

SX2 QuadBRI is an ISDN card with four BRI interfaces. It works with Cologne Chip HFC-4S and was developed especially for the use with SwyxWare. It is manufactured exclusively for Swyx.

**i** This documentation will mention the SX2 QuadBRI if both types (SX2 QuadBRI and SX2-express QuadBRI) are referenced. Differences, e.g. regarding the configuration of the board number, are pointed out explicitly.

## • Properties of SX2 QuadBRI

### ISDN Interface

- 4 x BRI interface
- Each line can be configured individually using a jumper field for the TE or NT mode. The BRI connector (adapter for use of internal BRI) is not needed for the SX2 QuadBRI
- Short circuit resistance is provided for the ISDN connection via a special fuse (non-blowing, auto-recovery)
- Line termination (100 Ohm) is adjustable for each connection individually via a DIP switch.
- A maximum of 4 different cards (SX2 QuadBRI, SX2 SinglePRI and SX2 DualPRI) can be used in one PC. In doing so, a maximum of 76 B channels will be supported. Please note that the SX2 DualPRI is counted as two cards because it will appear as two network cards in the Windows device manager.

### PCI Interface

- SX2 QuadBRI  
PCI Interface for 3.3V and 5V PCI 2.2 slots. If necessary, 5V is reduced to 3.3V using a voltage regulator located on the card.
- SX2-express QuadBRI  
There is a PCI express x1 interface without any other configuration.

### PCM Highway

- Tact synchronization between the different SX2 cards is possible. The cards are connected with a ribbon cable.

**i** A mixed usage of PCI and PCI-express board is not supported (incompatible).

- 2/4/8 Mbit/s data transfer rate
- Chipset: Cologne Chip HFC-4S Chip
- Exact 49,152 MHz quartz oscillator
- 512 x 8 bit serial EEPROM for programming the PCI configuration information

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- Cologne Chip HFC-4S Chip
- Exact 49,152 MHz quartz oscillator
- 512 x 8 bit serial EEPROM for programming the PCI configuration information

### General purpose I/O

- Four two-color LEDs (red/green) on the mounting bracket of the SX2 QuadBRI
- Three DIP switches that can be used for the identification of the card
- You will find more recent drivers for the SX2 QuadBRI in the download area of the homepage:  
<http://www.swyx.com/support/index.html>.

### Conformity Declaration

The ISDN card family SX2 conforms to the hardware specifications of the ISDN standards (I.430, CTR3).

### Dimensions of the SX2 QuadBRI

15.5 x 10.5 x 1.3 cm



If there are any problems during the installation using an old PC please update the BIOS.

## • Installation of the ISDN PC Cards

The ISDN card can be installed in the same PC on which the SwyxServer is also installed. In the standard installation, the SwyxGate service is also installed. This service controls the ISDN lines that appear in the SwyxWare Administration as an ISDN trunk.

In order to be able to install a SwyxGate on a separate PC, the SwyxServer must already be installed and operable. For the SwyxGate installation you will need

- the server name and
- the name of the domain account, which was created in preparation for the installation of the SwyxServer

Before the ISDN cards are inserted, they must be configured for operation.

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**Preparation of the SX2 QuadBRI before insertion**

The ISDN card SX2 QuadBRI must be configured using jumpers and DIP switches, before it is inserted into a PC.

The operating mode (TE/NT) and the bus termination must be configured for each line of the SX2 QuadBRI before insertion.

Requirement for further description: The SX2 QuadBRI is lying in front of you with the PCI plug strip facing down and the BRI connections to the left.

