Teleservice via RS232 interface
XC100/XC200

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Powering Business Worldwide

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Original Operating Instructions
The German-language edition of this document is the original operating manual.

Translation of the original operating manual
All editions of this document other than those in German language are translations of the original German manual.

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Danger!
Dangerous electrical voltage!

Before commencing the installation

- Disconnect the power supply of the device.

- Ensure that devices cannot be accidentally restarted.

- Verify isolation from the supply.

- Earth and short circuit.

- Cover or enclose neighbouring units that are live.

- Follow the engineering instructions (AWA) of the device concerned.

- Only suitably qualified personnel in accordance with EN 50110-1/-2 (VDE 0105 Part 100) may work on this device/system.

- Before installation and before touching the device ensure that you are free of electrostatic charge.

- The functional earth (FE) must be connected to the protective earth (PE) or to the potential equalisation. The system installer is responsible for implementing this connection.

- Connecting cables and signal lines should be installed so that inductive or capacitive interference does not impair the automation functions.

- Install automation devices and related operating elements in such a way that they are well protected against unintentional operation.

- Suitable safety hardware and software measures should be implemented for the I/O interface so that a line or wire breakage on the signal side does not result in undefined states in the automation devices.

- Ensure a reliable electrical isolation of the low voltage for the 24 volt supply. Only use power supply units complying with IEC 60364-4-41 (VDE 0100 Part 410) or HD 384.4.41 S2.

- Deviations of the mains voltage from the rated value must not exceed the tolerance limits given in the specifications, otherwise this may cause malfunction and dangerous operation.

- Emergency stop devices complying with IEC/EN 60204-1 must be effective in all operating modes of the automation devices. Unlatching the emergency-stop devices must not cause restart.

- Devices that are designed for mounting in housings or control cabinets must only be operated and controlled after they have been installed with the housing closed. Desktop or portable units must only be operated and controlled in enclosed housings.

- Measures should be taken to ensure the proper restart of programs interrupted after a voltage dip or failure. This should not cause dangerous operating states even for a short time. If necessary, emergency-stop devices should be implemented.

- Wherever faults in the automation system may cause damage to persons or property, external measures must be implemented to ensure a safe operating state in the event of a fault or malfunction (for example, by means of separate limit switches, mechanical interlocks etc.).

Contents

About this manual

List of revisions

The following are the main changes and amendments which have been made since the last edition of this manual:

Edition date	Page	Description	Change
07/04	8	„Handshake lines"	✓
	10	„Modem settings"	✓
	15	„Programming"	✓
10/10	all	Change to Eaton notation	✓

Structure

This manual describes the steps necessary for remote programming of XC100/XC200. It describes the installation, device configuration and parameter allocation of communication components.

This manual does not replace the modem manufacturer's operator manual. It is essential that you note and adhere to the modem documentation.

This manual refers to the use of Type TD32B DC analog modem from Messrs. Westermo. This modem is suitable for leased-line and dial-up line connection.

Abbreviations and symbols

Symbols used in this manual have the following meanings:

Modem	A modem is used for conversion of signals from a data terminal into electrical signals and vice versa

▶ Indicates actions to be taken.

Select ‹File → New› means: activate the instruction "New" in the "File" menu.

> ▽ **Note!**
> Warns of a hazardous situation that could result in damage to the product or components.

> ⚠ **Caution!**
> Warns of the possibility of a hazardous situation that could result in major damage and minor injury.

> ⚡ **Warning!**
> Warns of the possibility of a hazardous situation that could result in major damage and serious or fatal injury/death.

For clarity of layout, we adhere to the following conventions in this manual: at the top of left-hand pages you will find the Chapter heading, at the top of right-hand pages the current Section heading; exceptions are the first pages of Chapters and empty pages at the end of Chapters.

Further documentation

- XSoft, Programming software (h1437g.pdf)
- XI/OC signal modules, Hardware and engineering (MN05002002Z-EN; previously AWB2725-1452GB)
- XC-CPU101-..., Hardware, Engineering and Functional Description (MN05003004Z-EN; previously AWB2724-1453GB)
- XC-CPU201-..., Hardware, Engineering and Functional Description (MN05003001Z-EN; previously AWB2724-1491GB)
- Function blocks for XSoft (MN05010002Z-EN; previously AWB2786-1456GB)
- Installation manual TD-32/485; TD32 (Messrs. Westermo) 6178-2303.

