

# WiMOD - iC880A

Application Note AN014 / Version 1.2

USB modifications for direct SPI operation



Document ID: 4000/40140/0079

---

IMST GmbH

Carl-Friedrich-Gauss-Str. 2-4

D-47475 Kamp-Lintfort



## Document Information

<b>File name</b>	iC880A_AN014_USB modifications for direct SPI operation.docx
<b>Created</b>	2015-03-25
<b>Total pages</b>	9

## Revision History

<b>Version</b>	<b>Description</b>
1.0	Initial version
1.1	Figure 3 update
1.2	Picture of iC880A updated

## 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.

## Table of Contents

1	OVERVIEW	4
2	DESCRIPTION OF REQUIRED HARDWARE MODIFICATIONS	4
2.1	Disconnect Active USB Interface	4
2.2	Soldering of Plug-Connectors	5
2.3	Connect External Plug Connector	6
3	REGULATORY COMPLIANCE INFORMATION	8
4	IMPORTANT NOTICE	9
4.1	Disclaimer	9
4.2	Contact Information	9

# 1 Overview

The iC880A-USB<sup>1</sup> 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.

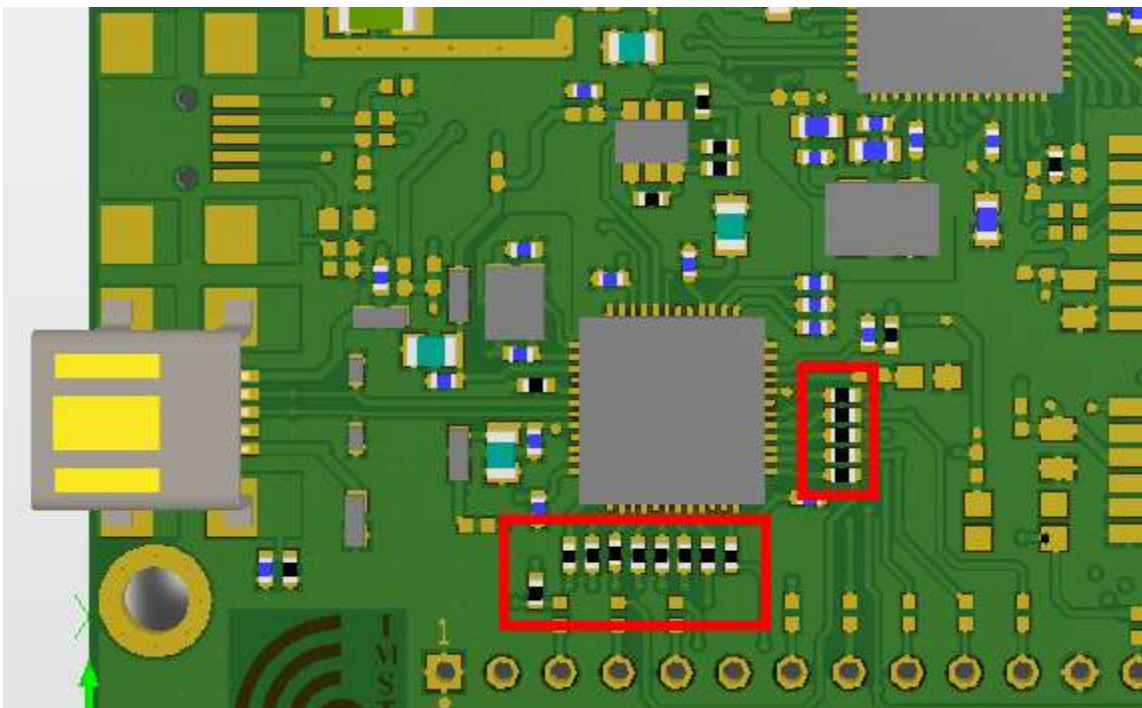


Figure 1: Top view of iC880A-USB with marked resistor to be removed

---

<sup>1</sup> 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

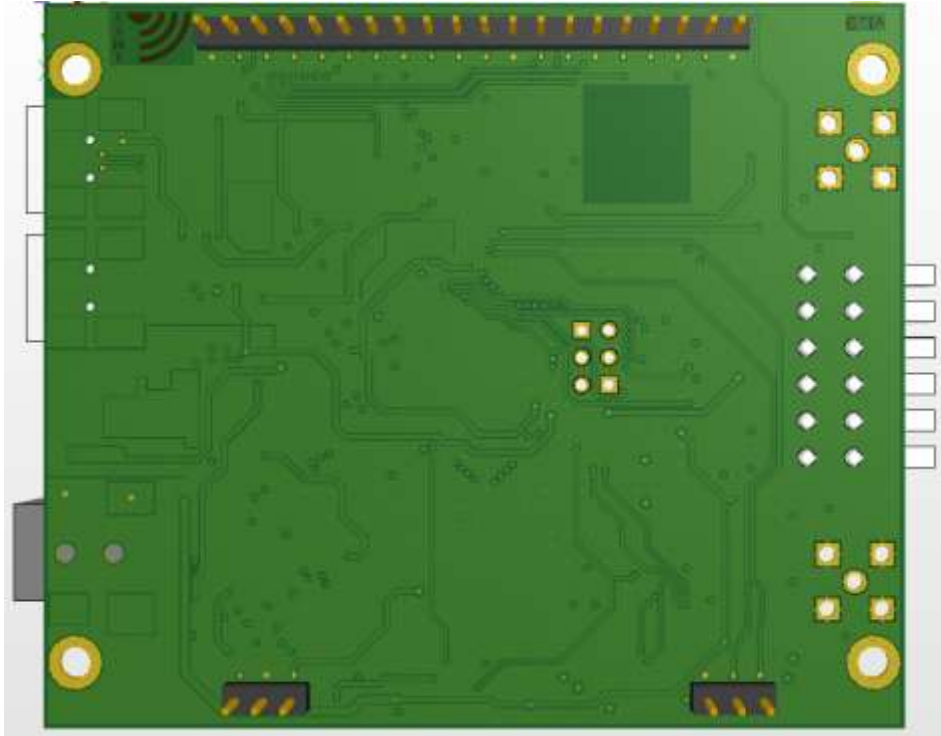


Figure 2: Bottom view of iC880A with soldered plug connectors

## 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  $\Omega$  resistors (15 pieces), size 0402.

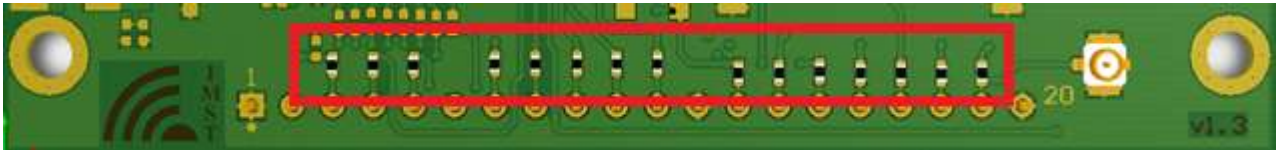
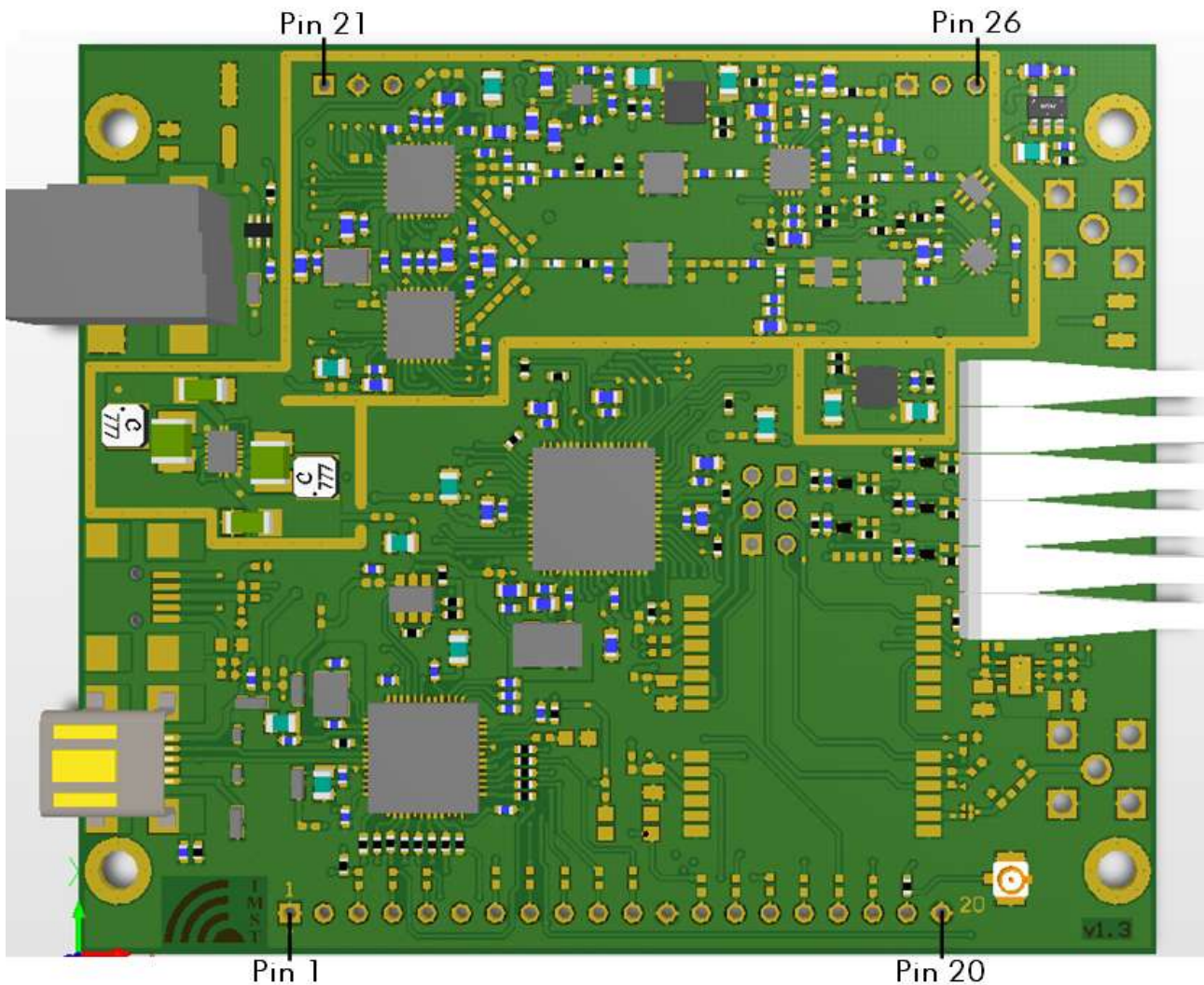


