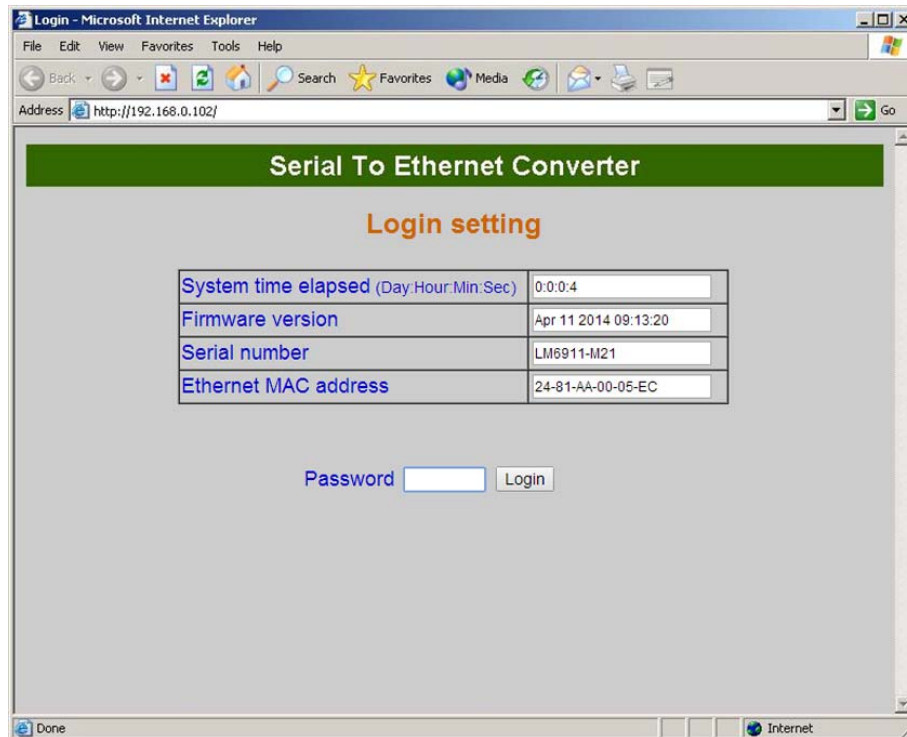
Login Setting

In addition to basic IP address and subnet mask, specific device settings can be set through HTTP protocol with popular browsers, e.g. Internet Explorer, Netscape, etc. Setup of the converters is as easy as surfing on WWW, no special software will be required.

Setup converter device is as easy as surfing on WWW; no special software will be required. Popular Browsers, such as IE, or Netscape, can easily do the setup process. In the browser URL field, set the IP address of device directly, to enter the “**Login Setting**” page, please follow the steps below.

- Open your browser. This chapter will use IE as an example.
- In the browser URL field, type the IP address of the converter directly and press ENTER. (The IP address is what you set using the Device Management Utility as EXBrowser.)
- To press fourth icon of “**Web Browser**” on function bar and a “**Login Setting**” Screen will be shown (see Figure 4.9) to login into the device.

Alternatively, if the IP address of the converter is already known, you can connect to the converter directly by providing its IP address in the URL field of browsers.



(Figure 4.9)

Login Setting Page Field Description

- ❑ **System time elapsed**

The time elapsed since start of this device in [Day Hour : Minute : Second] format. This information can be useful in identifying the reliability of system.
- ❑ **Firmware version**

Converter firmware is identified by date code. This information will be required looking for technical support.
- ❑ **Serial number**

It is a product serial number code in the converter device and has been provided by factory.

❑ **Ethernet MAC Address**

Converter is a unique MAC (Media Access Control) address used by Ethernet.

❑ **Password**

This field is the administration password for authentication. Factory default is “**empty**”. However, it is not recommended to leave it empty in field operation. If you could not login, it means you have to key in the password. If you do not know the password you can “Reset” this converter(First, turn on the power. Second, use any point tip to push this button and hold it about 3 seconds All the parameters will be reset to the factory default. But do not over 5 seconds , it will enter update mode).

