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## QUICK REFERENCE

### COME<sup>2</sup>ALLSAT GENPRO

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## OVERVIEW COME2ALLSAT GENPRO

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come2allsat GenPro is a fully automatic modem for correction data reception over mobile narrow band and broadband connections. An internal NTRIP client supports IP-based connections to different reference services or an own reference station. The unit automatically logs onto the reference station specified or the reference station within the shortest distance to the GNSS rover. Configuration of the modem for an individual so called NTRIP Mountpoint or an NTRIP Server IP address is performed by configuration tool or sending a SMS message to the device.

Status information about the come2allsat GenPro device can be requested either by SMS or via serial interface.

The connection for correction data can be controlled by NMEA messages from your GNSS receiver.

come2allsat GenPro is manufacturer independent and can be used as a correction data modem for different GNSS receivers.

You need a card with GPRS or GPRS/3G/4G tariff for operation. As a supplier for correction data you can use reference services like AXIO-NET in Germany or your own reference station. GSM- (GPRS) or UMTS/LTE-net (3G/4G) coverage must be sufficient within the area you plan to measure.

come2allsat GenPro is designed for stationary use as well as usage in a vehicle and as a correction data module for mobile GNSS systems. This quick reference serves as a help for installation and provides important hints to the handling.



## INSTALLATION

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To configure the come2allsat GenPro once please follow the steps mentioned below in the short overview. Each single step will be explained in detail later on.

- Note the PIN of your SIM card.
- Remove the cover of the SIM slot carefully.
- Insert the SIM card into the GenPro modem.
- Mount the cover again.
- Plug the come2allsat GenPro device to your Personal Computer using the configuration cable.
- Supply the come2allsat GenPro device with stabilized power within a voltage range from 6.5 to 32 Voltage. Connect the red cable with + and the black cable with -. For the standard operation the additional cable pins (yellow, brown) do no need to be connected. This also applies for the yellow/blue cable. Once current is applied, the device will turn on automatically.
- Start the configuration software and choose the serial interface of your Personal Computer.
- Perform your individual settings and transmit the configuration.
- Integrate the come2allsat GenPro device into your system. Here for, plug in data and power supply cable.
- Switch on the GNSS receiver.
- Configure your GNSS receiver for NMEA output to the come2allsat GenPro device at 19200 Baud.



## SIM CARD

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You need a valid SIM card to register at the mobile network. If you would like to use internet based connections you need an additional activation of it. Please clarify the details with your provider. We suggest negotiating a volume or flat tariff with your provider.

The PIN of the come2allsat GenPro can be chosen freely. Please note the PIN before inserting the SIM card into the modem as otherwise you would have to unlock the SIM with the PUK after three failed attempts before you can use the SIM card again. You will find the function for changing the PIN in the menu "settings" in many mobile phones.

Please note: All saved SMS drafts on your SIM card will be deleted. The come2allsat GenPro device saves the configuration on the SIM card as an unsent SMS.

To insert the SIM card please remove the cover at the side of the enclosure carefully.

Insert the SIM card according to figure 1 into the SIM card slot of the modem and notice the position of the recessed corner. Afterwards mount the cover again. To remove the SIM card later, simply push it slightly further into the modem and let it jump out by the spring mechanism.



figure 1



## CONFIGURATION IN GENERAL

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Mobile connection settings will be saved persistently on the SIM card as well as all parameters of the reference service. Once configured the come2allsat GenPro doesn't need to be reconfigured unless the SIM card is used elsewhere or you wish to change some settings.

In principle there are three different ways to configure the come2allsat GenPro device:

- by come2allsat GenPro configuration software from ALLSAT
- by terminal program via serial interface
- by SMS

In the two last-mentioned cases the configuration string has to be created manually. You will find detailed information in the chapter "Create configuration string manually".

In this quick reference guide the configuration by the user friendly configuration software will be explained in the following.

You can download the come2allsat configuration software from this URL:

<https://www.allsat.de/produktvertrieb/produktportfolio/allsat/come2allsat/#downloads>

The Configuration Software is supported by Windows XP, Vista, 7, 8 and 10. Simply install the configuration tool into a local directory with full administrator rights and run it.



