SDCM3_5 Spectrometer Processor

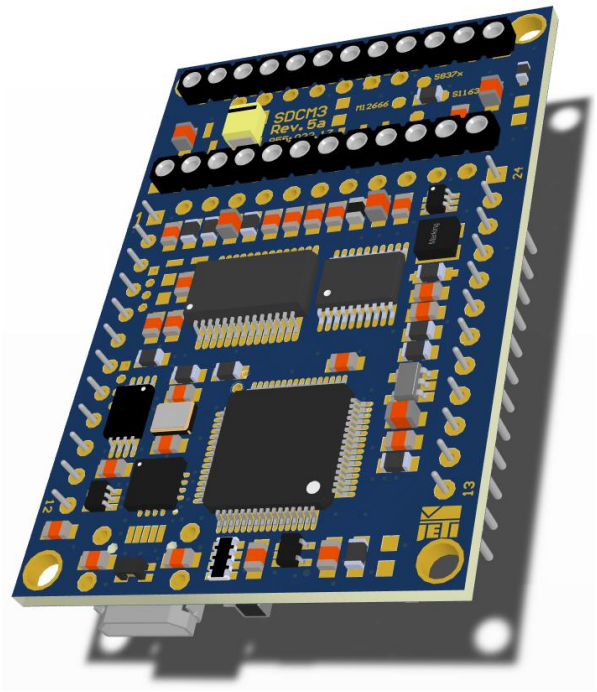
The **SDCM3_5** spectrometer processor electronics is a versatile powerful 32-bit RISC processor-based operation electronics for miniature spectrometers.

It can control several CMOS and InGaAs linear imaging arrays and supports useful additional functions.

It's ideally featured for embedded or mobile spectroscopic applications.

The SDCM3 spectrometer processor electronics has the following advanced features:

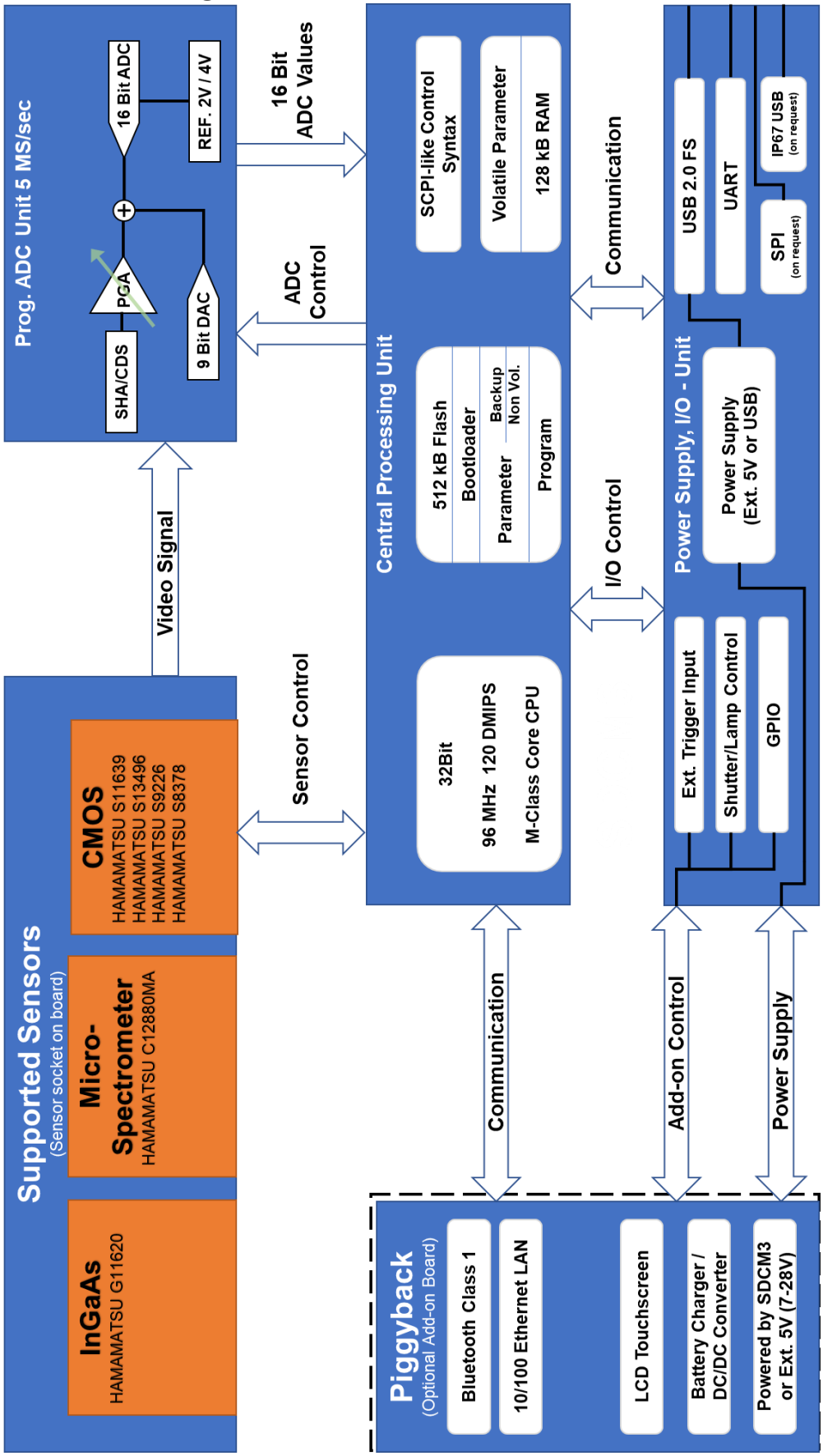
- 96 - MHz MIPS 4 K core-based RISC CPU with 512 kB flash program memory and 128 kB RAM
- Possibility of in field programming by integrated bootloader via the communication interfaces, which allows easy updating of firmware
- Firmware, that can be used in general application or user specific OEM applications in spectroscopy.
- SCPI like control syntax for setting operation parameters, configuration, measurement, data format, endianness, etc.
- 16 bit 5 MS/s ADC with programmable offset correction and gain
- Power supply via USB, external 5V, optional Battery or optional external 7-28V all with automatically switch over
- Power down feature by SCPI command to reduce the current consumption, useful in mobile, battery powered devices
- USB Full Speed communication interface with up to 3 Mbit/s via virtual COM port driver
- LV-TTLUART communication interface 8N1, 3 000 000, 1 000 000, 921 600, 230 400, 115 200 or 38 400 bit/s
- Digital trigger input LV-TTL
- Shutter/lamp control output LV-TTL
- SPI master or slave communication interface with up to 20 Mbit/s, mode 0, 1, 2 or 3 (application specific OEM solution)
- 5 V power supply output (from USB/USB-Charger with up to 300/1000 mA)



- Optional: microSD card (FATS formatted) for storing user data (e.g. for linearization, stray light compensation etc.) and measurements (with timestamps, needs RTCC)
- Optional: real time clock / calendar (RTCC) for time keeping with Li coin cell CR1216...CR1225
- Optional: output for high speed piezo actuator (for mechanical shutter)
- Optional: detached imaging array
- **Optional add-on piggy back board with:**
  - Bluetooth 2.1 + EDR Interface Class 1 (up to 100m range)
  - 10/100Mbit Ethernet module using TCP/IP protocol
  - Li-polymer battery charger from USB-Power.
  - DC/DC converter from Li-ION battery (5 V and 3.3 V Output)
  - PWM output with 5V or programmable current up to 150mA (e.g. for Laser diode, LED as Light source etc.)
  - 4 Status-LED's for PowerOn, BatCharge, BatLow and BluetoothCon
  - External Power Supply 7-28V
  - Reset-Button
  - FPC 10 pin connector for graphical touch screen color-LCD (SK-FT 834) WQGA (application specific OEM solution)

