# SD-Card Adapter 1

Version of Product 1.4

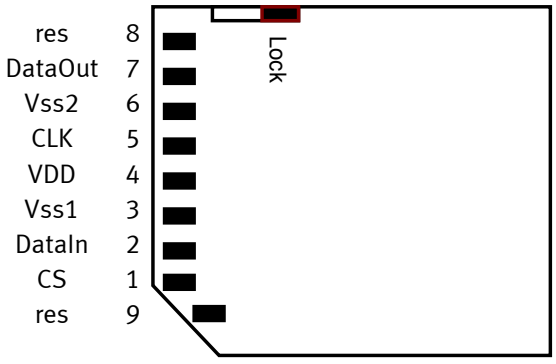
Technical Documentation

## 1 Introduction

The SD Memory Card provides application designers with a low cost mass storage device, implemented as a removable card, that supports high security level for copyright protection and a compact, easy-to-implement interface. Status LEDs signal the state of the card.

The SPI compatible communication mode is designed to communicate with a SD Memory Card. As any other SPI device the SD Memory Card SPI channel consists of the following four signals:

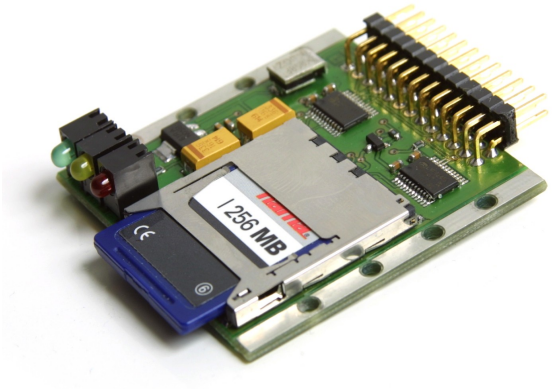
| | |
|---|---|
| CS: | Chip Select signal |
| CLK: | clock signal |
| DataIn: | Tiger to card data signal |
| DataOut: | card to Tiger data signal |




SD-Card (bottom)

## 2 Applications

- Data logger for storage of every kind of measurement data.
- Can be used for data transfer from / to your PC.
- Exchangeable storage device for log-files or thinks like that.



## 3 Features

This adapter is designed for using the SD-Card in applications with the SMC adapter. The board outline and the signal pins are compatible to the SMC adapter with using our BTI-ADAP-xxSMC Interface. So you can easily exchange the type of Card.

The SD-Card Adapter 1 can also integrated in your own hardware design. In this case you need only five free digital I/Os of the Tiger at least.

For reading and writing to the SD-Card you can free download our software with or without FAT system.

This software without FAT support need a TINY Tiger™ 1 / 4 at least. With FAT support you should use a TINY Tiger™ 4 / 4, or greater.

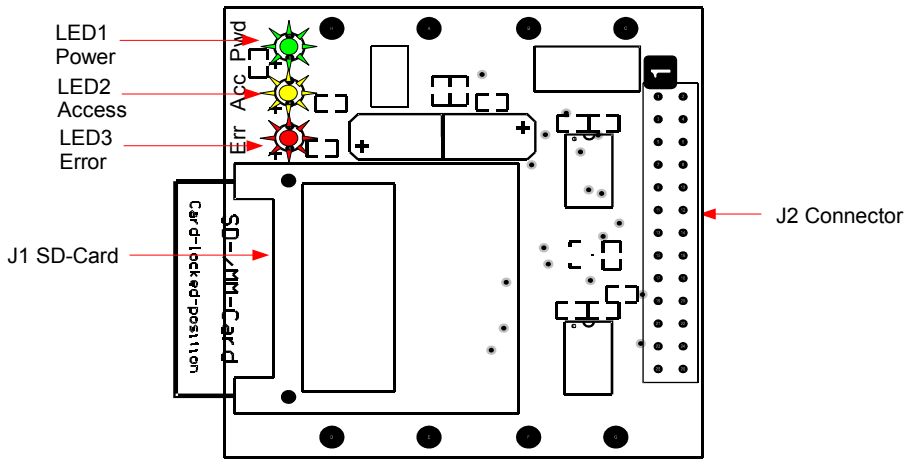
**Note:** By using FAT system the card capacitate is limited to 2GB. Please formated your SD-Card in FAT16 File system.

