EVK-G31, EVK-G35
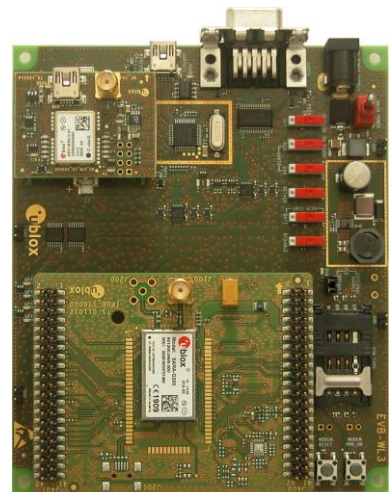## SARA-G310, SARA-G350
GSM/GPRS
Cellular evaluation kit
User Guide

Abstract

This guide explains how to set up the EVK-G31 and EVK-G35 Evaluation Kits to begin evaluating the u-blox SARA-G310 and SARA-G350 GSM/GPRS cellular modules.

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Document Information

Title	EVK-G31, EVK-G35
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Document status explanation	
Objective Specification	Document contains target values. Revised and supplementary data will be published later.
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Production Information	Document contains the final product specification.

This document applies to the following products:

Name	Type number	Firmware version	PCN / IN
EVK-G31	EVK-G31-00S-01	N/A	N/A
EVK-G35	EVK-G35-00S-01	N/A	N/A
	EVK-G35-02S-00	N/A	N/A

Contents

1 Starting up

1.1 EVK-G3x overview

The EVK-G31 and EVK-G35 are powerful and easy-to-use tools that simplify the evaluation of u-blox SARA-G310 and SARA-G350 GSM/GPRS cellular modules.

The evaluation kits differ depending on which SARA-G3 series module version is mounted:

- SARA-G310 module is provided on the EVK-G31 evaluation kit
- SARA-G350 module is provided on the EVK-G35 evaluation kit

This document identifies both evaluation kits as EVK-G3x.

This section describes the main connections and settings required to get started.

☞ EVK-G3x can also be used to evaluate other SARA-G3 series modules as SARA-G300 and SARA-G340.

☞ See the SARA-G3 series Data Sheet [3] and the SARA-G3 / SARA-U2 series System Integration Manual [4] for the features supported by SARA-G3 series modules.
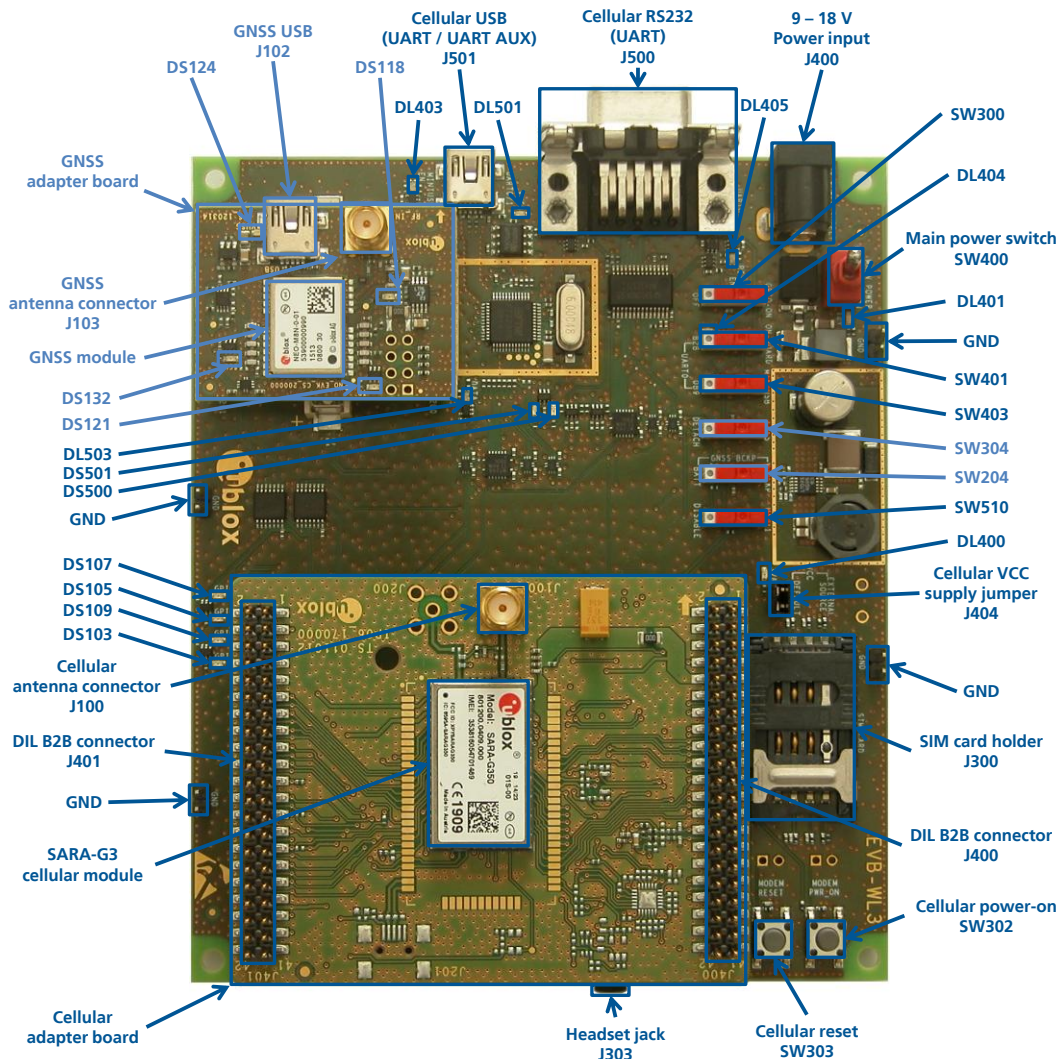

