

Document ID	Title	Version	Release date
SB-506	GPS Week Number Roll Over (WNRO)	1	01 MAR 2019

SERVICE BULLETIN

GPS Week Number Roll Over (WNRO)

A navigational warning has been issued with regard to a systemic GPS Week Number Roll Over issue (WNRO) that may affect GPS receivers and their functionality.

<https://www.gps.gov/cgsic/meetings/2017/powers.pdf>

We wish to inform about the cut off week/date of GPS receivers that are incorporated in Planevision Systems PlaneTRack ADS-B ground stations.

PlaneTRack ADS-B Ground Stations utilize two types of GPS receiver modules manufactured by Trimble: Resolution SMTx and Resolution SMT 360. According to a Trimble Service Bulletin the GPS rollover cutoff date, i.e. the last week/date when a GPS timestamp shows the correct data for these types are:

Type of Trimble module	Firmware version	Cutoff week	Cutoff date
Res SMTx	2.02 and higher		21 AUG 2032
Res SMT 360	1.1 or higher	2952	09 AUG 2036

The actual GPS module present in your PlaneTRack Ground Station can be found in the GUI menu item STATUS | GPS STATUS, e.g.:

```
HardwareId: ResSMT 360
Firmware version: 1.1 Build 0
```

Please note: Firmware versions 1.0x and 1.x are equal in Trimble nomenclature

Attachments:

- A - Navigational warning
- B - Trimble Service Bulletins

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 NAVAREA IV 187/19(GEN).
 POTENTIAL PROBLEMS FOR USERS OF GPS RECEIVERS.

1. USERS OF GPS RECEIVERS ARE ADVISED OF POTENTIAL PROBLEMS DUE TO GPS WEEK COUNTER ROLL OVER ON 06 APR 19.

2. THE GPS SYSTEM TRANSMITS TIME TO GPS RECEIVERS USING A FORMAT OF TIME AND WEEKS AFTER THE START DATE OF 06 JAN 80. THE DATA FIELD IN THE NAVIGATIONAL MESSAGE SENT BY GPS SATELLITES CONTAINING THE NUMBER OF WEEKS AFTER THE START DATE IS LIMITED TO A MAXIMUM OF 1023 WEEKS. WHEN THE GPS SYSTEM REACHES WEEK 1024, THE SYSTEM WILL REVERT BACK TO WEEK ZERO.

3. SOME GPS RECEIVERS ARE KNOWN TO BE UNABLE TO MAKE THE TRANSITION FROM WEEK 1023 TO 1024. IF THE GPS RECEIVER IS OUTDATED OR LACKS PROPER UPDATES, THE RECEIVER WILL REVERT TO READING THE WEEK ZERO AS AUGUST 1999. DURING THIS TIME THE INTERNAL CLOCKS OF THESE GPS RECEIVERS WILL EXPERIENCE A LACK OF ABSOLUTE REFERENCE AND MAY GIVE THE WRONG TIME AND POSITION OR MAY LOCK UP PERMANENTLY.

4. SOME OF THESE GPS RECEIVERS ARE REPAIRABLE WITH UPGRADES AND OTHERS WILL BECOME UNUSABLE. USERS ARE ADVISED TO CHECK WITH THEIR GPS MANUFACTURER REGARDING THE STATUS OF THEIR RECEIVER.

5. FOR FURTHER INFORMATION SEE:
 - A. GPS WEEK ROLL OVER ISSUE
www.gps.gov/cgsic/meetings/2017/powers.pdf.
 - B. TIMING CRITICALITY & GPS 1024 WEEK ROLLOVER
www.gps.gov/governance/advisory/meetings
 SELECT NOVEMBER 2017 AND THEN TIMING CRITICALITY & NOTE ON "GPS WEEK-ROLL-OVER"
 - C. GLOBAL POSITIONING SYSTEMS DIRECTORATE,
 SYSTEMS ENGINEERING & INTEGRATION INTERFACE
 SPECIFICATION IS-GPS-200,
www.gps.gov/technical/icwg/IS-GPS-200J.pdf.

6. FAILURE TO VERIFY YOUR GPS RECEIVER COULD LEAD TO SERIOUS NAVIGATIONAL PROBLEMS PLACING LIVES AND PROPERTY AT RISK.

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Technology Sales Group



November 11th, 2016

06_02_1111-01

Technology Sales Group

Res SMT(x) Module Week Number Roll Over (WNRO).

Overview

Trimble wishes to notify users of the Res SMT and Res SMTx family of GPS products that the firmware has the following Week Number Roll Over cutoff dates.

