VECTRONIC Aerospace

GSM-3 Ground Station

User Manual

Version: 1.0

Last Change: 03.03.2017

GSM-3 Ground Station

User Manual

	Name	Date	Signature
Prepared by	Marcel Butz	03.03.2017	
Edited by			
Checked by			
Approved by			
Authorized by			

Table of Contents

1 The GSM Ground Station

The GSM ground station is the communication counterpart of your GSM collars. It is a modem that receives the incoming SMS from the collars and transfers them to the computer. It also sends your commands to the collars. All you need to get it to work is a SIM card and an USB extension cable (optional, but more convenient).

Figure 1: GSM-3 Ground Station

2 Set-up

Ideally, the GSM station will be connected to one specific computer for the entire project; otherwise it is necessary to migrate SMS transmitted data between computers. To guarantee no data loss your GSM Station should always be connected to this computer.

2.1 Install Drivers

Please **insert the VECTRONIC CD** before you plug in the GSM Station. The easiest way to install the driver setup is to follow the **Autostart** of the CD. Alternatively you can get the driver application either on the VECTRONIC CD or on our website:

On CD: Resources\ VECTRONIC Tools and Drivers\ USB Drivers\ USB Driver_installer\ GSM-3 Ground Station Driver Setup.exe

On Website: www.vectronic-aerospace.com ⇨ Wildlife-Monitoring ⇨ Downloads ⇨ Driver ⇨ GSM-3 Ground Station Driver Setup

The Setup Wizard will guide you through the installation.

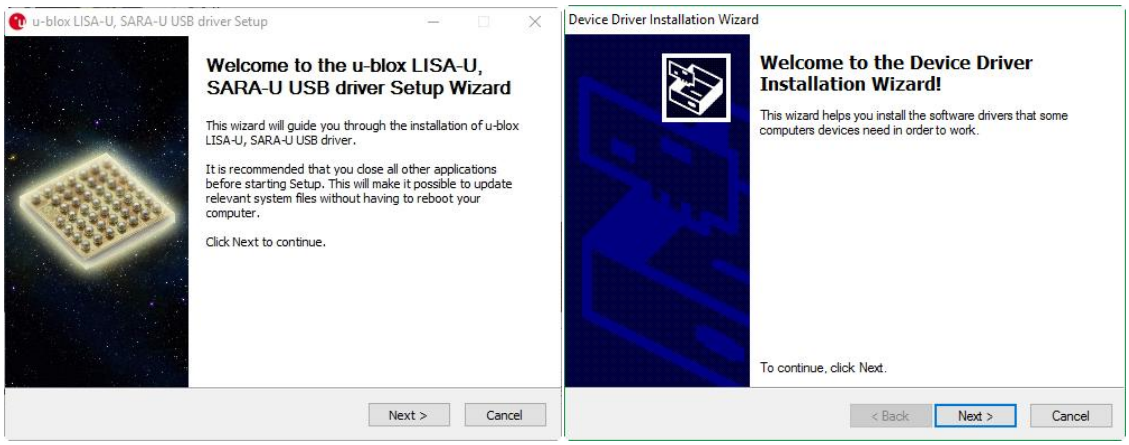

Figure 2: Driver Setup Wizard

2.2 Plug in the SIM card

Carefully push the SIM card into the slot in the orientation shown on the schematic on top of the GSM station. Push until the SIM card is entirely inside the GSM station (there might be a faint clacking noise). If the SIM card has not been inserted deep enough, it will be pushed out again. It might be necessary to use your fingernail to push it completely inside. To remove the SIM card, press the SIM card again and it will come out immediately.

Figure 3: GSM-3 Ground Station, SIM is inserted into slot and needs to be pushed inside

2.3 Connect the GSM ground station to a PC

To connect the GSM Station to a PC, you can simply plug it into any USB port. We suggest to use a USB extension cable, because it will allow you to position the GSM station in a more convenient way. **Make sure that the GSM station is in a place with GSM coverage otherwise it will not work.**

If your Computer can't provide current for the GSM-3 station, please use the enclosed Micro-USB wall charger and plug it to the Ground Station. Plug in the USB extension cable to your computer and the Ground Station. If you plug in the GSM Station it takes up to 1 minute that Communication Ports appear in the Device Manager of your computer.