## CONFIGURATION SOFTWARE

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Before you can start with the configuration the following requirements have to be fulfilled:

- A valid SIM card is inserted into the modem according to the preceding chapter.
- A mobile communications antenna is connected to the device.
- The come2allsat GenPro device is supplied by stabilized power between 7.2 and 32 Voltage.
- The come2allsat device is connected to a serial interface of your Personal Computer by the configuration cable.

Then proceed with the following steps:

- Switch on the power supply. The come2allsat GenPro device will register at the mobile network. If the registration is successful, the yellow LED turns from constant glowing into slowly flashing with 1Hz
- Start the configuration using the desktop shortcut or from start menu. A dialog shown in figure 2 opens. Choose the serial port of your Personal Computer which the come2allsat GenPro device is connected to. Click "Connect".

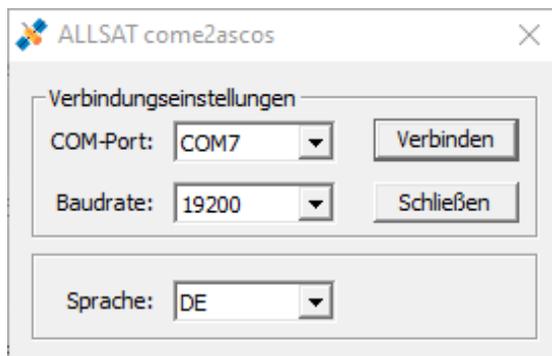


figure 2



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ALLSAT come2ascos

**Serielle Schnittstelle**  
Baudrate: 19200

**Verbindungsart**  
GPRS  Land: Germany

**GPRS Einstellungen**  
Anbieter: user defined  
Zugang: internet.t-mobile  
Benutzername: t-mobile  
Passwort: tm

**Korrekturdaten Einstellungen**  
Dienst: AXIO-PED-32  
IP/URL: caster.axio-net.eu Port: 2102  
Benutzername: username  
Passwort:   Zeigen  
Mountpoint: AX-PED  Statischen Mountpoint  
Format: RTCM 3.2

**Firmware**  
Name: come2ascos  
Version: V130b5\_EGM440b6  
Datum: Mar 16 2020  
Uhrzeit: 17:00:56

**Hardware**  
Modem Version: 16.19.192

**Verbindung**  
Netz: 2G  
Signalstärke (0-32): 4  
Telefonanbieter: Telekom.de  
Gesendete Bytes: 0

Konfiguration schreiben    Erweiterte Einstellungen    Profil Sichern    Info  
Konfiguration lesen    Einwahltest    Profil Laden    Schließen

figure 3

The configuration dialog shown in figure 3 will appear. Here you can enter your individual configuration settings. You can also find information to firmware version, hardware and signal strength of the mobile network connection.



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The meaning of the items will be explained in detail below.

### SERIAL INTERFACE

Using GenPro325e, baud rate is set to 19200 baud.

### CONNECTION TYPE

Please select the country you're using the modem in. The provider and correction data services are dependent on the selected country.

### MOBILE NETWORK SETTINGS (GPRS/3G/4G)

Provider dependant parameters for the internet access are specified in this field. A pre-selection of the mostly used providers in Germany can be accessed by the drop-down list instead of manual input. If your provider is not listed it is explained below how you can add your individual entries to the pre-defined settings.

### CORRECTION DATA SETTINGS (GPRS/3G/4G)

In this field the login details of your reference service provider are set. You will receive username and password from your reference service provider. Some AXIO-NET services are already pre-defined. If you choose a pre-defined setting also the optional parameters are included automatically.

### OPTIONAL PARAMETERS (GPRS/3G/4G)

„Set static mount point“ allows to set the mount point manually.

„Disable source table download“ disables the source table download. The come2allsat GenPro will not select a suitable mount point automatically, but goes directly to the manually specified one.

„Require GGA message“ activates control by GGA messages from your GNSS receiver.

„Disable control by NMEA“ can be used for modem tests without a GNSS receiver connected. The connection will be built up without receiving GGA – just to see if dialling in works. Afterwards the reference service will cut the connection because a GGA is normally needed.