These manuals are available as online PDF files, with the exception of the installation instruction from Messrs. Westermo which is supplied on a CD.

The most current and up-to-date edition of the manual can also be found under: http://www.eaton.com/moeller ⟶ **Support**

Search term: e.g. "MN05002002Z"

1 General

Range of applications

The telecontrol service for XC100/XC200 is intended for use wherever PC and XC100/XC200 controller are at different locations, and the connection therefore has to be established via analog modem and leased or dial-up line.

The telecontrol service enables user program download, ONLINE modification and status indication in the RUN mode.

Hardware/Software requirements

- Hardware
  – Programming PC
  – XC-CPU101/201-…-8DI-6DO (-XV)
  – Analog modem: TD32B
  – Analog leased line or dial-up line.

- Software
  – XSoft programming software.

2 XC100/X200 – PC Connection

Physical structure of the connection (overview)

The following diagram shows how the XC100/XC200 is connected with the PC. No target telephone number needs to be entered for leased-line connection. For dial-up line connection it is necessary to enter the target telephone number in the communication parameters.
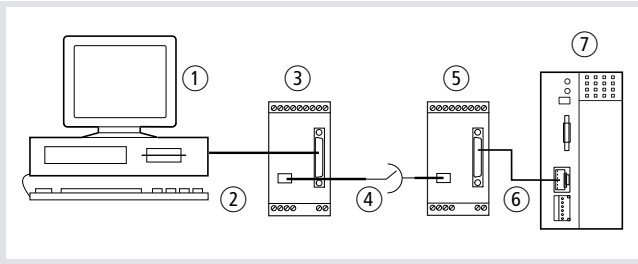

Figure 1:   Connection structure for leased line and dial-up line

① PC with XSoft programming system; connect the RS232 connection cable at the COM1 or COM2 interface.

② Connection via RS232 C; see figure 2 for the cable layout

③ Telephone modem: TD32B, from Messrs. Westermo; e.g. Tel.-No.: 1471

④ Analog telecontrol connection via leased line or dial-up line.

⑤ Telephone modem: TD32B, from Messrs. Westermo; e.g. Tel.-No.: 1875

⑥ Connection via RS232 C; see figure 3 for cable layout

⑦ XC100/XC200 automation system

Connection PC – modem or modem – XC100/XC200

Data transfer is asynchronous, handshake signals are not used. For RS232 communication you can use either the 9-pole terminal block at the top edge of the modem or the 25-pole SUB-D plug on the front of the modem.

In order to exclude as much interference as possible, we recommend that you do not use ribbon cable. Screened cables achieve satisfactory results in extremely noisy environments.

Connection PC – TD32B modem

Cable layout

Fig. 2 shows the necessary connection between the COM1 (2) interface on the PC and the RS232 interface on the modem. Since handshake signals are not being used, a link is required between terminals 2 and 6 on the terminal block at the top of the modem.
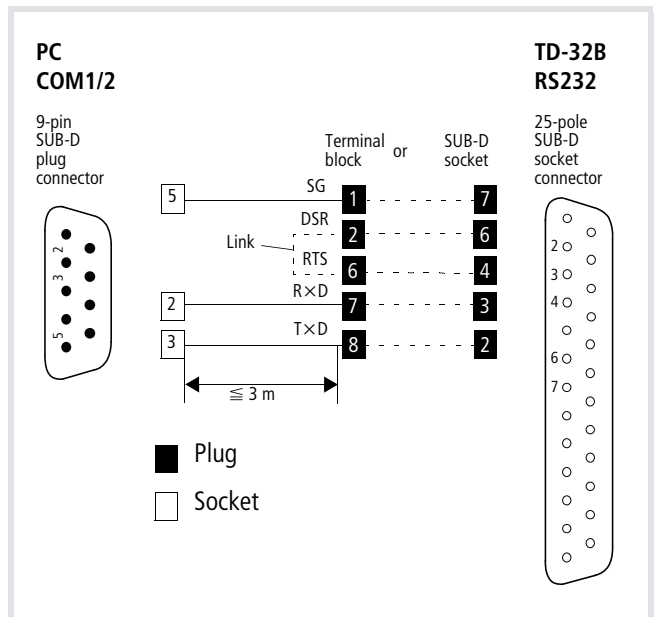

