Topcon GB-1000 - Receiver Board Firmware Version 3.4p2

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Topcon has recently released GNSS <u>receiver board firmware version 3.4p2 (.zip)</u> for GB-1000, Net-G3 and Net-G3A receivers. This firmware has been tested and accepted for use by UNAVCO's Development and Testing group.

Release notes:

User visible changes in the firmware version 3.4 p2 since version 3.4 p1

Highlights.

For G3-based boards only (GR-3, Net-G3, GMS-X, Net-G3A):

- N.1 Acquisition of P1, P2 and L2C signals has been tuned.
- N.2 [CE], [1E], [2E], [3E] messages have been supported.
- N.3 TCP client functionality has been added to EG2 (Net-G3, Euro-160PII) and E2G3 (Net-G3A) boards.
- N.4 New parameter for disabling the login prompt while establishing TCP connection has been added.
- N.5 Logic for determination the correspondance between GLONASS frequency channel numbers and slot numbers has been improved.
- N.6 Transformation from PZ-90.02 to WGS 84 datum has been corrected (stand-alone and code differential modes only).
- N.7 Additional noise in computed coordinates has been removed (stand-alone and code differential modes only).
- N.8 mmGPS has been made supported in GMS-X boards.
- N.9 Internal logic of AFRM mode has been improved.

For all boards (including GR-3, Net-G3, GMS-X, Net-G3A):

- A.1 Maximum number of satellites included in RTCM 3.x messages is now user-controllable.
- A.2 Problem connected with the appearance of 0.5 cycles in GLONASS P2 carrier

- phase observables when working at update rates of less than 2 Hz in Paradigm1 receivers has been solved.
- A.3 Problem connected with FH915 modem detection during PPP connection has been resolved.
- A.4 NTRIP connection stablilty during PPP session has been improved.
- A.5 For HGGDT boards: functionality for HiPer AG receivers has been implemented.
- A.6 For HGGDT_OMNI boards: "omni" input mode has been made working in assigned serial ports.
- A.7 The contents of NMEA-0183 GSA message has been corrected.
- A.8 The support of meteo sensors that output data in the form \$PASHS,XDR... has been added.
- A.9 BINEX message type 7F-05 has been supported.
- A.10 The opening of a file and starting file system initialization at the same time could lead to the system crash. This problem has been resolved.
- A.11 Recording into "slow" flash cards has been optimized.
- A.12 New options (HPAG: Hiper AG) and (RADR: radar output) have been added.
- A.13 For EGGDT boards: support of new model of quartz oscillator has been implemented.
- A.14 Bug with processing RTCM 3 1017 message (MAC) has been fixed.
- A.15 Bug connected with carrier phase multipath reduction for GLONASS satellites has been fixed (Paradigm1 boards only).
- A.16 The problem that manifested itself by means of position degrading in code differential mode has been resolved (Paradigm1 boards only).
 - 0. Compatibility Notes
- 0.1 When HPAG option is enabled, HGGDT boards will change some of the default values to ones required for HiPer AG.

1. Messages.

1.1 [3E]

```
[3E] L2C code Energy Potential {nSats+1}.
```

Contains array of energy potentials multiplied by 4 for each satellite from previous [SI] message.

```
struct EnergyPotentialL2C {
  u1 sn4[nSats]; // Energy potential [dB*Hz/4]
  + u1 cs; // Checksum
  };
```

2. Parameters.

2.1 Reference station parameters

Name: /par/rtcm3/base/svm

Access: rw
Type: integer
Values: [0..127]
Default: 0

Description: Maximum number of satellites for RTCM3 GPS and GLONASS RTK mesages.

Name: /par/base/glnoffs

Access: rw
Type: integer
Values: [-90..90]

Default: 0

Description: GLONASS elevation offset for weightning scheme on reference station side used

when number of satellites included in appropriate messages is limited by user

(See: /par/{rtcm,cmr,rtcm3}/base/svm)

Example: To make sure that GPS satellites will be inclded in RTK messages even if they have lower elevation than GLONASS

ones send set,/par/base/glnoffs,-90.