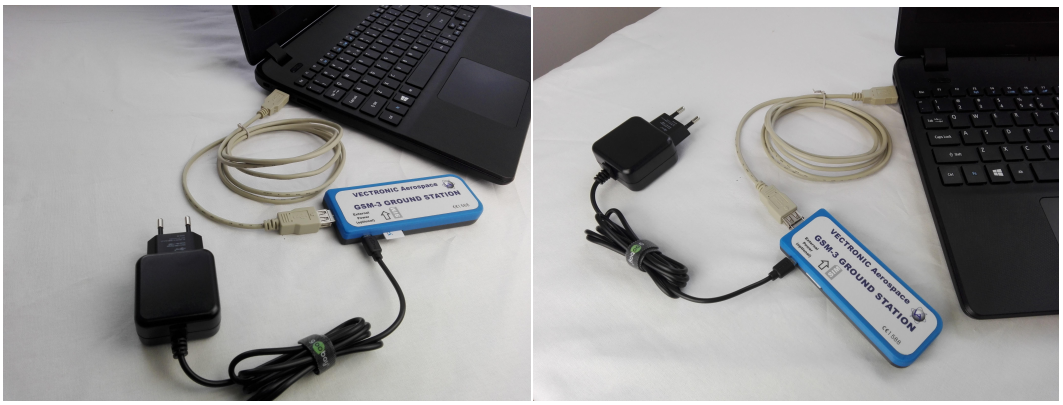

Figure 4: GSM-3 Ground Station with extension cable and Micro-USB wall charger (L: SIM out, R: SIM in)

3 Configuration with GPS Plus

Note: Make sure the GSM station is connected to the computer before you start GPS Plus X.

Note: Do not disconnect the GSM station from the computer while GPS Plus X is running, because the software might crash.

1. Connect the GSM station to your PC.

2. Start GPS Plus X.

3. To configure your GSM station go to *Configuration* ⇨ *Data Collectors* ⇨ *Default Collector* ⇨ *Collector Modules* and create a Collector Module as you can see in the next figure.

