

WiMOD - iC880A

Application Note AN014 / Version 1.3

USB modifications for direct SPI operation



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Document Information

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Revision History

Version	Description
1.0	Initial version
1.1	Figure 3 update
1.2	Picture of iC880A updated
1.3	Added chapter about power supply modifications

Aim of this Document

Aim of this document is to give a description about the modifications needed to replace the USB interface of the iC880A-USB by a direct SPI interface.

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1 Overview

The iC880A-USB¹ is generally intended to communicate via the USB interface with the appropriate host system. With some modifications on the printed circuit board, it is possible to get direct access to the SX1301 of the module via the SPI interface. The SPI interface is accessible via the external module connectors.

2 Description of Required Hardware Modifications

There are some simple modifications required, to get direct SPI access to the SX1301.

2.1 Disconnect Active USB Interface

It is required to reconnect the USB-Interface from the SPI-Interface by removing 14 resistors as marked in Figure 1.

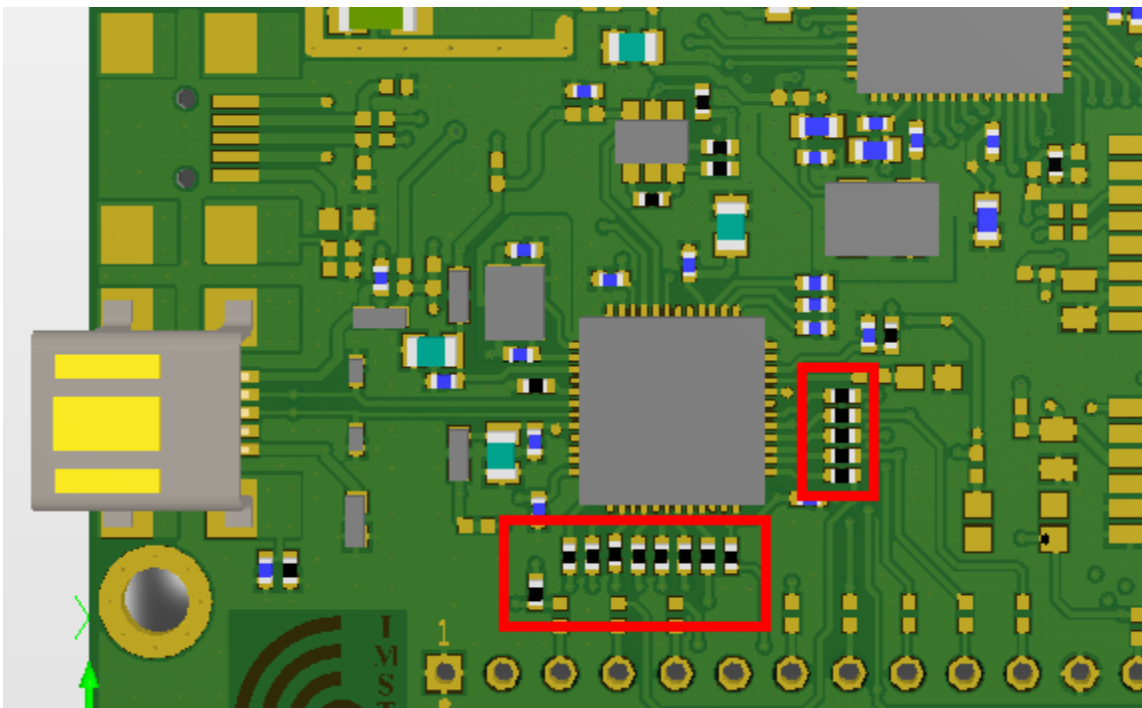


Figure 1: Top view of iC880A-USB with marked resistor to be removed

¹ Hardware Version C100

2.2 Soldering of Plug-Connectors

The module is providing footprints for soldering three plug connectors to the bottom side of the PCB. These connectors should be (as shown in Figure 2)

- 2 pieces of 1x3 pins with a pitch of 2.54 mm
- 1 piece of 1x20 pins with a pitch of 2.54 mm

