NAVdisplay

Real-time display software


# NAVdisplay User Manual

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## Contact Details

Oxford Technical Solutions Limited
77 Heyford Park
Upper Heyford
Oxfordshire
OX25 5HD
England

Tel: +44 (0) 1869 238 015
Fax: +44 (0) 1869 238 016

http://www.oxts.com
mailto:info@oxts.com

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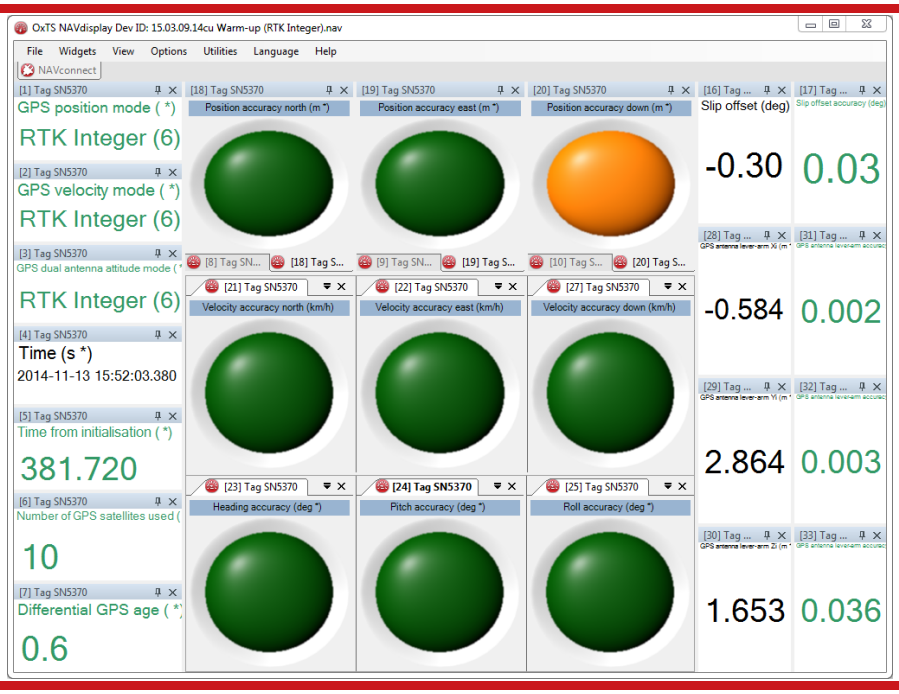
## Introduction

NAVdisplay is a very powerful digital dashboard that provides real-time monitoring of INS devices. Information from one or more connected products can be displayed in a number of highly configurable ways, including analogue dials or numeric displays and programmable lights. This allows engineers working in the field to make complex at-a-glance decisions, such as whether the system is ready to perform certain test scenarios.

**Figure 1. An "at-a-glance" NAVdisplay template to check the system accuracy**




This template has been created to quickly check the system accuracy. The buttons in the centre of the screen have all been configured with the required accuracy settings. By simply glancing at the screen and seeing they are mostly green, the user can be confident they system is at the accuracy they require.

NAVdisplay interprets all OxTS data formats and works with real-time information being transmitted via Ethernet, CAN bus or serial RS232. It can also replay previously saved measurement files that are in OxTS formats.

The design area in NAVdisplay is fully configurable and there is no limit to the number of measurements that can be watched, or to the number of templates that can be created. This freedom allows specific templates to be created for almost any test scenario that can be imagined, and is what makes NAVdisplay such a powerful and useful tool.

## Minimum requirements

The minimum system specifications required to support NAVdisplay are listed below.

- 1.6 GHz processor, Celeron, Pentium, i3 core, etc. with one thread
- 1 GB SDRAM
- 32-bit and 64-bit operating systems
- Windows Vista (SP2 with platform update), Windows 7 and Windows 8

## Installation

NAVdisplay is installed as part of the NAVsuite software—which is delivered on a CD with your product, or it can be downloaded as a compressed zip file (please email support@oxts.com for details of how to do this). To install the NAVsuite software, double-click NAVSetup.exe to start the software setup and then follow the instructions in the wizard.

NAVsuite contains the following programs:

- NAVdisplay
- NAVconfig
- NAVgraph
- RT Post-Process
- Relevant OxTS manuals
- Microsoft Visual C++ redistributable software (where not already installed)

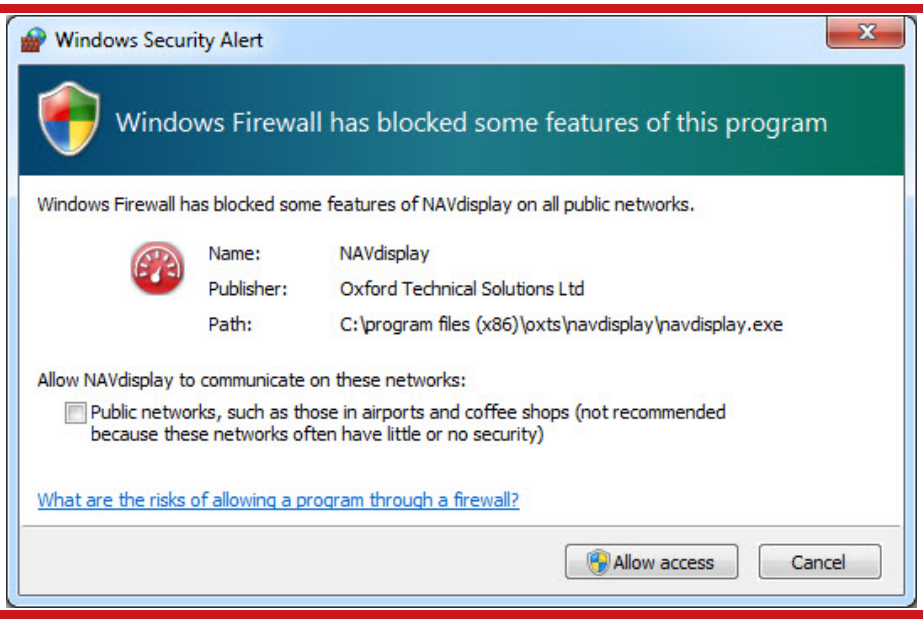
### Installing .NET

NAVsuite will also install the Microsoft .NET framework 4 if it is not already installed on your system. Alternatively you can download .NET free of charge from the Microsoft website.

### Firewall

The first time NAVdisplay is run, a firewall message similar to the one shown in Figure 2 may be triggered. This is because the program is attempting to listen for, and communicate with, OxTS devices on the network. The firewall must be configured to allow the program to talk on the network or it will not work as intended.

**Figure 2. Window's Firewall warning message**




Ensure both Private and Public networks are selected to ensure the software can continue functioning when moving from one type to another.

## Getting started

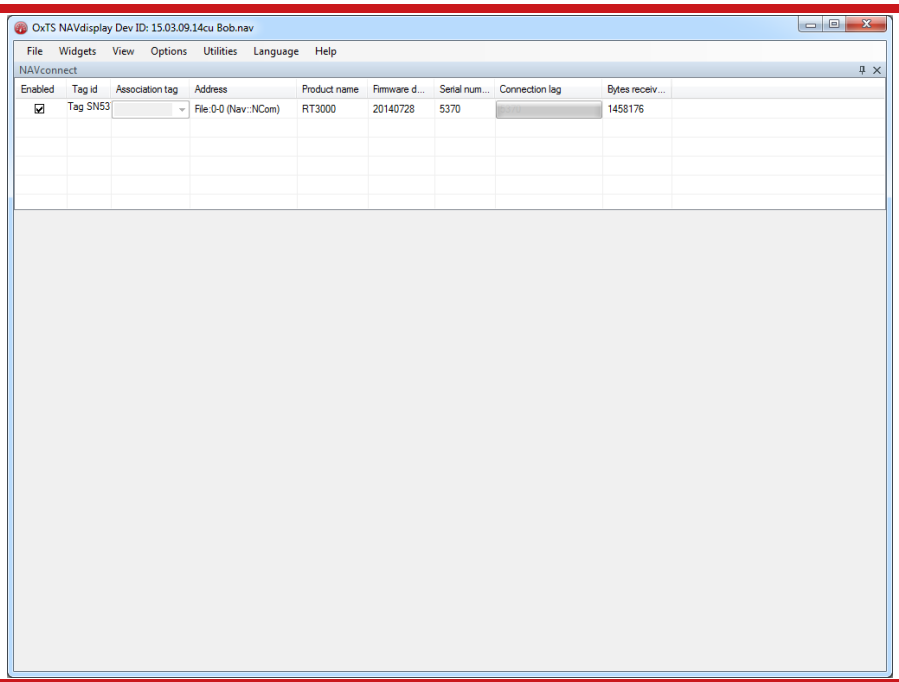
When NAVdisplay first runs, it looks similar to the screen shown in Figure 3.

**Note: before you can create a layout in NAVdisplay, the software *must* see at least one active data stream in NAVconnect, and at least one device with a tick in its Enabled column.**

Data streams can be sourced from a live product connected to the PC via Ethernet, CAN or serial RS232. A data stream can also be generated by replaying a previously saved measurement file using the File replay utility, which can be found under the Utilities menu on the main toolbar. This tricks NAVdisplay into thinking the device that recorded the data is available on the network.

