



NetAcquire® MissionView™ Users Manual

NetAcquire MissionView™ Users Manual

NA-MAN-062-1_4_6

NetAcquire Corporation

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1. Introduction

MissionView™ software provides easy point-and-click configuration, real-time data display, and control for NetAcquire systems.

MissionView Designer lets you quickly create highly-configurable and sophisticated graphic displays that leverage a large library of real-time charts, meters, gauges, and more.

MissionView Display conveniently connects to NetAcquire servers to display real-time measurement and telemetry data as well as configuration, control, and status.

MissionView supports configuration and management functions of a NetAcquire server, including advanced decommutation, real-time processing and derived measurands, engineering unit conversion, and recording/playback.

1.1 Features

1.1.1 Displays

- Easily create an unlimited number of displays using intuitive drag and drop interface
- Powerful data visualization
- Full control over color, sizing, spacing, and alignment
- Flexible real-time dynamics to change color, size, and more based on the values of incoming data

Gauges <ul style="list-style-type: none">• Circular gauges (many styles)• Dials• Thermometer• Compass	Numeric / State <ul style="list-style-type: none">• Numeric with configurable digits, radix (decimal, hex, <i>etc.</i>)• Seven segment• Bar segment• Alarm Indicator• Annunciator• IRIG time
---	--

Avionics <ul style="list-style-type: none"> • Artificial Horizon • Rate of Turn • Heading • Altimeter • Fuel • Tachometer 	Controls <ul style="list-style-type: none"> • Vertical and horizontal sliders • 2D slider • Spinner • Toggle switch • Multi-position switch • Pushbutton • Knob • Joystick • Pulldown option list • Multi-selection list
Drawing Objects <ul style="list-style-type: none"> • Text labels • Graphics images • Filled/unfilled rectangles and polygons • Filled and unfilled circles, ovals • Arcs, splines • Connectors 	Others <ul style="list-style-type: none"> • Tanks • Columns • Motors • Pumps • Fans • Heat exchanger • Valves

1.1.2 Data Acquisition

- Fast and easy setup of all kinds of input channels
- Acquire PCM telemetry, Mil-Std-1553, analog, and other signals simultaneously from different sources at different sampling rates
- Network client/server interface that supports an unlimited number of display stations
- Allows deterministic real-time processing on each NetAcquire server prior to display
- Transparent handling of all low-level details of network input/output, flow control, error detection, and recovery

1.1.3 User Interface and Management

- Manage multiple windows and multiple NetAcquire servers
- Intuitive operation that automatically discovers NetAcquire server capabilities and links
- Save, load, and transfer displays and visual layouts
- Deploy on any PC-based system including workstations, laptops, embedded smart displays, and rack-mount PCs

- Fully integrated with NetAcquire server access control security and encryption
- Support for Windows, Linux, and macOS operating systems

1.1.4 NetAcquire Server Status, Configuration, and Control including:

- Telemetry-over-IP (TMoIP)
- Recording/playback
- Data generation
- BERT
- Simulation
- Correlating Source Selection (CSS)

1.1.5 NetAcquire Publish/Subscribe (NAPS) Processing

a) Tabular Display

- Scrolling numeric display of a selectable list of subscriptions
- Choices for radix and floating-point number formatting
- Control over the presence of timestamp column
- Configurable up or down scrolling and column width
- Display pausing

b) Logging

- High-speed logging of selectable subscription data in convenient comma-delimited ASCII format
- Start, stop, pause functions
- Configurable time/date formatting

c) Replay

- Replay logged subscription data
- Automatic switching between replay and live server data
- Support various methods for interactive navigation through replay data: stepping forward/backward, skipping forward/backward, random access forward/backward
- Selectable replay speeds from 0.1x to 10x
- Option to continuous cycling of replay when end of file is reached
- Support for manually configured replay start and stop times

d) Alarms

- Configurable comparisons with multiple thresholds and ranges

- Table display of current alarms
- Disk logging of alarm events
- Flexible formatting of alarms conditions (event name, display colors, etc.)

1.2 Package Contents

Your MissionView package contains:

- *NetAcquire MissionView Users Manual*, NA-MAN-062 (this manual)
- A DVD-ROM containing installation software

1.3 What Else You Will Need

MissionView installation requires the following:

- Operating System
 - Windows (version 7 or greater)
 - Linux 64-bit (glibc 2.14 or greater) with X Windows
 - macOS 64-bit (version 10.10 or greater)
 - Virtual machines and hypervisors are not supported
- Disk free space: 200 MB
- NetAcquire system or virtual server running software version 7.4.0 or later (see section 9.2.1 c) for information on earlier software versions)
- See section 8.1 for client system requirements and limitations.

1.4 Organization of NetAcquire Manuals

NetAcquire MissionView includes the following manuals.

- *NetAcquire MissionView Users Manual*, NA-MAN-062 (this manual), describes the operation of MissionView Display and MissionView Designer
- *NetAcquire Command Line Guide*, NA-MAN-065, describes command line access to NetAcquire server functions.

In addition, the following manuals may also be useful:

- *NetAcquire Server Users Manual*, NA-MAN-001, describes features and procedures that are common to all NetAcquire systems, including how to use the web-based management interface
- *NetAcquire Server Users for Quasonix RDMS*, NA-MAN-058, describes features and procedures for administering TMoIP enabled Quasonix RDMS™ systems.
- *NetAcquire Server Data Flow Manual*, NA-MAN-004, describes NetAcquire server data processing capabilities including information on NetAcquire Publish/Subscribe.

The MissionView manual and other help information is also available from the MissionView Display/Designer application's **Help** menu.

2. MissionView Quick Start

MissionView consists of two software applications. MissionView Designer creates drawings consisting of various graphical elements. MissionView Display displays and connects drawings with NetAcquire server data sources and additionally manages multiple servers, offering access to configuration and status. This chapter provides a quick description of how to get started with both MissionView Designer and MissionView Display.

2.1 Installation

The installation software consists of a wizard-based installation program: *MissionViewSetup.exe* on Windows; *MissionViewSetup.sh* on Linux; or *MissionViewSetup.dmg* on macOS. A standard user may run the installer without administrator/root privileges.

MissionView Display and Designer may be installed independently. MissionView Designer is not available for macOS. Each application can be installed as a trial (evaluation) version or fully licensed edition. MissionView Display additionally supports a no-cost Base edition. See section 3.1.

A detailed description of the installation process may be found in chapter 6. Troubleshooting procedures may be found in section 8.1.

2.1.1 Installing a Trial Version

The trial version of MissionView Display does not require a product key. An Internet connection is required to start a trial. The installer automatically starts the trial if an Internet connection is available. Otherwise, the trial may be started either with or without Internet from within MissionView Display (click the **Help** menu then **Licensing**). The software is limited to Base edition functionality if the trial fails to start (e.g., no Internet and no offline trial request) or if the trial period expires.

The evaluation version of MissionView Designer requires an evaluation string but does not require Internet activation. The evaluation string has a fixed expiry date.

Please contact licensing@netacquire.com if you require more time to evaluate MissionView.

2.1.2 Installing a Full License

The fully licensed editions of MissionView Display and MissionView Designer each require separate product keys.

The license must be activated either online (e.g., Internet connection) or offline (e.g., by emailing licensing@netacquire.com). The installer automatically activates the license if an Internet connection is available. Otherwise, the license

may be activated from within MissionView Display (click **Help** menu then **Licensing**).

2.2 Operation and Demonstrations

This section provides a quick walk-through of some basic usage of MissionView Display and MissionView Designer, starting with opening an existing demonstration drawing and then showing the creation of a simple drawing in Designer and loading that drawing in MissionView Display.

2.2.1 *MissionView Display with Demo Drawings*

Start MissionView Display. If you have previously used MissionView Display, the application will open to your last layout.

a) **Open Demo Drawings**

During installation, if the “Open demo drawings” option was selected, demo drawings will automatically appear in your current layout.

Alternatively, click the **File** menu, then click **Open Layout...** and open the example layout *demo.mv* found in your Documents/MissionView folder. The

following display will appear. When finished with the demo.mv layout, use the File menu to **Close Layout**.

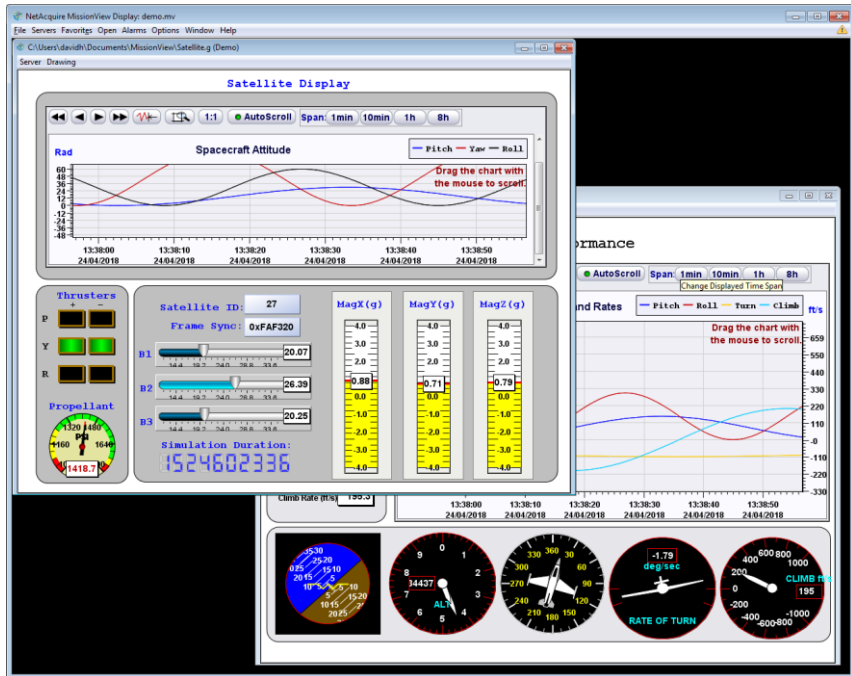


Figure 1—Demonstration Layout

The real-time chart in each drawing has interactive features that can be accessed via mouse clicks for scrolling, zooming, etc.

Right-click any graphical objects in a drawing to explore and configure display properties.

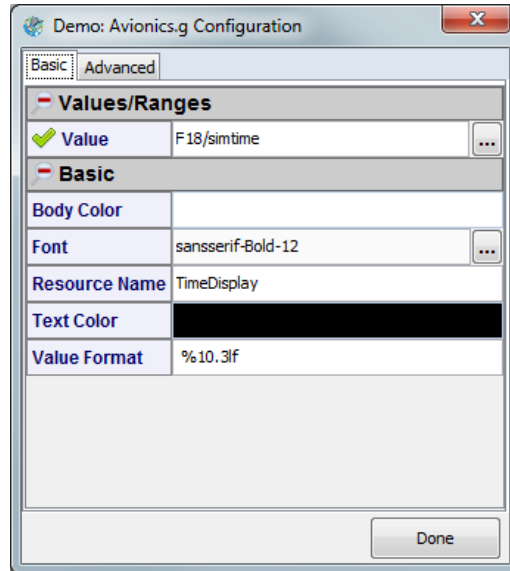


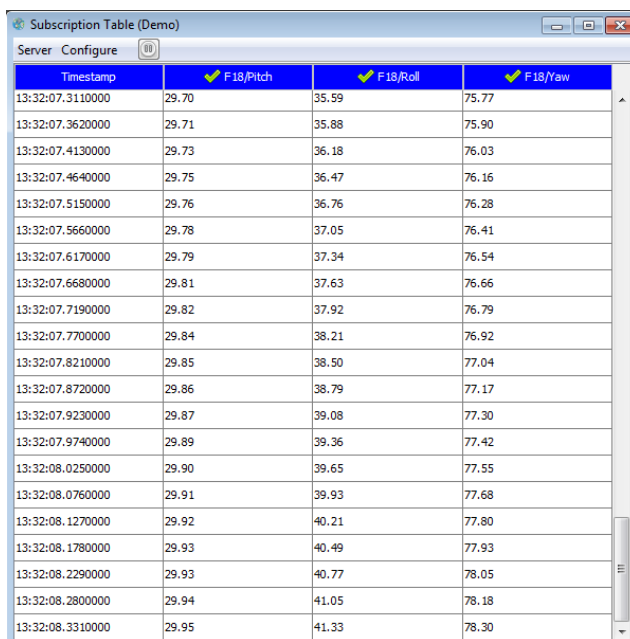
Figure 2—Configurable Graphical Object Display Properties

2.2.2 Demonstration: Subscription Table Display

To open a subscription table display, click the **Open** menu and click **Subscription Table**.

In the resulting Subscription Table window click the **Server** menu then click **Connect ...**, then select the **Demo** hostname.

Click the **Configure Subscriptions...** button in the middle of the Subscription Table window and select subscription names to display. The F18 and Satellite groups can be expanded by clicking on the “+” sign to see more subscriptions. Click the **OK** button to view subscriptions.



Timestamp	✓ F18/Pitch	✓ F18/Roll	✓ F18/Yaw
13:32:07.3110000	29.70	35.59	75.77
13:32:07.3620000	29.71	35.88	75.90
13:32:07.4130000	29.73	36.18	76.03
13:32:07.4640000	29.75	36.47	76.16
13:32:07.5150000	29.76	36.76	76.28
13:32:07.5660000	29.78	37.05	76.41
13:32:07.6170000	29.79	37.34	76.54
13:32:07.6680000	29.81	37.63	76.66
13:32:07.7190000	29.82	37.92	76.79
13:32:07.7700000	29.84	38.21	76.92
13:32:07.8210000	29.85	38.50	77.04
13:32:07.8720000	29.86	38.79	77.17
13:32:07.9230000	29.87	39.08	77.30
13:32:07.9740000	29.89	39.36	77.42
13:32:08.0250000	29.90	39.65	77.55
13:32:08.0760000	29.91	39.93	77.68
13:32:08.1270000	29.92	40.21	77.80
13:32:08.1780000	29.93	40.49	77.93
13:32:08.2290000	29.93	40.77	78.05
13:32:08.2800000	29.94	41.05	78.18
13:32:08.3310000	29.95	41.33	78.30

Figure 3—Subscription Table

2.2.3 Demonstration: Subscription Logging

To open the logger user interface, click the **Open** menu and click **Subscription Logger/Replayer**.

In the resulting Subscription Logger/Replayer window click the **Server** menu then click **Connect ...**, then select the **Demo** hostname.

Click the **Configure** menu and then click **Subscriptions...** and select subscription names to log. Selecting the F18 or Satellite domains will select all subscription in that domain for logging. Click the record (button with red circle) to start recording.

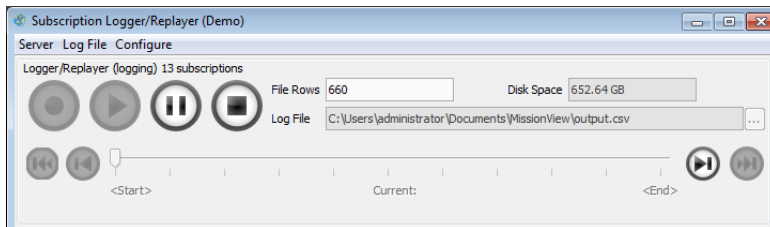


Figure 4—Subscription Logging

2.2.4 *Demonstration: Add NetAcquire Servers*

To add a NetAcquire server, click the **Servers** menu and click **Add...** Type in a NetAcquire server hostname or IP address, and click **OK**.

The Servers Management window will open and show the status of the connection.

Click the **Servers** menu and find the server added above. This new menu entry contains the menu items for connecting a drawing or opening configuration/status pages on the server.

Click on **System Management** then **Time Change & Source** and the configuration page will open in a window. Using the mouse, move this window so both it and other windows can be seen at the same time.

2.2.5 *Demonstration: Designing a New (Custom) Drawing*

Start MissionView Designer. Designer opens with a blank, untitled drawing.

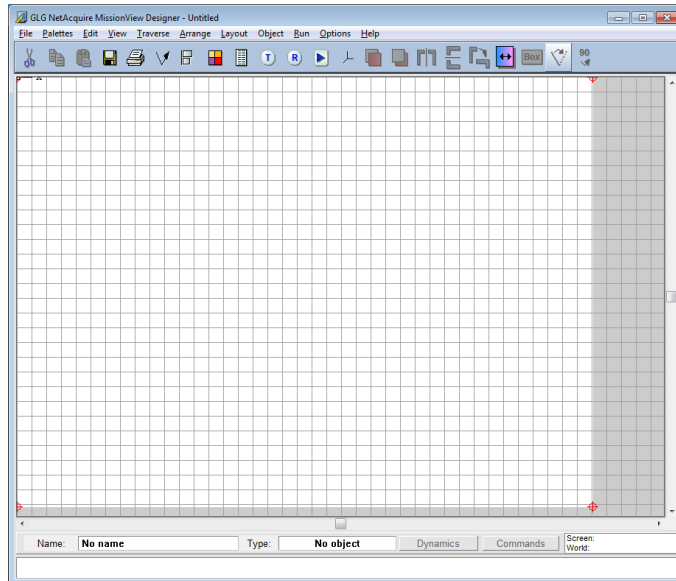
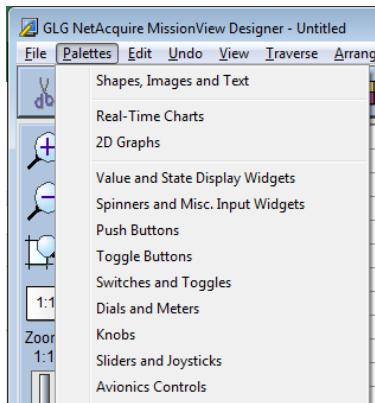


Figure 5—New Drawing

Click the **Palettes** menu, then click **Dials and Meters**:




Click on a dial in the palette window such as the one at the far right of the top row



, then click on the drawing area to place the dial into the drawing.

If not already selected, click on the dial in the drawing area to select it and then

click on the **Object Properties** button, , in the top toolbar.

Change the property for High to be **65** and Low to be **-65**, then Click **OK**.

Click the **File** menu, then click **Save** and save the drawing to a convenient location using the name “mydrawing.g” (make sure to include the .g suffix).

These steps complete the creation of a simple drawing with a single dial.

a) Displaying the New (Custom) Drawing

Start MissionView Display.

Click the **Servers** menu, then click **Demo**, and finally **Drawing...**, then navigate to the drawing created in the Designer section above (mydrawing.g).

Click **Open** to open the drawing with a connection to the Demo server.

Once the drawing has opened you will see a window with a dial. Right-click the dial to bring up the dial's configuration.

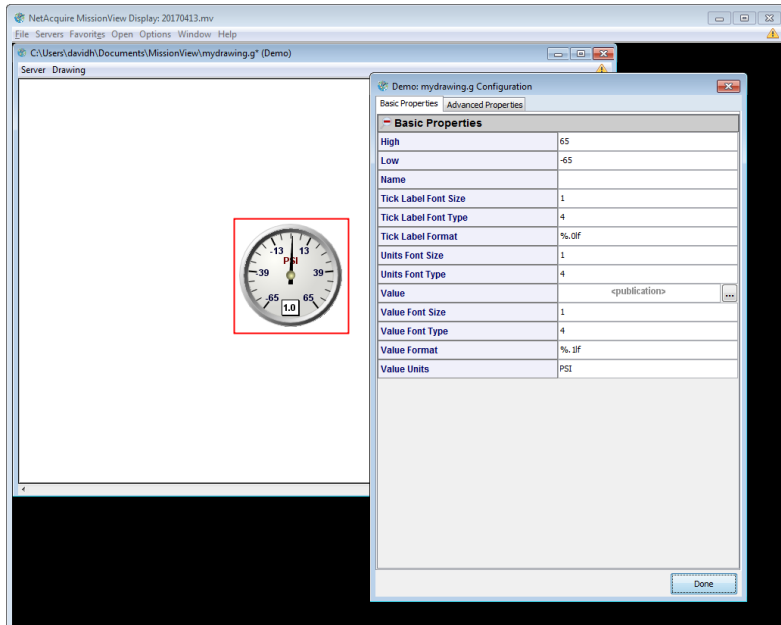


Figure 6—Configuration Dialog

Click on the **ellipsis (...)** button for the property **Value** to open the publication selection dialog. Select *Sine m60* and click **Link Publication**.

The dial will immediately begin displaying the value from the Demo server's publication (sine wave moving from -60 to 60).

Close the dialog when finished or you may make additional changes that get reflected immediately in the dial.

3. MissionView Display

MissionView Display provides configuration and control of NetAcquire systems and user-customizable real-time data displays. This chapter provides detailed information on everything related to MissionView Display.

3.1 MissionView Display Editions

MissionView Display licensing provides varying levels of features.

3.1.1 *Base Edition*

This no-cost version of MissionView Display includes all the capabilities of MissionView Display except for drawings. Users of Base edition can make use of features such as multiple servers management, favorites management, window layouts, and server configuration and status.

3.1.2 *Full Edition*

The Full edition of MissionView Display offers the drawings option and all associated functionality. Table 1 summarizes differences between Base edition and Full edition.

Table 1—Differences between MissionView Display Base and Full Editions

Capability	No-Cost Display Base Edition	Display Full Edition	Display Full Edition Plus Designer¹
NetAcquire server configuration, status, and control windows	Yes	Yes	Yes
Window favorites management	Yes	Yes	Yes
Desktop window layouts with save/restore	Yes	Yes	Yes
Support for multiple servers	Yes	Yes	Yes
Integrated display of NetAcquire web pages	Yes	Yes	Yes
Password management	Yes	Yes	Yes
NetAcquire server auto-discovery	No	Yes	Yes
Display of user-configured drawings with real-time data	No	Yes	Yes
Interactively change visual properties of drawings and optionally save changes	No	Yes	Yes
Display of tables of subscription values	No	Yes	Yes
Data charting with scrolling/zooming	No	Yes	Yes
Disk logging of subscription data	No	Yes	Yes
Playback of logged subscription data	No	Yes	Yes
Alarm configuration and display	No	Yes	Yes
Drawing dynamics	No	No	Yes
Issue NetAcquire server commands from drawings	No	No	Yes
Leverage GIS map server from drawings (including support for NetAcquire server-based GIS server)	No	No	Yes
Create customized real-time data drawings with over 200 graphical objects	No	No	Yes

¹ For more information on MissionView Designer, see Chapter 4. MissionView Designer runs on Windows and Linux, but not macOS.

3.1.3 Licensing

Licensing options can be accessed via the **Help** menu. Click **Help**, then **About** to see the licensing status for your product including time remaining in the trial (if applicable). Click **Help**, then **Licensing** to start or extend a Full edition trial or to activate the Full edition.

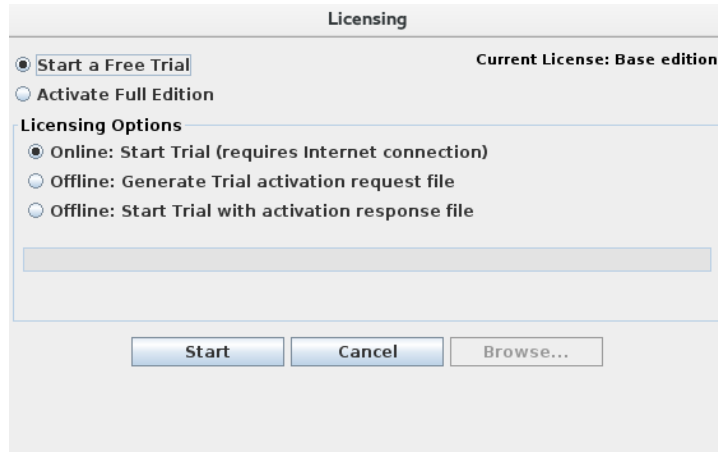


Figure 7—Licensing Dialog (Linux)

a) Starting a Trial

If the trial was not started during installation, click **Help**, then **Licensing** to open the Licensing dialog. Select **Start a Free Trial** then, under Licensing Options, select **Online: Start Trial** and click **Start**. The application will automatically activate via the Internet and switch from Base edition to operating in Full edition for the trial duration. Trials can also be started offline (*i.e.*, when not connected to the Internet). See below for details.

b) Extending a Trial

A Full edition trial can be extended beyond the initial thirty days. When a trial has expired, or while a trial is underway, the Licensing dialog will provide options for extending the trial. Unlike starting a trial, extending a trial requires a trial extension key when extending via the Internet. Contact NetAcquire Corporation (licensing@netacquire.com) for further information regarding trial extension keys. Trials can also be extended offline (see below for details).

c) Activating a License

To activate the Full edition, click **Help**, then **Licensing** to open the Licensing dialog. Select **Activate Full Edition** then, under the Licensing Options, select **Online: Activate** and click **Activate**. The application will automatically activate via the Internet and switch from Base edition or a Full edition trial to the Full

edition. Full edition activation can also be done offline (*i.e.*, when not connected to the Internet). See below for details.

d) Offline Requests

Full edition activation and Trials can be started offline (*i.e.*, without being connected to the Internet). This involves creating an offline request file. This request is then emailed to licensing@netacquire.com who then provides an activation response file. This response is then used to activate the Full edition or start/extend a Full edition trial.

Start by selecting **Offline: Generate...** and click **Generate**. Or click **Browse** prior to **Generate**, to change the default offline request file. Offline request files appear in your Documents\MissionView directory and are named

ActivationRequest.xml (or **TrialRequest.xml** for Full edition trials or trial extensions) by default. On Windows, this directory can be found at *C:\Users\<user>\Documents\MissionView*. On Linux and macOS, this directory is located at *~/Documents/MissionView*. After generating this offline request, send the generated file to NetAcquire Corporation to receive your offline activation key file.

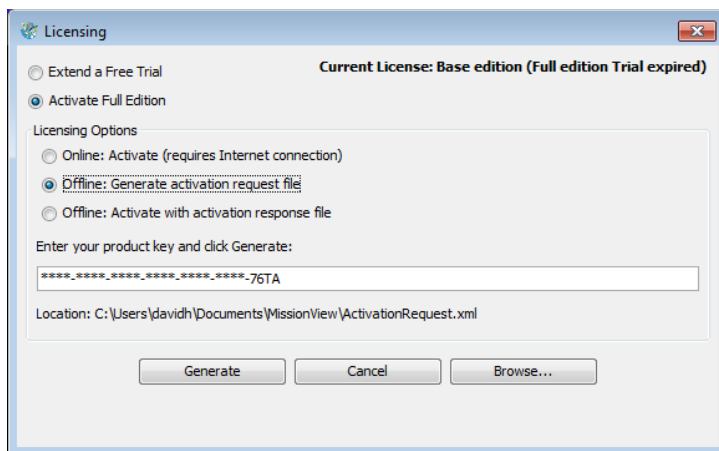


Figure 8—Offline Activation (Windows)

After receiving an offline activation key file, use the Licensing dialog to activate the product, providing the path to the supplied file from NetAcquire Corporation. Select **Offline: Activate** (or **Offline: Start Trial/Offline: Extend Trial**) and click **Activate** (or **Start/Extend**) to activate the Full edition or the Full edition Trial.

If any of the above connection attempts fail, MissionView Display prompts for proxy settings (Figure 9) before retrying the connection. If **Cancel** is pressed

MissionView Display tries once more with the default (non-proxy) settings. In both cases a second failure will result in the action being canceled.

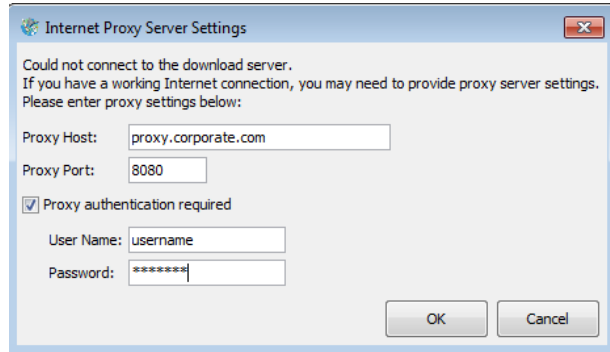


Figure 9—Proxy Settings

3.2 Overview

MissionView Display provides a desktop-type environment for opening configuration and status pages, drawings, and various management windows. This section discusses the use of MissionView Display and how to navigate these features.

3.2.1 Starting MissionView Display

On Windows, the MissionView Display application can be started by selecting the *MissionView Display* shortcut in the *NetAcquire MissionView* program folder.

On Linux, the MissionView Display application can be started by selecting the appropriate *MissionView Display* shortcut (available from different locations depending on the particular distribution or window manager in use).

On macOS, MissionView Display may be started by clicking its Dock icon (Figure 10).



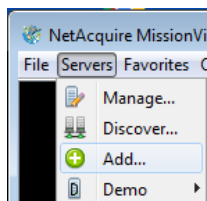
Figure 10—MissionView Dock Icon on macOS

3.2.2 Servers Management

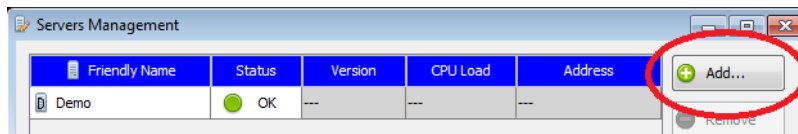
MissionView Display can manage and access all your servers at once. In order to do this, servers must be “added” to the active list of managed servers. Available

servers can be automatically discovered via the MissionView Display “Servers Discovery” feature. If this feature is unavailable (e.g., MissionView Display is unlicensed and running as the Base edition) *live* servers must be added manually.

To add a server to MissionView Display, use the menu **Servers**, then menu item **Add...**



or open the Servers Management window using the menu **Servers**, then menu item **Servers...** and use the **Add...** button to add a server.



Because server names are case insensitive they must differ by more than case from any other server when they're being added. *Live* servers are added by entering their IP address (IPv4 or IPv6) or their DNS resolvable hostname.

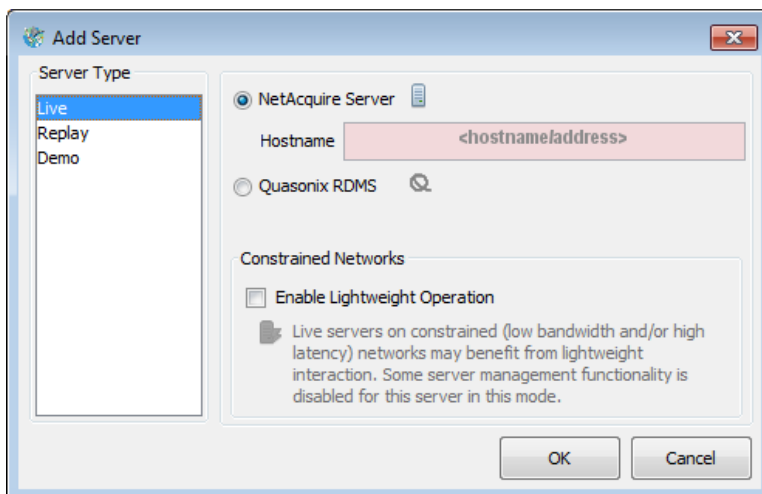


Figure 11—Add Server Dialog

Server Types

- **Live**
 - A NetAcquire server or a Quasonix RDMS receiver.
 - *Live* servers appear with their friendly name and their IPv4/IPv6 address or hostname in the Servers Management window.
- **Replay**
 - Simulated entry for replay of logged data (see section 3.3 for more information).
- **Demo**
 - Simulated entry that provides locally-generated data.

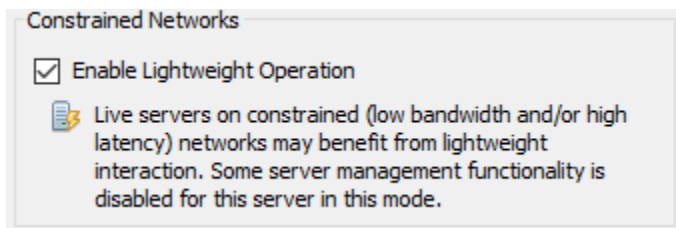
Constrained Networks

For situations where (live) servers may be operating on networks with extremely limited bandwidth and high latency, this option will minimize network traffic. This option sacrifices certain features.

- No specific webpage links
- No diagnostic monitoring
- Publications list is only read when detected server is online
- Checks for online state are reduced

To enable meaningful feedback, use publications on the server to provide status or state. For instance, use computation(s) to check status of certain targets such as serial channels and then publish the results.

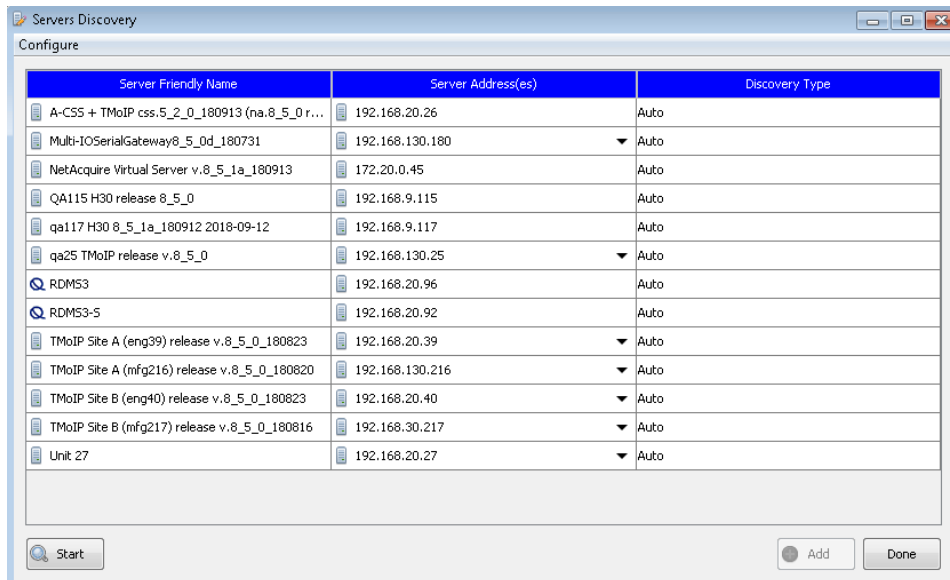
This feature should only be used if normal communications are not achievable and minimal access is acceptable.



a) Servers Discovery

MissionView Display is also able to automatically discover *live* servers. Both NetAcquire servers and Quasonix RDMS receivers periodically send discovery announcements on the network and MissionView Display listens for these

announcements. To view the list of automatically discovered servers use the menu **Servers**, then menu item **Discover...** This opens the following window:



The screenshot shows a window titled "Servers Discovery" with a "Configure" tab. It contains a table with three columns: "Server Friendly Name", "Server Address(es)", and "Discovery Type". The table lists 13 discovered servers. At the bottom of the window, there is a "Start" button with a magnifying glass icon, and "Add" and "Done" buttons.

Server Friendly Name	Server Address(es)	Discovery Type
A-CSS + TMOIP css.5_2_0_180913 (na.8_5_0 r...	192.168.20.26	Auto
Multi-IOSerialGateway8_5_0d_180731	192.168.130.180	Auto
NetAcquire Virtual Server v.8_5_1a_180913	172.20.0.45	Auto
QA115 H30 release 8_5_0	192.168.9.115	Auto
qa117 H30 8_5_1a_180912 2018-09-12	192.168.9.117	Auto
qa25 TMOIP release v.8_5_0	192.168.130.25	Auto
RDMS3	192.168.20.96	Auto
RDMS3-5	192.168.20.92	Auto
TMOIP Site A (eng39) release v.8_5_0_180823	192.168.20.39	Auto
TMOIP Site A (mfg216) release v.8_5_0_180620	192.168.130.216	Auto
TMOIP Site B (eng40) release v.8_5_0_180823	192.168.20.40	Auto
TMOIP Site B (mfg217) release v.8_5_0_180816	192.168.30.217	Auto
Unit 27	192.168.20.27	Auto

Figure 12—Automatic Server Discovery

The Servers Discovery window lists all the automatically discovered servers. Each line represents a single physical unit and each unit (line) may include multiple server addresses (network interface addresses). The first column in the table identifies the friendly name of the discovered server while the second column includes the list of network addresses associated with the server. This includes multiple server addresses for servers with multiple network interfaces and/or IPv4/IPv6 address assignments.

Servers may not automatically announce their presence on the network. This can happen for servers with earlier software versions or when the server configuration explicitly disables the announcement feature. In these cases, the Servers Discovery window can be used to manually scan the connected network. Manually scanning involves explicit network queries and these occur via TCP. Successful queries result in the manually detected servers being added to the discovered server list (the final column in the table represents these servers as manually discovered via the “Manual” identifier).²

² Quasonix RDMS receivers always issue announcements. As a result, they are not discovered via manual scans.

The manual scan characteristics must be set up prior to starting the scan and this is done by selecting the **Configure** menu item in the Servers Discovery window. This brings up the following dialog:

	Start Address(es)	End Address	Include in Scan?
1	192.168.9.1	192.168.9.254	<input checked="" type="checkbox"/>
2	205.159.216.128/25		<input type="checkbox"/>
3	192.168.20.0/24		<input checked="" type="checkbox"/>

Total Number of Addresses to Scan: 508

Additional Options

Ping Timeout (ms)

Maximum # of Threads

TCP Port to Scan

☒ Clear existing "manual" entries before starting new scan

☐ Force refresh of auto-discovered entries before starting new scan

OK Cancel

Figure 13—Servers Discovery Settings

Table 2—Servers Discovery Settings

IPv4 Address Scan Table	Up to three ranges of IPv4 addresses may be configured. These ranges are used to isolate the manual scan to specific portions of the IPv4 network. Specify each range explicitly with a start and end address (all addresses within the range are scanned) or by using CIDR notation (Classless Inter-Domain Routing). An example start and end range is as follows: "192.168.9.1" and "192.168.9.254". This specifies a scan for all addresses in the 192.168.9.0/24 subnet. A similar notation for specifying this range in CIDR notation is to use "192.168.9.0/24". When CIDR notation is used in the "Start Address" column the "End
--------------------------------	---

	<p>Address" column value is disabled (<i>i.e.</i>, the CIDR notation fully specifies the start and end addresses).</p> <p>Ranges can also be flagged for optional inclusion in the scan by selecting the "Include in Scan?" checkbox.</p>
Ping Timeout (ms)	<p>Each target query times out after the specified timeout (in milliseconds). Reducing the timeout value will reduce the amount of time it takes to complete the manual scan. Valid values are between 10 (10ms) and 10000 (10s).</p> <p>Default: 2000</p>
Maximum # of Threads	<p>Once started, manual scanning occurs in the background. This parameter specifies the number of threads to use while scanning. Each thread performs a single target address scan. Increasing the number of threads may reduce the amount of time it takes to complete the manual scan. This is primarily dependent on the number of processing cores on the machine where MissionView Display is running. Valid values are between 5 and 100.</p> <p>Default: 50</p>
TCP Port to Scan	<p>This parameter identifies the TCP port number to use during manual scans. This value typically never needs to be changed. Valid values are between 1 and 65535.</p> <p>Default: 3000</p>

Clear existing manual entries	Selecting this option results in the removal of all pre-existing manual entries in the discovered server list prior to starting a new manual scan. Default: off
Force refresh of auto-discovered entries	Selecting this option results in a refresh of all auto-discovered servers prior to starting a new manual scan. Default: off

After configuring the manual scan settings, a manual scan can be started by pressing the **Start** button. While the scan is underway a progress bar is visible, indicating how close the scan is to completing. A completion dialog appears when the scan is complete.

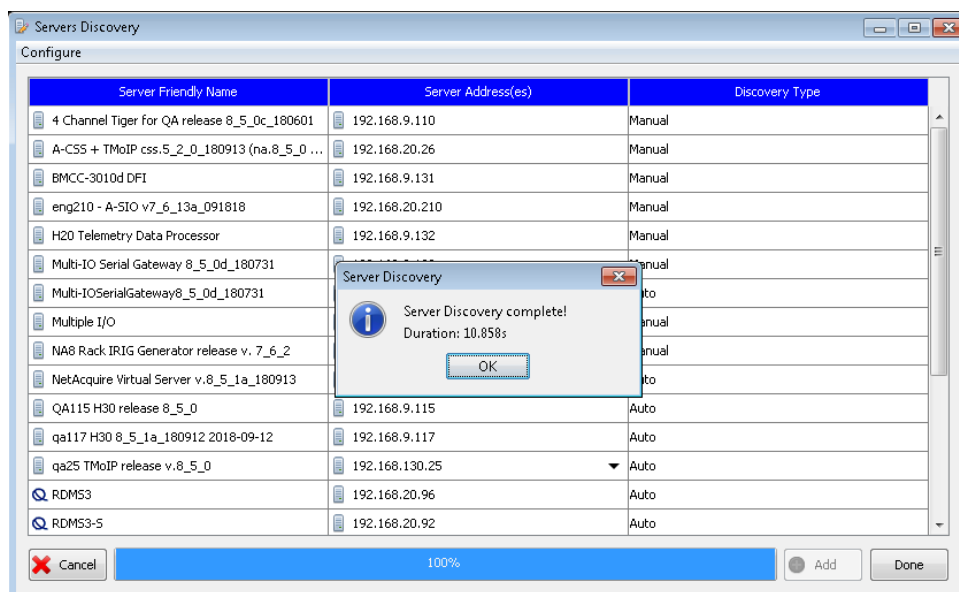


Figure 14—Manual Scan Completed

Discovered servers can be added to the actively managed server list by selecting the row and pressing the **Add** button. Multiple rows can be selected at once. Servers with multiple server addresses are added with the address currently listed in the server's "Server Address(es)" column. When successfully added, the servers will appear as new rows in the Servers Management window.

b) Servers Management Window

In addition to the **Add** button, The Servers Management window also provides a **Remove** button to remove a server from MissionView Display, a **Login** button to log into a secure server, and a **Power** button to selectively restart, reboot, or shutdown a server.

