PXB-Modem

Manual

taskit GmbH

Seelenbinder Straße 33

D-12555 Berlin

Germany

Tel +49(0)30 / 611295-0

Fax +49(0)30 / 611295-10

http://www.taskit.de/

Portux920T

Table of contents

1. Introduction

1.1 PXB-Modem Features

– USB-Host
– PSTN (RJ11)
– ISDN (RJ45)
– DC-Switch
– DC-Socket (2.1 mm)
– Status LED's
– SPI (3x Chipselect, X9 Pinheader)
– I²C (X9 Pinheader)
– USB-Device (X9 Pinheader)
– 1 USART (LVTTL-Level, X6 Pinheader)
– 5V and 3,3V VCC
– Size 100,00 x 75,2

1.2 ISDN-Modem Features

– Multitech MT128SMI Socketmodem
– Telecom approved (Europe)
– ETSI/DSS1 (EURO-ISDN)
– National, AT&T Nothern (US)
– NTT INS64 (Japan)
– France VN-4
– V.120, X75, raw HDLC
– Serial Interface up to 230 Kbs
– Caller ID

1.3 Analog Modem Features

– Multitech MT5600SMI Socketmodem
– FC-approved
– Serial Interface
– V92/56k
– Fax Class 1.0

1.4 Description

With both , the PXB-Modem ISDN and PXB-Modem Analog, an easy connection to the internet or directly to another PC can be realized. In it's design as a Socketmodem both modems can be used on the same base-card. With Multitech's Socketmodems MT128SMI and MT5600SMI proven quality has been choosen.

Both Modems are connected to the Portux920T via a serial line. They can be communicated with simple AT-commands. For dialing to the internet or establishing a direct connection the Linux PPP-Demon can be used. It is already integrated in the Standard Portux Linuxsystem and contains ready-to-use example scripts for dial-on-demand connections to a german internet provider.

The Card features an USB-Host Port, further peripherals can be accessed over pinheaders: SPI, USART, I²C and USB-Device. The signals of the USART-Port may be configured alternatively as I/O. By three Status LEDs, the system's status can be displayed.

1.5 Documentation

– PXB-Modem Manual (this document)

– Developer Guide - MT5600SMI-MT5656SMI AT Commands.pdf

– MT128SMI_AT.pdf

2. Getting Started

2.1 Connecting the Card to Portux920TEU

First connect the Portux920T mainboard with the PXB-Modem extension card via the PXB (Portux Extension Bus). Then supply the mainboard with power from the extension card by connecting the poles indicated on the mini spring-cage terminal block (X7) on Portux920T with the corresponding poles of the mini spring cage (X7) on the PXB-MODEM. To secure the cable properly you need to push the orange-colored inner part of the spring cage downward and insert the cable end completely. Check to make sure the cable is sitting securely.

The board can be powered on now and be used as described in the Linux Guide.

2.2 Using the PPPD-Example configuration

The standard distribution of Linux for Portux920T has an example for using the PPP-demon already preinstalled. The configuration resides in /config/ppp. This is on the JFFS2-Filesystem and thus persistant during repeated restarts of the board.

There are two examples, one for ISDN and one for Analog, for establishing a connection to internet by call providers in Germany. This connections are configured as dial-on-demand. After 5 minutes of inactivity, they stop the link automatically.

To use them, all to be done is to invoke the ppp with

```
root@Portux920T:# pppd call arcor
```

or

```
root@Portux920T:# pppd call lycos-isdn
```

for ISDN. After invoking the script, any network activity e.g. ping brings up the link.

Custom connection scripts can be modeled after these examples, which can be found in /config/ppp/peers.

When writing own connection scripts, some level of debugging might be useful. As the syslogd is not running per default on the portux-system, it has to be started manually:

```
root@Portux920T:# syslogd
root@Portux920T:# tail -f /var/log/messages
```

This can be done in a telnet-window for example. The PPPD logs a lot and useful hints to what has gone wrong (if anything has gone wrong) can be found in his debug messages.

