EVK-NINA-B1

Evaluation kit for NINA-B1 modules

User guide

Abstract

This document describes how to set up the EVK-NINA-B1 evaluation kit to evaluate NINA-B1 series standalone Bluetooth® Low Energy modules. It also describes the different options for debugging and the development capabilities included in the evaluation board.

Document information

Title	**EVK-NINA-B1**	
Subtitle	Evaluation kit for NINA-B1 modules	
Document type	User guide	
Document number	UBX-15028120	
Revision and date	R13	6-Nov-2020
Disclosure restriction	C1-Public	

This document applies to the following products:

Product name	Type number	Firmware version	PCN reference
EVK-NINA-B111	EVK-NINA-B111-00		
EVK-NINA-B112	EVK-NINA-B112-00		

u-blox or third parties may hold intellectual property rights in the products, names, logos and designs included in this document. Copying, reproduction, modification or disclosure to third parties of this document or any part thereof is only permitted with the express written permission of u-blox.
The information contained herein is provided “as is” and u-blox assumes no liability for its use. No warranty, either express or implied, is given, including but not limited to, with respect to the accuracy, correctness, reliability and fitness for a particular purpose of the information. This document may be revised by u-blox at any time without notice. For the most recent documents, visit www.u-blox.com.
Copyright © u-blox AG.

Contents

Document information **2**
Contents **3**
1 Product description **4**
1.1 Overview 4
1.2 Kit includes 5
1.3 Jumper description 5
1.4 LEDs 5
1.5 Connectors 6
1.6 Buttons 9
1.7 Configuration options 9
1.7.1 Power supply 9
1.7.2 Disconnecting the debug MCU interface and LEDs 10
1.7.3 NFC antenna interface 11
1.7.4 Current measurement 11
1.8 Software debug options 12
2 Setting up the evaluation board **13**
2.1 Evaluation board setup 13
2.2 Starting up 13
2.2.1 EVK-NINA-B1 13
2.2.2 Getting the latest u-connectXpress software 13
2.2.3 Open CPU 13
Appendix **15**
A Schematics **15**
B Glossary **20**
Related documents **21**
Revision history **22**
Contact **23**

1 Product description

1.1 Overview

The EVK-NINA-B1 evaluation kit includes an evaluation board, which can be used as a reference design for the NINA-B1 series modules, a quick start guide, an NFC antenna, and a USB cable. For the NINA-B111 module, the evaluation board has a U.FL coaxial connector for connecting to the external antenna. The NINA-B112 module has an onboard antenna; thus the evaluation board does not have a U.FL connector.

The main features of the EVK-NINA-B1 are:

- Available in two variants - NINA-B111 and NINA-B112
- All the NINA-B1 module pins are available at connectors
- Can be powered through USB, external power supply, or coin cell battery
- Has an onboard debug MCU that allows serial communication and flashing/debugging over USB.

The EVK-NINA-B1 evaluation kits are available in the following two different versions depending on the NINA-B1 series module that is mounted:

- EVK-NINA-B111 – Evaluation kit for NINA-B111module with antenna pin
- EVK-NINA-B112 – Evaluation kit for NINA-B112 module with onboard antenna

This section describes the main connectors and settings that are required to get started. Figure 1 shows the EVK-NINA-B1 evaluation board.

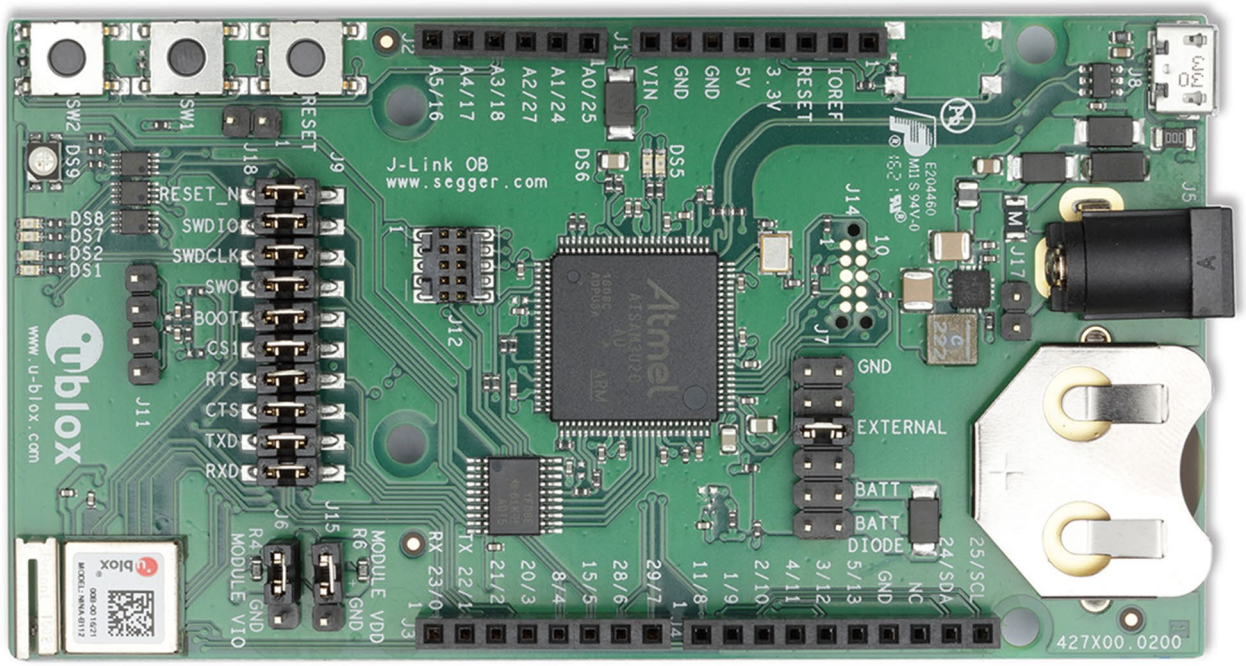


Figure 1: EVK-NINA-B1 evaluation board

⚠ Take care when handling the EVK-NINA-B112. Applying force to the NINA-B112 module might damage the internal antenna.

1.2 Kit includes

The EVK-NINA-B1 evaluation kit includes the following:

- NINA-B1 evaluation board
- 2.4 GHz antenna with U.FL connector (only in EVK-NINA-B111)
- NFC antenna
- USB cable
- Quick Start card

1.3 Jumper description

Parameter	Description	Name	Default
Power source selector	Selects the source from where the board is powered	J7	External/USB
Peripheral connections	Selects the signals that will be connected to the module peripherals such as LEDs and MCU interface	J9	All mounted

Table 1: EVK-NINA-B1 jumper description

1.4 LEDs

Function	Description	Name	Color
Orange Debugger LED	Red when EVK (both module and debug chip) is in reset	DS5	Orange
Green Debugger LED	Non blinking LED shows comunication link between the debug chip and the PC.	DS6	Green
UART Rx	Blinking LED shows UART Rx activity	DS7	Green
UART Tx	Blinking LED shows UART Tx acitivty	DS8	Orange
UART CTS	Blinking LED shows CTS activity	DS1	Green
UART RTS	Blinking LED shows RTS activity	DS2	Orange
RGB LED	RGB LED shows status for u-connectXpress ☞ See the NINA-B1 data sheet [1] for additional information.	DS9	RGB