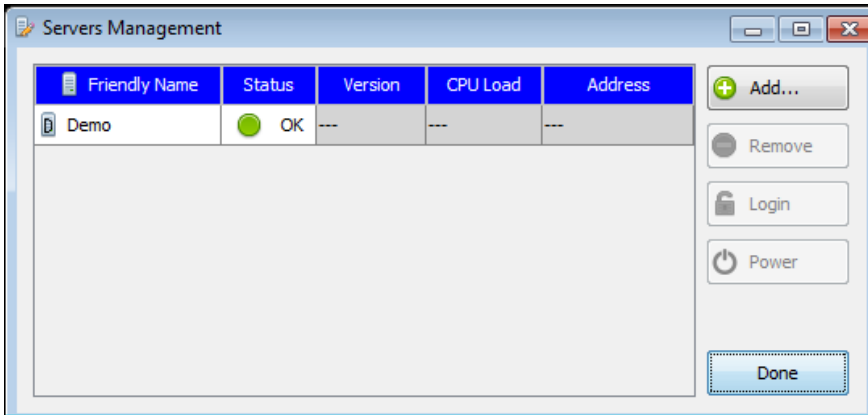


Figure 15—Servers Management Window

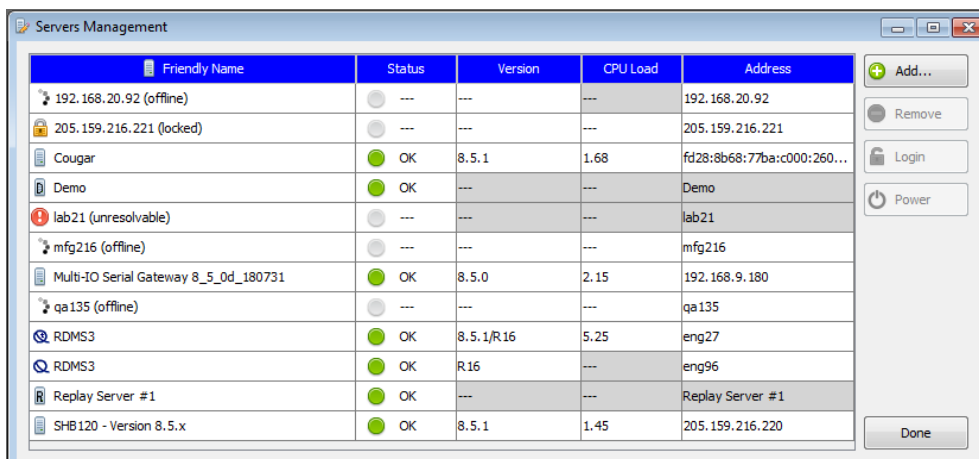
In some instances, servers may be added “dynamically”. For example, using a *favorite* (see section j)) may result in a server being added. This is because most favorites include information regarding their connected server. When this server isn’t already present in the active servers list it is automatically added when the favorite is used.

Live servers are presented throughout MissionView Display with names constructed from the system’s friendly name and the hostname/IP address (IPv4 or IPv6) used to create the server originally. For example, a system with a friendly name of “Unit 12” would be presented as follows (without double quotes):

- “Unit 12 (lab)”
where “lab” is the hostname entered when creating the *Live* server and is a resolvable hostname that identifies the system on the network
- “Unit 12 (192.168.1.1)”
where “192.168.1.1” is the IPv4 address entered when creating the *Live* server and the IPv4 address that identifies the system on the network
- “Unit 12 (fd28:8b68:77ba:c000::dc)”
where “fd28:8b68:77ba:c000::dc” is the IPv6 address entered when creating the *Live* server and the IPv6 address that identifies the system on the network

c) Server States

Server connection state is automatically reflected in the Servers Management window. For example, the following server list shows servers in various states.












The screenshot shows a window titled "Servers Management" with a table of servers. The table has five columns: Friendly Name, Status, Version, CPU Load, and Address. The servers listed include various states such as offline, locked, OK, and unresolvable. On the right side of the window, there are buttons for Add, Remove, Login, Power, and Done.

Friendly Name	Status	Version	CPU Load	Address
192.168.20.92 (offline)	---	---	---	192.168.20.92
205.159.216.221 (locked)	---	---	---	205.159.216.221
Cougar	OK	8.5.1	1.68	fd28:8b68:77ba:c000:260...
Demo	OK	---	---	Demo
lab21 (unresolvable)	---	---	---	lab21
mfg216 (offline)	---	---	---	mfg216
Multi-IO Serial Gateway 8_5_0d_180731	OK	8.5.0	2.15	192.168.9.180
qa135 (offline)	---	---	---	qa135
RDMS3	OK	8.5.1/R16	5.25	eng27
RDMS3	OK	R16	---	eng96
Replay Server #1	OK	---	---	Replay Server #1
SHB120 - Version 8.5.x	OK	8.5.1	1.45	205.159.216.220

Figure 16—Servers Management Server States

Table 3—Server States

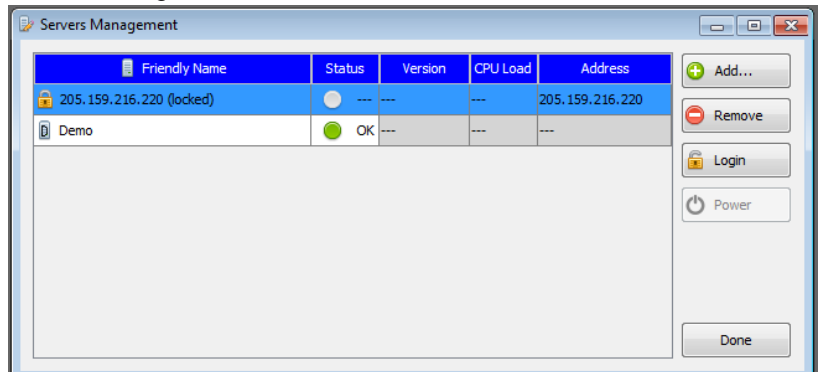
Icon	Description
	<p>Attempting to connect to server. Any offline server will continue to be contacted until it comes back online. The “working” animated icon indicates that the application continues to check the online status of the server.</p> <p>Offline servers will cause additional display information to appear in windows open to the server to indicate that the server is offline.</p> <p>Opening the application with previously connected windows will also cause the windows’ load to be delayed until the server returns to the online state.</p>
	An online live server. When MissionView Display can actively communicate with a server it is considered online. These servers are identified with no explicit state suffix after the server name.
	The demonstration server (Demo).
	A Replay server.
	Password protected server that has not been logged into.
	Unresolvable host. Unresolvable server names are those IP addresses that cannot be determined via lookup from the client PC. Check the name and DNS details for your network.
	An online Quasonix RDMS receiver.
	An online Quasonix RDMS TMoIP enabled receiver.
	Pre-Boot Authentication (PBA) environment. A supporting server has booted into its PBA and requires user interaction to unlock the disk.

In addition, and when applicable, live NetAcquire server rows also include the server’s version information and CPU load.

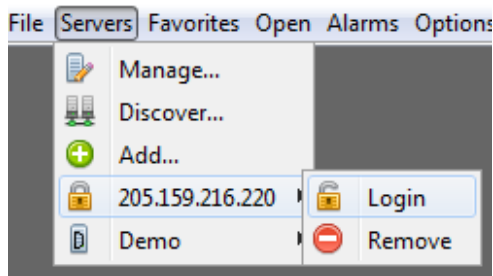
d) Server Login

Log in using one of the following methods.

- Servers Management
 - **Select** the locked server.
 - **Click** the Login button.



- Servers Menu
 - **Select** the locked server.
 - **Click** the Login item.



For both options, a login dialog will appear. Enter a valid user name and password and press the **Login** button. Optionally select the **Remember Password** checkbox to have MissionView Display remember the user name and

password. Remembering credentials eliminates the need to re-enter them the next time MissionView Display is started and anytime the login dialog appears.

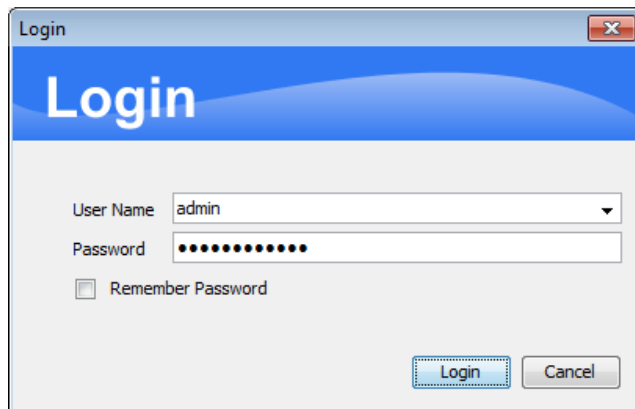
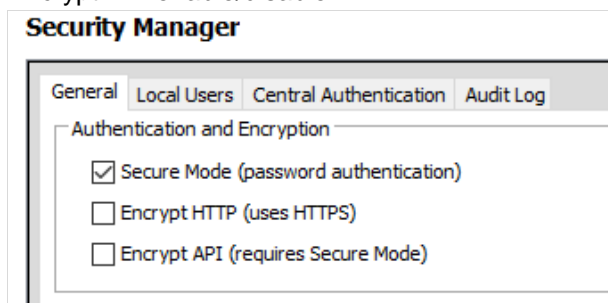


Figure 17—Server Login Dialog

As with an offline server, window loading will be delayed until successful user log-in. Once the log-in is successfully completed the server transitions to the online state.

Note: When changing certain security settings on the server, NetAcquire strongly recommends closing any MissionView Display windows you may have open to the server except the Security Manager where the changes will be made. A list of the sensitive operations follows.

- HTTPS operation enable/disable
- Encrypt API enable/disable



e) Pre-Boot Authentication (PBA)

A server found in pre-boot authentication will appear with a special icon in the servers management window.



Friendly Name	Status	Version	CPU Load	Address
 192.168.20.27 (pre-boot auth)	 ---	---	---	192.168.20.27

Figure 18—PBA Entry in Servers Management

Servers in PBA populate a single link in its servers menu. This link leads to the PBA configuration page where users can log in and manage the PBA disk environment.

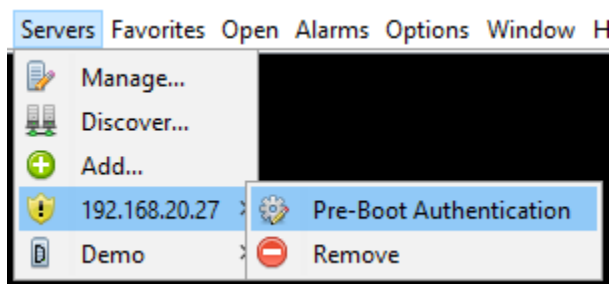


Figure 19—PBA Link

Note that reboots into PBA from the **Security Manager** page will open into a separate browser window within MissionView Display. Once a server leaves PBA and boots into standard environment, it will appear in its normal state within MissionView Display.

f) Server Logout

It is sometimes useful to log out from a server. For example, if you would like to log in as a different user or if you simply want to log out to return the server to the locked state. Servers that are secured and are identified as online include a

Logout popup menu for this purpose. Right-click one of these servers to trigger display of this menu.

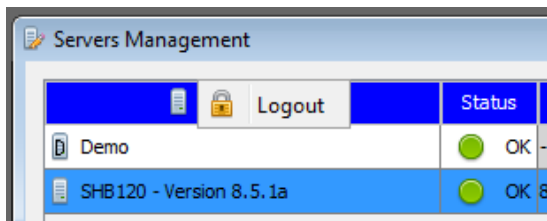


Figure 20—Server Logout

Selecting **Logout** and then accepting the subsequent dialog will log out the currently logged in user. The server state will return to locked and the **Login** button will be re-enabled.

g) **Server Restart**

To restart, reboot, or shut down a server, use the Servers Management window. Select an online server and select the **Power** button. Pressing this button will bring up the reboot dialog (Figure 21). Select the appropriate button for the desired operation.

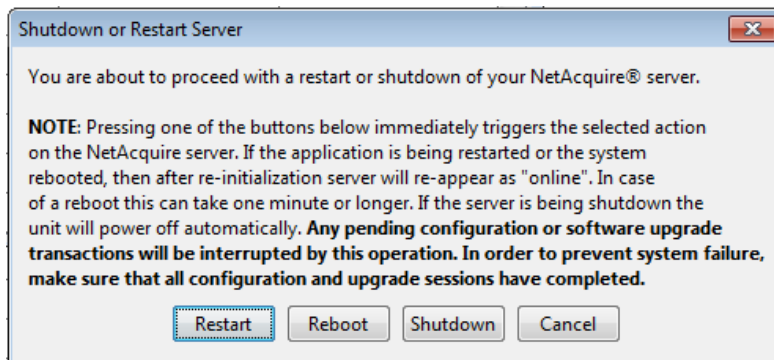


Figure 21—Server Restart Dialog

h) **Demo Server**

MissionView Display provides a demonstration data source via a server target named "Demo". This 'server' can be removed and later re-added by selecting the **Demo** server type during an add-server operation.

The Demo server provides a set of virtual publications that can be used as publication sources to a drawing to aid in demonstration and testing when no actual NetAcquire server is available. The Demo server appears in the menus as any other server but has no links to configuration/status pages.

i) **Replay Server**

Replay servers are used together with saved publication data to provide data replay capabilities within MissionView Display. See section 3.3 for full details. Replay servers appear in the menus as any other server but have no links to configuration/status pages.

j) **Quasonix RDMS Server**

Quasonix RDMS servers represent Quasonix RDMS™ (Receiver / DeModulator / bit Synchronizer) rackmount receivers. These servers represent standard and TMoIP (Telemetry over IP) enabled RDMS receivers.

3.2.3 **Favorites Management**

MissionView Display supports the ability to assign shortcuts to open windows. These shortcuts are referred to as favorites. A favorite includes a reference to the target window, including the window's size, location and default title, the window's type (e.g., a drawing window or a server's configuration/status window, etc.), and the window's associated server (if it has one),

To add a favorite to MissionView Display, use the menu **Favorites**, then menu item **Add...** or open the Favorites Management window using the menu **Favorites**, then menu item **Favorites...** and use the **Add...** button to add a favorite. In the first instance, the currently selected window (this is the window that has active focus) is used as the window for the favorite. In the second instance, you will be able to select from a list of windows when adding the favorite.

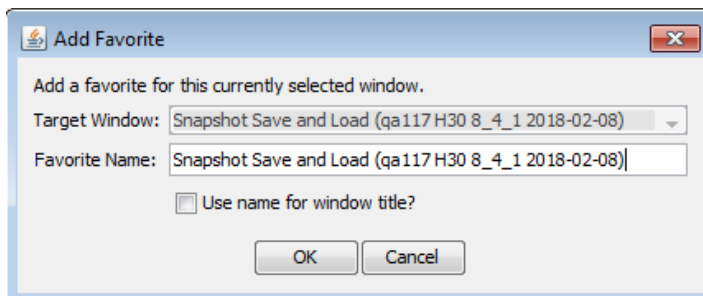


Figure 22—Adding a Favorite Dialog

Enter a name for the favorite and optionally select whether the name should be used as the target window's title. If the favorite name is used as the target window title the target window's title will be updated once the favorite is added. In addition, whenever the favorite is used the new window will also use the favorite name as its title. Because favorite names are case insensitive they must differ by more than case from any other favorite when they're being added. Once added,

the favorite can be used by double-clicking it in the list of favorites displayed in the Favorites Management window (see Figure 25 below).

Open windows with support for adding favorites allow for right-clicking in the window's title area to display a popup menu. This popup menu provides an interface for defining a favorite and for changing the window's title.

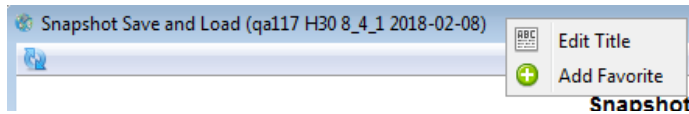


Figure 23—Window Title Favorite Popup Menu

A window's title can be changed independently of whether a favorite is defined. The default title for a window can be re-established by selecting the **Use Default** button in the

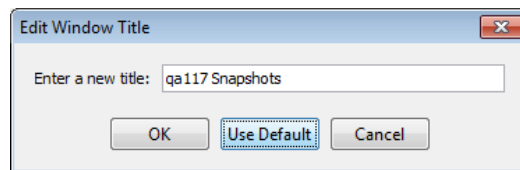


Figure 24—Edit Window Title Dialog

The Favorites Management window also provides a **Remove** button to remove a favorite (or favorites) from MissionView Display and an **Edit** button to edit a favorite.

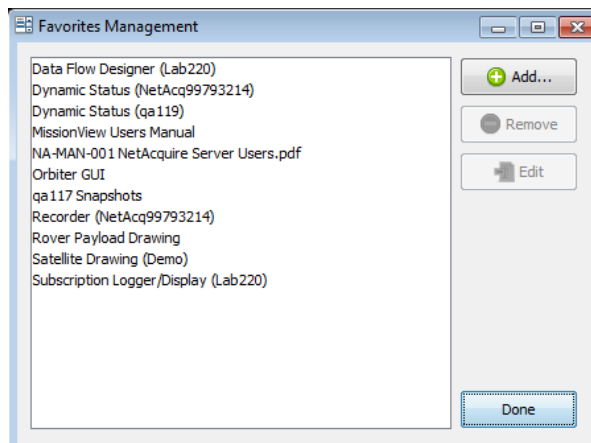
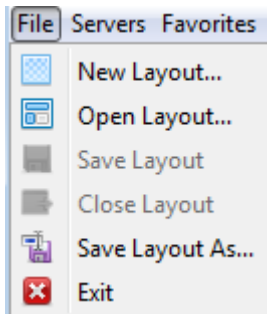


Figure 25—Favorites Management Window

3.2.4 Menus

The application menus provide access to top-level features.

a) File

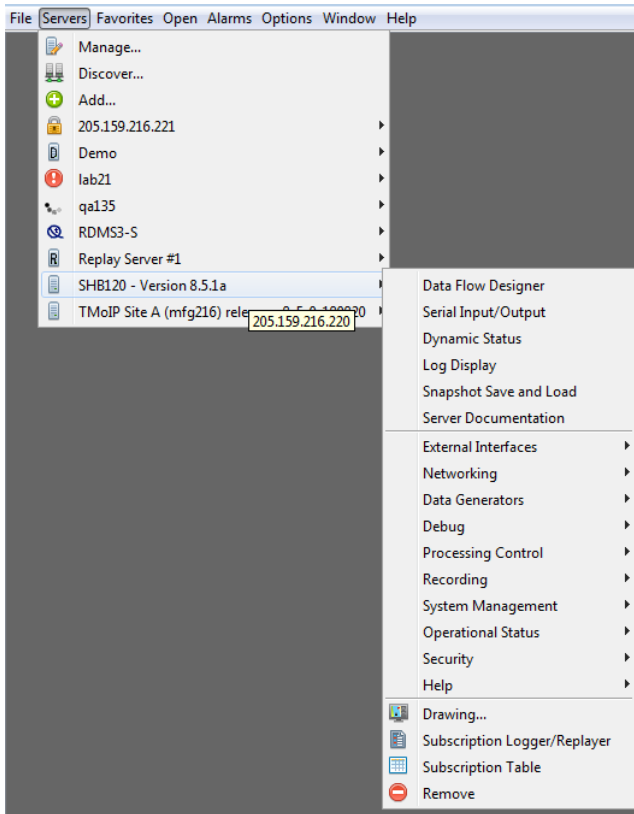


The **File** menu offers access to window layout functionality. See section 3.10 for information on layouts.

- **New Layout...**
 - Creates a new, blank layout workspace with no server list
- **Open Layout...**
 - Opens an existing layout
- **Save Layout**
 - Saves the current layout (if a layout is already open)
- **Close Layout**
 - Closes the current layout (if a layout is already open), reverting to the default workspace
- **Save Layout As...**
 - Save the current workspace to a layout file
- **Exit**
 - Exits MissionView Display application

b) Servers

The **Servers** menu provides access to the Servers Management window, **Add...** servers menu item, and the list of current servers.

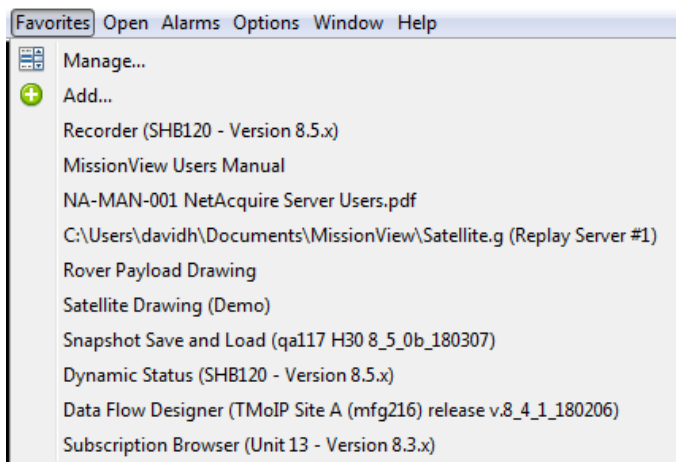


Each server entry displays a list of sub-menu items, separated into three groups.

1. Server's quick links (as described in NA-MAN-001)
2. Server's complete set of web page links, categorized in sub-menus corresponding to the groups presented on the server's home page in advanced mode (also described in NA-MAN-001)
3. Common drawing and status windows

c) Favorites

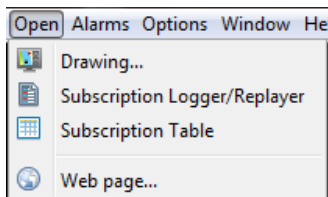
The **Favorites** menu provides access to the Favorites Management window, **Add...** favorites menu item, and the list of currently defined favorites.



Selecting a favorite from this list will open the target window associated with the favorite.

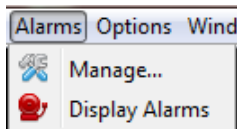
d) Open

The **Open** menu displays universally accessible window items. These include Drawing windows (see 3.6), Subscription Logger/Replayer, Subscription Table (see 3.3 and 3.5), and Web pages.



e) Alarms

The **Alarms** menu provides access to management and display of Alarms. See section 3.7 for details.



f) Options

The **Options** menu displays general options for the application.

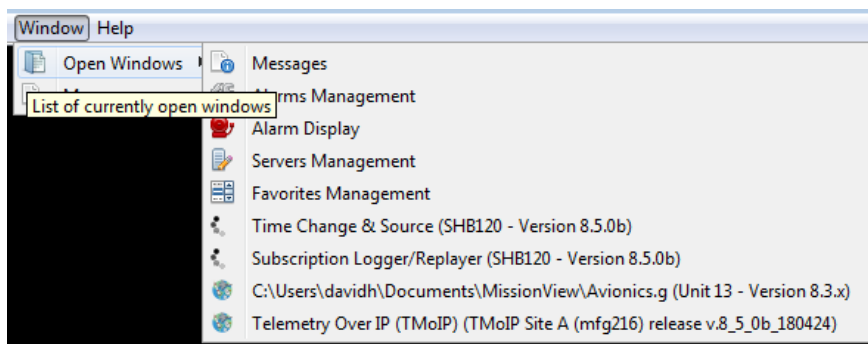


- **Settings**

- View and configure global application settings. See section 3.7 for further details.

g) Window

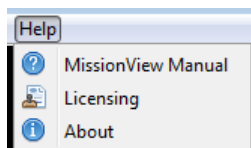
The **Window** menu displays a list of currently open windows (with server identification) and any MissionView Display application windows.



Selecting a window from this list will restore the window and bring it to the front with active focus.

h) Help

The **Help** menu provides access to the **MissionView Manual**, **Licensing**, and **About** windows.



- **MissionView Manual**

- A navigable and searchable copy of the manual

- **Licensing**

- Opens the Licensing dialog
- May also display a deactivation link if the product is fully licensed

- **About**

- Opens the **About** window with information about the application, current licensing, and NetAcquire Corporation contact information

3.2.5 Messages

MissionView Display provides a **Messages** window that displays various types of information for users to view.

```
[2018-05-02 16:10:19]: Application: NetAcquire MissionView
[2018-05-02 16:10:19]: Application: Version: 1.2.0
[2018-05-02 16:10:19]: Application: Build: 050218
[2018-05-02 16:10:19]: Application: License: Full edition
[2018-05-02 16:10:22]: WARNING: Unresolvable hostname: Lab21
[2018-05-02 16:10:22]: INFO: Demo Online
[2018-05-02 16:10:26]: WARNING: 192.168.12.12 Offline
[2018-05-02 16:10:34]: INFO: Replay Server #1 Online
[2018-05-02 16:10:35]: INFO: Load: C:\Users\davidh\Documents\MissionView\Avionics.g
[2018-05-02 16:10:35]: INFO: SHB120 - Version 8.5.0b (fd28:8b68:77ba:c000::dc) Online
[2018-05-02 16:10:35]: INFO: SHB120 - Version 8.5.0b (205.159.216.220) Online
[2018-05-02 16:10:36]: INFO: TMoIP Site B (mfg217) release v.8_5_0b_180424
(192.168.30.217) Online
[2018-05-02 16:10:36]: INFO: TMoIP Site A (mfg216) release v.8_5_0b_180424 (mfg216)
Online
[2018-05-02 16:10:36]: INFO: Loaded: Time Change & Source (SHB120 - Version 8.5.0b
(fd28:8b68:77ba:c000::dc))...
[2018-05-02 16:10:36]: INFO: Unit 13 - Version 8.3.x (205.159.216.221) Online
[2018-05-02 16:10:40]: INFO: Loaded: Telemetry Over IP (TMoIP) (TMoIP Site A (mfg216)
release v.8_5_0b_180424 (mfg216))...
```

Each message will appear with some source or priority level such as USER, INFO, WARNING, *etc.*, with additional highlight coloring of problematic items.

When messages appear with severity levels of warning or higher (e.g., severe), a notification icon will flash at the right-upper-most position within the application's

main menu area. Click on this icon to dismiss the warning and open the **Messages** window.

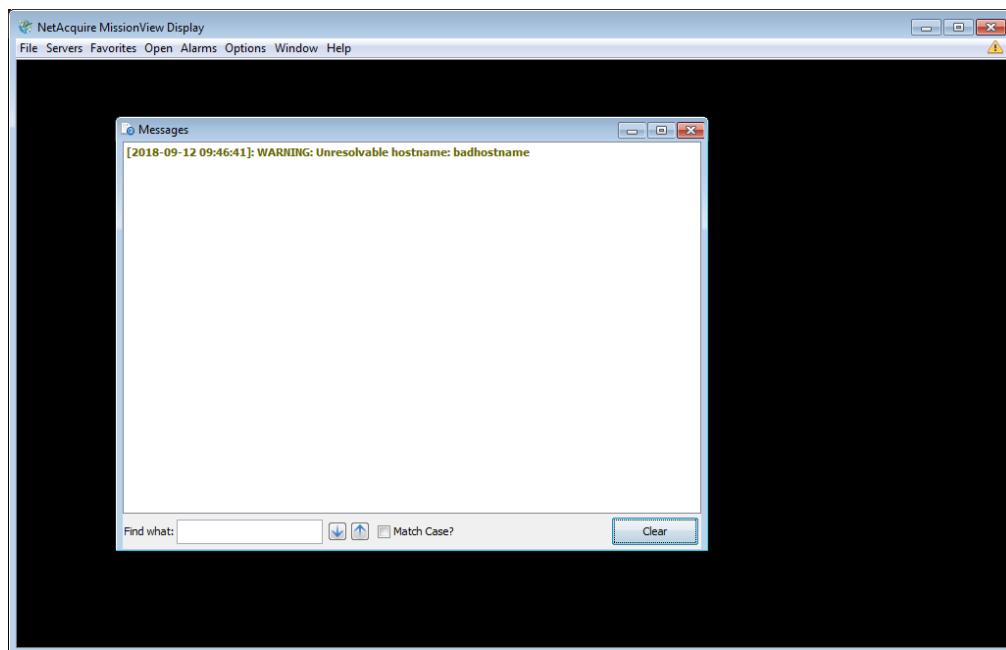


Figure 26—Messages Window and Warning Indication

3.3 Data Sources

Data Sources in MissionView come from Publications. A Publication represents any source of data that can be used throughout MissionView windows regardless of its source. For instance, data from a NetAcquire server comes from subscribing to measurements (aka Subscriptions), which are then made available in MissionView as Publications.

Users receive feedback about Publications both visually and in the Messages window. Visual cues take the form of icons that show the state of the Publication, such as “Disconnected”.





Icon	Description
	Live, connected to a server, data received.
	Connected to a server, no data received.
	Disconnected from server. <i>E.g.</i> , server went offline or publication became unavailable or could not be found.
	Configured, no server selected. <i>E.g.</i> , window open with no server indicated.

Figure 27—Publication States

Messages in the Message window will indicate when important events have occurred. For instance, if a server is restarted, messages about lost connection(s) will appear.

3.4 Subscription Logger/Replayer

The Full edition of MissionView Display supports logging and playback of subscription data. Data files are written and read in ASCII text with a comma separated values (CSV) format. The CSV files can be conveniently opened in many third-party applications, including Microsoft Excel (see section 3.4.6). Throughout this manual the logging entity is referred to as the Logger and the playback entity is referred to as the Replayer.

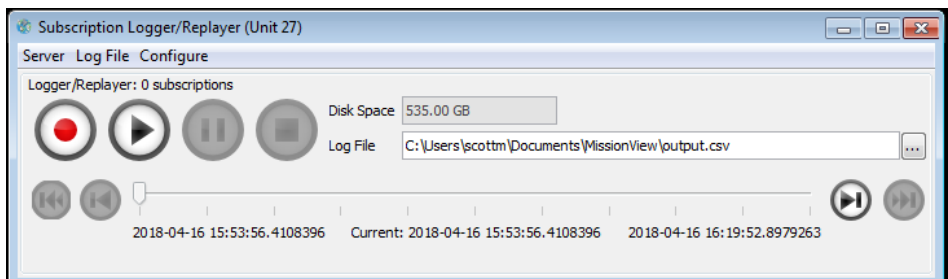
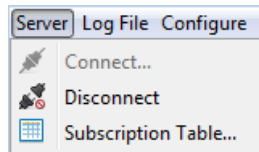


Figure 28—Subscription Logger/Replayer Window

Open the Subscription Logger/Replayer from either the main **Open** menu or under a specific server in the **Servers** menu. Opening to a specific server will

automatically configure the Logger to that server. You can change the server by using the Subscription Logger/Replayer window's **Server** menu.



- Connect...
 - If no server has been set or you have disconnected already, use this option to connect to a server in the list.
- Disconnect
 - Disconnect from the server and shut down any subscriptions currently in use.
- Subscription Table...
 - Open a table view to subscriptions.

3.4.1 Configuring Subscriptions

Both logging and playback require selection of a set of subscriptions. Open the configuration dialog by clicking the **Configure** menu and selecting **Subscriptions...**

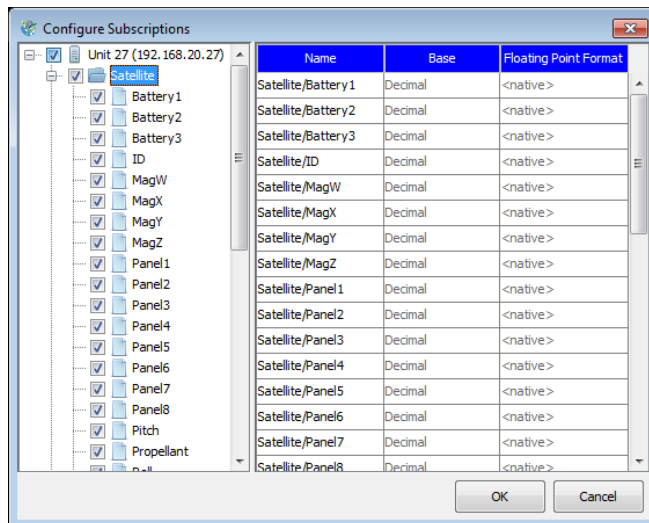


Figure 29—Configure Subscriptions Dialog

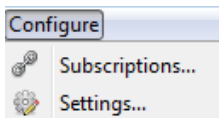
Select subscriptions by checking the box next to those you want to log. The table on the right contains format options (as applicable) for each subscription.

When using custom formatting, the **Base** column indicates the number base to format values and the **Floating Point Format** column provides entry of a format to use for floating-point values.

Configuration of subscriptions can only occur when the Logger is stopped and/or when it is not connected to a Replay server. When connected to a Replay server the ability to log subscription data is unavailable. This is represented by the disabled “Start Logger” button. In addition, the entire set of logged subscriptions is published when connected to a Replay server.

3.4.2 Logging

Configure the Logger by clicking the **Configure** menu.



And selecting **Settings...**

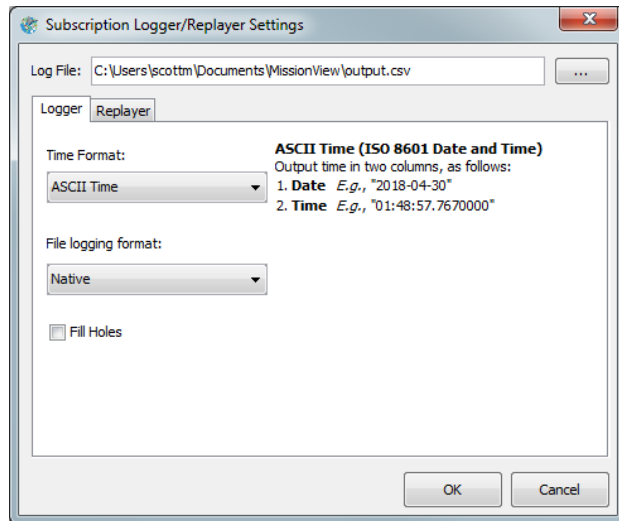


Figure 30—Subscription Logger/Replayer Settings (Logger) Dialog

a) Log File

Select a file to log subscriptions into. You may also configure this file from the main window’s **Log File** field. The ellipses button to the right opens a file explorer dialog.

b) **Time Format**

Select a format for the subscription timestamps.

- ASCII Time
 - Two column format with ISO 8601 date followed by time.
- Windows File Time
 - Native format for subscriptions. 64-bit integer representing the number of 100 nanosecond ticks since January 1, 1601 (UTC).
 - * Currently not a supported format for playback.
- Excel Serial Time
 - Commonly used by Excel. The number of fractional days that have elapsed since January 1, 1900 at midnight
 - * Currently not a supported format for playback.

c) **File Logging Format**

Select a numeric format for logging to file.

- Native
 - MissionView Display uses a native format to write numbers.
- Custom Format
 - Enter a unique format. Each subscription may have a different format. See Table 4 for details.
- High Performance
 - When logging extremely high-speed/volume subscriptions, use this format. This format optimizes the speed of conversion of floating-point values to text. This format requires a fixed selection for number of decimal places and does fast formatting.

Table 4—Custom Format Settings

Base	<p>The numeric base in which the value should be displayed. Options:</p> <ul style="list-style-type: none">• Binary• Octal• Decimal<ul style="list-style-type: none">○ Numeric types only• ASCII<ul style="list-style-type: none">○ Octet sequence types only
-------------	--









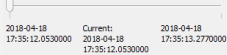
	<ul style="list-style-type: none"> Hexadecimal 																
Floating Point Format	<p>Format string for floating point values. Applies only when the base is Decimal and the publication is a floating-point type.</p> <p>The format string has features for controlling numeric display including integer (123), fixed-point (123.4), scientific notation (1.23E4), percentages (12%), <i>etc.</i></p> <p>Some characters in the format string are used literally—they output unchanged during formatting. Symbols, on the other hand, specify aspects of number formatting. The following table lists common symbols.</p> <table border="1"> <thead> <tr> <th>Symbol</th><th>Meaning</th></tr> </thead> <tbody> <tr> <td>0</td><td>Digit</td></tr> <tr> <td>#</td><td>Digit, zero shows as absent</td></tr> <tr> <td>.</td><td>Decimal separator or monetary decimal separator</td></tr> <tr> <td>-</td><td>Minus sign</td></tr> <tr> <td>,</td><td>Grouping separator</td></tr> <tr> <td>E</td><td>Separates mantissa and exponent in scientific notation.</td></tr> <tr> <td>%</td><td>Multiply by 100 and show as percentage</td></tr> </tbody> </table> <p>For example:</p> <ul style="list-style-type: none"> 0 will format values as an integer 0.00 will format values as “3.14” #,##0.0 will format values as “1,234.0” <p>A detailed reference for the format string is available in <i>java.text.DecimalFormat</i> at https://docs.oracle.com/javase/8/docs/api/java/text/DecimalFormat.html.</p> <p>Caution: Playback functionality can be affected by custom formats that add characters such as commas, non-numeric characters, <i>etc.</i> <i>E.g.</i>, a format “0,000 cm” will cause playback to fail.</p>	Symbol	Meaning	0	Digit	#	Digit, zero shows as absent	.	Decimal separator or monetary decimal separator	-	Minus sign	,	Grouping separator	E	Separates mantissa and exponent in scientific notation.	%	Multiply by 100 and show as percentage
Symbol	Meaning																
0	Digit																
#	Digit, zero shows as absent																
.	Decimal separator or monetary decimal separator																
-	Minus sign																
,	Grouping separator																
E	Separates mantissa and exponent in scientific notation.																
%	Multiply by 100 and show as percentage																

d) **Fill Holes**

By default, the Logger records values when they arrive, leaving blank CSV cells if other subscriptions do not have values for recorded timestamp. You may opt to fill these ‘holes’ with the previously received value for a subscription. Not recommended for high-speed/volume subscriptions.

3.4.3 Controls

The primary controls on the Logger/Replayer operate on the two major pieces of functionality, Logger and Replayer. More details regarding these buttons and their operation appear in subsequent sections.

Button	Description
	Start logging configured subscriptions (record)
	Start playing back configured log file (playback)
	Pause current operation (logging or playback)
	Stop current operation (logging or playback)
	Skip backward/forward during playback
	
	Step backward/forward during playback
	
	Slider provides jump-to access within playback.

3.4.4 Logging Operations

Press the record button to begin logging subscriptions. While logging, you may pause, resume, and stop logging. While logging, the window will display the number of rows of subscriptions created in the file and total disk space remaining for the disk the file exists on.

NOTE: Pausing logging will create gaps in the logged data.

a) Log File Header

The log file contains a versioned header along with the rows of subscription data. The header provides critical information for the playback of logged subscriptions as a set of key/value pairs.


Key	Example	Description
Format	1	Header format version
Host	Unit 27 (192.168.20.27)	Name of the server
File Creation	Tue Apr 1 12:51:23 PDT 2018	Time the logger began logging (local PC time)
Timezone	UTC	Time zone from global settings
Units	<user provided units>	Units assigned to subscriptions.
Type	Real64	Value type for each subscription.

b) Log File Data

Following the header, each row in the file contains a timestamp (1 or 2 columns) and the values of any subscriptions received with a matching timestamp. If subscriptions receive multiple values for the same timestamp, the Logger places subsequent values in a new row.

3.4.5 Errors

If problems occur with the logged subscriptions, a notification icon will flash in the upper-right corner of the Logger/Replayer window. Clicking the button will open a status dialog that shows the current status of the subscription(s) from an application-wide point-of-view. This dialog will update dynamically when left open. In addition to the standard Publication states, the following may appear.

Icon	Description
	Server is offline

3.4.6 Importing Logged Data to Microsoft Excel

Double-Click the file to open it automatically in Excel, or start Excel and then open the file.

- **Note:** Time and/or date cells may need to be formatted since Excel may pick a non-optimal time format.

After opening the output file, a few header rows are visible followed by the column names and subsequent rows containing received values (see Figure 31). This example demonstrates using the Logger's ASCII time option.

