SuperSystems incorporated

COMPACT HMI AND COMPACT HMI EDITOR

OPERATIONS MANUAL

Super Systems Inc.
7205 Edington Drive
Cincinnati, OH 45249
513-772-0060
Fax: 513-772-9466
www.supersystems.com

Super Systems Inc.
USA Office
Corporate Headquarters:
7205 Edington Drive
Shipping Address:
7245 Edington Drive
Cincinnati, OH 45249
Phone: (513) 772-0060
http://www.supersystems.com

Super Systems Europe
Unit E, Tyburn Trading Estate,
Ashold Farm Road, Birmingham
B24 9QG
UNITED KINGDOM
Phone: +44 (0) 121 306 5180
http://www.supersystemseurope.com

Super Systems México
Sistemas Superiores Integrales S de RL de CV
Acceso IV No. 31 Int. H Parque Industrial
Benito Juarez
C.P. 76120 Queretaro, Qro.
Phone: +52 442 210 2459
http://www.supersystems.com.mx

Super Systems China
No. 369 XianXia Road
Room 703
Shanghai, CHINA
200336
Phone: +86 21 5206 5701/2
http://www.supersystems.cn

Super Systems India Pvt. Ltd.
A-26 Mezzanine Floor, FIEE Complex,
Okhla Indl. Area, Phase – 2
New Delhi, India 110 020
Phone: +91 11 41050097
http://www.supersystemsindia.com

Table of Contents

Introduction

Compact HMI is a software platform that allows you to create customized HMI screens using an application called **Compact HMI Editor.** A programmed HMI screen can contain a graphical display of equipment, graphical display of process data, and objects used for interaction with equipment. These screens can then be run on a compatible touch screen that works with Super Systems Inc. (SSi) 9000 Series controllers. The touch screen application from SSi that provides the framework for running customized HMI screens is **Compact HMI.**

Compact HMI can handle communications via the Allen-Bradley DF1, Modbus TCP, and Modbus RTU communication protocols. Using Allen-Bradley DF1, for example, with the touch screen connected to a compatible data device (such as a MicroLogix 1400 PLC via an RS-232 serial connection), Compact HMI can perform I/O operations with the data device and can access register values within the data device. Design tools within Compact HMI Editor allow you to program evaluations of register values and design multiple panels for use by the operator.

Figure 1 illustrates the components that make up a Compact HMI system.

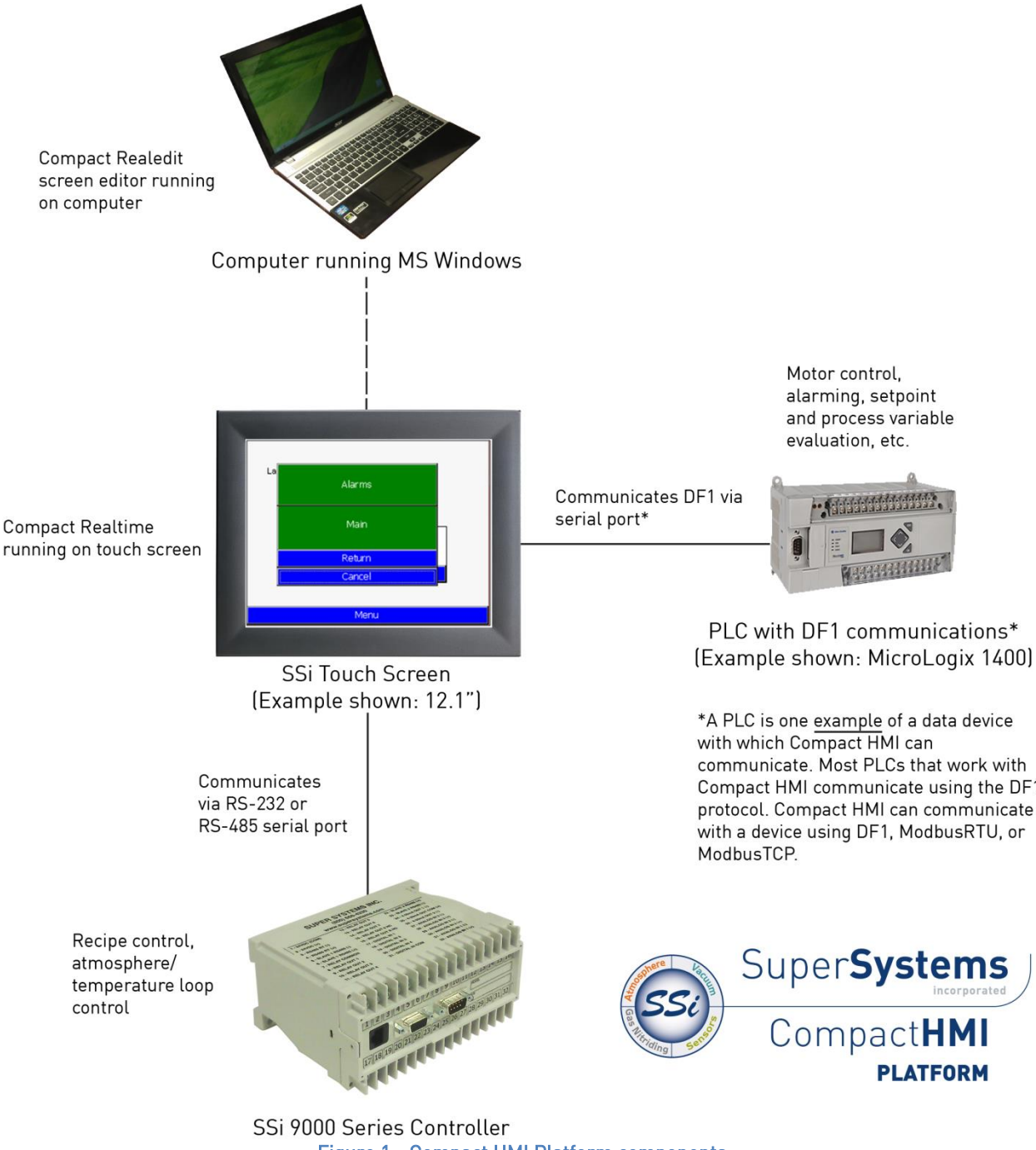


Figure 1 - Compact HMI Platform components

Compact HMI Editor

Installation

Prerequisites

Compact HMI Editor has prerequisites that must be fulfilled in order for the program to run properly. These include:

- A computer with Windows XP, Vista, 7, or 8
- Microsoft .NET Framework 3.5. Compact HMI Editor setup will install this package if it is not already present on the computer where Compact HMI Editor is being installed (see Figure 4). Version 3.5 is required.

In order to use the screen you create with Compact HMI Editor, you need a Super Systems touch screen with Compact HMI. Refer to the "Use with Compatible Touch Screens" section for more details.

Installation Procedure

Insert the Compact HMI Editor installation media into the USB port, CD/DVD drive, or other proper location. Open Windows Explorer and browse to the folder containing the Compact HMI Editor installation files. You will see installation files like those shown in Figure 2.

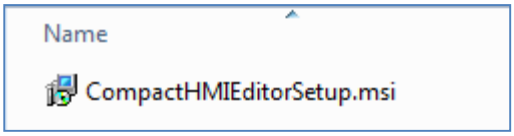


Figure 2 - Example Installation Files

Double click on the "CompactHMIEditorSetup.msi" file.

If Microsoft .NET Framework 3.5 is installed, the Setup Wizard will appear (Figure 3). If .NET Framework 3.5 is not installed, the Setup Wizard will first prompt you to install .NET Framework 3.5 (Figure 4). .NET Framework must be installed before Compact HMI Editor is run. An Internet connection is needed in order to download the required files for .NET Framework 3.5.

