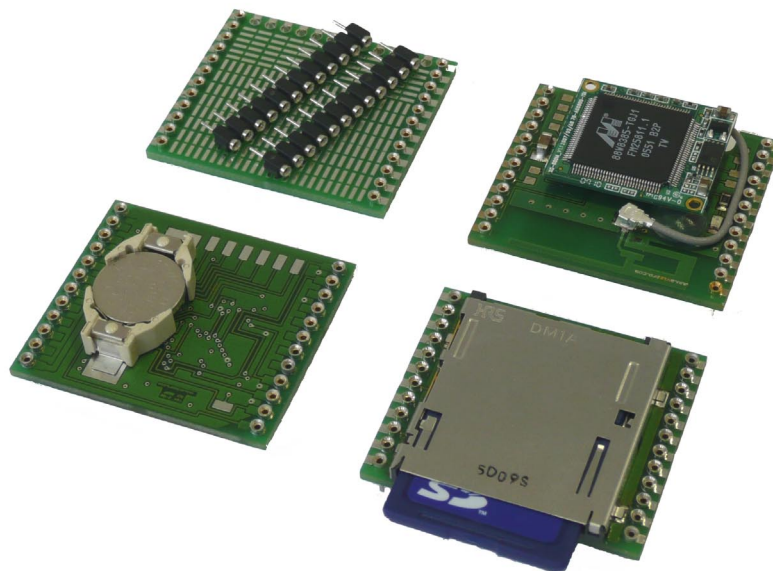


# HARDWARE MANUAL

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## Avisaro 2.0 Base and Trailer Modules



Version 1.0  
2007.11.21

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**CHANGE HISTORY**

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2007-09-01		Initial version

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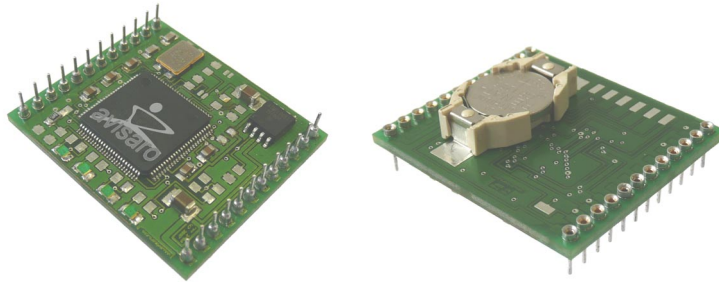
## INTRODUCTION

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This document describes the following products:

### BASE MODULE

The Avisaro 2.0 Base Module contains the main processing power to drive the WLAN or SD-Card trailer modules. The Base Module is designed to piggyback the Trailer Modules.



*reverse side shows the processor, top side shows the optional battery for real time clock*

### WLAN TRAILER MODULE

The Avisaro 2.0 WLAN Trailer Module contains the WLAN 802.11 b/g module, an internal antenna and connectors for external antennas.



*WLAN Trailer module, piggybacked with the Base Module*

### SD-CARD TRAILER MODULE

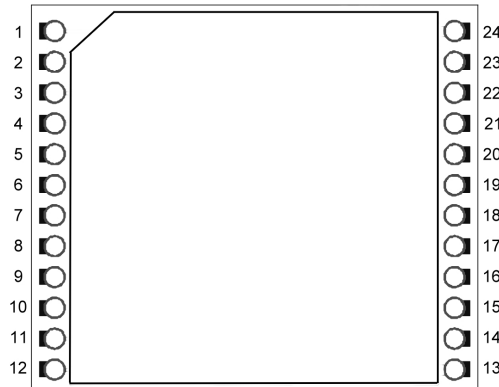
The Avisaro 2.0 SD-Card Trailer Module is equipped with a push/push slot for SD memory cards and can be piggybacked onto the Base Module.