	A	B	C	D	E	F	G	H
1	Host	205.159.216.220						
2	Time	Wed May 10 11:21:03 PDT 2017						
3								
4	Date	Time	Satellite/Yaw:units(Deg);type(Real64)	tock	Satellite/Roll:units(Deg);type(Real64)	Satellite/Propellant:units(PSI);type(Real64)	Satellite/Sync:units();type(Octet Sequence)	
5	05/10/201	11:18:48 AM				953.227		
6	05/10/201	11:18:48 AM			48.587008	953.227		
7	05/10/201	11:18:42 AM			48.587008	953.227 FAF320		
8	05/10/201	11:18:48 AM	-14.782368		48.587008	953.227 FAF320		
9	05/10/201	11:18:48 AM	-14.782368		48.587008	953.226 FAF320		
10	05/10/201	11:18:48 AM	-14.782368		48.587008	953.225 FAF320		
11	05/10/201	11:18:48 AM	-14.782368		48.587008	953.224 FAF320		
12	05/10/201	11:18:48 AM	-14.782368		48.587008	953.223 FAF320		
13	05/10/201	11:18:48 AM	-14.782368		48.587008	953.222 FAF320		
14	05/10/201	11:18:48 AM	-14.782368		48.587008	953.221 FAF320		
15	05/10/201	11:18:48 AM	-14.782368		48.587008	953.22 FAF320		
16	05/10/201	11:18:48 AM	-14.782368		48.529712	953.22 FAF320		
17	05/10/201	11:18:48 AM	-14.782368		48.529712	953.219 FAF320		
18	05/10/201	11:18:48 AM	-14.782368		48.529712	953.218 FAF320		
19	05/10/201	11:18:48 AM	-14.782368		48.529712	953.217 FAF320		
20	05/10/201	11:18:48 AM	-14.782368		48.529712	953.216 FAF320		
21	05/10/201	11:18:48 AM	-14.782368		48.529712	953.215 FAF320		
22	05/10/201	11:18:48 AM	-14.782368		48.529712	953.214 FAF320		
23	05/10/201	11:18:48 AM	-14.782368		48.529712	953.213 FAF320		
24	05/10/201	11:18:48 AM	-14.782368		48.529712	953.212 FAF320		
25	05/10/201	11:18:48 AM	-14.782368		48.529712	953.211 FAF320		
26	05/10/201	11:18:48 AM	-14.782368		48.529712	953.21 FAF320		
27	05/10/201	11:18:48 AM	-14.782368		48.529712	953.209 FAF320		
28	05/10/201	11:18:48 AM	-14.782368		48.529712	953.208 FAF320		
29	05/10/201	11:18:48 AM	-14.782368		48.529712	953.207 FAF320		
30	05/10/201	11:18:48 AM	-14.782368		48.529712	953.206 FAF320		
31	05/10/201	11:18:48 AM	-14.782368		48.529712	953.205 FAF320		

Figure 31—Microsoft Excel Import of Logger Data

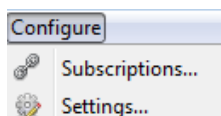
3.4.7 Playback (Replayer)

After creating or loading a log file, the subscription data can then be “replayed” via the **Replayer** function. The Replayer associates logged subscription data with the connected server. If replaying to a live server, the data source will be switched to only what is in the log file. Any subscriptions previously active on the server and not in the log file will appear as if they have lost their connection during playback.

Alternately, a replay server can be used to play back data. A replay server may be used when: 1) no live servers are available, or 2) live servers are available but are otherwise inappropriate for replaying subscription data (*i.e.*, their live

subscription data is already being used by another window – e.g., a drawing window). See section 3.2.2 for information on creating replay servers.

Configure the Replayer by clicking the **Configure** menu.



And selecting **Settings...**

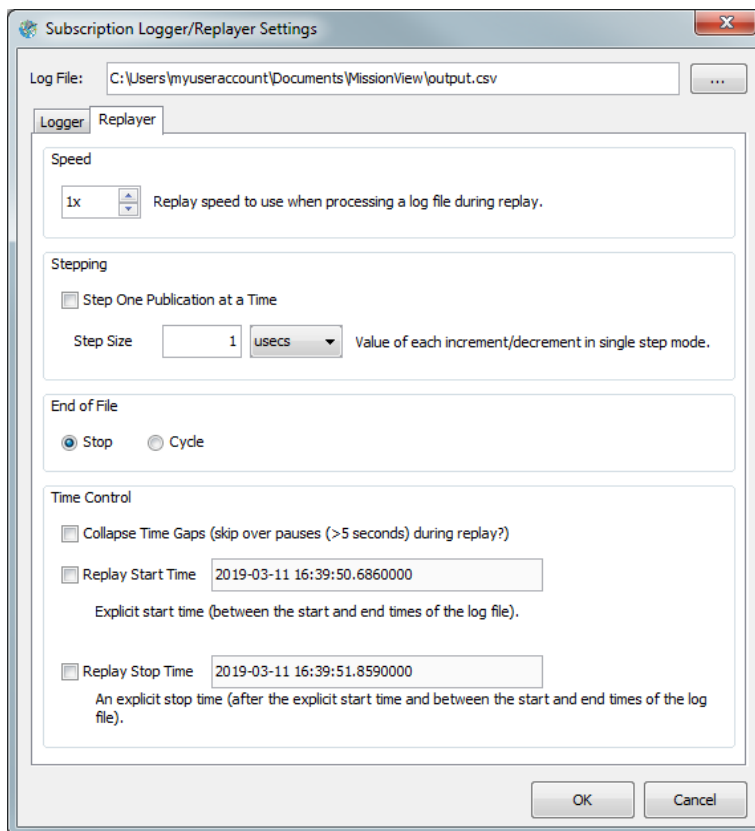


Figure 32—Subscription Logger/Replayer Settings (Replayer) Dialog

Table 5—Replayer Settings

Speed	When set to 1x (the default) subscription data is replayed in real-time (<i>i.e.</i> , adjacent rows in the logged file are replayed such that the time duration between their row timestamps exactly matches the duration between when each row's subscription data is published by the connected server). This time duration can be sped up or slowed down by adjusting this setting. A value of 10x informs the Replayer to replay data ten times as fast; a value of .1x informs the Replayer to replay data ten times slower.
Step One Publication at a Time	When this is checked single step operations (forward or backward) will replay publications one a time. For example, a log file with multiple publications per line will result in each individual publication being published for every step operation. When checked the Step Size setting is disabled.
Step Size	Determines the step size (in the time units specified) to use when single stepping. For example, the default step size of 1 usec means that one microsecond of data is skipped on every step (forward or backward). Note: depending on the characteristics of the logged data stepping may or may not result in subscription data being published by the connected server. Typically, a one microsecond step size results in each step operation publishing a single line of data from the log file.

End of File	Determines whether to the Replayer cycles back to the beginning of the file when it reaches the end of the file. If configured to Stop Replayer may also automatically switch the connected server back to its live publication data (for Live servers only). This latter behavior is controlled by the associated global setting (see section 3.11).
--------------------	--

Collapse Time Gaps	<p>Determines whether to skip over long time gaps when replaying subscription data. These time gaps may represent periods when the <i>Logger</i> was paused (during initial creation of the logged data) or otherwise when there are large delays between incoming subscriptions during logging.</p> <p>The fixed time gap duration is five seconds. If a gap of at least this duration is encountered while replaying data the Replayer will immediately skip ahead to the next available logged data.</p>
Replay Start Time	<p>Optional: Determines the start time (bounded by the logged data's start and end time – or the configured end time if specified) used by the Replayer.</p> <p>Specify the start time in the following standard Java date format: "yyyy-MM-dd'T'HH:mm:ssX". For e.g., 2018-03-01T14:52:09.667Z</p>
Replay Stop Time	<p>Optional: Determines the end time (bounded by the logged data's start – or the configured start time if specified - and end time) used by the Replayer.</p> <p>Specify the start time in the following standard Java date format: "yyyy-MM-dd'T'HH:mm:ssX". For e.g., 2018-03-01T14:56:19.398Z</p>

When started, the Replayer predetermines various characteristics of the logged subscription data including the set of named subscriptions along with various other attributes (e.g., the timestamp of the first and last logged subscription data). This information is used to control the connected server's notion of available publications.

NOTE: Only one Subscription Logger/Replayer can be open to a server at a time.

While playing back data, the pause and stop buttons affect the played back data. If playing back through a live server, stopping playback will automatically

transition back to the live data source from the server (based on the associated global setting – see section 3.11 for details).

Logged subscription values can be replayed by stepping forward and backward through the file.

After pressing the play button, the Replayer immediately begins reading the log file (identified in the **Log File** field) and replaying the logged subscription values. Press the *Pause* or *Stop* buttons to correspondingly pause or stop replaying of logged subscription values. Whenever the Replayer is running (*i.e.*, in the started or paused states) the control panel's title indicates this by appending the *Replaying* label as follows: "Logger/Replayer (Replaying)".

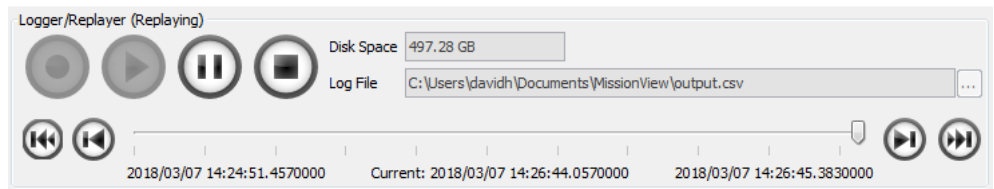


Figure 33—Subscription Logger/Replayer (Replaying) Window

a) Slider

While the Replayer is running or paused the slider's pointer can be dragged to reset the replay position. When released the Replayer will continue replay from the logged subscription data matching the time in the log file.

b) Skipping

When the Replayer is running or paused, the skip buttons may be used to skip forward or backward in the logged subscription data. The skip interval is equal to 10% of the time span of logged data as indicated by the timestamps of the first and last rows in the log file.

For example, if the logged subscription data represents one full hour (60 minutes) the skip interval is six minutes.

c) Stepping

When the Replayer is paused (only), the step buttons may be used to step forward or backward in the logged subscription data. The step interval is configurable via the **Step Size** setting (see section 3.5.1 for details).

NOTE: All but the step forward stepping and skipping buttons are disabled when Logger/Replayer is stopped. The step forward button may be used to start the Replayer when it is otherwise stopped.

3.5 Subscription Table

The Subscription Table displays a set of subscription values in a rolling table with the most recently received value(s) at the top or bottom.

To open a Subscription Table window, select from one of the following menu options.

- Click **Servers** and then **<hostname>**, then **Subscription Table**
 - Opens connected to the **<hostname>** server
- Click **Open** and then **Subscription Table**
 - Opens with no server connection
 - Use the **Server** menu button to connect to a specific server

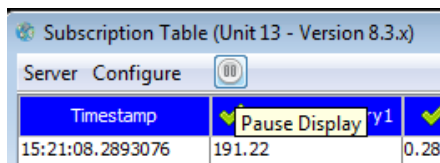
Configure subscriptions following the same procedure as found in Logger/Replayer section 3.4.1 . Once configured, the table will immediately begin displaying values.

Subscription names appear in the table's header, led by a timestamp column. The timestamp column contains the incoming timestamp (in formatted form) for the corresponding subscription values present in the table's rows. The subscription columns' values contain the current subscription value (or the filled value for subscription values that haven't arrived at this time – see the **Fill Holes** configuration setting, defined in section 3.5.1).

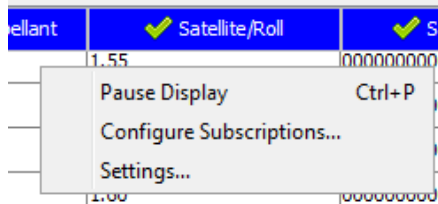
The table header also provides visual indications of whether a subscription is live (connected) or not (disconnected). In the following example the *tock* subscription is disconnected while the other subscriptions are all connected. Header tooltips include the column's publication name and, if available, the publication's type and units string. The units value is specified in the telemetry map where the publication is defined. The publication type is also specified in the map or indirectly via the server's publisher component.

Timestamp	✔ Satellite/Propellant	✔ Satellite/Roll	✔ Satellite/Sync	✔ Satellite/Yaw	✘ tock
10:17:47.808	1451.14	45.84	Satellite/Roll (Deg)	56.21	17
10:17:47.818	1451.14	45.95	type: Real64	56.21	17

The table can be paused/un-paused using the pause button next to the **Configure** menu item,



or by right-clicking the mouse anywhere in the table and selecting **Pause Display** in the popup menu (or by using the *Ctrl-P* keyboard shortcut). In addition, the *Configure Subscriptions* and *Settings* dialogs are also accessible through this popup menu.



NOTE: The table will maintain the current history of updates while paused. When un-paused, the table will immediately be updated with the most recent updates.

3.5.1 Settings

Select the **Settings** menu item to bring up the **Subscription Table Settings** dialog.

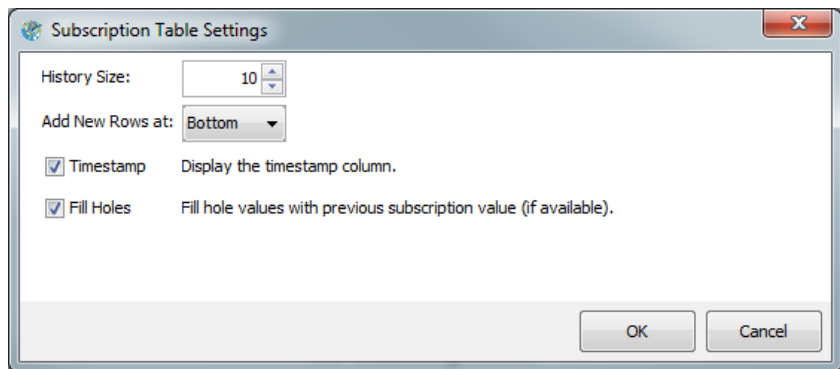


Figure 34—Subscription Table Settings Dialog

The *Subscription Table* configurable settings are defined in the following table.

Table 6—Table Settings

History Size	How many rows to display in the table (thereby maintaining this number of subscription values for the most frequently updating subscription).
Add New Rows at	Where the table should place new rows when subscription updates arrive (top or bottom).
Timestamp	Determines whether the Timestamp column is visible.
Fill Holes	Determines whether subscriptions other than the one for which an update was received should place their previously received value in the row with the new update. <i>I.e.</i> , should the table be sparse (only received values) or should the table be filled with previous values for those not received for a timestamp?

3.6 Drawings

The Full edition of MissionView Display supports opening drawings, configuring certain drawing features, and connection of data sources.

Configuring drawings from MissionView Display is often more convenient than making drawing changes from MissionView Designer. We recommend using Designer for creation of a drawing and the addition of graphical components, and then transitioning to Display in order to refine positions, sizes, and the general look-and-feel of the drawing and its graphical components.

3.6.1 Opening a Drawing

To open a drawing, select from one of the following menu options:

- Click **Servers**, then **<hostname>**, then **Drawing**
 - Opens connected to the **<hostname>** server
- Click **Open** and then **Drawing**
 - Opens with no server connection

Here's an example drawing window with the "Satellite.g" drawing open.

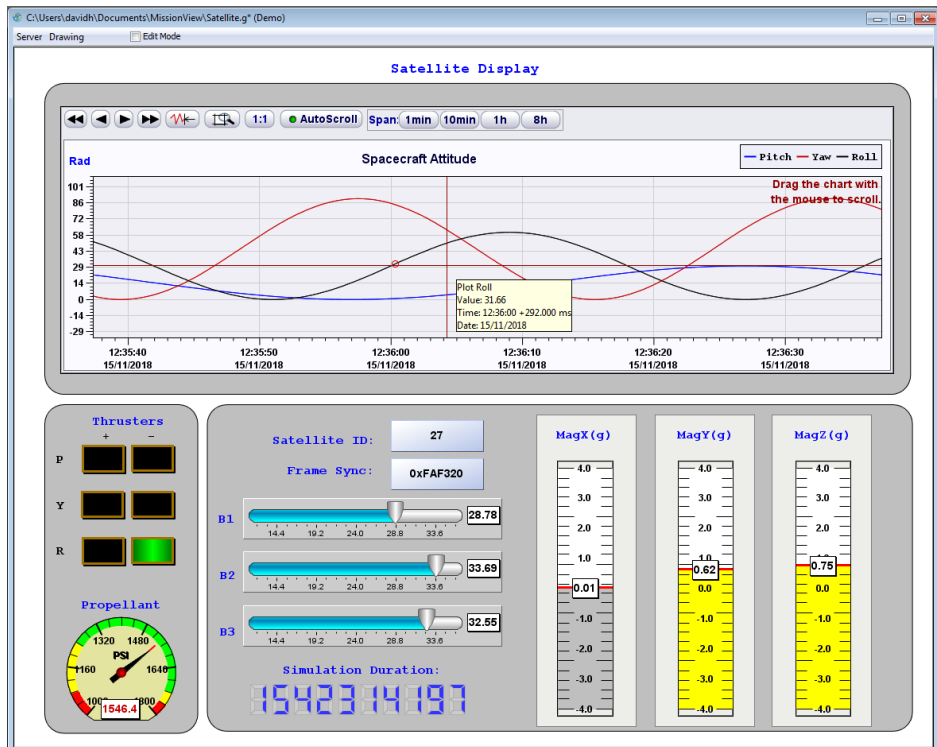


Figure 35—Example Drawing Window (Satellite.g)

3.6.2 Editing Drawings (Properties)

MissionView separates editing into manual property-based and physical positioning/sizing. Properties and move/resize are most conveniently accomplished using MissionView Display (rather than MissionView Designer).

At any time, right-click an object in a drawing to explore and configure properties (right-clicking highlights the object with a red rectangle and displays the object's properties in an edit dialog).

a) **Basic Properties**

Basic Properties displays the properties most commonly used to configure the graphical object.

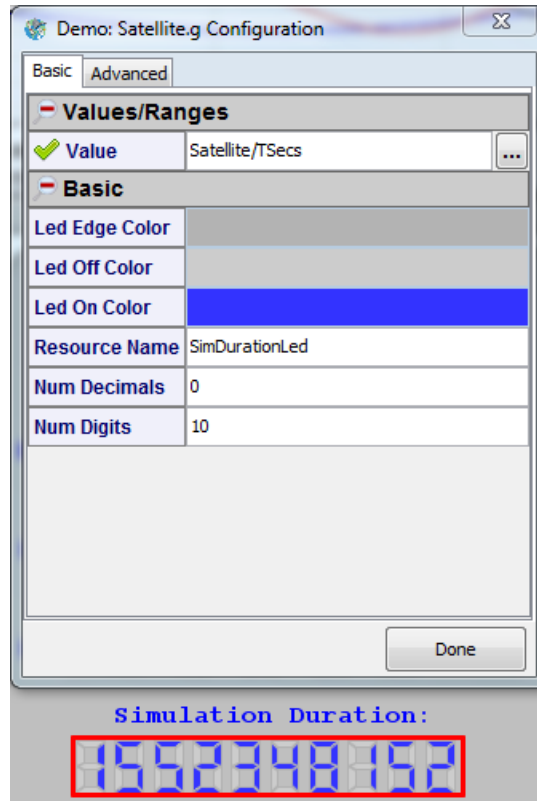


Figure 36—Graphical Object Configuration (Basic)

b) Advanced Properties

Advanced Properties displays the full hierarchical tree of drawing resources. Clicking on any folder in the tree will display all properties at the selected level while clicking a property will display a single property.

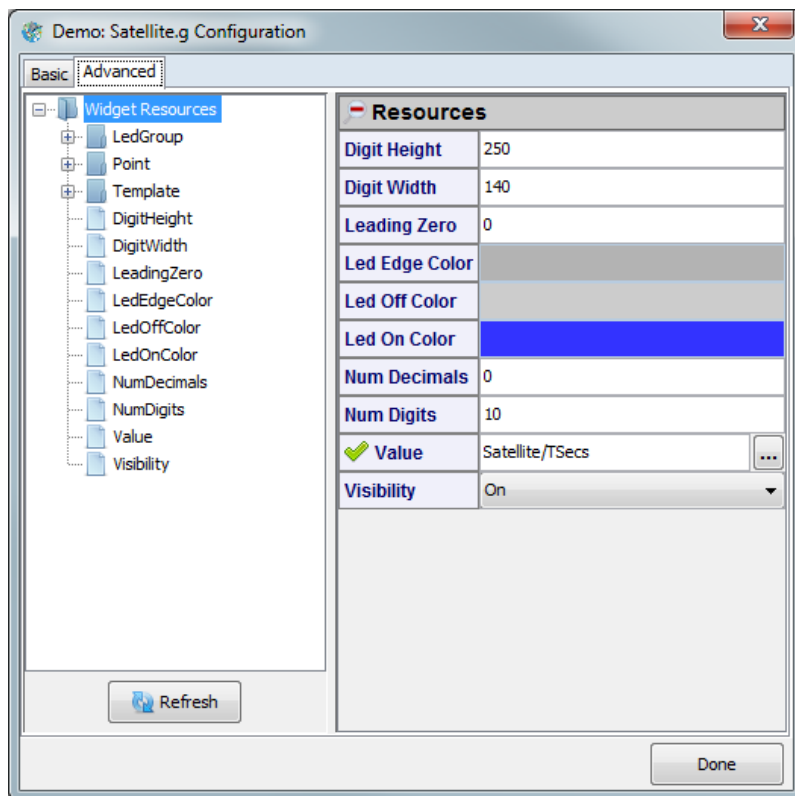


Figure 37—Graphical Object Configuration (Advanced)

c) Customizer

Configuration for more complex graphical objects may be presented with a wizard-like view. For example, chart configuration breaks up the properties into

elements such as plots, axes, basic-chart, *etc.*, making the configuration simpler to understand. Advanced properties can be found on the **Resource View** tab.

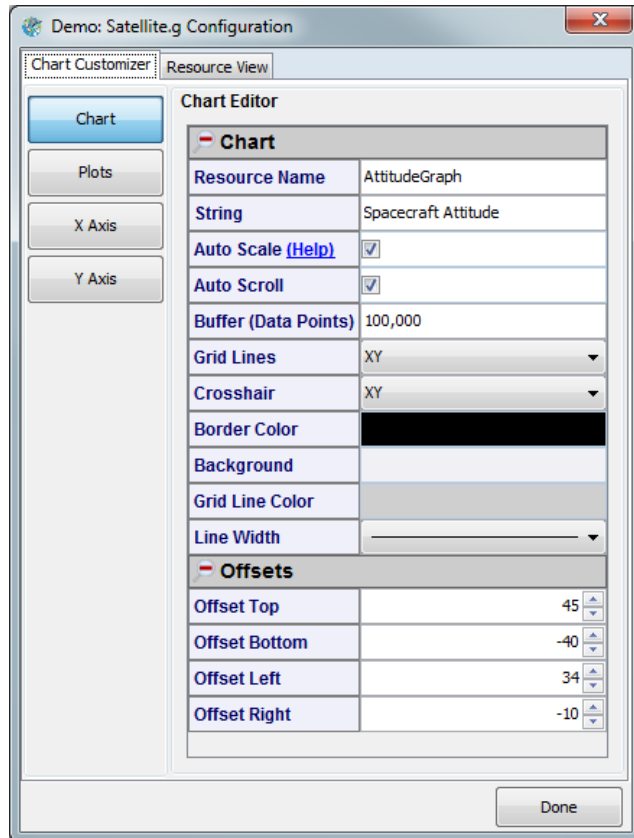


Figure 38—Graphical Object Configuration (Customizer)

d) **Resource Name**

Each graphical object has a resource name field. By default, MissionView Designer **does not** assign resource names to graphical objects. The user should add a useful name that will make identification easier should there be a need to later reference some component of a drawing. For instance, if a drawing has ten identical dials, all with blank names; it will be harder to troubleshoot an issue (error message) with a particular dial. Providing a *unique* resource name for graphical objects allows MissionView Display to show these unique names whenever issues arise, such as a publication becoming disconnected when a user restarts a server data flow.

3.6.3 Property Sheets

The property sheets display the properties of a graphical object using a table-like view. Properties with fixed-set values appear with a list of visual options and properties. For example, colors appear with a color chooser.

Any of the properties in the sheet can be assigned to an explicit literal value. In addition, the primary value-properties have been predesignated as expecting to be connected to a dynamic NetAcquire server publication.

a) Setting Properties

Properties can be edited like any spreadsheet: click in the cell and change the value.

While editing, you will see a **Pencil** icon indicating an edit is in process. Once you click enter or leave the cell, the icon will clear and the value is applied.

The on-screen drawing effect of the value change is immediate.



For properties, such as color or fixed-set values like line-width, the editor will provide a drop-down or a popup to select non-numeric settings (e.g., color).

For popup editors, the cursor will change to a hand as you hover over the cell.

b) Assigning Publications

Some properties are predesignated as likely to receive NetAcquire server publications—these properties are *publication-aware*. The property sheet displays these with a special editor with an **ellipsis** (...) button and (when blank) hint text to indicate that a publication name is normally provided.



Users can assign publications in two ways:

1. Typing a name into the cell assigns a publication to the property. If the drawing is attached to a server, the publication will automatically begin updating the drawing.
2. Clicking on the ellipsis opens a list of publications currently available on the server.
 - a. **Link Publication** (or double-click on publication name) links the selected publication to the property.
 - b. **Unlink Publication** unlinks any currently linked publication from the publication. See section c) for an alternate menu option for unlinking.

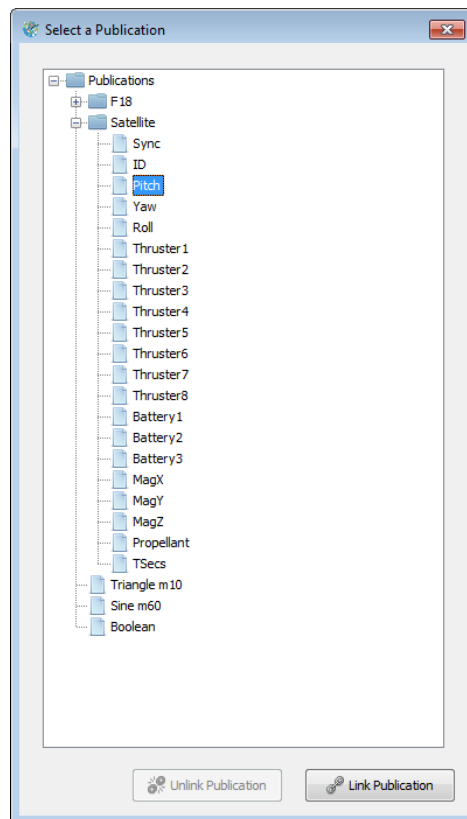






Figure 39—Publication Selection Dialog

Once linked, the property editor for a publication will display the state of the connection to the publication using an icon.

State	Status Display and Name	
Connected	 Value	F18/alt 
Disconnected	 Value	invalid-name 

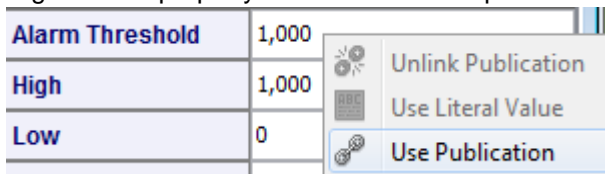
Connected publications automatically begin updating the drawing.

c) Assigning Publication-Awareness

In addition to properties predesignated as likely to receive publications, many other properties can be linked to a publication by making them publication-aware. Any property that has a standard editor can be made publication-aware.³

Publication-aware properties can also be switched back to literal values. The following example demonstrates changing a property between literal and publication-awareness.

1. Right-click a property cell or its label to open the value menu.



2. Click **Use Publication** to make the property publication-aware.



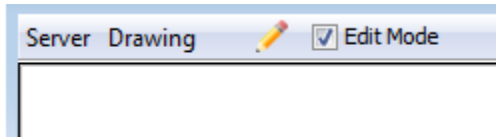
3. Right-click again and click **Use Literal Value** to return the property back to a standard property.

The value menu also provides **Unlink Publication**, providing an alternate means to clear the assigned publication name.

³ There are some cases where properties cannot have publications assigned. For example, dynamically assigned properties (see section 5) or properties identifying fonts.

3.6.4 Editing Drawings (Move and Resizing)

To enable moving and repositioning of graphics, click the **Edit Mode** checkbox in the menu bar at the top of the window.



Checking this box unlocks the graphics to be moved and resized.

a) **Move**

To move a graphic, start by clicking (left or 'normal' click) to select and select and highlight the object, then drag the object anywhere in the drawing with the mouse. You can also move a selected graphic using your keyboard arrow keys. Using **<ctrl>** and **<arrow>** will move five times the minor rate of just arrows.

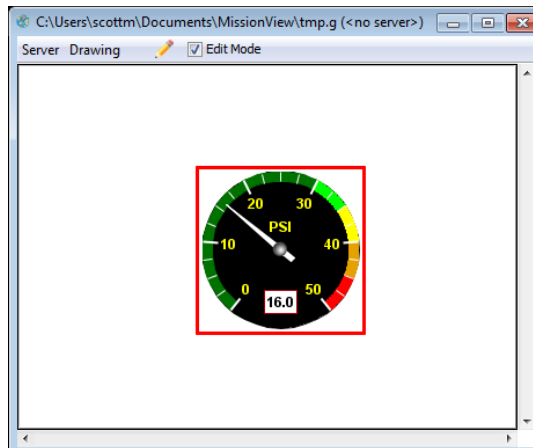


Figure 40—Selected Object in Edit Mode

b) **Resize**

To resize a selected object, grab the highlight rectangle as you would a Window and drag it to the size desired.

c) **Resizable Exceptions**

There are a few objects that do not resize, such as text fields; a text field's size is based on the font chosen.

3.6.5 Default Drawing Scaling

Drawings open in MissionView Display with a window size that attempts to match their native size when the drawing is created as *fixed scale, no stretch*.

When resizable, MissionView Display opens new windows to a default size, after which users may resize the window.

The following table summarizes default drawing sizes:

Drawing Scale Attribute	Window Size
Fixed Scale, No Stretch	Drawing size (from MissionView Designer)
Resize, No Stretch	Default: 75% of the size of the main MissionView Display window
Resize, Stretch	Default: 75% of the size of the main MissionView Display window

3.6.6 Text Formatting

Graphical objects offer a wide variety of formats to define the display format of numeric text. Format specifications derive from the C language's *printf* statement. For more details see https://en.wikipedia.org/wiki/Printf_format_string

For details about time formats in graphical objects, see <http://www.cplusplus.com/reference/ctime/strtime/>.

3.7 Charts and Graphs

MissionView provides a variety of charts and graphs for displaying changing values. MissionView distinguishes charts from graphs.

Real-time Chart is the term used when a scrolling time axis is supported. Some real-time charts are interactive and provide facilities for zoom in/out and mouse-based dragging.

2D Graph is the term used when data is display with a fixed set of samples within a drawing without scrolling. Each arriving value populates the 'next' bar or point until reaching the last, then the location for the next arriving value rotates back to the first bar or point again.

Real-time Charts are the most common type of chart or graph.

3.7.1 *Example Real-Time Chart Drawing*

A predefined drawing is available (file "nachart.g") containing a preconfigured chart. This drawing can be used for quick-look display of charts (*i.e.*, graphical plots of server-provided data) without needing to create a drawing from scratch in MissionView Designer. Suggested usage tips for the predefined drawing follows the discussion of Charts below, in section 3.7.3 e)

3.7.2 *Real-Time Chart Limitations*

Combining a large buffer with a large span and extremely high-rate publication updates can cause high client CPU use or cause MissionView Display to become sluggish or unresponsive. Use caution when connecting to high-rate publications. A future version of the chart graphics will address third party library limitations.

3.7.3 *Real-Time Chart Customizer*

Real-time Charts present a right-click customizer in place of a basic view, making their sophisticated structure simpler to navigate. The chart customizer presents the following categories in the editor via selectable panes.

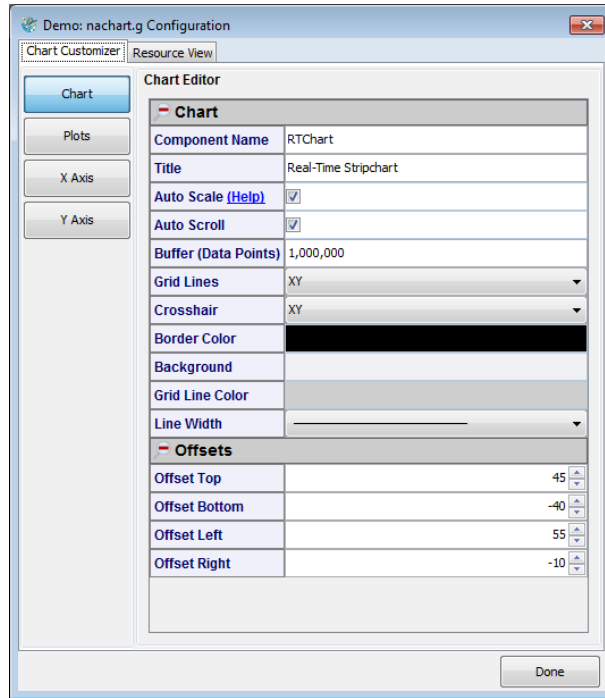


Figure 41—Chart Customizer

The Chart pane displays the top-level chart properties such as legend title, auto-scroll/scale, *etc.* Key chart properties are described below.

Table 7—Chart Properties

Property	Description
Component Name	The name of the chart object. Used only for identification.
Title	If a title is present (e.g., interactive chart), text to display in the title.

Auto Scale	<p>Enables auto-scaling of all plots on the chart if checked. Regardless of the auto-scale setting, the Low/High values for each Y axis must be set to indicate the initial Y axis range.</p> <p>When enabled, the plot's Y axis range(s) are automatically increased to accommodate out-of-range data.</p> <p>Auto Scale Delta</p> <p>Auto Scale Delta controls the amount of change when scaling.</p> <ul style="list-style-type: none"> • Positive values indicate a fixed amount to scale by. <i>E.g.</i>, value of 10 will increase by increments of 10. • Negative values represent a percent increase based on the current y-axis range. <i>E.g.</i>, -0.10 means the axis should scale by 10% of its current range.
Auto Scroll	Enables or disables the chart's auto-scroll when the values reach the edge of the chart area.
Buffer (Data Points)	<p>Controls the maximum number of samples per plot stored in the chart's data history buffer. When new samples are pushed into the chart and the size of the data buffer is exceeded, the oldest samples are discarded to maintain the requested maximum number of samples in the buffer.</p> <p>Note: <i>Large values can cause performance issues when trying to display large spans that cause large counts of points to be visible.</i></p>
Grid Lines	Which grid lines to display (X, Y).
Crosshair	Style of the mouse crosshair visual.
Border Color	Color of the border surrounding the chart's data area.
Background	Background color for the chart's data area.
Grid Line Color	Color for the grid lines.
Line Width	Width of the grid lines.

Offsets	Specifies offsets top/bottom/left/right from the outer edges of the charting area. When adding axes or changing fonts, these offsets can create more/less room at the outer edges of the chart. <i>E.g.</i> , positioning a y-axis on the right side of a chart may require changing offsets to accommodate the extra space requirement.
----------------	--

a) Plots

The **Plot** pane displays the list of plots present in the chart.

Plots can be added and removed with the **Add** and **Remove** buttons. An added plot will populate with no publication assigned and with default settings such as color, high/low values, and linked y axis.

Each plot represents a trace in the chart. Select a plot to edit by clicking on the plot in the list.

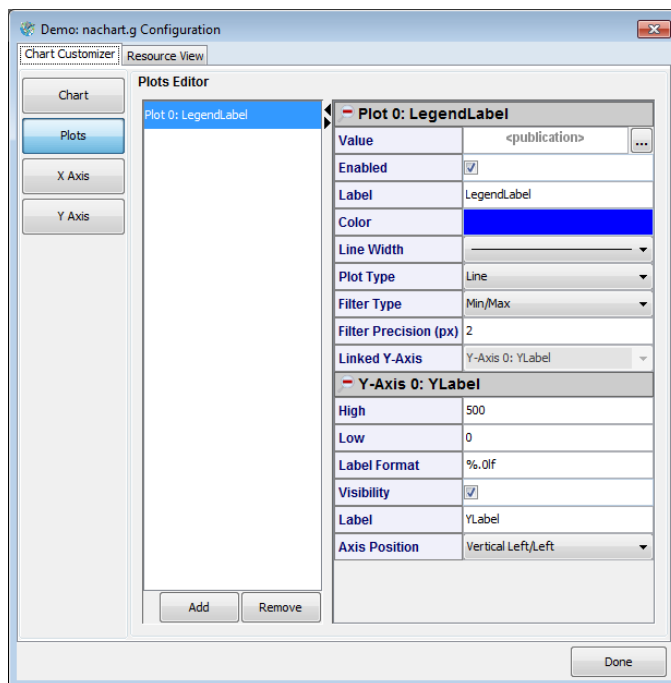


Figure 42—Plots Customizer

Table 8—Plot Properties

Property	Description				
Value	Value of the current entry. This property is intended to accept a publication name.				
Enabled	Hide or show the plot.				
Label	Label text for the legend.				
Color	Color for the plot's trace.				
Line Width	Width of the trace's lines.				
Plot Type	Changes how a trace is displayed. <i>E.g.</i> , line, bar, markers, etc.				
Filter Type	<p>Specifies the type of a filter to be used for plots that display a large number of data points. For example, when a plot shows 50000 data samples on a display that has only 1000 pixels in width, the plot will display 50 data points per each horizontal pixel. In this case, for rendering efficiency a filter can be used to combine the values of the data samples that fall within the same pixel into a single data sample (or two data-samples for the Min/Max filter). Using a filter increases performance and decreases the CPU load by decreasing the number of plot segments and markers that need to be rendered.</p> <table> <tr> <td>None</td><td>Disables data filtering to draw all data samples. Not recommended for charts with large number of data samples.</td></tr> <tr> <td>Min/Max</td><td>Combines multiple data samples into two data samples that hold the minimum and maximum values of the combined samples.</td></tr> </table>	None	Disables data filtering to draw all data samples. Not recommended for charts with large number of data samples.	Min/Max	Combines multiple data samples into two data samples that hold the minimum and maximum values of the combined samples.
None	Disables data filtering to draw all data samples. Not recommended for charts with large number of data samples.				
Min/Max	Combines multiple data samples into two data samples that hold the minimum and maximum values of the combined samples.				

	<p>Average</p> <p>Combines multiple data samples into a single data sample by averaging the values of the combined samples.</p> <p>Discard</p> <p>Plots the first encountered data sample, discarding any other samples that fall onto the same pixel in the horizontal direction</p>
Filter Precision (px)	Specifies the horizontal interval (in pixels) for combining multiple data samples. The default is 2 pixels, which will cause all data samples in each 2-pixel interval to be combined in one or two data samples depending on the filter type.
Linked Y-Axis	<p>Associates the plot with a specific Y axis in a chart with multiple Y axes. When the plot range is changed, the range of the associated axis will also change to display the same range, and vice versa.</p> <p>Once a Y axis has been linked, the axis properties are displayed beneath the plots for convenience.</p>

b) X-Axis

Displays properties for the X axis.

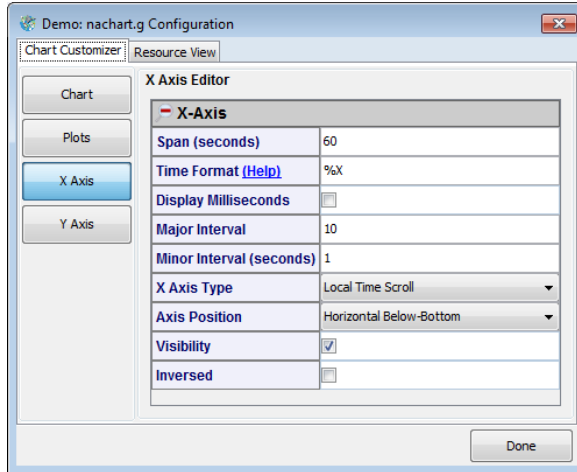


Figure 43—X-Axis Customizer

Table 9—X-Axis Properties

Property	Description
Span (Seconds)	Sets the desired number of seconds of data to show. For example, setting Span to 60 for a chart's time axis will display 60 seconds worth of data, bounded by the size of the chart buffer.
Time Format	Time formatting for the timestamps. Default uses %X, representing Time. <i>E.g.</i> , "14:55:02" or "12:55:02 PM" depending on PC localization settings. %T displays ISO-8601 Time. For complex formats, you may use "%n" to create new lines within the format. See section 3.6.6 for details on formatting.
Display Milliseconds	Sets a format that will append milliseconds to the Time Format . NetAcquire recommends using a Time Format of %T when displaying milliseconds.
Major Interval	How many seconds apart to place major interval ticks. Negative values indicate a fixed number of ticks for the span of the chart.

Minor Interval (seconds)	How many seconds apart to place minor interval ticks. Negative values indicate a fixed number of ticks for the span of the chart.
X Axis Type	Type of axis to use.
X Axis Position	Location to show the X Axis.
Visibility	Hides/shows this axis.
Inversed	When checked, inverts the data in the chart.

c) X-Axis for Relative Charts

For a Relative Chart, an advanced setting under X-Axis known as Time Origin controls the zero-value for the chart. This value must be provided as a floating-point value for Unix Epoch (number of seconds since January 1, 1970 UTC).

d) Y-Axis

Displays the list of Y axes present in the chart.

Y axes can be added and removed with the **Add** and **Remove** buttons. An added axis inherits property values from the last axis in the chart prior to the addition.

Select an axis to edit by clicking on the axis in the list.

