Micro
TSX ETZ 410/510 Modules
User Manual

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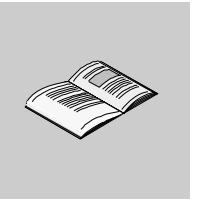
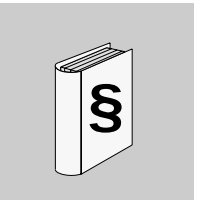


Safety Information



Important Information

NOTICE

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of this symbol to a Danger or Warning safety label indicates that an electrical hazard exists, which will result in personal injury if the instructions are not followed.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠ DANGER

DANGER indicates an imminently hazardous situation, which, if not avoided, **will result** in death, serious injury, or equipment damage.

⚠ WARNING

WARNING indicates a potentially hazardous situation, which, if not avoided, **can result** in death, serious injury, or equipment damage.

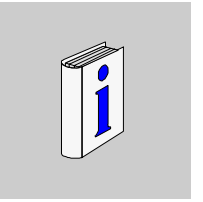
⚠ CAUTION

CAUTION indicates a potentially hazardous situation, which, if not avoided, **can result** in injury or equipment damage.

PLEASE NOTE

Electrical equipment should be serviced only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material. This document is not intended as an instruction manual for untrained persons.

About the Book



At a Glance

Document Scope This manual explains how to install Ethernet TSX ETZ 410/510 communication modules.

User Comments We welcome your comments about this document. You can reach us by e-mail at techpub@schneider-electric.com.

TSX ETZ 410/510 Modules: General

1

At a Glance

Aim of this Chapter

This chapter contains general information about the TSX ETZ 410 and TSX ETZ 510 network modules.

What's in this Chapter?

This chapter contains the following sections:

1.1 Introduction to the TSX ETZ 410/510 Modules

At a Glance

About this Section

This section introduces the TSX ETZ 410 and TSX ETZ 510 modules.

What's in this Section?

This section contains the following topics:

About ETHERNET

Introduction

ETHERNET communication principally targets the following applications:

- coordination between programmable PLCs,
- local or centralized supervision,
- communication with production management computers,
- communication with remote input/output.

The TCP/IP communication profile on ETHERNET, supported by the TSX ETZ modules, allows communication in:

- UNI-TE messaging with the X-WAY structure package,
- Modbus Messaging

TSX ETZ modules also allow, in agent mode, the management of the SNMP network supervision standard.

Associated Manuals

For more information, refer to the following manuals:

Title	Reference
Communication Application Setup Manual	TLX DS COMPL7 V4
ETHERNET network - Reference manual	TSX DR ETH
Micro PLCs - Application Setup Manual	TSX DM 37
X-Way communication - Reference Manual	TSX DR NET
Modbus - User guide	TSX DG MDB
Wiring recommendations - User guide	TSX DG KBL
FactoryCast - User guide	890 USE 152
Uni-Telway Communication Bus	TSX DG UTW

At a Glance

General

The **TSX ETZ 410** and **TSX ETZ 510** products are autonomous TCP-IP/Uni-Telway gateway modules, which allow the connection of Micro PLCs on a TCP-IP network.

They do not fit into a PLC rack.

They communicate with the Micro PLCs (from TSX 37-10 onwards) via the Terminal port, the AUX port, or using a TSX SCP114 PCMCIA series link card in a TSX 37-2•, directly or on a Uni-Telway bus via a TSX P ACC 01 isolation box.

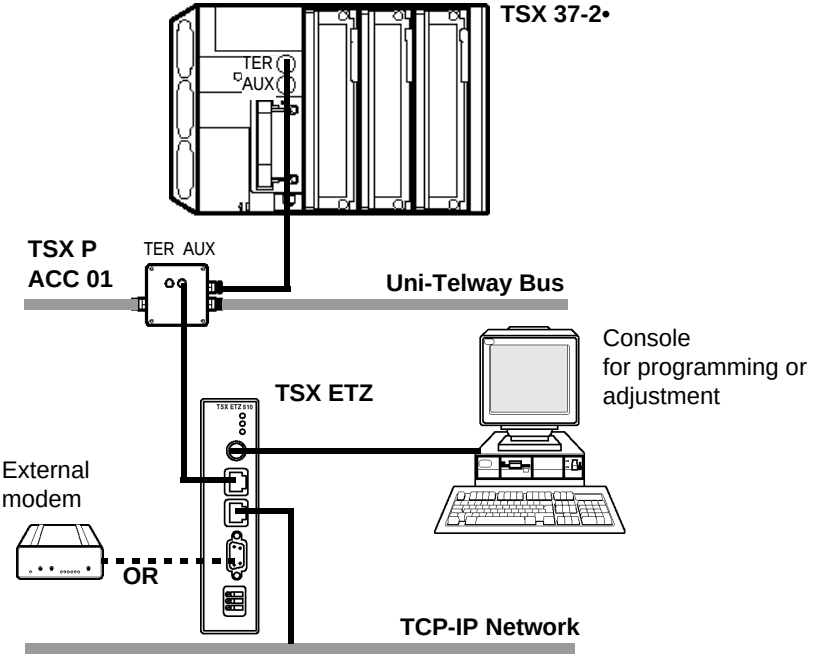
The TSX ETZ 410/510 modules can be configured using an integrated Web server, as they will not be recognized by PL7 software.

These modules are therefore outside the PLCs and can be fixed on a profiled DIN or on a Telequick perforated mounting plate.

They are supplied with 24 VDC and integrate a RS232 series link for connecting an external modem or to configure the module.

Illustration

Principle diagram:



Compatibility and Interoperability

The TSX ETZ 410 and TSX ETZ 510 modules can function with the following products:

- TSX ETY 110 (outside of Ethway profile)
- TSX ETY 210
- TSX ETY 410/510
- NOE 241
- NOE 771
- M1E
- All Uni-TE and Modbus TCP/IP devices
- ATV58
- Magelis

Note: Important: in order to be able to connect to a Micro PLC via an XIP driver (X-Way TCP/IP driver), it is essential that V4.2 or higher PL7 software is used.

General Information on TSX ETZ 410 and TSX ETZ 510 Modules

At a Glance

The TSX ETZ 410 and TSX ETZ 510 modules have the following specification:

- 24 volts direct current supply,
- 10/100 Base-T Ethernet connection,
- UNITELWAY slave (2 addresses used),
- RS485 serial link for UNITELWAY communication,
- RS 232 serial link for communication with an external modem or the configuration,
- 3 indicator LEDs,
- 4 Mb of non-volatile Flash Memory for saving loaded software and the web site.

Note: In operating phase, the RS232 modem and Ethernet interfaces are exclusive.

The TSX ETZ 410 Module

The following utilities are offered:

- Configuration using web pages, via Ethernet or through RS 232 serial link,
- IP configuration of the module in question, either by configuration, or automatically,
  - BOOTP client,
  - DHCP client: automatic reconfiguration on replacement of the module (FDR function).
- Default server accessible without configuration with secure access including:
  - module configuration pages,
  - diagnostic utilities.
- Management of the SNMP module V1, MIB-II agent and MIB private Ethernet Transparent Factory,
- Uni-TE/Modbus messaging on TCP/IP with a maximum of 32 simultaneous connections and Uni-TE/Modbus request limited to 128 bytes,
- Diagnostics by LEDs,
- Possibility of simultaneously connecting 8 Internet browsers,

The TSX ETZ 510 Module

The following utilities are offered:

- Configuration using web pages, via Ethernet or through RS 232 serial link,
- IP configuration of the module in question, either by configuration, or automatically,
  - BOOTP client,
  - DHCP client: automatic reconfiguration on replacement of the module (FDR function).
- Default server accessible without configuration with secure access including:
  - module configuration pages,
  - diagnostic utilities.
- Management of the SNMP module V1, MIB-II agent and MIB private Ethernet Transparent Factory,
- Uni-TE/Modbus messaging on TCP/IP with a maximum of 32 simultaneous connections and Uni-TE/Modbus request limited to 128 bytes,
- Diagnostics by LEDs,
- Possibility of simultaneously connecting 8 Internet browsers,
- FactoryCast utilities support (refer to the FactoryCast User Guide documents ref.: 890 USE 152),
- 8 Mbytes of additional Flash Memory reserved for the user application in FactoryCast: the user can add their own pages or "Applets" to the initial web site.

Synthesis of Module Functions

At a Glance

Depending on the module reference, the functions offered are different.

TSX ETZ 410 Module

The table below summarizes the different functions of the TSX ETZ 410 module:

Function	Details
Messaging on port 502 (Xway or Modbus on TCP/IP)	● 32 simultaneous connections maximum (Client + Server). ● Access control via configuration table.
TCP/IP connections	● 32 messaging connections.
Bootp client utility	-
DHCP(FDR) client utility	-
SNMP module	● SNMP MIB-II agent and MIB Ethernet Transparent Factory.
RS 232 link for external modem	● Up to 56 Kbauds.
Unitelway link	● Speed configurable from 9600 to 19200 baud
Web site	● Simultaneous connection of 8 Internet browsers. ● Non-modifiable factory -installed web site, with diagnostics and configuration pages.

TSX ETZ 510 Module

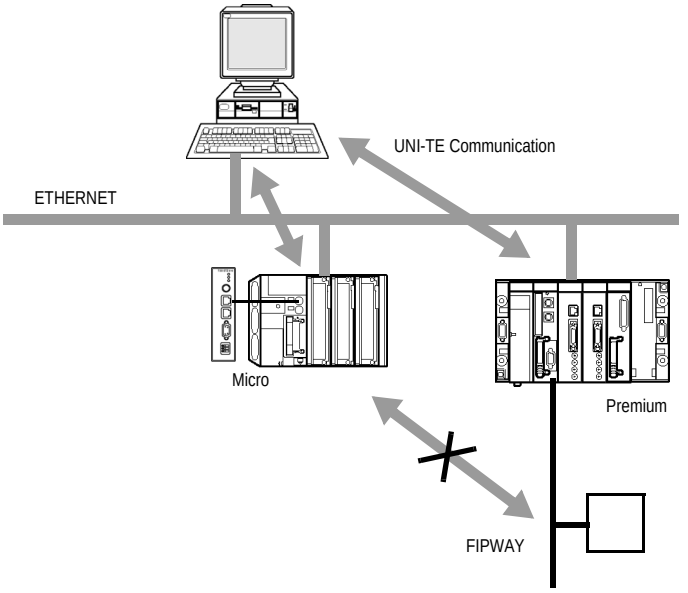
The table below summarizes the different functions of the TSX ETZ 510 module:

Function	Details
Messaging on port 502 (X-Way or Modbus on TCP/IP)	● 32 simultaneous connections maximum (Client + Server). ● Access control via configuration table.
TCP/IP connections	● 32 messaging connections.
Bootp client utility	-
DHCP(FDR) client utility	-
SNMP module	● SNMP MIB-II agent and MIB Ethernet Transparent Factory.
RS 232 link for external modem	● Up to 56 Kbauds.
Unitelway link	● Speed configurable from 9600 to 19200 baud
Web site	● Simultaneous connection of 8 Internet browsers. ● Non-modifiable factory -installed web site, with diagnostics and configuration pages. ● 8 Mbytes reserved for users web site.

Note

The inter-network routing is not realized by TSX ETZ modules (e.g.: TCP/IP - Fipway routing). It is responsible for the application.

Illustration



Utilities

2

At a Glance

About this Chapter

This chapter describes the utilities offered by the TSX ETZ 410/510 modules.

What's in this Chapter?

This chapter contains the following sections:

2.1 Uni-Telway Communication Function

Uni-Telway Communication

Principles

The TSX ETZ 410/510 is a TCP-IP/Uni-Telway gateway for transporting Modbus and UNI-TE requests.

The TSX ETZ 410/510 module is an Uni-Telway slave. So that the gateway functions, the module should be connected to a master TSX 3710/3721/3722.

The Uni-Telway link can be configured (speed, parity, address, etc.) so that it is compatible with the master.

The module communicates with the master PLC thanks to 2 consecutive slave numbers:

- 1st address: network access address, used in Micro client mode to access devices connected to the TCP/IP network.
- 2nd address: reserved, used by the module when it receives a message from a TCP/IP device, which is intended for the Micro (Micro server). It is equal to the 1st address + 1.

Uni-Telway Parameters

The table below gives the parameters to be configures for the module:

Parameters	Value
Address 1 for the network access	Can be configured from the web page: **Unitelway Configuration**.
Address 2 for the network access	It is equal to address 1 + 1: reserved (cannot be configured)
Speed	9600, 19200 baud or automatically adapts between these two values.
8 bits of data	Cannot be configured
1 stop bit	Cannot be configured
Parity	Even, odd or none
Time Out	Configurable between 1 and 10 seconds.

2.2 TCP/IP Messaging

At a Glance

About this Section

This section introduces the TCP/IP messaging service on the TSX ETZ 410/510 modules.

What's in this Section?

This section contains the following topics:

Summary of TCP/IP Specifications

Communication Port	The communication port reserved for the TSX ETZ 410/510 module is the port 502 (Schneider reserved port). When a client device requires access to the module, it asks for a connection to this port to be opened.
Timeout on TCP Connection	If a TCP connection cannot be established (when the destination is absent for example), the timeout error occurs after 80 seconds. It is advised that each of the timeout values for these communication functions should be set higher than 80 seconds if the 1st exchange was not successful.
"Keep Alive" Function	The function automatically generates a frame almost every 2 hours to detect any breakage in the connection. This mechanism is further detailed in the Behavior during a Connection Breakdown seciotn (*p. 41*).

Addressing Management

At a Glance

When installing ETZ modules, the following addresses must be configured:

- The IP address
- The X-WAY address

Note: From the factory, each module has a unique Ethernet interface IP address by default, which is calculated using it's MAC address. The MAC address is defined in the factory by the manufacturer and engraved on the front face of the module.

IP Address

It is defined by the user when configuring the module and identifies a machine linked to the network. On the same local network, this address **must be unique**.

Important: each module has an IP address by interface:

- An IP address for the Ethernet interface
- An IP address for the modem serial link interface, used by the PPP protocol.

Note: On a "private" network, it is not necessary to alter the IP address by default.

X-WAY Address

All TSX ETZ modules are Uni-Telway slaves. It has an X-Way address, which is also unique on the whole X-Way structure.

IP Address

General

Each device on the network should have a **unique IP address**.

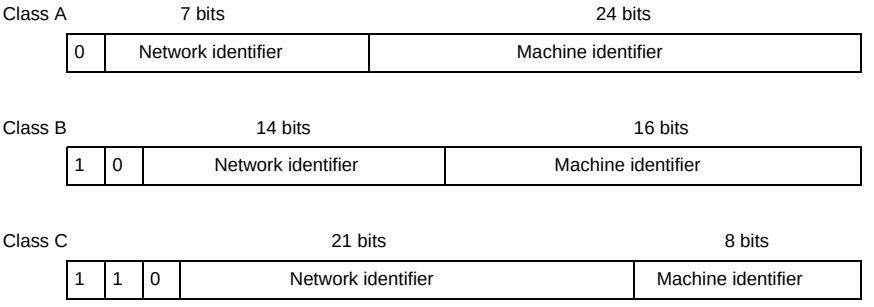
The uniqueness of the IP address is guaranteed by attributing "ID network" by an authorized party. The choice between the different classes depends upon the number of networks in the installation and on the number of machines to be connected.

Address Composition

Conceptually, each IP address is a pair (network name, machine identifier), whereby the network name identifies a network (or a site) and the machine identifier denotes a machine connected to this network. There are 3 types of IP addresses.

Address Types

The structure of the address types is as follows



Externally, an IP address for a machine is represented by a character string of 4 8-bit values (0 to 255), separated by the points: " a.b.c.d ".

Class	Values of "a"
A	0-127
B	128-191
C	192-223

Default Ethernet Interface IP Address for the ETZ Module

The default Ethernet interface IP address for the TSX ETZ module is made from it's MAC address:

085.016.xxx.yyy where xxx and yyy are the last two numbers of the MAC address.

Example:

The module's MAC address is (in hexadecimal): 00 80 F4 01 **12 20**.

In this case the default IP address is (in decimal): 085.016.**018.032**.

PPP Interface IP Address

The TSX ETZ manages an IP address by interface, the Ethernet interface IP address (configured by the user or service) and the IP address of the PPP interface. The latter is assigned during connection negotiation by the PPP protocol.

The TSX ETZ is configured to accept any type of IP address during negotiation. To do this, it is recommended that any machine with which the TSX ETZ has to open a Modem/PPP connection be configured to assign the IP address to the TSX ETZ.

However, if the remote device is configured to receive its IP address from the TSX ETZ, the IP addresses following negotiation will be:

- TSX ETZ: **85.16.0.2**
- Remote device: **85.16.0.1**

If the connection is a TSX ETZ <-> TSX ETZ connection, the two machines will use the IP address: **85.16.0.2** in respect of their PPP interface.

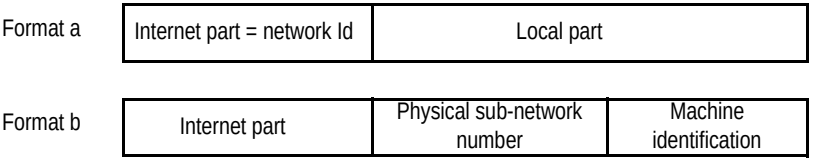
Sub-Addressing, Gateway

Sub-Addressing

The principle of sub-addressing is to break down the IP address (format a) into network and a local parts:

- The network part is identical to the IP address: it identifies a network (or a site).
- The local part is left to the initiative of the site: it is therefore sub-divided into a physical subnetwork number and a machine identification (format b).

Illustration:



Mask

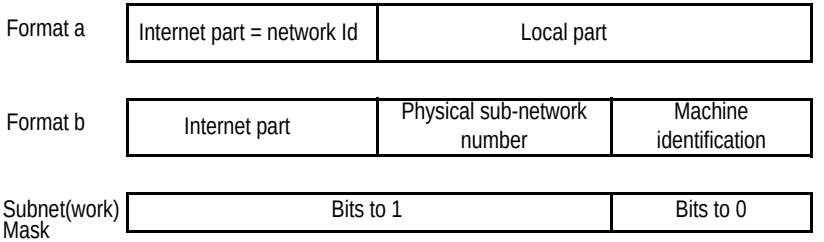
A Subnet(work) Mask, coded on 32 bits, allows the bits from an IP address to be defined as a network part.

The mask bits are:

- set to 1, if the corresponding IP address bits are to be identified as a part of the network address.
- set to 0 for machine identification.

This system allows internal local networks to be addressed using a single attributed IP address.

Illustration:



Gateway

The Gateway is used to route a message towards a machine that is not on the current network.

Connection Management

At a Glance

The connection can be opened either by the local Micro PLC or by a remote dialog that wishes to enter into a dialog with the local PLC.

A connection is characterized by the module:

Local TCP port, local IP address/remote TCP port, remote IP address.

Note: Important: The number of simultaneously open connections is 32. However, messaging saturation on these links can cause connection breakages. In the event of messaging saturation, it is advisable to decrease the number of Uni-Telway slaves and/or use a 19200 speed.

The configuration screen is used to configure:

- Either the modem profile
- Or the Ethernet profile

The RS232 Modem and Ethernet interfaces are exclusive.

Note: Connection management is transparent to the user.

Opening a Connection on the Ethernet Network

At a Glance

A connection can be opened either:

- Upon request from a remote device.
- Or upon request from a local Micro.

