

# ViewR 1.5.0 – Release Notes

Previous Version: 1.4.7

Release Date: September 18, 2025

This release especially targets the **Radargram View** in ViewR. It is a major upgrade with improved performance, new functionality, and a refined UI, all designed to provide the best possible quality control and comparison of radar data in the most user-friendly way.

## Highlights

- **Major Radargram Viewer upgrade** – Faster, smarter, and more user-friendly.
  - **Length-independent performance** – Load swaths instantly, no matter the size.
  - **Multi-channel & multi-project support** – Compare data from different channels and projects side by side.
  - **Full ImpulseRadar product support** – Compatible with all current ImpulseRadar systems and formats.
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## New Features & Improvements

### Radargram Viewer

- **Faster processing** – Swaths load significantly quicker.
- **Length-independent performance** – A smarter buffer ensures identical loading times whether the swath is 100 m or 100,000 m.
- **Instant filtering** – Filters are applied instantly, regardless of swath length.
- **Extended format support** – Now fully compatible with PinPointR, CrossOver, PLT, and RQT data.
- **Full ImpulseRadar support** – Works seamlessly with all current ImpulseRadar products.
- **Channel toggle buttons** – Switch between HF, LF, or HF+LF with dedicated buttons.
- **Multi-channel support** – Display all channels in a swath side by side.
- **Multi-project support** – Open multiple projects at once, even from different systems (e.g., Raptor45 and PinPoint in the same window).
- **Synchronized filters** – Filters are applied consistently across all opened projects.

## Cursor, Selection & Zoom

- **Move cursor** – Double-click or use **Ctrl + mouse move**.
- **Hide cursors** – Press **Esc**.
- **Rectangle selection** – Select an area to:
  - Plot the average trace (shown in red) in TraceView.
  - Plot the average spectrum (shown in red) in SpectraView.
- **Zoom** – Hold **Ctrl + mouse wheel** to zoom in and out.

## Header View

- New **Header View** accessible via the icon in the bottom toolbar.
- Displays metadata for the selected channel (currently displayed channel or the one under the cursor).

## Trace View

- Improved UI with a more intuitive way to measure plotted traces.

## Status Toolbar

- Now displays depth in **samples, time, meters, and feet**.

## Views & Layout

- TraceView, SpectraView, HeaderView, and FilterView are now independent controllers.
- All can be opened simultaneously.
- ViewR remembers which were open and restores them at startup.

## Project Management

- Radargram View now tracks the last **10 opened projects** for quick access.

## Swath & Channel Navigation

- Quickly switch between swath numbers or channel numbers using a **dropdown list**.
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## Global Changes (Top View & Radargram View)

### Time Zero Adjustment

- **Improved automatic adjustment:**
  - Automatically detects the first arrival wave more accurate.
  - Calculates time zero backward using antenna separation and average velocity (air + soil).
- **Visual enhancements:**
  - Time zero is marked with a **red line** on the vertical scales.
  - First arrival is marked out with a line and label in trace view.
  - **Double-click** the vertical scale to toggle between time and depth (ViewR will remember you choice).
  - Use the **Velocity button** to adjust project velocity.
- **Channel alignment** – With Auto Zero Level Adjustment enabled, all channels automatically cut away data above time zero, ensuring perfect alignment.

### Automatic Update Check

- ViewR now automatically checks for updates and notifies you on startup if a new version is available.

# Release Notes for ViewR 1.4.7

Previous Release Version: 1.4.5

## Bug Fixes

### 1. Manual Positioning Projects Not Loading

In the previous release, a bug prevented ViewR from loading projects with manual positioning. This has now been resolved. ViewR can once again load such projects, display the top view, and export data to Condor.

### 2. Crash When Loading Surface Features

Since version 1.2.0, ViewR has supported loading and visualizing of surface features. However, a bug caused linear surface features with only one recorded coordinate to be misinterpreted as point feature, which cause ViewR to Crash. This issue has now been fixed and ViewR now correctly determines whether the object is a linear or point feature based on the definition in the object definitions file (.oftproj).

