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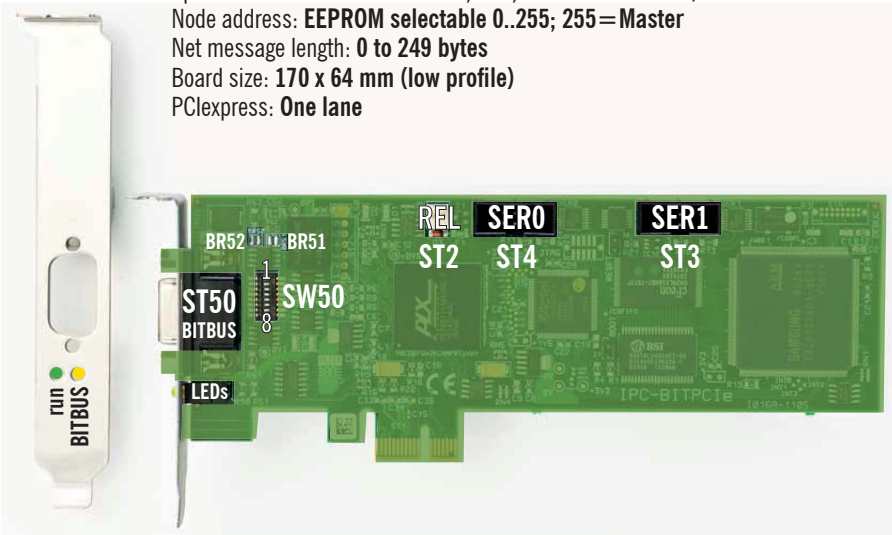
How to install the

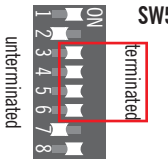
(Rev. 1105) Walter L. Giesler 26.9.2011

IPC-BIT<PCIE

BITBUS-PCI express board

Technical data:
BITBUS: **Isolated (500V) RS485 line driver, drives 32 standard loads**
Speed: **EEPROM selectable 62.5, 375, 750 and 1500 kBit/s**
Node address: **EEPROM selectable 0..255; 255=Master**
Net message length: **0 to 249 bytes**
Board size: **170 x 64 mm (low profile)**
PCIexpress: **One lane**





Board address and interrupts are set automatically by PCI-bus logic.

To set up the board as a standard BITBUS master or slave, only the following settings have to be checked - everything else is default:

Switch SW50: RS485 line termination

Switch 3, 4, 5, and 6 of SW50 to **ON** to add termination resistors at the extreme ends of a **physical** RS485 line. **Only there** termination is necessary, do not set these switches to ON at other locations even if the board is a master. All 4 switches have to be set alike.

The other 4 switches (standard half duplex: 1=ON, 2=OFF, 7=OFF, 8=ON) are used to switch the duplex operation, they must not be manipulated for standard BITBUS use.

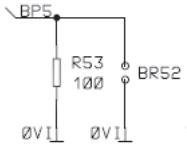
Use BAPImon to change speed or node address.

Signal ground direct/via 100 Ohm

Solder jumper BR52 (above the BITBUS connector, see front page) is used to select whether the RS485 ground line (pin 5 of the connector) gets connected directly to the isolated ground of the BIT<PCIe (jumper closed) or through a 100 Ohm resistor.

There are different ideas amongst experts as to what is most suitable for BITBUS - normal applications won't note a difference.

Default: open



*For **non-standard** applications **only** please consider the following settings*

RTS-level H-active: Open BR51 (Default: closed)

Full/half duplex mode (SW50)

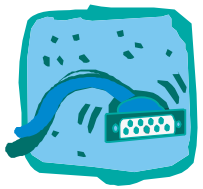
Half duplex means reception and transmission using the same wire pair, while the other wire pair can be used for RTS (active during transmit).

External amplifiers (repeaters) need RTS for direction control from the slave side. In full duplex nets all slave receivers are connected to the master's transmitter line.

For full duplex the switches at SW50 have to be inverted from the standard to read as follows:

1=OFF, 2=ON, 7=ON, 8=OFF.

BITBUS uses half duplex operation.

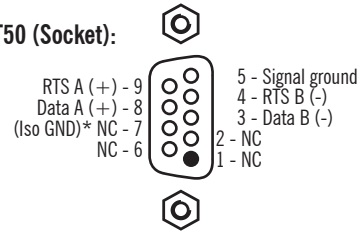


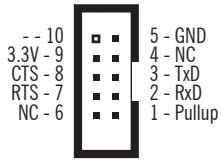
BITBUS

The BITBUS connection is realized through the sub-D-connector at the front bezel.

BEUG recommends using a socket for a master.

ST50 (Socket):





ST4: SER 0; ST3 SER1

Processor's internal asynchronous serial ports (SER1: mCAT programming port). **RS232 level**. Use flat cable to connect to sub-D9 plug. Pin numbers correspond to sub-D. Leave pin 10 unconnected on sub-D.

ST2: Relay driver

Transistor switch output for external relay. Switches pin 2 (left) to ground. Pin1 is 12V supply, fused at 50mA. Can be set from custom software, gets reset on RESET.

Software Setup

The board comes with the mCAT2 real time kernel (including the BITBUS driver) in Flash-EPROM. To be used as a BITBUS master or slave board, a native kernel mode driver is available for Windows NT and a WDM driver for Windows2000, XP, Vista, 7 both 32 and 64 bit. Up to 6 boards can be operated in parallel. The base address and interrupt are set by the PCI mechanism.

After successful initialisation the green LED at the front bezel will flash at a 1Hz frequency.
The yellow LED indicates transmission activity.

The board allows other real time tasks to be processed concurrently to the BITBUS master operation and independently from the PC, being BITBUS-related or for example using the serial ports to connect to other devices. The mCAT development package together with a C compiler are available at moderate cost. Large areas of the 2 MByte Flash-EPROM and the 512kByte RAM are available for user applications.