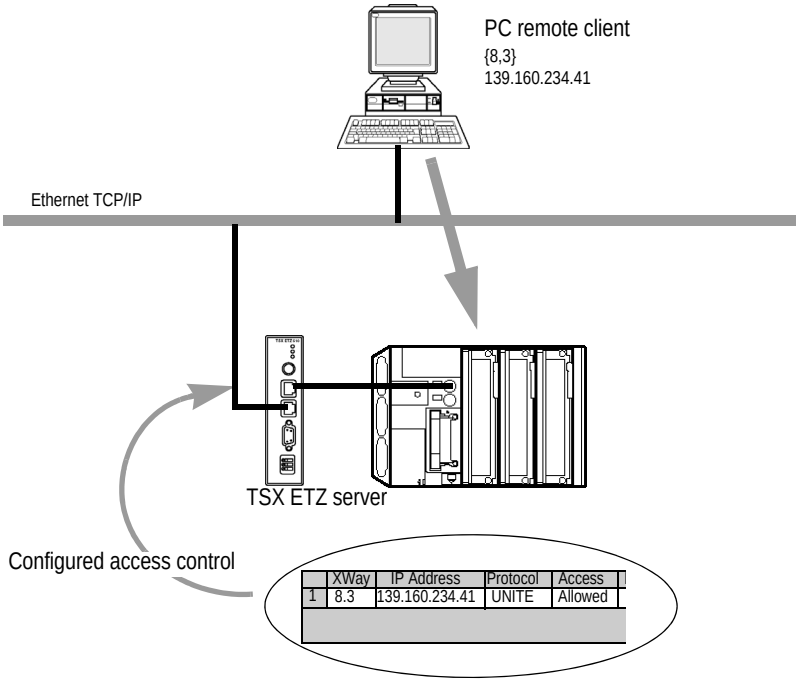
Upon Request from Remote Devices.

In this case, the TSX ETZ 410/510 is the connection server.

When a connection request is received from a remote device, the remote machine's IP address is only checked if and only if access control has been activated in the configuration.

The test consists of checking whether this address belongs to the list of remote machines that are authorized to be connected. If it is, the connection is accepted. If not, the connection is closed.

Illustration



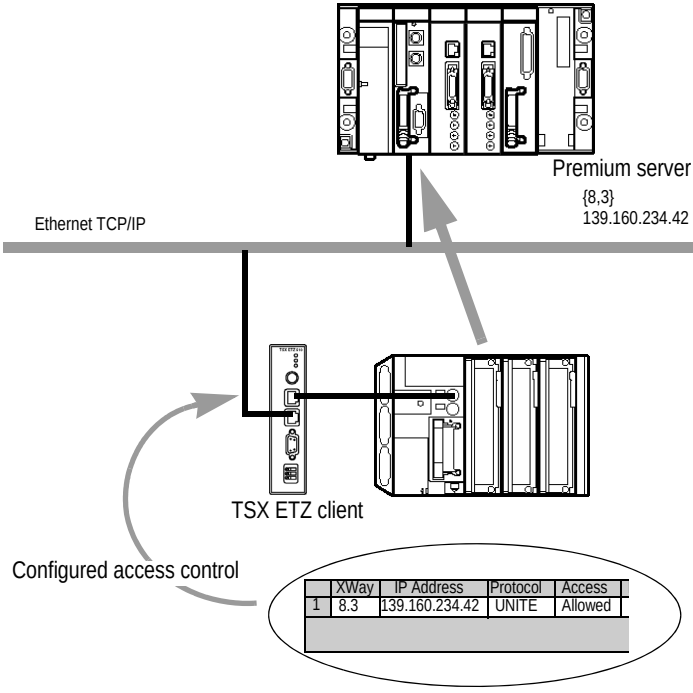
Upon Request from the Local Micro

In this case, the TSX ETZ 410/510 is the connection client.

When a message is transmitted by a communication function and if there is no connection with the remote device a connection is opened automatically by the TSX ETZ towards the remote device's port 502.

The remote device must be referenced in the X-Way/IP configuration table.

Illustration



Opening a Serial Link Connection via a Modem

At a Glance

A serial link connection via a modem can be opened either:

- Upon request from a remote device (server mode).
- Or upon request from a local Micro (client mode).

Note: Important: client mode takes priority over server mode. If a remote device in server mode has established communication with the Micro, the TSX ETZ will close the connection if this Micro wants to establish a connection in client mode with a different remote device.

Note: Important: the module only allows management of an RTC modem (the specialized mode line is not managed).

PPP and PAP Protocols

The connection uses the **PPP** protocol (Point-to-Point Protocol). Thanks to this protocol, once the telephone link has been established the modem link will be viewed on the application level in the same way as a TCP/IP link.

For **PPP**connection, the identification protocol is **PAP** (Password Authentification Protocol). Any device with which TSX ETZ is in Modem/PPP connection must be configured using the **PAP**. The **CHAP** protocol is not implemented on the TSX ETZ.

For the connection to be accepted, the UserName and Password **PAP** of the remote device must be known. Before connecting the TSX ETZ to the remote device, the remote device must also be configured to use the PAP protocol.

The TSX ETZ password and user name used by the PAP protocol are the same as those of the HTTP server (by default: USER/USER).

The modem connected to the TSX ETZ must respond to AT commands in ASCII mode.

The TSX ETZ manages an IP address by interface, the Ethernet interface IP address (configured by the user or service) and the IP address of the **PPP** interface. The latter is assigned during connection negotiation by the **PPP** protocol.

The TSX ETZ is configured to accept any type of IP address during negotiation. We recommend that any device with which the TSX ETZ must open a Modem/PPP connection be configured to assign the IP address to the TSX ETZ.

However, if the remote device is configured to receive its IP address from the TSX ETZ, the IP addresses following negotiation will be:

- TSX ETZ: **85.16.0.2**
- Remote device: **85.16.0.1**

Note:

If the connection is a TSX ETZ <-> TSX ETZ connection, the two machines will use the IP address: **85.16.0.2** in respect of their **PPP** interface.

Connection Establishment Time

The maximum connection establishment time is fixed. It comprises the following times:

- Maximum modem configuration time (transmission and HAYES command recognition times): **5 seconds**.
- Maximum call time (telephone dialing + time to establish line with remote modem): **90 seconds** (1mn 30s.)
- PPP connection time (IP address negotiation + password validation): **60 seconds** (1mn).

A total maximum time of**155 seconds**, or **2mn 35s**. This time should correspond to the Time out of the request that makes the telephone call (SEND_REQ()).

Example of telephone call programming:

```
(*Micro client: exchange Mirror request to the Premium system
port - @X-way:2.4*)
%MW10:=16#0402;
%MW11:=16#0000;
%MW12:=16#0000;

(*Start of Mirror request input parameters*)
%MW13:=...;

(*Connection establishment time=160seconds*) %MW2:=1660;

Send_Req(ADR#0.0.4,#FA,%MW10:13,%MW100:10,%MW0:4)
```

EF Reports

Operation reports specific to the modem connection are available.

List of possible operation reports:

If communication report = 16#FF	
Errno Value:	**Operation report: (least significant byte) Meaning:**
16#E8	Connection refusal by remote device (e.g., invalid password)
16#E9	Line busy
16#EA	No data carrier and/or no tone
16#EB	No response from remote modem
16#EC	No response from local modem

RS 232 Modem Diagnostics link

The PPP/Modem LogFile page on the HTTP server reports on the last four connections. (See *RS232 Modem Link Page Diagnostics, p. 74*.)

Connection on Request from Remote Devices

In this case, the TSX ETZ 410/510 is the connection server.

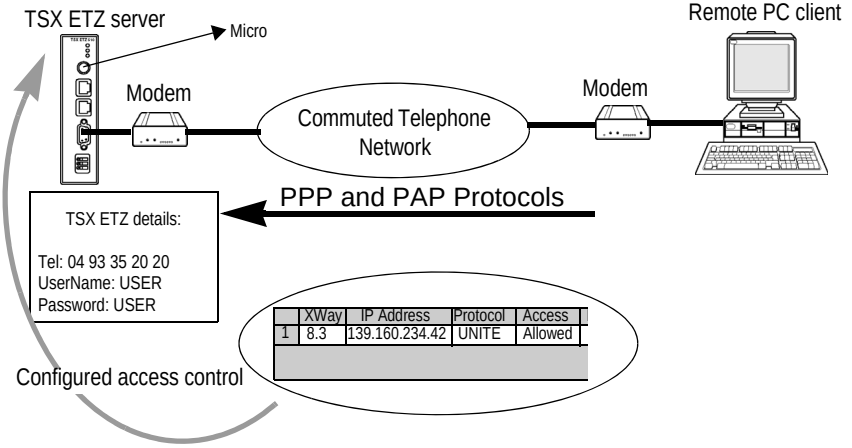
If the TSX ETZ module is used with a modem configuration, the module listens for an incoming request for telephone connection.

Once the telephone link is established and when a connection request is received from a remote device, the remote device's IP address is only checked (if and only if access control has been activated in the configuration).

This test consists of checking whether this address belongs to the list of remote machines with authorization to connect.

If the test is positive, the TCP connection is accepted. If not, the TCP connection is closed and the **telephone link is cut**.

Illustration:



Connection on Request from Local Machines

In this case, the TSX ETZ 410/510 is the connection client.

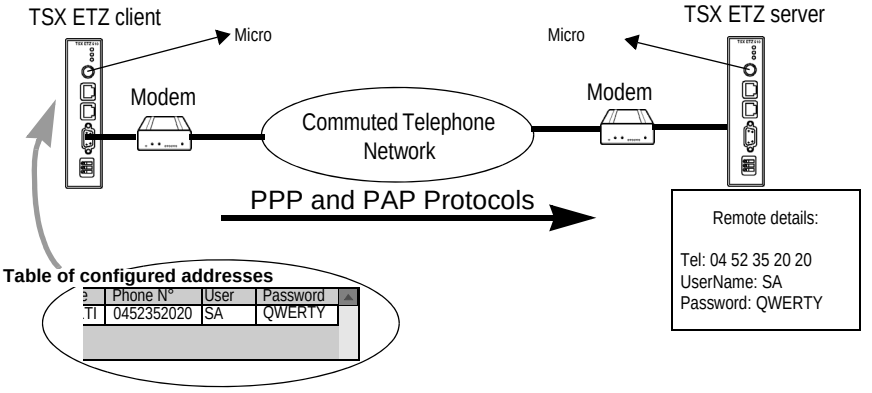
When a message is transmitted for the first time by a communication function and if there is no modem connection with the remote device and if the remote device is part of the configuration table, a modem connection is opened automatically by the TSX ETZ.

The module then establishes the telephone link by dialing the telephone number configured for the remote device.

The TCP/IP connection is then automatically opened by the TSX ETZ towards the remote device's port 502.

The remote device must be referenced in the X-WAY/IP configuration table.

Illustration:



Note: Important: For a defined remote device, the telephone number to be dialed can only be modified by accessing the Web server's **Setup home page** (*p. 82*) menu. It is then necessary to reboot the TSX ETZ so that the new configuration is recognized.

Closing the Connection

At a Glance

There are two different ways in which the TCP/IP connection can be closed:

- By the remote station deciding to cease communication and sending a TCP/IP connection close.
- By the TSX ETZ if the maximum number of open connections is reached (in which case the oldest open connection is closed).

When a connection is closed, the application is informed by an error report (message refused) once the exchange is activated.

In the case of a telephone link, the link is cut:

- By the remote station deciding to cease communication and cutting the telephone connection,
- If the remote device does not have authorization to connect,
- If the time between two frames, which is set at configuration, elapses,
- If connection duration exceeds the time defined at configuration (*p. 110*).
- If a Micro, which is a remote station server, wishes to establish a client mode connection to another remote station.

Behavior during a Connection Breakdown

At a Glance

Connection breakdown can occur in two ways:

- Network cable cut off (cable has been disconnected, cut, etc.)
- disappearance of remote devices (broken down devices, power outage, etc.)

Loss of connection is detected after 2 hours by a Keep Alive request.

If during this time the connection is re-established, the resumption of communication differs according to the type of breakdown.

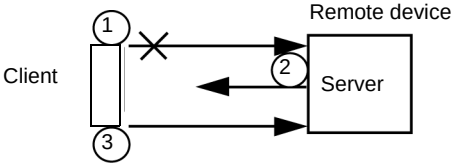
Cable Reconnection

In this case the connection breakdown originates from the network cable but the two stations remain operational.

Once the cable is reconnected, communication between the ETZ module and the remote device will resume on the TDP/IP connection previously opened.

Server Remote Device

The remote device, which has disappeared, was the server.



1 The ETZ client module still transmits data on the old connection (which remained semi-open).

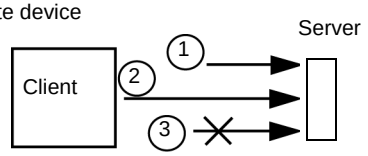
2 When the server receives data without a connection, it transmits a Reset command and closes the old connection.

3 The ETZ client module opens a new connection.

Client Remote Device

The remote device which has disappeared was the client.

Remote device



1 The client opens a new connection.
2 The server ETZ module receives a request to open a new connection.
3 The ETZ slave module closes the old connection (if there is no current activity) and authorizes the new connection.

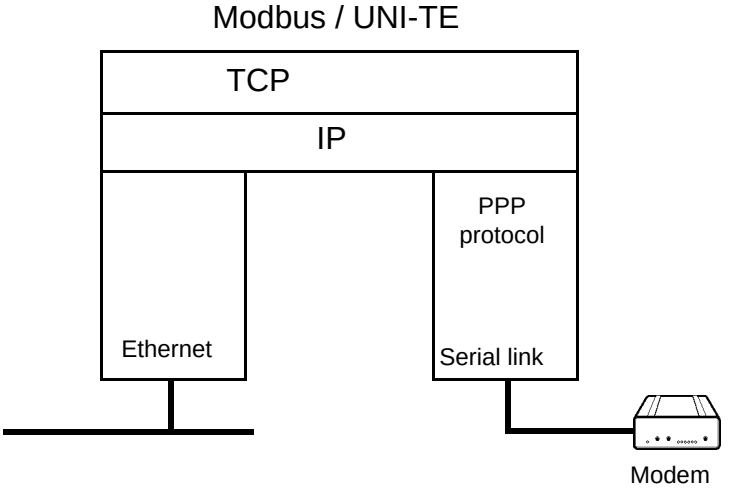
Communication Functions on TCP/IP

At a Glance

The communication profile on TCP/IP allows data exchange services.

The same communication services are available on Ethernet or on a link series via the PPP protocol.

Illustration:



UNI-TE Communication

At a Glance

The UNI-TE utility allows the exchange of data on the Mast task.

Server Mode

In server mode, the TSX ETZ module is transparent with regard to UNI-TE requests from the PLC.

Client Mode

In client mode, it is possible to transmit the following UNI-TE request: **SEND_REQ()**.

This request is sent to the TSX ETZ module's Address 1.

The following requests are addressed to remote devices to read and write variables:

Type of request	UNI-TE communication function
Reading of 1 or n bits	SEND_REQ(#36...)
Reading of 1 or n words	SEND_REQ(#36...)
Writing of 1 or n bits	SEND_REQ(#37...)
Writing of 1 or n bits	SEND_REQ(#37...)
Refer to TSX DR NET Communication Reference manuals for the coding of UNI-TE requests.	

Note: Important: SEND_REQ request does not monitor coherence of input parameters (e.g., checking between the number of facts to write and the size of the data buffer). The user should do this.

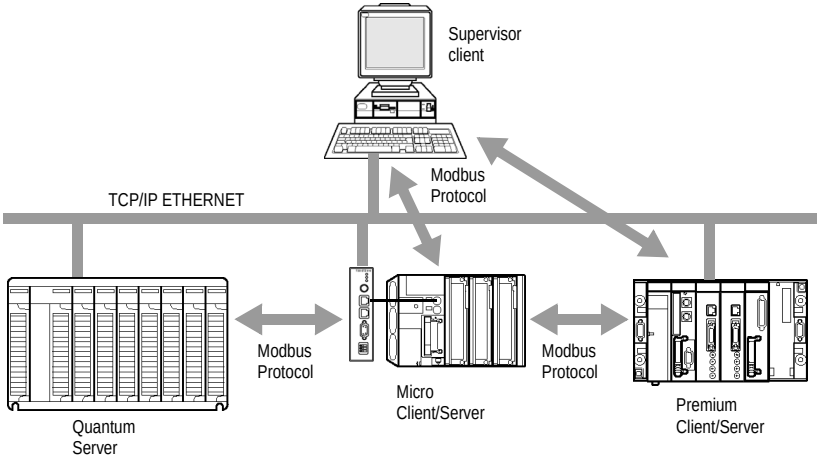
See *Examples of Programming on the Ethernet Profile, p. 51*.

Modbus Communication on the TCP/IP Profile.

At a Glance

This utility allows communication through the Modbus protocol between a Micro PLC and a Micro, Premium, Quantum, Momentum PLC or any other device complying with the Modbus protocol.

Illustration



A similar TSX ETZ can communicate with a remote device in the master mode (for example a Quantum PLC) and another remote device in the slave mode (for example a Supervisor PC).

The Micro PLC is the master of the Quantum PLC. It opens the TCP/IP connection and sends messages to the Quantum.

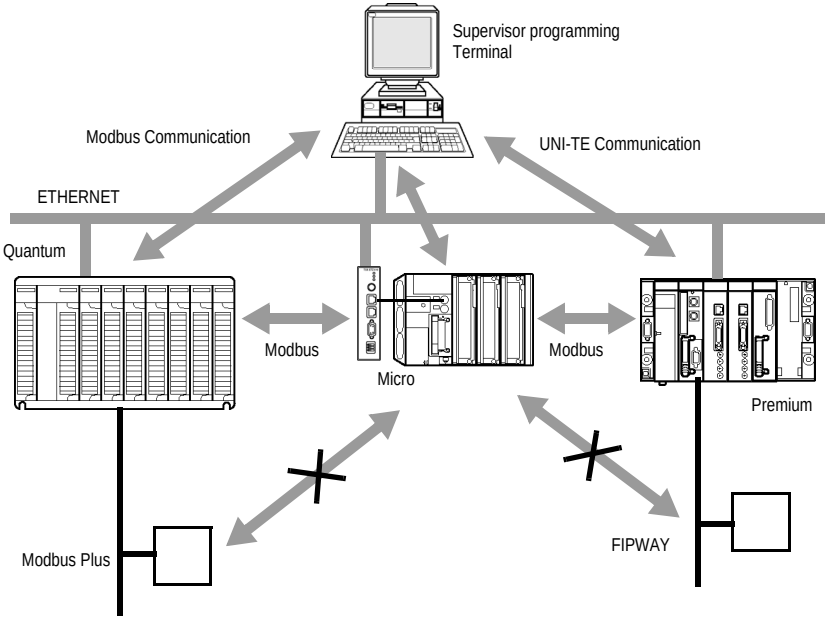
The Micro PLC is the slave of the supervisor. The supervisor has opened a TCP/IP connection and sends Modbus messages to the Micro.

Note: the double profile of UNI-TE/ Modbus is not supported on a similar distant station.

Structure supported by a Modbus Communication on the TCP/IP Profile

At a Glance

Illustration of the supported structure:



Accessibility

The Modbus protocol guarantees interoperability between Premium, Micro and Quantum stations on an Ethernet TCP/IP network.

However, access from a Micro PLC to a Modbus Plus network connected to the Quantum PLC is not possible via TCP/IP.

The Modbus protocol does not cross X-Way Premium bridges.

Modbus Messaging on the TCP/IP Profile

Installation Principle

Exchanges in the client and server modes are carried out in the same way as in UNI-TE, with the following restrictions.

Even though a Modbus remote station does not have an X-Way format address, each communication function uses an X-Way format address to denote a remote IP station.

For each Modbus remote station, you must configure the two following factors in the correspondence table: IP address, {network station} X-Way with:

- Network: network number of the local X-WAY station.
- Station: X Way station logic number = 100 to 164.

Example: X-Way address {2.108} is associated with IP address 139.160.2.8.

Note: This address is used by the TSX ETZ module but is not transmitted on the network. In the case of a remote station configured with the Modbus protocol, it is necessary to give an X-Way station address equal to the local X-Way station number plus 100.

Exchange of data

As seen from the Micro's PL7 application, the communication function to be installed **is always the UNI-TE request** SEND-REQ. It is the TSX ETZ module that performs the conversion to the corresponding remote station.

