



Module Replacement

ORG4572-R01, ORG1510-R01, ORG1518-R01

Application Note

OriginGPS.com



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RELATED DOCUMENTATION

| Nº | Description |
|----|-----------------------|
| 1 | ORG4572-R01 Datasheet |
| 2 | ORG4572-R02 Datasheet |
| 3 | ORG1510-R01 Datasheet |
| 4 | ORG1510-R02 Datasheet |
| 5 | ORG1518-R01 Datasheet |
| 6 | ORG1518-R02 Datasheet |

TABLE OF REVISIONS

| Ver. # | Description | Author/s | Date |
|--------|---------------|-------------|-------------------|
| 1.0 | First Release | Igor Mindel | December 20, 2021 |
| | | | |

ABBREVIATIONS

| Abbreviation | Description |
|--------------|--|
| ATP | Acceptance Test Procedures |
| DC | Direct Current |
| ESD | Electro-Static Discharge/Electronic Sensitive Device |
| FW | Firmware |
| GSV | GNSS Satellites in View (NMEA sentence) |
| GBGSV | Global positioning system fix data (time, position, fix type data) |
| GLONASS | Global Navigation Satellite System (Russian) |
| GGA | Global Positioning System Fix Data (NMEA sentence) |
| GNSS | Global Navigation Satellite System |
| VTG | Course Over Ground and Ground Speed (NMEA sentence) |
| GPGGA | Global positioning system fix data (time, position, fix type data) |
| GPS | Global Positioning System |
| HW | Hardware |
| MID | Message ID |
| NMEA | National Marine Electronics Association |
| OSP | One Socket Protocol |
| PCN | Parts Change Notice |
| POR | Power-On Reset |
| PSRF | Point Spread Response Function |
| ROM | Read-Only Memory |
| SGEE | Server Generated Extended Ephemeris |
| SPI | Serial Peripheral Interface |
| SW | Software |
| TTFF | Time to First Fix |



Scope

This document describes the technical process for changing OriginGPS modules with part numbers of ORG4572-R01, ORG1510-R01, and ORG1518-R01.

Disclaimer

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OriginGPS reserves the right to make changes in its products, specifications, and other information at any time without notice.

OriginGPS reserves the right to conduct, from time to time, and at its sole discretion, firmware (FW) upgrades. If those FW improvements have no material change on end customers, a PCN may not be issued.

OriginGPS navigation products are not recommended to use in life-saving or life-sustaining applications.

SAFETY INFORMATION



Improper handling or misuse of the product can cause permanent damage.

This product is an electronic sensitive device (ESD) and must be handled with care.

DISPOSAL INFORMATION



This product must not be treated as household waste.

For more detailed information about recycling electronic components, contact your local waste-management authority.

CONTACT INFORMATION

contactus@origingps.com

www.origingps.com

1. ABOUT ORIGINGPS

OriginGPS is a world-leading designer, manufacturer, and supplier of miniature GNSS modules and cellular IoT systems.

OriginGPS develops fully integrated, miniaturized GPS/GNSS and integrated IoT solutions for developers. OriginGPS modules introduce unparalleled sensitivity and noise immunity by incorporating Noise-Free-Zone system (NFZ™) proprietary technology for faster position fixing and navigation stability even under challenging satellite signal conditions.

Founded in 2006, OriginGPS specializes in developing unique technologies that miniaturize RF modules, thereby addressing the market need for smaller wireless solutions. For over a decade, our experts have been developing ultra-sensitive, reliable, high-performance modules with the smallest footprint on the market, supporting a range of categories, such as asset tracking, fleet management, industrial IoT, law enforcement, pet/people tracking, precise agriculture, smart cities, sports, and wearables.

2. ABOUT ROM BASED MODULES

Our GNSS modules portfolio includes the following ROM-based solutions:

- **ORG4572-R01 module**

The ORG4572-R01 module is sized at **7 x 7 x 1.5 mm** and does not include an antenna. It supports GPS + GLONASS and has a position accuracy of 1.5m.

- **ORG1510-R01 module**

The ORG1510-R01 module is sized at **10 x 10 x 6.2 mm** and includes a **patch antenna**. It supports GPS + GLONASS and has a position accuracy of 1.5m.

