# Piksi Settings
## Piksi Firmware version v3.0.17

# 1 Introduction

Piksi Firmware has a number of settings that can be controlled by the end user via the provided Piksi Console or through the SBP binary message protocol. This Document serves to enumerate these settings with an explanation and any relevant notes.

# 2   Settings Table

| Grouping | Name | Description |
|---|---|---|
| **acquisition** | | |
| | almanacs enabled | Enable the almanac-based acquisition. |
| | bds2 acquisition enabled | Enable Beidou2 acquisition. |
| | galileo acquisition enabled | Enable Galileo acquisition. |
| | glonass acquisition enabled | Enable GLONASS acquisition. |
| | qzss acquisition enabled | Enable QZSS acquisition. |
| | sbas acquisition enabled | Enable SBAS acquisition. |
| **can0** | | |
| | enabled sbp messages | Configure which messages should be sent to the server. |
| | mode | Communication protocol for CAN client 0. The client will send packets to a CAN bus. |
| **can1** | | |
| | enabled sbp messages | Configure which messages should be sent to the server. |
| | mode | Communication protocol for CAN client 0. The client will send packets to a CAN bus. |
| | termination | Configure status of CAN termination resistor on Duro. |
| **cell modem** | | |
| | APN | Access point name (provided by cell carrier). |
| | debug | Additional debug messages for cell modem. This setting must be saved and the device rebooted for it to take effect. Override the device used for |
| | device | cell modem connec- tivity. If left empty, uses |
| | device override | default device discovery to determine the correct device to use. The type of cell modem in use. |
| | enable | |
| | modem type | |
| **cn0 est** | | |
| | pri2sec threshold | Cn0 threshold to transition to 2nd stage tracking. |
| | sec2pri threshold | Cn0 threshold to transition to out of 2nd stage tracking. |
| **csac** | | |
| | telemetry enabled | Enables or disables the CSAC daemon which can communicate with Microsemi timing devices on UART0. |
| **ethernet** | | |
| | gateway | The default gateway for the IP config. |
| | interface mode | Ethernet configuration mode. |
| | ip address | The static IP address. |
| | ip config mode | Ethernet configuration mode. |
| | netmask | The netmask for the IP config. |

**ext event
a**

|  |  |  |
|---|---|---|
|  | edge trigger | Select edges to trigger timestamped event capture. |
|  | sensitivity | Minimum time between events (0 = disabled). |

**ext event
b**

|  |  |  |
|---|---|---|
|  | edge trigger | Duro only. Select edges to trigger timestamped event capture. |
|  | sensitivity | Duro only. Minimum time between events (0 = disabled). |

**ext event
c**

|  |  |  |
|---|---|---|
|  | edge trigger | Duro only. Select edges to trigger timestamped event capture. |
|  | sensitivity | Duro only. Minimum time between events (0 = disabled). |

**frontend**

|  |  |  |
|---|---|---|
|  | antenna selection | Determines which antenna to use. |
|  | activate clock steering | Enable/Disable Clock Steering of RF frontend. |
|  | antenna bias | Enable/Disable 4.85V antenna bias. |
|  | use ext clk | Enable/Disable External Clock Input. |

**glo    l1of
track**

|  |  |  |
|---|---|---|
|  | show unconfirmed | Show unconfirmed tracking channels in tracking state. |
|  | xcorr cof | cross correlation coefficient. |
|  | xcorr delta | cross correlation delta. |
|  | xcorr time | cross correlation time. |

**glo    l2of
track**

|  |  |  |
|---|---|---|
|  | show unconfirmed | Show unconfirmed tracking channels in tracking state. |
|  | xcorr cof | cross correlation coefficient. |
|  | xcorr delta | cross correlation delta. |
|  | xcorr time | cross correlation time. |

**imu**

|  |  |  |
|---|---|---|
|  | acc range | The approximate range of accelerations that can be measured. |
|  | gyro range | The approximate range of angular rate that can be measured. |
|  | imu rate | The data rate (in Hz) for IMU raw output. |
|  | imu raw output | Enable/Disable IMU raw data output from onboard Bosch BMI160 IMU. |
|  | mag rate | The data rate (in Hz) for magnetometer raw output. |
|  | mag raw output | Enable/Disable raw data output from onboard Bosch BMM150 Magnetometer. |

**ins**

| | |
|---|---|
| accel bias instability avar millig-sensorframe x | Accelerometer bias instability as defined in an Al-lan Variance plot. Accelerometer bias instability as defined in an Al- lan Variance plot. |
| accel bias instability avar millig-sensorframe y | Accelerometer bias instability as defined in an Al-lan Variance plot. Noise estimate for raw sensor |
| accel bias instability avar millig-sensorframe z | Gyro magnitude stillness thresold Accelerometer |
| accel noise | white noise. Accelerometer white noise. |
| accel still threshold | Accelerometer white noise. Enable updating the |
| accel velocity random walk- | alignment algorithm by as- suming course over |
| microgpersqrtHz sensorframe x | ground (i.e. the horizontal di- rection of the velocity vector) is equal to the vehi- cle heading. If |
| accel velocity random walk-microgpersqrtHz sensorframe y | this parameter is set to true, COG updates will also be used if the current vehicle speed does not |
| accel velocity random walk-microgpersqrtHz sensorframe z | exceed alignment cog min speed meters per sec-ond. If enabled, COG updates will only be used if |
| alignment cog enable | the current vehicle speed exceeds this threshold. Value should be >= 1m/s. Standard deviation of antenna lever arm mea- surement. X component of vector from device frame to an- tenna phase |
| alignment cog low speed disambiguation-enable | center Y component of vector from device frame to an- tenna phase center Z component of vector from device frame to an- tenna phase center inertial navigation system build date inertial |
| alignment cog min speed meters per-second | navigation system build name Experimental non-holonomic constraint feature that allows inertial system to make assumptions about vehicle dynamics Indicates the maximum duration in |
| alignment settings 1 | seconds for which the inertial system will dead |
| antenna offset deviation | reckon. Indicates the maximum standard |
| antenna offset x antenna offset y antenna offset z | deviation of position for which the inertial system |
| build date build name | will dead reckon. Enabled low-speed position |
| constrain vehicle sideslip | filtering (advanced use only) Enabled low-speed velocity filtering (advanced use only) Parameter for low-speed velocity filtering Velocity above which to disable velocity filtering Time constant parameter for low-speed velocity filtering Velocity below whih to enable advanced velocity filtering Fusion engine output rate in Hertz. |
| dr duration max | |
| dr timeout pos stddev | |
| filter pos | |
| filter vel | |
| filter vel half life alpha | |
| filter vel max | |
| filter vel max half life ms | |
| filter vel min | |
| fused soln freq | |

| Setting | Description |
|---|---|
| gyro angular random walk degpersqrth-sensorframe x | Angular rate white noise. |
| gyro angular random walk degpersqrth-sensorframe y | Angular rate white noise. |
| gyro angular random walk degpersqrth-sensorframe z | Angular rate white noise. |
| gyro bias instability avar degperh-sensorframe x | Angular rate bias instability as defined in an Allan Variance plot. |
| gyro bias instability avar degperh-sensorframe y | Angular rate bias instability as defined in an Allan Variance plot. |
| gyro bias instability avar degperh-sensorframe z | Angular rate bias instability as defined in an Allan Variance plot. |
| gyro noise | Noise estimate for raw sensor |
| gyro still threshold | Gyro magnitude stillness thresold |
| lowpass filter cutoff hz | The cut-off frequency of the low-pass filter (smaller than half the nominal sample rate hz). |
| odometry noise 1 | Noise parameter for odometry source 1 |
| odometry noise 2 | Noise parameter for odometry source 2 |
| odometry noise 3 | Noise parameter for odometry source 3 |
| odometry noise 4 | Noise parameter for odometry source 4 |
| output mode | Determines output mode of the inertial navigation outputs. |
| pos std deviation cutoff meters | GNSS position standard deviation cutoff - only solutions with a standard deviation lower than this will be used. |
| solution accuracy confidence level | Sets the confidence level for the message SBP MSG LLH ACC. |
| stillness autotune | Automatically attempt to tune stillness detection thresholds |
| stillness detection enable | Experimental stillness detection feature |
| stillness detection use accel | Use accelermoter in detecting stillness |
| stillness detection use gyro | Use gyro in detecting stillness |
| vehicle frame deviation | Standard deviation of misalignment measurement. |
| vehicle frame offset x | X component of vector from device frame to vehicle frame origin in which inertial outputs are provided |
| vehicle frame offset y | Y component of vector from device frame to vehicle frame origin in which inertial outputs are provided |
| vehicle frame offset z | Z component of vector from device frame to vehicle frame origin in which inertial outputs are provided |
| vehicle frame pitch vehicle frame roll | Pitch angle representing rotation from vehicle frame to device frame. |
| vehicle frame yaw vel still threshold | Roll angle representing rotation from vehicle frame to device frame. |
| zupt acceleration threshold mpers2 | Yaw angle representing rotation from vehicle frame to device frame. |
| zupt angular rate threshold degpers | Gyro magnitude stillness thresold |
| zupt enable full zerovel update zupt | Maximum allowed acceleration while in ZUPT. |
| enable partial zerovel update zupt | Maximum allowed angular rate while in in ZUPT. |
| enable zero angular rate update zupt | Enable full zero-velocity update (ZUPT). |
| settings 1 | Enable partial zero-velocity update (ZUPT). |
| | Enable zero angular rate update. |

| | | |
|---|---|---|
| | zupt settings 2 | |
| | zupt settings 3 | |
| | zupt settings 4 | |
| | zupt settings 5 | |

**l1ca track**

| | | |
|---|---|---|
| | show unconfirmed | Show unconfirmed tracking channels in tracking state. |
| | xcorr cof | |
| | xcorr delta | cross correlation coefficient. |
| | xcorr time | cross correlation delta. |
| | | cross correlation time. |

**l2c track**

| | | |
|---|---|---|
| | show unconfirmed | Show unconfirmed tracking channels in tracking state. |
| | xcorr cof | |
| | xcorr delta | cross correlation coefficient. |
| | xcorr time | cross correlation delta. |
| | | cross correlation time. |

**metrics**
**daemon**

| | | |
|---|---|---|
| | enable log to file | Enable metric logging to file |
| | metrics update interval | Set metric update interval |

**ndb**

| | | |
|---|---|---|
| | erase almanac | Erase stored almanacs during boot. |
| | erase almanac wn | Erase stored almanac week numbers during boot. |
| | erase ephemeris | Erase stored ephmerides during boot. |
| | erase gnss capb | Erase stored GNSS capability mask during boot. |
| | erase iono | Erase stored ionospheric parameters during boot. |
| | erase lgf | Erase stored last fix information during boot. |
| | erase utc params | Erase stored UTC offset parameters during boot. |
| | lgf update m | Change in position required to update last good fix. |
| | lgf update s | |
| | valid alm acc | Update period for navigation database last good fix. |
| | valid alm days | |
| | valid eph acc | Number of days for which Almanac is valid. |

**nmea**

| | | |
|---|---|---|
| | cog output min speed | Minimum speed for outputting Course-Over-Ground values. |
| | cog update min speed | Minimum speed for updating the current Course-Over-Ground value. |
| | gpgga msg rate | Number of Solution Periods between GGA NMEA messages being sent. |
| | gpgll msg rate | Number of Solution Periods between GLL NMEA messages being sent. |
| | | Number of Solution Periods between GSA NMEA messages being sent. |
| | | Number of Solution Periods between GST NMEA messages being sent. |
| | | Number of Solution Periods between GSV NMEA messages being sent. |

| | | |
|---|---|---|
| | gphdt msg rate | Number of Solution Periods between HDT NMEA messages being sent. |
| | gprmc msg rate | Number of Solution Periods between RMC NMEA messages being sent. |
| | gpvtg msg rate | Number of Solution Periods between VTG NMEA messages being sent. |
| | gpzda msg rate | Number of Solution Periods between ZDA NMEA messages being sent. Number of Solution Periods between GSA NMEA messages being sent. |

| **ntrip** | | |
|---|---|---|
| | debug | Additional debug messages for NTRIP (sent to /var/log/messages). |
| | enable | |
| | gga out interval | Enable NTRIP client. |
| | gga out rev1 | Interval at which the NMEA GGA sentence is uploaded to the NTRIP server |
| | password | |
| | url | If True, the NTRIP client will use an NTRIP 1.0 formatted GGA sentence. |
| | username | |
| | | NTRIP password to use. |
| | | NTRIP URL to use. |
| | | NTRIP username to use. |

| **pps** | | |
|---|---|---|
| | frequency | Generate a pulse with the given frequency (maximum = 20 Hz). |
| | offset | |
| | polarity | Offset in nanoseconds between GPS time and the PPS. |
| | propagation mode | |
| | propagation timeout | Logic level on output pin when the PPS is active. |
| | width | Configures the behavior of the PPS when no GNSS fix is available. |
| | | Configures the timeout length of the PPS when using the "Time Limited" propagation mode. |
| | | Number of microseconds the PPS will remain active (allowed range from 1 to 999999 us). |

| **rtcm out** | | |
|---|---|---|
| | ant descriptor | Antenna description to be sent out in RTCMv3 messages 1008 and 1033. |
| | antenna height | Antenna height to be sent out in RTCMv3 message 1006. |
| | enable ephemeris | Allow output of RTCMv3 ephemeris messages. |
| | output mode | Selects the format of RTCM observation messages for the RTCMv3 OUT protocol |
| | rcv descriptor | Receiver type description to be sent out in the RTCMv3 1033 message. |

| **sample daemon** | | |
|---|---|---|
| | broadcast hostname | Sets the broadcast hostname for the SDK sample daemon. |
| | broadcast port | Sets the broadcast port for the SDK sample daemon. |
| | enable broadcast | Enables or disables UDP broadcast in the SDK sample daemon. |
| | enabled | Enables or disables the SDK sample daemon. |

| | | |
|---|---|---|
| | offset | Sets the height offset for the SDK sample daemon. |

**sbp**

| | | |
|---|---|---|
| | obs msg max size | Determines the maximum message length for raw observation sbp messages. |

**simulator**

| | | |
|---|---|---|
| | enabled | Toggles the receiver internal simulator on and off. Simulated base station position. Simulated base station position. Simulated base station position. Standard deviation of noise added to the simu- lated signal to noise. ratio Determines the types of position outputs for the simulator. The number of satellites for the simulator. Standard deviation of noise added to the simulated carrier phase. Standard deviation of simulated single point po- sition. Standard deviation of noise added to the simu- lated pseudo range. Radius of the circle around which the simulated receiver will move. Simulated tangential speed of the receiver. Standard deviation of noise addition to simulated tangential speed. |
| | base ecef x | |
| | base ecef y | |
| | base ecef z | |
| | cn0 sigma | |
| | mode mask | |
| | num sats | |
| | phase sigma | |
| | pos sigma | |
| | pseudorange sigma | |
| | radius | |
| | speed | |
| | speed sigma | |

**solution**

| | | |
|---|---|---|
| | correction age max | The maximum age of corrections for which an RTK solution will be generated. Determines the type of carrier phase ambigu- ity resolution that the receiver will attempt to achieve. Selects the type of RTK solution to output. Disable Klobuchar Ionospheric corrections. Receiver Autonomous Integrity Monitoring. Selects the Filter uncertainty of position, velocity & acceleration in the Horizontal & Vertical direc- tions. SPP / RTK solution elevation mask. Enable Beidou measurement processing in the navigation filter. Enable Galileo measurement processing in the navigation filter. Enable GLONASS measurement processing in the navigation filter. Down weights GLONASS measurements by a given factor in the navigation filter. Rotate the heading output. Determines the baseline vector for the "init known baseline" feature. Determines the baseline vector for the "init known baseline" feature. |
| | dgnss filter | |
| | dgnss solution mode | |
| | disable klobuchar correction | |
| | elevation mask | |
| | enable galileo | |
| | glonass measurement std downweight- | |
| | factor | |
| | heading offset | |
| | known baseline d | |
| | known baseline e | |

| | | |
|---|---|---|
| | known baseline n | Determines the baseline vector for the "init known baseline" feature. Minimum assumed baseline |
| | min modelled baseline len km | length to use in RTK model calculations. This parameter can be used to improve performance with virtual reference station (VRS) services that generate the virtual base at an arbitrary location, independent from the quality of atmospheric models. Integer divisor of solution frequency for which the observations will be output. Enables |
| | output every n obs | SBP heading output. Heading is calculated from base station to rover and represents the inverse |
| | send heading | tangent of the north and east compo- nents of the baseline. The frequency at which GNSS navigation solution is computed. |
| | soln freq | |

**standalone logging**

| | | |
|---|---|---|
| | blacklist sdcard | Enable/Disable SD Card. |
| | copy system logs enable | Copy system logs to the SD card at regular inter- vals. |
| | file duration | Standalone logging enabled. |
| | logging file system | Duration of each logfile. |
| | max fill | Configure the file-system used for standalone log- ging (SD card only). |
| | output directory | Maximum storage device usage. |
| | sdcard enable | Standalone logging path. |
| | | Enable/Disable SD Card. |

**surveyed position**

| | | |
|---|---|---|
| | broadcast | Broadcast surveyed base station position. |
| | surveyed alt | Surveyed altitude of the antenna. |
| | surveyed lat | Surveyed latitude of the antenna. |
| | surveyed lon | Surveyed longitude of the antenna. |

**system**

| | | |
|---|---|---|
| | connectivity check addresses | A comma separated list of addresses to ping to check for network connectivity. The frequency at |
| | connectivity check frequency | which the network poll service checks for connectivity. The frequency at which the network |
| | connectivity retry frequency | poll service retries after a failed connectivity check. Resend any SBP MSG HEADING or SBP |
| | heading forwarding | MSG BASELINE NED messages received by this device to this device's output interfaces If set to true, the network poll service will also log ping activity. Enables or disables the Over-The-Air |
| | log ping activity | upgrade dae- mon's verbose output. Enables or disables the Over-The-Air upgrade dae- mon. |
| | ota enabled | |

| | | |
|---|---|---|
| | ota url | Set the URL of the Over-The-Air upgrade server. If |
| | resource monitor update interval | empty, an internal default address is used. |
| | system time | Interval to run the resource monitor at |
| | | Sources for Linux System Time. |

**system info**

| | | |
|---|---|---|
| | build variant | The build variant type for the current firmware. |
| | firmware build date | Firmware build date. |
| | firmware build id | Full build id for firmware version. |
| | firmware version | Firmware version of the receiver. |
| | hw revision | Hardware revision of the receiver. |
| | hw variant | Hardware Product Variant |
| | hw version | Hardware version number. |
| | imageset build id | Build id for the linux system image. |
| | loader build date | build date for boot loader (uboot). |
| | loader build id | build id for loader (uboot). |
| | mac address | The MAC address of the receiver. |
| | nap build date | build date for SwiftNap FPGA bitstream. |
| | nap build id | build id for SwiftNap FPGA bitstream. |
| | nap channels | Number of channels in SwiftNap FPGA. |
| | pfwp build date | build date for real-time GNSS firmware (piksi |
| | pfwp build id | firmware). |
| | product id | build id for real-time GNSS firmware (piksi |
| | sbp sender id | firmware). |
| | serial number | Product ID |
| | uuid | The SBP sender ID for any messages sent by the |
| | | device. |
| | | The serial number of the receiver. |

**system monitor**

| | | |
|---|---|---|
| | heartbeat period milliseconds | Period for sending the SBP HEARTBEAT mes- |
| | spectrum analyzer | sages. |
| | watchdog | Enable spectrum analyzer. |
| | | Enable hardware watchdog timer to reset the re- |
| | | ceiver if it locks up for. any reason |

**tcp client0**

| | | |
|---|---|---|
| | address | IP address and port for TCP client 0 to connect |
| | enabled sbp messages | to. Configure which messages should be sent on |
| | | the port. Does not effect which incoming |
| | | messages are listened to. Communication |
| | mode | protocol for TCP client 0. The client will initiate a |
| | | connection with the server and establish bi- |
| | | directional communications. |