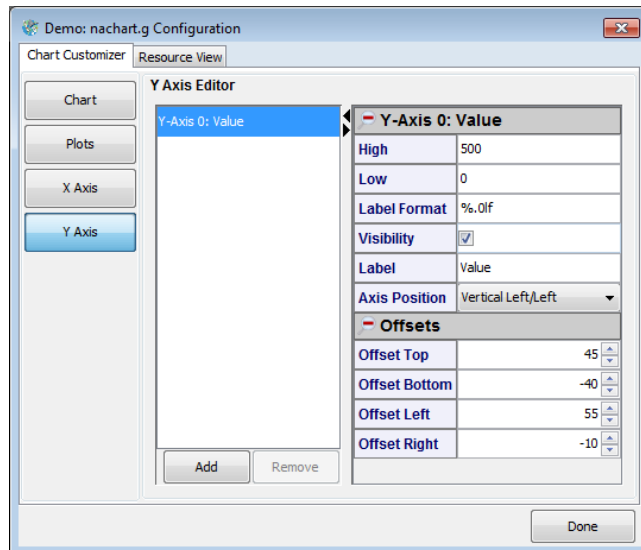


Figure 44—Y-Axis Customizer

Table 10—Y-Axis Properties

Property	Description
High	High value starting point for range.
Low	Low value starting point for range.
Label Format	Format for label values. <i>E.g.</i> , "%.1f". See section 3.6.6 for details on formatting.
Visibility	Hide/show this axis.
Label	Label for this axis instance.
Y Axis Position	Where to place this axis instance.
Offsets	Specifies offsets top/bottom/left/right from the outer edges of the charting area. When adding axes or changing fonts, these offsets can create more/less room at the outer edges of the chart. <i>E.g.</i> , positioning a y-axis on the right side of a chart may require changing offsets to accommodate the extra space requirement.

e) Using the Interactive Example Real-Time Chart

Click the **Servers** menu, point to the associated server, click **Drawing ...** and open the file *nachart.g* found in your Documents/MissionView folder.

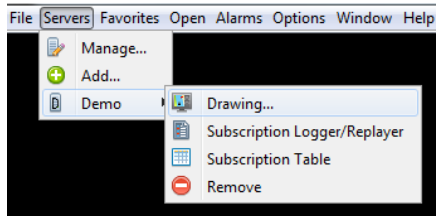
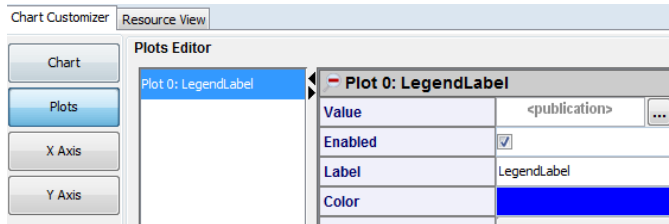




Figure 45—Example Real-Time Chart Drawing (nachart.g)

Right click on the chart background to open the chart customizer (as described in the above sections) to configure chart settings.

Click **Plots**, then click the ellipses button next to **Value**. Use the selection dialog to select a publication to display.



Customizations to *nachart.g* may be saved. Note, however, that these customizations will overwrite any previous settings in the *nachart.g* drawing. An alternative is to click **Save As ...** to save a copy of the drawing with a new/unique drawing name (this can be done when closing the drawing window or else from the drawing window's **Drawing** menu).

3.7.4 2D Graph Customizer

A 2D Graph displays data in a fixed set of samples within a drawing. Each arriving value populates the 'next' bar or point until reaching the last, then the location for the next arriving value rotates back to the first bar or point again.

2D Graphs present a right-click customizer in place of a basic view, making their sophisticated structure simpler to navigate. The graph customizer presents the following categories (broken into sections below).

The figure shows two side-by-side configuration windows for a 2D graph, titled "Demo: Transit.g Configuration".

Left Window (Graph Customizer):

- Graph Section:**
 - Resource Name: (empty)
 - Samples: 25
 - Value: Sine m60
 - Background: (empty)
 - Bar Color: Blue
 - Bar Outline: Black
- X-Axis Section:**
 - Label: Km/hr
 - Label Visible: ☒
 - Label Font: sansserif-Bold-14
 - Grid Visible: ☐
 - Initial Bar Value: 2
 - Bar Increment: 0.25
 - Initial Label Interval: 0
 - Label Interval: 4
 - Major Ticks: ☒
 - Major Labels: ☒
 - Major Label Font: sansserif-Bold-12
 - Minor Ticks: ☒

Right Window (Graph Customizer):

- Y-Axis Section:**
 - High: 60
 - Low: -60
 - Label: Altitude (m)
 - Label Visible: ☒
 - Label Font: sansserif-Bold-12
 - Grid Visible: ☒
 - Major Ticks: 5
 - Minor Ticks: 5
 - Major Tick Font: sansserif-Bold-12
 - Format: %, 1lf
- Data Area Section:**
 - Background: (empty)
 - Gradient Type: Acyclic Linear
 - Gradient Color: Blue
 - Offset Top: 35
 - Offset Bottom: -45
 - Offset Left: 40
 - Offset Right: -50

Figure 46—2-D Graph Customizer (split-screen)

Table 11—2-D Graph Properties

Property	Description
Resource Name	Name of the graph. Used to identify the graph within the drawing.
Samples	How many samples (bars) to display.

Value	Value of the current sample. Attach a publication to populate in iterative manner.
Background	Background color of the non-data area.
Bar Color	Color of the bars.
Bar Outline	Border color for bars.

Table 12—X-Axis Properties

Property	Description
Label	Axis label text.
Label Visible	Show or hide the label for the axis.
Label Font	Font for the axis label text.
Grid Visible	Show or hide the gridlines that extend from the X axis to indicate bar delineation.
Initial Bar Value	The value for the first bar.
Bar Increment	The amount to add to Initial Bar Value for each subsequent bar in the graph.
Initial Label Interval	The bar to display the first label on. <i>E.g., Initial Bar Value of 1.75 and Bar Increment of 0.25. Setting this value to “1” will result in the second bar displaying a label of “2”, skipping labeling from the first bar.</i>
Label Interval	How far apart (number of samples) to space the major ticks/labels. E.g. “4” indicates to place a major tick and label on every 4 th bar.
Major Ticks	Show or hide the major ticks on the axis.
Major Labels	Show or hide the labels for the major ticks.
Major Label Font	Font for the major tick labels.
Minor Ticks	Show or hide the minor ticks.

Table 13—Y-Axis Properties

Property	Description
High	High value for graph range.
Low	Low value for graph range.
Label	Axis label text.
Label Visible	Show or hide the label for the axis.
Label Font	Font for the axis label text.
Grid Visible	Show or hide the gridlines that extend from the Y axis to indicate range delineation.
Major Ticks	Show or hide the major ticks on the axis.
Major Label Font	Font for the major tick labels.
Format	Format for the values on the major ticks. For format details, please see Section 3.6.6 .

Table 14—Data Area Properties

Property	Description
Background	Non-gradient background color (or color to gradient into).
Gradient Type	Type of gradient, or None.
Gradient Color	Color for the gradient shading.
Offsets	Offsets around the data area of the graph.

3.8 GIS Maps

MissionView supports GIS (Geographic Information System) maps via GIS graphical objects. These graphical objects connect to a web-based map server to provide live runtime updates for the map image (see section 3.8.4 for details regarding the NetAcquire server GIS map server option). In addition, objects with position information (icons) can be configured for placement on the map. The position information for these “icons” can be driven by publications to provide real-time positioning on the map.

Here is an example drawing showing the *Map Zoom* GIS graphical object. This drawing illustrates a successfully established connection to the map server since

the map is rendered without error (see Figure 45) for an example of a drawing with an unsuccessfully connected map). In the example view it is unknown whether any icons have been configured; it may be the case that icons are configured and are positioned outside of the (potentially zoomed) map's view. See section 4.4.2 for further information on creating a drawing with the Map Zoom graphical object in MissionView Designer.

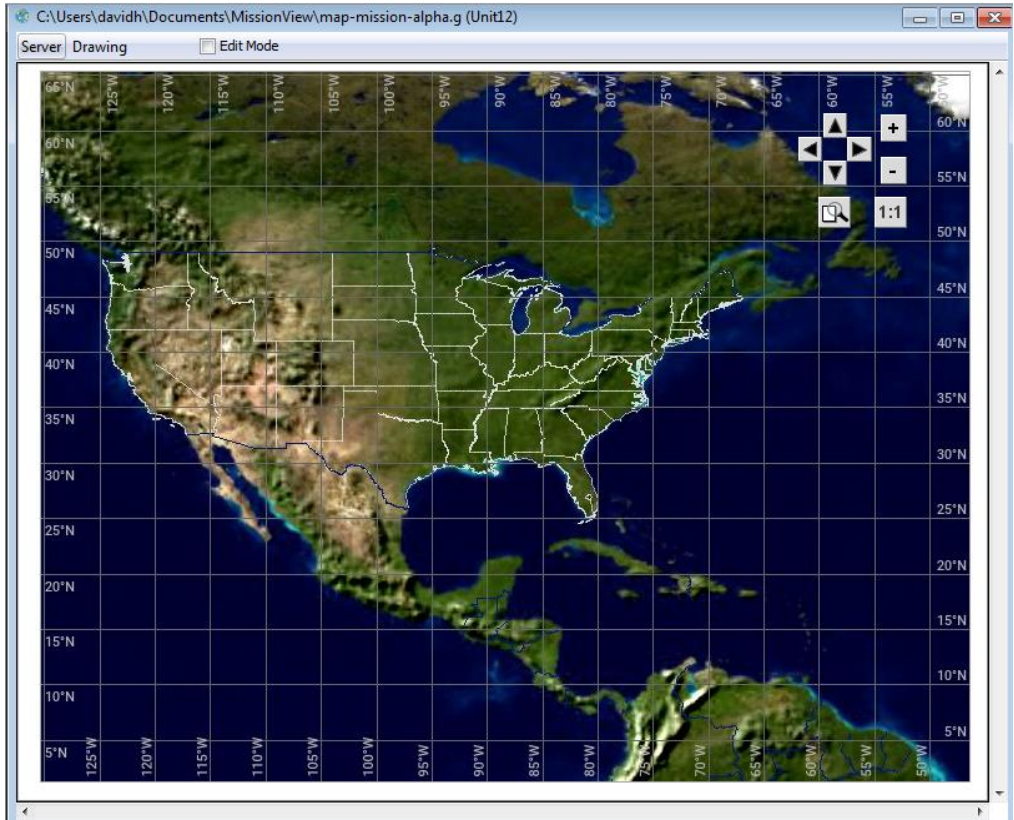


Figure 47—Map Zoom GIS Graphical Object Drawing

The control buttons in the top-right corner provide zoom and pan control for navigating the view of the underlying map.

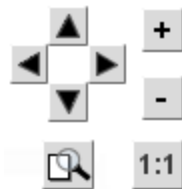


Figure 48—Map Zoom Controls

The arrow buttons move/scroll the map in the direction of the button while the plus and minus buttons zoom in and out, respectively. The magnifying glass button enables “selection-area zoom” with mouse. The **1:1** button will restore the map to the last saved state of zoom, pan, and projection.

3.8.1 Map Zoom Customizer

Like charts, GIS maps present a right-click customizer in place of a basic view, making their sophisticated structure simpler to navigate. The map customizer presents the following categories in the editor via selectable panes.

Unit12: map-mission-alpha.g Configuration

Map Customizer Resource View

Map

Icons

Map Editor

Map

Resource Name	Mission Alpha Map		
Map Server URL	http://unit12/cgi-bin/GlmScript.cgi		
Projection	Orthographic		
GIS Center	Longitude	-83.642500277	
	Latitude	0.006013737	
GIS Extent	Longitudinal (m)	14,000,000	
	Latitudinal (m)	14,000,000	
Map Layers	earth,shadow,states,us_cities,political,grid,gradient_black		
Background Color			
GIS Stretch	<input checked="" type="checkbox"/>		
Zoom Group Visibility	On		
Path Traces	<input checked="" type="checkbox"/> Enabled		
Trace Buffers	<input type="button" value="Clear All"/>		

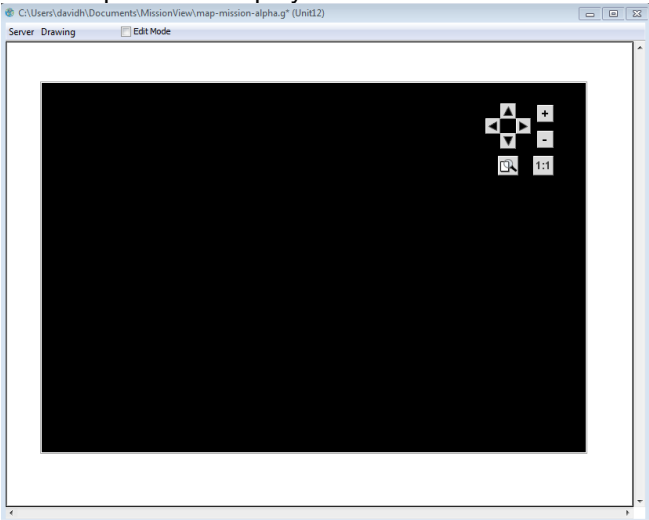
Icon Positions

Satellite with Altitude	<input checked="" type="checkbox"/> Longitude	Satellite/long	...
	<input checked="" type="checkbox"/> Latitude	Satellite/lat	...
	<input checked="" type="checkbox"/> Altitude	Satellite/height	...
	<input checked="" type="checkbox"/> End of Record	Satellite/EOR	...

Figure 49—Map Zoom Customizer

The primary map elements appear in the editor panel when the **Map** button is pressed. Key map properties are described below.

Table 15—Map Properties

Property	Description
Resource Name	The name of the GIS object. Used only for identification.
Map Server URL	<p>URL for querying map requests from server. Takes the form of http://<server address>/cgi-bin/GlmScript.cgi</p> <p>The rendered map image will not display if the map server is inaccessible or improperly configured. Here is an example of the display when this occurs:</p>  <p>Figure 50—Invalid Map Server URL</p> <p>In this case, messages like the following will also appear in the Messages windows:</p> <pre>[2018-11-15 13:49:30]: USER: Error or aborted image loading: <http://192.0.0.1/cgi-bin/GlmScript.cgi...</pre>
Projection	<p>Projection of the rendered map.</p> <ul style="list-style-type: none"> • Rectangular shows a “flat” 2D map • Orthographic shows a globe-style view.
GIS Center	Center of the viewport in latitude/longitude.

GIS Extent	Extent of the latitude/longitude within the view. Effectively controls the zoom in/out level. <ul style="list-style-type: none"> • Rectangular: extent defined in degrees • Orthographic: extent defined in meters
Map Layers	CSV list of the layers to be included in the map. The list of layers is map data dependent (<i>i.e.</i> , dependent on the map data configured on the target map server). Example layers include “earth”, “states”, “shadow”, “political”, “grid”, <i>etc.</i>
Background Color	Background color of the non-map area.
GIS Stretch	Should the map be stretched to fit the aspect ratio of a resizable drawing or not?
Zoom Group Visibility	Visibility of the zooming and panning control buttons. Uncheck to hide these controls.
Path Traces	Determines whether the icons will display a historical position trace as they move.
Trace Buffers	Clears path traces for all icons.

Individual icon object position properties are collected and presented in the “Icon Positions” category area of the map editor property sheet. This is a roll-up of all the configured icon positions (use the icon editor – see 3.8.2 below) and is a convenient way to edit icon positions independent of the individual, full set of each icon’s properties.

3.8.2 Icons

Maps support a variety of “icons” that can be added to a map. Each icon supports a set of position information with varying degrees of additional position/directional information depending on the type of icon.

Each icon represents an icon on the map. Select an icon to edit by clicking on the icon name in the list.

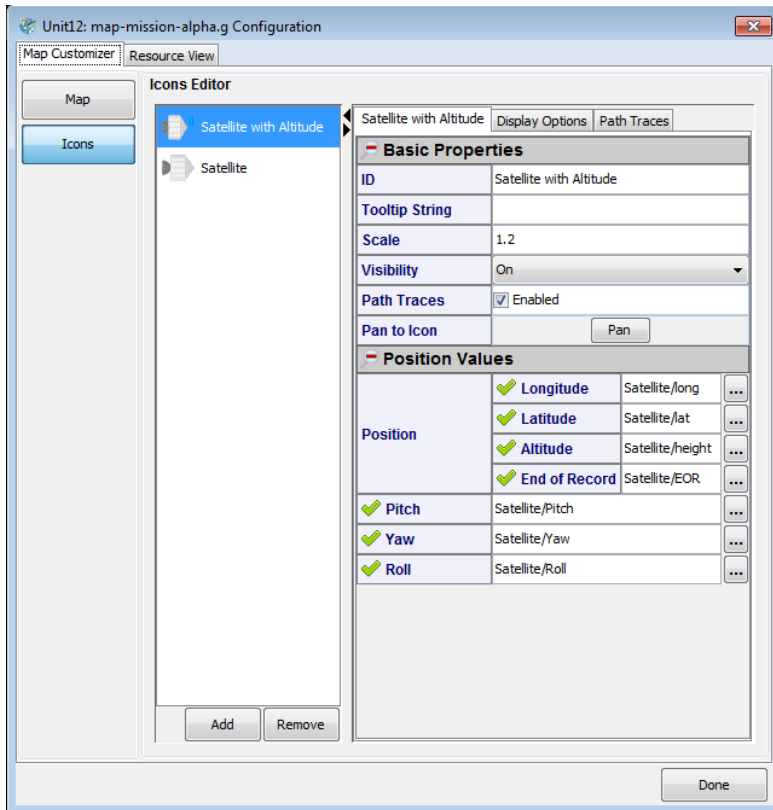


Figure 51—Map Zoom Icons Editor

a) Icon Editing

To work with icons, right-click the Map Zoom graphical object and click the **Icons** button. The following editor should be displayed. The actual contents of the list will depend on your drawing.

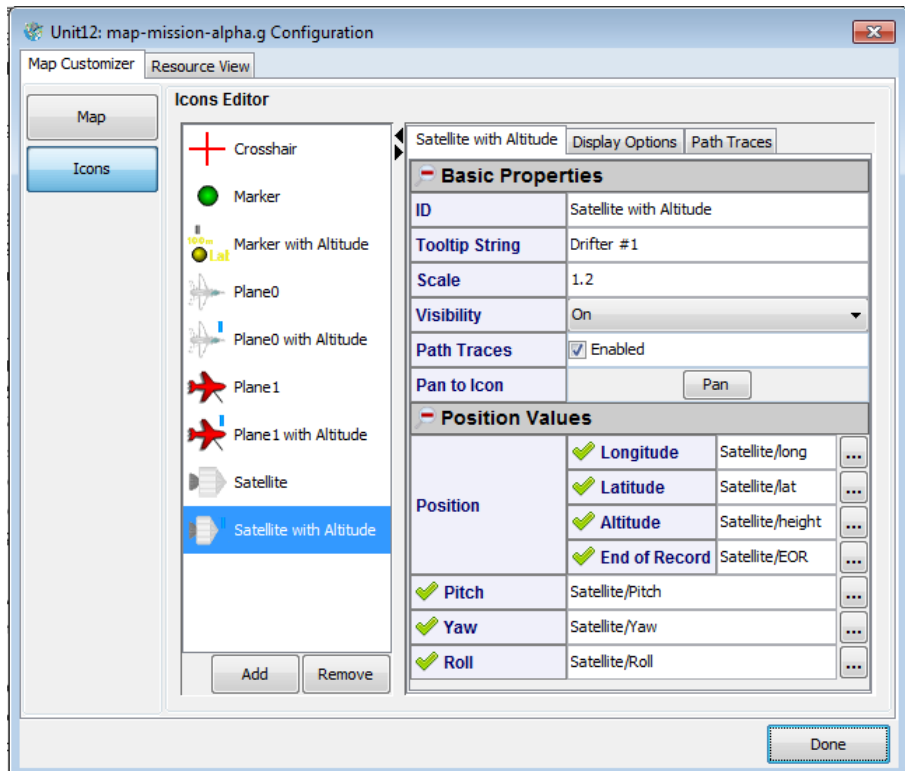
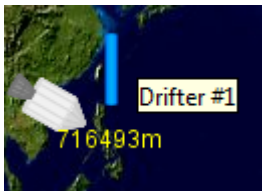


Figure 52—Icon Editor “Satellite with Altitude” Icon Properties

The above icon configuration results in the following icon representation on the map:



Icons can be added and removed with the **Add** and **Remove** buttons. An added icon will populate with no publications assigned and with default settings such as

various colors, scale, label values, *etc.* To add an icon, click the **Add** button to display the icon selector.

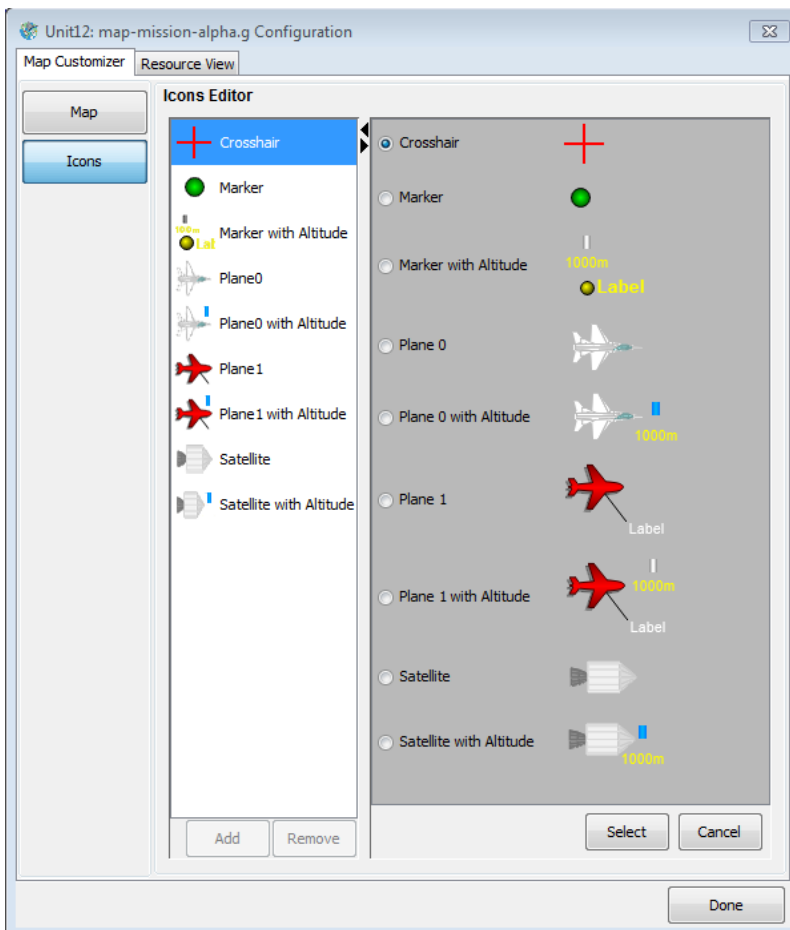











Figure 53—Map Zoom Icon Selector

Select the radio button of the icon you want to add and click the **Select** button. The icon will be added to the drawing.

Note: Icons are added with the latitude/longitude of NetAcquire headquarters. You can either change the position settings to literals (and then enter a new position) or enter edit mode and move the icon to the general location you desire.

Icon Name	Icon	Description
Crosshair		Supports position latitude, longitude, altitude.
Marker		Supports position latitude, longitude, altitude.
Marker with Altitude		Supports position latitude, longitude, altitude with additional altitude display and label.
Plane 0		Supports position latitude, longitude, altitude, pitch, yaw, roll.
Plane 0 with Altitude		Supports position latitude, longitude, altitude, pitch, yaw, roll, with additional altitude display.
Plane 1		Supports position latitude, longitude, altitude, and angle (heading), with additional label.
Plane 1 with Altitude		Supports position latitude, longitude, altitude, and angle (heading), with additional altitude display and label.
Satellite		Supports position latitude, longitude, altitude, pitch, yaw, roll.
Satellite with Altitude		Supports position latitude, longitude, altitude, pitch, yaw, roll, with additional altitude display.

You can edit any icon by selecting it in the list to load the editor. Fill in the various details to create a static or dynamic (using live position data, see 3.8.2 b) below) icon. The example below uses static position data (either because of the icon

being manually moved on the map or by entering literal values for the position information).

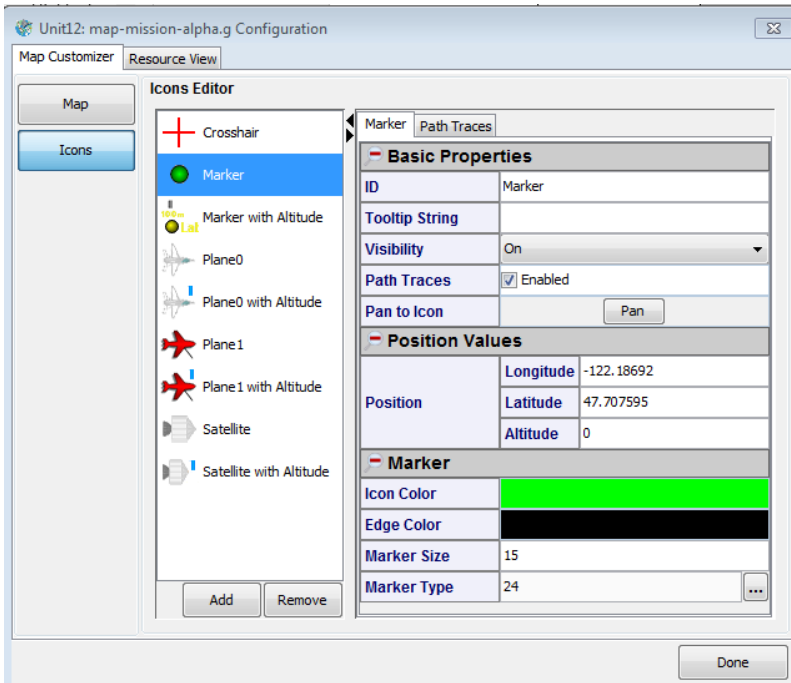


Figure 54—Map Zoom Icon with Static Position

While each icon's property set differs, the following table covers some of the most common categories and properties.

Table 16—Icon Basic Properties

Property	Description
ID	Name of the icon for display purposes, need not be unique.
Tooltip String	Text string to display when the mouse hovers over the icon in the map.
Scale	Scale of the icon. The icon does not scale with the map. Adjust to choose how large to show the icon.
Visibility	Whether the icon is visible or not.
Path Traces	Should this icon show any path traces?
Pan to Icon	Automatically pans the map view to center this icon.

Table 17—Icon Position Values Properties

Property	Description
Position	Latitude/Longitude/Altitude of the icon. Supports End-of-Record for synchronizing values (see 3.8.3 below). Each of the components may be treated as separate values.
Pitch	Pitch of the icon graphic.
Yaw	Yaw of the icon graphic.
Roll	Roll of the icon graphic.

Table 18—Icon Label Properties

Property	Description
Label Text	The text to display for the label display.
Font	Font settings for the label text.
Text Color	Test color for the label text.

b) Display Options

The Display Options tab offers controls for various icon display elements. All icons other than “Marker” support a “Position Display” object. This object is by

default not visible. When visible the following latitude/longitude presentation appears alongside the icon:



Other display options may also be available depending on the icon type.

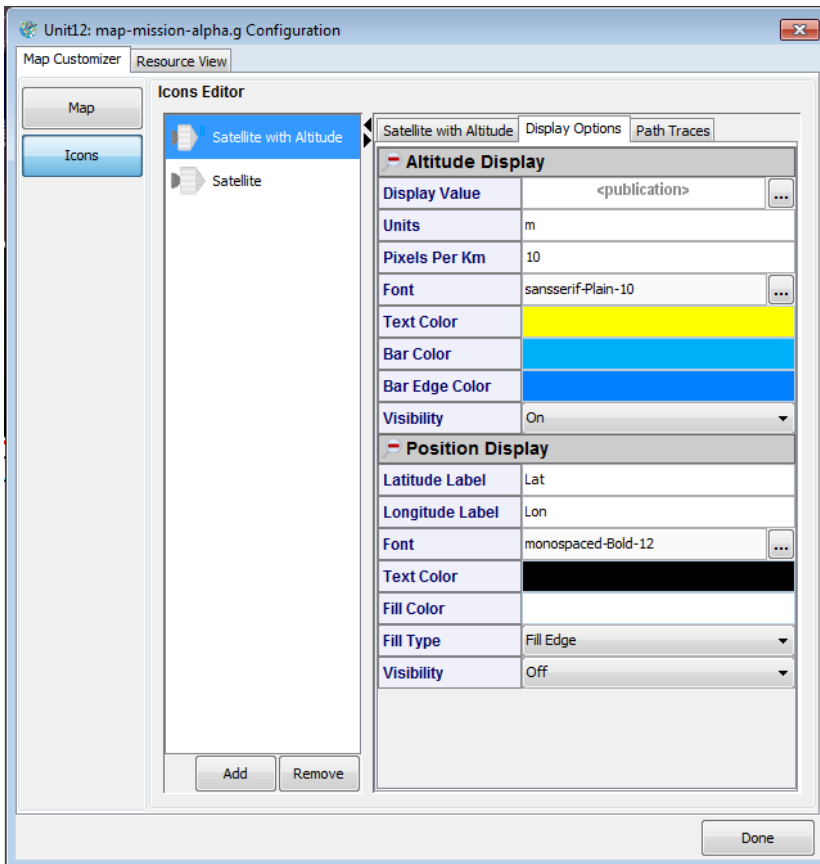


Figure 55—Map Zoom Icons Editor (Display Options)

Table 19—Icon Altitude Display Properties

Property	Description
Display Value	The value driving the display bar height and the display text (both used to represent the altitude).
Units	Units to use in the display text.
Pixels per Km	Changes the scaling of the display bar. Adjust to fit the magnitude of the display bar.
Font	Font settings for display text.
Text Color	Text color for the display text.
Bar Color	Center color of the display bar.
Bar Edge Color	Edge color of the display bar.
Visibility	Toggle to show/hide the altitude display.

Table 20—Icon Position Display Properties

Property	Description
Latitude Label	Text label to use for the latitude value.
Longitude Label	Text label to use for the longitude value.
Font	Font settings for display text.
Text Color	Text color for the display text.
Fill Color	The fill color of the box used to display the values.
Fill Type	The display value box type to use.
Visibility	Toggle to show/hide the position display.

c) Path Traces

The Path Traces tab offers controls for customizing the icon's path trace behavior. The Filters section contains special filters to decimate the number of

points being added to the view. Filters aid in performance, filtering out additions of points that are indiscernible to the user's eye.

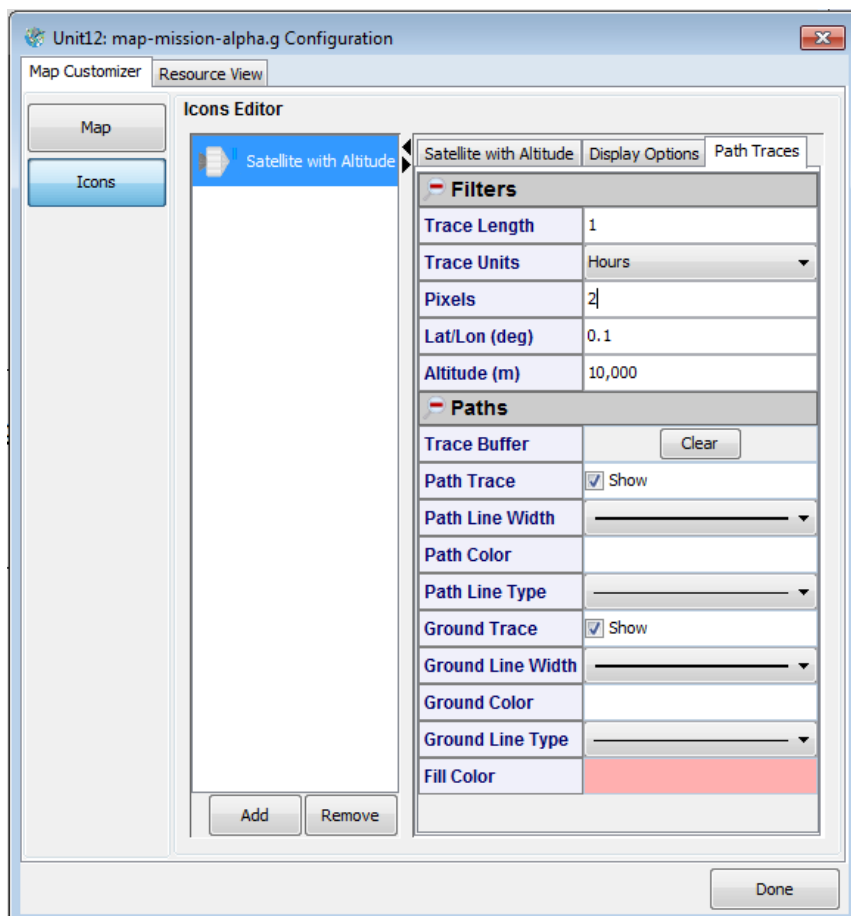


Figure 56—Map Zoom Icons Editor (Path Traces)

Table 21—Filters

Property	Description
Trace Length	Together with Trace Units, places a bound on the amount of data that will be displayed by time. To disable this filter, set Trace Units to <i>Disabled</i> . Default: 1
Trace Units	Together with Trace Length, places a bound on the amount of data that will be displayed by time. To disable this filter, set Trace Units to <i>Disabled</i> . Default: Minutes
Pixels	Add a point if the points lie this many pixels apart on the screen. Default: 2
Lat/Lon (deg)	Add a point if the position change has moved this far in degrees of Latitude or Longitude (or'ed with Altitude). Default: 0.1
Altitude (m)	Add a point if the altitude (in meters) has changed by this amount (or'ed with Lat/Lon). Default: 10000

Table 22—Paths

Property	Description
Trace Buffer	Clears the points in the path trace.
Path Trace	Hide/show the path trace for this icon (both actual path and ground path).
Ground Trace	Hide/show the ground position trace and vertical fill.
Path/Ground/Fill	Use the editors to customize the colors and lines in the traces.

d) Filter Operation

When tracing paths, the sheer number of points required to draw long-running paths can create a performance bottleneck. The filters help decimate the number of points used to draw the paths by using a two-tiered system. Arriving values are kept within a historical buffer from which values can be used to draw the paths on-screen. Only points that are both visible (on-screen) and lie in unique pixels are drawn. For example, when zoomed very far out, many points on the path

may all lie visually within the same pixel on the screen, making them superfluous until the user zooms in. When zooming in, the paths can be redrawn by accessing the buffer and using more and more of the points as they become relevant.

The Trace Length/Units filters control the visible historical path based on time. Historical path trace information beyond the time specified by this filter will not be drawn.

The Lat/Lon and Altitude filters control which points are added to the buffer. This filter will permanently discard values that do not meet its threshold. This macro-filter helps keep the buffer from growing too large, useful in cases where views are typically large such as satellite or orbital views.

The Pixel filter makes the decision that only points that lie this many pixels apart should be added to the paths. Some settings and brief description.

0. Likely to create wasted processing since users view pixels and many points may occupy the same pixel.
1. Points may occupy every visible pixel available. Will create the finest-grained path but may be heavyweight for large scale views.
2. (or greater) – Balances performance with the needs of granularity.

e) **Dynamic Icon Position**

Dynamic icon positioning is supported via publications. Publications that indicate a position's longitudinal/latitudinal/altitudinal values can be used by the icon's "Position" property. As values for these publications are processed the icon is re-positioned on the map.

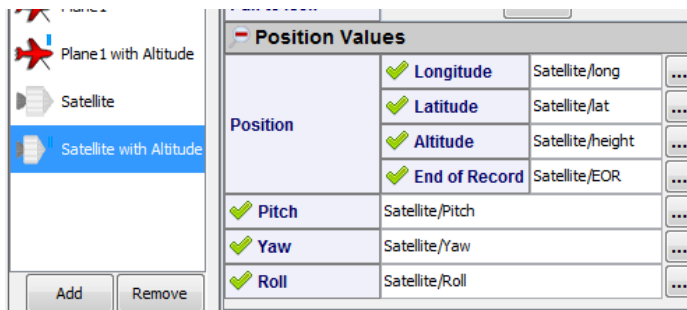


Figure 57—Map Zoom Icon with Dynamic Position

f) **Moving Icons**

Icons that are on the map and have not been assigned dynamic position data (*i.e.*, their position data is not driven by publications) can be manually positioned in two ways: 1) by using the mouse, or 2) by entering static position data.

To move an icon with the mouse simply enter edit mode by checking the **Edit Mode** checkbox in the drawing window. While in edit mode press the left mouse button over a (statically positioned) icon and drag it to its new position. To position an icon with static position data simply enter literal values in the icon's position values while in the icon editor.

Note: Panning and zooming of the map itself is not supported while the drawing is in edit mode.

3.8.3 *End-of-Record Publications*

NetAcquire publish/subscribe (NAPS) supports the notion of “End-of-Record” (EOR). Publications are stand-alone values with no added coupling to any other publication. Sometimes multiple publications are semantically linked, as in the case of latitude, longitude, and altitude. These three values indicate the simultaneous and coherent position of an object. Having these values arrive and be updated individually may cause temporarily unusual results since stale values may be mixing with current values.

A solution for this is to enable the EOR capability within a NetAcquire server data flow to cause a publication to be guaranteed to arrive at the end of all publications coming from a single publisher (see the *Decommutator* and *Publisher* sections of *NA-MAN-004* for more details). Using this feature will ensure correct results within MissionView Display by ensuring all position data has “settled” prior to receiving the EOR notification, and subsequently positioning the icon on the map.

3.8.4 *Dynamic Centering (Pilot View)*

The map can be dynamically centered by assigning publications to the GIS Center Latitude/Longitude values. Use cases include having the map stay centered on a specific icon and having the map stay centered on a calculated location such as the average center of a group of targets.

Dynamic zoom can be controlled by assigning publications to GIS Extent Latitudinal/Longitudinal values. Take care if opting to connect GIS Extent and read the previous details on what units are used with the GIS Extent property (units depend on the projection type).

3.8.5 *GIS Map Server*

As mentioned previously the *Map Zoom* graphical object is typically configured to have its GIS information displayed based on dynamically rendered images generated by a NetAcquire server configured and running with the **GIS Map Server** option. The GIS Map Server option provides a standards-based (OpenGIS), web-enabled GIS map server running on a real-time NetAcquire server. It generates map images dynamically based upon requests it receives through the NetAcquire system's web server. The *Map Zoom* graphical object

sends these requests based on its configuration and then also based on any dynamic panning and zooming operation that may occur.

The map server is a licensed option. However, an unlicensed version of the map server will still reply to requests. These “unauthorized” replies simply contain lower resolution renderings of map images along with rendered text in the lower right corner of the resulting image that indicates the unlicensed configuration (see Figure 58 below).



Figure 58—Unauthorized Copy of the Map Server

3.8.6 Default GIS Data Set

The default GIS data used by the map server contains publicly available image and vector data. The “earth” layer itself uses a high-resolution 8192x4096 earth image provided by NASA. The image is tiled to optimize performance of zoomed queries, and a smaller image in the “earth_fallback” layer is used as a fallback for high-level views.

Various other GIS data sets can be configured on the map server, including data sets with varying resolutions, layers, and other attributes.

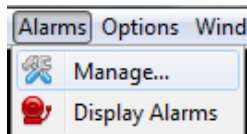
Please contact NetAcquire Corporation for further information on the NetAcquire server’s GIS Map Server option and its configuration/GIS data sets.

3.9 Alarms

The alarm system provides both visual cues to exceptional states and a log file that save the alarm states as they trigger. Users can create any number of alarms and attach them to various publications.

3.9.1 Managing Alarms

Open the Alarm Management window by clicking **Alarms** in the main menu and then **Manage...**



Click **Add** to add a new alarm. A selection tree will open that displays all of the servers in the server list and all of their publications. Select a publication and click **OK**.

Next, choose a limit type.

a) **Single-Range**

A simple ranged comparison where the alarm triggers when the publication value exceeds an upper or lower limit.

Lower Limit	<value>	Upper Limit
-------------	---------	-------------

b) **Double-Range**

A more complex ranged comparison with two sets of upper and lower limits. Conceptually one can think of this alarm as having a 'warning' inner limit and a 'critical' outer limit.

Outer Lower Limit	Inner Lower Limit	<value>	Inner Upper Limit	Outer Upper Limit
----------------------	----------------------	---------	----------------------	----------------------

c) **Comparison**

Compares the publication value to a user-entered value. *E.g.*, "Is publication > 10?"

3.9.2 Configuring Alarms

Once added, the alarms will appear in the alarm management window. The asterisk in the title indicates that the alarm configuration has not been saved. Click on an alarm to display its configuration in the editor pane. The alarm types all use the same basic layout.

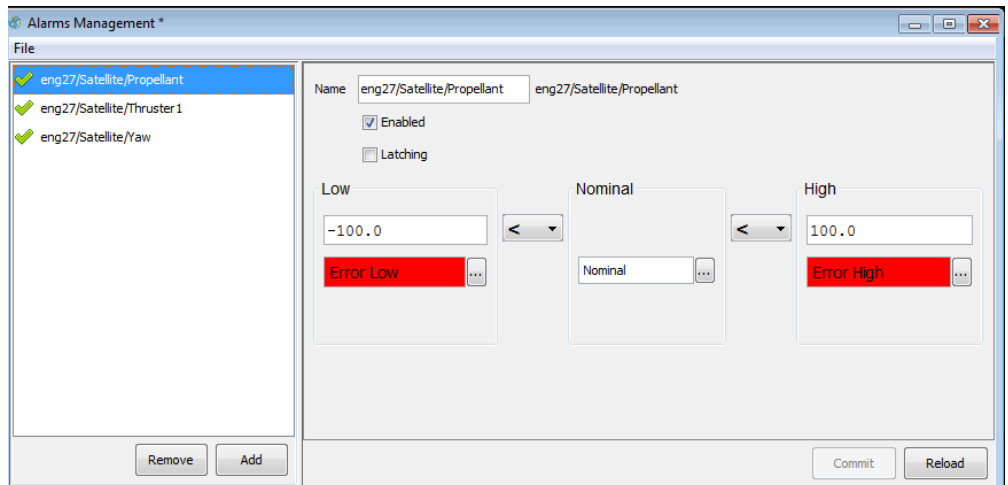


Figure 59—Alarm Management Window

a) **Name**

Alarms receive a name based on the server and publication, but the name can be changed to something more useful. The name is used for display throughout MissionView Display.

b) **Enabled**

Alarms can be disabled. To keep many alarms resident but only have a few active, deselect the **Enabled** checkbox to turn them off.

c) **Latching**

Alarms can latch a value when they trigger. For instance, if the alarm should 'stick' in a triggered state, turn on this feature by selecting the **Latching** checkbox. If an alarm value exceeds a bound, the triggered state will remain until dismissed by the user. For double-range alarms, the latched trigger will always be promoted to the outer limit (*i.e.*, outer bound has precedence).

d) **Editor Mini-Panels**

Each bounded box in the editor represents a limit or is a placeholder for an un-triggered state.