Technical Documentation

## 4 Contents

# SD-Card Adapter 1

Version of Product 1.4




## 5 Connectors and Status LEDs

### 5.1 SD-Card Reader J1

Here you can plug in your SD-Card.

Please don't remove, if the card is mounted and Access LED is light.

Card detection and write protection are prompted as digital outputs on connector J2. A low at card detection pin means the card is detected. A high at write protection pin means the card is write protected.

### 5.2 Connector J2

The connector J2 is the interface to your application. Please don't use cable longer then 0.5 meter.

For minimal function you have to connect ***SPI_MiSo***, ***SPI_MoSi***, ***SPI_Clk***, ***Chip selection*** and ***Power on*** to a digital I/O of the Tiger. You have to use the same port of the Tiger for the lines of the **SPI**. **Chip selection**, **Power on** and other optional signals can be connected to an other port of the Tiger. ***Write protection*** and ***Card detection*** can be switched off by software.

If using our **BTI-ADAP-xxSMC** Interface, you can directly connect it to the SD-Card Adapter 1. Use in your source code our pin definition with

```
#define SD_ADAPTER1
```

**Note:** In case of using our **BTI-ADAP-xxSMC** Interface the graphic LCD is not available!

The signals are listed in the following table:

| | | | | |
|---|---|---|---|---|
| GND | 1 | 2 | Vcc |
| Error LED | 3 | 4 | Chip selection |
| SPI_MiSo | 5 | 6 | SPI_Clk |
| SPI_MoSi | 7 | 8 | n.c. |
| n.c. | 9 | 10 | GND |
| n.c. | 11 | 12 | n.c. |
| n.c. | 13 | 14 | n.c. |
| n.c. | 15 | 16 | n.c. |
| n.c. | 17 | 18 | n.c. |
| GND | 19 | 20 | n.c. |
| GND | 21 | 22 | n.c. |
| Card detection | 23 | 24 | n.c. |
| Power on | 25 | 26 | Write protection |

Connector J2

### 5.3 LED 1 Power

The green Power LED light up if the SD-Card is powered on. An on board PolySwitch fused the SD-Card Adapter. So an external fuse is not necessary.

### 5.4 LED 2 Access

The yellow Access LED light up by read or write access. The LED is connected to signal ***chip selected*** of the Card.

### 5.5 LED 3 Error

The red Error LED is designed for signal every kind of error by using the SD-Card. It can be disabled by software.

## 6 Used Tiger Pins

| *Pin No* | *direction* | *signal* | *description* |
|---|---|---|---|
| L80 | output | SPI_clk | SPI clock line |
| L81 | input | SPI_MiSo | SPI data in |
| L82 | output | SPI_MoSi | SPI data out |
| L83 | output | Err_LED | Sign a error |
| L84 | | not use | - |
| L85 | | not use | - |
| L86 | output | OE | Chip selection |
| L87 | | not use | - |

**Note:** This table is only true for using our BTI-ADAP-xxSMC Interface! You can do your own pin mapping for your application.

## 7 Used Extended Port Addresses

| *Portaddress* physical address | *bits* | *Used for:* |
|---|---|---|
| 00F8 hex | 0<br>1<br>2<br>3<br>4<br>5<br>6<br>7 | -<br>-<br>Card detection<br>-<br>Write protection<br>-<br>-<br>- |
| 00F9 hex | 0<br>1<br>2<br>3<br>4<br>5<br>6<br>7 | -<br>-<br>-<br>-<br>-<br>-<br>Power on<br>- |

**Note:** This table is only true for using our BTI-ADAP-xxSMC Interface! In user application x-port addresses not recommend.