**tcp client1**

| | | |
|---|---|---|
| | address | IP address and port for TCP client 1 to connect |
| | enabled sbp messages | to. Configure which messages should be sent on |
| | | the port. Does not effect which incoming |
| | | messages are listened to. |

| | | |
|---|---|---|
| | mode | Communication protocol for TCP client 1. The client will initiate a connection with the server and establish bi-directional communications. |
| **tcp server0** | | |
| | enabled sbp messages | Configure which messages should be sent on the port. Does not effect which incoming messages are listened to. Communication protocol for TCP server 0. The server will listen for incoming client connections and establish a bi-directional communications. Port for TCP server 0 to listen on. |
| | mode | |
| | port | |
| **tcp server1** | | |
| | enabled sbp messages | Configure which messages should be sent on the port. Does not effect which incoming messages are listened to. Communication protocol for TCP server 1. The server will listen for incoming client connections and establish a bi-directional communications. Port for TCP server 1 to listen on. |
| | mode | |
| | port | |
| **tls client0** | | |
| | address | IP address and port for TLS client 0 to connect to. |
| | enabled sbp messages | Configure which messages should be sent on the port. Does not effect which incoming messages are listened to. Communication protocol for TLS client 0. The client will initiate a connection with the server and establish bi-directional communications. |
| | mode | |
| **track** | | |
| | elevation mask iq output mask max pll integration time ms mode send trk detailed | Tracking elevation mask. Output raw I/Q correlations. Controls maximum possible integration time for a measurement. Set the tracking loop configuration send detailed tracking state message. |
| **uar t0** | | |
| | baudrate | The Baud rate for the UART 0. |
| | enabled sbp messages flow control | Configure which messages should be sent on the por t. |
| | mode | Enable hardware flow control (RTS/CTS). Communication protocol for UART0. |
| **uar t1** | | |
| | baudrate | The Baud rate for the UART 1. |
| | enabled sbp messages flow control | Configure which messages should be sent on the por t. |
| | mode | Enable hardware flow control (RTS/CTS). Communication protocol for UART 1. |

**udp
client0**

| | | |
|---|---|---|
| | address | IP address for UDP client 0. Configure which |
| | enabled sbp messages | messages should be sent to the server. |
| | mode | Communication protocol for UDP client 0. The client will send packets to a server for uni-directional communications. |

**udp
client1**

| | | |
|---|---|---|
| | address | IP address for UDP client 1. Configure which |
| | enabled sbp messages | messages should be sent to the server. |
| | mode | Communication protocol for UDP client 1. The client will send packets to a server for uni-directional communications. |

**udp
server0**

| | | |
|---|---|---|
| | enabled sbp messages | Configure which messages should be sent on the por t. Communication protocol for UDP server 0. |
| | mode | The server will listen for incoming packets from a client for uni-directional communications. Port for UDP server 0 to listen to. |
| | port | |

**udp
server1**

| | | |
|---|---|---|
| | enabled sbp messages | Configure which messages should be sent on the por t. Communication protocol for UDP server 1. |
| | mode | The server will listen for incoming packets from a client for uni-directional communications. Port for UDP server 1 to listen to. |
| | port | |

**usb0**

| | | |
|---|---|---|
| | enabled sbp messages | Configure which messages should be sent on the por t. |
| | mode | Communication protocol for USB0. |

0.1: Summary of message types

# 3   Settings Detail

## 3.1   acquisition

### 3.1.1   almanacsenabled

**Description:** Enable the almanac-based acquisition.

| Label | Value |
|---|---|
| group | acq uisition |
| name | almanacs enabled |
| exper t | |
| type | bool ean |
| units | N/A |
| default value | F alse |
| readonly | |
| enumerated possible values | T rue, F alse |

Table 3.1.1: almanacs enabled

**Notes:**

### 3.1.2   bds2acquisitionenabled

**Description:** Enable Beidou2 acquisition.

| Label | Value |
|---|---|
| group | acquisition |
| name | bds2acquisitionenabled |
| exper t | |
| type | boolean |
| units | N/A |
| defaultvalue | True |
| readonly | |
| enumerated possible values | True,False |

Table 3.1.2: bds2 acquisition enabled

**Notes:** If Beidou2 satellites are already being tracked, this setting will not remove them from tracking or exclude them from being used in positioning - the setting must be saved and the receiver must be restarted for this to take effect.

### 3.1.3   galileoacquisitionenabled

**Description:** Enable Galileo acquisition.

| Label | Value |
|---|---|
| group | acq uisition |
| name | galileo acquisition enabled |
| exper t | |
| type | bool ean |
| units | N/A |
| default value | True |
| readonly | |
| enumerated possible values | T rue, F alse |

Table 3.1.3: galileo acquisition enabled

**Notes:** If Galileo satellites are already being tracked, this setting will not remove them from tracking or exclude them from being used in positioning - the setting must be saved and the receiver must be restarted for this to take effect.

### 3.1.4   glonassacquisitionenabled

**Description:** Enable GLONASS acquisition.

| Label | Value |
|---|---|
| group | acquisition |
| name | glonassacquisitionenabled |
| exper t | |
| type | boolean |
| units | N/A |
| defaultvalue | True |
| readonly | |
| enumerated possible values | True,False |

Table 3.1.4: glonass acquisition enabled

**Notes:** If GLONASS satellites are already being tracked, this setting will not remove them from tracking or exclude them from being used in positioning - the setting must be saved and the receiver must be restarted for this to take effect.

### 3.1.5   qzssacquisitionenabled

**Description:** Enable QZSS acquisition.

| Label | Value |
| --- | --- |
| group | acq uisition |
| name | qzss acquisition enabled |
| exper t | |
| type | bool ean |
| units | N/A |
| default value | F alse |
| readonly | |
| enumerated possible values | T rue, F alse |

Table 3.1.5: qzss acquisition enabled

**Notes:**

### 3.1.6 sbasacquisitionenabled

**Description:** Enable SBAS acquisition.

| Label | Value |
| --- | --- |
| group | acquisition |
| name | sbasacquisitionenabled |
| exper t | |
| type | boolean |
| units | N/A |
| defaultvalue | True |
| readonly | |
| enumerated possible values | True,False |

Table 3.1.6: sbas acquisition enabled

**Notes:** If SBAS satellites are already being tracked, this setting will not remove them from tracking or exclude SBAS corrections from being used in positioning - the setting must be saved and the receiver must be restarted for this to take effect.

## 3.2   can0

### 3.2.1   enabledsbpmessages

**Description:** Configure which messages should be sent to the server.

| Label | Value |
|---|---|
| group | can0 |
| name | enabled sbp messages |
| exper t | |
| type | str ing |
| units | N/A |
| default value | 72, 74, 117, 522, 527 |
| readonly | |

Table 3.2.1: enabled sbp messages

**Notes:** The enabled sbp messages settings is a list of message types and rate divisors that will be sent out of the interface. If left blank, all messages will be sent. If not blank, a comma separated list of SBP message IDs in base 10 integer format should be provided. Optionally, a divisor can be specified after the / character for each id. For example, an entry of 3456/10 would provide message with ID 3456 at 1/10th the normal rate. For Ethernet, the default value is optimal for logging and communication with the console.

### 3.2.2   mode

**Description:** Communication protocol for CAN client 0. The client will send packets to a CAN bus.

| Label | Value |
|---|---|
| group | can0 |
| name | mode |
| exper t | |
| type | enum |
| units | N/A |
| defaultvalue | Disabled |
| readonly | |
| enumerated possible values | SBP,NMEAOUT,RTCMv3IN,RTCMv3Out |

Table 3.2.2: mode

**Notes:** "SBP" configures the interface to transmit messages specified in the 'enabled_sbp_messages' setting.

"NMEA OUT" configures the interface to transmit the GGA, RMC, GLL, VTG, ZDA, GSA, and GSV NMEA 0183 messages. The interface will not receive incoming messages.
"RTCMv3 IN" configures the interface to receive RTK corrections in RTCMv3 format. The interface will receive 1002, 1004, 1005, 1006, 1010, 1012, 1033, 1230 and MSM4-7 RTCMv3 messages and will not transmit or receive any other messages.
"RTCMv3 OUT" configures the interface to transmit RTCMv3 messages.

## 3.3   can1

### 3.3.1   enabledsbpmessages

**Description:** Configure which messages should be sent to the server.

| Label | Value |
|---|---|
| group | can1 |
| name | enabled sbp messages |
| exper t | |
| type | str ing |
| units | N/A |
| default value | 72, 74, 117, 522, 527 |
| readonly | |

Table 3.3.1: enabled sbp messages

**Notes:** The enabled sbp messages settings is a list of message types and rate divisors that will be sent out of the interface. If left blank, all messages will be sent. If not blank, a comma separated list of SBP message IDs in base 10 integer format should be provided. Optionally, a divisor can be specified after the / character for each id. For example, an entry of 3456/10 would provide message with ID 3456 at 1/10th the normal rate. For Ethernet, the default value is optimal for logging and communication with the console.

### 3.3.2   mode

**Description:** Communication protocol for CAN client 0. The client will send packets to a CAN bus.

| Label | Value |
|---|---|
| group | can1 |
| name | mode |
| exper t | |
| type | enum |
| units | N/A |
| defaultvalue | Disabled |
| readonly | |
| enumerated possible values | SBP,NMEAOUT,RTCMv3IN,RTCMv3Out |

Table 3.3.2: mode

**Notes:** "SBP" configures the interface to transmit messages specified in the 'enabled_sbp_messages' setting.

"NMEA OUT" configures the interface to transmit the GGA, RMC, GLL, VTG, ZDA, GSA, and GSV NMEA 0183 messages. The interface will not receive incoming messages.
"RTCMv3 IN" configures the interface to receive RTK corrections in RTCMv3 format. The interface will receive 1002, 1004, 1005, 1006, 1010, 1012, 1033, 1230 and MSM4-7 RTCMv3 messages and will not transmit or receive any other messages.
"RTCMv3 OUT" configures the interface to transmit RTCMv3 messages.

### 3.3.3   termination

**Description:** Configure status of CAN termination resistor on Duro.

| Label | Value |
|---|---|
| group | can1 |
| name | ter mination |
| exper t | |
| type | bool ean |
| units | N/A |
| default value | f alse |
| readonly | |

Table 3.3.3: termination

**Notes:** This setting toggles the 120 ohm termination resistor for the CAN interface available on the AUX connector of Duro. It should only appear on Duro devices.

## 3.4   cell modem

### 3.4.1   APN

**Description:** Access point name (provided by cell carrier).

| Label | Value |
|---|---|
| group | cell modem |
| name | APN |
| exper t | |
| type | str ing |
| default value | INTERNET |
| readonly | |
| units | N/A |

Table 3.4.1: APN

### 3.4.2   debug

**Description:** Additional debug messages for cell modem. This setting must be saved and the device rebooted for it to take effect.

| Label | Value |
|---|---|
| group | cellmodem |
| name | debug |
| exper t | |
| type | boolean |
| defaultvalue | False |
| readonly | |

Table 3.4.2: debug

### 3.4.3   device

**Description:**

| Label | Value |
|---|---|
| group | cell modem |
| name | dev ice |
| exper t | |
| type | str ing |
| default value | ttyAC M 0 |
| readonly | |
| units | N/A |

Table 3.4.3: device

### 3.4.4   deviceoverride

**Description:** Override the device used for cell modem connectivity. If left empty, uses default device discovery to determine the correct device to use.

| Label | Value |
|---|---|
| group | cellmodem |
| name | deviceoverride |
| exper t | |
| type | string |
| default value | |
| readonly | |

Table 3.4.4: device override

 **Notes:** Cell modem 'enable' must be 'False' in order to change this setting.

### 3.4.5   enable

**Description:**

| Label | Value |
|---|---|
| group | cellmodem |
| name | enable |
| exper t | |
| type | boolean |
| defaultvalue | False |
| readonly | |
| units | N/A |

Table 3.4.5: enable

### 3.4.6 modemtype

**Description:** The type of cell modem in use.

| Label | Value |
|---|---|
| group | cell modem |
| name | modem type |
| exper t | |
| type | enum |
| enumerated possible val- | GSM,CDMA |
| ues | |
| default value | GSM |
| readonly | |

Table 3.4.6: modem type

## 3.5 cn0 est

### 3.5.1 pri2secthreshold

**Description:** Cn0 threshold to transition to 2nd stage tracking.

| Label | Value |
|---|---|
| group | cn0 est |
| name | pri 2secthreshold |
| type | f loat |
| exper t | |
| readonly | |

Table 3.5.1: pri2sec threshold

### 3.5.2 sec2prithreshold

**Description:** Cn0 threshold to transition to out of 2nd stage tracking.

| Label | Value |
|---|---|
| group | cn0 est |
| name | sec2prithreshold |
| type | f loat |
| exper t | |
| readonly | |

Table 3.5.2: sec2pri threshold

## 3.6   csac

### 3.6.1   telemetryenabled

**Description:** Enables or disables the CSAC daemon which can communicate with Microsemi timing devices on UART0.

| Label | Value |
|---|---|
| group | csac |
| name | telemetryenabled |
| exper t | |
| type | boolean |
| units | N/A |
| defaultvalue | false |
| readonly | |

Table 3.6.1: telemetry enabled

## 3.7   ethernet

### 3.7.1   gateway

**Description:** The default gateway for the IP config.

| Label | Value |
|---|---|
| group | ether net |
| name | g atew ay |
| exper t | |
| type | str ing |
| units | N/A |
| default value | 192.168.0 1. |
| readonly | |

Table 3.7.1: gateway

**Notes:** The configured gateway in XXX.XXX.XXX.XXX format.

### 3.7.2   interfacemode

**Description:** Ethernet configuration mode.

| Label group | Value |
|---|---|
| name | ether net |
| exper t | interf ace mode |
| type | |
| enumerated possible values | enum |
| units | C onf ig, Active |
| default value | |
| readonly | N/A |
| | Activ e |

Table 3.7.2: interface mode

**Notes:** "Config" IP configuration can be changed freely, but no change is made on the device. Returning to 'Active' mode will refresh ethernet connection with current values.

"Active" The current IP configuration is sent to the device and updated. Afterward, no IP settings can be changed until returned to 'Config' mode.

### 3.7.3   ipaddress

**Description:** The static IP address.

| Label | Value |
|---|---|
| group | ether net |
| name | ip address |
| exper t | |
| type | str ing |
| units | N/A |
| default value | 192.168.0 2. 22 |
| readonly | |

Table 3.7.3: ip address

**Notes:** The configured IP address in XXX.XXX.XXX.XXX format. Note: If DHCP is used, the DHCP assigned IP address cannot be viewed under the Settings tab, instead use the Advanced -> Networking Tab and click on 'Refresh Network Status'.

### 3.7.4   ipconfigmode

**Description:** Ethernet configuration mode.

| Label | Value |
|---|---|
| group | ether net |
| name | ip config mode |
| exper t | |
| type | enum |
| enumerated possible values | Static, DHCP |
| units | N/A |
| default value | S tatic |
| readonly | |

Table 3.7.4: ip config mode

**Notes:** If DHCP is chosen the IP address will be assigned automatically. Note: The DHCP assigned IP address cannot be viewed under the Settings tab, instead use the Advanced -> Networking Tab and click on 'Refresh Network Status'.

### 3.7.5   netmask

**Description:** The netmask for the IP config.

| Label | Value |
|---|---|
| group | ethernet |
| name | netmask |
| exper t | |
| type | string |
| units | N/A |
| defaultvalue | 255.255.255.0 |
| readonly | |

Table 3.7.5: netmask

**Notes:** The configured netmask in XXX.XXX.XXX.XXX format.

## 3.8   ext event a

### 3.8.1   edgetrigger

**Description:** Select edges to trigger timestamped event capture.

| Label | Value |
| --- | --- |
| group | ext event a |
| name | edge trigger |
| exper t |  |
| type | enum |
| units | N/A |
| default value | None |
| readonly |  |
| enumerated possible values | N one, Rising, F alling, Both |

Table 3.8.1: edge trigger

**Notes:** You can use this to record the exact time that some external event in your system occurred, e.g. camera shutter time. Upon detecting the event, receiver will generate a MSG_EXT_EVENT message reporting the event, including a timestamp accurate to better than a microsecond.

### 3.8.2   sensitivity

**Description:** Minimum time between events (0 = disabled).

| Label | Value |
| --- | --- |
| group | exteventa |
| name | sensitivity |
| exper t |  |
| type | integer |
| units | us(microseconds) |
| defaultvalue | 0 |
| readonly |  |
| enumerated possible values |  |

Table 3.8.2: sensitivity

**Notes:** Any event that is triggered within the sensitivity window after the previous event will be ignored and no MSG_EXT_EVENT will be generated.

## 3.9   ext event b

### 3.9.1   edgetrigger

**Description:** Duro only. Select edges to trigger timestamped event capture.

| Label | Value |
|---|---|
| group | ext event b |
| name | edge trigger |
| exper t | |
| type | enum |
| units | N/A |
| default value | None |
| readonly | |
| enumerated possible values | N one, Rising, F alling, Both |

Table 3.9.1: edge trigger

**Notes:** You can use this to record the exact time that some external event in your system occurred, e.g. camera shutter time. Upon detecting the event, receiver will generate a MSG_EXT_EVENT message reporting the event, including a timestamp accurate to better than a microsecond.

### 3.9.2   sensitivity

**Description:** Duro only. Minimum time between events (0 = disabled).

| Label | Value |
|---|---|
| group | exteventb |
| name | sensitivity |
| exper t | |
| type | integer |
| units | us(microseconds) |
| defaultvalue | 0 |
| readonly | |
| enumerated possible values | |

Table 3.9.2: sensitivity

**Notes:** Any event that is triggered within the sensitivity window after the previous event will be ignored and no MSG_EXT_EVENT will be generated.

## 3.10   ext event c

### 3.10.1   edgetrigger

**Description:** Duro only. Select edges to trigger timestamped event capture.

| Label | Value |
|---|---|
| group | ext event c |
| name | edge trigger |
| exper t | |
| type | enum |
| units | N/A |
| default value | None |
| readonly | |
| enumerated possible values | N one, Rising, F alling, Both |

Table 3.10.1: edge trigger

**Notes:** You can use this to record the exact time that some external event in your system occurred, e.g. camera shutter time. Upon detecting the event, receiver will generate a MSG_EXT_EVENT message reporting the event, including a timestamp accurate to better than a microsecond.

### 3.10.2   sensitivity

**Description:** Duro only. Minimum time between events (0 = disabled).

| Label | Value |
|---|---|
| group | exteventc |
| name | sensitivity |
| exper t | |
| type | integer |
| units | us(microseconds) |
| defaultvalue | 0 |
| readonly | |
| enumerated possible values | |

Table 3.10.2: sensitivity

**Notes:** Any event that is triggered within the sensitivity window after the previous event will be ignored and no MSG_EXT_EVENT will be generated.

## 3.11   frontend

### 3.11.1   antennaselection

**Description:** Determines which antenna to use.

| Label | Value |
|---|---|
| group | f rontend |
| exper t | |
| name | antenna selection |
| type | enum |
| units | N/A |
| default value | P rimary |
| readonly | |
| enumerated possible values | P rimary, Secondary |

Table 3.11.1: antenna selection

**Notes:** This setting selects the antenna input that should be used by the receiver. Piksi Multi boards and Duro units ship with only a "Primary" antenna connector, so this should always be set to "Primary."

### 3.11.2  activateclocksteering

**Description:** Enable/Disable Clock Steering of RF frontend.

| Label | Value |
|---|---|
| group | frontend |
| name | activateclocksteering |
| exper t | |
| type | bool |
| units | N/A |
| defaultvalue | False |
| readonly | |

Table 3.11.2: activate clock steering

**Notes:** This setting toggles the clock steering for the RF frontend. If timing drift is detected in the onboard oscillator, the clock will be continuously adjusted to align more precisely with clock data encoded within the GNSS signals received by the device.

