



# DWR-MkIII GPS date repair tools

Datawell - Oceanographic Instruments

## Correction of the DWR-MkIII Superstar GPS receiver date stamps

### Applicability

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

### Description

Since August 16 2015, DWR-MkIII 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.

The date stamps are in the year 2096.

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 NMEA strings contain a 2 digit year number, which is interpreted in the Datawell firmware as a year in the 21st century.

The combined result currently gives dates in the year 2096.

### 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](http://www.datawell.nl)). The logger tool (`mkiii_logger_gps_date_repair`) can be found in the Datawell library starting from version 0.20.0. The processed data tool (`wft_gps_date_repair`) is available starting from version 0.22.0.

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 (`mkiii_logger_gps_date_repair`). Similarly, WFT files can be repaired using `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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Only date stamps affected by the bug and within the life time of the tool are corrected. Date stamps are handled as shown in the table below.

Date stamp	Correction required?	Corrected datestamp
December 30, 2095 and earlier	No (the bug is not 'active' yet)	No correction
December 31, 2095 - May 17, 2097	Yes	August 16, 2015 - December 31, 2016
May 18, 2097 and beyond	No (the tool has expired)	No correction

The help information of the tools is obtained by running:

```
mkiii_logger_gps_date_repair -h
```

And

```
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 `mkiii_logger_gps_date_repair.exe` tool, the `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 0.20.0\bin" or "C:\Program Files (x86)\libdatawell 0.22.0\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".

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

```
mkiii_logger_gps_date_repair -l logfile_rdt -a *.RDT
```

For SDT files, type:

```
mkiii_logger_gps_date_repair -l logfile_sdt -a *.SDT
```

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 ".mlgdr-0-20-0.RDT" or ".mlgdr-0-20-0.SDT". For instance, if there was a file `DWR_1_180815.RDT`, then the repaired version is called `DWR_1_180815.mlgdr-0-20-0.RDT`.



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For WFT files, type:

```
wft_gps_date_repair -l logfile_wft -a *.WFT
```

This will produce a repaired copy for each of the WFT files found in the directory. The repaired copies have the suffix ".mlgdr-0-22-0.WFT".

For instance, if there was a file DWR\_1.WFT, then the repaired version is called DWR\_1.mlgdr-0-22-0.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.