Figure 2:   Physical link between PC and modem

Modem TD32B – XC100/XC200 connection

Cable layout

figure 3 shows the necessary connection between the RS232 interface on the XC100/XC200 and the RS232 interface on the modem. This connection also does not use handshake signals.
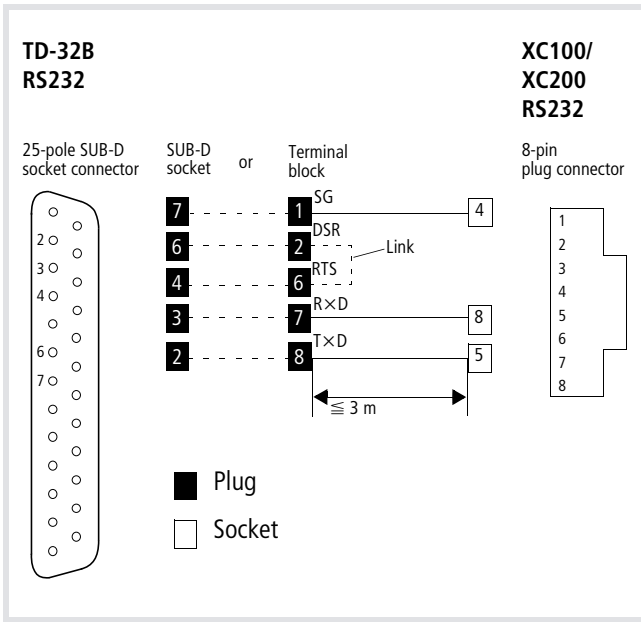

Figure 3:   Physical link between modem and XC100/XC200

Connection modem – modem

Telecontrol cable connection

The connection between the two modems is made via the public and/or private telephone network. The TD32B modem is suitable for use for a leased-line as well as for a dial-up line connection. Connect the telecontrol cable to the 6-pin RJ-12 plug on the front of the device or to the terminal block on the left at the bottom of the modem, to the terminals marked TXD and RXD.

Handshake lines

Since handshake connections are not available on XC100/XC200, please note the following:

The TD32B modem is set to hardware handshake with RTS – CTS ex-works. As a handshake signal is not available with the XC100/XC200, the signal will need to be simulated. The following possibilities can be applied:

- Physically connect a send and receive modem to the terminals 6 (RTS) and 2 (DSR) (insert wire jumper).
- Deactivate the handshake with the AT&K0 command.
- Set DIP switch SW3-2 with the send and receive modem to ON.

The settings have the effect that the RTS input signal is evaluated as a "High" signal. It is thus possible to set up a data transfer circuit with the sole connection of TX, RX and GND.
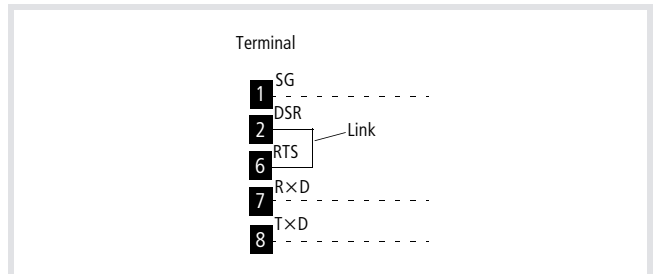

Figure 4:   Link DSR – RTS

Connection via 2-/4-wire leased line

The following diagrams show the telecontrol connection via the terminal block on the left at the bottom of the modem or at the RJ-12 connector.

If the telecontrol connection is made at the terminal block, then a bridging plug must be inserted into the RJ-12 connection socket. The necessary connection to the terminals is only achieved with the bridging plug inserted.