- **ORG1518-R01 module**

The ORG1518-R01 module is sized at **18 x 18 x 6.7 mm** and includes a **patch antenna**. It supports GPS + GLONASS and has a position accuracy of 1.5m.

3. COMPATIBLE MODULES

OriginGPS develops several Flash-based receiver modules which may be used as pin-to-pin compatible replacements for our ROM-based modules.

- **Replacement for ORG4572-R01 module**

The ORG4572-R02 module is a suitable module for upgrading your product with a Flash solution supporting Galileo/BeiDou. It is a module without an antenna, sized at 7 x 7 x 1.6 mm with a position accuracy up to 1.5m.

- **Replacement for ORG1510-R01 module**

ORG1510-R02 is a suitable solution for upgrading your product with a Flash solution supporting Galileo/BeiDou. It is a module with a patch antenna, sized at 10 x 10 x 6.2 mm with a position accuracy up to 1.5m.

- **Replacement for ORG1518-R01**

ORG1518-R02 is a suitable solution for upgrading your product with a Flash solution supporting Galileo/BeiDou. It is a module with a patch antenna, sized at 18 x 18 x 6.7 mm with a position accuracy up to 1.5m.



4. REPLACEMENT PROCEDURE

The following procedures will help you to replace specific modules used in your product. Feel free to contact us for review services and confirmation of the procedures for your product.

4.1. Replacing ORG4572-R01

After placing ORG4572-R02 instead of ORG4572-R01 in your product, you will receive further data even though the hardware is identical in terms of schematics, PCB, pinout, interfaces, and size, and the default baud rate on all interfaces is the same.

While the software concept is the same in each module, the control of the ON_OFF and SW commands may be different due to the move over from a ROM to a Flash module.

- NMEA mode—\$PSRF commands
- OSP mode—MID and ID commands

Most of the commands are the same, while any changes are detailed in the respective NMEA\OSP software manuals.

4.1.1. Product Differences

There are a number of differences between the modules in terms of performance, TTFF, and current consumption.

These are presented in the following table.

| Subject | ORG4572-R01 | ORG4572-R02 |
|--|-----------------------------|---------------------------------------|
| Performance (constellations) | GPS, GLONASS | GPS, GLONASS, Galileo, or GPS, BeiDou |
| TTFF | Patch update time + 27[sec] | 27[sec] |
| Current Consumption (Tracking/Hibernate) | 50[mA] / 50[uA] | 62[mA] / 30[uA] |

Table 1. ORG4572-R01 vs ORG4572-R02 Product Differences

4.1.2. Software Differences

There are a number of differences between the modules in terms of SGEE, FW, satellites ID, ON_OFF, startup process, and power modes.

These are presented in the following table.

| Subject | ORG4572-R01 | ORG4572-R02 |
|--|--|---|
| SGEE implementation easier | Files are stored and updated on the host | SGEE file are uploaded just once to the module |
| New NMEA sentences (with default settings) | GPGGA | GNGGA, GBGSV, GAGSV, GNVTG |
| OSP new MIDs (with default settings) | MID 13 (version 5.5.34) | No output for MID 13 |
| ON_OFF (Refer to datasheet) | Pull-down, controlled by high-level pulses | Pull-up, controlled by high/low levels and pulses |
| Power Modes | ATP, PTF | ATP, PTF, SiRFSmartGNSS™1, SiRFSmartGNSS™2 |
| FW upgrade | Need to update patch on every power-up | No need for a patch, only FW updates |

Table 2. ORG4572-R01 vs ORG4572-R02 Software Differences

4.2. Replacing ORG1510-R01

After placing ORG1510-R02 instead of ORG1510-R01 in your product, you will receive further data even though the hardware is identical in terms of schematics, PCB, pinout, interfaces, and size, and the default baud rate on all interfaces is the same.

While the software concept is the same in each module, the control of the ON_OFF and SW commands may be different due to the move over from a ROM to a Flash module.

- NMEA mode—\$PSRF commands
- OSP mode—MID and ID commands

Most of the commands are the same, while any changes are detailed in the respective NMEA\OSP software manuals.