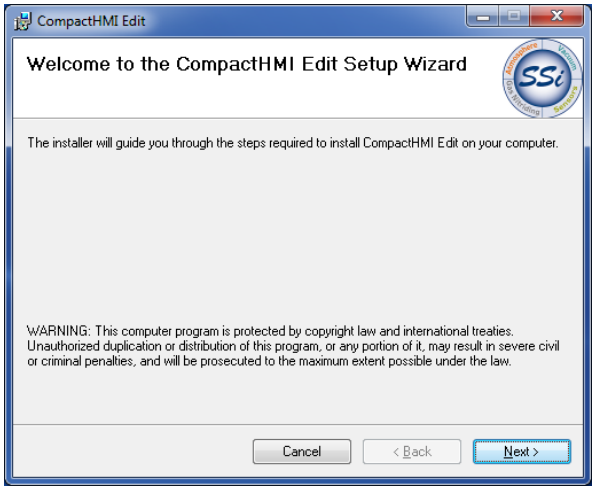


Figure 3 - Compact HMI Editor Setup Wizard screen

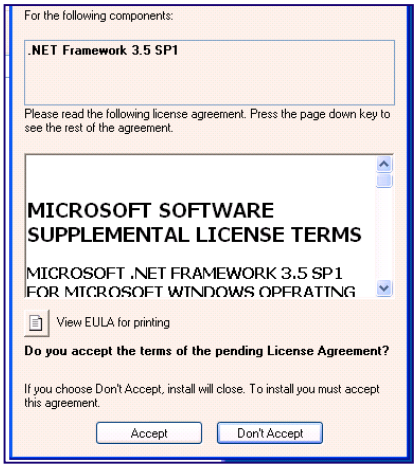


Figure 4 - .NET Framework 3.5 Setup Screen (will appear if needed)

The installation URL for .NET Framework 3.5 is http://www.microsoft.com/en-us/download/details.aspx?id=21, if for some reason it cannot be installed properly using the Setup Wizard.

When ready to proceed with installation of Compact HMI Editor, click the Next button on the first screen of the Setup Wizard. The screens below show typical screens that will appear in a Compact HMI Editor installation (Figure 5).

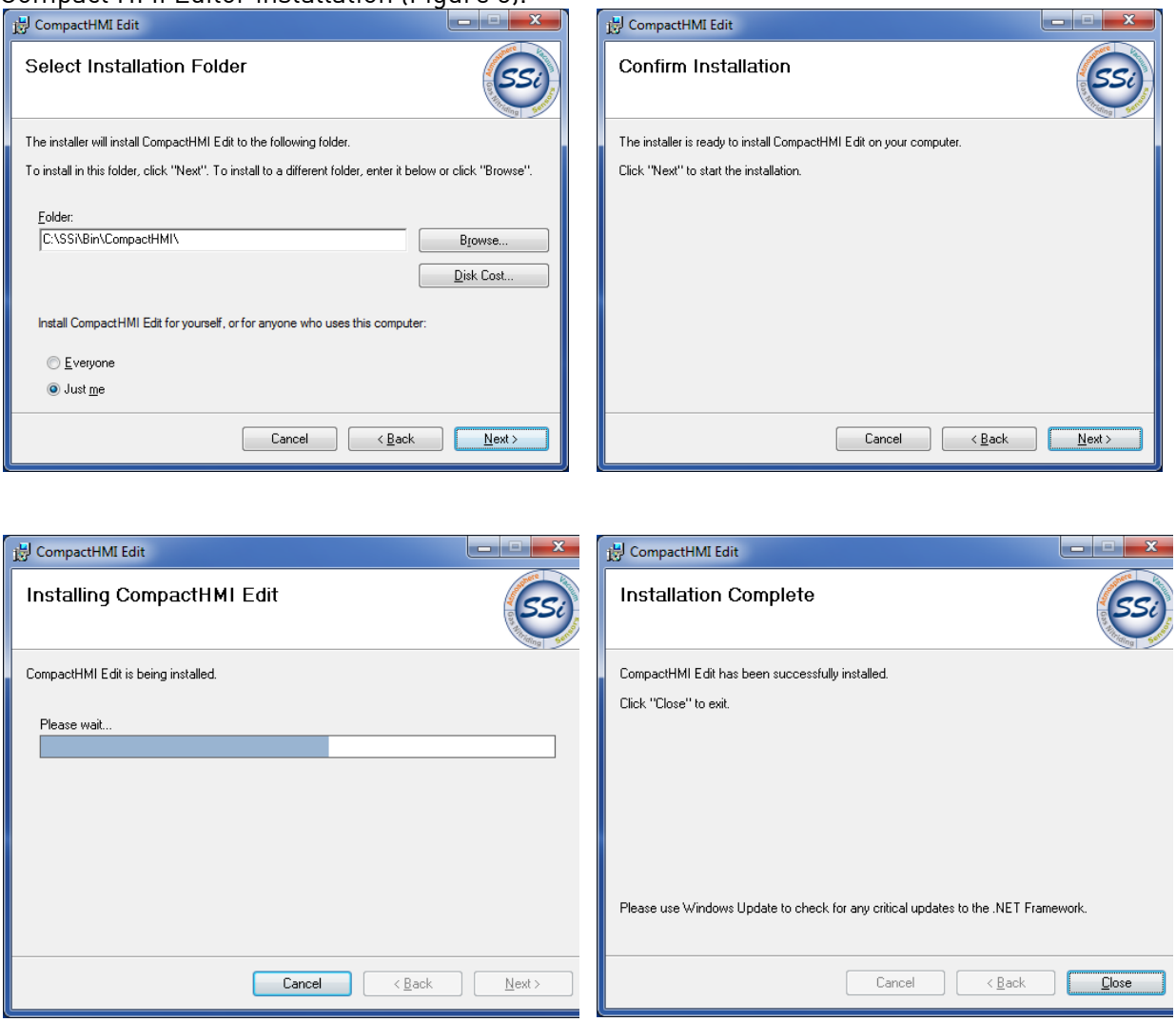


Figure 5 - Compact HMI Editor Setup Screens (in succession)

Once Compact HMI Editor is installed, you may begin using it.

Solution Overview

A **Solution** is a collection of files that will be translated into a complete HMI during runtime. Each screen within a solution is called a **Panel.** Each Panel represents individual screens accessible via the touch screen. Therefore, a Solution can also be defined as a collection of HMI Panels.

Compact HMI Editor creates display files for each Panel. When Compact HMI Editor is first started, it will load a new Solution. You will be able to add Panels to the Solution.

