WinCC Flexible and TOP Server CE

Using on Siemens Panels

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Introduction

This document covers the TOP Server for Siemens Panels in the examples and can be used as a guide for any of the TOP Servers for Siemens Panels drivers. TOP Server for Siemens Panels currently works on MP277, MP370 and MP377 panels, regardless of screen size.

Note: The server is not licensed on the desktop but on the panel only. We automatically create Icons for licensing on the MP panels as part of the transfer process to the panel. Licensing is covered in detail in the driver help file. You do not have to have a license in order to test the TOP server connection or do configuration. This paper does not cover licensing.

Installation

You will have to install both the TOP Server for Siemens Panels and the desktop version of the TOP Server. It is important that the version of the TOP Server Desktop and the Panel version are consistent with each other. You can insure this by making sure you install the desktop version from the installer listed with the installer for the panel drivers. After installing it, the Desktop Server is used to build the configuration used on the panel. The TOP Server can be found under the Windows Start Menu as shown here.

It is important you run the OPC Server installer version for Siemens Panels after you have installed the TOP Server Desktop version, since that installer installs the driver CE runtime binaries and advises WinCC Flexible of the presence of the drivers. This paper will use the terms OPC Server and TOP Server interchangeably though out this document. Also, if you are using the UCON driver, it is important that you install the TOP Server and not the UCON Standalone Server.

When you run the TOP Server Desktop installer, it is important to select either a Full Installation or make certain to select all applicable drivers that you plan to use on the Siemens panel. Otherwise, you will not be able to select the drivers when you are configuring your TOP Server project.

When you run the TOP Server Panel Driver installer, you will have the option to select any or all of our available TOP Server for Siemens Panel drivers. Make certain to select the applicable drivers for installation, otherwise you will not be able to transfer TOP Server to your Siemens panel.

Configuring the TOP Server

When TOP Server opens it should open the sample project installed at the following location on your computer:

C:\Program Files\Common Files\Siemens\PTProSave\AddOn\Software Toolbox\Common

You can get to it manually by opening an existing project and browsing to the same file location and choosing: topserverwince.opf. This project can be modified to meet the needs of the particular project or a new project can be opened. At a minimum the channel and device need to be configured. Tag configuration in the server is recommended, but dynamic tags can be added from WinCC Flexible once the device is fully configured in the OPC Server.

Configure the server with tags first and save this file with the name, “topserverwince.opf” to the path the sample project was installed to as shown above. It is **critical** this file name and location is used. You can save off back-up versions of this file to other locations.

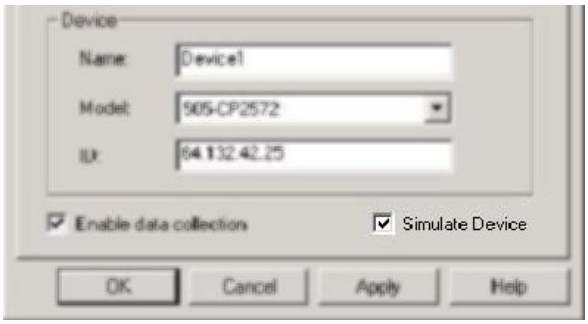
If you need instructions on configuring the TOP Server please use this link, as this topic is outside the scope of this paper:

http://www.toolboxopc.com/Support/More_Downloads/more_downloads.html

Help on using the UCON driver can be found at:

http://www.toolboxopc.com/ucon/QuickStart/quickstart.html

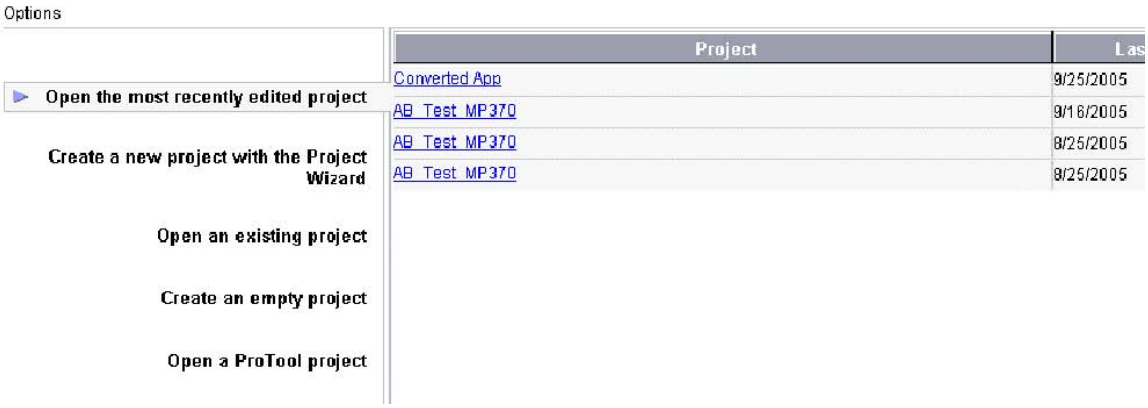
Before starting configuration in WinCC Flexible, if you do not have active devices connected to the TOP Server computer, make sure the devices in the OPC Server have the “Simulate Device” box check as shown below.



If this isn’t done it will take a very long time to configure the project. It is also critical that the devices are taken off Simulate I/O, by un-checking this box before downloading the project to the Panel. This is a particular problem with Array tags. Siemens HMIs ask the OPC Server to verify the tag with the PLC on each tag configuration. If you configure the project on the desktop OPC Server while it is not connected to the PLC, we have to wait for a timeout, since the HMI wants us to verify each tag exists in the PLC before moving on.