Note: Important: SEND_REQ request does not monitor coherence of input parameters (e.g.: checking between the number of facts to write and the size of the data buffer). The user should do this.

The following requests are addressed to remote devices to read and write variables:

Modbus request	Modbus function code	Corresponding UNI-TE communication function
Reading of 1 or n bits	16#01	SEND_REQ(#36...)
Reading of 1 or n words	16#03	SEND_REQ(#36...)
Writing of 1 or n bits	16#05 or 16#0F	SEND_REQ(#37...)
Writing of 1 or n bits	16#06 or 16#0F	SEND_REQ(#37...)
See communication reference manuals TSX DR NET for the coding of UNI-TE requests and manual TSX DG MDB for the coding of Modbus requests.		

See *Examples of Programming on the Ethernet Profile, p. 51*.

Correspondence of objects

The following table gives the correspondence between the types of objects of a Micro PLC and a TSX Quantum PLC or Momentum input/output.

Micro objects	Quantum or Momentum objects
%MW: Internal Words	4x... memory area
%M: Internal bits	0x... memory area

Messaging Service

At a Glance

The TSX ETZ messaging module allows the following modes:

- The client mode
- The server mode

Note: For these modes it is only possible to have access to the device's system gate. It would not be possible to access for example the Fipway network of a Micro.

Client Mode

In this mode, the Micro has the initiative of an exchange into a remote station, by using the SEND_REQ() communication functions in the application (a maximum of 4 communication functions can be used simultaneously).

Usage in the client mode requires the introduction of a table of 6 bytes corresponding to the destination address at the beginning of the transmission stamp.

For more information refer to the TSX DR NET manual.

Illustration:

	Byte 1 (most significant)	**Byte 0 (least significant)**
Word 1	Station number	Network number
Word 2	0	0
Word 3	0	0

Example: transmission to the system gate of a remote PLC (network 2.station3):

	Byte 1 (most significant)	**Byte 0 (least significant)**
Word 1	3	2
Word 2	0	0
Word 3	0	0

Server Mode

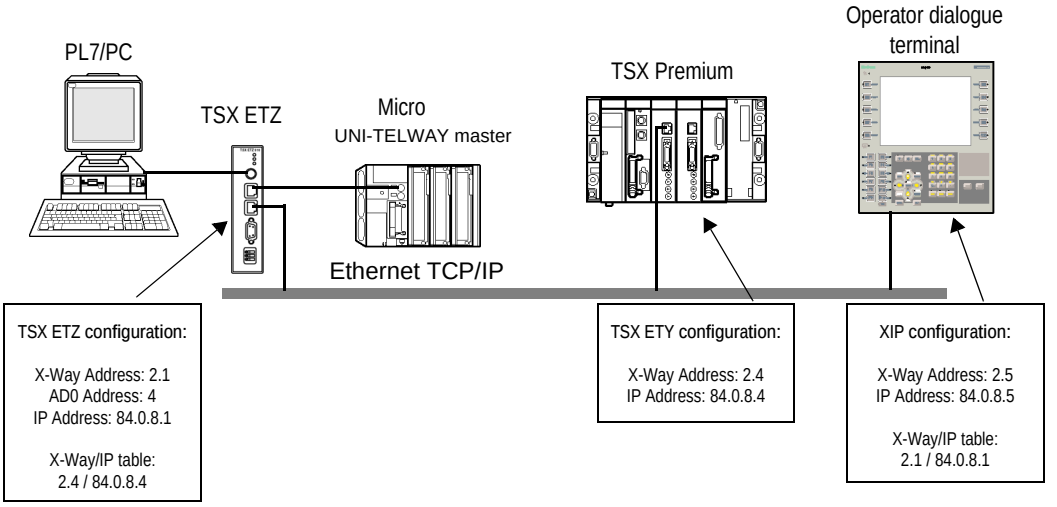
In this case, the Micro is the server of exchanges, which originate from remote stations. The system gate of the Micro is accessible from remote stations using the following address:

{AdressNetworkETZ.AdresseStationETZ}.SYS

Examples of Programming on the Ethernet Profile

Configuration Example

Namely the following configuration:



Example of Programming a Mirror Request

Using the configuration below, the programming is the following:

```
(*Micro exchange client Mirror request to the Premium system
gate*)
%MW10:=16#0402;
%MW11:=16#0000;
%MW12:=16#0000;

(*Start of Mirror request input parameters*)
%MW13:=...;

Send_Req(ADR#0.0.4,#FA,%MW10:13,%MW100:10,%MW0:4)
```

Micro Server

The system gate of the Micro is accessible from stations on the Ethernet network using the following address:

{2.1}SYS

Example of word reading programming in UNI-TE

This program allows a UNI-TE request to be sent to a remote device with an X-Way address: 60.18 (16#123C). The request allows the words %MW10000, %MW10001, %MW10002. to be read:

```
(*ETZ in client mode*)
(*request for the reading of three words (UNITE)*)
If NOT %MW300:X0 THEN
%MW302:=60;(*time out by 100ms*)
%MW303:=12;(*length in bytes of data to transmit*)
%MW100:=16#123C;(*station-network: XWAY address (UNITE)*)
%MW101:=16#0000;
%MW102:=16#0000;
%MW103:=16#0768;(*segment type: internal word*)
%MW104:=10000;(*address of the first word to read*)
%MW105:=3;(*nb word to read*)

(*%MW200:4 = 4 word reception table: type of object on 1 byte
+ 3 words of data*)
SEND_REQ(ADR#0.0.4,16#0036,%MW100:6,%MW200:4,%MW300:4);
END_IF
```

The confirmation of the correct report is: 16#6600

Note: In the reception table, the significance of the first word of the read data is contiguous with the object byte.

Example of programming of writing words in Modbus

This program allows the sending of a request for writing in Modbus messaging to the same remote device. 100 is added to the address below: 60.118 (16#763C). The request allows the writing in the words %MW10006, %MW10007, %MW10008, of the values 4, 5 and 6 respectively.

```
(*ETZ in client mode*)
(*Request to write 3 words (Modbus)*)
If NOT %MW1200:X0 THEN
%MW1202:=60;(*time out by 100ms*)
%MW1203:=18;(*length in bytes of data to transmit*)
%MW1000:=16#763C;(*station-network: XWAY address (Modbus*)
%MW1001:=16#0000;
%MW1002:=16#0000;
%MW1003:=16#0768;(*segment type: internal word*)
%MW1004:=10009;(*address of the 1st word to write*)
%MW1005:=3;(*no. words to write*)
%MW1006:=4;(*value of facts to write*)
%MW1007:=5;(*value of facts to write*)
%MW1008:=6;(*value of facts to write*)

(*%MW1100:1 = 1 word reception table: Report on 1 byte*)
SEND_REQ(ADR#0.0.4,16#0037,%MW1000:9,%MW1100:1,%MW1200:4);
END_IF
```

The confirmation of the correct report is: 16#FE00

Example of Bits Reading Programming in UNI-TE

This program allows a UNI-TE request to be sent to a remote device with an X-Way address: 60.118 (16#123C). The request allows 3 bits to be read: %M100, %M101, %M102.

```
(*ETZ in client mode*)
(*request for the reading of 3 bits (UNITE)*)
If NOT %MW1500:X0 THEN
%MW1502:=60;(*time out by 100ms*)
%MW1503:=12;(*length in bytes of data to transmit*)
%MW1300:=16#123C;(*station-network: XWAY address (UNITE)*)
%MW1301:=16#0000;
%MW1302:=16#0000;
%MW1303:=16#0564;(*segment type: internal bit*)
%MW104:=100;(*address of the 1st bit to read*)
%MW1305:=8;(*no. words to read (multiple of 8)*)

SEND_REQ(ADR#0.0.4,16#0036,%MW1300:6,%MW1400:2,%MW1500:4);
END_IF
```

The confirmation of the correct report is: 16#6600

Note: The number of bits to be read must **always** be a multiple of 8

Example of programming of writing of bits in Modbus

This program allows the transmission of a Modbus request to the same remote device. 100 is added to the address below: 60.18 (16#763C). The request allows 16 bits to be written: %M400 to %M415 in the remote device.

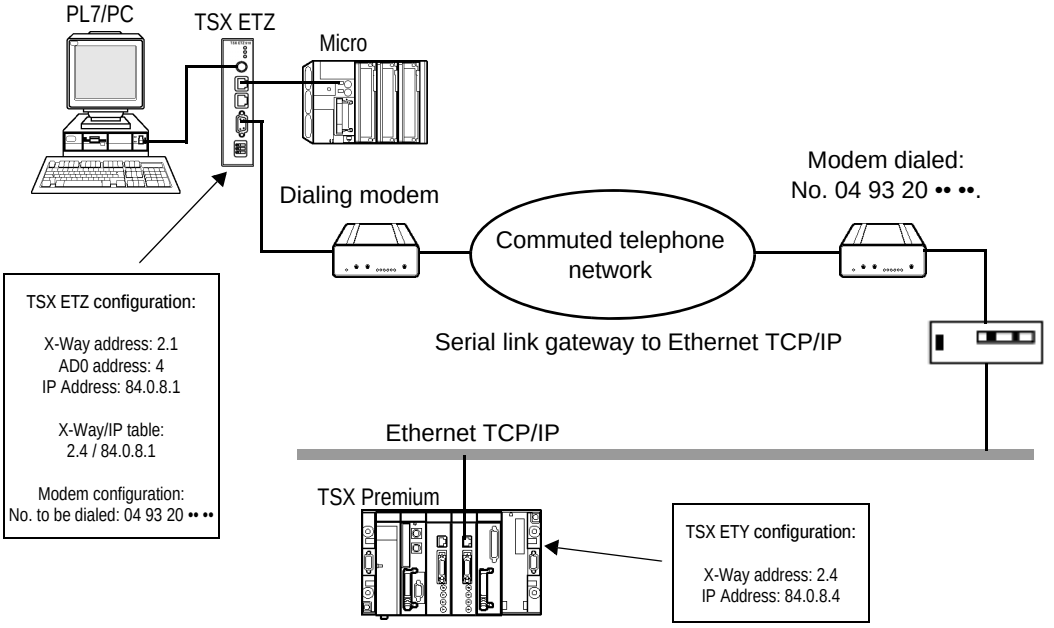
```
(*ETZ in client mode*)
(*Request to write 16 bits (MODBUS)*)
If NOT %MW2400:X0 THEN
%MW2402:=60;(*time out by 100ms*)
%MW2403:=14;(*length in bytes of data to transmit*)
%MW2200:=16#763C;(*station network: XWAY address (MODBUS)*)
%MW2201:=16#0000;
%MW2202:=16#0000;
%MW2203:=16#0564;(*segment type: internal bit*)
%MW2204:=400;(*address of 1st bit to write*)
%MW2205:=16;(*no. of bits to write*)
%MW2206:=16#00A5;(*value of bits to write*)

SEND_REQ(ADR#0.0.4,16#0037,%MW2200:7,%MW2300:1,%MW2400:4);
END_IF
```

The confirmation of the correct report is: 16#FE00

Example of Programming via a RTC Modem Connection

Configuration Example

Namely the following configuration:



Example of Programming of a Client Micro

Using the configuration below, the programming is the following:

```
(*Micro client: exchange Mirror request to the Premium system
port - @X-way:2.4*)
%MW10:=16#0402;
%MW11:=16#0000;
%MW12:=16#0000;

(*Start of Mirror request input parameters*)
%MW13:=...;

(*Connection establishment time=160seconds*) %MW2:=1660;
%MW2:=1660;

Send_Req(ADR#0.0.4,#FA,%MW10,%MW100,%MW0:4)
```

Note: Programming via a modem connection is the same as on the Ethernet profile, it is only the TSX ETZ configuration that changes. (See *Examples of Programming on the Ethernet Profile, p. 51*.)

Micro Server

The system door of the Micro shown in the example below, is accessible from stations on the Ethernet network using the following address:

{2.1}SYS

Limitations

At a Glance

The limit to the number of messages is linked to that of the Terminal port of the Micro PLC.

In Uni-Telway master mode, the terminal port authorizes the processing of:

- 4 messages being sent to the Uni-Telway bus
- 4 messages being received

The maximum size of each message is 128 bytes.

2.3 BOOTP and DHCP(FDR) Utilities

At a Glance

About this Section

This section introduces the BOOTP and DHCP (FDR) utilities.

What's in this Section?

This section contains the following topics:

BOOTP/DHCP(FDR) Utilities - General

At a Glance

The TSX ETZ module can be configured directly with its Ethernet interface IP address in the **IP Configuration** page or by using an automatic configuration protocol. These protocols are: **BOOTP** and **DHCP**.

BOOTP (Bootstrap Protocol) and DHCP (Dynamic Host Configuration Protocol) are the start up protocols for terminals or stations without disks via centralized management of network parameters.

They are mainly used to supply an IP address or a configuration to a station that starts up on the network.

The TSX ETZ is a BOOTP client or DHCP client.

The BOOTP/DHCP server can therefore be a TSX Premium fitted with a TSX ETY module, or a Quantum fitted with a NOE module.

Note: Automatic configuration only works via the Ethernet connection. It does not work via the RS 232 link or via modem.

TSX ETZ BOOTP client

Principle

The principle applied is as follows:

- The TSX ETZ module requests an IP configuration (IP address, Subnetwork Mask, Gateway) from a BOOTP server, using its MAC address,
- The BOOTP server uses a MAC Address/IP Configuration correspondence table to return the IP configuration to the TSX ETZ.

Note: Important: to use the BOOTP utility, the address server (e.g., TSX ETY410•/ 510•) must be configured to the BOOTP server, and the client device identified by its MAC address.

Note: The BOOTP server only sends back the IP address, the Subnetwork mask and the Gateway. Other information has to be filled out in the configuration page (e.g. XWay/IP connections correspondence table).

At Initial Start-Up

Behavior of TSX ETZ module during its initial start-up:

The TSX ETZ module sends the server a request in order to obtain a configuration:

- If this module is not recognized, it will start up using its default IP configuration (factory settings),
- If the BOOTP server sends an IP configuration, the TSX ETZ will use it but **without saving it in the Flash memory**.

At Subsequent Start-Ups

Behavior of modules during subsequent start-ups:

The TSX ETZ module sends the server a request in order to obtain a configuration:

- If the BOOTP server sends a configuration, the TSX ETZ will use it.
- If the BOOTP server does not respond after approximately 1 minute has elapsed, the TSX ETZ module will use the IP configuration saved in the Flash memory (the default configuration, the factory set configuration or the one saved in the Flash memory using the module's Web server).

TSX ETZ DHCP(FDR) client

At a Glance

This utility allows automatic retrieval of IP, Uni-Telway and SNMP configurations by a TSX ETZ module connected to an Ethernet Transparent Factory segment.

The FDR function uses a combination of DHCP and FTP/TFTP protocols.

The TSX ETZ uses a Name (Device Role Name) to obtain its configuration from the server. The **Device Role Name** is a character string (maximum 15) associated with the module and which must be **unique** in the architecture.

The TSX ETZ can therefore be automatically configured using a parameters file that has been saved in the DHCP server, for example a Premium TSX ETY 5102.

Note: Important: to use the FDR utility, the address server (eg. TSX ETY410•/510•) must be configured to the DHCP server, and the client device identified by its Role Name.

Note: Important: passwords are not saved in the server. The passwords recovered will be the default passwords.

Operation

The operating principle of the FDR utility is as follows:

1	A TSX ETZ is connected to the network using a configured Name (Device Role Name)
2	The TSX ETZ sends a request to the DHCP server, indicating its associated Device Role Name.
3	If the Device Role Name appears in the DHCP server configuration table, the DHCP server sends the following to the module: ● the IP address that must be used, ● the FTP/TFTP server's IP address, ● the location in the FTP/TFTP server of the configuration file to be retrieved.
4	In this case, the TSX ETZ accesses the FTP/TFTP server so that the configuration file is remotely loaded to or from the FTP/TFTP server. The configuration file is identified by a name consisting of the Device Role Name with the .prm extension.

At Initial Start-Up

Behavior of TSX ETZ module during its initial start-up:

The TSX ETZ module sends the server a request in order to obtain a configuration:

- If this module is not recognized, it will start up using its default configuration (factory settings), after about 1 minute has elapsed.
- If the module is recognized, the TSX ETZ will start up using the Client/Server configuration and will save this in its Flash memory (except the IP configuration).

At Subsequent Start-Ups

Behavior of modules during subsequent start-ups:

The TSX ETZ module sends the server a request in order to obtain a configuration:

- If the module is recognized, the TSX ETZ will start up using the Client/Server configuration and will save this in its Flash memory (except the IP configuration).
- If this module is not recognized, it will start up after about 1 minute has elapsed, with the default configuration saved in its Flash memory.

2.4 SNMP Server

SNMP Communication on UDP/IP

At a Glance

The SNMP (Simple Network Management Protocol) standard defines network management solutions in terms of protocol and the exchange of supervised data.

The SNMP structure relies on the following essential elements:

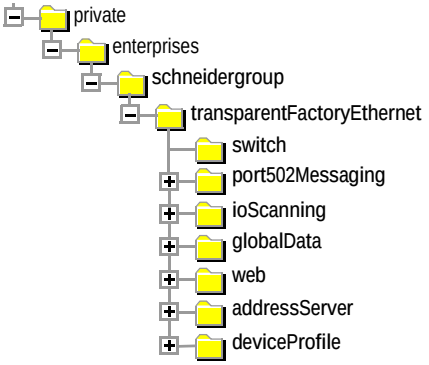
- The **Manager** allows entire or partial network supervision,
- One or more **Agents**. Each supervised device has a software module named **Agent** used by the SNMP protocol.
- An **MIB** (Management Information Base) is a database or a collection of objects updated by the agents.

The SNMP module agent is implemented on the TSX ETZ modules. The SNMP protocol allows a Manager to access MIB standardized objects from the TSX ETZ module.

The **MIB-II** allows the management of TCP/IP communication layers.

The **MIB Ethernet Transparent Factory** allows a Manager to access information about messaging services from port 502.

Branching view of the MIB Ethernet Transparent Factory via a Manager:



The **MIB Ethernet Transparent Factory** source file is available on the TSX ETZ 410/510 module. It can be remotely loaded from an internet browser by clicking the link "MIB Upload" from the Diagnostics home page (*p. 71*). This file may be compiled by the main SNMP Managers on the market.

The SNMP Protocol

The SNMP protocol defines 5 types of message between the agent and the manager. These messages are encapsulated in the **UDP** datagrams.

Messages from the manager to an agent:

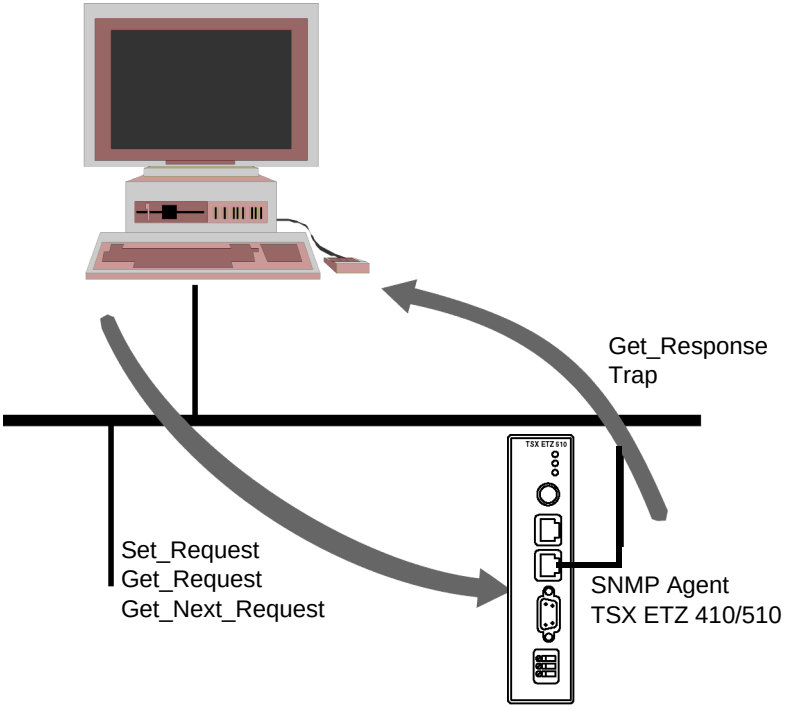
- `Get_Request`: message used to obtain the value of one or more variables.
- `Get_Next_Request`: obtains the value of the next variables.
- `Set_Request`: sets the value of a variable.