Converter device uses the same password protection mechanism commonly used in Windows NT or UNIX. If there are more than “**3 consecutive failures**” in password check during login, the login function will be disabled for “**15 minutes**”. During this 15 minutes period, even if you supply correct password, login will not proceed. This prevents intruders from finding the password by computer generated program.

Parameter Setting Page

□ The Parameter Setting Page

Type the correct password in the “**Password**” field and click the “**Confirm**” button in the “**Login Setting**” page, then the “**Parameter Setting**” page will be shown (see Figure 4.10).

Note: If you forget the password or can't login successfully, please contact the manufacturer directly.

Parameter setting	
IP address	60.251.35.138
Subnet mask	255.255.255.0
Gateway IP	0.0.0.0
Link Modes	Auto detect ▼
DHCP Client	Disable ▼
Auto Reset (No data input)	0 (1 ~ 255 Minute)
Device Name	EX-9132C-2-MTCP
Login password	
Serial I/O Port 1 0	
Local port,Socket mode	501 TCP Server ▼
Remote IP,Port (TCP Client)	0.0.0.0 0
Interface	RS232 ▼
Baudrate	9600 ▼
Parity,Data bit,Stop bit	None ▼ 8 ▼ 1 ▼
Force off-line time (No data input)	10 (1 ~ 255 Minute)
Packet collect time	Tx 0 Rx 0 (mSec)
Modbus type	TCP To RTU Slave ▼
Serial I/O Port 2 0	
Local port,Socket mode	502 TCP Server ▼
Remote IP,Port (TCP Client)	0.0.0.0 0
Interface	Auto Detect ▼
Baudrate	9600 ▼
Parity,Data bit,Stop bit	None ▼ 8 ▼ 1 ▼
Force off-line time (No data input)	10 (1 ~ 255 Minute)
Packet collect time	Tx 0 Rx 100 (mSec)
Modbus type	TCP To RTU Slave ▼

(Figure 4.10)

□ **Parameter Setting Page Field Description**

□ **IP Address**

The IP address of converter device, 4 digits separated by '.' Don't let it conflict with the other devices on the network.

If DHCP client mode is enabled and there's a DHCP server on the network, this field will be assigned by DHCP server automatically.

□ **Subnet mask**

Subnet mask of the converter device has connected to. "255.255.255.0" is usually used for small network, "255.255.0.0" for larger network, 4 digits separated by '.'

If your IP address is provided by an ISP or the internal network administrator, please inquire of them that information and type it correctly.

If DHCP client mode is enabled and there's a DHCP server on the network, this field will be assigned by DHCP server automatically.

□ **Gateway address**

Gateway or Router IP address. 'Gateway' is a device which connects local network to external network. If you need to communicate with other networks or your device owns a real IP address on the internet, please inquire of them that information and type it correctly. If there's no gateway on the network, just leave it as "0.0.0.0".

If DHCP client mode is enabled and there's a DHCP server on the network, this field will be assigned by DHCP server automatically.

□ **DHCP client**

DHCP client mode could be enabled/disabled status. If DHCP is enabled, there should be a DHCP server on the network. If DHCP is disabled, [IP address], [Subnet mask], and [Gateway address] should be manually assigned.

□ **Auto Reset(Reboot)**

It is for resetting when the device has been disconnected or some reasons, the data stop transmitting for a while. You can prevent it and restart the device after waiting a while (1 ~ 255 Minute) as your settings.

❑ **Login Password**

For security and management issues, you may setup the “Login Password”. This administration password uses to login converter parameter setting pages. It may be empty or up to 15 characters long.

❑ **Serial I / O Port 1 (RS-232)**

This converter device model provides one serial port as RS-232 interface for connecting the extension serial device.

❑ **Local Port/Socket Mode/Remote IP & Port**

This converter device provides one socket connection port.

