# GPS Receiver BU-353W11

# User's Guide V1.0 (Windows)



BU-353W11 (USB Type, u-blox 8 GNSS)



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# SYSTEM REQUIRMENTS

The GlobalSat BU-353W11 GPS receiver require a Windows system with USB port, and Windows Location/GPS Sensor compatible Apps only. The 3<sup>rd</sup> party mapping/navigation App software may have its own system requirements, please check with software

vendor for details.

USB driver installation and access to the User's Guide. Can be downloaded from the Internet at : https://www.globalsat.com.tw



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## WELCOME

Thank you for purchasing a GlobalSat BU-353W11 GPS receiver! The GPS receivers allow for real-time street navigation by using your device for graphical plotting and positioning of your route. Simply load the ublox Gnss Sensor Device Driver, plug the GPS receiver into your equipment's USB port and install your own personal mapping Windows App to begin to view your position in real-time in relation to the surrounding streets in your travel area. You'll find that almost any Windows navigation/charting App will be compatible with your BU-353W11 GPS receiver.

## **1.** Introduction

Starting with Windows 7 Microsoft introduced a built-in platform for the support of sensor devices, including location sensors, such as GNSS positioning chips and modules. As part of this support, the Windows Sensor and Location Platform provides a standard way for u-blox to connect GNSS devices. At the same time, the platform gives developers a standardized API and device driver interface (DDI) to work with sensors and sensor data.

The u-blox Sensor Device Driver connects BU-353W11 GNSS receivers to the sensor and location API structure for Windows 7 onwards. It parses and converts u-blox GNSS messages into the standard sensor properties which can be accessed by the location and sensor APIs (see Figure 1).

#### 1.1 About Location Sensor Devices

The Windows Sensor and Location platform organizes sensors into categories, which represent broad classes of sensor devices, and types, which represent specific kinds of sensors. In Windows 7 onwards, a GNSS sensor is part of the Location category.

## 1.2 Sensor and Location Platform Architecture

The following diagram shows the architectural layers of the various components of the Sensor and Location platform, and the relationship between the u-blox components (hardware and software) and the applications:



#### Figure 1: Sensor and Location Platform Architecture

The following chapters will provide a description of the different blocks.



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## 1.3 Sensor API

The Sensor API enables developers to create sensor-based programs by using a set of COM interfaces. The API defines interfaces to perform common sensor programming tasks, like managing sensors by category, type or ID, managing sensor events, working with individual sensors and sensor collections, and working with sensor data. The Windows SDK includes header files, documentation, samples, and tools to help guide software developers to use sensors in Windows programs. More information can be found on the Microsoft MSDN homepage.

## **1.4** Location API

Built on the Sensor API, the Location API provides an easy way to retrieve data about geographic location while protecting user privacy. The Location API provides its functionality through a set of COM interfaces that represent objects. These objects can be used by programmers who understand how to use COM through programming or scripting languages. Scripting support gives easy access to location data for projects that run in the Local Computer zone, such as gadgets. The Windows SDK includes header files, documentation (including scripting reference documentation), samples, and tools to help guide Web and software developers on how to use location information in their programs.

> For more information see the Introduction to Microsoft's Sensor and Location Platform in Windows[1].

## 1.5 Location Settings

Windows 7 includes a control panel that lets computer administrators enable or disable sensors system-wide or for each user. Because some sensors can expose sensitive data, this user interface gives administrators control over whether all programs have access to each sensor for each user. Users can also view location sensor properties and change the sensor description that is displayed in the user interface.

The Control Panel also provides a Default Location page to enable users to provide their location. When no sensor is available, the platform will use the user-provided location. Users can provide civic address fields, which include the street address, city, state or province, and country or region.

➤ For more information see the Introduction to Microsoft's Sensor and Location Platform in Windows [1].

In Windows 8 and 8.1, the control panel for system-wide enabling/disabling of sensors is now called "Location Settings". Also, individual control of application access to location can be found in PC Settings->Privacy->Location.

In Windows 10, the "Location Settings" control panel has been removed, and all access control to location has been placed in Settings->Privacy->Location.

