

# SBC 4020

Single Board Computer



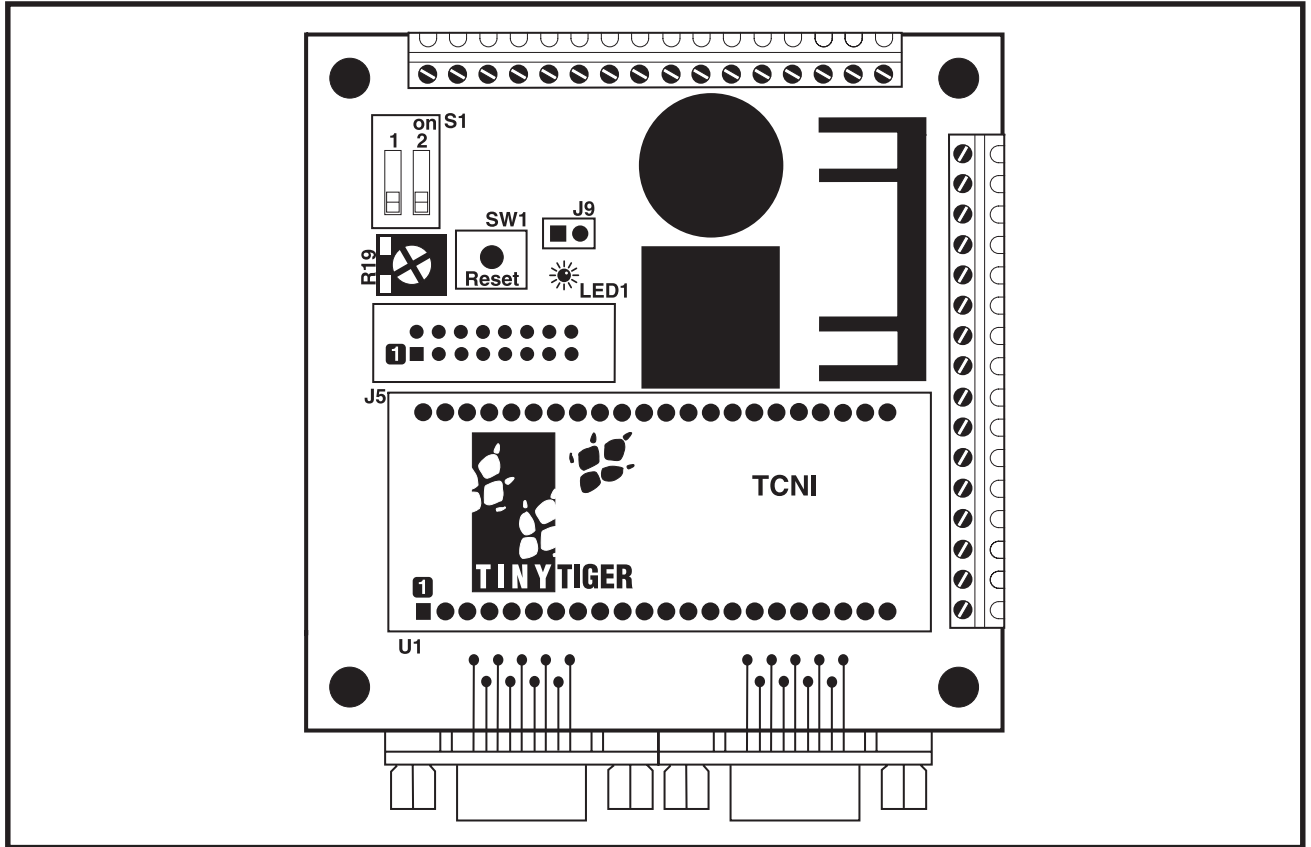
Technical Documentation



# SBC 4020

# SBC 4020

## Single Board Computer



The SBC 4020 is a well priced multitasking singleboard computer with low power consumption and small dimensions.

- Features:**
- Tiny Tiger Multitasking Computer
  - 9V - 24V Supply Voltage
  - Typical Power Consumption:
    - 1.8W @ 9V supply voltage
    - 4.8W @ 24V supply voltage
  - Up to 500h battery backup
  - 2 serial ports RS232
  - In-field programmable
  - Text LC display connector
  - 8 digital Tiger I/Os (5V)
  - 8 extended inputs 5V...24V with pull up resistors
  - 4 power FET outputs 60V/2A max.
  - 4 extended power FET outputs 60V/2A max.
  - All I/Os and supply voltage available at screw terminals
  - Dimensions: 80mm x 80mm x 31mm

**Description:** The Single Board Computer SBC4020 can be used for many applications because of its free programmability and small dimensions.