Messages from an agent to the manager:

- `Get_Response`: allows the agent to re-send the value of the requested variable.
- `Trap`: allows the agent to signal an event to the Manager (non-authorized access attempt or device restart).

Description of the Utilities

The SNMP manager transmits read or write requests (`Set_Request`, `Get_Request`, `Get_Next_Request`, etc.) for objects defined in the MIB - II SNMP, and the SNMP agent of the TSX ETY module responds.



The module's SNMP agent transmits events (Traps) to the Manager. The managed Traps Systems are as follows:

- `Coldstart Trap`:
  - The event is only transmitted once the module is switched on.
- `Authentification Failure Trap`: event transmitted following an authentication problem. The **Community Name** field in the received message is different to the one configured on the module. This trap can be checked when configuring the TSX ETZ module.

2.5 HTTP Server

At a Glance

About this Section

This section introduces the HTTP server utility on TSX ETZ 410/510 modules.

What's in this Section?

This section contains the following topics:

Installed HTTP Server

At a Glance

TSX modules have a Web server installed on them by default, allowing:

- the module to be configured:
  - TCP/IP Parameters
  - Modem
  - UNI-TELWAY
  - SNMP
- to modify the user name and the password to access the site,
- access to PLC data,
- to view the Micro rack,
- to assign a Device Role Name if auto-configuration has been chosen

None of the functions supplied by the Web site require any prior configuration or programming within the module.

All server data is constructed as standard Web pages in HTML format. It can therefore be accessed by any current Internet browser that can run installed JAVA code. These pages can be viewed using an Internet browser or FactoryCast software.

Differences between the two module types:

Functions	**TSX ETZ 410**	**TSX ETZ 510**
Number of Connected Browsers	8 max.	8 max.
Default Web Site installed	Yes	Yes
Memory reserved for user page creation	No	8 Mbytes

Default Web Server Functions

The functions are as follows:

- Diagnostic module functions:
  - Ethernet and Uni-Telway network statistics,
  - View of Micro rack driving the TSX ETZ,
  - TSX data editor driving the module,
  - RS232 modem link diagnostics.
- Module configuration functions:
  - Password modification,
  - TCP/IP Parameter Configuration,
  - UNI-TELWAY Parameter Configuration,
  - SNMP Parameter Configuration,
  - Resetting module.

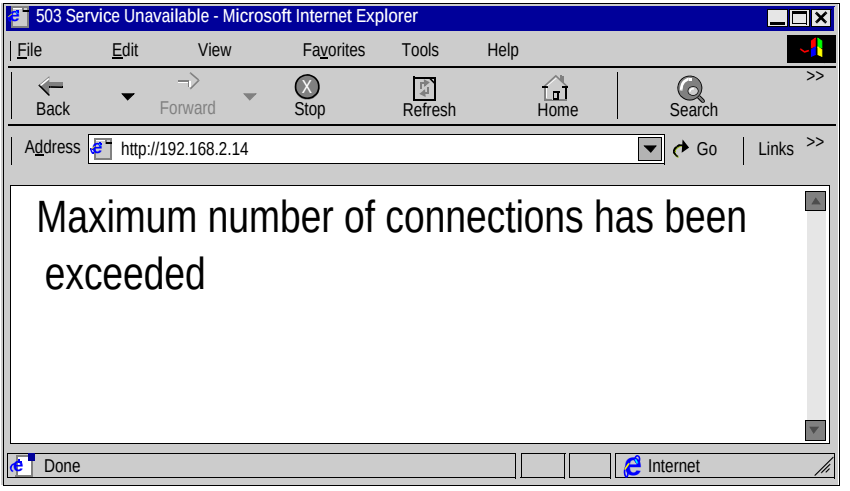
HTTP Connections

The following connection rules should be followed:

- 1 connected Internet browser can open 2 connections and the TSX ETZ authorizes a maximum of 16 connections.
- Each HTTP connection is automatically closed after one minute of inactivity.
- The connection remains active whilst passwords are entered.

As a result, 8 Internet browsers can be connected to a TSX ETZ module.

If the number of HTTP connections is reached, the browser displays the following page:



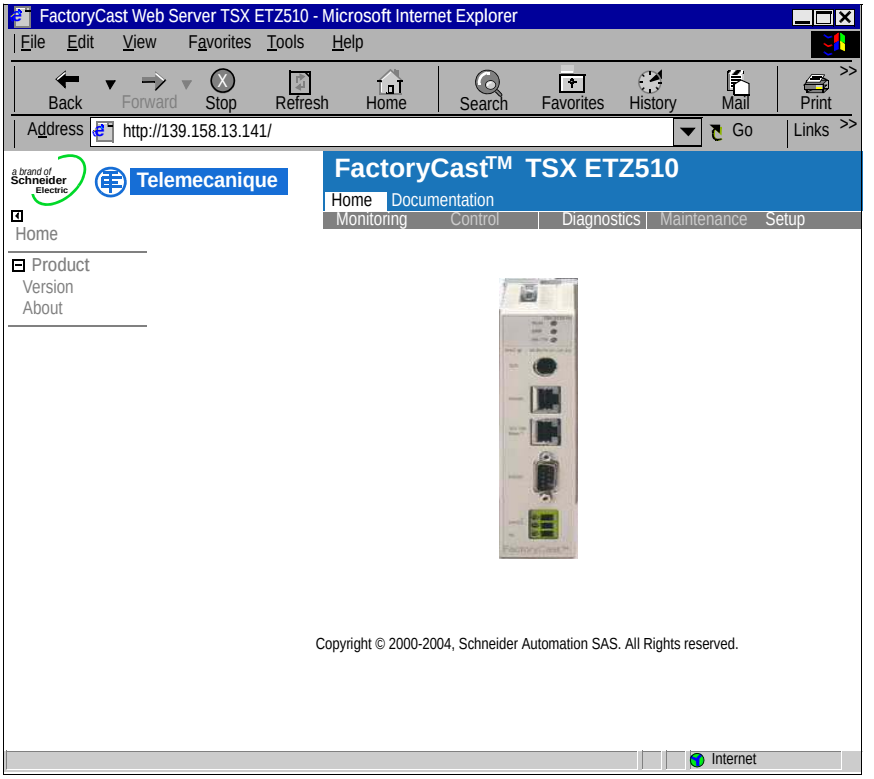
Micro Home Page

Overview

The visitor accesses the Micro home page by entering the IP address of the module in his web browser. No password is required to display this page.

Home Page

This Micro home page looks like this.



Links

From the Micro home page, you can access the following pages :

- ‘Monitoring’,
- ‘Diagnostics’,
- ‘Setup’,
- ‘Documentation’.

The visitor will have to supply a user name and a password to access the services proposed in these pages.

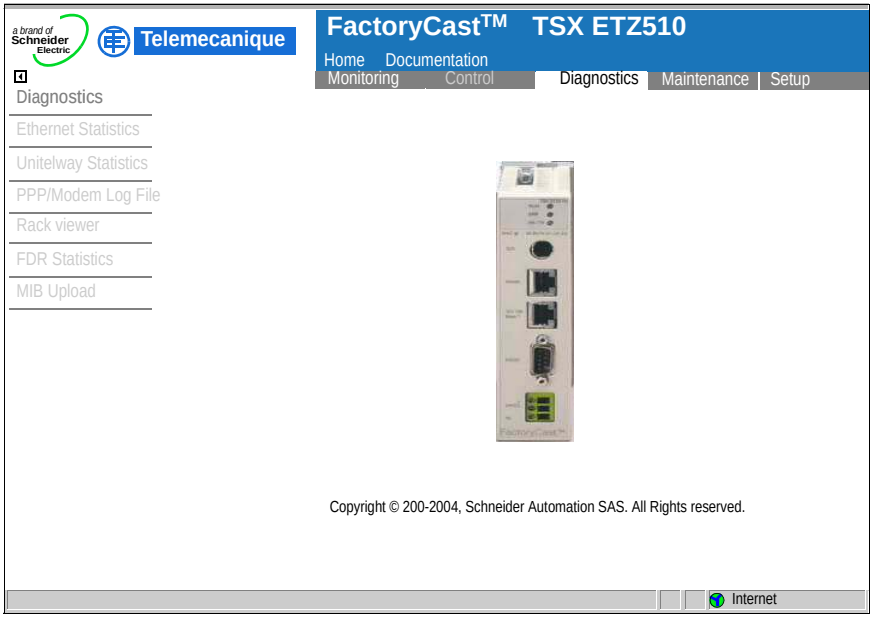
Diagnostics Home Page

Home Page

This page lists the various services supported by the default web site of the module and provides links for accessing the services you require.

Illustration

The ‘Diagnostics’ home page looks like this :



Links

To access the service you require, click on a link.

- ‘Ethernet Statistics’,
- ‘Unitelway Statistics’,
- ‘PPP/Modem Log File’,
- ‘Rack viewer’,
- ‘FDR Statistics’.
- ‘MIB Upload’.

Note: The ‘Rack viewer’ service is the only described. Other services are in TSX ETZ User’s Guide.

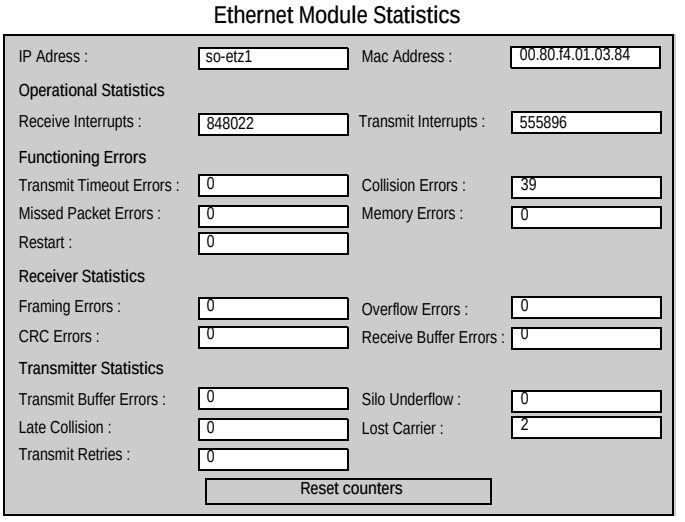
Ethernet Statistics Page

At a Glance

This page shows the Ethernet network statistics. It is used to perform diagnostics on a network.

Illustration

View of the TSX ETZ 410 Ethernet Statistics page:



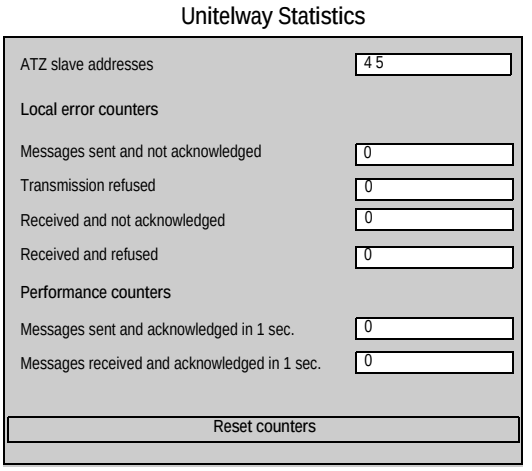
Unitelway Statistics Pages

At a Glance

This page shows the Unitelway network statistics. It is used to perform diagnostics on a network.

Illustration

View of the TSX ETZ 410 Unitelway Statistics page:



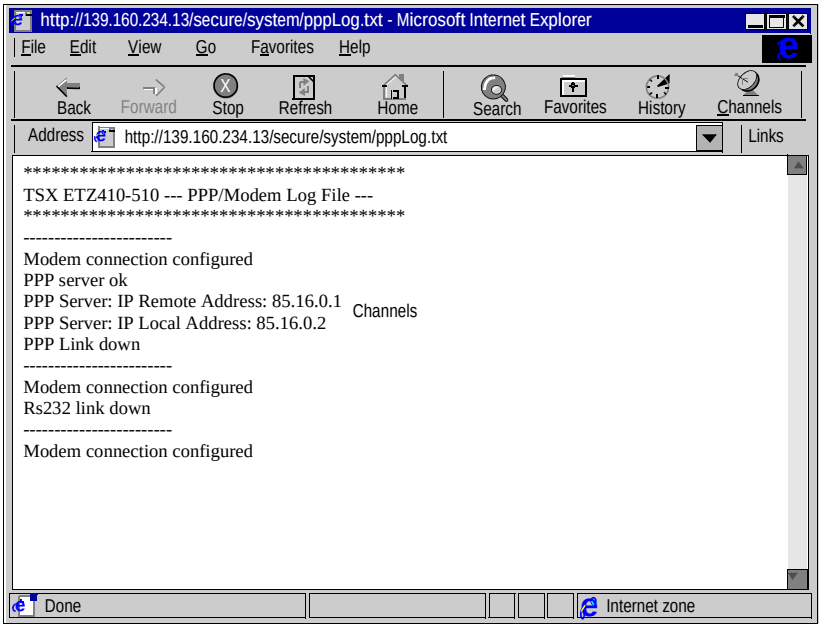
RS232 Modem Link Page Diagnostics

At a Glance

This page is used to perform diagnostics on the RS232 Modem link.

Illustration

View of the PPP/Modem Log File page:



Description

The page displays a text file reporting on the last four connections.

Possible reports are as follows:

Name	Meaning
`Dial phone number...`	The modem is dialing the remote number.
`No Remote Modem Answer`	The remote modem does not reply.
`Remote Modem connection OK`	modem connection is established.
`Phone line Busy`	remote modem is engaged.
`Phone Line Error`	No dialing tone.
`No Modem answer`	local modem does not reply.
`PPP Client Connected on Remote network`	Local client has successfully connected to a network or a remote station.
`PPP Client: IP Remote Address: xx.xx.xx.xx`	IP address of the station dialed
`PPP Client: IP Remote Network: xx.xx.xx.xx`	Network number of the IP station dialed
`PPP Client: IP Local Address: xx.xx.xx.xx`	Local IP address of the dialing station
`PPP Client Connection Error`	The PPP connection does not set up (password problem or IP address problem).
`Direct cable connection configured`	The RS232 link is ready for a cable connection.
`Modem connection configured`	A modem connection is configured.
`PPP server ok`	A call from a remote station has been established.
`PPP Server: IP Remote Address:`	IP address of the remote dialing station
`PPP Server: IP Local Address`	Local IP address of the station
`RS232 link down`	Communication breakdown (cable disconnected etc.) **NOTE**: this report is usual procedure before the modem dials a remote number (Dial phone number).
`PPP connection timeout expired`	Detection of connection Time Out, communication has been cut.
`PPP Link down`	Modem communication has been cut.

Rack Viewer Page

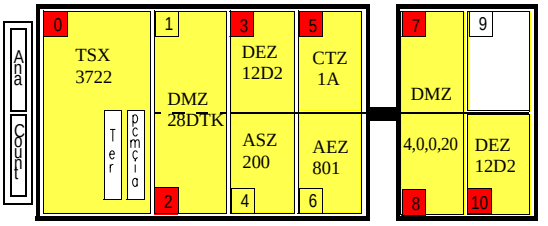
Overview

The Rack Viewer Page displays the current configuration of the TSX Micro.

Sample Page

Here is an example of a Rack Viewer page.

RACK VIEWER



Data

The following information is provided for each module displayed in the rack.

- A vertical label displays the module type and part number
- The box in the upper left hand corner of the module displays the slot number and module health:
  - A yellow box indicates that the module is functioning properly
  - A red box indicates that the module is not functioning properly

Links

Click a module icon to obtain detailed information about that module.

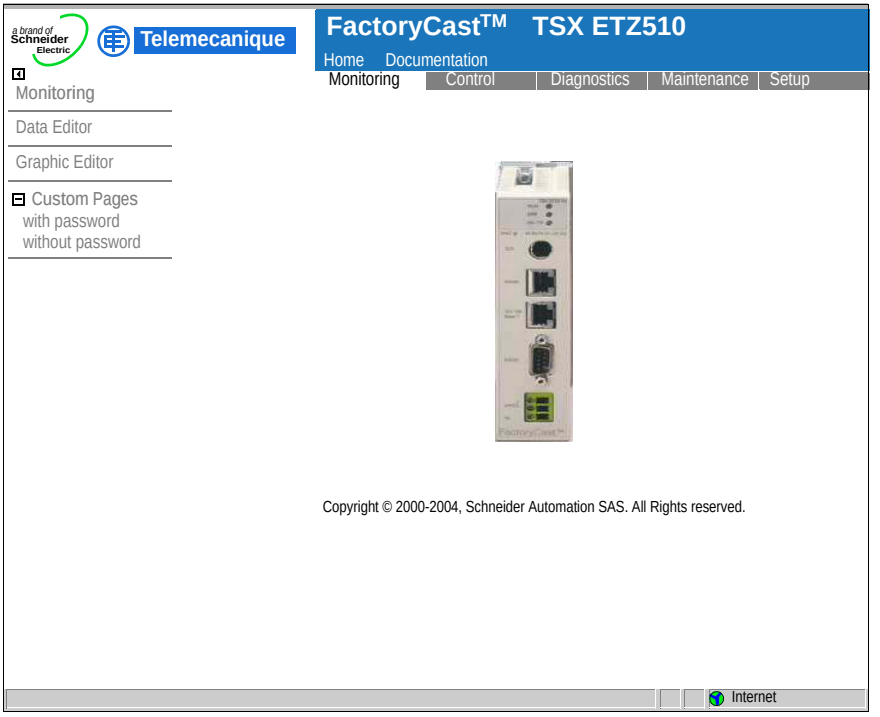
Monitoring Home Page

Home Page

This page lists the various viewer services supported by the default web site of the module and provides links for accessing the services you require.

Illustration

The ‘Monitoring’ home page looks like this:



To access the service you require, click on a link.

- Data editor : for creating variable data tables, so as to be able to determine their value when the table is animated.
- Graphic editor : for creating graphics, so as to be able to determine the value of variables when the graphic is animated.
- Password-protected custom pages : for viewing screen pages (accessible with password) created by the user.
- Custom pages without password protection : for viewing screen pages (accessible to everyone) created by the user.

Data Editor Page

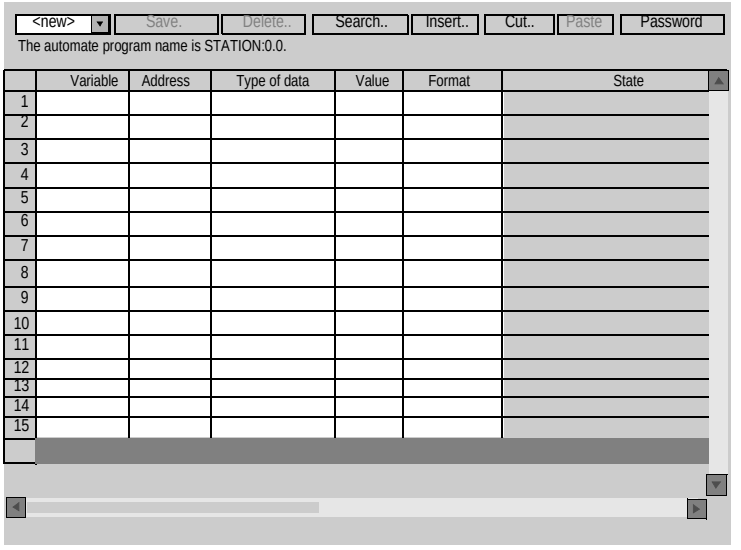
At a Glance

This page is used to create animation tables containing lists of PLC variables to be displayed or modified. This function is useful when running diagnostics on an application. Variables are accessed:

- By numbers for the TSX ETZ 410,
- By numbers and symbols for the TSX ETZ 510.