Connection via 2-wire leased line
Connect the 2-wire connection to the "TX" terminals on the lower left side of the terminal block.
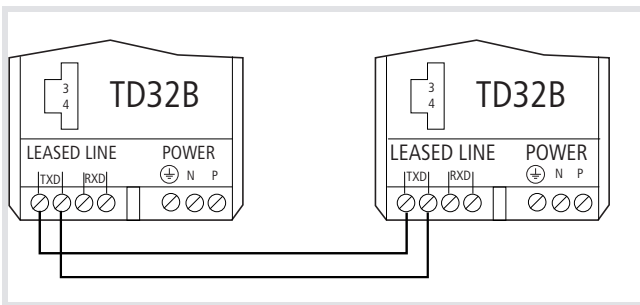
Figure 5: Modem connection via 2-wire leased line

Connection via 4-wire leased line
4-wire connections are also connected to the lower left of the terminal block. Connect the send cables to the "TX" terminals and the receive cables to the "RX" terminals.
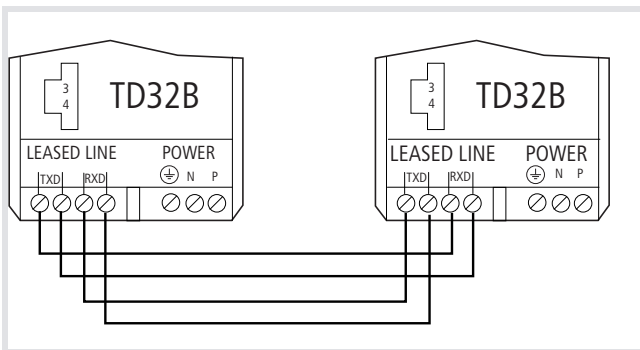
Figure 6: Modem connection via 4-wire leased line

Connection via dial-up line

The following diagram shows the telecontrol connection via the terminal block on the left at the bottom of the modem or at the RJ-12 connector.

If the telecontrol connection is made at the terminal block, then a bridging plug must be inserted into the RJ-12 connection socket. The necessary connection to the terminals is only achieved with the bridging plug inserted.

2-wire connections must be connected to pins 3 and 4 in the RJ-12 plug or to the "TX" terminals on the terminal block on the left at the bottom.

Figure 7: Modem connection via 2-wire leased line

① Telephone exchange
② 2-wire dial-up line

Modem settings

The modem settings for leased line or dial-up line connections are made using the DIP switches.

▽ **Note!**
Switch Off the power supply before adjusting the DIP switches and make sure that you adhere to the protective measures against electrostatic charging!

The DIP switches can be found under the cover at the top of the modem. The default switch setting is "OFF".

Please follow the instructions in the modem manufacturer's operator manual.

Dial-up line

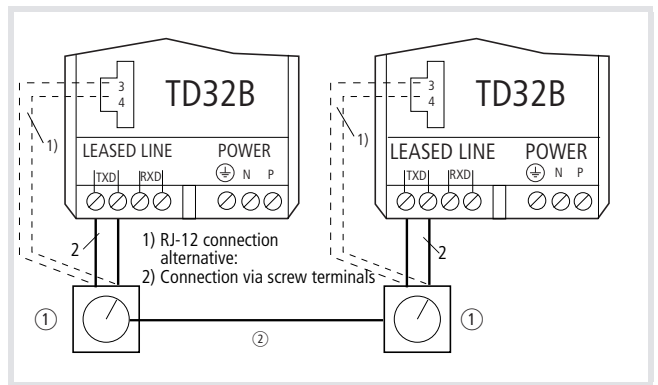Table 1: DIP switch SW 1: Settings for dial-up line

DIP switch SW 1	Modem settings PC end								Description	Modem settings XC100/200 end							
PC end	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
	0	0	×	×	–	–	–	–	Standard dial-up line	0	0	×	×	–	–	–	–
	0	I	×	×	–	–	–	–	Leased lines, answer function	0	I	×	×	–	–	–	–
	I	I	×	×	–	–	–	–	Leased lines, dial function	I	I	×	×	–	–	–	–
XC100/XC200 end	×	×	I	×	–	–	–	–	Negotiation of the connection is not interrupted by incoming signals	×	×	I	×	–	–	–	–
	×	×	×	I	–	–	–	–	Escape sequence disabled (commands are ignored during a connection	×	×	×	I	–	–	–	–
	0	0	I	0	–	–	–	–	Current settings 0 = OFF ; I = ON ; × = not used	0	0	0	I	–	–	–	–