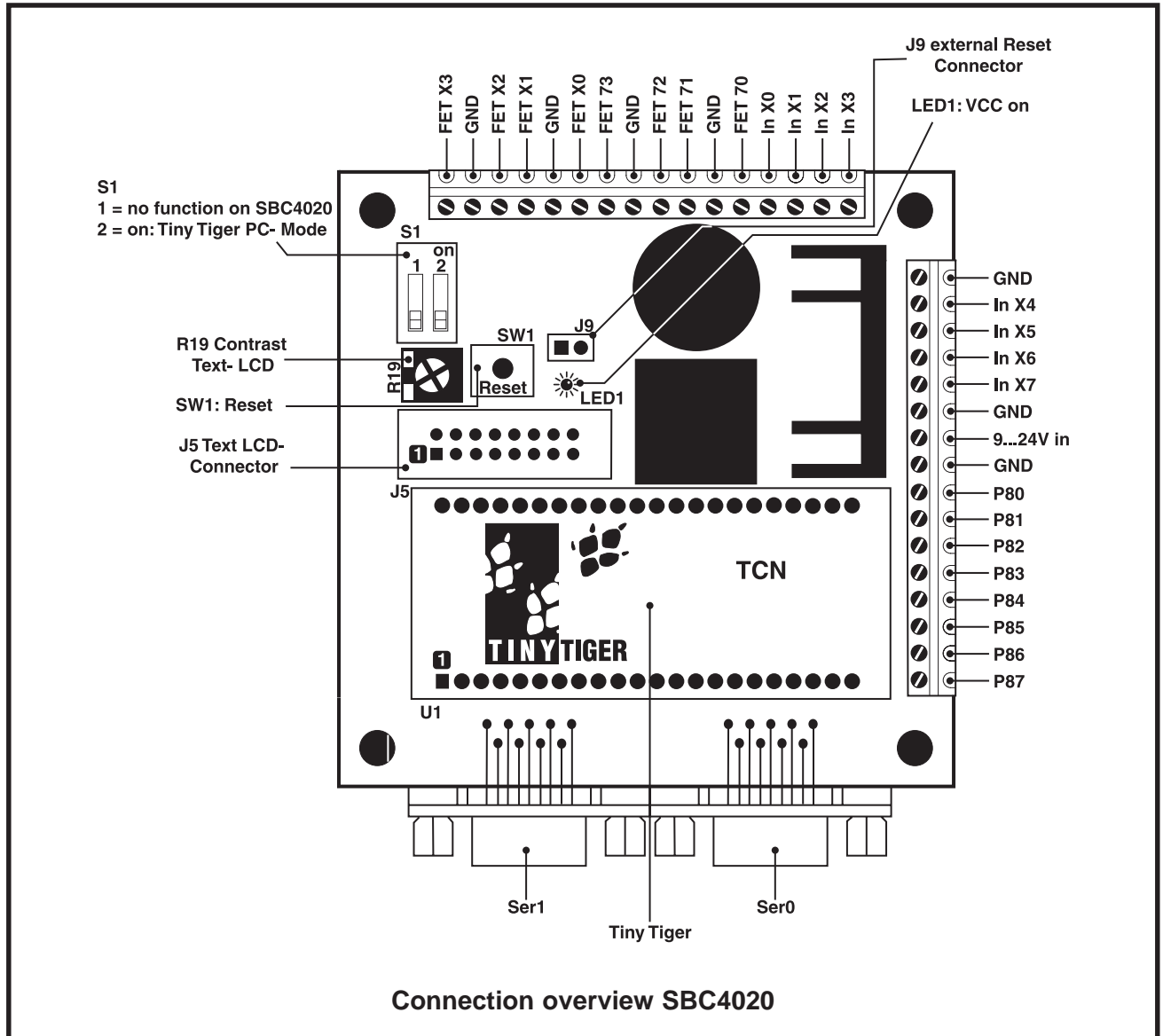
The rugged PCB contains 4 assembly holes (4.2mm) for easy fixing of the SBC4020. With onboard RS232, PC-Mode switch and reset button the SBC4020 can easily be reprogrammed in-field.

