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RUT956 GPS

The information in this page is updated in accordance with firmware version **RUT9M_R_00.07.07**.

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Summary

The **Global Positioning System** (**GPS**) is a space-based radionavigation system. This page is an overview of the GPS service in RUT956 devices.

General

The **General** is used to enable the GPS service and the support for different types satellites. Once you turn on GPS, you can check the Map page in order to see if the device has obtained a GPS fix. It is very important to attach the GPS antenna on the device and place it outside (not inside of a building). The device will not be likely to obtain a GPS fix otherwise.

The figure below is an example of the General page and the table below provides information on the fields contained in that page:

Field	Value	Description
Enabled	off | on; default: **off**	Turns the GPS service on or off.

*Changing these options requires a modem reboot. Therefore, if you make changes to these options and save them, the device will lose cellular connectivity for about 30 seconds.

Map

The **Map** page displays the device's current coordinates and position on the map. To see the device's location on the map, make sure to attach the GPS antenna on the device and enable GPS in the General page.

The figure below is an example of the Map page:

NMEA

The **NMEA** page is used to configure settings related to NMEA sentence collecting and forwarding.

NMEA forwarding

The **NMEA forwarding** section is used to configure and enable NMEA forwarding. The figure below is an example of the NMEA forwarding section and the table below provides information on the fields contained in that section:

Field	Value	Description
Enabled	off | on; default: **off**	Turns NMEA forwarding on or off.
Hostname	ip | host; default: **none**	IP address or hostname of the server to which NMEA data will be forwarded.
Protocol	TCP | UDP; default: **TCP**	Protocol that will be used to send NMEA data.
Port	integer [0..65535]; default: **8500**	Port number off the server to which NMEA data will be forwarded.
Contain connection	off | on; default: **off**	Contains active session with the remote server if turned on.
Select prefix	Custom | None |Serial | Mac address | IMEI; default: **None**	Prefix is added to the NMEA sentence before it is transmitted.

NMEA forwarding cache

The device **caches NMEA forwarding** information if NMEA forwarding is enabled. This section is used to select the memory type where the cache will be stored and the maximum amount of data that will be saved:

Field	Value	Description
Save cache in	RAM Memory | FLASH Memory; default: **RAM Memory**	Selects which type of memory will be used for storing NMEA forwarding cache.
Maximum sentences	integer; default: **5000**	Maximum amount of NMEA sentences that will be saved in the cache before older entries are deleted and replaced by new ones.
File	filepath; default: **none**	Location of the file where NMEA forwarding cache information will be stored. This field becomes visible only when the selected memory type is "flash".

NMEA collecting

The **NMEA collecting** section is used to enable NMEA sentence gathering and storing. The figure below is an example of the NMEA collecting section and the table below provides information on the fields contained in that section:

Field	Value	Description
Enabled	off | on; default: **off**	Turns NMEA sentence collecting on or off.
File	filepath; default: **none**	Location of the file where NMEA sentences will be stored. This field becomes visible only when NMEA collecting is enabled.

NMEA sentence settings

The **NMEA sentence settings** section provides the possibility to configure which NMEA sentences will be forwarded or collected and at what frequency. The figure below is an example of the NMEA sentence settings section and the table below provides information on the fields contained in that section:

Field	Value	Description
Forwarding enabled	off | on; default: **off**	Enables forwarding for the adjacent NMEA sentence.
Forwarding interval	positive integer; default: **5**	NMEA sentence forwarding frequency in seconds.
Collecting enabled	off | on; default: **off**	Enables collecting for the adjacent NMEA sentence.
Collecting interval	positive integer; default: **5**	NMEA sentence collecting frequency in seconds.

NMEA sentence reference table:

NMEA sentence name	Description
GPGSV	Number of GPS satellites in view.
GPGGA	GPS fix data.
GPVTG	GPS track made good and speed relative to the ground.
GPRMC	Recommended minimum specific GPS/Transit data.

GPGSA	GPS DOP and active satellites.
GNGSA	GLONASS DOP and active satellites.
GLGSV	Number of GLONASS satellites in view.
GNGNS	GNSS position fix from more than one constellation (e.g., GPS + GLONASS).
GAGSV	Number of Galileo satellites in view.
GARMC	Recomended minimum specific for Galileo data.
GAGGA	Galileo fix data.
GAGSA	Galileo DOP and active satellites.
GAVTG	Galileo track made good and speed information relative to the ground.
PQGSV	Detailed satellite data (used in BeiDou and QZSS (Quectel Quirk) sentences).
PQGSA	Overall satellite data (used in BeiDou and QZSS (Quectel Quirk) sentences).
GBGSV	Detailed satellite data (used in BeiDou sentences).
GBGSA	BeiDou DOP and active satellites.
GQGSV	Detailed QZSS satellite data (QZSS regional GPS augmentation system (Japan)).
GQGSA	QZSS DOP and active satellites (QZSS regional GPS augmentation system (Japan)).