Note: Write access is managed by password (default value): USER.

Illustration View of the TSX ETY 410 Data Editor page:



Note: For further information, refer to the FactoryCast user manual ref. 890 USE 152.

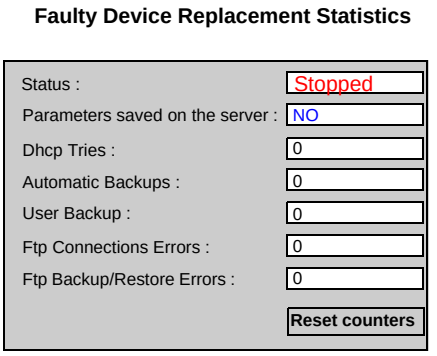
Faulty Device Replacement Statistics Page - FDR

At a Glance

This page allows diagnostics for the Faulty Device Replacement (FDR) function.

Illustration

View of the TSX ETZ 410 faulty device replacement statistics page:



Parameters

Description of the parameters:

Name	Description
Status	Indicates the FDR function status: ● **Starting, Running, Stopped or Error**
Parameters saved on server	Parameters saved on the server: ● **Yes or No** this information is only important when the FDR function is active.
Dhcp Tries	Total number of DHCP tries.
Automatic Backups	Total number of TSX ETZ configuration backups successfully performed automatically in the server. (See *Commands Zone, p. 116*.)
User Backups	Total number of TSX ETZ configuration backups successfully performed in the server by the user, using the **Force Backup** button on the **Automatic Configuration page** (*p. 116*).
Ftp Connections Errors	Number of times, where the FTP connection could not be made. This error counter indicates FTP errors besides those of reading or writing the configuration file.
Ftp Backup/Restore Errors	Number of times, where the backup or restoration by FTP of the configuration file could not be performed.

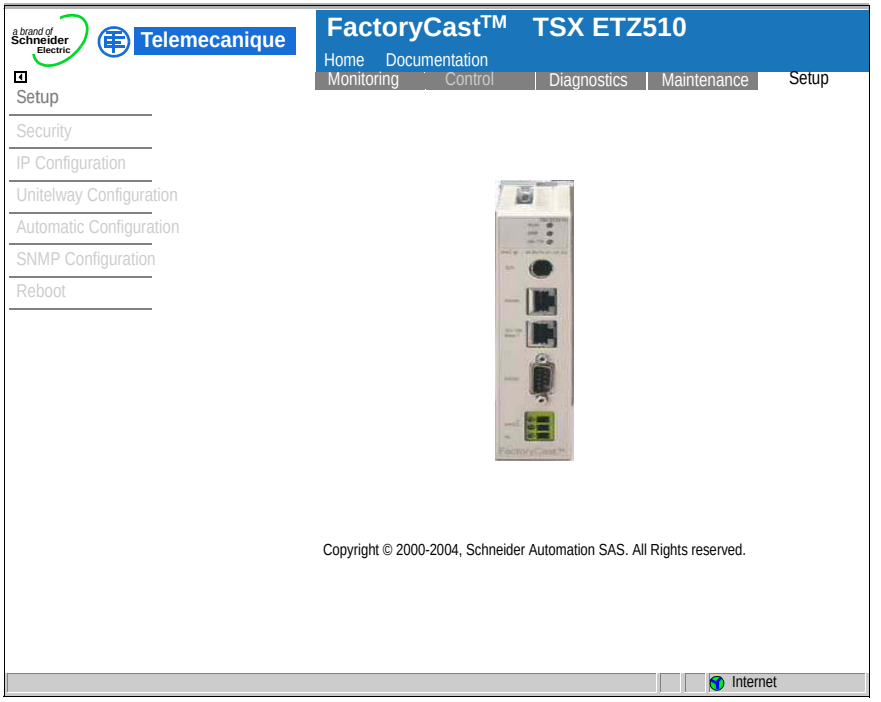
Setup Home Page

Home Page

This page lists the various services used to configure the module.

Illustration

The ‘Setup’ home page looks like this :



Links

To access the configuration service you require, click on a link :

- ‘Security’,
- ‘IP Configuration’,
- ‘Unitelway Configuration’,
- ‘Automatic Configuration’,
- ‘SNMP Configuration’,
- ‘Reboot’.

Note: These configuration services are described in TSX ETZ User’s Guide.

Security Page

At a Glance

When accessing via HTTP, this page allows modification of:

- The user name and the password for accessing the home page,
- The password for writing variables in the data editor,
- The password for access to configuration parameters.

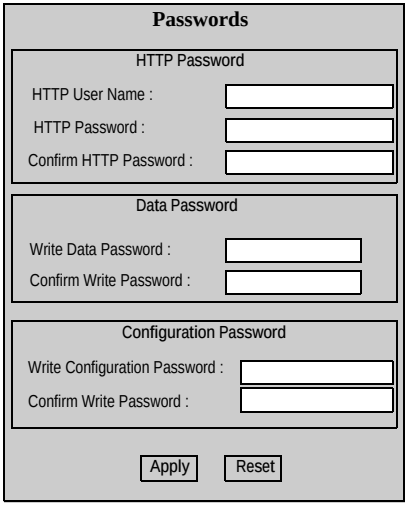
The user name and passwords are a maximum of 15 characters in non-extended ASCII.

The default values of the Username/Password fields protecting access to web pages are set to **USER**/**USER**.

Note: In the case of a TSX ETZ 510 module, the **HTTP Password** and **Data Password** zones do not appear. It is the FactoryCast Configurator, which allows these passwords to be modified.

Illustration

View of the TSX ETZ 410 security page:



How to Modify HTTP Access Rights

The procedure is as follows:

Step	Action
1	Enter the new **User** name.
2	Enter the new password.
3	Confirm the new password.
4	Enable the alteration with the **Apply** button. **Result:** a confirmation window appears.
5	Click on the **Reboot** button to accept the modification in the module.

How to Modify the Data Password

The procedure is as follows:

Step	Action
1	Enter the current password (case-sensitive).
2	Enter the new password.
3	Confirm the new password.
4	Enable the alteration with the **Apply** button. **Result:** a confirmation window appears.
5	Click on the **OK** button to accept the modification in the module. **Result:** a window appears to signal that the password has been successfully changed

How to Modify the Configuration Password

The procedure is as follows:

Step	Action
1	Enter the current password (case sensitive).
2	Enter the new password.
3	Confirm the new password.
4	Enable the alteration with the **Apply** button. **Result:** a confirmation window appears.
5	Click on the **OK** button to accept the modification in the module. **Result:** a window appears to signal that the password has been successfully changed.

Configuration Page for the TCP/IP Utilities

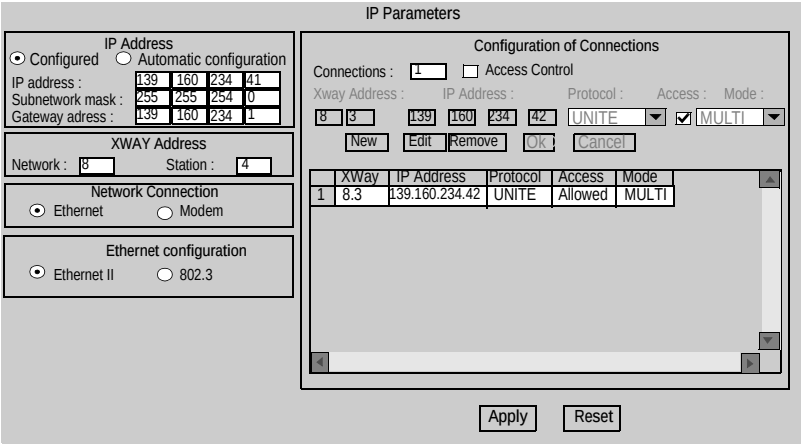
At a Glance

This page allows the configuration of the TCP/IP utilities of the TSX ETZ module.

Note: Write access is managed by a password (**Configuration password**) which is by default **USER**.
The content of this page is explained in the chapter Configuring TSX ETZ Modules (*p. 102*).

Illustration

View of the IP Configuration page:



Configuration Page for the Unitelway Link

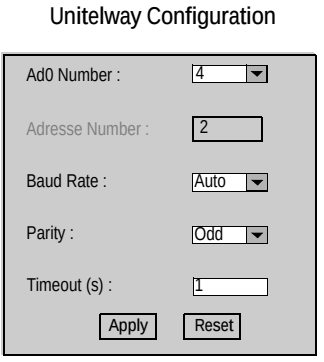
At a Glance

This page allows the configuration of the Unitelway function of the TSX ETZ module.

Note: Write access is managed by a password (**Configuration password**) which is by default **USER**.
The content of this page is explained in the chapter Configuring TSX ETZ Modules (*p. 102*).

Illustration

View of the Unitelway Configuration page:



Automatic Configuration Page

At a Glance

This page is used to configure the TSX ETZ module to the BOOTP or DHCP(FDR) client.

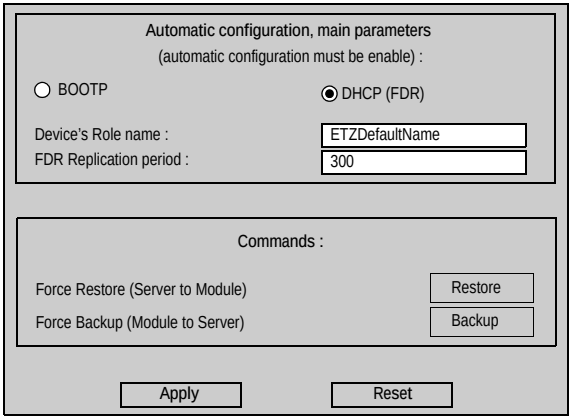
Note: Important: Automatic Configuration **Field** must have been selected on the **IP Configuration page** (*p. 85*).

Note: Write access is managed by a password (**Configuration password**) which is by default **USER**.
The content of this page is explained in the chapter Configuring TSX ETZ Modules (*p. 102*).

Illustration

View of the Automatic Configuration page:

Automatic Configuration



Configuration Page for the SNMP Function

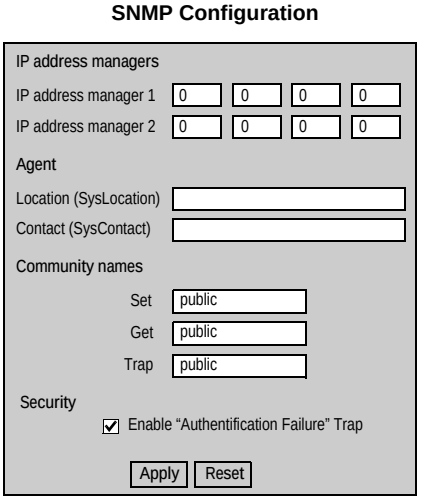
At a Glance

This page allows the configuration of the SNMP function of the TSX ETZ module.

Note: Write access is managed by a password (**Configuration password**) which is by default **USER**.
The content of this page is explained in the chapter Configuring TSX ETZ Modules (*p. 102*).

Illustration

View of the SNMP Configuration page:



Module Reboot Page

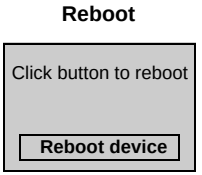
At a Glance

This page reboots the TSX ETZ module. The reboot should be performed to accept new configuration parameters. All connections are broken following a reboot.

Note: Reboot is managed by a password (**Configuration password**) which is by default **USER**.

Illustration

View of the reboot page:



Installing the TSX ETZ 410/510 Module

3

At a Glance

About this Chapter

This chapter deals with the installation of the TSX ETZ 410/510 modules.

For an overview of the installation of the module, see *Installing the TSX ETZ - Summary, p. 121*.

What's in this Chapter?

This chapter contains the following sections:

3.1 Topology Principles

At a Glance

About this Section

This section introduces the topology principles for connecting the TSX ETZ modules.

What's in this Section?

This section contains the following topics:

General

At a Glance

The ETZ module is autonomous.

Changing speed on the Ethernet medium (10/100 Mbits) is automatic. So that the module is operational, it should be powered and connected by a Unitelway network to a Unitelway master TSX 3710/3721/3722.

A lit RUN LED indicates that the module is operating (correct Unitelway scanning, module configured on the TCP/IP level, etc.).

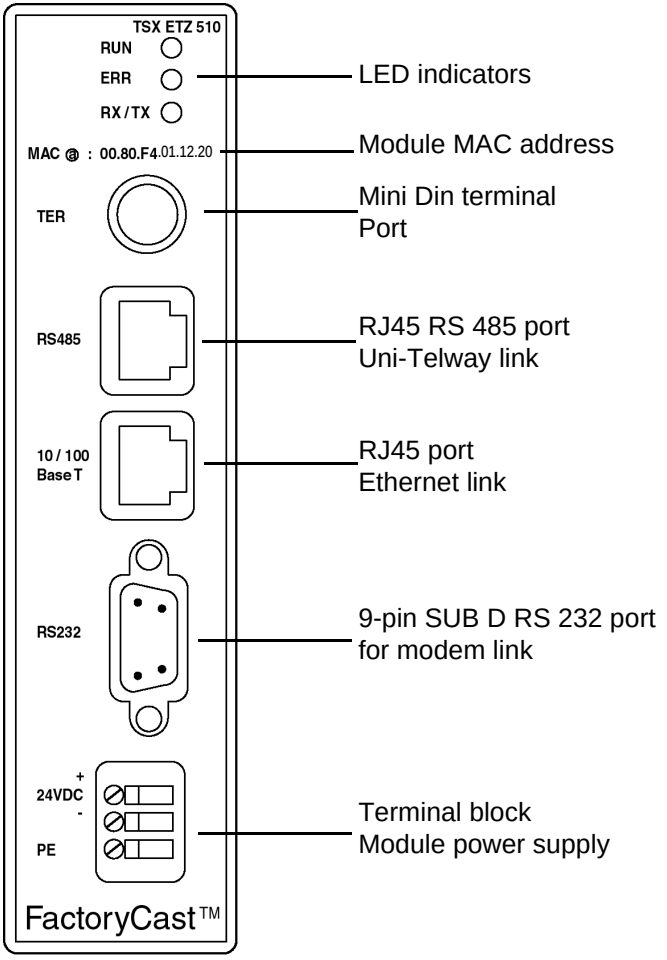
The module does not have the concept of starting from cold or warm as the memory is not backed up when there is a power outage.

When powered, the module systematically reboots the hardware and the software.

The connection speed on the Terminal port of the Micro is optimized at 19200 baud.

Front Face

View of the front face of the TSX ETZ 510 module:



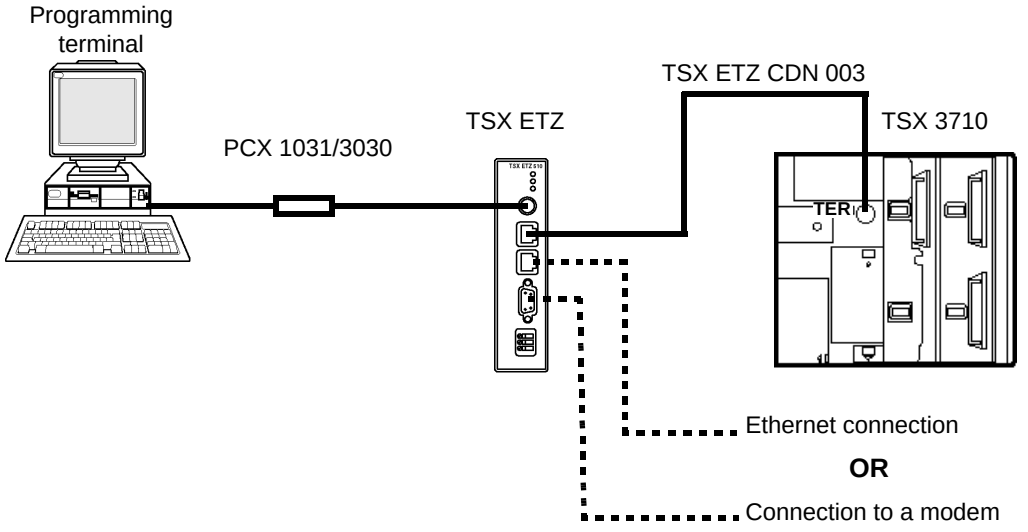
Direct Connection between Micro and TSX ETZ

At a Glance

From the possible direct connections of the TSX ETZ module, the most common ones are given below.

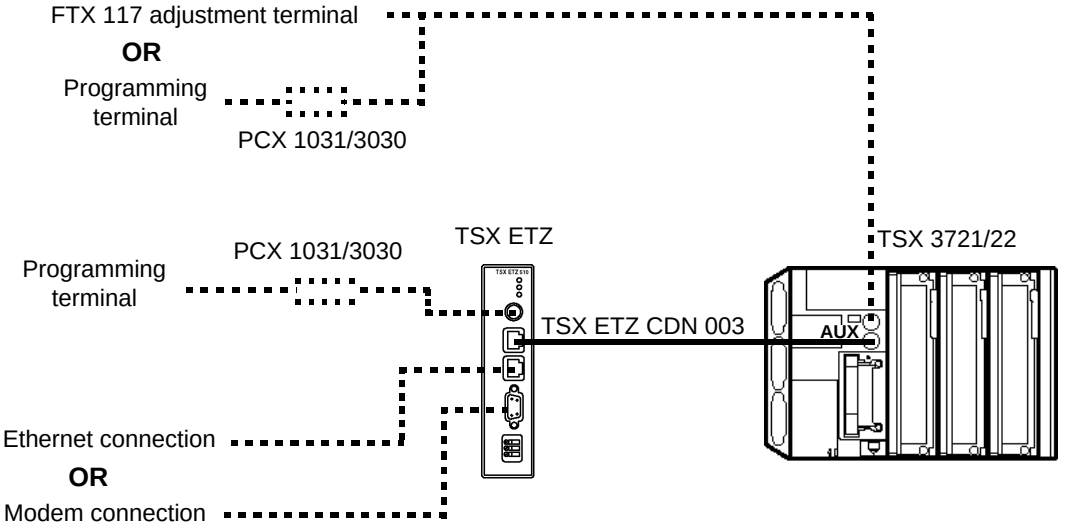
Connection on TER Port

Example of connection of a TSX ETZ on the TER port of a TSX 3710:



Connection on AUX Port

Example of connection of a TSX ETZ on the AUX port of a TSX 3721:



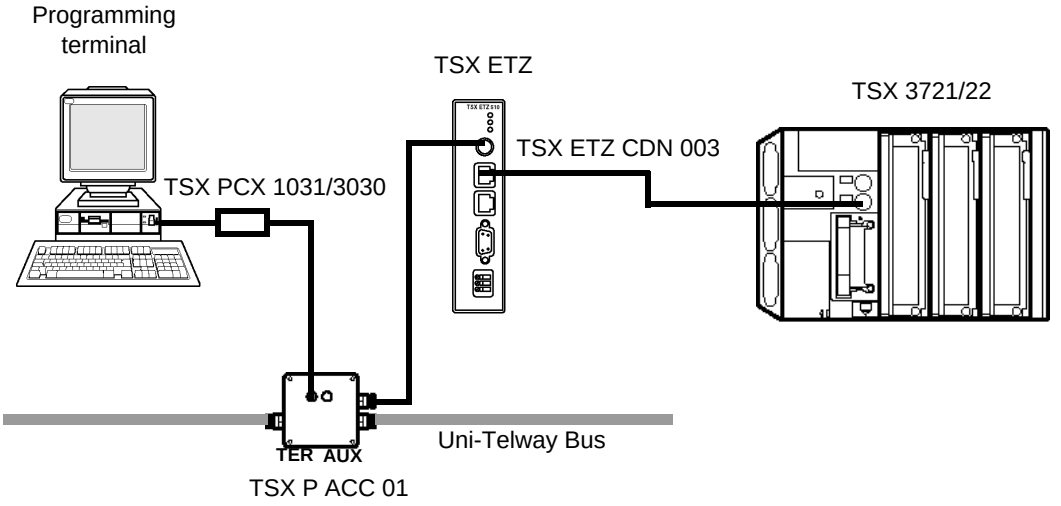
Connection of a TSX ETZ on the Uni-Telway Network

At a Glance

From the possible direct connections of the TSX ETZ module on a Uni-Telway network, the most common ones are given below.

