Schneider Electric

Uni-Telway Protocol
XBT N/R/RT

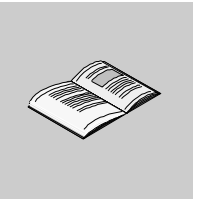
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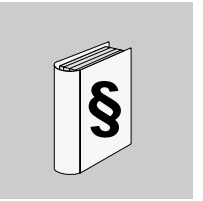
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Table of Contents



	Safety Information	**5**
	About the Book	**7**
Chapter 1	**Operating Principle**	**9**
	General	11
	Operating Principle	13
	Presentation of X-Way Addressing	16
	Operating Principle of XBT Terminals Using the Uni-Telway Protocol	18
Chapter 2	**Software Configuration**	**19**
	Configuring the Address of the Terminal	20
	Configuring Equipment Addresses	22
	Uni-Telway Equipment Address Dialog Box	24
Chapter 3	**Variable Types Supported**	**27**
	Variable Types Supported	27
Chapter 4	**Cables and Connectors**	**29**
	Cables	30
	SUB-D25 Pin Connections	32
	RJ45 Pin Connections	34
Chapter 5	**Diagnostics**	**39**
	XBT Detected Error Indication	39
Appendices		**45**
Appendix A	**RS485 Recommendations**	**47**
	RS485 Recommendations	47
Glossary		**49**
Index		**51**

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 or serious injury.

⚠ WARNING

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

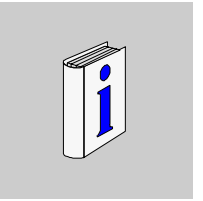
⚠ CAUTION
CAUTION indicates a potentially hazardous situation, which, if not avoided, **can result** in injury or equipment damage.

PLEASE NOTE

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

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About the Book



At a Glance

Document Scope

This document describes communication between automation systems and the XBT N/R/RT product range using the Uni–Telway protocol.

Validity Note

The data and illustrations found in this document are not binding. We reserve the right to modify our products in line with our policy of continuous product development. The information in this document is subject to change without notice and should not be construed as a commitment by Schneider Electric.

Related Documents

Title of Documentation	Reference Number
XBT N/R/RT Instruction sheet	W916810140111 A07
XBT N/R/RT User Manual	33003962
Vijeo-Designer Lite	Online help
X-Way reference manual, UNI-TE protocol, coding, electro-magnetic compatibility	TSX DR NET

You can download these technical publications and other technical information from our website at www.schneider-electric.com.

Product Related Information

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All pertinent state, regional and local safety regulations must be observed when installing and using this product. For reasons of safety and to ensure compliance with documented system data, only the manufacturer should perform repairs to components.

Since the XBT N/R/RT terminals are not designed to pilot safety critical processes, no specific instructions apply in this context.

User Comments

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

Operating Principle

1

Overview

This chapter describes the operating principle of XBT terminals in applications using the Uni-Telway protocol.

⚠ WARNING

LOSS OF CONTROL

- The designer of any control scheme must consider the potential failure modes of control paths and, for certain critical functions, provide a means to achieve a safe state during and after a path failure. Examples of critical control functions are emergency stop and overtravel stop.
- Separate or redundant control paths must be provided for critical for critical control functions.
- System control paths may include communication links. Consideration must be given to the implications of unanticipated transmission delays or failures of the link.*
- Each implementation of a Magelis XBT N/R/RT must be individually and thoroughly tested for proper operation before being placed into service.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

*For additional information, refer to NEMA ICS 1.1 (latest edition), *Safety Guidelines for the Application, Installation, and Maintenance of Solid State Control*

What's in this Chapter?

This chapter contains the following topics:

Topic	Page
General	11
Operating Principle	13

Topic	Page
Presentation of X-Way Addressing	16
Operating Principle of XBT Terminals Using the Uni-Telway Protocol	18

General

At a Glance

Uni-Telway is a field bus used to communicate between devices of the same type according to a protocol defined by Schneider Electric.

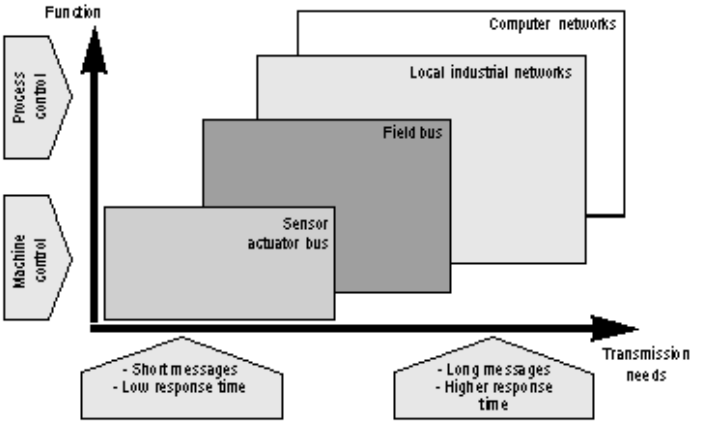
Numerous proprietary or third-party devices can be used on this bus, which has become one of the industry standards.

The communication protocol terminology defines the software (driver) installed in the devices that are connected to the Uni-Telway bus.

This section gives a brief description of the principles of the communication bus.

