

EVK-7

u-blox 7 Evaluation Kits

User Guide



Abstract

This document describes the structure and use of the EVK-7 evaluation kits and provides information for evaluating and testing u-blox 7 positioning technology.

Document Information

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Document status information

Objective Specification	This document contains target values. Revised and supplementary data will be published later.
Preliminary	This document contains data from product verification. Revised and supplementary data may be published later.
Released	This document contains the final product specification.

This document applies to the following products:

Name	Type number	ROM/FLASH version	PCN reference
EVK-7N	EVK-7N-0-000	1.00	N/A
EVK-7C	EVK-7C-0-000	1.00	N/A

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Preface

Using this guide

This guide assumes, the user has basic computer skills and is familiar with the Windows Graphical User Interface (GUI) and GPS/GNSS receiver environments.

The following symbols are used in the document to highlight information:



A warning symbol indicates actions that could negatively impact or damage the device.



An index finger points out key information pertaining to device operation and performance.

Warnings and certifications



CAUTION! IN THE UNLIKELY EVENT OF A FAILURE IN THE INTERNAL PROTECTION CIRCUITRY THERE IS A RISK OF AN EXPLOSION WHEN CHARGING FULLY OR PARTIALLY DISCHARGED BATTERIES. REPLACE THE BATTERY IF IT NO LONGER HAS SUFFICIENT CHARGE FOR UNIT OPERATION. CONTROL THE BATTERY BEFORE USING IF THE DEVICE HAS NOT BEEN OPERATED FOR AN EXTENDED PERIOD OF TIME.



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EVK-7 evaluation kits are RoHS compliant and green (no halogens).

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1 Product description

1.1 Overview

EVK-7 Evaluation Kits make evaluating the high performance of u-blox 7 positioning products simple. The built-in USB interface provides both power supply and high-speed data transfer, and eliminates the need for an external power supply. u-blox 7 Evaluation Kits are compact, and their user friendly interface and power supply make them ideally suited for use in laboratories, vehicles and outdoor locations. Furthermore, they can be used with a PDA or a notebook PC, making them the perfect companion through all stages of design-in projects.

Evaluation Kit	Suitable for
EVK-7N: u-blox 7 Evaluation Kit with TCXO	MAX-7Q; NEO-7N; u-blox 7 positioning chips with TCXO
EVK-7C: u-blox 7 Evaluation Kit with Crystal	MAX-7C; NEO-7M; u-blox 7 GPS/GNSS chips with Crystal

Table 1: List of available EVK-7 evaluation kits

1.2 Kit includes

- Evaluation unit
- USB cable
- Active GPS/GNSS/GLONASS antenna with 3 m cable
- Extra Battery RENATA CR2450
- Quick Start Guide



EVK-7 installation software package can be downloaded from the u-blox website <http://www.u-blox.com/evk-downloads.html>. It installs software and documentation required for EVK-7.

1.3 u-center GPS/GNSS evaluation software

The installer includes u-center, an interactive tool for configuration, testing, visualization and data analysis of GPS/GNSS receivers. It provides useful assistance during all phases of a system integration project.

1.4 System requirements

- PC with USB interface
- Operating system: Microsoft® Windows 8 (Intel version platform), Windows 7, Windows Vista or Windows XP
- USB drivers are provided in the evaluation kit installation software

2 Specifications

Parameter	Specification
Serial Interfaces	1 USB V2.0
	1 RS232, max. baud rate 921,6kbaud - DB9: PC compatible - 14-pin connector: 3.3V level
	1 DDC (I ² C compatible) max. 400kHz
	1 SPI - clock signal max. 5,5MHz – SPI DATA max. 1Mbit
Dimensions	105 x 64 x 26mm
Power Supply	5V via USB or external powered via extra power supply pin 14 (V5_IN) 13 (GND)
Normal Operating temperature	-40°C to +65°C
Extended temperature range - only for use with restricted service access	-40°C to +85°C

Table 2: EVK-7 specifications

3 Getting Started

3.1 Software installation



Installation of the EVK-7 software and documentation requires Internet access.

- Download and unzip the executable installation software package from the u-blox website <http://www.u-blox.com/evk-downloads.html>. The installer requires Internet access to ensure that the most up-to-date components are installed on your system; these will be placed under the "u-blox" folder in the Start → Programs menu.

3.2 Hardware installation

- Connect the unit to a PC running Microsoft Windows. Options:

- USB: Connect via USB port.
- UART: Connect via RS232. Set slide switch to I2C.
- SPI / I²C compliant DDC: Connect corresponding pins (see Table 5 for pin description). Set slide switch accordingly to SPI or I2C.

NOTE: Press the RST button after changing the switch.

- The device must always have power, either via USB on the back or the V5_IN input on the front.
- Connect the GPS/GNSS antenna to the evaluation unit and place the antenna in a location with good sky view.
- Start the u-center GPS/GNSS Evaluation Software and select corresponding COM port and baud rate. (Refer to the *u-center User Guide* [9] for more information.)

3.3 Serial port default configuration

Parameter	Description	Remark
UART Port 1, Input	UBX and NMEA protocol at 9'600 Baud	
UART Port 1, Output	UBX and NMEA protocol at 9'600 Baud	Only NMEA messages are activated
USB, Input	UBX and NMEA protocol	
USB, Output	UBX and NMEA protocol	Only NMEA messages are activated

Table 3: Default configuration

4 Device description

4.1 Interface connection and measurement

For connecting the EVK to a PC use a standard SUBD-9 cable and the included USB-Mini cable.

