



DWR-G GPS date repair tools

Datawell - Oceanographic Instruments

Correction of the DWR-G Superstar GPS receiver date stamps

Applicability

This note addresses a date stamp problem in data from DWR-G buoys fitted with the NovAtel Inc. Superstar II GPS receiver. For date problems in MkIII buoy data, please refer to the corresponding technical note [datawell_technicalnote_mkiii_gps_date-repair-tools](#).

Description

Since August 16 2015, DWR-G buoys fitted with the Superstar II GPS receiver may produce wrong date stamps. The problem only shows up after the power to the GPS receiver has been completely removed for several days.

After power up, the DWR-G date stamps then start in the year 1970.

The data logger uses these wrong date stamps in its output files. The following data logger files are affected:

- RDT files
- SDT files

The wrong date stamps also appear in the following processed data files:

- WFT files

Datawell has made available tools to correct these files.

Background

This date stamp issue is the result of a combination of two problems:

1. The Superstar II GPS receiver has experienced a rollover problem on August 16, 2015, which caused the rollover counter to decrement its value, effectively reducing the week count by 1024. Since this date, the receiver's date stamps are 1024 weeks in the past, which is currently in the 20th century. More information on GPS can be found on e.g. <http://www.colorado.edu/geography/gcraft/notes/gps/gpseow.htm>.
2. The Datawell DWR-G firmware does not accept gps dates before December 25, 1999. This prevents synchronisation of the buoy clock.

The combined result gives dates starting in the year 1970.

Tools

There are two separate tools for the logger files and the processed data. They are both command line tools and their use is similar to the other Datawell library tools you may be familiar with. Both are available for download on the Datawell website (www.datawell.nl). The tools (`dwrg_logger_gps_date_repair` and `dwrg_wft_gps_date_repair`) can be found in the Datawell library starting from version 0.24.0.

A typical use case would be to automatically correct the date stamps in all SDT and/or RDT logger files in a directory using the logger tool (`dwrg_logger_gps_date_repair`). Similarly, WFT files can be repaired using `dwrg_wft_gps_date_repair`. See the 'Examples' section below for examples.

The tools do not alter your original files, but make copies in which the date stamps are corrected.

We recommend that you make a backup of all files and directories containing your data files before applying the tools. The tools should not be applied directly to your original data files, but to a copy of the files instead.

The tools will stop working in 2017. After that Datawell will provide a new version if required.



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Date stamps are only corrected within the lifetime of the tool and only if they are affected by the bug. Date stamps are handled as shown in the table below.

Date of dwr-g buoy power-on	Wrong datestamp?	Correction performed
August 15, 2015 and earlier	No (the bug is not 'active' yet)	No correction
August 16, 2015 – August 9, 2019	Yes, starting at January 1, 1970	Date is set to supplied date. Tool expires at January 1, 2017

The help information of the tools is obtained by running:

```
dwr_logger_gps_date_repair -h
```

And

```
dwr_wft_gps_date_repair -h
```

Examples

In these examples we assume the copied data files are in a directory named "my_data_files".

For Windows, copy the `dwr_logger_gps_date_repair.exe` tool, the `dwr_wft_gps_date_repair.exe` tool and the `libwaves.dll` library into the "my_data_files" directory. These files are located in "C:\Program Files (x86)\libdatawell 0.24.0\bin". For Linux the files do not need to be copied as they can already be found on the search path.

Open a command prompt and change directory to the "my_data_files".

The tool needs to know the date and approximate time the buoy was switched on. The supplied date and time must be in UTC, or, alternatively, you can specify a UTC time offset.

Assume that the DWR-G buoy was switched on at 14:03 on April 14, 2016 local time, and our time zone is 2 hours ahead of UTC (such as Amsterdam during summertime).

Now type the following command for RDT files (note that the tool only processes files with the extensions .SDT and .RDT):

```
dwr_logger_gps_date_repair -l logfile_rdt -d2016-04-14T14:03+02:00 -a *.RDT
```

For SDT files, type:

```
dwr_logger_gps_date_repair -l logfile_sdt -d2016-04-14T14:03+02:00 -a *.SDT
```



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These commands will produce a repaired copy for each of the RDT and SDT files found in the directory. The repaired copies can be recognised by their new suffix ".glgdr-0-24-0.RDT" or ".glgdr-0-24-0.SDT ". For instance, if there was a file `DWRG_1_180815.RDT`, then the repaired version is called `DWRG_1_180815.glgdr-0-24-0.RDT`.

For WFT files, type:

```
dwrg_wft_gps_date_repair -l logfile_wft -d2016-04-14T14:03+02:00 -a *.WFT
```

Again, if you don't specify a UTC time offset the time is assumed to be in UTC.

This will produce a repaired copy for each of the WFT files found in the directory. The repaired copies have the suffix ".dwgdr-0-24-0.WFT".

For instance, if there was a file `DWR_1.WFT`, then the repaired version is called `DWR_1.dwgdr-0-24-0.WFT`.

If a file does not contain the wrong date, a 'repaired' copy will still be created.

The log files contain information on the processed files.