To transmit the configuration to the come2allsat GenPro device push the button “Configure Device”. The writing process needs several seconds while the come2allsat GenPro device should not be disconnected from power supply.

The button „Read Settings from Device“ displays the current configuration of the come2allsat GenPro device.



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You can create your individual configuration settings as pre-defined items in the drop-down boxes by editing the text file Settings.txt in the directory of your configuration software. To create a new entry, simply add a new line. Notice the syntax: Values are separated by semicolons. The key words PROVIDER, SERVICE\_GPRS and SERVICE\_GSM specify, in which drop-down list the new entry will appear. The Syntax in detail:

```
PROVIDER;[provider name];[GPRS gateway];[username];[password];
```

```
SERVICE_GPRS;[identifier];[IP address];[port];[mount point];[disable  
source table download];[require GGA];
```



## CREATE CONFIGURATION STRING MANUALLY

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First a configuration string has to be created before the come2allsat GenPro device can be configured by SMS or via terminal program. A configuration string is composed by different single parameters which will be described in the following together with their range of values.

Syntax of a configuration string for GPRS connections:

```
[IDENTIFIER] CONFIG,NTRIP,[BAUD_RATE],[GPRS_GATEWAY],  
[GPRS_USER],[GPRS_PASSWORD],[URL]:[PORT],[USER]:[PASSWORD],  
[OPTIONAL_PARAM]
```

Parameters' semantics:

[IDENTIFIER]: An identifier can be set as an optional parameter in order to distinguish between different configuration strings stored in your mobile phone easier. Choose a speaking name. Please note that the maximum SMS length of 160 characters is not exceeded. Blanks and special characters cannot be used.

[BAUD\_RATE]: 4K8, 9K6, 19K2, 38K4 and 57K6 are possible values for the baud rate at the serial interface. Using come2allsat-GenPro-modem it is set to 19K2 (19200 baud).



- [GPRS\_GATEWAY]: APN (Access Point Name) of the mobile provider.
- [GPRS\_USER]: Username for internet access. Username and password are not personal, but public login combinations for mobile network access. The authentication is realized by the SIM card. Some providers use the empty username and password; others don't check this combination at all.
- [GPRS\_PASSWORD]: Password for internet access. See [GPRS\_USER].
- [URL]: URL or simply IP address of the reference service.
- [PORT]: Port at the correction data server. The port is separated from the URL by a colon.
- [USER]: Username for identification of the user account at the reference service. You will receive your individual login combination by your reference service.
- [PASSWORD]: Password associated to the username. Username and password are separated by colon.
- [OPTIONAL\_PARAM]: Further parameters can be optionally set by adding them to the configuration string, separated by comma:
- MOUNT:[MOUNTPOINT] allows to specify a certain mount point manually. The keyword MOUNT is followed by a colon and the name of the source. This parameter is reserved for GPRS connections.
- SKIP-TABLE is a keyword that disables the source table download. This setting makes sense in combination with a manually specified mount point as the source table download and an automatic choice of a suitable reference station is



needless then. This parameter is reserved for GPRS connections.

NEED-GGA is a keyword that must be set if the reference service uses the VRS concept and therefore requires receiving GGA messages in certain time intervals. At the same time the come2allsat is controlled by GGA messages: If no GGA is received for 90 seconds the unit logs off until it receives a GGA message again.

SKIP-NMEA allows disabling the GGA control for test purpose. The device connects to the reference service even without receiving GGA messages. Thus, it is possible to test the connection to the reference service without connecting a GNSS receiver to the come2allsat device. The reference service will neglect the request if a GGA is needed. NEED-GGA and SKIP-NMEA cannot be set at the same time as they are opposed to each other.

## CONFIGURATION BY SMS

To perform a configuration by SMS, simply send the created configuration string to the telephone number of the SIM card inserted in the come2allsat GenPro device.

An example for a configuration string

```
CONFIG,NTRIP,19K2,web.vodafone.de,,,62.180.42.56:2101,user:secret,  
MOUNT:07-AXIO,SKIP-TABLE,NEED-GGA
```

for using a Vodafone D2 SIM card and the AXIO-PED service with GPS and GLONASS.