Connection via the TSX P ACC 01 Box

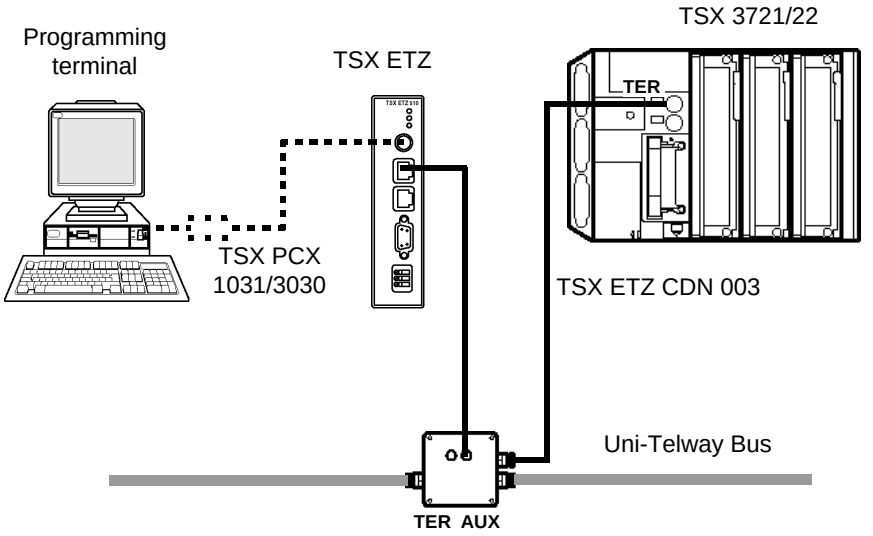
Example of connection of a TSX ETZ on a Uni-Telway network, via the TSX P ACC 01 box:



Note: It is not possible to connect a FTX 117 adjustment terminal on the TER port of the TSX ETZ module. The consumption of the terminal on the TER port is very important.

Connection on the TSX P ACC 01 AUX Port

Example of connection of a TSX ETZ on a Uni-Telway network, via the TSX P ACC 01 AUX port:



This configuration is recommended, as it leaves the TER port of the TSX ETZ module available to connect a terminal, for example.

In this case, the TER port of the Micro offers a maximum of 8 configurable slave addresses:

- the TSX ETZ occupies 2 Uni-Telway addresses,
- the programming terminal occupies 3 addresses,

Three addresses therefore remain available.

TSX ETZ Connection via Modem

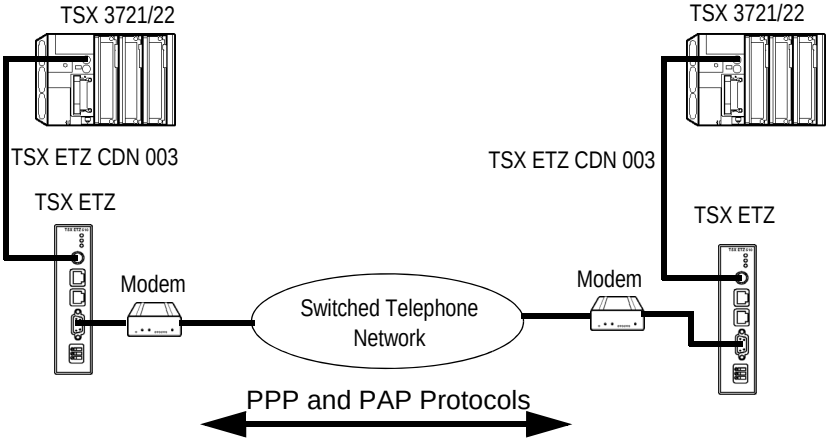
At a Glance

From the possible connections that can be made to the TSX ETZ module, the most common ones are given below.

Note: Under all circumstances, the TSX ETZ 410/510 is connected to a modem via a straight-thru cable.

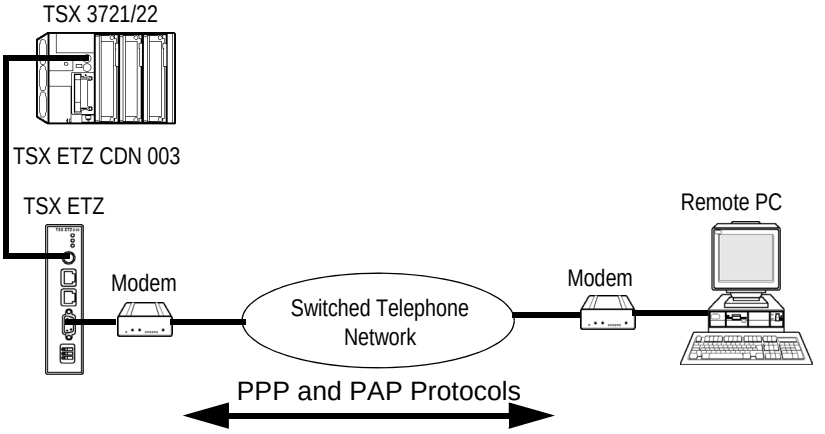
ETZ to ETZ Connection

Example of a connection between two Micros via a modem link.



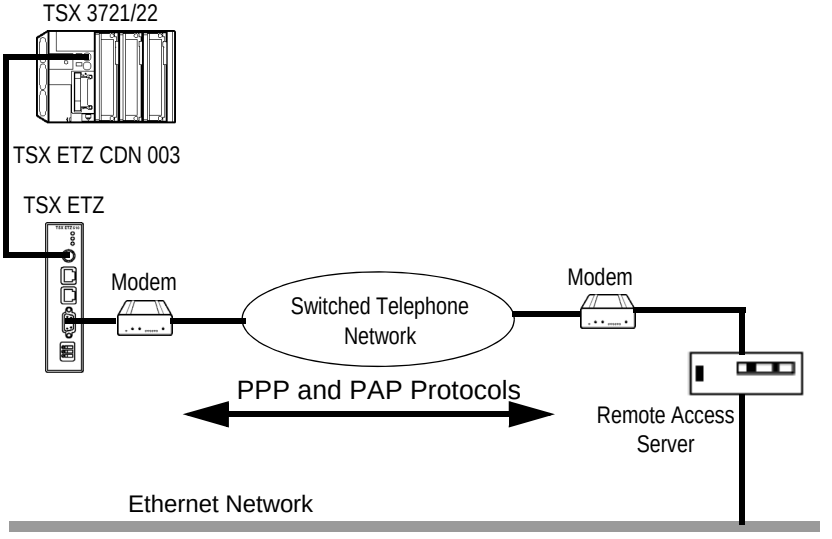
ETZ to PC Connection

Connection between a Micro and a remote PC via a modem



Connection of ETZ to an Ethernet Network

Connection between a Micro and an Ethernet network via a modem



3.2 Configuring TSX ETZ 410/510 Modules

At a Glance

About this Section

This section deals with the configuration of the TSX ETZ 410/510 modules.

What's in this Section?

This section contains the following topics:

Access to the Module Configuration

At a Glance

The TSX ETZ modules are only configured using an Internet browser, which is currently available on the market.

It is possible to access the configuration page either by Ethernet link, or by RS 232 serial link.

The module configuration does not require connection to a Micro. In this case, the RUN LED will be extinguished and the ERR LED will flash.

Configuring via Ethernet Link

To access the module configuration pages **for the first time**, via a HTTP link, follow the steps below:

Step	Action
1	Connect the module to the Ethernet network and switch it on.
2	Open the Internet browser on your PC.
3	In the "Address" field, enter the command: http://<ETZ_default_IP_address>, then <Enter>. **Note:** the IP address is calculated using the MAC address of the module, which is printed on its front face. (See *Default Ethernet Interface IP Address for the ETZ Module, p. 30*). The home page is displayed on the screen.
4	Click the link marked **Setup home page.** (See *Setup Home Page, p. 82*.)
5	Enter the default user name (UserName): "USER" and the default password: "USER" (without quotation marks), then <Enter>.
6	The configuration index page appears: then click on the required link. (See *Setup Home Page, p. 82*.)

Note: For the following connections, proceed in the same way, but enter the IP address, the corresponding user name and password, if these have been modified.

Configuring via RS 232 Serial Link

For the first connection, it is necessary to configure the components of your operating system, so that it can communicate with the TSX ETZ module. (See *Configuration of Serial RS232 Links, p. 120*). Once these components are configured, follow the steps below:

Step	Action
1	Connect a RS 232 crossover cable between a PC COM port and the 9-pin SUB-D port on the ETZ module (*p. 140*.)
2	Establish the serial connection between the PC and the module.
3	Open the Internet browser on your PC
4	In the "Address" field, type: **http://85.16.0.2**, then <Enter>.
5	Enter the default user name (UserName): "USER" and the default password: "USER" (without quotation marks), then <Enter>.
6	The configuration index page appears: then click on the required link. (See *Setup Home Page, p. 82*.)

Note: For the following connections, the IP address to be entered is always the same, but enter the corresponding user name and password, if these have been modified.

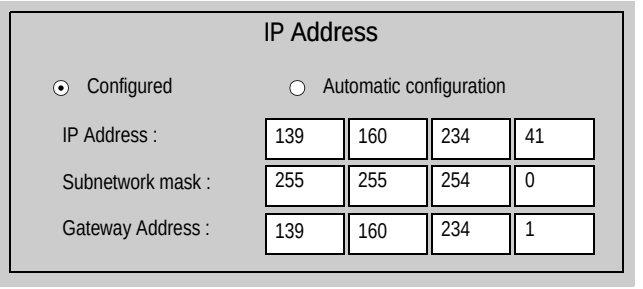
Configuration Parameters linked to TCP/IP Utilities

At a Glance

The TCP/IP utilities are configured using the **IP Configuration** (*p. 85*) screen and the **Setup home page** (*p. 82*) menu in the HTTP server embedded into the module.

IP Address Zone

View of the IP address



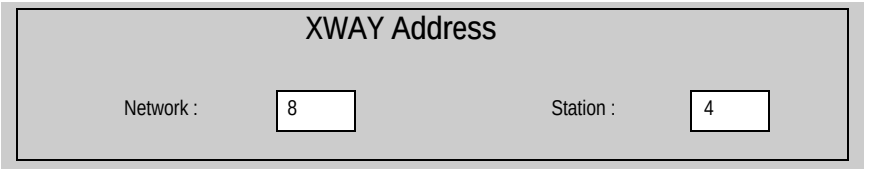
This zone allows the Ethernet Interface IP address of a module to be defined in two distinct ways:

- Either by manually configuring the address by clicking on the **Configured** button.
- Or the address is supplied by a BOOTP server device by clicking on the **Automatic configuration**, the entry zone for the addresses is therefore grayed.
- If manual configuration is selected, you can enter:
  - The IP address of the module in the **IP Address** zone.
  - The subnetwork mask, **Subnetwork mask**
  - The **Gateway** address
- If you select the auto configuration, the IP address of the module is configured via a remote device, which serves as the BOOTP/DHCP server.

XWAY Address Zone

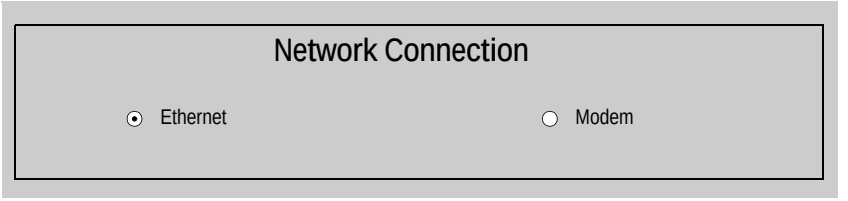
X-Way address entry: Network and Station number

Illustration



Network Connection Zone

View of the Network connection zone:



This zone allows the selection of the type of link to be used:

- Ethernet (default)
- Modem

Depending on the type of link selected, certain sections of the IP configuration page are different.

Ethernet Connection Parameters

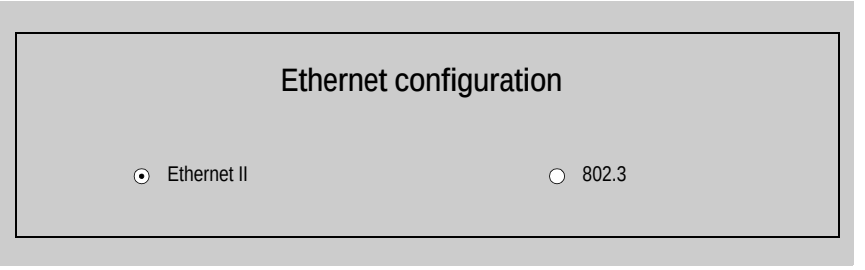
At a Glance

If **Ethernet** is selected in the **Network Connection** zone, the configuration page allows the modification of:

- The Ethernet format in the **Ethernet Configuration** zone.
- The configuration and the list of connections that can be opened by the module, in the **Configuration of connections** zone.

Ethernet Configuration

This is configured in the following zone:



The two available buttons allow the selection of:

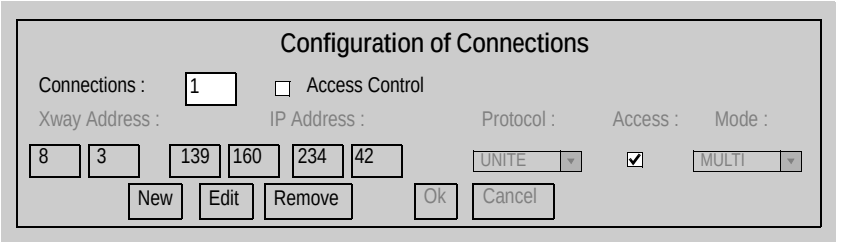
- The Ethernet II format, corresponding to the RFC 894 standard (most commonly used).
- The 802.3 format, corresponding to the RFC 1042 standard. This format will be used when the remote devices use this format.

Configuration of Connections

This zone allows:

- The configuration of the number of connections that can be opened by the module,
- The activation of an access control utility,
- The entry of remote devices, which can be connected to the module, depending on whether a mono or multi-connection communication protocol is used.

Illustration:



General Parameters:

Parameters	Value to enter
Connections	This field allows the entry of the maximum number of remote devices, which are likely to be connected parallel to the module. ● The default value is 8 connections ● The value can be made from between 1 and 32 connections
Access Control	This checkbox allows (de)activation of the control of the remote devices requesting the opening of a TCP connection towards the module. ● If the box is checked, the access control management is activated and the **Access** column in the table is not grayed (active). When the module functions in server mode, only the remote devices selected by the **Access** box are authorized to connect as a client then communicate. ● If the box is not checked, the access control management is inactive and the **Access** column in the table is grayed (inactive). When the module functions in server mode, the remote third party devices can be connected as clients and communicate with the module without having to be declared in the table.

Entry of information for remote devices to be connected to the module:

Parameters	Values
Editing buttons	
	● **New**: allows entry of a new device ● **Edit**: allows a device to be modified ● **Remove**: removes a device ● **OK**: confirms the entry ● **Cancel**: cancels the current modifications
Entry zones	

X-Way Address	Allows entry of X-Way address:
	● Network number: between 0 and 127
	● Station number. Between:
	  ● 0 and 63 for a UNITE connection
	  ● 100 and 163 for a Modbus connection

IP Address	Allows entry of device's IP address.
Protocol	List, which allows the selection of the communication protocol used by each remote device: ● UNITE (default) ● MODBUS
Access	When checked, this box denotes the remote devices, which are authorized to open a TCP connection, then send to the PLC (Micro in server mode).
Mode	● **MONO**: the module only allows one connection with the same remote IP address. ● **MULTI**: the module allows only one connection in client mode with the same remote IP address and several connections in server mode with the same remote IP address.

Correspondence Table

A table lists all the remote devices connected to the TSX ETZ module:

Illustration

	XWay	IP Address	Protocol	Access	Mode
1	8.3	139.160.234.42	UNITE	Allowed	MULTI
2	8.5	139.255.250.255	MODBUS	Allowed	MONO

To edit a device, double click on the required line.

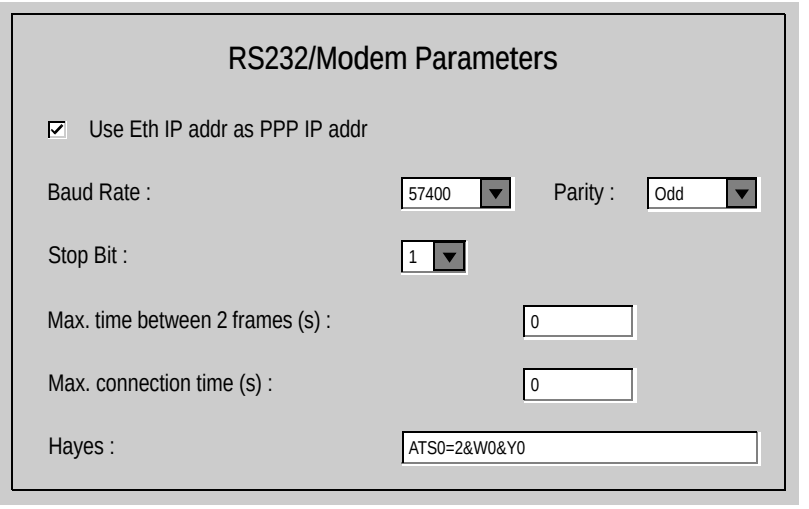
Modem Connection Parameters

At a Glance

If **Modem** is chosen in the **Network Connection** zone, the configuration page allows the modification of the configuration and the list of connections, which can be opened by the module, in the **Configuration of connections** zone.

Configuration of the RS 232/ Modem Parameters

These parameters are configured in the following zone:



Parameters to configure:

Parameters	Values
Baud Rate	Speed of RS 232 link to be chosen according to the modem you have: 4800, 9600, 19200, 38400 and 57400.
Parity	Odd, even or without parity
Stop Bit	Number of stop bits
Max. time between 2 frames	If the time between two frames is greater than the entry value in this field (in seconds), the connection will be cut. If the entry time is 0; no checks are carried out.
Max. connection time	This field allows the maximum connection time (in seconds) to be set. At the end of this time the connection will be cut. If the entry time is 0; no checks are carried out.
Hayes	Configuration by string of Hayes characters. Allows the sending of commands in Hayes* format to the modem
Use Eth IP addr as PPP IP addr	If the box is checked then the IP address for the modem interface will be the same as the Ethernet interface, if not, the IP address for the modem interface will be 85.16.0.2.

* Refer to your modem's documentation for the supported Hayes commands.

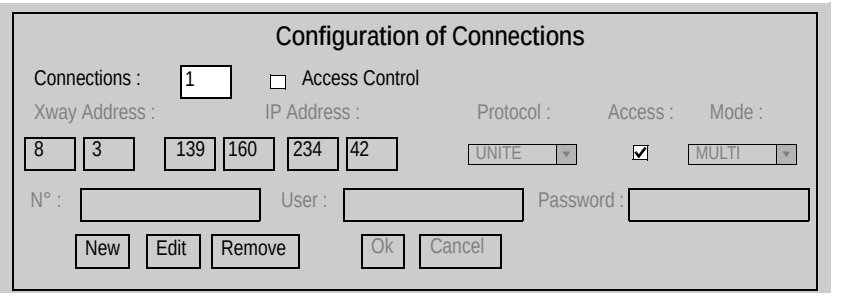
Example: AT&FS0=2

Configuration of Connections

This zone allows:

- The configuration of the number of connections that can be opened by the module
- The activation of an access control utility
- The entry of remote devices, which can be connected to the module, depending on whether a mono or multi-connection communication protocol is used.