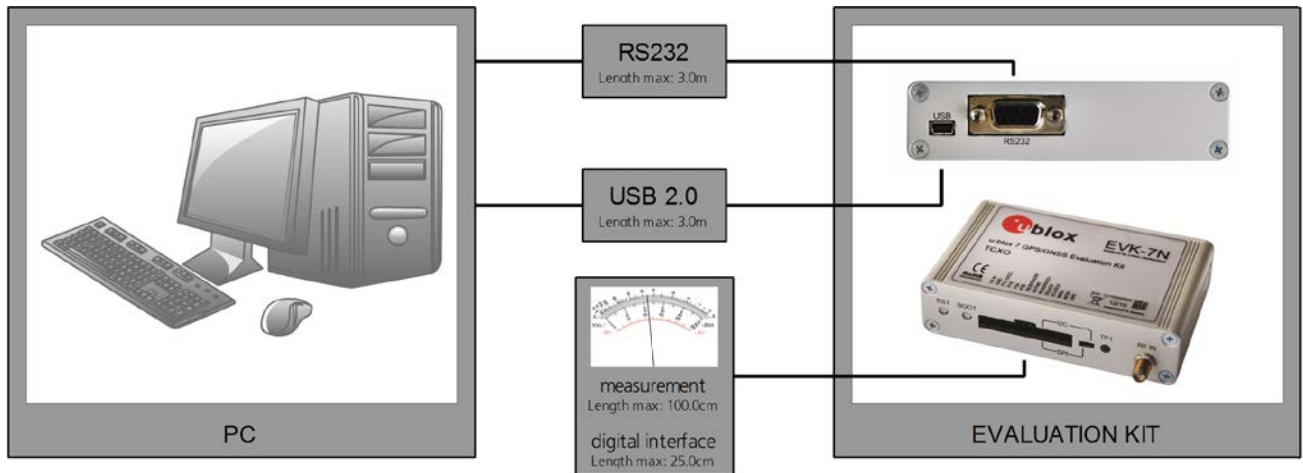


Figure 1: Connecting the unit for power supply and communication

4.2 Active antenna

EVK-7 evaluation kits include a GPS/GLONASS antenna with a 3 m cable. It is possible to connect various active and passive GPS/GNSS antennas with SMA connectors to the evaluation unit.

The recommended maximum antenna supply current for active antennas is 30 mA.

4.3 Evaluation unit

Figure 2 shows the front and the rear panel of the EVK-7 evaluation unit.



Figure 2: EVK-7 evaluation unit - front and rear panels

4.3.1 Antenna connector

An SMA female jack is available on the front side (see Figure 2) of the evaluation unit for connecting an active or passive antenna. DC voltage at the RF input is 3.3 V. The internal short circuit protection limits the maximum current to 60 mA. Please note, the 30mA maximum supply current for active antenna stays the same. This pin is also ESD protected.

The connector is only to be used with a GPS/GNSS antenna or simulator. Do not connect this equipment to cable distribution systems.

4.3.2 USB

A USB V2.0 compatible serial port is featured for data communication and power supply.

4.3.3 UART

The evaluation unit includes an RS232 port for serial communication that is compatible with PC serial ports. In addition to the RS232 communication port, the time pulse 1 signal is available on the DB9 connector (Pin 1; 6).

Connect using a straight RS232 serial cable with male and female connectors to the port on your PC. The maximum cable length is 3 meters. To configure the RS232 port, use the CFG_PRT command in the u-center application. The maximum operating baud rate is 921.6 kbaud.

If you are using a USB to RS232 adaptor cable, you can connect it directly to the evaluation kit RS232 port.

The 9-pin D-SUB female connector is assigned as listed in Table 4:

Pin Nr.	Assignment
1	GPS/GNSS time pulse output
2	TXD, GPS/GNSS Transmit Data, serial data to DTE
3	RXD, GPS/GNSS Receive Data, serial data from DTE
4	not connected
5	GND
6	GPS/GNSS time pulse output
7-9	not connected

Table 4: SUB-D9 Connector pin description for EVK-7

4.3.4 RST button

The RST button on the front panel resets the unit. To avoid an inadvertent reset, the button is recessed.

4.3.5 Safe boot button

This is used to set the unit in safe boot mode. In this mode the receiver executes only the minimal functionality, such as updating new firmware into the SQI flash. In order to set the receiver in safe boot mode please follow these steps.

1. Press the BOOT button and keep holding
2. Press the RST button
3. Release the RST button
4. Release the BOOT button
5. If the UART interface has to be used, the training sequence has to be sent to the receiver. The training sequence is a transmission of 0x55 at the baud rate of 9600 baud. Wait for at least 100 milliseconds before the interface is ready to accept commands.

4.3.6 Slide Switch

Use the slide switch on the front panel to choose between I2C (and RS232) and SPI communication ports. You must reset the unit by pressing the RST button when the slide switch has been changed.

1. *I2C* – In this selection the EVK operates with the RS232 (DB9 – rear panel) or the 3.3V level TxD (MISO) , RxD (MOSI) at the front panel. Also the communication via 3.3V DDC interface (I2C) is selected.
2. *SPI* – In this selection the EVK operates only with the SPI interface. RS232 (DB9) is switched off.

4.3.7 Test Connector

This 14-pin test-connector provides additional functionality to the EVK, allowing access to the interface pins and an ability to measure the current used by the EVK. All pins are ESD protected.

For accurate measurements, it is recommended to use a cable of at most 1 meter in length. Figure 3 shows an example to connect a power supply to the test connector by using standard adapter cables from the manufacture Hirschmann. Figure 4 shows an example for over all current measurement. When connecting the 3.3V digital interfaces RS232, SPI and DDC to your application, a cable length less than 25 cm is recommended.