Until a data stream is available in NAVconnect, it is not possible to create a template. This is because NAVdisplay is capable of simultaneously monitoring several devices. So, to make it clear what data is being displayed, each display component (called a widget) is linked to a specific product serial number. Unless a data stream is available, NAVconfig can't assign a serial number to the widget—so can't create any display items.

**Figure 3. NAVdisplay initial screen**




The first time NAVdisplay runs, you will see something like this screen. In order to design a new template, a device must be available in the NAVconnect (docked to the top of the window). In this case you can see an RT3000 with the serial number 5370 is available, and the Enabled checkbox has been selected. It will now be possible to create a template.

## Connection manager (NAVconnect)

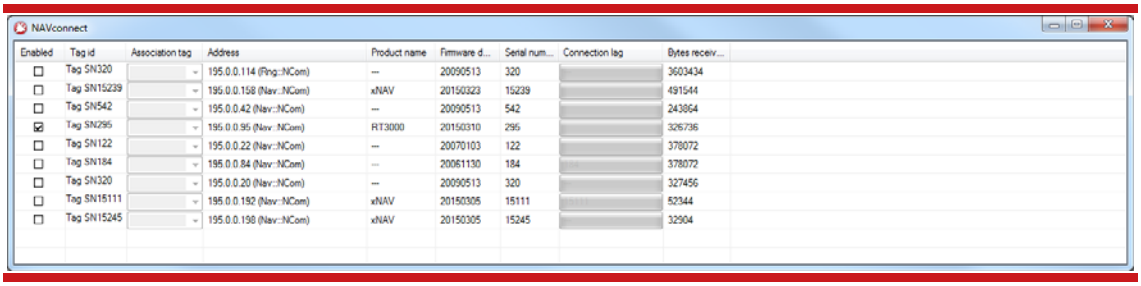
Connections between available devices and NAVdisplay are managed with NAVconnect. NAVconnect is a dockable window that can be toggled on and off using the View menu on the main toolbar.

In the example shown in Figure 4, you can see there are multiple devices available on the OxTS network where this screenshot was taken. To create a new template using measurements from one or more of the available devices shown in NAVconnect, select the Enabled box in the left-hand column.

Please note that the Enabled checkbox does not need to be checked in order to view streaming data once a template has been created. What the Enabled checkbox actually does is make selected devices available in the Widgets menu. The process of adding widgets is fully explained on page 18.

Table 1 explains the fields listed in the NAVconnect window.

**Figure 4. Available devices shown in the NAVconnect window**




Checking items in the Enabed column makes them available in the Widget menu, so widgets can be added. Enabled does not need to be checked in order to view live data, only to add widgets.

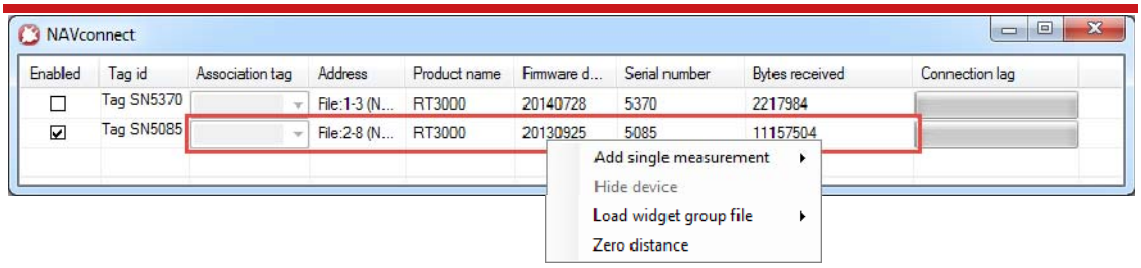
**Table 1. Description of the NAVconnect window**

| Field | Description |
|---|---|
| Enabled | When this box is checked, the device will show up in the Widgets menu allowing widgets to be added. It does not need to be checked to view live data. |
| Tag id | Information displayed here will appear in each widget's header for easy identification of the source of the measurement. The Tag id can be renamed by double clicking on it and typing the new name. |
| Association tag | *This is not currently used in NAVdisplay.* |
| Address | Displays the device's IP address when data is transmitted via Ethernet and CAN. Serial connections show up as *Serial: {stream ID}-{device Id}*. Serial connections do not show the device's IP address. The information in brackets shows the packet container type and the codec being used (e.g. NAV::NCom). In that case NAV stands for navigation information and NCom is the codec. |
| Product name | Displays the product family name of the device. Blank when replaying an RD file. |
| Firmware id | Displays the firmware version currently running on the device. Blank when replaying files. |
| Serial number | Displays the serial number of the device. |
| Connection lag | The connection lag bar represents a delay of 10 seconds. If the delay is too great NAVdisplay disables the device in the list. |
| Bytes received | Displays the number of bytes received. |

### NAVconfig context menu

A context menu to quickly access key features is available within NAVconnect. It is accessed by right-clicking on any cell (except Enabled, Tag id or Connection lag) of an enabled device.

**Figure 5. NAVconnect context menu**




NAVconfig's context menu is accessed by right-clicking on any of the highlighted columns within an enabled device.

- Add single measurement. Provides the same functionality as selecting one of the single measurement widgets from the main toolbar.

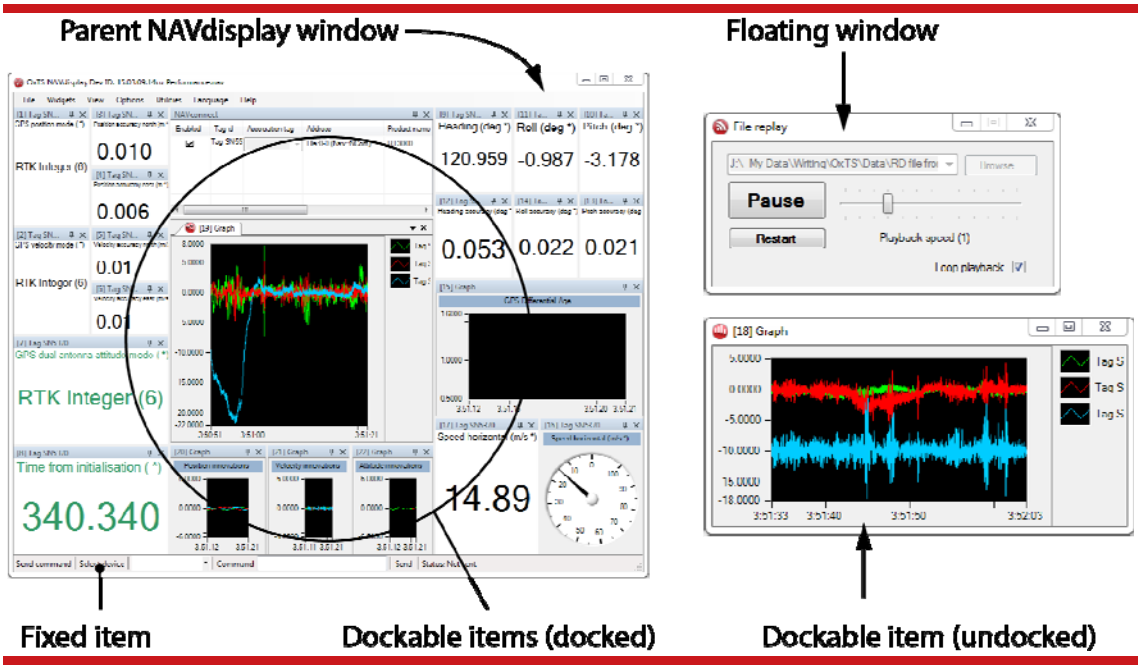
- Hide device. This command is disabled unless the device's connection lag has timed out. It removes devices that have dropped off the network from the list.
- Load widget group file. This command is currently not implimented.
- Zero distance. This command saves the current "distance travelled" value of the device.

## Working with templates

Unlike other OxTS software applications, NAVdisplay does not have a fixed user interface. Instead, it provides a blank canvas that can be filled using a number of items called widgets. In this way you can build exactly the interface you need, showing only important information.

In terms of layout there are three different kinds of control items; fixed, dockable and floating. Examples of these are shown in Figure 6.

**Figure 6. Overview of window types**




NAVdisplay works just as well on multi-monitor configurations; however, you should note that the main application window always opens on the primary monitor.

**Fixed item:** The main toolbar and the Send command bar are examples of fixed items. No matter what happens they always appear in the same place within the parent NAVdisplay window.

**Dockable item:** Windows like NAVconnect and widgets such as analogue dials, graphs and digital displays, are dockable items. This means they can be docked within the parent window or they can be torn off and maintain their position anywhere on the desktop.

**Floating item:** The third style of window is a floating window, which cannot be docked inside the main NAVdisplay window at all. Examples of floating windows include the File replay window and the Device status windows. These windows remember their location when closed, and open in the same place.

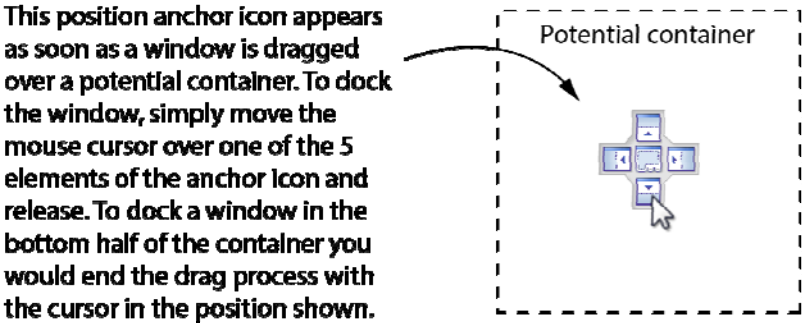
Docking and undocking windows in NAVdisplay is easy. To undock a window, simply click and drag with the mouse on its title area. Once a window has been undocked it can be placed anywhere on the desktop, and will remember its position. You can also undock a window by double clicking its title bar.