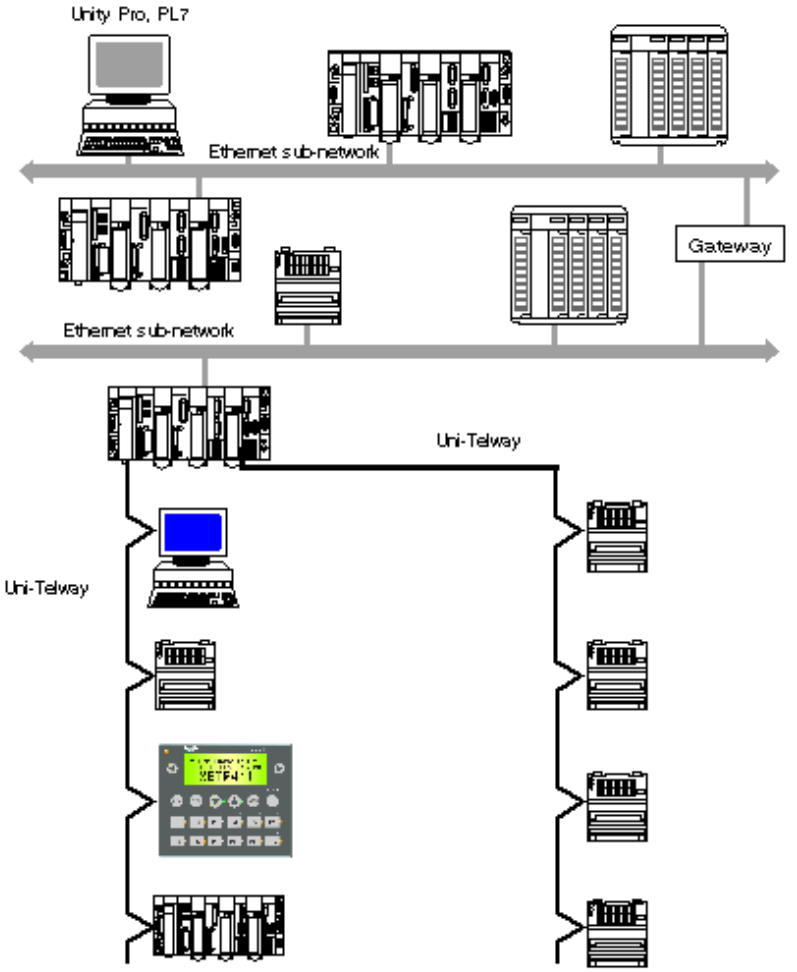
Illustration

The following illustration shows the position of the field buses in an industrial communication environment.



Architecture Example

The following illustration shows a communication architecture, featuring a Uni-Telway bus.



Operating Principle

At a Glance

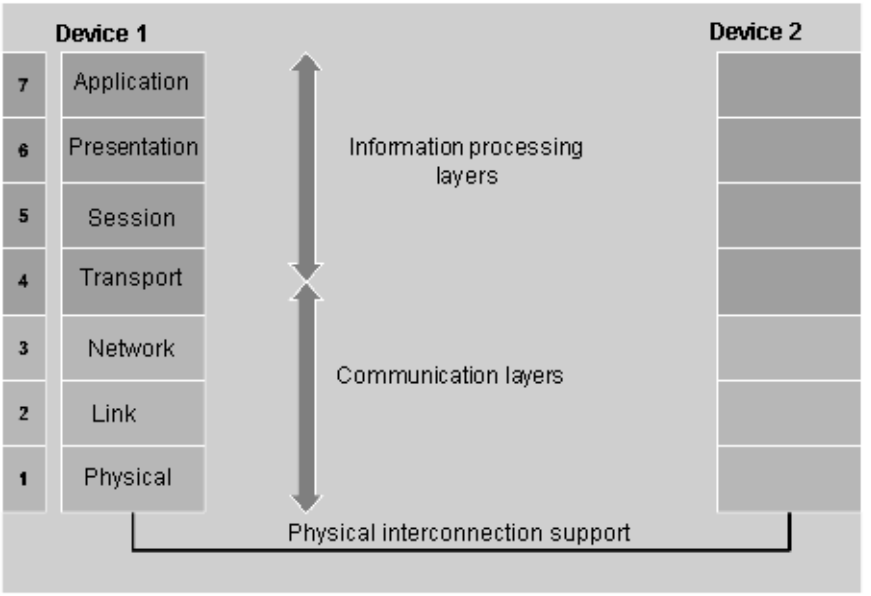
Communication between same-type devices can only take place by defining interconnection standards that define the behavior of each device in relation to the others. These standards were developed by ISO (the International Standard Organization), which defined a standardized Network Architecture more commonly known as the OSI (Open System Interconnection) model.

This model is made up of seven ranked layers that each perform a specific part of the functions necessary for interconnecting systems.

The layers communicate with equivalent layers from other devices, via standardized protocols. Within a single device, layers communicate with their immediate neighbors via hardware or software interfaces.

Illustration

The figure below describes the layers of the OSI model.



NOTE: The Uni-Telway bus matches this model in terms of layers, without possessing all of them. Only the Application, Network, Link and Physical layers are necessary for this field bus.

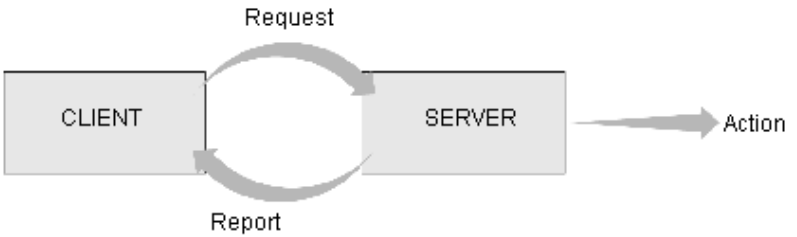
Application Layer

The field bus' application layer is the one visible by the programs of the interconnected devices. This is used to formulate the requests (reading/writing words and bits, identification, etc.) that will be sent to the remote device.

The Application layer used by the Uni-Telway bus is the UNI-TE application protocol.

Example: an XBT N/XBT R/XBT RT connected to a Uni-Telway bus will send UNI-TE requests in order to update the graphic objects displayed on these pages.

The UNI-TE protocol is a CLIENT/SERVER protocol enabling each device of a Uni-Telway bus to send or receive requests.



Certain devices can support the double status of CLIENT and SERVER. For example, a PLC is SERVER for its system tasks, (programming functions, adjustment, diagnostics, etc.) and can be CLIENT to the user program code (command sending, status reading, etc.) with regard to another PLC, to the digital control of tool machines, to a sensor or to a protector). In general, XBT N/XBT R/XBT RTs have the status CLIENT to PLCs whose operation they visualize or control. They have the status SERVER when they meet requests for identification, protocol version, detected error counters, etc.

NOTE: For further details on the UNI-TE application protocol, refer to the Schneider Electric TSX DR NET documentation.

Network Layer

The network layer of the Uni-Telway bus is used to define and use the addresses of the devices that communicate between themselves. In the case of a Uni-Telway bus, this layer is the X-Way layer.

X-Way addressing is used to identify a device on a network or a bus. Each station of a network is identified by a unique address, made up of a network number and a station number. Addresses then differ according to the bus.

To identify the address system used by the XBT N / XBT R / XBT RT, refer to the section in this manual on configuring the Uni-Telway driver.

NOTE: For further details on X-Way addressing, refer to *Presentation of X-Way Addressing, page 16* or Schneider Electric TSX DR NET documentation.

Link Layer

The link layer of the Uni-Telway bus uses the Master/Slave communication principle. The principle of a link layer is to define the low-level communication method for the communication medium (physical layer).

A Uni-Telway bus has one master device, the other devices of the bus are slaves The master device can send directly a request or an answer to any slave.

Cyclically, the master device interrogates each slave. The interrogated slave can thus send a request or an answer to the master. If this request or answer is not for the master but for another slave device, the master forwards it to the right addressee.

NOTE: One reason for Master/Slave management is that at any time it is possible to calculate transfer time for requests and the answers from each device. This therefore enables us to size the buses precisely, in order that there be no saturation or information loss.

