Atrium / TCP Gateway
Installation manual

eng

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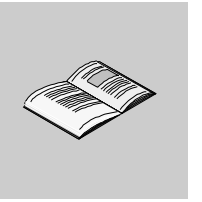
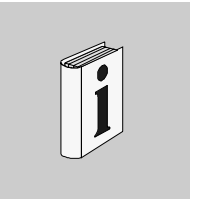


About the Book



At a Glance

Document Scope

This document explains how to install, operate and configure Atrium / TCP Gateway software.

Related Documents

Title of Documentation	Reference Number
X-Way installation manual	TSX DR NET
TSX Micro Modules ETZ 410/510 User manual	
Installation manual - Communication -	TSX DM 57-T4

User Comments

We welcome your comments about this document. You can reach us by e-mail at TECHCOMM@modicon.com

General presentation

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At a Glance

Subject of this Chapter

This chapter describes the specifications of the Atrium / TCP Gateway product. It provides a general view of the product's functionalities and architecture.

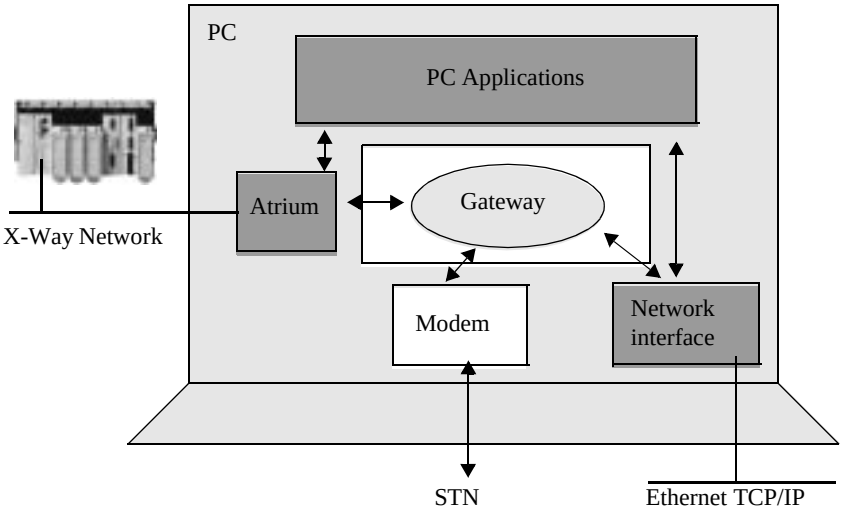
What's in this Chapter?

This chapter contains the following topics:

General

Definition of Gateway

The Atrium / TCP Gateway (simply referred to as `Gateway`, throughout this document) is a software application used to connect an Atrium coprocessor to the TCP network using existing PC connections (software and hardware connections). It runs on Windows 2000 or XP operating systems.
It can either use an Ethernet or modem connection.
With a modem connection, you need to use the RAS for Atrium (See *Configuring the "RAS profile" screen, p. 22*) function and communicate using the PPP protocol.
The communication initiative can come from a PLC connected on the X-Way network.
Existing PC connections, as well as Ethernet and modem connections, can be used simultaneously.
Software and hardware architecture:



The Gateway can be used to communicate on the Ethernet network in Modbus and Uni-TE.
Modbus and Uni-TE messaging services are identical to those of Ethernet Premium communication modules, whatever the Ethernet connection:

- with the ISA card: TSXETHPC101M,
- with the PCI card: TCCETH01.

The user can also use applications such as OPC, PL7 and Vijeo Look simultaneously.

Examples of use

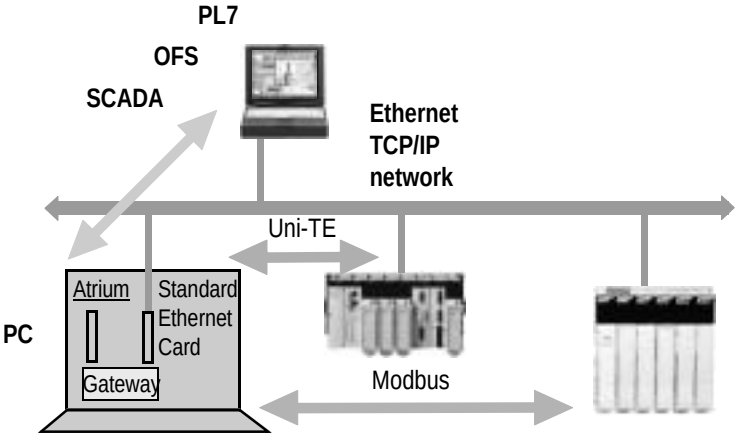
At a Glance

In this section, we describe how and in what context the Gateway is to be used.

Atrium to PC or PLC

Communication is possible using the Modbus or Uni-TE protocols.

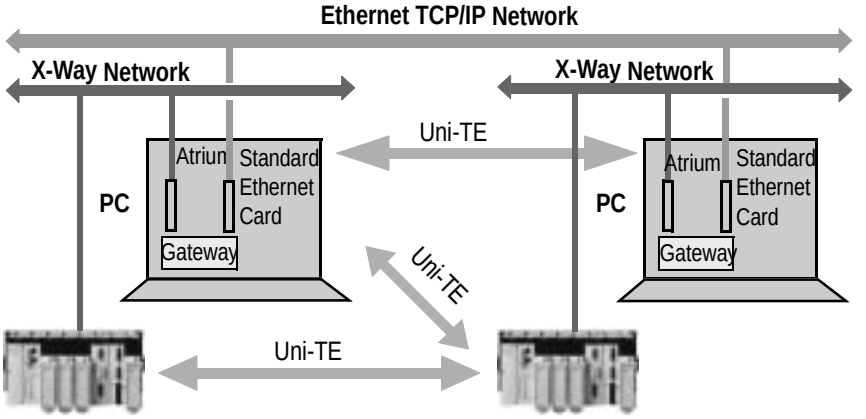
- the X-Way local address is configured in the "global parameters" (See *Configuring the "General" screen, p. 18*) configuration screen, or obtained through the server,
- as for Ethernet TSXETY network modules, the configuration screens are used to define the remote IP addresses.



The Gateway provides access control, based on remote IP addresses (as for the TSXETY).

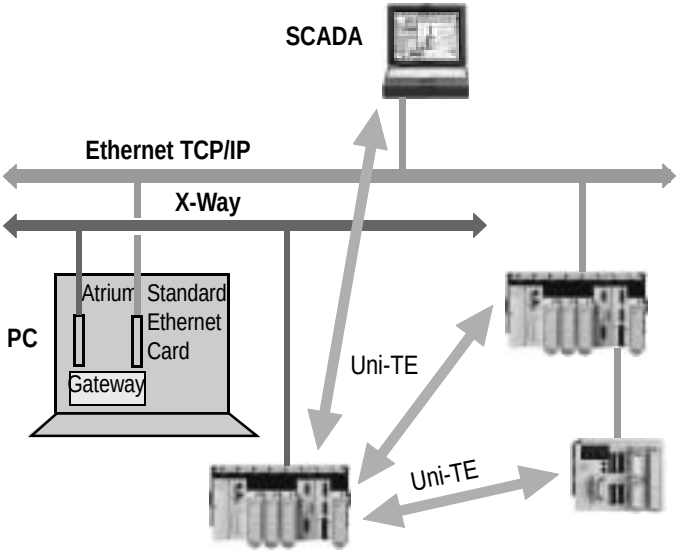
Atrium to Atrium

Communication between Atriums is possible using the Uni-TE protocol.
X-Way transparency is possible between X-Way sub-networks.



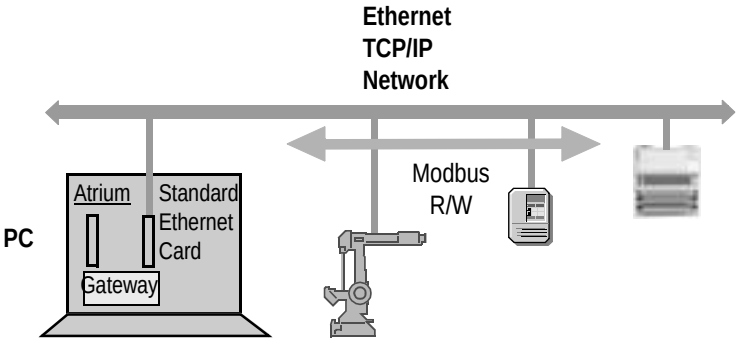
X-Way transparency via the Atrium

Using the X-Way remote address and the IP address of the Gateway, a remote station can communicate in Uni-TE with a station on the X-Way sub-network connected to the Atrium.