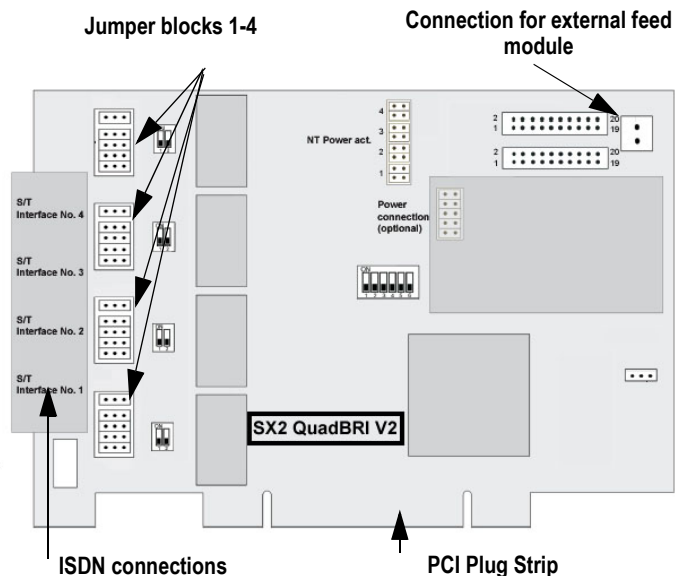


Figure 1 Jumpers of SX2 QuadBRI

**Configuration of the Operating Mode**

- TE mode is set if the ISDN connection is connected to an NTBA or the SwyxWare is configured as a subsystem.
- NT mode is set if the ISDN connection is used for an external subsystem or directly connected ISDN telephones are to be used.

Each BRI bus connection is a jumper block with five assigned jumpers. If all five jumpers are inserted to the left, the connection is configured as NT. If all five jumpers are on the right-hand side of the block, the connection is configured as TE.

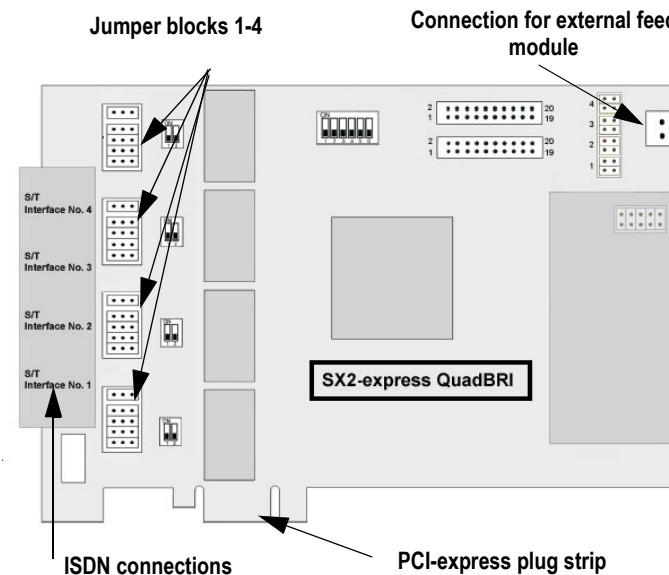


Figure 2 Jumpers of SX2-express QuadBRI

- ⚠ Important: All five jumpers must always have the same orientation, e.g. all to the right or all to the left.
- ⚠ After the installation of the driver software, the same operating type must be set in the configuration dialog. It is therefore not sufficient to configure the operating mode on the hardware only or in the software only.

### Configuration of the supply voltage in NT mode

An interface configured for NT mode can be fed with 40V from an optional external feed module. Connect this feed module to the green connector on the upper right side of the SX2 QuadBRI.

Using the SX2 QuadBRI V2 with an external feed module you have to insert additionally the two outer jumpers on the plug-in slot of the internal feed module (see figure below).