In Windows 11, the "Location Settings" control panel has been removed, and all access control to location has been placed in Settings->Privacy & security ->Location.



## 2. Components and Software

#### 2.1 Supported GNSS Receivers

The u-blox GNSS Sensor Device Driver supports the Globalsat GNSS receivers: BU-353W11 (Product ID = 0x01A8, Vendor ID = 0x1546)

#### 2.2 Supported Microsoft Windows Versions

The Sensor Device Driver is signed for the following version of Microsoft Windows:

- Windows 7 32 and 64-bit
- Windows 8.1 32 and 64-bit
- Windows 10 Anniversary update (version 1607, build 14393) 32 and 64-bit

The VCP Device Driver is signed for the following version of Microsoft Windows:

- Windows 7 32 and 64-bit
- Windows 8.1 32 and 64-bit
- Windows 10 32 and 64-bit



Attention Please note that the N versions of Microsoft Windows (like Windows 10 N) do not support the Sensor and Location platform. More information can be found here:

- Description of the Windows Media Feature Pack for Windows 7 N and for Windows 7 KN (KB968211)
- Description of the Windows Media Feature Pack for N and KN versions of all Windows 8 editions (KB2703761)
- Media Feature Pack for Windows 8.1 N and Windows 8.1 KN Editions: April 2014 (KB2929699)
- Media feature pack for Windows 10 N and Windows 10 KN editions (KB3010081)

#### 2.3 u-blox GNSS Sensor Device Driver

The u-blox USB Sensor Device Driver connects any u-blox GNSS positioning chips and modules to the Windows Sensor and Location Platform. The u-blox GNSS Sensor Device Driver conforms to Microsoft's Windows Driver Model. It is based on the Windows User Mode Driver Framework (UMDF) and supports the USB suspend mode and integrates with the radio manager present in Windows 8 and beyond. The driver also signed by Microsoft's Windows Hardware certification program for all OS's supporting the sensor platform.

The u-blox GNSS Sensor and VCP Device Driver parses NMEA messages from the receiver[2] to convert latest location information (e.g. latitude, longitude, altitude) to sensor data for the location and sensor platform. The supported sensor data and properties are listed in Appendix A.

#### 2.4 u-blox Virtual COM Port (VCP) Device Driver

In addition to the Sensor Device Driver, u-blox provides a Virtual COM Port (VCP) driver to help customers connecting or testing u-blox GNSS positioning chips and modules with legacy Windows applications that can connect only to a COM port. This solution is intended to help u-blox customers to smoothly migrate their legacy location applications to the modern Windows Location and Sensor Platform.

This driver is optional and is not required for the sensor device driver to operate correctly.

#### 2.5 u-center for Windows

The u-center GNSS evaluation software for automotive, mobile terminal and infrastructure applications provides a powerful tool for evaluation, performance analysis and configuration of u-blox GNSS receivers. Its unique flexibility makes the u-center GNSS evaluation software an invaluable tool for evaluation, analysis and configuration of u- blox GNSS receivers. u-blox GNSS receivers can be configured using the u-center evaluation software.

From version 5.08 on, u-center allows collection and monitoring of location and u-blox sensor properties and data (see Appendix A). Users can access this functionality by activating either the Location API or the bidirectional Sensor API functions (see <u>Appendix B</u>). u-center converts sensor data and properties into NMEA and UBX-similar messages to benefit from all u-center evaluation features, and therefore all u-blox aiding, reset (e.g. warm start),



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 and other proprietary functionalities.

The Sensor API initiates events whenever sensor data and property events are generated (like Location API functions). The bi-directional sensor API also features access to u-blox proprietary messages through the Sensor API property fields.

u-center software with location API capabilities is available free of charge from the u-blox website.

#### 2.6 Required Messages

Please note that the Sensor Device Driver will activate the following messages in the receiver. This is to ensure the receiver outputs the messages that are needed to extract the information required by the sensor platform.

