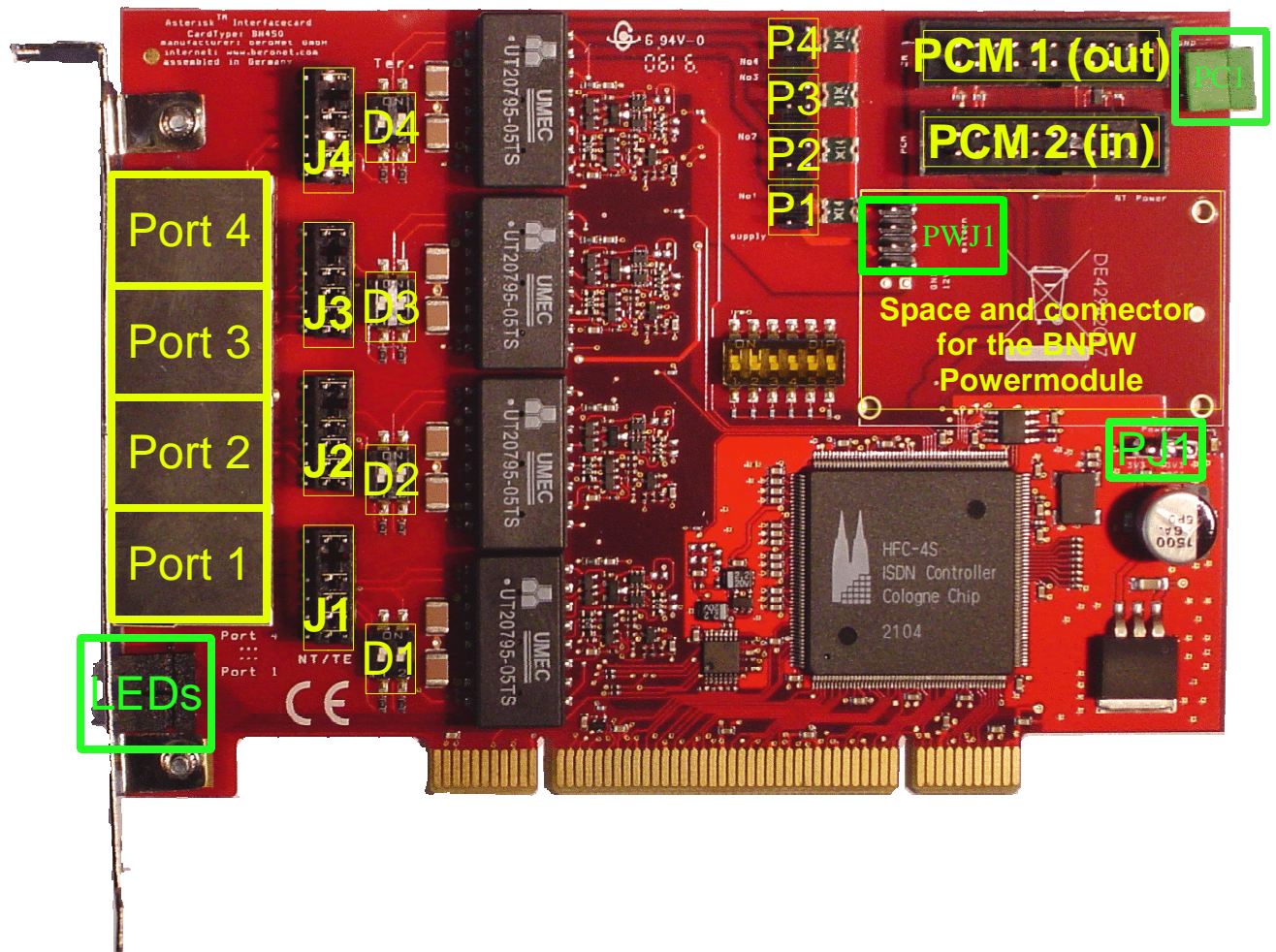


3.Installation and Configuration of beroNet Cards

The BNxS0 are so called Basic Rate Interface cards (BRI). These cards are equipped with either four (BN4S0) or eight (BN8S0) ISDN ports. These ports can be configured individually as TE or NT. If you connect un-powered ISDN phones to the NT ports, you should use an additional power supply (BNPW1) with the card.

Also, you can specify the type of signaling on each port, selecting whether they function as "point-to-multi-point" (multiple devices) or as "point-to-point" (single device).

3.1.Installation of the BN2S0/BN4S0



pic. 3.1.1

This installation description is also valid for the BN2S0 just with two ports less.

Before you install the BN4S0, you should decide how to utilize the four available ports. Determine which ports connect to terminal equipment and which ports connect to the network.

Picture 3.1.1 shows the card with four ports, each with an adjacent group of jumpers and DIP-switches to the right.