**Figure 7. Undocking a window**


To undock a window, click and hold on the window's title area and drag it out of its container.

Docking a window is also easy. Click and hold on the title area of the window you want to dock, and drag it to where you would like to place it. When the dragged window is held above a potential location, a position anchor will appear to help you place the widget. The docking process is shown in Figure 8.

**Figure 8. Docking a window**



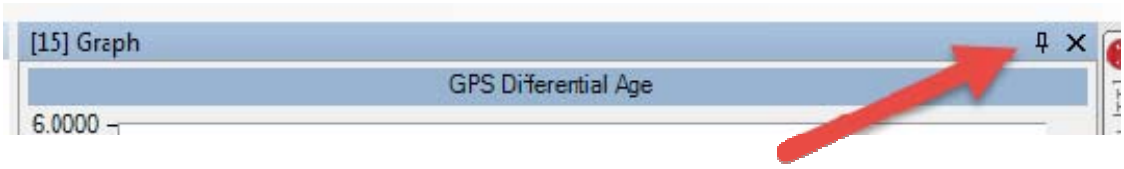

To undock a window, click and hold on the window's title area and drag it out of its container.

Once a window has been undocked it behaves like a normal window and can be moved, resized, minimised and maximised as normal. That single undocked window can also act as a container for other windows. This means an undocked window can be dragged onto another undocked window—creating a single undocked window that now contains two items.

### Pinning and unpinning windows

As well as docking and undocking, some dockable windows have the ability to be pinned and unpinned. Windows that can be pinned feature an extra icon on the right-hand side of their title bar, as shown in Figure 9. Clicking the pin icon toggles the feature on and off. When enabled, the pinning feature collapses the item into a tab on the edge of its parent container. As soon as the mouse pointer hovers above the tab, the item will spring open to its original position.

**Figure 9. Window featuring a pinning icon**




Windows that feature the pin icon in the title bar can be collapsed into a tab to save space. When the mouse is hovered over the tab, the window will spring open again.

### Creating a template

NAVdisplay opens with a blank template. To add widgets to this template you must first enable a device in NAVconnect. Once this is done widgets can be added to the template and moved around as required.

### Saving a template

Templates can be saved via the main toolbar. To save a template click File, then select Save and finally select Template from the pop out menu. A dialog box will appear where a file name a location can be entered. Click Save to complete the process.

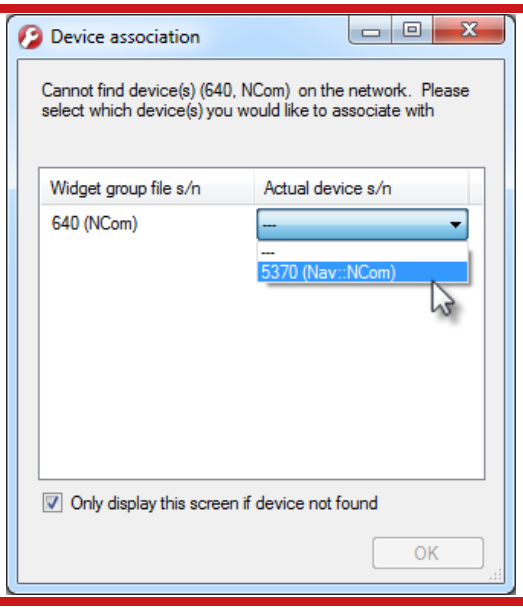
### Loading a template

Existing templates are loaded using the Open command in the File menu. The Open command has a pop out submenu where a template can be chosen. At this point it is possible to Browse for a template location or to select a recently opened template from the pop out list.

The Device association window, shown in Figure 10, will appear by default when opening a template. If the device that was used to create a template is currently available on the network, that device will automatically be selected, and the template can be opened by selecting OK. Alternatively, a new device can be selected and any widgets previously associated with the other device will be re-assigned to a new device that *is* currently available.

The default behaviour can be changed by selecting the "Only display this screen if device not found" option at the bottom of the window. When this option is checked, the Device association window will not appear, as long as the device used to create a template is available. To reverse this option, and force the Device association window to always show, select "Always display serial number mapping screen" in the Options menu of the main toolbar.

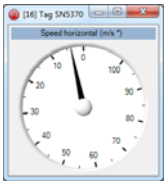
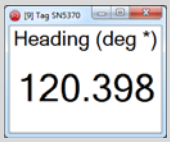
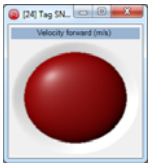
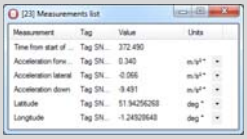
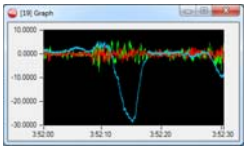
**Figure 10. Device association window**



## Widget types

The visual devices that NAVdisplay uses to relay data are called widgets—and there are 5 different styles to choose from as shown in Table 2.

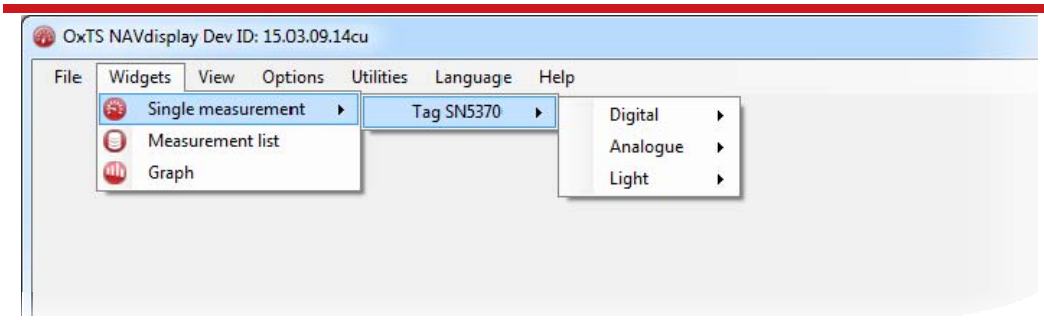
**Table 2. Widget overview**

| Widget name | Example | Description |
|---|---|---|
| Analogue (single measurement) |  | The analogue measurement widget displays a single measurement in the form of an analogue dial. To configure the settings for each gauge, right-click on the widget and select Configure. |
| Digital (single measurement) |  | The digital measurement widget displays a single measurement as digits. The colour of the text can change to indicate the measurement is within a defined range. To configure the settings, right-click on the widget and select Configure. |
| Light (single measurment) |  | The light widget watches a single measurement and changes colour depending on the value of that measurement. Three definable colour ranges can be set for the light. If the measurement value is not within any of the defined ranges the light will turn black. To configure the settings, right-click on the widget and select Configure. |
| Measurement list |  | The measurement list widget displays the value of multiple measurements in digital form. As with a digital widget, the text colour indicates whether the value is within a user-defined range. This is a good way to view multiple measurements in a small space. To configure the settings, right-click on the widget and select Configure. |
| Graph |  | The graph widget provides a scrolling time-based plot of one or more measurements. To add measurements, configure the graph and toggle the visibility of the legend, right-click on the graph area. To remove or configure individual measurements you must find that measurement within the legend and right-click on it. |

## Adding widgets

The Widget menu in the main toolbar is used to add new widgets as shown in Figure 11. In order to successfully execute any of the commands in the Widgets menu, at least one device listed in NAVconnect must have its Enabled checkbox selected. This allows NAVdisplay to associate those widgets with the relevant device.

**Figure 11. Widgets menu structure**




One or more devices must be enabled in NAVconnect before it is possible to create widgets using the Widgets menu.

Widgets added through the Widgets menu initially appear docked in the main application window. However, they can easily be undocked and rearranged as described on page 14, and once a template is finished, it can be saved for later use.

## Analogue widgets

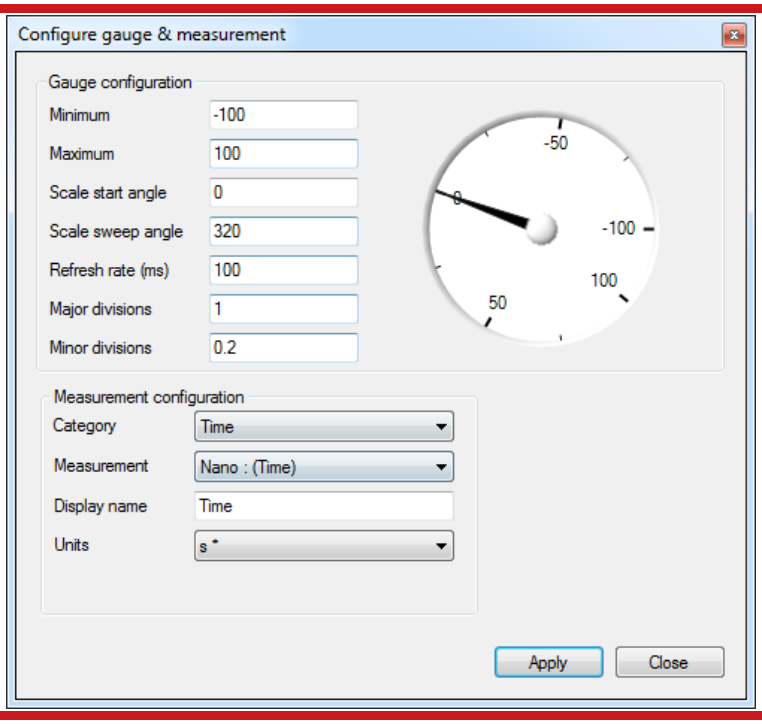
Analogue widgets only display a single measurement, which is chosen when the widget is created. The appearance of each analogue widget, and the measurement it displays, can be changed via the configuration window.