The following messages will be enabled by the driver:

- NMEA-GST
- NMEA-GBS
- NMEA-GGA
- NMEA-GLL
- NMEA-GNS
- NMEA-GSA
- NMEA-GSV
- NMEA-RMC
- NMEA-GRS
- NMEA-VTG
- NMEA-ZDA



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## 3. Selection Guide for GNSS USB Driver

See the "Figure 2" will help you choose the correct USB driver for Windows for your application.



Figure 2: Selection Guide for GNSS USB Driver for Windows

#### Important notes

Only one driver can be installed on your computer.



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# 4. Driver Installation

- > To use the u-blox GNSS Sensor Device Driver, you have to:
- 1. Install the u-blox GNSS Sensor Device Driver (see Sensor Device Driver Installation with the Installer)
- 2. Connect the device (see Connecting the u-blox GNSS receiver)
- 3. Enable the sensor (see <u>Connecting the u-blox GNSS receiver</u>)
  - > To use the u-blox GNSS VCP Device Driver, you have to:

Install the u-blox GNSS VCP Device Driver (see VCP Device Driver Installation with the Installer)

> To use the u-blox GNSS Standard Device Driver, you have to:

Install " ubloxGnss\_usbcdc\_windows\_3264\_v1.2.0.8 " Download the latest version of the u-blox GNSS Standard Driver for Windows.

The following sections explain the installation procedure.

#### 4.1 Sensor Device Driver Installation with the Installer

This section explains the installation of the Sensor Device Driver with the provided installer.

- If not otherwise noted, the screen shots are taken from a Windows 10 installation.
- 1. Download the latest version of the u-blox GNSS Sensor Device Driver installer
- 2. Double-click on the downloaded file to start the installation.
- 3. On the pop-up window, select the language, and then accept the License Agreement.



Figure 3: Language selection



	au-blox GNSS Sensor Devi	ce Driver for Windows Setup			X
		Welcome to u-blox	<b>GNSS Se</b>	nsor	
		Device Driver for W	indows Se	etup	
		Setup will guide you through th Sensor Device Driver for Windo	e installation of u ws.	-blox GNSS	
		It is recommended that you do before starting Setup. This will relevant system files without ha computer. Click Next to continue.	se all other applic make it possible t aving to reboot y	ations o update our	
			Nexts	Cancel	
		L	Next >	Cancel	
Figure 4: Welcome mess	age				
8	🕐 u-blox GNSS Sensor Devi	ce Driver for Windows Setup	_		×
		License Agreement Please review the license terms be Sensor Device Driver for Windows	fore installing u-b	blox GNSS	
	iocate, communicate, accelerate				
	Press Page Down to see the	e rest of the agreement.			_
	U-BLOX USB DRIVERS SOFT	TWARE LICENSE AGREEMENT		^	
	This Software License Agre individual or a single entity) SLA, which includes comput materials, "online" or electrr ("Software"). An amendmen YOU AGREE TO BE BOUND OTHERWISE USING THE SO OR USE THE SOFTWARE, Y "SOFTWARE", E.G. BY COM	ement ("SLA") is a legal agreement b ) and u-blox for the u-blox software ter software and may include associa onic documentation, and Internet-ba nt or addendum to this SLA may acc BY THE TERMS OF THIS SLA BY INST OFTWARE. IF YOU DO NOT AGREE, I OU MAY CONTINUE TO USE U-BLOX IMUNICATING VIA UART, DDC OR SI	etween you (eith that accompanies ted media, printe ased services ompany the Softw 'ALLING, COPYIN DO NOT INSTALL, PRODUCTS WITI PI INTERFACES.	her an this d ware. IG, OR , COPY, H THE V	,
	If you accept the terms of t agreement to install u-blox (	he agreement, click I Agree to conti GNSS Sensor Device Driver for Windo	nue. You must ac ows.	cept the	

Figure 5: License agreement

**4.** On the "Choose Components" window, as shown below, make sure the GNSS Sensor Device Driver is selected as shown in Figure 6. Then click on the "Install" button.