### 3.11.3  antennabias

**Description:** Enable/Disable 4.85V antenna bias.

| Label | Value |
|---|---|
| group | frontend |
| name | antennabias |
| exper t | |
| type | bool |
| units | N/A |
| defaultvalue | True |
| readonly | |

Table 3.11.3: antenna bias

**Notes:** Most active antennas require an antenna bias in order to power the amplifier in the antenna.

### 3.11.4 useextclk

**Description:** Enable/Disable External Clock Input.

| Label | Value |
|---|---|
| group | f rontend |
| name | use ext clk |
| exper t | |
| type | bool |
| units | N/A |
| default value | F alse |
| readonly | |

Table 3.11.4: use ext clk

**Notes:** This setting toggles the hardware switch for Piksi Multi 10Mhz clock source. When true, Piksi Multi will be configured to use an external clock source rather than its onboard oscillator. It is only available on Piksi Multi hardware versions greater than or equal to 5.1 (00108-05 rev 1). The external clock input signal can be provided on the Piksi Multi evaluation board through a labeled SMA connector. It is not exposed on Duro.

## 3.12 glo l1of track

### 3.12.1 showunconfirmed

**Description:** Show unconfirmed tracking channels in tracking state.

| Label | Value |
|---|---|
| group | glo l1of track |
| name | show unconfirmed |
| exper t | |
| type | bool ean |
| readonly | |

Table 3.12.1: show unconfirmed

### 3.12.2 xcorrcof

**Description:** cross correlation coefficient.

| Label | Value |
|---|---|
| group | glo l1of track |
| name | xcorr cof |
| exper t | |
| type | f loat |
| readonly | |

Table 3.12.2: xcorr cof

### 3.12.3   xcorrdelta

**Description:** cross correlation delta.

| Label | Value |
|---|---|
| group | glo l1of track |
| name | xcorr delta |
| exper t | |
| type | f loat |
| readonly | |

Table 3.12.3: xcorr delta

### 3.12.4   xcorrtime

**Description:** cross correlation time.

| Label | Value |
|---|---|
| group | glo l1of track |
| name | xcorr time |
| exper t | |
| type | f loat |
| readonly | |

Table 3.12.4: xcorr time

## 3.13   glo l2of track

### 3.13.1   showunconfirmed

**Description:** Show unconfirmed tracking channels in tracking state.

| Label | Value |
|---|---|
| group | glo l2of track |
| name | show unconfirmed |
| exper t | |
| type | bool ean |
| readonly | |

Table 3.13.1: show unconfirmed

### 3.13.2   xcorrcof

**Description:** cross correlation coefficient.

| Label | Value |
|---|---|
| group | glo l2of track |
| name | xcorr cof |
| exper t | |
| type | f loat |
| readonly | |

Table 3.13.2: xcorr cof

### 3.13.3   xcorrdelta

**Description:** cross correlation delta.

| Label | Value |
|---|---|
| group | glo l2of track |
| name | xcorr delta |
| exper t | |
| type | f loat |
| readonly | |

Table 3.13.3: xcorr delta

### 3.13.4   xcorrtime

**Description:** cross correlation time.

| Label | Value |
|---|---|
| group | glo l2of track |
| name | xcorr time |
| exper t | |
| type | f loat |
| readonly | |

Table 3.13.4: xcorr time

## 3.14   imu

### 3.14.1   accrange

**Description:** The approximate range of accelerations that can be measured.

| Label | Value |
| --- | --- |
| group | imu |
| name | acc range |
| exper t | |
| type | enum |
| default value | |
| readonly | 8 |
| enumerated possible values | 2,4,8,16 |
| units | g |

Table 3.14.1: acc range

**Notes:** When 2 g is chosen, it means the accelerometer is scaled to measure about +/- 2 g of acceleration. Refer to the IMU datasheet for detailed information.

### 3.14.2  gyrorange

**Description:** The approximate range of angular rate that can be measured.

| Label | Value |
| --- | --- |
| group | imu |
| name | gyrorange |
| exper t | |
| type | enum |
| defaultvalue | 125 |
| readonly | |
| enumerated possible values | 125,250,500,1000,2000 |
| units | deg/s |

Table 3.14.2: gyro range

**Notes:** When 125 is chosen, it means the gyro is scaled to measure about +/- 125 deg/s of angular rate. Refer to the IMU datasheet for detailed information.

### 3.14.3  imurate

**Description:** The data rate (in Hz) for IMU raw output.

| Label | Value |
|---|---|
| group | imu |
| name | imu rate |
| exper t | |
| type | enum |
| default value | |
| readonly | 100 |
| enumerated possible values | 25,50,100,200 |
| units | Hz |

Table 3.14.3: imu rate

**Notes:** It is recommended to use Ethernet or USB for IMU data output for data rates over 25 Hz. Make sure that the rate is greater than that of INS solutions.

### 3.14.4   imurawoutput

**Description:** Enable/Disable IMU raw data output from onboard Bosch BMI160 IMU.

| Label | Value |
|---|---|
| group | imu |
| name | imurawoutput |
| exper t | |
| type | boolean |
| defaultvalue | False |
| readonly | |

Table 3.14.4: imu raw output

**Notes:** The IMU raw data can be seen in the Advanced Tab of the Swift Console. The default enabled_sbp_messages settings on all interfaces decimate the raw IMU messages sent by the device by a factor of 50 to reduce bandwidth.

### 3.14.5   magrate

**Description:** The data rate (in Hz) for magnetometer raw output.

| Label | Value |
|---|---|
| group | imu |
| name | magrate |
| exper t | |
| type | enum |
| defaultvalue | 12.5 |
| readonly | |
| enumerated possible values | 6.25,12.5,25 |
| units | Hz |

Table 3.14.5: mag rate

### 3.14.6   magrawoutput

**Description:** Enable/Disable raw data output from onboard Bosch BMM150 Magnetometer.

| Label | Value |
| --- | --- |
| group | imu |
| name | magrawoutput |
| exper t | |
| type | boolean |
| defaultvalue | False |
| readonly | |

Table 3.14.6: mag raw output

**Notes:** The magnetometer raw data can be seen in the Advanced Tab of the Swift Console. imu.imu_raw_output must also be set to True for the magnetometer output to be enabled.

## 3.15   ins

### 3.15.1   accelbiasinstabilityavarmilligsensorframex

**Description:** Accelerometer bias instability as defined in an Allan Variance plot.

| Label | Value |
| --- | --- |
| group | ins |
| name | accel bias instability avar millig sensorf rame x |
| type | doubl e |
| exper t | |
| units | milli _ g |
| defaultvalue | 0 3 |
| readonly | |

Table 3.15.1: accel bias instability avar millig sensorframe x

**Notes:**

### 3.15.2   accelbiasinstabilityavarmilligsensorframey

**Description:** Accelerometer bias instability as defined in an Allan Variance plot.

| Label | Value |
| --- | --- |
| group | ins |
| name | accel bias instability avar millig sensorf rame y |
| type | doubl e |
| exper t | |
| units | milli _ g |
| defaultvalue | 0 3 |
| readonly | |

Table 3.15.2: accel bias instability avar millig sensorframe y

**Notes:**

### 3.15.3 accelbiasinstabilityavarmilligsensorframez

**Description:** Accelerometer bias instability as defined in an Allan Variance plot.

| Label | Value |
|---|---|
| group | ins |
| name | accel bias instability avar millig sensorf rame z |
| type | doubl e |
| exper t | |
| units | milli _ g |
| defaultvalue | 0 3 |
| readonly | |

Table 3.15.3: accel bias instability avar millig sensorframe z

**Notes:**

### 3.15.4 accelnoise

**Description:** Noise estimate for raw sensor

| Label | Value |
|---|---|
| group | ins |
| name | accelnoise |
| exper t | |
| type | float |
| units | Gs |
| default value | |

Table 3.15.4: accel noise

### 3.15.5 accelstillthreshold

**Description:** Gyro magnitude stillness thresold

| Label | Value |
|---|---|
| group | ins |
| name | accel still threshold |
| exper t | |
| type | f loat |
| units | Gs |
| default value | |
| readonly | |

Table 3.15.5: accel still threshold

### 3.15.6    accelvelocityrandomwalkmicrogpersqrtHzsensorframex

**Description:** Accelerometer white noise.

| Label | Value |
|---|---|
| group | ins |
| name | accel velocity random walk microgpersqrtHz sensorf rame x |
| type | doubl e |
| exper t | |
| units | micro _ gpersquareroothertz |
| defaultvalue | 177 |
| readonly | |

Table 3.15.6: accel velocity random walk microgpersqrtHz sensorframe x

**Notes:**

### 3.15.7    accelvelocityrandomwalkmicrogpersqrtHzsensorframey

**Description:** Accelerometer white noise.

| Label | Value |
|---|---|
| group | ins |
| name | accel velocity random walk microgpersqrtHz sensorf rame y |
| type | doubl e |
| exper t | |
| units | micro _ gpersquareroothertz |
| defaultvalue | 177 |
| readonly | |

Table 3.15.7: accel velocity random walk microgpersqrtHz sensorframe y

**Notes:**

### 3.15.8    accelvelocityrandomwalkmicrogpersqrtHzsensorframez

**Description:** Accelerometer white noise.

| Label | Value |
|---|---|
| group | ins |
| name | accel velocity random walk microgpersqrtHz sensorf rame z |
| type | doubl e |
| exper t | |
| units | micro _ gpersquareroothertz |
| defaultvalue | 177 |
| readonly | |

Table 3.15.8: accel velocity random walk microgpersqrtHz sensorframe z

**Notes:**

### 3.15.9   alignmentcogenable

**Description:** Enable updating the alignment algorithm by assuming course over ground (i.e. the horizontal direction of the velocity vector) is equal to the vehicle heading.

| Label | Value |
|---|---|
| group | ins |
| name | alignmentcogenable |
| type | boolean |
| exper t | |
| units | |
| defaultvalue | true |
| readonly | |

Table 3.15.9: alignment cog enable

**Notes:**

### 3.15.10   alignmentcoglowspeeddisambiguationenable

**Description:** If this parameter is set to true, COG updates will also be used if the current vehicle speed does not exceed alignment_cog_min_speed_meters_per_second.

| Label | Value |
|---|---|
| group | ins |
| name | alignmentcoglowspeeddisambiguationenable |
| type | boolean |
| exper t | |
| units | |
| defaultvalue | false |
| readonly | |

Table 3.15.10: alignment cog low speed disambiguation enable

**Notes:**

### 3.15.11   alignmentcogminspeedmeterspersecond

**Description:** If enabled, COG updates will only be used if the current vehicle speed exceeds this threshold. Value should be >= 1m/s.

| Label | Value |
|---|---|
| group | ins |
| name | alignmentcogminspeedmeterspersecond |
| type | double |
| exper t | |
| units | meterspersecond |
| defaultvalue | 5 |
| readonly | |

Table 3.15.11: alignment cog min speed meters per second

**Notes:**

### 3.15.12   alignmentsettings1

**Description:**

| Label | Value |
|---|---|
| group | ins |
| name | alignment settings 1 |
| type | doubl e |
| exper t | |
| units | |
| default value | 3 |
| readonly | |

Table 3.15.12: alignment settings 1

**Notes:**

### 3.15.13   antennaoffsetdeviation

**Description:** Standard deviation of antenna lever arm measurement.

| Label | Value |
|---|---|
| group | ins |
| name | antennaoffsetdeviation |
| type | double |
| units | meters |
| defaultvalue | 0.05 |
| readonly | |

Table 3.15.13: antenna offset deviation

**Notes:** Must be greater than 0.

This value should overestimate the actual expected error.

### 3.15.14   antennaoffsetx

**Description:** X component of vector from device frame to antenna phase center

| Label | Value |
| --- | --- |
| group | ins |
| name | antenna offset x |
| exper t | |
| type | doubl e |
| units | meter s |
| default value | 0 |
| readonly | |

Table 3.15.14: antenna offset x

**Notes:** The vector is measured in the device frame according to the markings on the device.

### 3.15.15   antennaoffsety

**Description:** Y component of vector from device frame to antenna phase center

| Label | Value |
| --- | --- |
| group | ins |
| name | antennaoffsety |
| exper t | |
| type | double |
| units | meters |
| defaultvalue | 0 |
| readonly | |

Table 3.15.15: antenna offset y

**Notes:** The vector is measured in the device frame according to the markings on the device.

### 3.15.16   antennaoffsetz

**Description:** Z component of vector from device frame to antenna phase center

| Label | Value |
| --- | --- |
| group | ins |
| name | antennaoffsetz |
| exper t | |
| type | double |
| units | meters |
| defaultvalue | −0.12674 |
| readonly | |

Table 3.15.16: antenna offset z

**Notes:** The vector is measured in the device frame according to the markings on the device. The default value represents the offset from the Duro Device Frame to the antenna phase center when the antenna mounting bracket shipped with Duro is in use.

### 3.15.17   builddate

**Description:** inertial navigation system build date

| Label | Value |
|---|---|
| group | ins |
| name | build date |
| exper t | |
| type | str ing |
| units | N/A |
| default value | N/A |
| readonly | |

Table 3.15.17: build date

### 3.15.18   buildname

**Description:** inertial navigation system build name

| Label | Value |
|---|---|
| group | ins |
| name | build name |
| exper t | |
| type | str ing |
| units | N/A |
| default value | N/A |
| readonly | |

Table 3.15.18: build name

### 3.15.19   constrainvehiclesideslip

**Description:** Experimental non-holonomic constraint feature that allows inertial system to make assumptions about vehicle dynamics

| Label | Value |
|---|---|
| group | ins |
| name | constrainvehiclesideslip |
| exper t | |
| type | boolean |
| units | N/A |
| default value | |
| readonly | |

Table 3.15.19: constrain vehicle sideslip

**Notes:** This settings should only be enabled provided the vehicle frame Euler angles are measured precisely and are correct. It assumes a vehicle can have no velocity in the direction aligned with the vehicle "y" axis (i.e no sideslip). This is a reasonable assumption for passenger vehicles and many tractors.

### 3.15.20   drdurationmax

**Description:** Indicates the maximum duration in seconds for which the inertial system will dead reckon.

| Label | Value |
|---|---|
| group | ins |
| name | drdurationmax |
| exper t | |
| type | double |
| units | seconds |
| defaultvalue | 600 |
| readonly | |

Table 3.15.20: dr duration max

**Notes:** The default value of 600 seconds was chosen as the expected duration for which the Duro Inertial solution can maintain sub-meter accuracy.

### 3.15.21   drtimeoutposstddev

**Description:** Indicates the maximum standard deviation of position for which the inertial system will dead reckon.

| Label | Value |
|---|---|
| group | ins |
| name | drtimeoutposstddev |
| exper t | |
| type | double |
| units | meters |
| defaultvalue | 20 |
| readonly | |

Table 3.15.21: dr timeout pos stddev

**Notes:** The default value of 20 meters was chosen as the logical minimum standard of the position accuracy during dead reckon mode.

### 3.15.22   filterpos

**Description:** Enabled low-speed position filtering (advanced use only)

| Label | Value |
|---|---|
| group | ins |
| name | filter pos |
| exper t | |
| type | bool ean |
| default value | |

Table 3.15.22: filter pos

### 3.15.23   filtervel

**Description:** Enabled low-speed velocity filtering (advanced use only)

| Label | Value |
|---|---|
| group | ins |
| name | filtervel |
| exper t | |
| type | boolean |
| default value | |

Table 3.15.23: filter vel

### 3.15.24   filtervelhalflifealpha

**Description:** Parameter for low-speed velocity filtering

| Label | Value |
|---|---|
| group | ins |
| name | filter vel half life alpha |
| exper t | |
| type | f loat |
| units | N/A |
| default value | |

Table 3.15.24: filter vel half life alpha

### 3.15.25   filtervelmax

**Description:** Velocity above which to disable velocity filtering

| Label | Value |
|---|---|
| group | ins |
| name | filter vel max |
| exper t | |
| type | f loat |
| units | m/s |
| default value | |

Table 3.15.25: filter vel max

### 3.15.26   filtervelmaxhalflifems

**Description:** Time constant parameter for low-speed velocity filtering

| Label | Value |
|---|---|
| group | ins |
| name | filter vel max half life ms |
| exper t | |
| type | f loat |
| units | mil l iseconds |
| default value | |

Table 3.15.26: filter vel max half life ms

### 3.15.27   filtervelmin

**Description:** Velocity below whih to enable advanced velocity filtering

| Label | Value |
|---|---|
| group | ins |
| name | filtervelmin |
| exper t | |
| type | float |
| units | m/s |
| default value | |

Table 3.15.27: filter vel min

### 3.15.28   fusedsolnfreq

**Description:** Fusion engine output rate in Hertz.

| Label | Value |
|---|---|
| group | ins |
| name | f used soln f req |
| type | doubl e |
| exper t | |
| units | her tz |
| default value | 10 |
| readonly | |

Table 3.15.28: fused soln freq

**Notes:** Make sure that the rate is less than the imu rate.

### 3.15.29   gyroangularrandomwalkdegpersqrthsensorframex

**Description:** Angular rate white noise.

| Label | Value |
|---|---|
| group | ins |
| name | gyro angular random walk degpersqrth sensorf rame x |
| type | doubl e |
| exper t | |
| units | deg r eesper sq uar er oothour |
| defaultvalue | .69 |
| readonly | |

Table 3.15.29: gyro angular random walk degpersqrth sensorframe x

**Notes:**

### 3.15.30   gyroangularrandomwalkdegpersqrthsensorframey

**Description:** Angular rate white noise.

| Label | Value |
|---|---|
| group | ins |
| name | gyro angular random walk degpersqrth sensorf rame y |
| type | doubl e |
| exper t | |
| units | deg r eesper sq uar er oothour |
| defaultvalue | .69 |
| readonly | |

Table 3.15.30: gyro angular random walk degpersqrth sensorframe y

**Notes:**

### 3.15.31   gyroangularrandomwalkdegpersqrthsensorframez

**Description:** Angular rate white noise.

| Label | Value |
|---|---|
| group | ins |
| name | gyro angular random walk degpersqrth sensorf rame z |
| type | doubl e |
| exper t | |
| units | deg r eesper sq uar er oothour |
| default value | .69 |
| readonly | |

Table 3.15.31: gyro angular random walk degpersqrth sensorframe z

**Notes:**

### 3.15.32   gyrobiasinstabilityavardegperhsensorframex

**Description:** Angular rate bias instability as defined in an Allan Variance plot.

| Label | Value |
|---|---|
| group | ins |
| name | gyro bias instability avar degperh sensorf rame x |
| type | doubl e |
| exper t | |
| units | deg r eesper hour |
| defaultvalue | 10 |
| readonly | |

Table 3.15.32: gyro bias instability avar degperh sensorframe x

**Notes:**

### 3.15.33   gyrobiasinstabilityavardegperhsensorframey

**Description:** Angular rate bias instability as defined in an Allan Variance plot.

| Label | Value |
|---|---|
| group | ins |
| name | gyro bias instability avar degperh sensorf rame y |
| type | doubl e |
| exper t | |
| units | deg r eesper hour |
| defaultvalue | 10 |
| readonly | |

Table 3.15.33: gyro bias instability avar degperh sensorframe y

**Notes:**

### 3.15.34   gyrobiasinstabilityavardegperhsensorframez

**Description:** Angular rate bias instability as defined in an Allan Variance plot.

| Label | Value |
|---|---|
| group | ins |
| name | gyro bias instability avar degperh sensorf rame z |
| type | doubl e |
| exper t | |
| units | deg r eesper hour |
| default value | 10 |
| readonly | |

Table 3.15.34: gyro bias instability avar degperh sensorframe z

**Notes:**

### 3.15.35   gyronoise

**Description:** Noise estimate for raw sensor

| Label | Value |
|---|---|
| group | ins |
| name | gyronoise |
| exper t | |
| type | float |
| units | deg/s |
| default value | |

Table 3.15.35: gyro noise

### 3.15.36   gyrostillthreshold

**Description:** Gyro magnitude stillness thresold

| Label | Value |
|---|---|
| group | ins |
| name | gyro still threshold |
| exper t | |
| type | f loat |
| units | r ad/sec |
| default value | |

Table 3.15.36: gyro still threshold

### 3.15.37   lowpassfiltercutoffhz

**Description:** The cut-off frequency of the low-pass filter (smaller than half the nominal_sample_rate_hz).

| Label | Value |
|---|---|
| group | ins |
| name | lowpass filter cutoff hz |
| type | doubl e |
| exper t | |
| units | |
| default value | g er tz |
| readonly | 1 |

Table 3.15.37: lowpass filter cutoff hz

**Notes:**

### 3.15.38   odometrynoise1

**Description:** Noise parameter for odometry source 1

| Label | Value |
|---|---|
| group | ins |
| name | odometrynoise1 |
| exper t | |
| type | double |
| units | m/s |
| defaultvalue | 0.28 |
| readonly | |

Table 3.15.38: odometry noise 1

### 3.15.39   odometrynoise2

**Description:** Noise parameter for odometry source 2

| Label | Value |
|---|---|
| group | ins |
| name | odometry  noise  2 |
| exper t | |
| type | doubl e |
| units | m/s |
| defaultvalue | 028 |
| readonly | |

Table 3.15.39: odometry noise 2

### 3.15.40   odometrynoise3

**Description:** Noise parameter for odometry source 3

| Label | Value |
|---|---|
| group | ins |
| name | odometry noise 3 |
| exper t | |
| type | doubl |
| units | e m/s |
| default value | 0.28 |
| readonly | |

Table 3.15.40: odometry noise 3

### 3.15.41 odometrynoise4

**Description:** Noise parameter for odometry source 4

| Label | Value |
|---|---|
| group | ins |
| name | odometry noise 4 |
| exper t | |
| type | doubl e |
| units | m/s |
| defaultvalue | 028 |
| readonly | |

Table 3.15.41: odometry noise 4

### 3.15.42 outputmode

**Description:** Determines output mode of the inertial navigation outputs.

| Label | Value |
|---|---|
| group | ins |
| name | output mode |
| exper t | |
| type | enum |
| units | N/A |
| default value | D isabl ed |
| readonly | |
| enumerated possible values | Disabled, LooselyC oupled |

Table 3.15.42: output mode

**Notes:** Disabled - output GNSS-only solutions.

Loosely Coupled - output loosely coupled solutions, utilizing GNSS and inertial data.