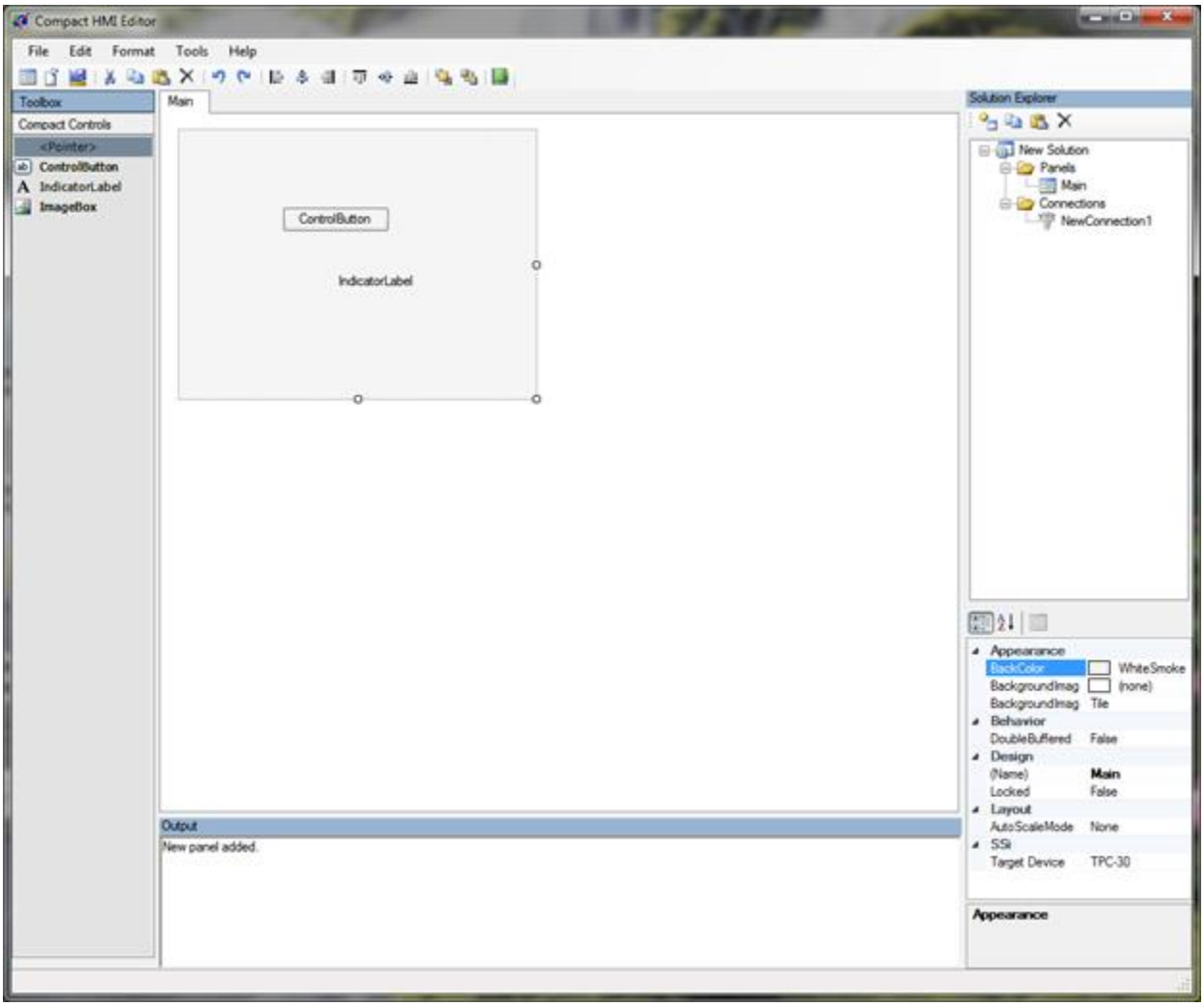


Figure 6 - Compact HMI Editor Design Environment

Panels

You can add a **Panel** by using **File → New → Panel** or right clicking on the **Solution** name in the Solution Explorer in the upper right part of the screen and selecting Panel. The Panel will serve as a container for your display and command controls. Each Panel can have independent communication setups and basic visual properties. Compact HMI communicates with a data device using Allen-Bradley DF1, Modbus RTU, and Modbus TCP communications.

The most common settings to be modified on the Panel are the BackgroundImage and BackColor (under Appearance) and the Target Device (under the SSi grouping). The Target Device can be modified at the Panel level. The Panel size should match the resolution of the target screen, which is determined by the Target Device selection.

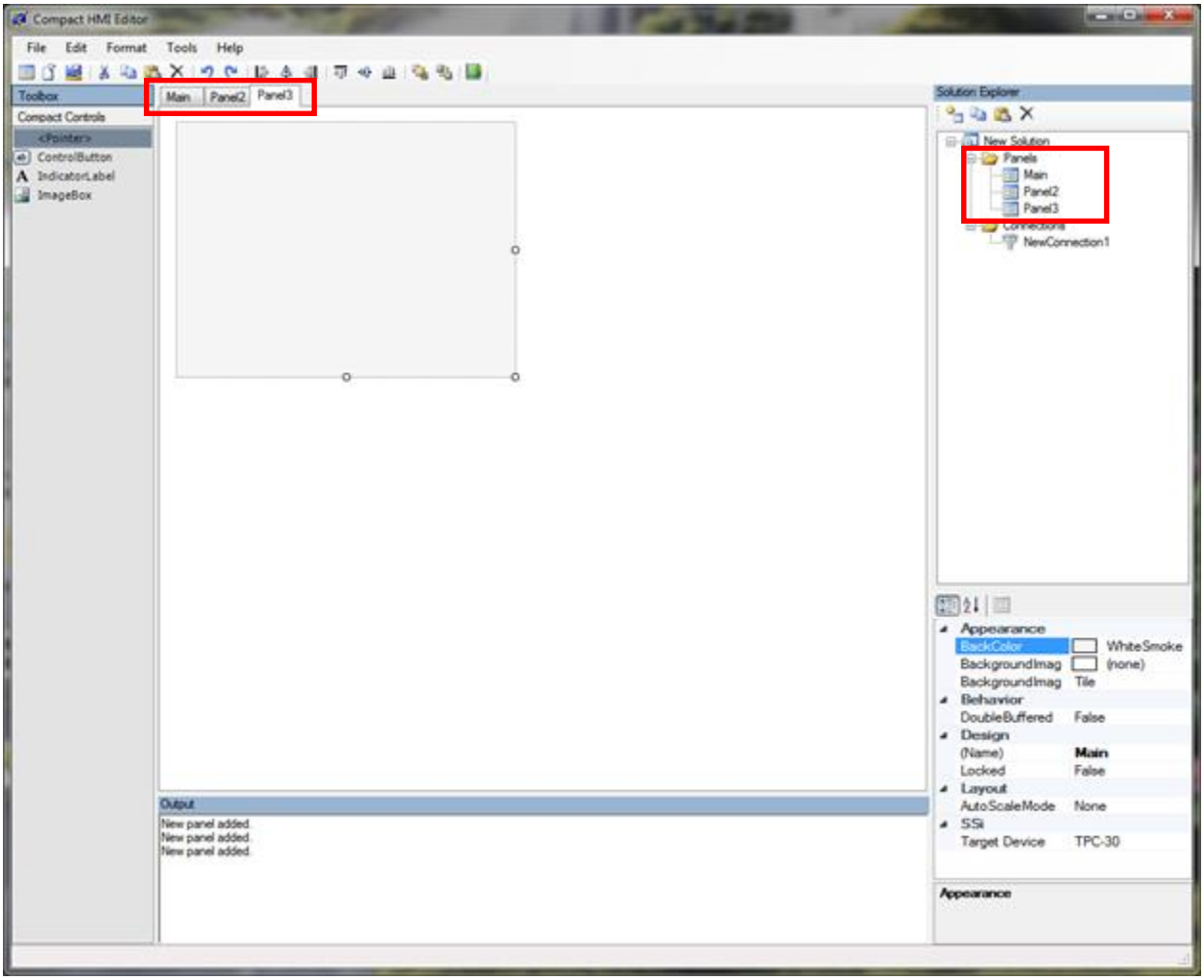


Figure 7 - Design Environment with Panels Added

Figure 7 shows a Design Environment view with multiple Panels. On the bottom right is a view of the Panel's properties.
NOTE: The first Panel created is called "Main" by default. You may change the name of this Panel (or any others) as you wish. See Table 1 for descriptions of Panel properties and an example properties grid in Figure 8.

Remember that Panels can be arranged in the order in which you want them to appear in Compact HMI on the touch screen. To reorder Panels, simply click and drag each tab into the order in which you wish it to appear.

Appearance	
BackColor	The background color of the Panel
BackgroundImage	The background image used for the Panel
BackgroundImageLayout	The layout used for the background image. Possible settings are: • None: Image will be applied with no changes to its appearance. • Tile: Image will be tiled multiple times in the background (the smaller the image's dimensions, the more frequently it will appear). • Center: The image will be centered in the background. • Stretch: The image will be stretched to fit the background area. • Zoom: The image will be enlarged within the background area. Note that the visible part of the image will appear larger than it otherwise would.
Behavior	
DoubleBuffered	*Do not change this setting.*
Design	
(Name)	Identifies the name used in code to identify the object
Locked	Determines whether the control can be moved or resized
Layout	
AutoScaleMode	Determines how the form or control will scale when screen resolution or fonts change
SSi	
See the "SSi Options" section below.	