< Back

I Agree

Cancel



Chlor	Choose Components		
locate, communicate, accelerate	Choose which features of u-blox GNSS Sensor Device Driver for Windows you want to install.		
Check the components yo install. Click Install to star	ou want to install and uncheck the co t the installation.	mponents you don't want to	
Select components to insi	tall: GNSS Sensor Device Driv	Description Position your mouse over a component to see its description,	
Space required: 7.2MB	< >		

#### Figure 6: Driver selection

**5.** Click on "Next" to start the installation of the Sensor Device Driver.

Device Driver Installation Wizard	d
	Welcome to the Device Driver Installation Wizard! This wizard helps you install the software drivers that some computers devices need in order to work.
	< Back Next > Cancel

Figure 7: Installation of Sensor Device Driver start

After a successful installation, the following window will be shown. Click on "Finish" to complete the USB Sensor Device Driver installation.



Device Driver Installation Wizar	d	
	Completing the De Installation Wizard	wice Driver 1
	The drivers were successfully in	stalled on this computer.
	Driver Name ✓ u-blox (WUDFRd) Senso	Status Device Updated
	< Back	Finish Cancel

Figure 8: Installation of Sensor Device Driver completed

6. The installation of the Sensor Device Driver is now finished and you can click on "Finish" to quit the installer.

😲 u-blox GNSS Sensor Device I	Driver for Windows Setup — 🗌 🛛 🕹
	Completing u-blox GNSS Sensor Device Driver for Windows Setup u-blox GNSS Sensor Device Driver for Windows has been installed on your computer. Click Finish to dose Setup.
	u-blox Website
	< Back Finish Cancel

Figure 9: Installation completed

#### 4.2 Virtual COM Port Device Driver Installation with the Installer (Optional)

• The Sensor Device Driver has to be installed in order to get the Virtual COM Port Device Driver

to work. This section explains the installation of the VCP Device Driver with the provided installer.

- 1. Download the latest version of the installer. Follow the steps below to install it.
- 2. Double-click on the downloaded file to start the installation.
- 3. On the pop-up window, select the language, and then accept the License Agreement.



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Installer La	anguage	×
•	Please select a language.	
	English / English	~
	OK	Cancel

#### Figure 10: Language selection





Ublox	License Agreement Please review the license terms before installing u-blox GNS	s vo
locate, communicate, accelerate	Device Driver for Windows.	
Press Page Down to see	the rest of the agreement.	
U-BLOX USB DRIVERS S	OFTWARE LICENSE AGREEMENT	~
This Software License A	groomant ("CLA") is a logal agroomant between you (either an	
individual or a single ent	ity) and u-blox for the u-blox software that accompanies this	
SLA, which includes com	puter software and may include associated media, printed	
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SLA, which includes com materials, "online" or ele ("Software"). An amend YOU AGREE TO BE BOUI OTHERWISE USING THE OR USE THE SOFTWARE "SOFTWARE", E.G. BY C If you accept the terms ( agreement to install u-blo	puter software and may include associated media, printed ctronic documentation, and Internet-based services ment or addendum to this SLA may accompany the Software. NO BY THE TERMS OF THIS SLA BY INSTALLING, COPYING, OR SOFTWARE. IF YOU DO NOT AGREE, DO NOT INSTALL, COPY, YOU MAY CONTINUE TO USE U-BLOX PRODUCTS WITH THE COMMUNICATING VIA UART, DDC OR SPI INTERFACES. of the agreement, dick I Agree to continue. You must accept the ox GNSS VCP Device Driver for Windows.	~
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Figure 12: License agreement

**4.** On the "Choose Components" window, as shown below, make sure the VCP Device Driver is selected as shown in Figure 13. Then click on the "Install" button.



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🕦 u-blox GNSS VCP Device	u-blox GNSS VCP Device Driver for Windows Setup $ \sim$ X			
	Choose Components Choose which features of u-blox Windows you want to install.	GNSS VCP Device	Driver fo	r
Check the components you install. Click Install to start	want to install and uncheck the co the installation.	mponents you dor	l't want to	,
Select components to insta	II: Virtual COM Port Driver	Description Position your over a comp see its descr	r mouse onent to iption,	
Space required: 2.0MB				
	< <u>B</u> ack	Install	Cano	el

#### Figure 13: Driver selection

5. Click on "Next" to start the installation of the VCP Device Driver.

Device Driver Installation Wizar	d
	Welcome to the Device Driver Installation Wizard! This wizard helps you install the software drivers that some computers devices need in order to work.
	To continue, click Next.
	< Back Next > Cancel

Figure 14: Installation of VCP Device Driver start

After a successful installation, the following window will be shown. Click on "Finish" to complete the Virtual COM Port installation.