Figure 1: EVK-G3x evaluation kit overview

1.2 EVK-G3x block diagram

Figure 2 shows the main interfaces and internal connections of the EVK-G3x:
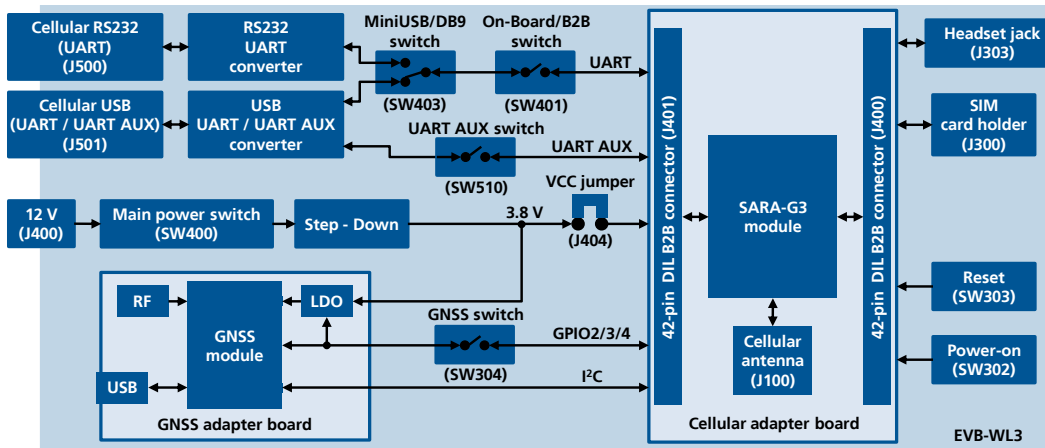

Figure 2: EVK-G3x block diagram

The EVK-G3x is formed by three boards:

* The lower one, called EVB-WL3, contains the power supply and other peripherals for the SARA-G series cellular module (SIM card holder, reset button and power-on button).

* The cellular adapter board, called ADP-G310 or ADP-G350, contains the SARA-G310 or the SARA-G350 cellular module, the cellular antenna connector.

* The GNSS adapter board, called ADP-GNSS, contains the u-blox GNSS module, the LDO supply regulator, the GNSS antenna connector, and the USB connector for the GNSS module

The boards are connected by means of male header board-to-board connectors mounted on the bottom side of the adapter boards and their corresponding female connectors mounted on the top side of the EVB-WL3 board.

The cellular module's interfaces are accessible on the Dual-In-Line male header connectors mounted on the top side of the cellular adapter board (J400, J401), providing the same pin-out of the corresponding connectors mounted on the adapter board's bottom side and the corresponding ones mounted on the EVB-WL3 board's top side.

1.3 Switches, jumpers and buttons

Function	Description	Name	Board
Main Power Switch	Switch to power on / off the whole evaluation kit	SW400	EVB
Cellular VCC	Jumper socket to provide the 3.8 V supply to the cellular module VCC input	J404	EVB
Cellular Power-on	Push button to switch-on the cellular module	SW302	EVB
Cellular Reset	Push button to reset the cellular module	SW303	EVB
Cellular UART detach	Slide switch to attach / detach cellular module UART from USB and RS232 connectors: when detached, UART signals available only on the DIL B2B connector on ADP board	SW401	EVB
Cellular UART routing	Slide switch to select cellular module UART routing on USB or on RS232 connector	SW403	EVB
Cellular UART AUX detach	Slide switch to attach / detach cellular module UART AUX from USB connector: when detached, UART AUX signals available only on the DIL B2B connector on ADP board	SW510	EVB
Cellular GPIO detach	Slide switch to attach / detach the cellular module GPIOs, SIM_DET from peripherals: when detached, the signals are available only on the DIL B2B connector on ADP board	SW300	EVB
Cellular GNSS detach	Slide switch to attach / detach the cellular module to the GNSS module (GPIO2-3-4): when detached, the signals are available only on DIL B2B connector on ADP board	SW304	EVB
GNSS V_BCKP	Slide switch to connect / disconnect backup battery to V_BCKP pin of GNSS module	SW204	EVB

Table 1: EVK-G3x switches and buttons description

1.4 LEDs

Function	Description	LED #	Board	Color
Main Power	Power supply plugged in the **9 - 18 V Power Input**	DL401	EVB	
Cellular VCC supply	Cellular module supplied. **Main Power Switch** must be switched on	DL400	EVB	
Cellular USB	USB cable plugged in **Cellular USB** connector for UART / UART AUX access	DL501	EVB	
Cellular USB / UART	Green light is activated when UART is routed to **Cellular USB** connector Red light blinks at UART TX or RX data on **Cellular USB** connector	DL403	EVB	
Cellular RS232 / UART	Green light is activated when UART is routed to **Cellular RS232** connector Red light blinks at UART TX or RX data on **Cellular RS232** connector	DL405	EVB	
Cellular UART detach	UART signals are available only on the DIL B2B connector on ADP board	DL404	EVB	
Cellular UART AUX	Green light is activated when UART AUX routed to **Cellular USB** connector Red light blinks at UART AUX TX or RX data on **Cellular USB** connector	DL503	EVB	
Cellular RI indicator	RI line turns ON (active low)	DS501	EVB	
Cellular CTS indicator	CTS line turns ON (active low)	DS500	EVB	
Cellular GPIO1 indicator	Green light is activated when cellular GPIO1 is high	DS107	EVB	
Cellular GPIO2 indicator	Green light is activated when cellular GPIO2 is high	DS105	EVB	
Cellular GPIO3 indicator	Green light is activated when cellular GPIO3 is high	DS109	EVB	
Cellular GPIO4 indicator	Green light is activated when cellular GPIO4 is high	DS103	EVB	
GNSS VCC supply	GNSS module supply is turned ON	DS118	ADP-GNSS	
GNSS USB	USB cable plugged in **GNSS USB** connector	DS124	ADP-GNSS	
GNSS Timepulse	Pulses at 1 Hz when valid GNSS fix	DS121	ADP-GNSS	
Cellular / GNSS DDC	Cellular / GNSS module communication over DDC (I^{2}C) interface	DS132	ADP-GNSS	