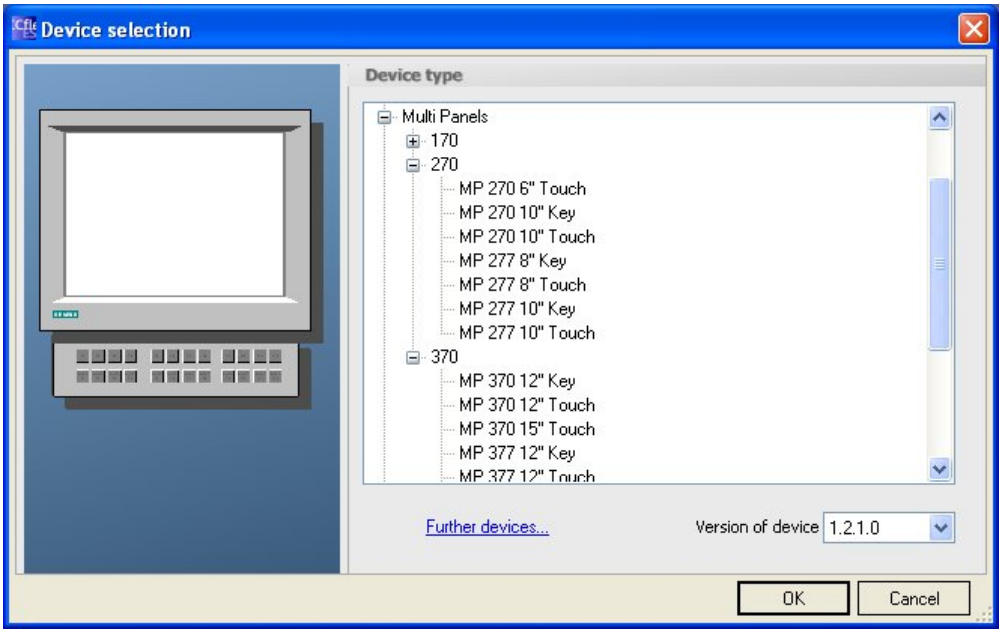
Configuring the WinCC Flexible Project

When you launch WinCC Flexible, you will see a screen similar to the one shown below.



Creating a WinCC Flexible Project

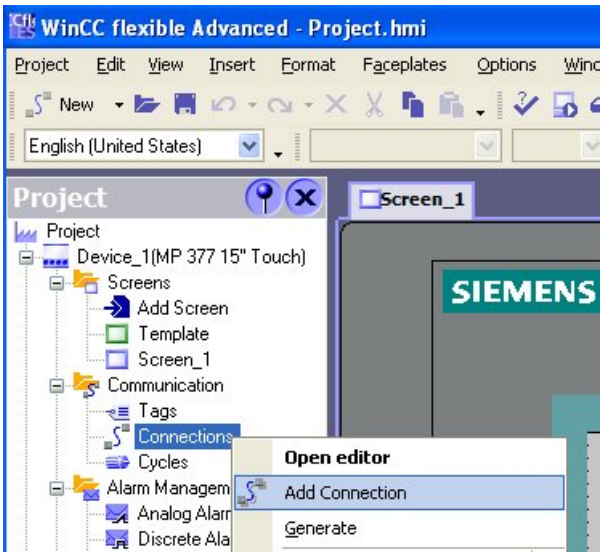
The first step is to create an empty project by selecting “Create an empty project”. This results in the following dialog box being displayed.



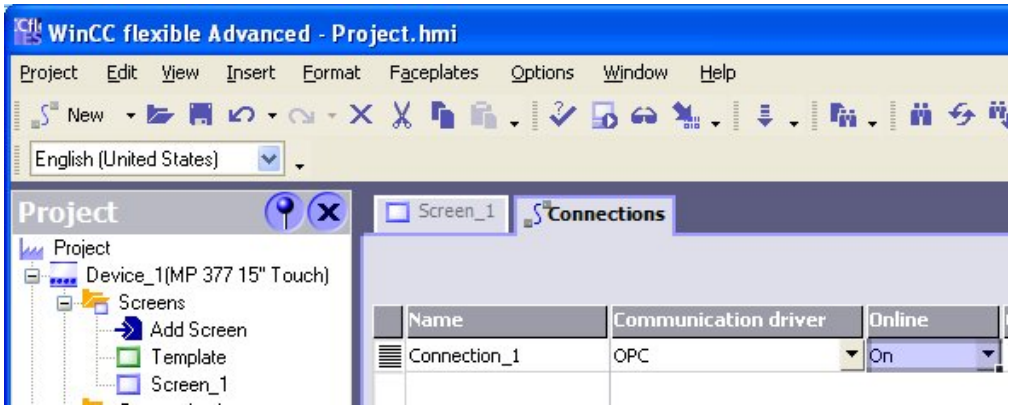
Make sure to select the proper device type from the list of Siemens panels prior to clicking OK. The project must use an MP277, MP370 or MP377 device type to work with TOP Server.

Configuring Connections

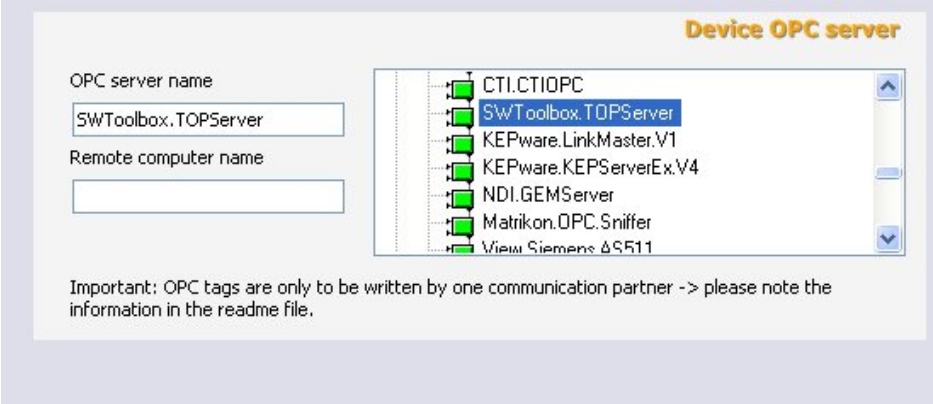
The next step in the new project is to configure the connection between WinCC Flexible and TOP Server. This connection is accomplished using the OPC Driver. To open the Connections, right-click on "Connections" under the "Communication" section and select "Add Connection", as shown below.



This will open the Connections editor and will add a new connection to the list that will default to using the "SIMATIC S7 300/400" Communication driver. Clicking on that field will open a list of drivers to choose from, and we want to choose the OPC driver, as shown below.



This opens the “Device OPC Server” section at the bottom of the interface, as shown below.