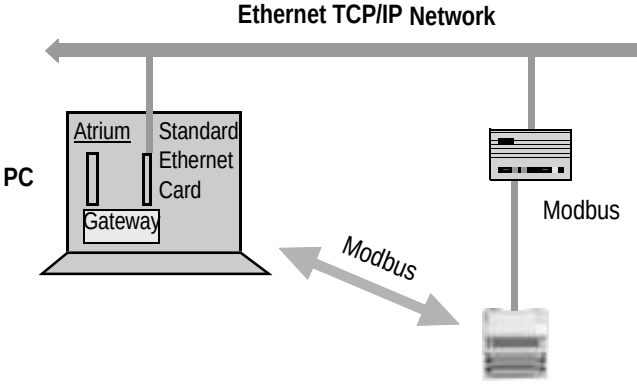
The Atrium behaving as an I/O scanner

Write / read requests managed using an Atrium application:
using Modbus on the TCP/IP protocol, Atrium applications are capable of communicating with peripheral units such as Momentum, Altivar, or any other product supporting a Modbus server.
The Gateway does not support the FDR service (Faulty device Replacement).



Atrium to Modbus

The Gateway authorizes communication between the Atrium application and all remote Modbus devices through the 174CEV30010 gateway.

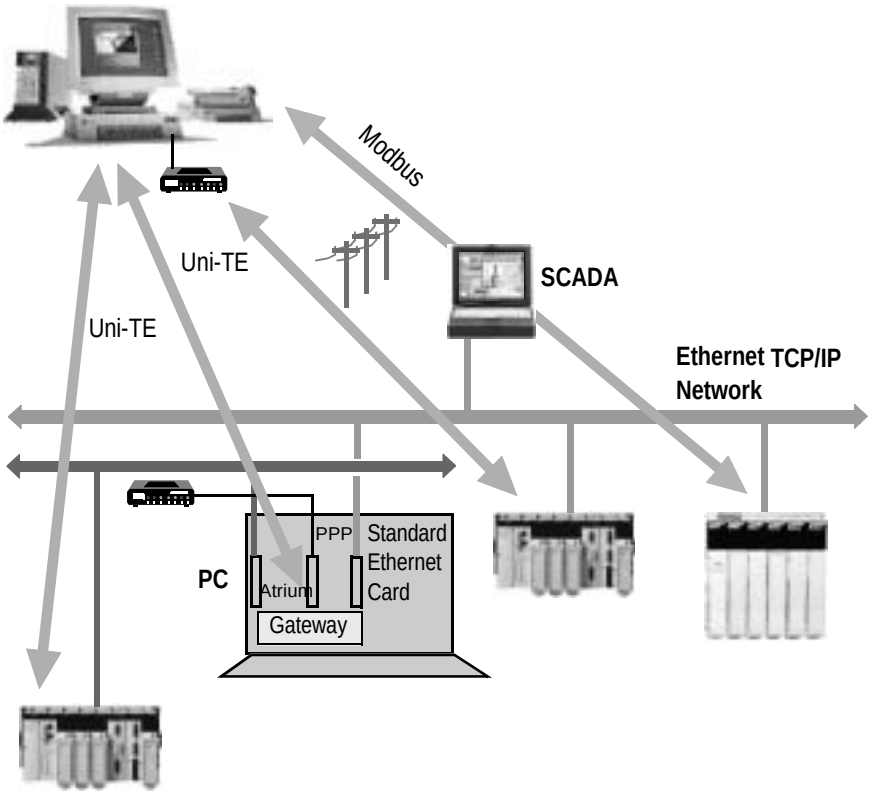


RAS

Transparent remote access to Atrium PLCs:
the Gateway can be configured to communicate using PPP protocol on a Modem of the PC.

- it offers transparent routing to/from the local PC application using the Uni-TE or Modbus protocol (example: through ISAway or PCIway). The X-Way sub-networks are also accessible.
- standard Windows routing is used to guarantee routing to/from a remote station on Ethernet.

The Gateway uses the RAS service of Windows.



Note: to use the Windows RAS service, the user should be familiar with Windows configurations.

Compatibility and standards

Atrium TCP Gateway Software

- **compatible with all Ethernet ports or serial links of the PC:**
  The Gateway can use Ethernet PCI (TCCETH01) or ISA (TSXETHPC101M) cards supplied by Schneider or any other card on the market. It is also compatible with embedded Ethernet ports.

- **management of the Uni-TE and Modbus protocols:**
  as for the Ethernet TSXETY410x module, the Gateway supports Ethernet Uni-TE and Modbus communications for the message handling service. The Atrium card is therefore able to communicate with Quantum PLCs, or any other product that supports the Modbus protocol.

- **RAS (Remote Access protocol) connection:**
  the Gateway uses the Windows RAS function to communicate on the STN modem link.

- **compatibility and transparency with X-Way drivers:**
  X-Way transparency is provided with the Atrium card.

Operate mode

Installation

The Gateway software is installed using a CD-ROM which, once inserted in the drive, automatically starts the installation of the software onto the hard disk of a PC or Magelis iPC (if the CD-ROM automatic start-up option under Windows is activated).

Hardware and software configuration

This software is based on Windows interfaces enabling easy configuration of the parameters according to needs. This tool is used to set up a static configuration of the Gateway.
During validation, all parameters are checked and recorded in a file.
There is no dynamic reconfiguration of the Gateway. All reconfigurations require the Gateway software to be restarted.
The Gateway operates under the following Windows operating systems:

- Windows 2000,
- Windows XP.

It can only be run on a PC or Magelis iPC with a built-in Intel processor. PCs with built-in multi-processors are also supported.
There is no version of **Online mode (Run Time)** for platforms without a built-in Intel processor.

Online mode

This mode can be launched automatically (See *Detailed description, p. 19*) on start-up of the system (PC or Magelis iPC). A service window opens before user identification and provides information on the status of remote PLCs on the network.
Once the configuration has been recorded, no user operation is required on starting up the system.

Product configuration

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At a Glance

Subject of this Chapter

This chapter provides a general description of the services and configurations offered by Gateway.

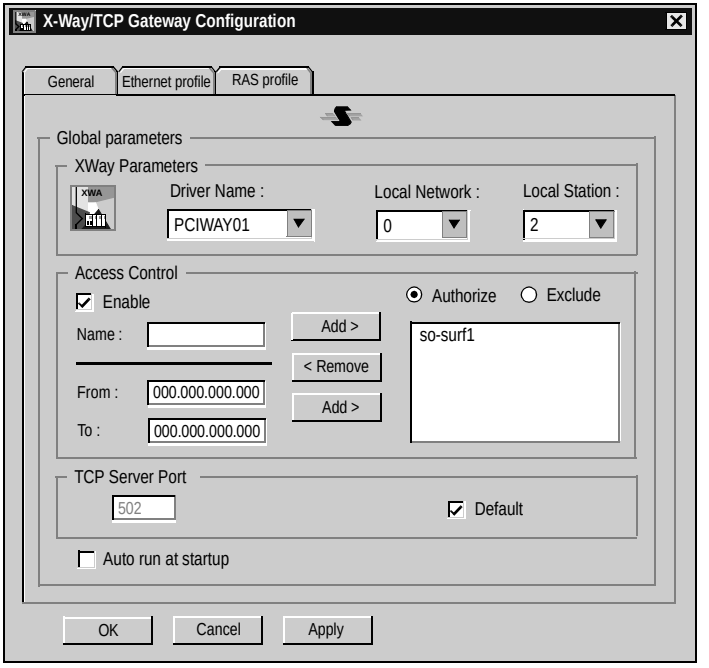
What's in this Chapter?

This chapter contains the following topics:

Configuring the "General" screen

Illustration

This screen allows you to set up the overall parameters of Gateway.



Detailed description

X-Way Parameters:

- **Driver Name:** this field is used to select the PCIWAY01 driver (on Atrium) or ISAWAY01 driver (on PCX57).
- **Local Network:** is used to select the network used by Gateway (0 to 127),
- **Local Station:** is used to select the station used by Gateway (0 to 63),

Access control:

in server mode, this part is used to check and validate the incoming IP addresses.

- **Enable:** authorizes or excludes the IP addresses and remote domain names configured in the server's connection table.
  This table is updated using the "Add >" and "< Remove" fields:
  - Add: is used to add an IP address interval or domain name,
  - Remove: is used to remove an IP address interval or domain name.

  Meaning of "Authorize" and "Exclude":
  - Authorize: is used to set up incoming IP addresses or domain names of authorized remote stations. These IP addresses are configured using the "from / to" field.
    The "Name" field is used to set up a domain name for the remote station.
  - Exclude: is used to set up incoming IP addresses or domain names of any non-accepted remote stations. These IP addresses are configured using the "from / to" field.
    The "Name" field is used to set up a domain name for the remote station. All other addresses are accepted.