# Release Notes for ViewR 1.4.5

Previous Release Version: 1.4.0

## Improvements / Bug Fixes

### Interpolation of Channels with Missing Binary Files

- If a swath is missing a binary or header file for a channel, ViewR will still load the swath.
- The affected channel will be displayed in **black** in both the **Top View** and **Radargram View** to indicate missing data.
- A **warning prompt** is shown during project load to notify the user.
- If the option “**Interpolate GPR Data**” is enabled, ViewR will interpolate missing channels in the **Top View**.
- During export to Condor, ViewR will **always interpolate** missing channels and display a **warning prompt** during the export process.

### Offset Handling

- ViewR now correctly reads the **Y offset** from Talon.
- The offset logic now matches Talon: offsets are defined relative to the **center of the GPR system**.
- For example, if the GPS is mounted **2 meters in front** of the array (in the driving direction) and **1 meter to the left** of the array center, the offset will be:
  - **X offset:** -1 (left of center)

- **Y offset:** +2 (in front of center)
- If the offset is **less than 1 cm**, ViewR will automatically set it to **0**.

#### Regional Timestamp Format

- Fixed an issue where, under certain regional settings (e.g. Finnish), timestamps in files used a **dot (.) instead of a colon (:)**, causing compatibility issues with Condor.
- The timestamp format is now **consistent and region independent**.

#### DC and Dewow Filter

- The **DC** and **Dewow** filters can now be **enabled simultaneously** in the **Radargram View**.

#### Swaths with Identical Coordinates

- Swaths that have **identical coordinates for all points** in the positioning file, will no longer load in the **Top View**.

#### .ord Files

- ViewR now loads **.ord files individually for each swath**.
- Swaths with missing .ord files will **not be loaded**.

#### Incorrect Traveling Speed in Radargram View

- A bug introduced in **ViewR 1.4.0** caused incorrect traveling speed to be shown in the **Radargram View**.
- This has now been fixed: ViewR correctly displays the **traveling speed** for each trace, based on the movement of the **positioning system** (e.g., GPS or total station).

# Release Notes for ViewR 1.4.0

**Previous Release Version: 1.3.10**

## Import/Merge Project

It's now possible to combine projects in ViewR. For example, if you have several different Talon projects from the same location, such as one with an 8-channel configuration and another with 18 channels, you can now merge them into a single large project using the new import project function.

- Click the Import button.
- Select Import Project and choose a .iprb the project you want to import.  
ViewR will copy and rename the files to match the working project's name while continuing the swath numbering from the highest existing number in the working project.
- Markers and surface features will also be imported.

**Note:** ViewR checks if the projects are compatible with each other. Antenna frequency, sampling frequency, number of samples, bit mode, and positioning system must be the same. If not, the import will be aborted.

## Mixed Channel Configurations

ViewR now supports projects with mixed channel configurations across different swaths, such as 18-channel and 8-channel.

## Bug Fixes

### Handling Large Projects and Long Swaths

Very large projects that required resolution scaling were sometimes not displayed correctly; not all data was shown. This issue was introduced in previous release version and has now been fixed.

**Note:** In theory, ViewR should be able to handle projects of any size, meaning it should always be possible to load the project, regardless of size. ViewR loads the entire project into RAM. If it doesn't fit in memory, it automatically scales down the data to ensure the project can still be loaded for further steps, such as chunk it into smaller parts or exporting it in full resolution to Condor.

### Multi-UTM Zone Support

ViewR now supports projects spanning multiple UTM zones, which was not previously possible. This is achieved by forcing all latitude/longitude coordinates into a single UTM zone. As a result, projects can be exported as a single piece to Condor and subsequently exported as GeoTIFFs or other formats in one seamless process.

# Release Notes for ViewR 1.3.10

**Previous Release Version: 1.3.8**

## Bottom Toolbar with Coordinate Info

A bottom toolbar has been added to the Top View Window. When you move the mouse over the map or top view, the X, Y coordinates and corresponding Latitude/Longitude will be displayed in the toolbar.

- **GPS Source:** If GPS is used as the source, you will see UTM coordinates along with Latitude/Longitude.
- **Total Station/Manual Positioning:** If a Total Station or manual positioning is used, only X, Y coordinates will be displayed.