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Device Driver Installation Wizard	d	
	Completing the De Installation Wizard	vice Driver 1
	The drivers were successfully ins	stalled on this computer.
	Driver Name Vu-blox AG (ubloxVcp) Po	Status Device Updated
	< Back	Finish Cancel

Figure 15: Installation of Virtual COM Port completed

6. The installation of the VCP Device Driver is now finished and you can click on "Finish" to quit the installer.

🕐 u-blox GNSS VCP Device Dri	ver for Windows Setup			×
	Completing u-blox Device Driver for W	GNSS VCI Vindows Se	P etup	
	u-blox GNSS VCP Device Driver installed on your computer.	f <mark>or Windows</mark> has	been	
	Click Finish to dose Setup.			
	u-blox Website			
	< <u>B</u> ack	Einish	Cance	el

Figure 16: Installation completed

## 4.3 Connecting the u-blox GNSS receiver

Once the Sensor Device Driver has been installed (see <u>Sensor Device Driver Installation with the Installer</u>), a u-blox GNSS receiver can be connected to any USB port.

1. When the device is connected for the first time to any port, the driver is installed. The following window will appear.



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Device Setup		×
Installing u-blox	GNSS receiver	
	Please wait while Setup installs necessary files on your system. This may take several minutes.	
	Clos	e

Figure 17: Device Setup

2. The installed drivers appear in the Device Manager as in the figure below.



Figure 18: Device Manager



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- **3.** The access to the sensor data (like position) needs to be granted/enabled in the Control Panel of Windows, depending on the used Windows version.
  - In Windows 7 under "Location and Other Sensors":

Change user settings Sensors can detect information about your computer's current location	
Once a sensor is enabled all programs and users can access it Sensors	, surroundings, and more.
View location activity installed on your computer. To enable a sensor, select the check box ne sensor for more details.	ext to it. You can also click th
How is my privacy affected?	
Sensor	Enabled
u-blox 5 GPS and GALILEO Location Sensor	V

Figure 19: Location Sensor Dialog Windows 7

• In Windows 8/8.1 under "Location Settings":

	Location Settings – 🗖 🗙
€ ∋ ▼ ↑ 🖬 ► Control P	anel ► Hardware and Sound ► Location Settings  v 🖒 Search Control Panel $ ho$
Control Panel Home	Change location settings
	When signed in as administrator, you can let users control how apps use their location and help Microsoft improve its location services. Privacy statement
	✓ Turn on the Windows Location platform Let users choose their own location settings.
	✓ Help improve Microsoft location services Let Windows periodically send GPS and other location information to Microsoft when you use location-aware applications. We won't use this information to identify or contact you.
	Papely Cancel

Figure 20: Location Sensor Dialog Windows 8/8.1



• In Windows 10 under "Settings->Privacy->Location":



Figure 21: Location Sensor Dialog Windows 10

• In Windows 11 under "Settings->Privacy & security->Location":

#### Privacy & security > Location

Find a setting	٩	improve the accuracy of its location services. Some desktop apps might not appear of affected by these settings. Learn more about location	on this page or be
System Bluetooth & devices		Location services Location will be available to Windows and anyone using this device when this is on	On <b>O</b>
<ul> <li>Network &amp; internet</li> <li>Personalization</li> </ul>		Let apps access your location Choose which apps can access your precise location	On 🧰 ^
Apps		O Camera	Off
<ul> <li>Accounts</li> <li>Time &amp; language</li> </ul>		Desktop App Web Viewer	Off
Gaming		Mail and Calendar Last accessed 2023/1/18   上午 11:28:07	On 💽
Accessibility     Privacy & security		Maps Last accessed 2023/3/24   上午 09:53:51	On 💽
Windows Update		Microsoft Teams Last accessed 2023/3/21   下午 02:13:36	On 💽
		News	Off
		Operator messages	Off
		5 Settings	On 🦳

Figure 22: Location Sensor Dialog Windows 11



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4. In order to see if the device works through the installed sensor, Microsoft Maps can be used.