This bulletin covers the following products.

Trimble Part Number	Description	Firmware	0x41 cutoff date	0x8F-AB cutoff date
66266-00	Res SMT	1.01.00	19 th June 2027	19 th June 2027
66266-00	Res SMT	1.05.01	19 th June 2027	19 th June 2027
66266-05	Res SMT	1.14.00	10 th May 2031	10 th May 2031
99899-00	Res SMTx	2.02.00	21 st August 2032	21 st August 2032

Verification of WNRO

Trimble has performed tests for the WNRO (cutoff date) on Res SMT firmware versions v1.01.00, v1.05.01, v1.14.00 and Res SMTx v2.02.00.

The cutoff dates for the 0x41 message and 0x8F-AB messages are listed above. The date output of these messages will be correct up to those dates listed. Afterwards the dates will not be valid.

A Spectracom simulator using a GPS static scenario was used to perform our verification of this cutoff date.

Workaround

There is no firmware update available for the affected units.

The Res SMT GG and Res SMT 360 products have WNRO cut off dates in the 2034/2036 timeframe. Another bulletin will be released in the future with more specific information for the GG and 360 ranges.

If you have any further questions please contact your local Trimble sales representative.

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Product Bulletin

Time and Frequency
02-003-JD11-2018

Week Number Roll Over (WNRO) for Trimble (active) standard products

Overview

Trimble wishes to notify users of Thunderbolt, 360 and GG variants of timing receivers that the firmware has the following Week Number Roll Over cutoff dates.

This bulletin covers the following products.

Trimble Part Number	Description	Firmware	Cutoff date Week number mm/dd/yyyy	Roll over to Week number mm/dd/yyyy
97975-05	Res SMT 360	1.04	2952 08/09/2036	1929 12/25/2016
97975-05	Res SMT 360	1.05	3004 08/08/2037	1981 12/24/2017
96975-00	ICM SMT 360	1.04	2952 08/09/2036	1929 12/25/2016
96975-00	ICM SMT 360	1.05	3004 08/08/2037	1981 12/24/2017
106406-00/05	Acutime 360	1.03	2952 08/09/2036	1929 12/25/2016
106406-00/05	Acutime 360	1.04	3004 08/08/2037	1981 12/24/2017
89999-00	Res SMT GG	1.08	2863 11/25/2034	1840 04/12/2015
89999-00	Res SMT GG	1.09	2927 02/16/2036	1904 07/03/2016
92626-00/05	Acutime GG	1.08	2863 11/25/2034	1840 04/12/2015
92626-00/05	Acutime GG	1.09	2927 02/16/2036	1904 07/03/2016
95959-00	Mini T GG	1.02	2927 02/16/2036	1904 07/03/2016
95959-00	Mini T GG	1.03	2959 11/27/2036	1936 02/12/2017

<http://www.trimble.com/timing>

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TRANSFORMING THE WAY THE WORLD WORKS



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60333-30	Thunderbolt E	1.03	2590 09/01/2029	1567 01/17/2010
60333-50	Thunderbolt E	1.04.01	2606 12/22/2029	1583 05/09/2010

Verification of WNRO

Trimble has performed tests for the WNRO (cutoff date) on timing receivers and firmware versions listed in the table above.

The "cutoff date" column shows the last day when the correct day, month, year is output. Afterwards the dates will not be valid.

The "roll over to" column is the date output the day after the cutoff date.

Note that although after "roll over" the reported date will not be correct, the PPS output is still valid.

A simulator using a GPS static scenario was used to perform our verification of this cutoff date.

WNRO extension for 360 products

From v1.05 of the Res SMT 360 and ICM SMT 360 software release and v1.04 of the Acutime 360 a new command to extend the WNRO date was introduced. The 0x30 command described below adds the ability to change the base week so that it extends the week number roll over based on the new date instead of the firmware build date.

Command Packet 0x30 Use input as UTC Date and Time to add future roll over date

Byte	Item	Type	Description
0	Packet ID	U8	30
1-2	Year	U16	Four Digits of the year
3	UTC:Month	U8	1-12
4	UTC:Day of Month	U8	1-31
5	UTC:Hour	U8	0-23
6	UTC:Min	U8	0-59
7	UTC:Sec	U8	0-59

NOTE: Do not use a date earlier than the current firmware date.

For example

10 30 07 E3 01 01 00 00 00 10 03 ### Change base date to 2019 1st Jan 00:00:00 ####

If you have any further questions please contact your local Trimble sales representative.