



GENESIS64

Commanding Introduction



APPLICATION NOTE

September 2013

Description: An introduction to powerful commands for SCADA applications.

OS Requirement: Windows Vista x64/ Windows 7 x64/ Windows 8 x64/ Windows Server 2008 x64/ Windows Server 2008 R2 x64 / Windows Server 2012

General Requirement: Basic knowledge of GENESIS64 and its architecture.

Introduction

The main purpose of Commanding is to provide users with a simple way to monitor their asset structures with minimum development effort. Commanding also provides a way to accomplish actions that were previously only possible with JScript .NET, which is not supported in the Silverlight version of ICONICS applications.

You can take advantage of Commanding in ICONICS client applications and controls such as GraphWorX64, AssetWorX, AlarmWorX64 Viewer, TrendWorX64 Viewer, AnalytiX Viewers, and others.

Use of Commanding

Before explaining the architecture and logic of Commanding we should understand how it can be used within ICONICS products.

One of the typical uses of commanding is to execute commands for particular assets by clicking on them in the AssetWorX Navigator. Commands assigned to your assets might open various displays, set filters on your AlarmWorX64 or GridWorX64 Viewers, add pens into TrendWorX64 Viewer, navigate to geographic location in an EarthWorX64 Viewer, hide objects, and many more. However Commanding can be used with the same versatility within GraphWorX64 without AssetWorX or the AssetWorX Navigator. In that case they simply represent other variants of pick actions.

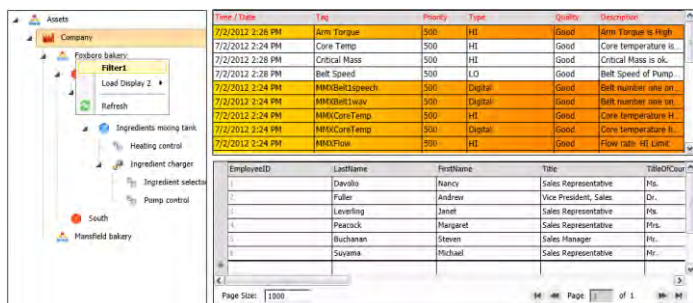


Figure 1 - Sending Commands from AssetWorX Navigator to AlarmWorX64 Viewer and GridWorX64 Viewer controls

This document explains the concept of Commanding and its architecture. A guide of how to configure Commanding and use it in runtime can be found in the application note entitled *GENESIS64 – Commanding Configuration and Runtime*. You can also find further information about AssetWorX in the application notes whose titles start with “AssetWorX”.

Commanding Types

There are 2 types of commands:

- **Commands without a target** – these commands are immediately executed in the calling application. Examples are Send SMS, Open URL, or show Login Dialog.

Some of the possible commands without a target are executed on the server side if they are triggered from AssetWorX Navigator. These include Run Transaction, Run Report, Write Value and Server Custom Commands. These commands are executed on the server side for security reasons because they may contain confidential information such as passwords. No parameters are transmitted to clients and they remain on the server. However, if you define these commands in GraphWorX64 Dynamic actions, all the parameters are stored within the display and they are executed on the client side like other commands without targets.

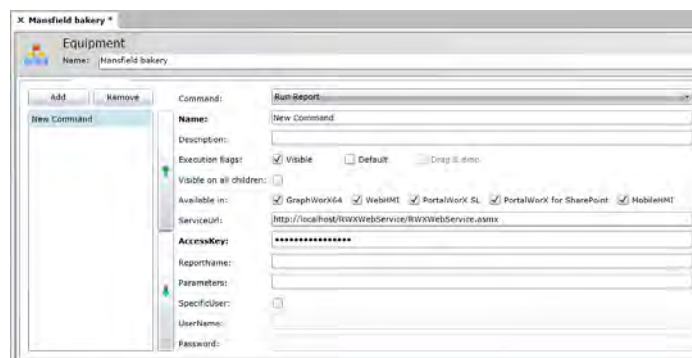


Figure 2 – Run Report Command without a Target

- **Commands with a target** – commands that target objects which then execute the requested operation. You can specify specific controls/displays or groups of controls/displays as your targets. All objects need to have unique names so that you can target specific objects with commands. If you target a control with a specific name and multiple controls with that name exist within the scope then all of them will be affected by the



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command. Examples are Load Display, Create Pen, and Set Visibility.