Table 1 - Panel properties

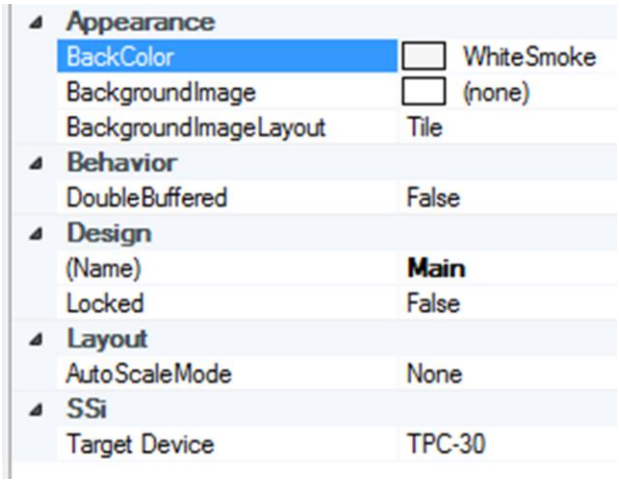


Figure 8 - Panel properties grid

SSi Options

<u>The active panel must be selected for this to be visible.</u> If a control object is currently selected, for example, the options will not be visible. Figure 9 shows what the options look like in the Design View.

Figure 9 - SSi Options

Target Device: The touch screen device model on which the Compact HMI will be running. Models can be selected from a drop-down list. Typically, the models will start with "TPC-" and end in a number, sometimes followed by one or more letters.

- If the model starts with "TPC-3," the screen size is usually 3.5".
- If the model starts with "TPC-6", the screen size is usually 5.7".
- If the model starts with "TPC-12", the screen size is usually 12.1".
- If the model starts with "TPC-15", the screen size is usually 15.1".
- Finally, if the model starts with "TPC-17", the screen size is usually 17.1".

This setting will determine the size of each panel in the Solution and is extremely important. An incorrect setting will result in the panels being rendered incorrectly—or not being rendered at all—on the touch screen.

Contact SSi at (513) 772-0060 for help with setting up these options.

Tags (Tag Management)

Compact HMI Editor includes a database framework that allows you to associate connections with tags and tags with register locations. Each connection is identified by a user-defined name along with relevant connection details. Each tag is associated with a 16-bit word register. All of the connection, tag, and register data is contained in a "tags database" that Compact HMI maintains. This approach allows you to configure Compact HMI to access data in a straightforward and organized fashion.

To access the tags database, click on **Tools → Tags** (Figure 10) in the Compact HMI Editor main window.

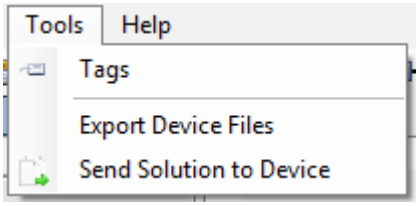


Figure 10 - Tag Management

The Tag Management window will appear (Figure 11). In the example screen shot in Figure 11, the window is populated with connection, tag, and bit data. More information is provided in this section on how to configure connection, tag, and bit settings.

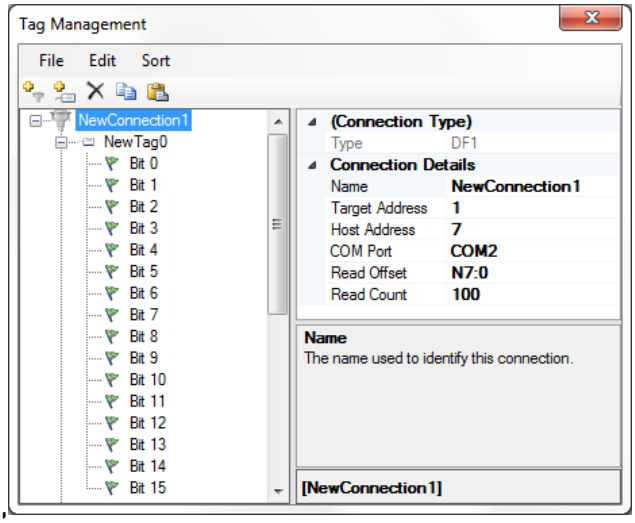


Figure 11 - Tag Management window

In the Tag Management window, you can perform several actions:

- Create a new connection name and define the connection parameters;
- Create a new tag under a connection name and associate it with a register location;
- Name tags and register bits associated with tags by using specific designations such as *Input*, *Output*, and *Alarm*;
- Identify bits that are associated with a bit alarm;
- Filter tags by search string (partial strings are okay); and
- Remove existing connections, tags, and bit definitions.

In the Tag Management window, the File menu provides these options: **Add Connection, Add Tag,** and **Close**. Select **Add Connection** to add a new connection, **Add Tag** to add a new tag, and **Close** to close the Tag Management window.

Connection properties are first defined in the New Connection window (Figure 12). The parameters that must be set are as follows:

For Allen-Bradley DF1 Connections

(Example: Figure 12)

- Connection Type: The protocol used for communication between Compact HMI and the data device. Available settings are DF1, ModbusRTU, and ModbusTCP.
- Connection Name: The user-defined name for the Connection. *Recommended:* Use a Connection Name that can be easily associated with the data device and register locations from which Compact HMI will be reading and writing data.
- Host Address: The address of the touch screen. Normally, this setting can be kept as the default.
- Target Address: The address of the data device. Normally, this setting can be kept as the default.
- COM Port: The COM (serial) Port with which the Compact HMI touch screen will be connected to the data device. This must match the actual COM Port on which the serial cable is connected to the touch screen.
- Read Offset: The register address where Compact HMI starts reading. This must be defined to the word level within the data device.

  The default COM Port is COM 2. Some touch screens may have only one COM Port. In such a case, COM 1 will need to be used for the data device connection, and an Ethernet connection will need to be used for the SSi 9000 Series controller.

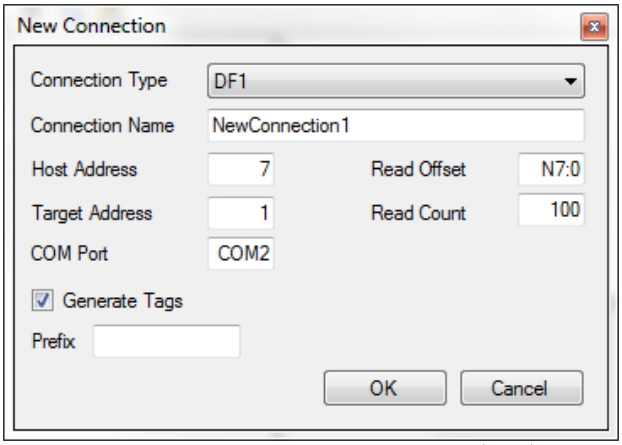


Figure 12 – New Connection window (DF1)

- Read Count: The default number of registers, starting with the Read Offset, that will be read. The default is 100. This value must not exceed the number of registers actually defined within the data device.

Generate Tags checkbox: When checked, this checkbox will cause tags to be generated. The tags generated will be based on the Read Offset and Read Count defined in this menu. For example, with default settings, the tags generated will start "N7:0" and end "N7:99". Bits will be created for each tag as well (Bit 0 through Bit 15).

Prefix Tag: When tags are generated, they are numbered sequentially. The prefix is added to the number. For example, if the text "PLC" is entered in the Prefix Tag field, the resulting tags would be named "PLC1", "PLC2", "PLC3", and so on.

For ModbusRTU Connections

(Example: Figure 13)

- Host Address: The address of the touch screen. Normally, this setting can be kept as the default.
- Target Address: The address of the data device. Normally, this setting can be kept as the default.
- COM Port: The COM (serial) Port with which the Compact HMI touch screen will be connected to the data device. This must match the actual COM Port on which the serial cable is connected to the touch screen.