Illustration:



General Parameters:

Parameters	Value to enter
Connections	This field allows the entry of the maximum number of remote devices, which are likely to be connected to the module.
Access Control	This checkbox allows (de)activation of the control of the remote devices requesting the opening of a TCP connection towards the module. ● If the box is checked, the access control management is activated and the **Access** column in the table is not grayed (active). When the module functions in server mode, only the remote devices selected by the **Access** box are authorized to connect as a client then communicate. ● If the box is not checked, the access control management is inactive and the **Access** column in the table is grayed (inactive). When the module functions in server mode, the remote third party devices can be connected as clients and communicate with the module without having to be declared in the table.

Entry of information for remote devices to be connected to the module:

Parameters	Values
Editing buttons	
	● **New**: allows entry of a new device ● **Edit**: allows a device to be modified ● **Remove**: removes a device ● **OK**: confirms the entry ● **Cancel**: cancels the current modifications
Entry zones	

X-Way Address	Allows entry of X-Way address:
	● Network number: between 0 and 127
	● Station number. Must be between:
	  ● 0 and 63 for a UNITE connection
	  ● 100 and 163 for a Modbus connection

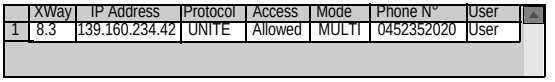
IP Address	Allows entry of an IP address
Protocol	List, which allows the selection of the communication protocol used by each remote device: ● UNITE (default) ● MODBUS
Access	When checked, this box denotes the remote devices, which are authorized to open a TCP connection, then send to the PLC (Micro in server mode).
Mode	● **MONO**: the module only allows one connection with the same remote IP address. ● **MULTI**: the module allows only one connection in client mode with the same remote IP address and several connections in server mode with the same remote IP address.
No.	This field allows the entry of the number of each remote device.
User	This field allows the entry of the username of each remote device.
Password	This field allows the entry of the password of each remote device.

Note: The TSX ETZ module does not manage the password associated with the modem connection in server mode. All telephone connections are accepted. Access control takes place on the IP address level of the remote device, as well as by the PAP protocol. The password should be managed on the modem level.

Correspondence Table

A table lists all the remote devices connected to the TSX ETZ module:

Illustration



	XWay	IP Address	Protocol	Access	Mode	Phone N°	User
1	8.3	139.160.234.42	UNITE	Allowed	MULTI	0452352020	User

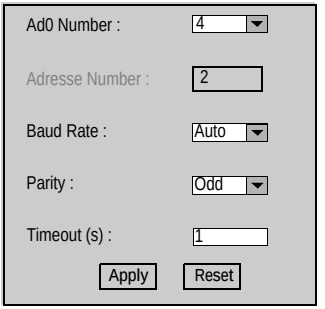
To edit a device, double click on the required line.

Configuration Parameters Connected to the Uni-Telway Link

At a Glance

The Uni-Telway link is configured using the **Uni-Telway Configuration** (*p. 86*) screen and the **Setup home page** (*p. 82*) menu in the HTTP server loaded into the module.

View of the entry zone:



Parameters

Table of the parameters:

Parameter	Values
Ad0 Number	Network access address, used in Micro client mode to access devices connected to the TCP/IP network. Values: 4 to 98
Address Number	Cannot be configured. The TSX ETZ occupies 2 Uni-Telway addresses. The second is used by the loaded software when the TSX ETZ receives a message from a TCP/IP device, which is intended for the Micro (Micro server).
Baud Rate	Auto, 9600 or 19200 baud (recommended).
Parity	Odd, Even, None (recommended).
Timeout (s)	Value of the completion time (in seconds).

Click on the **Apply** button to validate the alterations performed.

Click on the **Reset** button to cancel the current alterations.

Automatic Configuration

At a Glance

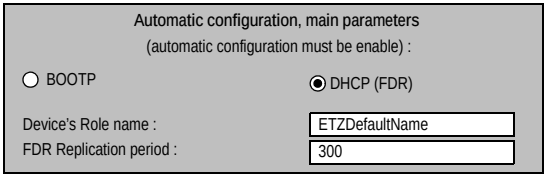
In order to use the module in automatic configuration mode, you must set the configuration parameters. Configuration takes place with the help of the **Automatic Configuration** (*p. 87*) page from the**Setup home page** (*p. 82*) menu.

The **Automatic Configuration** option must then be chosen in the **IP Configuration** page. (See *IP Address Zone, p. 105*.)

Two buttons: **Apply** and **Reset** allow you to confirm the modifications or reset the old values.

Main Parameters Zone

Illustration:



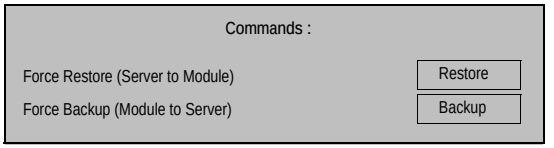
Utility choice:

- The BOOTP/DHCP(FDR) buttons allow you to choose between a BOOTP or a DHCP (FDR) server.

If the Faulty Device Replacement function (FDR) is required, set the button to DHCP(FDR), then:

- in the entry zone **Device's Role name** enter the name given to the module.
- In the **FDR Replication period** entry zone, enter the period of automatic comparison (in seconds) between the TSX ETZ configuration and the configuration saved in the DHCP server. If a difference is detected, the TSX ETZ module automatically saves the configuration in the server.

Commands Zone Illustration:



- The **Restore** button: Forces the TSX ETZ to revert to the configuration from the server.
- The **Backup** button: Forces the TSX ETZ to save its configuration in the server.

Important

Note: when DHCP(FDR) mode is active, any modification of the content of a configuration page is automatically saved in the server (Backup), as soon as the modification is validated by the **Apply** button.

Configuration of the SNMP Module

At a Glance

In order to use the module as an SNMP agent, you must set the configuration parameters.

The configuration of the SNMP module is carried out using the **SNMP Configuration** (*p. 88*) screen and the **Setup home page** (*p. 82*) menu of the HTTP server embedded into the module.

Parameters linked to the SNMP module are divided into 4 categories:

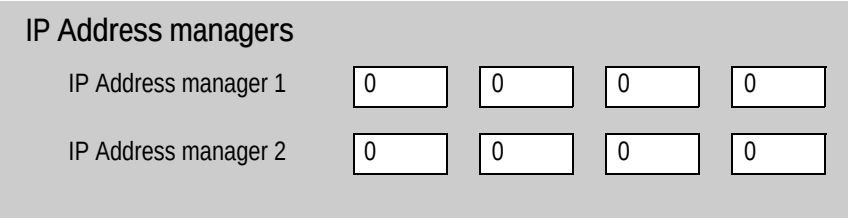
- **IP address managers** zone z
- **Agent** zone
- **Zone Community names** zone
- **Security** zone

Two buttons: **Apply** and **Reset** allow you to confirm the modifications or reset the old values.

Note: Only 7-bit ASCII characters can be used in the character string entry fields.

IP Address Managers Zone

Illustration:

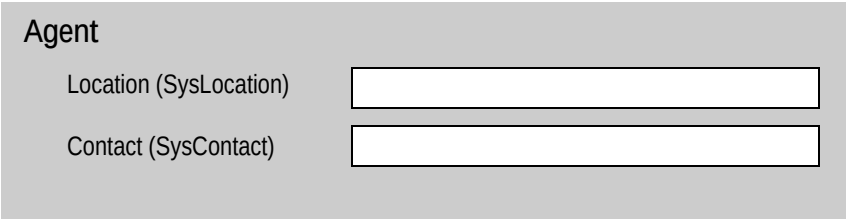


This zone allows the completion of the SNMP administrator's IP addresses. The modules authorize a maximum of two administrators.

These addresses are used during possible transmission of events (TRAP).

Agent Zone

Illustration:

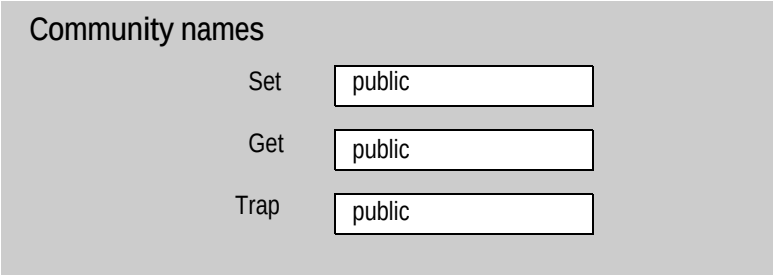


This zone allows the localization and identification of an agent from the SNMP administrator. It comprises two fields:

- The **Location (SysLocation)** field: indicates the physical location of the device (maximum string of 32 characters).
- The **Contact (SysContact)** field: indicates the personnel to contact for device management and the method of contact (maximum string of 32 characters).

Community Zone

Illustration:



This zone allows the definition of a community name by utility family Set, Get and Trap. It comprises three fields:

- The **Set** field: defines the community name to the Set utility (maximum string of 16 characters). The default value of the field is "Public".
- The **Get** field: defines the community name to the Get utility (maximum string of 16 characters). The default value of the field is "Public".
- The **Trap** field: defines the community name to the Trap utility (maximum string of 16 characters). The default value of the field is "Public".

Security Zone

Illustration:

This zone contains a checkbox that allows the validation of the transmission of an identification error event (TRAP) from the SNMP agent to the administrator who sent the request transmission.

In this way, the agent warns the administrator that the request has been refused following an identification error (community name configured in the administrator is different to the one configured in the agent).

3.3 Configuration of Serial RS232 Links

Configuration of Serial RS232 Links

At a Glance

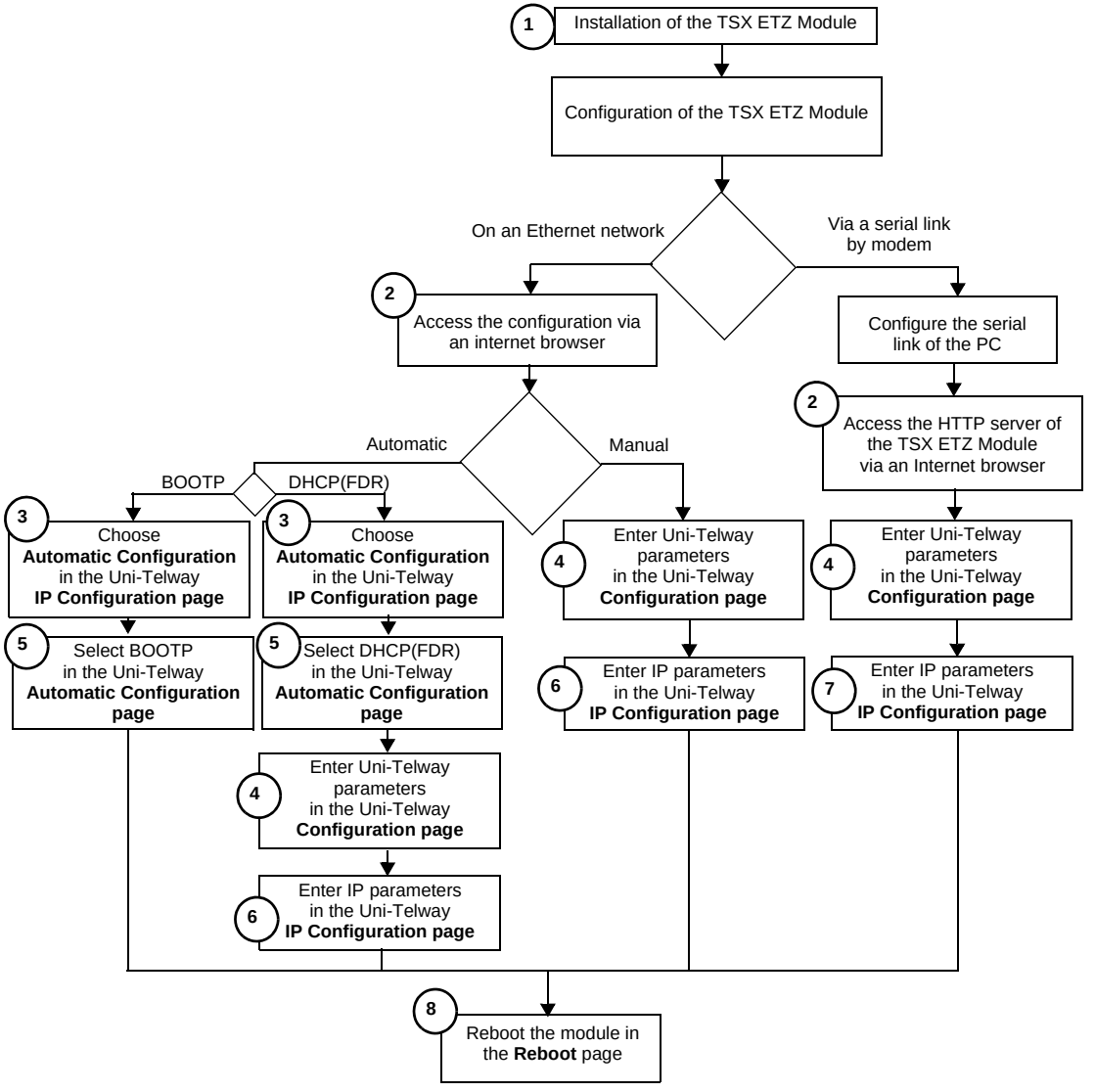
In order to use a connection by serial modem link, you need to install and/or configure certain elements in your Windows operating system.

To do this, refer to the general Readme file on the CD-ROM supplied with this product.

3.4 Installing the TSX ETZ - Summary

Installing the TSX ETZ - Summary

Illustration Summary of operations to be performed



Rapid access

Number	Page number
1	*Dimensions and Mounting of TSX ETZ modules, p. 128*
2	*Access to the Module Configuration, p. 103*
3	*Configuration Parameters linked to TCP/IP Utilities, p. 105*
4	*Configuration Parameters Connected to the Uni-Telway Link, p. 114*
5	*Automatic Configuration, p. 115*
6	*Ethernet Connection Parameters, p. 107*
7	*Modem Connection Parameters, p. 110*
8	*Module Reboot Page, p. 89*

Hardware Specifications

4

At a Glance

About this Chapter

This chapter deals with the hardware specifications of the TSX ETZ 410/510 modules.

What's in this Chapter?

This chapter contains the following sections:

4.1 Description

At a Glance

About this Section

This section deals with the physical description of the TSX ETZ 410/510 modules.

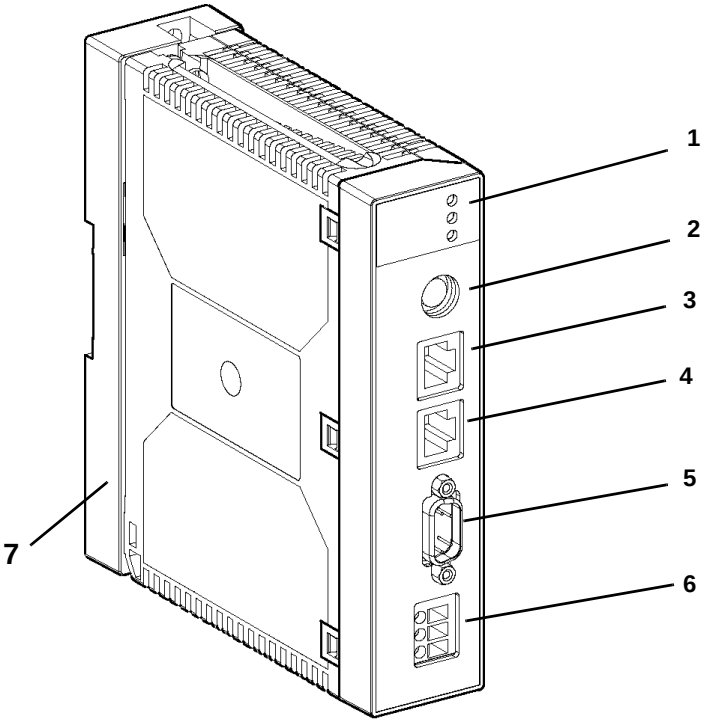
What's in this Section?

This section contains the following topics:

Physical Description

At a Glance

View of the TSX ETZ module:



Description

Description of the front of the module:

Number	Description
1	3 indicator LEDs (See *Indicator LEDs, p. 141*): ● A RUN LED (green) ● An ERR LED (red) ● An Rx/Tx LED (orange)
2	A Mini-Din connector for terminal port (*p. 135*).
3	A type RJ45connector for Uni-Telway RS 485 link (*p. 135*).
4	A type RJ45 connector for Ethernet link (*p. 133*).
5	A SUB D 9 points connector for modem link (*p. 134*).
6	A screw in terminal block to link the 24 VDC supply voltage (*p. 132*).
7	Support plate allowing for the attachment of the module directly on AM1-DE200/ DP200 type DIN profile or Telequick AM1-PA perforated mounting plate.

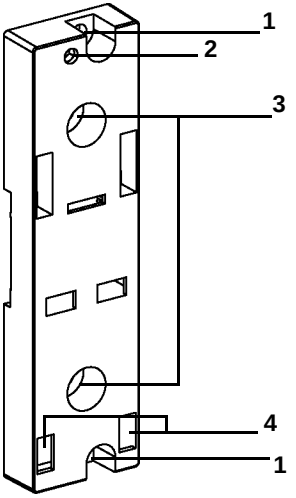
Description of the Support Plate

At a Glance

Each TSX ETZ module is delivered mounted on a support plate, which allows attachment to either: the DIN AM1-DE200 or AM1-DP200 profile, or to a Telequick AM1-PA perforated mounting plate.

Illustration

View of the plate:



Description

Description of the plate:

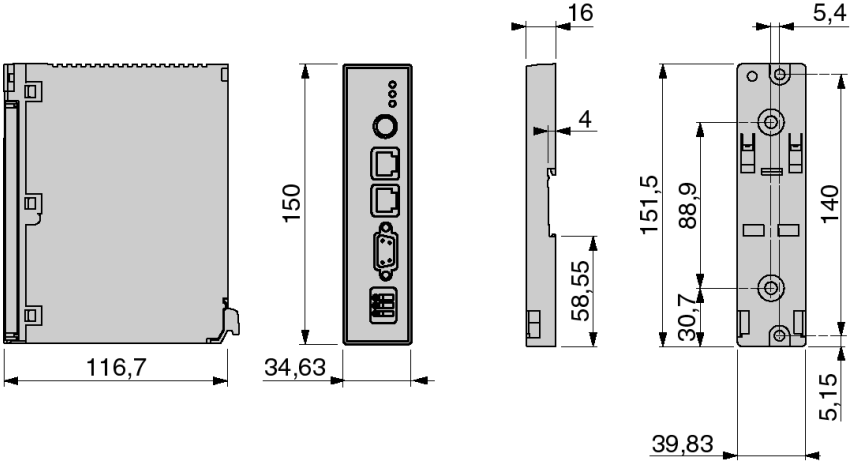
Number	Description
1	Two 5.5-mm diameter holes allow attachment of the plate on to a panel or AM1-PA perforated mounting plate with an entre-axe of 140-mm (Micro entre-axe attachment).
2	M4 attachment hole allowing the attachment of the TSX ETZ module.
3	Two 6.5-mm diameter holes allow attachment of the plate on to a panel or AM1-PA perforated mounting plate with an entre-axe distance of 88.9-mm (TSX Premium entre-axe attachment distance).
4	Windows designed to ink pins situated at the bottom and at the back of the module.