## CONFIGURATION BY HYPERTERMINAL

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For configuration by serial terminal (for example HyperTerminal) the come2allsat GenPro device is accessed via serial interface. The configuration string is created like described in the chapter "Create configuration string manually". Additionally the string is preceded by the Prefix "\$PSLL," and ends with a line feed "<CR NL>".

Connect the come2allsat GenPro device to the serial interface of your Personal Computer using the configuration cable. Configure the interface with these parameters:

19200 baud, 8 data bits, 1 stop bit, no parity, no flow control.

In classic HyperTerminal navigate to the dialog File -> Properties -> Settings -> ASCII Setup... and activate the check boxes in front of the entries „Send line ends with line feeds“ and „Echo typed characters locally“.

An example for a configuration string

```
$PSLL,CONFIG,NTRIP,19K2,internet.t-d1.de,t-d1,gprs,62.180.42.56:2101,  
user:geheim,MOUNT:02-AXIO,SKIP-TABLE,NEED-GGA<CR NL>
```

for using a T-Mobile SIM card and the AXIO-ED service with GPS and GLONASS.



ASSEMBLY COME2ALLSAT GENPRO

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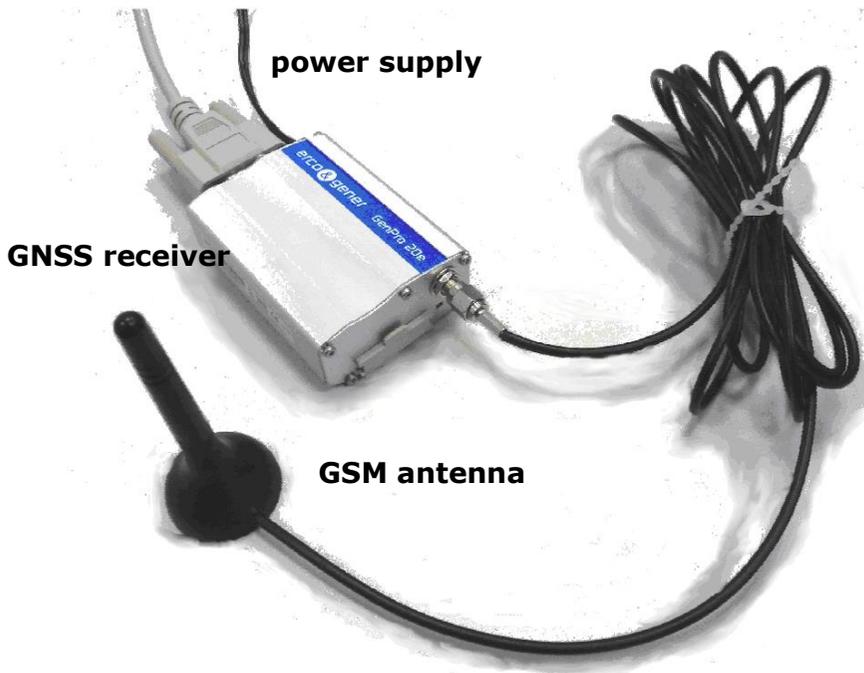


figure 4

Connect your come2allsat GenPro device as shown in figure 44 to power supply and your GNSS receiver by the split cable. Don't forget connecting a mobile communications antenna that fits to your mobile network.



## OPERATION

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The come2allsat GenPro device indicates its current status by its LED. The following table shows the possibilities:

STATUS	LED YELLOW	HINT
Turned Off	 off	Switch on by connecting with power supply -> Initialisation.
Powersupply active	 constant flashing	SIM PIN is expected. Afterwards the net registration begins. It takes 30-60 seconds. If the LED stays lit up: verify PIN of the SIM card.
Initialisation	 Switch from constant to slowly flashing	Registration at GSM/GRPS-net successful.
Registered	 Switch between quickly and slowly flashing	Registered at LTE-net.
Data Transmission	 quickly flashing	Transmission of correction data. With no GGS, data transmission stops

Ensure that you have inserted a valid and configured SIM card and connected a mobile communications antenna.