Figure 23: Maps with Location service

The Windows 10 taskbar shows an icon when an application requests the location from the platform:



Figure 24: Location Request Icon



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# 4.4 Silent Installation

The installers support silent installation, allowing an installation to occur in the background with no need for the user interaction during installation.

To do a silent installation, run the following from the command line

ubloxGnss\_sensorDeviceDriver\_windows\_3264\_v2.31.exe /S or

ubloxGnss\_vcpDeviceDriver\_windows\_3264\_v2.30.exe /S

Please note that the command parameter '/S' is case-sensitive.

Drivers are installed after a short while, after which (assuming the Sensor Device Driver installer was run), a u-blox GNSS device can be connected (see <u>Connecting the u-blox GNSS receiver</u>).



Figure 25: Silent Installation



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# 4.5 Uninstalling the Driver

1. On Apps & Features, click on the appropriate Windows Driver Package to uninstall as shown below.

र्ट्छे SYSTEM			Find a setting	Q
		містозоті согрога	uon	13/10/2013
Display	67	Phone Companior	1	40.0 KB
Notifications & actions		Microsoft Corpora	tion	19/10/2015
Apps & features	n	3D Builder Microsoft Corpora	tion	36.0 KB 19/10/2015
Multitasking	8	Get Skype Skype		32.0 KB 19/10/2015
Tablet mode	I	Calculator Microsoft Corpora	tion	24.0 KB 26/10/2015
Battery saver		Notepad++		Unavailable
Power & sleep		Notepad++ Team		27/10/2015
Storage		PicPick NTeWORKS		Unavailable 27/10/2015
Offline maps	×.	Windows Driver Pa u-blox	ackage - u-blox (WUDFRd	Unavailable 27/10/2015
Default apps	<b>*</b>	Windows Driver Pa u-blox AG	ackage - u-blox AG (ublox	Unavailable 27/10/2015
About				

Figure 26: Uninstall Driver

2. The driver is now removed.



## 5. Supported Sensor Data Properties

#### 5.1 Read Only Properties

```
SENSOR_PROPERTY_CONNECTION_TYPE
SENSOR_PROPERTY_CURRENT_REPORT_INTER
VAL SENSOR_PROPERTY_DESCRIPTION
SENSOR_PROPERTY_FRIENDLY_NAME
SENSOR PROPERTY MANUFACTURER
SENSOR_PROPERTY_MIN_REPORT_INTERVAL
SENSOR_PROPERTY_MODEL
SENSOR_PROPERTY_PERSISTENT_UNIQUE_ID
SENSOR_PROPERTY_SERIAL_NUMBER
SENSOR_PROPERTY_STATE
SENSOR_PROPERTY_TYPE
SENSOR_DATA_TYPE_TIMESTAMP
SENSOR_DATA_TYPE_ALTITUDE_ELLIPSOID_METERS
SENSOR_DATA_TYPE_ALTITUDE_SEALEVEL_METERS
SENSOR_DATA_TYPE_ERROR_RADIUS_METERS
SENSOR DATA TYPE FIX QUALITY
SENSOR_DATA_TYPE_FIX_TYPE
SENSOR_DATA_TYPE_HORIZONAL_DILUTION_OF_PRECISION
SENSOR_DATA_TYPE_LATITUDE_DEGREES
SENSOR_DATA_TYPE_LONGITUDE_DEGREES
SENSOR_DATA_TYPE_POSITION_DILUTION_OF_PRECISION
SENSOR_DATA_TYPE_SATELLITES_IN_VIEW
SENSOR_DATA_TYPE_SATELLITES_IN_VIEW_AZIMUTH
SENSOR_DATA_TYPE_SATELLITES_IN_VIEW_ELEVATION
SENSOR DATA TYPE SATELLITES IN VIEW PRNS
SENSOR_DATA_TYPE_SATELLITES_IN_VIEW_STN_RATIO
SENSOR_DATA_TYPE_SATELLITES_USED_COUNT
SENSOR_DATA_TYPE_SATELLITES_USED_PRNS
SENSOR_DATA_TYPE_SPEED_KNOTS
SENSOR_DATA_TYPE_TRUE_HEADING_DEGREES
SENSOR_DATA_TYPE_VERTICAL_DILUTION_OF_PRECISION
SENSOR_DATA_TYPE_ALTITUDE_ELLIPSOID_ERROR_METERS
SENSOR_DATA_TYPE_ALTITUDE_SEALEVEL_ERROR_METERS
SENSOR_DATA_TYPE_GEOIDAL_SEPARATION
SENSOR_DATA_TYPE_GPS_OPERATION_MODE
SENSOR_DATA_TYPE_GPS_SELECTION_MODE
SENSOR_DATA_TYPE_GPS_STATUS
```