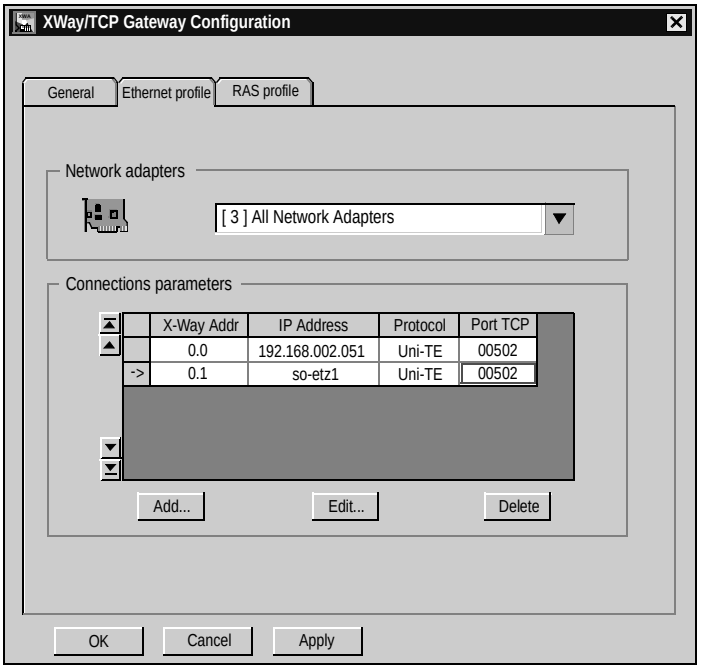
  In both cases, the IP addresses and remote domain names configured appear in the server's connection table.

TCP Server port: set by default to 502 (Schneider Electric port).

Auto run at startup: determines whether the software is launched automatically when the system starts up (PC or Magelis iPC).

Configuring the "Ethernet profile" screen

Illustration



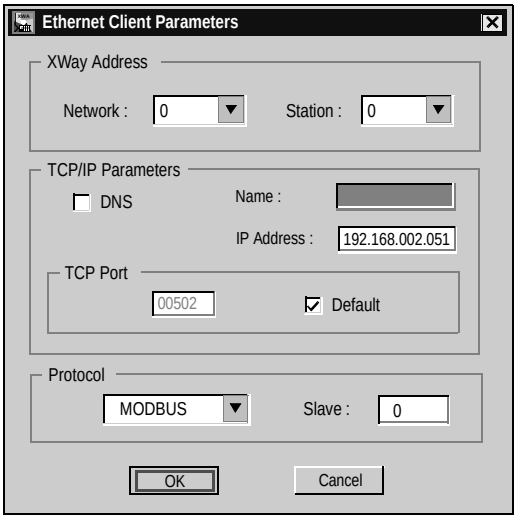
Detailed description

Network adapters: this field is used to select a network Ethernet adapter. To do this, you can choose all the adapters or a specific adapter. The Ethernet adapter lets you communicate with remote modules.

Connections parameters: these are TCP connection parameters in client mode. The table describes the client part of Gateway. To configure this, simply click "Add" to add a remote station, "Edit" to edit or modify a remote station, or "Delete" to delete a remote station.

Ethernet Client Parameters screen

This window appears when you click "Add" or "Edit":



- **X-Way address:** X-Way address of the remote station,
- **IP address:** IP address of the remote station.
  IP addresses can be configured formally (e.g.: 139.160.234.153) or by domain name (DNS).
- **Protocol:** to be used with the remote station: Modbus or Uni-TE,
  The "Slave" parameter is used to set up (in Modbus only) the Modbus slave number you want to reach using a serial TCP/Modbus bridge.
- **TCP Port:** is used to obtain a connection. Set by default to 502 (Schneider Electric port).

Configuring the "RAS profile" screen

At a Glance

The Gateway supports the management of the RAS (Remote Access Service), used normally for communication by modem via the PPP protocol. Its operation is limited to an output modem and an input modem.

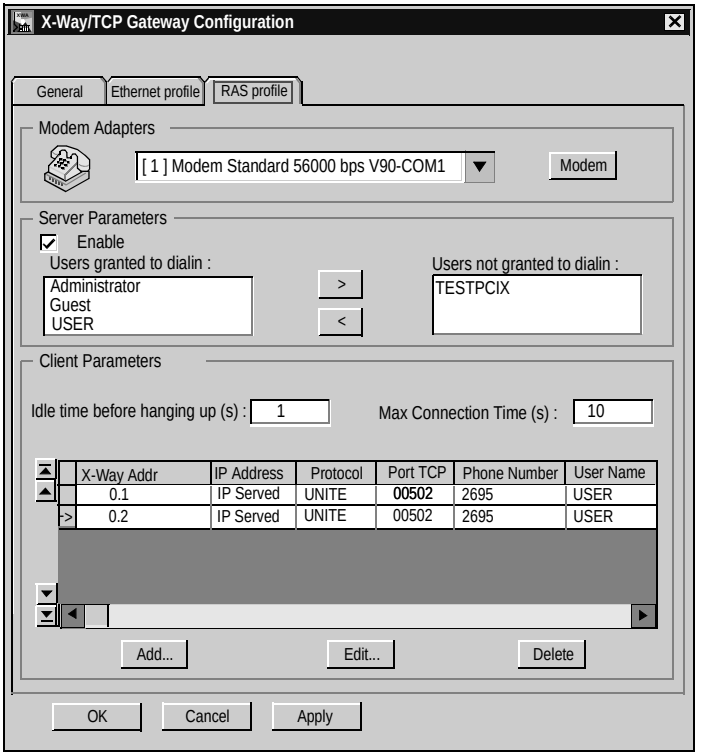
Note: before each configuration the modem(s) must be installed first of all on the PC.

Characteristics integrated in the Gateway:

- initialize the RAS connection in order to accept a remote PPP connection,
- initialize the RAS connection in order to create a PPP connection to a remote RAS server:
  - dynamically, when it is necessary to establish a remote TCP connection.

In the case where there are two modems, a client link and a server link can both be active at the same time.
If several modems (internal or external) are installed, all incoming connections will be accepted regardless of the modem used.
Once communication is established, the communication is two-way (See *Uni-TE and Modbus message handling, p. 27*).

Illustration



Detailed description

Modem Adapters:

- this zone allows you to select the modem on which the PC's outgoing calls are made (dial out or Atrium clients).
  For incoming (Dial in) calls, the Gateway accepts all calls from all the modems configured on the PC. However, the PC must be configured to accept incoming calls. This configuration is set up using the Windows "Network and Dial-up Connections" window.
- the "Modem" button activates the Windows "Modems" window.

Note: if two STN lines are available, one modem can be used for outgoing calls (Atrium Clients), and the other for incoming calls, for remote connections to Atrium.

Server parameters:

these parameters enable you to configure controls for incoming calls (dial in).

Note: the PC must be configured to accept incoming calls.

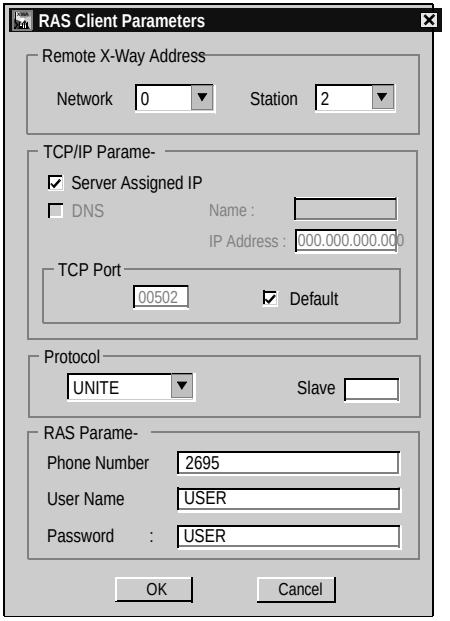
- the "Enable" checkbox enables or disables incoming calls. If the box is not checked (disabled) all incoming calls are ignored.
- The "Users granted to dial in / Users not granted to dial in" field allows you to select the user accounts that are authorized or not to connect to the PC. To define new users, use the Windows "User manager" program.
  The right/left arrows are used to to move user names from one side to the other, depending on whether they are authorized to connect or not.

Client Parameters:
these parameters are used to to configure the PC's outgoing calls activated by Atrium.

- **Idle Time before Hanging up:** the modem will disconnect automatically when it reaches maximum idle time allowed on the modem link. This time is configured in seconds. For it never to hang up, configure it to 0.
- **Max connection time:** the modem will disconnect automatically when it reaches the maximum connection time. This time is configured in seconds. For it never to disconnect, configure it to 0.
- to configure the table, click "Add" to add a remote station, "Edit" to edit or modify a remote station, or "Delete" to delete a remote station.

RAS Client Parameters screen

This window appears when you click "Add" or "Edit":



Remote X-Way address:
X-Way address of the remote station.

TCP/IP Parameters:
- if the box "**Server Assigned IP Address**" is checked, the Atrium client can only communicate with the RAS server called (for example, a call to an ETZ or another Atrium).
- if the box "**Server Assigned IP Address**" is unchecked, the user must specify an IP address or a name. The Atrium client can then only communicate with a station other than the RAS server (for example, a call to an ETY connected to an RAS server via Internet).

TCP Port:
enables you to obtain a connection. Set by default to 502 (Schneider Electric port).

Protocol:
the Modbus or Uni-TE application protocol is used with the remote station.
The "**Slave**" zone is used to set up (in Modbus only) the Modbus slave number you want to reach using a serial TCP/Modbus bridge.

RAS Parameter:
- **Phone Number:** telephone number of remote server,
- **User Name and password:** identifier and password used to identify a user account on the remote server.

