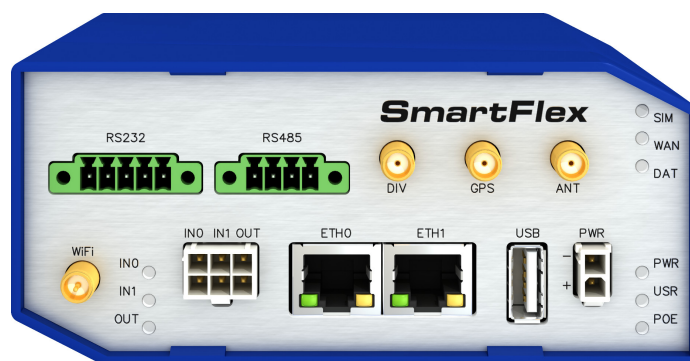


# User Module

# GPS

## APPLICATION NOTE



# ADVANTECH

## Used symbols



*Danger* – Information regarding user safety or potential damage to the router.



*Attention* – Problems that may arise in specific situations.



*Information or notice* – Useful tips or information of special interest.



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# 1. Description of user module

User module *GPS* (Global Positioning System) allows your v2 or v3 router to provide location and time information in all weather, anywhere on or near the Earth, where there is an unobstructed line of sight to four or more GPS satellites.



This module is not contained in the standard router firmware. Uploading of this user module is described in the Configuration manual (see [1, 2, 3, 4]).

This user module is compatible with all the routers equipped with one of the following GSM modules:

- Gobi 3000,
- SW MC8705,
- SW MC7710,
- SW MC7304,
- PLS8,
- PHS8,
- Quectel EC25.

Type of the GSM module installed in the router can be found in the *Mobile WAN* status in the *Mobile Network Information* part.

For the SW MC8705 module it is necessary to update the firmware of this module to version 3.5.2.1. Update must be done externally, which means that it is necessary to take out the module from the router and update firmware via corresponding tool. If firmware version is incompatible, warning in log will be displayed.



**Warning! For routers with two antennas is not functional diversity reception when using GPS!** In case that router has three antennas, GPS and diversity reception can be used simultaneously.

## 2. Web interface

The left part of the web interface contains the menu with pages for monitoring (*Status*), *Configuration* and *Customization* of the router. *Customization* block contains only the *Return* item, which switches the GPS web interface to the interface of the router.

### 2.1 Location

If the device has an unobstructed line of sight to four or more GPS satellites, there are available detailed information about accurate location of the device (router).

Item	Description
Current time (UTC)	Current time in hhmmss.0 format (it's patterned on Coordinated Universal Time)
Latitude	Geographic coordinate that specifies the north-south position (in ddmm.mmmmmmmG format where <i>d</i> stands for degrees, <i>m</i> for minutes and <i>G</i> for geographical direction [N, S])
Longitude	Geographic coordinate that specifies the east-west position (in dddmm.mmmmmmmG format where <i>d</i> stands for degrees, <i>m</i> for minutes and <i>G</i> for geographical direction [E, W])
Altitude	Specifies the height above sea level of a location (in meters)
Satellites in view	Number of satellites that are directly visible for the router
Fix status	Indicates the availability of data and its quality. If no data is available, the value of this item is 0. A nonzero value indicates the presence of data.
Speed over ground	Current speed of the router relative to Earth's surface (in knots)
Course over ground	The actual course the router is moving along at the moment relative to Earth's surface (in degrees)
Date	Current date in ddmmyy format

Table 1: Location

There is a clickable item called *Show on map* at the bottom part of the window that displays an exact location of the Advantech router on the map server of Google company (Google Maps) in a new tab.



Figure 1: GPS Status – Location

## 2.2 System Log

In case of any problems it is possible to view the system log by pressing the *System Log* menu item. There are displayed detailed reports from individual applications running in the router. Using the *Save* button it is possible to save the system log to the computer.

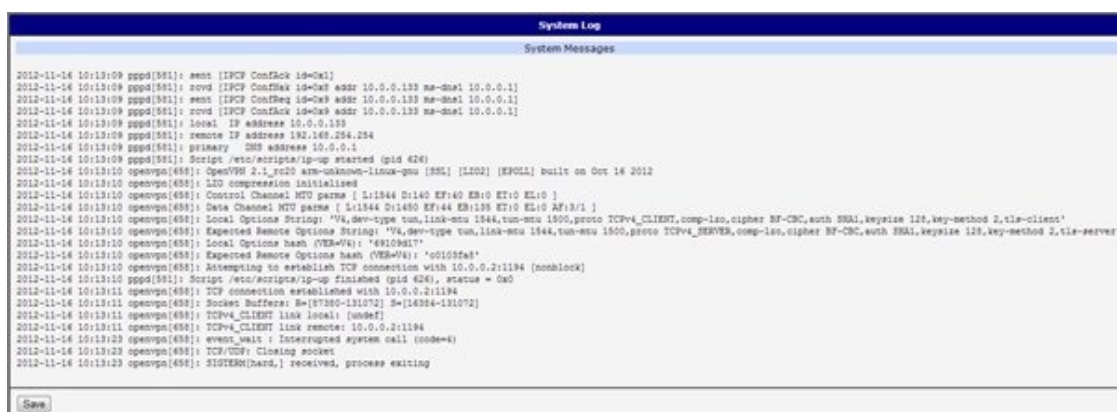


Figure 2: System Log



The System Log default size is 1000 lines. After completion of the 1000 lines it will be created a new file for storing system log. After completion of the 1000 lines in the second file, the first file will be deleted and then will be created a new one.