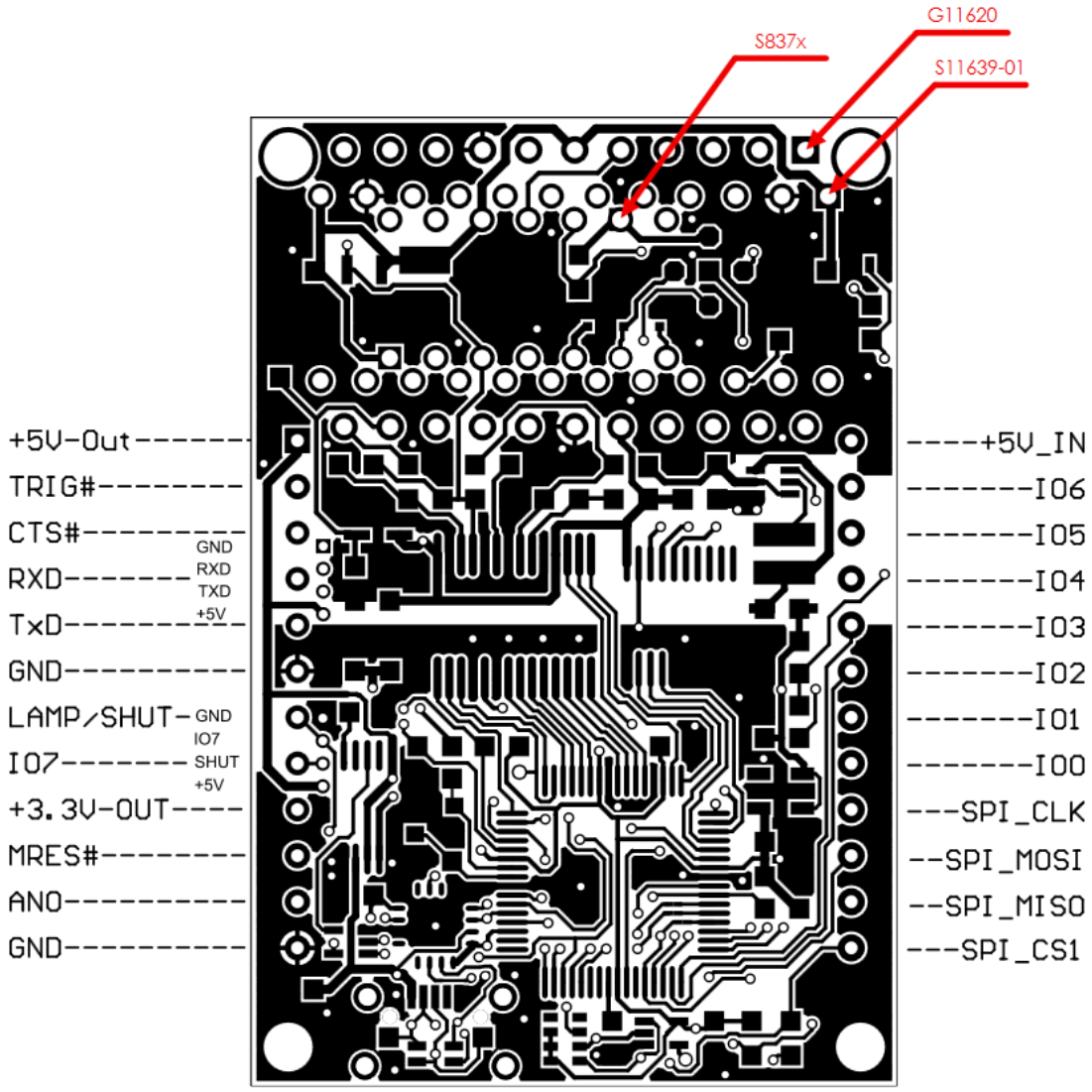
Contents

1. Block Diagram

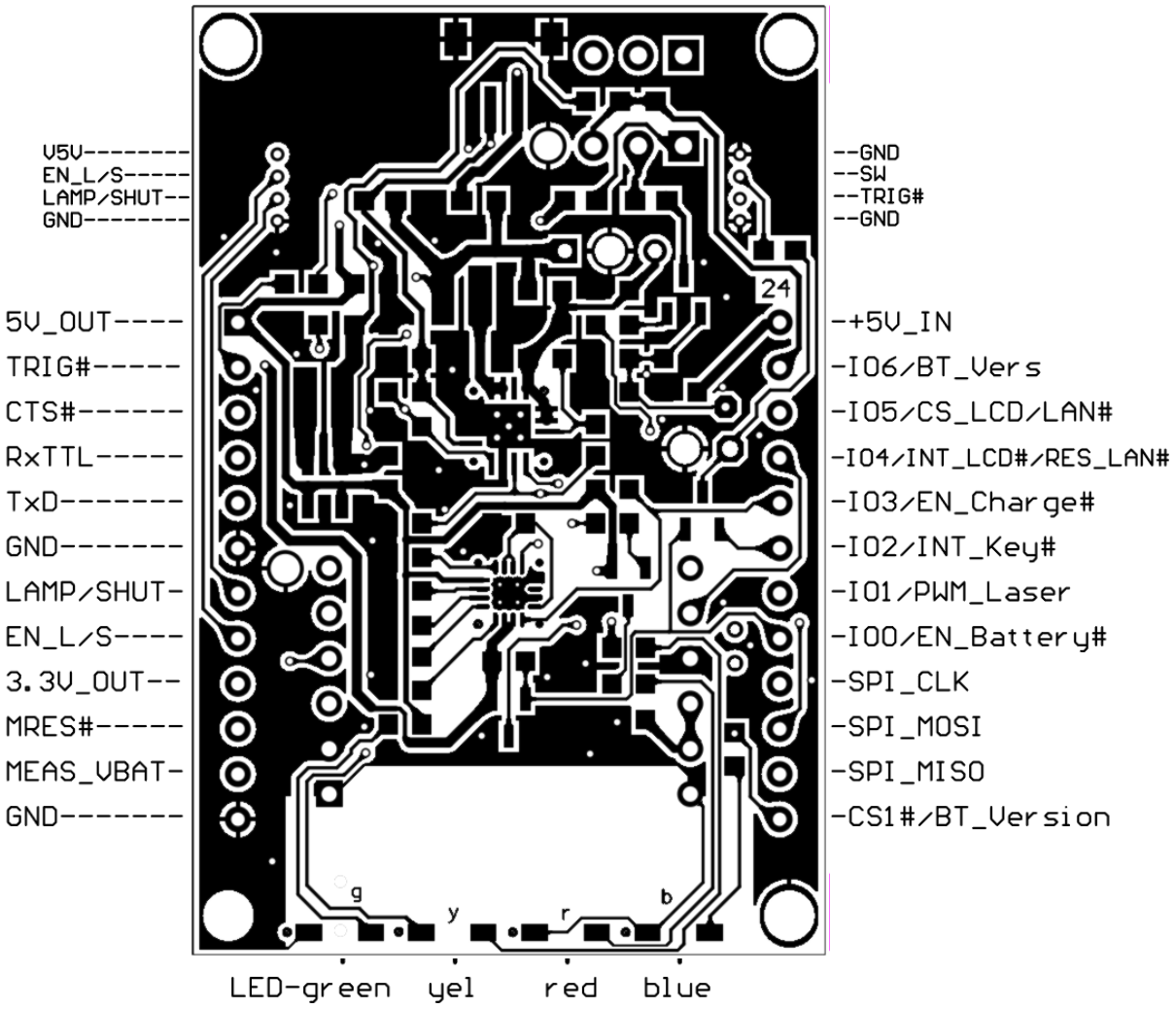


2. Pinout

2.1. SDCM3_5 Pinout and Line-Aray's Pin1 position



2.2. SDCM3_6Piggy: Pinout



3. Signals

Pin	Name	Signal	Value	Min	Typ	Max	Unit
1	+5V_Out	Output	Voltage	-	+5 V (Vext) or VUSB	5.5	V
			Current	0	50	100(1000)	mA
2	TRIG	Input	Low	0.0	-	0.5	V
			High	2.2	-	5	V
3	CTS#	Output		0	-	5	V
4	RXD	Input	Low	0	-	0.5	V
			High	2.2	-	3.3	V
5	TXD	Output	Low	0	-	0.5	V
			High	2.2	-	3.3	V
6	GND	GND	Voltage	-	0	-	V
7	LAMP/SHUT	Output	Low	0	-	0.5	V
			High	2.2	-	3.3	V
8	IO7	I/O	Low	0	-	0.5	V
			High	2.2	-	3.3	V
9	+3.3V_Out		Voltage	3.2	3.3	3.4	V
			Current	0	50	100	mA
10	MRES#	Input	Low	0	-	0.5	V
			High	2.2	-	5	V
11	AN0	Analog-In		0	-	3.3	V
12	GND		Voltage	-	0	-	V
13	SPI_CS1#	Output	Low	0	-	0.5	V
			High	2.2	-	3.3	V
14	SPI_MISO	Input	Low	0	-	0.5	V
			High	2.2	-	5	V
15	SPI_MOSI	Output	Low	0	-	0.5	V
			High	2.2	-	3.3	V
16	SPI_CLK	I/O / Output	Low	0	-	0.5	V
			High	2.2	-	3.3	V
17	IO0	I/O	Low	0	-	0.5	V
			High	2.2	-	3.3 (5)*	V
18	IO1	I/O	Low	0	-	0.5	V
			High	2.2	-	3.3	V
19	IO2	I/O	Low	0	-	0.5	V
			High	2.2	-	3.3 (5)*	V

Pin-Nr.	Name	Signal	Value	Min	Typ	Max	Unit
20	IO3	I/O / Output	Low	0	-	0.5	V
			High	2.2	-	3.3	V
21	IO4	I/O	Low	0	-	0.5	V
			High	2.2	-	3.3	V
22	IO5	I/O / Output	Low	0	-	0.5	V
			High	2.2	-	3.3	V
23	IO6	I/O / Analog-In	Low	0	-	0.5	V
			High	2.2	-	3.3	V
24	+5V_IN	Ext. Power	Voltage	4.7	5.0	5.5	V
			Current	-	300	1250	mA

# Denotes low active signal *5V tolerant Input

3.1. Signal Description

3.1.1. Pin 1 +5V_Out

Pin 1 is +5V output from USB power voltage or +5 V external power supply, whichever is higher.
Available current depends on Power-source (USB, Battery or external Supply) and requirements of optional modules. Please ask for solutions with more than 100mA.

3.1.2. Pin 2 TRIG

Measurement trigger input, programmable active slope, should be debounced. Internally pulled up to 3.3 V using 10 kΩ resistor.

3.1.3. Pin 3 CTS#

Clear To Send Input. Handshake signal for UART Communication. Used on SDCM3_6 Piggy for Bluetooth-Module.

3.1.4. Pin 4 RXD

LV-TTL (3.3 V) UART serial communication input signal RXD. Communication protocol is startbit, 8 bit data, no parity, 1 stopbit (8N1), no handshake. The baudrate is determined by the baudrate parameter. Used on SDCM3_6 Piggy for Bluetooth-Module.

3.1.5. Pin 5 TXD

LV-TTL (3.3 V) UART serial communication output signal TXD. Communication protocol is startbit, 8 bit data, no parity, 1 stopbit (8N1), no handshake. The baudrate is determined by the baudrate parameter. Same signal as used for the USB-Serial Bridge TXD and used on SDCM3_6 Piggy for Bluetooth-Module.