Uni-TE and Modbus message handling

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At a Glance

Subject of this Chapter

This chapter provides an overview of the message handling service.
The Gateway supports X-way, Uni-TE and Modbus communication in client / server mode. For more details, consult "Communication Specific-Applications Volume 3 - TCP/IP message handling".

What's in this Chapter?

This chapter contains the following topics:

Uni-TE message handling

TCP server mode

The Gateway is awaiting a remote connection on the previously configured port (port 502 by default). In this case, it acts as server for the exchanges initiated by the remote stations.
On a Client TCP request, the Gateway opens a connection according to which access rights are set as "authorized / excluded". This mode is frequently used for a typical client connection such as PL7 / Unity Pro programming tools.

Note: A maximum of 53 simultaneous connections in server mode are accepted by the Gateway.

Client TCP mode

The Gateway opens a connection with a remote station on the previously configured port (port 502 by default) according to the connection parameters in client TCP mode for a given X-Way address.
In this mode, the Atrium initiates an exchange to a remote station using the SEND_REQ() communication functions.
When using the Gateway in client mode, a table of 6 bytes corresponding to the destination address needs to be placed at the start of the send buffer. For further information, consult the TSX DR NET manual.

	Byte 1 (most significant)	**Byte 1 (least significant)**
Word 1	Station No.	Network No.
Word 2	0	0
Word 3	0	0

Example: transmission to the system gate of a remote PLC (network2.station3):

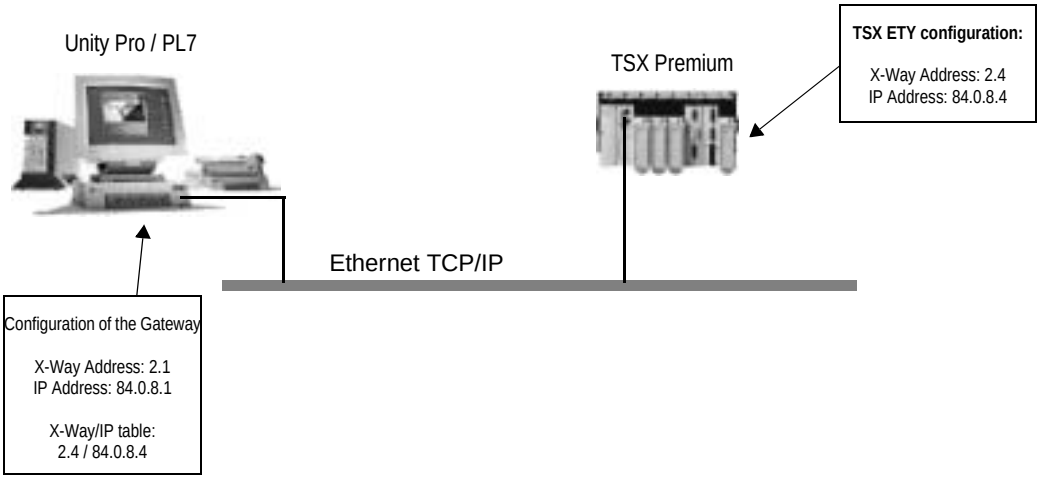
	Byte 1 (most significant)	**Byte 1 (least significant)**
Word 1	3	2
Word 2	0	0
Word 3	0	0

Note: in client mode, only the request SEND_REQ is used. This request does not carry out a consistency check of the input parameters (e.g.: check the number of data items to be written against the size of the data buffer). This must be checked by the user.

Programming examples on an Ethernet profile in Uni-TE.

Configuration example

Namely the following configuration:



Example of Programming a Mirror Request

If Atrium is in client mode:

- in the General (See *Configuring the "General" screen, p. 18*) screen:
  - Driver Name: PCIWAY01
  - Local Network: 2
  - Local Station: 1
  - do not check the Enable box
  - TCP Server Port: 502
- in the Ethernet profile (See *Configuring the "Ethernet profile" screen, p. 20*) screen:
  - Network adapters: choose the appropriate network card,
  - in the "Connection parameters" table, add the remote station server with: X-Way address = 2.4, IP address = 84.0.8.4, Protocol = Uni-TE and TCP Port = 502.

On the server side, open the PL7 Pro software and configure the X-Way address and IP address of the TSXETY:
- X-Way address: 2.4
- IP address: 84.0.8.4 (configure also the sub-network mask and Gateway address).
In the "Configuration of connections" table of the "Message handling" tab, configure the client address, i.e.:

- X-Way Address: 2.1
- IP Address: 84.0.8.1
- Protocol: Uni-TE

Using the configuration below, the programming is the following:

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

(*Start of Mirror request input parameters*)
%MW13:=...;
(*ADR#0.3 corresponds to ADR#rack-Module.channel*)
Send_Req(ADR#0.3,#FA,%MW10:13,%MW100:10,%MW0:4)
```

Note: under Unity Pro, the Send_Req request is:
Send_Req(ADDR('0.0.3'),#FA,%MW10:13,%MW0:4,%MW100:10)

Example of word reading programming in UNI-TE

This program is used to send a Uni-TE request to a remote device with an X-Way address: 2.4 (16#0402). The request allows the words %MW10000, %MW10001, %MW10002. to be read

```
(*Atrium in client mode*)
(*read request for 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#0402;(*network-station: XWAY address (Modbus)*)
%MW101:=16#0000;
%MW102:=16#0000;
%MW103:=16#0768;(*segment type: internal word*)
%MW104:=10000;(*address of the first word to read*)
%MW105:=3;(*no. of words to read*)

(*%MW200:4 = 4 word reception table: type of object on 1 byte
+ 3 data words*)
SEND_REQ(ADR#0.3,16#0036,%MW100:6,%MW200:4,%MW300:4);
END_IF
```

Note: under Unity Pro, the Send_Req request is:
Send_Req(ADDR('0.0.3'),16#0036,%MW100:6,%MW300:4,%MW200:4)

The confirmation of the correct report is: 16#6600

Note: Caution: in the reception table, the most significant byte of the first data word read is contiguous with the object type byte.

Example of bits reading programming in UNI-TE

This program is used to send a Uni-TE request to a remote device with an X-Way address: 2.4 (16#0402). The request allows 3 bits to be read: %M100, %M101, %M102.

```
(*Atrium 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#0402;(*network-station: 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. of words to read (multiple of 8)*)

SEND_REQ(ADR#0.3,16#0036,%MW1300:6,%MW1400:2,%MW1500:4);
END_IF
```

Note: under Unity Pro, the Send_Req request is:
Send_Req(ADDR('0.0.3'),16#0036,%MW1300:6,%MW1500:4,%MW1400:2)

The confirmation of the correct report is: 16#6600

Note: the reading is performed by modulo 8. In our example, we wish to read 3 bits. In all cases, the reception table must be capable of reading 8 bits (%MW1305:=8;).

Atrium server

If Atrium is in server mode:

- consult the screen enabling you to configure the global parameters (See *Configuring the "General" screen, p. 18*) with:
  - Driver Name: PCIWAY01
  - Local Network: 2
  - Local Station: 1
  - do not check the Enable box
  - TCP Server Port: 502

On the client side (TSXETY), open the PL7Pro software and configure the X-Way address and IP address of the TSXETY:
- X-Way address: 2.4
- IP address: 84.0.8.4 (configure also the sub-network mask and Gateway address).
In the "configuration of connections" table of the "Message handling" tab, configure the server address, i.e.:

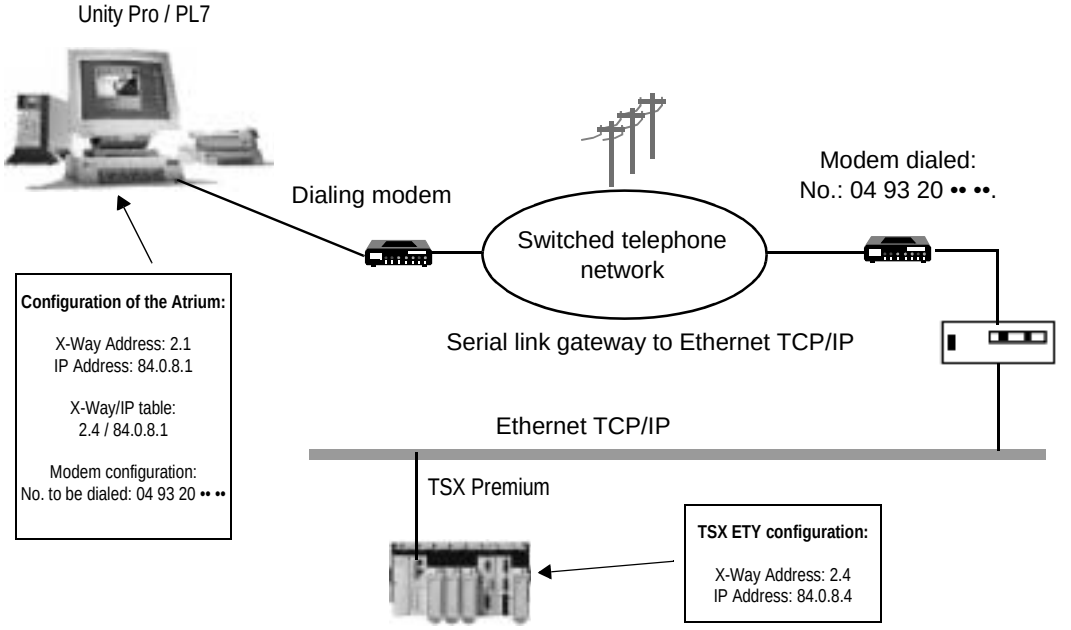
- X-Way Address: 2.1
- IP Address: 84.0.8.1
- Protocol: Uni-TE

All requests are possible.
The Atrium system gate is accessible from stations on the Ethernet network using the following address: **{2.1}SYS**

Programming example via an STN Modem in Uni-TE

Configuration example

Namely the following configuration:



Programming example 1

If Atrium is in client mode:

- use the same configuration as the previous example (See *Programming examples on an Ethernet profile in Uni-TE., p. 29*).
- in the "RAS Profile" tab, define the modem to be used then fill in the "RAS Client parameters" server table indicating your use of the Uni-TE protocol.
  In the "RAS parameters" field, enter the telephone number, identifier and password.
  The default TCP port is port 502.
- On the server side, open the PL7 Pro software and configure the X-Way address and IP address of the TSXETY:
  - X-Way address: 2.4
  - IP address: 84.0.8.4 (configure also the sub-network mask and Gateway address).

Using the configuration below, the programming is the following:

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

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

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

Send_Req(ADR#0.3,#FA,%MW10:13,%MW100:10,%MW0:4)
```