Table 2: DIP switch SW 2: Settings for dial-up line
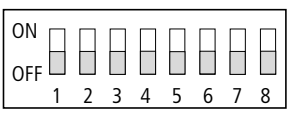
DIP switch SW 2	Modem settings PC end								Description	Modem settings XC100/200 end							
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
	0	×	×	×	×	×	×	×	Switches SW2-2 to SW2-8 are **not** used	0	×	×	×	×	×	×	×
	I	×	×	×	×	×	×	×	Switches SW2-2 to SW2-8 are used	I	×	×	×	×	×	×	×
	I	0	0	×	×	×	×	×	Asynchronous connection	I	0	0	×	×	×	×	×
	I	I	0	×	×	×	×	×	Synchronous, external timing via pin 24 of the SUB-D	I	I	0	×	×	×	×	×
	I	0	I	×	×	×	×	×	Synchronous, internal timing; the modem generates the clocking signal	I	0	I	×	×	×	×	×
	I	I	I	×	×	×	×	×	Synchronous slave; timing from line	I	I	I	×	×	×	×	×
	I	×	×	I	×	×	×	×	DTR/DSR disabled	I	×	×	I	×	×	×	×
	0	0	0	0	0	0	0	0	Current settings 0 = OFF ; I = ON ; × = not used	0	0	0	0	0	0	0	0

Table 3: DIP switch SW 3: Settings for dial-up line

DIP switch SW 3	Modem settings PC end								Description	Modem settings XC100/200 end							
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
	0	×	×	×	×	×	×	×	4-wire connection	0	×	×	×	×	×	×	×
	I	×	×	×	×	×	×	×	2-wire connection	I	×	×	×	×	×	×	×
	×	I	×	×	×	×	×	×	Handshake OFF	×	I	×	×	×	×	×	×
	×	×	I	×	×	×	×	×	REL mode disabled	×	×	I	×	×	×	×	×
	×	×	×	I	×	×	×	×	Loudspeaker always OFF	×	×	×	I	×	×	×	×
	×	×	×	×	×	I	×	×	PLC settings	×	×	×	×	×	I	×	×
	×	×	×	×	×	×	I	×	DCD follows the carrier on the line	×	×	×	×	×	×	I	×
	×	×	×	×	×	×	×	I	Line monitoring and reset OFF	×	×	×	×	×	×	×	I
	I	I	0	0	0	I	I	I	**Current settings** 0 = OFF ; I = ON ; × = not used	I	I	0	0	0	I	I	I

Table 4: DIP switch SW 4: Settings for dial-up line
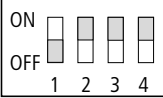
DIP switch SW 4	Modem settings PC end								Description	Modem settings XC100/200 end							
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
	0	0	0	0	×	×	×	×	Automatic speed and format setting	0	0	0	0	×	×	×	×
	I	0	0	0	×	×	×	×	300 Bit/s	I	0	0	0	×	×	×	×
	0	I	0	0	×	×	×	×	600 Bit/s	0	I	0	0	×	×	×	×
	I	I	0	0	×	×	×	×	1 200 Bit/s	I	I	0	0	×	×	×	×
	0	0	I	0	×	×	×	×	2 400 Bit/s	0	0	I	0	×	×	×	×
	I	0	I	0	×	×	×	×	4 800 Bit/s	I	0	I	0	×	×	×	×
	0	I	I	0	×	×	×	×	9 600 Bit/s	0	I	I	0	×	×	×	×
	I	I	I	0	×	×	×	×	19 200 Bit/s	I	I	I	0	×	×	×	×
	0	0	0	I	×	×	×	×	38 400 Bit/s	0	0	0	I	×	×	×	×
	I	0	0	I	×	×	×	×	56 600 Bit/s	I	0	0	I	×	×	×	×
	×	×	×	×	0	0	0	×	7 Bits no Parity [7N]	×	×	×	×	0	0	0	×
	×	×	×	×	I	0	0	×	7 Bits even Parity [7E]	×	×	×	×	I	0	0	×
	×	×	×	×	0	I	0	×	7 Bits odd Parity [7O]	×	×	×	×	0	I	0	×
	×	×	×	×	I	I	0	×	8 Bits no Parity [8N]	×	×	×	×	I	I	0	×
	×	×	×	×	0	0	I	×	8 Bits even Parity [8E]	×	×	×	×	0	0	I	×
	×	×	×	×	I	0	I	×	8 Bits odd Parity [8O]	×	×	×	×	I	0	I	×
	×	×	×	×	0	I	I	×	Direct mode; [8E] or [8O] [8O] in command mode	×	×	×	×	0	I	I	×
	×	×	×	×	I	I	I	×	Direct mode; [7E] or [7O] [8O] in command mode	×	×	×	×	I	I	I	×
	×	×	×	×	×	×	×	I	2 stop Bits	×	×	×	×	×	×	×	I
	0	0	0	I	I	I	0	0	**Current settings** 0 = OFF ; I = ON ; × = not used	0	0	0	I	I	I	0	0