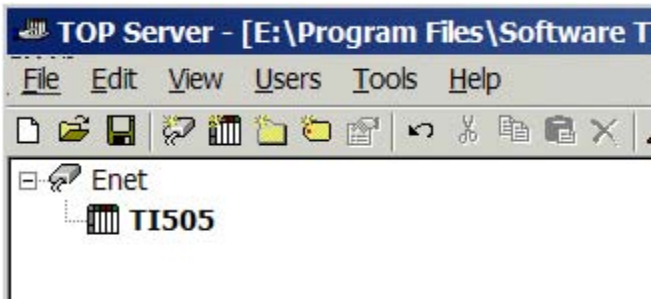
This section allows you to browse for all OPC Servers on your local or remote machines. We are only interested in the TOP Server on the local machine, so we find the ProgID for TOP Server in the list of servers, “SWToolbox.TOPServer” and select it.

Configuring OPC Tags

The next step is to create tags for the addresses you want to access in your device. We recommend creating tags in the TOP Server configuration, since it is easier in most cases than doing dynamic tags in WinCC Flexible. However, it is possible to do dynamic tags by entering a fully qualified OPC path.

Example: ChannelName.DeviceName.TagAddress@datatype

A dynamic tag going to the Channel and Device shown in the picture below would use the syntax **Enet.TI505.V10@Word** for example.



An Array tag for the Simatic 505 Ethernet driver in this example would look like: **Enet.TI505.V10[10]@Word**

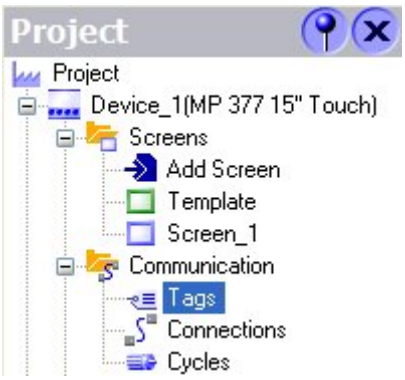
The Tag Address is dependent on the particular driver being used. See the Addressing under the TOP Server driver help file for the specific driver you are using for more details. More information on dynamic

tags including possible data types can be found in the TOP Server Help file under Basic Server Components – What is a Tag? – Tag Properties – Dynamic Tags.

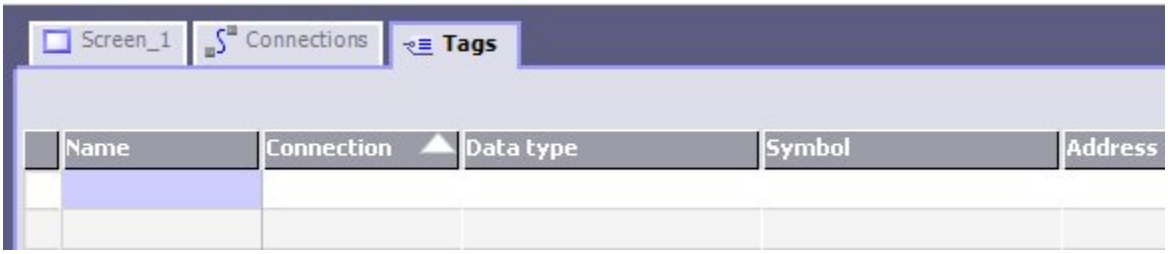
From the Help file:

> To specify an optional data type, append one of the following strings after the '@' symbol:
>
> **Boolean**
> **Byte**
> **Char**
> **Short**
> **Word**
> **Long**
> **DWord**
> **Float**
> **BCD**
> **LBCD**
> **String**

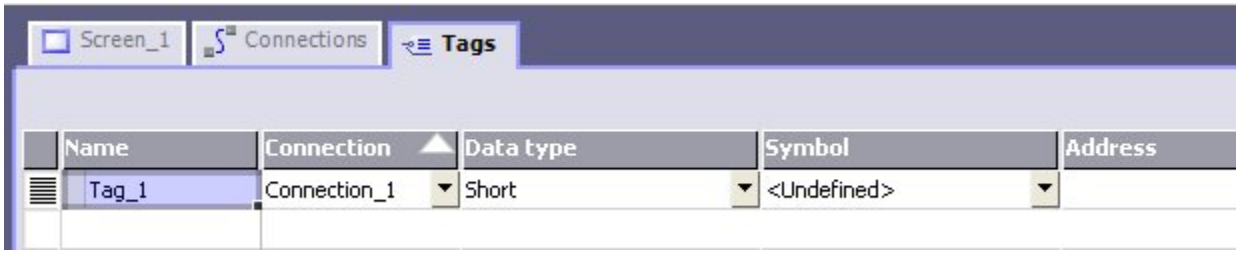
To create tags in your WinCC Flexible project, double click on “Tags” under “Communication” in the Project tree, as shown below.



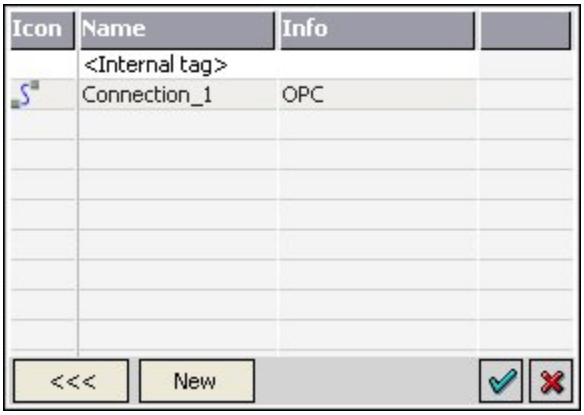
This opens the Tag Editor, as shown below.



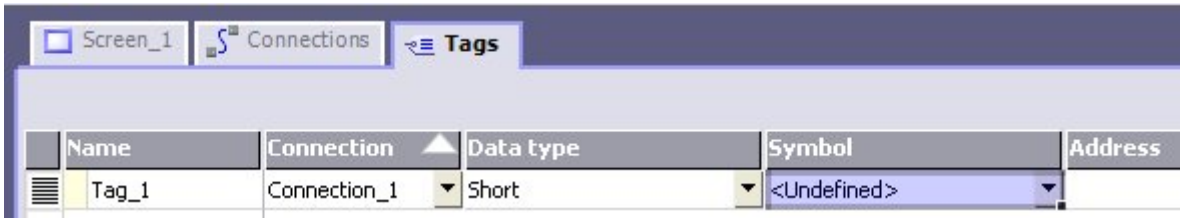
To add a new tag, simply click on the first empty line in the Tag Editor. This adds a tag named “Tag_1” and it defaults to using the first connection in your connections list, a data type of Short, and the “Symbol” field is undefined, as you can see below.



