

The GNS 202/902 Starter Kit has been designed to support developers during design-in of the GNS 202/902(B) module family.



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Introduction

This manual shows, how to connect the GNS 202/902 Starter Kit to a PC in order to verify GNS 202/902 module performance and test supported features. Connected to a PC, all NMEA data is routed to the miniUSB port.

All documents which are highlighted in **bold** letters, are available for download at the GNS forum: <http://www.forum.gns-gmbh.com/> or from our website www.gns-gmbh.com

For technical module specification, please refer to the **GNS 202 or 902 (B) datasheets**.

For receiver configuration programming via NMEA command interface and getting more information about the command parameters, please refer to **NMEA_Interface_manual_MTK_Vx**

Important note :

This manual covers all versions of GNS 202 and 902 GNSS receivers.

The following versions are available :

GNS 202 : ROM based GPS all- in one receiver

GNS902 : Flash based GNSS receiver for concurrent reception of GPS and Glonass

GNS902B : Flash based GNSS receiver for concurrent reception of GPS and Beidou

Whenever needed for clarity, the type of referenced module is mentioned in the text.

GNS 202/902 Starter Kit Features

- On board USB2UART bridge for PC connection
- 5V DC input via mini USB
- LED fix indicator
- Access to 202/902 module pins for evaluation and system integration purpose

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1 Description of the GNS 202/902 StarterKit Hardware

FEATURES

- Small evaluation board designed for verification of GNS 202/902 module GPS performance parameters
- Small evaluation board designed for easy implementation to MCU controlled applications
- LED fix indicator
- PC connection via USB
- USB powered

The GNS 202/902 Starter Kit is equipped to provide NMEA data via USB or UART to the application software.

Package Content

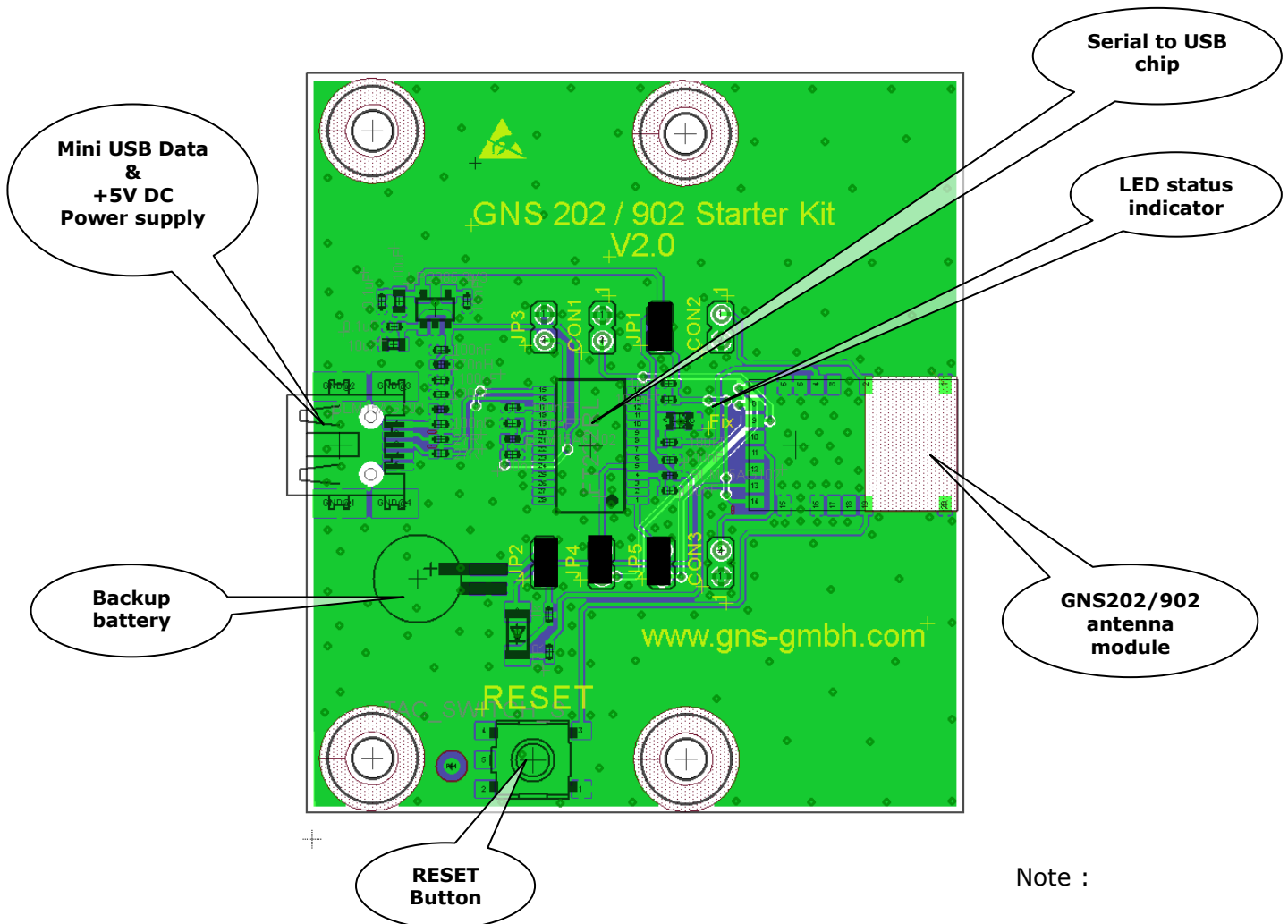
- GNS 202/902 Evaluation Board
- USB to miniUSB cable
- CD with documentation & software