Table 5: DIP switch SW 5: Settings for dial-up line

DIP switch SW 5	Modem settings PC end								Description	Modem settings XC100/200 end							
	1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8
 ON OFF 1 2 3 4 5 6 7 8	0	0	0	0	×	×	×	×	Use saved parameters	0	0	0	0	×	×	×	×
	I	0	0	0	×	×	×	×	V.21, 300 Bit/s	I	0	0	0	×	×	×	×
	0	0	I	0	×	×	×	×	V.22, 1 200 Bit/s	0	0	I	0	×	×	×	×
	I	0	I	0	×	×	×	×	V.22, up to 2 400 Bit/s	I	0	I	0	×	×	×	×
	0	I	I	0	×	×	×	×	V.32, up to 4 800 Bit/s	0	I	I	0	×	×	×	×
	I	I	I	0	×	×	×	×	V.32, up to 7 200 Bit/s	I	I	I	0	×	×	×	×
	0	0	0	I	×	×	×	×	V.32, up to 9 600 Bit/s	0	0	0	I	×	×	×	×
	I	0	0	I	×	×	×	×	V.32, up to 12 000 Bit/s	I	0	0	I	×	×	×	×
	0	I	0	I	×	×	×	×	V.32, up to 14 400 Bit/s	0	I	0	I	×	×	×	×
	I	I	I	I	×	×	×	×	Auto detect mode	I	I	I	I	×	×	×	×
	I	I	I	I	0	0	0	0	Current settings 0 = OFF ; I = ON ; × = not used	I	I	I	I	0	0	0	0

Leased line

Table 6: DIP switch SW 1: Settings for dial-up line

	Modem settings PC end								Description	Modem settings XC100/200 end							
	1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8
PC end ON OFF 1 2 3 4	0	0	×	×	–	–	–	–	Standard dial-up line	0	0	×	×	–	–	–	–
	0	I	×	×	–	–	–	–	Leased lines, answer function	0	I	×	×	–	–	–	–
	I	I	×	×	–	–	–	–	Leased lines, dial function	I	I	×	×	–	–	–	–
XC100/XC200 end ON OFF 1 2 3 4	×	×	I	×	–	–	–	–	Negotiation of the connection is not interrupted by incoming signals	×	×	I	×	–	–	–	–
	×	×	×	I	–	–	–	–	Escape sequence disabled (commands are ignored during a connection	×	×	×	I	–	–	–	–
	I	I	I	I	–	–	–	–	Current settings 0 = OFF ; I = ON ; × = not used	0	I	I	I	–	–	–	–

LED status indication

PWR	Full intensity	The modem is in normal operation
	Half intensity	The modem is in test mode
	Flashing, with click in the loudspeaker	Voltage supply problems
	Flashing with 1 : 6 (ON : OFF)	RAM defective
	ON/OFF, with click in the loudspeaker	Modem unable to start
LINE	LED is On when the modem has a line	
ANS	LED flashes when an incoming call is recognised. ANS is On continuously while an incoming call is being answered and subsequently dims once the call has been answered.	
REL	The LED flashes when the modem is in fault correction mode or in compressed mode. It is On continuously when the modem is only in the fault correction mode. During direct or normal operation, the LED is Off.	
TD	Transmitted data. Indicates that data are being received at the local RS232 port.	
RD	Received data. Indicates that data are being sent from the local RS232 port.	
RTS	Request To Send from the DTE	
DCD	Data Carrier Detect modem signal	
DSR	Data Set Ready modem signal	

3 Programming

A simple user program (counter function with LED display) serves as an example.