The following explains the areas in yellow and green:

J1-J4	A group of five jumpers determines the port type, NT or TE. If the jumpers short the two pins on the right (default setting), then the port is configured as "TE". If the jumpers connect the two pin on the left, the port is configured as "NT". Please note that a complete set of jumpers must be moved for each port.
P1-P4	This group of pins must be shorted (horizontally) if PC1 is connected to a BNPW1 power supply.
D1-D4	The DIP switches are in the "on" position by default . This sets the terminal resistance to 100 Ohm. To change the terminal resistance, set the DIP switches to "off".
PJ1	Jumper for PCI Voltage (3.3V / 5V). Default is 3.3V
PC1	Powerconnector for BNPW1 + BNPW2
PCM1-PCM2	Connectors for the PCM bus. The PCM bus potentiates to bridge calls in hardware across different beroNet cards whcih are connected over the PCM bus.

Important: If you have an older motherboard, it is possible the PCI voltage is not detected automatically. Please set jumper PJ1 (in pic. 3.1.1) to the right position "3V3 reg." (the two pins on the right should be shorted).

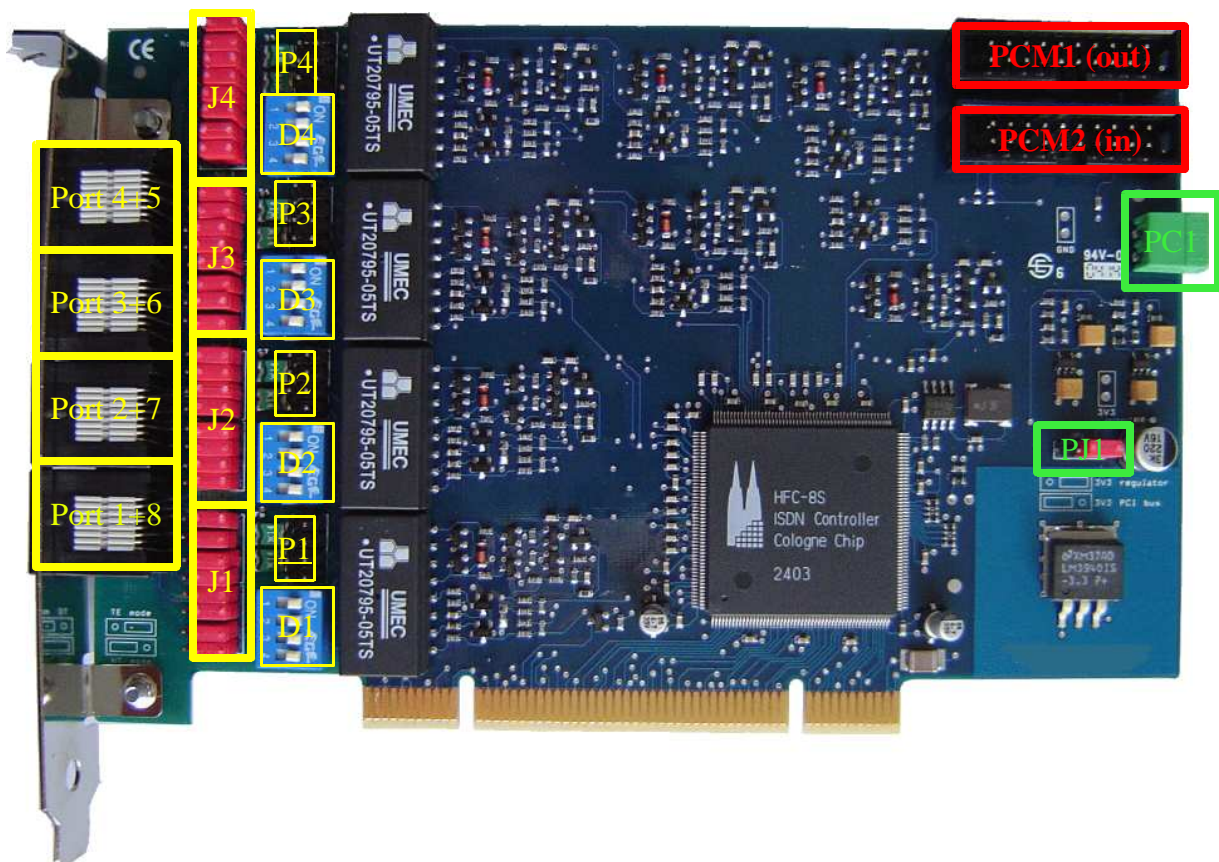
Tip: To set the jumpers, use a small tweezer and handle the jumpers from above.

After configuring the card according to your plan, you can install it in an empty PCI slot. Please follow these directions:

1. Turn off your PC.
2. Disconnect computer power completely by pulling the power cord from the wall socket.
3. Firmly insert the card into an empty PCI slot and tighten the screw.
Use extreme care when inserting cards, so you do not damage components on it by touching other cards or the computer case.
4. Close the case, reconnect power and turn on the PC.