Table 2: EVK-NINA-B1 LEDs description

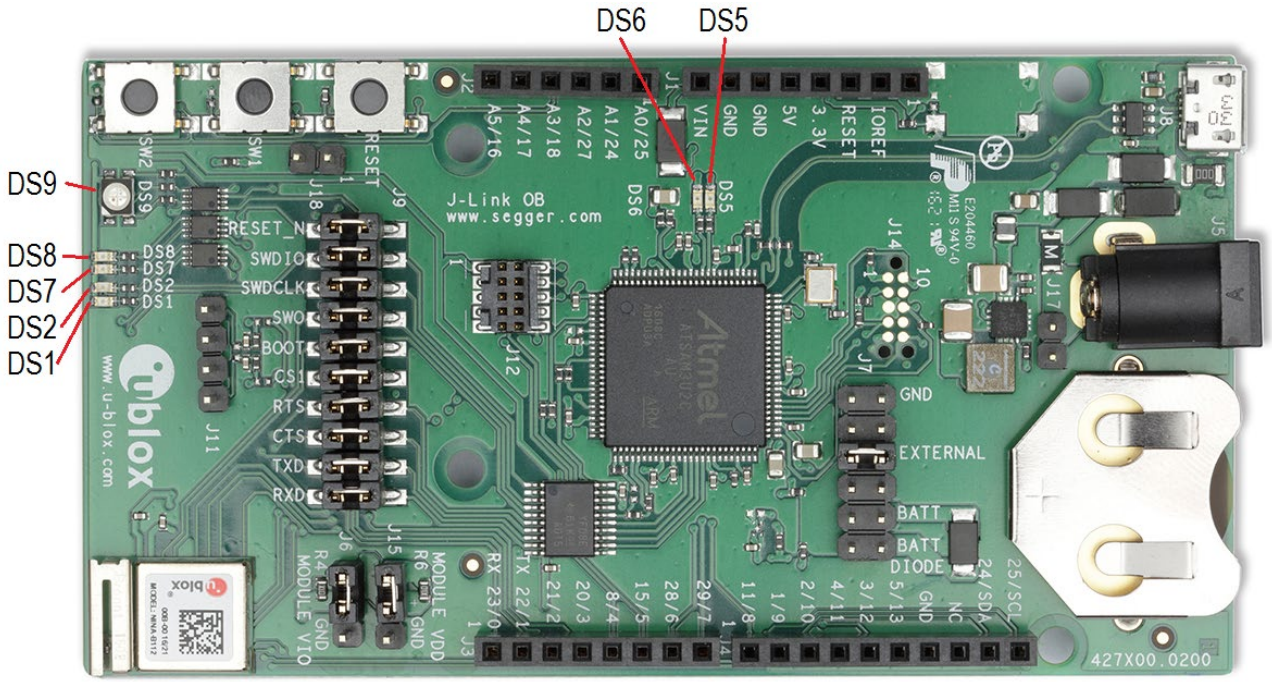


Figure 2: LED placement on the EVK-NINA-B112

1.5 Connectors

The available connectors on the EVK-NINA-B1 evaluation board are shown in Figure 3.

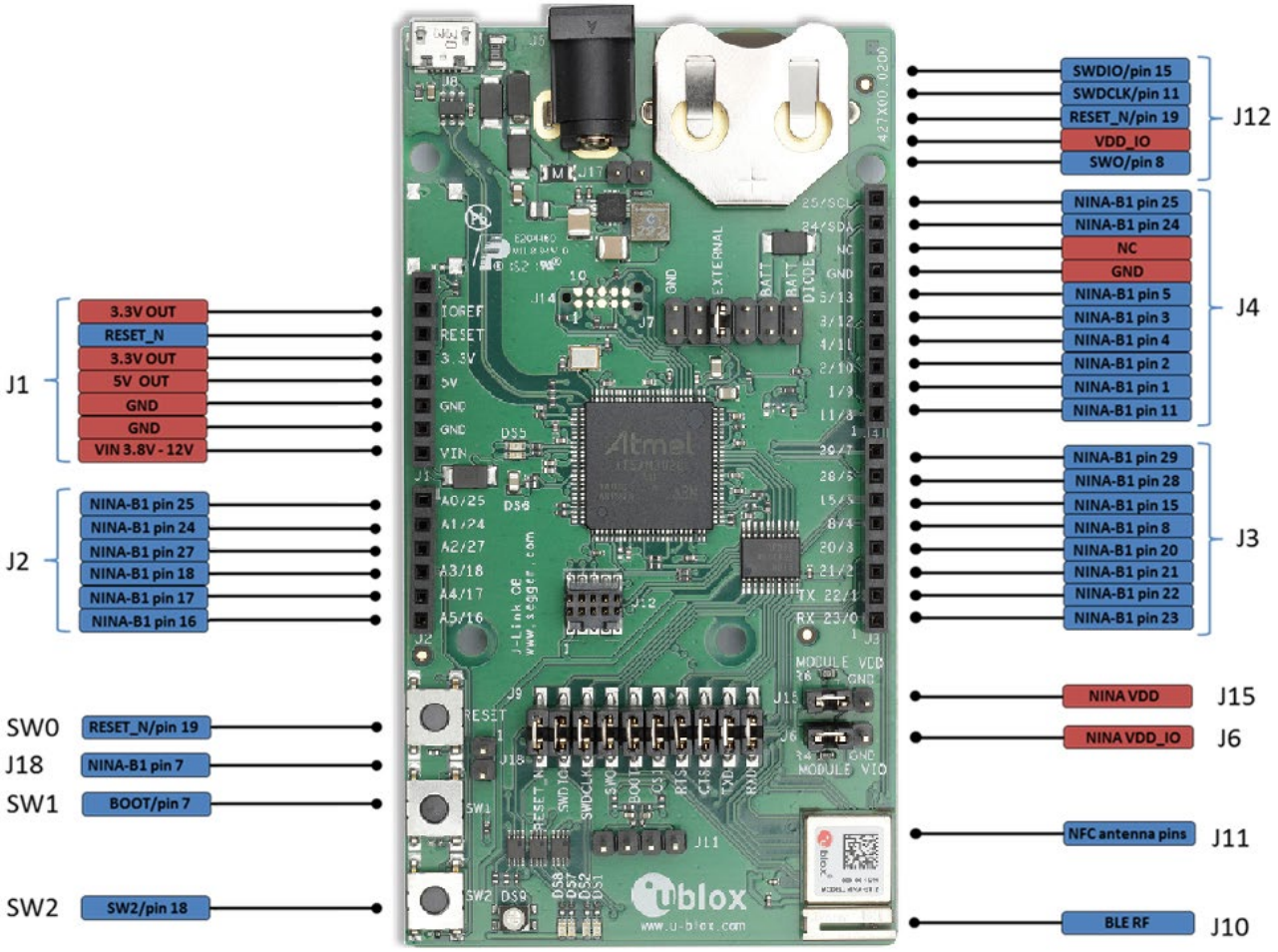


Figure 3: EVK-NINA-B1 connectors

Connector	Description
J1, J2, J3, J4 and J18	Connectors for accessing all GPIOs on NINA-B1
J12	Serial wire debug connector for NINA-B1 module
J10	U.FL connector for external antenna (EVK-NINA-B111 only)
J11	Pin header for NFC antenna connection
J5	Power jack
BT1	Battery holder
J8	USB connector
J15	Module VCC power rail header
J6	Module VCC_IO power rail header
J17	External 5-12V supply pin