  The default COM Port is COM 2. Some touch screens may have only one COM Port. In such a case, COM 1 will need to be used for the data device connection, and an Ethernet connection will need to be used for the SSi 9000 Series controller.
- Read Offset: The register address where Compact HMI starts reading. This must be defined to the word level within the data device.
- Read Count: The default number of registers, starting with the Read Offset, that will be read. The default is 100. This value must not exceed the number of registers actually defined within the data device.

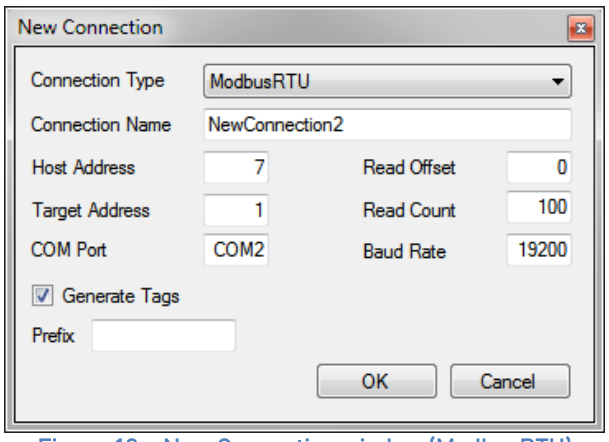


Figure 13 – New Connection window (ModbusRTU)

- Baud Rate: The rate (in units per second) at which communications bits are sent between the touch screen and data device. The default is 19200.

Generate Tags checkbox: When checked, this checkbox will cause tags to be generated. The tags generated will be based on the Read Offset and Read Count defined in this menu. For example, if the Read Offset is 0 and the Read Count is 100, the tags generated will be named Tag0, Tag1, and so on, through Tag99.

Prefix Tag: When tags are generated, they are numbered sequentially. The prefix is added to the number. For example, if the text "PLC" is entered in the Prefix Tag field, the resulting tags would be named "PLC1", "PLC2", "PLC3", and so on.

For ModbusTCP Connections

(Example: Figure 14)

- IP Address: The IP address of the data device.
- Port: The port number on the data device through which the data device will exchange data.
- Read Offset: The register address where Compact HMI starts reading. This must be defined to the word level within the data device.
- Read Count: The default number of registers, starting with the Read

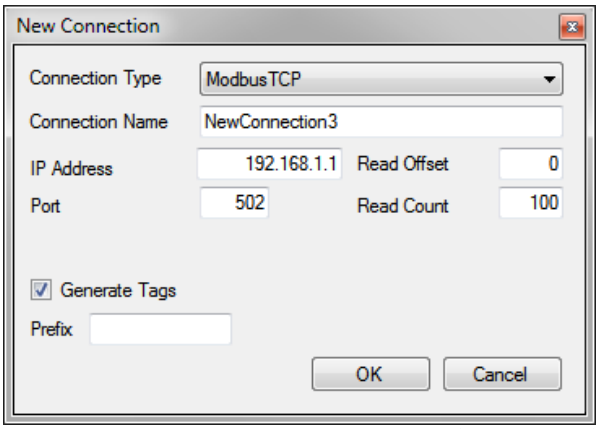


Figure 14 – New Communications Window (ModbusTCP)

Offset, that will be read. The default is 100. This value must not exceed the number of registers actually defined within the data device.

Generate Tags checkbox: When checked, this checkbox will cause tags to be generated. The tags generated will be based on the Read Offset and Read Count defined in this menu. For example, if the Read Offset is 0 and the Read Count is 100, the tags generated will be named Tag0, Tag1, and so on, through Tag99.

Prefix Tag: When tags are generated, they are numbered sequentially. The prefix is added to the number. For example, if the text "PLC" is entered in the Prefix Tag field, the resulting tags would be named "PLC1", "PLC2", "PLC3", and so on.

Connection types can be changed after a connection is defined. To do this, right click on the Connection Name, select "Change Connection Type", and select the Connection Type desired. See an example in Figure 15.

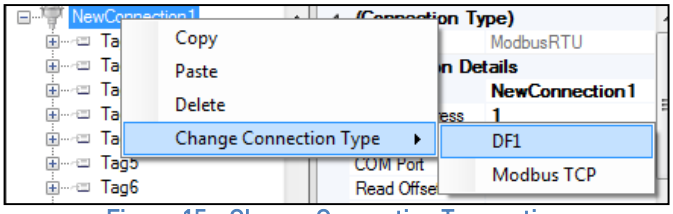


Figure 15 - Change Connection Type option

The Edit menu allows you to copy an existing connection or tag with all of its properties and bit settings. Do this by first selecting the item you want to copy, then click **Copy** in the Edit menu, and then click **Paste** in the Edit menu. The new (copied) item will be added to the tags list as "*ItemName* – Copy(*number*)". Using the Edit menu's **Delete** option, you can remove an item. Finally, using the **Find & Replace** option, you can direct Compact HMI Editor to search for a specific string of text in tag names and replace that text names with text that you enter.

The Sort menu allows you to order connection names and tags alphabetically (by name) or by address (in the case of tags, that is the register address associated with the tag). Sorting can be performed in ascending or descending order.

Using the tag properties grid, you can name the tag set and address offset, and enter a brief description. See Figure 16.

The default name of the tag will be "NewTag*x*", where *x* is a sequential number. The Address Offset will be applied to the Data Offset previously assigned to the Panel. For example, referring to Figure 9 and Figure 16, if a Data Offset of N7:0 and Address Offset of 4 are defined, the actual register being evaluated will be N7:4.

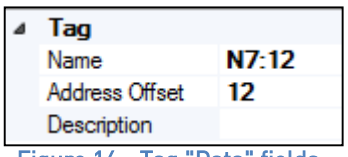


Figure 16 - Tag "Data" fields

Each register is made up of 16 bits. The bits are numbered 0 through 15. Compact HMI Editor allows you to name each bit, add a brief description, and identify whether the bit is an alarm bit (see Figure 17).

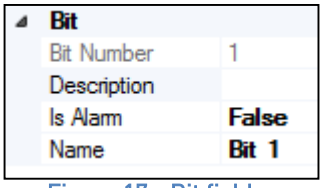


Figure 17 - Bit fields

If "Is Alarm Bit" is set to False, Compact HMI will not identify the bit as an alarm bit; if "Is Alarm Bit" is set to True, then Compact HMI will identify the bit as an alarm bit. The default setting for this field is False. *This feature is intended for future use.*

Once configured, tags are used with Compact HMI's control objects to help determine display conditions and other characteristics of a control system.

Please refer to Appendix 1: Software Best Practices, "When Configuring Connections and Tags in Compact HMI Editor," for information on best practices for configuring connections and tags in Compact HMI Editor.

Expression Editor

The Expression Editor is used in conjunction with two Control properties: Display Expression and Display Conditions. The Expression Editor will be displayed when Display Expression or Display Conditions is selected (for example, from the Control Properties Grid).

NOTE: Some Display Conditions (described in more detail below) and the Expression Editor utilize Tags.