No further settings are necessary to connect to ISDN circuits or ISDN devices. Any crossover is done with the jumpers on the card.

3.2.Installation of the BN8S0



pic. 3.2.1

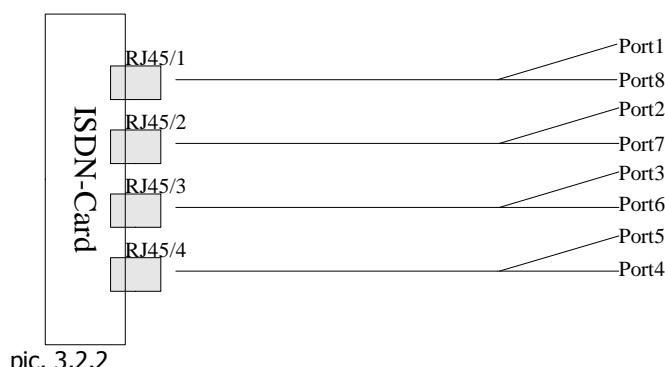
First determine how to utilize the ports. Note that every RJ45 connector contains two ISDN ports. Connector pin outs are listed in the appendix (8.2.1). The jumpers and DIP switches always refer to two ISDN ports. They are color coded to each ISDN port. The jumper and DIP switch settings are the same as for the BN4S0 in section 3.1.

Note that the ports are counted from bottom to top, and the Jumper and Dip switches are present twice per RJ45 connector!

To install the card, follow the directions in section 3.1.

Once again, we like to point out that the card should be handled with extreme care.

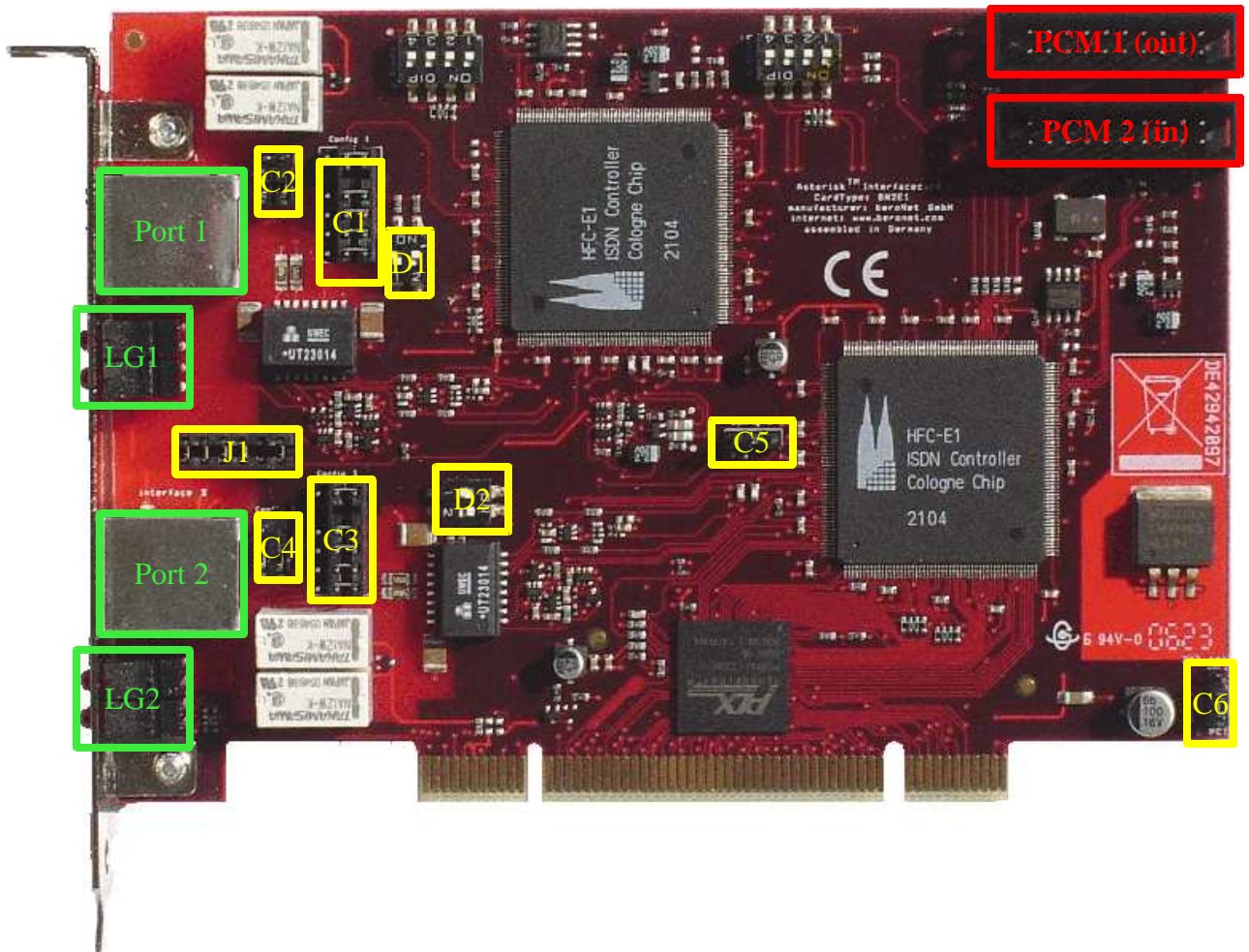
The BN8S0 comes with an Y-adapter cable. The connections must be split because two ISDN interfaces are combined into one port. Picture 3.2.2 shows the Y-cable port setup:



pic. 3.2.2

Each end of the Y-cable has an RJ45 jack. If you want to connect ISDN telephones, please use straight RJ45 cables.

3.3.Installation of the BN2E1



pic. 3.3.1

Before you install the BN2E1, you should decide how to utilize the two available ports. Determine which ports connect to terminal equipment and which ports connect to the network.

Picture 3.3.1 shows the card with two ports, each with an adjacent group of jumpers and DIP-switches to the right.

The following explains the areas in yellow and green:

J1	A group of 6 Jumpers for enabling the Watchdog. For activating the watchdog all pins must to be shorted vertically.
C1	A group of five jumpers determines the port type, NT or TE, of port 1. If the jumpers short the two pins on the right (default setting), then the port is configured as "NT". If the jumpers connect the two pin on the left, the port is configured as "TE". Please note that a complete set of jumpers must be moved for each port.
C2	Pin out configuration for Port 1. The pins must be shorted vertically. If the two lower are shorted, the pin out is 3,4,5,6. If the two upper are shorted the pin out is 1,2,4,5
C3	A group of five jumpers determines the port type, NT or TE, of port 2. If the jumpers short the two pins on the right (default setting), then the port is configured as "NT". If the jumpers connect the two pin on the left, the port is configured as "TE". Please note that a complete set of jumpers must be moved for each port.
C4	Pin out configuration for Port 2. The pins must be shorted vertically. If the two lower are shorted, the pin out is 3,4,5,6. If the two upper are shorted the pin out is 1,2,4,5
C5	Jumper determines if the both HFC-E1 share one IRQ or not. The left two pins or none must to be shorted for getting each chip an own IRQ (not sharing).
C6	Jumper for PCI Voltage (3.3V / 5V). Default is 3.3V
D1	A group of two Dip switches to configure the line termination resistance of Port 1 to 75 Ohm or to 120 Ohm. The default setting is 75 Ohm (first switch „off“, second one to „on“). If you want to set to 120 Ohm the the first switch must be set to „on“ and the second one to „off“.
D2	A group of two Dip switches to configure the line termination resistance of Port 2 to 75 Ohm or to 120 Ohm. The default setting is 75 Ohm (first switch „off“, second one to „on“). If you want to set to 120 Ohm the the first switch must be set to „on“ and the second one to „off“.
PCM1-PCM2	Connectors for the PCM bus. The PCM bus potentiates to bridge calls in hardware across different beronet cards which are connected over the PCM bus.

Important: If you have an older motherboard, it is possible the PCI voltage is not detected automatically. Please set jumper „config6“ (in pic. 3.3.1) to the lower position "3V3 reg." (the two pins on the lower should be shorted).

Tip: To set the jumpers, use a small tweezer and handle the jumpers from above.

After configuring the card according to your plan, you can install it in an empty PCI slot. Please follow these directions:

5. Turn off your PC.
6. Disconnect computer power completely by pulling the power cord from the wall socket.
7. Firmly insert the card into an empty PCI slot and tighten the screw.
Use extreme care when inserting cards, so you do not damage components on it by touching other cards or the computer case.
8. Close the case, reconnect power and turn on the PC.

No further settings are necessary to connect to ISDN circuits or ISDN devices. Any crossover is done with the jumpers on the card.

3.4.Connection of the BNPW1



...pic 3.4.1

The BNPW1 is a power adapter that enables you to supply the ISDN ports with power, in case they are configured as NT devices and you want to connect them to non-powered ISDN terminal devices.