Table 3: EVK-NINA-B1 connector description

Conn.	NINA-B1 Pin No.	nRF52 pin	Arduino pin	Description	Schematic net name	Alternate functions and notes
J1	1	-	N/C	Not Connected	-	Not connected
	2	-	IOREF	I/O reference voltage level. Selectable by user to 1.7 – 3.6 V	VDD_IO	See section 1.7.1
	3	P0.21	RESET	Reset signal input. Active low logic	RESET_N	
	4	-	3.3V	3.3 V DC regulated supply output	3V3	

Conn.	NINA-B1 Pin No.	nRF52 pin	Arduino pin	Description	Schematic net name	Alternate functions and notes
	5	-	5V	5 V regulated supply output	5V	Cannot be used as supply input, use VIN instead. Only supplied by USB VBUS.
	6	GND	GND	Ground	GND	
	7	GND	GND	Ground	GND	
	8	-	VIN	External DC supply input, 5 – 12 VDC	VIN	
J2	1	P0.03	A0	Analog input	GPIO_25	Analog function capable GPIO
	2	P0.02	A1	Analog input	GPIO_24	Analog function capable GPIO
	3	P0.04	A2	Analog input	GPIO_27	Analog function capable GPIO
	4	P0.30	A3	Analog input	SWITCH_2/ GPIO_18	Analog function capable GPIO, SWITCH_2 on NINA-B1. This signal is pulled low when the button SW2 is pressed
	5	P0.29	A4	Analog input	UART_DSR/ GPIO_17	Analog function capable GPIO, UART_DSR signal on NINA-B1
	6	P0.28	A5	Analog input	UART_DTR/ GPIO_16	Analog function capable GPIO, UART_DTR signal on NINA-B1
J3	1	P0.05	D0/RX	Digital I/O, UART RX	UART_RXD/ GPIO_23	UART_RXD signal on NINA-B1
	2	P0.06	D1/TX	Digital I/O, UART TX	UART_TXD/ GPIO_22	UART_TXD signal on NINA-B1
	3	P0.07	D2	Digital I/O	UART_CTS/ GPIO_21	UART_CTS signal on NINA-B1
	4	P0.31	D3	Digital I/O	UART_RTS/ GPIO_20	UART_RTS signal on NINA-B1
	5	P0.18	D4	Digital I/O	GPIO_8	SWO signal on NINA-B1
	6	-	D5	Digital I/O	GPIO_15	SWDIO
	7	P0.09	D6	Digital I/O	GPIO_28	Configured for NFC use
	8	P0.10	D7	Digital I/O	GPIO_29	Configured for NFC use
J4	1	-	D8	Digital I/O	GPIO_11	SWDCLK
	2	P0.08	D9	Digital I/O	GPIO_1	
	3	P0.11	D10	Digital I/O	GPIO_2	
	4	P0.13	D11	Digital I/O	GPIO_4	
	5	P0.12	D12	Digital I/O	GPIO_3	
	6	P0.14	D13	Digital I/O	GPIO_5	
	7		GND	Ground	GND	
	8	-	AREF	Analog reference voltage level	-	Not connected
	9	P0.02	SDA	I2C data signal	GPIO_24	
	10	P0.03	SCL	I2C clock signal	GPIO_25	

Table 4: Pin number mapping of NINA-B1 Module and nRF52

☞ The EVK-NINA-B1 has an I/O voltage range of 1.7-3.6 V. It can therefore be used only with shields that support an I/O voltage within this range.

The EVK-NINA-B1 has a pinout that is compatible with some Arduino or Arduino inspired shields. This section describes the features of the EVK pins that a shield has to comply with:

- IOREF: The I/O voltage level of the NINA-B1 module. Is 3.3 V by default, but the EVK can be modified to allow for other voltages (1.7-3.6 V).
- RESET: Is connected to the RESET button (SW0).

- 3.3 V: A regulated 3.3 V output or the battery supply voltage, depending on the power configuration used. May only be used as a 3.3 V input if no jumpers are mounted on jumper J7.
- 5 V: Is only a 5 V supply output if the EVK is being powered by USB. If any other power configuration is used, this pin will be unconnected (floating). It is safe to connect an external 5 V supply to this pin when the USB power configuration is not used.
- VIN: May be used as a 3.8-12 V supply input to power the EVK-NINA-B1.
- A0: Is also connected to the EVK pin SCL (NINA pin 25).
- A1: Is also connected to the EVK pin SDA (NINA pin 24).
- Pin 0 (RX): Is connected to the NINA-B1 UART RX pin (NINA pin 23).
- Pin 1 (TX): Is connected to the NINA-B1 UART TX pin (NINA pin 22).
- SDA: Is also connected to the EVK pin A1.
- SCL: Is also connected to the EVK pin A0.

☞ **Note on SCL/SDA:** On some Arduino boards, the I^2C signals, SCL and SDA, are connected to the pins A4 and A5 while on some other boards, it is connected to the SCL and SDA pins in the top right hand corner. Some shields therefore short these pins together. This can cause problems when using the EVK-NINA-B1 as in this scenario, the SCL/SDA pins are also connected to the A0/A1 pins.

☞ **Note on digital I/O pins:** Some of the digital I/O pins can be connected to the on-board debug MCU, thus allowing serial communication and flashing/debugging over USB. This can cause interference on signals that are also used by an Arduino shield. See Section 1.7.2 on how to disconnect these signals from the debug MCU.

1.6 Buttons

The EVK-NINA-B1 evaluation board has four buttons. Three of them are directly connected to NINA-B1 pins. The fourth button is connected to the debug MCU interface.

Button	Description
SW0	NINA-B1 reset button connected to pin 19
SW1	General function button connected to pin 7
SW2	General function button connected to pin 18

Table 5: EVK-NINA-B1 buttons description

1.7 Configuration options

1.7.1 Power supply

The EVK-NINA-B1 can be powered the following different ways:

- USB
- External power supply
- CR2032 coin cell battery

Depending on the selected power source, and whether or not NFC will be used, you must fit the jumper on pin header J7 in one of the three different positions as shown in Figure 4.

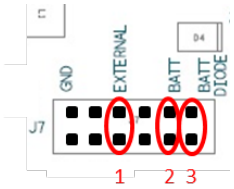


Figure 4: Power supply jumper positions of EVK-NINA-B1

1. To power the board from USB or external power supply, the jumper on J7 should be in position 1 as shown in Figure 4.
2. To power the board from the CR2032 coin cell battery for applications where NFC is not used, the jumper on J7 should be in position 2.
3. To power the board from the CR2032 coin cell battery for applications where NFC will be used, the jumper on J7 should be in position 3. The rationale for this is that the high field strength on the NFC antenna can cause reverse current flow to the coin cell battery – hence the possibility to connect the D4 diode as a protection for the reverse current.