In general, the master device is a PLC. To find out the maximum number of slaves, refer to the documentation of the master you have chosen.

NOTE: Do not confuse the notions of CLIENT/SERVER and Master/Slave. These are not located on the same layers of the OSI model. There is only one master on the bus, but several CLIENTS and/or SERVERS), and a single device can be a CLIENT one moment and a SERVER another.

Physical Layer

The physical layer of the OSI model characterizes the topology of the communication bus or network, as well as the medium (cable, wire, fiber optic, etc.) that will transport the information and its electrical coding.

Within the framework of a Uni-Telway bus, topology may be daisy-chained, derived or a mix of both. The medium is made up of shielded twisted pairs, and the signal is a base band signal with a default speed of 9600 bit/s, odd parity, 8 data bits and 1 stop bit.

NOTE: In order for all devices to be able to communicate among themselves on the same Uni-Telway bus, the speed, parity and data bit number characteristics must be identical.

Presentation of X-Way Addressing

General Rules

In a communication architecture, all exchanges generally take place as point-to-point exchanges between two logical entities (client and server). Each of these logical entities must be identified by a unique address. The address has two construction levels, described over the following pages.

NOTE: An XBT N / XBT R / XBT RT type operator dialog terminal, connected to a Uni-Telway bus from a station in this communication architecture, is able to reach a device through the X-Way addressing, indicating the address of the objects to display or control.

Architecture Level

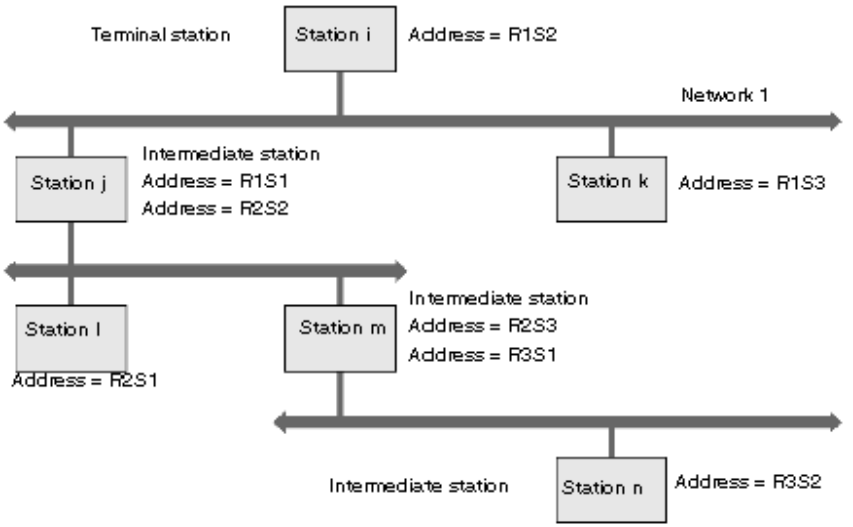
A network architecture is made up of terminal stations and intermediate stations (bridges) that link together 2 or more networks.

A station is identified by:

- a single network number in the architecture,
- a single station number in a network.

The intermediate stations connected to different networks therefore have several network addresses.

Illustration:



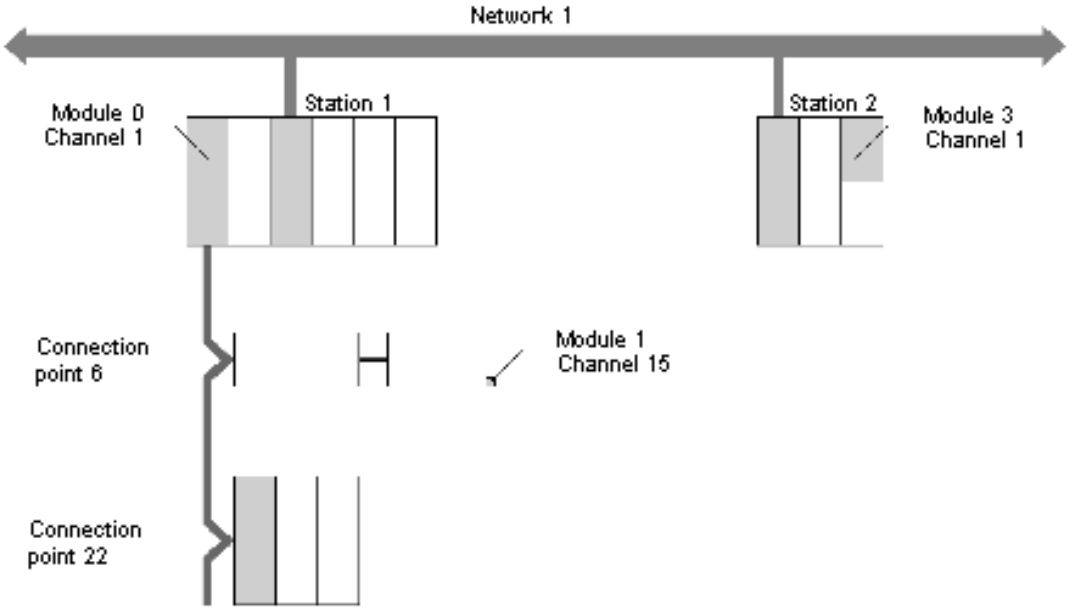
Station Level

This level is used to call an entity in the station.

A station connected to a network is made up of a set of communication entities located both in the station itself and in the devices connected to its internal communication channels (FIPIO bus, PLC backplane bus, Uni-Telway bus, etc.).

A communication entity is identified in its station by an address (module number, channel number in the module, connection point or slave address, etc.).

Examples:



Operating Principle of XBT Terminals Using the Uni-Telway Protocol

Status of XBT Terminals in Uni-Telway Applications

The XBT terminal has the status of a CLIENT.

The XBT N410/401 and XBT R410/411 are slaves on the Uni-Telway network, unless they are connected to the programming port of a TSX 17 PLC via an XBT Z958 cable.

The XBT occupies 2 consecutive addresses on the bus. CLIENT address = cabled address + 1; this is the address that the XBT uses to read and write variables in a device on its own initiative; this address is transparent for the other devices (it simply has to be reserved on the bus).

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

The protocol must be installed and used by authorized and properly trained personnel.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Roles of XBT Terminals

XBT terminals perform the following functions:

- monitoring function: XBT terminals visualize the processes that are active in the PLCs and indicate alarm states
- command function: XBT terminals send information to the PLC upon user request

Software Configuration

2

Overview

For Uni-Telway applications you do not have to configure protocol parameters because the communication parameters (transmission speed, parity etc.) are automatically detected. That is why this chapter only contains a dialog box for configuring equipment addresses.