- **Nominal, Undetected** – Not triggered, within bounds.
- **Detected** – Comparison returns true.
- **Low, Very Low** – Low-side bounds.
- **High, Very High** – High-side bounds.

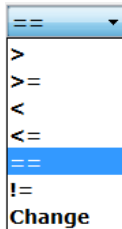
e) **Comparator Drop-Downs**

In between mini-panels drop-downs appear that contain comparison operators. These can be changed to modify the ranges or comparisons. For the ranged alarms, the options keep the limits in order. For example:

Very Low [$<$ or \leq] Low [$<$ or \leq] Nominal, etc.
--

The comparison alarm type offers a drop-down with a wide variety of comparison operations that can be used against the value entered.

Table 23—Alarm Comparison Operations



Operator	Description
>	Greater than user value
>=	Greater than or equal to user value
<	Less than user value
<=	Less than or equal to user value
==	Equal to user value
!=	Not equal to user value
Change	Any change to the publication

f) Comparison Values

Set the values for the limits by entering a value in the field(s). Changing the limit values will broaden or narrow a range or change the simple comparison value.

g) Example Ranged Alarm

The following alarm compares a publication's value using a Single-Range alarm. If the publication drops below -100 or rises above 100, the alarm will trigger.

Figure 60—Single Range Alarm Example

h) Example Comparison Alarm

The following alarm compares the current publication value to “12.2”.

The screenshot shows a configuration window for a comparison alarm. At the top, the 'Name' field contains 'Thruster1' and the path 'eng27/Satellite/Thruster1'. Below this, there are two checked checkboxes: 'Enabled' and 'Latching'. The 'Current' section displays '<value>' and a dropdown menu set to '>='. The 'Detected' section has a text field with '12.2' and a dropdown menu set to 'Detected'. The 'Undetected' section has a dropdown menu set to 'Nominal'. Both the 'Detected' and 'Undetected' sections have a three-dot menu icon to their right.

Figure 61—Comparison Alarm Example

3.9.3 Alarm Display Options

In addition to setting operators and limit values, display options or *look and feel*, can also be configured. For each limit set the following characteristics can be changed: descriptive text, colors (background and font), and font.

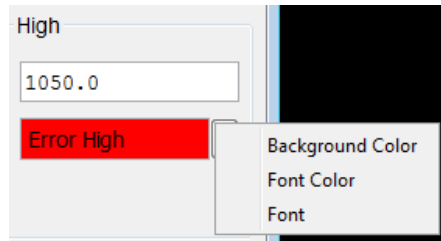
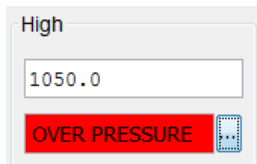


Figure 62—Alarm Display Options

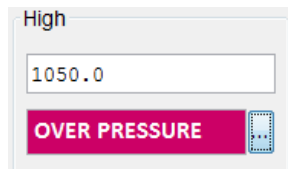
- **Descriptive Text** – Use the text field to change the text.
 - *E.g.*, “Error High” may be changed to user-appropriate text such as “OVER PRESSURE”.



- **Colors** – Click the ellipses button next to the text to pop up a menu, then click on **Background Color** or **Font Color** to open a color chooser and select your colors.

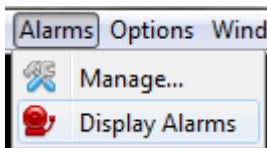


- **Font** – Click the ellipses button next to the text to pop up a menu, and then click on **Font** to open a font chooser and select your font type, style, and size.



3.9.4 Displaying Alarms

Open the **Alarm Display** from the main menu **Alarms** by clicking on **Display Alarms**.



The Alarm Display will open, showing all of the configured alarms. Each row presents one alarm with the configured look and feel.



Alarm Display			
Name	Value	State	Latched
Propellant	893.449	UNDER PRESSURE	 17:03:12.0684593
Thruster1	0.0	Nominal	
Yaw	-19.022	Nominal	
Battery1	23.646	<Disabled>	

Figure 63—Alarm Display Window

The table visually separates alarms in different states and makes the user aware of latching values.

Table 24—Alarm Display Table

Column	Description
Name	Name of the alarm.
Value	The current value of the alarm. This field <u>always</u> updates to the latest value.
State	The current state of the alarm. Latching alarms will <u>remain latched</u> in a triggered state. Disabled alarms appear grayed-out.
Latched	When an alarm latches, the timestamp of the current latched state will appear. Click on the cell to release the latch. Note: If a limit is still triggered (e.g., still exceeds the upper bound), the alarm may immediately latch again.

3.9.5 Alarm Log

In addition to the display window, an alarm log is written to your Documents/MissionView/alarms folder. The log file uses comma separate values format (CSV) and records the following information.

Table 25—Alarm Log Format

Column	Description
1	Trigger Time – Local PC Time
2	Trigger Time – Publication Timestamp (server-based)
3	Alarm Name
4	Value when triggered
5	State String (E.g., OVER PRESSURE)
6	Brief descriptive text to help identify the alarm limit conditions. E.g., a single-range alarm might appear as, “Outer Low(<1000.0) Outer High(>1050.0)”

3.10 Application Persistence

MissionView Display opens in the same state as its last shutdown, keeping a particular workspace seamless across application runs. MissionView Display also supports the use of saved workspaces, known as *Layouts*.

3.10.1 Layouts

A layout defines a beginning state for the application including the following saved information:

- Servers list
- Favorites list
- Window sizes and locations
- Application options (e.g., refresh rate, log timestamping)

Creating a layout can be accomplished in two ways:

1. Click **File** and then **New Layout...**
 - a. Creates a new, empty layout with no server list. Use this option to start from a blank workspace.
2. Click **File** and then **Save Layout As...**
 - a. Saves the current workspace information to a new layout. Use this option to derive a layout from an existing layout or workspace.

a) Drawing File Paths in Layouts

Layouts keep track of any associated drawings using relative file system paths. Relative paths assist with portability of layouts between different PCs and different users.

The following example demonstrates creating a simple layout that can be transferred between PCs:

1. Create a folder "MyLayout", with subfolder "Drawings".
2. Click **File** and then **New Layout...**, saving layout as "my-layout.mv" to the MyLayout folder.
3. Click **Favorites** and then **Drawing...** to open the Avionics.g drawing found in your Documents/MissionView folder.
4. In the drawing window's menu click **Drawing** and then **Save As...** to save the drawing as "Avionics" to the new folder MyLayout/Drawings.
5. From the application menu, click **File** and then **Save Layout** to save this layout.

The "MyLayout" folder can now be copied to a different location on the same PC or some other PC. Since the layout uses relative paths to refer to the drawing,

the drawing must be moved along with the layout or exist in the same location relative to the layout file at the target location.

If MissionView Display cannot find a drawing, an error message will display in the window indicating the path and a message will be logged in the **Messages** window. When this occurs, use the main **Drawing** menu and the **Open...** sub-menu item to bring up the open file dialog in order to locate the drawing file or to select another drawing file.

3.10.2 Example Layout

MissionView Display comes pre-packaged with an example layout “demo.mv” found in the Documents/MissionView folder. This layout presents two drawings connected to a demonstration data source.

3.11 Global Settings

MissionView Display maintains several categories of configuration settings as global settings. These settings can be used as configurable defaults for various individual configurations. For example, the Subscription Logger/Replayer supports various configuration parameters and users may want to configure

global defaults for these parameters in order to minimize re-configuration within individual Subscription Logger/Replayer windows.

Use the **Options** menu and the **Settings** sub-menu to bring up the global settings dialog (Figure 64 below).

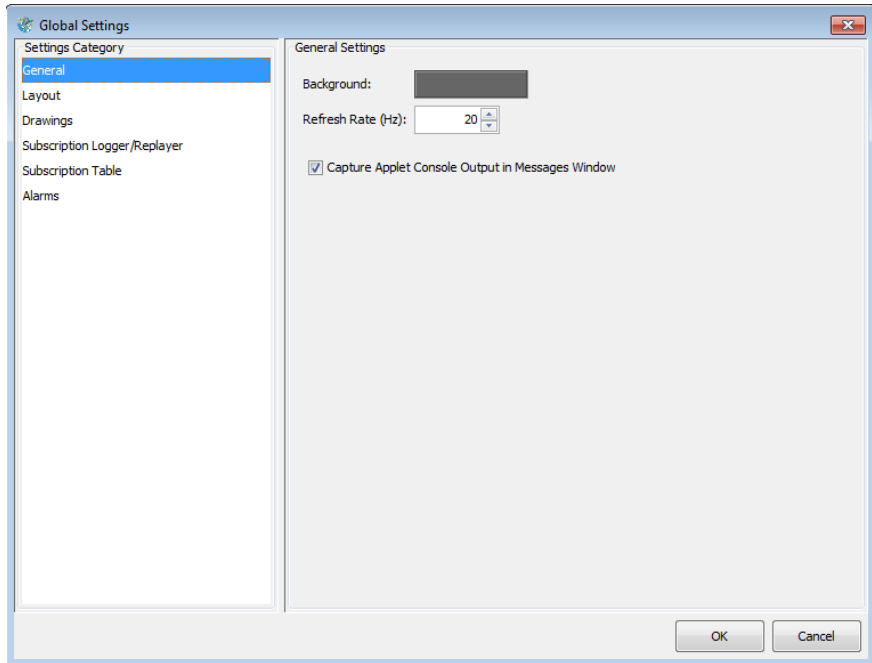


Figure 64—Global Settings Dialog

3.11.1 General Settings

This category includes settings that apply to general MissionView Display operation.

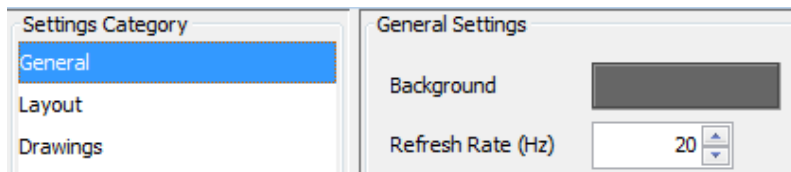


Figure 65—General Settings

Table 26—General Global Settings

Background	The background color of the desktop. Click on the color to open a color chooser to select the color.
Refresh Rate (Hz)	<p>This setting configures the refresh rate for various application windows. For example, this rate indicates how often the drawings are updated graphically (repainted).</p> <p>Note: This setting has no effect on how fast MissionView can ingest data. This setting only changes how fast the screen is refreshed to reflect current data.</p>
Capture Applet Console Output in Messages Window	MissionView supports Java applets found on server pages. To capture log messages from these applets into the main MissionView messages window, check this box. By default, log messages from each applet can be found in the menu of each applet window.

3.11.2 *Layout Settings*

This category includes settings that apply to the visual display of the MissionView Display application, including settings related to application persistence (*i.e.*, layouts).

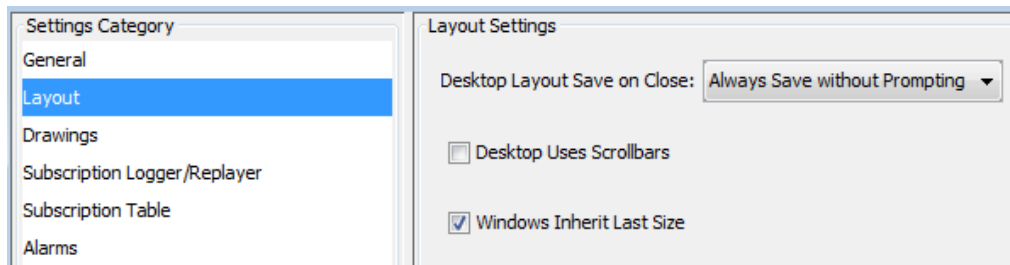


Figure 66—Layout Settings

Table 27—Layout Global Settings

Desktop Layout Save on Close	<p>This setting determines whether the active layout is automatically saved when MissionView Display is closed, or whether confirmation is required instead.</p> <p>NOTE: The application state is always saved on close when no custom layout is active.</p>
Desktop Uses Scrollbars	<p>This setting determines whether main application display scrollbars are used when windows within the display extend beyond the bounds of the main display.</p> <p>This setting is a convenient when using layouts saved on other machines and when these layouts represent large resolution displays. In this case the layout is loaded with scrollbars visible so the main display can be scrolled to view windows that might otherwise be off screen.</p> <p>When this setting is off, layouts loaded from systems with larger resolution displays will result in no scrollbars being visible and all persisted windows moved within the bounds of the main application display.</p>
Windows Inherit Last Size	<p>When opening windows such as web and configuration pages, this option will cause the windows to open to the last-used size. For instance, resizing a web page or the server's dynamic status page implies that the next time the page is opened, the current window size should be used.</p>

3.11.3 Drawings Settings

This category includes settings that apply MissionView Display drawings.

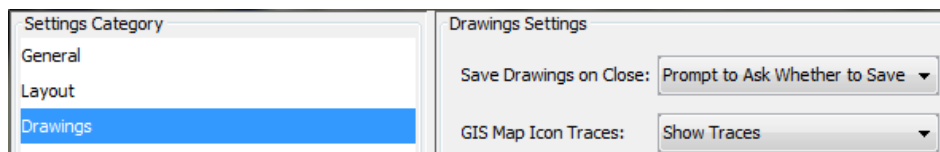


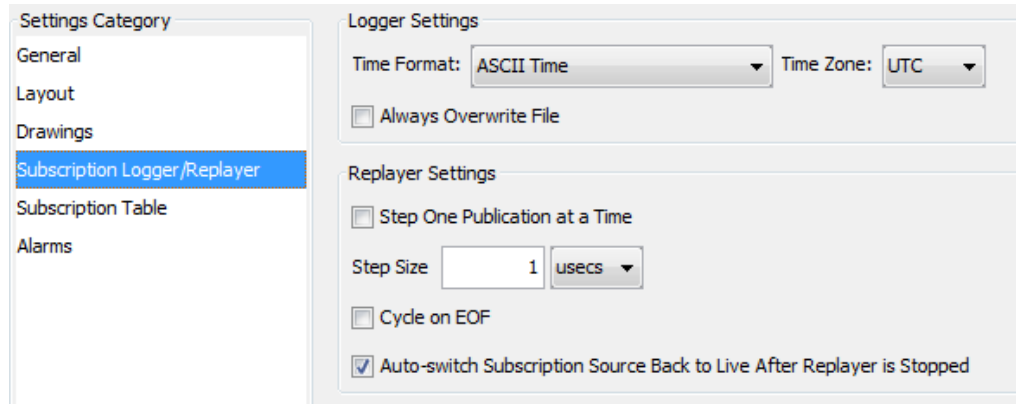
Figure 67—Drawings Settings

Table 28—Drawings Global Settings

Save Drawings on Close	This setting determines whether drawings with unsaved changes are automatically saved when a drawing window is closed (including when MissionView Display itself is closed) or whether confirmation is required instead.
GIS Map Icon Path Traces	Each GIS object inherits this value to determine whether to show icon path traces by default.

3.11.4 Subscription Logger/Replayer Settings

This category includes settings that apply to MissionView Display subscription logging and replaying operations.



The screenshot displays the 'Subscription Logger/Replayer Settings' window. On the left, a 'Settings Category' list includes General, Layout, Drawings, Subscription Logger/Replayer (highlighted), Subscription Table, and Alarms. The main panel is split into two sections: 'Logger Settings' and 'Replayer Settings'. Under 'Logger Settings', 'Time Format' is set to 'ASCII Time', 'Time Zone' is 'UTC', and the 'Always Overwrite File' checkbox is unchecked. Under 'Replayer Settings', 'Step One Publication at a Time' is unchecked, 'Step Size' is '1 usecs', 'Cycle on EOF' is unchecked, and 'Auto-switch Subscription Source Back to Live After Replayer is Stopped' is checked.

Figure 68—Subscription Logger/Replayer Settings

Table 29—Subscription Logger/Replayer Settings

Logger Settings	
Time Format	<p>This setting indicates the default time format used by the Logger when logging subscription data.</p> <p>NOTE: Only files created with the ASCII Time are compatible with the Replayer. ASCII Time is the default setting for this reason.</p>
Always Overwrite File	<p>This setting determines whether the specified log file is automatically overwritten when the Logger is started or whether confirmation is required instead.</p>
Replayer Settings	
Step One Publication at a Time	<p>This setting indicates whether the Replayer plays back one publication at a time when single stepping. When this setting is not checked Replayer plays back publications based on the Step Size setting(s).</p>
Step Size	<p>This setting specifies the default step size when the Replayer is single stepping. Valid values are dependent on the units (microseconds, milliseconds, seconds, minutes, or hours).</p>
Cycle on EOF	<p>This setting indicates whether Replayer should automatically cycle around to the beginning of the log file when it reaches the end. The default behavior is to stop playing back data when Replayer reaches the end of the log file.</p>
Auto-switch Subscription Source Back to Live After Replayer is Stopped	<p>This setting indicates whether a live server automatically begins advertising (and publishing) its live publications when Replayer is stopped.</p> <p>When configured this way, subscribers (e.g., a drawing window) will automatically switch to processing live data when it otherwise has been processing replayed data.</p>

3.11.5 Subscription Table

This category includes settings that apply to MissionView Display subscription table operation.

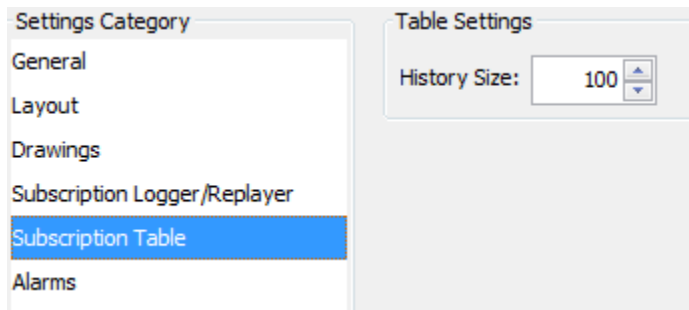


Figure 69—Subscription Table Settings

Table 30—Subscription Table Settings

History Size	This setting indicates how many rows to display in the table.
---------------------	---

3.11.6 Alarms Settings

This category includes default settings that apply to MissionView Display alarm configuration and display.

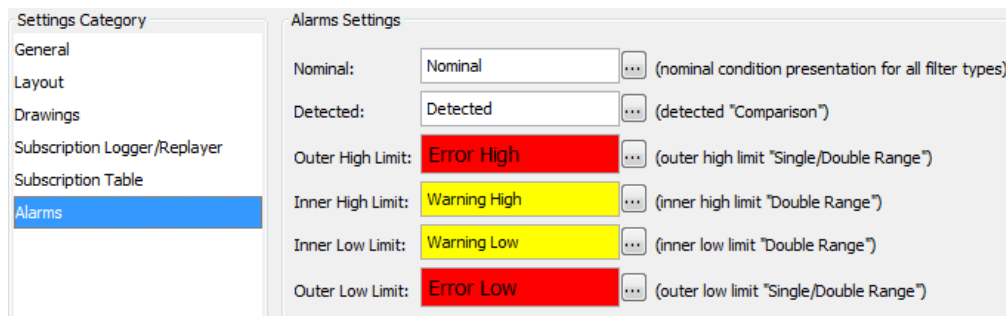


Figure 70—Alarms Settings

The *Alarms* configurable settings are defined in the following table. See 3.9.3 for details regarding the configuration of alarm display options.

Table 31—Alarms Settings

Nominal	The default display options for Nominal (for Single/Double range) and Undetected (for Comparison) conditions alarm states.
Detected	The default display options for Detected (for Comparison) condition alarm states.
Outer High Limit	The default display options for Outer High (for Double range) and High (for Single range) conditions alarm states.
Inner High Limit	The default display options for Inner High (for Double range) condition alarm states.
Inner Low Limit	The default display options for Inner Low (for Double range) condition alarm states.
Outer Low Limit	The default display options for Outer Low (for Double range) and Low (for Single range) conditions alarm states.

3.12 Help

Help documentation includes a web-based version of the *NetAcquire MissionView Users Manual* (this manual). These pages include the following features:

1. Full document hierarchy and convenient traversal capability
2. Search by keyword

3.12.1 *MissionView Manual (MissionView Display Chapter)*

In MissionView Display click on the **Help** menu and then **MissionView Manual** to display the MissionView Display chapter of the MissionView manual.

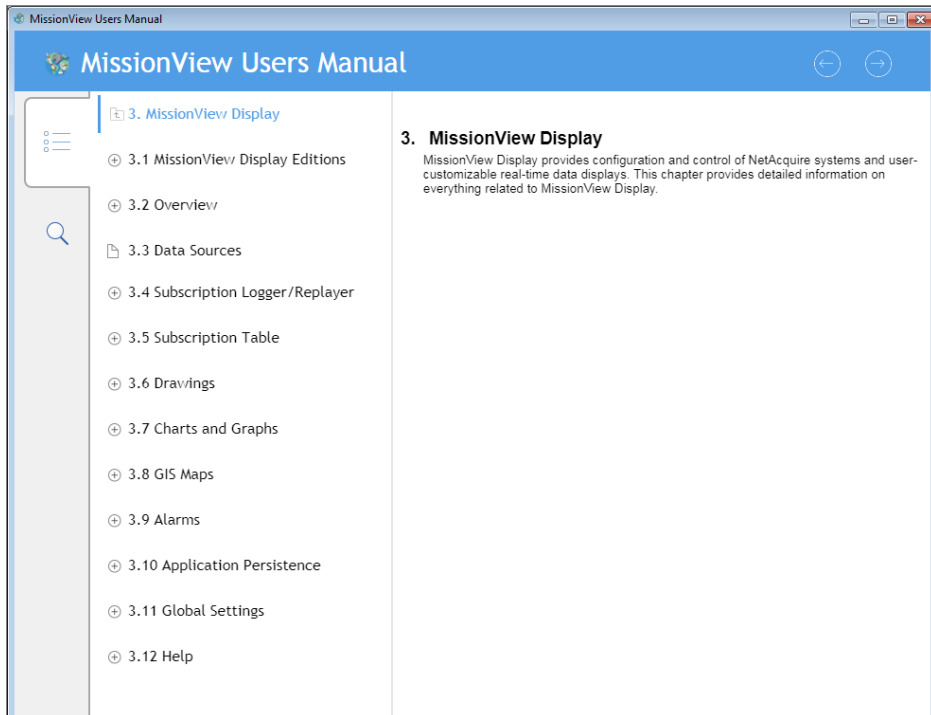


Figure 71—MissionView Manual Help Page

MissionView manual documentation pages are designed to be displayed optimally regardless of the size of the window. Each page provides navigation capabilities for traversing table of contents pages.

When the table of contents tab is highlighted the currently active help section's table of contents entries are shown. Use the first link in the list to traverse up to the next highest level in the table of contents.

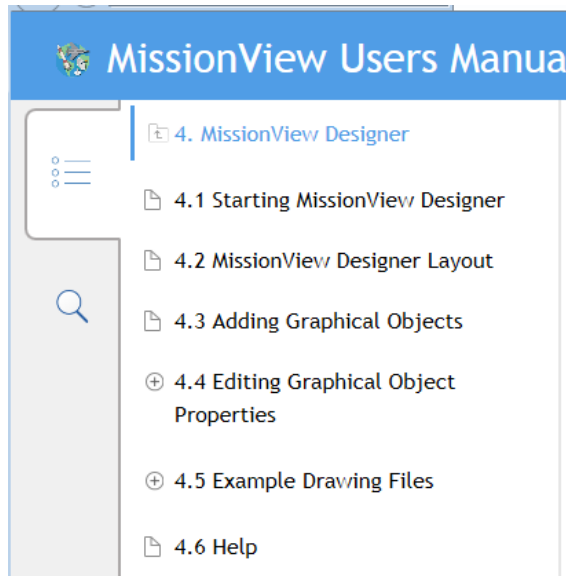


Figure 72—MissionView Manual Help Page Navigation

Page by page traversal is also possible via the previous and next buttons located at the upper right portion of each page.

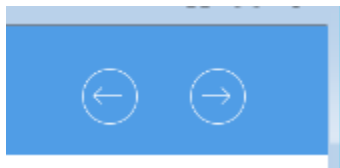


Figure 73—Previous and Next Page Navigation

Search capability is also available. Enter the search term and press the **Enter** key:

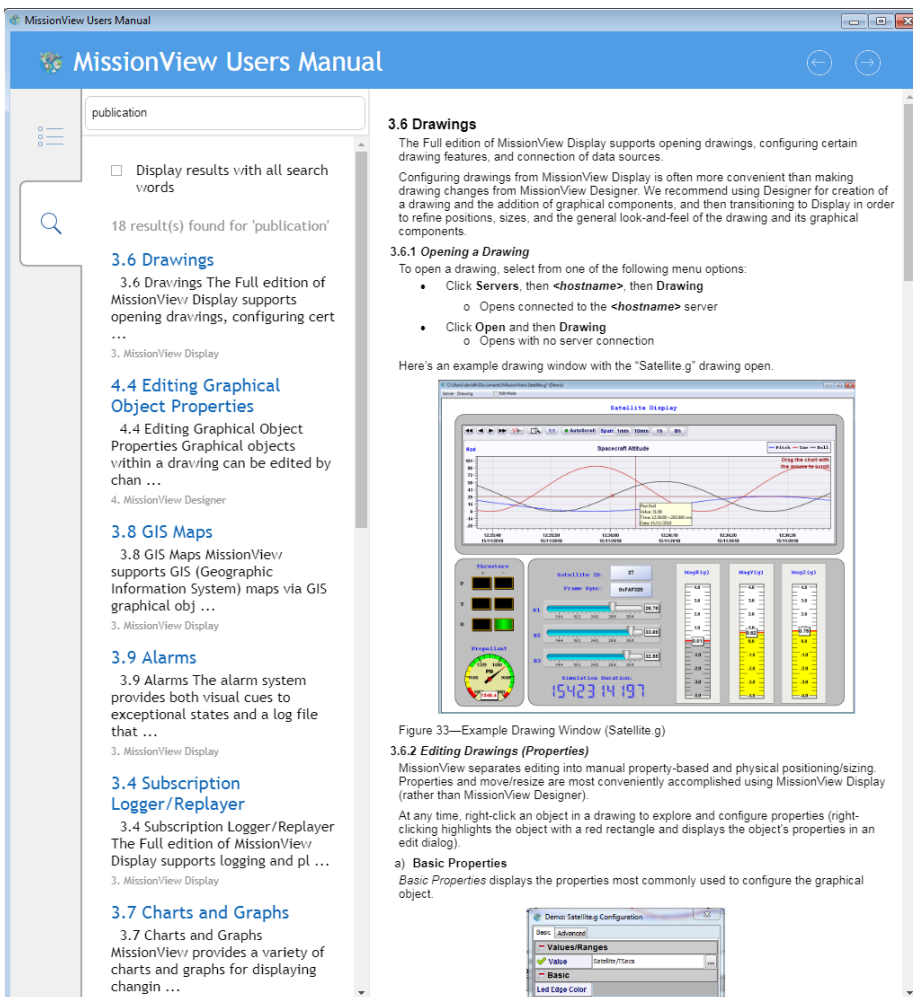


Figure 74—MissionView Manual Help Search

4. MissionView Designer

MissionView Designer lets you create configurable and sophisticated graphic displays that leverage a large library of real-time, graphical charts, meters, gauges, and more. These graphical displays are referred to as drawings.

MissionView Designer is used to create drawings that are used in MissionView Display. MissionView Designer is also used whenever an existing drawing requires the addition or removal of graphical objects, or whenever graphical objects need to be moved or resized.

Note that many aspects of visual representation of graphical object can also be modified directly from MissionView Display, and that it is often more convenient to use MissionView Display for this purpose.

This chapter provides a basic description of MissionView Designer and its use. This includes how to add graphical objects as well as how to configure both their graphical presentation and their connection to NetAcquire server publications.

4.1 Starting MissionView Designer

On Windows, the MissionView Designer application can be started by clicking the **MissionView Designer** shortcut in the **NetAcquire MissionView** program folder.

On Linux, the MissionView Designer application can be started by selecting the appropriate **MissionView Designer** shortcut (available from different locations depending on the particular distribution of Linux in use).

MissionView Designer is not available for macOS.

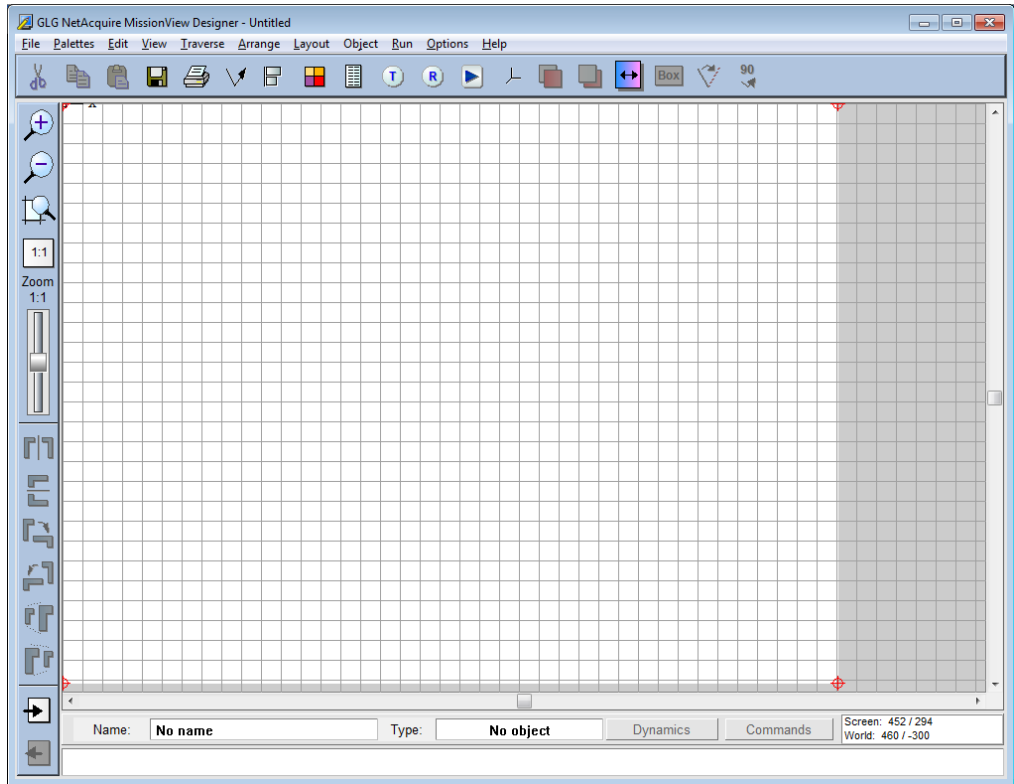


Figure 75—MissionView Designer Window

4.2 MissionView Designer Layout

When MissionView Designer is first started it automatically creates a new, empty drawing. The drawing area (identified by the white area in the main application window) is of size 800x600 pixels. Graphical objects that are placed in this area are immediately visible. The contents of the drawing area are also what are presented when the drawing is opened in MissionView Display.

The toolbar that appears under the main menu bar provides quick access to various MissionView Designer functions, including copy/paste, saving, printing as well as graphical object configuration, alignment, and positioning. Similarly, the toolbar that appears along the left side of the main window provides quick access to other MissionView Designer functions, including zooming and object transformation functions.

The **File** menu provides basic file input/output options, including options for creating new drawings. New drawings can be created in one of three forms:

1. **Fixed Scale, No Stretch**

Fixed size drawings will never stretch or resize their graphical objects when the enclosing window is resized. Drawings of this type can be created with a default size (800x600) or a specific size by specifying the absolute width and height (in pixels).

2. **Resize and Stretch**

Drawings of this type allow for the graphical objects to be scaled along with the size of the enclosing window. Options exist to create the drawing with an aspect ratio matching the size of the window (1:1, 4:3, and 16:9).

3. **Resize, No Stretch**

Drawings of this type allow for the graphical objects to scale while maintaining their width/height aspect ratio. Options exist to create the drawing with an aspect ratio matching the size of the window (1:1, 4:3, and 16:9).

4.3 Adding Graphical Objects

Graphical objects include both simple and complex objects. Complex graphical objects are located in the MissionView Designer **Palettes** menu. Examples of complex graphical objects include: charts, buttons, meters, *etc.*

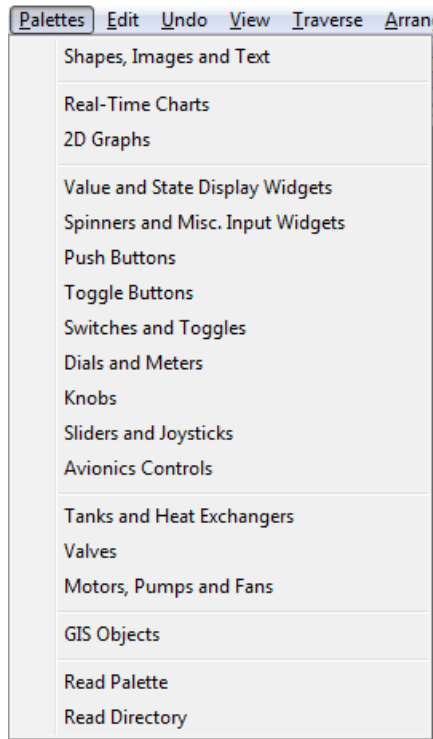


Figure 76—Palettes Menu (Complex Graphical Objects)

An example palette, **Avionics Controls** appears as follows.

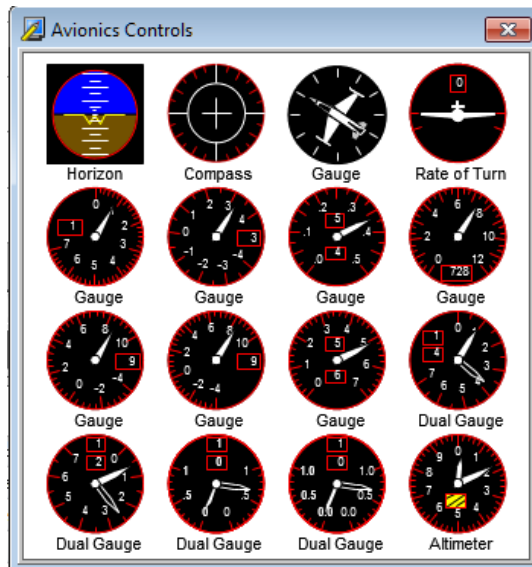


Figure 77—Avionics Controls Palette

Simple graphical objects include polygons, lines, circles, text, *etc.* and these are found in the **Shapes, Images and Text** palette.

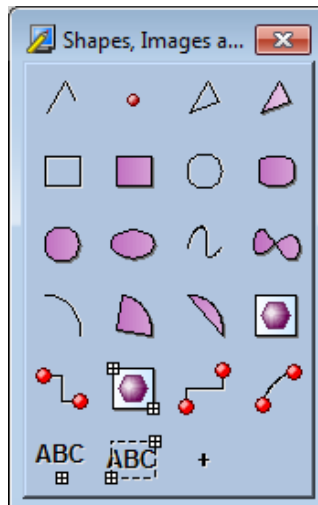


Figure 78—Object/Create Menu (Simple Graphical Objects)

Placing graphical objects in the drawing area is as straightforward as selecting an object from its palette by clicking it with the left mouse button. Once an object

is selected from the palette the mouse pointer changes to a cross-hair, indicating that the object is ready for placement in the drawing. At this point click in the drawing area at a position where the object's center should appear and press the left mouse button. This will place the object at the position identified in the drawing area.

Here is an example of a single avionics control placed onto a fixed size drawing.

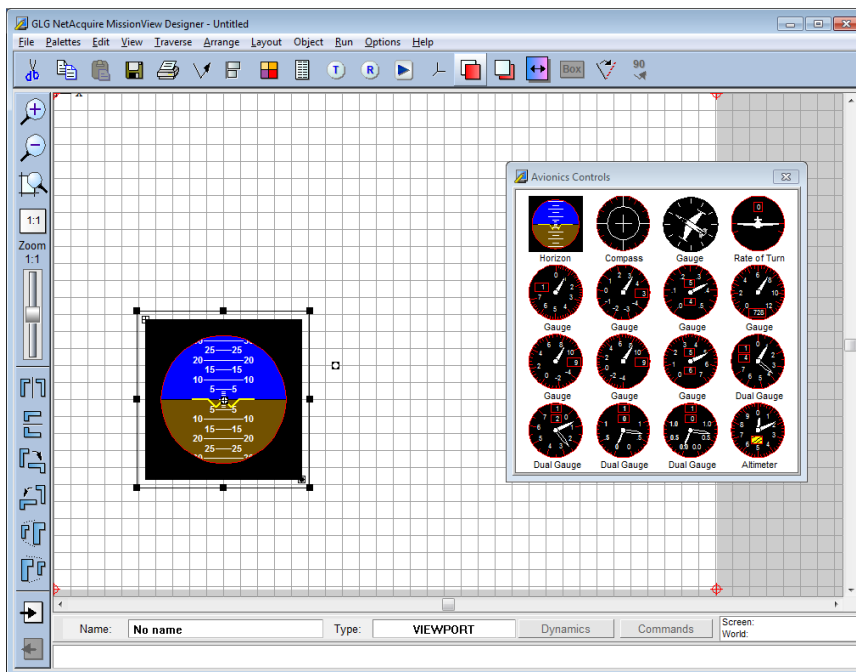


Figure 79—Graphical Object Placement

Continue to add objects by selecting them from their particular palette and placing them in the drawing area. Objects can be resized and moved respectively by grabbing and moving their selection anchors or grabbing and moving the object itself. Cut, copy and paste can be used to remove, re-add, and copy already placed objects.

Note: **Cut** and **Delete** (button) cannot be undone by an Undo (e.g., Ctrl-z). You can only undo a **Cut/Delete** by pasting the cut/deleted item.

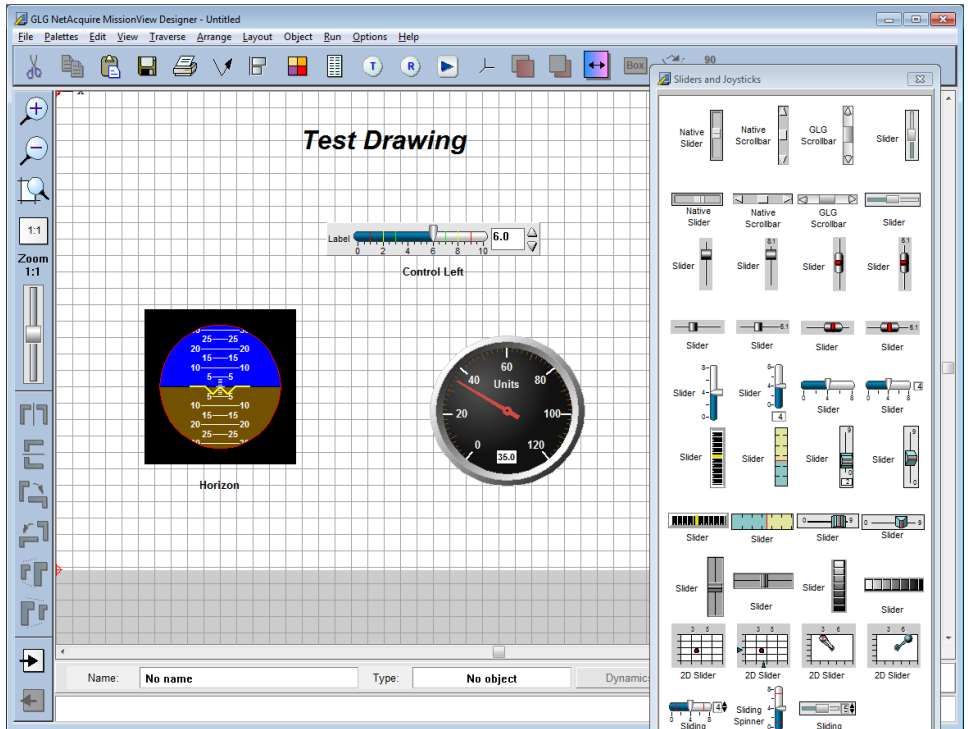


Figure 80—Drawing with Several Graphical Objects

4.4 Editing Graphical Object Properties

Graphical objects within a drawing can be edited by changing their object attributes. Object attributes can be edited from either MissionView Designer or MissionView Display, but editing using MissionView Display is recommended as a more convenient user interface.