If you would like to utilize the flexible input voltage 1.7-3.6 V of the NINA-B1 module, the power source has to be connected to header J7. Connect the positive voltage to one of the pins - 1, 2 or 3 (bottom row in Figure 4) and connect the ground to one of the two pins marked “GND” in Figure 4.

Coin cell battery considerations

When powering the EVK with a coin cell battery, keep in mind that the debug MCU will also have to be powered by the battery. This will drain the battery faster than needed for a realistic solution. The debug chip can be disabled to minimize the leakage during a battery powered setup. This is done by removing resistor R9; R9 is shown in Figure 5.

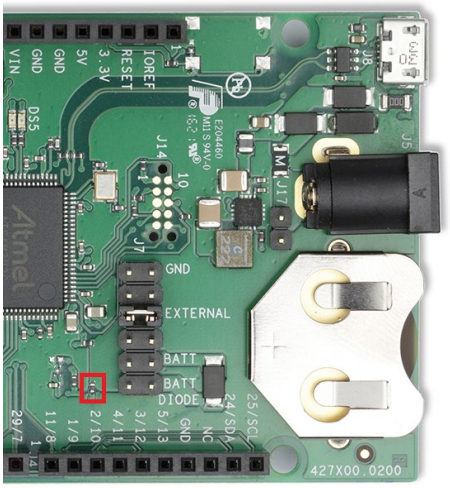


Figure 5: Resistor R9

1.7.2 Disconnecting the debug MCU interface and LEDs

The J9 pin header includes all signals that are passed between the NINA-B1 module, MCU interface, and LEDs.

If these connections are not required, you can disconnect these signals separately by removing the jumpers for that particular connection. This could be useful in a current measurement scenario for example.

☞ When taking any throughput measurements, we recommend that you disconnect the debug MCU and connect a USB to serial converter, or similar, to connector J9. This is suggested because the performance of the UART connection through the debug MCU is not equal to that

of the NINA-B1 module. This connection arrangement is also recommended when flashing u-connect software using the UART.

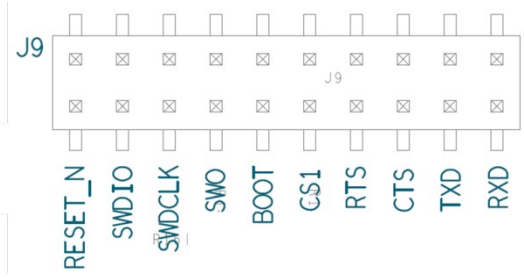


Figure 6: EVK-NINA-B1 peripherals connection to the pin header

1.7.3 NFC antenna interface

The NFC antenna interface is available on the J11 connector. The default configuration is shown in Figure 7. 0 Ω resistors are mounted on R15 and R16. This connects the J11 NFC antenna connector to pins 28 and 29 of the NINA-B1 module. If NFC is not needed, and pins 28 and 29 are used as GPIOs available on connector J3, then resistors on R15 and R16 should be removed and instead mounted on R13 and R14.

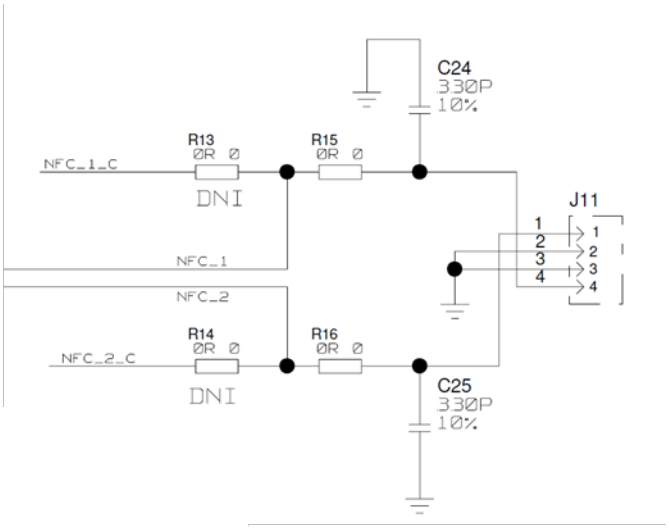


Figure 7: NFC antenna interface J11 of EVK-NINA-B1

1.7.4 Current measurement

The EVK-NINA-B1 offers the possibility to measure current consumption for the NINA-B1 module.

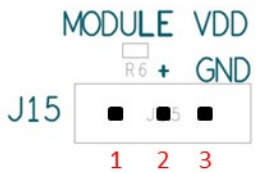


Figure 8: Current measurement pin header J15 of EVK-NINA-B1

The current consumption for the NINA-B1 module on the EVK-NINA-B1 can be measured in two ways as explained in the following subsections.

Figure 9: Placement of R4 and R6 (10 Ω resistors)

1.7.4.1 Current measurement with ampere-meter

Remove the jumpers on J15 and J6. Remove the 10 Ω resistors R4 and R6 and connect the ampere-meter in series between the pins 1 and 2 of the J15 pin header. This will give the NINA-B1 current consumption reading on the ampere-meter.

1.7.4.2 Current measurement with Oscilloscope

Remove the 10 Ω resistor on R4. Remove the jumpers on J15 and J6 and connect an oscilloscope to pins 1 and 2 of the J15 pin header. Then, this will display the voltage drop over the R6 resistor. Current consumption will be proportional to the voltage drop.

If R6=1 Ω, then 1 mV voltage drop equals 1 mA of current. If R6=10 Ω, then 10 mV voltage drop equals 1 mA of current.

⚠ The USB interface, MCU interface, and the LEDs should not be connected during current consumption measurement.

1.8 Software debug options

You can debug the software using the following two options in EVK-NINA-B1:

- Onboard debug solution available on the USB connector
- Using an external debugger connected to J12 connector

An external debugger connected to the J12 connector is useful when powering the evaluation board with the CR2032 coin cell battery, or through the external power supply connector J5. It could also be useful in a scenario where the debug MCU interface has been disconnected from the NINA-B1 module using the jumpers on J9 header. The SEGGER J-Link software [5] is required to debug using the onboard J-Link hardware on the EVK-NINA-B1.

2 Setting up the evaluation board

2.1 Evaluation board setup

The EVK-NINA-B1 will be delivered with the u-blox Connectivity Software installed on the module.

Before connecting the module, download and install the latest u-blox s-center evaluation software from the u-blox website.

To use Bluetooth Low Energy on the EVK-NINA-B111, connect a 2.4 GHz antenna to the U.FL antenna connector (J10). The EVK-NINA-B112 has an onboard antenna.

Plug in either an external power supply in J5 connector or connect to a USB host with a USB cable attached to J8 connector. You can also power the evaluation board with a CR2032 coin cell battery. The status light (**DS6**) will turn green, indicating it has power. The NFC antenna can be connected to the J11 connector.

⚠ Be careful to check polarity before connecting external power supply to the EVK-NINA-B1 evaluation board. Center conductor is positive (+) and the ring is negative (-).

The operating system will install the correct drivers automatically. The drivers will only need to be installed the first time you connect the unit to a new computer.

⚠ If the drivers are not installed automatically, download the nRFgo Studio from www.nordicsemi.com to get the Jlink CDC UART driver.