*SD-Card Trailer module piggybacked with the Base Module*

## PIN LAYOUT

The Base Module and the Trailer Modules have the same footprint and pin layout. The pin functionality however varies from configuration to configuration. The active configuration is set via CS-Card, WLAN or wired interface (see ...):

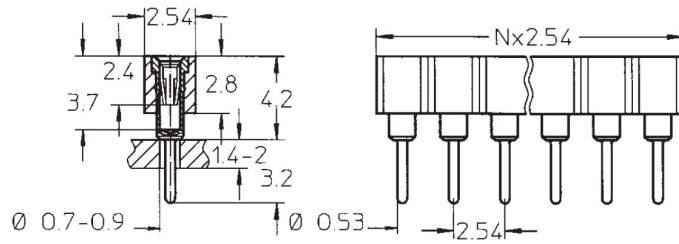


The following configurations for the Base Module are pre-defined (see the following paragraphs for details):

Config name	Active interfaces	Description
RS232-1	RS232, IO pins for status indication and control	Enables the full featured RS232 interface. All control lines (RTS, DCD,... are active). Status indication with 2 LEDs and 1 control key.
RS232-2	2x RS232	Two RS232 lines are active
SPI-1	SPI, IO pins for status indication and control	The high speed SPI connection is active. The Avisaro Module is in SPI slave mode.
I2C-1	I2C	The I2C (slave) interface is active.
CAN-1	CAN, IO pins for status indication and control	CAN Interface is enabled. Status indication with 2 LEDs and 1 control key.
CAN-2	2x CAN	Two CAN interfaces are active

## MATCHING CONNECTOR

The connector used at the Avisaro 2.0 is a male PCB single row connector with solder tail. A grid of 2.54 mm is used. The Avisaro Module can be soldered into the application, or plugged using a suitable PCB connector.



The matching connector is a high-precision female headers soldering technique. Those connectors are widely available.

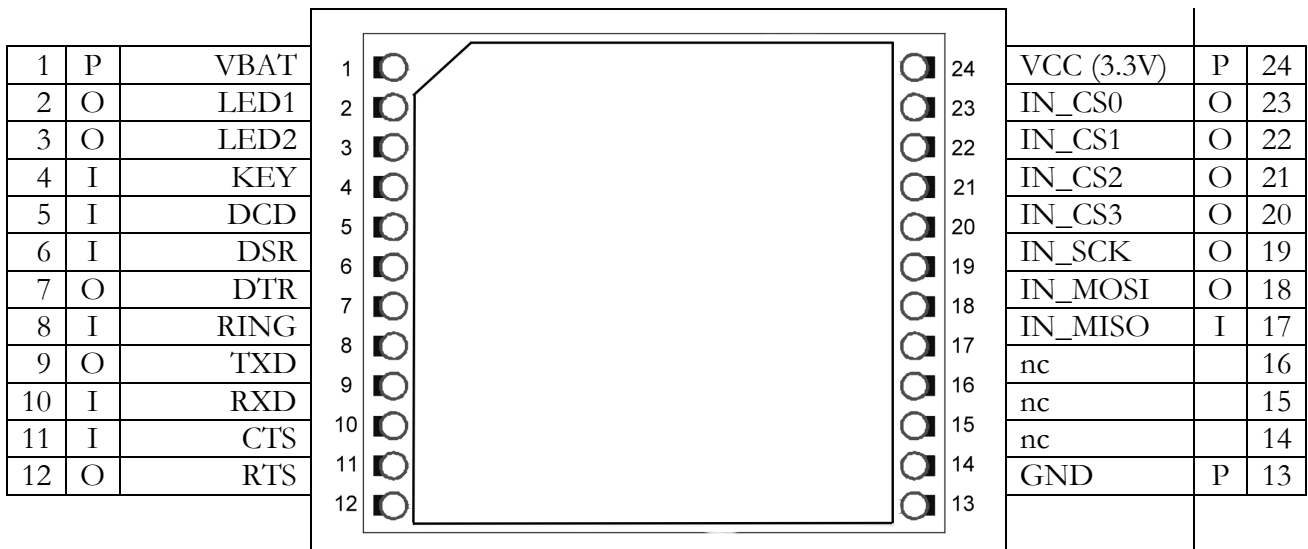
Example: MK01 from Fischer Elektronik: [www.fischerelektronik.de/index.php?id=118&L=1](http://www.fischerelektronik.de/index.php?id=118&L=1)

The parameters of the mating connector should be:

- plug-in cross-section Ø 0.5
- no. of contacts 12 for each side
- number of rows 1
- grid 2.54 mm

**BASE MODULE: CONFIG: RS232-1**

This configuration is the preferred one for the RS232 data logger and device server products.