Note: under Unity Pro, the Send_Req request is:
Send_Req(ADDR('0.3'),#FA,%MW10:13,%MW0:4,%MW100:10)

Note: Programming via a modem connection is the same as on the Ethernet profile. Only the Atrium configuration changes.

Programming example 2

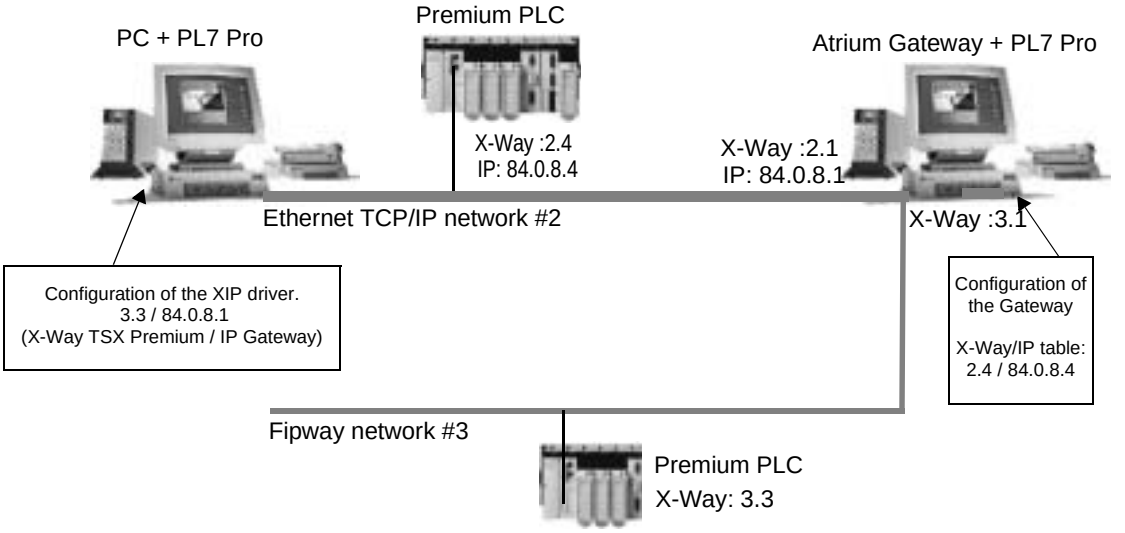
If Atrium is in server mode:

- use the same configuration as the previous example (See *Programming examples on an Ethernet profile in Uni-TE., p. 29*).
- in the "RAS Profile" tab, define the modem to be used and check the "Enable" box in order to activate server mode.
- on the client side, use the same configuration as the previous example (See *Programming examples on an Ethernet profile in Uni-TE., p. 29*).

The Atrium system gate in the above example is accessible from stations on the Ethernet network using the following address: **{2.1}SYS**

Example of X-Way transparency

At a Glance



Sending a mirror request:

- communication between a PLC on the Fipway network and a PLC on the Ethernet network:

```
%MW10:=16#0402;(*network-station*)
%MW11:=16#0000;
%MW12:=16#0000;
Send_Req(ADR#{3.1}0.3,#FA,%MW10:13,%MW100:10,%MW0:4)
```

Note: using Unity Pro, the Send_Req request is:
Send_Req(ADDR('{3.1}0.0.3'),#FA,%MW10:13,%MW0:4,%MW100:10)

- communication between a PLC on the Fipway network and a PLC on the Ethernet network:

```
Send_Req(ADR#{3.3}SYS,#FA,%MW10:13,%MW100:10,%MW0:4)
```

Note: using Unity Pro, the Send_Req request is:
Send_Req(ADDR('{3.3}SYS'),#FA,%MW10:13,%MW0:4,%MW100:10)

Modbus messaging

At a Glance

The Gateway uses the Uni-TE messaging service to communicate with the Atrium. A Modbus / Uni-TE conversion (or vice versa) is automatically carried out by the Gateway for both modes (client and server) as described below.

Server mode

If a Modbus frame is recognized by the Gateway, Modbus to Uni-TE conversion is carried out before the request is sent to the PLC. This conversion enables the reply to be sent back.

Note: for each Modbus remote station, the couple (IP address, {station network} X-Way) must be configured in the correspondence table:

Client mode

The Uni-TE to Modbus conversion is carried out by Gateway only if the client connection is identified as a Modbus connection and the X-Way addressing complies with the Uni-TE to Modbus format.

The correspondence between Modbus function codes and Uni-TE requests is described in the table below:

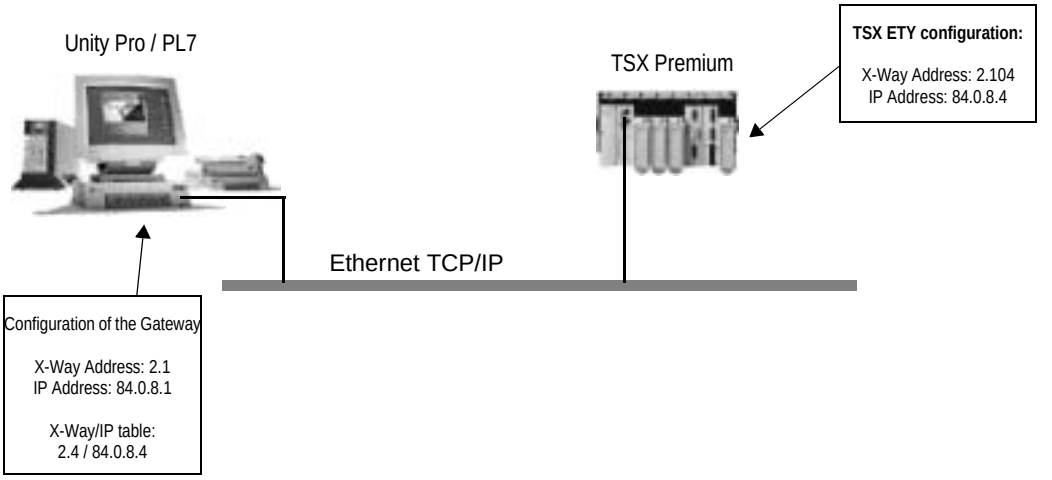
Modbus commands	Modbus function codes	Uni-TE requests	Uni-TE parameters			PL7 object
			Code	Segment	Type	
Read Coils	0X01	Read object	0X36	100	5	%Mi
Read Input Discrete	0X02	Read object	0X36	100	5	%Mi
Read Multiple Registers	0X03	Read object	0X36	104	7	%MWi
Read Input Registers	0X04	Read object	0X36	104	7	%MWi
Write Single Coil	0X05	Write object	0X37	100	5	%Mi
Write Single Register	0X06	Write object	0X37	104	7	%MWi
Force Multiple Coils	0X0F	Write object	0X37	100	5	%Mi
Write Multiple Registers	0X10	Write object	0X37	104	7	%MWi

The Gateway does not support other Modbus codes.

Programming example on an Ethernet profile in Modbus

Configuration example

Namely the following configuration:



Example of word writing programming in Modbus

If Atrium is in client mode:

- in the General (See *Configuring the "General" screen, p. 18*) screen:
  - Driver Name: PCIWAY01
  - Local Network: 2
  - Local Station: 1
  - do not check the Enable box
  - TCP Server Port: 502
- in the Ethernet profile (See *Configuring the "Ethernet profile" screen, p. 20*) screen:
  - Network adapters: choose the appropriate network card,
  - in the "Connection parameters" table, add the remote station server with: X-Way address = 2.4, IP address = 84.0.80.1, Protocol = Modbus and the TCP Port = 502.