If you ordered an additional BNPW1, you should have a grey case power supply and two connecting cables as shown in picture 3.3.1. There are connectors at each end of the adapter.



pic. 3.4.2



pic. 3.4.3

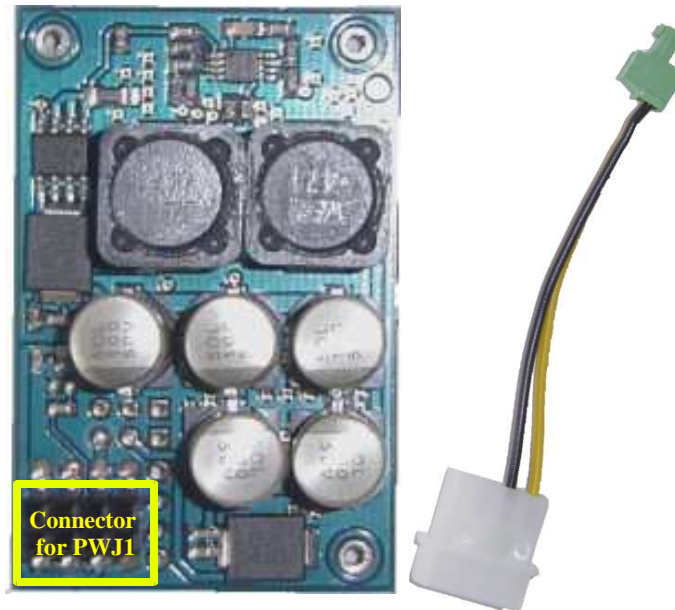
Picture 3.4.2. shows the connector that powers the BNxS0 card, which has an identical connector. Connect the power supply and the card with the supplied cable. Check your jumper settings, as described in section 3.1, to ensure the ports are set up properly.

Picture 3.4.3. shows the socket that connects to 5/12V power of your computer power supply. Please attach it to an unused 5/12V power connector.

Make sure to fasten the power supply BNPW1 inside your computer in such a way that it does not move. It would be best to screw it or to glue it to the floor of the computer case.

If you plan to connect the BNPW1 to a BN4S0 card version 2, then you have to close the whole group of jumper PWJ1 (see pic. 3.1.1) and connect the power supply directly how described.

3.5.Connection of the BNPW2 (only for BNxS0 Vers. 2)



pic. 3.4.1

What you can see in pic. 3.4.1 is the new BNPW2 power module for feeding NT. This small module will be putted onto the BN4S0 or the BN2S0. The module delivers power for 2 Phones per BRI-Port at the maximum.

For installing the BNPW2 onto the BNxS0 card you have to connect it to the jumper array PWJ1 (see at pic. 3.1.1). If it is connected you should screw the three delivered screws from the back of the card, so that the module is fixed. Now you can connect the green power connector (PC1 in pic. 3.1.1.) on the card with one free 12V jack of your system power supply with the delivered cable (see pic. 3.4.1). After that you must close the corresponding jumpers of the jumper array P1-P4 (see pic. 3.1.1) for the ports you wish to feed.

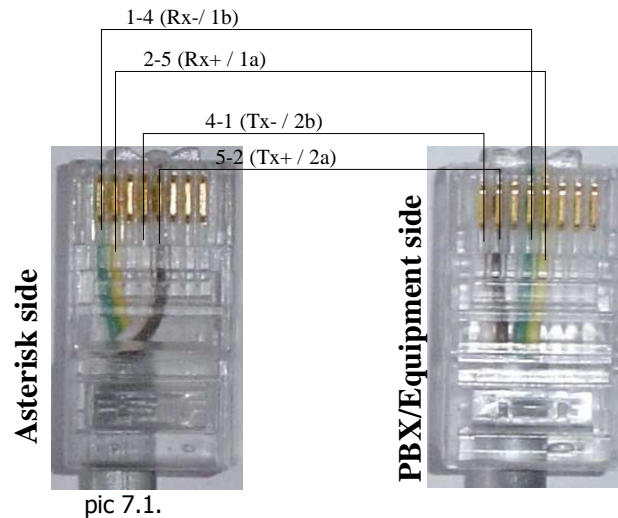
How does it looks if the module is installed you can see at the following picture:



pic. 3.4.2

7.E1 Cable Selection for Connection to PRI Circuits or other Telephony Devices

Usual connection between a Digium PRI card and a telecom-device:



When connecting a NTPM, it is possible the wires are crossed inside the NTPM. In this case, use a simple patch cable (pin 1 to pin 1).