*P': Power, T': Input, 'O': Output, 'B': Bidirectional*

VBAT: Battery Supply for the real time clock. See chapter ... for details

LED1: Module is up and running

LED2: Module is working (transmitting data)

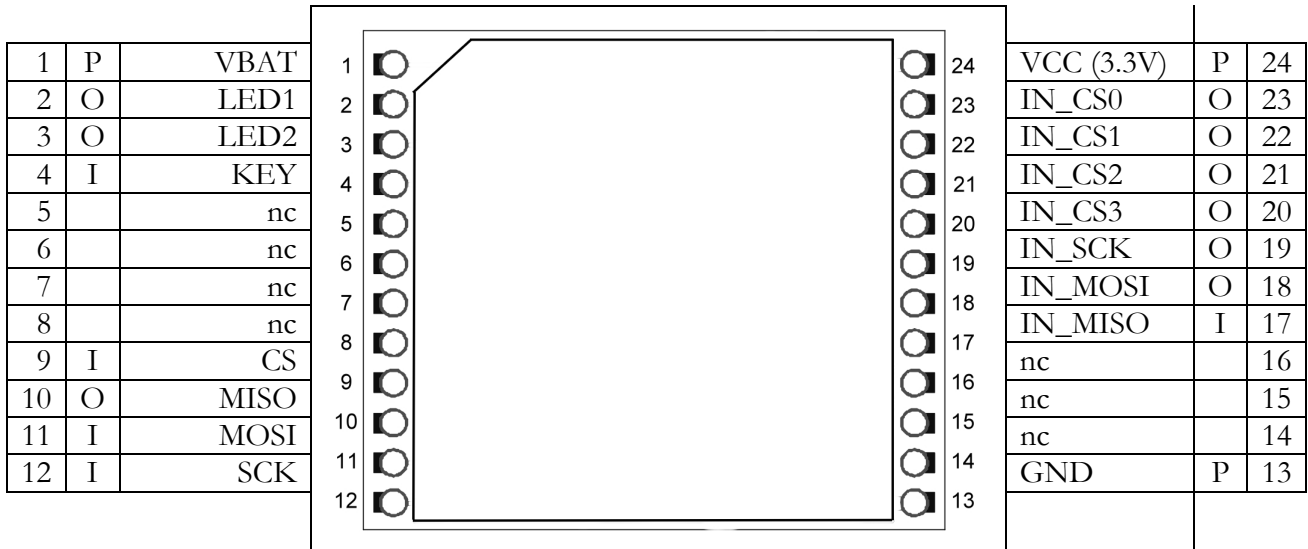
KEY: Stop current action. Start defined action (data logging, WLAN transmittion)

TXD, RXD, ....: RS232 connection

IN\_\*: Internal SPI bus to connect trailer modules

**BASE MODULE: CONFIG: SPI-1**

This configuration is ideal for high speed data transfer. Modules is SPI slave.