Figure 12 shows the analogue widget configuration window, which is accessed by right-clicking on an analogue widget and selecting Configure. The gauge configurations are clearly labelled, and the effect of each one is previewed on the right-hand side.

As well as configuring each gauge, the measurement assigned to the widget can also be changed using the measurement configuration controls in the lower half of the window.

The * by the default unit means this widget will be affected by the global default options that are defined using the Options window from main toolbar. To force a widget to *always* use a specific unit, choose one without the *.

**Figure 12. Analogue widget configuration menu**




To access the analogue configuration window, right-click on an analogue widget and select configure.

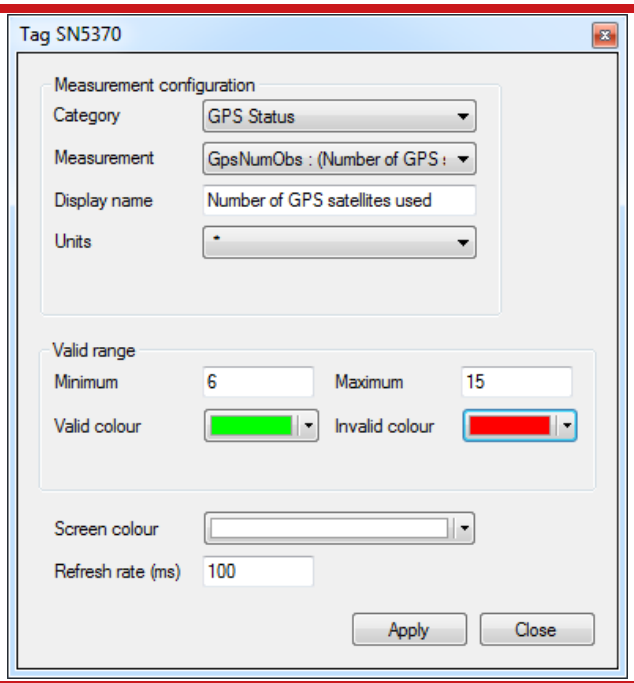
## Digital widgets

Digital widgets only display a single measurement which is chosen when the widget is created. The appearance of each digital widget, and the measurement it displays, can be changed at any time via the configuration window.

The digital widget configuration window is accessed by right-clicking on the widget and selecting Configure. This will open the window shown in Figure 13. The measurement displayed by the widget can be changed using the Measurement configuration controls.

To visually speed up the checking of the NAVdisplay window, the text used in a digital control can change depending on the value of the measurement. This is set using the valid range controls. The Minimum value is equivalent to ≥, while the Maximum value is equivalent to ≤.

**Figure 13. Digital widget configuration menu**




To access the digital configuration window, right-click on a digital widget and select configure.

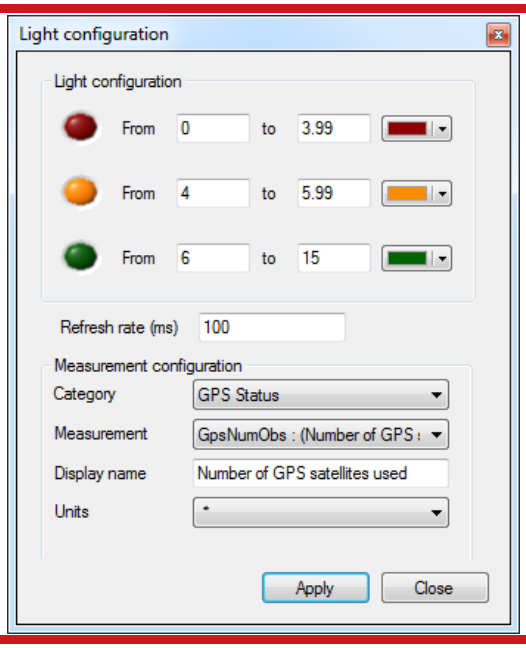
## Light widgets

Light widgets only display a single measurement, which is chosen when the widget is created. The appearance of each light widget, and the measurement it references, can be changed via the configuration window.

The configuration panel for light widgets is accessed by right-clicking on the widget and selecting configure. This will open the window shown in Figure 14. Light widgets have 3 configurable states, which makes them very useful for creating templates that can be read 'at-a-glance'. Three colour and measurement ranges can be defined. In each case the From value is equivalent to ≥, while the 'to' value is equivalent to ≤.

The measurement the light widget displays can be changed using Measurement configuration controls in the lower half of the window.

**Figure 14. Light widget configuration menu**




To access the light configuration window, right-click on a digital widget and select configure.

## Measurement list widgets

Measurement list widgets display one or more digital measurements in a space-efficient way. When a measurement list widget is first created, the Add measurements window will appear. This is the leftmost image in Figure 15.

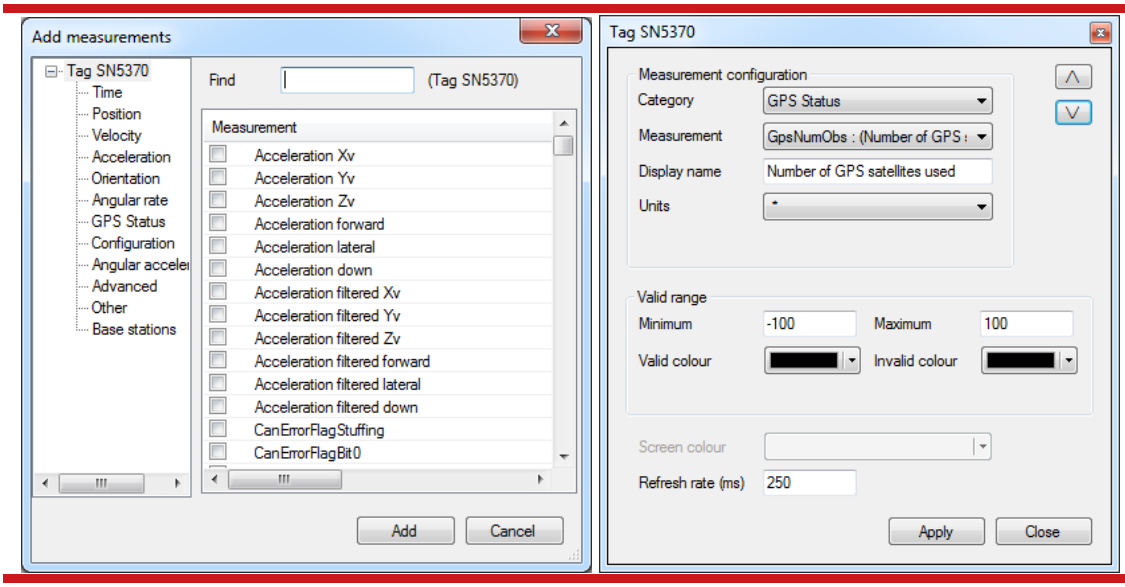
To add a measurement to the list, simply select one of the enabled devices from the tree view on the left-hand side of the window, and then click on the checkbox next to the name of the measurement to be added. Several measurements can be added at once. The Add measurements window can also be accessed by right-clicking on the widget itself, in order to add additional measurement later on.

The appearance of individual measurements is controlled by right-clicking a measurement and selecting Configure. This will open the rightmost window in Figure 15. From this window the measurement being displayed can be changed using the Measurement configuration controls. The colour of the display text can also be defined based on the measurement value, by using the Valid range controls.

The up/down buttons in the top right of the window allow multiple measurements present in the list, to be configured without the need to close the window.

Measurements are removed from the measurement list by selecting the measurement and pressing the delete key, or by right-clicking on the measurement and selecting Remove.

**Figure 15. Measurement list widget configuration menu**




Two configuration windows control the appearance of Measurement lists. The leftmost window is used to add measurements and is accessed by right-clicking on the widget. The rightmost window is accessed by right-clicking on a specific measurement.