A COM port will automatically be assigned to the unit by Windows. On Windows 7, open the Control Panel, click Hardware and Sound. Click Device Manager in Devices and Printers. This will open Device Manager window where you can view the assigned COM ports.

2.2 Starting up

2.2.1 EVK-NINA-B1

Perform the following steps to enable communication with the module:

1. Start the u-blox s-center evaluation software.
2. Use the default baudrate 115200, 8N1 with flow control.
3. You will now be able to communicate with the module through AT-commands.

For a list of available AT commands, see the u-blox Short Range At commands manual [3].

To get started with basic use case setups of the EVK-NINA-B1 with u-blox u-connect Software, see the u-connectXpress user guide [4].

If you would like to use the EVK-NINA-B1 together with Nordic Semiconductor SDK or Arm® Mbed™ operating system, refer to the Software section of the NINA-B1 system integration manual [2].

2.2.2 Getting the latest u-connectXpress software

Go to the u-blox support webpage to obtain the latest available firmware. Instructions on reflashing the EVK-NINA-B1 can be found in the Software section of the NINA-B1 system integration manual [2].

2.2.3 Open CPU

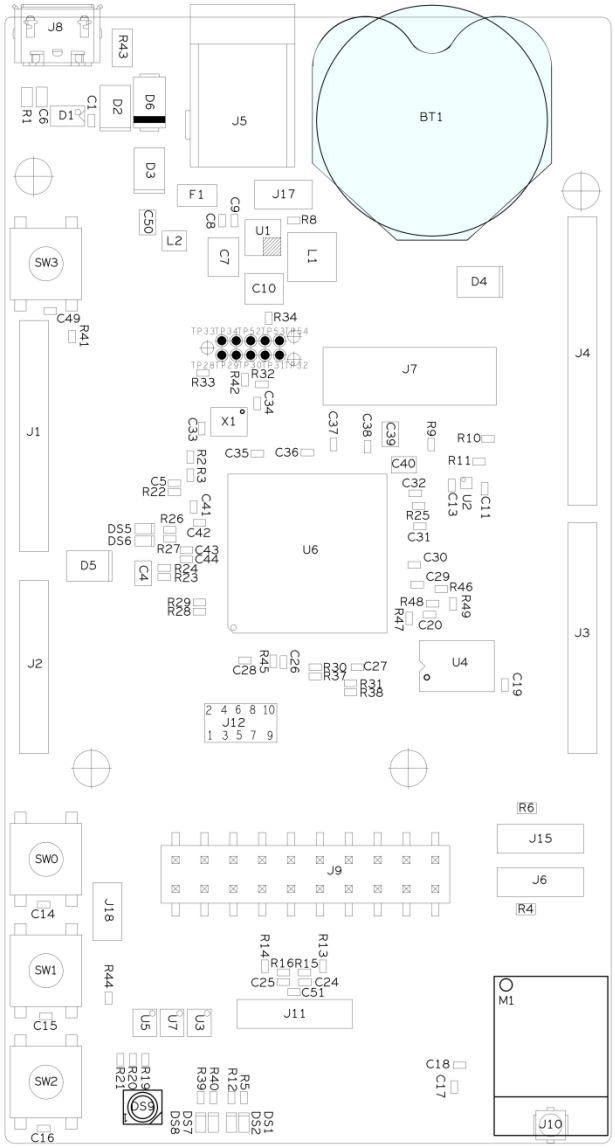
If you would like to use the EVK-NINA-B1 together with Nordic Semiconductor SDK, refer to the Software section of the NINA-B1 system integration manual [2], where it is described how to

- Create your own board file
- Adapt the examples in the Nordic Semiconductor SDK to use this board file

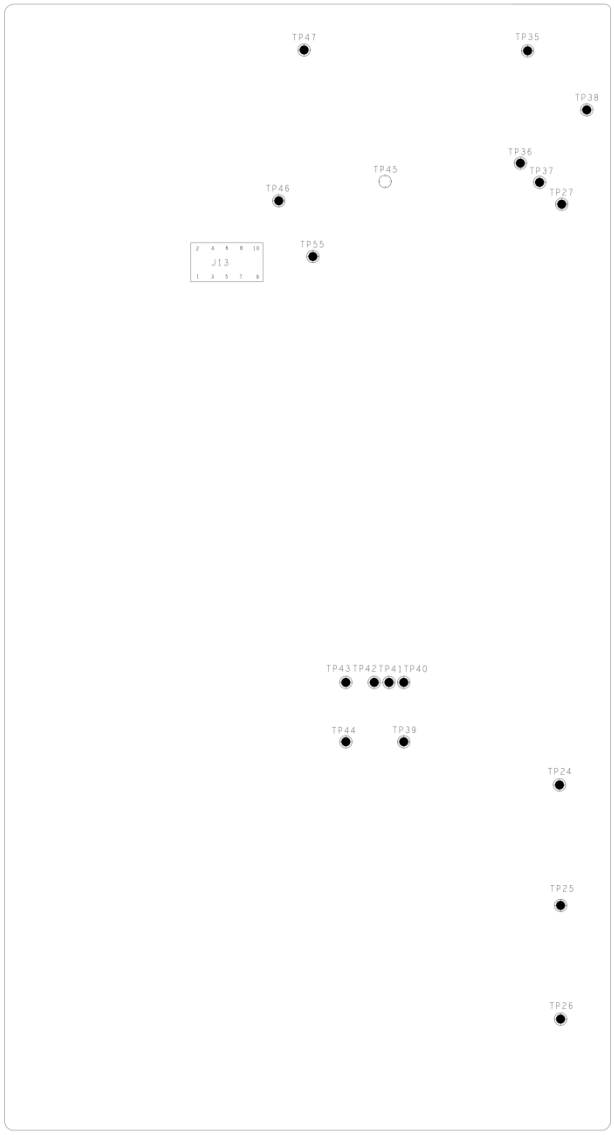
See also the u-blox short range open CPU github repository [6].