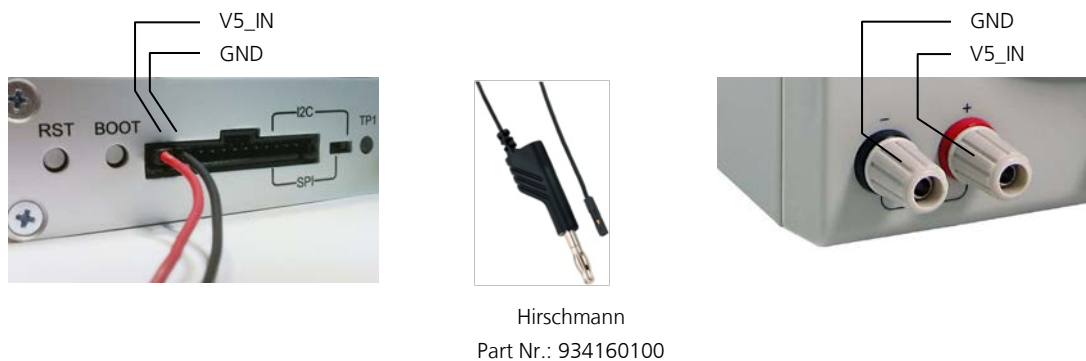


Figure 3: Example 5V DC power supply

PIN Nr.	PIN NAME	I/O	LEVEL	DESCRIPTION
14	V5_IN	I	4.75V – 5.25V	power input – can be used instead of USB
13	GND	I	-	common ground pin
12	P1A (VCC)	O	3.3V	Power output – max. current supply 100mA 1Ω 1% resistor for over-all current measurement to pin 11 (P1B) <i>NOTE: the current includes also SQI Flash, LNA</i>
11	P1B	O		second connection for over-all current measurement (see Figure 5)
10	P2A	O	3.0V	battery output (unloaded) 100Ω 1% resistor for battery backup current measurement to pin 9 (P2B) <i>NOTE: There is a current protection to 3mA. See circuit in figure 7 (D2, D4, R29)</i>
9	P2B	O		second junction for battery backup current measurement
8	RESERVED0	-	-	not connected
7	EXTINO	I	3.3V	external interrupt input
6	RESERVED1	-	-	not connected
5	SDA / CS	I/O	3.3V	slide switch I2C – DDC Interface selected - Function: data input / output slide switch SPI – SPI Interface selected - chip select input - LOW ACTIVE
4	SCL / SCK	I/O	3.3V	clock input / output
3	TxD / MISO	I/O	3.3V	slide switch I2C – DDC Interface selected - Function: TxD output RS232 interface slide switch SPI – SPI Interface selected - Master in Slave out
2	RxD / MOSI	I/O	3.3V	slide switch I2C – DDC Interface selected - Function: RxD input RS232 interface slide switch SPI – SPI Interface selected - Master out Slave in
1	GND	I	-	common ground pin

Table 5: Connector pin description for EVK-7

4.3.8 LED

On the front panel of the unit a blue single LED shows the time pulse 1 signal. The LED starts flashing one pulse per second during a GPS/GNSS fix. If there is no GPS/GNSS fit, the LED will only light, without flashing.

4.3.9 Backup Battery

There is a backup battery in the unit. This is necessary to store orbital information between operations and to enable faster start-up. It is a RENATA 3.0 V Li / MnO₂ battery of the type CR2450. The battery has a rated capacity of 540 mA. The operating temperature range is -40°C to +85°C.

CAUTION! RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE. DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS!

4.3.10 GNSS Configuration

In addition to GPS, the EVK-7 also supports QZSS and GLONASS. The GNSS to be used can be configured on u-center (View → Messages View then UBX-CFG-GNSS). For more information, refer to the *u-center User Guide* [9], and the *u-blox 7 Receiver Description including Protocol Specification* [8].

5 Measuring tracking current

To measure the tracking current with EVK-7, follow these steps:

1. Connect a true rms multimeter across P1A (VCC) and P1B of the front connector. (see Table 4)
2. Wait 12 minutes to download all GPS/GNSS orbital data, or download all the Aiding Data via the AssistNow Online service
3. Read the voltage (and average if necessary) on the multimeter and convert to current (1 mV equals 1 mA)
4. Perform the test with good signals and clear sky view to ensure that the receiver can acquire the satellite signals.

NOTE: The overall current measurement also includes the internal SQI flash and the low noise amplifier. The current will be significantly higher when operating with SQI FLASH.

For more details see the circuit in Figure 7.

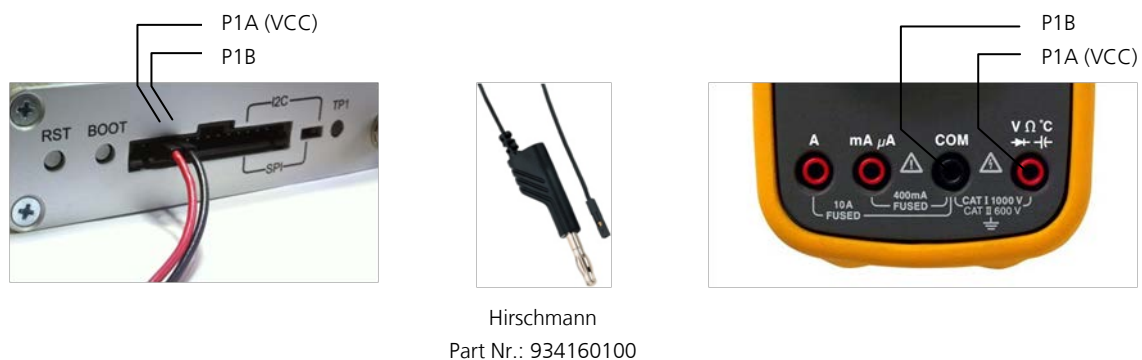


Figure 4: Example – tracking current measurement

6 Testing Power Save Mode

When testing Power Save Mode with EVK-7, observe the following points:

- When configuring Power Save Mode you must set up the parameters using the CFG-PM2 message first and then enable Power Save Mode using CFG-RXM. The Configuration view or Messages view of the u-center evaluation software can be used to do this. When enabling the mode using CFG-RXM, always save the configuration by checking the "save configuration" box in u-center otherwise the configuration will be lost.
- When you want to alter the Power Save Mode configuration, you must first disable the mode using CFG-RXM first (remember to enable "save configuration" again), before changing the CFG-PM2 parameters. You can then re-enable Power Save Mode using CFG-PM2.
- Communications to the evaluation kit must be via the RS232 (not USB).
- The evaluation kit can be supplied via the USB connector or via V5_IN at the front panel connector. Do not connect the USB cable to the PC! This can be done by either connecting a USB cable from the evaluation kit to a USB hub, or by using a USB power connector.
- When altering the Power Save Mode configuration, first disable the mode using CFG- RXM (remember to enable "save configuration" again), before changing the CFG-PM2 parameters. Then re-enable Power Save Mode.

7 Block diagram

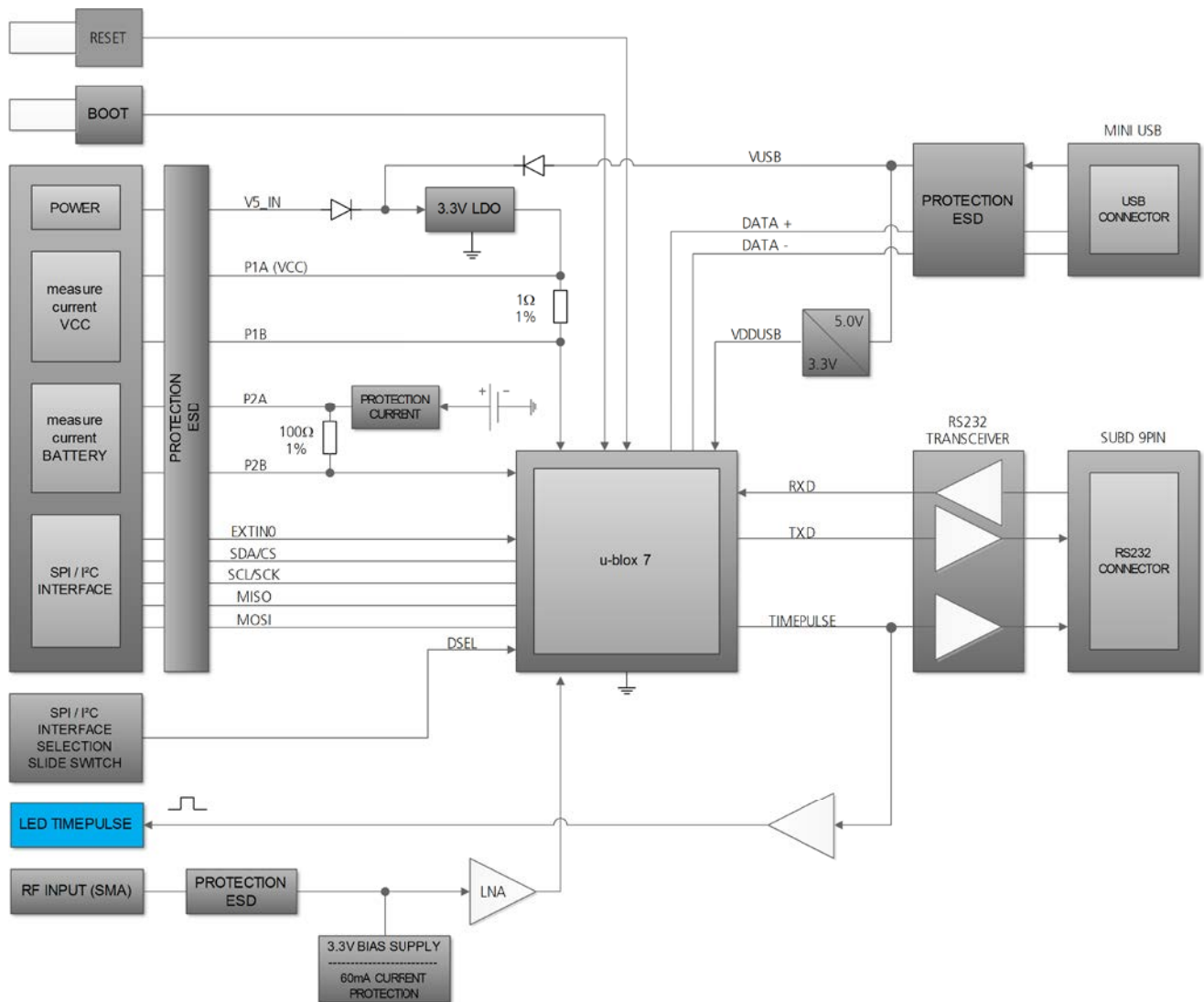


Figure 5: EVK-7 block diagram

8 Board layout

Figure 6 shows the EVK-7 board layout – the EVB-7. See Table 6 for the component list of the EVB-7.