## Graph widgets

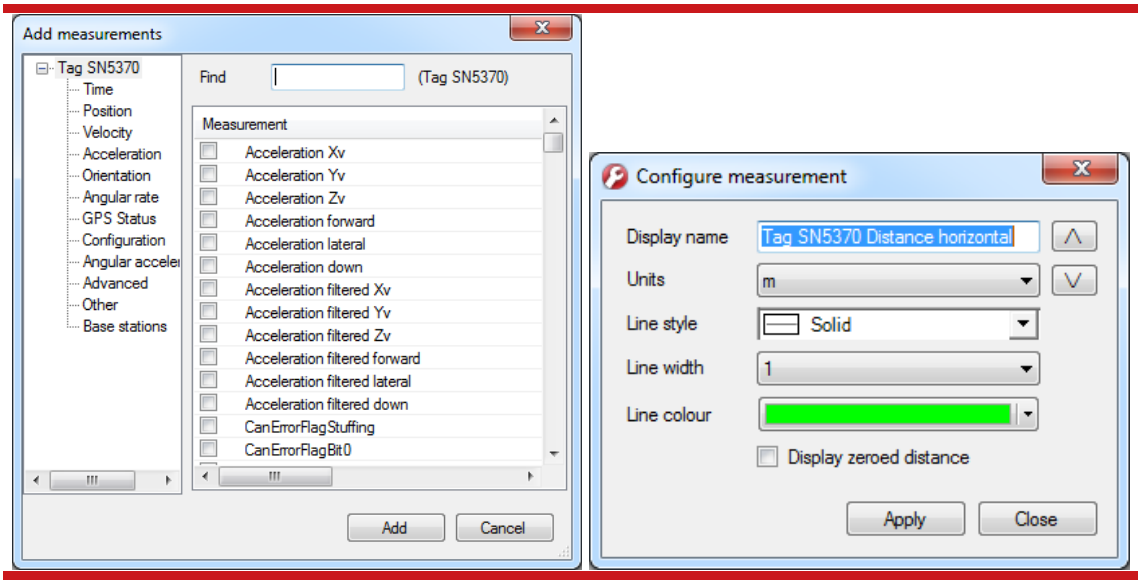
Graph widgets display one or more measurements in a time-based plot. The appearance of each graph widget, and the measurements it displays, can be changed at any time by right-clicking in different areas of the graph.

Measurements are added to graph widgets by right-clicking on the plot area of the graph and selecting Add measurement from the context menu. This will open the window show on the left of Figure 16. To add a measurement to the list, simply select one of the enabled devices from the tree view on the left-hand side of the window, and then click on the checkbox next to the name of the measurement to be added. Several measurements can be added at once.

Measurements can be removed, and their appearance changed, by right-clicking on a measurement in the graph legend. If the graph legend is not visible, it can be displayed by right-clicking on the plot area and selecting View legend. To remove the measurement select Remove. To remove all measurements select Remove all.

To edit the appearance of the measurement that was right-clicked, select Configure. This will open the window show on the right of Figure 16. The up/down buttons in the top right of the window allow multiple measurements present in the list to be configured without the need to close the window.

**Figure 16. Graph widget configuration menu**



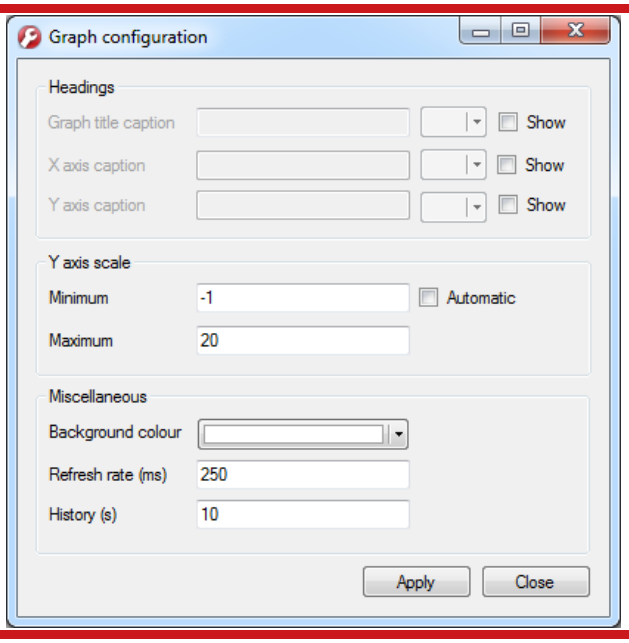

The Add measurement window is accessed by right-clicking on the graph plot area and selecting Configure. The Configure measurement window is accessed by right-clicking on a measurement in the graph legend. If the legend is not visible, right-click on the graph plot area and select View legend.

The appearance of the graph itself is controlled through the Graph configuration window as shown in Figure 17. This window is opened by right-clicking on plot area and selecting Configure.

While they are not displayed by default, a graph title, *x*-axis caption and *y*-axis caption can be added from the Graph configuration window. The scale of the *y*-axis, which is set to automatic by default, can also be manually defined.

The Miscellaneous controls in the lower part of the window allow you to change the background colour of the graph plot area, the refresh rate of the widget and the History of the graph—the time period that is displayed.

**Figure 17. Graph configuration window**



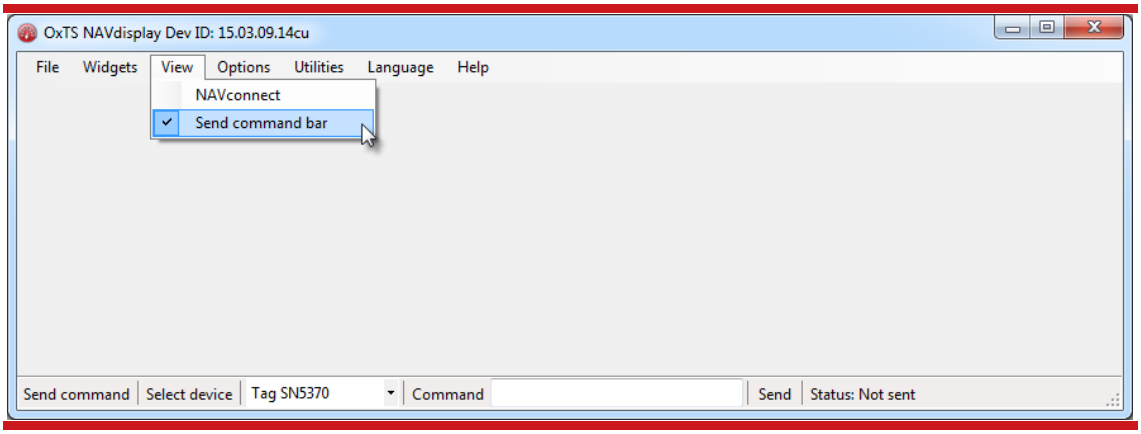

The Graph configuration window is opened by right-clicking on the plot area and selecting Configure.

## Send command bar

The Send command bar, see Figure 18, is a fixed window located at the bottom of the main application window. Its visibility is toggled on and off and via the View menu in the main toolbar.

The purpose of the Send command bar is to send advanced commands to selected devices that are visible to NAVdisplay. It is mainly used by OxTS employees for diagnostic purposes but is safe to use if you are familiar with advanced commands.

**Figure 18. Send command toolbar**




The Send command bar (bottom of the window) is used to send advanced commands to the selected device. Its visibility is toggled on and off use the View command on the main toolbar.

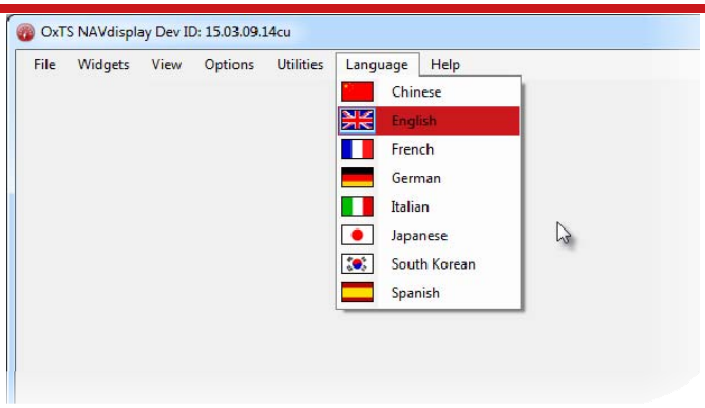
## Changing the language

NAVdisplay can operate in several languages. To change the language, select the language from the Language menu on the main menu. The language can be changed at any time without affecting the operation of the application.

The application uses the PC's regional settings to choose whether numbers are represented in the English or European format (dot or comma as the thousands separator).

At the time of writing, not all languages are yet implemented.

**Figure 19. Languages supported**



## Default options

The Options window shown in Figure 20 is accessed by selecting Options on the main toolbar. The default settings NAVdisplay uses for measurement units, timings and file locations is configured here.

Changing the default unit changes how the measurements appear in the measurement configuration windows of the main display. When working with CAN data, it is not possible to change the default units as they are fixed by the CAN DBC file used to create the data.

The fields in the Options area are shown in Figure 20 and described in Table 3.