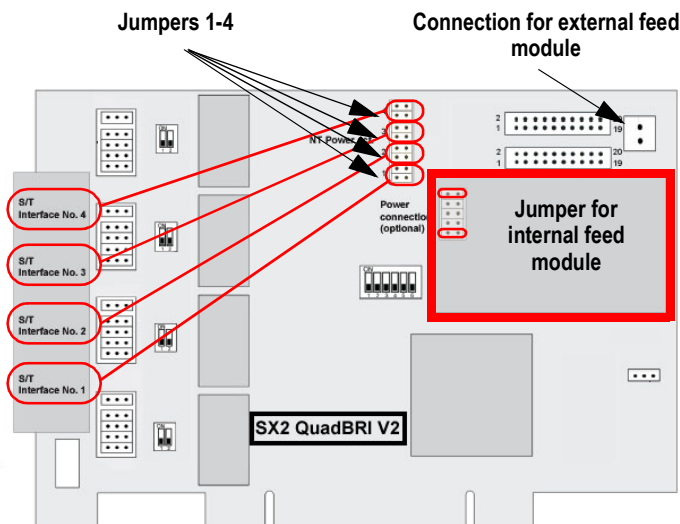


Figure 3 Configuration of the supply voltage in NT mode of SX2 QuadBRI V2

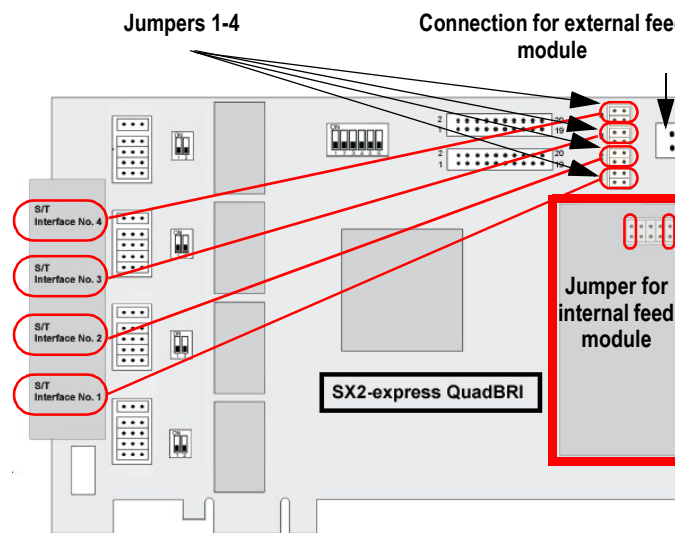


Figure 4 Configuration of the supply voltage in NT mode of SX2-express QuadBRI

For each NT interface to be fed, set two jumpers for each port to which you want to supply power. Afterwards, ISDN devices that are intended for supply from the public line can also be operated directly on the SX2 QuadBRI V2.

**⚠ Please ensure that you use the feed module only for interfaces that are configured for NT mode. Otherwise the interface will be damaged.**

Alternatively, you can mount an internal feed module directly on the SX2 QuadBRI.

**⚠ Do not use an internal and an external feed module at the same time.**

**Configuration of the BRI Bus Terminal**

- In TE mode, the termination depends on the cabling.
- In NT mode the termination should be switched on, since the card then normally represents the end of the BRI bus.

Next to the block of jumpers for a connection, you will find a two-pole DIP switch which can be used to configure the BRI bus terminal.