### 3.15.43   posstddeviationcutoffmeters

**Description:** GNSS position standard deviation cutoff - only solutions with a standard deviation lower than this will be used.

| Label | Value |
| --- | --- |
| group | ins |
| name | posstddeviationcutoffmeters |
| exper t | |
| type | double |
| units | meters |
| defaultvalue | 30 |
| readonly | |

Table 3.15.43: pos std deviation cutoff meters

**Notes:**

### 3.15.44   solutionaccuracyconfidencelevel

**Description:** Sets the confidence level for the message SBP MSG_LLH_ACC.

| Label | Value |
| --- | --- |
| group | ins |
| name | solution accuracy confidence level |
| type | enum |
| exper t | |
| units | per cent |
| defaultvalue | 68 |
| readonly | |
| enumerated possible values | 40,68 |

Table 3.15.44: solution accuracy confidence level

**Notes:**

### 3.15.45   stillnessautotune

**Description:** Automatically attempt to tune stillness detection thresholds

| Label | Value |
| --- | --- |
| group | ins |
| name | stillnessautotune |
| exper t | |
| type | boolean |
| default value | |

Table 3.15.45: stillness autotune

### 3.15.46   stillnessdetectionenable

**Description:** Experimental stillness detection feature

| Label | Value |
| --- | --- |
| group | ins |
| name | stillness detection enable |
| exper t | |
| type | bool ean |
| units | N/A |
| default value | |
| readonly | |

Table 3.15.46: stillness detection enable

**Notes:** This settings attempts to automatically determine that a particular vehicle is still based upon its vibration and dynamics profile. It can improve performance on vehicles when stopped and/or idling.

### 3.15.47   stillnessdetectionuseaccel

**Description:** Use accelermoter in detecting stillness

| Label | Value |
| --- | --- |
| group | ins |
| name | stillnessdetectionuseaccel |
| exper t | |
| type | boolean |
| default value | |

Table 3.15.47: stillness detection use accel

### 3.15.48   stillnessdetectionusegyro

**Description:** Use gyro in detecting stillness

| Label | Value |
| --- | --- |
| group | ins |
| name | stillness detection use gyro |
| exper t | |
| type | bool ean |
| default value | |

Table 3.15.48: stillness detection use gyro

### 3.15.49   vehicleframedeviation

**Description:** Standard deviation of misalignment measurement.

| Label | Value |
| --- | --- |
| group | ins |
| name | vehicle frame deviation |
| type | doubl e |
| units | deg r ees |
| defaultvalue | 1 |
| readonly | |

Table 3.15.49: vehicle frame deviation

**Notes:** Must be greater than 0.

This value should overestimate the actual expected error.

### 3.15.50   vehicleframeoffsetx

**Description:** X component of vector from device frame to vehicle frame origin in which inertial outputs are provided

| Label | Value |
| --- | --- |
| group | ins |
| name | vehicleframeoffsetx |
| exper t | |
| type | double |
| units | meters |
| defaultvalue | 0 |
| readonly | |

Table 3.15.50: vehicle frame offset x

**Notes:** The vector is measured in the device frame according to the markings on the device. In order to output inertial solutions at the antenna phase center, this should be the same value (both sign and magnitude) as antenna_offset_x setting.

### 3.15.51   vehicleframeoffsety

**Description:** Y component of vector from device frame to vehicle frame origin in which inertial outputs are provided

| Label | Value |
|---|---|
| group | ins |
| name | vehicle frame offset y |
| exper t | |
| type | doubl e |
| units | meter s |
| default value | 0 |
| readonly | |

Table 3.15.51: vehicle frame offset y

**Notes:** The vector is measured in the device frame according to the markings on the device. In order to output inertial solutions at the antenna phase center, this should be the same value (both sign and magnitude) as antenna_offset_x setting.

### 3.15.52  vehicleframeoffsetz

**Description:** Z component of vector from device frame to vehicle frame origin in which inertial outputs are provided

| Label | Value |
|---|---|
| group | ins |
| name | vehicleframeoffsetz |
| exper t | |
| type | double |
| units | meters |
| defaultvalue | −0.12674 |
| readonly | |

Table 3.15.52: vehicle frame offset z

**Notes:** The vector is measured in the device frame according to the markings on the device. In order to output inertial solutions at the antenna phase center, this should be the same value (both sign and magnitude) as antenna_offset_x setting. The default value represents vehicle outpus at the antenna phase center when the Duro antenna mounting bracket is in use.

### 3.15.53  vehicleframepitch

**Description:** Pitch angle representing rotation from vehicle frame to device frame.

| Label | Value |
|---|---|
| group | ins |
| name | vehicleframepitch |
| exper t | |
| type | double |
| units | degrees |
| defaultvalue | 0 |
| readonly | |

Table 3.15.53: vehicle frame pitch

**Notes:** The euler angles are applied extrinsically in order roll, pitch, then yaw about the defined vehicle axes to describe how the vehicle should rotate to align with the device frame as mounted in the vehicle. These rotations directly affect body velocities, attitude outputs.

### 3.15.54   vehicleframeroll

**Description:** Roll angle representing rotation from vehicle frame to device frame.

| Label | Value |
|---|---|
| group | ins |
| name | vehicleframeroll |
| exper t | |
| type | double |
| units | degrees |
| defaultvalue | 0 |
| readonly | |

Table 3.15.54: vehicle frame roll

**Notes:** The euler angles are applied extrinsically in order roll, pitch, then yaw about the defined vehicle axes to describe how the vehicle should rotate to align with the device frame as mounted in the vehicle. These rotations directly affect body velocities, attitude outputs.

### 3.15.55   vehicle frame yaw

**Description:** Yaw angle representing rotation from vehicle frame to device frame.

| Label | Value |
|---|---|
| group | ins |
| name | vehicleframeyaw |
| exper t | |
| type | double |
| units | degrees |
| defaultvalue | 0 |
| readonly | |

Table 3.15.55: vehicle frame yaw

**Notes:** The euler angles are applied extrinsically in order roll, pitch, then yaw about the defined vehicle axes to describe how the vehicle should rotate to align with the device frame as mounted in the vehicle. These rotations directly affect body velocities, attitude outputs.

### 3.15.56   velstillthreshold

**Description:** Gyro magnitude stillness thresold

| Label | Value |
| --- | --- |
| group | ins |
| name | vel still threshold |
| exper t | |
| type | f loat |
| units | m/s |
| default value | |

Table 3.15.56: vel still threshold

### 3.15.57   zupt acceleration threshold mpers2

**Description:** Maximum allowed acceleration while in ZUPT.

| Label | Value |
| --- | --- |
| group | ins |
| name | zupt acceleration threshold mpers2 |
| type | doubl e |
| exper t | |
| units | meter sper secondsq uar ed |
| defaultvalue | 005 |
| readonly | |

Table 3.15.57: zupt acceleration threshold mpers2

**Notes:**

### 3.15.58   zuptangularratethresholddegpers

**Description:** Maximum allowed angular rate while in in ZUPT.

| Label | Value |
| --- | --- |
| group | ins |
| name | zupt angular rate threshold degpers |
| type | doubl e |
| exper t | |
| units | deg r eesper second |
| defaultvalue | 0 3 |
| readonly | |

Table 3.15.58: zupt angular rate threshold degpers

**Notes:**

### 3.15.59   zuptenablefullzerovelupdate

**Description:** Enable full zero-velocity update (ZUPT).

| Label | Value |
|---|---|
| group | ins |
| name | zupt enable full zerovel update |
| type | bool ean |
| exper t | |
| units | |
| default value | |
| readonly | true |

Table 3.15.59: zupt enable full zerovel update

**Notes:**

### 3.15.60   zuptenablepartialzerovelupdate

**Description:** Enable partial zero-velocity update (ZUPT).

| Label | Value |
|---|---|
| group | ins |
| name | zupt enable partial zerovel update |
| type | bool ean |
| exper t | |
| units | |
| defaultvalue | |
| readonly | true |

Table 3.15.60: zupt enable partial zerovel update

**Notes:**

### 3.15.61   zupt enable zero angular rate update

**Description:** Enable zero angular rate update.

| Label | Value |
|---|---|
| group | ins |
| name | zupt enable zero angular rate update |
| type | bool ean |
| exper t | |
| units | |
| defaultvalue | |
| readonly | true |

Table 3.15.61: zupt enable zero angular rate update

**Notes:**

### 3.15.62   zuptsettings1

**Description:**

| Label | Value |
|---|---|
| group | ins |
| name | zupt settings 1 |
| type | doubl e |
| exper t | |
| units | |
| default value | 0.1 |
| readonly | |

Table 3.15.62: zupt settings 1

**Notes:**

### 3.15.63   zuptsettings2

**Description:**

| Label | Value |
|---|---|
| group | ins |
| name | zupt settings 2 |
| type | doubl e |
| exper t | |
| units | |
| default value | 0.1 |
| readonly | |

Table 3.15.63: zupt settings 2

**Notes:**

### 3.15.64   zuptsettings3

**Description:**

| Label | Value |
|---|---|
| group | ins |
| name | zupt settings 3 |
| type | doubl e |
| exper t | |
| units | |
| default value | 0.05 |
| readonly | |

Table 3.15.64: zupt settings 3

**Notes:**

### 3.15.65   zuptsettings4

**Description:**

| Label | Value | |
|-------|-------|---|
| group | ins | |
| name | zupt settings | 4 |
| type | doubl e | |
| exper t | | |
| units | | |
| default value | 0.5 | |
| readonly | | |

Table 3.15.65: zupt settings 4

**Notes:**

### 3.15.66    zuptsettings5

**Description:**

| Label | Value | |
|-------|-------|---|
| group | ins | |
| name | zupt settings | 5 |
| type | doubl e | |
| exper t | | |
| units | | |
| default value | 4 | |
| readonly | | |

Table 3.15.66: zupt settings 5

**Notes:**

## 3.16    l1ca track

### 3.16.1    showunconfirmed

**Description:** Show unconfirmed tracking channels in tracking state.

| Label | Value |
|-------|-------|
| group | l1catrack |
| name | show unconfirmed |
| exper t | |
| type | bool ean |
| readonly | |

Table 3.16.1: show unconfirmed

### 3.16.2    xcorrcof

**Description:** cross correlation coefficient.

| Label | Value |
|---|---|
| group | l1catrack |
| name | xcorr cof |
| exper t | |
| type | f loat |
| readonly | |

Table 3.16.2: xcorr cof

### 3.16.3  xcorrdelta

**Description:** cross correlation delta.

| Label | Value |
|---|---|
| group | l1catrack |
| name | xcorr delta |
| exper t | |
| type | f loat |
| readonly | |

Table 3.16.3: xcorr delta

### 3.16.4  xcorrtime

**Description:** cross correlation time.

| Label | Value |
|---|---|
| group | l1catrack |
| name | xcorr time |
| exper t | |
| type | f loat |
| readonly | |

Table 3.16.4: xcorr time

## 3.17  l2c track

### 3.17.1  showunconfirmed

**Description:** Show unconfirmed tracking channels in tracking state.

| Label | Value |
|-------|-------|
| group | l2ctrack |
| name | show unconfirmed |
| exper t | |
| type | bool |
| readonly | |

Table 3.17.1: show unconfirmed

### 3.17.2  xcorrcof

**Description:** cross correlation coefficient.

| Label | Value |
|-------|-------|
| group | l2ctrack |
| name | xcorr cof |
| exper t | |
| type | f loat |
| readonly | |

Table 3.17.2: xcorr cof

### 3.17.3  xcorrdelta

**Description:** cross correlation delta.

| Label | Value |
|-------|-------|
| group | l2ctrack |
| name | xcorr delta |
| exper t | |
| type | f loat |
| readonly | |

Table 3.17.3: xcorr delta

### 3.17.4  xcorrtime

**Description:** cross correlation time.

| Label | Value |
|---|---|
| group | l2ctrack |
| name | xcorr time |
| exper t | |
| type | f loat |
| readonly | |

Table 3.17.4: xcorr time

## 3.18   metricsdaemon

### 3.18.1   enablelogtofile

**Description:** Enable metric logging to file

| Label | Value |
|---|---|
| group | metrics daemon |
| name | enable log to file |
| exper t | |
| type | bool |
| units | N/A |
| default value | true |
| readonly | |

Table 3.18.1: enable log to file

**Notes:**

### 3.18.2   metricsupdateinterval

**Description:** Set metric update interval

| Label | Value |
|---|---|
| group | metrics daemon |
| name | metrics update interval |
| exper t | |
| type | integ er |
| units | seconds |
| default value | 1 |
| readonly | |

Table 3.18.2: metrics update interval

**Notes:**

## 3.19 ndb

### 3.19.1 erasealmanac

**Description:** Erase stored almanacs during boot.

| Label | Value |
|---|---|
| group | ndb |
| name | erase almanac |
| exper t | |
| type | bool ean |
| default value | F alse |
| readonly | |

Table 3.19.1: erase almanac

### 3.19.2 erasealmanacwn

**Description:** Erase stored almanac week numbers during boot.

| Label | Value |
|---|---|
| group | ndb |
| name | erase almanac wn |
| exper t | |
| type | bool ean |
| default value | F alse |
| readonly | |

Table 3.19.2: erase almanac wn

### 3.19.3 eraseephemeris

**Description:** Erase stored ephmerides during boot.

| Label | Value |
|---|---|
| group | ndb |
| name | erase ephemeris |
| exper t | |
| type | bool ean |
| default value | True |
| readonly | |

Table 3.19.3: erase ephemeris

### 3.19.4   erasegnsscapb

**Description:** Erase stored GNSS capability mask during boot.

| Label | Value |
| --- | --- |
| group | ndb |
| name | erase gnss capb |
| exper t | |
| type | bool ean |
| default value | F alse |
| readonly | |

Table 3.19.4: erase gnss capb

### 3.19.5   eraseiono

**Description:** Erase stored ionospheric parameters during boot.

| Label | Value |
| --- | --- |
| group | ndb |
| name | eraseiono |
| exper t | |
| type | boolean |
| defaultvalue | False |
| readonly | |

Table 3.19.5: erase iono

### 3.19.6   eraselgf

**Description:** Erase stored last fix information during boot.

| Label | Value |
| --- | --- |
| group | ndb |
| name | erase lgf |
| exper t | |
| type | bool ean |
| default value | True |
| readonly | |

Table 3.19.6: erase lgf

### 3.19.7 eraseutcparams

**Description:** Erase stored UTC offset parameters during boot.

| Label | Value |
| --- | --- |
| group | ndb |
| name | erase utc params |
| exper t | |
| type | bool ean |
| default value | F alse |
| readonly | |

Table 3.19.7: erase utc params

### 3.19.8 lgfupdatem

**Description:** Change in position required to update last good fix.

| Label | Value |
| --- | --- |
| group | ndb |
| name | lgf update m |
| exper t | |
| type | int |
| defaultvalue | 10000 |
| readonly | |
| units | meters |

Table 3.19.8: lgf update m

### 3.19.9 lgfupdates

**Description:** Update period for navigation database last good fix.

| Label | Value |
| --- | --- |
| group | ndb |
| name | lgfupdates |
| exper t | |
| type | int |
| defaultvalue | 1800 |
| readonly | |
| units | seconds |

Table 3.19.9: lgf update s

### 3.19.10   validalmacc

**Description:**

| Label | Value |
|---|---|
| group | ndb |
| name | valid alm acc |
| exper t | |
| type | int |
| default value | 5000 |
| readonly | |
| units | meter s |

Table 3.19.10: valid alm acc

### 3.19.11   validalmdays

**Description:** Number of days for which Almanac is valid.

| Label | Value |
|---|---|
| group | ndb |
| name | valid alm days |
| exper t | |
| type | int |
| defaultvalue | 6 |
| readonly | |
| units | days |

Table 3.19.11: valid alm days

### 3.19.12   validephacc

**Description:**

| Label | Value |
|---|---|
| group | ndb |
| name | valid eph acc |
| exper t | |
| type | int |
| default value | 100 |
| readonly | |
| units | meter s |

Table 3.19.12: valid eph acc

## 3.20 nmea

### 3.20.1 cogoutputminspeed

**Description:** Minimum speed for outputting Course-Over-Ground values.

| Label | Value |
| --- | --- |
| group | nmea |
| name | cogoutputminspeed |
| exper t | |
| type | float |
| units | Meterspersecond |
| digits | 2 |
| defaultvalue | 0.1 |
| readonly | |
| enumerated possible values | |

Table 3.20.1: cog output min speed

**Notes:** For value '0' Course-Over-Ground is output always when fix is available.

### 3.20.2 cogupdateminspeed

**Description:** Minimum speed for updating the current Course-Over-Ground value.

| Label | Value |
| --- | --- |
| group | nmea |
| name | cogupdateminspeed |
| exper t | |
| type | float |
| units | Meterspersecond |
| digits | 2 |
| defaultvalue | 0.1 |
| readonly | |
| enumerated possible values | |

Table 3.20.2: cog update min speed

**Notes:** For value '0' Course-Over-Ground is updated always when a fix is available. For non '0' values, the Course-Over-Ground value will only be recomputed and updated when the speed exceeds the specified value.

### 3.20.3 gpggamsgrate

**Description:** Number of Solution Periods between GGA NMEA messages being sent.

| Label | Value |
| --- | --- |
| group | nmea      gpgga |
| name | msg rate |
| exper t | |
| type | integ er |
| units | S olutionP eriod |
| default value | 1 |
| readonly | |

Table 3.20.3: gpgga msg rate

**Notes:** This setting represents the integer number of solution periods between each transmission of the NMEA message. For example, if the solution rate is 10 Hz, and this rate setting is 2, the NMEA message will be sent every two solution epochs at a rate of 5 Hz. If this setting is 0, the msg will be suppressed.

### 3.20.4  gpgllmsgrate

**Description:** Number of Solution Periods between GLL NMEA messages being sent.

| Label | Value |
| --- | --- |
| group | nmea |
| name | gpgllmsgrate |
| exper t | |
| type | integer |
| units | SolutionPeriod |
| defaultvalue | 10 |
| readonly | |

Table 3.20.4: gpgll msg rate

**Notes:** This setting represents the integer number of solution periods between each transmission of the NMEA message. For example, if the solution rate is 10 Hz, and this rate setting is 2, the NMEA message will be sent every two solution epochs at a rate of 5 Hz. If this setting is 0, the msg will be suppressed.