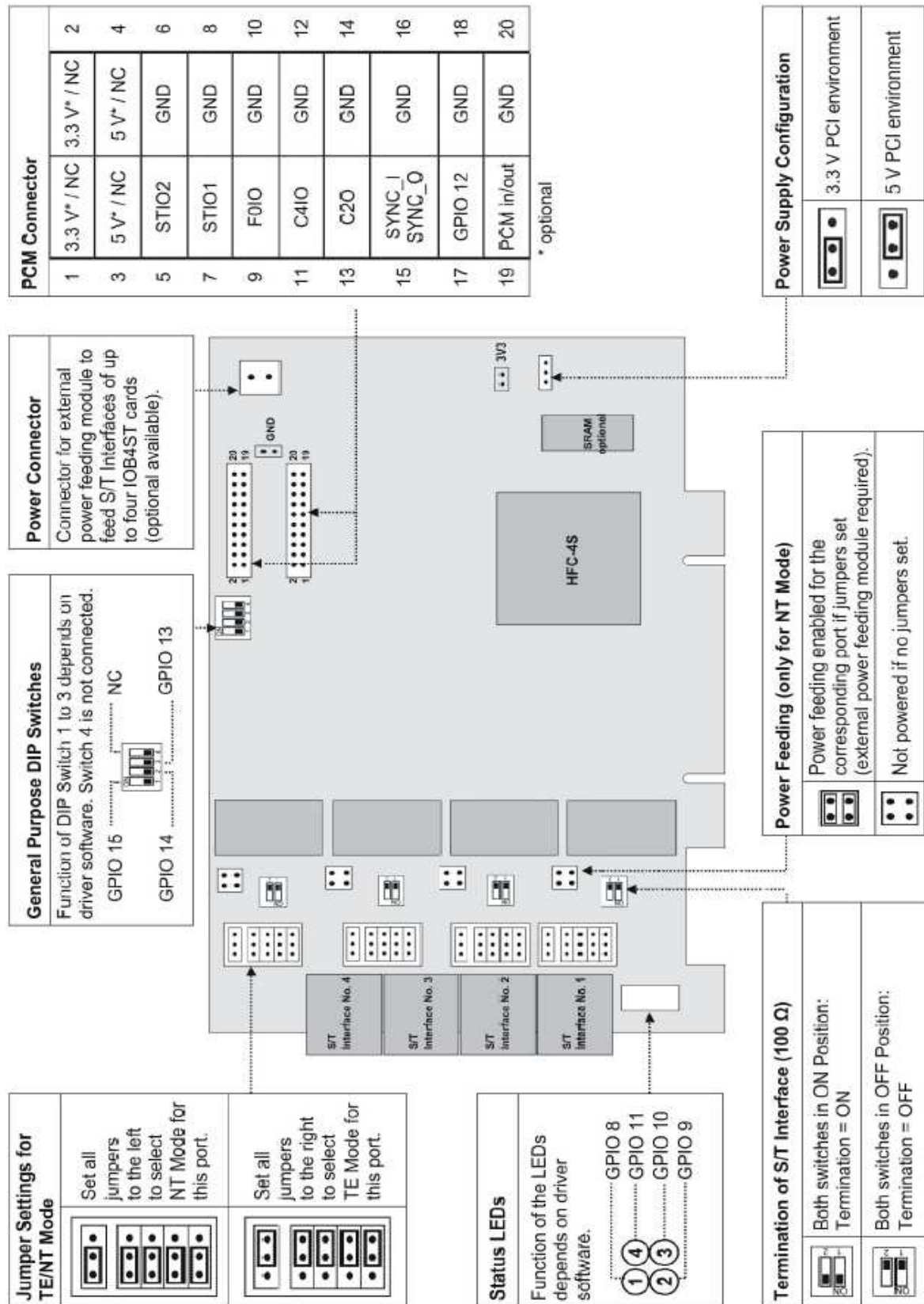
There is no standard pinout for PRI circuits, some manufacturers' pinouts differ from the image above. When connecting to LSA blocks of your provider, the wiring is installation specific. You should request a particular setting from your provider or identify the circuits before connecting to them. This applies to most telecommunications devices.