Table 2: EVK-G3x LEDs description

1.5 Connectors

Function	Description		Name	Board
9 - 18 V Power Input	Connector for the AC / DC power adapter of the EVK AC: 100-240 V, 0.8 A, 50-60 Hz / DC: +12 V, 2.5 A	IEC 60417-5172 Class II equipment	J400	EVB
Cellular antenna	SMA connector for the cellular module antenna		J100	ADP-G3xx
SIM card holder	SIM card holder		J300	EVB
Cellular USB (UART / AUX)	Mini USB connector for cellular module UART / UART AUX converted as USB		J501	EVB
Cellular RS232 (UART)	DB9 connector for cellular module UART interface converted as RS232 interface		J500	EVB
Cellular headset	Audio headset jack connector for cellular module audio interface		J303	EVB
DIL B2B headers	Dual-In-Line Board-to-Board connectors for cellular module interfaces		J400, J401	ADP-G3xx
GNSS antenna	SMA connector for the GNSS module antenna (GNSS Antenna)		J103	ADP-GNSS
GNSS USB	Mini USB connector for GNSS module USB interface		J102	ADP-GNSS
GNSS backup battery	Backup battery socket for the GNSS module (under GNSS adapter board)		BT200	EVB
GND	Ground terminals for probe reference		J402/3/5/6	EVB

Table 3: EVK-G3x connectors description

⚠ **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 battery. Replace battery when it no longer has sufficient charge for unit operation. Control the battery before use if the device has not been used for an extended period of time.**

⚠ **Caution! Risk of explosion if battery is replaced with an incorrect type. Dispose of used batteries according to the instructions!**

1.6 EVK-G35 pinout

DIL B2B connector Name/Pin Number	SARA-G350 Signal Name	SARA-G350 Pin N°	SARA-G350 Pin N°	SARA-G350 Signal Name	DIL B2B connector Name/Pin Number
J401 Pins 7-8-9-10	GND	1	64	GND	J401 Pins 7-8-9-10
J401 Pin 3	V_BCKP	2	63	GND	J401 Pins 7-8-9-10
J401 Pins 7-8-9-10	GND	3	62	ANT_DET[1]	J400 Pin 36
J401 Pin 36	V_INT	4	61	GND	J401 Pins 7-8-9-10
J401 Pins 7-8-9-10	GND	5	60	GND	J401 Pins 7-8-9-10
J401 Pins 18	DSR	6	59	GND	J401 Pins 7-8-9-10
J401 Pins 17	RI	7	58	GND	J401 Pins 7-8-9-10
J401 Pins 11	DCD	8	57	GND	J401 Pins 7-8-9-10
J401 Pin 12	DTR	9	56	ANT	Not available
J401 Pin 13	RTS	10	55	GND	J401 Pins 7-8-9-10
J401 Pin 14	CTS	11	54	GND	J401 Pins 7-8-9-10
J401 Pin 15	TXD	12	53	VCC	J400 Pins 7-8-9-10
J401 Pin 16	RXD	13	52	VCC	J400 Pins 7-8-9-10
J401 Pins 7-8-9-10	GND	14	51	VCC	J400 Pins 7-8-9-10
J401 Pin 29	PWR_ON	15	50	GND	J401 Pins 7-8-9-10
J401 Pin 33	GPIO1	16	49	MIC_P	J400 Pins 28
J401 Pin 28	RSVD	17	48	MIC_N	Not available
J400 Pin 26	RESET_N	18	47	MIC_GND	J400 Pin 27
J401 Pin 24	RSVD	19	46	MIC_BIAS	Not available
J401 Pins 7-8-9-10	GND	20	45	SPK_N	J400 Pin 34
J401 Pins 7-8-9-10	GND	21	44	SPK_P	J400 Pin 33
J401 Pins 7-8-9-10	GND	22	43	GND	J401 Pins 7-8-9-10
J401 Pin 31	GPIO2	23	42	SIM_DET	J401 Pin 23
J401 Pin 32	GPIO3	24	41	VSIM	J400 Pin 13
J401 Pins 25	GPIO4	25	40	SIM_RST	J400 Pin 16
J400 Pin 21	SDA	26	39	SIM_IO	J400 Pin 14
J400 Pin 20	SCL	27	38	SIM_CLK	J400 Pin 15
J401 Pin 20	RXD_AUX	28	37	I2S_RXD	J400 Pin 23
J401 Pin 19	TXD_AUX	29	36	I2S_CLK	J400 Pin 22
J401 Pins 7-8-9-10	GND	30	35	I2S_TXD	J400 Pin 24
Not available	RSVD	31	34	I2S_WA	J400 Pin 25
J401 Pins 7-8-9-10	GND	32	33	RSVD	Not available

Table 4: Interfaces of SARA-G350 modules, as routed on the 42-pin Dual-In-Line Board-to-Board connectors (J400, J401) available on the adapter board ADP-G350 of the EVK-G35 evaluation kit

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[1] SARA-G350 ANT_DET pin connected to the J400 Pin 36 with 18 kΩ series resistor and the antenna detection circuit mounted on ADP-G350

DIL B2B J401					DIL B2B J400			
Signal Name	Pin N°	Pin N°	Signal Name		Signal Name	Pin N°	Pin N°	Signal Name
Not connected	2	1	GND		Not connected	2	1	GND
Not connected	4	3	V_BCKP		Not connected	4	3	Not connected
Not connected	6	5	Not connected		Not connected	6	5	Not connected
GND	8	7	GND		VCC	8	7	VCC
GND	10	9	GND		VCC	10	9	VCC
DTR	12	11	DCD		Not connected	12	11	Not connected
CTS	14	13	RTS		SIM_IO	14	13	VSIM
RXD	16	15	TXD		SIM_RST	16	15	SIM_CLK
DSR	18	17	RI		Not connected	18	17	Not connected
RXD_AUX	20	19	TXD_AUX		SCL	20	19	Not connected
Not connected	22	21	GND		I2S_CLK	22	21	SDA
RSVD_#19	24	23	SIM_DET		I2S_TXD	24	23	I2S_RXD
Not connected	26	25	GPIO4		RESET_N	26	25	I2S_WA
RSVD_#17	28	27	Not connected		MIC_P_BIAS[2]	28	27	MIC_GND
Not connected	30	29	PWR_ON		Not connected	30	29	Not connected
GPIO3	32	31	GPIO2		Not connected	32	31	Not connected
Not connected	34	33	GPIO1		SPK_N	34	33	SPK_P
V_INT	36	35	Not connected		ANT_DET[3]	36	35	Not connected
Not connected	38	37	Not connected		Not connected	38	37	Not connected
Not connected	40	39	Not connected		Not connected	40	39	Not connected
GND	42	41	GND		GND	42	41	Not connected