GNS 202/902(B) StarterKit

manual

confidential information manual

2 GNS 202/902 StarterKit Board Layout



Note :

Standard Jumper setting in ready-to-run configuration for USB connected to PC is shown on picture.

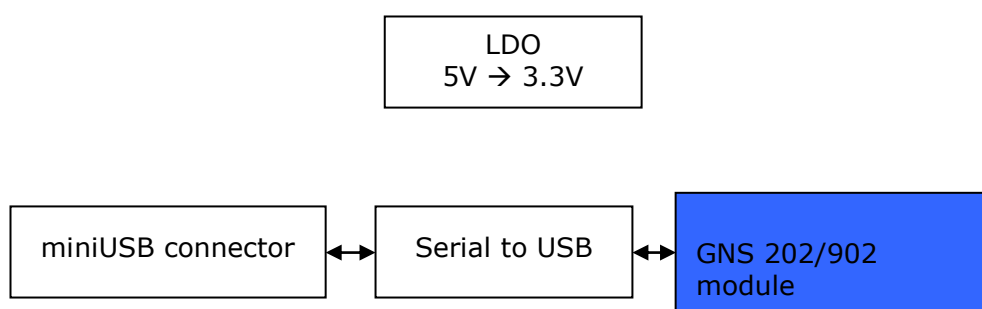
Description of LED status indicator:

status LED	GNS202	GNS902	GNS902B
blinking	Position fix found, tracking	Acquisition, no fix available	Acquisition, no fix available
on	NA	Position fix, tracking mode	Position fix, tracking mode
off	Acquisition, no fix	NA	NA

JUMPER AND CONNECTOR DESCRIPTION

CONNECTOR	DEFAULT	SIGNAL	DESCRIPTION
JP1	set	V _{CC}	This jumper must be connected to DC supply GNS 202/902. Can be used to evaluate power consumption.
JP2	set	V _{Backup}	Connects the battery to VBackup, can be removed to erase data and stop RTC
JP3	open	USB Bridge reset	Resets FTDI USB to serial bridge. Releases uart pins . Should be set if UART is used
JP4	set	GPS Tx line	Connects GPS Tx to USB bridge . Closed for USB operation, open if UART should be used. Pin2 is GPS Tx.
JP5	set	GPS Rx line	Connects GPS Rx to USB bridge . Closed for USB operation, open if UART should be used. Pin2 is GPS Rx.
CON1	open	GPS RxB line for RTCM feed	Pin2 is feed in for RTCM data. Pin1 is GND. Do not short !
CON2	open	Wakeup	TBD . Do not short!
CON3	open	1 PPS output	Pin2 is PPS output, Pin1 is GND. Do never short !