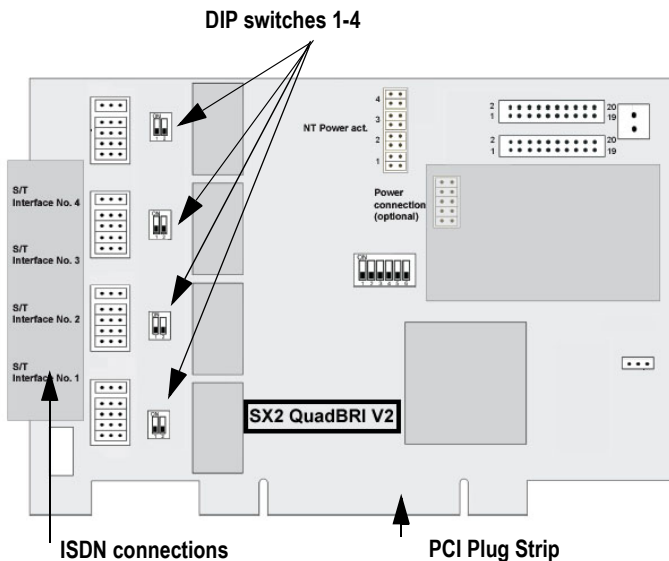


Figure 5 Configuration of the BRI Bus Terminal of SX2 QuadBRI

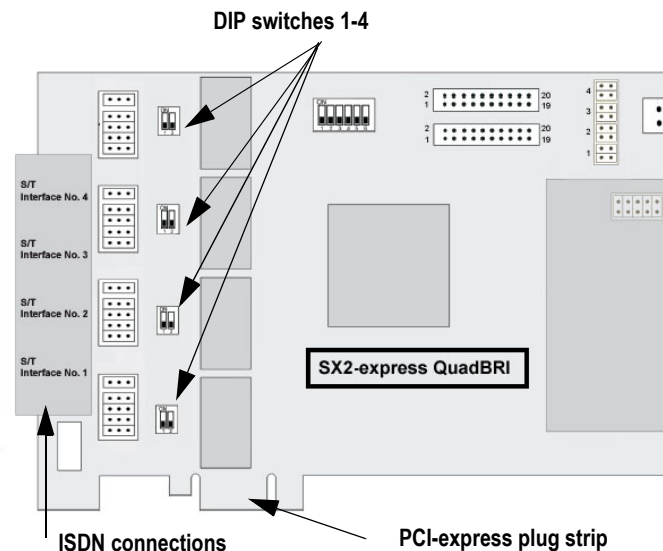


Figure 6 Configuration of the BRI Bus Terminal of SX2-express QuadBRI

If both pins of the switch are in the "ON" position, the 100 ohm terminal is switched on, otherwise it is switched off.

⚠ Both pins must have the same setting.

**Configuration of the PCI bus power supply (not SX2-express QuadBRI)**

On the right side of the SX2 QuadBRI is a three-pole jumper field for setting the PCI bus power supply.

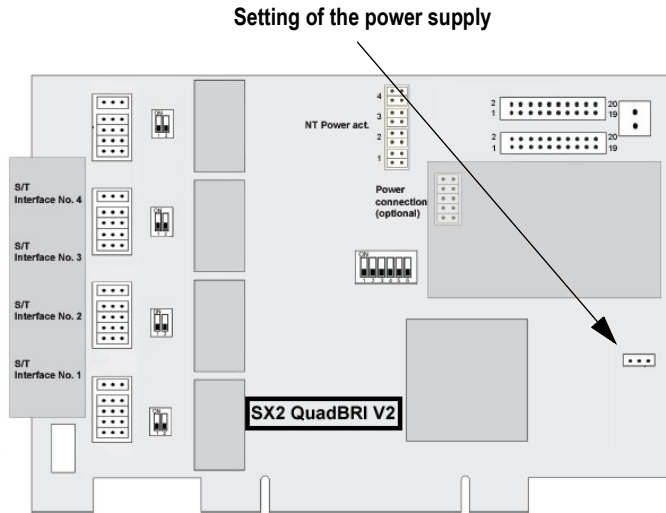


Figure 7 PCI bus power supply of SX2 QuadBRI

Make sure that the jumper is at the correct setting for the PC main board.

Right ("3V3 reg") for an environment with 3 V, left for an environment with 5 V, which will be found on older main boards.

**Configuration of the card number**

You can set the card number with the six-pole DIP switch in the middle of the SX2 QuadBRI.

**SX2 QuadBRI V2**

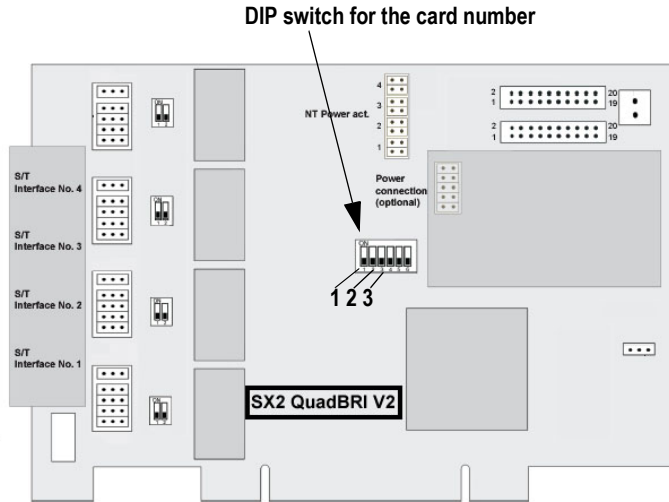


Figure 8 Card number configuration of SX2 QuadBRI V2

The following assignment is valid for **SX2 QuadBRI V2**:

Switch 1	Switch 2	Switch 3	Card number
off	off	on	1
off	on	off	2
off	on	on	3
on	off	off	4
on	off	on	5
on	on	off	6
on	on	on	7
off	off	off	assigned automatically

⚠ If you use several cards in one system, please make sure that either one card number was assigned for all cards, or automatic card number assignment is set for all cards.

**SX2-express QuadBRI**

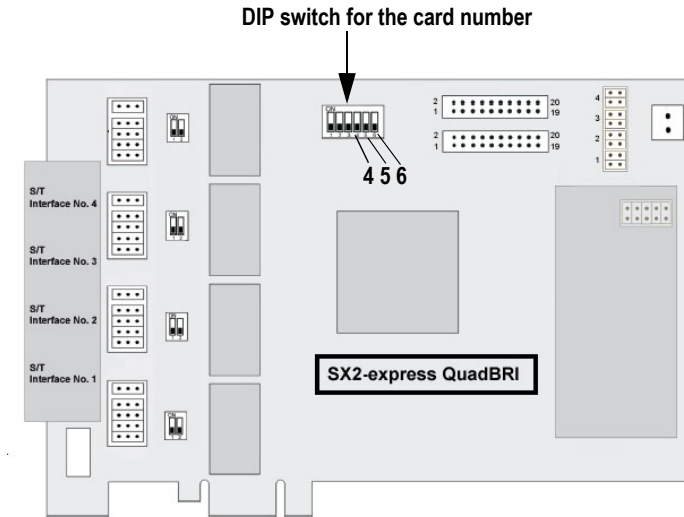


Figure 9 Card number configuration of SX2-express QuadBRI

The following assignment is valid **SX2-express QuadBRI**:

Switch 4	Switch 5	Switch 6	Card number
on	off	off	1
off	on	off	2
on	on	off	3
off	off	on	4
on	off	on	5
off	on	on	6
on	on	on	7
off	off	off	assigned automatically

⚠ If you use several cards in one system, please make sure that either one card number was assigned for all cards, or automatic card number assignment is set for all cards.

**PCM bus connection**

The SX2 QuadBRI card has two 20-pole jacks for connection with an optional PCM cable.