The Name field can be given any representative name you would like. This will be the name of the tag you will see as you configure your HMI Screens later. If the default connection does not match the OPC connection you created, you can change the connection by clicking the dropdown under that field, as shown below.

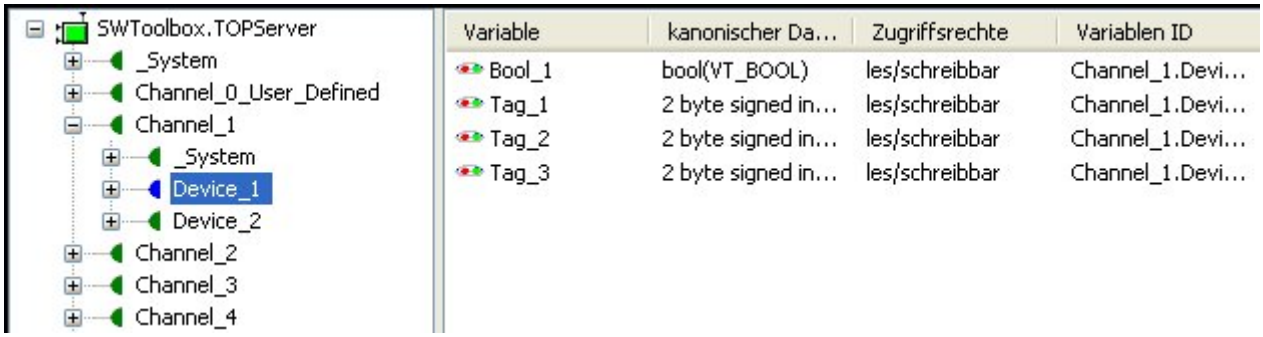


Just select the connection that corresponds to your OPC connection for TOP Server and click the Check button to accept the change. If you have created a tag database in your TOP Server configuration (recommended), you can browse those tags from the Tag Editor. Simply click the dropdown under the “Symbol” field, as shown below.

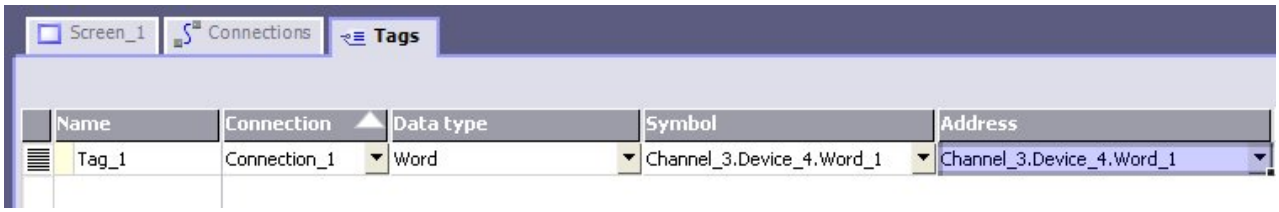


This opens the tag browser, which connects to and displays the tag address space of the OPC Server defined in your connection, which is TOP Server. If this takes a long time, make sure the server is open and devices are in I/O mode as discussed previously.

The tree structure allows you to expand your TOP Server channels and, by highlighting the underlying devices, displays the tags you have configured, as you can see below.



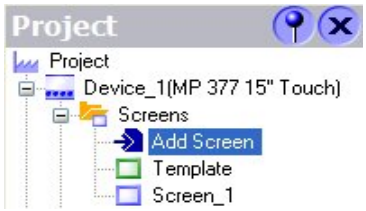
To select a tag, simply highlight it and click the Check button at the bottom of the browser. This fills the Symbol and Address fields with the proper fully qualified OPC item name, as well as changing the Data type to match that of the tag in TOP Server, as shown below.



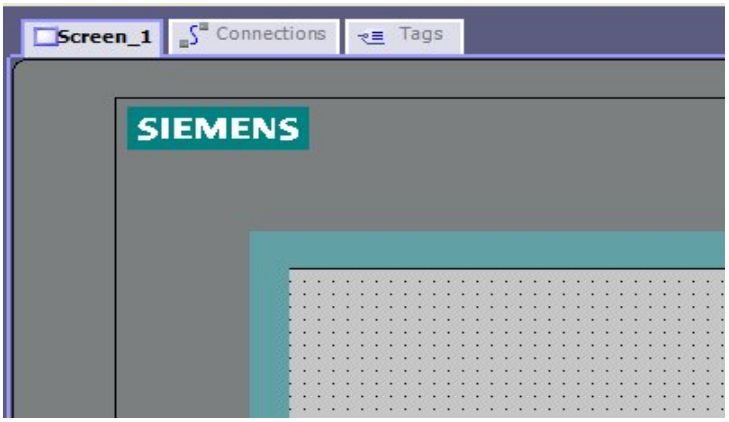
This is all that is required if you are reading a non-array tag. When configuring an Array Tag, the next step is to choose which element in the array tag in the OPC Server is connected to this particular tag in WinCC Flexible. The 6th element is selected in the example shown below. Arrays in the PLC begin with zero, so this corresponds to MyArray[5].

Configuring an HMI Screen

WinCC Flexible adds your first HMI screen by default when you create your new project. When you need to add new screens, simply double click the “Add Screen” option under Screens, as shown below.



When a screen is open, it will have a tab above the main display and clicking on the tab will change to that screen, as shown below.

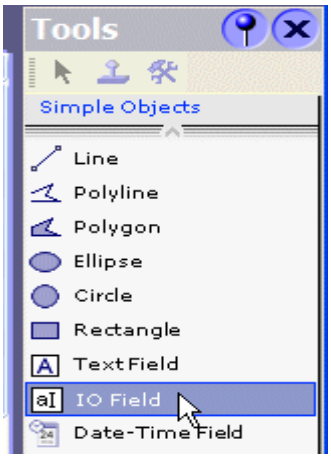


If a screen is not open, you can open the screen by double clicking on it in the Project menu under “Screens” as shown below.