These attributes are collectively grouped into two main categories: *properties* and *resources*. An object's *resources* define the full set of object attributes. An object's *properties* are special designations for common attributes that ultimately map to a specific resource. Stated another way, commonly used attributes are grouped into properties while the full set of attributes is grouped together as resources.

Object properties may be viewed and changed by selecting the object and then

using the **Object Properties** toolbar icon  in the toolbar or clicking on the

Object menu and then **Properties**, or right clicking the object and selecting **Properties**.

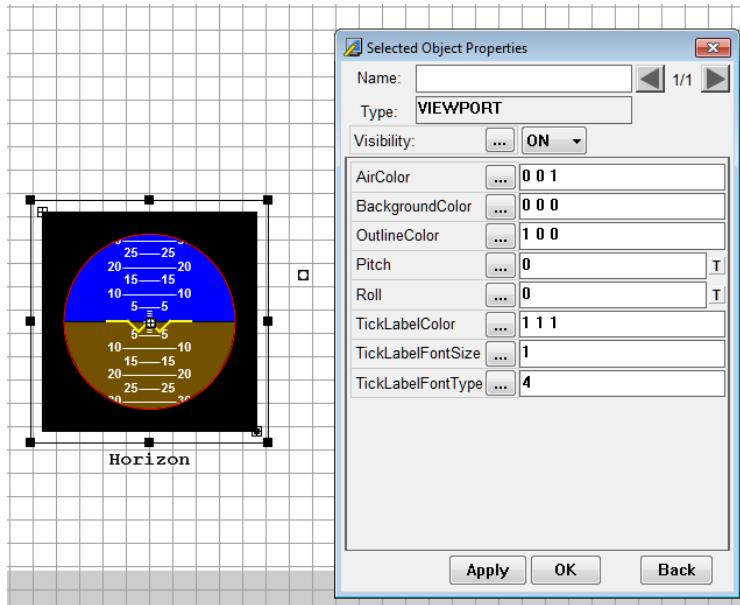


Figure 81—Object Properties Configuration Dialog

The resulting dialog displays the most commonly used attributes (*i.e.*, properties) for controlling the graphical object's display. Each property is listed in a table for which each row includes the property name and its value. Some properties are common to many graphical objects, *e.g.*, Name, Type, and Visibility. Other properties are specific to each graphical object or each category of graphical objects (*e.g.*, most buttons). Example of these object-specific properties might include, BackgroundColor, TickLabelColor, Value, High, Low, *etc.*

The property value can be edited directly in the text field or via the ellipsis button. Clicking the ellipsis button brings up property type specific value editors (for example, when editing a property that identifies a color).

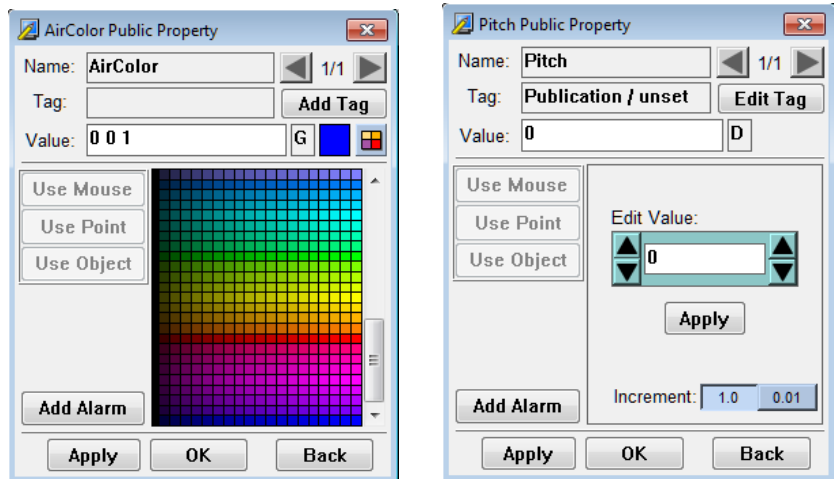


Figure 82—Type Specific Property Editors

4.4.1 Real-Time Charts

Graphical objects representing real-time charts have complex sets of attributes, including attributes that define individual plots and axes.

Real-time charts may be configured from MissionView Display (see section 3.7) or else from MissionView Designer (see below). MissionView Display configuration is recommended as a more convenient user interface.

MissionView Designer provides direct access to these attribute sets via buttons in the real-time chart's graphical object properties dialog (available via the **Object Properties** toolbar or menu item):

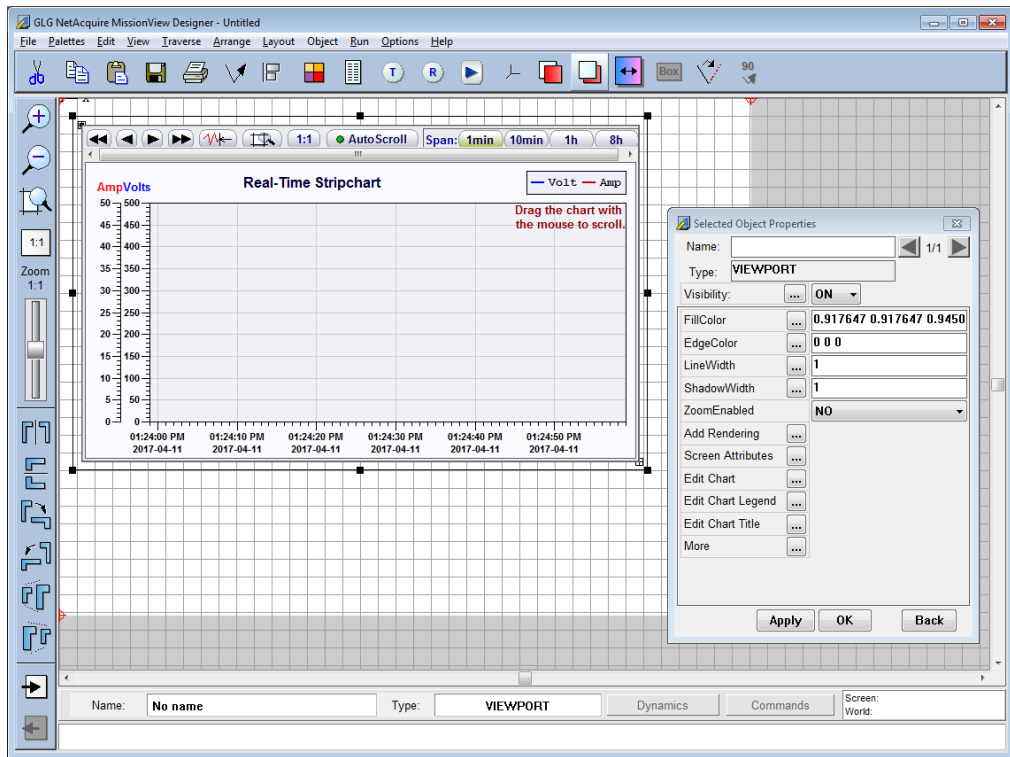


Figure 83—Real-Time Chart Properties Dialog

The **Edit Chart**, **Edit Chart Legend**, and **Edit Chart Title** buttons can be used to edit chart attributes. Selecting **Edit Chart** brings up the following properties

dialog. This dialog provides access to the various elements of the chart such as plots axes, grid, etc.

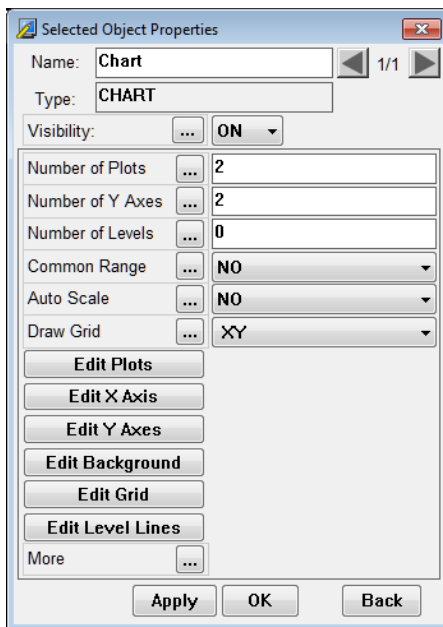


Figure 84—Edit Chart Properties Dialog

Additional buttons exist within each of these **Edit Chart** properties dialogs. These dialogs can further be used to define additional real-time chart characteristics. For example, use the **Edit Plots** button to add and remove plots to/from the chart. Or use the **Edit Y Axes** button to add and remove individual y-axes to/from the chart. Charts with multiple plots may require unique y-axis ranges/definitions and the individual plot property dialog can be used to link a plot to a defined y-axis.

After clicking **Edit Plots**, click on a plot in the list and notice the properties dialog change to the selected plot's properties. The **Linked Y Axis** attribute is used to select the linked y-axis from the list of configured y-axes:

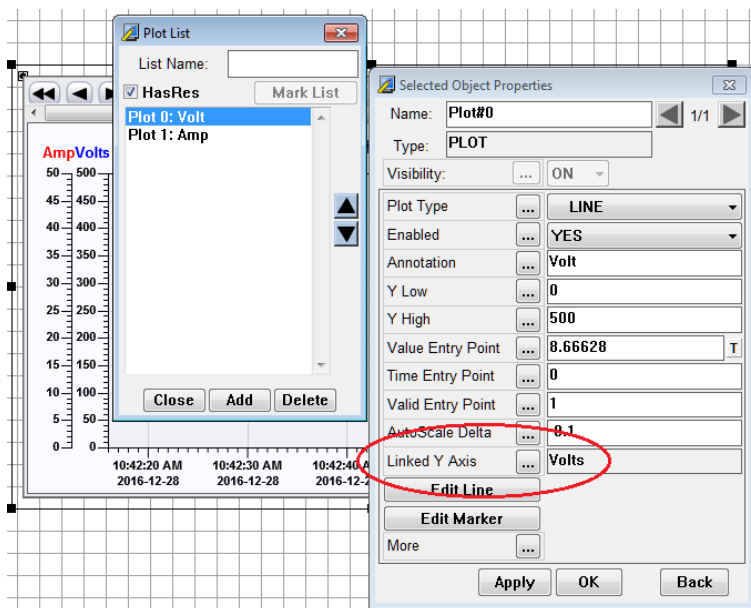


Figure 85—Linking Y-Axis to a Plot

4.4.2 GIS Maps

GIS maps are added to a drawing in MissionView Designer. In order to add a GIS map, open the **GIS Objects** palette and select the **Map Zoom** object. Once added, GIS maps may be configured from MissionView Display (see section 3.8)

or else from MissionView Designer (see below). MissionView Display configuration is recommended as a more convenient user interface.

MissionView Designer provides direct access to the GIS map attribute set via buttons in the Map Zoom graphical object properties dialog (available via the **Object Properties** toolbar or menu item):

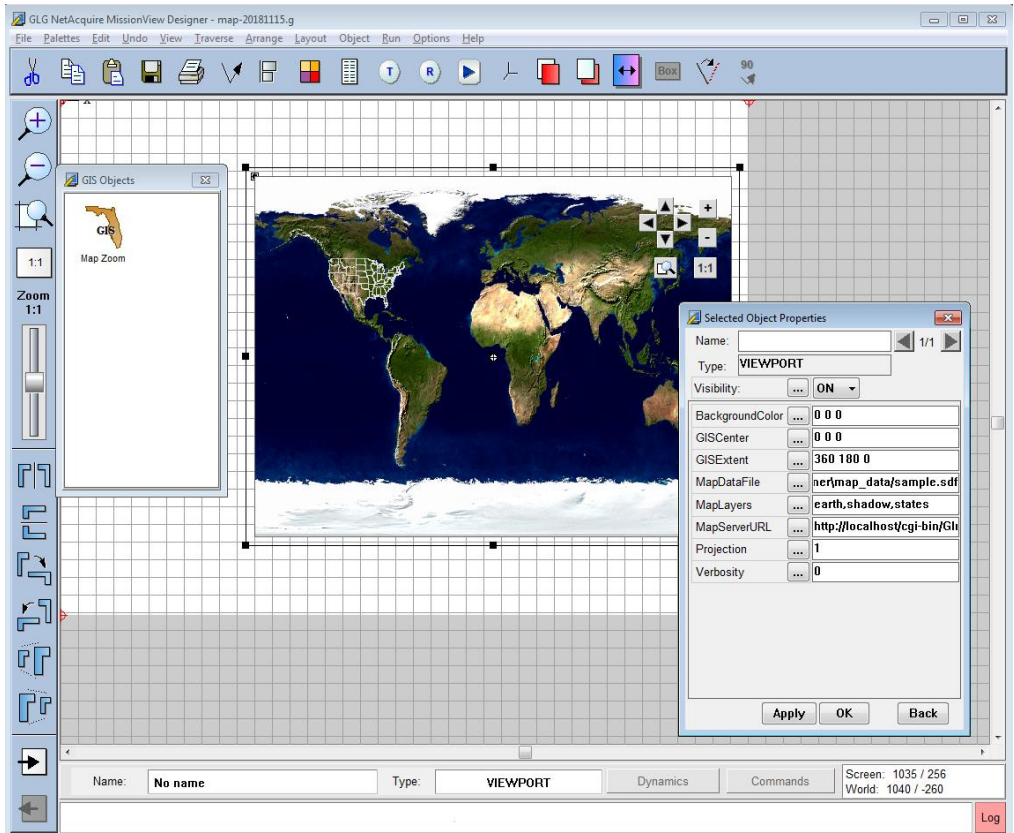


Figure 86—Map Zoom Properties Dialog

This dialog provides access to the various elements of the map such as the type of projection, the zoom level and position (via “GIS Extent” and “GIS Center”), etc.

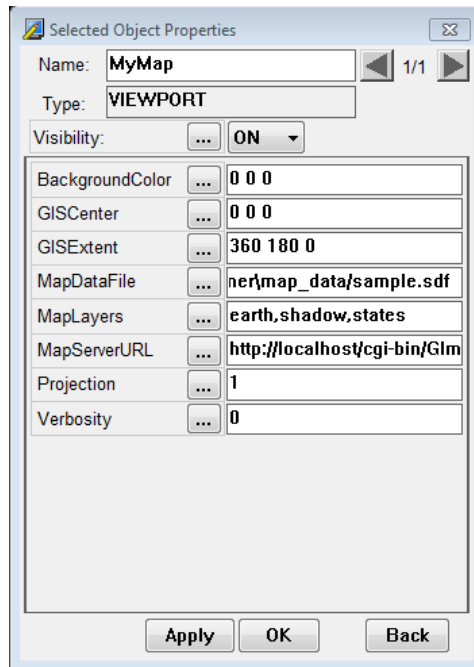


Figure 87—Map Zoom Properties

Two important properties are “MapDataFile” and “MapServerURL”. Both properties identify how the map data is accessed.

a) **MapDataFile**

Used only by MissionView Designer to define the map files that designer uses to display the map images. These files are local to your PC. After creating a GIS drawing and saving, it's common for the map to appear completely black, indicating that this setting needs to be updated to point to the correct location. You can find the map files (sample.sdf) in the MissionView installation directory under MissionView\Designer\map_data\sample.sdf. For example, on Windows this path may be {C:\Program Files (x86)\NetAcquire Corporation\MissionView\Designer\map_data}.

b) **MapServerURL**

The URL to a map server. This setting must point to a valid online map server, or be blank. If this setting is misconfigured or otherwise incorrect, MissionView

Display may become unresponsive while the map requests are failing. Ensure that this setting is configured properly.

Further configuration, including adding and configuring icon objects, should be done in MissionView Display.

4.4.3 Connecting Dynamic Data

As previously described in MissionView Display section 3.6.3 b) graphical objects can have their attributes optionally driven by dynamic data and this configuration is most conveniently accomplished from MissionView Display; however, configuring the data connection can also occur within MissionView Designer.

To predesignate an attribute or property as publication-aware, a data tag must be attached and configured with a Name set to **Publication**. The following example demonstrates attaching an appropriate data tag.

1. A Fixed Text field was added to a drawing and the **Object Properties** opened and appears as follows.

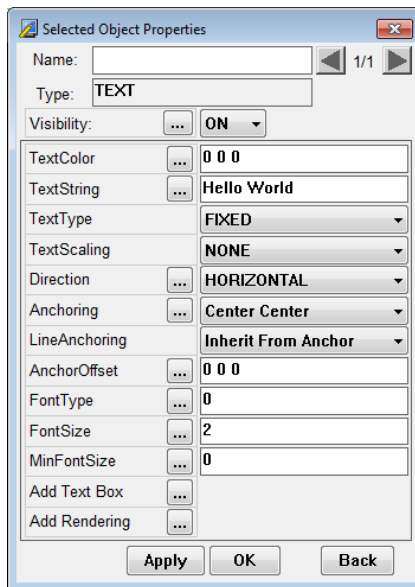


Figure 88—Text Field Prior to Data Tag

2. Click on the **ellipsis (...)** button next to **TextString**.

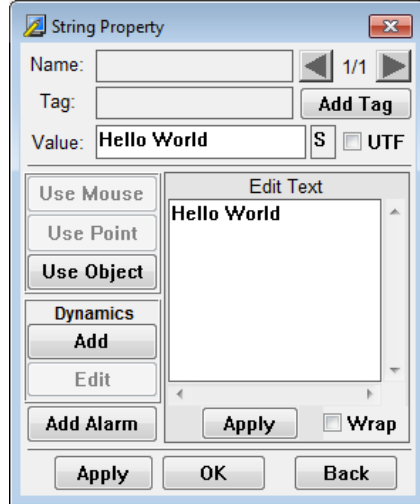


Figure 89—Property Value Display

3. Click on **Add Tag**.
4. Change the **Tag Name** to **Publication**.

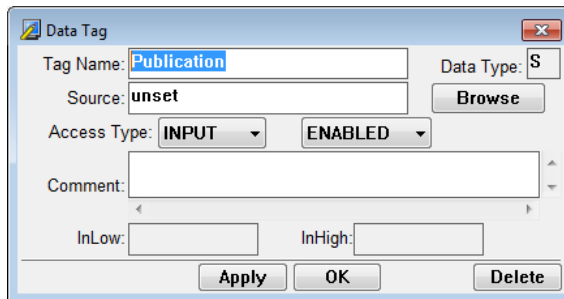


Figure 90—Data Tag Editor

5. *Optional:* Change **Source** to be the name of an expected publication name.
6. Click **OK**.

After these steps, the **Object Properties** dialog will show a **T** letter next to the **TextString** property as follows.

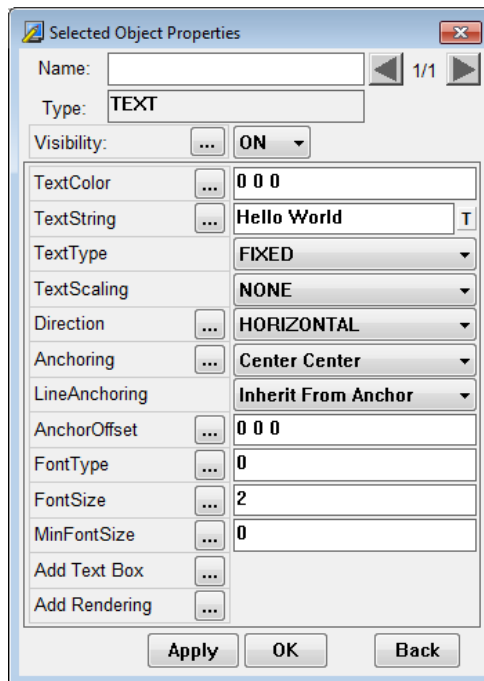


Figure 91—Text Field After Addition of Data Tag

The text field is now set to receive a publication.

All graphical objects, by default, have data tags pre-defined for at least one of their attributes. Many objects have a *Value* (or equivalent) attribute/property as the primary receiver of publication values.

When drawings created with explicit publication data tags are opened in MissionView Display and connected to a NetAcquire server, their graphical objects will immediately begin being driven by the associated publication data values (assuming the publications are present/available on the NetAcquire server).

See section 3.6.3 b) for information on changing a graphical object's attributes that are linked to publications in MissionView Display.

Note: when adding NetAcquire publication names to an object's attribute be sure the attribute is of a supported type that's consistent with the publication type.

a) Data Tags for Geometric (G type) Attributes

Some graphical object attributes are represented as a coherent set of values (e.g., an XYZ coordinate or an RGB color). Attaching dynamic data to these attributes requires a slightly modified configuration. This involves assigning publications to each element of the tuple.

This is easy to do in MissionView Display since the property editor presents each element separately when displaying geometric attributes.

Origin	X	<publication>	...
	Y	<publication>	...
	Z	<publication>	...
	End of Record	<publication>	...

To assign publications to geometric attributes in MissionView Designer the attribute's data tag must be formatted uniquely. The attribute's data tag *Source* field can identify a publication name associated with each individual element of the tuple. For example, an XYZ coordinate attribute data tag's *Source* value of "longitude,latitude,altitude," indicates that the value of the "longitude" publication is used to seed the first element of the XYZ coordinate attribute's tuple value. Similarly, for both the "latitude" and "altitude" publications.

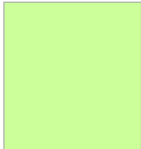
Not all elements of the geometric attribute's tuple must identify a publication name. Explicit numeric values for individual elements can be used in combination with publication values for other elements. This is done by using the special "literal" publication name. Using the same example as above a *Source* value of "longitude,latitude,'literal'," indicates that the third element of the geometric attribute's tuple should use the literal, numeric value of the attribute element's value.

b) Colors

Colors are also represented as geometric attributes (as RGB values, with each element of the tuple as the respective R, G, and B component). MissionView

Display treats color attributes specially when assigning dynamic data and offers some options for assigning a single publication to provide the value.


- Single publication to provide the integer RGB value (each hex nibble of the integer value represents the respective R, G, and B element of the tuple).
- Single publication to provide a String (via byte array or 'octet sequence') that provides a hexadecimal string. e.g., "CCFF99".

Hex: #	CCFF99	
Red:	204	
Green:	255	
Blue:	153	

Consequently, the color attribute's data tag *Source* field can be set to a single publication name (unlike other geometric attributes).

4.4.4 Object Resources

Attributes that are not represented as properties can be viewed and edited via the Resource Browser. Once an object is selected, the resource browser is

available via the **Resources** toolbar icon , via the menu **Object** then **Resources**, or via right-click and click menu item **Resources**.

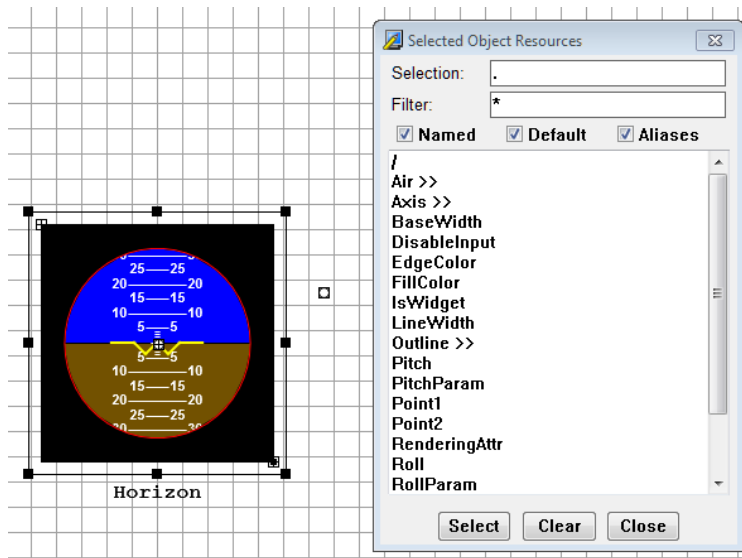


Figure 92—Object Resources Configuration Dialog

Resources are referenced as a named hierarchy with elements of the resource hierarchy separated by the '/' character. An example of a resource that is not represented as a property is the avionics *Horizon* object's *Air/EndAngle* attribute.

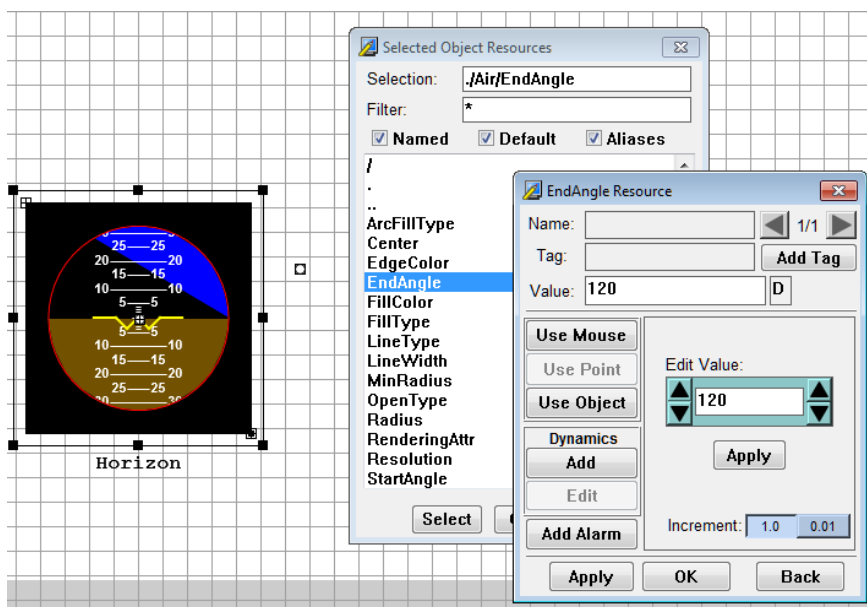


Figure 93—Example Resource Attribute

Resource attribute values are edited in the same manner as property values, including the definition and configuration of data tags.

4.5 Example Drawing Files

MissionView comes with example drawings and these are located in the user's *Documents* folder. On Windows, these are located in *C:\Users\<user>\Documents\MissionView*. On Linux and macOS, these are located in *~/Documents/MissionView*.

As described previously in section 3.10.2 the *demo.mv* layout provides a default layout that includes both example drawings. This layout also has these drawings pre-configured to connect to the Demo server (and its demonstration data sources). This server includes default publications that are appropriate for driving the graphical objects in these two drawings.

The “Satellite.g” drawing has its data driven graphical objects connected to publications in the Demo server’s *Satellite* publication domain.

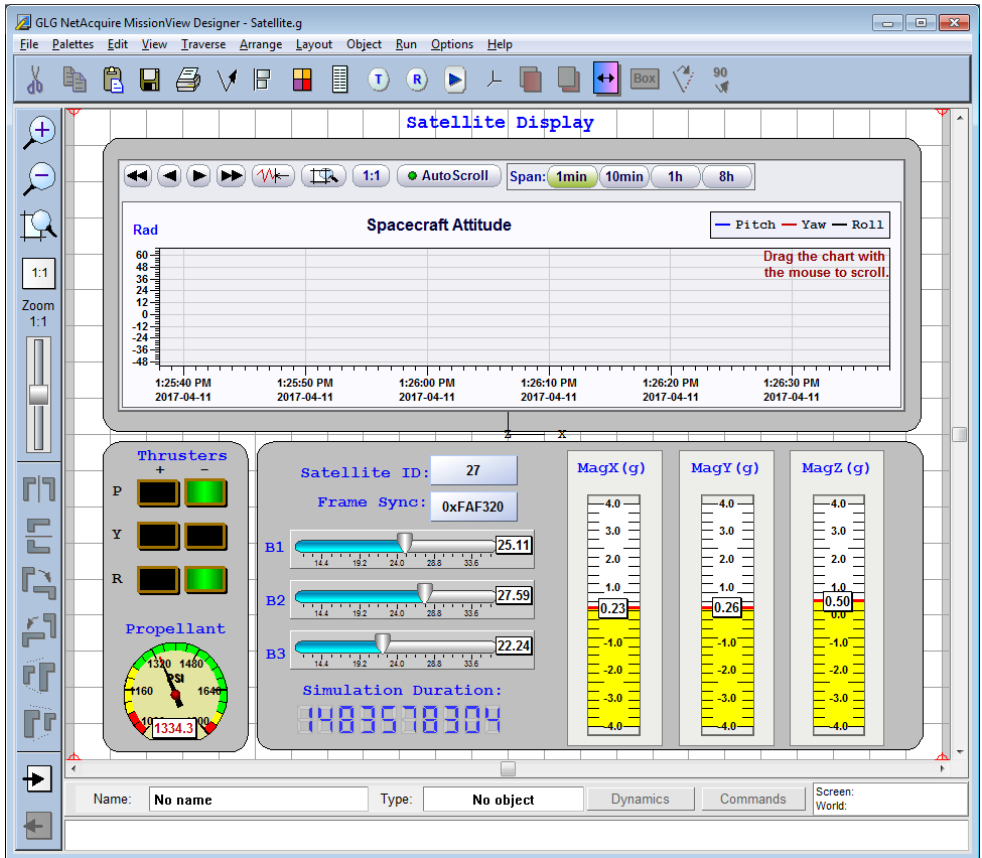


Figure 94—Example Drawing 'Satellite.g'

The “Avionics.g” drawing has its data driven graphical objects connected to publications in the Demo server’s *F18* publication domain.

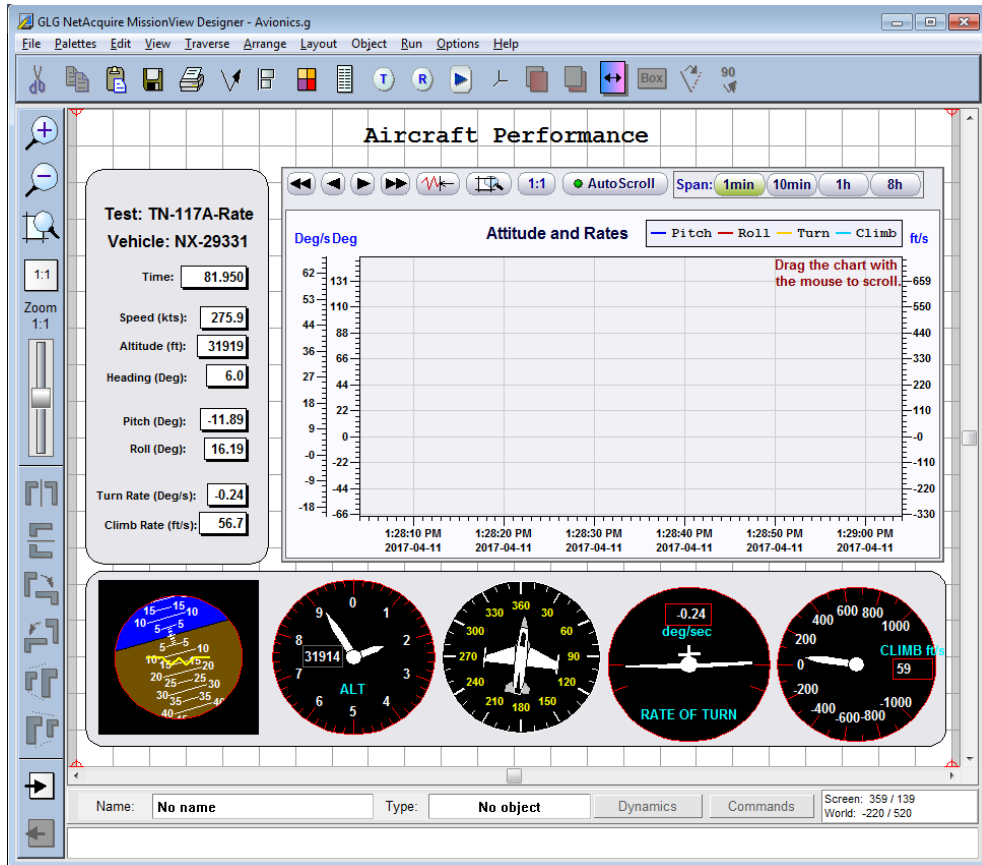


Figure 95—Example Drawing 'Avionics.g'

4.5.1 Example Drawings in Installation Folder

Example drawings also exist in the *MissionView* installation folder. This folder location is distinct depending on the operating system. If *MissionView* is installed in a privileged system location, users have administrative permissions to change drawings directly. Users with read-only permission to these directories can copy them to a user directory prior to editing.

4.6 Help

Help documentation includes:

1. The MissionView Users manual.
2. HTML reference guides for creating and editing drawings.

See section 3.12 for information regarding the first item. Help content also includes links to two Generic Logic Graphics (GLG) reference guides: a reference guide to the MissionView Designer application and a reference guide for the various graphical objects (“widgets”).

In MissionView Designer press the **Help** menu and select **Online Reference** to display the following HTML links in the default web browser:



Figure 96—MissionView Designer Online Help

The first item is a link to the MissionView Designer chapter of the online *MissionView Users Manual* documentation. The second and third items are the aforementioned HTML GLG reference guides.

5. Drawing Dynamics

Dynamics represent a real-time operation that can be performed on a display property (resource). For instance, a value display can change color when the value exceeds certain thresholds. Dynamics are *attached* to resources in order to change their behavior.

As an example, we'll use MissionView Designer to attach a *Color Alert* dynamic to a value display to demonstrate how to adjust background color based on the value of the display. We'll start with a drawing that has a single value display.

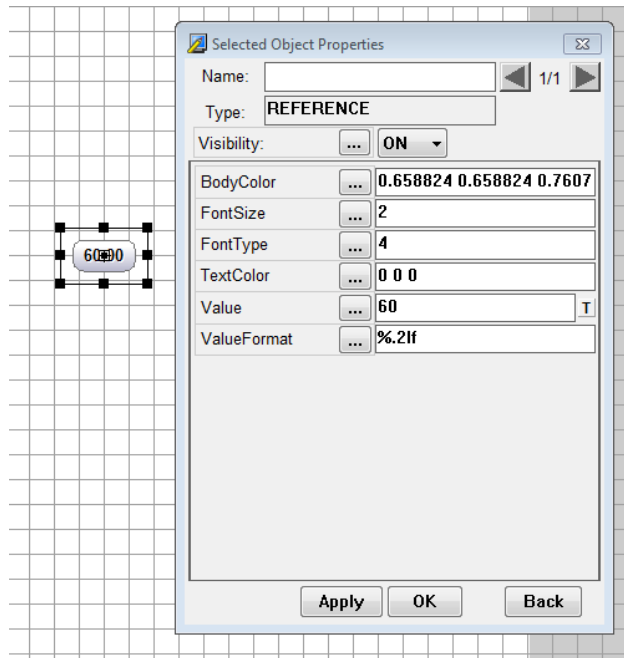


Figure 97—Drawing Before Dynamics

1. Open the value display object properties and click the **BodyColor ellipses (...)** button.

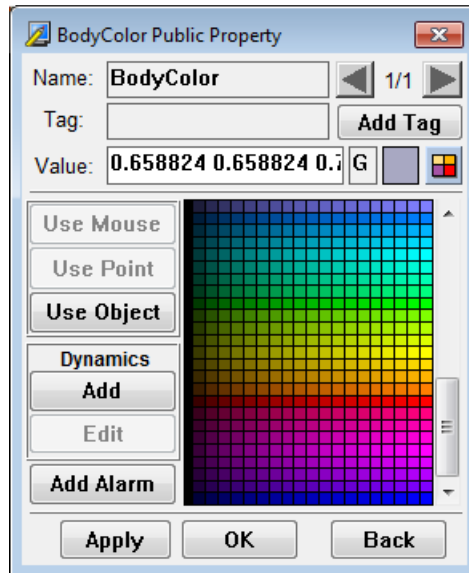


Figure 98—Graphical Object Body Color Properties

2. On the **Dynamics** panel, click **Add**.

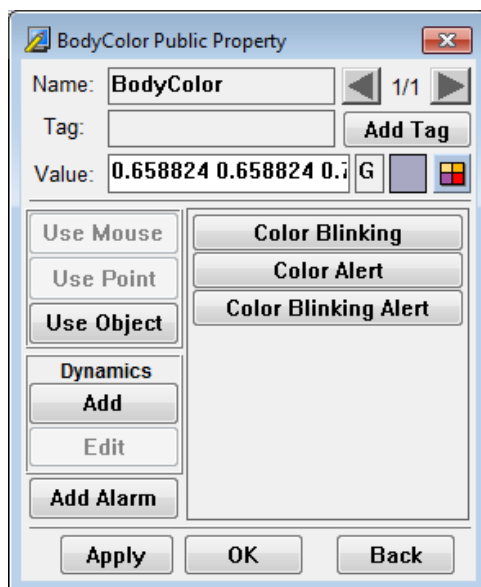


Figure 99—Adding Dynamics

3. Click **Color Alert**.

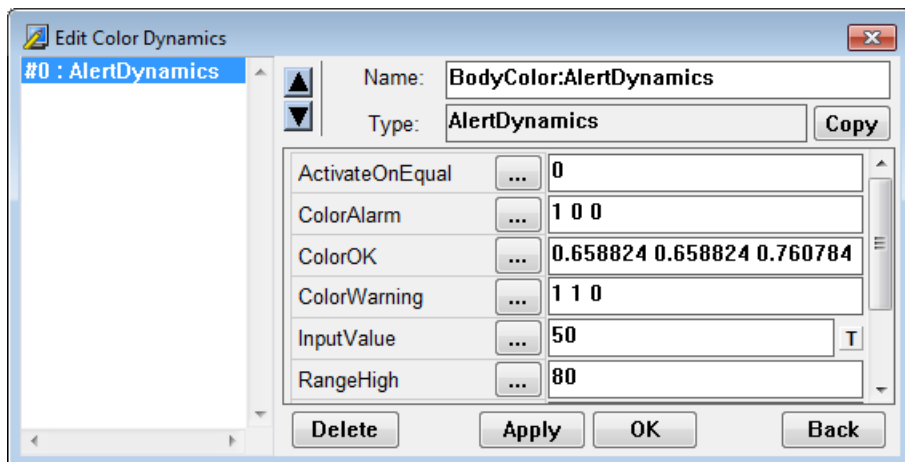


Figure 100—Color Dynamics Editor

The dynamic receives a default name based on the attached resource, in this case, *BodyColor:AlertDynamics* (you may optionally rename this dynamic, but take care to use a unique name in case you add more than one dynamic).

Each type of dynamic has a predefined set of options such as ranges, colors, and equality options. You can either change the alert ranges and colors here in MissionView Designer or else edit the settings from within MissionView Display (using MissionView Display is recommended).

Dynamics typically have a resource that requires a value to be set in order to 'drive' the dynamic. In the case of the *Color Alert*, changing the *InputValue* resource causes the dynamic to trigger which in turn sets *BodyColor*. MissionView Display will automatically **constrain** (bind) the *InputValue* resource of the dynamic to the *Value* resource in the primary graphical object – this ensures that the dynamic will set *BodyColor* based on the graphical object's *Value*.

5.1 Other Dynamics

Most displays use only color or blinking dynamics, but other, more complex, dynamics are available. These other dynamics are not typically used and are not covered in this manual, but these dynamics can manipulate nearly any part of a drawing. In MissionView Designer click the **Help** menu and select **Online Reference** to learn more. There are several topics listed that provide information about other available dynamics.

Note that only color and blinking dynamics have user-friendly MissionView Display configuration and editing capability.

5.2 Editing Dynamics from MissionView Display

Once you have added one or more dynamics to your drawing, it's recommended that dynamics editing is performed in MissionView Display.

Start by opening the drawing in MissionView Display. When a dynamic has been added to a graphical object in a drawing, the graphical object's *Transforms* tab will additionally display each dynamic in its own section.

Use the dynamic section of the property sheet to change dynamic settings and thresholds such as colors, ranges, *etc.* Using the Avionics.g *Speed Display* as an example:

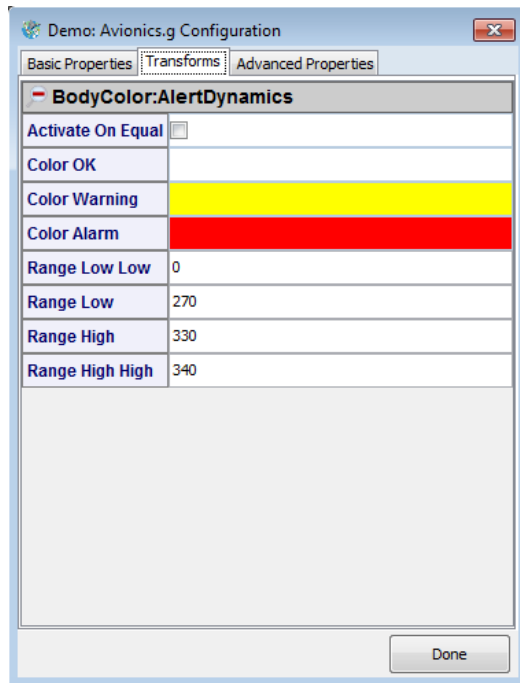


Figure 101—Dynamics in Transforms Tab

5.3 Constraining/Unconstraining

MissionView Display will automatically **constrain** (bind) a dynamic's standard *InputValue* resource to the *Value* property of the associated graphical object.

Once the constraining has occurred, the *InputValue* resource will appear as if it has been replaced by *Value*.

The following description of explicit constraining/unconstraining is an advanced topic and is typically not needed.

To unconstrain a resource, click the **Advanced Properties** tab and navigate to the resource. Using the Avionics.g *Speed Display* as an example, navigate to *BodyColor:AlertDynamics/Value*.