3 GNS 202/902 StarterKit Board Block Diagram



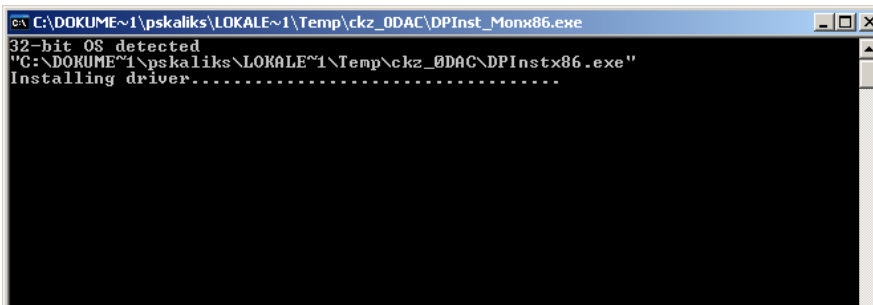
3.1 Getting started

1. Connect the active GPS/GLONASS antenna to the GNS 202/902 Starter Kit.
2. Insert the included CD into your CD Rom Drive. Change to \Driver folder.
3. Copy the two files from the \Driver folder to a PC folder of your choice.
4. GNS 202/902 Starter Kit will be connected to the PC via a virtual COM-Port with USB. This conversion is performed by an onboard chip.

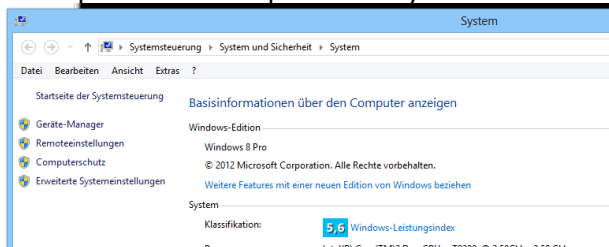
Do not connect the USB cable now!

First, please install the FTDI VCP (Virtual Com Port) driver by invoking USB-Driver-CDM20600.exe.

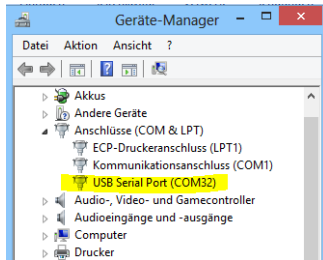
A DOS window will open and close again after a few seconds when finished.



5. The VCP USB driver is now ready to use.
6. Connect the Starter Kit to your PC by using the USB- to miniUSB cable. This will power up the Starter Kit (shown by the blinking green LED fix indicator) and establish the active state.
7. You should see a hint on the right lower corner of your PC screen, that a new hardware has been found and is ready to use.
8. The USB connection will create a new virtual COM Port on your system. To locate this COM port number (to find out which COM port has been assigned automatically), please open the device manager:
 - a. Press the start button
 - b. Type "device manager" or the appropriate name in your language (for example in Deutsch : "Geräte-Manager"). Windows will provide a direct link to open the device manager
 - c. Alternatively, you find the device manager by pressing the "Windows"-key together with "pause". This opens the system overview:



- d. On the left side selection menu, please select device manager. (german: "Geräte-Manager") . The devoce manager window opens.
9. Open the section *ports* ("Anschlüsse").



The new COM port is listed as an USB Serial Port.
Remember the displayed COM port number.

1. Use a GPS viewer of your choice to visualize the received NMEA data. We recommend to use VisualGPSView freeware for quick testing. Setting should be made as follows:
 - UART Comport number : as indicated above in the device manager
 - UART baud rate : 9600
 - UART format (should be already default) 8N1, no handshake

For deeper testing, a special tool from mediatek is available under NDA.

4 GNS 202/902 configuration

In all cases, where a UART or USB connection to a PC is available, the **GNS 202/902 Starter Kit** offers a comfortable way to reprogram the firmware options or settings using the bidirectional NMEA command interface.

Note:

Removing the power of the GPS device will effect that any modified setting will be lost and reset to factory default settings. If the module has backup power supply through V_{BACKUP} , it will be able to keep the modified setting until the backup power is exhausted.

After selecting the preferred settings or features at the **NMEA_Interface_manual_MTK_Vx** document, first the checksum has to be calculated for this command, refer to chapter 5.1 *Checksum Calculation*. To execute the \$PMTK commands, use a terminal program of your choice (for example HyperTerminal, HTerm, TerraTerm,... available as part of your WindowsOS or as freeware).

Use the COMport setting as explained under 3.1.

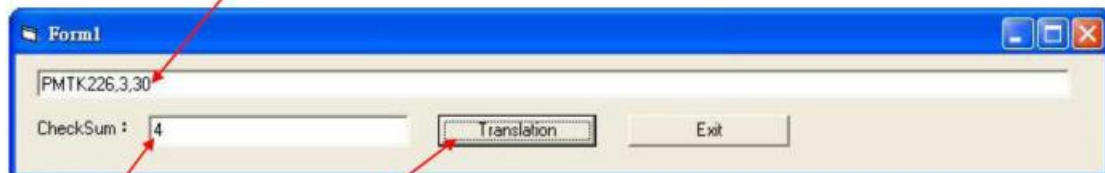
Use the PMTK-Commands attaching the calculated checksum (see 5.1) and the Carriage Return sequence at the end of each command line. Most terminal programs offer the option to attach Carriage-Return (use option *add CR-LF* or similar).