3.1.6. Pin 6 GND

Ground reference level. Recommended to be used as reference level of LV-TTL UART communication signals.

3.1.7. Pin 7 LAMP/SHUT

LV-TTL lamp output. Can be used to control external light source or shutter. This signal is programmable in active polarity by the parameter lamppol (0/1). It will be active before the scan of the line array for the time determined by scan delay parameter and during the light- or darkscan. In case of using a flash lamp as a light source, the shut/lamp signal can be used to trigger a flash lamp. Flash lamp burst mode (several flashes in programmable intervals and pulse length) can be also controlled by this signal.

3.1.8. Pin 8 IO7

User Programmable General Purpose Input Output Pin. Used on SDCM3_6 Piggy to enable the piezo driven shutter.
Refer to *chapter 8* for more information.

3.1.9. Pin 9 +3.3 V OUT

Output of the 3.3 V processor and digital circuits regulated supply voltage. Up to 100 mA can be drawn from this voltage to provide power to external electronics with low power consumption.

3.1.10. Pin 10 MRES#

Master Reset input, active low, internally pulled up to 3.3 V via 10 kΩ resistor. This pin can be used to reset the whole electronics. Leave it unconnected, if not used.

3.1.11. Pin 11 AN0

Analog input 0 for the processors 10 bit ADC (3.3 V full scale), used on SDCM3_6 Piggy to measure battery voltage.

3.1.12. Pin 12 GND

Ground reference level for power supply and analog or digital I/O.

3.1.13. Pin 13 SPI_CS1#/BT_Connect

ChipSelect input/output (active low) for SPI serial interface or Bluetooth connection status on SDCM3_6 Piggy.

Internal used for micro SD-Card control or available as ChipSelect input to use SDCM3 Electronics as SPI-Slave.

Note: The parameters of SPI (SPI mode 0...3) and SPI speed are user configurable

3.1.14. Pin 14 SPI_MISO

Master In Slave Out signal for SPI serial interface.

Internal used for micro SD-Card control and for communication with Ethernet-Module and LC-Display on SDCM3_6 Piggy.

3.1.15. Pin 15 SPI_MOSI

Master Out Slave In signal for SPI serial interface.
Internal used for micro SD-Card control and for communication with Ethernet-Module and LC-Display on SDCM3_6 Piggy.

3.1.16. Pin 16 SPI_CLK

Clock used for SPI serial interface communication.
Internal used for micro SD-Card control and for communication with Ethernet-Module and LC-Display on SDCM3_6 Piggy.

3.1.17. Pin 17 IO0 / EN_Battery#

User Programmable 5V tolerant General Purpose Input Output Pin.

This GPIO-Pin is configured as an output on SDCM3_6 Piggy-Board to control battery-driven power supply when this module is assembled.

3.1.18. Pin 18 IO1 / PWM_Laser

User Programmable General Purpose Input Output Pin.

This GPIO-Pin can be configured to control the 5V switching- and PWM-Output on the SDCM3_6 Piggy board for periphery control with up to 150mA (e.g. LED, Laser, DC-Motor, …). Custom specific use as current source with up to 500mA for diode control on request.

3.1.19. Pin 19 IO2 / INT_Key#

User Programmable, 5V tolerant General Purpose Input Output Pin.

This GPIO-Pin is configured as low-active key-interrupt input on battery powered SDCM3_6 Piggy-Boards using an additional hold circuit. This way the SW-Signal on the SW/TRIG-Connector can be used with the following logic:

SW=low & Device off:	Device on
SW=low < 2 sec:	Laser on/off
SW=low ≥ 2sec:	Device off

3.1.20. Pin 20 IO3 / EN_Charge#

User Programmable General Purpose Input Output Pin.

This GPIO-Pin is configured as low-active charge enable output for battery charge control via MCU on SDCM3_6 Piggy-Board when battery module is assembled

3.1.21. Pin 21 IO4 / INT_LCD# / RES_LAN#

User Programmable General Purpose Input Output Pin.

This GPIO-Pin is configured as low-active output to reset the LAN-Interface-Module or Interrupt Input to detect movements on LCD-Screen whichever is assembled on SDCM3_6 Piggy-Board.

3.1.22. Pin 22 IO5 / CS_LCD# / CS_LAN#

User Programmable General Purpose Input Output Pin.

This GPIO-Pin is configured as low-active ChipSelect output for SPI connected LAN-Module or LC-Display on SDCM3_6 Piggy-Board when it is assembled

3.1.23. Pin 23 IO6 / BT_Vers

User Programmable General Purpose Input Output Pin.

This GPIO-Pin is configured as pull-down input to detect the assembled Bluetooth-module on SDCM3_6 Piggy-Board. High decodes a microchip “RN4x-Module”, low stand for older versions like Panasonics “PAN1322”.

3.1.24. Pin 24 +5V_IN

Optional +5 V power supply Input.

SDCM3_6 Piggy-Board can generate 5V on PIN 24 from Battery (1.5-5.5V) or external 7-28V power supply.

USB power supply and +5 V external power supply are possible in parallel. The higher voltage of both will be used internal due to the automatic switch over.

Refer to *Chapter 5* for voltage supply requirements.

4. USB Interface

The USB communication port can be used for powering the SDCM3 electronics, provided it's connected to an active USB hub capable to draw up to 500 mA current at 4.7V - 5.25V.

Passive USB hubs do not provide sufficient power. In this case, the electronics has to be powered externally.

For battery charging or if connected via Bluetooth an external USB charging adapter can be used to draw up to 1250mA.

The USB powering design provides a USB 2.0 compliant power management sequence during plugin and enumeration of the device.

The OR gated low drop out power circuitry switches automatically over to USB powering or external power, which voltage is ever higher.

4.1. Full Speed USB

On USB 2.0 Full Speed option the communication took place via a USB to serial bridge device FTD230XQ using a virtual COM Port driver from FTDI Ldt., which can be obtained for the used operating system from here:

http://www.ftdichip.com/Drivers/VCP.htm

The following transmission speeds are possible:

3 000 000 bit/s,

921 600 bit/s,

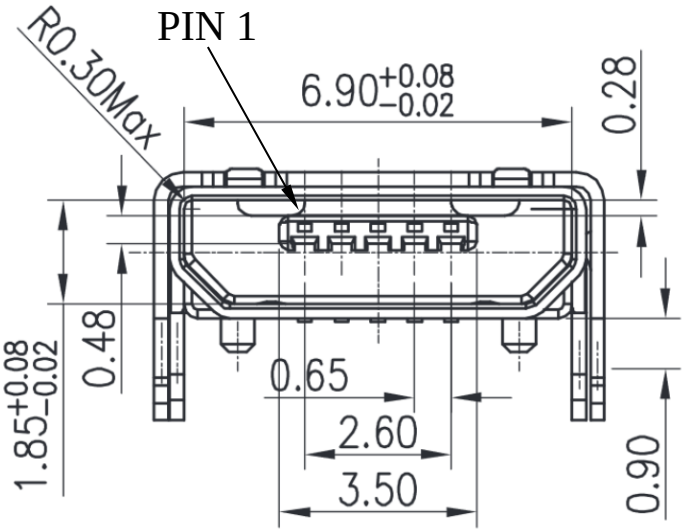
230 400 bit/s,

115 200 bit/s,

38 400 bit/s.

The protocol settings are 8N1 (1 startbit, 8 bit, no parity, 1 stopbit) and no handshake.
Users program or the OS must provide sufficient communication queue memory in case of huge amount of data to be transmitted at once.

4.2. USB Pinout



The connector in use is a micro USB 2.0 Type B receptacle connector with SMT and THT components for maximal stability:

USB Signals

Pin-Nr.	Description	Signal	Level	Min	Typ	Max	Unit
1	USB Power	VUSB		4.7	-	5.5	V
2	Differential Data -	USB D-	Low	0	-	0.4	V
			High	2.4	3.3	5.5	
3	Differential Data +	USB D+	Low	0	-	0.4	V
			High	2.4	3.3	5.5	
4	USB OTG Signal	USB ID		Not used, electronics is always device			
5	USB GND	USB GND		-	0	-	V

5. Power Supply

Beside the standard USB Power supply which is described above, an external voltage source can be applied to the 5V_EXT Pin (PIN 24).

	Voltage Range	Current	Ripple
minimum requirements	3.0V-5.5V	500mA	
recommended	4.2V-5.1V	>=1500mA	<=100mV

Exceeding the recommended voltage range and ripple may increase the noise of the video signal but should still work if it fulfills the minimum requirements.

On the Piggyback PCB, the external supply can be provided using the battery connectors also for the optional 7V-28V external supply option.

7V-28V External power supply and battery use are mutually exclusive.

6. LV TTL UART Interface

The LV TTL UART interface provides an easy to use serial interface for direct communication with embedded hosts, bridging the hard- or software effort for other serial interfaces.

The following transmission speeds are possible:

3 000 000 bit/s,

921 600 bit/s,

230 400 bit/s,

115 200 bit/s,

38 400 bit/s.

The protocol settings are 8N1 (1 startbit, 8 bit, no parity, 1 stopbit) and no handshake

On the optional SDCM3_6Piggy-Board this interface is used for the serial to Bluetooth bridge.

In case of Bluetooth connection, the baudrate maximum is 921 600 bit/s.

7. SPI Interface

The SPI Interface is intended to operate as a SPI-slave in SPI mode 0.

The transmission speed can be up to 20 Mbit/s.

Using the SDCM3 Electronics as SPI-slave prohibits the use of its Piggyback-Board and all included modules.