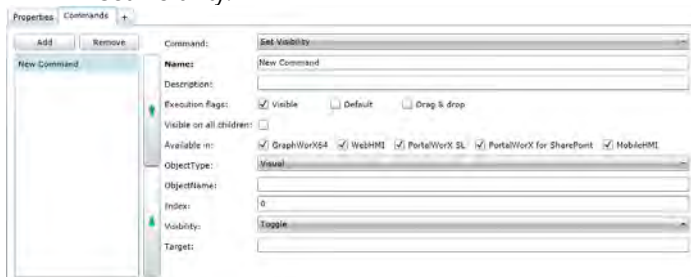


Figure 3 - Set Visibility Command with a Target

Commanding Scopes

Commanding bridges the gap between different controls as well as different displays or processes. For instance, you can send a command from one display to a different display on a single machine. ICONICS plans to extend commanding to allow targets on remote machines and devices in future releases of GENESIS64.

Currently there are two scopes of commands:

- **Process Scope** – commands can target and be targeted by any control or display within the process in which the command has been invoked.

NOTE: If you have multiple instances of PortalWorX or Workbench-SL in one web page or they are in different tabs of an internet browser they are treated as different processes due to Silverlight limitations.

- **Machine Scope** – commands may target and be targeted by any control or display running on the machine where command has been invoked with one exception. You cannot pass commands between native GraphWorX64 and GraphWorX64 Silverlight clients.

Note that only objects that have the CommandingEnabled property set to 'True' can receive commands. Their names are registered in the FrameWorX server.

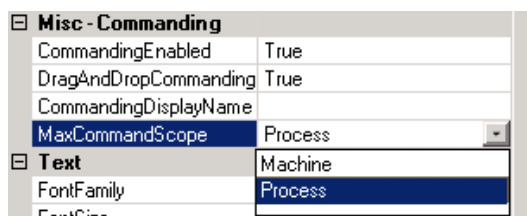


Figure 4 - Setting Maximum Commanding Scope of a Control in GraphWorX64

Commanding Logic

Commands are defined either in GraphWorX64 or the AssetWorX provider of Workbench-SL. If defined in the AssetWorX provider they are stored in the AssetWorX configuration database and are attached to assets or equipment classes. They can be executed from the AssetWorX Navigator in client applications such as GraphWorX or PortalWorX-SL. If defined in GraphWorX64 they are stored within the display and are executed like any other pick action. This means that you have the freedom of attaching these to any of your objects.

In either case, when it comes to executing commands in runtime, commands are first checked against security. If they do not pass the security check they are automatically hidden from the AssetWorX Navigator. In GraphWorX64, commands behave like ordinary pick actions, so they do not automatically hide, but the user is asked to log in if they try to execute a command that is now allowed to them. The FrameWorX server holds a list of names of all objects that are registered for Commanding. When a command is issued the FrameWorX server passes the command to all intended recipients. The recipients check whether security allows the requested actions and will perform them, if allowed.

Commanding Security

You can control which commands your users have permission to execute using the Security Server provider in Workbench. Security for Commands is defined in the Application tabs of users and groups.

Keep in mind that there are two security checks in case of Client commands. First, a check is performed to see if the user has permission to execute the command, then a second check is performed to see if the action taken by the command is allowed. For example, a Load GraphWorX Display command might be allowed but if the display file is denied for the user the page will not be opened.

The AssetWorX Navigator hides all commands that are not available for the current user.

For more information about the Security Server see the application note entitled *GENESIS64 Security - Quick Start*.

More Information

ICONICS recommends reading the application note entitled *GENESIS64 – Commanding Configuration and Runtime* for further understanding and sample scenarios.