What's in this Chapter?

This chapter contains the following topics:

Topic	Page
Configuring the Address of the Terminal	20
Configuring Equipment Addresses	22
Uni-Telway Equipment Address Dialog Box	24

Configuring the Address of the Terminal

Overview

Use the Vijeo-Designer Lite software to configure the address of your XBT terminal.

⚠ WARNING

INCOMPATIBLE SOFTWARE

Use only Schneider Electric manufactured or approved software to program hardware.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

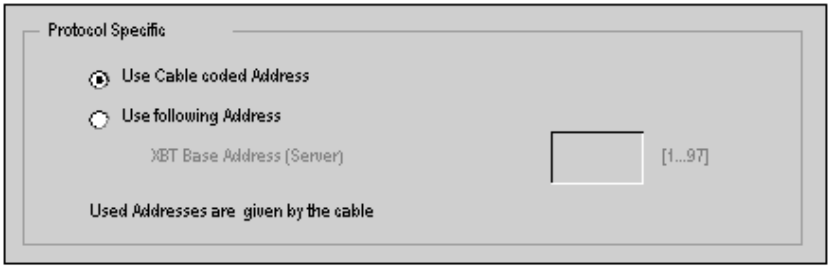
Opening the Protocol Specific Dialog Box

To open the **Protocol Specific** dialog box in Vijeo-Designer Lite for configuring Uni-Telway terminal address, proceed as follows:

Step	Action
1	Start Vijeo-Designer Lite.
2	From the application browser on the left-hand side of the Vijeo-Designer Lite window select the item **Protocol-Unitelway**. **Result**: The **Protocol Specific** dialog box is displayed on the right-hand side of the Vijeo-Designer Lite window.

Configuring the Address

Illustration of the **Protocol Specific** dialog:



Element	Description	
Use Cable coded Address	The terminal uses the default address. In this case the **XBT Base Address (Server)** field is grayed out. Depending on the cable used the address is:	
	RJ45	forced to 4
	SUB-D25	cable coded (the **XBT Base Address (Server)** field is empty)
Use following Address	You can specify in the **XBT Base Address (Server)** field the address of the terminal. The value must be between 1 and 97 and the default value is 4.	
Used Addresses are ...	This text details the current configuration by indicating the server and client addresses used by the terminal.	

Configuring Equipment Addresses

Overview

Use the Vijeo-Designer Lite software to configure addresses for the equipment your XBT terminal should communicate with.

⚠ WARNING

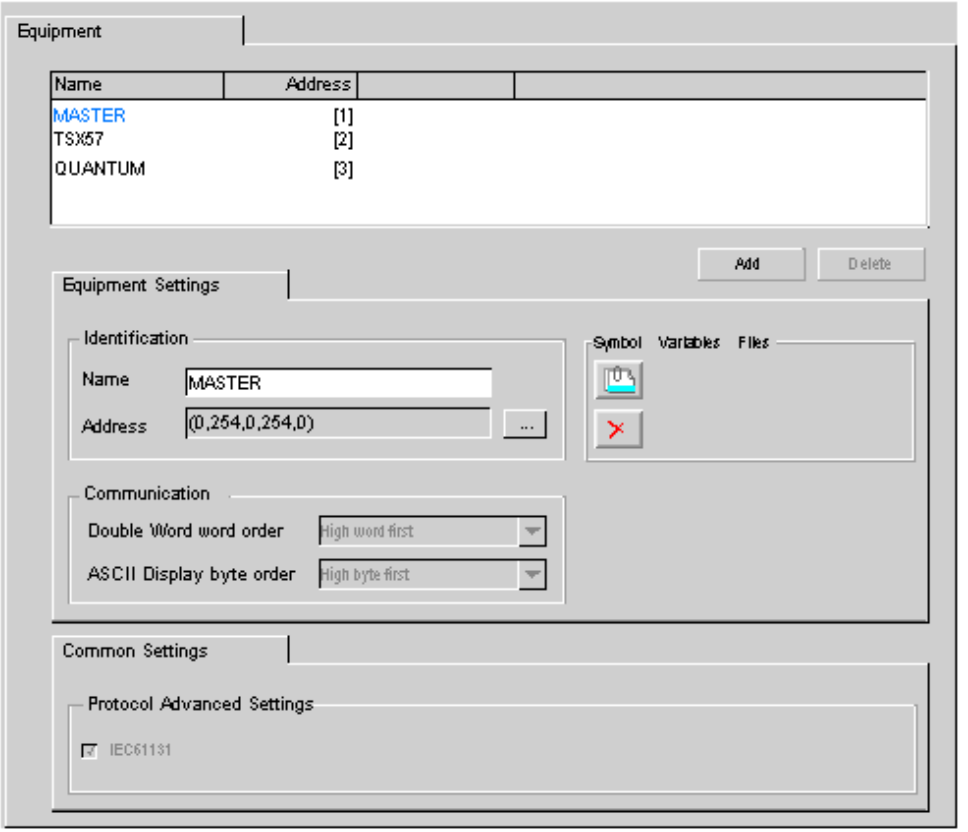
INCOMPATIBLE SOFTWARE

Use only Schneider Electric manufactured or approved software to program hardware.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Opening the Equipment Address Dialog Box

To open the **Equipment Address** dialog box in Vijeo-Designer Lite for configuring Uni-Telway equipment addresses, proceed as follows:

Step	Action
1	Start Vijeo-Designer Lite.
2	From the application browser on the left-hand side of the Vijeo-Designer Lite window select the item **Equipments**. **Result**: The following dialog box will be displayed on the right-hand side of the Vijeo-Designer Lite window. 
3	In the **Equipments** dialog box select a slave device from the list.
4	In the **Equipment Settings** → **Identification** box below click the **...** button right to the **Address** text box. **Result**: The dialog box **Equipment Address** will be displayed where you can configure an address for the selected Uni-Telway equipment.

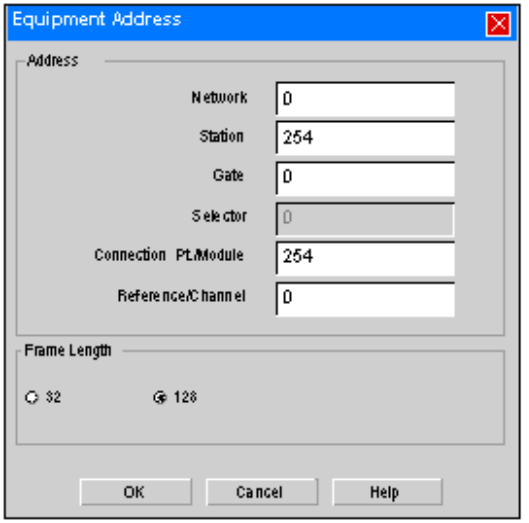
Uni-Telway Equipment Address Dialog Box

Purpose

Use this dialog box to configure the address of equipments connected to the network.