On the server side, open the PL7 Pro software and configure the X-Way address and IP address of the TSXETY:
- X-Way address: 2.104 (add 100 to the X-Way address: 2.4)
- IP address: 84.0.8.1 (configure also the sub-network mask and Gateway address).
In the "Configuration of connections" table of the "Message handling" tab, configure the client address, i.e.:

- X-Way Address: 2.1
- IP Address: 84.0.8.1
- Protocol: Modbus

This program is used to send a write request in Modbus messaging to the same remote device. The X-Way address of the TSXETY is 2.4 (16#0402). The request is used to write the values 4, 5 and 6 in words %MW10006, %MW10007, %MW10008 respectively.

```
(*Atrium 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#0402;(*network-station: XWAY address*)
%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. of words to write*)
%MW1006:=4;(*value of data to write*)
%MW1007:=5;(*value of data to write*)
%MW1008:=6;(*value of data to write*)

(*%MW1100:1 = 1 word reception table: report on 1 byte*)
```

```
SEND_REQ(ADR#0.3,16#0037,%MW1000:9,%MW1100:1,%MW1200:4);
END_IF
```

Note: using Unity Pro, the Send_Req request is:
Send_Req(ADDR('0.0.3'),16#0037,%MW1000:9,%MW1200:4,%MW1100:1)

The confirmation of the correct report is: 16#FE00

Example of bit writing programming in Modbus

This program is used to send a Modbus request to the same remote device. The X-Way address of the TSXETY is 2.4 (16#0402). The request is used to write 16 bits: %M400 to %M415 in the remote device.

```
(*Atrium 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#0402;(*network-station: XWAY address*)
%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#0.3,16#0037,%MW2200:7,%MW2300:1,%MW2400:4);
END_IF
```

Note: using Unity Pro, the Send_Req request is:
Send_Req(ADDR('0.0.3'),16#0037,%MW2200:7,%MW2400:4,%MW2300:1)

The confirmation of the correct report is: 16#FE00

Online mode

4

At a Glance

Subject of this Chapter

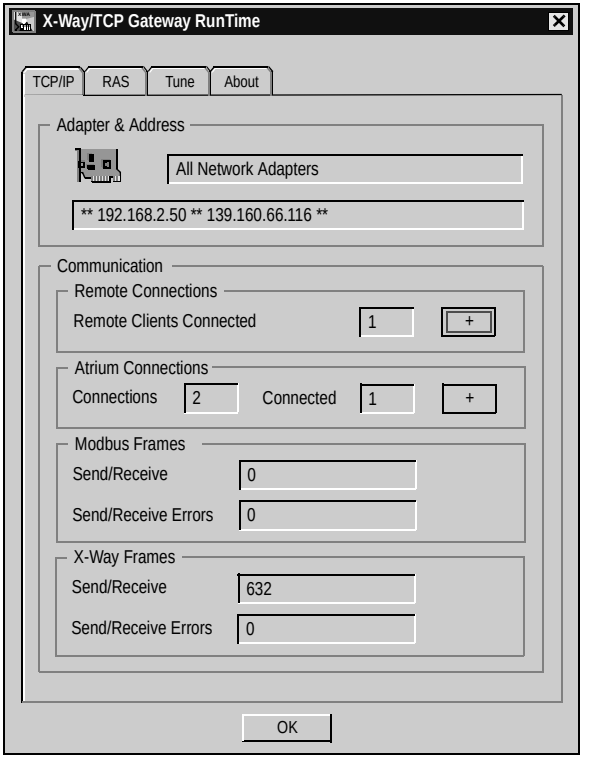
The Gateway is easy to use, both for configuration interfaces and for interfaces in online mode. It uses Windows standards.

What's in this Chapter?

This chapter contains the following topics:

"TCP/IP" screen in online mode

Illustration



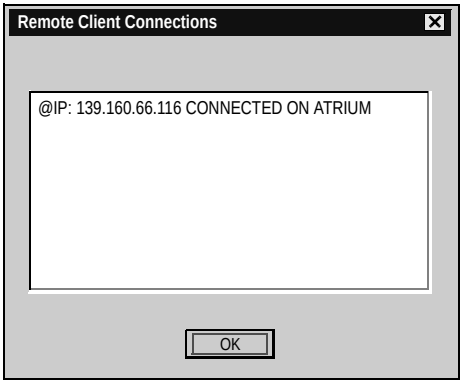
The "OK" button enables you to iconize the window in the task bar.

Detailed description

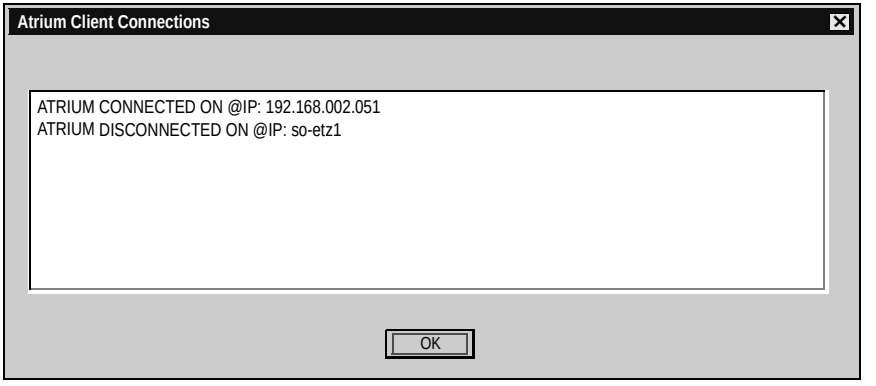
Adapter & address: this zone displays the name of the Ethernet adapter and the local IP addresses for communication.

Communication:

- **Remote connections:** number of remote clients connected on the Atrium card. By clicking on "+" the "Remote Client Connections" window opens,



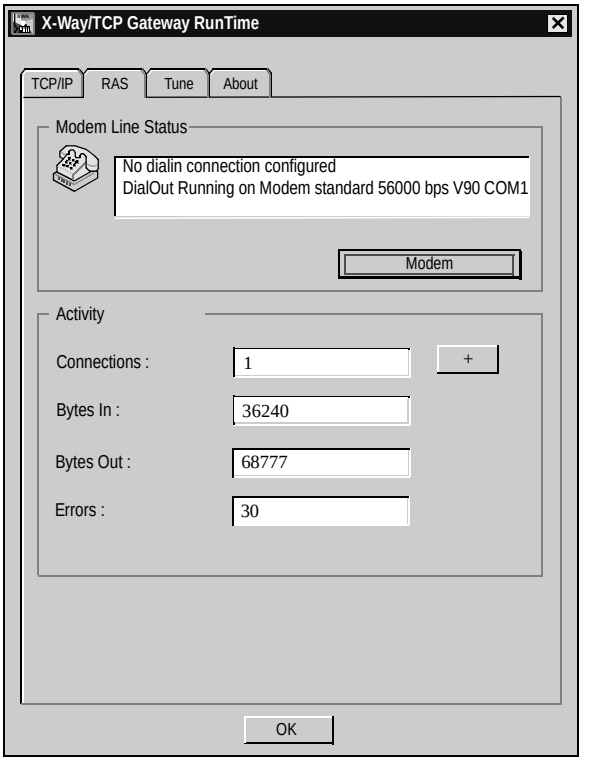
- **Atrium Connections:** number of client connections and number of connected clients.
  By clicking on "+" the "Atrium client connections" window opens,



- **Modbus Frames and X-Way Frames:** these fields correspond to request counters. They indicate the total number of transactions performed (requests sent and received as well as request errors).

"RAS" screen in online mode

Illustration



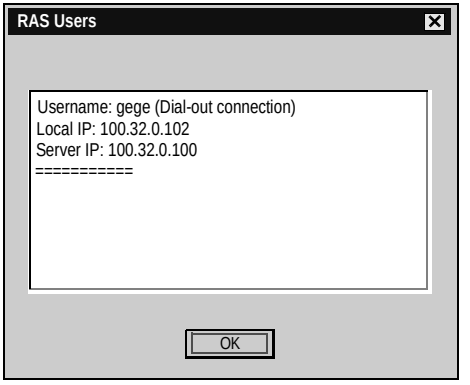
Detailed description

Modem Line Status: this zone gives the current status of modem connections, and can contain the following messages:
- **No Modem configured for dial in:** the PC is not configured to accept incoming calls (there is no modem),
- **No dialin connection configured:** no dialin connection configured,
- **COM1- Listening (Standard V90 56K modem):** the modem is awaiting a call,
- **COM1- not operational (Standard V90 56K modem):** the modem is not able to reply to calls (problem on the STN line, etc.),
- **COM1- connected (Standard V90 56K modem):** a remote client is connected on the PC,

DialOut running on Modem standard V90-COM1: the Atrium is connected on a remote server.

Activity: this zone provides information on the activity of the modem link(s).

