NAVILOCK®

Data Sheet

Positioning technology
provided by **ublox**
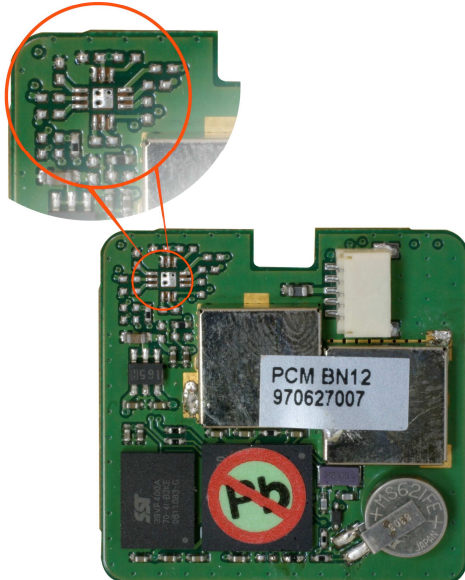
Engine Module
NL-550ERS   (60418)
NL-551EUSB (60419)
NL-552ETTL (60721)

NAVILOCK®

Pin	Assignment
1	+5 Volt
2	GND
3	Shield
4	USB D+
5	USB D-
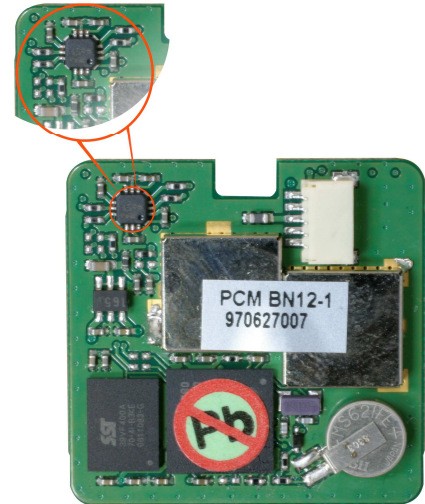
Pin	Assignment
1	+5 Volt
2	GND
3	Shield
4	RS232 TXD
5	RS232 RXD

Pin 1

Unpopulated in USB version

Pin 1

Populated in RS232 version
(USB to Serial Bridge)
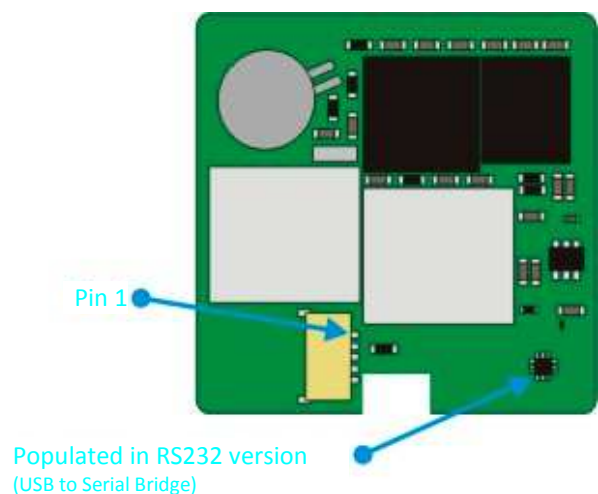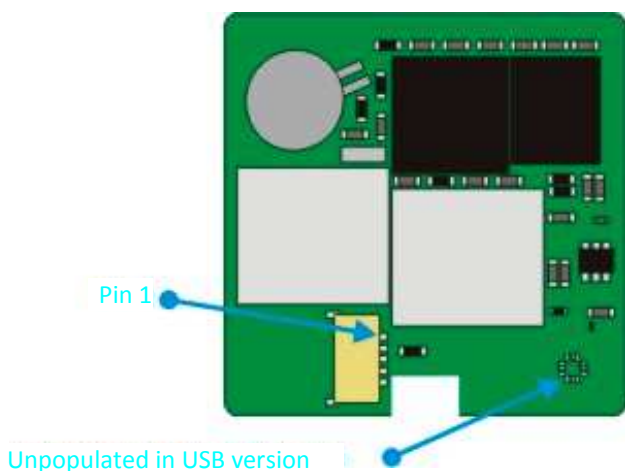
NAVILOCK®

Pin	Assignment
1	+5 Volt
2	GND
3	Shield
4	3.3V TTL TX Level/Output
5	3.3V TTL RX Level/Input