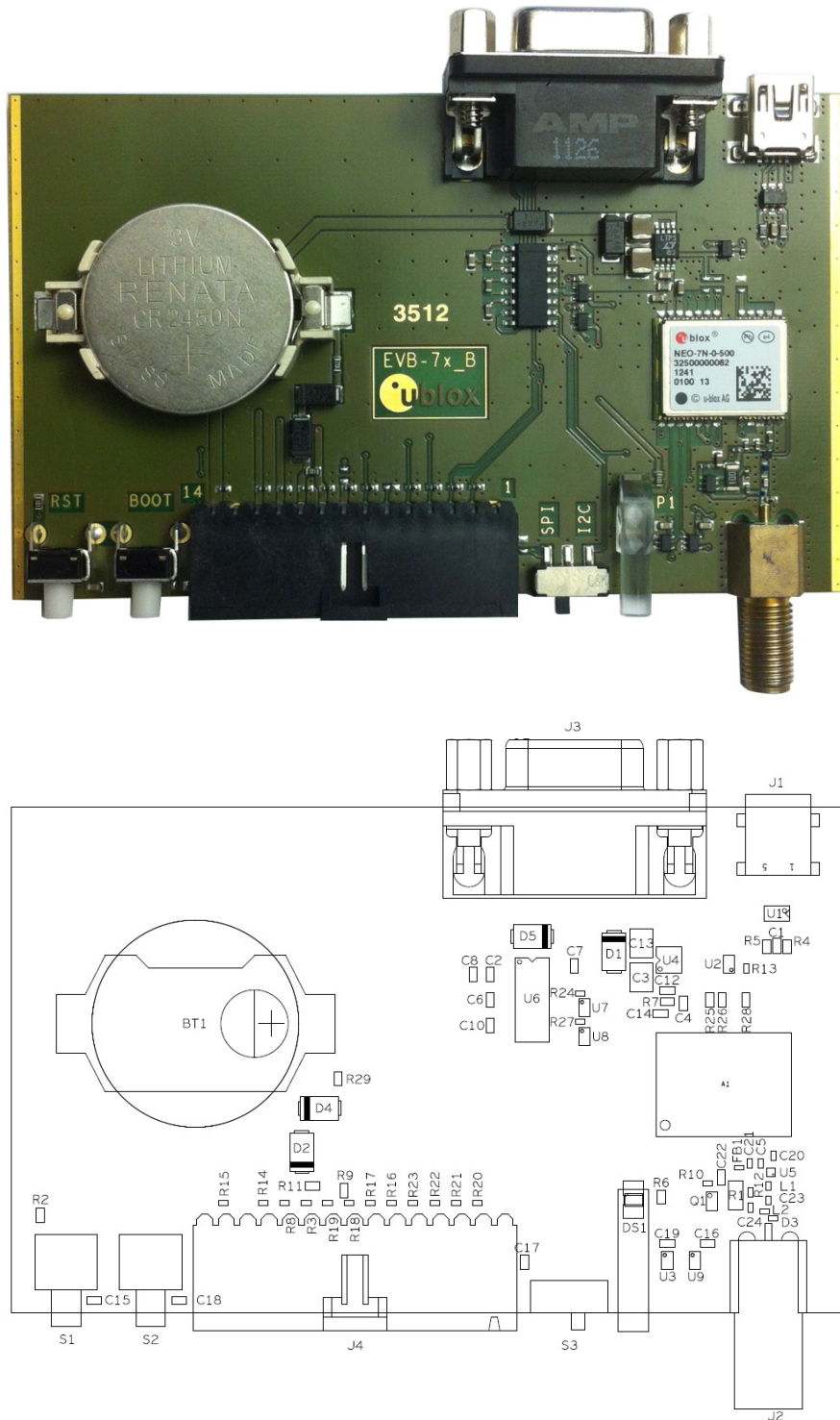


Figure 6: EVB-7 layout

PART	DESCRIPTION
A1	GPS/GNSS RECEIVER U-BLOX NEO-7N-0-500 -40/+85C (EVK-7N)
	GPS/GNSS RECEIVER U-BLOX NEO-7C-0-500 -40/+85C (EVK-7C)
BT1	BATTERY HOLDER RENATA CR2450N 3V
C1 C14 C16 C19 C7	CAP CER X7R 0603 100N 10% 10V
C10 C2 C22 C6 C8	CAP CER X5R 0603 1U0 10% 6.3V
C12 C15	CAP CER X7R 0603 10N 10% 10V
C13 C3	CAP CER X5R 1210 10U 10% 10V
C20	CAP CER COG 0402 1P8 +/-0.1P 25V
C21	CAP CER COG 0402 22P 5% 25V
C23	CAP CER COG 0402 47P 5% 25V
C24	CAP CER X5R 0402 100N 10% 10V
C4	CAP CER X5R 0603 4U7 10% 6.3V
C5	CAP CER X7R 0402 1N0 10% 16V
D1 D2 D4 D5	SURFACE MOUNT SCHOTTKY BARRIER RECTIFIER SS14 1A -55/+125C
D3 R17 R18 R20 R21 R22 R23	ESD PROTECTION FOR HIGH SPEED LINES, TYCO, 0.25PF, PESD0402-140 -55/+125C
DS1	LED OSRAM HYPER MINI TOPLED LB M673-L1N2-35 BLUE 0.02A
FB1	FERRITE BEAD MURATA BLM15HD 0402 1000R@100MHZ
J1	CON MINI USB RECEPTABLE B TYPE SMD CERTIFIED -40/+85C
J2	CON SMA SMD STRAIGHT JACK 11.4MM HEIGHT WITHOUT WASHER AND NUT
J3	9 POLE SUBD CONNECTOR FEMALE
J4	14PIN 90DEGREE 2.54MM PITCH DISCONNECTABLE CRIMP CONNECTOR -40/+85C
L1	IND MURATA LQW15A 0402 8N7 3% 0.54A -55/+125C
L2	IND MURATA LQW15A 0402 120N 5% 110mA -55/+125C
Q1	MBT3906DW1T1G DUAL GENERAL PURPOSE TRANSISTOR 0.2A 0.15W -40/+125C
R1	RES THICK FILM CHIP 1206 10R 5% 0.25W
R10	RES THICK FILM CHIP 0402 220R 5% 0.1W
R11 R2 R6	RES THICK FILM CHIP 0603 100R 5% 0.1W
R12	RES THICK FILM CHIP 0402 2K2 5% 0.1W
R13	RES THICK FILM CHIP 0402 10K 5% 0.1W
R14 R15 R19 R3 R8	VARISTOR BOURNS MLE SERIES CG0402MLE-18G 18V
R24 R27	RES THICK FILM CHIP 0402 100K 5% 0.1W
R29	RES THICK FILM CHIP 0603 1K0 5% 0.1W
R4 R5	RES THICK FILM CHIP 0603 22R 5% 0.1W -55/+125C
R7	RES THICK FILM CHIP 0603 1R0 5% 0.1W
S1 S2	SWITCH SPST ON 1POL TYCO
S3	2 WAY SUB-MINIATURE SLIDE SWITCH SMD JS SERIES - SPDT -40/+85C
U1	USB DATA LINE PROTECTION ST USBLC6-2SC6 SOT23-6
U2 U3 U7 U8 U9	TINY LOGIC UHS BUFFER OE_N ACTIVE LOW FAIRCHILD NC7SZ125 SC70
U4	LOW DROPOUT REGULATOR LINEAR LT1962 MS8 3.3V 0.3A
U5	LOW NOISE AMPLIFIER GAAS MMIC 1.575 GHZ 1.5V-3.6V JRC EPFFP6-A2 3.6V -40/+85C
U6	RS-232 TRANSCEIVER MAXIM MAX3232 SO16 -40/+85C