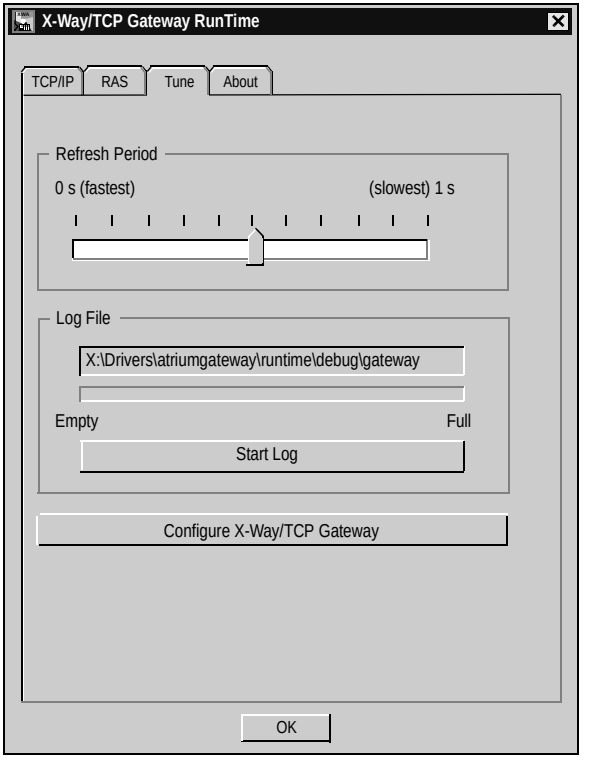
- **Connections:** number of active modem connections.
  By clicking on "+" the "RAS Users" window opens and the following information appears:
  - the name of the user and the type of connection (DialIn or DialOut),
  - the IP address of the client station
  - the IP address of the server station



- **Bytes In:** number of bytes correctly received,
- **Bytes Out:** number of bytes correctly sent,
- **Errors:** number of bytes received or sent in error.

"Tune" screen in online mode

Illustration



Detailed description

Refresh Period: corresponds to the frequency with which the displays of all counters are updated.
Log file: this is the trace journal file. This file records the transient events during connection.
Start Log: the "Start Log" button enables the user to start recording events in the file. The maximum size of this file is 1 Mb.

Performance and limits

5

At a Glance

Subject of this Chapter

This chapter describes the performance and limits of the Gateway software.

What's in this Chapter?

This chapter contains the following topics:

Performance

At a Glance

Performance is that of the TSXETY410x modules used by Premium PLCs.

- 53 simultaneous connections are possible in server mode, and 128 simultaneous connections are possible in client mode.
- message handling performance is identical to that for a configuration based on an Atrium using an extension rack and a TSXETY410x.
  For direct PPP or WAN connections, performance will be determined by the actual data transfer speed between the client and the server.

Note: due to the wide variety of PC architectures, performance may vary from one PC to another.

Limits

Message handling	a maximum of 53 simultaneous connections are possible in server mode, and a maximum of 128 simultaneous connections are possible in client mode.
SNMP agent	The Gateway has no SNMP agent. The PC supporting the Gateway is capable of managing the Microsoft SNMP agent (MIB II standard), but the private TF MIB is not supported.
Global data	Global data is not supported. If necessary, you can use an external rack and Ethernet TSXETY4102/5102 communication modules.
Web diagnostic	Web diagnostic is not supported.
Bandwidth management	Bandwidth management is not supported.
Security, access verification	Access to the PLCs is verified using the IP entry address. The list of authorized IP addresses is declared on configuration of the software. Security management is Microsoft Windows standard.
I/O Scanning	The I/O Scanning function is not supported. It can be carried out for each application (See *The Atrium behaving as an I/O scanner, p. 12*).

Example

6

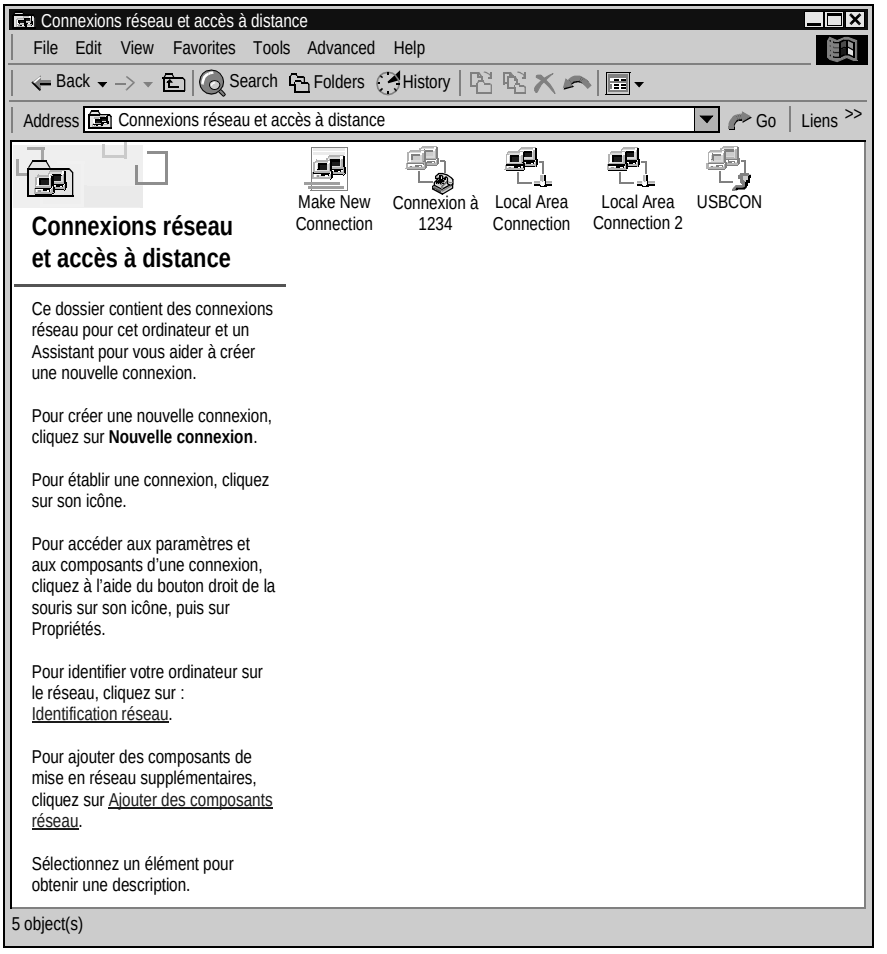
Example: how to create a connection to other computers and networks using Windows 2000

Description

This example allows you to configure the PC in order to create connections to other computers and networks enabling the applications to function.

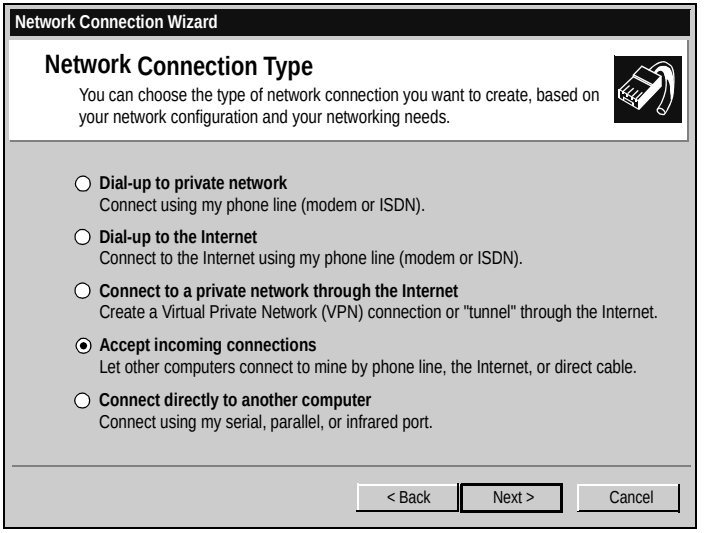
Note: the modem(s) must be configured on the PC. To install the modem(s), consult the help manual "Installing a new modem" using Windows 2000 or XP.

- Activate the "Network and Dial-up Connections" window using the control panel.

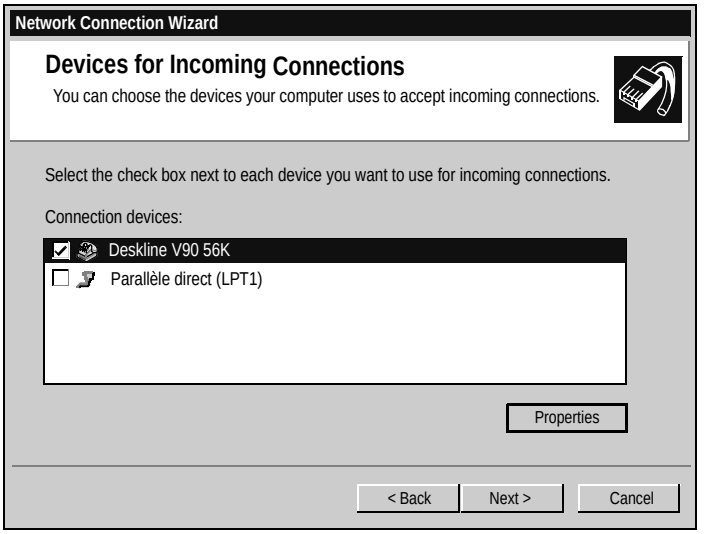


- Active the "Make New Connection" icon.