❑ **Port number**

A socket port assigned for the serial port. It's a 16-bit numbers, ranging from 1 to 65535. Because the numbers below 1000 are used for specific purposes (e.g. 80 is for HTTP protocol), we suggest you use the numbers larger than **1000**. Generally the port number 4660 is used for the serial communication. However you should specify different port number for each serial port.

❑ **Socket type**

❑ Modbus TCP Server: Modbus TCP protocol, passive open, to be connected from the Modbus TCP clients.

❑ **Remote IP address**

The server IP address and socket port would be connected in Modbus TCP Client mode for a certain serial port .

❑ **Remote socket port**

The server socket port would be connected in Modbus TCP Client mode for a certain serial port.

❑ **Interface of serial I/O**

RS232 : TxD, RxD for data stream, no flow control

RS232 (RTS/CTS) : TxD, RxD for data stream, RTS/CTS for flow control.

❑ **Baudrate**

Baud Rate: 300 ~ 115.2K bps

- **Parity, Data bits, Stop bit**
Parity: None, Even, Odd, Space, Mark.
Data Bits: 5, 6, 7, 8.
Stop Bit: 1 or 2.

- **Force off-line time(Close the Socket)**
It is for setting the off-line time period of device will be taken when there is no data input. The parameter can be from “1 to 255” and the time unit is “Minute”.

- **Packet Collect Time**
It is for setting a packet collecting period of the device serial port’s Tx and Rx. The parameter can be from “0 to 999” and the time unit is “mSec”.

- **Modbus type**
It is for setting the ModbusTCP to **Modbus-RTU/Modbus-ASCII** or **Modbus-RTU/Modbus-ASCII** to ModbusTCP

- **Serial I/O Port 2 (RS-232/422/485)**
This converter device model is provided second serial port as RS-232/422/485 (Auto-Detect) interfaces for connecting the extension serial device.
 - **Local Port/Socket Mode/Remote IP & Port**
This converter device provides one socket connection port.

 - **Port number**
A socket port is assigned for the serial port. It’s a 16-bit numbers, ranging from 1 to 65535. Because the numbers below 1000 are used for specific purposes (e.g. 80 is for HTTP protocol), we suggest you use the numbers larger than 1000. Generally the port number 4660 is used for the serial communication. However you should specify different port number for each serial port.

 - **Socket type**
 - Modbus TCP Server: Modbus TCP protocol, passive open, to be connected from the Modbus TCP clients.

 - **Remote IP address**
The server IP address and socket port would be connected in Modbus TCP Client mode for a certain serial port.

- ❑ **Remote socket port**
The server socket port would be connected in Modbus TCP Client mode for a certain serial port.
- ❑ **Interface of serial I/O**
It provides an “**Auto Detect**” function and just depends on the connected serial device’s interface as RS-422 or RS-485.
- ❑ **Baudrate**
Baud Rate: 300 ~ 115200 bps
- ❑ **Parity, Data bits, Stop bit**
Parity: None, Even, Odd, Space, Mark.
Data Bits: 5, 6, 7, 8.
Stop Bit: 1 or 2.
- ❑ **Force off-line time(Close the Socket)**
It is for setting the off-line time period of device will be taken when there is no data input. The parameter can be from “**1 to 255**” and the time unit is “**Minute**”.
- ❑ **Packet Collect Time**
It is for setting a packet collecting period of the device serial port’s Tx and Rx. The parameter can be from “**0 to 999**” and the time unit is “**mSec**”.
- ❑ **Modbus type**
It is for setting the ModbusTCP to **Modbus-RTU or Modbus-ASCII or Modbus-RTU/Modbus-ASCII to ModbusTCP**

□ **Interface of serial I/O**

- RS-232: TxD, RxD for data stream, no flow control
- RS-232 (RTS/CTS): TxD, RxD for data stream, RTS/CTS for flow control
- RS-485 (Half-duplex): Half-duplex RS-485 interface, RTS for driver enable/disable
- RS-422 (Full-duplex): Full-duplex RS-422 interface

Controller Updated

Press “Update” Button after finish the detailed parameter setting. The converter will save all parameters into internal non-volatile memory and then reboot (see Figure 4.11). It takes about 5 seconds to complete the whole process, and a new login page will be presented (see Figure 4.9).