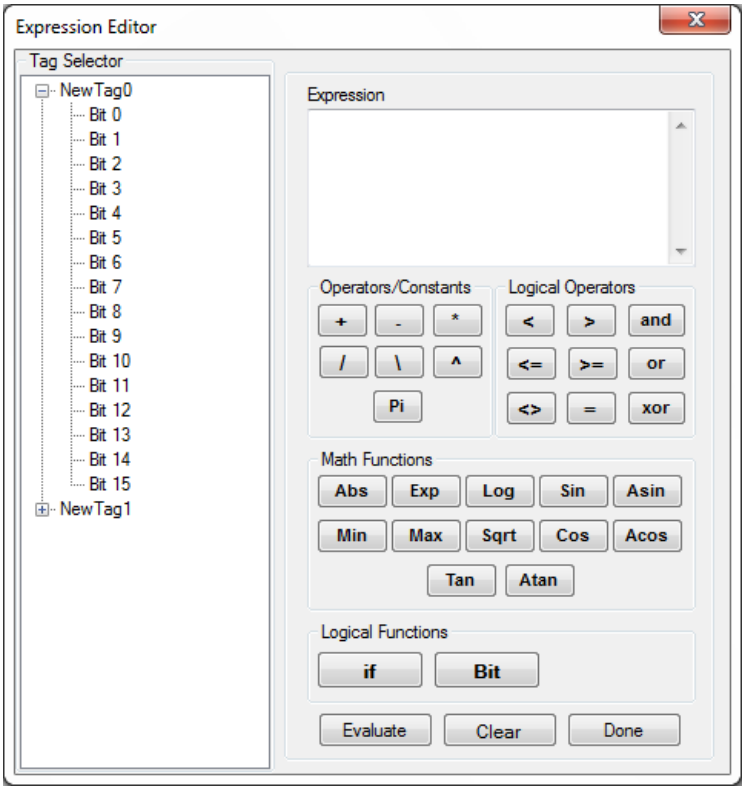


Figure 18 - Expression Editor window

Expression Operators, Constants, and Functions

Tag names identify register locations within a data device. Each register is constituted by a word containing 16 bits. Compact HMI Editor provides ways of evaluating values contained within data device registers against values defined by the user. In order to program valid expressions, it is important to understand the expression syntax used in Compact HMI.

A **Tag** can be called using the following syntax:
`Tag("[ConnectionName]TagName")` where *ConnectionName* is the name of a defined connection and *TagName* is the name of a defined Tag within that connection.

A particular **bit** can be called according to one of the following two syntaxes:

1. `Tag("[ConnectionName]TagName.BitName")` where *ConnectionName* is the name of a defined Connection, *TagName* is the name of a defined Tag within that connection, and *BitName* is the name of a defined bit within the register represented by *TagName*.
2. `Bit(BitNumber,Tag("[ConnectionName]TagName"))` where BitNumber is the number of a bit (0 to 15) within the register represented by *TagName* that is part of the connection *ConnectionName*.

In most cases, Tags and bits will be called for the purpose of:

1. Calculating a value, which will typically be displayed and sometimes scaled before being displayed; or
2. Evaluating a condition as True or False.

Table 2 provides details on the operators, constants, and functions that can be used in Compact HMI Editor; the purpose of each; and examples of how they may be used in a valid expression.

Operator/Constant/ Function	Purpose	Examples of Use in Valid Expression
Operators and Constants		
+	Performs an addition	Tag("[Connection1]N7:0") + 15
-	Performs a subtraction	Tag("[Connection1]N7:0") - 15
*	Performs a multiplication	Tag("[Connection1]N7:0") * 15
/	Performs a division and keeps the decimal value (division)	Tag("[Connection1]N7:0") / 15 Note: 3/2 returns 1.5
\	Performs a division and drops the decimal value (modulus)	1 / Tag("[Connection1]N7:1") Note: 3\2 returns 1
^	Performs an exponential calculation (calculates a number raised to a certain power)	Tag("[Connection1]N7:0") ^ 3 3^3
Pi	Returns the value of Pi, which is the ratio of the circle's circumference to its diameter	Pi + Tag("[Connection]N7:0") Note: Pi by itself returns 3.14159265358979
Logical Operators		
<	Less than	Tag("[Connection1]N7:0") < Tag("[Connection1]N7:1")
>	Greater than	Tag("[Connection1]N7:0") > 1
And	Inclusive of more than one condition	(Tag("[Connection1]N7:0") < 10) and (Tag("[Connection1]N7:0") > 5)
<=	Less than or equal to	Tag("[Connection1]N7:0") <= 3
>=	Greater than or equal to	Tag("[Connection1]N7:0") >= 3
Or	Inclusive of either/or condition	(Tag("[Connection1]N7:0") < 1) or (Tag("[Connection1]N7:3") > 14)
<>	Not equal to	Tag("[Connection1]N7:0") <> Tag("[Connection1]N7:1")
=	Equal to	Tag("[Connection1]N7:0.1") = 0

Operator/Constant/ Function	Purpose	Examples of Use in Valid Expression
Xor	Inclusive of one condition, exclusive of a second condition	(Tag("[Connection1]N7:0") <= 15) xor (Tag("[Connection1]N7:0") = 5)
Math Functions		
Abs	Absolute value	Abs(Tag("[Connection1]N7:0"))
Exp	Calculates base *e* raised to a specified power	Exp(Tag("[Connection1]N7:0")) Note: Exp(3) calculates e to the power of 3
Log10	Base 10 logarithm	Log10(Tag("[Connection1]N7:0")) Log10(100) returns 2
Sin	Sine (trigonometric)	Sin(Tag("[Connection1]N7:0"))
Asin	Arcsine or inverse sine (trigonometric)	Asin(Tag("[Connection1]N7:0"))
Min	Minimum	Min(Tag("[Connection1]N7:0"),Tag("[Connection1]N7:1"), Tag("[Connection1]N7:2"),Tag("[Connection1]N7:3"))
Max	Maximum	Max(Tag("[Connection1]N7:0"),Tag("[Connection1]N7:1"), Tag("[Connection1]N7:2"),Tag("[Connection1]N7:3"))
Sqrt	Square root	Sqrt(Tag("[Connection1]N7:1"))
Cos	Cosine (trigonometric)	Cos(Tag("[Connection1]N7:1"))
Acos	Arccosine or inverse cosine (trigonometric)	Acos(Tag("[Connection1]N7:1"))
Tan	Tangent (trigonometric)	Tan(Tag("[Connection1]N7:1"))
Atan	Arctangent or inverse tangent (trigonometric)	Atan(Tag("[Connection1]N7:1"))
Logical Functions		
If	Returns a value of TRUE or FALSE Syntax: `If(condition,return_if_true,return_if_false)`, where condition is the condition evaluated, `return_if_true` is the value returned if the condition is true, `return_if_false` is the value returned if the condition is false)	If(Tag("[Connection1]N7:0")<Tag("[Connection1]N7:1"),1,0) Note: If(2<3,1,0) returns 1

Table 2 - Expression Operators, Constants, and Functions in Expression Editor

Display Conditions

Display Conditions determine display elements for control objects by using the results of evaluated expressions. The display conditions are found in the properties grid for controls. You can also bring up the display conditions by double clicking on the control object for which you want to set the display conditions.

NOTE: Some Display Conditions and the Expression Editor (described in more detail above) utilize Tags.

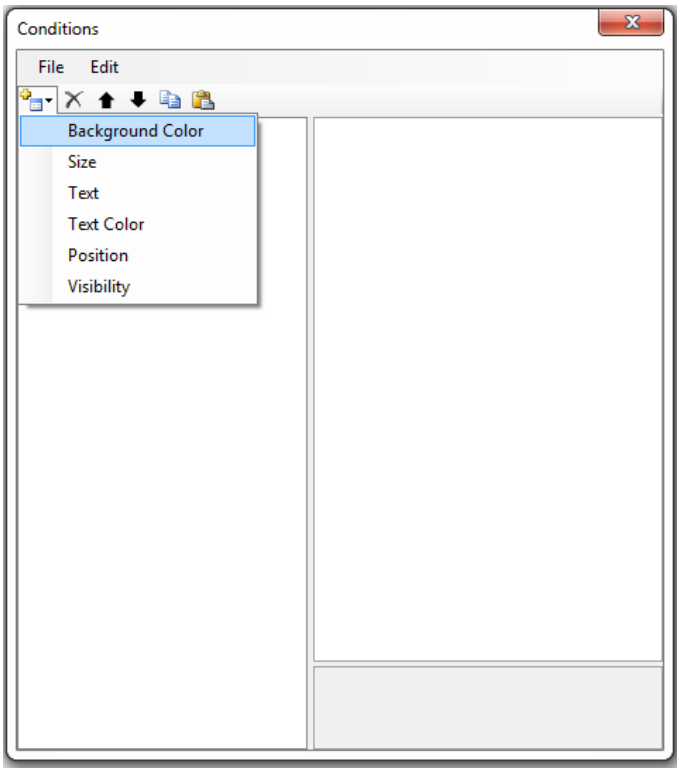


Figure 19 - Display Conditions window

Figure 19 shows the base window that appears when Display Conditions are opened. Note the expanded list of options shown below the  (**Add Condition**) button. You can also access these options from the **File → Add Condition** menu selection. Both show the categories of display conditions that can be applied to a control based on evaluations described in "Expression Editor". These categories are as follows:

- **Background Color** affects the background color of the control.
- **Position** affects the position of the control.
- **Size** affects the size of the control.
- **Text** affects the text displayed within the control.
- **Text Color** affects the color of the text displayed within the control.
- **Visibility** affects whether the control is visible (true) or not (false).