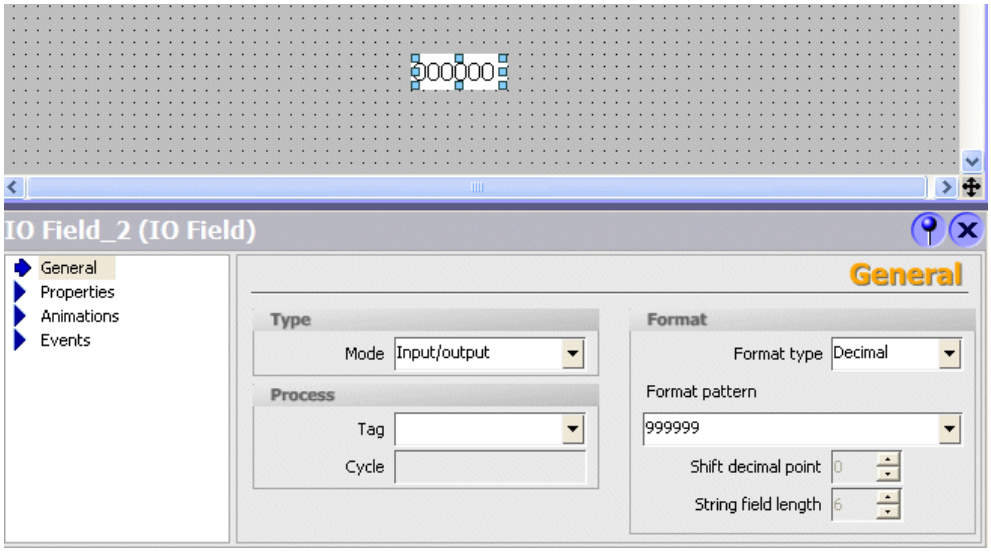
These screens are the screens that will appear on the Siemens panel once everything is transferred. For the purposes of this example, we are just going to create a simple I/O Field that will be attached to our sample tag for demonstrating the basic process.

The information provided here is not a substitute for your WinCC Flexible documentation. This is being covered to show how a complete connection is configured, not to provide comprehensive training on building WinCC Flexible screens.

To create a display on the screen, you will need to select “IO Field” from the right Tools panel, as shown below.

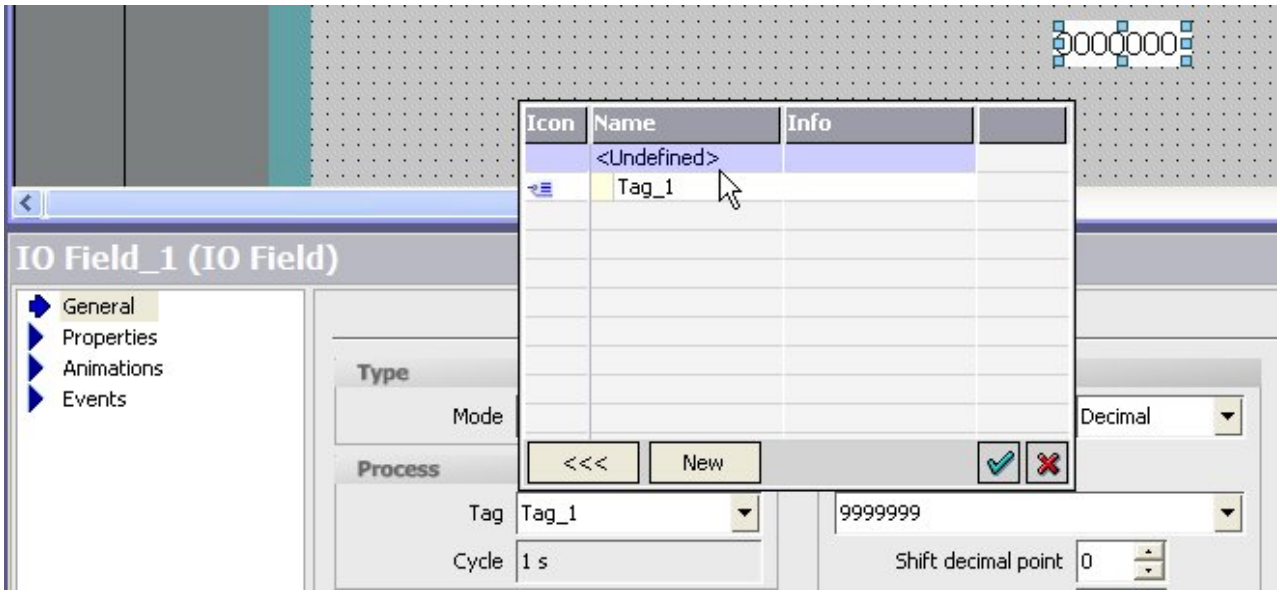


You can now return to the screen in the main panel and click and drag to create an IO field as large as you would like, as shown below.



As you can see, with the input field highlighted on the screen, you can edit the properties of that field at the bottom. The properties we are most interested in are the “Type”, “Tag” and “Cycle” properties. The type of the I/O Field determines what read and write privileges the I/O Field has at runtime. Input/Output would be Read/Write, Output would be Read-Only and Input would be Write-Only.

The Tag field is where you will associate which of the created tag connections you would like to associate with this field. By clicking the dropdown for the Tag field, the list of configured tags is displayed, as shown below.



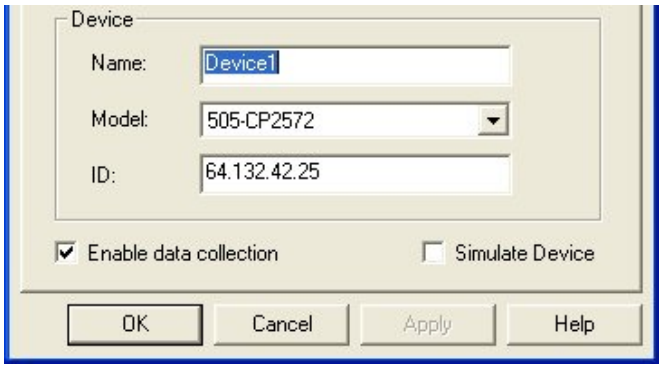
The Cycle field is the update or polling rate. The choices provided for Cycle are not a function of the OPC server but of your WinCC Flexible configuration. If you need a different polling rate that is not listed, consult your WinCC Flexible documentation on how to setup other Cycle rates.

It is also important to note the “Format” section of the I/O Field properties. The Format section is how the data will appear on the screen. It is critical that this is set correctly for the data type your reading. Data will not appear if the actual data is larger than the format configuration. Consult your WinCC Flexible documentation for information on specifying display formats.