4.2 Installing TSX ETZ Modules

Dimensions and Mounting of TSX ETZ modules

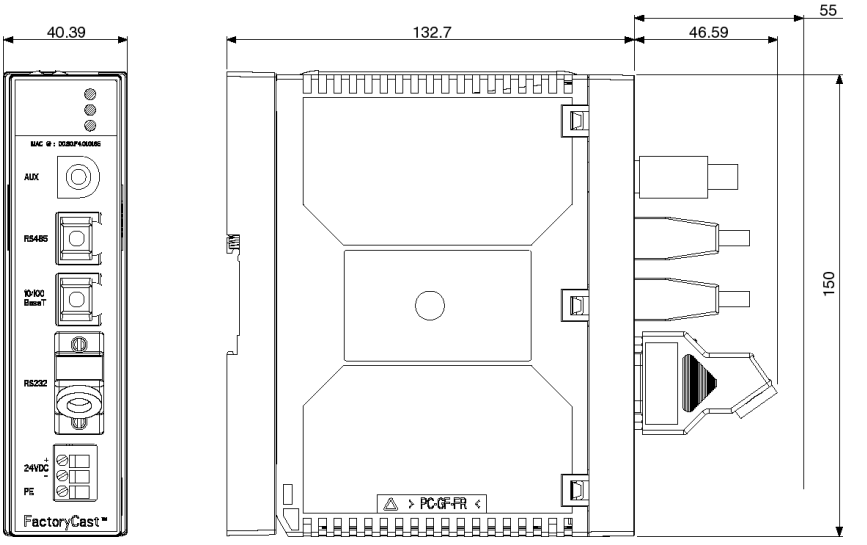
Dimensions

Illustration:



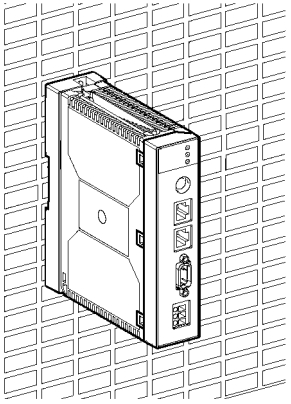
Dimensions of Fitted Module

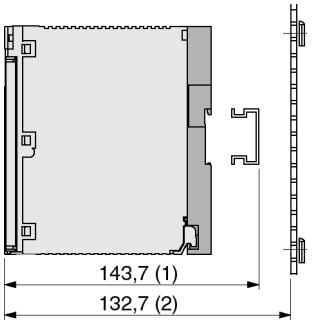
Dimensions of module with cables on front face

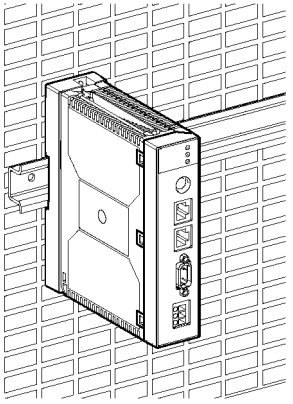


Mounting on profile or plate

Illustration of module mounted on profile **AM1-DE200**, **AM1-DP200** or plate **AM1-PA**:





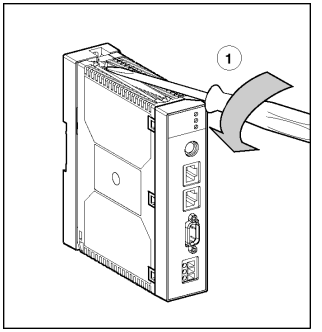
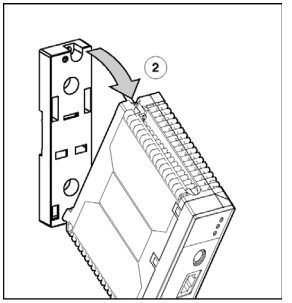


(1) 143.7 mm (AM1-DE200)
136.2 mm (AM1-DP200)

(2) 132.7 mm (AM1-PA)

Dismounting Module from the Plate

To remove the module from its plate proceed as follows:

Step	Action	Illustration
1	Unscrew the screw at the top part of the module in order to remove it from its support	
2	Swing the module forwards and disengage the module's pins from the holes situated in the bottom part of the support.	

4.3 Connections

At a Glance

About this Section

This section deals with the electrical connections of TSX ETZ modules

What's in this Section?

This section contains the following topics:

Module Connectors

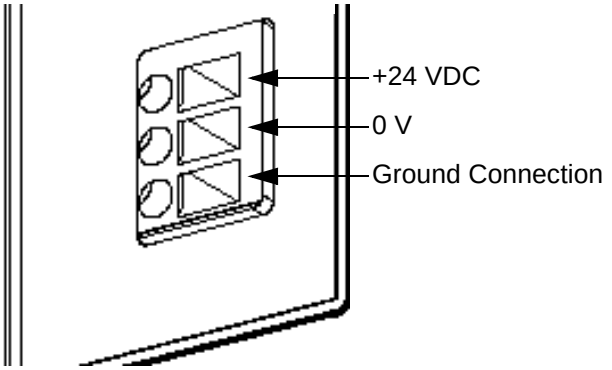
At a Glance

The different linking connectors of the TSX ETZ module are described below.

Supply Terminal Block

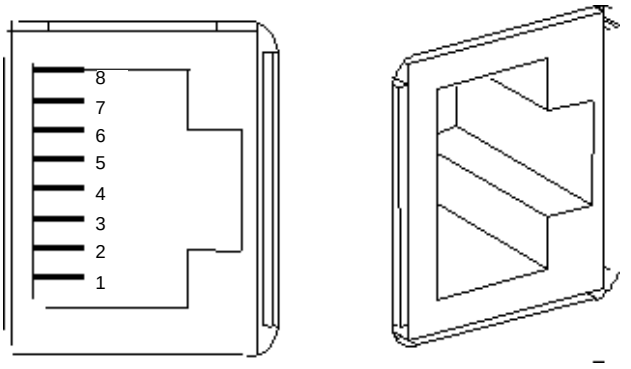
The supply terminal block consists of 3 limits with frontal threaded joints. It cannot be disconnected. Each limit accepts 2.5 mm of cable ^{2} maximum.

Illustration:



RJ45 Ethernet Connector

Illustration of the RJ 45 connector shielded for Ethernet link:

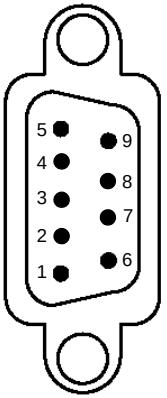


Wiring:

No.	Signal
1	Tx+
2	Tx-
3	Rx+
4	Not connected
5	Not connected
6	Rx-
7	Not connected
8	Not connected

Series RS 232 modem link connector

Illustration of the 9-pin SUB-D connector for series RS 232 modem link:



Wiring:

No.	Signal
1	Data Carrier Detect
2	Received Data
3	Transmitted Data
4	Data Terminal Ready
5	Signal Ground
6	Data Set Ready
7	Request to send
8	Clear to Send
9	Ring Indicator

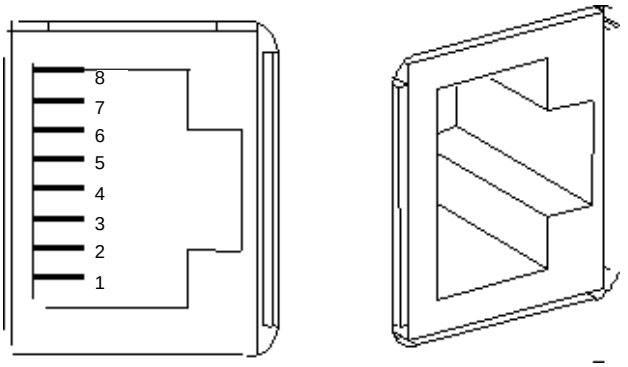
Note: This connector conforms with PC standards

The cable used between the Ethernet connector and the Micro has the reference number:

TSX ETZ CDN 003

RJ45 Uni-Telway link connector

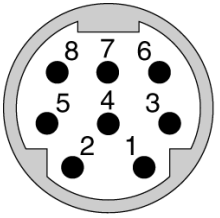
Illustration of the RJ 45 connector shielded for Uni-Telway RS 485 link:



Note: The pin assignment conforms the Schneider standards.

Mini Din Connector

Illustration of the Mini Din connector for the Terminal port:



Wiring:

No.	Signal
1	D(B)
2	D(A)
3	Reserved
4	Not connected
5	Not connected
6	Not connected
7	0 V
8	5 V

Ground Connection

The ground connection situated at the end of the Ethernet cable can be of a different voltage than that of the module.

Due to the length of the Ethernet cable, the difference in voltage can be significant. The ground connection package is linked locally to the module socket.

For more information refer to the TSX DGKBLF ground wiring Guidance Manual.

⚠ WARNING

It is essential to ground the module through the supply terminal block.

Failure to follow this instruction can result in death, serious injury, or equipment damage.

Linking Cables

At a Glance

It is possible to use different cables to link TSX ETZ modules. These cables are either available in the Schneider Automation catalog, or can be produced by the user. For the Application Setup of a Uni-Telway bus, refer to the **TSX DG UTW** manual.

RJ45 Lead to Mini Din

The lead which is delivered with the TSX ETZ module and which has the following reference **TSX ETZ CDN 003** is designed to link a Micro to the module's RJ45 Uni-Telway port, directly or via a TSX P ACC 01 linking box. Its length is 35cm. (See *Topology Principles, p. 93*.)

If it is not the correct length, it is possible to make a new lead from a reference **TSX CX 100** lead with a Mini Din port at one end and nothing at the other end. It is 10m in length.

Cut the cable to the desired length and at the free end, fasten a connector of type **RJ45 cat 5 with 8 contacts**.

Wiring:

RJ45	TSX CX 100
1	White
2	Orange
3	Yellow
4	Black
5	Brown
6	Red
7	Green
8	Blue

Mini Din Lead to TSX SCA 50

This lead has the reference number: **TSX CX 100**. On one end it has a Mini Din connector and it has nothing at the other end. It allows a link between the Mini Din port of the TSX ETZ and the linking terminal block of a Bus Uni-Telway **TSX SCA 50**. Its length is 10m.

Wiring:

Free end of the cable	**TSX SCA 50**	
Color	**Terminal number**	**Signal**
Black	5	D(B)
Brown	4	D(A)
Red	-	-
Orange	-	-
Yellow	-	-
Green	-	-
Blue	2 and 3	0 V
White	-	-
Shield covering	1	Earth

RJ45 Lead to TSX SCA 50

This lead is not available in the Schneider Automation catalog. However, it is possible to make one using an **uncrossed Ethernet cat 5 (TIA 568A/TIA568A) lead with 4 twisted shield pairs**.

You should cut one end and expose the conductors for wiring on the TSX SCA 50.

Wiring:

RJ45		TSX SCA 50	
No.	**Color**	**Terminal number**	**Signal**
1	White/Green	-	-
2	Green	-	-
3	White/Orange	-	-
4	Blue	5	D(B)
5	White/Blue	4	D(A)
6	Orange	-	-
7	White/Brown	-	-
8	Brown	2 and 3	0 V
Shield	Shield covering	-	-

RJ45 Lead to TSX SCA 62

This lead is not available in the Schneider Automation catalog. However, it is possible to make one using an **uncrossed Ethernet cat 5 (TIA 568A/TIA568A) lead with 4 twisted shield pairs**.

You should cut one end and link it to a Sub D 15 pin female connector.

Wiring:

RJ45		Sub D 15 pin	
No.	**Color**	**No.**	**Signal**
1	White/Green	-	-
2	Green	-	-
3	White/Orange	-	-
4	Blue	14	D(B)
5	White/Blue	7	D(A)
6	Orange	-	-
7	White/Brown	-	-
8	Brown	8	0 V
Shield	Shield covering	Shield	-

Linking Leads on the Ethernet Network

For connection to the Ethernet network, the use of cables with the following connectors **RJ 45 (interface 10/100baseT) with pairs of 100 Ω, STP type (shield twisted pair) twisted shields** or category 5 Ethernet cables which conform to the TIA/EIA-568A standard is recommended.

RS232 Lead to PC

This lead is a standard lead available on the market. It is a DTE/DTE type crossed lead. It is also called "Nullmodem" by some suppliers.

Example of possible supply: EYN257H-0006-FF reference from Black Box.

Connectors: 9-way SUB-D female with a UNC-4-40-2B screw.

Shielded cable.

Wiring:

9-pin SUB-D female			**9-pin SUB-D female**		
2	RD		3	TD	
3	TD		2	RD	
4	DTR		6 and 1	DSR + CD	
5	GND		5	GND	
6 and 1	DSR + CD		4	DTR	
7	RTS		8	CTS	
8	CTS		7	RTS	
9	NC		9	NC	
Body	-	Shield covering	Body	-	Shield covering

Note: the DSR and CD signals are linked to simulate an on-line situation for the application (see the following site for more information: http://www.shadownet.com/hwb/ca_nullmodem9to9.htm).

4.4 Diagnostics

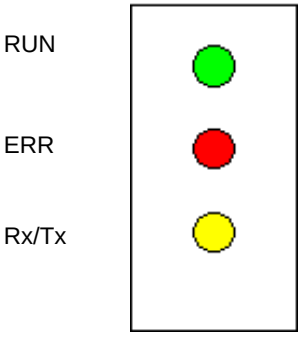
Indicator LEDs

At a Glance

On the front of the module, three display LEDs allow the diagnostic of the TSX ETZ module.

Diagnostics

Illustration of LEDs:



Meaning of LEDs:

Status of the module	RUN	ERR	Comments
Power up	ON	ON	Fugitive status
Self-test in process	Flashing	Flashing	-
Module in default hardware	OFF	ON	Replace the module
Configuration error or broken connection with the Micro or difference in Uni-Telway speed between the master and the TSX ETZ	OFF	Flashing	The HTTP server remains accessible
TSX ETZ BOOTP client or DHCP(FDR): The module is configured in auto-configuration and is waiting for a response from the server.	OFF	5 Flashes	Waiting period: about 1 minute
TSX ETZ BOOTP client or DHCP(FDR): No response from server.	ON	5 Flashes	Graded mode: the module then uses the configuration saved in its flash memory
In operation	ON	OFF	-

The Rx/TX LED flashes in time with communication.

4.5 Electrical Specifications

Electrical Specifications

General

The TSX ETZ module is an autonomous module, which should be powered from a 24 VDC supply.

Specifications

Table of electrical specifications:

Parameter	Minimum	Nominal	Maximum
Supply voltage	19.2 VDC	24 VDC	30 VDC
Wave rate	-	-	5%
Permissible overvoltage (for 1 hour and per 24 hours)	-	-	34 VDC
Power consumption	50 mA	100 mA	200 mA
Power dissipation (excluding consumption on the Terminal port)	-	2.4 W	4 W
Period of invisible supply disconnection	-	-	1 ms

Note: The supply input is protected against accidental polarity inversions.

4.6 Norms and Standards

Norms and Standards

Conformity to the norms

The TSX ETZ module conforms with the following standards and norms:

- ISO/IEC 8802-3
- ANSI/IEEE Std 802.3 (4th edition 1993-07-08)
- UL 508
- IEC 1131-2
- CSA C22.2/142
- Conforms with FCC-B regulation for radiated emissions (50082-1).
- EC mark
- Merchant navy classification

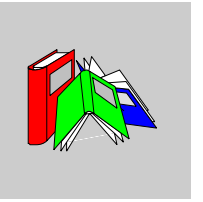
4.7 Service Conditions

Service Conditions

Applicable Conditions

- **Usage conditions**
  - Temperature: from 0 to +60 °C
  - Relative humidity: from 10 to 95% (excluding condensation)
  - Altitude: from 0 to 2000 m
  - Resistance to vibrations: conforms to IEC 68-2-6 test Fc norm
  - Resistance to shocks: conforms to IEC 68-2-27 test Ea norm
  - Resistance to free falls, conditioned hardware: conforms to norm 1131-2
- **Storage conditions**
  - Temperature: from -25 to +70°C
  - Relative humidity: from 5 to 95% (excluding condensation)

Glossary



A

ASCII — **American Standard Code for Information Interchange**.
Pronounced "aski" An American code (but which has become the international standard) which, using 7 bits allows the definition of all alphanumeric characters used in English, punctuation marks, and certain graphics characters, as well as various commands.

B

BIT — Contraction of English words Binary Digit.
It is the binary unit of quantity of information, which can represent two distinct values (or states): 0 or 1.
A field of 8 bits constitutes what we call 1 **Byte** or 1 **Eight-bit byte**.

BOOTP — **Bootstrap Protocol**: start up protocol of terminals or stations without disks by centralized management of the network parameters.

C

Communication fault — Fault detected by the module when periodic exchanges with the PLC CPU are no longer carried out.

Configuration — The configuration unites all the data which characterizes the machine (invariant) and which are necessary to the working of the module.

CPU — **Control Processing Unit.**
This is the microprocessor. It is made up of the unit control package and the arithmetic unit. The control unit aims to extract the instruction to be executed, as well as the data necessary for its execution from the central memory, to establish electrical connections in the arithmetic and logic unit and to launch the processing of this data in this unit. We can sometimes find **ROM** or **RAM** memories included on the same chip, or even some I/O interfaces or buffers.

CPU — Central Processing Unit: generic designation of Schneider Automation CPUs

D

DHCP — **Dynamic Host Configuration Protocol**: protocol that allows a station connected to a network to dynamically obtain its configuration.

DIN — **Deutsches Institut für Normung**: German Normalization Institute.

Driver — Program informing the operating system of the presence and specifications of a device. Also known as the device driver.

F

FDR — **Faulty Device Replacement**: utility offered by its configuration's automatic retrieval module.

FTP/TFTP — **File Transfer Protocol/Trivial File Transfer Protocol** : transfer protocol for files on the network.

H

HTTP — **HyperText Transfer Protocol** : transfer protocol for supply of documents written in Hypertext (links).

I

IP — **Internet Protocol**: communication protocol used by Internet.

ISO — International Standard Organization. The ISO code is the most used code. The transmission rules, formats and symbols are ISO standards. AFNOR is a member of ISO.

M

MIB — **Management Information Base**: database used by the SNMP protocol for network management and which contains information on the transmission of data, on the station's components or on the bridge etc.
- MIB II: MIB standard
- Schneider Automation MIB: Private MIB

Modbus Plus — Communication protocol based on the logic token bus principle.

MTBF — **Mean Time Between Failure**: mean time between two failures.

O

Operating mode — All these rules regulate the module's behavior during transitory phases or if a fault occurs.

P

PAP — **Password Authentification Protocol**: identification protocol by password used in case of a remote connection by modem.

PCMCIA — **Personal Computer Memory Card International Association**

PL7 — Schneider Automation PLC programming software.

PPP — **Point-to-Point Protocol**: point-to-point communication protocol used in the case of connection by modem.

Premium — Schneider Automation programmable PLC family.

Q

Quantum — Schneider Automation programmable PLC family.

R

RS 232C — Communication serial standard, which particularly defines the voltage of the following service:

- a signal from +3V to +25V indicates a logic of 0,
- a signal from -3V to -25V indicates a logic 1.

Between +3V and -3V, the signal will be considered as invalid.
RS 232 links are quite sensitive to interference. The standard recommends that a distance of 15 meters and a maximum of 20000 baud (bits/s) should not be exceeded.

RS 485 — Serial link standard which works with a +/-5V differential. The link uses two leads for to send and to receive. This "three state" output allows it to switch to standby status when the transmission is finished.

RUN — Function allowing the start up of the execution of the application program in the PLC.

S

SNMP — **Simple Network Management Protocol**: Network Management Protocol, which allows the remote control of a network, by interrogating the stations on their status and modifying their configuration, carrying out security tests and observing different information linked to the transmission of data. It can even be used to remotely manage software and databases.

T

TCP — **Transmission Control Protocol**: data transmission protocol on a network.

Time Out — **Exceeding the time limit.**
Application shut down or disconnection following a period of non-usage, which is too long.

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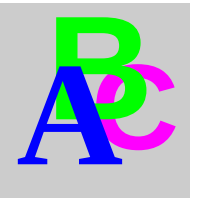

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