4.1 Checksum Calculation

To execute the a \$PMTK command it is required to terminate the command by * $\langle\text{chksum}\rangle$ and a $\langle\text{CR}\rangle\langle\text{LF}\rangle$. The checksum calculation is simple, just XOR all the bytes between the \$ and the * (not including the delimiters themselves). Then use the hexadecimal ASCII format.
Or use the checksum tool at the \Software\Checksum tool folder, which is available on Starter Kit CD or at the GNS forum: www.forum.gns-gmbh.com.

Example: \$PMTK226,3,30*4 $\langle\text{CR}\rangle\langle\text{LF}\rangle$

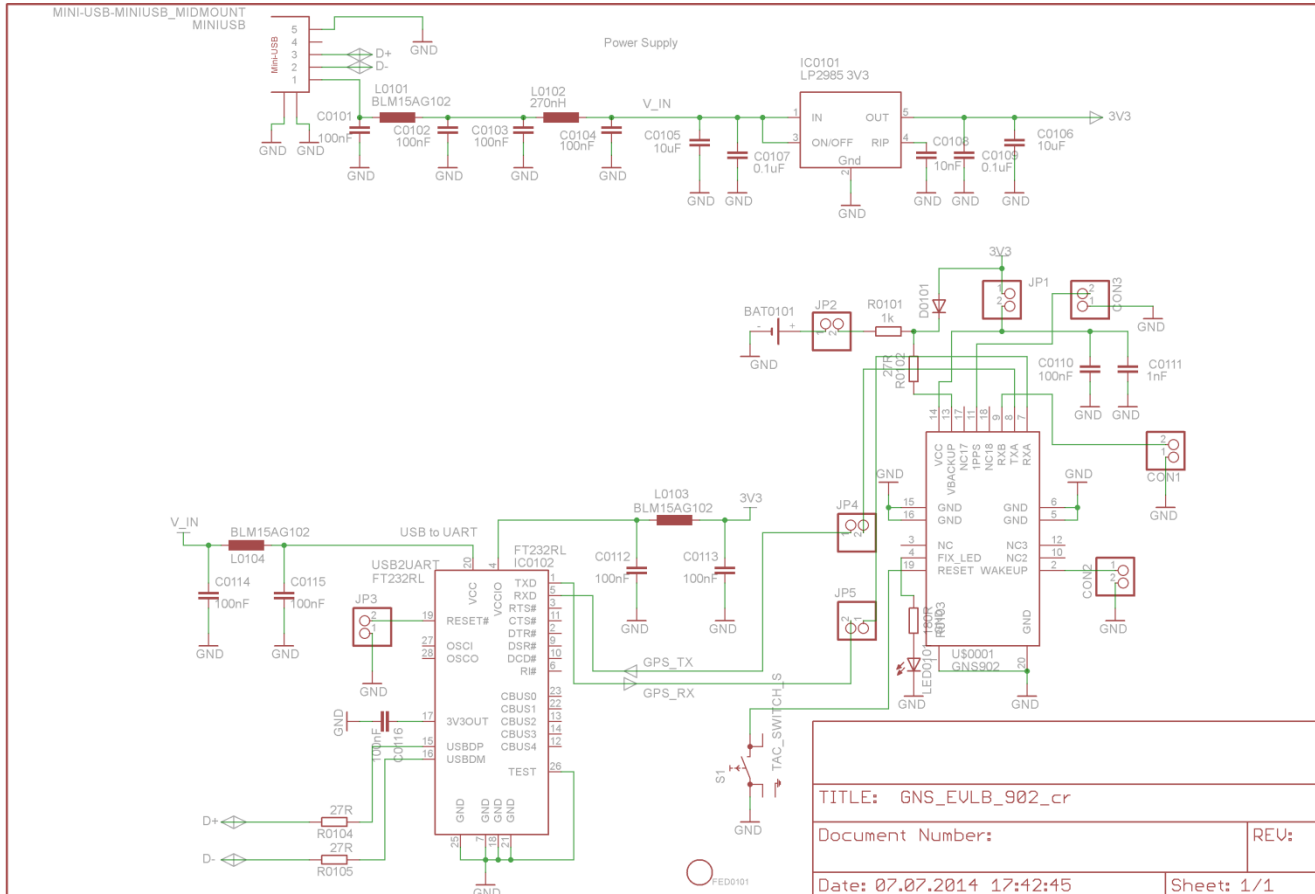
1. Key in command contents



2. Click Translation

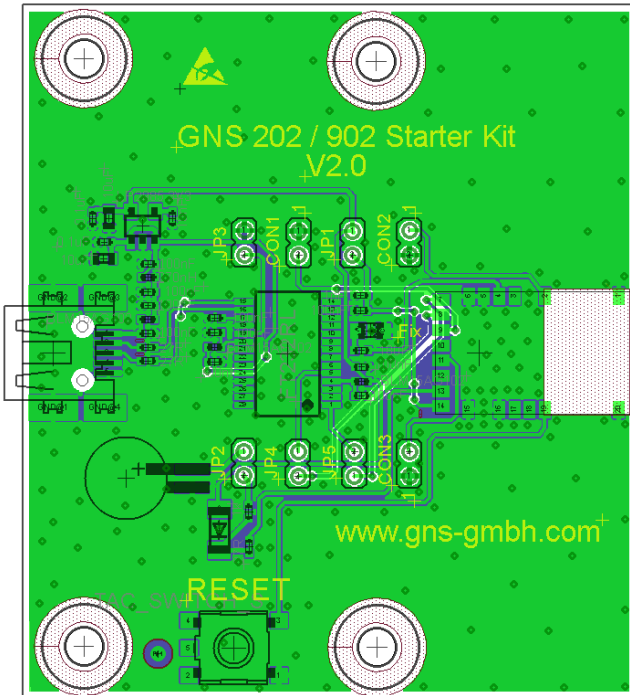
3. That checksum will display

5.2 GNS 202/902 StarterKit Schematic page1/2

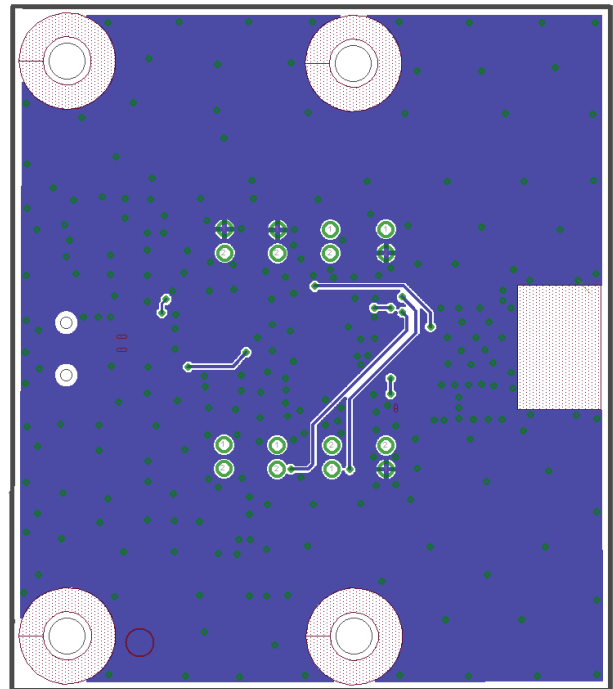


5.3 PCB Layout TOP/BOTTOM Layer

TOP Layer



BOTTOM Layer



6 ORDERING INFORMATION

Type	Part#	Description
GNS 902 StarterKit	4037735105225	Evaluation Board with GNS902 (GPS & GLONASS)
GNS 902B StarterKit	4037735105232	Evaluation Board with GNS902B (GPS & BEIDOU)
GNS 202 StarterKit	4037735105300	Evaluation Board with GNS202 (GPS)

7 RELATED DOCUMENTS

Type	description	Available from
<i>GNS 902(B) data sheet</i>	Data sheet for GNS 902 (B) module	http://www.forum.gns-gmbh.com , www.gns-gmbh.com
<i>GNS 202 data sheet</i>	Data sheet for GNS 202 module	http://www.forum.gns-gmbh.com , www.gns-gmbh.com
<i>NMEA_Interface_manual_MTK_Vx.pdf</i>	Detailed description of NMEA commands for MTK chipsets	http://www.forum.gns-gmbh.com , www.gns-gmbh.com

8 DOCUMENT REVISION HISTORY

V0.1	07/14/2014	P.Skaliks	initial document
V0.2	Oct 24 2014	P.Skaliks	New version covers 202 and 902

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