Table 5: Pin-out of the 42-pin Dual-In-Line Board-to-Board connectors (J401, J400) available on the adapter board ADP-G350 of the EVK-G35 evaluation kit for SARA-G350 modules

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[2] Signal and bias line for an external electret microphone: biasing bridge circuit mounted on ADP-G350
[3] SARA-G350 ANT_DET pin connected to the J400 Pin 36 with 18 kΩ series resistor and the antenna detection circuit mounted on ADP-G350

1.7 EVK-G31 pinout

DIL B2B connector Name/Pin Number	SARA-G310 Signal Name	SARA-G310 Pin N°	SARA-G310 Pin N°	SARA-G310 Signal Name	DIL B2B connector Name/Pin Number
J401 Pins 7-8-9-10	GND	1	64	GND	J401 Pins 7-8-9-10
J401 Pin 3	V_BCKP	2	63	GND	J401 Pins 7-8-9-10
J401 Pins 7-8-9-10	GND	3	62	RSVD	Not available
J401 Pin 36	V_INT	4	61	GND	J401 Pins 7-8-9-10
J401 Pins 7-8-9-10	GND	5	60	GND	J401 Pins 7-8-9-10
J401 Pins 18	DSR	6	59	GND	J401 Pins 7-8-9-10
J401 Pins 17	RI	7	58	GND	J401 Pins 7-8-9-10
J401 Pins 11	DCD	8	57	GND	J401 Pins 7-8-9-10
J401 Pin 12	DTR	9	56	ANT	Not available
J401 Pin 13	RTS	10	55	GND	J401 Pins 7-8-9-10
J401 Pin 14	CTS	11	54	GND	J401 Pins 7-8-9-10
J401 Pin 15	TXD	12	53	VCC	J400 Pins 7-8-9-10
J401 Pin 16	RXD	13	52	VCC	J400 Pins 7-8-9-10
J401 Pins 7-8-9-10	GND	14	51	VCC	J400 Pins 7-8-9-10
J401 Pin 29	PWR_ON	15	50	GND	J401 Pins 7-8-9-10
J401 Pin 33	RSVD	16	49	RSVD	Not available
J401 Pin 28	RSVD	17	48	RSVD	Not available
J400 Pin 26	RESET_N	18	47	RSVD	Not available
J401 Pin 24	RSVD	19	46	RSVD	Not available
J401 Pins 7-8-9-10	GND	20	45	RSVD	Not available
J401 Pins 7-8-9-10	GND	21	44	RSVD	Not available
J401 Pins 7-8-9-10	GND	22	43	GND	J401 Pins 7-8-9-10
J401 Pin 31	RSVD	23	42	SIM_DET	J401 Pin 23
J401 Pin 32	32K_OUT	24	41	VSIM	J400 Pin 13
J401 Pins 25	RSVD	25	40	SIM_RST	J400 Pin 16
J400 Pin 21	RSVD	26	39	SIM_IO	J400 Pin 14
J400 Pin 20	RSVD	27	38	SIM_CLK	J400 Pin 15
J401 Pin 20	RXD_AUX	28	37	RSVD	J400 Pin 23
J401 Pin 19	TXD_AUX	29	36	RSVD	J400 Pin 22
J401 Pins 7-8-9-10	GND	30	35	RSVD	J400 Pin 24
Not available	EXT32K	31	34	RSVD	J400 Pin 25
J401 Pins 7-8-9-10	GND	32	33	RSVD	Not available

Table 6: SARA-G310 module interfaces availability on the 42-pins Dual-In-Line Board-to-Board connectors on the adapter board

DIL B2B J401				DIL B2B J400			
Signal Name	Pin N°	Pin N°	Signal Name	Signal Name	Pin N°	Pin N°	Signal Name
Not connected	2	1	GND	Not connected	2	1	GND
Not connected	4	3	V_BCKP	Not connected	4	3	Not connected
Not connected	6	5	Not connected	Not connected	6	5	Not connected
GND	8	7	GND	VCC	8	7	VCC
GND	10	9	GND	VCC	10	9	VCC
DTR	12	11	DCD	Not connected	12	11	Not connected
CTS	14	13	RTS	SIM_IO	14	13	VSIM
RXD	16	15	TXD	SIM_RST	16	15	SIM_CLK
DSR	18	17	RI	Not connected	18	17	Not connected
RXD_AUX	20	19	TXD_AUX	RSVD_#27	20	19	Not connected
Not connected	22	21	GND	RSVD_#36	22	21	RSVD_#26
RSVD_#19	24	23	SIM_DET	RSVD_#35	24	23	RSVD_#37
Not connected	26	25	RSVD_#25	RESET_N	26	25	RSVD_#34
RSVD_#17	28	27	Not connected	Not connected	28	27	Not connected
Not connected	30	29	PWR_ON	Not connected	30	29	Not connected
32K_OUT	32	31	RSVD_#23	Not connected	32	31	Not connected
Not connected	34	33	RSVD_#16	Not connected	34	33	Not connected
V_INT	36	35	Not connected	Not connected	36	35	Not connected
Not connected	38	37	Not connected	Not connected	38	37	Not connected
Not connected	40	39	Not connected	Not connected	40	39	Not connected
GND	42	41	GND	GND	42	41	Not connected

Table 7: Pin-out of the 42-pin Dual-In-Line Board-to-Board connectors (J401, J400) available on the adapter board ADP-G310 of the EVK-G31 evaluation kit for SARA-G310 modules

☞ The pins / interfaces that are not supported by a specific SARA-G3 module product version should be not driven by an external device (see the SARA-G3 series Data Sheet [3] and SARA-G3 and SARA-U2 series System Integration Manual [4] for the features supported by each SARA-G3 module product version).