**Figure 20. Options window**

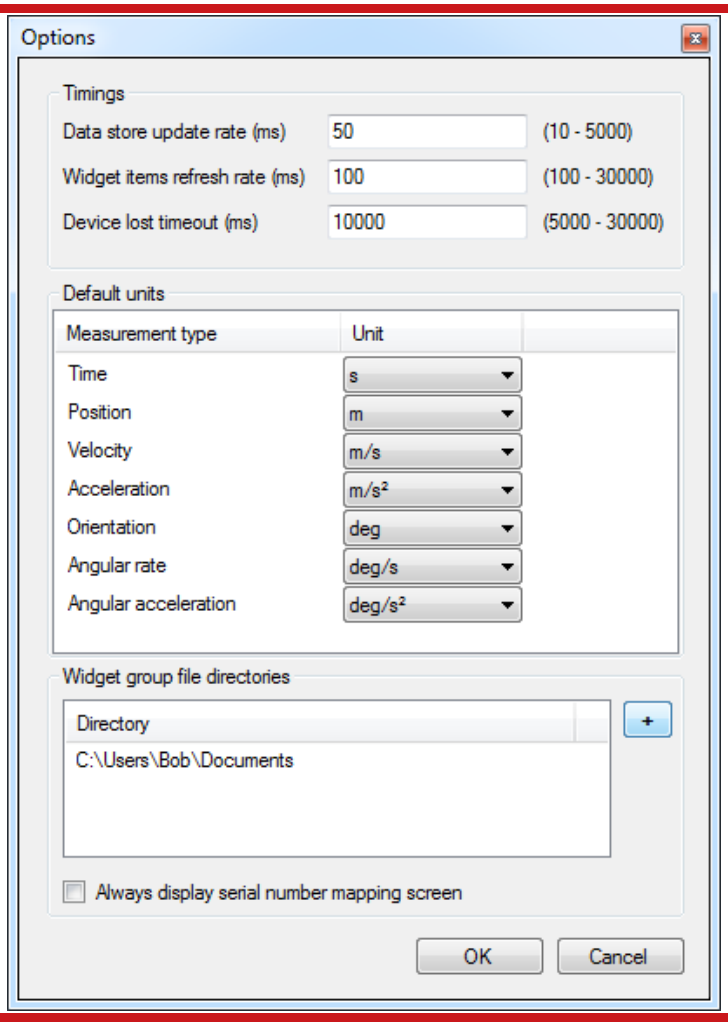


**Table 3. Description of the Options window**

| Field | Description |
|---|---|
| Data store update rate (ms) | An integer value of 10 ms to 5000 ms. This is how often the data store should process the data it has stored in its buffers. |
| Widget item refresh rate | An integer value of 100 ms to 30000 ms. This is how often each widget asks the data store for updated data. If this value is changed, the refresh rate for all the open measurements will change to the value specified in the options box.<br>This value can be individually set for different widgets using the measurement configuration tool. |
| Device lost timeout (ms) | An integer value of 5000 to 30000 ms.<br>This defines how long NAVconnect should wait before deeming the device is no longer present on the network. After this time, it will grey out the device in the list. |
| Default units | The default units can be set for each measurement type. When configuring individual widgets, the default unit is shown as an *. To override the default unit, choose a unit that does not have * in it. |
| Widget group file directories | This is the default file save location(s) for widget groups. There can be more than one location so all directories locations are visible to assign to a device within the NAVconnect window. New locations can be set using the + button. |
| Always display serial number mapping screen | This option forces the Device association window to be displayed when opening templates. See page 16. |

## Cone placement

This utility will be covered in a future update. Some information can currently be found in the Enginuity manual.

## Drift test

This utility will be covered in a future update. Some information can currently be found in the Enginuity manual.

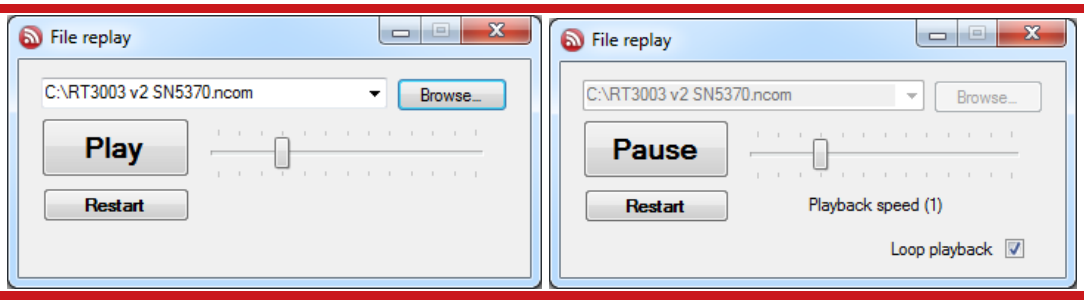
## File replay

The File replay utility reads data from an NCOM, RCOM, XCOM or MCOM file and uses it to simulate a device broadcasting live data on the network. This allows templates to be created when no physical device is connected and for the functionality of templates to be checked.

The utility can also control the playback speed too. This feature, and the option to loop the playback of files, becomes available once playback commences.

Multiple instances of the File replay utility can be run at once, enabling one or more devices to be simulated. However, if the File replay window is closed at any time, the simulated device will become unavailable.

**Figure 21. File replay window**



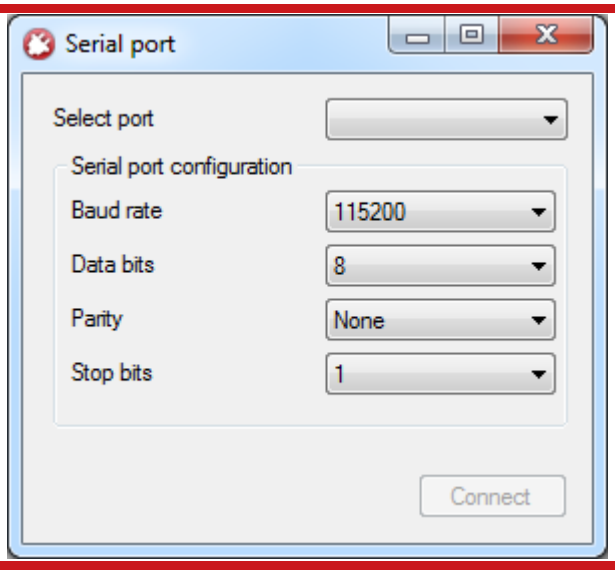

The File replay utility simulates a device broadcasting on the network. Playback speed can also be adjusted.

## Serial port

OxTS devices are normally connected to PCs via Ethernet. However, the Serial port utility found in the Utilities menu enables navigation data to be received via serial RS232 connections. The settings used on the Serial port window will need to match the serial connection settings that your OxTS product has been configured with.

This window must be left open at all times while viewing the data. If it is closed NAVdisplay will immediately stop reading from the device. Multiple instances of the Serial port window can be opened at once.

**Figure 22. Serial port window**




The Serial port window is accessed via the Utilities menu on the main menu.

## Device status

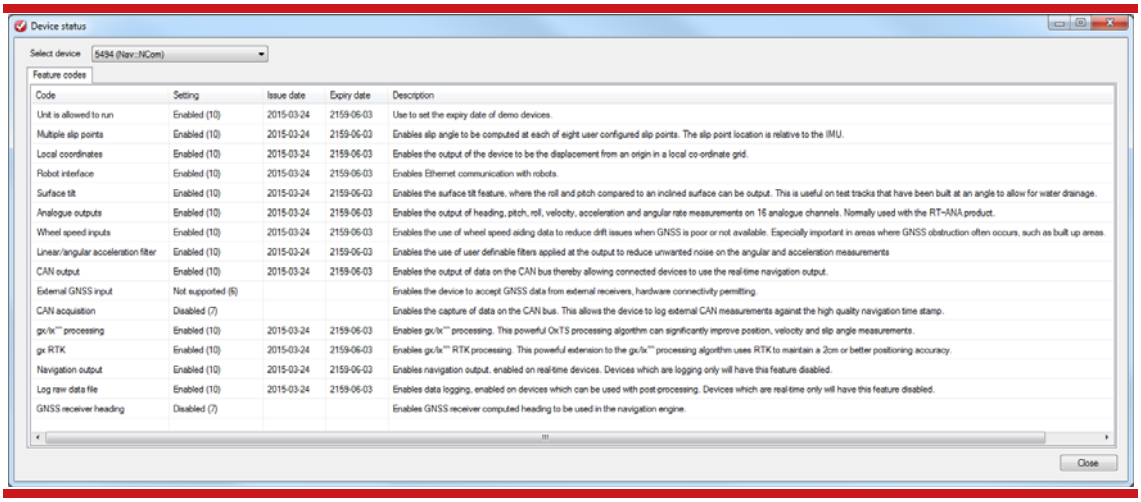
The device status utility is a software tool that allows the feature code status of selected devices to be checked. The utility is launched by selecting Device status from the Utilities menu on the main toolbar. This will open the window shown in Figure 23.

The Device status window provides a list of all features that can be enabled using feature codes. The Setting column has four states:

- Enabled
- Disabled
- Not supported
- Expired

The issue date and expiry data for any enabled features is shown in the relevant column. For more information on feature codes, or to enable available features, please email sales@oxts.com.

**Figure 23. Device status window**




The Device status window is accessed via the Utilities menu on the main toolbar. It shows what feature codes have been enabled on the selected device.

## Test and save module

The Test and save utility can be found in the Utilities menu of the main toolbar. This utility is designed to automatically extract and save test data that fits the criteria defined on the stop start tabs. It is useful because it allows real-time evaluation of the data without the need to stop and select data to be analysed in an external program.