## Bug Fixes

### Handling Large Projects and Long Swaths

On some computers, there was a limitation in handling very large projects or long swaths in the Top View window, causing ViewR to freeze and making it impossible to use features like the cut functionality. This issue has now been identified and resolved.

# Release Notes for ViewR 1.3.8

**Previous Release Version: 1.3.4**

## Inverse Array Functionality

ViewR now supports reversed x-coordinate configurations for arrays. This enhancement allows the x-offset of channels to start with a positive value and decrease to a negative value, accommodating inverted array setups.

For example, this feature is useful when mounting the array rotated 180 degrees, such as on the front of a vehicle. In such cases, the default left-to-right channel configuration is inverted, and the x-coordinates need to reflect the reversed orientation.

## Other Improvements

The following updates have been made to the Radargram View:

- The top swath view now displays with the zero-level adjusted, regardless of whether "Auto Adjust Zero Level" is enabled.
- A DC filter has been added to the Radargram View. This basic DC filter adjusts the DC offset using the average sample value of the trace.
- All filters are now disabled by default when opening a project in the Radargram View.
- When plotting the average spectra, it is now optional to include individual spectra plots.
- Added functionality to measure RMS in the Trace View.
- It is now possible to open a single profile even if the header and binary file do not follow standard naming conventions.
- Added support for loading data collected with Intools.

# Release Notes for ViewR 1.3.4

**Previous Release Version: 1.3.0**

## Bug Fixes

### Spectrum Tool

In ViewR 1.3.0, an incorrect frequency scale was displayed when plotting multiple traces. This issue has now been fixed.

### Time Sync

Since ViewR 1.2.5, the software did not handle GPS files correctly when they contained GPS points collected while the GPR system was stationary and not collecting GPR data. This issue has been resolved, and ViewR now properly handles such cases.

**Note:** The data collection software (Talon) should not save GPS data when the system is stationary while using the wheel as the trigger source. However, certain versions of Talon contained a bug that caused GPS data to be saved even when the system was stationary. So, ViewR must be able to handle this case properly to be compatible with all versions of Talon.

# Release Notes for ViewR 1.3.0

**Previous Release Version: 1.2.5**

## Spectrum Tool

A spectrum tool has been added to the Radargram View. You'll now find a tab named "Spectrum" on the right side of the radargram.

### Key points about the spectrum tool:

- **Single Trace Mode:** Move the cursor (Ctrl + Left Mouse Button) in the radargram to select a single trace.
- **Select Multiple Traces:** Click on the select icon in the Spectrum View to select an area in the radargram. Then, use the mouse to drag out a rectangle over the area you want to analyze. The spectrum for each sub-trace within the selected area will be plotted, along with the average spectrum for the entire selected area.
- **Scale Options:**
  - Full: The full spectrum is displayed. Zoom (mouse wheel) and scroll are enabled.
  - -10 dB: The spectrum within the range of 0 to -10 dB is displayed. Zoom and scroll are disabled.
  - -3 dB: The spectrum within the range of 0 to -3 dB is displayed. Zoom and scroll are disabled.
- The spectra reflect the data with the selected filters applied, but do not include display filters such as gain and contrast. This approach is consistent with the trace view.



## Bugfixes

### X, Y, and Z Offset Adjustments in Cut Export

The principle of "What you see is what you get" is now applied to all exports, including cut export and Condor export. This means that the output positioning data will be adjusted with the offset you specified during the cut/export process.

If you then open the cut export in ViewR or the Condor export in Condor, it will show that the X, Y, Z offset is zero, since the positioning data was adjusted according to the specified parameters when the cut was made.

### UTM Zone Bug for Condor Export

In some situations, Incorrect UTM zone written to the condor export files for Total Station Projects and projects with Manual Positioning which caused Condor to crash during the import procedure of the project. This has now been fixed.