Once you have added a condition, Compact HMI Editor will create a category for the condition, as shown in Figure 20. The number of conditions in each category will be the total number of conditions that have been added to that category. Each condition will have the name of the category to which the condition applies until you change the condition's name, as described below.

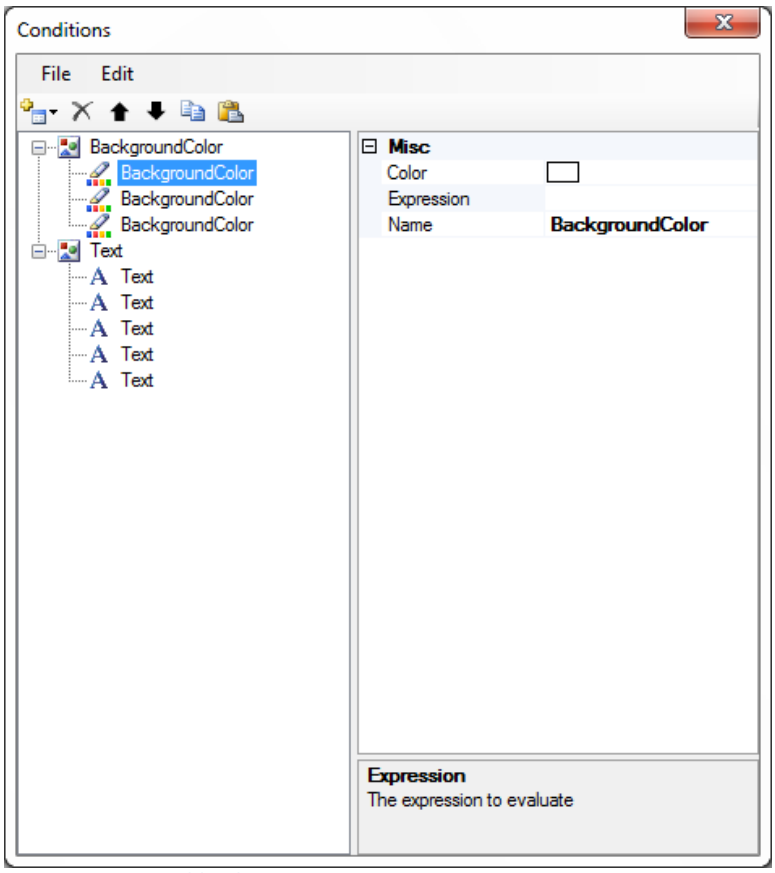


Figure 20 - Conditions window with conditions added

To change the name of the condition, click on the name of the condition shown in the "Name" field of the property grid (Figure 21).

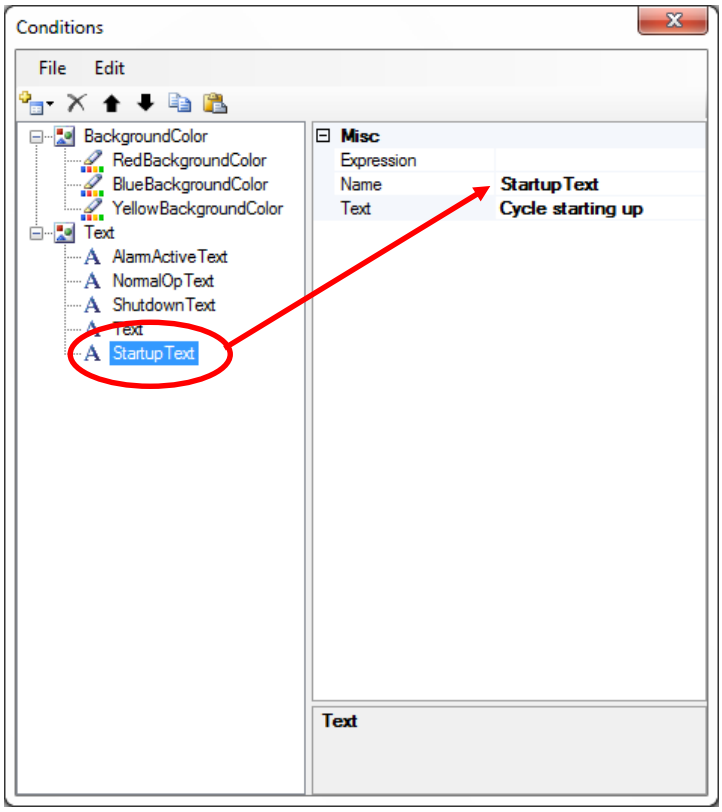


Figure 21 - Changing condition name

The "Text" field contains the text that will be displayed when the condition is applied.

The "Expression" field determines whether the condition is true or false, in this case. Setting up an expression is described in "Expression Editor".

To delete a condition, simply right click on the condition in the list on the left bar, and then click **Delete** (Figure 22), or use the "X" ( ) button.

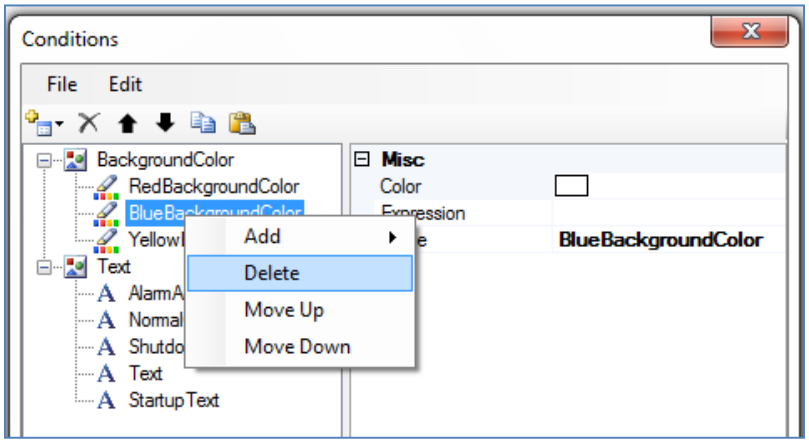


Figure 22 - Delete option

How Conditions are Prioritized

Compact HMI will evaluate each condition in a linear order—from top to bottom as each condition appears in the list of conditions in Compact HMI Editor. To change the priority of a condition, simply use the arrow buttons (and) or right click on the condition whose priority you want to change and click "Move Up" or "Move Down" as needed.

As conditions are evaluated as true or false, the following rules will be applied:

- When a condition is false, no action will be taken.
- When a condition is true, the action associated with that condition will be implemented.
- When more than one condition in a single category is true, the last condition that is true will be the condition whose associated action is implemented.
- When all of the conditions in a single category are false, the setting associated with that category will be set to the default.

Consider the following cases.

The examples below could apply to a number of scenarios. For illustration, assume that Compact HMI controls were developed for a batch furnace. When designing the HMI, the interface designer wanted to make sure that the control clearly indicates conditions such as running and alarm states so that the operator is aware of the those states. The following are programmed conditions that were evaluated as true or false by Compact HMI and how those evaluations affect the actions taken within a condition category on the control.