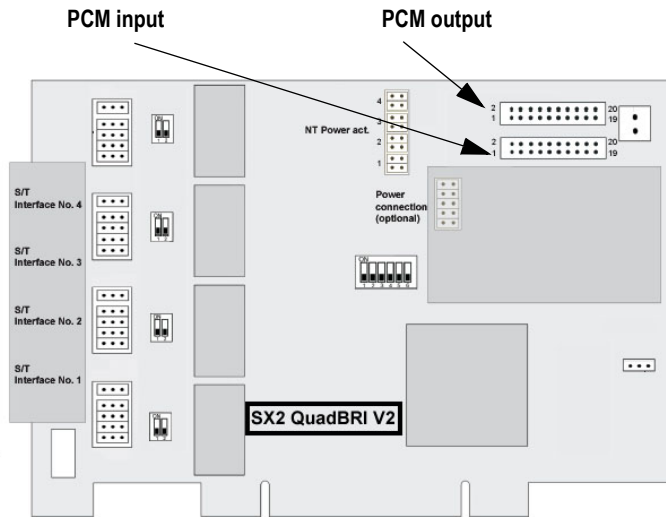


Figure 10 PCM connection of SX2 QuadBRI

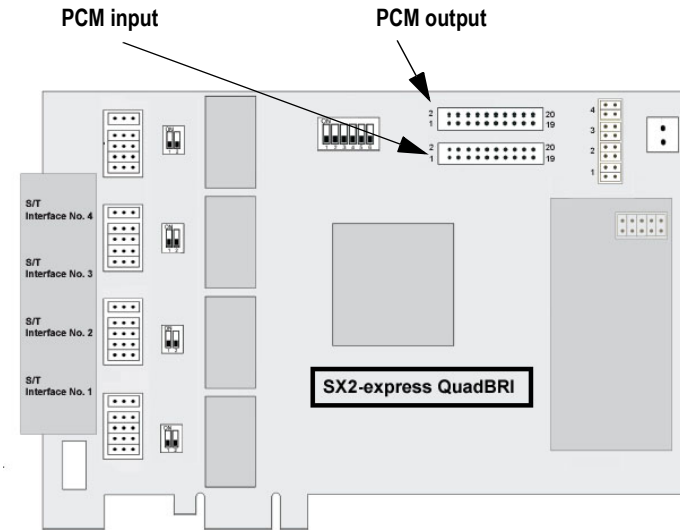


Figure 11 PCM connection of SX2-express QuadBRI

The upper jack is the output, the lower jack the input. Connect the **SX2** cards with the PCM cable, by connecting the output jack of one card to the input jack of another card.

⚠ Please keep in mind that the connection cable differs between both SX2 boards ( SX2 QuadBRI or SX2-express QuadBRI). A mixed operation using both card types in one PC is not supported.

**LED Status Display**

Each BRI connection is assigned one of the four LEDs. The number of the connection corresponds to the number of the LED.

The following illustration shows a slot of the SX2 QuadBRI to identify the Basic Rate Interfaces 1 to 4, shown here as L(ine) 1 to 4:

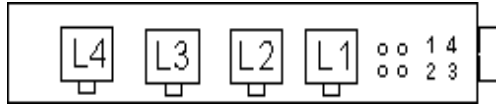


Figure 12 Lines of the SX2 QuadBRI

The following assignments are valid:

LED	Statement
off	Layer 1 deactivated
red glowing	Layer 1 activated
green glowing	Layer 2 activated
green, blinking	At least one connection is active
red, blinking	The line is being configured

After the hardware for the SX2 QuadBRI has been configured according to the use scenario, insert it into the PC on which SwyxGate is to be installed.

After the card has been installed physically, it will automatically be recognized the next time the computer is booted and a request for the installation of the driver software will appear.

You may find more recent drivers for the ISDN cards in the download area of the homepage:

<http://www.swyx.com/support/index.html>.

**Insertion of the ISDN Card**

Do the necessary hardware configuration before the insertion. For more details, please read chapter •, *Preparation of the SX2 QuadBRI before insertion*.

**⚠** It is absolutely necessary that you **turn off the PC** and remove the **mains plug** from the power supply whenever you are doing something which requires you to open the PC case!

**⚠** Do not touch **any of the electronic components** of the PC card during the entire installation process. The electronic components of the PC card can be damaged by electrostatic discharges!

**⚠** For safety reasons, it is necessary that you disconnect all **connection cables from the telephone network** before you open the PC case.

**This is how you install the ISDN cards in your PC**

1. Turn off your PC and pull the respective mains plug out of the socket.
2. Open your PC.
3. Remove the screw from the metal panel covering a free PCI (expansion) slot:

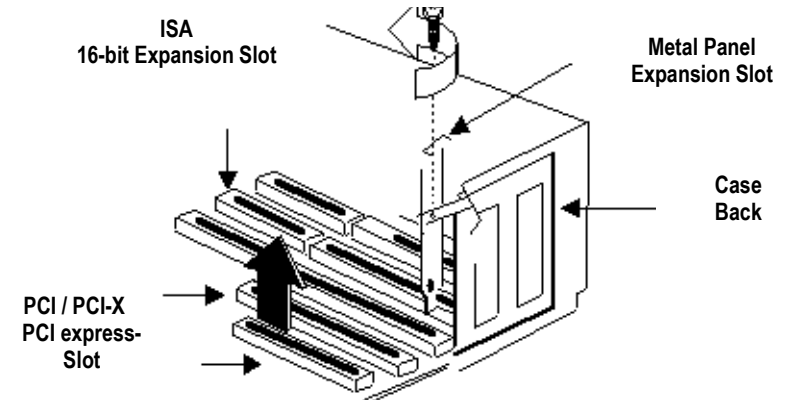


Figure 13 Removing the Metal Panel

4. Insert the ISDN PC card into a free PCI / PCI-X or PCI-express plug-in slot.
5. Use the screw you just removed to secure the PC card.
6. Connect the SX2 QuadBRI to the BRI ISDN connections using the cable which has been supplied.

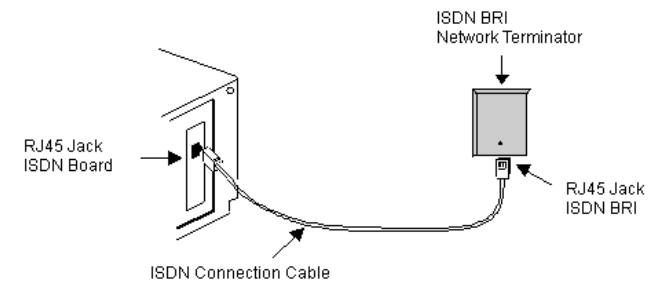


Figure 14 Connecting the ISDN Cable

7. Close your PC and restore the power supply by plugging in the mains plug.




### Installation of the software for the ISDN card

After the card has been installed, it will automatically be recognized the next time the computer is booted and a request for the installation of the driver software will appear.

#### This is how you install the drivers for the ISDN card

1. Follow the instructions given by the hardware wizard.
2. When you are asked to enter the source for the driver, select "Enter other source".
3. Put the SwyxWare CD in your CD ROM drive.  
Click on "Next >".
4. Enter the path on the SwyxWare CD for the driver files on the SwyxWare CD.  
Depending on the used PC please enter
  - „\ISDN\SX2 Standard Driver 32bit“
  - „\ISDN\SX2 Standard Driver 64bit“
 During the installation of the driver you will be asked to enter the ISDN switching type or the D-channel protocol.
5. Select the ISDN exchange type or the switch protocol used by your telephone company (in Europe this is Euro-ISDN (DSS1)).  
Click on "Next >".
6. Follow the wizard's instructions and then click on "Finish" in the dialog "Completing the wizard".

You can check to see if the driver installation was successful by checking the entries in the Device Manager in the 'Network Cards' category. You will find more information on the Device Manager under *This is how you modify the ISDN PC card driver configuration*, page 9.

-  You can check whether the installed ISDN cards function properly by using the utilities supplied on the SwyxWare CD.


### Configuration of the ISDN Card

If you would like to connect the card to a direct dialing in line, you must make some configuration changes for the ISDN PC card driver.

You can change the defined parameters in the driver software of the ISDN card at a later point in time.

#### This is how you modify the ISDN PC card driver configuration

1. Run computer management, the simplest possibility is to use the shortcut menu for "My Computer" on the Windows Desktop
2. Select "Manage".  
The Microsoft Management Console (MMC) will be started.
3. Select "Device Manager" in the console structure.  
A list of all installed devices will now be shown on the right. There you will find the following entry under "Network Cards": "SX2 QuadBRI".
4. Enter the appropriate settings under "Properties":
  - Select "ISDN Parameters" on the "Advanced" tab.  
Select the "Port" tab in the dialog which is displayed.
  - To switch to a line configured for direct dialing-in, please choose "Point to Point" and close both this tab and the previous tab by clicking on "OK".

-  Tip: If the line of a SX2 QuadBRI is configured, the LED, which is associated with this line, will blink. This simplifies the identification when operating several SX2 cards.