*P': Power, T': Input, 'O': Output, 'B': Bidirectional*

VBAT: Battery Supply for the real time clock. See chapter ... for details

LED1, LED2, KEY: see description in RS232 config

CS, MISO, MOSI, SCK: SPI bus to user application

IN\_\*: Internal SPI bus to connect trailer modules

**BASE MODULE: CONFIG: CAN-1**

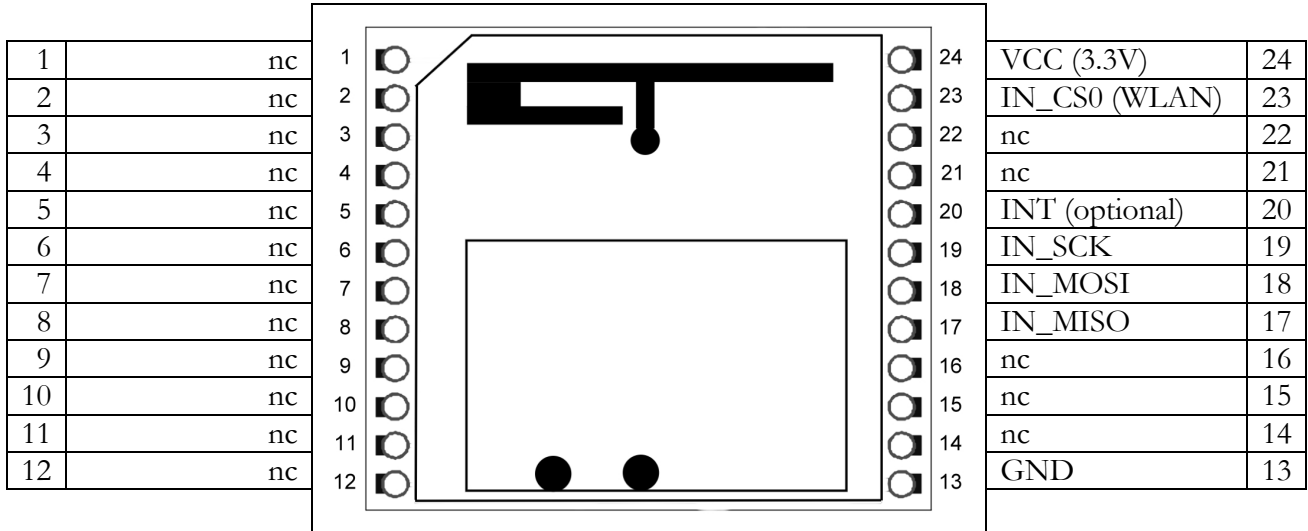
Description follows.

**BASE MODULE: CONFIG: CAN-2**

Description follows.

### WLAN TRAILER MODULE

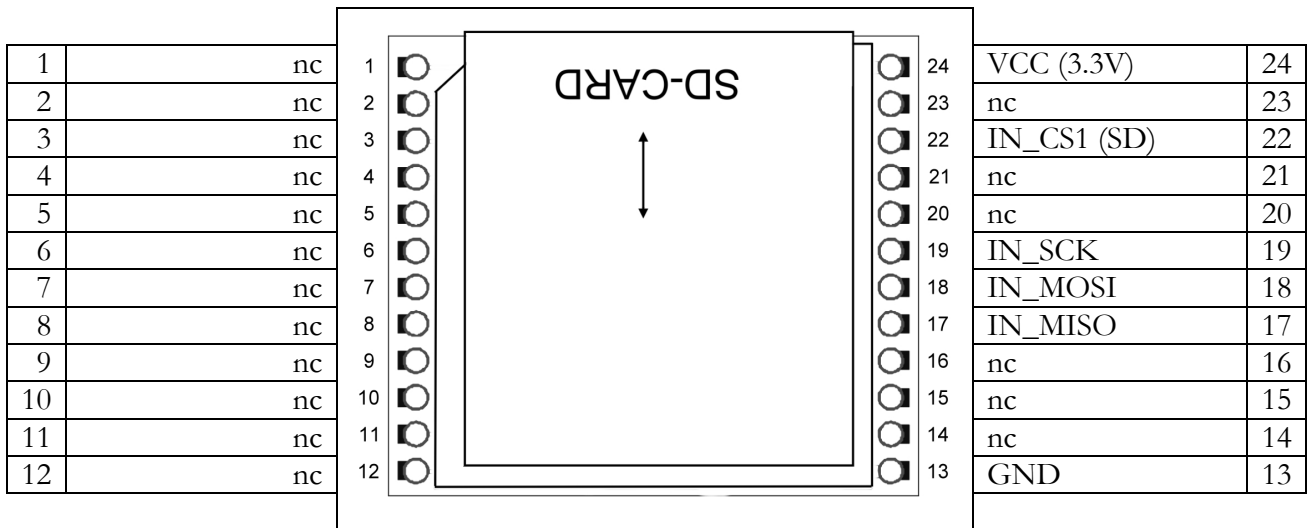
The WLAN Trailer Module only requires a connection to power supply and to the internal SPI bus of the Base Module. The interrupt line (INT) is optional.