Screw terminals at all I/O ports and for connecting supply voltage as well as female DB9 connectors for the RS232 ports provide fast and simple connection.

**Note:** Because of the small dimensions there is no additional EMV protection on the SBC4020. EMV protection must be realized externally if needed.

# SBC 4020

## Single Board Computer

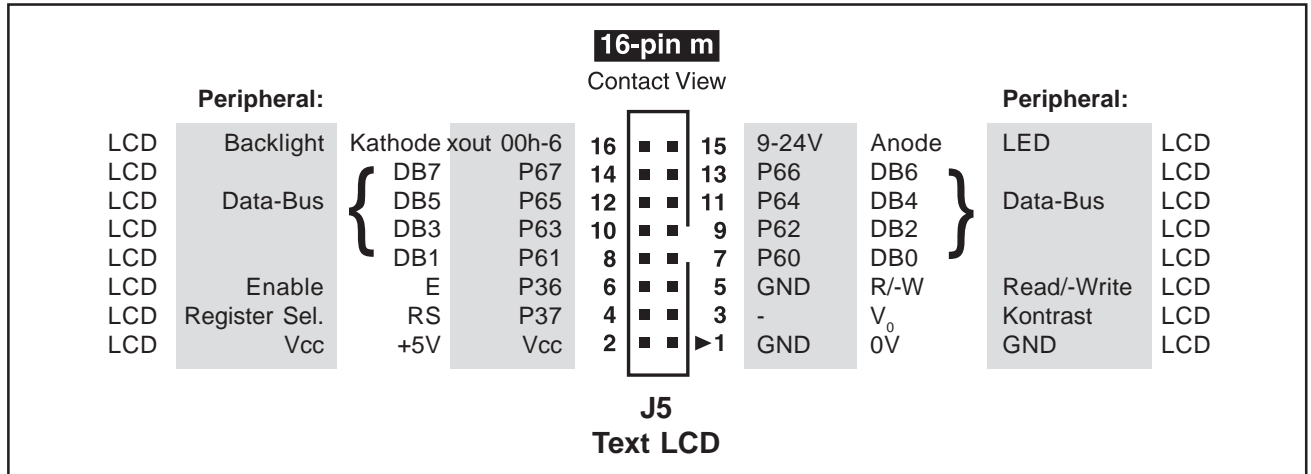


**Reset:** The reset can be triggered by the button SW1 directly onboard SBC4020. If it is necessary to reset the SBC4020 frequently, an external button can be connected to header J9. A connection between the two pins of J9 triggers the reset.

**PC-Mode:** If switch 2 of DIP switch S1 is switched to „on“, the Tiny Tiger on SBC4022 is switched to PC-Mode, e.g. for reprogramming Tiny Tiger or to run debug mode.

**Ser1:** Serial port Ser1 is used for debugging and programming the Tiny Tiger. Therefore Ser1 is always configured as RS232 port. In run mode Ser1 can be used as normal RS232 port.