Representation

Uni-Telway equipment address



The following elements configure the X-Way addressing for further details refer to *Presentation of X-Way Addressing, page 16*:

Element	Description
Address	Define your Uni-Telway device with the following parameters.
Network	Enter the network address (between 0 and 255).
Station	Enter the station number (between 0 and 255).
Gate	Enter the gate number (between 0 and 255).
Selector	This parameter is not available.
Connection Pt./Module	Enter the number of the connection point or module (between 0 and 255).
Reference/Channel	Enter a reference number or channel (between 0 and 255).

Element	Description
Frame Length	Choose a frame length to optimize communication. ● Select **32** to support a frame length of 32 bytes for connections to equipment that does not support the maximum frame length (e.g. TSX17 PLCs). ● Select **128** (default) to support the maximum possible frame length that is supported by the PLCs.
OK button	Click the **OK** button to assign the entered address to the selected equipment.
Cancel button	Click the **Cancel** button to discard the changes and to close the dialog box.
Help button	Click the **Help** button to open the Vijeo-Designer Lite online help.

NOTE: For the parameter **Frame Length** select a value that is at least equal to the largest variable length expected. If the value of the parameter **Frame Length** is smaller than the variable length the following conditions will occur:

- PLC read/write operations will fail
- question marks will be displayed on the XBT terminals instead of values

Variable Types Supported

3

Variable Types Supported

Table of Variable Types Supported by the XBT

The following table lists all Uni-Telway variables XBT terminals can access.

Variable Type Supported	Syntax complying with IEC 61131-3 Standard
Word Bit	%MWi:Xj Unity Premium: %MWi.j)
Internal Word	%MWi
Internal Double Word	%MDi
Floating Point	%MFi (IEEE754 standard)

Identifiers

- i : 0...65535
- j : 0...15

Cables and Connectors

4

Overview

This chapter specifies the cables and connectors required for XBT terminals in Uni-Telway applications.

What's in this Chapter?

This chapter contains the following topics:

Topic	Page
Cables	30
SUB-D25 Pin Connections	32
RJ45 Pin Connections	34

Cables

Overview

The following table lists the cables required to connect the different XBT terminals to different Schneider PLCs using RS485 lines in Uni-Telway applications.

In Uni-Telway applications, when power is first applied to the XBT N terminals, the XBT N terminals will issue noise on the bus for approximately 100 ms. This noise will disturb the communication of the equipment connected to the bus. Always apply power to the XBT N terminal first, before applying power to the master of the bus.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

Always apply power to the XBT N terminal first, before applying power to the master of the bus.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Technical Data

Connected Device	XBT Type	Cable Reference	Length	Comments
Programming port TSX Modicon Nano , Modicon TSX Micro , Modicon Premium	XBT N200/N400* XBT R400 XBT RT500/XBT R T511	XBT Z9780* XBT Z9782*	2.5 m (8.2 ft.) 10 m (32.8 ft.)	point-to-point XBT address = 4
	XBT N401/N410 XBT R410/R411	XBT Z968 XBT Z9680 XBT Z9681	2.5 m (8.2 ft.) straight 2.5 m (8.2 ft.) angled 5 m (16.4 ft.)	
SCI plug TSX 7 series 40	XBT N401/N410 XBT R410/R411 XBT RT511	XBT Z948**	2.5 m (8.2 ft.)	point-to-point XBT address = 1 accessory: TSX LES64
Programming port TSX 17	XBT N401/N410 XBT R410/R411 XBT RT511	XBT Z958**/Z 928**	2.5 m (8.2 ft.)	point-to-point XBT address = 0***
TSX SCA62	XBT N401/N410 XBT R410/R411 XBT RT511	XBT Z908**	2.5 m (8.2 ft.)	multipoint XBT address = 1...28****

Connected Device	XBT Type	Cable Reference	Length	Comments
TSX SCM21x6	XBT N401/N410 XBT R410/R411 XBT RT500/XBT R T511	XBT Z918**	2.5 m (8.2 ft.)	point-to-point XBT address = 1
TSX SCG116	XBT N401/N410 XBT R410/R411 XBT RT500/XBT R T511	XBT Z928**	2.5 m (8.2 ft.)	point-to-point XBT address = 1

* Depending on your hardware (for XBT N200/N400 display units), you may need to use a different cable if you have intermittent connections (see *XBT Detected Error Indication, page 39*).

**
- **XBT RT 511**: you must add a XBT ZG939 cable adapter (SUB-D25 <-> RJ45) (+ XBT ZRTPW for XBT RT500.)
- **XBT RT 500**: you must add a XBT ZG939 cable adapter (SUB-D25 <-> RJ45) and a XBT ZRTPW for power supply.

*** In this case, the XBT is the master! In all other applications, it is a slave.
**** 1...28 devices

Special Case for the TSX 17

If the XBT is the master, the following rules have to be applied.

Change the address of the master device in the Vijeo-Designer Lite programming software.

Step	Action
1	In the application browser of Vijeo-Designer Lite select **Configuration** → **Equipments**.
2	Use **Modify...** or add a new device.
3	In the **Equipment Address** dialog box set the parameter **Reference/Channel** to the value `101` (see *Uni-Telway Equipment Address Dialog Box, page 24*).
4	Set the parameter **Frame Length** to the value `32`.

Configure the TSX 17 programming port in the PL7-2 17 programming software.

Step	Action
1	In PL7-2 17 select the **Configuration** menu, then **Application** and **Terminal**.
2	For the parameter **UTW Address** enter the value `1`.

NOTE: For more detailed instructions, please refer to the *PL7-2 Operating Mode* documentation.

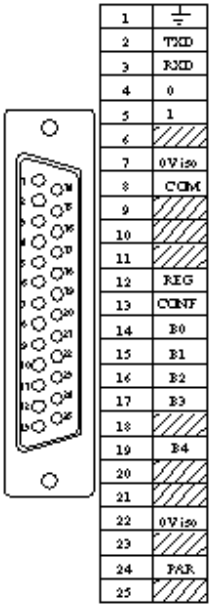
SUB-D25 Pin Connections

Overview

The following XBT terminals provide a SUB-D25 connector on their rear panels:

- XBT N401
- XBT N410
- XBT R410
- XBT R411

The SUB-D25 connector supports RS232 as well as RS485 lines. The pin assignment is shown in the following figure.