## 2.3 Global

After clicking the *Global* item in the configuration part of the menu, you can find a form that allows you to activate the GPS service by checking *Enable GPS service* item. In the next part of this form is an availability to choose the port that will be used for sending data from the GPS. You can select from the following options: *expansion port 1*, *expansion port 2*, *USB port* and pseudoterminal */dev/tty5*. Expansion port 1 and expansion port 2 are optional ports of the router. Data are stored in *raw NMEA* format.

The configuration form also allows router to forward raw NMEA output to a remote socket. In this case it is necessary to check the box in front of the "configuration line" and define the following information:

Item	Description
IP Address	IP address to which the raw NMEA output will be forwarded
Protocol	The protocol by which raw NMEA output will be sent
Port	Port on which the communication will be underway
Period	Forwarding period

Table 2: Forwarding data to a remote socket

At the bottom of the form, it can be enabled the automatic reset of GPS. It is performed every time when location data are not available within set number of minutes.

Figure 3: Global Configuration

## 2.4 SNMP

The SNMP form can be displayed by selecting the *SNMP* item in the configuration part of the menu. If the *Enable reporting to supervisory system* option is checked, the router automatically sends messages to supervisory system at the specified period.

Item	Description
IP Address	Destination IP address
Period	Interval of sending messages to supervisory system (in seconds)

Table 3: SNMP Configuration

Figure 4: SNMP Configuration

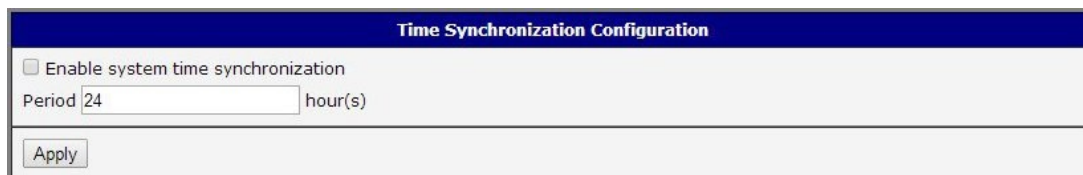
For sending GPS messages is used the following range of OIDs. The importance of individual items is described in table [2.1 Location](#) on page 2.

OID	Designation
.1.3.6.1.4.1.30140.7.1.0	gpsTimeUTC
.1.3.6.1.4.1.30140.7.2.0	gpsLatitude
.1.3.6.1.4.1.30140.7.3.0	gpsLongitude
.1.3.6.1.4.1.30140.7.4.0	gpsAltitude
.1.3.6.1.4.1.30140.7.5.0	gpsSatellites
.1.3.6.1.4.1.30140.7.6.0	gpsFixStatus
.1.3.6.1.4.1.30140.7.7.0	gpsSpeedOverGround
.1.3.6.1.4.1.30140.7.8.0	gpsCourseOverGround
.1.3.6.1.4.1.30140.7.9.0	gpsDate

Table 4: GPS OID

## 2.5 Time synchronization

Form for synchronization of the system time can be invoked by pressing *Time Synchronization* item in the configuration part of the web interface menu. *Enable system time synchronization* check box is used to activate automatic time synchronization. Number of hours after which the synchronization is performed must be defined in the box below.



The screenshot shows a web interface titled "Time Synchronization Configuration". It contains a checkbox labeled "Enable system time synchronization" which is currently unchecked. Below the checkbox is a text input field labeled "Period" with the value "24" entered, followed by the text "hour(s)". At the bottom of the form is an "Apply" button.

Figure 5: Time synchronization

### 3. Recommended literature

- [1] Advantech B+B SmartWorx: **v2 Routers Configuration Manual** (MAN-0021-EN)
- [2] Advantech B+B SmartWorx: **SmartFlex Configuration Manual** (MAN-0023-EN)
- [3] Advantech B+B SmartWorx: **SmartMotion Configuration Manual** (MAN-0024-EN)
- [4] Advantech B+B SmartWorx: **SmartStart Configuration Manual** (MAN-0022-EN)
- [5] Advantech B+B SmartWorx: **ICR-3200 Configuration Manual** (MAN-0042-EN)



Product related documents can be obtained on *Engineering Portal* at <https://ep.advantech-bb.cz/> address.