4.2.1. Product Differences

There are a number of differences between the modules in terms of performance, TTFF, and current consumption.

These are presented in the following table.

| Subject | ORG1510-R01 | ORG1510-R02 |
|--|-----------------------------|---------------------------------------|
| Performance (constellations) | GPS, GLONASS | GPS, GLONASS, Galileo, or GPS, BeiDou |
| TTFF | Patch update time + 27[sec] | 27[sec] |
| Current Consumption (tracking/hibernate) | 50[mA]/ 50[uA] | 52[mA] / 21[uA] |

Table 3. ORG1510-R01 vs ORG1510-R02 Product Differences

4.2.2. Software Differences

There are a number of differences between the modules in terms of SGEE, FW, satellites ID, ON_OFF, startup process, and power modes.

These are presented in the following table.

| Subject | ORG1510-R01 | ORG1510-R02 |
|--|--|---|
| SGEE implementation | Files are stored and updated on the host | SGEE file are uploaded just once to the module |
| New NMEA sentences (with default settings) | GPGGA | GNGGA, GBGSV, GAGSV, GNVTG |
| OSP new MIDs (with default settings) | MID 13 (version 5.5.34) | No output for MID 13 |
| ON_OFF (refer to datasheet) | Pull-down, controlled by high-level pulses | Pull-up, controlled by high/low levels and pulses |
| Power Modes | ATP, PTF | ATP, PTF, SiRFSmartGNSS™1, SiRFSmartGNSS™2 |
| FW upgrade | Need to update patch on every power-up | No need for a patch, only FW updates |

Table 4. ORG1510-R01 vs ORG1510-R02 Software Differences

4.3. Replacing ORG1518-R01

After placing ORG1510-R02 instead of ORG1518-R01 in your product, you will receive further data even though the hardware is identical in terms of schematics, PCB, pinout, interfaces, and size. There is no requirement for a startup process due to the internal POR component inside the ORG1518-R02.

Note: The only HW change is the supply voltage—R01 is 1.8v and R02 is 3.3v. Also, the default baud rate in all interfaces is the same.

While the software concept is the same in each module, the control of the ON_OFF and SW commands may be different due to the move over from a ROM to a Flash module.

- NMEA mode—\$PSRF commands
- OSP mode—MID and ID commands

Most of the commands are the same, while any changes are detailed in the respective NMEA\OSP software manuals.

4.3.1. Product Differences

There are a number of differences between the modules in terms of performance, TTFF, and current consumption:

These are presented in the following table.

| Subject | ORG1518-R01 | ORG1518-R02 |
|--|-----------------------------|---------------------------------------|
| Performance (constellations) | GPS, GLONASS | GPS, GLONASS, Galileo, or GPS, BeiDou |
| TTFF | Patch update time + 27[sec] | 27[sec] |
| Current Consumption (Tracking/Hibernate) | 50[mA] / 50[uA] | 56[mA] / 37[uA] |
| Internal POR component | No | Yes |

Table 5. ORG1518-R01 vs ORG1518-R02 Product Differences

4.3.2. Software Differences

There are a number of differences between the modules in terms of SGEE, FW, satellites ID, ON_OFF, startup process, and power modes.

These are presented in the following table.

| Subject | ORG1518-R01 | ORG1518-R02 |
|--|--|---|
| SGEE implementation | Files are stored and updated on the host | SGEE file is uploaded just once to the module |
| New NMEA sentences (with default settings) | GPGGA | GNGGA, GBGSV, GAGSV, GNVTG |
| OSP new MIDs (with default settings) | MID 13 (version 5.5.34) | No output for MID 13 |
| ON_OFF (refer to the datasheet) | Pull-down, controlled by high-level pulses | Pull-up, controlled by high/low levels and pulses |
| Startup process | ON_OFF sequence | Internal POR, no additional steps needed |
| Power modes | ATP, PTF | ATP, PTF, SiRFSmartGNSS™1, SiRFSmartGNSS™2 |
| FW upgrade | Update patch on every power-up | No need for a patch, only FW updates |

Table 6. ORG1518-R01 vs ORG1518-R02 Software Differences