Testing the WinCC Flexible Runtime

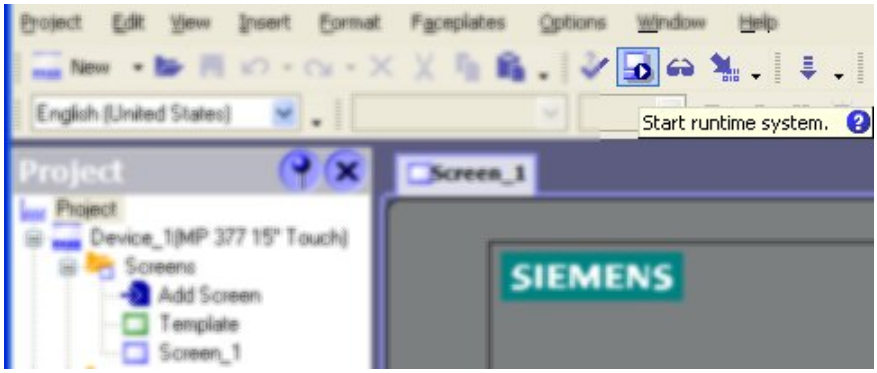
Once your TOP Server configuration is complete and you have configured your WinCC Flexible project, it is always recommended to test your configuration on the configuration PC if at all possible. This may or may not be possible depending on your device network and the availability of connecting the PC to that network. If possible, it is definitely worthwhile to perform this test to ensure that your configuration is correct prior to transferring both the TOP Server and your WinCC Flexible project to the destination Siemens panel.

The first step, if you followed our directions for enabling “Simulate Device” mode earlier, is to disable this mode. This is accomplished by opening the Device properties in TOP Server, selecting the “General” tab, and unchecking the “Simulate Device” box, as shown below.



You will, of course, need to make sure that your device settings are correct for communications with your actual device. Save the project once this setting has been made.

With your WinCC Flexible project configured, all you need to do to test the runtime is click the “Start Runtime” button at the top of the WinCC Flexible interface, as shown below.



If you have not recently saved your WinCC Flexible project, you will be prompted to do so. WinCC Flexible will then compile your project and launch the runtime, displaying the first screen in your project. You should see correct values for all of your fields in this runtime if everything is configured correctly and your machine is connected to your device properly, as shown below for our example.

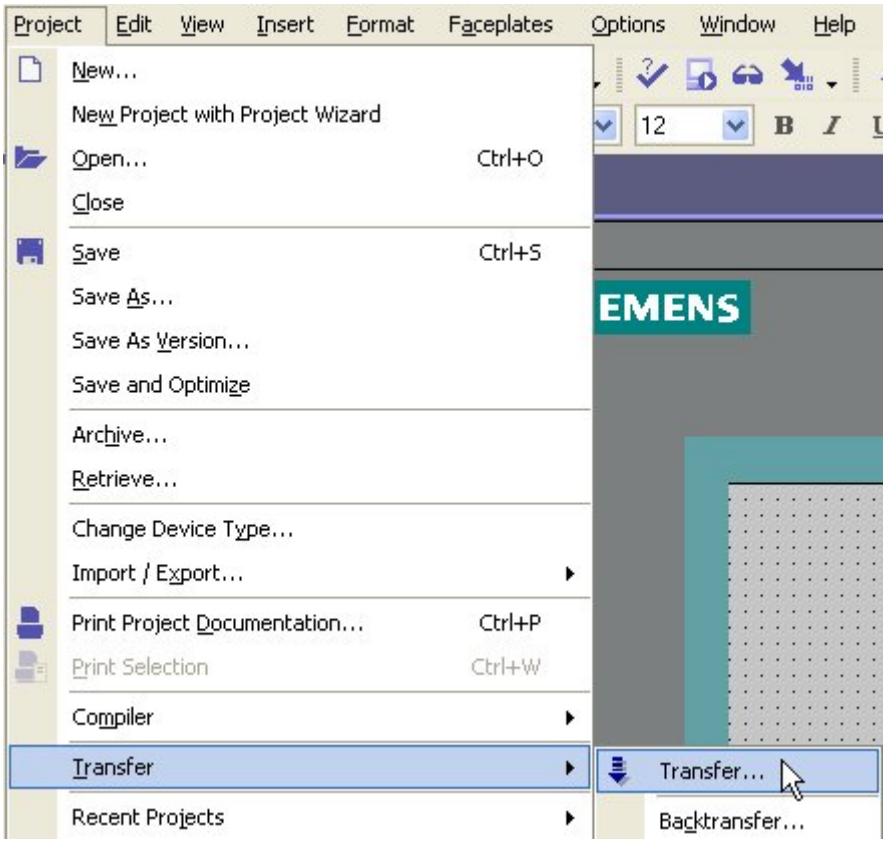
If this is not the case, and you know that you should have no physical connectivity issues from this PC to your devices, then there is a configuration issue in either your WinCC Flexible application or your TOP Server configuration file. You can contact our technical support team via the contact information at the end of this document for assistance in troubleshooting your communications.

Given that you are seeing expected behavior with your runtime, the next step is to transfer the TOP Server and your WinCC Flexible project to your Siemens panel.

Transferring TOP Server

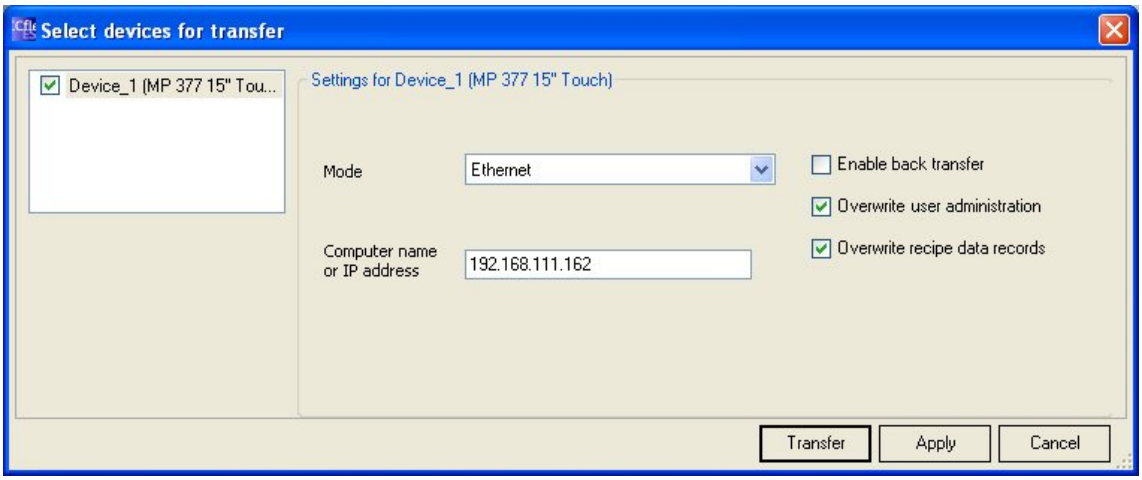
This step can be done before a project is complete, if desired, but a project has to at least be started for the particular Panel type and the Connection configured before the OPC Server can be transferred to the Panel. Before you can transfer the OPC Server you have to configure an Ethernet connection to the Panel in WinCC Flexible.