Modem connection via leased and dial-up lines

The communication connection between the two modems is established via a leased or dial-up line. The following illustration takes consideration of both of these connection types.

Perform the following steps for this purpose:

▶ Open a new project in XSoft with the fundamental, user relevant project parameters.
▶ Create the user program.
▶ Define the communication parameters.

Communication parameters

▶ Access the menu with ‹Online → Communication parameters → New›.
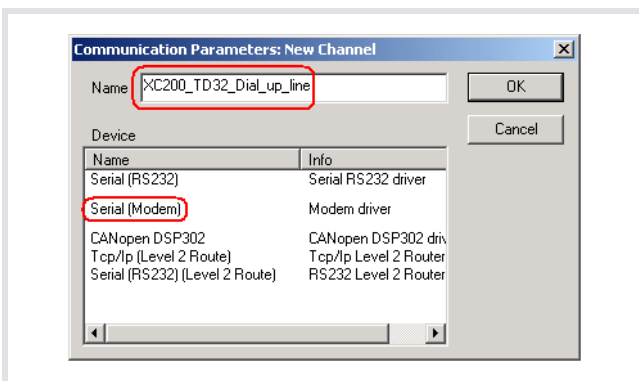
Figure 8: Communication connection via dial-up line
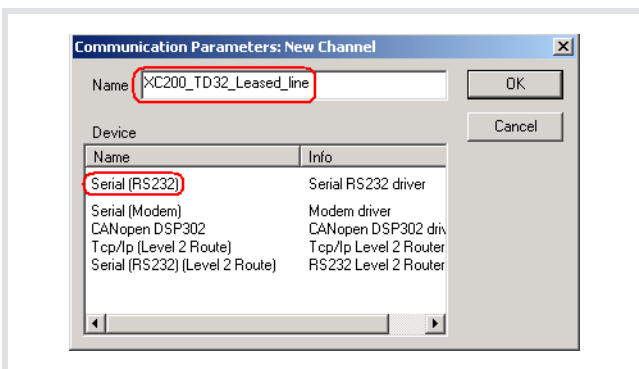
Figure 9: Communication connection via leased line

After you have defined the communication connection type and name, confirm with OK.

A new window opens after confirmation. Enter the communication specific connection parameters. Complete the default parameters as described in Table 7.
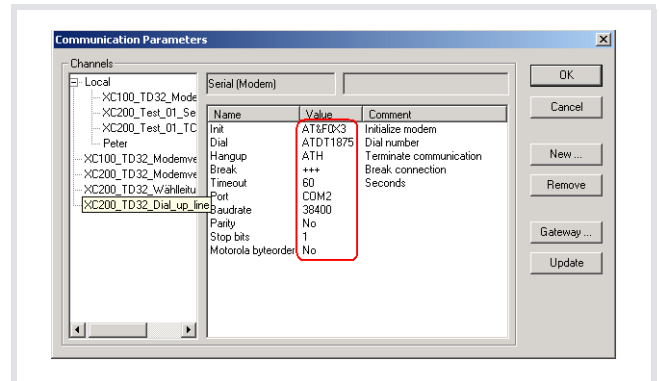
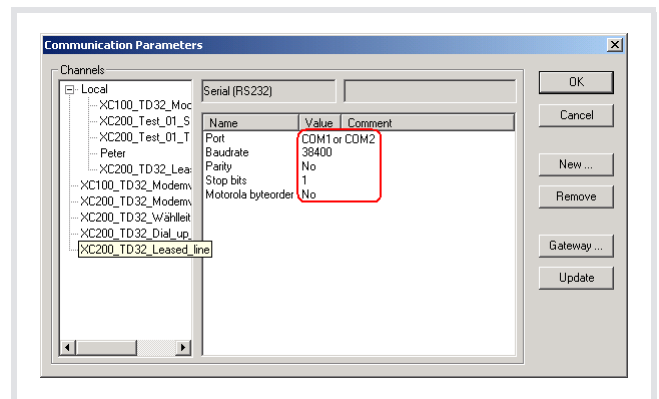Figure 10: Communication parameters with dial-up line