8. Technical Data

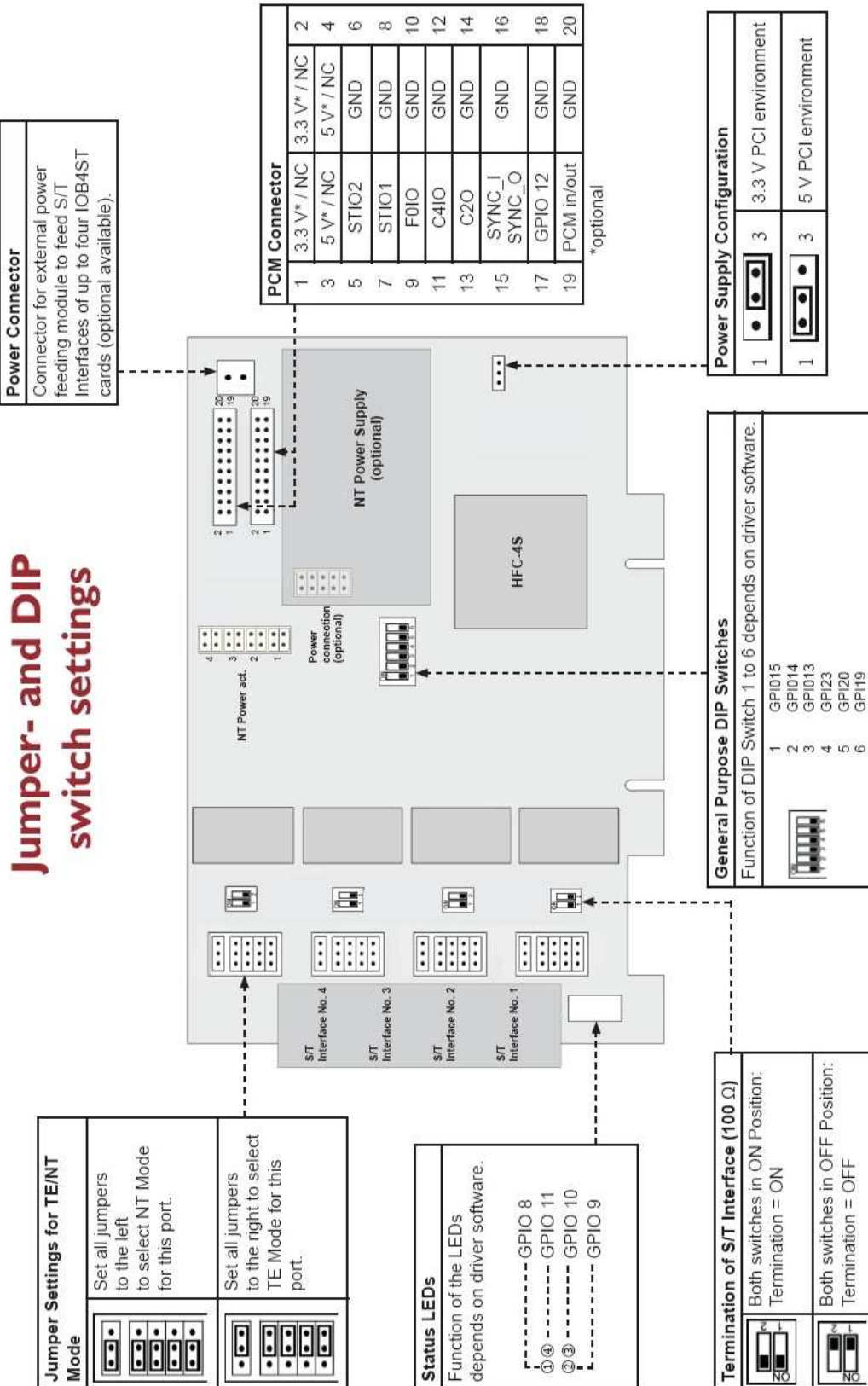
8.1. BN4S0 Board

- **S/T Interface**
 - **4 BRI ports** (TE/NT mode; fed by external power supply;
 - selectable, 100 Ohm line termination
 - ISDN short circuit protection through fuses
- **PCI Interface**
 - PCI interface is switch selectable to operate on 3.3V or on 5V PCI 2.2
- **PCM Bus**
 - Daisy chain two or more cards
 - 2/4/8 Mbit/s data transfer rate
- **Chipset**
 - Cologne Chip HFC-4S ISDN IC
 - Highly stable 49.152 MHz quartz oscillator
 - 512 bit x 8 serial EEPROM (PCI configuration information)
- **General Purpose I/O**
 - 4 dual LEDs on the slot bracket (status: *green, red, off*)
 - 3-DIP switches, can be checked by software
- **ISDN Conformity**
 - The BN4S0 board family is hardware compliant with the specifications of the ISDN standard (I.430, CTR3).
- **Board Dimensions**
 - 15.5 x 10.5 x 1.3 (cm)