#### 5.2 Read/Write Properties

SENSOR\_PROPERTY\_CURRENT\_REPORT\_INTERVAL SENSOR\_PROPERTY\_LOCATION\_DESIRED\_A CCURACY



## **6.u-center for Windows**

Selection of the Sensor API functionality is shown in the figure below. When the u-blox sensor is enabled, the Sensor API should blink green every time sensor location data events are generated.



#### Figure 27: u-center using Sensor API

You can use the U-center as a test tool. Please execute the accessory CD-ROM "auto.exe". Click the "u-center User Guide" button on the Home screen .The content will teach you how to use it.

## 7. INITIALIZING YOUR GPS RECEIVER

Before using your GPS receiver for navigation (especially for the first time), the receiver must obtain a local GPS fix (coordinates) of the current position. To do this, take your laptop (with your USB driver and the mapping software loaded and configured) to an open area that has a clear view to the sky (such as a park or empty field). Start your software (or the included GPS Info utility program) and wait for initialization of the GPS to complete. This may take a few minutes depending on various factors such as the distance of the current coordinates from the last time the GPS receiver was activated, GPS signal strength and surrounding terrain (tall trees and buildings can block the satellite signals). Once the RAW GPS data is displayed onto the screen, if applicable for your software, a fix has been initialized (red LED on the GPS will also start to flash). In some cases initialization can take up to several minutes depending on the conditions mentioned above before complete GPS data will be displayed on the screen.

Coordinates scrolling with zero's means that the port connection is complete, but the satellite data is not being received yet (possibly still initializing or in a bad area for satellite reception).



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# 8. SAFETY AND LEGAL NOTICES

## Please read this section carefully before using the GPS receiver

Globalsat WorldCom Corporation / USGlobalsat, Inc. will not accept any responsibility whatsoever for accidents resulting from failure to observe common sense precautions. Your personal judgment, traffic regulations, and common sense must always take precedence over any directions produced by GPS receiver or the mapping software

#### WARNING: Make sure that the GPS receiver is secure and does not interfere with driving visibility and safety.

It is your responsibility as the vehicle operator to securely place the GPS unit and antenna so that they will not interfere with driving and prevent operations of any safety device (such as the Airbag) in your vehicle. Do not mount the devices in a place where the driver or passengers may receive injury during vehicle operation or collision. For your safety, take care to route all cables away from shifters, pedals, accessory controls and mechanisms.

## WARNING: Drive safely and use common sense.

It is your responsibility as the vehicle operator to drive safely, observe all traffic rules and above all use your own personal judgment while driving. If you feel that a route suggested by the navigation software instructs you to perform an unsafe or illegal maneuver, places you in an unsafe situation, or routes you into an area which you consider unsafe, do not follow the instructions.

## WARNING: Keep your eyes on the road.

It is your responsibility as the vehicle operator to keep your eyes on the road and be an alert driver at all times, especially when the vehicle is moving. The vehicle's operator should not be distracted by the navigation equipment or software. Should there be a distraction with the ability to drive responsibly, please turn off the device. Should you want to look at the display for a prolonged time, park the car safely, while following all traffic regulations before looking at the display.