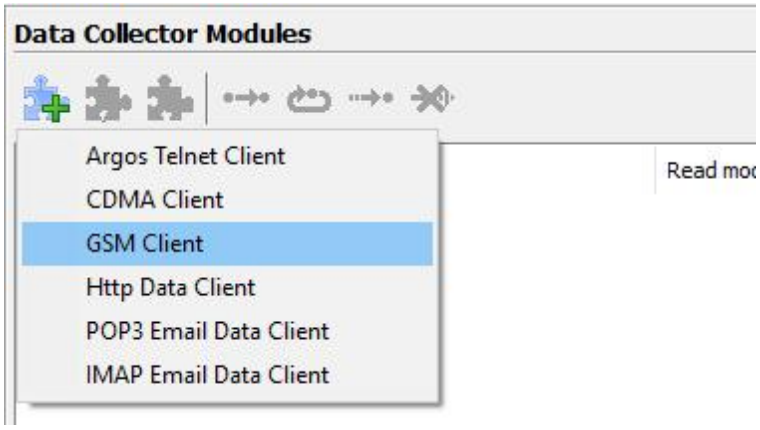

Figure 5: Create Data Collector Module

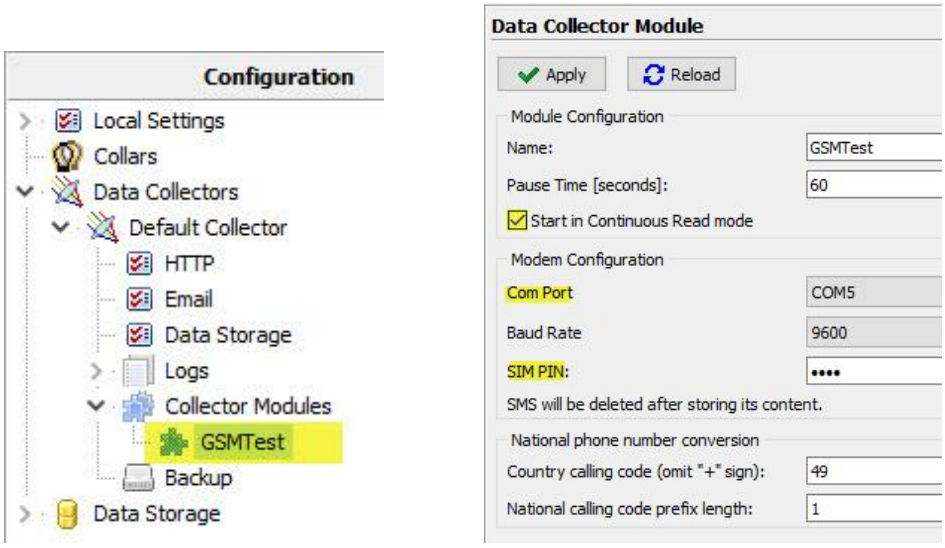

Figure 6: GSMTest Station Configs

4. Configure the parameters of the GSM Station.

Name	the name for the GSM Station to identify it
Pause Time [seconds]	the time interval between single readings
Start in Continuous Read mode	check this box if you want to start reading immediately after configuration and if you want this plugin to read contiuously (recommended)

Com Port	port through which the GSM ground station is connected to the computer. The next step (5.) describes how to choose the correct port.
Baud Rate	select the Baud Rate from the drop-down list (9600 to 115200 bit/s); select the one that is appropriate to the GSM module you are using. Most of them work with 9600 or 19200 Baud as default and many even use autobauding, which leaves the choice to you
SIM PIN	enter the PIN of the SIM card used in the GSM ground station
Country calling code	the international country calling code of your collars. In some rare cases SMS messages use national phone number coding rather than international. In these cases the phone number has to be transformed to be identified by removing the national calling code prefix and adding the international calling code for the country the collars GSM SIM card is coming from. Note: This only needs to be configured if there are any problems with receiving SMS. We suggest to contact the VECTRONIC Aerospace support before entering any information here.
National calling code prefix length	the number of national calling code prefix digits of your collars. It is necessary in the same cases as explained for the Country calling code.

5. Choose the correct Com Port: Right click on **Start** ⇨ **Device Manager** ⇨ **Ports (COM & LPT)** ⇨ Choose **u-blox Modem USB AT and Data (Com_)** Choose the lowest Modem **AT and Data (Com_)** value as you can see in the screenshot below.

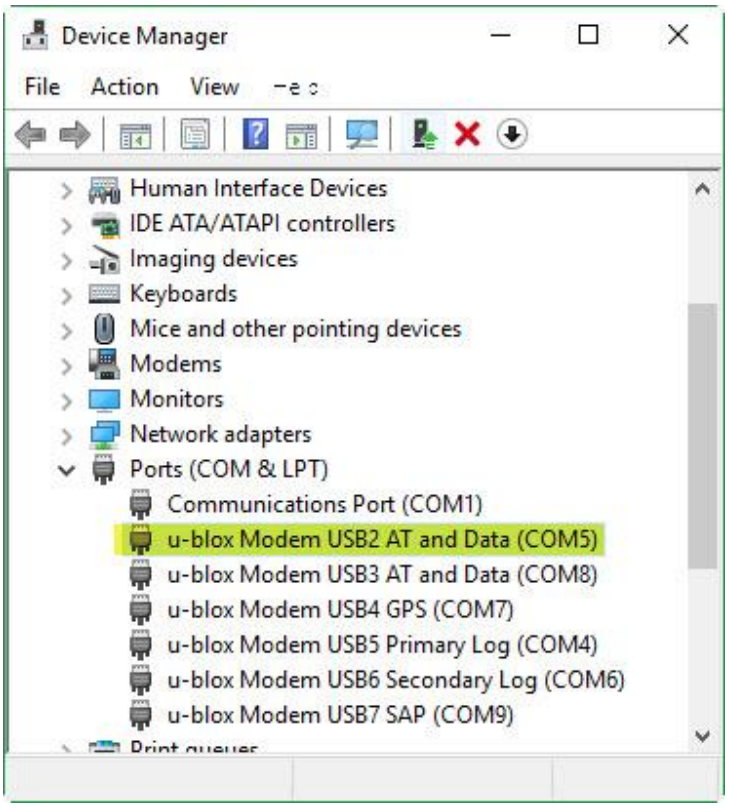

Figure 7: Device Manager, COM Port choice

Press Apply to upload the settings. Now the GPS Station is fully installed and can perform according to the configurations on the collar. If you want to know how to access Collar Data please refer to the GPS Plus X software manual.

