

Lassen iQ FW v1.12 and v1.10 Differences

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COMPONENT TECHNOLOGIES

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This bulletin describes the enhancements and fixes for the new Lassen iQ firmware version 1.12:

New Features in Lassen iQ Firmware Version 1.12.

1. The navigation firmware has been upgraded to NAV 2.22.
2. Two TAIP commands have been added AP and DC.
3. RTCM Type 2 messages are no longer required for DGPS to work properly.

Bug Fixes in Lassen iQ Firmware Version 1.12:

1. The satellite drop and position outage problem during WNRO and weekend rollover is fixed.
2. When the static filter is turned off by the user, it will no longer be turned on automatically after 255 fixes.
3. The RX pins do not have to be tied to VCC, when not used.
4. A stack overflow problem is fixed.
5. TAIP message configuration now works on both serial ports.
6. Both serial ports can now output the same NMEA messages
7. The Real Time Clock (RTC) can now work beyond the year 2022.

1. New Features

1.1 The Navigation Code Upgraded to NAV 2.22

The Navigation Code was upgraded from 2.20 (in Lassen iQ FW v1.10) to 2.22.

1.2 New TAIP Command – AP and DC

There are two new TAIP commands in Lassen iQ FW v1.12: AP and DC. The AP command is to set and query the auxiliary port. The DC command provides differential corrections (Type 1 and 9) to the receiver (converted from RTCM-104). Please see Appendix A in the Lassen iQ manual for the definitions of the two commands.

1.3 RTCM Type 2 messages are no longer required for DGPS

The RTCM Type 2 messages were required for DGPS to work properly in previous versions. But since these Type 2 messages are not used or broadcast by most differential systems today and the information in Type 2 messages does not provide significant improvements to the accuracy, the handling of these messages has been removed.



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2. *Bug fixes*

2.1 **Satellite Drops and Position Outages during WNRO and Weekend Rollover**

During weekend rollover (Saturday to Sunday), when the GPS time of the week rolls from 604799 back to 0, the receiver experienced satellite drops and position outages for 3 seconds or more in FW v1.10. This is fixed in version 1.12 and ensures that the receiver works properly before, during, and after the weekend rollover without any satellite drops, position outages, and any other abnormal behavior.

The same problem occurred during Week Number Rollover (WNRO) because WNRO is a special case of weekend rollover.

Lassen iQ Firmware release version 1.12 has corrected this issue.

2.2 **Static Filter was Turned On Automatically After 255 Fixes**

When the user turned off the static filter (by issuing the TSIP 0x 70 commands) in Lassen iQ FW v1.10, it would be turned on automatically after 255 fixes.

Lassen iQ Firmware release version 1.12 has corrected this issue.

2.3 **Serial Driver Issues**

In Firmware version 1.10 when the RX pin of either port 1 or port 2 is grounded or left floating the receiver would fail to generate position fixes. The RX pins had to be pulled to VCC, if unused. Use of pull-up resistors and attaching to VCC on Rx lines (pins 3 and 6) was mandatory for firmware release v1.10 when these pins were not connected to the system's communication ports.

Lassen iQ Firmware release version 1.12 has corrected this issue.

Proper error handling has been added to the Firmware v1.12 to prevent the serial driver issue caused by improper connection of the RX pins. Use of pull-up resistors and attaching to VCC on Rx lines (pins 3 and 6) is still recommended, but not mandatory, for firmware release v1.12.

Please note that the TX pins shall not be tied to ground even with the new Firmware, otherwise the receiver will fail to generate position fixes. The TX pins should be left floating if unused per hardware requirement.

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2.4 Stack Overflow

It was found in Lassen iQ version 1.10 that issuing the TSIP packet 0x65 (Request DGPS information) caused the receiver to halt. After investigation, it was discovered that the response packet of the command required a large amount of stack size. This caused a stack overflow condition. By increasing the stack size, the receiver is now able to respond to the command and functions properly.

The Lassen iQ Firmware release version 1.12 has corrected this issue.

2.5 TAIP Message Configuration Applied to Only Port A

When the user configured the TAIP messages to be output (with TSIP 0x7E) in Lassen iQ FW v1.10, the change was applied only to port A. Port B was always left in the default configuration state.

The Lassen iQ Firmware release version 1.12 has corrected this issue.

2.6 Both Ports Could Not Be Configured to Simultaneously Output NMEA

If both ports were configured to have NMEA as the output protocol in Lassen iQ FW v1.10, port A would report the correct position fixes but port B always reported position outages.

The Lassen iQ Firmware release version 1.12 has corrected this issue.

2.7 Extended TTFB times beyond 2022

With the Lassen iQ FW v1.10, the user would experience extended warm and hot startup times beyond year 2022. The Real Time Clock (RTC) did not work properly beyond 2022 and incorrect data was used to calculate the current time and date for the RTC. On warm starts, invalid time from the RTC was injected to the source code and it caused the source code to search for an incorrect set of satellites and thus took an extended amount of time to generate the first fix.

The Lassen iQ Firmware release version 1.12 has corrected this issue.