## Other Improvements

### Improved Handling of Corrupt Position/Time Files

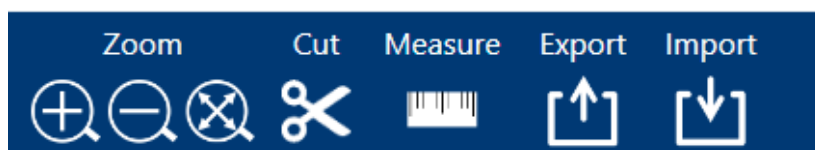
- ViewR now handles cases where a position/time file contains duplicate entries for the same line.
- ViewR also manages situations where a row in the time file has an invalid time tag.

# Release Notes for ViewR 1.2.5

**Previous Release Version: 1.2.0**

## Import Positioning Data

A new import function has been integrated, allowing seamless import of positioning data from alternative sources, such as a post-processed trajectory file. This functionality is specifically tailored to align with .csv files exported from the Trimble MX9 system. If your .csv file format differs, some modifications may be needed.

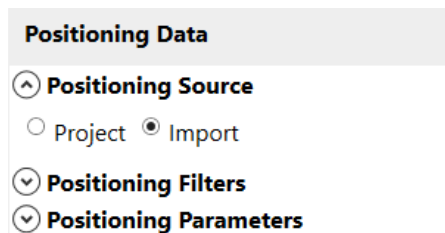


For a smooth import, ViewR requires the following fields in the .csv file:

- gps\_seconds[s]
- latitude[deg]
- longitude[deg]
- altitude\_ellipsoidal[m]
- Optional field: quality/status (ViewR searches for a column containing the string "quality" or "status". If not found, it will set the status to 6 for all coordinates).

**Key points about the import function:**

- ViewR requires a single .csv file covering the entire Raptor project.
- Only swaths successfully matched with positioning data in the .csv file will be loaded.
- If the .csv file lacks a GPS quality field, ViewR will set all coordinates to status 6.
- The .csv file can be comma-separated or tab-separated.
- It's possible to toggle between the imported positioning data and the original positioning data for the project.
- When exporting a project or cutting the project, the selected positioning source will be used.



## Improved Cut Functionality

- Option to open a new subproject directly after the cut has finished has been added.
- Time files are now included in the subproject.

## Radargram Toolbar

The radargram window now contains a bottom toolbar with fields for trace, sample, and traveling speed (km/h and mph) based on the positioning data.

## Bugfixes

- ViewR now ignores duplicate lines from the positioning files.
- ViewR is now able to load Projects without positioning data.
- UTM zone letter now exports correctly to Condor for project with Total station as positioning source.

## Other Improvements

- Improved loading time for positioning data.
- Improved stability.

# Release Notes for ViewR 1.2.0

**Previous Release Version: 1.1.6**

## Surface Features

Surface features in ViewR now accurately reflect the color, symbol, and size specifications from Talon.

## Markers

- Markers are now visible in the top view in ViewR. They are displayed with a pink color and the symbol "M".

- A checkbox for markers has been added in the ViewR interface under the "Display" section.
- When exporting a project to Condor, markers are now included and exported correctly.
- When cutting a project in ViewR, markers within the selected area will also be included.

## Condor Export - Time Files

ViewR now includes time files in the Condor Export, ensuring that the correct time span of the project/swath is displayed in Condor.

**Note:** ViewR will only export data from the first valid position to the last valid position. For example, if the raw swath contains 1000 traces, with the first valid position starting on trace 5 and the last valid position on trace 995, ViewR will export swath data from trace 5 to 995, totaling 990 traces. This approach also applies to positioning files, time files, and marker files.

## Condor Export/ Cut Export – Positioning filters and Parameters

The export will from now on reflect the selected positioning parameters and filters. The exported coordinates will be adjusted for the x, y, z-offset and all other parameters and filters that have been applied on the project. For example, if a z-offset of 1.0 m was applied on the project in ViewR, the coordinates exported to Condor will have been adjusted for this offset. And the header file for the export will say that the z-offset is 0.

## UTM Zone Code

### Total Station

In ViewR, it's now possible to specify the UTM zone code for projects using Total Station as the positioning source. The UTM zone code will be correctly exported in the Condor export files.

### UTM Zone Format

The UTM Zone Format used in ViewR has been replaced from the "Grid Zone Designator" to the "Zone Designator" format, which is considered a standard in GIS applications.