Figure 3: Top view of iC880A-SPI with marked resistor to be populated

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

### 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.

The applicable regulation requirements are subject to change. IMST GmbH does not take any responsibility for the correctness and accuracy of the aforementioned information. National laws and regulations, as well as their interpretation can vary with the country. In case of uncertainty, it is recommended to contact either IMST's accredited Test Center or to consult the local authorities of the relevant countries.



## 4 Important Notice

### 4.1 Disclaimer

IMST GmbH points out that all information in this document is given on an “as is” basis. No guarantee, neither explicit nor implicit is given for the correctness at the time of publication. IMST GmbH reserves all rights to make corrections, modifications, enhancements, and other changes to its products and services at any time and to discontinue any product or service without prior notice. It is recommended for customers to refer to the latest relevant information before placing orders and to verify that such information is current and complete. All products are sold and delivered subject to “General Terms and Conditions” of IMST GmbH, supplied at the time of order acknowledgment.

IMST GmbH assumes no liability for the use of its products and does not grant any licenses for its patent rights or for any other of its intellectual property rights or third-party rights. It is the customer’s duty to bear responsibility for compliance of systems or units in which products from IMST GmbH are integrated with applicable legal regulations. Customers should provide adequate design and operating safeguards to minimize the risks associated with customer products and applications. The products are not approved for use in life supporting systems or other systems whose malfunction could result in personal injury to the user. Customers using the products within such applications do so at their own risk.

Any reproduction of information in datasheets of IMST GmbH is permissible only if reproduction is without alteration and is accompanied by all given associated warranties, conditions, limitations, and notices. Any resale of IMST GmbH products or services with statements different from or beyond the parameters stated by IMST GmbH for that product/solution or service is not allowed and voids all express and any implied warranties. The limitations on liability in favor of IMST GmbH shall also affect its employees, executive personnel and bodies in the same way. IMST GmbH is not responsible or liable for any such wrong statements.

Copyright © 2015, IMST GmbH

### 4.2 Contact Information

IMST GmbH

Carl-Friedrich-Gauss-Str. 2-4  
47475 Kamp-Lintfort  
Germany

T +49 2842 981 0

F +49 2842 981 299

E [wimod@imst.de](mailto:wimod@imst.de)

I [www.wireless-solutions.de](http://www.wireless-solutions.de)