4 SMS Transmission & Reception

The collar will send the SMS to the GSM Station according to the "GSM Mode". The GSM Mode shows GPS locations per SMS. The number of locations can be set to a maximum of seven. In this case, the collar will take seven GPS locations, then switch on its GSM modem and attempt to send a SMS. Afterwards it will listen to incoming SMS

(e.g. new schedules). If the collar has not been able to send an SMS (e.g. due to lack of GSM coverage), it will make a new attempt after another seven GPS positions and send two SMS.

On their way from the collar to your desktop, the SMS are transmitted in three steps:

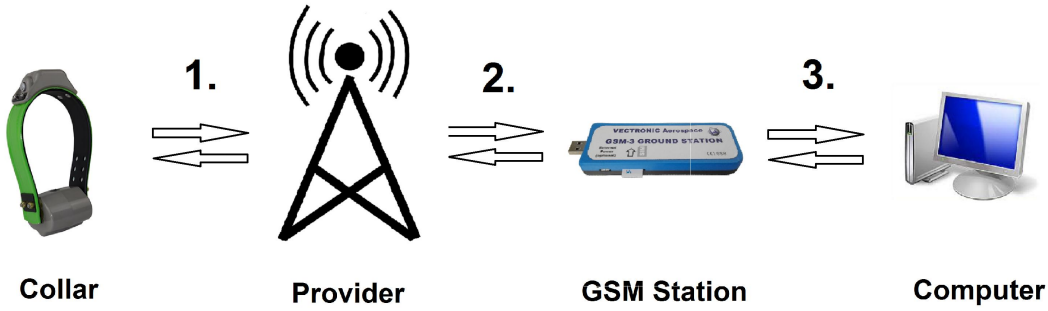

Figure 8: GSM Communication in 3 steps

1. The SMS is sent from the collar to the server of the mobile provider according to your configurations. The collar can only transmit SMS messages in GSM covered areas.
2. The provider transmits the SMS to your GSM station. If the GSM station is offline (e.g. no power or no GSM reception), the SMS will be stored until your GSM station books itself into the mobile net again. Depending on the mobile provider's storage-time, an SMS will be deleted after a few days if the receiver is not online.Your GSM station can store up to 310 SMS in its internal memory. As long as it is powered and has free memory, it will download and store SMS from the mobile provider, even if GPS Plus X is not running.
3. Your computer downloads the SMS from the GSM station with the GPS Plus X software and you can access the data. For how to access, please refer to the GPS Plus X manual.

Note: Mobile phone providers delete SMS from their server after a certain time span if they have not been downloaded by the intended receiver. How long an SMS is stored depends on the provider. It is therefore advisable to read SMS frequently, we even recommend to always leave the GSM Station connected to the computer.

5 Certificate

Notified Body Statement of Opinion

The TCF listed below has been evaluated to the requirements of the European R&TTE Directive 1999/5/EC

Applicant name:	u-blox AG
EUT:	2G and 3G Module
Model:	SARA-U270
Frequency bands:	880 MHz to 915 MHz 1710 MHz to 1785 MHz 1920 MHz to 1980 MHz

TCF Number:	NB_ SARA U270
ACB Project Number:	ATCB015758

ACB is designated as a Notified Body under the U.S.-EU Mutual Recognition Agreement

ACB, Inc.
Notified Body Number 1588
6731 Whittier Avenue, Suite C110
McLean, VA 22101, USA

In the opinion of ACB the examination of the technical construction file presented demonstrates the requirements of Directive 1999/5/EC have been met. The product listed above and in Annex 1 of this document, is in conformity with Annex IV and the essential requirements of Articles 3.1a, 3.1b and 3.2 of Directive 1999/5/EC. This statement of opinion relates only to the documents provided to ACB. A list of documentation forming the basis for the examination is provided in Annex 2 of this document.