### 3.20.5  gpgsamsgrate

**Description:** Number of Solution Periods between GSA NMEA messages being sent.

| Label | Value |
| --- | --- |
| group | nmea |
| name | gpgsamsgrate |
| exper t | |
| type | integer |
| units | SolutionPeriod |
| defaultvalue | 10 |
| readonly | |
| enumerated possible val-ues | |

Table 3.20.5: gpgsa msg rate

**Notes:** This setting represents the integer number of solution periods between each transmission of the NMEA message.

### 3.20.6   gpgstmsgrate

**Description:** Number of Solution Periods between GST NMEA messages being sent.

| Label | Value |
|---|---|
| group | nmea |
| name | gpgstmsgrate |
| exper t | |
| type | integer |
| units | SolutionPeriod |
| defaultvalue | 1 |
| readonly | |
| enumerated possible values | |

Table 3.20.6: gpgst msg rate

**Notes:** This setting represents the integer number of solution periods between each transmission of the NMEA message.

### 3.20.7   gpgsvmsgrate

**Description:** Number of Solution Periods between GSV NMEA messages being sent.

| Label | Value |
|---|---|
| group | nmea |
| name | gpgsvmsgrate |
| exper t | |
| type | integer |
| units | SolutionPeriod |
| defaultvalue | 10 |
| readonly | |

Table 3.20.7: gpgsv msg rate

**Notes:** This setting represents the integer number of solution periods between each transmission of the NMEA message. For example, if the solution rate is 10 Hz, and this rate setting is 2, the NMEA message will be sent every two solution epochs at a rate of 5 Hz. If this setting is 0, the msg will be suppressed.

### 3.20.8   gphdtmsgrate

**Description:** Number of Solution Periods between HDT NMEA messages being sent.

| Label | Value |
|---|---|
| group | nmea      gphdt |
| name | msg rate |
| exper t | |
| type | integ er |
| units | S olutionP eriod |
| default value | 1 |
| readonly | |

Table 3.20.8: gphdt msg rate

**Notes:** This setting represents the integer number of solution periods between each transmission of the NMEA message. For example, if the solution rate is 10 Hz, and this rate setting is 2, the NMEA message will be sent every two solution epochs at a rate of 5 Hz. If this setting is 0, the msg will be suppressed.

### 3.20.9   gprmcmsgrate

**Description:** Number of Solution Periods between RMC NMEA messages being sent.

| Label | Value |
|---|---|
| group | nmea |
| name | gprmcmsgrate |
| exper t | |
| type | integer |
| units | SolutionPeriod |
| defaultvalue | 10 |
| readonly | |

Table 3.20.9: gprmc msg rate

**Notes:** This setting represents the integer number of solution periods between each transmission of the NMEA message. For example, if the solution rate is 10 Hz, and this rate setting is 2, the NMEA message will be sent every two solution epochs at a rate of 5 Hz. If this setting is 0, the msg will be suppressed.

### 3.20.10   gpvtgmsgrate

**Description:** Number of Solution Periods between VTG NMEA messages being sent.

| Label | Value |
|---|---|
| group | nmea |
| name | gpvtgmsgrate |
| exper t | |
| type | integer |
| units | SolutionPeriod |
| defaultvalue | 1 |
| readonly | |

Table 3.20.10: gpvtg msg rate

**Notes:** This setting represents the integer number of solution periods between each transmission of the NMEA message. For example, if the solution rate is 10 Hz, and this rate setting is 2, the NMEA message will be sent every two solution epochs at a rate of 5 Hz. If this setting is 0, the msg will be suppressed.

### 3.20.11    gpzdamsgrate

**Description:** Number of Solution Periods between ZDA NMEA messages being sent.

| Label | Value |
|---|---|
| group | nmea |
| name | gpzdamsgrate |
| exper t | |
| type | integer |
| units | SolutionPeriod |
| defaultvalue | 10 |
| readonly | |
| enumerated possible values | |

Table 3.20.11: gpzda msg rate

**Notes:** This setting represents the integer number of solution periods between each transmission of the NMEA message. For example, if the solution rate is 10 Hz, and this rate setting is 2, the NMEA message will be sent every two solution epochs at a rate of 5 Hz. If this setting is 0, the msg will be suppressed.

### 3.20.12    gsamsgrate

**Description:** Number of Solution Periods between GSA NMEA messages being sent.

| Label | Value |
|---|---|
| group | nmea |
| name | gsamsgrate |
| exper t | |
| type | integer |
| units | SolutionPeriods |
| defaultvalue | 10 |
| readonly | |
| enumerated possible values | |

Table 3.20.12: gsa msg rate

**Notes:** This setting represents the integer number of solution periods between each transmission of the NMEA message. For example, if the solution rate is 10 Hz, and this rate setting is 2, the NMEA message will be sent every two solution epochs at a rate of 5 Hz. If this setting is 0, the msg will be suppressed.

## 3.21    ntrip

### 3.21.1    debug

**Description:** Additional debug messages for NTRIP (sent to /var/log/messages).

| Label | Value |
|---|---|
| group | ntr ip |
| name | debug |
| exper t | |
| type | bool ean |
| default value | F alse |
| readonly | |

Table 3.21.1: debug

### 3.21.2  enable

**Description:** Enable NTRIP client.

| Label | Value |
|---|---|
| group | ntr ip |
| name | enabl e |
| exper t | |
| type | bool ean |
| units | N/A |
| default value | F alse |
| readonly | |
| enumerated possible values | T rue, F alse |

Table 3.21.2: enable

**Notes:** If True, NTRIP client will be used.

### 3.21.3  ggaoutinterval

**Description:** Interval at which the NMEA GGA sentence is uploaded to the NTRIP server

| Label | Value |
|---|---|
| group | ntrip |
| name | ggaoutinterval |
| exper t | |
| type | integer |
| units | seconds |
| defaultvalue | 0 |
| readonly | |
| enumerated possible values | |

Table 3.21.3: gga out interval

**Notes:** The interval (in seconds) at which the NMEA GGA sentence is uploaded to the specified NTRIP server. The

default of 0 disables the GGA sentence upload.

### 3.21.4   ggaoutrev1

**Description:** If True, the NTRIP client will use an NTRIP 1.0 formatted GGA sentence.

| Label | Value |
| --- | --- |
| group | ntrip |
| name | ggaoutrev1 |
| exper t | |
| type | boolean |
| units | seconds |
| defaultvalue | False |
| readonly | |
| enumerated possible values | |

Table 3.21.4: gga out rev1

**Notes:** By default, the NTRIP client will use an NTRIP 2.0 formatted GGA sentence, which prefixes the GGA sentence with "Ntrip-GGA: ". If this option is enabled, the prefix will be dropped.

### 3.21.5   password

**Description:** NTRIP password to use.

| Label | Value |
| --- | --- |
| group | ntr ip |
| name | passw or d |
| exper t | |
| type | str ing |
| units | N/A |
| default value | N/A |
| readonly | |
| enumerated possible values | |

Table 3.21.5: password

**Notes:** Password to use with NTRIP client. NTRIP must be enabled to use this setting.

### 3.21.6   url

**Description:** NTRIP URL to use.

| Label | Value |
|---|---|
| group | ntr ip |
| name | url |
| exper t | |
| type | str ing |
| units | N/A |
| default value | N/A |
| readonly | |
| enumerated possible values | |

Table 3.21.6: url

**Notes:** NTRIP must be enabled to use this setting. URLs should be HTTP URLs with a port, and a mountpoint path such as example.com:2101/BAZ_RTCM3. NTRIP 'enable' must be 'False' in order to change this setting.

### 3.21.7   username

**Description:** NTRIP username to use.

| Label | Value |
|---|---|
| group | ntrip |
| name | username |
| exper t | |
| type | string |
| units | N/A |
| defaultvalue | N/A |
| readonly | |
| enumerated possible values | |

Table 3.21.7: username

**Notes:** Username to use with NTRIP client. NTRIP must be enabled to use this setting.

## 3.22   pps

### 3.22.1   frequency

**Description:** Generate a pulse with the given frequency (maximum = 20 Hz).

| Label | Value |
|---|---|
| group | pps |
| name | f requency |
| exper t | |
| type | doubl e |
| units | Hz |
| default value | 1.0 |
| readonly | |
| enumerated possible values | |

Table 3.22.1: frequency

**Notes:**

### 3.22.2   offset

**Description:** Offset in nanoseconds between GPS time and the PPS.

| Label | Value |
|---|---|
| group | pps |
| name | offset |
| exper t | |
| type | integer |
| units | ns(nanoseconds) |
| defaultvalue | 0 |
| readonly | |
| enumerated possible values | |

Table 3.22.2: offset

**Notes:** This setting can be used to compensate for cable delays in timing systems.

### 3.22.3   polarity

**Description:** Logic level on output pin when the PPS is active.

| Label | Value |
|---|---|
| group | pps |
| name | polarity |
| exper t | |
| type | integer |
| units | LogicLevel |
| defaultvalue | 1 |
| readonly | |
| enumerated possible values | 0,1 |

Table 3.22.3: polarity

**Notes:**

### 3.22.4   propagationmode

**Description:** Configures the behavior of the PPS when no GNSS fix is available.

| Label | Value |
|---|---|
| group | pps |
| name | propagation mode |
| exper t | |
| type | enum |
| units | N/A |
| default value | T imeLimited |
| enumerated possible values | N one, T imeLimited, U nlimited |

Table 3.22.4: propagation mode

### 3.22.5   propagationtimeout

**Description:** Configures the timeout length of the PPS when using the "Time Limited" propagation mode.

| Label | Value |
|---|---|
| group | pps |
| name | propagationtimeout |
| exper t | |
| type | float |
| units | seconds |
| defaultvalue | 5 |
| readonly | |

Table 3.22.5: propagation timeout

### 3.22.6   width

**Description:** Number of microseconds the PPS will remain active (allowed range from 1 to 999999 us).

| Label | Value |
|---|---|
| group | pps |
| name | w idth |
| exper t | |
| type | integ er |
| units | us(microseconds) |
| default value | 2000 |
| readonly | |
| enumerated possible values | |

Table 3.22.6: width

**Notes:**

# 3.23   rtcm out

### 3.23.1   antdescriptor

**Description:** Antenna description to be sent out in RTCMv3 messages 1008 and 1033.

| Label | Value |
|---|---|
| group | rtcmout |
| name | antdescriptor |
| exper t | |
| type | string |
| units | N/A |
| defaultvalue | HXCGPS500NONE |
| readonly | |
| enumerated possible values | |

Table 3.23.1: ant descriptor

**Notes:** Alphanumeric characters. IGS limits the number of characters to 20 at this time, but this setting allows for 31 characters for future extension.

### 3.23.2   antennaheight

**Description:** Antenna height to be sent out in RTCMv3 message 1006.

| Label | Value |
|---|---|
| group | rtcm out |
| name | antenna height |
| exper t | |
| type | doubl e |
| units | meter s |
| default value | 0.0 |
| readonly | |
| enumerated possible values | |

Table 3.23.2: antenna height

**Notes:** The Antenna Height field provides the height of the Antenna Reference Point above the marker used in the survey campaign.

### 3.23.3   enableephemeris

**Description:** Allow output of RTCMv3 ephemeris messages.

| Label | Value |
|---|---|
| group | rtcmout |
| name | enableephemeris |
| exper t | |
| type | boolean |
| units | N/A |
| defaultvalue | false |
| readonly | |
| enumerated possible values | |

Table 3.23.3: enable ephemeris

**Notes:** RTCM Message Type - 1019 (GPS Ephemeris), 1020 (GLONASS Ephemeris), 1045/1046 (Galileo Ephemeris), 1042 (Beidou Ephemeris)

### 3.23.4   outputmode

**Description:** Selects the format of RTCM observation messages for the RTCMv3 OUT protocol

| Label | Value |
|---|---|
| group | rtcm out |
| name | output mode |
| exper t | |
| type | enum |
| units | N/A |
| default value | MSM5 |
| readonly | |
| enumerated possible values | Legacy, M SM 4, M SM 5 |

Table 3.23.4: output mode

**Notes:** Legacy mode outputs the RTCMv3.1 1004 & 1012 observation messages (GPS&GLO only), whereas the RTCMv3.2 MSM4 and MSM5 modes send observations from all constellations.

### 3.23.5   rcvdescriptor

**Description:** Receiver type description to be sent out in the RTCMv3 1033 message.

| Label | Value |
|---|---|
| group | rtcmout |
| name | rcvdescriptor |
| exper t | |
| type | string |
| units | N/A |
| defaultvalue | PIKSI |
| readonly | |
| enumerated possible values | |

Table 3.23.5: rcv descriptor

**Notes:** Alphanumeric characters. Maxmimum 31 characters.

## 3.24   sample daemon

### 3.24.1   broadcasthostname

**Description:** Sets the broadcast hostname for the SDK sample daemon.

| Label | Value |
|---|---|
| group | sample daemon |
| name | broadcast hostname |
| exper t | |
| type | str ing |
| units | N/A |
| default value | 255.255.255.255 |
| readonly | |

Table 3.24.1: broadcast hostname

### 3.24.2 broadcastport

**Description:** Sets the broadcast port for the SDK sample daemon.

| Label | Value |
|---|---|
| group | sample daemon |
| name | broadcast port |
| exper t | |
| type | integ er |
| units | N/A |
| defaultvalue | 56666 |
| readonly | |

Table 3.24.2: broadcast port

### 3.24.3 enablebroadcast

**Description:** Enables or disables UDP broadcast in the SDK sample daemon.

| Label | Value |
|---|---|
| group | sampledaemon |
| name | enablebroadcast |
| exper t | |
| type | boolean |
| units | N/A |
| defaultvalue | false |
| readonly | |

Table 3.24.3: enable broadcast

### 3.24.4 enabled

**Description:** Enables or disables the SDK sample daemon.

| Label | Value |
|---|---|
| group | sample daemon |
| name | enabl ed |
| exper t | |
| type | bool ean |
| units | N/A |
| default value | f alse |
| readonly | |

Table 3.24.4: enabled

### 3.24.5  offset

**Description:** Sets the height offset for the SDK sample daemon.

| Label | Value |
|---|---|
| group | sample daemon |
| name | of f set |
| exper t | |
| type | f loat |
| units | meter s |
| defaultvalue | −321·597 |
| readonly | |

Table 3.24.5: offset

## 3.25   sbp

### 3.25.1  obsmsgmaxsize

**Description:** Determines the maximum message length for raw observation sbp messages.

| Label | Value |
|---|---|
| group | sbp |
| name | obsmsgmaxsize |
| exper t | |
| type | integer |
| units | bytes |
| defaultvalue | 255 |
| readonly | |
| enumerated possible values | |

Table 3.25.1: obs msg max size

**Notes:** This parameter is useful for tuning observation messages for compatibility with radio modems. Some serial modems will internally split serial packets for their protocol and this parameter allows the size of the message to be reduced as to prevent the modem from sending multiple packets. If the parameter exceeds 255 bytes (the maximum size of an SBP message), the receiver firmware will ignore the parameter and use 255 bytes. If the parameter is set smaller than the size of one observation, the firmware will ignore the parameter and use the size of one observation as the maximum message size.

# 3.26    simulator

### 3.26.1    enabled

**Description:** Toggles the receiver internal simulator on and off.

| Label | Value |
|---|---|
| group | simul ator |
| exper t | |
| name | enabl |
| type | ed bool |
| units | ean |
| default value | N/A    F |
| readonly | alse |
| enumerated possible values | T rue, F alse |

Table 3.26.1: enabled

**Notes:** The simulator will provide simulated outputs of a stationary base station and the Local receiver moving in a circle around the base station. The simulator is intended to aid in system integration by providing realistic looking outputs but does not faithfully simulate every aspect of device operation.

### 3.26.2    baseecefx

**Description:** Simulated base station position.

| Label | Value |
|---|---|
| group | simulator |
| name | baseecefx |
| exper t | |
| type | double |
| units | meters |
| defaultvalue | −2706098.845 |
| readonly | |
| enumerated possible values | |

Table 3.26.2: base ecef x

**Notes:** Earth Centered Earth Fixed (ECEF) x position of the simulated base station.

### 3.26.3    baseecefy

**Description:** Simulated base station position.

| Label | Value |
|---|---|
| group | simul ator |
| name | base ecef y |
| exper t | |
| type | doubl e |
| units | meter s |
| default value | − 4261216.475 |
| readonly | |
| enumerated possible val-ues | |

Table 3.26.3: base ecef y

**Notes:** Earth Centered Earth Fixed (ECEF) y position of the simulated base station.

### 3.26.4  baseecefz

**Description:** Simulated base station position.

| Label | Value |
|---|---|
| group | simulator |
| name | baseecefz |
| exper t | |
| type | double |
| units | meters |
| defaultvalue | 3885597.912 |
| readonly | |
| enumerated possible val-ues | |

Table 3.26.4: base ecef z

**Notes:** Earth Centered Earth Fixed (ECEF) z position of the simulated base station.

### 3.26.5  cn0sigma

**Description:** Standard deviation of noise added to the simulated signal to noise. ratio

| Label | Value |
|---|---|
| group | simulator |
| name | cn0sigma |
| exper t | |
| type | double |
| units | dBm−Hz |
| defaultvalue | 0.3 |
| readonly | |
| enumerated possible val-ues | |

Table 3.26.5: cn0 sigma

**Notes:**

### 3.26.6   modemask

**Description:** Determines the types of position outputs for the simulator.

| Label | Value |
|---|---|
| group | simul ator |
| name | mode mask |
| exper t | |
| type | packedbitf ield |
| units | N/A |
| defaultvalue | 15( decimal),0xF he(xadecimal) |
| readonly | |
| enumerated possible values | |

Table 3.26.6: mode mask

**Notes:** bit 0 (decimal value 1) turns on single point position PVT simulated outputs

bit 1 (decimal value 2) turns on the satellite tracking simulated outputs
bit 2 (decimal value 4) turns on Float IAR simulated RTK outputs
bit 3 (decimal value 8) turns on Fixed IAR simulated RTK outputs

### 3.26.7   numsats

**Description:** The number of satellites for the simulator.

| Label | Value |
|---|---|
| group | simul ator |
| name | num sats |
| exper t | |
| type | integ er |
| units | N/A |
| defaultvalue | 9 |
| readonly | |
| enumerated possible values | |

Table 3.26.7: num sats

**Notes:**

### 3.26.8   phasesigma

**Description:** Standard deviation of noise added to the simulated carrier phase.

| Label | Value |
|---|---|
| group | simul ator |
| name | phase sigma |
| exper t | |
| type | doubl e |
| units | cy cl es |
| default value | 0.03 |
| readonly | |
| enumerated possible val-ues | |

Table 3.26.8: phase sigma

**Notes:**

### 3.26.9  possigma

**Description:** Standard deviation of simulated single point position.

| Label | Value |
|---|---|
| group | simulator |
| name | possigma |
| exper t | |
| type | double |
| units | meters2 |
| defaultvalue | 1.5 |
| readonly | |
| enumerated possible val-ues | |

Table 3.26.9: pos sigma

**Notes:**

### 3.26.10   pseudorangesigma

**Description:** Standard deviation of noise added to the simulated pseudo range.

| Label | Value |
|---|---|
| group | simulator |
| name | pseudorangesigma |
| exper t | |
| type | double |
| units | meters |
| defaultvalue | 4 |
| readonly | |
| enumerated possible val-ues | |

Table 3.26.10: pseudorange sigma

**Notes:**

### 3.26.11 radius

**Description:** Radius of the circle around which the simulated receiver will move.

| Label | Value |
|---|---|
| group | simulator |
| name | radius |
| exper t | |
| type | double |
| units | meters |
| defaultvalue | 100 |
| readonly | |
| enumerated possible values | |

Table 3.26.11: radius

**Notes:**

### 3.26.12 speed

**Description:** Simulated tangential speed of the receiver.

| Label | Value |
|---|---|
| group | simulator |
| name | speed |
| exper t | |
| type | double |
| units | m/s |
| defaultvalue | 4 |
| readonly | |
| enumerated possible values | |

Table 3.26.12: speed

**Notes:**

### 3.26.13 speedsigma

**Description:** Standard deviation of noise addition to simulated tangential speed.

| Label | Value |
|---|---|
| group | simul ator |
| name | speed sigma |
| exper t | |
| type | doubl e |
| units | meter s2 /s2 |
| default value | 0.15 |
| readonly | |
| enumerated possible values | |

Table 3.26.13: speed sigma

**Notes:**

## 3.27  solution

### 3.27.1  correctionagemax

**Description:** The maximum age of corrections for which an RTK solution will be generated.

| Label | Value |
|---|---|
| group | solution |
| name | correctionagemax |
| exper t | |
| type | float |
| units | seconds |
| defaultvalue | 30 |
| readonly | |
| enumerated possible values | |

Table 3.27.1: correction age max

**Notes:**

### 3.27.2  dgnssfilter

**Description:** Determines the type of carrier phase ambiguity resolution that the receiver will attempt to achieve.

| Label | Value |
|---|---|
| group | sol ution |
| name | dgnss f ilter |
| exper t | |
| type | enum |
| units | N/A |
| default value | F ixed |
| readonly | |
| enumerated possible values | F ixed, F loat |

Table 3.27.2: dgnss filter

**Notes:** If "fixed", the receiver will output a integer fixed ambiguity estimate. If no fixed solution is available, it will revert to the float solution. If "float", the device will only output the float ambiguity estimate.