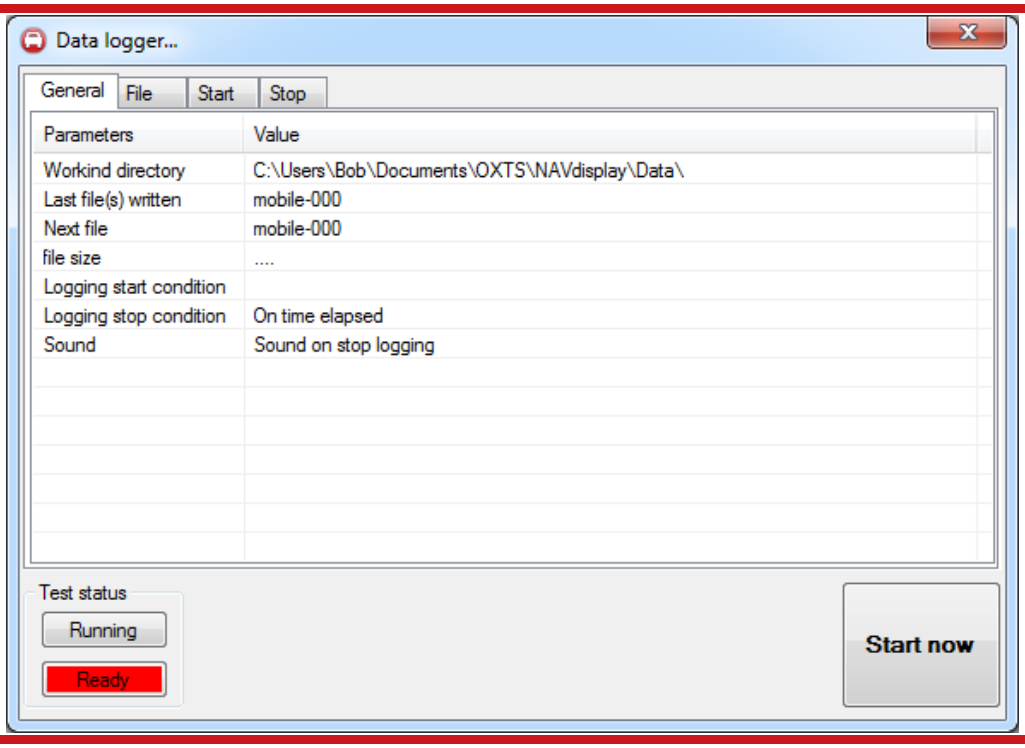
Please note this utility only works with actual products that are streaming data. It will not work if you are replaying a file with the File replay utility.

When the Test and save option is selected from the Utilities menu, the Data logger window shown in Figure 24 will appear. Several instances of this utility can be launched simultaneously, allowing multiple tests to be conducted in parallel.

The interface features four tabs. The General tab summarises the data defined on the other three tabs for quick reference. The File tab is where file location and names are defined for any test results that are produced, while the Start and Stop tabs enable the test conditions to be defined. Below the tabbed section there are three buttons that remain the same for each tab page.

Each tab is described in more detail below along with the function of the buttons.

**Figure 24. Test and save Window**



### Test status and Start buttons

The Test status box at the bottom of the window shows whether the unit is ready to record a test, and whether a test is currently recording or not. When the Ready button is red, the unit is ready. When the Running button is red, a test is currently running as per the defined settings.

Test can be started manually at any time by pressing the Start now button. Once a test has started, either manually or automatically, the Start now button will display Stop now instead, and can be used to manually stop a test at any point.

### General tab

The General tab summarises the file settings and tests defined on the other tabs. Table 4 below lists all parameters and describes their purpose.

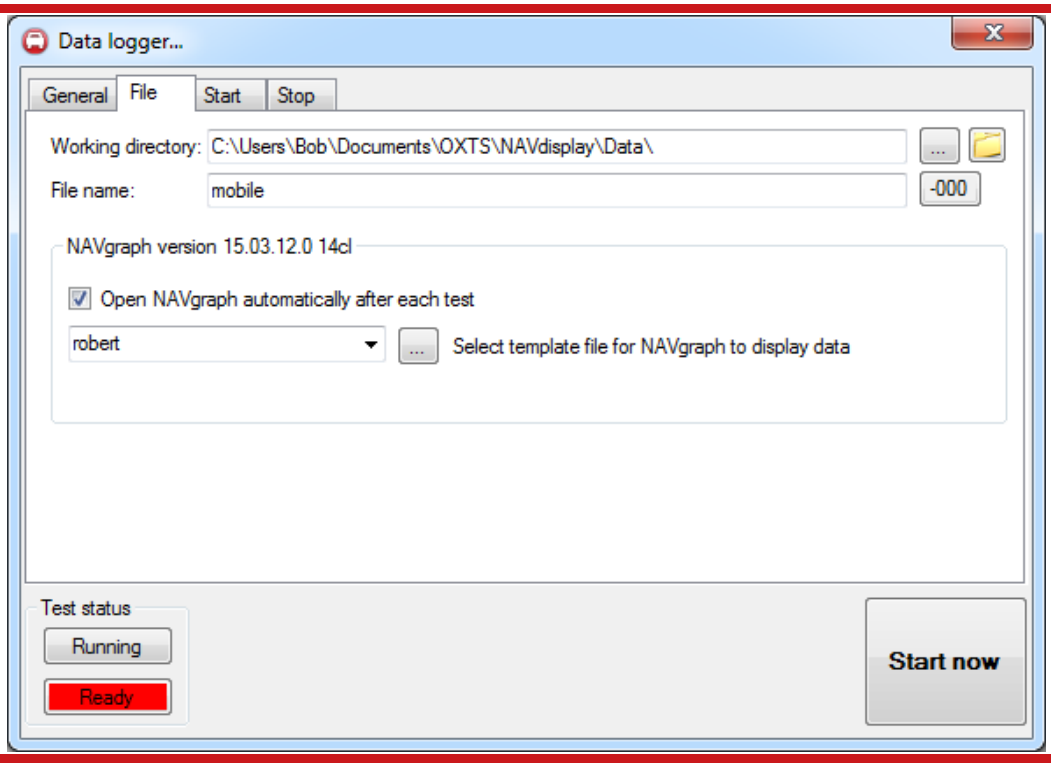
**Table 4. Description of General tab parameters**

| Parameter | Description |
|---|---|
| Working directory | Displays the directory where all test files will be saved. |
| Last file(s) written | Displays the name of the last test file recorded. |
| Next file | Displays the name of the next test file to be recorded. |
| File size | Displays the size of the file currently being recorded. |
| Logging start condition | Displays all options selected for starting the test. |
| Logging stop condition | Displays all options selected for stopping the test. |
| Sound | Displays whether any of the start or stop sounds are active. |

### File tab

The File tab shown in Figure 25 is where the path used to store any test data is defined and where the automatic file naming function is configured.

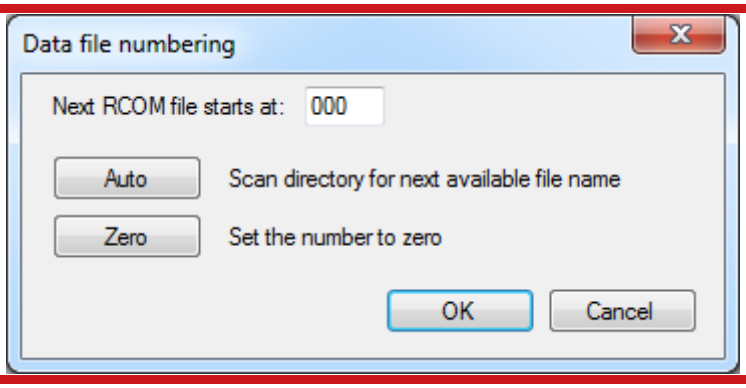
**Figure 25. File Page**




Working directories can be defined by copying and pasting a path directly into the text box, or by clicking the "…" button and navigating to a target folder. Pressing the folder icon at the end opens the specified target folder in Windows Explorer.

When test files are created, they will be named with the text entered into the File name text box and suffixed with the auto-incrementing number displayed on the -000 button to the right hand side. Clicking the -000 button opens the Data file numbering window shown in Figure 26, where the suffix can be formatted.

**Figure 26. Enter Start Number Window**

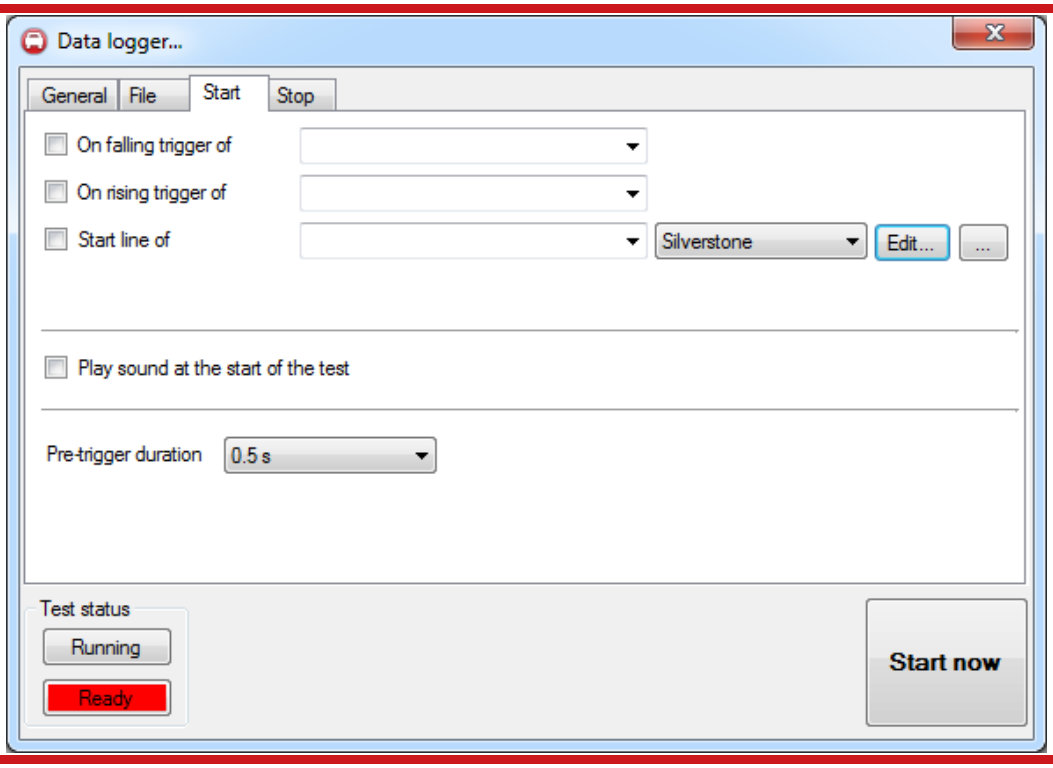



Once a test file has been created, it can be automatically opened in NAVgraph. To enable this option, select the Open NAVgraph automatically after each test option. The menu below this option allows a NAVgraph template to be selected. To access NAVgraph templates not located in the default location, use the "…" button to navigate to this folder. The templates will then appear in the drop-down menu.