Pin 1

Unpopulated in TTL version
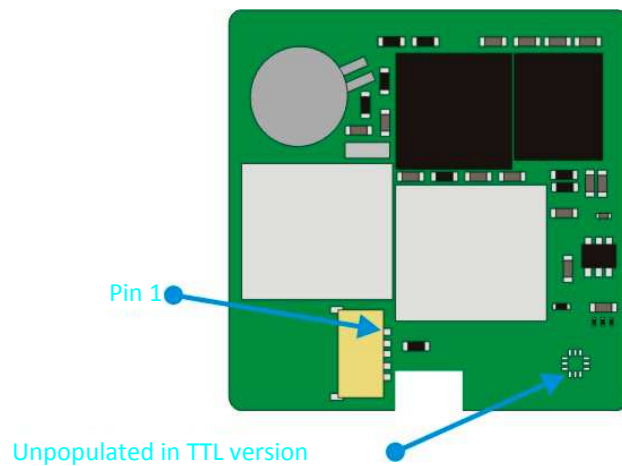
NAVILOCK®

A connection cable is required to operate the engine boards in one of their applications. It can be delivered in a standard length of 10 cm. A longer cable is feasible on a project basis starting from 1000 pieces.

Navilock Item 95843 = 5-pin Connection Cable 10 cm
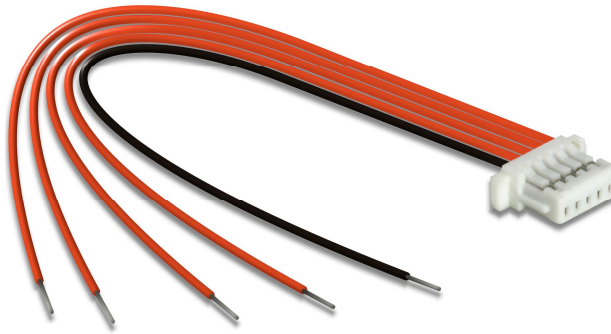
Three u-blox5 modules support AssistNow !

AssistNow is a standard **A-GPS service** to increase the performance of the **GPS receiver** by making the calculation of a position possible almost in real time, even during difficult reception conditions. **A-GPS** improves all GPS enabled applications, especially the ones requiring constant operational availability, such as applications for fleet management, or **GPS enabled handheld devices** whose users request direct access to locally fixed services, independent of reception conditions.

Without A-GPS, a GPS receiver must locate at least 4 satellites in direct line of sight, and then download their location data. This process requires 30 seconds under the best of reception conditions, and can take much longer, when conditions are worse, such as in an urban environment or inside a building where **GPS reception** is weaker. AssistNow transmits data directly to the GPS receiver, and thus enables fast calculation of the position.

The offline service provides assistance data valid up to 14 days. Therefore, users are able to benefit from an increase in **satellite tracking power** for longer periods of time, and will only occasionally need an internet connection to update assistance data.

Notice!

Standard use of GPS receivers is limited to an altitude of 16,000 m, and maximum speed of 1,000 knots. Portable Platform was applied to achieve higher accuracy for the u-blox5 chipset. It implements a sanity check of 12,000 m in height. For example, for a business jet flying at an altitude of 43,000 ft. (13106 m) we would recommend to use the Ariborn <1g platform.

Thus, the limit is set to 50,000 m. Although Airborn <1g specifies a speed of 100 m/s, it will not be tested, and will not cause invalidation of the fix. This adjustment is set by use of UBX-CFG-NAV5 message. As initially mentioned, NL-55XEXX modules are subject to GPS basic properties, despite Portable Platform being selected in the Default Setup. Thus, there is no fault in the adjustment of 12,000 m; quite the contrary, it causes an improvement in quality.

NAVILOCK®

Please refer to u-blox5 Receiver Description / Protocol Specifications:
http://www.u-blox.com/images/downloads/Product_Docs/u-blox5_Protocol_Specifications%28GPS.G5-X-07036%29.pdf

See the Chapter Navigation Configuration Settings Description on page 42. You can configure it by use of u-center, or transmit it to the receiver by batch command every time the system starts up.

GPS modules NL-550ERS, NL-551EUSB, and NL-552ETTL are designed to "forget" all user settings, when the battery pack is low, to be able to meet demands of the broad range of private users who make adjustments whose effect they do not know. In order not to render the module unusable thereafter, the memory is volatile for user settings.