1.8 Software installation

The USB driver can be downloaded from the Web; see the EVK-G3x Quick Start card [5] for the URL. Save the executable file to any location of the hard drive on the computer. The installation can be started by running the executable file on the computer running the Windows operating system.

1.9 Board setup and settings

1   Insert a SIM card into the **SIM card holder** (J300).

2   Connect the cellular antenna provided with the evaluation kit box to the **Cellular antenna** SMA connector (J100 on ADP-G3xx, RF input/output for transmission and reception of 2G RF signals).

3	If the GNSS functionality is required, connect the GNSS antenna provided with the evaluation kit box to the **GNSS antenna** SMA connector (J103 on ADP-GNSS). Put the GNSS antenna in a place with good sky view.

4	Connect the AC / DC +12 V power adapter provided with the Evaluation Kit box to **9 – 18 V Power Input** connector (J400 on EVB). LED DL401 lights blue.

5	Be sure to provide a jumper socket on the **Cellular VCC supply jumper** (J404). This provides connection from the 3.8 V output of the supply circuit on the EVB to the VCC input of the module.

6	To enable the whole board power supply, turn the **Main Power** switch (SW400 on EVB) to ON position. LED DL400 lights green. The cellular module switches on.

7	For communication via UART interface of the cellular module, the following connections are allowed and can be alternatively enabled in a mutually exclusive way (see Table 8 for switch position and LED status):

    a.	Connect a USB cable to mini USB connector (**Cellular USB**, J501 on EVB), LED DL501 lights blue
    b.	Connect an RS232 cable to DB9 connector (**Cellular RS232**, J500 on EVB)

Type of connections	SW401	SW403	LED
Access to cellular UART over the **Cellular USB (UART)** mini USB connector (J501)	ON BOARD	MINIUSB	DL403
Access to cellular UART over the **Cellular RS232 (UART)** DB9 connector (J500)	ON BOARD	DB9	DL405
Access to cellular UART on DIL Board-to-Board connector on the adapter board: cellular UART detached from USB (UART) J501 and RS232 (UART) J500 connectors	B2B	Do not care	DL404

Table 8: Serial interface configuration

Using the **Cellular USB** connector (case a), two COM ports are enabled with Windows (the numbering of the COM ports can be seen via the Windows Device Manager)[4]:

o	SARA UART (by default for AT commands and data) is available over the first COM port
o	SARA UART AUX (by default for FW update and diagnostic) is available over the second COM port

8	Run an AT terminal application (e.g. m-center, HyperTerminal) on PC COM-port, with these settings:

o	Data rate: 115200 b/s
o	Data bits: 8
o	Parity: N
o	Stop bits: 1
o	Flow control: HW

See Appendix A for how to configure the u-blox m-center AT terminal for Windows.

9	Connect the headset provided with the evaluation kit box to the **Headset jack** connector (J303 on EVB), if the audio functionality is required.

---

[4] For the possible alternative configurations and services available over UART and UART AUX interfaces of SARA-G3 series modules see the u-blox AT commands Manual [1], +USIO AT command

1.10 Enabling error result codes

Command sent by DTE (user)	DCE response (module)	Description
AT+CMEE=2	OK	Enables the cellular module to report verbose error result codes.

1.11 PIN code insertion (when required)

Command sent by DTE (user)	DCE response (module)	Description
AT+CPIN="8180"	OK	Enter the PIN code, if needed (enter the PIN of the SIM card – 8180 is written here as an example).
AT+CLCK="SC",0,"8180"	OK	Unlock the PIN at power on (the last parameter is the PIN of the SIM card – 8180 is written here as an example).
AT+CLCK="SC",1,"8180"	OK	Lock the PIN at power on (the last parameter is the PIN of the SIM card – 8180 is written here as an example).

1.12 Registration on a cellular network

Command sent by DTE (user)	DCE response (module)	Description
AT+CREG?	+CREG: 0, 1 OK	Verify the network registration.
AT+COPS=0	OK	Register the phone on the network. The cellular module automatically registers itself on the cellular network. This command is necessary only if the automatic registration failed (AT+CREG? returns 0,0).
AT+COPS?	+COPS: 0,0,"I TIM" OK	Read operator name.

1.13 Switching off the EVK-G3x

To switch off the EVK-G3x, send the AT+CPWROFF command. Make sure to use this command before switching off the main power, otherwise settings and configuration parameters may not be saved on the EVK-G3x.

Appendix

A Setting up AT terminal applications for communication with EVK-G3x

The u-blox m-center cellular module evaluation tool is a powerful platform for evaluating, configuring and testing u-blox cellular products. m-center includes an AT commands terminal for communication with the device and can be downloaded free-of-charge from our website (http://www.u-blox.com).

1. Follow the board setup instructions in section 1.9 to provide all the required connections and switching on the cellular module.

2. Run the m-center tool: after the m-center start-up, the Home page appears.

3. On the Home page, set up the AT COM port; for the setting values see section 1.9.

   Check with the Windows Device Manager to find out which COM port is being used by EVK-G3x.

4. Enable the connection to the u-blox cellular module by clicking on the **Connect** button.

5. Retrieve the module and network information by clicking on the **Get Info** button.
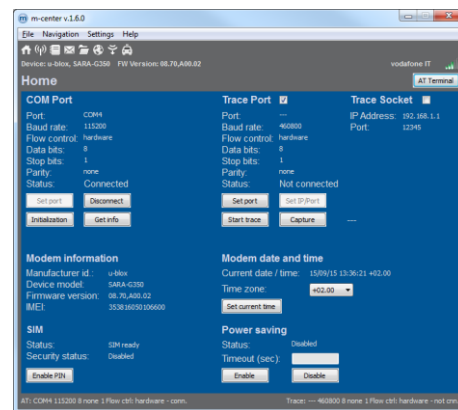

Figure 3: "Home" page

6. The module information is retrieved and displayed on Home page.

7. Click on the **AT Terminal** button, found at the upper right of the Home page. A new window opens and the AT-command terminal is now ready for communication with EVK-G3x.