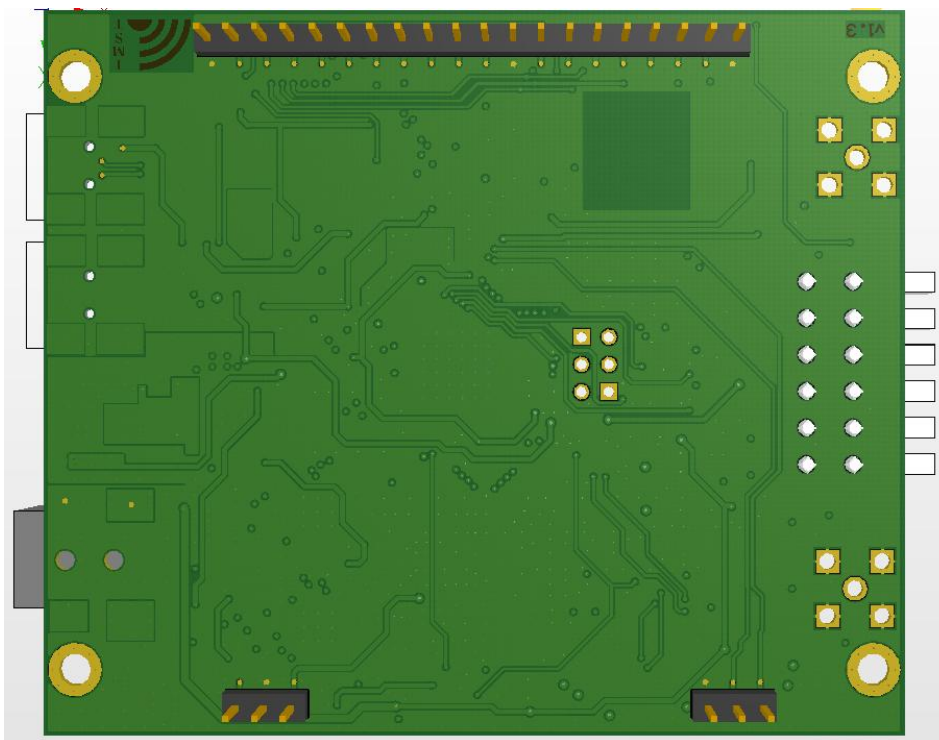


Figure 2: Bottom view of iC880A with soldered plug connectors

2.3 Connect External Plug Connector

Finally the external 1x20 pin plug connector has to be connected to the modules components by populating the marked resistors as given in Figure 3 with 100 Ω resistors (15 pieces), size 0402.