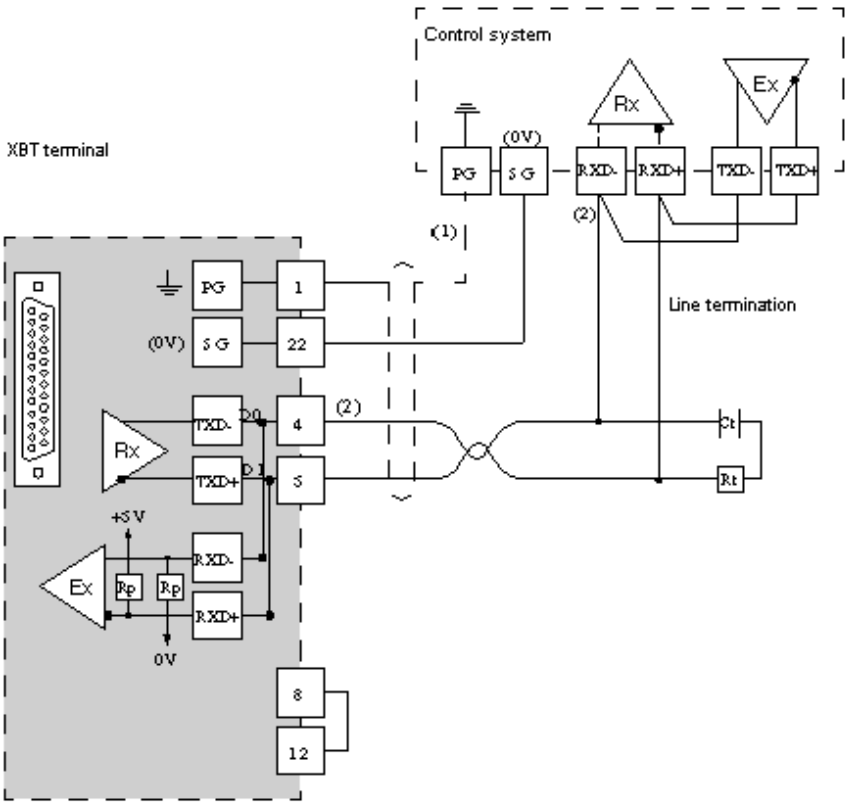


1	⏚
2	TXD
3	RXD
4	0
5	1
6	
7	0Viso
8	COM
9	
10	
11	
12	REG
13	CONF
14	B0
15	B1
16	B2
17	B3
18	
19	B4
20	
21	
22	0Viso
23	
24	PAR
25	

Technical Data

The illustration below shows the cabling for RS485 equipment.

RS485 link example



Legend

(1)	Connection of the shielding at both ends depends on any electrical restrictions affecting the installation.
(2)	Rt: Line impedance resistor (typically 110 Ω). It is recommended to install the line impedance resistor with a RC circuit (R = 120 Ω/0.25 W and C = 1 nF/10 V min). Make sure that only one line impedance resistor is installed.

NOTE: RP resistors are integrated into the XBT and feature:

- 4.7 kΩ for XBT N
- 100 kΩ for XBT R

RJ45 Pin Connections

Overview

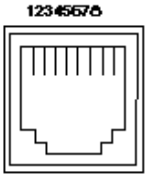
The following XBT terminals provide RJ45 connectors on their rear panels:

- XBT N200
- XBT N400
- XBT R400
- XBT RT500
- XBT RT511

These XBT terminals are equipped with different RJ45 connectors. Their individual pin assignments are listed in the following tables.

XBT N200/XBT N400/XBT R400

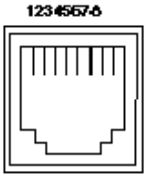
Pin assignment of the RJ45 connector on XBT N/R terminals

Representation	Pin	Signal	Comments
RJ45 	1	CONF	Reserved
	2	TxD	TXD RS232 signal
	3	RXD	RXD RS232 signal
	4	D1	RS485 + signal
	5	D0	RS485 - signal
	6	REG	Reserved
	7	+5 V	Power supply: +5 V, I = 200 mA
	8	GND	Common non isolated

NOTE: Some XBT N200 or XBT N400 hardware types require different cables. If you have intermittent connections with these terminals, refer to *Diagnostics, page 39*.

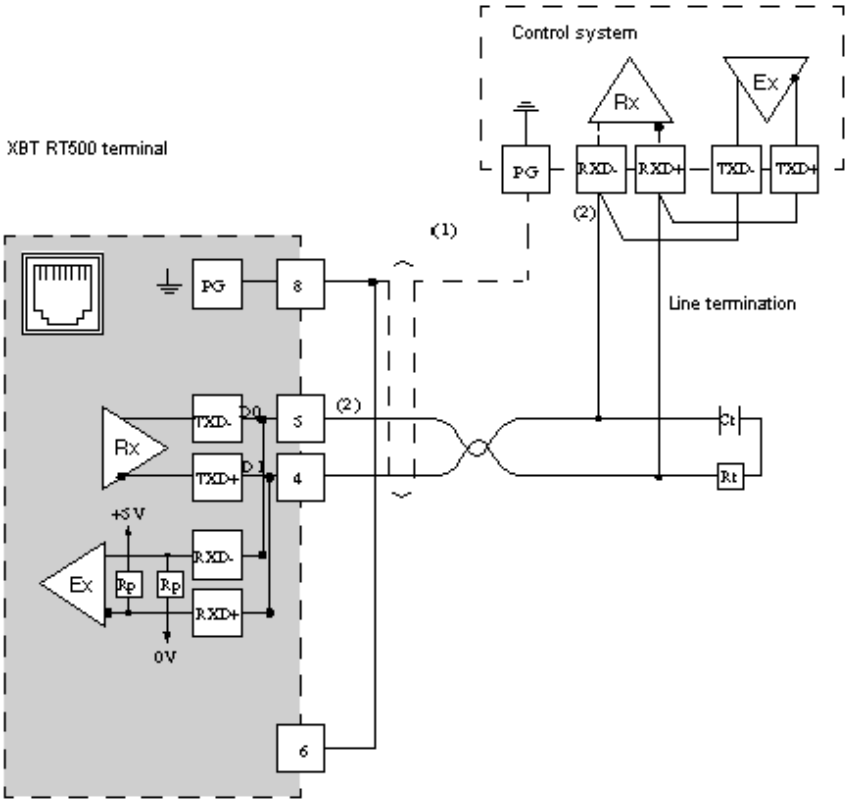
XBT RT500

Pin assignment of the RJ45 connector on XBT RT500 terminals

Representation	Pin	Signal	Comments
RJ45 	1	RXD	RXD RS232 signal
	2	TxD	TXD RS232 signal
	3	IN1	Input configuration signal
	4	D1	RS485 + signal
	5	D0	RS485 - signal
	6	IN2	Input operating signal
	7	+5 V	Power supply: +5 V, I = 200 mA
	8	GND	Common non isolated

The illustration below shows the cabling for RS485 equipment.