Appendix

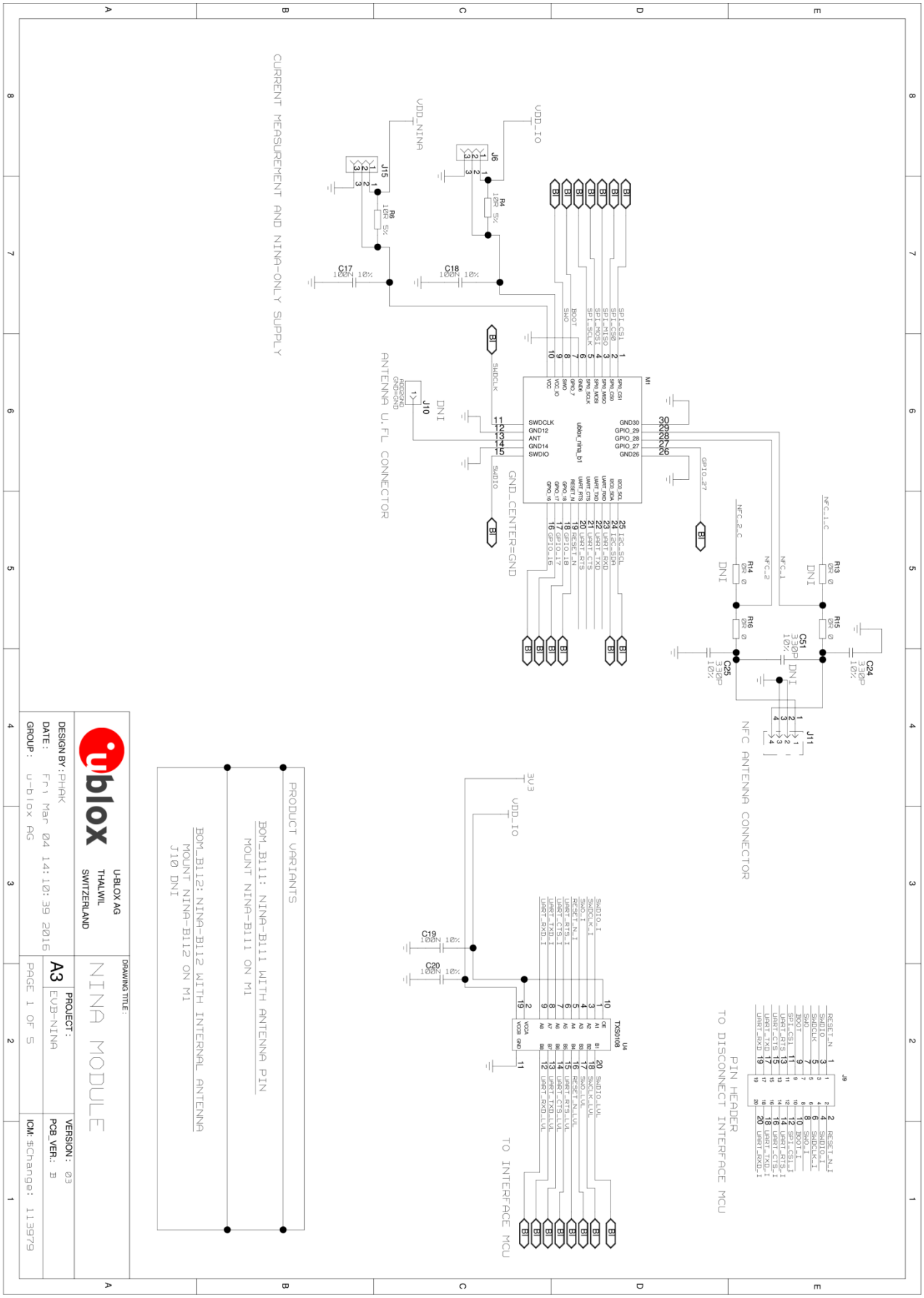
A Schematics

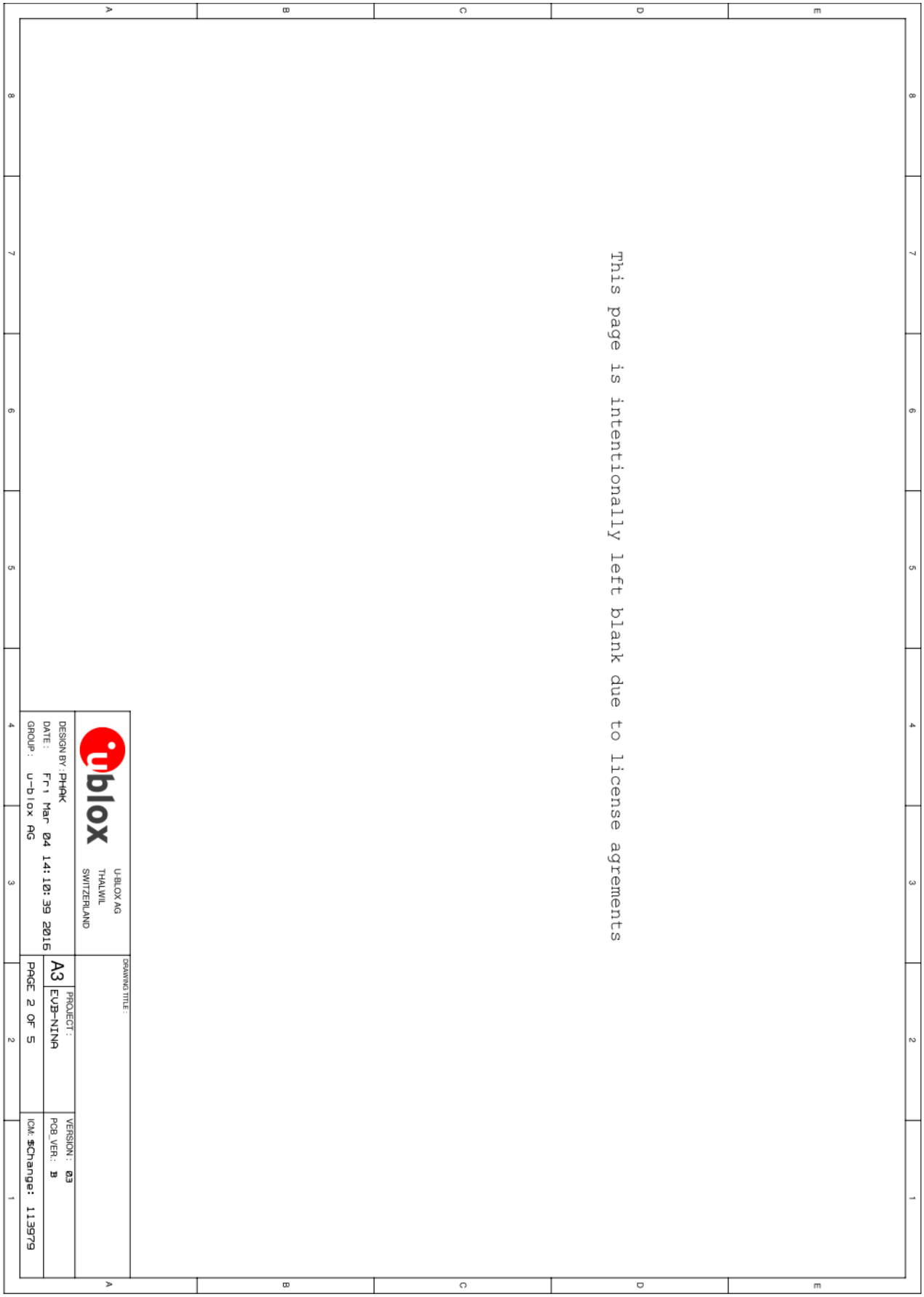


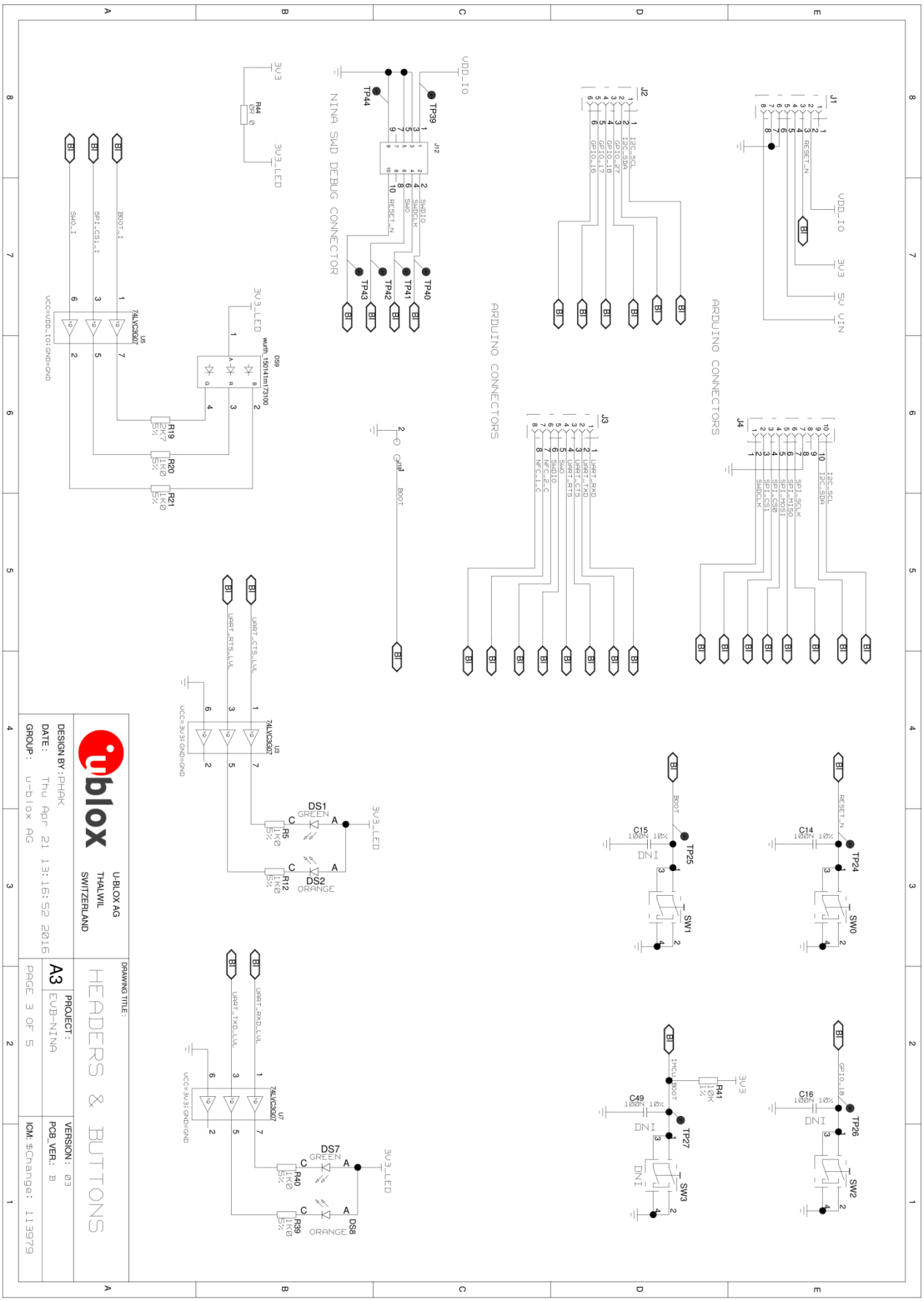
Top

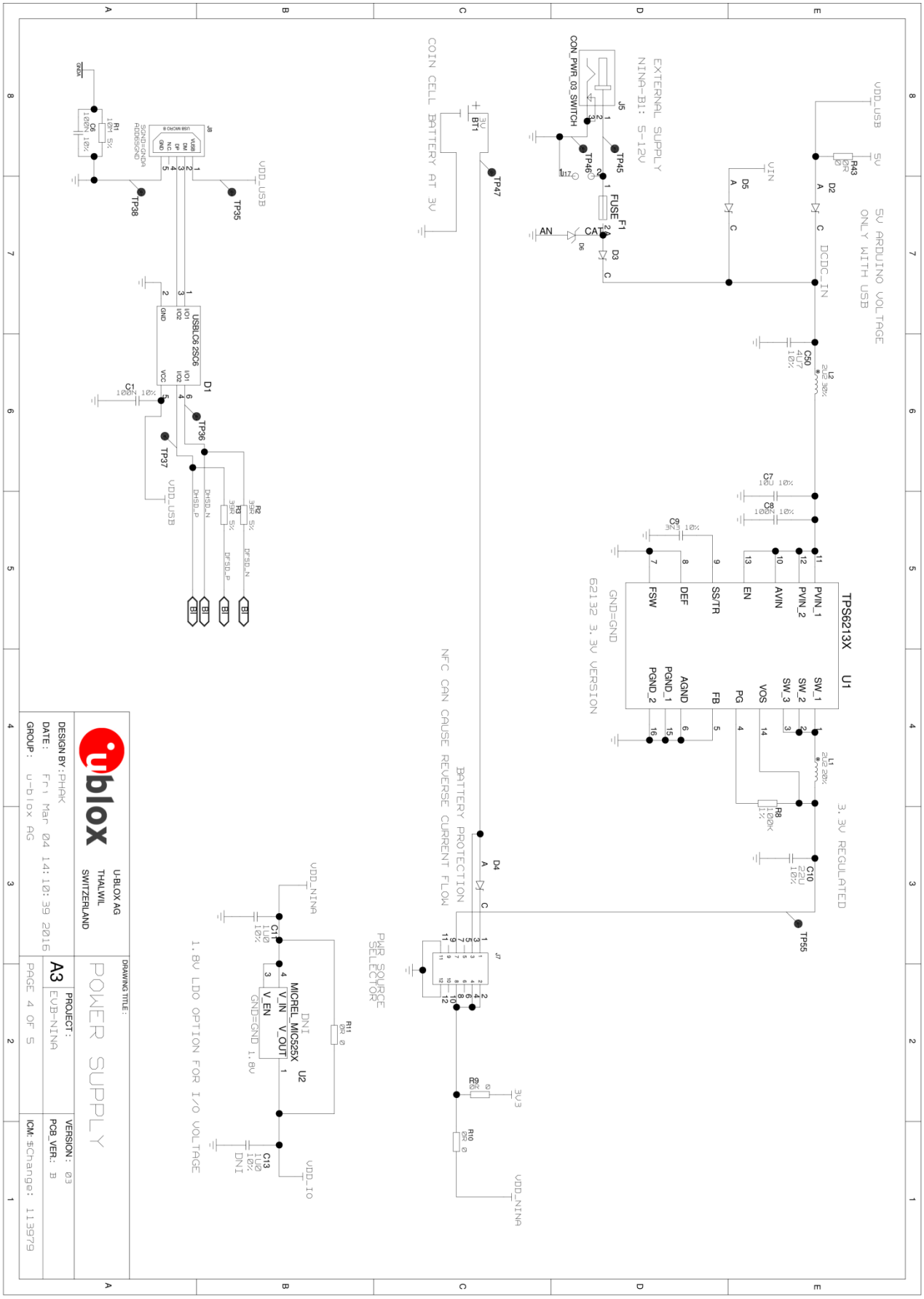


Bottom


CURRENT MEASUREMENT AND NINA-ONLY SUPPLY
VDD_NINA
VDD_IO
ANTENNA U.FL CONNECTOR
GND_CENTER=GND
NFC ANTENNA CONNECTOR
PIN HEADER
TO DISCONNECT INTERFACE MCU
TO INTERFACE MCU
3V3
PRODUCT VARIANTS
BOM_B111: NINA-B111 WITH ANTENNA PIN
MOUNT NINA-B111 ON M1
BOM_B112: NINA-B112 WITH INTERNAL ANTENNA
MOUNT NINA-B112 ON M1
J10 DNI
U-BLOX AG
THALWIL
SWITZERLAND
DESIGN BY: PHAK
DATE: Fri Mar 04 14:10:39 2016
GROUP: u-blox AG
DRAWING TITLE:
NINA MODULE
PROJECT: EVK-NINA
VERSION: 03
PCB_VER: B
ICM: $Change: 113979
A3
PAGE 1 OF 5