Using the SDCM3 Electronics as SPI-master requires application specific implementation of communication protocols into SDCM3-firmware and is possible only on request.

Default SPI master implementation is set up to control a micro SD-Card, a high speed Ethernet Network Module (WIZ820io) or a graphic colour WQXA-resolution LCD with touch screen (e.g. SK-FT843, 4.3“).

Ask JETI on special requirements.

8. General Purpose Input/Output-Pins (GPIO's)

The eight provided GPIO Pins provide direct access to the micro-controller and are configure- and controllable by firmware commands.

Accessible functions are:

- Digital Input with pull-up
- Digital Input with pull-down
- Digital Input floating
- Digital Output

Refer to the "Specfirm Firmware Operation Instructions" for more Information.

The following GPIO pins are available:

GPIO	Hardware Pin
GPIO0	17
GPIO1	18
GPIO2	19
GPIO3	20
GPIO4	21
GPIO5	22
GPIO6	23
GPIO7	8

GPIO0 and GPIO2 tolerate up to 5V the others 3.3V input voltage. The maximum output current is specified with 25mA at 3.3V.

All GPIO Pins are used to enable specific options on the SDCM3_6 piggyback-board and are only available if the related option is deactivated. Refer to *chapter 3.1* for the availability of certain GPIO's.

9. Options

9.1. Options on SDCM3_5

9.1.1. Array Types

As shown in chapter 1, SDCM3_5 supports three different Hamamatsu Line-Arrays:
S11639
G11620
S837x
Others are in progress or possible on request.

9.1.2. Option: Real Time Clock Calendar - RTCC

The SDCM3 is optionally fitted with a real-time clock calendar circuit (RTCC), operating Li coin cell battery buffered. This feature allows to get time stamps for measurements with the granularity of one second. Usable Li coin cells are CR1216, CR1220 or CR1225. This allows continuous operation of the RTCC for minimum 4 years. The RTCC internal clock, delivered from a 32768 Hz fork crystal clock can be fine-tuned to achieve a sufficient precision under intended operating temperature conditions.

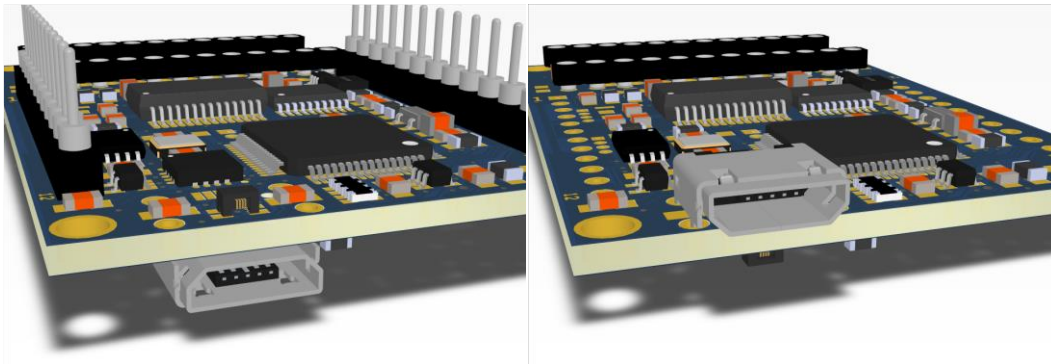
9.1.3. Option: Micro SD Card

The optional fitting of the SDCM3 with a microSD card connector provides the on board storing capability of measurement results in a FAT32 file system.
The microSD card connector provides a push-push connection for easy inserting, fixation and removing of the card from the same site as the USB connector plug in of the board.

In this case, one of the SPI select signals is used for the data transfer via SPI to the microSD card. Usable SD cards can have up to 32 GB capacity.

9.1.4. Option: USB-Connector on TOP

USB-Connector can be assembled on both sides of the PCB to fit customer's mechanical requirements. Standard is assembly on Bottom Layer (left picture). Assembly on TOP is an interesting option to achieve minimal construction height.



9.2. Options on SDCM3_6Piggy

9.2.1. Option: Bluetooth-Module (on Piggyback-Board)

One option on SDCM3_6Piggyback-Board is the Class 1 Bluetooth 2.1 module RN41 with up to 921600bit/s UART Interface and EDR.

Automatically switch over between different low power modes and adaption of transmission power drastically reduces current consumption by reaching up to **100m operating range**.

Follow the standard procedure on your PC to establish the Bluetooth connection and enter the Code “0000” if your are asked to.

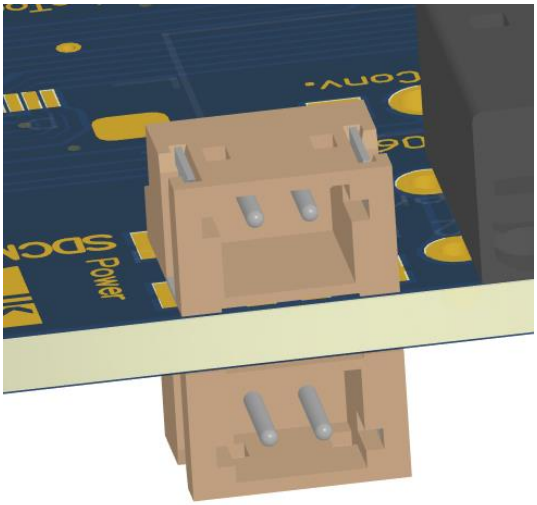
A blue status LED signalizes a successful established Bluetooth connection.

The class 2 variant RN42 with up to 10m range and lower price is possible on request.

Bluetooth- and LAN-Module are mutually exclusive.

9.2.2. Option: Battery Functionality (on Piggyback-Board)

The battery Option on SDCM3_6 Piggyback-Board includes a Li-Ion battery charging IC for 4.2 single cells. On active USB-Hub (5V, 500mA) charging current up to 500mA (@ 3-4.2V) is possible. For fast charging or large battery capacities a charging current of up to 1200mA can be reached using an external USB-Charger with sufficient supply current. Users can choose between three connection options:



- One Connctor pointing off the board (BAT1)
- Connectors for two batteries in parallel, pointing off the board (BAT2)
- One Connector pointing to the board (BAT180)

All using WR-WTB 648102131822connectors.

Charging is signalized by a yellow status LED.

Battery functionality also includes a synchronous boost converter to generate stabilized 4.67V from 1.8V-5.5V battery Voltage. If USB or external supply voltage is higher than that or the device is turned of, discharge current is typically below 1µA, much less than battery self-discharge.

If battery voltage drops below a hardware-programmable value (standard 2.95V) a red status LED lights up. Decreasing further and below a firmware programmed value (standard 2.9V) the device is turned off shortly afterwards if no external voltage source is applied.

Batteries included in standard configurations are 2000mAh Lithium-Ion-Cells with a nominal voltage of 3.7V. The maximal charging current is set to 400mA for one and 800mA for two cells (refers to the number of battery connectors mounted). If not

enough current is supplied charging current will be reduced to ensure proper operation.

A battery powered device can be turned on and off using PIN 19 (see chapter 3.1.19). Starting a battery powered device with less than 30% capacity remaining will result in 5 pulses of yellow LED to signallize low battery status.

9.2.3. Option: LAN-Module (on Piggyback-Board)

If necessary, a complete LAN/Ethernet Module can be provided on the SDCM3_6Piggy board. The module with typical RJ45-package is connected via SPI-Bus and can reach up to 11Mbit/s data rate.

The Module supports:

- 10/100 Base TX
- Half/full duplex operation
- Hardware Internet protocols: TCP, IPv4, UDP, ICMP, ARP, PPPoE, IGMP
- Hardware Ethernet protocols: DLC, MAC
- IEEE 802.3/802.3u

Bluetooth- and LAN-Modul are mutually exclusive.

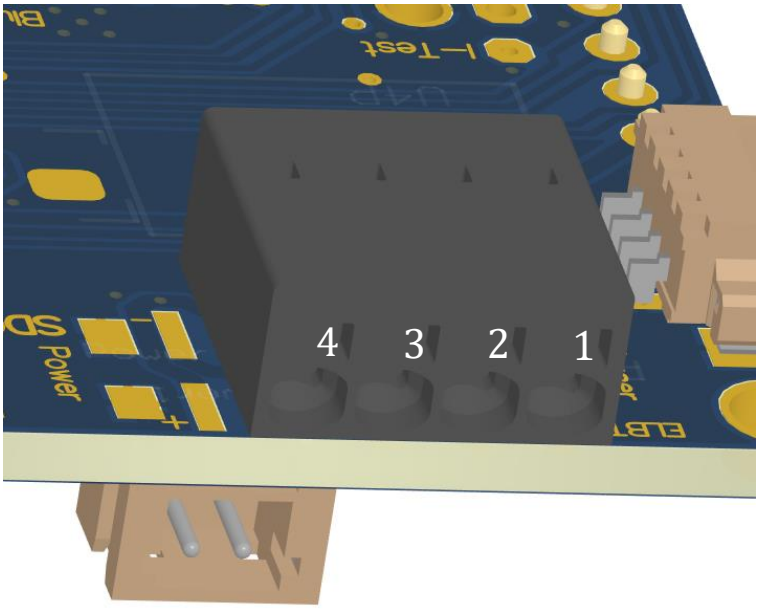
9.2.4. Option: 7-28V external Voltage supply (on Piggyback-Board)

This Option includes a 5V fixed output voltage dc/dc step down regulator with up to 500mA output current. The converter allows to use the electronics with supply voltages between 7V and 28V and provides a sufficient low output voltage ripple (typ. 10mV) and a peak efficiency up to 95%.