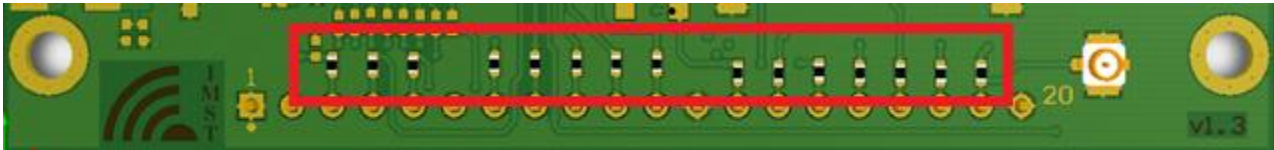
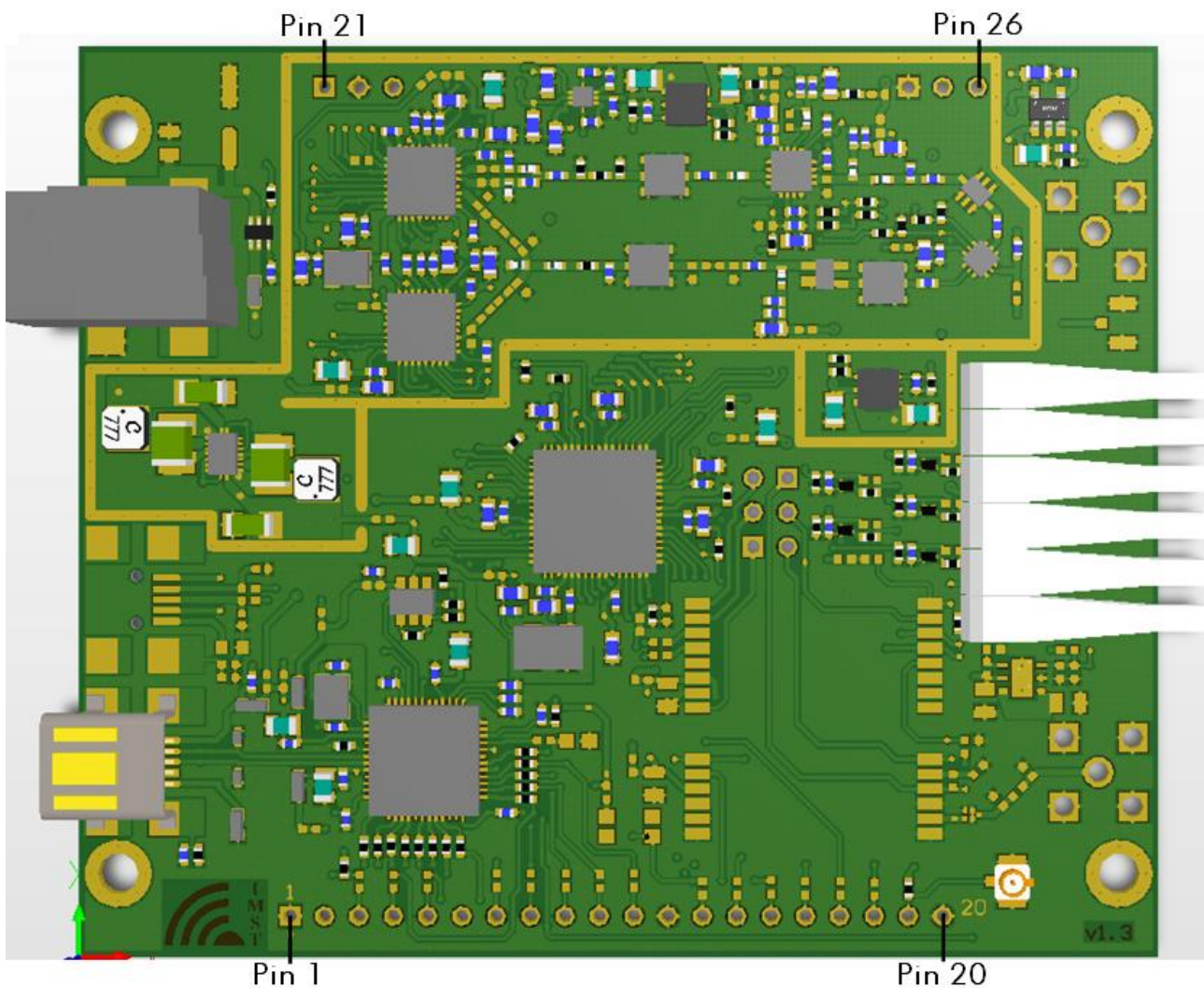


Figure 3: Top view of iC880A-SPI with marked resistor to be populated

The pin description of the external connector can be found in Table 1.



PIN	PIN Name	PIN Type	Description
1	GND	Power	
2	NC	NC	Reserved
3	#GPS_Reset	Input	GPS Module Reset (low active)
4	SPValid	Input	Sx1301 Radio C Sample Valid (don't connect)
5	EN_GPS_Supply	Input	GPS Module LDO: Enable Pin
6	NC	NC	Reserved
7	GPIO0	I/O	Sx1301 GPIO 0
8	GPIO1	I/O	Sx1301 GPIO 1
9	GPIO3	I/O	Sx1301 GPIO 3
10	GPIO2	I/O	Sx1301 GPIO 2
11	GPIO4	I/O	Sx1301 GPIO 4
12	GND	Power	
13	Reset	Reset	Sx1301 Reset
14	CLK	Input	Sx1301 SPI-Clock
15	MISO	Output	Sx1301 SPI-MISO
16	MOSI	Input	Sx1301 SPI-MOSI
17	NSS	Input	Sx1301 SPI-NSS
18	ScanMode	Input	Sx1301 ScanMode Signal
19	PPS	Input	GPS PPS Input Signal
20	GND	Power	
21	VDD	Power	+5 V Supply Voltage
22	GND	Power	
23	VDDDB	Power	GPS backup supply voltage
24	GND	Power	
25	GPS_TX	Output	GPS UART TxD
26	GPS_RX	Input	GPS UART RxD

Table 1: External connector description of iC880A

2.4 Change Power Supply from DC-Jack-Connector to I/O Pins

By default the USB variant uses the mounted DC-Jack connector to supply power the board. If the Pins 21 and 22 should be used instead, the following modifications must be done (for hardware versions >C100):

In Figure 2-1 there is a power diode mounted on the position marked with a green circle. This component must be unsoldered and placed back on the position marked with a red circle.