### 3.27.3    dgnsssolutionmode

**Description:** Selects the type of RTK solution to output.

| Label | Value |
|---|---|
| group | solution |
| name | dgnsssolutionmode |
| exper t | |
| type | enum |
| units | N/A |
| defaultvalue | LowLatency |
| readonly | |
| enumerated possible values | LowLatency,TimeMatched,NoDGNSS |

Table 3.27.3: dgnss solution mode

**Notes:** A "Low Latency" solution uses an internal model of anticipated satellite observations to provide RTK output with minimal latency but slightly reduced accuracy. "Low Latency" mode assumes that the base station is stationary. For applications where accuracy is desired over timeliness or when both receivers are moving, "Time Matched" mode should be chosen. This means that the RTK output will require a corresponding set of correction observations for each timestamp. When "No DGNSS" is chosen, no differential output will be attempted by the receiver.

### 3.27.4    disableklobucharcorrection

**Description:** Disable Klobuchar ionospheric corrections.

| Label | Value |
|---|---|
| group | sol ution |
| name | disable klobuchar correction |
| exper t | |
| type | bool ean |
| units | N/A |
| default value | F alse |
| readonly | |
| enumerated possible val-ues | T rue, F alse |

Table 3.27.4: disable klobuchar correction

**Notes:** If True, Klobuchar ionospheric corrections will not be applied.

### 3.27.5  disableraim

**Description:** Receiver Autonomous Integrity Monitoring.

| Label | Value |
|---|---|
| group | sol ution |
| name | disable raim |
| exper t | |
| type | bool ean |
| units | |
| default value | F alse |
| readonly | |
| enumerated possible val-ues | T rue, F alse |

Table 3.27.5: disable raim

**Notes:** If True, RAIM checks will not be performed on observation output.

### 3.27.6  dynamicmotionmodel

**Description:** Selects the Filter Uncertainity of position, velocity & acceleration in the Horizontal & Vertical directions.

| Label | Value |
|---|---|
| group | sol ution |
| name | dynamic motion model |
| exper t | |
| type | enum |
| units | N/A |
| default value | H ighDynamics |
| readonly | |
| enumerated possible values | H ighDynamics, H ighH orizontalDynamics, LowDynamics |

Table 3.27.6: dynamic motion model

**Notes:** High dynamics - suitable when dynamics are high in all axes, High horizontal dynamics - suitable when dynamics are high in the horizontal plane and low in the vertical axis and Low dynamics - suitable when dynamics are high in all axes.

### 3.27.7   elevationmask

**Description:** SPP / RTK solution elevation mask.

| Label | Value |
|---|---|
| group | solution |
| name | elevationmask |
| exper t | |
| type | float |
| units | degrees |
| defaultvalue | 10 |
| readonly | |
| enumerated possible values | |

Table 3.27.7: elevation mask

**Notes:** Satellites must be above the horizon by at least this angle before they will be used in a solution.

### 3.27.8   enablebeidou

**Description:** Enable Beidou measurement processing in the navigation filter.

| Label | Value |
|---|---|
| group | sol ution |
| name | enable beidou |
| exper t | |
| type | bool ean |
| units | N/A |
| default value | True |
| readonly | |
| enumerated possible values | T rue, F alse |

Table 3.27.8: enable beidou

**Notes:** If set to True, Beidou measurements are processed in the navigation filter for SPP and RTK.

### 3.27.9   enablegalileo

**Description:** Enable Galileo measurement processing in the navigation filter.

| Label | Value |
|---|---|
| group | solution |
| name | enablegalileo |
| exper t | |
| type | boolean |
| units | N/A |
| defaultvalue | True |
| readonly | |
| enumerated possible values | True,False |

Table 3.27.9: enable galileo

**Notes:** If set to True, Galileo measurements are processed in the navigation filter for SPP and RTK.

### 3.27.10   enableglonass

**Description:** Enable GLONASS measurement processing in the navigation filter.

| Label | Value |
|---|---|
| group | solution |
| name | enableglonass |
| exper t | |
| type | boolean |
| units | N/A |
| defaultvalue | True |
| readonly | |
| enumerated possible values | True,False |

Table 3.27.10: enable glonass

**Notes:** If set to True, GLONASS measurements are processed in the navigation filter for SPP and RTK.

### 3.27.11  glonassmeasurementstddownweightfactor

**Description:** Down weights GLONASS measurements by a given factor in the navigation filter.

| Label | Value |
| --- | --- |
| group | solution |
| name | glonassmeasurementstddownweightfactor |
| exper t | |
| type | float |
| units | N/A |
| defaultvalue | 4.0 |
| readonly | |
| enumerated possible values | |

Table 3.27.11: glonass measurement std downweight factor

**Notes:** This parameter down weights GLONASS observations relative to GPS observations by this factor.

### 3.27.12  headingoffset

**Description:** Rotate the heading output.

| Label | Value |
| --- | --- |
| group | solution |
| name | headingoffset |
| exper t | |
| type | double |
| units | degrees |
| defaultvalue | 0.0 |
| readonly | |
| enumerated possible values | N/A |

Table 3.27.12: heading offset

**Notes:** Adds an offset to the heading output to rotate the heading vector to align the baseline heading with a desired 0 heading. Valid values are -180.0 to 180.0 degrees

### 3.27.13  knownbaselined

**Description:** Determines the baseline vector for the "init known baseline" feature.

| Label | Value |
|---|---|
| group | sol ution |
| name | known baseline d |
| exper t | |
| type | doubl e |
| units | meter s |
| default value | 0 |
| readonly | |
| enumerated possible values | |

Table 3.27.13: known baseline d

**Notes:** This sets the number of meters that the rover is Down from the base station when the "init known baseline" feature is used.

### 3.27.14   knownbaselinee

**Description:** Determines the baseline vector for the "init known baseline" feature.

| Label | Value |
|---|---|
| group | solution |
| name | knownbaselinee |
| exper t | |
| type | double |
| units | meters |
| defaultvalue | 0 |
| readonly | |
| enumerated possible values | |

Table 3.27.14: known baseline e

**Notes:** This sets the number of meters that the rover is East from the base station when the "init known baseline" feature is used.

### 3.27.15   knownbaselinen

**Description:** Determines the baseline vector for the "init known baseline" feature.

| Label | Value |
|---|---|
| group | sol ution |
| name | known baseline n |
| exper t | |
| type | doubl e |
| units | meter s |
| default value | 0 |
| readonly | |
| enumerated possible values | |

Table 3.27.15: known baseline n

**Notes:** This sets the number of meters that the rover is North from the base station when the "init known baseline" feature is used.

### 3.27.16   minmodelledbaselinelenkm

**Description:** Minimum assumed baseline length to use in RTK model calculations. This parameter can be used to im- prove performance with virtual reference station (VRS) services that generate the virtual base at an arbitrary location, independent from the quality of atmospheric models.

| Label | Value |
|---|---|
| group | solution |
| name | minmodelledbaselinelenkm |
| exper t | |
| type | double |
| units | km |
| defaultvalue | 0.0 |
| readonly | |
| enumerated possible values | N/A |

Table 3.27.16: min modelled baseline len km

**Notes:** Typically 50 km can be used with most VRS services.

### 3.27.17   output every n obs

**Description:** Integer divisor of solution frequency for which the observations will be output.

| Label group | Value |
|---|---|
| name | sol ution |
| exper t | output every n obs |
| type | |
| units | |
| default value | integ er |
| readonly | N/A |
| enumerated possible values | 10 |

Table 3.27.17: output every n obs

**Notes:** For instance, if the solution frequency (soln_freq) is 10 Hz, and the output_every_n_obs setting is 10, it means that the observation output will occur at a rate of 1 Hz. This parameter is designed to tune the rate at which correction information is passed from one receiver to the other as to efficiently use radio modem bandwidth and fit with user applications.

### 3.27.18   sendheading

**Description:** Enables SBP heading output.
Heading is calculated from base station to rover and represents
the inverse tangent of the north and east components of the baseline.

| Label | Value |
|---|---|
| group | sol ution |
| name | send heading |
| exper t | |
| type | bool ean |
| units | N/A |
| default value | F alse |
| readonly | |
| enumerated possible values | T rue, F alse |

Table 3.27.18: send heading

**Notes:** No smoothing or additional processing is provided to improve heading output.

The heading feature requires the following additional settings
Time Matched Mode
Equal Observation rate between both base and rover
The observation rate will also determine the heading output rate and is defined as "soln freq" / "output every n obs"

### 3.27.19   solnfreq

**Description:** The frequency at which GNSS navigation solution is computed.

| Label group | Value |
|---|---|
| name | sol ution |
| exper t | soln f req |
| type | |
| units | |
| default value | integ er |
| readonly | Hz |
| enumerated possible values | 10 |

Table 3.27.19: soln freq

**Notes:** Minimum is 1 Hz. Maximum is 10 Hz for RTK positioning with a maximum of 15 used satellites. At 5 Hz and lower the maximum number of used satellites is 22. 20 Hz is an absolute maximum with a limit of 5 used satellites.

System with inertial fusion (Duro Inertial, Piksi Multi Inertial) can output position at a higher rate than the GNSS-only solution. See fused_soln_freq in the INS group.

## 3.28   standalone logging

### 3.28.1   blacklistsdcard

**Description:** Enable/Disable SD Card.

| Label | Value |
|---|---|
| group | standalone logging |
| name | blacklist sdcard |
| exper t | |
| type | bool ean |
| default value | F alse |
| readonly | |

Table 3.28.1: blacklist sdcard

### 3.28.2   copysystemlogs

**Description:** Copy system logs to the SD card at regular intervals.

| Label | Value |
| --- | --- |
| group | standalone logging |
| name | copy system logs |
| type | bool ean |
| exper t | |
| default value | F alse |
| readonly | |
| units | N/A |

Table 3.28.2: copy system logs

**Notes:** Setting this to true will cause the device to copy the system logs to the SD card at regular intervals. Setting this to false will stop the device from copying the systems logs to the SD card.

### 3.28.3 enable

**Description:** Standalone logging enabled.

| Label | Value |
| --- | --- |
| group | standalonelogging |
| name | enable |
| type | boolean |
| exper t | |
| defaultvalue | False |
| readonly | |
| units | N/A |

Table 3.28.3: enable

**Notes:** Setting this to true triggers the logger to start trying to write logs to the output_directory. Setting this to false will immediately close the current file and stop logging. Reenabling logging will increment the session counter which is reflected in the log file names (see USB Logging File Output section).

### 3.28.4 fileduration

**Description:** Duration of each logfile.

| Label | Value |
| --- | --- |
| group | standalonelogging |
| name | fileduration |
| exper t | |
| type | int |
| defaultvalue | 10 |
| readonly | |
| units | minutes |

Table 3.28.4: file duration

**Notes:** Sets the number of minutes to output to each standalone log file before opening the next one. If this setting is changed while logging is enabled, it will go into effect immediately which will close the current file if its length exceeds the new duration.

### 3.28.5  loggingfilesystem

**Description:** Configure the file-system used for standalone logging (SD card only).

| Label | Value |
| --- | --- |
| group | standalonelogging |
| name | loggingfilesystem |
| type | enum |
| exper t | |
| defaultvalue | FAT |
| readonly | |
| units | N/A |

Table 3.28.5: logging file system

**Notes:** Configures the file-system used for standalone logging. Setting this to F2FS will reparition and the reformat any SD card that is not formatted with F2FS upon system reboot. Settings must be persisted for this to take effect.

### 3.28.6  maxfill

**Description:** Maximum storage device usage.

| Label | Value |
| --- | --- |
| group | standalonelogging |
| name | maxfill |
| exper t | |
| type | int |
| defaultvalue | 95 |
| readonly | |
| units | percent |

Table 3.28.6: max fill

**Notes:** Sets a limit on how full the storage device can be before logging is stopped. If the drive is more than this percent full, no new log files will be created and a warning will be logged every 30 seconds. If this setting is changed while logging is enabled, it will go into effect on the next file thatâĂŹs created.

### 3.28.7  outputdirectory

**Description:** Standalone logging path.

| Label | Value |
| --- | --- |
| group | standalonelogging |
| name | outputdirectory |
| exper t | |
| type | string |
| defaultvalue | /media/sda1/ |
| readonly | |
| units | N/A |

Table 3.28.7: output directory

**Notes:** Sets the paths in which to write logs. A warning will be logged every 30 seconds if this path is invalid or unavailable. The system will not create a folder that does not exist. If this setting is changed while logging is enabled, it will go into effect on the next file thatâĂŹs created.

### 3.28.8   sdcardenable

**Description:** Enable/Disable SD Card.

| Label | Value |
|---|---|
| group | standalonelogging |
| name | sdcardenable |
| exper t | |
| type | boolean |
| defaultvalue | False |
| readonly | |

Table 3.28.8: sdcard enable

## 3.29   surveyed position

### 3.29.1   broadcast

**Description:** Broadcast surveyed base station position.

| Label | Value |
|---|---|
| group | surveyed position |
| name | br oadcast |
| exper t | |
| type | bool ean |
| units | |
| default value | F alse |
| readonly | |
| enumerated possible values | T rue, F alse |

Table 3.29.1: broadcast

**Notes:** This flag ultimately determines whether the SBP message with identifier MSG_BASE_POS_ECEF will be calculated and sent. Logically, setting this attribute to "true" sets the Local receiver as a base station and configures the unit to send its surveyed position coordinates to the other receiver(s) with which the base station is communicating. If "true", the remote receiver that receives the surveyed position will calculate and communicate a pseudo absolute RTK position based upon the received position.

### 3.29.2   surveyedalt

**Description:** Surveyed altitude of the antenna.

| Label | Value |
|---|---|
| group | surveyed position |
| name | surveyed alt |
| exper t | |
| type | D oubl |
| units | e |
| default value | meter |
| readonly | s |
| enumerated possible values | 0 |

Table 3.29.2: surveyed alt

**Notes:** This setting represents the altitude of the receiver's antenna above the WGS84 ellipsoid, in meters. If surveyed position "broadcast" is set to "true", this coordinate will be communicated to remote receivers for use in calculating their pseudo-absolute position. This value should be precise to 1 cm. Any errors in the surveyed position will directly affect the pseudo-absolute RTK position measurement reported by the Rover.

### 3.29.3   surveyedlat

**Description:** Surveyed latitude of the antenna.

| Label | Value |
|---|---|
| group | surveyedposition |
| name | surveyedlat |
| exper t | |
| type | Double |
| units | degrees |
| defaultvalue | 0 |
| readonly | |
| enumerated possible values | |

Table 3.29.3: surveyed lat

**Notes:** This setting represents the latitude of the local receiver's antenna, expressed in decimal degrees relative to the equator (north = positive, south = negative). If surveyed position "broadcast" is set to "true", the coordinate will be communicated to remote receivers for use in calculating their pseudo-absolute RTK position. The value should be as accurate as possible and should have precision to at least 7 digits following the decimal point. For reference, 1e-7 degrees of latitude is about 1.1 cm on the surface of the earth. Any errors in the surveyed position will directly affect the pseudo-absolute RTK position measurement reported by the remote receiver.

### 3.29.4   surveyedlon

**Description:** Surveyed longitude of the antenna.

| Label | Value |
|---|---|
| group | surveyed position |
| name | surveyed lon |
| exper t | |
| type | D oubl e |
| units | deg r ees |
| default value | 0 |
| readonly | |
| enumerated possible values | |

Table 3.29.4: surveyed lon

**Notes:** This setting represents the longitude of the local receiver's antenna, expressed in decimal degrees relative to the Prime Meridian (east = positive, west = negative). If surveyed position "broadcast" is set to "true", the coordinate will be communicated to remote receivers for use in calculating their pseudo-absolute RTK position. The value should be as accurate as possible and should have precision to at least 7 digits following the decimal point. For reference, 1e-7 degrees of longitude at 35 degree latitude is about 1 cm. Any errors in the surveyed position will directly affect the pseudo-absolute RTK position measurement reported by the remote receiver.

# 3.30    system

### 3.30.1    connectivitycheckaddresses

**Description:** A comma separated list of addresses to ping to check for network connectivity.

| Label | Value |
|---|---|
| group | system |
| name | connectivitycheckaddresses |
| type | string |
| exper t | |
| defaultvalue | 8.8.8.8 |
| readonly | |
| units | N/A |

Table 3.30.1: connectivity check addresses

**Notes:** A comma separated list of addresses, for example: 8.8.8.8,1.1.1.1 to which an ICMP echo request is sent, each in succession until a successful response is received.

### 3.30.2    connectivitycheckfrequency

**Description:** The frequency at which the network poll service checks for connectivity.

| Label | Value |
|---|---|
| group | sy stem |
| name | connectivity check frequency |
| type | f loat |
| exper t | |
| default value | 0.1 |
| readonly | |
| units | Hz |

Table 3.30.2: connectivity check frequency

**Notes:** The network poll service will perform a connectivity check with a well known IP address at the frequency configured by this setting. A value of 0 will disable the connectivity check and the Link LED will not show Internet access status.

### 3.30.3   connectivityretryfrequency

**Description:** The frequency at which the network poll service retries after a failed connectivity check.

| Label | Value |
|---|---|
| group | system |
| name | connectivityretryfrequency |
| type | float |
| exper t | |
| defaultvalue | 1.0 |
| readonly | |
| units | Hz |

Table 3.30.3: connectivity retry frequency

**Notes:** If a connectivity check fails, this settings controls the frequency at which a new connectivity check is performed.

### 3.30.4   headingforwarding

**Description:** Resend any SBP_MSG_HEADING or SBP_MSG_BASELINE_NED messages received by this device to this device's output interfaces

| Label | Value |
|---|---|
| group | system |
| name | headingforwarding |
| type | boolean |
| exper t | |
| defaultvalue | False |
| readonly | |
| units | N/A |

Table 3.30.4: heading forwarding

**Notes:** This is intended to enable a dual piksi / duro installation so a consumer can read both RTK heading or moving baseline and RTK position from the same communication interface.

### 3.30.5   logpingactivity

**Description:** If set to true, the network poll service will also log ping activity.

| Label | Value |
| --- | --- |
| group | system |
| name | logpingactivity |
| type | boolean |
| exper t | |
| defaultvalue | False |
| readonly | |
| units | N/A |

Table 3.30.5: log ping activity

**Notes:** Configures the network poll service to log ping activity to /var/log/ping.log.

### 3.30.6   otadebug

**Description:** Enables or disables the Over-The-Air upgrade daemon's verbose output.

| Label | Value |
| --- | --- |
| group | system |
| name | otadebug |
| type | boolean |
| exper t | |
| defaultvalue | False |
| readonly | |
| units | N/A |

Table 3.30.6: ota debug

**Notes:** The OTA daemon must be disabled in order to change this setting.

### 3.30.7   otaenabled

**Description:** Enables or disables the Over-The-Air upgrade daemon.

| Label | Value |
| --- | --- |
| group | system |
| name | otaenabled |
| type | boolean |
| exper t | |
| defaultvalue | False |
| readonly | |
| units | N/A |

Table 3.30.7: ota enabled

**Notes:** The OTA daemon contacts the OTA server once per hour and checks if the offered version is newer than currently installed. If the offered version is newer, then the image is downloaded and an upgrade is performed. After the upgrade the device is automatically rebooted.