**Ser0:** Ser0 is the second RS232 port. Ser0 needs handshake of RTS and CTS.



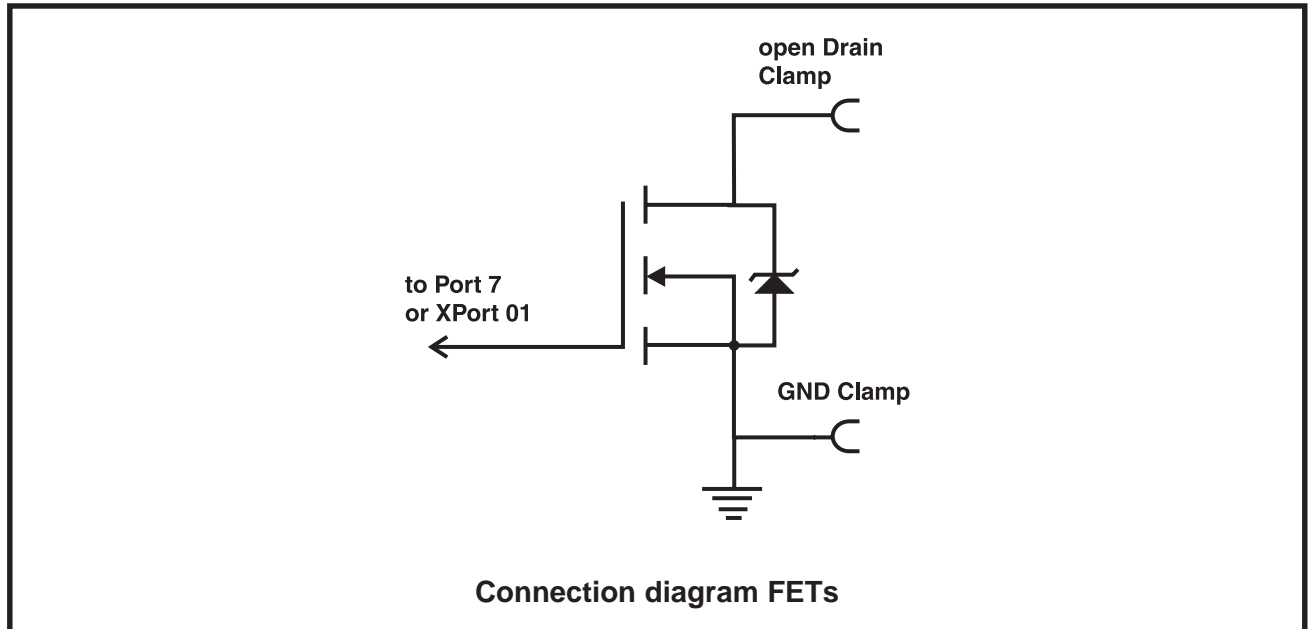
**Text LCD:** A 16-pin header on the SBC4020 offers a direct connection for a 4 x 20 text LC display. The text LCD uses Tiny Tiger ports as follows:

Port 6:	Address / Data port
Port 3, Pin 6	-Enable
Port 3, Pin 7	Register Select
x-Port 00 Bit 6	Backlight on/off

**Contrast:** The contrast of the text LCD is regulated with potentiometer R19.

**Note:** The anode of the LCD backlight is directly connected to the 9 - 24V power supply input of the SBC 4020. Because of this the backlight connection does not contain a resistor. A resistor must be installed externally in the LCD connection.

**Backup:** An onboard accumulator supplies real time clock and SRAM of the Tiny Tiger for up to 500 hours if SBC4020 is cut off external power supply. The accumulator will be re-charged within 13 hours.



### Screwterminals:

**GND:** 0V ground potential

**9...24V:** Supply voltage input 9...24V

**P80...P87:** These clamps are directly connected to port 8 of the Tiny Tiger. Port 8 is onboard connected to a 68k pull up resistor.

**Note:** P80...P87 are **directly** connected to the Tiny Tiger. Use only TTL signals. This port has no protection against higher voltages.

**In X0:** Extended input at XPort 01h Bit 0.  
**In X1:** Extended input at XPort 01h Bit 1.  
**In X2:** Extended input at XPort 01h Bit 2.  
**In X3:** Extended input at XPort 01h Bit 3.  
**In X4:** Extended input at XPort 01h Bit 4.  
**In X5:** Extended input at XPort 01h Bit 5.  
**In X6:** Extended input at XPort 01h Bit 6.  
**In X7:** Extended input at XPort 01h Bit 7.  
 The extended inputs are configured for high level voltage from +5V up to 24V and connected to pull up resistors. Reading the extended port may take place by the command: `[VARIABLE] = XIN (01)`. It will read the whole byte at XPort 01.

**FET 70:** Power MOSFET open drain output. FET will be conductive with high level at port 7 bit 0.

**FET 71:** Power MOSFET open drain output. FET will be conductive with high level at port 7 bit 1.

**FET 72:** Power MOSFET open drain output. FET will be conductive with high level at port 7 bit 2.

**FET 73:** Power MOSFET open drain output. FET will be conductive with high level at port 7 bit 3.

**FET X0:** Power MOSFET open drain output. FET will be conductive with high level at extended port 00 bit 0.

**FET X1:** Power MOSFET open drain output. FET will be conductive with high level at extended port 00 bit 1.

**FET X2:** Power MOSFET open drain output. FET will be conductive with high level at extended port 00 bit 2.

**FET X3:** Power MOSFET open drain output. FET will be conductive with high level at extended port 00 bit 3.

Hi level conductive N-channel MOSFETs, the connections on the PCB are capable for a current of  $I_{max} = 2A$  and a maximum voltage of  $U_{max} = 60V$ .