Note: If both positions are mounted the DC-Jack and the I/O pins 21 and 22 can be used as power supply, but special care must be taken not to use both options at the same time!

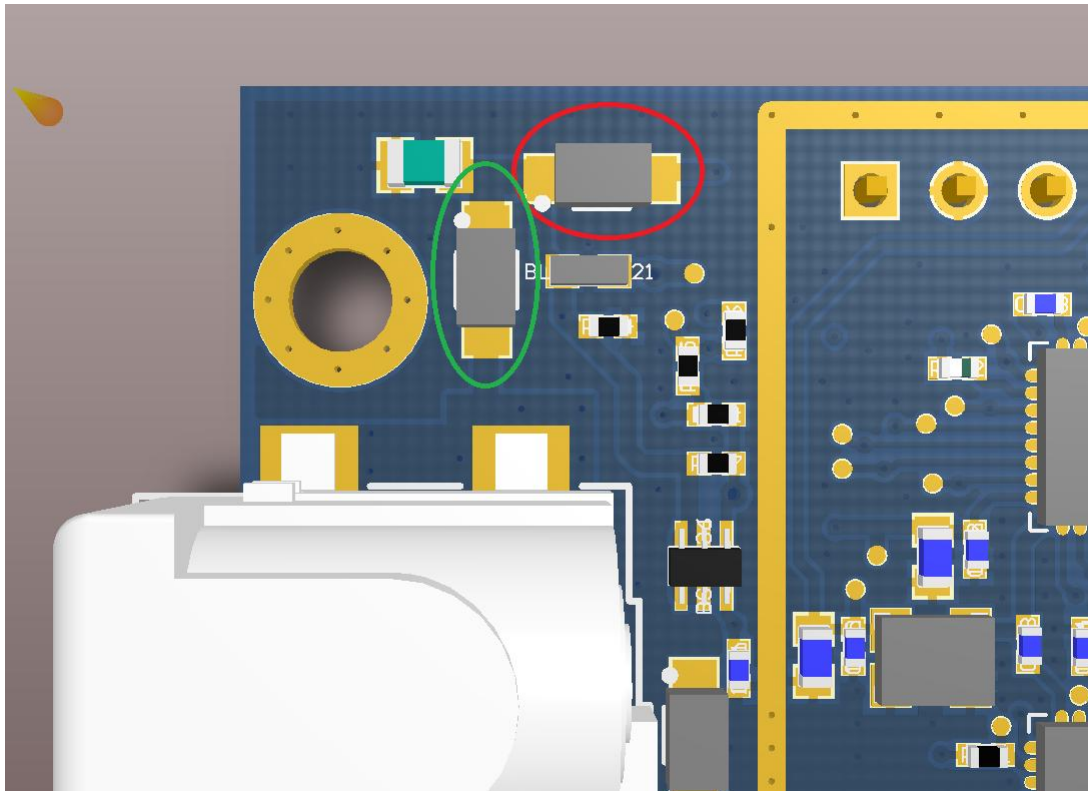


Figure 2-1: Power Supply

3 Regulatory Compliance Information

The use of radio frequencies is limited by national regulations. The radio module has been designed to comply with the European Union's R&TTE (Radio & Telecommunications Terminal Equipment) directive 1999/5/EC and can be used free of charge within the European Union. Nevertheless, restrictions in terms of maximum allowed RF power or duty cycle may apply.

The radio module has been designed to be embedded into other products (referred as "final products"). According to the R&TTE directive, the declaration of compliance with essential requirements of the R&TTE directive is within the responsibility of the manufacturer of the final product. A declaration of conformity for the radio module is available from IMST GmbH on request.

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