### 3.30.8   otaurl

**Description:** Set the URL of the Over-The-Air upgrade server. If empty, an internal default address is used.

| Label | Value |
|---|---|
| group | system |
| name | otaurl |
| type | string |
| exper t | |
| defaultvalue | N/A |
| readonly | |
| units | N/A |

Table 3.30.8: ota url

**Notes:** The OTA daemon must be disabled in order to change this setting.

### 3.30.9   resourcemonitorupdateinterval

**Description:** Interval to run the resource monitor at

| Label | Value |
|---|---|
| group | sy stem |
| name | resource  monitor  update  interval |
| exper t | |
| type | integ er |
| units | seconds |
| defaultvalue | 0 |
| readonly | |

Table 3.30.9: resource monitor update interval

**Notes:** Value of 0 disables the resource monitor

### 3.30.10   systemtime

**Description:** Sources for Linux System Time.

| Label | Value |
|-------|-------|
| group | sy stem |
| name | system time |
| type | enum |
| exper t | |
| default value | GPS |
| enumerated possible values | GPS+NTP,GPS,NTP |
| readonly | |
| units | N/A |

Table 3.30.10: system time

**Notes:** Configures the possible sources for Linux system time on the Swift Device. Linux system time is required for HTTPS certification validation and other Linux system functionality.

## 3.31   system info

### 3.31.1   buildvariant

**Description:** The build variant type for the current firmware.

| Label | Value |
|-------|-------|
| group | system info |
| name | build variant |
| exper t | |
| type | str ing |
| units | N/A |
| default value | r el ease |
| readonly | |
| enumerated possible values | |

Table 3.31.1: build variant

**Notes:** This is a read only setting.

### 3.31.2   firmwarebuilddate

**Description:** Firmware build date.

| Label | Value |
|---|---|
| group | system info |
| name | firmware build date |
| exper t | |
| type | str ing |
| units | N/A |
| default value | N/A |
| readonly | |
| enumerated possible values | |

Table 3.31.2: firmware build date

**Notes:** This is a read only setting.

### 3.31.3   firmwarebuildid

**Description:** Full build id for firmware version.

| Label | Value |
|---|---|
| group | systeminfo |
| name | firmwarebuildid |
| exper t | |
| type | string |
| units | N/A |
| defaultvalue | N/A |
| readonly | |
| enumerated possible values | |

Table 3.31.3: firmware build id

**Notes:** For user generated images, this will appear the same as the command "git describe −dirty". This is a read only setting.

### 3.31.4   firmwareversion

**Description:** Firmware version of the receiver.

| Label | Value |
|---|---|
| group | system info |
| name | f irmware version |
| exper t | |
| type | str ing |
| units | N/A |
| default value | N/A |
| readonly | |
| enumerated possible values | |

Table 3.31.4: firmware version

**Notes:** The git hash is removed from this version identifier. This is a read only setting.

### 3.31.5   hwrevision

**Description:** Hardware revision of the receiver.

| Label | Value |
|---|---|
| group | systeminfo |
| name | hwrevision |
| exper t | |
| type | string |
| units | N/A |
| defaultvalue | N/A |
| readonly | |
| enumerated possible values | |

Table 3.31.5: hw revision

**Notes:** This is a read only setting that refers to the product family of the hardware.

### 3.31.6   hwvariant

**Description:** Hardware Product Variant

| Label | Value |
|---|---|
| group | systeminfo |
| name | hwvariant |
| exper t | |
| type | string |
| units | N/A |
| defaultvalue | N/A |
| readonly | |
| enumerated possible values | |

Table 3.31.6: hw variant

**Notes:** This is a read only setting that corresponds to the variant of the current hardware revision that is connected to the console.

### 3.31.7 hwversion

**Description:** Hardware version number.

| Label | Value |
|---|---|
| group | systeminfo |
| name | hwversion |
| exper t | |
| type | string |
| units | N/A |
| defaultvalue | N/A |
| readonly | |
| enumerated possible values | |

Table 3.31.7: hw version

**Notes:** This is a read only setting that corresponds to the version number printed on the oem module hardware version sticker.

### 3.31.8 imagesetbuildid

**Description:** Build id for the linux system image.

| Label | Value |
|---|---|
| group | systeminfo |
| name | imagesetbuildid |
| exper t | |
| type | string |
| units | N/A |
| defaultvalue | N/A |
| readonly | |
| enumerated possible values | |

Table 3.31.8: imageset build id

**Notes:** Relevant for determining uimage version when using DEV image, otherwise this will be identical to the firmware build id. This is a read only setting.

### 3.31.9 loaderbuilddate

**Description:** build date for boot loader (uboot).

| Label | Value |
|---|---|
| group | system info |
| name | loader build date |
| exper t | |
| type | str ing |
| units | N/A |
| default value | N/A |
| readonly | |
| enumerated possible values | |

Table 3.31.9: loader build date

**Notes:** This is a read only setting.

### 3.31.10   loaderbuildid

**Description:** build id for loader (uboot).

| Label | Value |
|---|---|
| group | systeminfo |
| name | loaderbuildid |
| exper t | |
| type | string |
| units | N/A |
| defaultvalue | N/A |
| readonly | |
| enumerated possible values | |

Table 3.31.10: loader build id

**Notes:** This is a read only setting

### 3.31.11   macaddress

**Description:** The MAC address of the receiver.

| Label | Value |
|---|---|
| group | systeminfo |
| name | macaddress |
| exper t | |
| type | string |
| units | N/A |
| defaultvalue | N/A |
| readonly | |
| enumerated possible values | |

Table 3.31.11: mac address

**Notes:** This is a read only setting.

### 3.31.12  napbuilddate

**Description:** build date for SwiftNap FPGA bitstream.

| Label | Value |
| --- | --- |
| group | system info |
| name | nap build date |
| exper t | |
| type | str ing |
| units | N/A |
| default value | N/A |
| readonly | |
| enumerated possible values | |

Table 3.31.12: nap build date

**Notes:** This is a read only setting.

### 3.31.13  napbuildid

**Description:** build id for SwiftNap FPGA bitstream.

| Label | Value |
| --- | --- |
| group | systeminfo |
| name | napbuildid |
| exper t | |
| type | string |
| units | N/A |
| defaultvalue | N/A |
| readonly | |
| enumerated possible values | |

Table 3.31.13: nap build id

**Notes:** This is a read only setting.

### 3.31.14  napchannels

**Description:** Number of channels in SwiftNap FPGA.

| Label | Value |
|---|---|
| group | system info |
| name | nap channels |
| exper t | |
| type | str ing |
| units | N/A |
| default value | 40 |
| readonly | |
| enumerated possible values | |

Table 3.31.14: nap channels

**Notes:** This is a read only setting.

### 3.31.15 pfwpbuilddate

**Description:** build date for real-time GNSS firmware (piksi_firmware).

| Label | Value |
|---|---|
| group | systeminfo |
| name | pfwpbuilddate |
| exper t | |
| type | string |
| units | N/A |
| defaultvalue | N/A |
| readonly | |
| enumerated possible values | |

Table 3.31.15: pfwp build date

**Notes:** This is a read only setting.

### 3.31.16 pfwpbuildid

**Description:** build id for real-time GNSS firmware (piksi_firmware).

| Label | Value |
|---|---|
| group | systeminfo |
| name | pfwpbuildid |
| exper t | |
| type | string |
| units | N/A |
| defaultvalue | N/A |
| readonly | |
| enumerated possible values | |

Table 3.31.16: pfwp build id

**Notes:** This is a read only setting.

### 3.31.17   productid

**Description:** Product ID

| Label | Value |
|---|---|
| group | system info |
| name | product id |
| exper t | |
| type | str ing |
| units | N/A |
| default value | N/A |
| readonly | |
| enumerated possible values | |

Table 3.31.17: product id

**Notes:** This is a read only setting that displays the product id of the device.

### 3.31.18   sbpsenderid

**Description:** The SBP sender ID for any messages sent by the device.

| Label | Value |
|---|---|
| group | systeminfo |
| name | sbpsenderid |
| exper t | |
| type | string |
| units | N/A |
| defaultvalue | N/A |
| readonly | |
| enumerated possible values | |

Table 3.31.18: sbp sender id

**Notes:** ID value is equal to the lower 16 bits of the UUID. This is a read only setting.

### 3.31.19   serialnumber

**Description:** The serial number of the receiver.

| Label | Value |
|---|---|
| group | system info |
| name | serial number |
| exper t | |
| type | str ing |
| units | N/A |
| default value | N/A |
| readonly | |
| enumerated possible values | |

Table 3.31.19: serial number

**Notes:** This number should match the number on the barcode on the board and cannot be modified.

### 3.31.20   uuid

**Description:** The UUID of the receiver.

| Label | Value |
|---|---|
| group | systeminfo |
| name | uuid |
| exper t | |
| type | string |
| units | N/A |
| defaultvalue | N/A |
| readonly | |
| enumerated possible values | |

Table 3.31.20: uuid

**Notes:** The UUID is a Universally Unique IDentifier for this receiver. The lower 16 bits of the UUID are used for the SBP Sender ID. This is a read only setting.

## 3.32   system monitor

### 3.32.1   heartbeatperiodmilliseconds

**Description:** Period for sending the SBP_HEARTBEAT messages.

| Label | Value |
|---|---|
| group | system monitor |
| name | heartbeat  period  milliseconds |
| exper t | |
| type | integ er |
| units | ms |
| default value | 1000 |
| readonly | |
| enumerated possible values | |

Table 3.32.1: heartbeat period milliseconds

**Notes:**

### 3.32.2   spectrumanalyzer

**Description:** Enable spectrum analyzer.

| Label | Value |
|---|---|
| group | systemmonitor |
| name | spectrumanalyzer |
| exper t | |
| type | boolean |
| units | N/A |
| defaultvalue | False |
| readonly | |
| enumerated possible values | True,False |

Table 3.32.2: spectrum analyzer

**Notes:** This setting enables the on-device spectrum analyzer and associated SBP output. The spectrum analyzer is available from the "Advanced" tab of the console.

### 3.32.3   watchdog

**Description:** Enable hardware watchdog timer to reset the receiver if it locks up for. any reason

| Label | Value |
|---|---|
| group | system monitor |
| name | w atchdog |
| exper t | |
| type | bool ean |
| units | N/A |
| default value | True |
| readonly | |
| enumerated possible values | T rue, F alse |

Table 3.32.3: watchdog

**Notes:** You must reset the receiver for this change to take effect.

## 3.33   tcp client0

### 3.33.1   address

**Description:** IP address and port for TCP client 0 to connect to.

| Label | Value |
|---|---|
| group | tcpclient0 |
| name | address |
| exper t | |
| type | string |
| units | N/A |
| default value | |
| readonly | |

Table 3.33.1: address

**Notes:** The address setting is defined according to the convention "hostname:port". For example, it should match the format 192.168.0.222:55555 or xxxxx.net:2101 .

### 3.33.2   enabledsbpmessages

**Description:** Configure which messages should be sent on the port. Does not effect which incoming messages are listened to.

| Label | Value |
|---|---|
| group | tcpclient0 |
| name | enabledsbpmessages |
| exper t | |
| type | string |
| units | N/A |
| defaultvalue | 23,65 7, 2 7,48 1 97, 11 7 134, 136,137 1, 38 1,39 1 4 4 14,9 16,3 165, 166,167,,171,1, |
| readonly | |

Table 3.33.2: enabled sbp messages

**Notes:** The enabled sbp messages settings is a list of message types and rate divisors that will be sent out of the interface. If left blank, all messages will be sent. If not blank, a comma separated list of SBP message IDs in base 10 integer format should be provided. Optionally, a divisor can be specified after the / character for each id. For example, an entry of 3456/10 would provide message with ID 3456 at 1/10th the normal rate. For Ethernet, the default value is optimal for logging and communication with the console.

### 3.33.3   mode

**Description:** Communication protocol for TCP client 0. The client will initiate a connection with the server and establish bi-directional communications.

| Label | Value |
| --- | --- |
| group | tcpclient0 |
| name | mode |
| exper t | |
| type | enum |
| units | N/A |
| defaultvalue | Disabled |
| readonly | |
| enumerated    possible    values | SBP,NMEAOUT,RTCMv3IN,RTCMv3OUT |

Table 3.33.3: mode

**Notes:** ”SBP” configures the interface to transmit messages specified in the ’enabled_sbp_messages’ setting and to receive incoming SBP messages. If the mode is changed from SBP the console will no longer be able to communicate over the interface.

”NMEA OUT” configures the interface to transmit the GGA, RMC, GLL, VTG, ZDA, GSA, and GSV NMEA 0183 messages. The interface will not receive incoming messages.
”RTCMv3 IN” configures the interface to receive RTK corrections in RTCMv3 format. The interface will receive 1002, 1004, 1005, 1006, 1010, 1012, 1033, 1230 and MSM4-7 RTCMv3 messages and will not transmit or receive any other messages.
”RTCMv3 OUT” configures the interface to transmit RTCMv3 messages. The connection is bi-directional so these modes

behave the same as the UART modes.

## 3.34   tcp client1

### 3.34.1   address

**Description:** IP address and port for TCP client 1 to connect to.

| Label | Value |
|---|---|
| group | tcp client1 |
| name | addr ess |
| exper t | |
| type | str ing |
| units | N/A |
| default value | |
| readonly | |

Table 3.34.1: address

**Notes:** The address setting is defined according to the convention "hostname:port". For example, it should match the format 192.168.0.222:55555 or xxxxx.net:2101 .

### 3.34.2   enabledsbpmessages

**Description:** Configure which messages should be sent on the port. Does not effect which incoming messages are listened to.

| Label | Value |
|---|---|
| group | tcpclient1 |
| name | enabledsbpmessages |
| exper t | |
| type | string |
| units | N/A |
| defaultvalue | 23,65 7, 2 7,48 1, 97,11 7  134, 136,137 1, 38 1,39 1 4  4 14,9 16,3 165, 166,167,,171,1, |
| readonly | |

Table 3.34.2: enabled sbp messages

**Notes:** The enabled sbp messages settings is a list of message types and rate divisors that will be sent out of the interface. If left blank, all messages will be sent. If not blank, a comma separated list of SBP message IDs in base 10 integer format should be provided. Optionally, a divisor can be specified after the / character for each id. For example, an entry of 3456/10 would provide message with ID 3456 at 1/10th the normal rate. For Ethernet, the default value is optimal for logging and communication with the console.

### 3.34.3   mode

**Description:** Communication protocol for TCP client 1. The client will initiate a connection with the server and establish bi-directional communications.

| Label | Value |
|---|---|
| group | tcp client1 |
| name | mode |
| exper t | |
| type | enum |
| units | N/A |
| default value | D isabl ed |
| readonly | |
| enumerated possible val-ues | SBP, N M EAOU T, RT CM v3IN, RT CM v3OU T |

Table 3.34.3: mode

**Notes:** "SBP" configures the interface to transmit messages specified in the 'enabled_sbp_messages' setting and to receive incoming SBP messages. If the mode is changed from SBP the console will no longer be able to communicate over the interface.

"NMEA OUT" configures the interface to transmit the GGA, RMC, GLL, VTG, ZDA, GSA, and GSV NMEA 0183 messages. The interface will not receive incoming messages.
"RTCMv3 IN" configures the interface to receive RTK corrections in RTCMv3 format. The interface will receive 1002, 1004, 1005, 1006, 1010, 1012, 1033, 1230 and MSM4-7 RTCMv3 messages and will not transmit or receive any other messages.
"RTCMv3 OUT" configures the interface to transmit RTCMv3 messages. The connection is bi-directional so these modes

behave the same as the UART modes.

## 3.35   tcp server0

### 3.35.1   enabledsbpmessages

**Description:** Configure which messages should be sent on the port. Does not effect which incoming messages are listened to.

| Label | Value |
|---|---|
| group | tcpserver0 |
| name | enabledsbpmessages |
| exper t | |
| type | string |
| units | N/A |
| defaultvalue | 23,65 7, 2 7,48 1, 97, 11 7, 134, 136,137 1, 38 1,39 1 4, 4 14,9 16,3 165, 166,167,,171,1, |
| readonly | |

Table 3.35.1: enabled sbp messages

**Notes:** The enabled sbp messages settings is a list of message types and rate divisors that will be sent out of the interface. If left blank, all messages will be sent. If not blank, a comma separated list of SBP message IDs in base 10 integer format should be provided. Optionally, a divisor can be specified after the / character for each id. For example, an entry of 3456/10 would provide message with ID 3456 at 1/10th the normal rate. For Ethernet, the default value is optimal for logging and communication with the console.

### 3.35.2   mode

**Description:** Communication protocol for TCP server 0. The server will listen for incoming client connections and establish a bi-directional communications.

| Label | Value |
|---|---|
| group | tcpserver0 |
| name | mode |
| exper t | |
| type | enum |
| units | N/A |
| defaultvalue | SBP(SwiftBinaryProtocol) |
| readonly | |
| enumerated   possible   values | SBP,NMEAOUT,RTCMv3IN,RTCMv3OUT |

Table 3.35.2: mode

**Notes:** "SBP" configures the interface to transmit messages specified in the 'enabled_sbp_messages' setting and to receive incoming SBP messages. If the mode is changed from SBP the console will no longer be able to communicate over the interface.

"NMEA OUT" configures the interface to transmit the GGA, RMC, GLL, VTG, ZDA, GSA, and GSV NMEA 0183 messages. The interface will not receive incoming messages.
"RTCMv3 IN" configures the interface to receive RTK corrections in RTCMv3 format. The interface will receive 1002, 1004, 1005, 1006, 1010, 1012, 1033, 1230 and MSM4-7 RTCMv3 messages and will not transmit or receive any other messages.
"RTCMv3 OUT" configures the interface to transmit RTCMv3 messages. The connection is bi-directional so these modes

behave the same as the UART modes.

### 3.35.3   port

**Description:** Port for TCP server 0 to listen on.

| Label | Value |
|---|---|
| group | tcp server0 |
| name | port |
| exper t | |
| type | integ er |
| units | N/A |
| default value | 55555 |
| readonly | |

Table 3.35.3: port

**Notes:**

## 3.36  tcp server1

### 3.36.1  enabledsbpmessages

**Description:** Configure which messages should be sent on the port. Does not effect which incoming messages are listened to.

| Label | Value |
|---|---|
| group | tcpserver1 |
| name | enabledsbpmessages |
| exper t | |
| type | string |
| units | N/A |
| defaultvalue | 23,65 7, 2 7,48 1, 97, 11 7, 134, 136,137 1, 38 1,39 1 4, 4 14,9 16,3 165, 166,167,,171,1, |
| readonly | |

Table 3.36.1: enabled sbp messages

**Notes:** The enabled sbp messages settings is a list of message types and rate divisors that will be sent out of the interface. If left blank, all messages will be sent. If not blank, a comma separated list of SBP message IDs in base 10 integer format should be provided. Optionally, a divisor can be specified after the / character for each id. For example, an entry of 3456/10 would provide message with ID 3456 at 1/10th the normal rate. For Ethernet, the default value is optimal for logging and communication with the console.

### 3.36.2  mode

**Description:** Communication protocol for TCP server 1. The server will listen for incoming client connections and establish a bi-directional communications.

| Label | Value |
|---|---|
| group | tcpserver1 |
| name | mode |
| exper t | |
| type | enum |
| units | N/A |
| defaultvalue | SBP(SwiftBinaryProtocol) |
| readonly | |
| enumerated  possible  values | SBP,NMEAOUT,RTCMv3IN,RTCMv3OUT |

Table 3.36.2: mode

**Notes:** "SBP" configures the interface to transmit messages specified in the 'enabled_sbp_messages' setting and to receive incoming SBP messages. If the mode is changed from SBP the console will no longer be able to communicate over the interface.

"NMEA OUT" configures the interface to transmit the GGA, RMC, GLL, VTG, ZDA, GSA, and GSV NMEA 0183 messages. The interface will not receive incoming messages.