IN\_\*: Internal SPI bus to connect trailer modules

### SD-CARD TRAILER MODULE

The SD-Card Trailer Module only requires a connection to power supply and to the internal SPI bus of the Base Module.



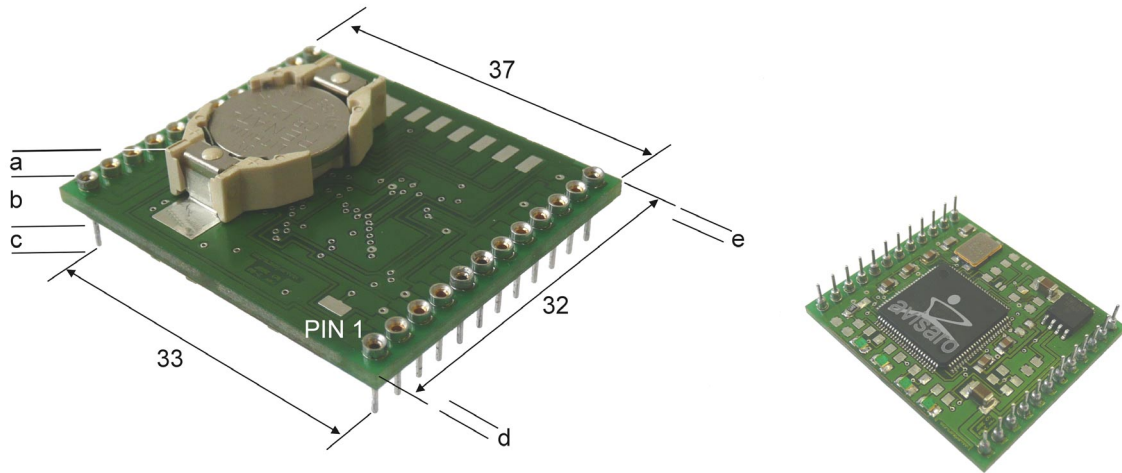
IN\_\*: Internal SPI bus to connect trailer modules

## DIMENSIONS

Base and Trailer Modules have the same outer dimensions unless otherwise stated. All modules differ in height.

### BASE MODULE

The battery shown is optional. Supply for the real time clock can be provided via one pin if needed.



*Dimensions of the base module without trailer modules attached*

b: relevant height of module: 4mm

c: length of solder pin: 3mm

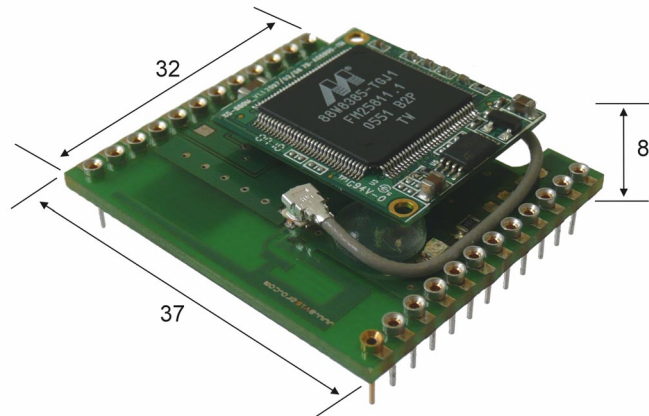
a: extra relevant height if battery is used: 3mm