Forcing the PPPD to stop manually can be done with this script:

```
#!/bin/sh
# stop the pppd, if running


if [ -r /var/run/ppp0.pid ];then
        /bin/kill -INT `/bin/cat /var/run/ppp0.pid`
        if [ ! "$?" = "0" ];then
                /bin/echo "removing stale pid file."
                /bin/rm -f /var/run/ppp0.pid
        fi
fi
```

There is abundant documentation concerning the use of ppp under linux to be found in the internet. Some useful links include:

http://www.faqs.org/docs/linux_network/x6507.html

http://www.tldp.org/HOWTO/PPP-HOWTO/

2.3 Communication with the modem in applications

In the directory examples/serial the source-code terminal.c can be found. It lets you communicate with the modem directly over the serial line. By this, AT-commands can be issued and the modems answer seen.
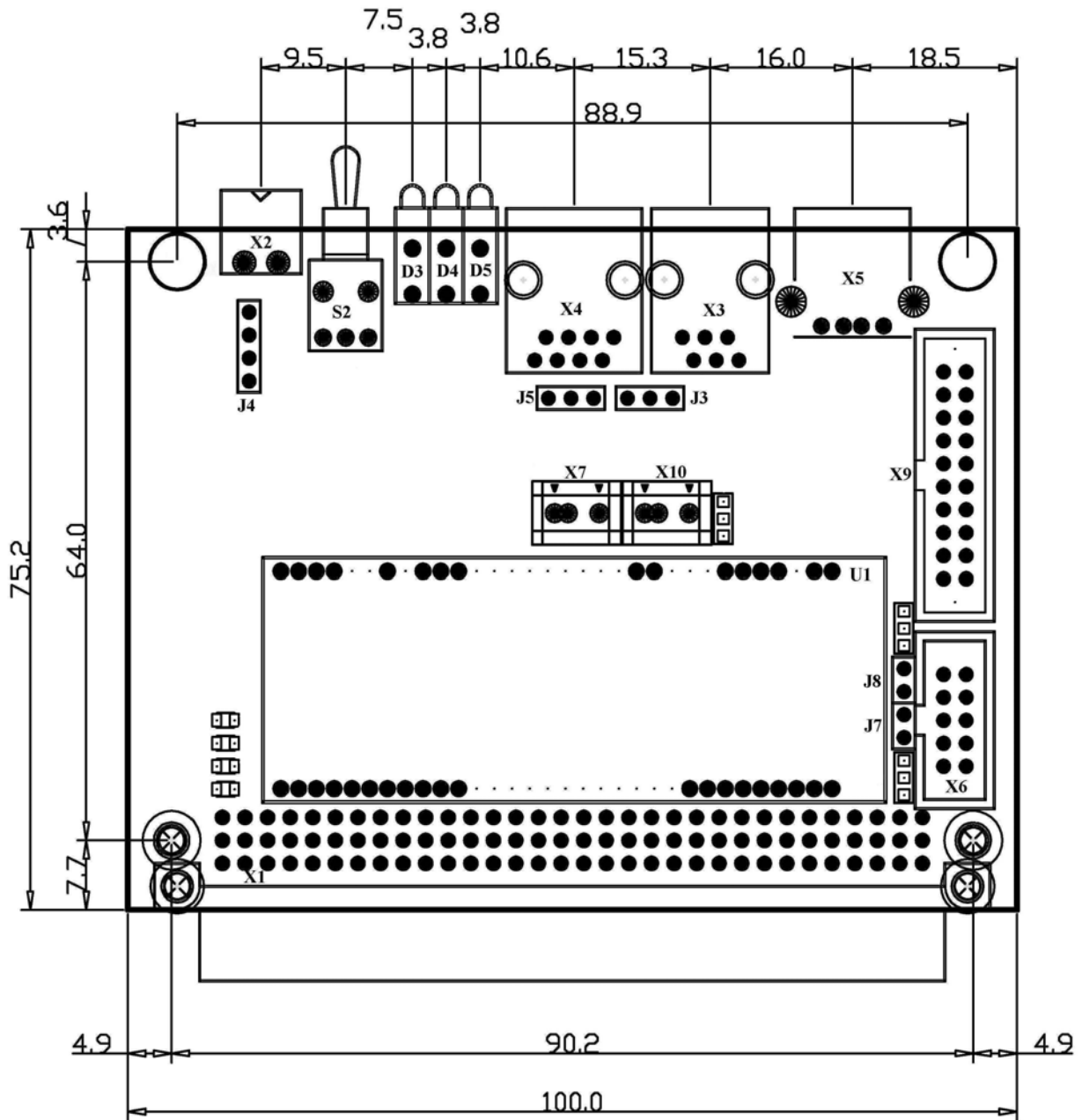
To compile it, just do in your development system:

```
gieselher:/develop/examples/serial# arm-linux-3.4.2-gcc -o
terminal terminal.c
```