Battery-Function and 7-28V external Voltage supply are mutually exclusive.

9.2.5. Option: 5V/150mA Switch/PWM output (on Piggyback-Board)

With this option included, GPIO 1 can be used to switch external 5V periphery at up to 150mA current between Pin 1(5V) and 2.



A second possibility is to use the firmware internal functions to generate configurable 100Hz, 256 Step PWM-Output also with 5V and up to 150mA.

Customer specific solutions with hardware programmed current are available to directly drive LED's/Laser Diodes at this output.

Depending on the overall configuration currents up to 500mA are possible on this output on request.

Pin 3 is a 3.3V output in standard configuration or can be used to access the General-Purpose-Input/Output-Pin IO6 on the OEM-LAN configuration.

Pin 4 is connected to GND.

All concerning connections can be established using the direct wire input of the black PTSM 0,5/ 4-2,5-H THR R32 connector with four pins.

9.2.6. Option: LC-Display: (on Piggyback-Board)

The SDCM-unit provides a serial interface to connect an external display. Via the 10 port FPC connector it is possible to communicate with an Embedded Video Engine, which is powered by FTDI´s FT800. This Engine has 3 in 1 functionality including display, audio, and touch. The FT800 is an easy to use graphic controller for embedded applications to generate high-quality Human Machine Interfaces. It supports LC-display in WQVGA (480x272) and QVGA (320x240) formats.
The communication is running via SPI with up to 24MHz.

In our sample application, a 4D Systems 4.3" TFT LC-Display with 480x272 Resolution, 4 wire resistive touch, and 262K colors is used.

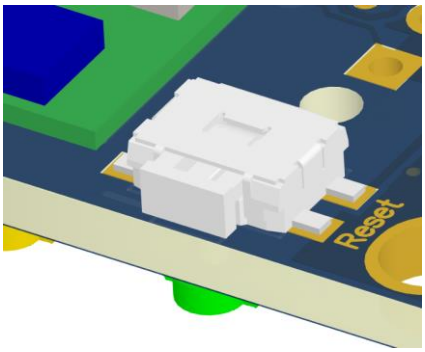
For more information on EVE support from 4D systems please visit www.4dsystems.com.au.

9.2.7. Option: Reset-Button: (on Piggyback-Board)

Physical button to reset the whole electronics. Triggering Master Reset of the microcontroller performs reset routine and brings all periphery to initial state.

Active-low Master-Reset-Signal is internal pulled up to VCC over 10kOhm.

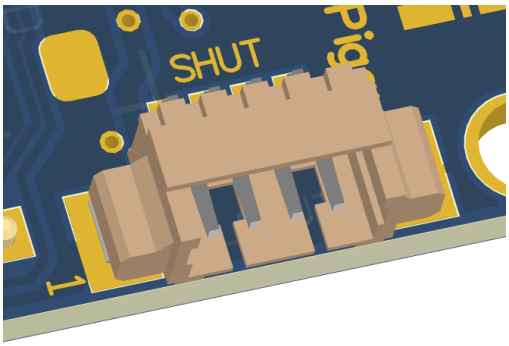
Mutually exclusive with LAN-Module.

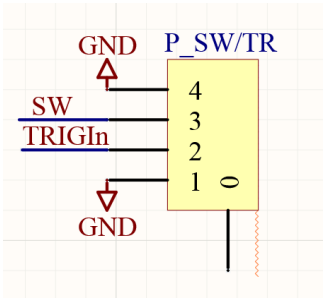


9.2.8. Option: Lamp/Shutter, Switch-ON/OFF/Trigger-Connector

For easy accessing of Lamp/Shutter and/or Switch/Trigger functionality, the two WR-WTB 653104131822 connectors can be used. They are 4Pin, Male shrouded headers witch 1.25mm pitch and 1A current rating. The Pin-names are printed on the TOP-Layer of the Piggyback-board.

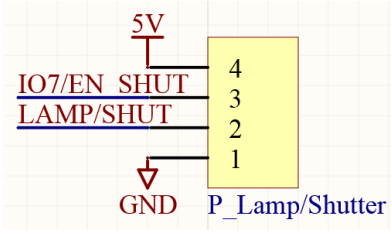
Connecting the SW Signal (Pin 3) to GND can be used as ON/OFF switch in battery powered configurations using the following logic.





SW=low & Device off: Device on
SW=low < 2 sec: Laser on/off
SW=low ≥ 2sec: Device off

The LAMP/SHUT signal can be used to drive a mechanical shutter or lightsource together with “DARK” and “LIGHT” measurements. IO7 can be used as an additional output for more complex shutter or lightsource components.



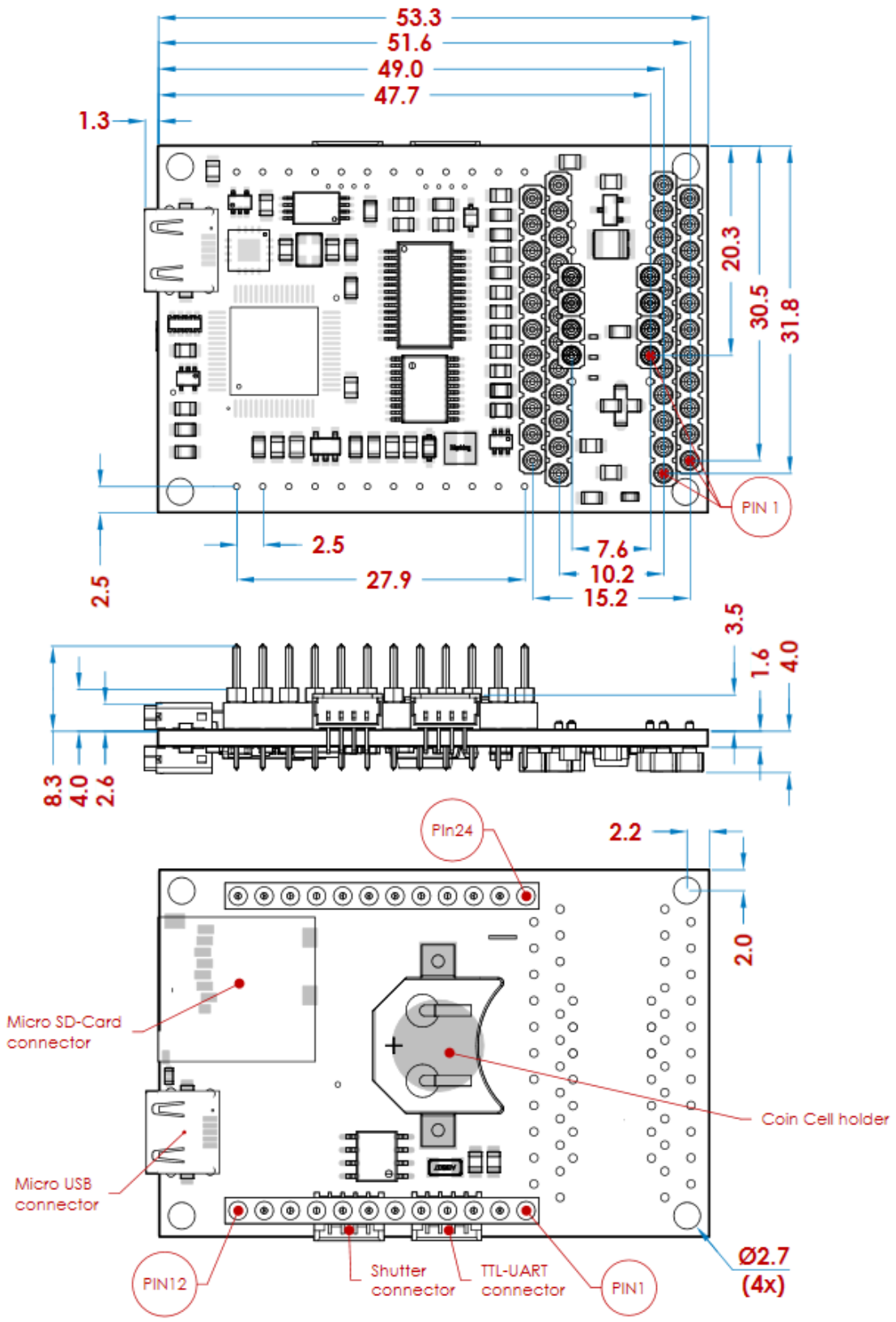
10. Firmware Update Feature

The firmware implemented bootloader allows infield updates of the firmware using the serial interfaces. For proper operation, it is recommended to use only the USB-Interface.