Notified Body: P.A.J.M. Robben

8 July 2014
Date

CE1588

This Opinion is documented in the report for the above-reference ACB project number which is an integral part of this document, and includes all observations, comments and recommendations appropriate for this Opinion.

Annex 1 of NB Statement of Opinion
Number: NB_SARA U270 ATCB015758

The device under evaluation was a 2G/3G radio module.
It used GPRS technology in the E-GSM 900 MHz and DCS 1800 MHz bands.
It used UMTS technology in the 900 MHz Band VIII and 2100 MHz Band I.

Details of operation:

Description of service:	GSM 900 MHz
Transmit frequency:	880 MHz to 915 MHz
Receive frequency:	925 MHz to 960 MHz
Modulation type:	GMSK
Power class	Class 4
Transmit power (GPRS):	30.5 dBm (GMSK), conducted

Description of service:	DCS 1800 MHz
Transmit frequency:	1710 MHz to 1785 MHz
Receive frequency:	1805 MHz to 1880 MHz
Modulation type:	GMSK
Power class	Class 1
Transmit power (GPRS):	27.9 dBm (GMSK), conducted

Description of service:	UMTS 2100 MHz Band I
Transmit frequency:	1920 MHz to 1980 MHz
Receive frequency:	2110 MHz to 2170 MHz
Modulation type:	QPSK
Power class	Class 3
Transmit power:	22.9 dBm, conducted

Description of service:	UMTS 900 MHz Band VIII
Transmit frequency:	880 MHz to 915 MHz
Receive frequency:	925 MHz to 960 MHz
Modulation type:	QPSK
Power class	Class 3
Transmit power:	22.4 dBm, conducted

CE1588

This Opinion is documented in the report for the above-reference ACB project number which is an integral part of this document, and includes all observations, comments and recommendations appropriate for this Opinion.

Annex 2 of NB Statement of Opinion
Number: NB_SARA U270 ATCB015758

1 Test Report:

	Report number:	Dated:
EMC	MDE_UBLOX_1405_EMCa	12 June 2014
Radio (GSM/UMTS)	MDE_UBLOX_1405_01	11 June 2014
Radio (GSM/UMTS)	Annex to MDE_UBLOX_1405_01	30 June 2014
RF Safety	MDE_UBLOX_1405_MPEa	11 June 2014
Electrical Safety	071-75926706-100	3 July 2014

2 Technical Documentation provided:

Antenna Details	Block Diagram	Schematic/Circuit Diagram
External Photographs	Internal Photographs	Label Drawing
Parts List / Bill of Materials	Technical Description	Test Reports
Test Photographs	User Manual	Operational Description

3 Standards used to show conformity to 1999/5/EC:

Radio Spectrum :	EN 301 511 V9.0.2	
	EN 301 908-1 V6.2.1	EN 301 908-2 V6.2.1
EMC :	EN 301 489-1 V1.9.2	EN 301 489-7 V1.3.1
	EN 301 489-24 V1.5.1	
RF Safety:	EN 62311: 2008	
Product Safety	EN 60950-1: 2006 + A11: 2009 + A1: 2010 + A12: 2011 + A2: 2013	

4. Other Relevant Essential Requirements

Art 6.3 Information to user provided:	Yes
Art 6.4 Alert Symbol required:	No
Art 12 CE Marking appropriate:	Yes

5. Further information:

This is a Class 1 device if the device satisfactorily meets the requirements of EU sub-class 9 and is only used under the control of a public licensed network.
The appropriate conformity information, CE Mark and Notified Body number (1588) must be clearly displayed on the equipment label, the user's manual and the packaging.
A statement of compliance with Directive 1999/5/EC or a copy of the Declaration of Conformity must be provided with each device.
The responsible party for integrating this device into host equipment must assess if the combination of this device and the host equipment will remain compliant with the essential requirements of the R&TTE Directive 1999/5/EC.

6. Contact information:

For contact with ACB or questions regarding this Statement of Opinion:
Web: www.acbcert.com; e-mail: customerservice@acbcert.com; Tel.: (+1) 703 847 4700

CE1588

This Opinion is documented in the report for the above-reference ACB project number which is an integral part of this document, and includes all observations, comments and recommendations appropriate for this Opinion.