8. The AT terminal is ready to use.

   For the complete list of AT commands supported by the modules and their syntax, see the u-blox AT commands Manual [1].
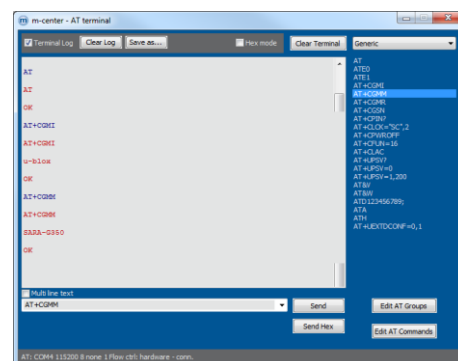

Figure 4: AT Terminal window

For more information on using the u-blox m-center cellular module evaluation tool, press the F1 key on your keyboard to open the m-center help window on your computer.

B Setting up cellular packet data connection on PC

This section describes how to set up a packet data connection with Windows 7 operating systems (for PC) and EVK-G3x, using the TCP/IP stack of the PC (external TCP/IP stack).

B.1 Install a new modem from the control panel

1. Select: Control panel -> Phones and Modem -> Modems -> Add.
   This opens the Install New Modem Wizard.

2. Select "Don't detect my modem" checkbox.
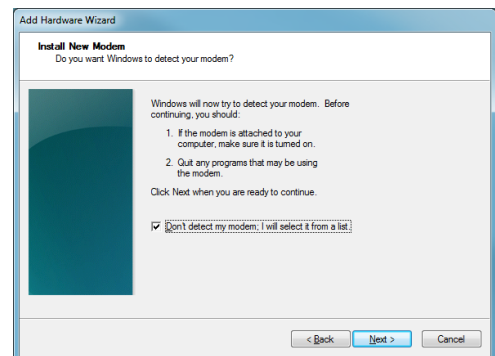
3. Select: Standard Modem (33600 b/s).
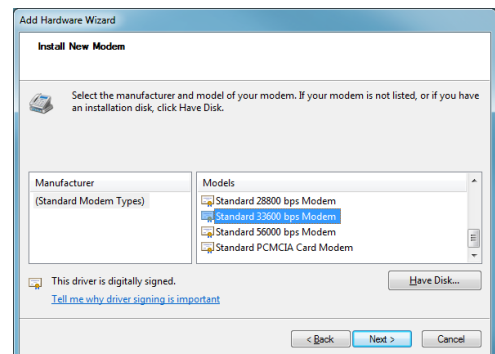
4. Set the COM-port on which the modem will be installed.
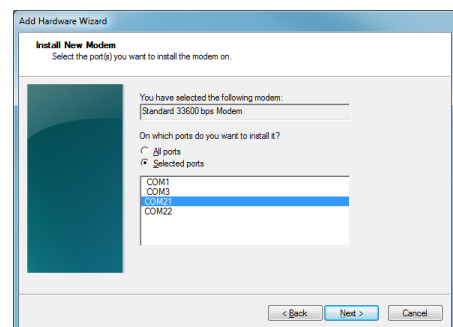
5. Select: Control panel -> Phones and Modem -> Modems -> Standard Modem 33600 bps Modem -> Properties.

6. Select Change Settings -> Advanced.

7. Add APN settings command (APN shown is just an example. Make sure to have the correct APN defined by the network operator).

8. Select "Change Default Preferences".
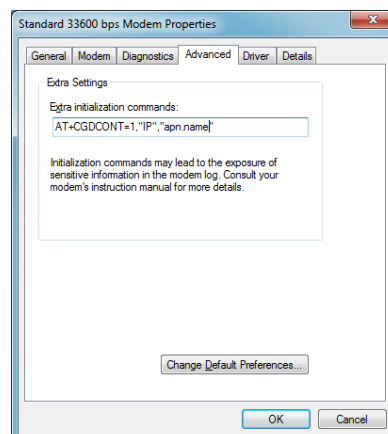
9. Press OK twice, and then the new connection is ready to be configured.
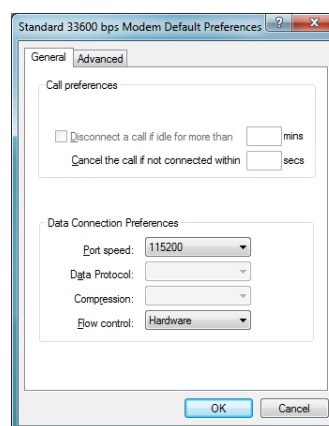
☞ The modem can also be configured using the Device Manager by clicking on the modem name.

B.2 Configuring a new connection

1. Select: Control Panel -> Network and Sharing Center -> Set up a new connection or network.
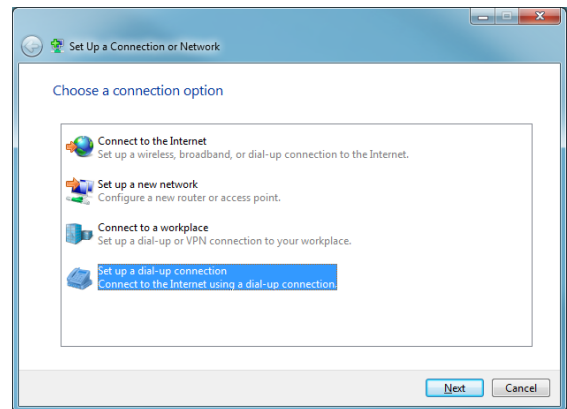
2. Select the modem, if requested.
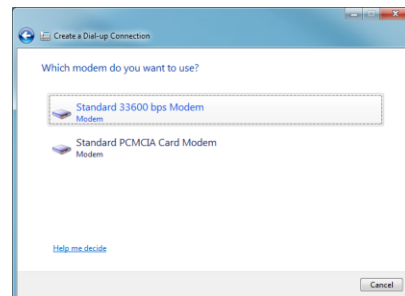
3. Enter parameters for the dial-up connection:
   - the module telephone number (*99***1#)
   - the specific GPRS account information for the network operator
   - a name for the new connection (e.g. "u-blox GPRS Connection")
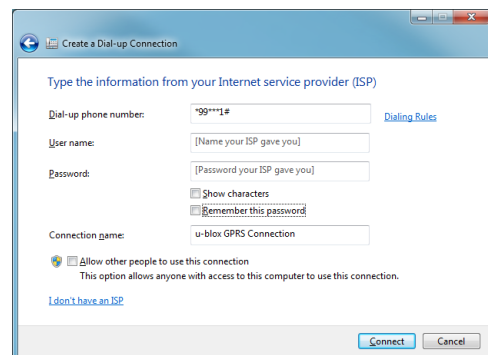
4. The packet data connection is now ready to be used with the EVK-G3x. To check the connection, start a browser.