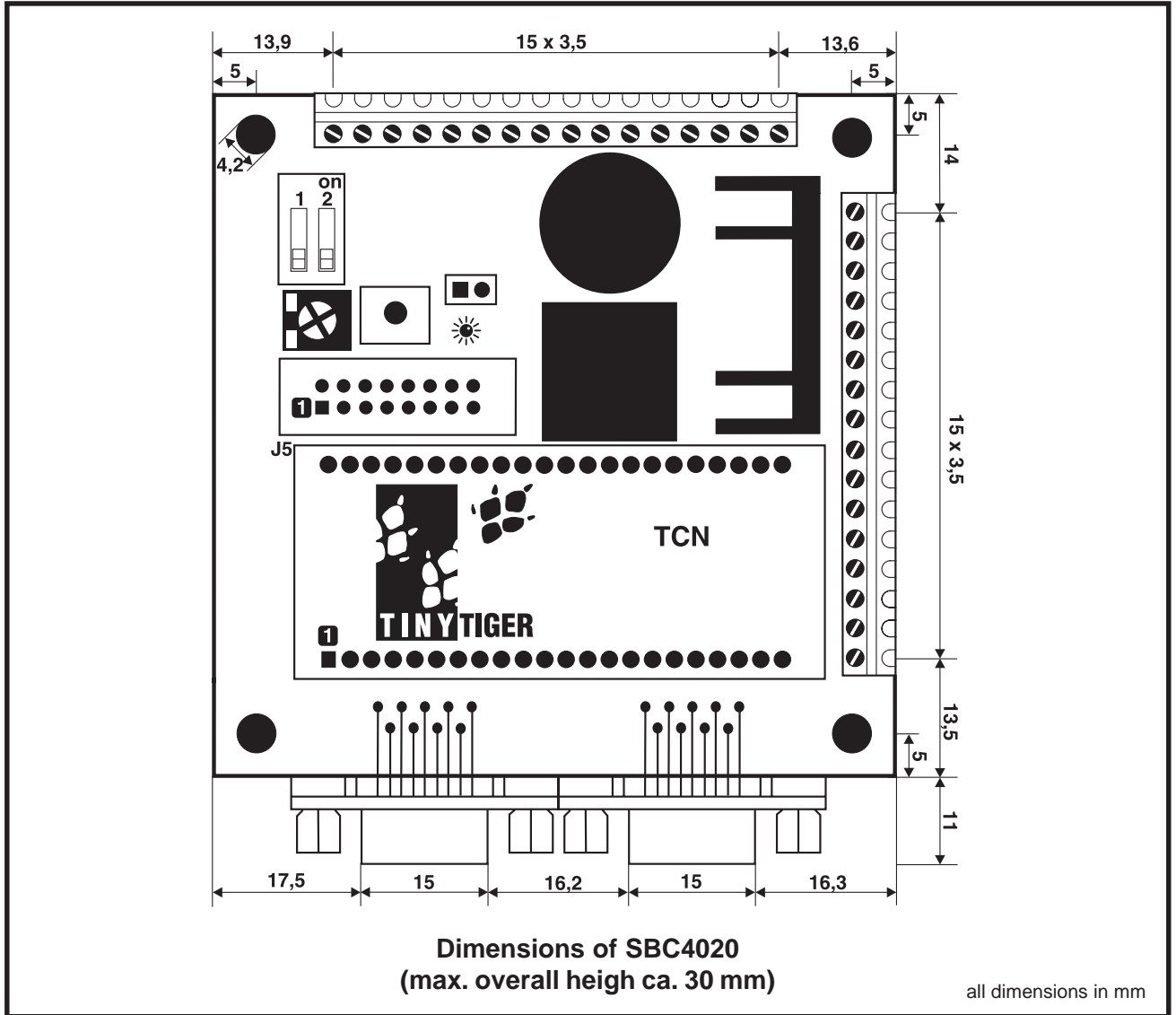
The FETs 70 to 73 are directly controlled by port 7.

The FETs X0 to X3 are controlled by the extended port 01. E.g. FET X0 is switched conductive by the command: `XOUT (01, 01h)`.

**Note:** The high current switched by the FETs must not be lead across the PCB. Always use the GND clamps next to the used FET outputs.

# SBC 4020

Single Board Computer



- |                         |                     |                  |
|-------------------------|---------------------|------------------|
| <b>Screw terminals:</b> | max. wire diameter: | 2mm              |
|                         | Screw:              | M2 $\cup$ 0.2 Nm |
|                         | stainless           |                  |
| <b>Weight:</b>          | 140 g               |                  |
| <b>Operating temp.:</b> | 0...40°C            |                  |