#### WARNING: Do not remove covers or open housings, there are no user serviceable parts inside. Refer servicing to qualified personnel only.



# 9. SPECIFICATIONS

# BII-353W11

GPS Electrical Chara	acteristics	(Re	ceiver)		
Parameter		Špe	cification		
GPS Module		u-blo	ox M8M GNSS hi	gh performan	се
Receiver type Channels		GPS 72-	S/QZSS L1C/A, G	ONASS L10	F, SBAS L1C/A, Galileo∗ı
Operational Limits*3					
Dynamics		$\leq$ 2	1 a		
Altitude			00 meters		
Velocity		500	meters/sec.		
Accuracy					
Velocity accuracy*4 Heading accuracy*4		0.05 0.3	o meters/sec. degrees		
GNSS		(	GPS & GLONASS	GPS	GLONASS
Horizontal position accuracy *5		2	2.5 m	2.5 m	4.0 m
Max navigation	ROM		10 Hz	18 Hz	18 Hz
Update rate	FLASH	ę	5HZ	10 Hz	10 Hz
Time-To-First-Fix *6	Cold start	2	26 s	30 s	31 s
	Hot start		1 s	1 s	1 s
	Aided starts *	<sup>•</sup> 7	3 s	3 s	3 s
Sensitivity	Tracking & Navigation	-	-164 dBm	–164 dBm	-163 dBm
	Reacquisitior	n -	–160 dBm	–159 dBm	-156 dBm
	Cold start	-	–148 dBm	–147 dBm	-145 dBm
	Hot start	-	–157 dBm	–156 dBm	-155 dBm
Protocol			Тур	Э	
NMEA 0183, version	2.1、2.3、	4.0、	4.1 Inpu	ut/output ,ASC	
(The default NMEA ve	ersion is 4.0	)			
UBX			Inp	ut/output ,bina	ary,u-blox proprietary
RTCM 2.3 *8			Inp	ut, messages	1,2,3,9
Temperature		40			
Operating		-40	C~85 C		
Storage		-40	°C <b>~85</b> °C		
Humidity		Up	to 95% non-cond	lensing	
Power		A -			
voitage		4.5	$0V \sim 5.5V$		
Current		401	na typical		



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Physical Characteristics	
Dimension	
USB Cable Length	

- \*1 The augmentation systems: SBAS and QZSS can be enabled only if GPS operation is configured. Galileo is not enabled as the default configuration .
- \*2 The EVA M8M series modules comes in two variants: EVA-M8M-0 defaults to GPS/QZSS/GLONASS whereas EVA-M8M-1 defaults to GPS/QZSS/BeiDou.
- \*3 Assuming Airborne < 4 g platform
- \*4 50% @ 30m/s
- \*5 CEP, 50%, 24 hour static, -130dBm, >6 SVs
- \*6 All satellites at -130 dBm, except Galileo at -127 dBm
- \*7 Dependent on aiding data connection speed and latency
- \*8 RTCM correction cannot be used together with SBAS.
- \*9 Rates with SBAS and QZSS enabled for > 98% fix report rate under typical conditions

## **10.** Pin description

#### BU-353W11 USB A Type

PIN Number	Name	Туре	Description
1	Vin	Р	Main power supply to the GPS receiver.
2,3	USB IF		USB IF to transmits channel for outputting navigation and measurement data to user's navigation software or user written software.
4	GND	Р	Ground.

Indicator	Color	Description
LED	RED	LED OFF: Receiver switch off LED ON: Receiver switch on, No fixed, Signal searching LED Flashing: Position Fixed

## **11. Related Documents**

Reference	Document name
1	Introduction to the Sensor and Location Platform in Windows
2	u-blox M8 Receiver Description and Protocol Specification, Doc. No UBX-13003221
3	u-blox-GNSS-Sensor-and-VCP-Device-Driver_UserGuide_(UBX-15022397)
4	USBDriverWindowsSelectionGuide_(UBX-15022403)
5	u-blox M8 Receiver Description and Protocol Specification, Doc. No UBX-13003221

For regular updates to u-blox documentation and to receive product change notifications please register on the u-blox website.



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