☞ Consult the cellular network operator for username and password. In most cases, these can be left empty.

C Examples of AT commands

For the complete description and syntax of the AT commands supported by each SARA-G3 series cellular module product version, see the u-blox AT commands Manual [1].

For detailed examples of AT commands for network registration and configuration, context activation, data connection management, SIM management and other module settings, see the u-blox AT Commands Examples Application Note [2].

C.1 Incoming voice call

Command sent by DTE (user)	DCE response (module)	Description
AT	OK	
AT+CLIP=1	OK	Activation of Caller line ID presentation.
		Call the phone number of the SIM in the device.
	RING	Incoming Call.
	+CLIP: "+3930012345678", 145,,,,0 RING +CLIP: "+3930012345678", 145,,,,0	Presentation of Caller ID: +3930012345678 is written here as example.
ATA	OK	Answer to Voice Call.
ATH	OK	Talk to the caller using the headset. Hang up.

C.2 Outgoing voice call

Command sent by DTE (user)	DCE response (module)	Description
AT	OK	
AT+CLIP=1	OK	Activation of Caller line ID presentation.
ATD+3930012345678;	OK	Outgoing voice call (+3930012345678 is written here as example).
		Voice call is accepted from network.
ATH	OK	Hang up.

C.3 Data call (CSD mode)

Command sent by DTE (user)	DCE response (module)	Description
AT+CBST=7,0,1	OK	Set data call to 9600 RLP analog.
ATD+3930012345678	CONNECT 9600 ~ }#À!}!}1} }4}"}&} }*} } }%}&ú…}<□}'}"}(}"}/Ë~~ }#À!}!}2} }4}"}&} }*} } }%}&ú…}<□}'}"}(}"Åv~~ }#À!}!}3} }4}"}&} }*} } }%}&ú…}<□}'}"}(}"Œå~ +++ OK	Outgoing data call (+3930012345678 is written here as example).
		Connect to remote analog modem.
ATH	OK	Hang up.
AT+CBST=71,0,1	OK	Set data call to 9600 RLP V.110 ISDN.

Command sent by DTE (user)	DCE response (module)	Description
ATD+3930012345678		Outgoing data call (+3930012345678 is written here as example).
	CONNECT 9600 ~ }#À!}!Œ} }4}"}&} }*} } }%}&ú„Ej}'}"}(}"KÌ~~ }#À!}!□} }4}"}&} }*} } }%}&ú„Ej}'}"}(}"}"_~~ }#À!}!Ž} }4}"}&} }*} } }%}&ú„Ej}'}"}(}"Èâ~ +++ OK	Connect to remote ISDN modem.
ATH	OK	Hang up.

C.4 SMS management

Command sent by DTE (user)	DCE response (module)	Description
AT+CMGF=1	OK	Set the text mode as the format that will be used. To be set before of the first operation.
AT+CMGS="+3930012345678" SMS TEXT MESSAGE 0123456789<CTRL-Z>	> +CMGS: 0 OK	Send 1st SMS (+3930012345678 is written here as example).
AT+CMGS="+3930012345678" SMS TEXT MESSAGE 0123456789<CTRL-Z>	> +CMGS: 1 OK	Send 2nd SMS (+3930012345678 is written here as example).
AT+CMGL	+CMGL:302,"REC UNREAD","+3930012345678",,"05/09/27,16:40:36+08" SMS TEXT MESSAGE 0123456789 OK	List all the incoming SMSes (+3930012345678 is written here as example).

C.5 Internet connection in GPRS mode (using external TCP/IP stack)

Command sent by DTE (user)	DCE response (module)	Description
AT+CGATT?	+CGATT: 1 OK	Check if the cellular module is attached to GPRS service (1 – attached, 0 – detached).
AT+CGDCONT=1,"IP","uni.tim.it"	OK	Define the PDP context parameters.
AT+CGDCONT?	+CGDCONT: 1,"IP","my_apn","0.0.0.0",0,0 OK	
ATD*99***1#	CONNECT	Initiate the GPRS connection.
+++	NO CARRIER	Disconnect with +++ sequence.

C.6 Internet connection in GPRS mode (using internal TCP/IP stack)

Command sent by DTE (user)	DCE response (module)	Description
AT+UPSD=0,1,"my apn"	OK	Configure PDP-context parameters. Make sure to have the correct APN.
AT+UPSD=0,2,"my username" AT+UPSD=0,3,"my password"	OK OK	Username and password depend on the mobile operator used. In most cases these are not required. Simply use space or omit these commands.
AT+UPSD=0	(configuration parameters)	Check the configuration.
AT+UPSDA=0,1	OK	Store configuration in non-volatile memory (NVM).
AT+UPSDA=0,3	OK	Activate PDP-context.

Verify connection and PDP-context

Command sent by DTE (user)	DCE response (module)	Description
`AT+UPSND=0,0`	`(IP address)`	Check IP addresses assigned.
`AT+UPSND=0,1`	`(IP address of DNS)`	Check DNS assigned.
`AT+UDNSRN=0,"www.ublox.com"`	`195.34.89.137 or 195.34.89.138 OK`	Example: resolve DNS name.

C.7 Enable communication between cellular and GNSS modules

Command sent by DTE (user)	DCE response (module)	Description
`AT+UGPS=1,0`	`OK`	Enable communication. On the ADP-GNSS: LED DS118 lights green, LED DS132 blinks.

C.8 Read NMEA messages (example: GLL)

Several NMEA messages via Cellular USB or RS232 (UART) can be read. The example below shows how to read a GLL message to get the last available Geographic position Latitude / Longitude. For the full list of NMEA messages that can be read, see the u-blox AT commands manual [1].