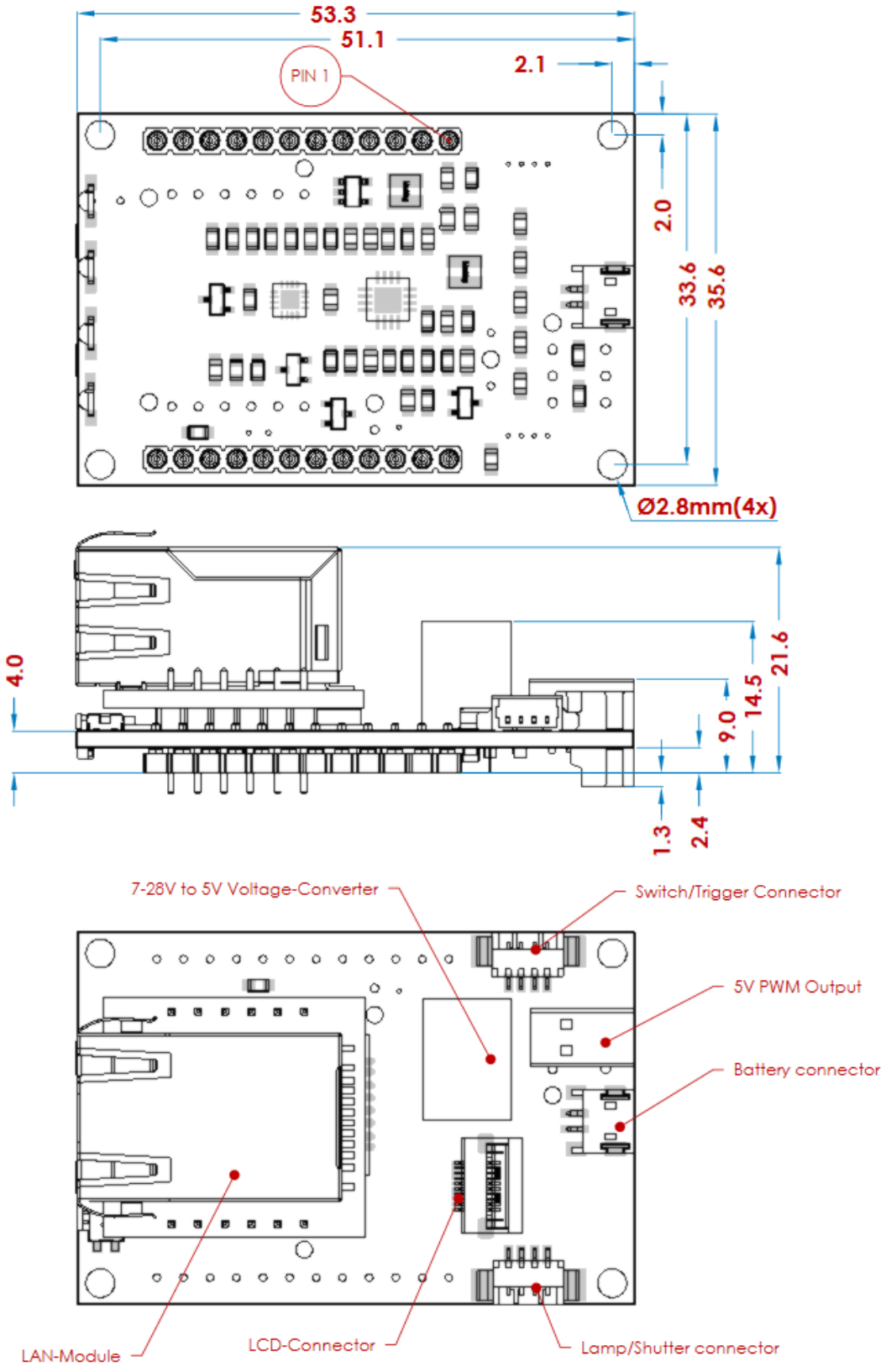
For the necessary tool “SFProg” or if you have any questions concerning technical problems please contact the JETI-support: support@jeti.com