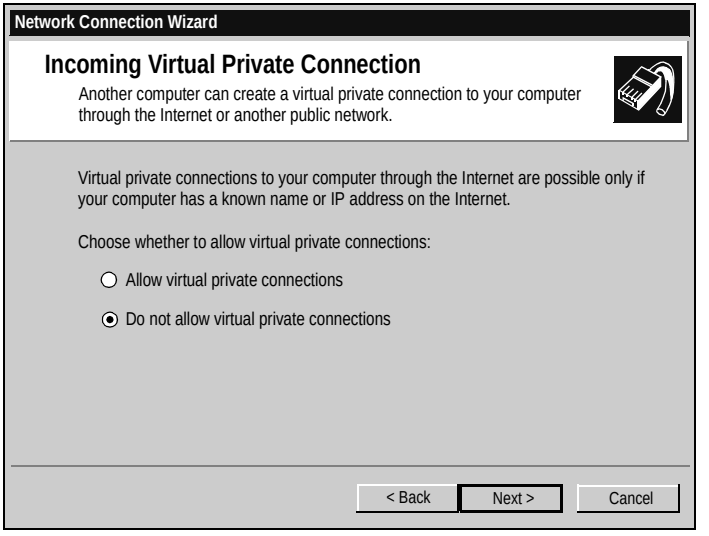
- Choose "Accept incoming connections".



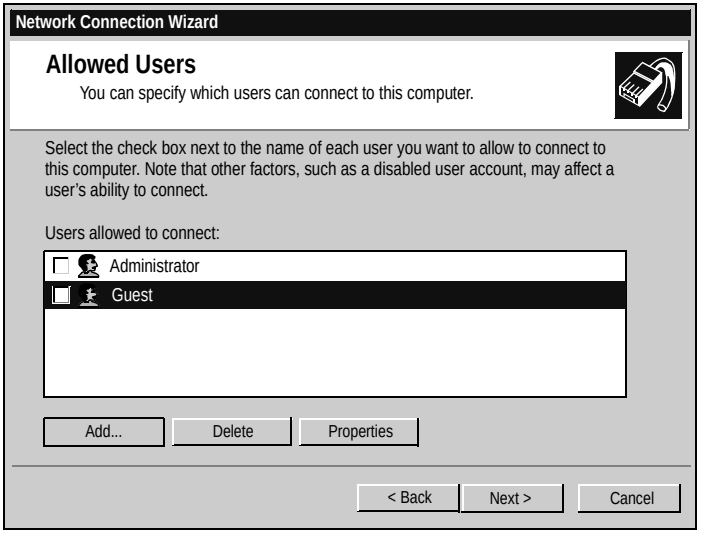
- Select the modem(s) to be used.

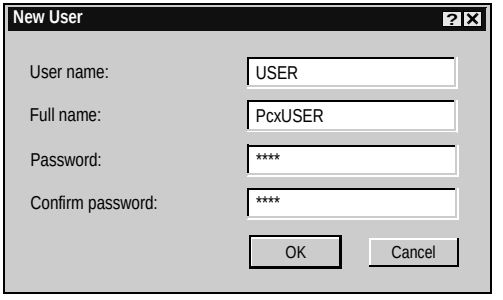


- Select "Do not allow virtual private connections".

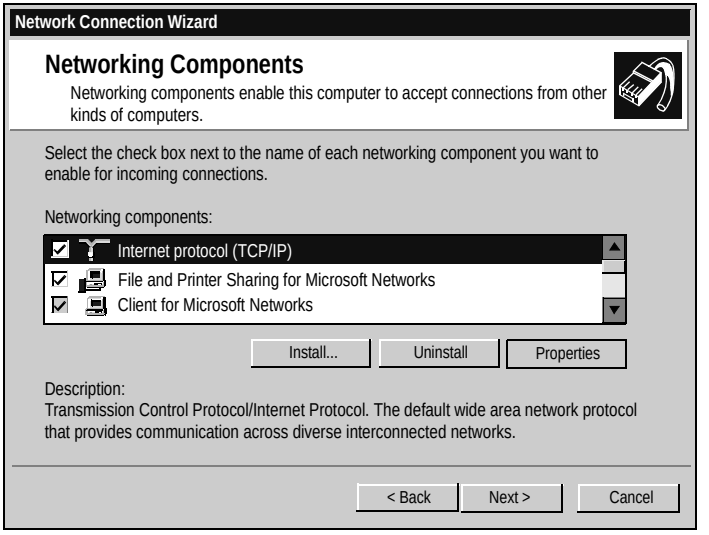


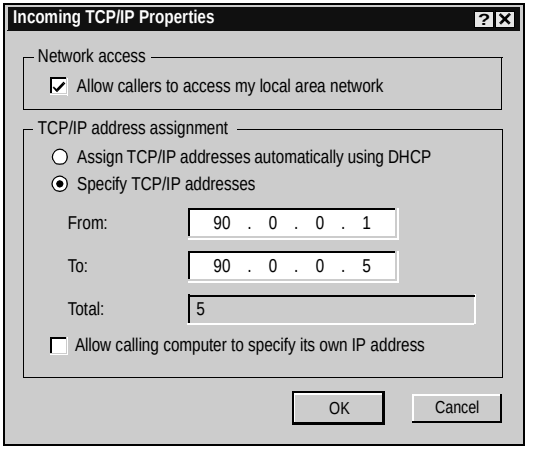
- Use the "Add" button to select or create user accounts authorized to connect.

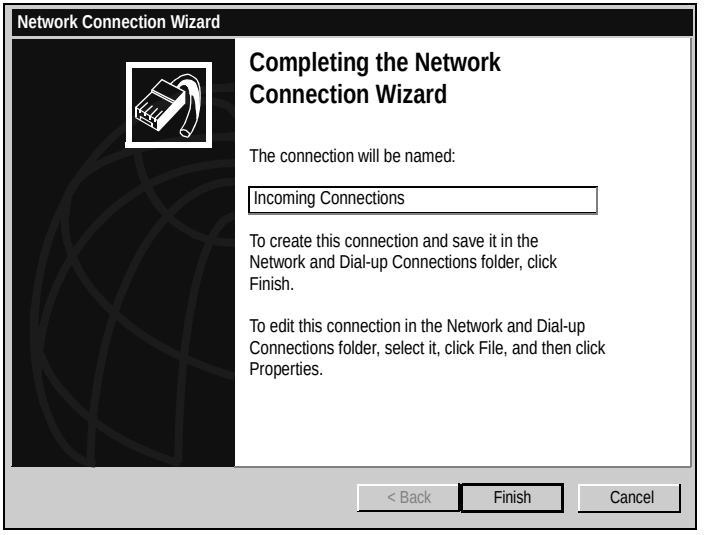




- Select the "Clients for Microsoft, TCP/IP...." network components.
  Select "Internet Protocol (TCP/IP)", then give the list of IP addresses that are to be assigned to clients.

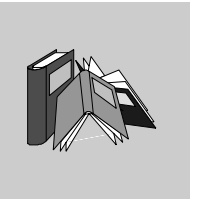






- A new icon is created in the "Network and Dial-up Connections" window.

Glossary



C

Client An application installed on your computer which receives data from a remote server.

D

DNS **Domain Name Service:** each station has its own IP address. However, users do not want to work with IP addresses such as 193.174.142.38, but rather with more explicit station names and addresses.
For this reason, TCP/IP is used to associate everyday language names with numerical addresses using the DNS (Domain Names Service) system.

F

FDR **Faulty Device Replacement:** service offered by the module allowing automatic configuration retrieval.

G

Gateway Gateway between networks of different kinds.

I

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

L

LAN **Local Area Network**: local network situated in a collapsed zone or a common environment. A local area network becomes part of an extended network when a link is established (using modems, remote routers, telephone lines, satellites or wireless connection) with a larger system.

M

MIB **Management Information Base**: network management databases using SNMP protocol containing information on data transmission, station or router components, etc.

Modem Device that enables a computer to be linked to another computer via a telephone line.

P

PL7 Schneider Automation PLC programming software.

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

Premium Schneider Automation TSXP57xxx family of programmable PLCs.

S

Server Computer system used to provide services to users (Clients) connected to the network.

SNMP **Simple Network Management Protocol**: network management protocol enabling you to control a remote network by polling the stations on their status and modify their configuration, carry out security tests and observe different data transmission information. It can also be used to remotely manage software and databases.

STN **Switched Telephone Network:** network shared by several computers enabling one computer to communicate with any of the others. Example: the standard telephone network.

T

TCP **Transmission Control Protocol**: network data transmission protocol.

W

WAN **Wide Area Network**: this network can extend worldwide, in contrast to the LAN (Local Area Network) network.