(Figure 4.11)

You can re-login and check if all parameters have been correctly saved. If everything is ok, you can close the browser now.

Note : If the domain of the converter is different from that of the computer running the browser, the login page won't appear unless the converter's "Gateway Address" has been correctly set.

Factory Default Setting

If you forget the setup password or have incorrect settings making the converter inoperable, there are two ways to reset the setting and the following procedures can be used to reset all settings to factory default:

A:

1. Please turn on the power and then use any point tip to push “Reset” button for 5 seconds. The password will be reset to the factory default as “empty”.

Appendix A

FAQ

Q. Why can't the EXBrowser.exe detect the converter on the network?

A. Please check

- ❑ if the power is properly plugged to the converter.
- ❑ if the network cable is properly connected between the converter and the Hub.

Please refer to the "Hardware Installation" steps in Chapter 3.

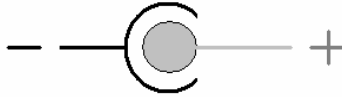
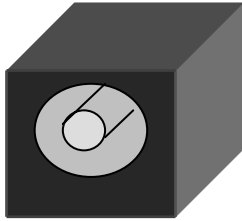
Q. Why can't I use IE to setup the converter?

A. Please check if the network domain of your PC is the same as that of the converter.

Appendix B

Pin outs and Cable Wiring

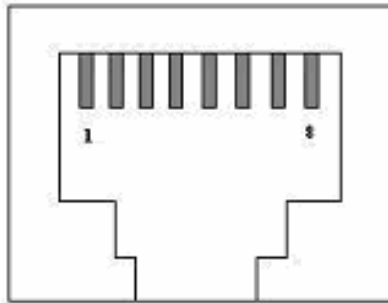
□ DC-In Jack



□ RJ-45 Pin Assignment

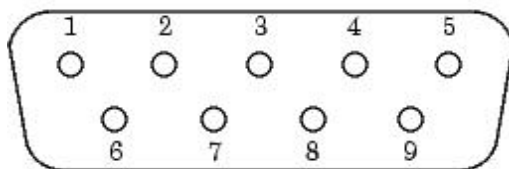
RJ45 Port

Pin	Signal
1	Tx+
2	Tx-
3	Rx+
6	Rx-



□ RS-232 Pin Assignment

The pin assignment scheme for a 9-pin male connector on a DTE is given below.



PIN 1 : N/A

PIN 2 : RXD

PIN 3 : TXD

PIN 4 : DTR

PIN 5 : GND

PIN 6 : DSR

PIN 7 : RTS

PIN 8 : CTS

PIN 9 : N/A

□ **RS-232 Wiring Diagram**

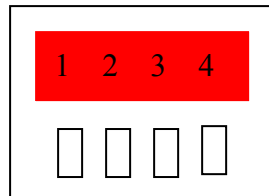
Serial Device

EX-9132C-2-MTCP

2 RX	3 TX
3 TX	2 RX
5 GND	5 GND
7 RTS	8 CTS
8 CTS	7 RTS

□ **RS-422 Pin Assignment**

The pin assignment scheme for a 4-pin RS-422 is given below.



PIN 1 : R-

PIN 2 : R+

PIN 3 : T-

PIN 4 : T+

□ **RS-422 Wiring Diagram**

Serial Device

EX-9132C-2-MTCP

R-	3 T-
R+	4 T+
T-	1 R-
T+	2 R+

□ **RS-485 Wiring Diagram**

Serial Device

EX-9132C-2-MTCP

D+	D+
D-	D-