Table 6: EVB-7 component list

9 Schematic

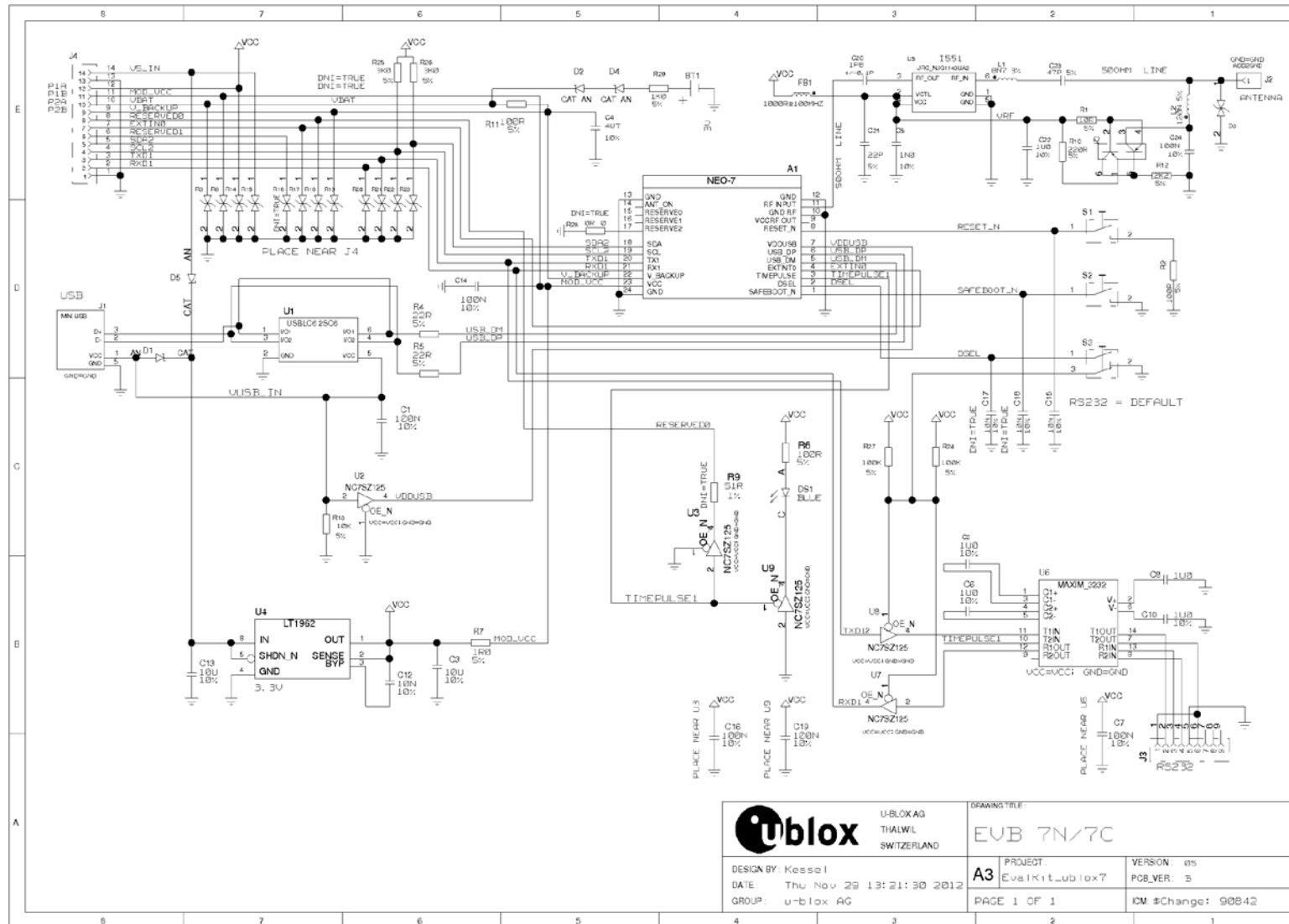


Figure 7: Schematic EVK-7: DNI=TRUE in the schematic means: Component not installed

10 Battery replacement

To replace the battery (Number 5 in Figure 8), open the unit (unscrew four screws on the front panel).