"RTCMv3 IN" configures the interface to receive RTK corrections in RTCMv3 format. The interface will receive 1002, 1004, 1005, 1006, 1010, 1012, 1033, 1230 and MSM4-7 RTCMv3 messages and will not transmit or receive any other messages.

"RTCMv3 OUT" configures the interface to transmit RTCMv3 messages.

The connection is bi-directional so these modes behave the same as the UART modes.

### 3.36.3 port

**Description:** Port for TCP server 1 to listen on.

| Label | Value |
|---|---|
| group | tcp server1 |
| name | port |
| exper t | |
| type | integ er |
| units | N/A |
| default value | 55556 |
| readonly | |

Table 3.36.3: port

**Notes:**

## 3.37 tls client0

### 3.37.1 address

**Description:** IP address and port for TLS client 0 to connect to.

| Label | Value |
|---|---|
| group | tlsclient0 |
| name | address |
| exper t | |
| type | string |
| units | N/A |
| default value | |
| readonly | |

Table 3.37.1: address

**Notes:** The address setting is defined according to the convention "hostname:port". For example, it should match the format 192.168.0.222:55555 or xxxxx.net:2101 .

### 3.37.2 enabledsbpmessages

**Description:** Configure which messages should be sent on the port. Does not effect which incoming messages are listened to.

| Label | Value |
|---|---|
| group | tls client0 |
| name | enabled sbp messages |
| exper t | |
| type | str ing |
| units | N/A |
| default value | 23,65 ,72 7, 4 8,1 9,7 1,17,134,136,137,138,139,144,149,163,165,166,167,171,1 |
| readonly | |

Table 3.37.2: enabled sbp messages

**Notes:** The enabled sbp messages settings is a list of message types and rate divisors that will be sent out of the interface. If left blank, all messages will be sent. If not blank, a comma separated list of SBP message IDs in base 10 integer format should be provided. Optionally, a divisor can be specified after the / character for each id. For example, an entry of 3456/10 would provide message with ID 3456 at 1/10th the normal rate. For Ethernet, the default value is optimal for logging and communication with the console.

### 3.37.3   mode

**Description:** Communication protocol for TLS client 0. The client will initiate a connection with the server and establish bi-directional communications.

| Label | Value |
|---|---|
| group | tlsclient0 |
| name | mode |
| exper t | |
| type | enum |
| units | N/A |
| defaultvalue | Disabled |
| readonly | |
| enumerated possible values | SBP,NMEAOUT,RTCMv3IN,RTCMv3OUT |

Table 3.37.3: mode

**Notes:** "SBP" configures the interface to transmit messages specified in the 'enabled_sbp_messages' setting and to receive incoming SBP messages. If the mode is changed from SBP the console will no longer be able to communicate over the interface.

"NMEA OUT" configures the interface to transmit the GGA, RMC, GLL, VTG, ZDA, GSA, and GSV NMEA 0183 messages. The interface will not receive incoming messages.
"RTCMv3 IN" configures the interface to receive RTK corrections in RTCMv3 format. The interface will receive 1002, 1004, 1005, 1006, 1010, 1012, 1033, 1230 and MSM4-7 RTCMv3 messages and will not transmit or receive any other messages.
"RTCMv3 OUT" configures the interface to transmit RTCMv3 messages.

The connection is bi-directional so these modes behave the same as the UART modes.

## 3.38    track

### 3.38.1    elevationmask

**Description:** Tracking elevation mask.

| Label | Value |
|---|---|
| group | tr ack |
| name | elevation mask |
| exper t | |
| type | f loat |
| units | deg r ees |
| default value | 0 |
| readonly | |
| enumerated possible values | |

Table 3.38.1: elevation mask

**Notes:** Satellites must be above the horizon by at least this angle before they will be tracked.

### 3.38.2    iqoutputmask

**Description:** Output raw I/Q correlations.

| Label | Value |
|---|---|
| group | track |
| name | iqoutputmask |
| exper t | |
| type | integer |
| units | N/A |
| default value | |
| readonly | |
| enumerated possible values | |

Table 3.38.2: iq output mask

**Notes:** Bitmask of channel IDs (not PRNs)

### 3.38.3    maxpllintegrationtimems

**Description:** Controls maximum possible integration time for a measurement.

| Label | Value |
| --- | --- |
| group | tr ack |
| name | max pll integration time ms |
| exper t | |
| type | integ er |
| units | N/A |
| default value | 20 |
| readonly | |
| enumerated possible values | |

Table 3.38.3: max pll integration time ms

**Notes:** This can be used to configure the sensitivity and dynamic tracking modes permitted to be used by receiver. Lower values provide lower sensitivity and noisier phase measurements but better performance in dynamic conditions.

### 3.38.4   mode

**Description:** Set the tracking loop configuration

| Label | Value |
| --- | --- |
| group | track |
| name | mode |
| exper t | |
| type | enum |
| defaultvalue | rover |
| readonly | |
| enumerated possible values | rover,basestation |

Table 3.38.4: mode

**Notes:** Base station profile should only be used in situations where the receiver is kept static. Degraded performance will be seen if the receiver is moving with base station profile enabled.

### 3.38.5   sendtrkdetailed

**Description:** send detailed tracking state message.

| Label | Value |
| --- | --- |
| group | track |
| name | sendtrkdetailed |
| exper t | |
| type | boolean |
| default value | |
| readonly | |

Table 3.38.5: send trk detailed

**Notes:**

## 3.39    uar t0

### 3.39.1    baudrate

**Description:** The Baud rate for the UART 0.

| Label | Value |
|---|---|
| group | uart 0 |
| name | baudr ate |
| exper t | |
| type | integ er |
| units | bps |
| default value | 115200 |
| readonly | |
| enumerated possible values | |

Table 3.39.1: baudrate

**Notes:** The maximum baud rate supported by the USB to RS232 adapter cable provided in the Piksi Multi / Duro kits is 230400.

### 3.39.2    enabledsbpmessages

**Description:** Configure which messages should be sent on the port.

| Label | Value |
|---|---|
| group | uart0 |
| name | enabledsbpmessages |
| exper t | |
| type | string |
| units | N/A |
| defaultvalue | 72,74,117,65535 |
| readonly | |

Table 3.39.2: enabled sbp messages

**Notes:** The enabled sbp messages settings is a list of message types and rate divisors that will be sent out of the interface. If left blank, all messages will be sent. If not blank, a comma separated list of SBP message IDs in base 10 integer format should be provided. Optionally, a divisor can be specified after the / character for each id. For example, an entry of 3456/10 would provide message with ID 3456 at 1/10th the normal rate. For uart1, the default value is optimal for logging and communication with the console.

### 3.39.3    flowcontrol

**Description:** Enable hardware flow control (RTS/CTS).

| Label | Value |
|---|---|
| group | uart 0 |
| name | f low control |
| exper t | |
| type | enum |
| units | NA |
| default value | None |
| readonly | |
| enumerated possible values | N one, RT S/CT S |

Table 3.39.3: flow control

**Notes:**

### 3.39.4   mode

**Description:** Communication protocol for UART0.

| Label | Value |
|---|---|
| group | uart 0 |
| name | mode |
| exper t | |
| type | enum |
| units | N/A |
| defaultvalue | SBP S(wiftBinaryProtocol) |
| readonly | |
| enumerated possible values | SBP, N M EAOU T, RT CM v3IN, RT CM v3OU T |

Table 3.39.4: mode

**Notes:** "SBP" configures the interface to transmit messages specified in the 'enabled_sbp_messages' setting and to receive incoming SBP messages. If the mode is changed from SBP the console will no longer be able to communicate over the interface.

"NMEA OUT" configures the interface to transmit the GGA, RMC, GLL, VTG, ZDA, GSA, and GSV NMEA 0183 messages. The interface will not receive incoming messages.
"RTCMv3 IN" configures the interface to receive RTK corrections in RTCMv3 format. The interface will receive 1002, 1004, 1005, 1006, 1010, 1012, 1033, 1230 and MSM4-7 RTCMv3 messages and will not transmit or receive any other messages.
"RTCMv3 OUT" configures the interface to transmit RTCMv3 messages.

## 3.40   uar t1

### 3.40.1   baudrate

**Description:** The Baud rate for the UART 1.

| Label | Value |
|---|---|
| group | uart 1 |
| name | baudr ate |
| exper t | |
| type | integ er |
| units | bps |
| default value | 115200 |
| readonly | |
| enumerated possible val-ues | |

Table 3.40.1: baudrate

**Notes:** The maximum baud rate supported by the USB to RS232 adapter cable provided in the Piksi Multi / Duro kits is 230400.

### 3.40.2   enabledsbpmessages

**Description:** Configure which messages should be sent on the port.

| Label | Value |
|---|---|
| group | uart1 |
| name | enabledsbpmessages |
| exper t | |
| type | string |
| units | N/A |
| defaultvalue | 23,65 7, 2 7,4 8 1, 97, 1 17, 134, 136,137 1, 38 1,39 1 4, 4 14,9 16,3 165, 166,167,,171,1, |
| readonly | |

Table 3.40.2: enabled sbp messages

**Notes:** The enabled sbp messages settings is a list of message types and rate divisors that will be sent out of the interface. If left blank, all messages will be sent. If not blank, a comma separated list of SBP message IDs in base 10 integer format should be provided. Optionally, a divisor can be specified after the / character for each id. For example, an entry of 3456/10 would provide message with ID 3456 at 1/10th the normal rate. For uart1, the default value is optimal for logging and communication with the console.

### 3.40.3   flowcontrol

**Description:** Enable hardware flow control (RTS/CTS).

| Label | Value |
|---|---|
| group | uart 1 |
| name | f low control |
| exper t | |
| type | enum |
| units | NA |
| default value | None |
| readonly | |
| enumerated possible values | N one, RT S/CT S |

Table 3.40.3: flow control

**Notes:**

### 3.40.4   mode

**Description:** Communication protocol for UART 1.

| Label | Value |
|---|---|
| group | uart 1 |
| name | mode |
| exper t | |
| type | enum |
| units | N/A |
| defaultvalue | SBP S(wiftBinaryProtocol) |
| readonly | |
| enumerated possible values | SBP, N M EAOU T, RT CM v3IN, RT CM v3OU T |

Table 3.40.4: mode

**Notes:** "SBP" configures the interface to transmit messages specified in the 'enabled_sbp_messages' setting and to receive incoming SBP messages. If the mode is changed from SBP the console will no longer be able to communicate over the interface.

"NMEA OUT" configures the interface to transmit the GGA, RMC, GLL, VTG, ZDA, GSA, and GSV NMEA 0183 messages. The interface will not receive incoming messages.
"RTCMv3 IN" configures the interface to receive RTK corrections in RTCMv3 format. The interface will receive 1002, 1004, 1005, 1006, 1010, 1012, 1033, 1230 and MSM4-7 RTCMv3 messages and will not transmit or receive any other messages.
"RTCMv3 OUT" configures the interface to transmit RTCMv3 messages.

## 3.41   udp client0

### 3.41.1   address

**Description:** IP address for UDP client 0.

| Label | Value |
|---|---|
| group | udp client0 |
| name | addr ess |
| exper t | |
| type | str ing |
| units | N/A |
| default value | |
| readonly | |

Table 3.41.1: address

**Notes:** The address setting is defined according to the convention "hostname:port". For example, it should match the format 192.168.0.222:55555 or xxxxx.net:2101 .

### 3.41.2 enabledsbpmessages

**Description:** Configure which messages should be sent to the server.

| Label | Value |
|---|---|
| group | udpclient0 |
| name | enabledsbpmessages |
| exper t | |
| type | string |
| units | N/A |
| defaultvalue | 23,65 72 7,4 8,1 97, 11,7 134, 136,137,138 1, 39 1,44 14, 9 16,3 1 6 5 166,,167,,171,1 |
| readonly | |

Table 3.41.2: enabled sbp messages

**Notes:** The enabled sbp messages settings is a list of message types and rate divisors that will be sent out of the interface. If left blank, all messages will be sent. If not blank, a comma separated list of SBP message IDs in base 10 integer format should be provided. Optionally, a divisor can be specified after the / character for each id. For example, an entry of 3456/10 would provide message with ID 3456 at 1/10th the normal rate. For Ethernet, the default value is optimal for logging and communication with the console.

### 3.41.3 mode

**Description:** Communication protocol for UDP client 0. The client will send packets to a server for uni-directional communications.

| Label group | Value |
|---|---|
| name | udp client0 |
| exper t | mode |
| type | |
| units | |
| default value | enum |
| readonly | N/A |
| enumerated possible values | D isabl ed |
| | SBP, N M EAOU T, RT CM v3IN, RT CM v3OU T |

Table 3.41.3: mode

**Notes:** "SBP" configures the interface to transmit messages specified in the 'enabled_sbp_messages' setting.

"NMEA OUT" configures the interface to transmit the GGA, RMC, GLL, VTG, ZDA, GSA, and GSV NMEA 0183 messages. The interface will not receive incoming messages.
"RTCMv3 IN" has no effect for UDP clients.

"RTCMv3 OUT" configures the interface to transmit RTCMv3 messages.

## 3.42   udp client1

### 3.42.1   address

**Description:** IP address for UDP client 1.

| Label | Value |
|---|---|
| group | udp client1 |
| name | addr ess |
| exper t | |
| type | str ing |
| units | N/A |
| default value | |
| readonly | |

Table 3.42.1: address

**Notes:** The address setting is defined according to the convention "hostname:port". For example, it should match the format 192.168.0.222:55555 or xxxxx.net:2101 .

### 3.42.2   enabledsbpmessages

**Description:** Configure which messages should be sent to the server.

| Label | Value |
|---|---|
| group | udp client1 |
| name | enabled sbp messages |
| exper t | |
| type | str ing |
| units | N/A |
| default value | 23,65 ,72  7,  4  8,1  9,7   1,17,134,136,137,138,139,144,149,163,165,166,167,171,1 |
| readonly | |

Table 3.42.2: enabled sbp messages

**Notes:** The enabled sbp messages settings is a list of message types and rate divisors that will be sent out of the interface. If left blank, all messages will be sent. If not blank, a comma separated list of SBP message IDs in base 10 integer format should be provided. Optionally, a divisor can be specified after the / character for each id. For example, an entry of 3456/10 would provide message with ID 3456 at 1/10th the normal rate. For Ethernet, the default value is optimal for logging and communication with the console.

### 3.42.3   mode

**Description:** Communication protocol for UDP client 1. The client will send packets to a server for uni-directional communications.

| Label | Value |
|---|---|
| group | udpclient1 |
| name | mode |
| exper t | |
| type | enum |
| units | N/A |
| defaultvalue | Disabled |
| readonly | |
| enumerated    possible    values | SBP,NMEAOUT,RTCMv3IN,RTCMv3OUT |

Table 3.42.3: mode

**Notes:** "SBP" configures the interface to transmit messages specified in the 'enabled_sbp_messages' setting.

"NMEA OUT" configures the interface to transmit the GGA, RMC, GLL, VTG, ZDA, GSA, and GSV NMEA 0183 messages. The interface will not receive incoming messages.
"RTCMv3 IN" has no effect for UDP clients.

"RTCMv3 OUT" configures the interface to transmit RTCMv3 messages

## 3.43   udp server0

### 3.43.1   enabledsbpmessages

**Description:** Configure which messages should be sent on the port.

| Label | Value |
|---|---|
| group | udp server0 |
| name | enabled sbp messages |
| exper t | |
| type | str ing |
| units | |
| default value | N/A |
| readonly | bl ank– allmessagesareenabled |

Table 3.43.1: enabled sbp messages

**Notes:** Has no effect for a UDP server.

### 3.43.2   mode

**Description:** Communication protocol for UDP server 0. The server will listen for incoming packets from a client for uni-directional communications.

| Label | Value |
|---|---|
| group | udpserver0 |
| name | mode |
| exper t | |
| type | enum |
| units | N/A |
| defaultvalue | SBP(SwiftBinaryProtocol) |
| readonly | |
| enumerated    possible    values | SBP,NMEAOUT,RTCMv3IN,RTCMv3OUT |

Table 3.43.2: mode

**Notes:** ”SBP” configures the interface to receive incoming SBP messages.

”NMEA OUT” has no effect for a UDP server.

”RTCMv3 IN” configures the interface to receive RTK corrections in RTCMv3 format. The interface will receive 1002, 1004, 1005, 1006, 1010, 1012, 1033, 1230 and MSM4-7 RTCMv3 messages and will not receive any other messages. ”RTCMv3 OUT” has no effect for a UDP server.

### 3.43.3   port

**Description:** Port for UDP server 0 to listen to.

| Label | Value |
|---|---|
| group | udp server0 |
| name | port |
| exper t | |
| type | integ er |
| units | N/A |
| default value | 55557 |
| readonly | |

Table 3.43.3: port

**Notes:**

## 3.44   udp server1

### 3.44.1   enabledsbpmessages

**Description:** Configure which messages should be sent on the port.

| Label | Value |
|---|---|
| group | udp server1 |
| name | enabled sbp messages |
| exper t | |
| type | str ing |
| units | N/A |
| default value | |
| readonly | |

Table 3.44.1: enabled sbp messages

**Notes:** Has no effect for a UDP server.

### 3.44.2   mode

**Description:** Communication protocol for UDP server 1. The server will listen for incoming packets from a client for uni-directional communications.

| Label | Value |
|---|---|
| group | udpserver1 |
| name | mode |
| exper t | |
| type | enum |
| units | N/A |
| defaultvalue | SBP(SwiftBinaryProtocol) |
| readonly | |
| enumerated possible values | SBP,NMEAOUT,RTCMv3IN,RTCMv3OUT |

Table 3.44.2: mode

**Notes:** "SBP" configures the interface to receive incoming SBP messages.

"NMEA OUT" has no effect for a UDP server.

"RTCMv3 IN" configures the interface to receive RTK corrections in RTCMv3 format. The interface will receive 1002, 1004, 1005, 1006, 1010, 1012, 1033, 1230 and MSM4-7 RTCMv3 messages and will not receive any other messages.

"RTCMv3 OUT" has no effect for a UDP server.

### 3.44.3   port

**Description:** Port for UDP server 1 to listen to.

| Label | Value |
|---|---|
| group | udp server1 |
| name | port |
| exper t | |
| type | integ er |
| units | N/A |
| default value | 55558 |
| readonly | |

Table 3.44.3: port

**Notes:**

## 3.45   usb0

### 3.45.1   enabledsbpmessages

**Description:** Configure which messages should be sent on the port.

| Label | Value |
|---|---|
| group | usb0 |
| name | enabled sbp messages |
| exper t | |
| type | str ing |
| units | N/A |
| defaultvalue | blank – allmessagesareenabled |
| readonly | |

Table 3.45.1: enabled sbp messages

**Notes:** The enabled sbp messages settings is a list of message types and rate divisors that will be sent out of the interface. If left blank, all messages will be sent. If not blank, a comma separated list of SBP message IDs in base 10 integer format should be provided. Optionally, a divisor can be specified after the / character for each id. For example, an entry of 3456/10 would provide message with ID 3456 at 1/10th the normal rate. For uart1, the default value is optimal for logging and communication with the console.

### 3.45.2   mode

**Description:** Communication protocol for USB0.

| Label | Value |
|---|---|
| group | usb0 |
| name | mode |
| exper t | |
| type | enum |
| units | N/A |
| default value | SBP (Swif tBinaryP rotocol) |
| readonly | |
| enumerated possible values | SBP, N M EAOU T, RT CM v3IN, RT CM v3OU T |

Table 3.45.2: mode

**Notes:** "SBP" configures the interface to transmit messages specified in the 'enabled_sbp_messages' setting and to receive incoming SBP messages. If the mode is changed from SBP the console will no longer be able to communicate over the interface.

"NMEA OUT" configures the interface to transmit the GGA, RMC, GLL, VTG, ZDA, GSA, and GSV NMEA 0183 messages. The interface will not receive incoming messages.
"RTCMv3 IN" configures the interface to receive RTK corrections in RTCMv3 format. The interface will receive 1002, 1004, 1005, 1006, 1010, 1012, 1033, 1230 and MSM4-7 RTCMv3 messages and will not transmit or receive any other messages.
"RTCMv3 OUT" configures the interface to transmit RTCMv3 messages.