HTTPS

The **HTTPS** page can be used to configure data sending to an HTTP(S) server.

HTTPS/HTTP server settings

The HTTPS/HTTP Server Settings section is used to enable GPS data sending to an HTTP or HTTPS server.

Field	Value	Description
Enabled	off | on; default: **off**	Turns data sending to HTTP/HTTPS server on or off.
URL	url string; default: **none**	URL of the remote server (ex. example.com/xxxx).
Interval	integer; default: **none**	Interval on which collected NMEA sentences should be forwarded.

TAVL settings

The **TAVL settings** section is used to select which data will be sent to the TAVL server:

Field	Value	Description
Signal	off | on; default: **off**	Includes GSM signal strength information in the GPS data sent to server.
Din1	off | on; default: **off**	Includes Din1 status information in the GPS data sent to server.
Din2	off | on; default: **off**	Includes Din2 status information in the GPS data sent to server.
Din2	off | on; default: **off**	Includes Din2 status information in the GPS data sent to server.
Iio	off | on; default: **off**	Includes Iio status information in the GPS data sent to server.
Adc0	off | on; default: **off**	Includes Adc0 status information in the GPS data sent to server.
Acl0	Current | Percent; off | on; default: **Current; off**	Includes Acl0 Current/Percent information in the GPS data sent to server.

AVL

The **AVL** page is used to set up GPS data sending to an AVL server.

AVL server settings

The **AVL server settings** section is used to configure the main parameters of data sending to an AVL server. The figure below is an example of the AVL Server Settings section and the table below provides information on the fields contained in that section:

Field	Value	Description
Enabled	off | on; default: **off**	Turns data sending to AVL server on or off.
Retry on Fail	off | on; default: **off**	Turn retries in case of a failed attempts on or off. When turned on, the device will try to send the same data to the server until the transmission is successful.
Hostname	ip | host; default: **192.168.0.1**	IP address or hostname of an AVL server.
Protocol	TCP | UDP; Default: **TCP**	Protocol that will be used for communication with the AVL server.
Port	integer [0..65535]; default: **8501**	TCP/UDP port number of the AVL server to which the device will be connecting.
Don't Contain Connection	off | on; default: **off**	When turned on, handles each AVL packet iteration as a new connection. When turned off, connects once and uses the same socket for future communication.
Static Navigation	off | on; default: **off**	Stop collecting NMEA data if object is stationary. Ignores data when speed equals to 0 or same as previous coordinates (rounded to 4 decimals).

Main rule

The **Main rule** section defines how and when GPS data will be collected and sent to a specified AVL server. Refer to the figure and table below for information on the configuration fields of Main Rule.

Field	Value	Description
Enable	off | on; default: **on**	Turns the main rule on or off.
Rule priority	Low priority level | High priority level | Panic priority level | Security priority level; default: **Low priority level**	The rule's priority. Different priority settings add different flags to event packets, so they can be displayed differently in the receiving system. The device sends data of higher priority first. Priority levels from highest to lowest are as follows: 1. Security 2. Panic 3. High 4. Low

Collect period	integer [1..999999]; default: **5**	How often (in seconds) data will be collected.
Min distance	integer [1..999999]; default: **50**	Minimum distance change (in meters) before sending records.
Min angle	integer [1..360]; default: **50**	Minimum angle change (in degrees) before sending records.
Min accuracy	integer [1..999999]; default: **10**	Minimum accuracy (in meters) required before saving record. The lower the accuracy value, the better.
Min saved records	integer [1..32]; default: **20**	Minimum amount of gathered records before sending.
Send period	integer [0..999999]; default: **60**	How often (in seconds) gathered data is sent.

Secondary rules

The **Secondary rules** section provides you with the possibility to create additional data sending rules. The difference from the main rule is that the secondary rules only send data when the device uses a specified type of WAN and when the digital isolated output is in the specified state.

Refer to the figure and table below for information on the configuration fields of the Secondary rules section.