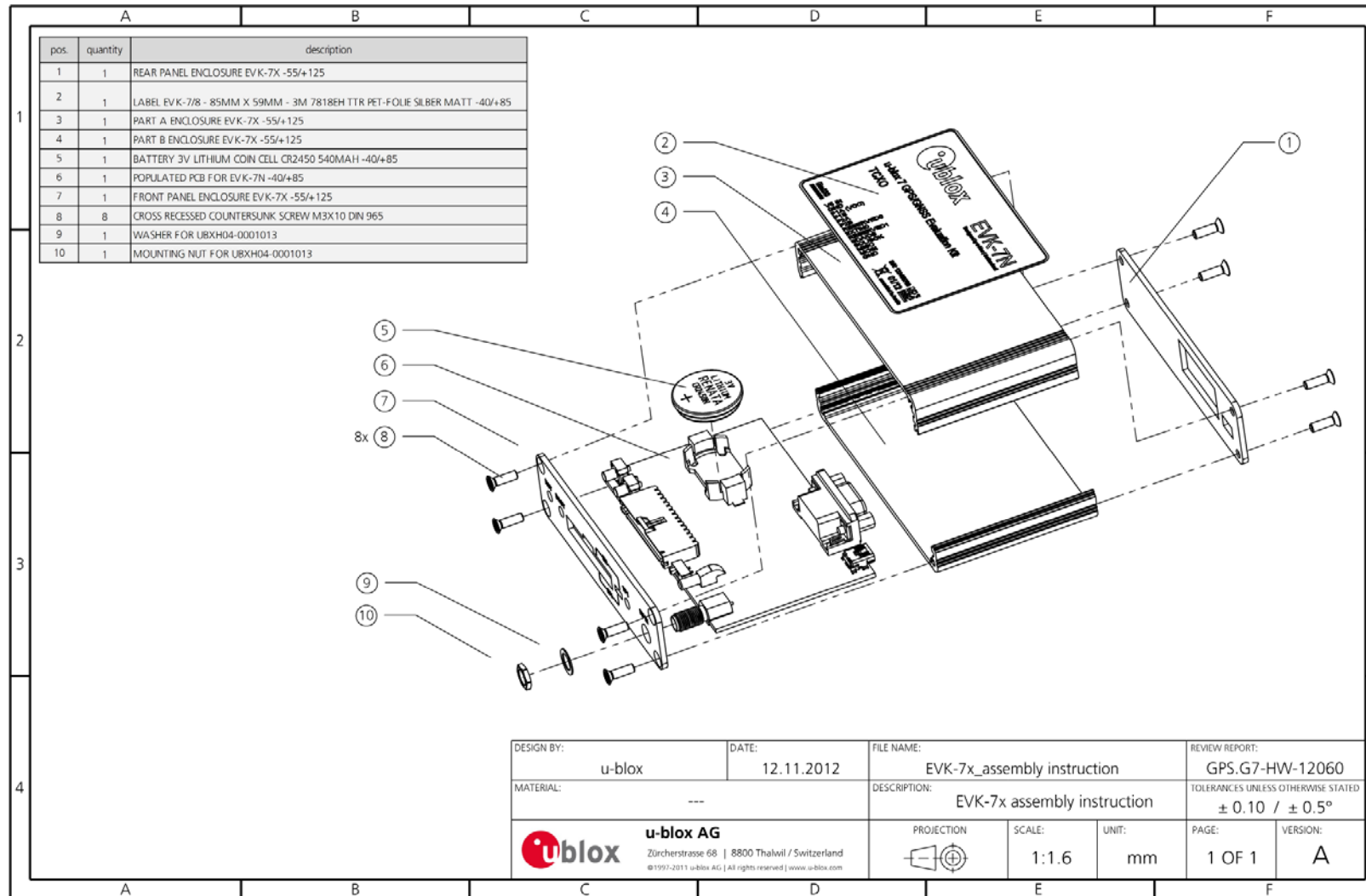


Figure 8: EVK-7 battery location

11 Troubleshooting

My application (e.g. u-center) does not receive anything

Check if the blue LED on the evaluation unit lights up and make sure the USB cable is properly connected to the evaluation unit and the PC. By default, the evaluation unit outputs NMEA protocol on Serial Port 1 at 9600 Baud, or on the USB.

My application (e.g. u-center) does not receive all messages

When using UART, make sure the baud rate is sufficient. If the baud rate is insufficient, GPS/GNSS receivers based on u-blox 7 GPS/GNSS technology will skip excessive messages. Some serial port cards/adapters (i.e. USB to RS232 converter) frequently generate errors. If a communication error occurs while u-center receives a message, the message will be discarded.

My application (e.g. u-center) loses the connection to the GPS/GNSS receiver

u-blox 7 positioning technology and u-center have an autobauding feature. If frequent communication errors occur (e.g. due to problems with the serial port), the connection may be lost. This happens because u-center and the GPS/GNSS receiver both autonomously try to adjust the baud rate. Do not enable the u-center autobauding feature if the GPS/GNSS receiver has the autobauding flag enabled.

The COM port does not send any messages

Be sure that the slide switch at the front panel is set to I2C and not SPI. In SPI Mode the RS232 pins on the DB9 connector are switched off and the Rx/D and Tx/D output at the front panel are used for SPI (MISO, MOSI).

NOTE: After changing the slide switch, always reset the EVK, otherwise the change will not take place.