### Start Tab

The start tab shown in Figure 27 is used to define the conditions under which a test file will be started. When an INS is configured using NAVconfig, trigger events can be defined. These are captured by NAVdisplay and can be used to start and stop tests.

**Figure 27. Start tab**

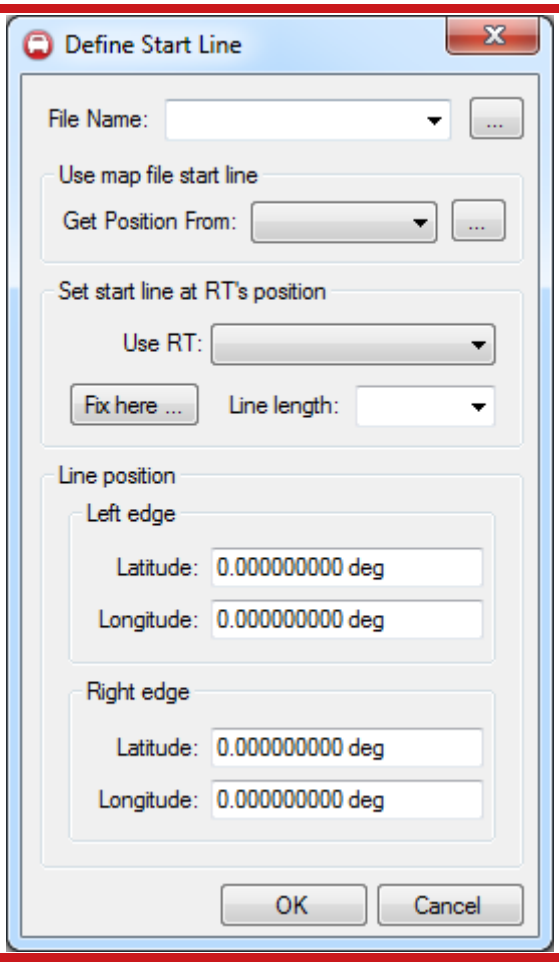



The tag ID of any live products that are visible to NAVdisplay will show up in the drop down menus. To start a test on the falling edge trigger of a product, select the On falling trigger of option, and choose the correct device from the adjacent menu.

Selecting the Start Line of option will start the test when the chosen INS crosses a predefined line in the correct direction. This option cannot be selected until a valid start line is either defined or selected. Pressing the Edit... button opens the Define Start Line window as shown in Figure 28.

To create a new start line, enter the desired name in the File Name box at the top of the window and choose a location by pressing the "..." button.

**Figure 28. Define Start Line window**



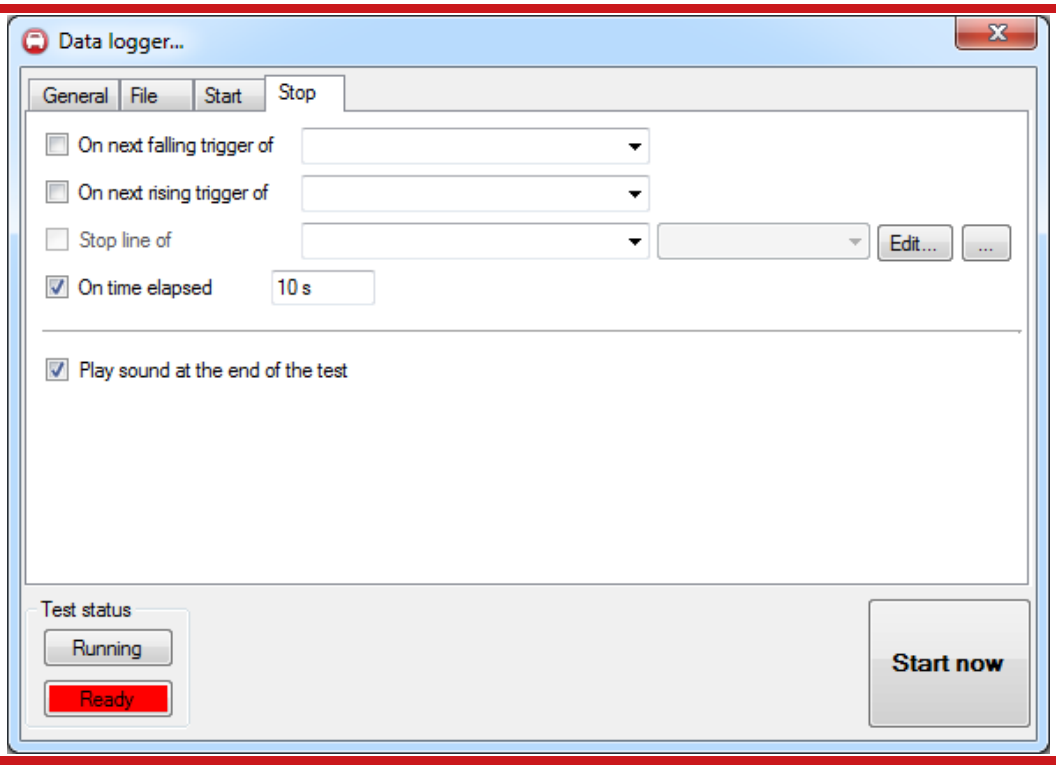

To set a start line using live data from a device, move the vehicle to the desired start line position and ensure it is pointing in the right direction, then press Fix here.... This will set the start line at the current position perpendicular to the current heading.

The desired length of the start line can be selected using the Line length dropdown list box. The latitude and longitude of each end of the start line are displayed lower down. These edit boxes can also be used to manually type in the co-ordinates of a desired start line.

### Stop Page

The Stop tab shown in Figure 29 is used to define the conditions under which a test file will be stopped. The triggers are defined in each INS using NAVconfig. Tests can be stopped on the rising or falling edge of a trigger, when crossing a stop line or after an elapsed time period.

**Figure 29. Stop Page**




To end a test using a trigger, select either the rising or falling edge option and select the ID of the trigger device from the relevant drop-down menu.

Stop lines are defined in the same way as start lines were in the previous section.

When On time elapsed is selected, the test will automatically end after the defined number of seconds has passed.

## Quick config

This utility will be covered in a future update.

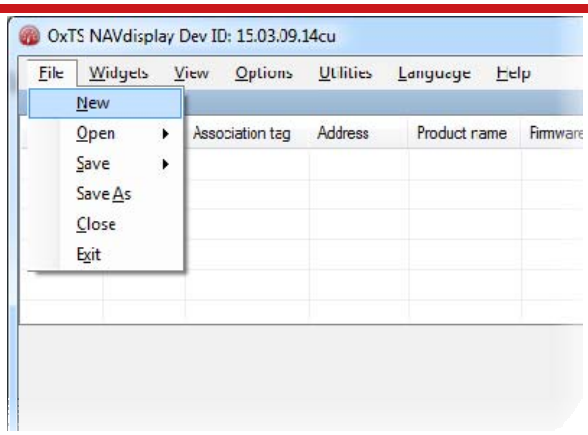
# Shortcuts and hotkeys

## Hotkeys

Hotkeys provide access to many of NAVdisplay's features without the use of a mouse. This is useful in the field, where it is often hard to see the mouse pointer in bright sunlight.

To access hotkeys, press the Alt key once and a line will appear under certain letters in the GUI. Pressing the corresponding letter on the keyboard, as the underlined letter on the GUI, has the same effect as clicking on that menu item with the mouse.

**Figure 30. Hotkeys**




Hotkeys are activated by pressing the Alt key, which underlines certain letters. Pressing the relevant key on the keyboard causes the same behaviour as clicking that menu with the mouse. In this example the Alt key was pressed, followed by the F key. Pressing the X key would cause the application to exit.

## Shortcuts

A number of keyboard shortcuts can be used when working with widgets. The key combinations must be held down simultaneously unlike the hotkeys, which are pressed in sequence.

| | |
|---|---|
| ALT+C | Opens the configuration window of the currently selected widget. On multi-measurement widgets a single measurement must be selected first. |
| ALT+A | Opens the Add measurements window (Measurement list and Graph widgets). |

| | |
|---|---|
| ALT+N | Selects the next measurement when working with Configure measurement windows. |
| ALT+P | Selects the previous measurement when working with Configure measurement windows. |

# Revision History

**Table 5. Revision History**

| Revision | Comments |
|---|---|
| 150324 | Initial Version. |
| | |