11. Dimensional Drawing

11.1. SDCM3_5

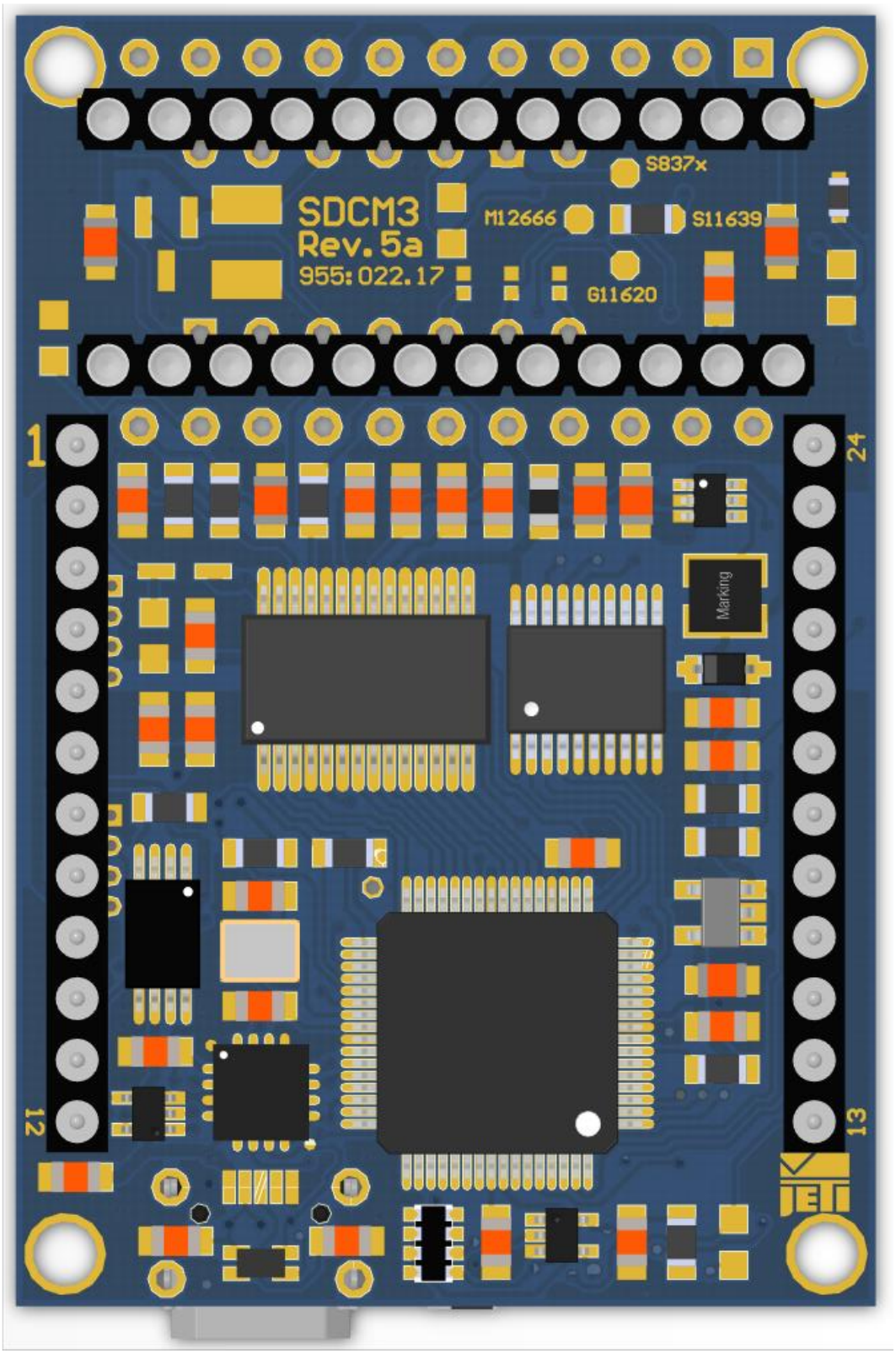


11.2. SDCM3_6Piggy

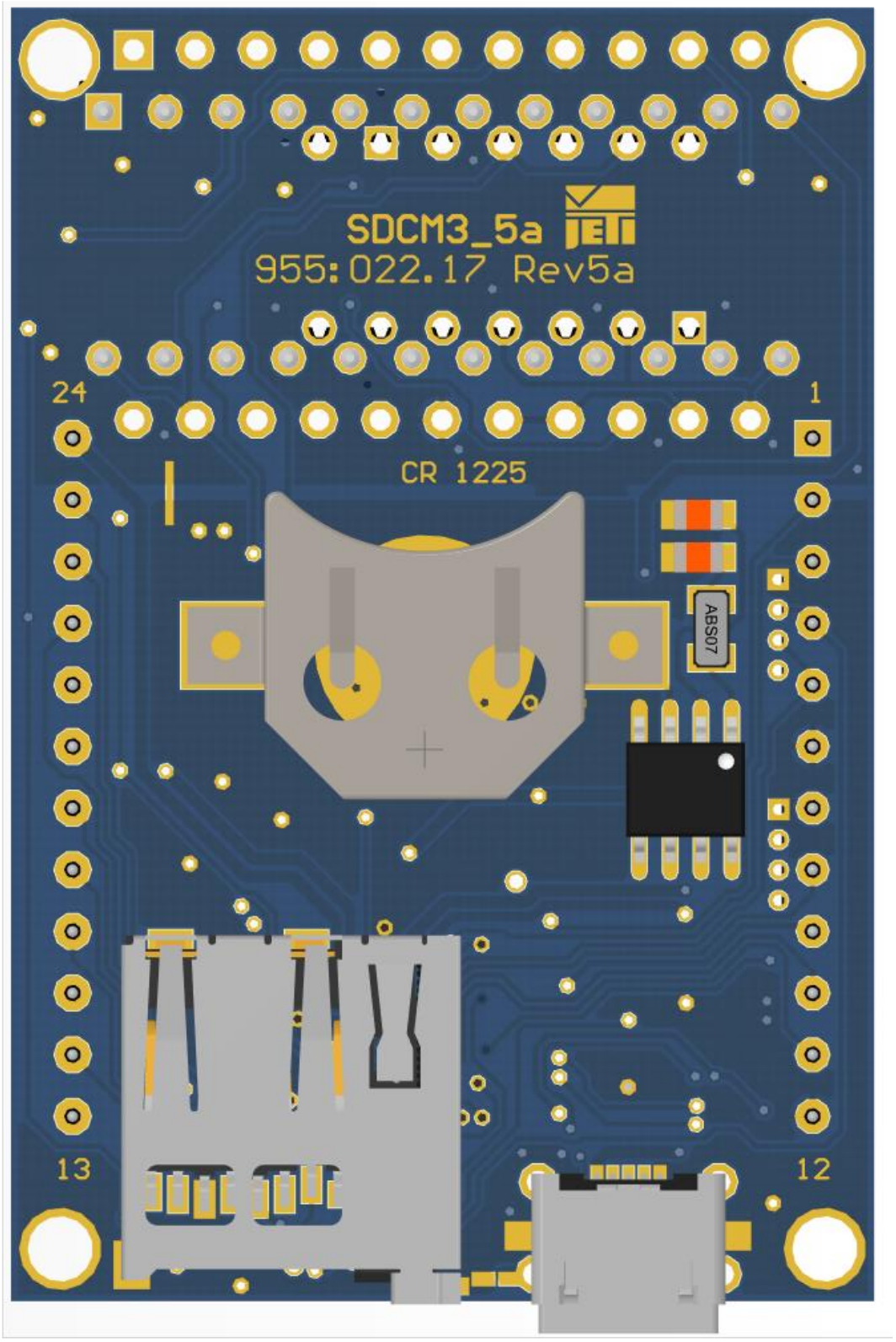


12. Variant Population examples

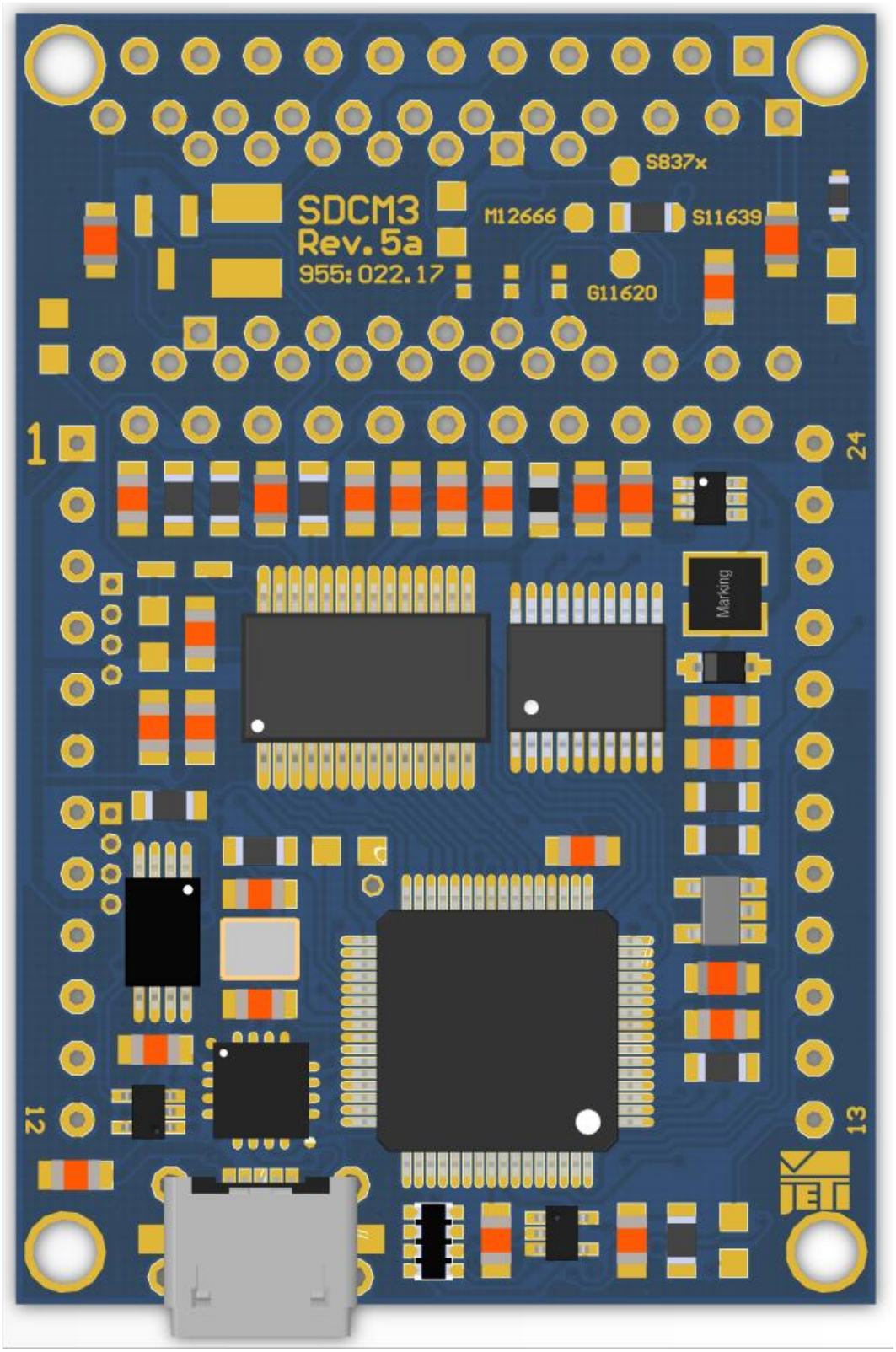
12.1. SDCM3_5a – S11639-01 OEM complete TOP



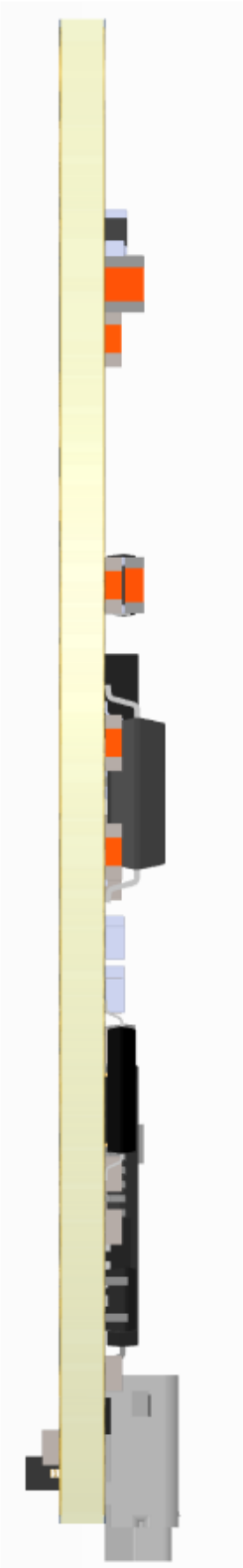
12.2. SDCM3_5 – S11639-01 OEM complete BOTTOM