Some COM ports are not shown in the port list of my application (e.g. u-center)

Only the COM ports that are available on your computer will show up in the COM port drop down list. If a COM Port is gray, another application running on this computer is using it.

The position is off by a few dozen meters

u-blox 7 GPS/GNSS technology starts up with the WGS84 standard GPS/GNSS datum. If your application expects a different datum, you'll most likely find the positions to be off by a few dozen meters. Don't forget to check the calibration of u-center map files.

The position is off by hundreds of meters

Position drift may also occur when almanac navigation is enabled. The satellite orbit information retrieved from an almanac is much less accurate than the information retrieved from the ephemeris. With an almanac only solution, the position will only have an accuracy of a few kilometers but it may start up faster or still navigate in areas with obscured visibility when the ephemeris from one or several satellites have not yet been received. The almanac information is NOT used for calculating a position, if valid ephemeris information is present, regardless of the setting of this flag.

In NMEA protocol, position solutions with high deviation (e.g. due to enabling almanac navigation) can be filtered with the Position Accuracy Mask. UBX protocol does not directly support this since it provides a position accuracy estimation, which allows the user to filter the position according to his requirements. However, the 'Position within Limits' flag of the UBX-NAV-STATUS message indicates whether the configured thresholds (i.e. P Accuracy Mask and PDOP) are exceeded.

TTFF times at startup are much longer than specified

At startup (after the first position fix), the GPS/GNSS receiver performs an RTC calibration to have an accurate internal time source. A calibrated RTC is required to achieve minimal startup time.

Before shutting down the receiver externally, check the status in MON-HW in field 'Real Time Clock Status'. Do not shut down the receiver if the RTC is not calibrated.

The EVK-7 does not meet the TTFF specification

Make sure the antenna has a good sky view. An obstructed view leads to prolonged startup times. In a well-designed system, the average of the C/No ratio of high elevation satellites should be in the range of 40 dBHz to

about 50 dBHz. With a standard off-the-shelf active antenna, 47 dBHz should easily be achieved. Low C/No values lead to a prolonged startup time.

EVK-7 does not preserve the configuration in case of reset

u-blox 7 GPS/GNSS technology uses a slightly different concept than most of the other GPS/GNSS receivers do. Settings are initially stored to volatile memory. In order to save them permanently, sending a second command is required. This allows testing the new settings and reverting to the old settings by resetting the receiver if the new settings aren't good. This provides safety, as it's no longer possible to accidentally program a bad configuration (e.g. disabling the main communication port).

Power Save Mode and USB

For communication in Power Save Mode, use the RS232.

EVK-7 receives GPS/GNSS and GLONASS

Use u-center, version 7.02 or newer. Message UBX-CFG-GNSS allows switching on and off the supported GNSS.

12 Common evaluation pitfalls

- Parameter may have the same name but a different definition. GPS/GNSS receivers may have a similar size, price and power consumption but can still have different functionalities (e.g. no support for passive antennas, different temperature range). Also, the definitions of Hot, Warm, Cold Start times may differ between suppliers.
- Verify design-critical parameters; do not base a decision on unconfirmed numbers from datasheets.
- Try to use identical or at least similar settings when comparing the GPS/GNSS performance of different receivers.
- Data, which has not been recorded at the same time and the same place, should not be compared. The satellite constellation, the number of visible satellites and the sky view might have been different.
- Do not compare momentary measurements. GPS/GNSS is a non-deterministic system. The satellite constellation changes constantly. Atmospheric effects (i.e. dawn and dusk) have an impact on signal travel time. The position of the GPS/GNSS/GNSS receiver is typically not the same between two tests. Comparative tests should therefore be conducted in parallel by using one antenna and a signal splitter; statistical tests shall be run for 24 hours.
- Monitor the Carrier-To-Noise-Ratio. The average C/No ratio of the high elevation satellites should be between 40 dBHz and about 50dBHz. A low C/No ratio will result in a prolonged TTFF and more position drift.
- When comparing receivers side by side, make sure that all receivers have the same signal levels. The best way to achieve this is by using a signal splitter. Comparing results measured with different antenna types (with different sensitivity) will lead to incorrect conclusions.
- Try to feed the same signal to all receivers in parallel (i.e. through a splitter); the receivers won't have the same sky view otherwise. Even small differences can have an impact on the accuracy. One additional satellite can lead to a lower DOP and less position drift.
- When doing reacquisition tests, cover the antenna in order to block the sky view. Do not unplug the antenna since the u-blox 7 positioning technology continuously performs a noise calibration on idle channels.

Related documents

- [1] UBX-G7020-Kx Data Sheet, Docu. No GPS.G7-HW-12001 (NDA required)
- [2] UBX-G7020-CT Data Sheet, Docu. No GPS.G7-HW-12002 (NDA required)
- [3] LEA-7 Data Sheet, Docu. No GPS.G7-HW-12039
- [4] NEO-7 Data Sheet, Docu. No GPS.G7-HW-11004
- [5] MAX-7 Data Sheet, Docu. No GPS.G7-HW-12012
- [6] UBX-G7020 Hardware Integration Manual, Docu. No GPS.G7-HW-10003 (NDA required)
- [7] MAX-7 / NEO-7 / LEA-7 Hardware Integration Manual, Docu. No GPS.G7-HW-11006
- [8] u-blox 7 Receiver Description including Protocol Specification, Docu. No GPS.G7-SW-12001 (Public Release), GPS.G7-SW-12002 (NDA Version)
- [9] u-center – User Guide, Docu. No GPS-SW-08007

Revision history

Revision	Date	Name	Status / Comments
-	19-Dec- 2012	khir	Initial release
1	19-Mar-2013	smos	Revised images of EVK-7
2	05-Apr-2013	smos	Revised specifications section

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