In WinCC Flexible, under the Project menu, select Transfer then Transfer Settings, as shown below.



This opens the Transfer Settings dialog box, where you will select your mode of connection to the Panel and input the correct communications settings.

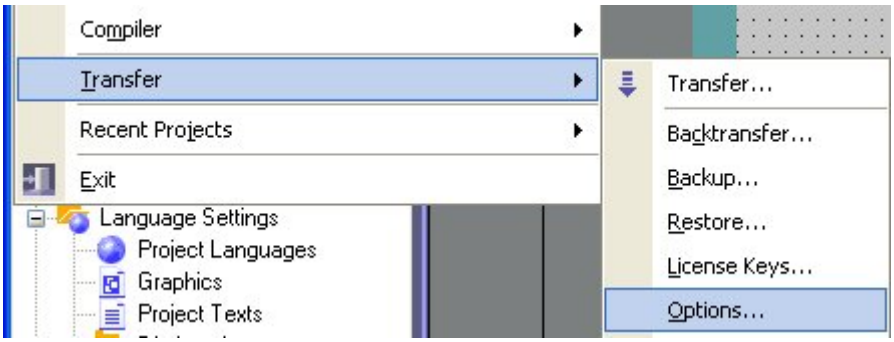
The most common method for connecting to the panel is via Ethernet, which is what is used in this example, as shown below.



Once all these settings are correct click Apply. Do not click the Transfer button until you are ready to transfer the WinCC Flexible project to the panel. This dialog will close after you click any of the buttons.

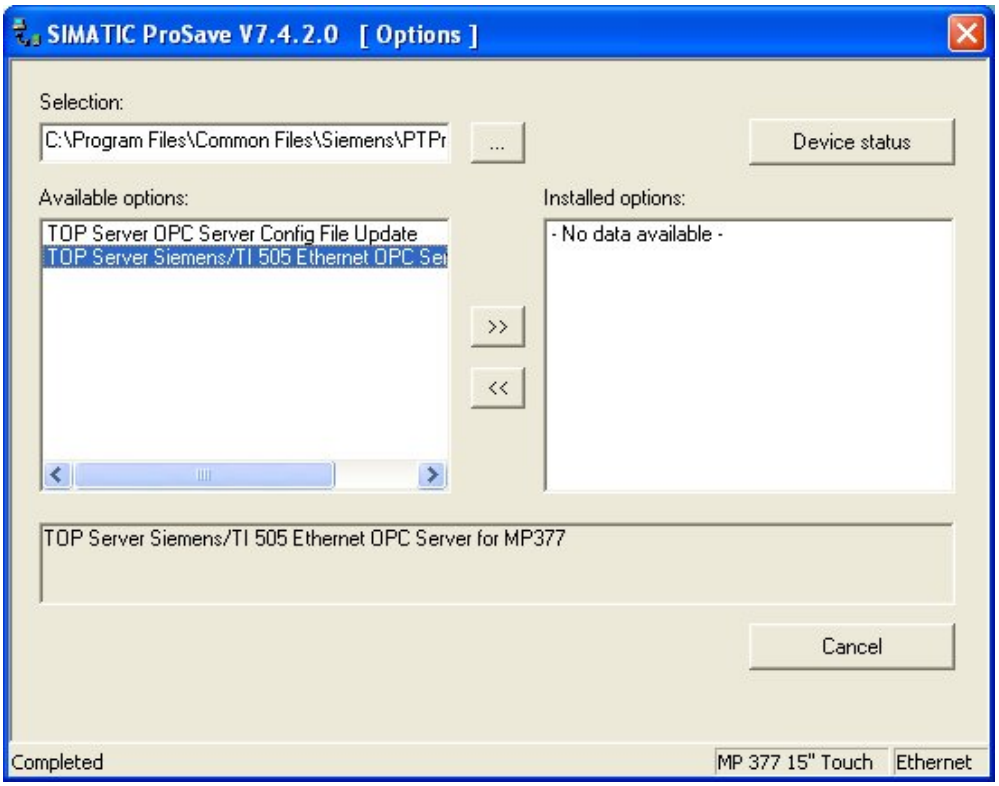
(It is important to note that your Ethernet connection must be configured properly for the network card on the Siemens panel, as well. You must ensure that a valid IP Address is assigned to the Siemens panel, and also that the correct Subnet Mask and Gateway IP Address are configured. Otherwise, communications on the Siemens panel may not be successful.)

Now, open the Project menu again, select Transfer and then Options, as shown below.



This will open the ProSave dialog box, which allows you to browse your computer for files to transfer to your Siemens panel (separate from your WinCC Flexible HMI project).

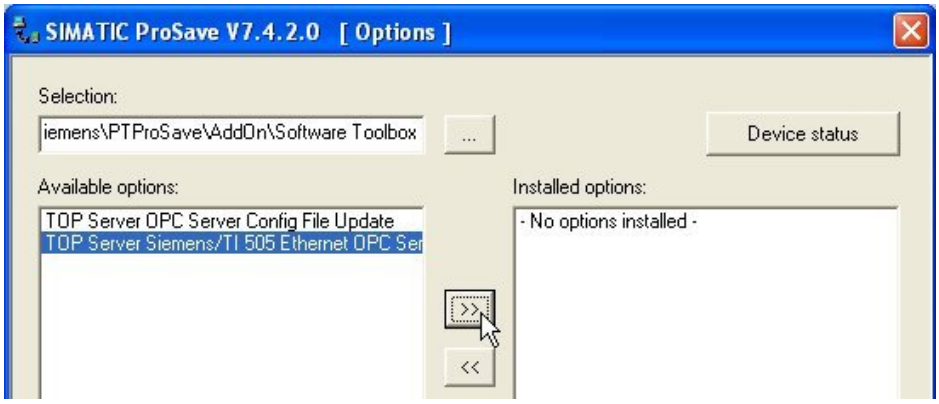
If the browse location does not default to the TOP Server for Siemens Panels installation directory (**C:\Program Files\Common Files\Siemens\PTProSave\AddOn\Software Toolbox**), you will need to click the (…) Ellipses button, then browse and select the correct path, as shown below.