8.1.1.technical overview of BN4S0 rev. 1



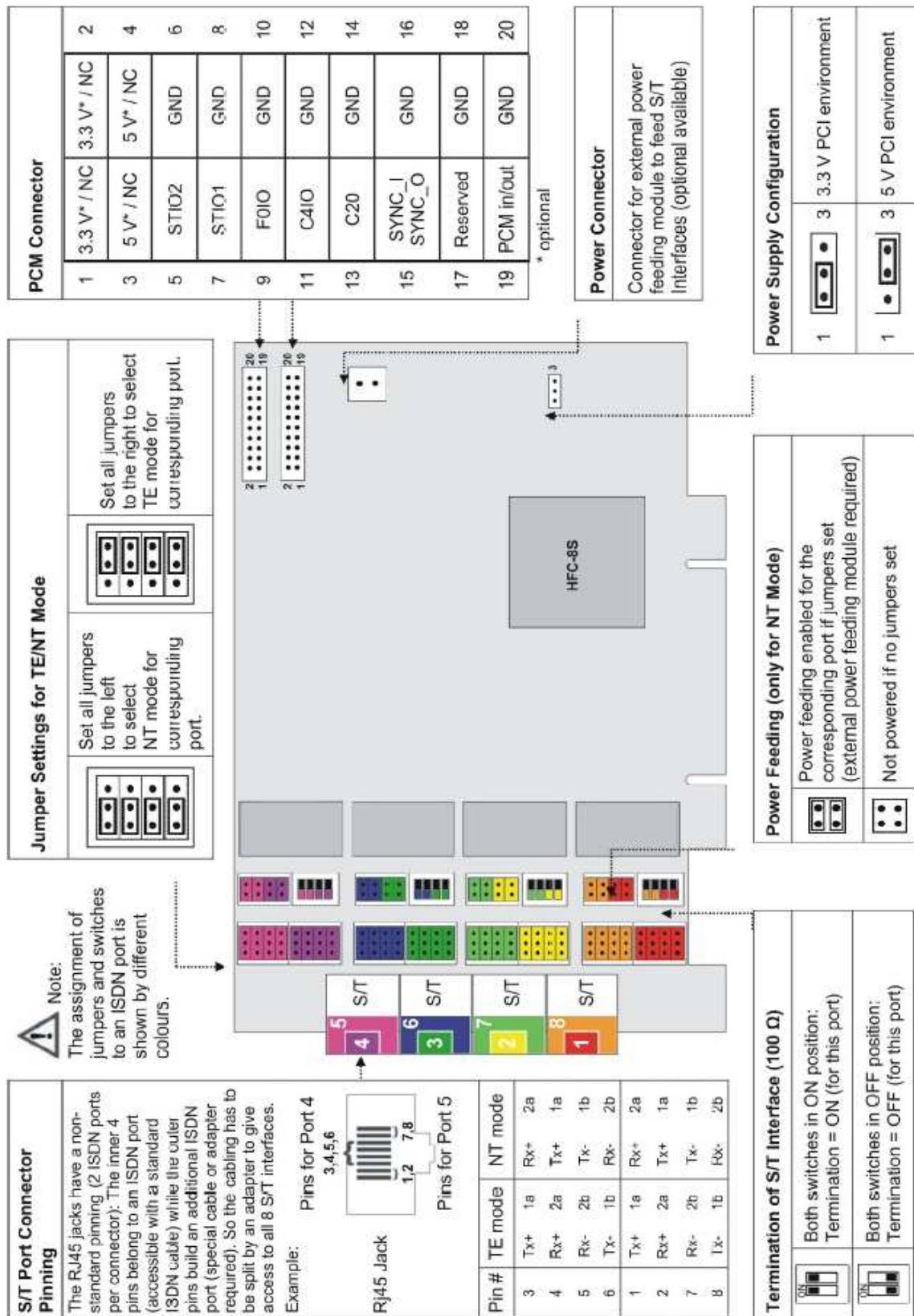
8.1.2.technical overview of BN4S0 rev. 2



8.2.BN8SO Board

- **S/T Interface**
- **8 S/T interfaces:** 4 RJ45 jacks using non-standard pin-outs (2 ISDN ports per connector); TE/NT mode; fed by external power supply;
- selectable, 100 Ohm line termination
- **ISDN short circuit protection** through fuses
- **PCI Interface**
PCI interface is switch selectable to operate on 3.3V or on 5V PCI 2.2
- PCM Bus
Daisy chain two or more cards
2/4/8 Mbit/s data transfer rate
- **Chipset**
Cologne Chip HFC-4S ISDN IC
Highly stable 49.152 MHz quartz oscillator
512 bit x 8 serial EEPROM (PCI configuration information)
- **ISDN Conformity**
The BN8SO board is hardware compliant with the specifications of the ISDN standard (I.430, CTR3).
- **Board Dimensions**
16 x 10.5 x 2 cm (exceeds standard PCI dimensions)

8.2.1.technical overview of BN8S0 rev. 1



8.3.BN2E1 Board

- **E1 Interface**
 - 2 PRI port
 - can be configured to TE/NT mode by jumpers
 - TE/NT mode setting can be detected by software
 - line termination (120 Ω default / 75 Ω optional) is selectable by DIP switch
- **PCI Interface**
 - PCI interface is suitable for 3.3V as well as 5V PCI 2.2 slots (5V to 3.3V regulator on board)
- **PCM Bus**
 - daisy chaining possible by two connectors (2x10 pins, 2.54cm pin pitch) on the card
 - flat ribbon cable for connection of several cards optional available
 - 2/4/8 Mbit/s data transfer rate
- **Chipset**
 - 2 Cologne Chip HFC-E1 ISDN IC
 - high precision 32.768 MHz quartz oscillator
 - 512 bit x 8 serial EEPROM for the storing of PCI configuration
 - 512k x 8 SRAM for enlarging FIFO buffer (soldering option)
- **General Purpose I/O**
 - 4-DIP switch can be checked by software for e.g. identification of the card (controllable via GPI – general purpose input)
 - 4 monochrome LEDs (2 red and 2 green LEDs) on board that can be controlled by software (controllable via GPIO – general purpose input/output)
- **Board Dimensions**
 - 15 x 10.6 x 1.5 (cm)

8.3.1.technical overview of BN2E1