After having it transferred to Portux (NFS, FTP ...) it can be used.

3. Technical Reference

3.1 PXB-Modem Layout

Drawing 1: PCB-Layout PXB-Modem

3.2 PXB-Modem Pin Assignment

X1 PXB

Portux Extension Bus, Assignment see Technical Reference Portux920T

X2 DC IN Jack

DC-In Jack, 6,5V to 35 V.

X3 PSTN (RJ11 Analog)

Pin	Assignment
1	NC
2	NC
3	TIP
4	RING
5	NC
6	NC

Table 1: Pin Assignment X3

X4 ISDN (RJ45)

Pin	Assignment
1	NC
2	NC
3	TX+
4	RX+
5	RX-
6	TX-
7	NC
8	NC

Table 2: Pin Assignment X4

X5 USB-HOST

X6 RS232-3 IF

Interface Header for USART2 of AT91RM9200. Levels are LVTTL (3.3V).

Pin	Assingment	PXB-Pin
1	VCC	-
2	-DSR	C23 (PA24)
3	-RI	A24 (PB08)
4	RXD	C24 (RXD2)
5	TXD	A25 (TXD2)
6	-DTR	C25 (PB02)
7	-RTS	A26 (PC14)
8	-CTS	C26 (PC15)
9	-DCD	A27 (PB09)
10	GND	-

Table 3: Pin Assignment X6

X7 Mini Spring-Cage Terminal Block DC-IN

X9 Pinheader

Pinheader X9 has SPI, USB-Host and USB-Device, TWI (I²C) and further I/O ports.

Pin	Assignment	PXB-Pin
1	HDMA	A14 (HDMA)
2	PC00	C14 (PC00)
3	HDPA	A14 (HDPA)
4	PC01	C15 (PC01
5	DDM	A16 (DDM)
6	DDP	C16 (DDP)
7	TWD	A17 (TWD)
8	TWCK	C17 (TWCK)
9	VCC	-
10	GND	-
11	MISO	A19 (MISO)
12	MOSI	C19 (MOSI)
13	SPCK	A20 (SPCK)
14	NPCS1	C20 (NPCS1)
15	PB27	A21 (PB27)
16	NCS7	C21 (NSC7)
17	PC05	A22 (PC05)
18	PB17	C22 (PB17)
19	NC	-
20	NC	-

Table 4: Pin Assignment X9

X10 Mini Spring-Cage Terminal Block VCC 5V/3.3V

3.3V from PXB or 5V from PXB-Modem, depends on J6 (default none)

J3

Terminate Resistor for RX- RX+ on ISDN-Bus

When the PXB-Modem is used as the final device on an ISDN-Bus, the use of terminating resistors is advisable.

1 and 2, none: Resistor inactive

2 and 3: Resistor active

J4

Turn off/on power regulator on PXB-Modem, test for jumper

Pin	Assignment
1	GND
2	OFF/-ON IC6
3	PC13
4	GND

Table 5: Pin Assignment J4

1 and 2: Power regulator always on

2 and 3: Power regulator can be switched on/off with I/O PC13.

3 and 4: Test for jumper (PC13 configured as input).

J5

Terminate Resistor for TX- TX+ on ISDN-Bus

When the PXB-Modem is used as the final device on an ISDN-Bus, the use of terminating resistors is advisable.

1 and 2, none: Resistor inactive

2 and 3: Resistor active

J7

Speaker

J8

Microphone

D3-D5 LED

LED	Assignment
Red	PC00
Green	PC01
Yellow	PB27

Table 6: Assignment LED to CPU Pin

U1

Pinheader for Socketmodem