- Zone Designator: Zone number + N/S (e.g., 33N)
- Grid Zone Designator: Zone number + Zone code (e.g., 33T)

## Invalid Swaths

ViewR now provides a warning and will ignore the loading of corrupted swaths when opening a project. Please note that since ViewR doesn't open corrupted swaths, they will not be exported to Condor.

## Adjust Antenna Separation and Channel Spacing

ViewR now allows users to adjust channel spacing and antenna separation settings.

**Note:** ViewR will never manipulate the raw data files; these new parameters will only be applied within ViewR and reflected in the Condor Export files.

## Swath Coverage Width

The Swath Coverage Width has been updated to align with the visualization method employed by Condor, which is widely adopted in the industry. In ViewR, the coverage width of a swath is now depicted as the distance between the center of the leftmost and rightmost channels.

- New Calculation Method:  
 $SWATH\_WIDTH = CHANNEL\_SPACING * (NUMBER\_OF\_CHANNELS - 1)$
- Old Calculation Method:  
 $SWATH\_WIDTH = CHANNEL\_SPACING * NUMBER\_OF\_CHANNELS$

Example: 8-channel Raptor

New Method:  $SWATH\_WIDTH = 0.084m * (8-1) = 0.588m$

Old Method:  $SWATH\_WIDTH = 0.084m * 8 = 0.672m$

## GPR Data Interpolation

Interpolation of GPR data is now optional. A checkbox in the “GPR Data” section has been added to ViewR. The interpolation width is fixed. All empty pixels that has at least one neighbor containing GPR data will be interpolated.

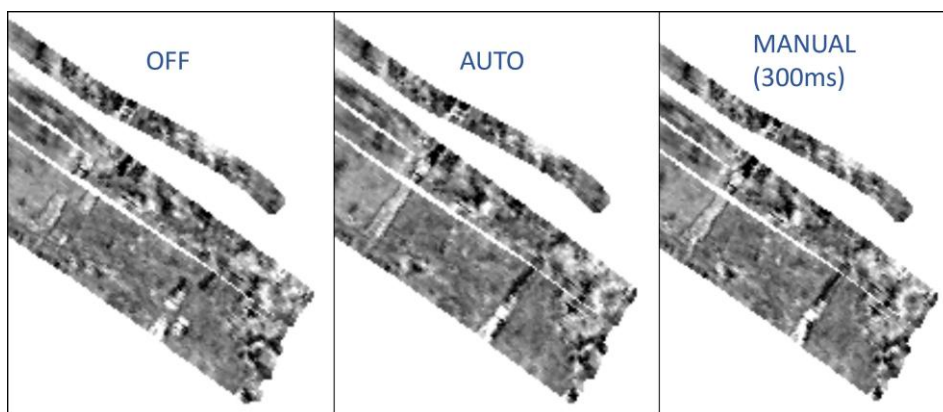
## Total Station Delay Compensation

When using a Total Station, there is no time sync between the coordinates and the GPR data. This means that there always will be a delay between the Total Station and the time the coordinate is registered in Talon. When Talon receives a coordinate from the Total Station, it tags it with the current trace number. This will not be the correct trace number since there is a delay.

Our recommendation has therefore been to make sure that the GPR system is stationary during start/stop and to run the system in a constant speed. When doing so, ViewR can automatically compensate and approximate the correct trace number for each coordinate. This has been the default approach in earlier versions of ViewR.

If not following our recommendations regarding start/stop and speed, the automatic function will not work. We have therefore introduced a manual delay option where we assume that the delay is constant throughout the whole project. The default value is 300 ms. It is recommended to use this method if you have a running start/stop. To summarize, there are three options for delay compensation:

- OFF (No delay compensation)
- AUTO (Automatic delay compensation, ideal for stationary start/stop)
- MANUAL (Ideal for running start/stop).



## Bugfixes

- The depth line in the Trace Viewer had an incorrect position when "Auto Adjust Zero Level" was disabled. This bug has now been fixed.
- If a CUT-area contained several intervals of one Swath, only one interval was exported. This bug has now been fixed.