Figure 11: Communication parameters with leased line

Table 7: Default parameter expansion and their meaning

Name	Default value	Default value with amendment	Note
Init	AT&F0	AT&F0**X3**	If you add "X3" (without space and/or special characters), this deactivates the monitoring for engaged tone during a dialling attempt
Dial	ATDT	ATDT**1875**	Add the target telephone number (without space and/or special characters)

Connection between PC and control

Once the compiled program is present and the communication parameters are set, establish the connection between the programming PC and the PLC via ‹Online – Log-in›.

▶ Load the user program into the PLC with the "Log-in" command.
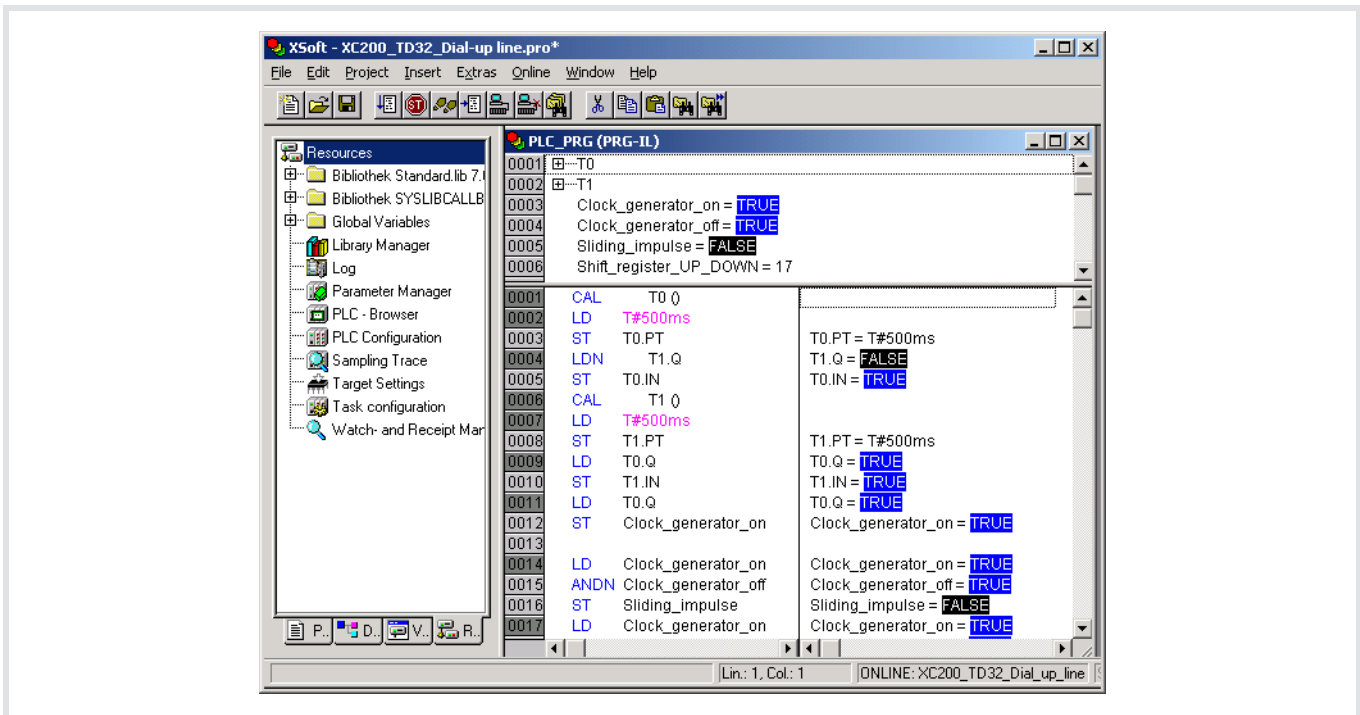▶ Start the PLC with the "START" command.

The status display is activated.

Figure 12: Status display via modem connection with a leased line or dial-up connection

ONLINE modification

For a connection via a leased line and dial-up line, you can use the ONLINE modification function as described in the ONLINE documentation of XSoft.

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