Command sent by DTE (user)	DCE response (module)	Description
`AT+UGGLL=1`	`OK`	Enable GLL message.
`AT+UGGLL?`	`+UGGLL: (State),(GLL-msg) OK Or +UGGLL: (state), Not Available OK`	Read message. The last available GLL message is displayed.

C.9 GNSS AssistNow online

Command sent by DTE (user)	DCE response (module)	Description
`AT+UGAOP="agps.u-blox.com",46434,1000,0`	`OK`	Insert server data - the parameters are written as an example.
`AT+UPSD=0,1,"web.omnitel.it"`	`OK`	Configure the GPRS connection - "web.omnitel.it" is written as APN example.
`AT+UGPS=1,4`	`OK`	Start the GNSS. No need to do this if this is already done before.
`AT+UGAOS=4`	`OK`	Send data to the u-blox server.

C.10 GNSS AssistNow offline

Command sent by DTE (user)	DCE response (module)	Description
`AT+UGAOF="http://alp.u-blox.com/current_14d.alp",0,1,3`	`OK`	Insert server data - the parameters are written as an example.
`AT+UGPS=1,2`	`OK`	Start the GNSS (the default interface is DDC).

D Current consumption measurement

Current consumption of SARA-G3 series modules can be measured on the EVK-G3x by removing the jumper socket from the **Cellular VCC supply jumper** (J404 on the EVB), described in Figure 5.
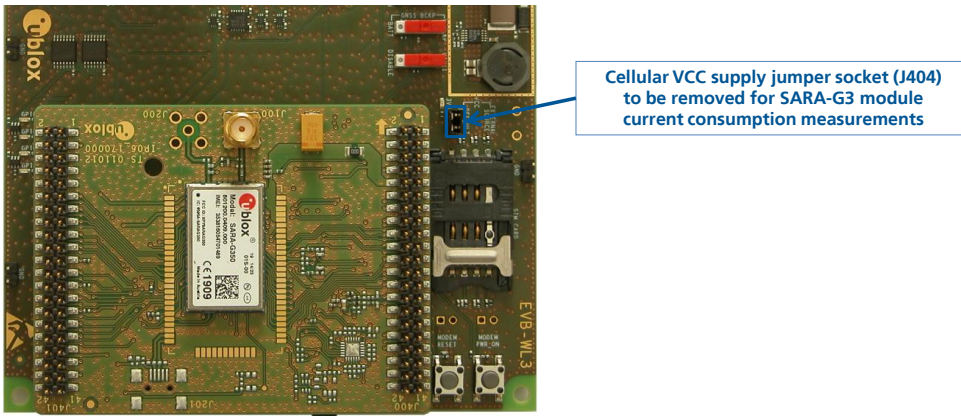

Figure 5: Jumper socket to be removed for SARA-G3 series modules current consumption measurement

A suitable external digital multi-meter (as for example the Agilent 34410A or 34411A) can be used for current consumption measurements. In this case the 3.8 V supply circuit on the EVB will supply the SARA-G3 module mounted on the adapter board, with the digital multi-meter placed in series as described in Figure 6.
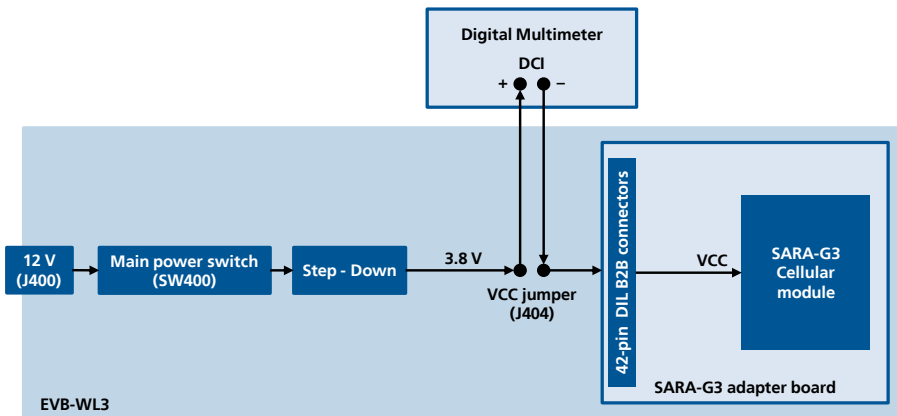

Figure 6: Block diagram of current consumption setup for SARA-G3 series modules

Alternatively, a suitable external DC power supply with dynamic current measurement capabilities (as for example the Agilent 66319B/D) can be used for current consumption measurements, acting also as 3.8 V supply source for the SARA-G3 module mounted on the adapter board.

Declaration of conformities

The equipment is intended for indoor usage. It is the users duty to verify if further restrictions apply such as airplanes, hospitals and hazardous location (petrol stations, refineries…).

Any changes or modification made to this equipment will void its compliance to the safety requirements.

Maintenance, inspections and/or reparations of the EVK-G3x shall be performed by u-blox AG.

Hereby, u-blox AG declares that this EVK-G3x is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

A copy of the Declaration of Conformity can be found at http://www.u-blox.com/.

Related documents

[1]   u-blox AT Commands Manual, Docu No UBX-13002752

[2]   u-blox AT Commands Examples Application Note, Docu No UBX-13001820

[3]   u-blox SARA-G3 series Data Sheet, Docu No UBX-13000993

[4]   u-blox SARA-G3 and SARA-U2 series System Integration Manual, Docu No UBX-13000995

[5]   u-blox EVK-G3x Quick Start, Docu No UBX-13002850

All these documents are available on our homepage (http://www.u-blox.com).

☞   For regular updates to u-blox documentation and to receive product change notifications, register on our homepage.

Revision history

Revision	Date	Name	Status / Comments
-	15-Nov-2012	lpah	Initial Release
1	21-Jan-2013	lpah	Improved jumper J502 description
2	11-Apr-2013	lpah	Updated status to Preliminary (Last revision with old doc number, GSM.G2-EK-12001)
A	08-Jul-2013	sses	Extended to support EVK-G31
A1	18-Sep-2013	mrod	Wireless packet data connection procedure aligned to Windows 7
R06	14-Dec-2015	sses / lpah	Updated EVK-G3x description including EVB-WL3 instead of EVB-WL1 Added current consumption measurement description

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