When the correct path is selected, available options will be listed, which will depend on which TOP Server drivers for Siemens panels you have installed. For this example, only a single driver was installed, so there will be two options available: the actual TOP Server Driver/Server and the Config File Update.

For every TOP Server driver you want installed on a given Siemens panel, you will need to perform this transfer process. Prior to any transfer, you must make sure to click the “Transfer” button on the Loader menu on the Siemens panel. After this, click on the Device status button. If no error happens you have a good connection. (If other TOP Server drivers are installed on the panel, they will appear in the “Installed options” list after a Status check.)

Next highlight the OPC Server driver you want to download. The names for all TOP Server OPC Servers in this list will include the driver name and panel type. Click on the >> button to initiate the transfer, as shown below. **Note: Selecting the OPC Server driver option for transfer also transfers the relevant TOP Server configuration files.**



The transfer process will begin and you will see a progress dialog box. After completion, a message telling you the downloaded completed will display, as shown below.

On the Siemens panel, you will be prompted to reboot the panel, which will finish the installation process. The other available option for install, **TOP Server Config File Update**, in the ProSave list is only for updating the TOP Server configuration file when and if you have made changes to your TOP Server project, and should be used if you have already transferred the TOP Server driver to the panel and need to update the project file.

For a configuration file update to be successful the WinCC project can't be running on the Panel and the OPC Test applications must all be shut down on the Panel, with the Transfer button in the Loader menu pressed. If you cycle power on the panel after downloading the configuration, it will insure that the new

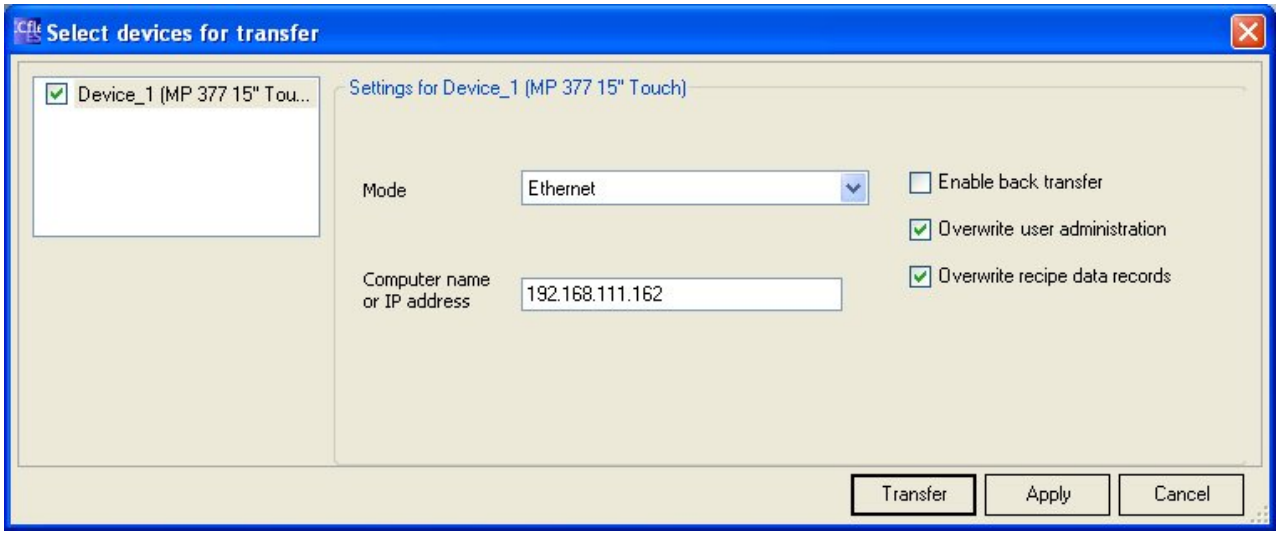
OPC Server project is used by the server. It is critical that the OPC project you create on the desktop for download is saved under the correct name and saved to the correct path.

Once the transfer is complete you can test the configuration and connection to devices using the OPC Quick Client Icon that is installed on the Panel.

There is also an Icon for the license utility installed for licensing the product. Licensing of the driver on the panel is also covered in the TOP Server CE help file version installed by the Siemens Panel version installer.

Transferring the WinCC Flexible Project

The last step is to transfer you WinCC Flexible project to the Siemens panel. We recommend transferring this last because it will automatically launch and try to connect to TOP Server after transfer. To transfer the project, go to the Project menu and select Transfer then Transfer Settings once again to open the transfer settings, as shown below.



Ensure that you have clicked the “Transfer” button in the Loader menu on the Siemens panel. Then, simply click the Transfer button here to begin the transfer process. Depending on the size of your WinCC Flexible project, this transfer could take several minutes.

Once the transfer is complete, your WinCC Flexible project should launch automatically. If your network settings on the Siemens panel are correct and all configuration files were named correctly in the correct locations, you should have successful communications.

Troubleshooting Tips

1. If you cannot successfully transfer to the panel, make sure you can Ping the IP address of the Panel from the PC. You can also launch a command prompt from the Start menu and ping from the Siemens panel.

2. If you get bad quality data:

   - Try transferring the whole OPC server onto the Panel again.
   - Verify the configuration with the OPC Quick Client through browsing.
   - If this is Ethernet communications, verify that the Network Card on the Siemens panel has a valid Subnet Mask and Gateway IP Address configured for communications with your devices on the network.

Contact Us

If you have any questions or are seeking further information and help:

Online Support: http://support.softwaretoolbox.com/

Email Support: support@softwaretoolbox.com

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Fax: +1 (704) 849-6388

Mailing Address: Software Toolbox, Inc. 148A East Charles Street, Matthews, NC, 28105 USA