d: front edge to center of pin 1: 2mm

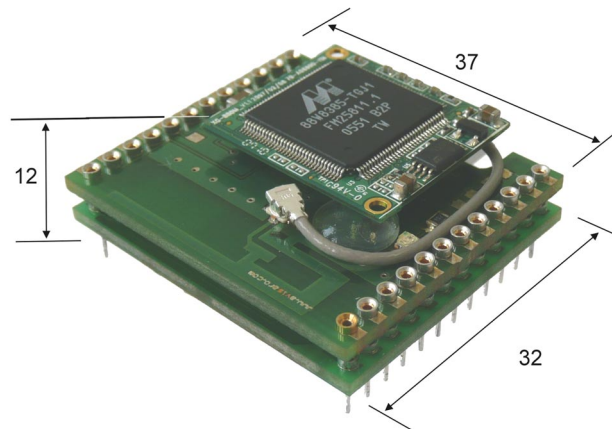
e: back edge to center of pin 12: 1.5mm

### WLAN TRAILER MODULE

The WLAN Trailer Module has the same footprint as the base module. Stacked onto the base module, the complete unit comes to a height of 12 mm. As a stand alone module, it comes to 8 mm.



*WLAN Trailer module without base module. With cable connection for internal antenna*



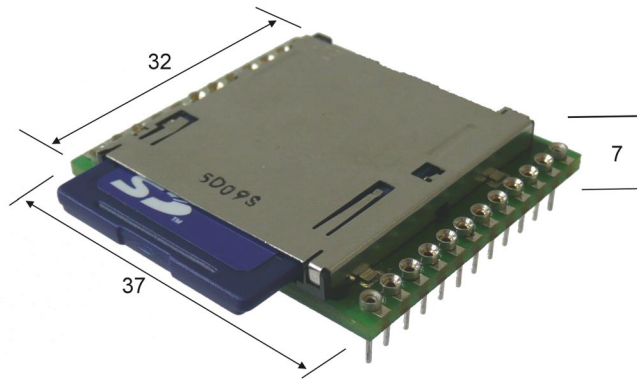
*WLAN Trailer module including the base module*



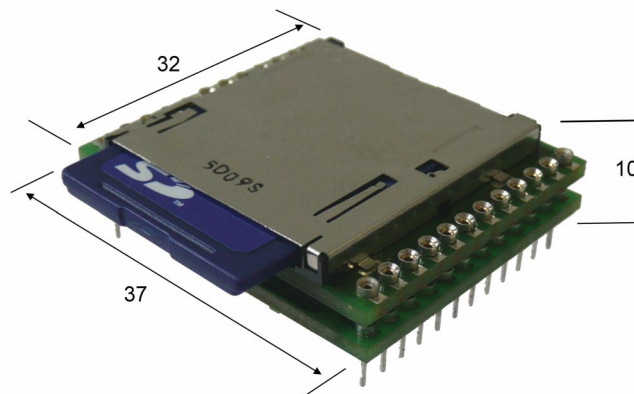
*The reverse side with the U.FL antenna connectors*

### **SD-CARD TRAILER MODULE**

The SD Card Trailer Module has the same footprint as the Base Module.