2.2 TCP client functionality has been added

Name: /par/net/tcpc/addr

Access: rw Type: string

Description: IP address of external TCP server

Name: /par/net/tcpc/port

Access: rw Type: integer Values: [0..65535]

Description: Port of external TCP server

Name: /par/net/tcpc/timeout

Access: rw
Type: integer
Values: [1..3600]

Description: Seconds to try reastablish connection until give-up if losing connection with server

Name: /par/net/tcpc/enable

Access: rw
Type: boolen
Values: [on,off]
Default: off

Description: Start/stop TCP client port

Name: /par/net/tcpc/error

Access: r

Type: integer Values: [-11..0] Default: 0

Description: Error of last attempt to connect to external sever

0 - No error

- -2 Socket error
- -3 No such host
- -5 Out of buffer space
- -6 Connection attempts timeout. Need to switch /par/net/tcpc/enable to off and then to on to start connection again.

Corresponding port /dev/tcpc/a has been added. For example, command "em,/dev/tcpc/a,nmea/GGA" enabling

GGA message from GNSS receiver to external TCP server.

2.3 New parameter for disable login promt while establishing TCP connection has been added

Name: /par/net/tcp/noauth

Access: rw
Type: boolen
Values: [on,off]
Default: off

Description: Setting noauth=on will disable login promt

2.5 Enable or disable outputing of L2 signal from NAVSTAR GPS system in BINEX format.

Name: /par/binex/meas/gps/l2

Access: rw
Type: boolean
Values: on | off
Default: on

Description: Enable or disable outputing of L2 signal from NAVSTAR GPS system in BINEX

format.

2.6 Enable or disable outputing of L2 signal from GLONASS system in BINEX format.

Name: /par/binex/meas/glo/12

Access: rw
Type: boolean
Values: on | off
Default: on

Description: Enable or disable outputing of L2 signal from GLONASS system in BINEX

format.

2.7 Signal type in L2 slot for NAVSTAR GPS system in BINEX format.

Name: /par/binex/meas/gps/l2type

Access: rw

Type: enumerated Values: all | p2 | 12c

Default: all

Description: Signal type in L2 slot for NAVSTAR GPS system in BINEX format.

2.8 Signal type in L2 slot for GLONASS system in BINEX format.

Name: /par/binex/meas/glo/l2type

Access: rw

Type: enumerated Values: all | p2 | 12c

Default: all

Description: Signal type in L2 slot for GLONASS system in BINEX format.

2.9 Priority of signal type for NAVSTAR GPS system in BINEX format.

Name: /par/binex/meas/gps/l2prio

Access: rw

Type: enumerated Values: p2 | 12c p2

Description: Priority signal type for NAVSTAR GPS system in BINEX format.

2.10 Priority of signal type for GLONASS system in BINEX format.

Name: /par/binex/meas/glo/l2prio

Access: rw

Type: enumerated Values: p2 | 12c p2 p2

Description: Priority signal type for GLONASS system in BINEX format.

2.11 Enabled NAVSTAR GPS systems in BINEX format.

Name: /par/binex/meas/sys/gps

Access: r

Type: boolean

Values: y
Default: y

Description: Enabled NAVSTAR GPS systems in BINEX format. .

2.12 Enabled GLONASS systems in BINEX format.

Name: /par/binex/meas/sys/glo

Access: r

Type: boolean Values: yln Default: y

Description: Enabled GLONASS systems in BINEX format. .

3. Options.

3.1 Radar output

Name: RADR Values: [0..1]

Description: Enables the radar output

3.2 HiPer AG

Name: HPAG Values: [0..1]

Description: Enables HGGDT boards to run in HiPer AG mode

This is a bit-field option.

bit#0: enables HGGDT boards to run in HiPer AG mode

Online URL:

https://kb.unavco.org/article/topcon-gb-1000-receiver-board-firmware-version-3-4p2-669.html