This page is intentionally left blank due to license agreements
U-BLOX AG
THALWIL
SWITZERLAND
DESIGN BY: PHAK
DATE: Fri Mar 04 14:10:39 2016
GROUP: u-blox AG
A3
PROJECT:
EVB-NINA
DRAWING TITLE:
PAGE 2 OF 5
VERSION: 03
PCB_VER: B
IOM: $Change: 113979


NINA SWD DEBUG CONNECTOR
ARDUINO CONNECTORS
ARDUINO CONNECTORS
U-BLOX AG
THALWIL
SWITZERLAND
DESIGN BY: PHAK
DATE: Thu Apr 21 13:16:52 2016
GROUP: u-blox AG
A3
PROJECT: EVB-NINA
VERSION: 03
PCB_VER: B
PAGE 3 OF 5
ICM: $Change: 113979
DRAWING TITLE:
HEADERS & BUTTONS


5V ARDUINO VOLTAGE ONLY WITH USB
EXTERNAL SUPPLY NINA-B1: 5-12V
COIN CELL BATTERY AT 3V
NFC CAN CAUSE REVERSE CURRENT FLOW
BATTERY PROTECTION
3.3V REGULATED
62132 3.3V VERSION
GND=GND
TPS6213X
U1
PWR SOURCE SELECTOR
1.8V LDO OPTION FOR I/O VOLTAGE
MICREL_MIC525X
U2
DESIGN BY: PHAK
DATE: Fri Mar 04 14:10:39 2016
GROUP: u-blox AG
U-BLOX AG
THALWIL
SWITZERLAND
DRAWING TITLE:
POWER SUPPLY
A3
PROJECT: EVB-NINA
VERSION: 03
PCB_VER: B
PAGE 4 OF 5
ICM: $Change: 113979

B Glossary

Abbreviation	Definition
API	Application programming Interface
CTS	Clear To send
EVK	Evaluation kit
GND	Ground
GPIO	General-Purpose Input/Output
LED	Light-Emitting Diode
MCU	Micro controller unit
MSD	Mass storage device
NFC	Near Field Communication
U.FL	Coaxial RF connector
USB	Universal serial bus
RTS	Request to send
SDK	Software development kit
SPA	Serial port application
UART	Universal Asynchronous Receiver/Transmitter

Table 6: Explanation of the abbreviations and terms used

Related documents

[1] NINA-B1 data sheet, UBX-15019243
[2] NINA-B1 series system integration manual, UBX-15026175
[3] u-blox u-connect AT commands manual, UBX-14044127
[4] u-connectXpress user guide, UBX-16024251
[5] SEGGER J-Link software - https://www.segger.com/jlink-software.html
[6] https://github.com/u-blox/u-blox-sho-OpenCPU

☞ For product change notifications and regular updates of u-blox documentation, register on our website, www.u-blox.com.

Revision history

Revision	Date	Name	Comments
R01	22-Feb-2016	phak,fbro, kgom	Initial release.
R02	26-May-2016	fbro	Updated information about current measurement (section 1.7.4). Updated the links to Nordic resources in section 2.2. Removed SW3 from section 1.6.
R03	17-Jun-2016	fbro, kgom	Modified the document status to Advance Information. Modified Figure 3 and Table 3. Included information about the u-blox NINA-B1 firmware (section 2).
R04	5-Jul-2016	fbro, kgom	Included information about how to flash the EVK-NINA-B1.
R05	9-Sep-2016	fbro, kgom	Modified Figure 2. Updated the section “UART flashing”. Changed the document status to Early Production Information.
R06	24-Oct-2016	apet, kgom	Added information about mbed OS.
R07	1-Mar-2017	ajoh, fbro, kgom, apet	Included information on Arduino shield compatibility. Added schematics and placement (Appendix A). Updated all the figures. Replaced Document status with Disclosure restriction.
R08	16-May-2017	kgom	Minor updates.
R09	23-Nov-2017	kgom	Minor changes based on the recent brand guidelines of Arm Mbed.
R10	6-Dec-2018	mwej, fbro, kgom	Added a new table describing Arduino to NINA to nRF pin numbering (Table 4).
R11	21-Oct-2019	flun	Clarified the status for RGB LED in Table 2 (section 1.4).
R12	7-Apr-2020	mape	Added recommendation to use connector J9 instead of UART via debug chip for performance measurements and flashing.
R13	6-Nov-2020	mape	Clarified open CPU chapter.

Contact

For complete contact information, visit us at www.u-blox.com.

u-blox Offices

North, Central and South America

u-blox America, Inc.

Phone: +1 703 483 3180
E-mail: info_us@u-blox.com

Regional Office West Coast:

Phone: +1 408 573 3640
E-mail: info_us@u-blox.com

Technical Support:

Phone: +1 703 483 3185
E-mail: support@u-blox.com

Headquarters
Europe, Middle East, Africa

u-blox AG

Phone: +41 44 722 74 44
E-mail: info@u-blox.com
Support: support@u-blox.com

Asia, Australia, Pacific

u-blox Singapore Pte. Ltd.

Phone: +65 6734 3811
E-mail: info_ap@u-blox.com
Support: support_ap@u-blox.com

Regional Office Australia:

Phone: +61 2 8448 2016
E-mail: info_anz@u-blox.com
Support: support_ap@u-blox.com

Regional Office China (Beijing):

Phone: +86 10 68 133 545
E-mail: info_cn@u-blox.com
Support: support_cn@u-blox.com

Regional Office China (Chongqing):

Phone: +86 23 6815 1588
E-mail: info_cn@u-blox.com
Support: support_cn@u-blox.com

Regional Office China (Shanghai):

Phone: +86 21 6090 4832
E-mail: info_cn@u-blox.com
Support: support_cn@u-blox.com

Regional Office China (Shenzhen):

Phone: +86 755 8627 1083
E-mail: info_cn@u-blox.com
Support: support_cn@u-blox.com

Regional Office India:

Phone: +91 80 405 092 00
E-mail: info_in@u-blox.com
Support: support_in@u-blox.com

Regional Office Japan (Osaka):

Phone: +81 6 6941 3660
E-mail: info_jp@u-blox.com
Support: support_jp@u-blox.com

Regional Office Japan (Tokyo):

Phone: +81 3 5775 3850
E-mail: info_jp@u-blox.com
Support: support_jp@u-blox.com

Regional Office Korea:

Phone: +82 2 542 0861
E-mail: info_kr@u-blox.com
Support: support_kr@u-blox.com

Regional Office Taiwan:

Phone: +886 2 2657 1090
E-mail: info_tw@u-blox.com
Support: support_tw@u-blox.com