General Specifications

- u-blox5 GPS & GALILEO SuperSense® UBXG5000/UBXG0010 GPS Chipset
- High Sensitiv (Tracking Sensitivity: -160 dBm)
- AssistNow Offline Support (14 Days Almanac Data)
- DGPS, WAAS, EGNOS, and MSAS Support (EGNOS Default disable)
- Supports NMEA 0183 Protocol
- Internal patch antenna

Specifications

- Chipset: u-blox5 GPS & GALILEO SuperSense®
- Frequency: L1, 1575.42 MHz
- C/A Code: 1,023 MHz
- Channels: max 50 channels
- Position UP-DATE Rate: 4 Hz
- Sensitivity: -160 dBm Tracking
- Sensitivity: -160 dBm Satfixing
- Sensitivity: -145 dBm Cold Start
- Positioning accuracy 2.5 m CEP; 5.0 m SEP, or SBAS 2.0 m CEP; 3.0 m SEP
- Speed: 0.1 m/s
- Time: 1µs synchronized to GPS time
- Internal CMOS Multi-Purpose Flash 2^N Byte (13H = 19; 2^{19} = 512 KByte (SST39VF400A)

Date

- Basic setting: WGS-84

Time

- New acquisition: 1 sec. on average
- Hot start: 3.5 sec. on average
- Warm start: 25 sec. on average
- Cold start: 30 sec. on average

Dynamic Conditions

- Altitude of reception: Max. 18,000 Meter (60,000 Feet)
- Speed of reception: Max. 515 Meter /Second (1000 Knots)
- Acceleration: Max. 4g
- Vibration: Max. 20 m/s × 3

Power Supply

- Electrical connection: 5V DC
- Current draw: Approx. 80 mA

Interface Properties

- **USB 1.1**
- Baud rate: Auto
- Output protocol: NMEA 0183 GGA, GSA, GSV, RMC, VTG

NAVILOCK®

- **Serial RS232 Level**
- Baud rate: 38,400 bps
- Output protocol: NMEA 0183 GGA, GSA, GSV, RMC, VTG

- **TTL Level 3.3 Volt**
- Baud rate: 38,400 bps
- 0 to 0.6 Volt TTL Low Level
- 2.31 to 3.3 Volt TTL High Level
- 3.3 Volt +/- 2% TTL Level Tolerance
- Output protocol: NMEA 0183 GGA, GSA, GSV, RMC, VTG

Physical Properties

- Dimensions: 30 mm x 30 mm x 7.9 mm
- Cable length: none (optional connection cable 95843 required (10 cm at open cable ends))
- Operating temperature range: -40℃ to +85℃
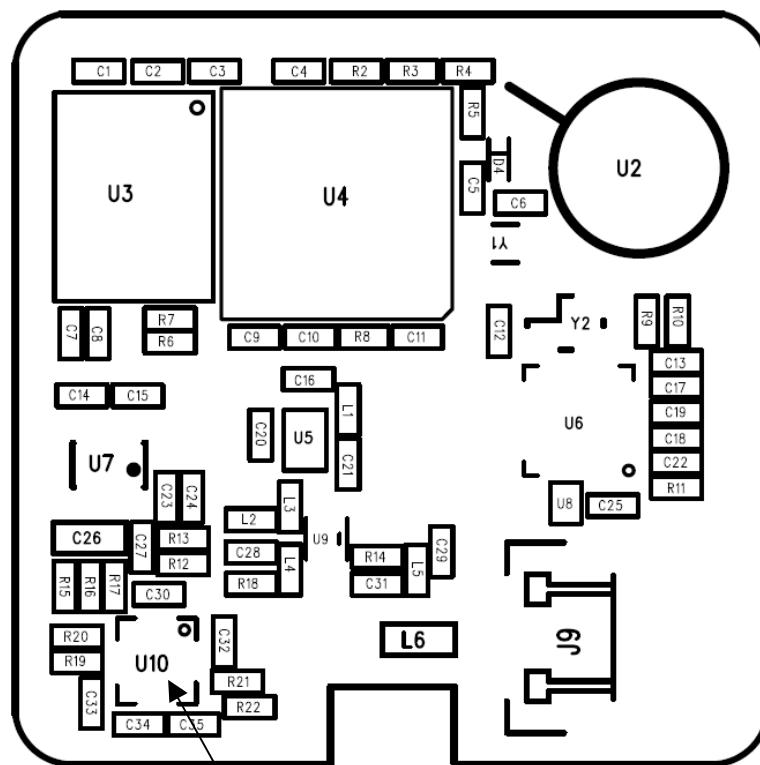
The USB/Serial Bridge "U10" is only populated on NL-550ERS.

Please refer to the ublox5 reference manual for protocol description.

It is available for download under:
http://www.navilock.de/produkte/gruppen/13/Boards_und_Module/60418_NL-550ERS_ublox5.html?show=datafile&type=7.

The NL-551EUSB requires a ublox5 USB driver which is available for download under:
http://www.navilock.de/produkte/gruppen/13/Boards_und_Module/60419_NL-551EUSB_ublox5.html?show=datafile&type=3.