Integrate the come2allsat GenPro device into your system as shown in the preceding chapter.



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### INITIALISATION

As soon as the come2allsat GenPro device is supplied with power, the initialisation starts. This process lasts for about 10 to 20 seconds. The quality of the mobile network signal is checked and if not sufficient, the LED flashes constantly. If the registration at the mobile network is successful, the LED switches to slowly flashing.

### DATA TRANSMISSION

The yellow LED flashes constantly. Correction data are being transmitted. If the connection is disconnected because of low mobile network signal or electromagnetic interferences the come2allsat GenPro device might restart automatically. For improving stability please read the chapter about "Performance Optimization".

In order to reduce mobile provider costs you can stop the flow of correction data temporarily by stopping the GGA output of your GNSS receiver. The flow of correction data is activated again as soon as a new GGA message is received. In GPRS mode the data flow is resumed quickly within only a few seconds as the come2allsat GenPro device stays online in pause mode. Unplug the power supply for shutting down the device.



## STATUS INFORMATIONS

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The current status of the come2allsat GenPro device can be requested by special commands which are explained in the following:

- NTRIP,STATUS: Used sources, RTCM data format
- NTRIP,USER: NTRIP user account (username, password), optional configuration parameters
- NTRIP,LIST: List of reference stations within the area of max. 140 km.
- GPRS,STATUS: GPRS gateway, GPRS username, GPRS password, telephone provider, received bytes, transmitted bytes, signal quality (3 is min. necessary)
- NMEA,LIST: Type of received GGA messages
- NMEA,FIX: Last known position (GGA)
- FIRMV: Firmware version

Status information can be requested by SMS or by terminal program. Requests by terminal program require "\$PSLL," as prefix and a line feed "<CR NL>" as postfix.



## PERFORMANCE OPTIMIZATION

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Optimal stability of the data connection can be reached by following the items below:

- The power supply must be stabilized.
- The mobile connections antenna should have at least 2dB gain, better 3-5dB – especially in areas with low mobile network coverage stability can be raised significantly.
- Mount the mobile connections antenna as high, free and far away from electronic components as possible. Electromagnetic fields in the surrounding can influence the performance negatively (for instance high-voltage transmission lines etc.).
- Mobile network coverage should be sufficient. Best performance and stability is reached in areas with high signal quality. If the coverage is not sufficient maybe another provider can offer a better net structure in your surrounding.
- Please note that GPRS/3G/4G is a service that doesn't offer Quality of Service (QoS) as this service is Internet based. In areas with few GPRS/3G/4G communication slots and a high usage rate delays of the data transfer can occur.
- Configure your GNSS receiver to output a GGA message in an interval of one up to ten seconds. This should be the only output at the communication port the come2allsat GenPro device is connected to.



## TECHNICAL DATA COME2ALLSAT GENPRO

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### MECHANICAL CHARACTERISTICS

Enclosure size	73 x 54.5 x 25.5 mm (excl. connector)
Weight	90g
Enclosure	aluminium
Colour	silver

### ENVIRONMENTAL FEATURES

Operating temperature	-20° to +60° Celsius
Storage temperature	-40° to +85° Celsius
Protection class	IP31

### DATA OUTPUT

Format	RTCM 2.x/3.x, CMR and other
Serial Port	RS232; 2400 – 115200 bauds; 8 data bits; 1 stop bit; no parity (output at 19200 bauds)

### POWER SUPPLY

Voltage	6.5 – 32 VDC
Supply current	GPRS/3G: *106mA @ 12VDC (* ) Peaks of current is 1.6A.

### NTRIP

VRS reference net	Send own GGA-Position to provider every 12s
Single reference station	max. 140km Distance

### GSM/UMTS/LTE MODEM

GSM/GPRS/EDGE	850/900 1800/1900 MHz
3g	850/900 1900/2100 MHz
4g	Bands 20(800 MHz), 5(850 MHz), 8(900 MHz), 3(1800 MHz), 1(2100 MHz), 7(2600 MHz)

Data communication	DL 7.2 Mbps UL 5.76 Mbps
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Antenna connector

SMA-F

Roaming

Dial-in into a foreign mobile network.