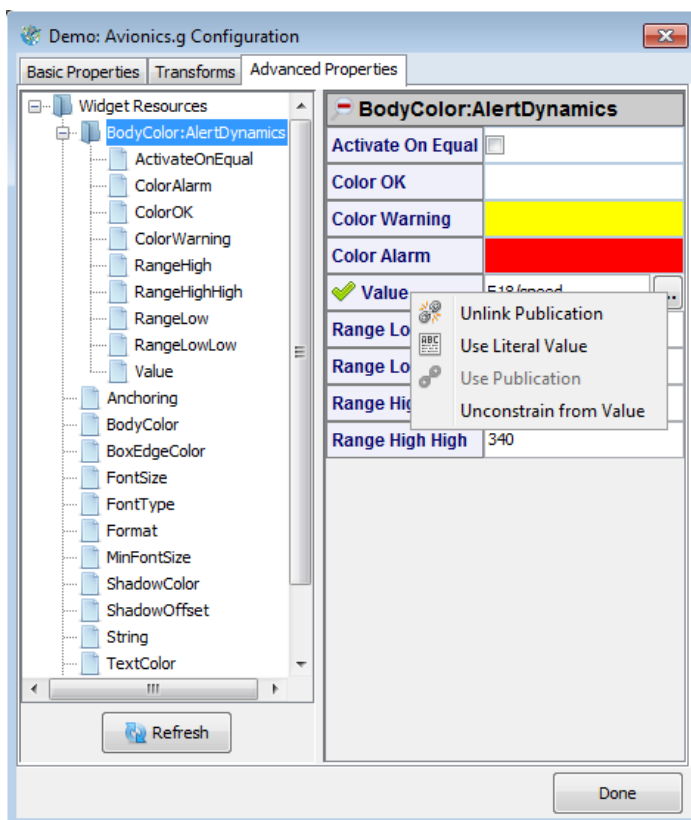


Figure 102—Dynamics (Unconstraining) in Advanced Properties

1. Right-click the **Value** resource as shown in Figure 102.
2. Click **Unconstrain from Value**.
 - a. The resource will unbind from *Value* and operate like any other resource. Additionally, the name will revert to *InputValue*. For

- instance, you can manually set a value, connect *InputValue* to a publication, *etc.*
- b. Once a resource is unbound, it will not automatically be constrained on startup.
3. The right-click menu will now offer **Constrain to Value** to reverse the operation.

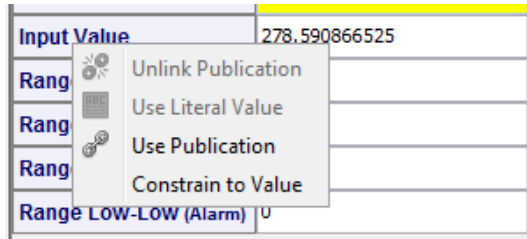


Figure 103—Performing a Constrain to Value

5.4 Dynamics Example: Avionics

The *Avionics.g* drawing (Figure 95) contains several value display objects that use color alert dynamics.

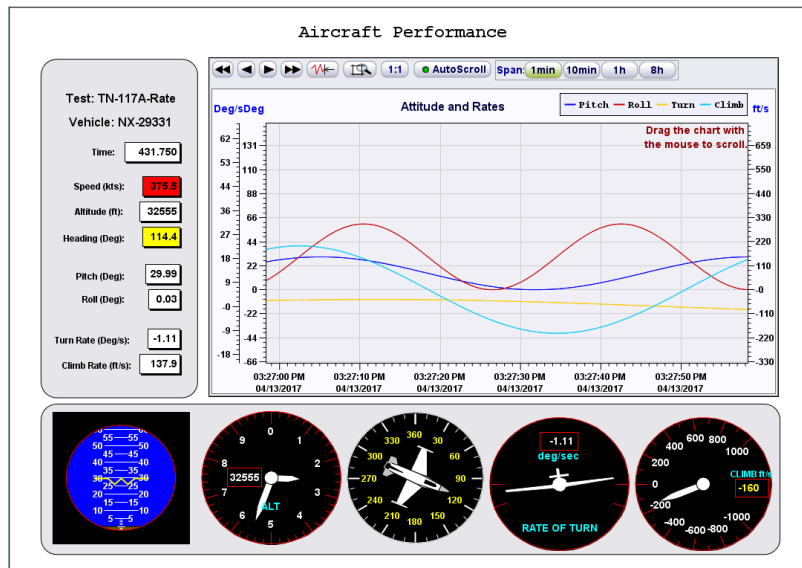


Figure 104—Avionics Drawing

The body color of the *Speed*, *Altitude*, and *Heading* values change from white to yellow to red in response to the input value.

The *Range High* and *Range Low* properties define the threshold at which the color switches between *Color OK* (white) and *Color Warning* (yellow). The *Range High High* and *Range Low Low* properties define the threshold between *Color Warning* (yellow) and *Color Alarm* (red). See Figure 101.

5.5 Dynamics Example: Satellite

The Satellite.g drawing (Figure 94) contains several slider objects that use color alert and blinking alert dynamics.

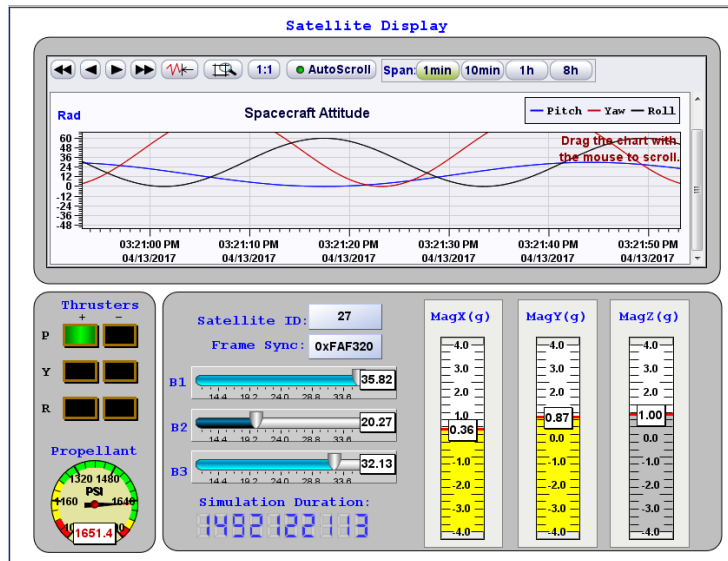


Figure 105—Satellite Drawing

The horizontal *B1*, *B2*, and *B3* sliders use an alert dynamic to change brightness in response to input values below the specified thresholds. *Range Low Low* (22) is the threshold between dark (*Color Alarm*) and medium blue (*Color Warning*). *Range Low* (26) is the threshold between medium (*Color Warning*) and bright

blue (Color OK). *Range High* and *Range High High* are set to a value beyond the maximum value (not used). These properties are shown in Figure 106.

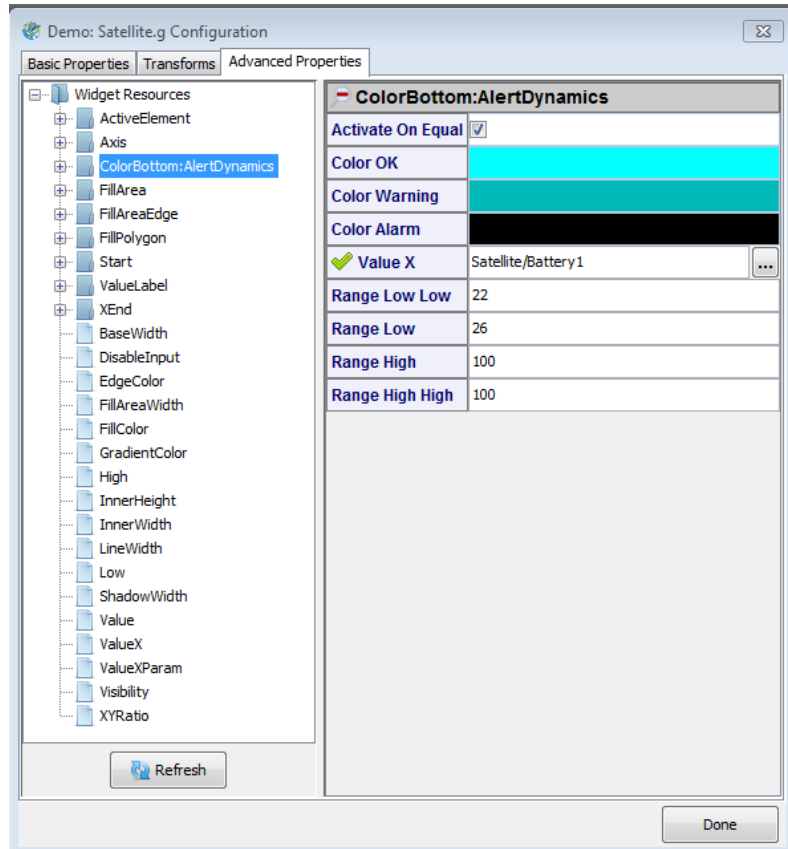


Figure 106—Satellite Drawing Alert Dynamics

The vertical *MagX*, *MagY*, and *MagZ* sliders use a blinking alert dynamic to flash the color of the level indicator (yellow and silver) when the input value falls outside of the defined range (Figure 107).

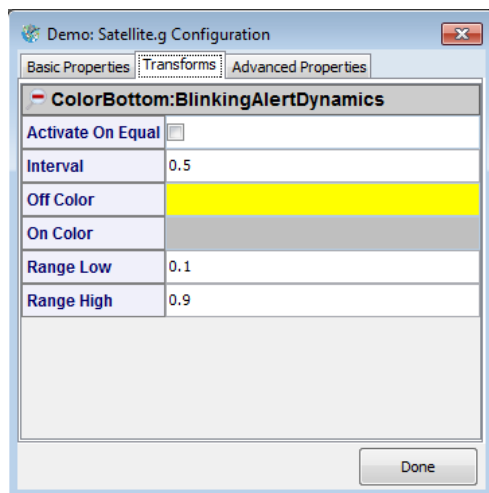


Figure 107—Satellite Drawing Blinking Alert Dynamics

6. Drawing Actions

An **action** can be attached to a graphical object to perform specific operations when interaction occurs at run-time. For example, clicking on a button in a drawing can issue a command to the connected NetAcquire server. This command might include starting or stopping NetAcquire server entities or saving or loading a configuration snapshot.

Actions can only be added from MissionView Designer. However, once added, actions can be edited from MissionView Display. See the following section for how to add an action in MissionView Designer and section 6.5 for information on editing actions in MissionView Display.

6.1 Action Example

As an example, we'll use MissionView Designer to attach a *NaCmd* command action to a button to demonstrate how to start a data flow instance on the connected NetAcquire server. We'll start with a drawing that has a single button.

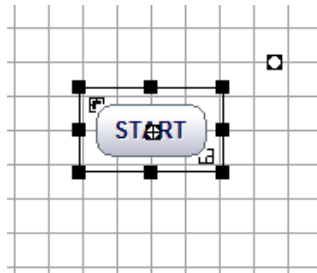


Figure 108—Button for Action

1. Click on the **Object** and then **Actions** menu.

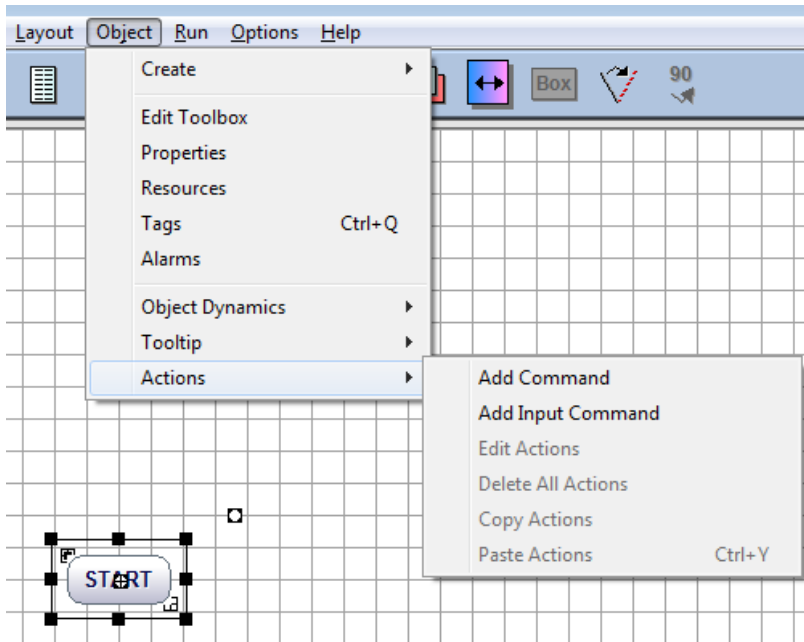


Figure 109—Objects Add Input Command Menu

2. Select the **Add Input Command** menu item:

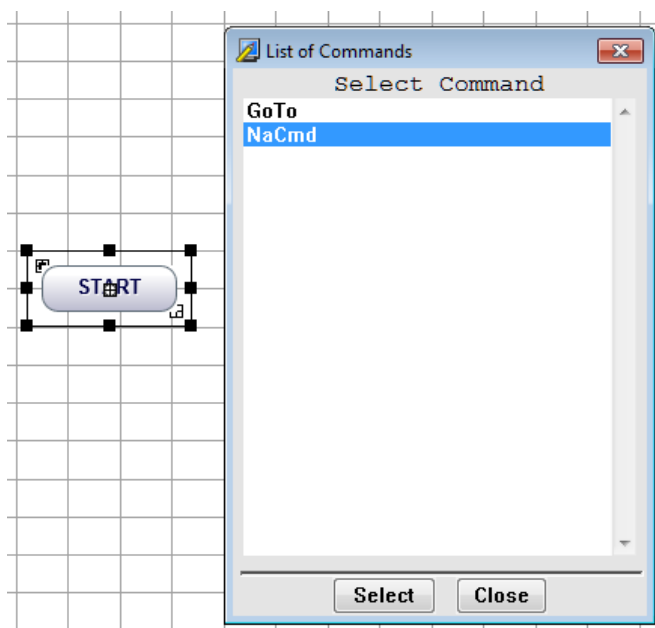


Figure 110—NaCmd Command Action

3. Select the **NaCmd** command and enter the CORBA command for starting data flow #1 ("**CommandEntity /device/dfe/1 Start**", without quotes):

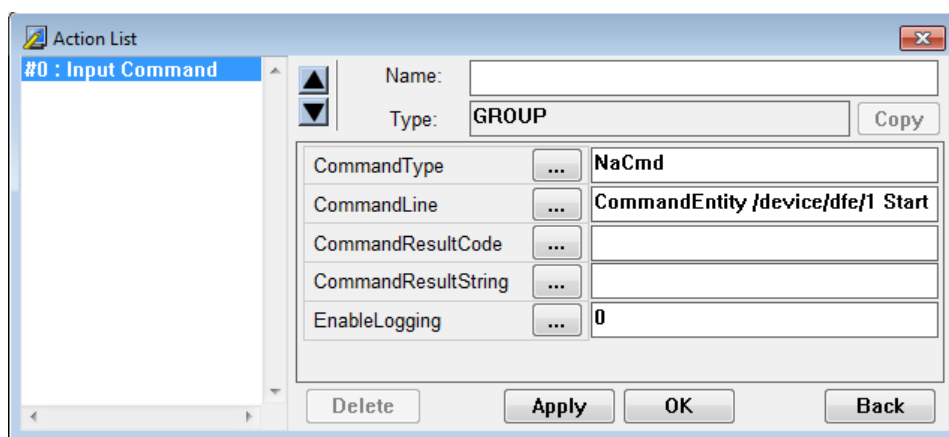


Figure 111—NaCmd Action Command Line

4. Click **OK** and save the drawing.

The drawing can now be opened in MissionView Display. Connect the drawing to the appropriate NetAcquire server and, once connected, press the button to send the command. The data flow will start if it was previously in a stopped state. Otherwise an error will be displayed, with information regarding the cause of the failure.

6.2 Input Handling and Action Commands

Graphical objects such as buttons, sliders, and meters can react to input events and these objects are sometimes referred as *input graphical objects*. These types of objects offer two types of actions: *Input Command* and *Command*. If an action command is added as the former type then its applicability is subject to the graphical objects *DisableInput* property. By default, this property value is disabled (*i.e.*, enable input processing). If the property value is enabled (*i.e.*, disable input processing) then action commands that were added to the graphical object as *Input Commands* will not take effect. However, action commands that were added as *Commands* (not *Input Commands*) will continue to take effect. For this reason, it is recommended that action commands be added as *Input Commands* for any input graphical object (*i.e.*, any graphical object with a *DisableInput* property). This provides a convenient way to disable commanding and all other input processing on the graphical object (simply set the *DisableInput* property to true).

For non-input graphical objects (or for input graphical objects where action commands should still take effect when *DisableInput* is enabled) add action commands via the *Add Commands* menu item (not the *Add Input Commands* menu item).

6.3 NaCmd Action

This action provides an interface for performing remote invocation of the server-side 'nacmd' utility, thereby supporting the ability to trigger server configuration, commanding, and statusing from MissionView drawings. This command is only relevant when connected to a live server. Command line content and syntax for the 'nacmd' utility are defined in *NA-MAN-065*. Please consult this manual for detailed information regarding 'nacmd' semantics.

6.3.1 Parameters

Specify a value in the **NaCmd CommandLine** parameter field indicating the 'nacmd' command to run on the connected server. Each of the **CommandLine**, **CommandResultCode**, and **CommandResultString** parameter fields may contain *references* to graphical objects. This is useful, for *e.g.*, with **CommandLine** when a portion of the command line is constructed from the value of another graphical object in the drawing. Similarly, command results

(both the result code and the result text) may optionally be sent to appropriate graphical objects in the drawing. Parameter fields that contain textual references in the form: [**\$**]*<object-name>*[*<resource-path>*]/*<resource-name>* indicate the particular graphical object and it's resource to retrieve a value from or to populate a result to (the former for **CommandLine** and the latter for **CommandResultCode/CommandResultString**).

For example, a graphical object with name 'Command' and value resource name of 'TextString' can be referenced as '*Command/TextString*'. Specifying the **CommandLine** as '*CommandEntity /device/dfe/0 \$Command/TextString*' would then result in the following 'namcd' invocation on the connected server: '*namcd CommandEntity /device/dfe/0 Start*'. Note the use of '\$' as a prefix when referencing a graphical object resource. This is needed in **CommandLine** parameter field references only since this field typically treats everything as regular text. Parameter field values for this parameter that require use of the '\$' character (e.g., for passing through to the connected server) can instead reference the dollar sign as '\\$' (these references are ignored when attempting to match graphical object resource references).

a) Example

An example that uses "NaCmd" parameter functionality follows. Create a new drawing with a single "toggle button" in MissionView Designer.

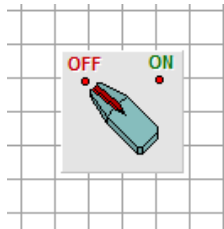


Figure 112—Toggle Button for Action

Name the toggle button object uniquely (**MyToggleButton** in this example).

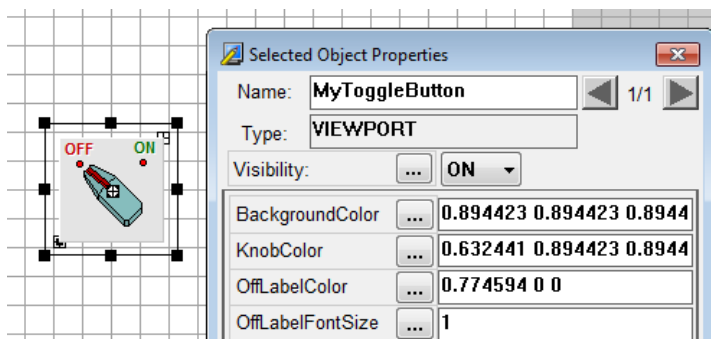


Figure 113—MyToggleButton Object Name

Add an *NaCmd* input command action (as described previously) to this button.

Now, edit the action in MissionView Display. In this example the **Command Line** property contains a reference to the toggle button's **OnState** resource as a parameter value to use in the action's **SetString** command (in this case the registry key being set must already exist on the server). Pressing the toggle button will now set the button's "value" (either 0 or 1) in the specified registry key.

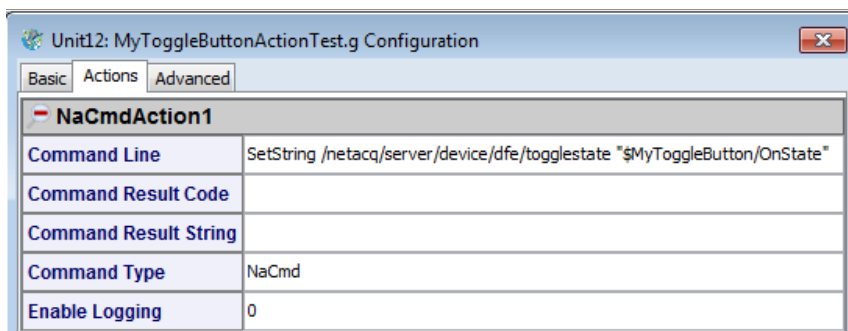


Figure 114—ToggleButton NaCmd Command Line with Parameter

Table 32—NaCmd Action Parameters

Parameter	Description
CommandType	This is the string “NaCmd”. This value should never be modified. Default: NaCmd
CommandLine	This is the textual string representing the ‘nacmd’ command line (see <i>NA-MAN-065</i> for detailed syntax and semantic definitions. Reference graphical object resource value replacements with any number (according to the specific ‘nacmd’ command to be sent) of ‘\$<object-name>[/<resource-path>]/<resource-name>’ references. Default: <blank>
CommandResultCode	This an optional, graphical object resource reference. When specified correctly the remote ‘nacmd’ invocation result code (the exit code) is set as the value of the referenced resource. Default: <blank>
CommandResultString	This an optional, graphical object resource reference. When specified correctly the successful remote ‘nacmd’ invocation result (the result text) is set as the value of the referenced resource. The referenced resource value is not set if the remote invocations fails (<i>i.e.</i> , a non-zero result code is returned, or a timeout occurs). The referenced resource and the textual result must be able of compatible types. For example, a resource of type string will accept any/all textual results. However, a resource of numeric type (<i>e.g.</i> , a graphical meter object’s value resource) may only accept a textual result if the result can be converted successfully to a number. Default: <blank>

EnableLogging	This parameter is a number and when the number is something other than '0' (zero) NaCmd actions will be logged to the Messages window.
----------------------	--

6.3.2 Server Requirements

An *NaCmd* action uses user credentials when issuing the command on the connected server because these commands are issued over a secure shell (SSH) session. These user credentials are the same credentials used when the server is in secure mode and a successful login has occurred (see section 3.2.2 d)). In addition to valid user credentials the user must also have the **Shell** permission enabled. Enabling shell permission is done from the server's **Security Manager** page on the **Local Users** tab:

Security Manager

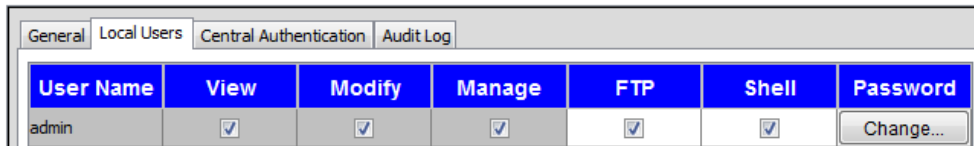


Figure 115—Local Users Enabled Shell Permission

A drawing window with a connected secure server that has successfully been logged into should never result in *NaCmd* action failure due to authentication.

However, a connected non-secure server can sometimes result in a failed *NaCmd* command action due to authentication failure. This will happen when the 'admin' user (which is the user that *NaCmd* actions always use when establishing a session to a non-secure server) credentials have changed from the default credentials (see *NA-MAN-001*) and these credentials have not been *saved* (see section 31 and Figure 17). As a result, ensure the 'admin' user's credentials are correctly saved when issuing *NaCmd* actions to a non-secure server and the 'admin' user's password is not the default password.

6.4 'GoTo' Action

The **GoTo** action can be used to automatically open a named drawing in the existing drawing window. Simply attach a **GoTo** action to an input graphical object (e.g., button) and the specify the target drawing file in the **DrawingFile** parameter field. Fill in the field using either an absolute path or a path relative to

the path of the current drawing (the one you are configuring). Do not change any of the other parameter field values.

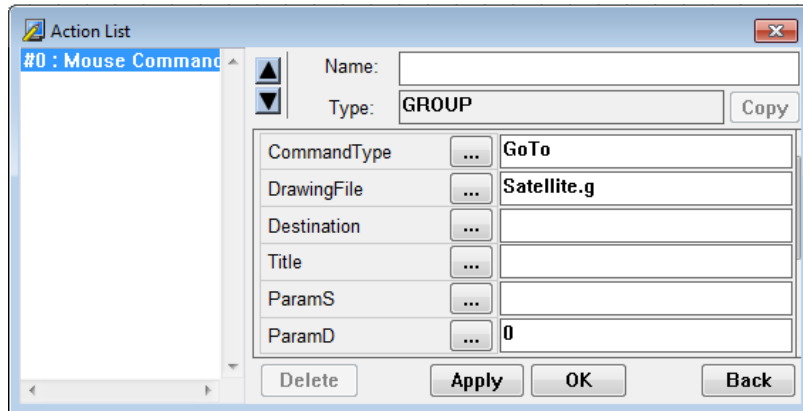


Figure 116—GoTo Action Parameters

When the action is performed, the referenced drawing file will open in the existing drawing window (the window is not resized).

6.5 Editing Actions

Actions that have been added in MissionView Designer can be edited directly from MissionView Display. Simply right-click on the graphical object to bring up the customizable display properties.

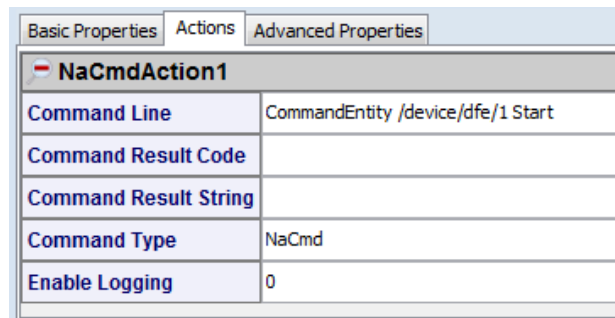


Figure 117—Edit NaCmd Command Action

7. Software Installation

This chapter provides detailed information on installing MissionView on Microsoft Windows, Linux, and macOS.

7.1 Installation

7.1.1 User Privileges

A standard user may install MissionView without administrator/root privileges, but the software will only be accessible to the user who installs it.

To allow multiple users on the same PC to use MissionView, the software should be installed by a user with administrator/root privileges.

Updates and removal should be performed by the same user to maintain consistency.

7.1.2 Starting the Installer

The MissionView installer may be downloaded from the NetAcquire Corporation website and saved to the local hard disk, or the installer may be provided on a DVD from NetAcquire Corporation.

Windows

Click the **Start** menu button and enter `D:\MissionViewSetup.exe` in the **Run** (or **Search**) text box. Replace `D:` with the DVD drive letter or the location of the downloaded file. The installer may prompt for administrator credentials during the installation process.

Linux

To run the installer as a standard user, execute the following from a shell prompt:

```
sh /media/MissionView/MissionViewSetup.sh
```

To run the installer with root privileges, use `su` to open a *root* shell or use the `sudo -E` command:

```
sudo -E sh /media/MissionView/MissionViewSetup.sh
```

Replace `/media/MissionView` with the DVD mount point or location of the downloaded file.

macOS

Open the *MissionViewSetup.dmg* image file in the macOS Finder and launch *NetAcquire MissionView Installer*.

7.1.3 Installation Wizard

The installer presents a series of wizard screens. A **Check for updates** option is available on the Welcome screen. The update check requires an Internet connection. If the installer finds an update, it automatically downloads the new installer, exits the current installer, and launches the new installer.

After the update check, the wizard prompts for the installation type. Choose "All Users" to configure the software for all users on the same PC. This is the recommended type of installation. On Windows, the next screen prompts for administrator credentials if the current user is not an administrator. On Linux, the installer exits unless it was started with root privileges (sudo).

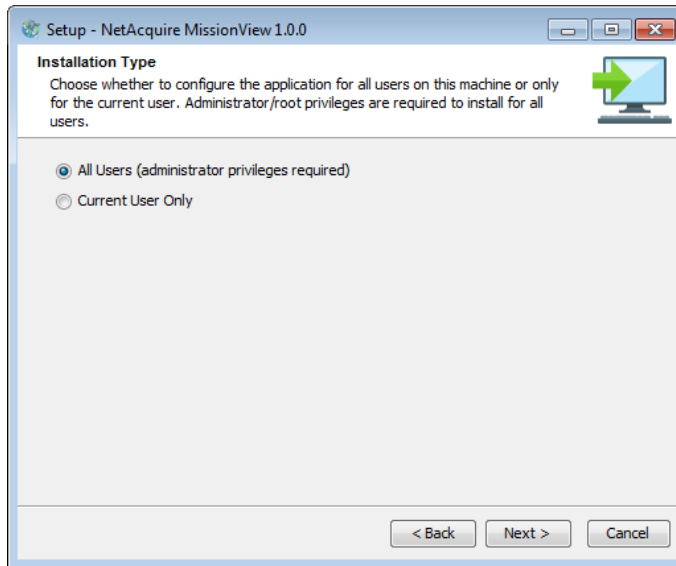


Figure 118—Installation Type

"Current User Only" configures shortcuts, registry keys, icons, and environment variables for the current user only. This type of installation should only be used on a single user PC.

The wizard then prompts for a destination directory. The field is pre-populated with the recommended installation location (Figure 119).

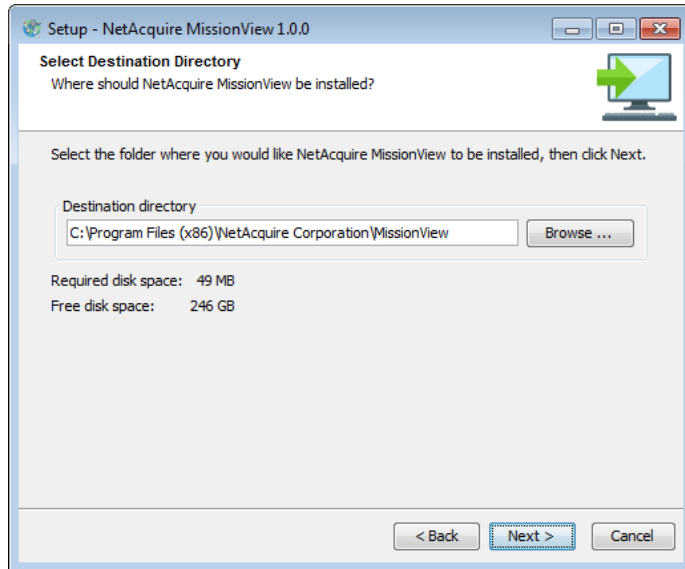


Figure 119—Installation Location

The next wizard screen presents a component selection screen (Figure 120).

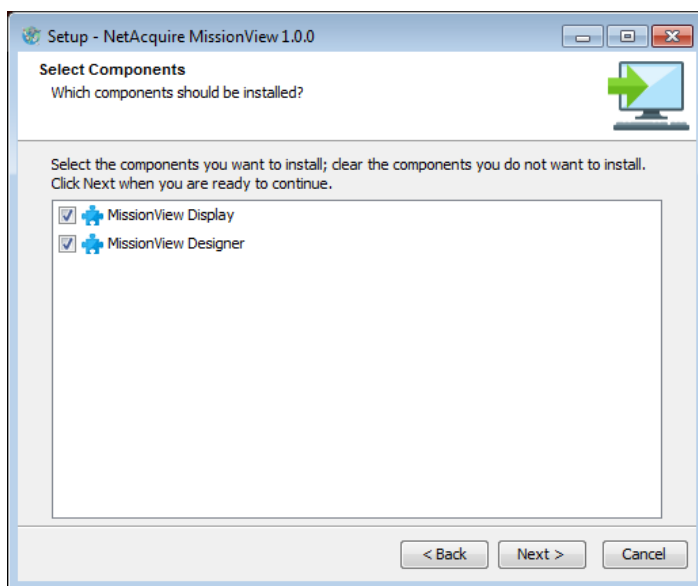


Figure 120—Component Selection

MissionView Display and MissionView Designer may be installed independently. Each application can be installed as a trial/evaluation version or fully licensed edition. Evaluation licenses may be upgraded to full licenses at any time.

MissionView Display may be installed as a "30-day Trial" or with a "Full License" (Figure 121). See section 3.1 for a description of the differences between the Base and Full editions of MissionView Display.

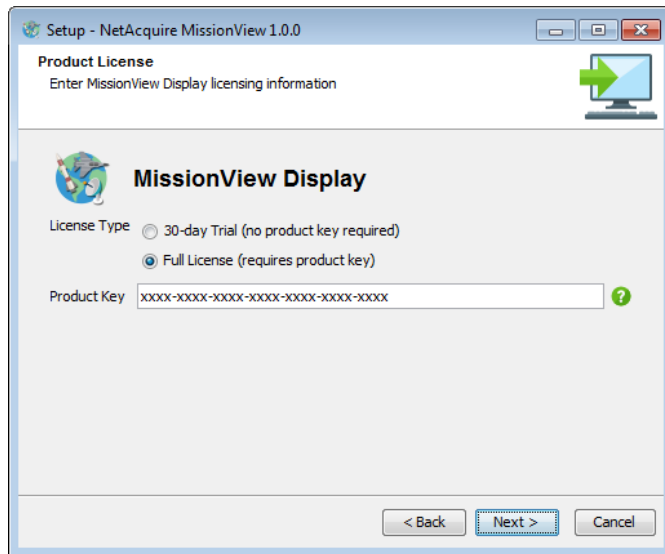


Figure 121—MissionView Display Licensing

No product key is needed when installing an evaluation. A product key is required when installing a Full License. The product key consists of 28 alphanumeric characters plus optional hyphens. The MissionView Display and MissionView Designer product keys are **not** interchangeable. Click the **Next** button to validate the key.

If MissionView Designer is selected, the installer prompts for licensing information (Figure 122).

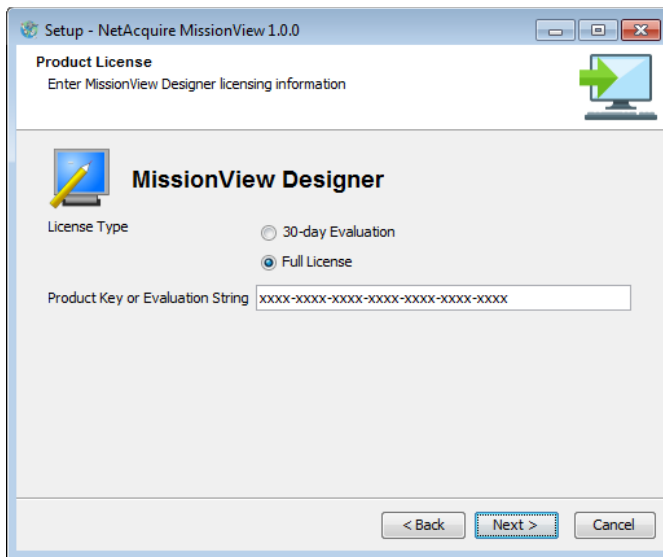


Figure 122—MissionView Designer Licensing

MissionView Designer may be installed as an evaluation or as a fully licensed product. The full license requires a product key. Evaluation requires an evaluation string. These may be found in the MissionView shipping materials. These keys must be re-entered when upgrading or repairing the installation.

A product key consists of 28 alphanumeric characters plus hyphens. The product key is case-insensitive and hyphens are optional.

An evaluation string consists of 20 alphanumeric characters plus hyphens. The evaluation string **must be entered exactly as it appears** with hyphens and uppercase letters. Furthermore, the evaluation string has a fixed expiry date. Please contact NetAcquire Corporation if you require a new evaluation string.

After entering licensing information, the wizard prompts for additional installation preferences:

- **Update Frequency:** Configures how often MissionView Display checks for a newer software version. See section 7.4.
- **Start Menu shortcuts (Windows):** Configure the name of the **Start** Menu group/folder under which application shortcuts are created. The recommended name is NetAcquire MissionView.

- Directory for Symbolic Links (Linux): Configure symbolic links under the specified directory. `/usr/local/bin` is the default.
- File Associations: Configures MissionView Display as the default application for `.mv` files and MissionView Designer as the default application for `.g` files.

Proceed through the wizard screens until the installer completes the installation. At the end of the installation process, the installer automatically starts the trial or activates the license for MissionView Display if an Internet connection is available. If the connection attempt fails, the installer prompts for proxy settings (Figure 123) before retrying the connection.

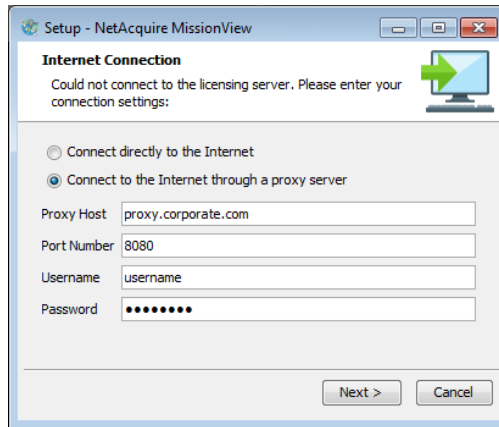


Figure 123—Proxy Settings

If license activation fails, an error dialog containing the details of the problem appears (Figure 124).

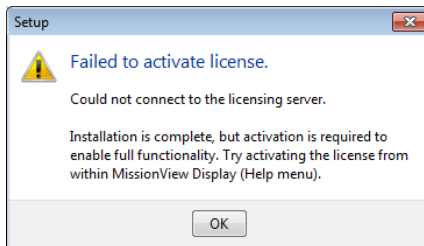


Figure 124—License Activation Error

Even if an error dialog is displayed, the software installation is complete. However, to enable full functionality, the trial or license activation process must be completed within MissionView Display. See section 3.1.3 .

Click the **Finish** button on the final screen to exit the installer. Use the checkboxes on the final screen to optionally launch and open the demo drawings in MissionView Display.

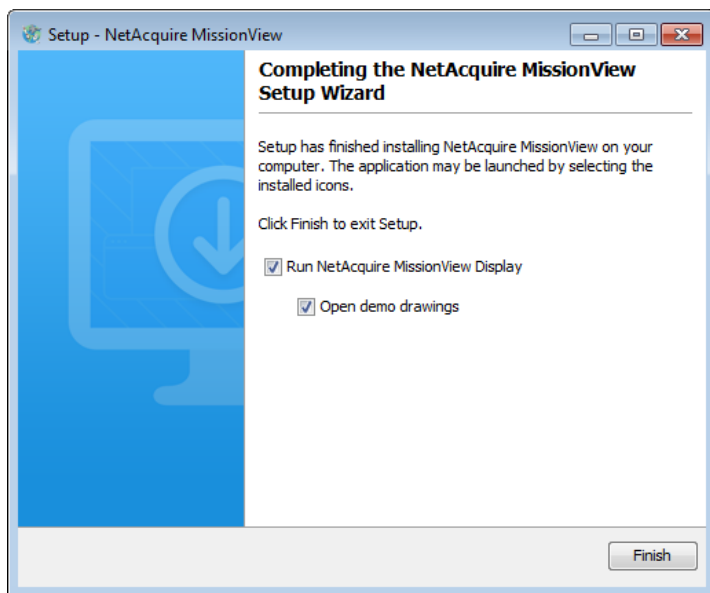


Figure 125—Installation Completed

7.2 Updating or Reinstalling

To add, update, or reinstall components, run the installer as described in section 7.1. Use the same user credentials that were used to run the original installation.

The upgrade overwrites previously installed files. If you wish to move the installation location, uninstall the previous version first.

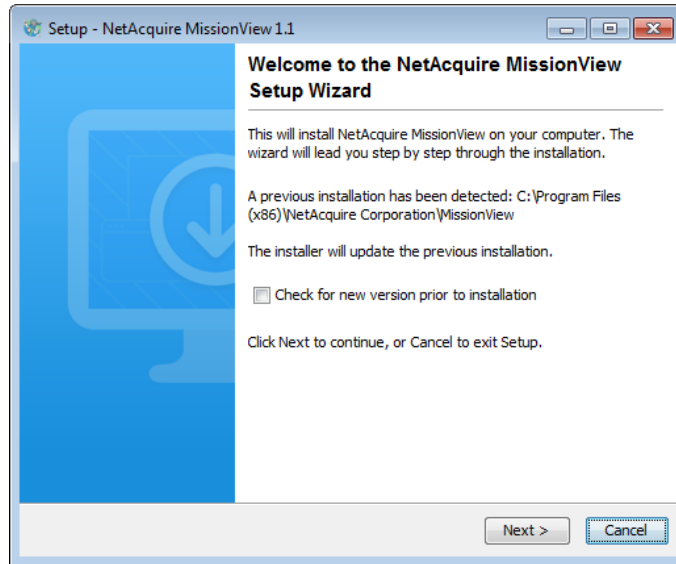


Figure 126—Upgrade Screen

The installer presents a subset of the screens described in section 7.1. Note that installed components are not removed during this process even if they are unchecked in the component selection screen.

Files under the installation directory are overwritten. If the installer needs to overwrite data files under the user's home directory, it will first prompt for confirmation.

7.3 Removing the Installation

To remove the MissionView software on Windows, use the Windows *Programs and Features* control panel (click on Windows Start menu and search for

"uninstall"). Uninstall must be run with administrator privileges if the install was performed by an administrator.