Field	Value	Description
Enable	off | on; default: **off**	Turns the secondary rule on or off.
WAN	Mobile Both | Mobile Home | Mobile Roaming | Wired; default: **Mobile Home**	Selects which type of WAN will trigger the rule.
Ignore	off | on; default: **off**	If enabled, the rule ignores state of input.
IO level	Low level | High level | Both; default: **High level**	Selects which input state will trigger the rule.
IO type	GPIO; default: **GPIO**	Selects input type.
IO name	Selects which specific input will trigger the rule.	
Rule priority	Low priority level | High priority level | Panic priority level | Security priority level; default: High priority level	The rule's priority. Different priority settings add different flags to event packets, so they can be displayed differently in the receiving system. The device sends data of higher priority first. Priority levels from highest to lowest are as follows: 1. Security 2. Panic 3. High 4. Low
Collect period	integer [1..999999]; default: **10**	How often (in seconds) data will be collected.
Min distance	integer [1..999999]; default: **25**	Minimum distance change (in meters) before sending records.

Min angle	integer [1..360]; default: **25**	Minimum angle change (in degrees) before sending records.
Min accuracy	integer [1..999999]; default: **10**	Minimum accuracy (in meters) required before saving record. The lower the accuracy value, the better.
Min saved records	integer [1..32]; default: **10**	Minimum amount of gathered records before sending.
Send period	integer [0..999999]; default: **10**	How often (in seconds) gathered data is sent.

TAVL settings

The **TAVL settings** section is used to select which data will be sent to the TAVL server:

Field	Value	Description
Signal	off | on; default: **off**	Includes GSM signal strength information in the GPS data sent to server.
Din1	off | on; default: **off**	Includes Din1 status information in the GPS data sent to server.
Din2	off | on; default: **off**	Includes Din2 status information in the GPS data sent to server.
Din2	off | on; default: **off**	Includes Din2 status information in the GPS data sent to server.
Iio	off | on; default: **off**	Includes Iio status information in the GPS data sent to server.
Adc0	off | on; default: **off**	Includes Adc0 status information in the GPS data sent to server.
Acl0	Current | Percent; off | on; default: **Current; off**	Includes Acl0 Current/Percent information in the GPS data sent to server.

AVL I/O

The **AVL I/O** tab provides you with the possibility to configure input rules.

Input Rules

The **Input Rules** section displays existing input rules. To create a new input rule click the 'Add' button.

After this you should be redirected to configuration page of the newly added rule, which should look similar to this:

Field	Value	Description
Enable	off | on; default: **on**	Turns the input rule on or off.

Input type	Analog Current Loop (6,9) | Analog Input (6,9) | Input (3) | Digital Input (1) | Isolated Input (2,7); default: **Analog Current Loop (6,9)**	Select type on your own intended configuration.
ACL Property	Current | Percent; default: **Current**	Select which property - ampere or percentage the condition listens to.
Min current	float [4..20]; default: **none**	Specifies minimum current of the range. Values between 4-20mA.
Max current	float [4..20]; default: **none**	Specifies maximum current of the range. Values between minimum-20mA.
Min voltage	float [0..40]; default: **none**	Specify minimum voltage range.
Max voltage	float [0..40]; default: **none**	Specify maximum voltage range.
Trigger	Inside range | Outside range; Inside range | Outside range; Input active | Input low | Both; default: **Inside range; Inside range; Input active**	Inside range - Input voltage falls in the specified region, Outside range - Input voltage drops out of the specified region; Select trigger event for your own intended configuration.
Priority	Low | High | Panic | Security; default: **Low**	The rule's priority. Different priority settings add different flags to event packets, so they can be displayed differently in the receiving system. The device sends data of higher priority first.

GPS Geofencing

A **geofence** is a virtually defined boundary for a real-world geographic area. The GPS Geofencing page provides you with the possibility to set this custom area and apply rules that will inform you when the device leaves or enters the geofence.

To create a new geofence area, enter a custom name for it and click the 'Add' button. A new geofence area configuration with the given name should appear in the "Geofencing" list. Click the button that looks like a pencil next to it to begin editing.

The figure below is an example of GPS Geofencing configuration and the table below provides information related to that configuration:

Field	Value	Description
Enable	off | on; default: **off**	Turns the Geofence rule on or off.
Longitude (X)	degrees [-180.000000..180.000000]; default: **0.000000**	East-west position of a point on the Earth's surface. Combining this and the Latitude information will produce a point on the world map that will serve as the center of the geofence area.
Latitude (Y)	degrees [-90.000000..90.000000]; default: **0.000000**	North-south position of a point on the Earth's surface. Combining this and the Longitude information will produce a point on the world map that will serve as the center of the geofence area.
Radius	integer [1..999999]; default: **200**	Radius (in meters) of the geofence area.

Generate event on	Exit | Enter | Enter/exit; default: **Exit**	Specifies whether the rule should be triggered when the device enters the geofence area, leaves it or on both events.
Switch profile	configuration profiles; default: **none**	Selects a profile to switch to on this geofencing event.
Get current coordinates	- (interactive button)	Obtains the device's current coordinates and places them in the Longitude and Latitude fields.