RS485 link example

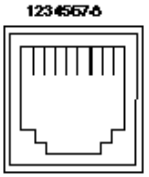


Legend

(1)	Connection of the shielding at both ends depends on any electrical restrictions affecting the installation.
(2)	If your control systems provides connectors for 4-wire connections, wire the RXD and TXD pins as shown in the above figure to form a 2-wire connection.
(3)	Rp: Polarization resistors: 4.7 kΩ

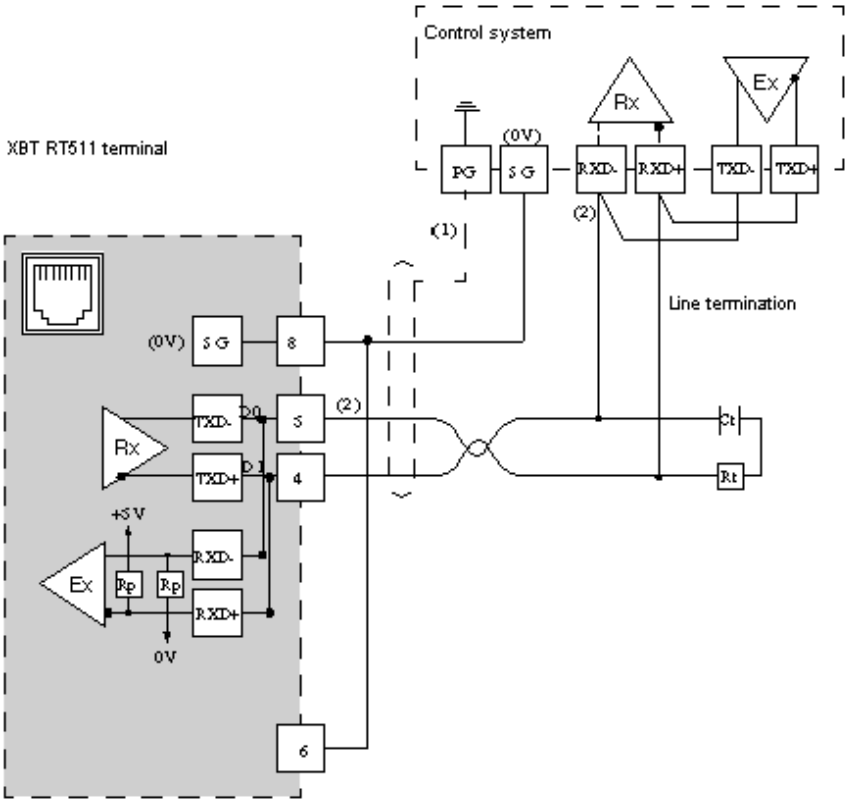
XBT RT511

Pin assignment of the RJ45 connector on XBT RT511 terminals

Representation	Pin	Signal	Comments
RJ45 	1	RXD	RXD RS232 signal
	2	TxD	TXD RS232 signal
	3	IN1	Input configuration signal
	4	D1	RS485 + signal
	5	D0	RS485 - signal
	6	IN2	Input operating signal
	7	-	-
	8	0 V ISO	0 V isolated

The illustration below shows the cabling for RS485 equipment.

RS485 link example



Legend

(1)	Connection of the shielding at both ends depends on any electrical restrictions affecting the installation.
(2)	If your control systems provides connectors for 4-wire connections, wire the RXD and TXD pins as shown in the above figure to form a 2-wire connection.
(3)	Rp: Polarization resistors: 4.7 kΩ

Diagnostics

5

XBT Detected Error Indication

Overview

XBT terminals indicate detected errors in different ways

- by displaying question marks ?????? in alphanumerical fields
- by displaying crosses for graphic objects
- by displaying hash characters in alphanumerical fields
- by blinking alphanumerical fields
- by issuing system error messages
- Persistent display of the connection popup:
  For XBT N200/N400 display units, persistent display of the popup indicating that the connection is in progress may be due to loss of communication.

The cable connecting the display unit to the PLC may be the reason for this.

If the Cable Used is an...	Then...
XBT Z978,	use an XBT-Z9780 cable.
XBT Z9780,	add an XBT ZN999 adaptor.

If the condition persists, update the Vijeo-Designer Lite with the most recent version available.

The following paragraphs list these detected errors and their possible reasons.

Question Marks and Crosses

When question marks ?????? and crosses XXXXXX are displayed on the display of your XBT terminal, a transmission error has occurred. To correct this, check the following:

If...	Then ...
question marks are displayed	verify that all cables are correctly connected.
question marks are displayed	the XBT terminal may have received no response from the PLC.

If...	Then ...
question marks are displayed	the XBT terminal may have received an exception response from the PLC.
question marks are displayed	check the value of the parameter **Frame Length** in the **Equipment Address** dialog box (for more information refer to *Uni-Telway Equipment Address Dialog Box, page 24*).

Hash Characters

Hash characters displayed in alphanumerical fields on your XBT terminal indicate that the value to be displayed is too long for this alphanumerical field and cannot completely be displayed. The value `100` can, for example, not be displayed in a 2-digit alphanumerical field. To correct this, enter a shorter value or adapt the size of the alphanumerical field so that it can display any of the possible values of the PLC variable.

Blinking Alphanumerical Fields

Blinking alphanumerical fields on your XBT terminal indicate that the value of this field has exceeded or fallen below a user-defined threshold.

System Error Messages

A variety of system error messages is by default configured for the terminals. All these standard system messages are assigned a panel number 200+x. A distinction is made between system error messages indicating communication interruptions and status messages provoked by inputs at the terminal.

These 2 message types differ by the numbers they are assigned and by the way they are displayed at the terminal as shown in the list below:

System Error Message Caused by:	System Error Message Numbers	Display Mode
Communication Interruptions	201– 204	To indicate that a communication interruption has occurred, the message is displayed in a popup dialog box every 10 seconds.
Input at Terminal	241 – 258	The status message is displayed as a response to user input at the terminal.

Messages Caused by Communication Interruptions

Messages 201 to 204 are issued by the terminal to indicate that a communication interruption has occurred. They are displayed in a popup dialog every 10 seconds.