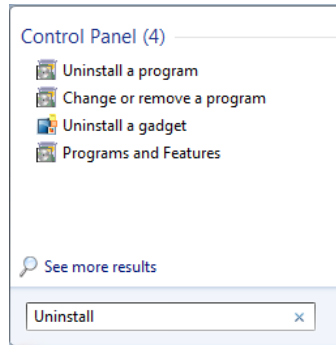


Figure 127—Searching for Uninstall with the Start Menu

To remove MissionView software on Linux, run the uninstall utility located under the installation directory (e.g., `/opt/netacquire/missionview`). If the install was performed by a standard user, simply run the utility located under the installation directory:

```
$HOME/netacquire/missionview/uninstall
```

If the install was performed by root, uninstall must be run with root privileges. Use the `su` command to open a *root* shell or use the `sudo` command:

```
sudo -E /opt/netacquire/missionview/uninstall
```

To uninstall MissionView on macOS, launch *MissionView Uninstaller* from the Finder.

The uninstaller presents a series of wizard screens (Figure 128).

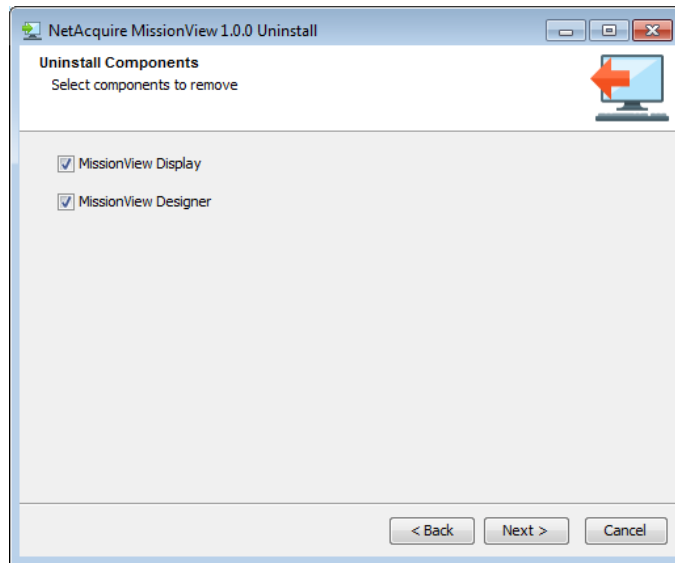


Figure 128—Uninstaller Wizard

When permanently removing the product from the current host machine (e.g., migrating to a new host), it is important to deactivate the product license so that the product can be activated on another machine (Figure 129).

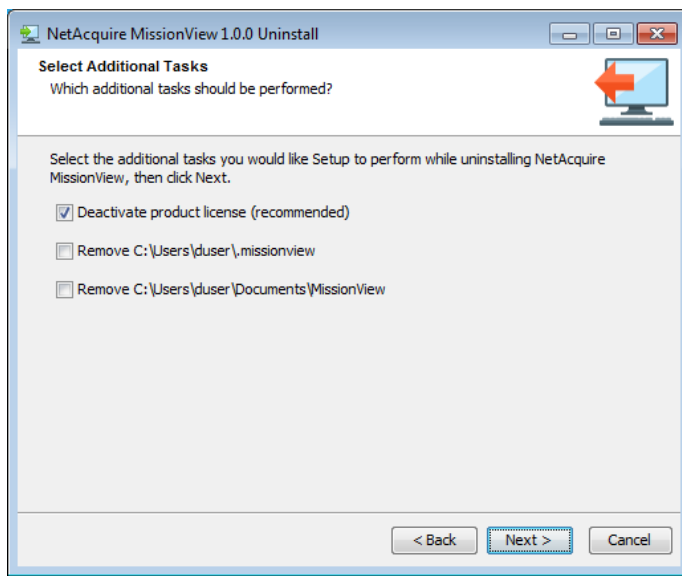


Figure 129—License Deactivation

If there is no Internet connection, the online deactivation process will fail. If this happens, the uninstaller generates an offline deactivation request file *DeactivationRequest-hostname.xml* in the Documents directory. After uninstallation completes, email the XML file to licensing@netacquire.com so that the license can be released for use on another machine.

MissionView data directories and all files contained within them may also be removed during uninstallation. Files removed during this process are not recoverable.

Proceed through the remaining wizard screens until the uninstaller completes the software removal process.

7.4 Automatic Update Check

MissionView Display automatically checks for updates each time it runs based on the configured schedule. If an update is available, wizard screens step through

the download process (Figure 130). MissionView Designer does not automatically check for updates.

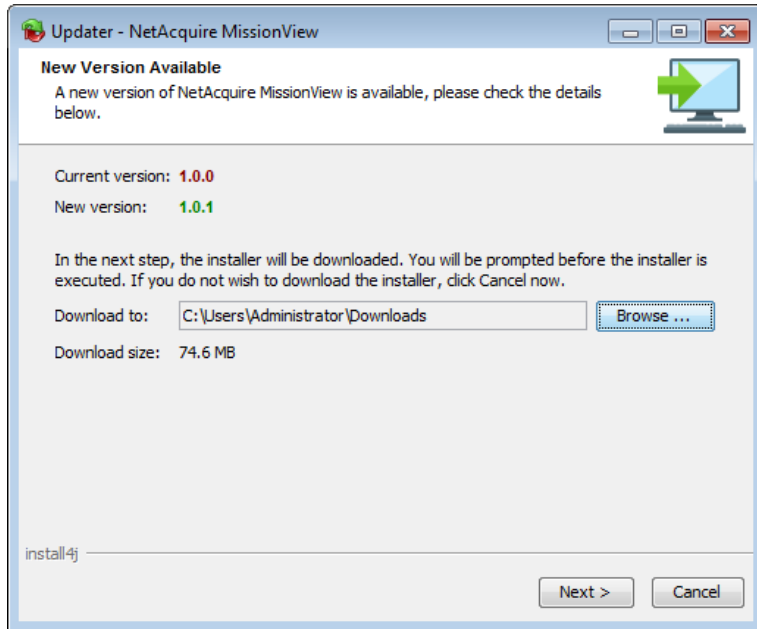


Figure 130—Update Available

Once the download completes, the new installer can be run immediately or saved for later (Figure 131). On Linux, if the current user is not *root*, then the installer must be saved and executed later as *root*. The instructions for running the

installer can be found in section 7.1. The MissionView Designer evaluation string or product key must be reentered when installing the update.

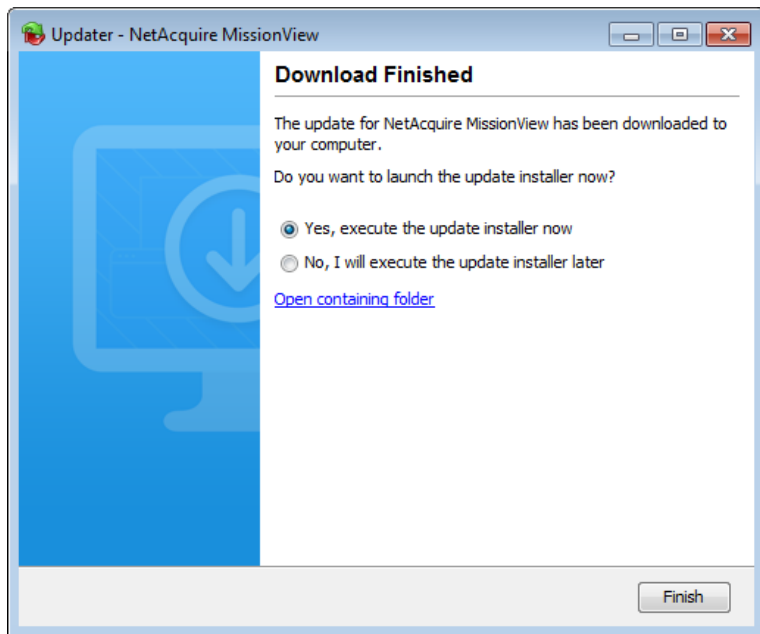


Figure 131—Completed Download

7.5 Manual Update Check

A manual update check can be run by: selecting the *Check for MissionView Update* shortcut under the Windows **Start** menu; executing the `/usr/local/bin/MissionViewUpdater` utility from a Linux shell prompt; or launching *MissionViewUpdater* from the macOS Finder. The update utility can also be used to modify the automatic update schedule (see section 7.4).

Use the combo box on the first wizard screen to modify the automatic update schedule (Figure 132).

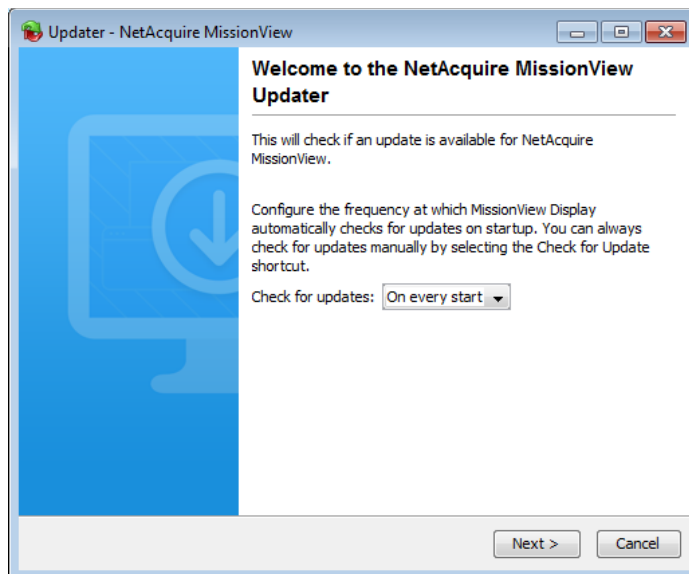


Figure 132—Update Schedule

Step through the wizard screens to check for and download an update if available. This is described in section 7.4.

7.6 Activating MissionView Display

If a MissionView Display product key is not provided or activated during installation then MissionView Display is initially installed as a Full edition trial.

All features are available for 30 days after initial installation. Activating MissionView Display with a product key permanently enables all features. If MissionView Display is not activated before the trial period expires, some features are disabled.

To activate a product key in MissionView Display, select **Licensing** under the Help menu (Figure 133).

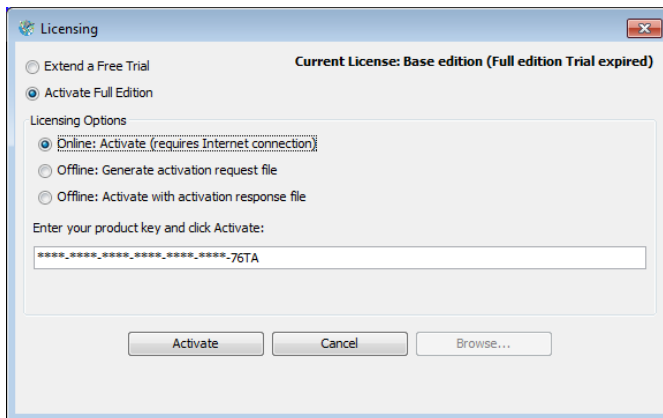


Figure 133—License Activation

In the Licensing dialog, select an activation method:

- **Online: Activate:** Immediately activates the product over the Internet
- **Offline: Generate...:** If the PC does not have Internet access, use this method to write activation request data to a file on the local disk. Email the XML file to NetAcquire Corporation (licensing@netacquire.com).
- **Offline: Activate...** (or **Offline: Start/Extend...**): Provide a path to the file supplied by NetAcquire Corporation in response to an activation request

Next, enter the product key or file path. The product key consists of 28 alphanumeric characters. It is not case-sensitive and hyphens are optional. MissionView Display and MissionView Designer use separate product keys and they are not interchangeable.

Click the **Activate** or **Generate** (or **Start/Extend**) button to proceed with the operation.

7.7 Deactivating MissionView Display

After MissionView Display is activated, the **Help** menu item label will say "**Licensing (Deactivate)**" (Figure 134). Selecting this item immediately deactivates the product license over the Internet. MissionView Display will revert to a fully functional trial mode if the trial period has not expired. Otherwise, only Base functionality is enabled.

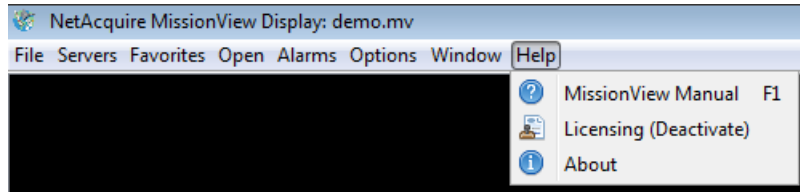


Figure 134—Licensing Menu

Online deactivation requires an Internet connection. If MissionView cannot connect to the licensing server, an offline deactivation file *DeactivationRequest-hostname.xml* is automatically generated in the Documents directory. Email the XML file to licensing@netacquire.com so that the license can be released for use on another machine.

When uninstalling MissionView, select the deactivate product license option if the product is being migrated to another machine.

7.8 MissionView Display Data Files

The installer places data files in the home directory of the user who installs MissionView. The home directory is typically located at *C:\Users\<username>* on Windows, */home/<username>* on Linux, and */Users/<username>* on macOS. Data file directories created by the installer are:

- *\$HOME\.missionview* – contains default workspace, application log, and security files
- *\$HOME\Documents\MissionView* – contains demo drawings and the demo layout file

If MissionView Display will be used by multiple user accounts on the same machine, additional users should manually set up the above directory structure in their own home directories.

8. Diagnostics

There are several ways to diagnose installation issues and in-system communications problems. This chapter provides an overview of some tools.

8.1 Client System Requirements

8.1.1 *Operating System Compatibility*

MissionView Display and MissionView Designer are compatible and tested with,

- **Windows** 7, 8, and 10
- **MacOS** Sierra, High Sierra, Mojave
- **Linux** CentOS 7, Redhat 6 and newer, Fedora 25 and newer

MissionView Display provides Base functionality with certain limitations on older Linux operating systems. The application will require web browsing to occur with an external browser.

MissionView Designer is not compatible with certain older Linux operating systems.

8.1.2 *Java*

MissionView Display requires Java 8 (Desktop) as its runtime environment. MissionView Display bundles a current Java 8 runtime for those clients without one. The Java files are not installed and are only used by MissionView Display.

8.2 Custom Startup Arguments

MissionView Display supports startup arguments that provides or enables specific functionality. To change these parameters, you must edit the *MissionViewDisplay.vmoptions* file within your MissionView installation's Display directory. For instance, on Windows the path may be `C:\Program Files (x86)\NetAcquire Corporation\MissionView\Display`. On Linux, a likely path is `/opt/netacquire/missionview/Display/`.

Parameter	Description
-DextBrowser=true	Indicates that MissionView Display should use an external browser. Default defers to Java to find an appropriate browser.
-DextBrowserPath=</path/to/browser>	Provide an explicit path to a browser. Implicitly sets extBrowser=true. For example, Firefox may exist at <code>/usr/bin/firefox</code> . Do not use quotes for the path.

8.3 Installation

This section describes error conditions and messages that may occur during installation, upgrade, or uninstallation.

8.3.1 *Windows-Specific*

This section describes installation error conditions and messages specific to Windows.

"You must have administrator privileges to install this program"

- Right-click the installer and select "Run as administrator". If this does not open a UAC elevation prompt, Windows UAC settings may be preventing the automatic UAC elevation prompt. If this cannot be corrected through the Windows control panel, log onto the machine directly as administrator and run the installer.
- Administrator privileges are required when installing the software for "All Users" or upgrading/uninstalling an installation created by an administrator.

8.3.2 *Linux-Specific*

This section describes installation error conditions and messages specific to Linux.

Legacy Linux Distributions

Some Linux distributions like CentOS 6 have legacy runtimes and security libraries that create limitations within MissionView Display. During installation you may be warned about these limitations but can continue installing MissionView Display. MissionView Designer will not be installed. If the browsing capabilities are curtailed, MissionView Display will attempt to fall back to using the system's default browser.

If you receive an error dialog regarding browsing, you can test to see if MissionView Display has found an alternate by using the Open... menu; simply provide the address of a web page or intranet target. If MissionView Display successfully opens an external browser, you can thereafter prevent the initial error dialog from opening by adding a startup parameter.

You may also direct the application to use a specific browser by providing an executable path, for instance if MissionView Display cannot find an appropriate alternative. Within your MissionView Display installation directory (e.g., */opt/netacquire/missionview/Display/*) you will find the file *MissionViewDisplay.vmoptions*. See section 8.2 for details on specifying options that control browsing.

"ELF not found.

The architecture or bitness (32/64) of the bundled JVM might not match your machine."

```
Unpacking JRE ...
Preparing JRE ...
bin/unpack200: 1: bin/unpack200: ELF[1][1]: not found
bin/unpack200: 2: bin/unpack200: not found
bin/unpack200: 3: bin/unpack200: /lib64/ld-linux-x86-64.so.2
GNU[1]: not found
bin/unpack200: 8: bin/unpack200: Syntax error: ")" unexpected
Error unpacking jar files. The architecture or bitness (32/64)
of the bundled JVM might not match your machine.
```

- MissionView requires 64-bit Linux.

"Could not display the GUI. This application needs access to an X Server."

- Both the MissionView installer and MissionView products must run under an X window system such as KDE or GNOME.
- If the system is using the OpenJDK JRE, verify that the JRE includes graphical support. The installed package should be *java-1.8.0-openjdk* or *openjdk-8-jre*, and not just *java-1.8.0-openjdk-headless* or *openjdk-8-jre-headless*.
- If "`sudo sh MissionViewSetup.sh`" fails, try "`sudo -E sh MissionViewSetup.sh`". The `-E` option preserves the required X window environment variables in the *root* shell.
- Security settings may prevent the *root* user from running X applications. Run "`xhost +`" to disable X access control temporarily and then run the installer with "`sudo -E`". After installation is complete, restore X access control by running "`xhost -`".
- Run "`su`" to open an interactive *root* shell then run the installer.

8.4 MissionView Display

This section describes error conditions and messages that may occur when using MissionView Display.

8.4.1 All Operating Systems

Application Does Not Open Drawing

"Drawing..." menu items grayed out

"WARNING: Licensing: '<filename>' drawing window prevented from opening"

- Click on the **Help** menu and then **About** to check the contents of the License field.
- If the product has been licensed for Base, you need to start a trial of the product or activate a full product license.
- If your trial has expired, contact NetAcquire Corporation support or sales.

Notification Icon

- Any time you see the notification icon at the bottom-right of the MissionView Display application, open the **Messages** window and check for problems.
- Problem entries will be styled with bold and colored font.

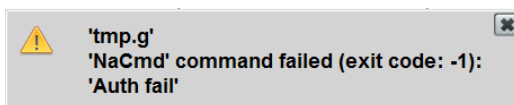
Log File

- MissionView Display creates log files that capture the contents of the **Messages** window, more details about failures, and additional internal logging that can help with diagnostic efforts.
- The log files are written to the same directory as MissionView Display data files (\$HOME\missionview). The file with the latest date is the relevant log file.
- When communicating problems to NetAcquire Corporation support, you may be asked for recent log files to aid in determining the problem.

Drawing Graphics Not Updating

- Right-click the problem graphical object to bring up the properties, then check for publication error icons. Additionally, check the **Messages** window for any problems.
- If the server is online, click the ellipsis button to open the publication list, then check for the presence of the publication.

'NaCmd' command failed (exit code: -1): Auth fail



- Current user does not have Shell permissions on the connected server. See NA-MAN-001 for details regarding granting permissions.

User Name	View	Modify	Manage	FTP	Shell	Password
admin	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Change...
ftp	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Change...

"No suitable Java Virtual Machine could be found on your system.

The version of the JVM must be at least 1.8.

Please define INSTALL4J_JAVA_HOME to point to a suitable JVM."

- Run "java -version" to determine the default Java version. If the java command is not found or if the reported version is not 8, then install Java 8.
- On Linux, use the package manager (rpm, yum, dnf, or apt) to install the latest Java version from the software repository. The software repositories for older distributions, particularly those near end-of-life, might not support Java 8. If this is the case, use one of the methods described below.
- The latest installers for Windows, Linux, and macOS are available on java.com. Download the latest 1.8 micro-version for the appropriate platform/architecture.
- If the above methods are not feasible, then reinstall MissionView. If no compatible JRE is found, the installer will install a private JRE for use with MissionView.

Firewall blocks Display from accessing the network

- MissionView Display connects to the NetAcquire server on several well-known port numbers (80, 443, and 22) and a few uncommon port numbers (e.g., 3000 and 11112).
- To avoid connection problems, grant outgoing access to MissionView Display.

Display takes a long time (> 10 seconds) to start up

- MissionView Display may be checking for software updates on startup. If the connection to <http://updates.netacquire.com> is slow, the hostname cannot be resolved, or the server is unreachable, this can cause a noticeable delay on startup.
- If the connection problem cannot be resolved, then disable automatic update checks by running the update utility. See section 7.4.

"Activation failed. <Detailed description of error>"

The error details describe the nature of the problem. Check the following based on the description:

- The product key must contain 28 alphanumeric characters. Keys are not case-sensitive and hyphens are optional. MissionView Display and MissionView Designer product keys are not interchangeable.
- An Internet connection is required to start a trial or activate a license. Use the offline activation method if Internet access is unavailable.
- Verify that the default browser can reach <https://wyday.com>. On Windows, test the URL using Internet Explorer. There should be no certificate warnings. If <https://wyday.com> cannot be reached without warnings, the proxy server may be interfering. Use the offline activation method.
- Verify that the firewall is not blocking MissionView Display. Add an exception rule if necessary.
- MissionView cannot be used in a hypervisor (VM), sandbox, or container. This includes Windows 10 with Hyper-V enabled. To disable Hyper-V, refer to: <https://support.microsoft.com/en-ca/help/3204980/virtualization-applications-do-not-work-together-with-hyper-v-device-g>
- Trial licenses are valid for 30 days. Reinstalling MissionView does not reset the trial period. To acquire a full license or trial extension, please contact NetAcquire Corporation (licensing@netacquire.com).

"For your convenience the trial period has been extended by X days. Please contact licensing@netacquire.com if you require additional time."

- A MissionView trial was installed and activated on this machine over 30 days ago.
- The installer automatically extends expired trials to allow additional evaluation time for each new minor release.

- The automatic extension only occurs once per minor release. Please contact licensing@netacquire.com for additional evaluation time.

Help/Licensing menu is disabled (gray). Some features disabled.

- Do not run the "MissionView.jar" JAR file directly. Use the application menu shortcut whenever possible. On Linux, use the shortcut, MissionView Display symbolic link, or run the launch script directly from the installation directory: `/opt/netacquire/missionview/display`
- The MISSIONVIEW_INSTALL_DIR environment variable must be defined and point to the top-level directory of the MissionView installation (e.g., `/opt/netacquire/missionview`). MissionView Display files must be located under `$MISSIONVIEW_INSTALL_DIR\Display`. Modify the environment variable if needed.

"Unable to get the local host address. Name or service not known."

- The default host name of the machine must resolve to an IP address. If MissionView Display cannot resolve the default host name, the above error appears on start up. Normally, host names are automatically configured through DHCP. If this is not happening, a static host file entry can be used to work around the issue.
- Use the "hostname" command to determine the default host name (e.g., myHostName), then edit `/etc/hosts` (Linux or macOS) or `c:\windows\system32\drivers\etc\hosts` (Windows) and add or modify the following entry:

```
# loopback address entry
127.0.0.1 localhost myHostName
```

Cannot connect to server or load applets

- Secure mode might be enabled (login required) and the NetAcquire server version might be older than 8.3.4.
- Verify that the firewall is not blocking MissionView Display. Add an exception rule if necessary.

"The JVM could not be started. The maximum heap size (-Xmx) might be too large or an antivirus or firewall tool could block the execution."

"java.lang.UnsatisfiedLinkError: could not load i4inst from <path>"

The security (virus) scanner may have quarantined or removed some installation files. Check the security scanner's log or quarantine area for MissionView files. If files have been quarantined, add them to the scanner's whitelist, submit the files

to the security vendor for analysis, then either restore the files or reinstall MissionView.

8.4.2 *Windows Specific*

This section describes MissionView Display error conditions and messages specific to Windows.

Internet Explorer issues warning when opening the MissionView Users Manual (HTML) via Start Menu

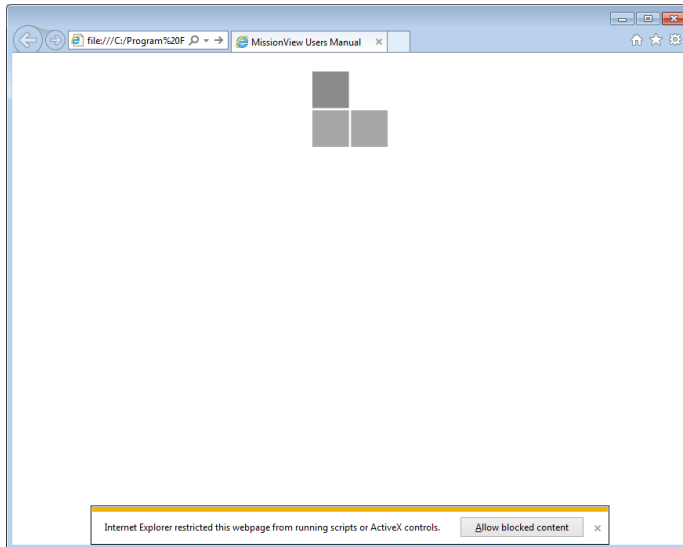
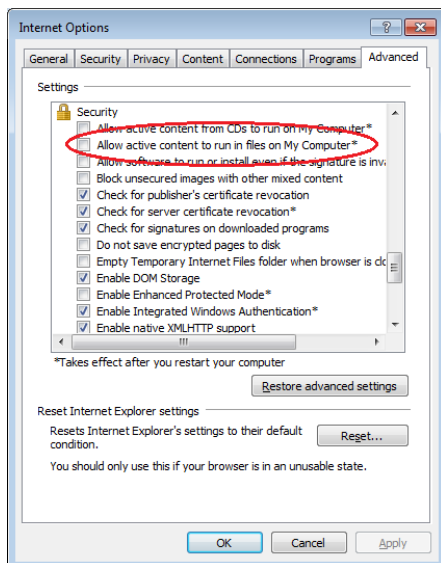


Figure 135—Internet Explorer Warning Opening MissionView Manual

- By default, Internet Explorer issues a warning when displaying HTML files with active content (e.g., JavaScript) when these files are present on the local disk. The web-based version of the MissionView Manual contains JavaScript to provide advanced navigation and search functions. Simply press **Allow blocked content** to bring up these pages in IE.

To permanently prevent this warning from appearing configure IE's advanced security options. Select **Internet Options** in IE and go into the

Advanced pane. Scroll down to the *Security* section and enable the checkbox for “Allow active content to run files on My Computer”:



Long delays starting MissionView Display or when adding a live server

- MissionView Display performs reverse name lookup operations on the server list to ensure uniqueness of each server in the list. This lookup can take a long time if they fail (either due to Windows NetBIOS failures or other network misconfigurations). Ensure that name lookups work correctly by observing no delays when running the following Windows command from a command prompt:
`nbtstat -A <server-ip-address>`.
- If delays occur in the previously run command then disable NetBIOS over TCP/IP in the Windows network configuration.

8.4.3 Linux-Specific

This section describes MissionView Display error conditions and messages specific to Linux.

Application does not launch and no error dialogs appear

- MissionView Display can be launched from application menu shortcuts; however, if the application does not launch, try running the executable

from a shell prompt to see console messages. The messages may describe the problem.

- To run MissionView from a shell, use the MissionView Display or MissionView Designer symbolic links, or run the launch scripts directly from the installation directory:

```
/opt/netacquire/missionview/Display/MissionViewDisplay
```

```
/opt/netacquire/missionview/Designer/MissionViewDesigner
```

Web page and MissionView Manual windows are blank

"ERROR:sandbox_linux.cc(344)] InitializeSandbox() called with multiple threads in process gpu-process."

- Both the MissionView User Manual (Help menu) and Web Page (Open menu) functions use the Chromium browser engine to display content. Chromium is incompatible with some video cards/drivers.
- Run MissionView Display from a shell window to see console messages associated with the blank windows.
- Try opening a second instance of the window, leaving the initial blank window open in the background. The second window may open correctly in some cases.
- The other alternative is to use an external browser to view web content.

"Browser Load Failed:

**/home/devuser/.missionview/.jxbrowser/libbrowsercore-common64.so:
/lib/x86_64-linux-gnu/libc.so.6: version `GLIBC_2.14' not found (required by
/home/devuser/.missionview/.jxbrowser/libbrowsercore-common64.so)"**

- The GNU C runtime library on the system is too old. Minimum required version is 2.14. See section 8.3.2 .
- See the *JxBrowser System Requirements* page for a list of supported Linux distributions and versions:
<https://jxbrowser.support.teamdev.com/support/solutions/articles/9000013733-system-requirements>

"Browser Load Failed:

Missing dependencies have been detected. Check the log for details."

- Run MissionView Display from a shell window to see console messages associated with the failed browser load. The messages should include a list of missing dependencies (.so shared libraries).
- Install the packages associated with the missing libraries. For example, if the missing dependency is *libXss.so*, run "sudo yum install libXScrnSaver" on Fedora/RHEL/CentOS.

8.5 MissionView Designer

8.5.1 All Operating Systems

This section describes error conditions and messages that may occur when using MissionView Designer.

"Switching from OpenGL to GDI renderer."

"Use -glg-disable-opengl option to disable OpenGL renderer and this warning."

"OpenGL is supported only for TrueColor visuals."

"Detected SLOW unaccelerated OpenGL renderer. Check the graphics card setup or use the GDI version of the Toolkit. To disable this warning, set the GLG_OPENGL_MODE environment variable to TRUE."

- The graphics hardware/driver/settings are incompatible with MissionView Designer. These warnings also appear when using MissionView Designer over an RDC/VNC connection.
- Do not run the MissionView Designer executable directly. Always launch MissionView Designer using the "MissionView Designer" application shortcut. On Linux, the symbolic link is named *MissionViewDesigner*. The shortcut includes the *-glg-disable-opengl* argument which disables OpenGL.

"Invalid GLG protection string, please check and try again."

- The GLG_EVAL_STRING environment variable contains the evaluation license string. This string must be entered exactly as provided by NetAcquire Corporation, including upper case letters and hyphens in the

specified locations. Furthermore, the evaluation string has a fixed expiry date.

- To correct the evaluation string, the `GLG_EVAL_STRING` environment variable must be modified. Administrative/root privileges may be required. The evaluation string can also be corrected by reinstalling MissionView and entering the updated evaluation string on the MissionView Designer licensing screen.
- On Linux, do not directly run the MissionView Designer binary located under the MissionView Designer bin directory. Always use the shortcut, launch script or symbolic link. The launch script configures the required environment variables including the evaluation string.

Cannot find graphical object

- Graphical objects that are placed in MissionView Designer may appear *behind* pre-existing graphical objects in the drawing area. When attempting to locate a graphical object that is not visible simply move currently visible objects aside by selecting them and dragging them with the mouse.

Drawings appeared to be scaled differently between MissionView Designer and MissionView Display

- Drawings can be zoomed in MissionView Designer and when these drawings are saved and then re-opened in MissionView Display their zoom level is maintained. Because zooming is not supported in MissionView Display a “reset zoom” option is available.

Unknown graphical object attributes

- Use the *GLG Graphical Widgets Reference* to obtain detailed information regarding graphical object attributes and properties. See section 4.6 for the online reference for this documentation.

8.5.2 Linux-Specific

This section describes MissionView Designer error conditions and messages specific to Linux.

"Can't find default font! Make sure 75dpi fonts are installed."

```
Can't find default font!  
Make sure 75dpi fonts are installed:  
xfonts-75dpi package for Debian.  
xorg-x11-fonts-ISO8859-1-75dpi package for RedHat/Fedora.  
Restart the X Server after the fonts are installed.  
Null font name.
```

- Some Linux distributions do not have the 75dpi X11 fonts installed by default. Use the package manager to install the required fonts. On Debian/Ubuntu systems, the font package name is "xfonts-75dpi". On RHEL/CentOS/Fedora systems, the font package is "xorg-x11-fonts-ISO8859-1-75dpi".

"/lib64/libc.so.6: version `GLIBC_2.11` not found"

- The GNU C runtime library on the system is outdated. Version 2.11 or later is required.
- To determine the current runtime version, execute `/lib64/libc.so.6`. This will report the library version. e.g., "GNU C Library stable release version 2.5"

9. Other Topics

This chapter provides information on some upcoming MissionView product features as well as currently known MissionView software notes and limitations.

9.1 Performance Optimization

9.1.1 *Drawing Performance*

Drawings containing graphical objects that have historical data can create performance issues within MissionView Display if not configured reasonably or properly.

a) **GIS Drawings**

- **MapServerURL**

If the URL to the map server is not properly configured, MissionView Display may encounter lockups due to failure to load the map images.

- **GIS Icon Paths**

Path traces are drawn using polygons. As more data arrives, more points are added to create these polygons. As the number of points grows, the time taken to recalculate the drawing grows. Use the filters property to reduce the total number of points. Some tips:

- The buffer for the “path traces” filters by lat/lon/altitude. When panning or zooming, the polygons are recalculated from this buffer, so no granularity is lost.
- The “pixels” filter helps by not adding points to the polygon that are so close together that they aren’t discernable. For example, 10 points could all fall within the same pixel, consuming processing time but adding nothing visually. Adjust this value to provide a reasonable display.

b) **Chart Buffering**

Charts have a setting on the main Chart Editor named **Buffer (Data Points)**.

This setting controls how many values are held in each plot’s historical buffer and get used to calculate the chart. Combining chart spans (displayed time) with large buffer sizes can lead to long recalculation times to display the chart based on the sheer volume of data points.

While there is no hard and fast rule for what value to use, NetAcquire Corporation recommends trying to balance reasonable values if performance issues arise. For example, setting the buffer to one million and filling it up may result in problematic performance.

9.1.2 Refresh Rate (Hz)

MissionView Display has a global setting for refresh rate. This setting relates only to how fast displays are repainted for visuals such as drawings, tables, *etc.* This setting does **not** affect internal processing of data updates. Regardless of this setting, MissionView Display will receive all data at full speed.

The default setting of 20Hz provides a rate pleasant to the human eye as normal animation. If the PC is very fast or a quicker response in painting is desired, set the value higher.

9.1.3 Overflow Notifications

MissionView Display monitors data input and utilization rates. If the application finds itself falling behind the rate of input, notifications will appear in the **Messages** window. These messages may appear in extreme-rate situations. If you see these messages appear, data loss may occur.

9.1.4 Subscription Logger

Logging of extreme-rate publications requires special consideration.

Note that, if the PC running MissionView Display is older or does not have much memory, trying to log more than one million updates per second might not be reasonable. This section assumes a capable PC.

a) Log File Formatting

Formatting floating-point values into text uses extra processing resources, and MissionView Display offers a high-performance formatting option described in the Logger section (3.4.2). When logging floating point values at high data rates, use this high-performance formatting option with a reasonable setting for precision.

b) Byte Arrays

Logging larger byte arrays or strings can require additional overhead, and so take care when logging these in extreme-rate situations.

9.1.5 Data Flow Publishers

a) Using Publisher's Timestamp Source

Beginning with NetAcquire server software version 8.4.0, publishers include a new setting called Timestamp Source that offers higher accuracy time tagging.

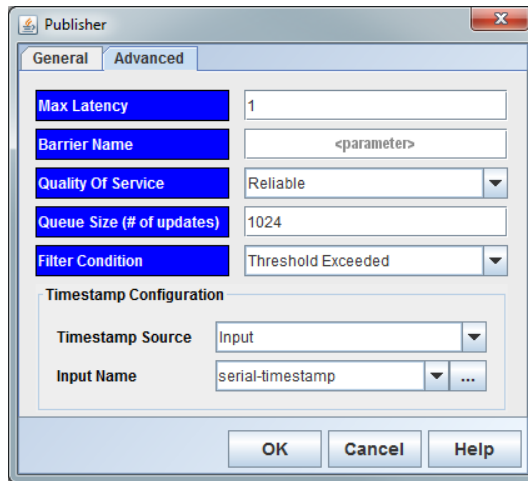


Figure 136—Data Flow Publisher Timestamp Configuration

This setting accepts a parameter that is typically a hardware-derived timestamp value. For example, this timestamp is typically supplied as a decommutator output (which in turn is received by the decommutator from the serial channel's pull reader).

NetAcquire Corporation recommends using this feature in order to provide more accurate time tags to network clients such as MissionView Display. The default if this is not done is that a publisher will use current system time at the point in time when the publication is sent to the client.

b) Multi-Publisher Timestamping and Ordering

Each data flow publisher operates independently and asynchronously. Data updates that flow out of a single publisher will be published with timestamps in ascending order.

Sometime partitioning data across publishers helps create namespace organization (via domains), but this can also create potential complications for a real-time client.

Let's assume a packet of data is decommutated and half of its data is routed to one publisher and half to another. In the following example another publisher is

introduced and these two publishers are used to separate data by telemetry and avionics in order to organize it by type.

Publisher
Map Name = telemetry QoS = Reliable Domain = Tlm Timestamp = serial-timestamp Max Latency = 1

Publisher
Map Name = avionics QoS = Reliable Domain = Av Timestamp = serial-timestamp Max Latency = 1

This setup works fine, and the client will receive properly timestamped updates. However, these publishers operate asynchronously of one another, which means that ordering of updates may be slightly out-of-sequence when they reach the client.

For the majority of cases where MissionView is displaying or graphing data, this out-of-order situation does not matter. When logging, however, the resulting log file may have lines with timestamps transition slightly backwards and forwards in time.

c) **Multi-Publisher Logging/Replay**

Logger indicates out-of-sequence timestamps as an information message. The resulting log files are still perfectly accurate. Replayer will, however, drop out-of-order data during playback.

d) **Multi-Publisher Overhead**

The data for different publishers transmits across different network ports, and so there is a bit more overhead involved when receiving the data. Typically, this extra overhead is minimal, but for extreme-update rates the overhead may be significant.

9.2 Restrictions

9.2.1 *MissionView Display*

Certain features and (re)configuration scenarios are not supported within MissionView Display.

a) **Offline Server Behavior**

NetAcquire server versions 7.5.10 and earlier exhibit problems with MissionView Display's offline server handling of closing applets to the server. Server versions

7.5.10 and earlier applet pages will display server state dialogs when a server goes offline.

b) Old Windows Themes

Old-style Windows themes such as Windows Classic may cause display issues.

c) Dynamic Status Page

NetAcquire server versions prior to 7.4 exhibit loading problems with the dynamic status page. Only portions of the page initialize.

d) Subscription Replayer

Replayer uses time-based operations, expecting a forward-moving sequence of timestamps. Replayer will drop any out-of-sequence timestamps and no updates associated with out-of-sequence times will occur.

e) GIS Rectangular Projection

In rectangular projection, when using path tracing where an icon wraps around the end of the map, the path will trace across the map where no path should exist. A future version will resolve this limitation.

10. Limited Warranty

This product is warranted against defects in materials and workmanship for one year from the date of shipment from NetAcquire Corporation. If the product is not in good working order, Purchaser should notify NetAcquire Corporation or its authorized representative immediately. NetAcquire Corporation will repair or replace, at its sole option, any product found to be defective during the Warranty period.

NetAcquire Corporation and its suppliers' entire liability and your exclusive remedy shall be, at NetAcquire Corporation's option, either (a) return of price paid, or (b) repair or replacement of the Product that does not meet NetAcquire Corporation's limited warranty. This limited warranty does not include service to repair damage resulting from accident, disaster, misuse, or modification by parties other than NetAcquire Corporation or its authorized representative. The postage, insurance, and shipping costs incurred in presenting or shipping the Product for service are the responsibility of the Purchaser. Input and output buffers are excluded from this limited warranty.

NetAcquire Corporation reserves the right to make changes in the hardware and software specifications identified in the Product documentation without notice.

EXCEPT TO THE EXTENT PROHIBITED BY APPLICABLE LAW, NO OTHER WARRANTIES, WHETHER EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, SHALL APPLY TO THIS PRODUCT. THE PRODUCT IS SOLD "AS IS". UNDER NO CIRCUMSTANCES SHALL NETACQUIRE CORPORATION BE LIABLE FOR CONSEQUENTIAL DAMAGES SUSTAINED IN CONNECTION WITH SAID PRODUCT AND NEITHER ASSUMES NOR AUTHORIZES ANY REPRESENTATIVE OR OTHER PERSON TO ASSUME FOR IT ANY OBLIGATION OR LIABILITY OTHER THAN SUCH AS IS EXPRESSLY SET FORTH HEREIN.

YOU ARE RESPONSIBLE FOR DETERMINING WHETHER A BACKUP SYSTEM IS NECESSARY. IF A BACKUP SYSTEM IS NECESSARY YOU ARE RESPONSIBLE FOR PROVIDING THE BACKUP SYSTEM.

Before returning this product, you must receive a Return Material Authorization (RMA). Returned product will not be accepted without this authorization. Unit must be shipped prepaid in its original container. If non-permanent modifications have been made to the unit, restore it completely to its original operating configuration. Permanent modification will void the Warranty. Warranty field service is available on an emergency basis. Travel expenses (travel time, per diem expense, and related airfare) are the responsibility of the purchaser.

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