*SD-Card Trailer module without the Base Module*

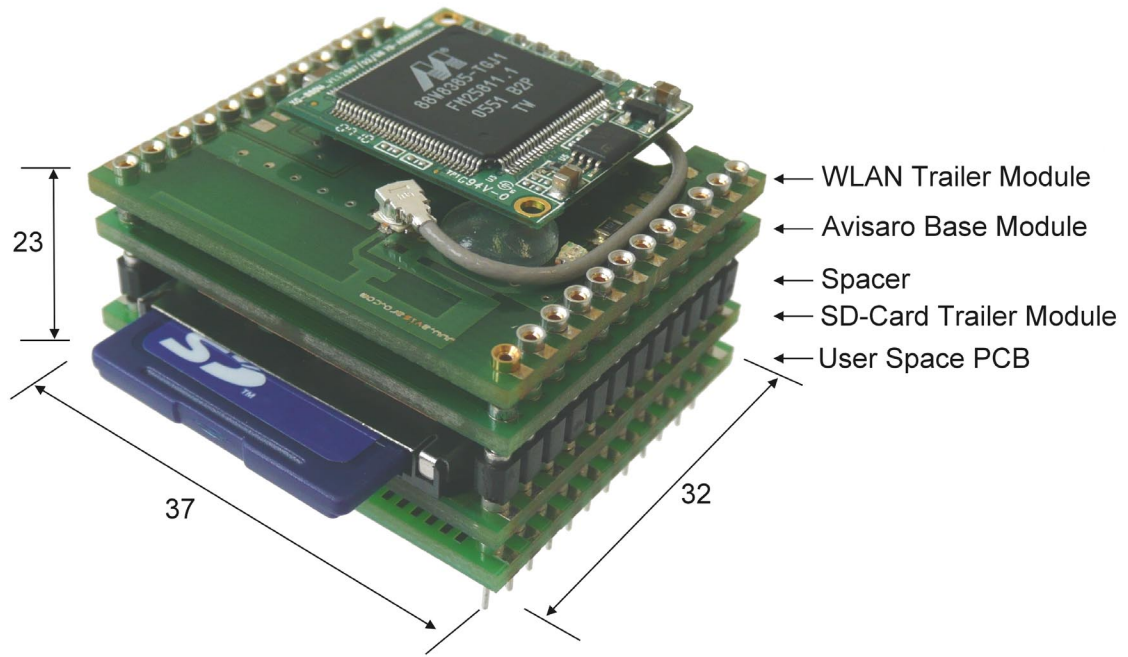


*SD-Card Trailer module stacked on Base Module*

### **EXAMPLE: ALL MODULES STACKED**

The Avisaro stacking system allows to build full featured systems by simply adding functionality. This example shows (bottom to top):

- 1) User PCB – i.e. user specific IO drivers, interface boards, ...
- 2) SD-Card Trailer to read and write SD Memory Cards
- 3) Spacer to give base module enough distance. These are simple 2.54 precision type PCB connectors.
- 4) Base Module with all the drivers and smartness to operate the SD-Cards, WLAN interface and user logic.
- 5) WLAN Trailer module to communicate wirelessly.



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## FIRMWARE UPDATE

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The firmware of the Avisaro Base Module can be updated to add newly released features or to correct bugs. There are three ways to update the firmware: 1) Using the data interface (i.e. RS232) 2) using a SD memory card 3) using the web interface.

**Attention: Do not interrupt a firmware update process. Make sure power supply is stable. A firmware update always has the risk of leaving the module in a non-functional state.**

### FIRMWARE UPDATE USING A SERIAL CONNECTION

Not implemented yet.

### FIRMWARE UPDATE USING WEB INTERFACE

Not implemented yet.

### FIRMWARE UPDATE USING A SD MEMORY CARD

To perform a firmware update using a SD memory card, follow the steps:

- 1) Copy the firmware image on a SD memory card. The name of the firmware typically looks like “aviup001.frm”. You find the latest version on the [www.avisaro.com](http://www.avisaro.com) home page. Usually, the downloaded firmware is zipped – use your preferred unzip program.’ Create a file “autorun.txt” on the same SD card. This file contains commands to be executed after power up. Fill this file with the following commands:
  - loadfw aviup001.frm
  - progfw
- 2) Switch off the Avisaro module. Insert the SD card.
- 3) Switch on the Avisaro module. The process will be started by first loading the firmware into the module (loadfw) and than performing the firmware update (progfw). The process can be supervised by observing the LEDs on the base module. A flashing red LED signals a ongoing process. A solid red and green LED signals finished process.
- 4) Switch off the module, take out SD Card. Remove the files to avoid an accidental firmware update.

Alternatively to using the autorun.txt file, the commands can be entered using the command line interface.