If...	Then ...
message `201: DIALOG TABLE AUTHORIZATION INCORRECT` is displayed	the authorization word in the dialog table does not have the expected value. (Refer to the Vijeo-Designer Lite online help for information on how this word is working.) To correct this, verify that:. ● you are connected to the right PLC ● the memory of your PLC is not corrupted ● the correct value is saved on the PLC
message `202: DIALOG TABLE WRITING IMPOSSIBLE` is displayed	the write cycle of the PLC could not be ended. This condition may have the following causes: ● too much load on the communication bus ● EMC disturbances on the communication bus Check the value of the parameter **Frame Length**. For more information refer to *Uni-Telway Equipment Address Dialog Box, page 24*). Use the value (**128**, except for connection with very specific PLCs like TSX17).
message `203: DIALOG TABLE READING IMPOSSIBLE` is displayed	the read cycle of the PLC could not be ended. The values requested from the PLC cannot be retrieved from its dialog table. This condition may have the following causes: ● too much load on the communication bus ● EMC disturbances on the communication bus Check the value of the parameter **Frame Length**. For more information refer to *Uni-Telway Equipment Address Dialog Box, page 24*). Use the value (**128**, except for connection with very specific PLCs like TSX17).

Messages Caused by Input at the Terminal

Messages 242 to 254 are issued by the XBT as a response to user input at the terminal. These messages are displayed directly after the operator has sent an incorrect command to the terminal and will persist until the user has corrected the entered command or value. Messages 255 to 258 are status messages displayed after the user has initiated an operation at the terminal to indicate that it has (or has not) been accepted and is in progress.

If...	Then ...
message `241: IMPOSSIBLE TO READ VARIABLE` is displayed	the terminal has attempted to read a variable and could not retrieve its value. This condition may have the following causes: • too much load on the communication bus • EMC disturbances on the communication bus
message `242: IMPOSSIBLE TO WRITE VARIABLE` is displayed	the terminal has attempted to write in a memory area of the equipment and has received a negative acknowledgement or no acknowledgement at all. This condition may have the following causes: • too much load on the communication bus • EMC disturbances on the communication bus
messages `243` to `249` are displayed	correct the value or command you have entered as indicated by the message.
error message `250: LANGUAGE IMPOSED BY PLC` is displayed	the PLC forces the terminal to use a language. This language cannot be changed by the operator. For more information see the Vijeo-Designer Lite online help, functions of the dialog table.
messages `251` or `252` are displayed	correct the value or command you have entered as indicated by the error message.
message `253: PASSWORD IMPOSED BY PLC` is displayed	you cannot change the password at the terminal because it is forced by the PLC. For more information see the Vijeo-Designer Lite online help, functions of the dialog table.
message `254: PROTECTED ACCESS PAGE` is displayed	you are trying to access a page that is password protected but you do not have the required authorization level.
messages `255` to `258` are displayed	the commands you entered at the terminal are executed or not executed, as indicated in these status messages.

Diagnosis Counters

4 diagnosis counters can be displayed on the protocol's system page (line parameters):

Counter	Meaning	Explanation
1	number of emitted messages that were not acknowledged (no response at all or undefined response)	Possible reasons: • The PLC may have not received the request (due to cabling problems). • The PLC may not be able to process the request (due to incoherent communication parameters between XBT terminal and PLC).
2	number of emitted messages that were refused	The PLC has received the request but is too busy to answer it (due to cabling problems). Possible reason: • too much equipment connected • too many requests from the XBT terminal (optimize the pages so that the variables are contiguous or reduce the size and the speed of the dialog table by reducing the number of requests
3	number of received messages that were not acknowledged (no response at all)	This counter will remain at 0 in normal operation. It will only be increased if the XBT terminal receives wrong requests on its server channel (due to incoherent communication parameters between XBT terminal and PLC).
4	number of received messages that were refused (no response at all)	This counter will remain at 0 in normal operation. It will only be increased if the XBT terminal receives too much diagnose requests.

Appendices



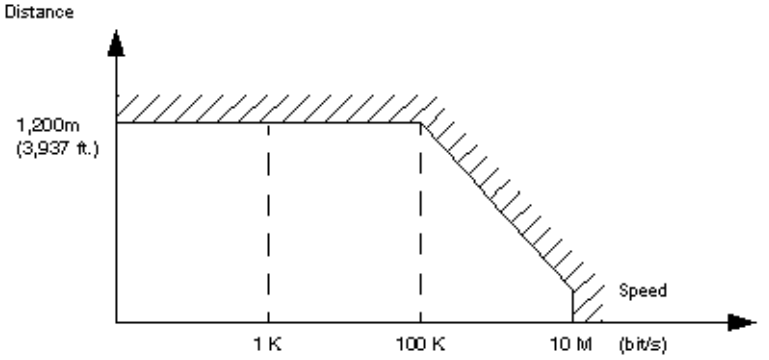
RS485 Recommendations

A

RS485 Recommendations

Diagrams for RS485 Link

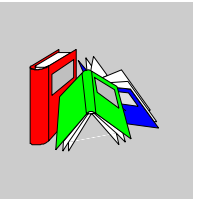
RS485 link



- Maximum length for the link is 1,200 m (3,937 ft.).
- Wiring = 2 shielded twisted wires with a minimum cross-section of 0.6 mm^2 (AWG22) and one 0 V wire

NOTE: The maximum length including the RS485 link is 1,200 m (3,937 ft.), provided that the equipment connected to the XBT terminal is not subject to more stringent restrictions (refer to connected devices instruction sheet) and for XBT N200, XBT N400, XBT R400 and XBT RT500 provided that the length of the cable is below 10 m (32.8 ft.) (because power is also supplied by this cable).

Glossary



A

AWG

American wire gauge (wire diameter)

M

Magelis

Generic commercial name of the range of Schneider HMI terminals.

P

PLC

programmable logic controller

R

RS485

recommended standard for connecting serial devices = EIA/TIA 485

V

Vijeo-Designer Lite

Configuration software for the low end Magelis range. It replaces the XBT-L1000 software.

X

XBT

Any HMI terminal (when it is not necessary to make a distinction).

Index



A

address
configuring equipment address, *22*
configuring XBT address, *20*

C

cables
Uni-Telway protocol, *30*

D

data types
Uni-Telway protocol, *27*
diagnostics
Uni-Telway protocol, *39*

E

equipment address, *22*

O

objects
Uni-Telway protocol, *27*
operating principles
Uni-Telway protocol, *18*

P

pin connections
RJ45, *34*
SUB-D25, *32*

R

RJ45
pin connections, *34*
RS485
recommendations, *47*

S

SUB-D25
pin connections, *32*

U

Uni-Telway protocol
cables, *30*
data types, *27*
diagnostics, *39*
operating principles, *18*

V

variable types
Uni-Telway protocol, *27*

X

X-WAY addressing
Architecture Level, *16*
Station Level, *17*
XBT address, *20*