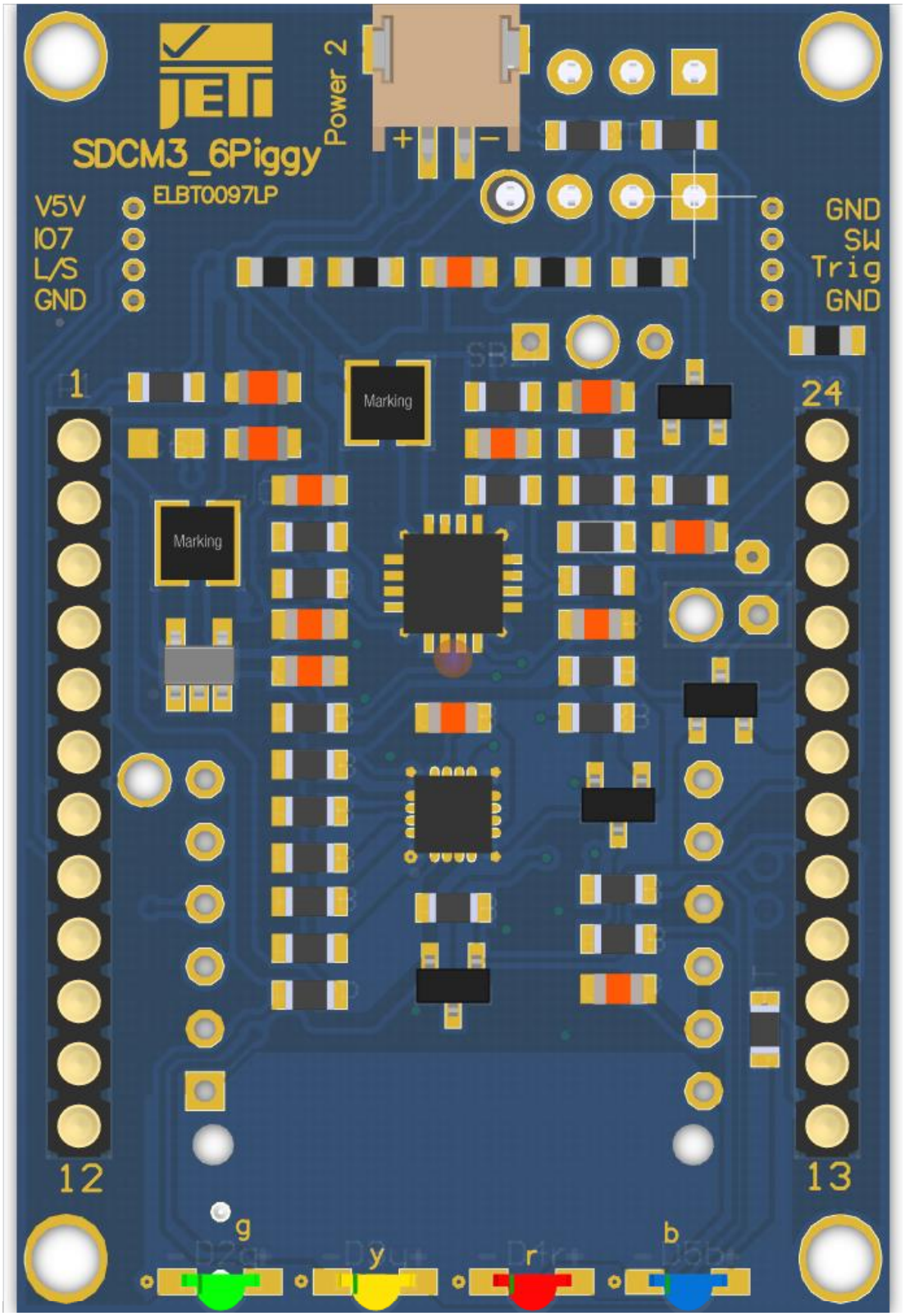
12.3. SDCM3_5a – S11639-01 OEM Flat TOP



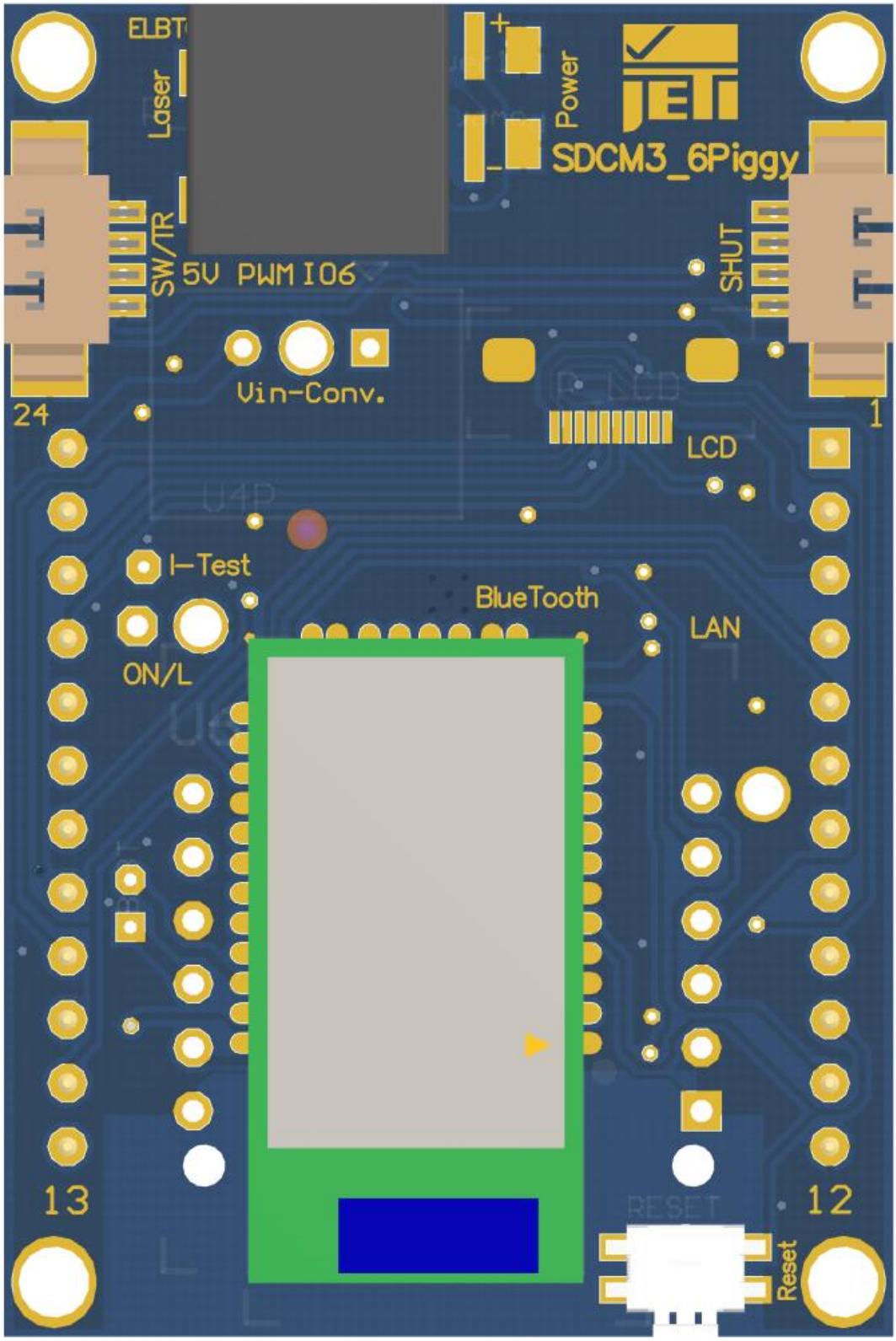
12.4. SDCM3_5a – S11639-01 OEM Flat - SIDE



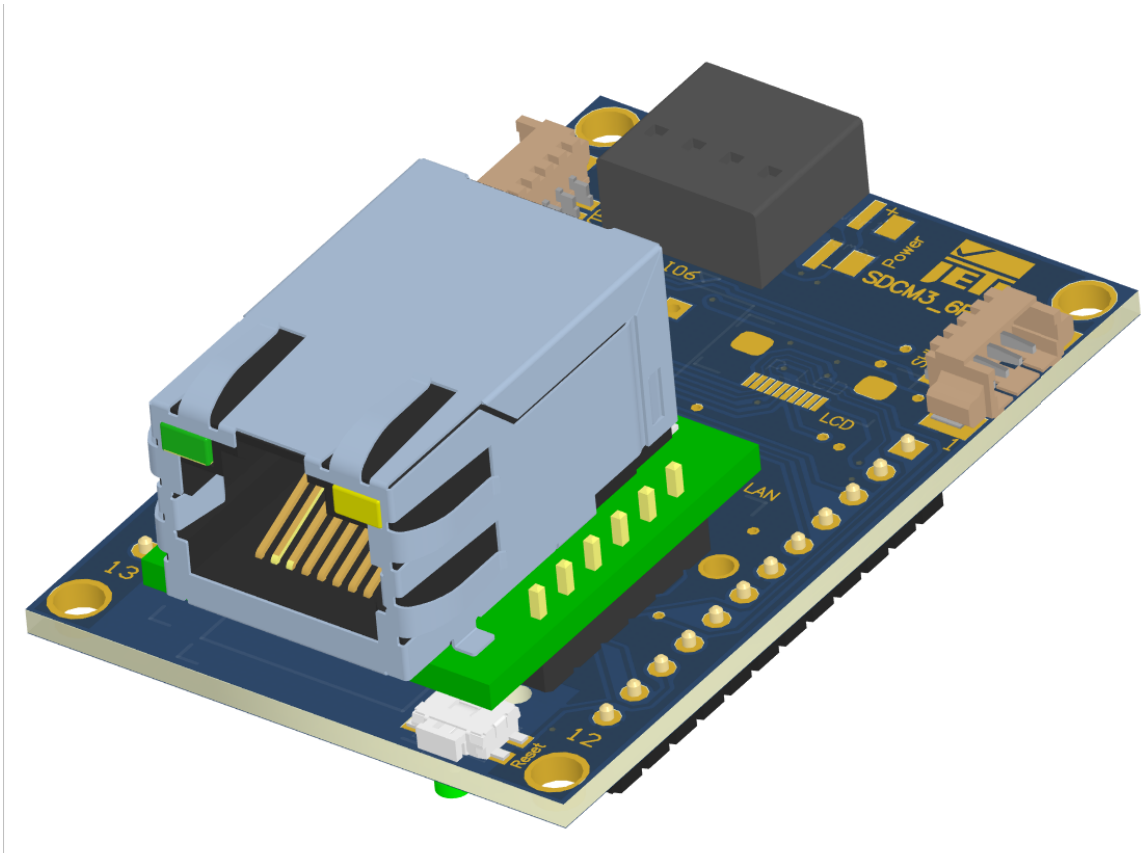
12.5. SDCM3_6Piggy OEM BT – TOP



12.6. SDCM3_6Piggy OEM BT – Bottom



12.7. SDCM3_6Piggy OEM LAN – TOP



13. Orderinformation

13.1. Available SDCM3_5 standard configurations

SDCM3_5 Variant	OEM basic	OEM complete	OEM complete remote	OEM Flat
Order ID	**EBG0197**	**EBG0198**	**EBG0199**	**EBG0208**
Sensor	S11639-01	S11639-01	S11639-01*	S11639-01
2x12Pin Connector stripes	x	X	x	
CCD plug-in socket	x	x	x	
SD-Card		x	x	
Real-time Clock Calendar		x	x	
USB Connector on	BOTTOM	BOTTOM	BOTTOM	TOP

*on remote PCB, connected via 16pol flat ribbon cable

Please contact us for other configurations (e.g. other Sensors).

Send your order to: sales@jeti.com

13.2. Available SDCM3_6 Piggy standard configurations

SDCM3_6 Piggy Variant	Piggy OEM BT	Piggy OEM LAN
Order ID	**EBG0212**	**EBG0213**
Bluetooth	x	
Battery Supported	x	
2000mAh Li-Ion Battery	x (xx)*	
LAN		x
External 5V Supply		x (7-28V optional)
5V PWM Output	x	x
GPIO's available (0-7)	4,5,6	0,2,3,6
Shutter-Connector	x	x
Switch/Trigger-Connector	x	x
Reset-Button	x	
LCD		
Status LED's	x	x**

* optional: Parallel use of two batteries (4000mAh total)

** only the green "Power on"-LED is mounted

Please contact us for other configurations.

Send your order to: sales@jeti.com

14. Service

JETI Technische Instrumente GmbH
Göschwitzer Strasse 48
D-07745 Jena
Tel.: +49 3641 23292 00
Fax: +49 3641 23292 01
E-mail: support@jeti.com
Internet: www.jeti.com