# 8 Technical Specification

## 8.1 Absolute maximum Ratings

(beyond which permanent damage may occur)

| | |
|---|---|
| maximum supply voltage Vcc<br>(in respect of GND) | 6.5V DC |
| input voltage at digital input | -0.3...30V DC |
| operating temperature | -20°C...80°C |

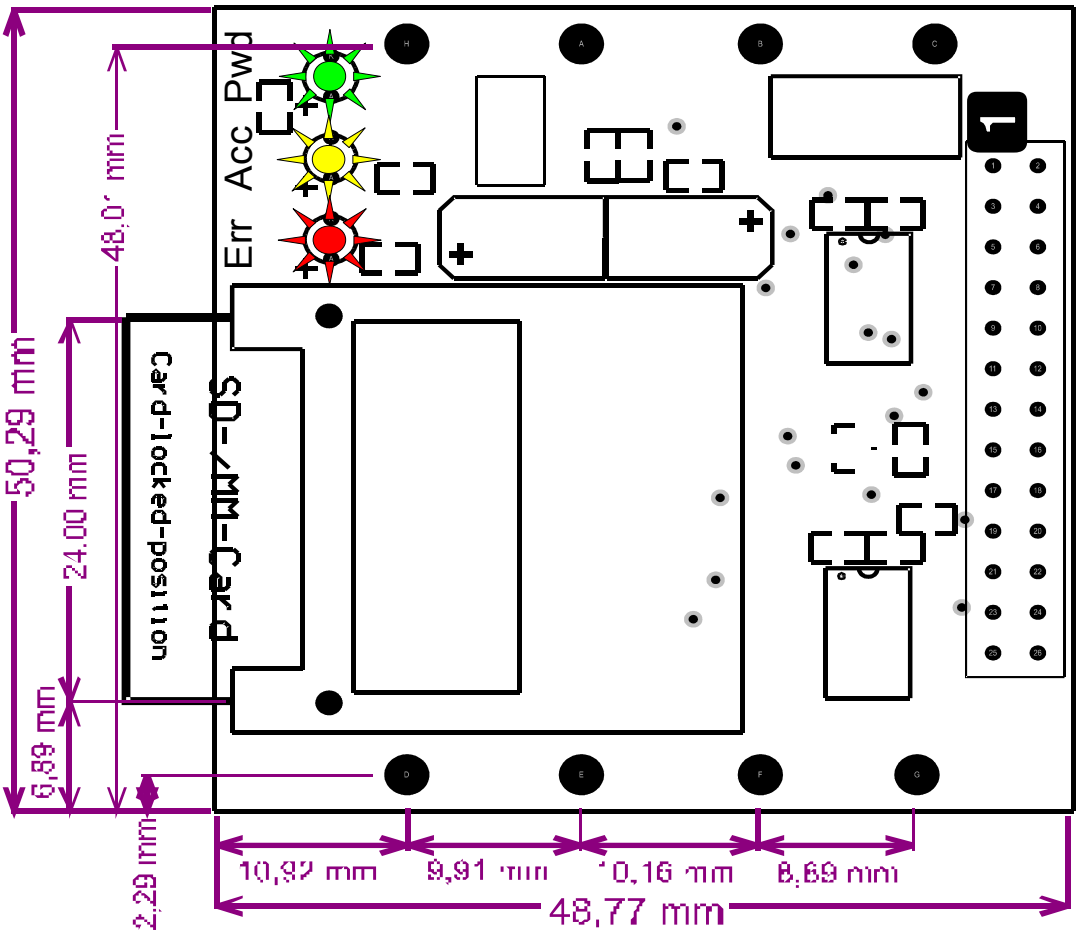
## 8.2 Electrical Specifications

| | |
|---|---|
| supply voltage U_in | 5V DC |
| supply current<br>at 5V input voltage | 15mA |
| FUSES: | |
| F1 | MiniSMD<br>0.14A |

Technical Documentation

### 8.3 Mechanical Specifications

#### 8.3.1 Board Dimensions



## 9 Document History

| *Version of Documentation* | *Version of Product* | *Description / Changes* |
|---|---|---|
| V001 | V0.0 | preliminary version |
| V002 | V1.0 | preliminary version |
| V003 | V1.1 | Add features |
| V004 | V1.2 | Final version |
| V005 | V1.3 | Correction Schematics |
| V006 | V1.3 | Add description |
| V007 | V1.4 | Change Fonts |