Case 1: All Conditions Are Evaluated as True

In the first example, a control's background color is changed based on running conditions of the furnace. RedBackgroundColor, BlueBackgroundColor, and YellowBackgroundColor are true. However, the YellowBackgroundColor action will be the one implemented and seen by the user; the reason for this is that YellowBackgroundColor occurs after the other two in the list of conditions. If RedBackgroundColor should take priority over BlueBackgroundColor and YellowBackgroundColor, RedBackgroundColor should be moved so that it occurs after the other two in the list.

Category	Condition Name	Order of Evaluation within Category	Condition	True or False	Result
Background Color	RedBackgroundColor	First	Machine is in alarm state	True	Background color implemented
Background Color	BlueBackgroundColor	Second	Machine is running	True	Background color implemented
Background Color	YellowBackgroundColor	Third	Machine is not running	True	Background color implemented

Table 3 - Example of Condition Evaluation (All True)

Case 2: At Least One Condition Is Evaluated as True, the Others as False

In this example, text displayed in a control changes based on whether an alarm state is present, the furnace is running normally with no alarms, the furnace is shut down, or the furnace is starting up. In the case of the Text category, AlarmActiveText is true; therefore, text programmed for the AlarmActiveText condition will be the text shown. Compact HMI evaluated the remaining Text conditions and found them to be false. Therefore, even though AlarmActiveText occurs first in the Text category, it will still be the

condition whose text is displayed on the control. This does not change until (A) AlarmActiveText is evaluated as false or (B) one of the conditions following AlarmActiveText is evaluated as true.

Category	Condition Name	Order of Evaluation within Category	Condition	True or False	Result
Text	AlarmActiveText	First	One or more alarms are on	True	Alarm text displayed
Text	NormalOpText	Second	Machine is running with no alarms	False	No change
Text	ShutdownText	Third	Machine is shut down	False	No change
Text	StartupText	Fourth	Machine is starting up	False	No change

Table 4 - Example of Condition Evaluation (At Least One True, Others False)

Case 3: All Conditions Are Evaluated as False

The HMI programmer wants a control to be visible when a heating cycle is running and the user wants to manually control the cycle's output; this is the default setting for the control. The HMI programmer set up the control so that the control will not be visible when either the heating cycle is not running or the furnace is in Auto (non-manual) mode. In this case, the heating cycle is running and the machine is not in Auto mode. Both conditions in the Visibility category are evaluated as false; therefore, the default action (to display the control) is taken.

Category	Condition Name	Order of Evaluation within Category	Condition	True or False	Result
Visibility	HeatModeOff	First	The heating cycle is not running	False	No change
Visibility	AutoModeOn	Second	The machine is in Auto mode (output cannot be manually adjusted)	False	Control is displayed

Table 5 - Example of Condition Evaluation (All False)

Tag Usage

The purpose of the Tag Usage window is to help identify how tags are used within a Compact HMI Solution. Tags fit into one of three usage categories:

1. **In Use:** The tag is defined and is used within the current Solution.
2. **Unused:** The tag is defined and is not used within the current Solution.
3. **Orphaned:** A tag is referenced in the current Solution, but it is not defined. An orphaned tag must be defined, replaced, or removed from the Solution before the Solution can be deployed.

Each time a tag is used in a control within the current Solution, that tag will be shown in the list. Tags are defined in the Tag Management window. See the Tags (Tag Management) section on page 12 for more details.

Figure 23 below shows the layout of the Tag Usage window. Following that is a description of the window's features.

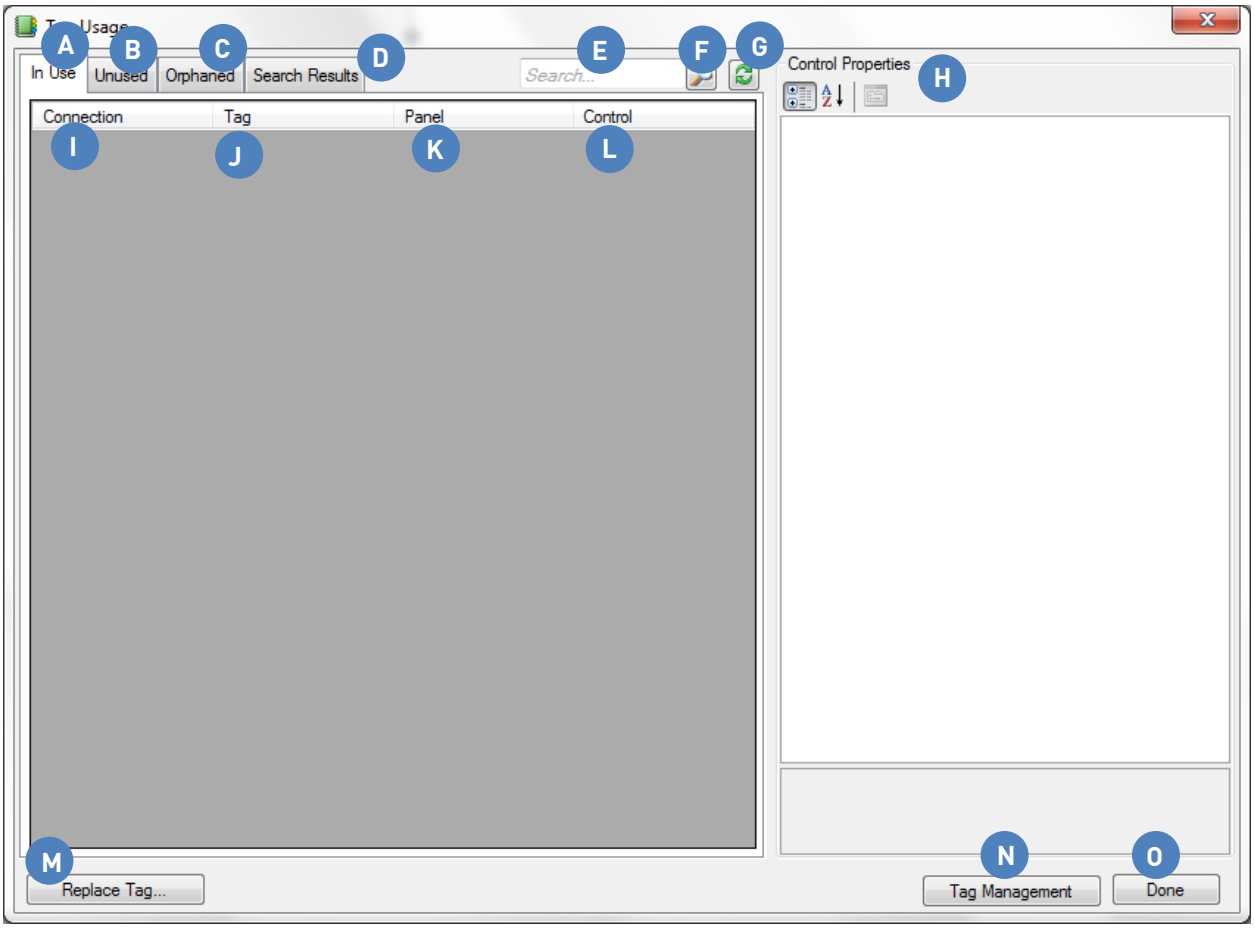


Figure 23 - Tag Usage window

The features and fields shown in this window are described in the following list.

A. **In Use** tab: Shows tags that are in use in the Solution.
B. **Unused** tab: Show tags that are defined, but not in use in the Solution.

C. **Orphaned** tab: Shows tags that are referenced in the Solution but not defined in Tag Management.
D. **Search Results** tab: Displays the results of a tag search.
E. **Search** field: Provides a text entry field for searching for tags.
F. **Magnifying glass:** When pressed, begins a search for a tag string entered in the Search field.
G. **Refresh** button: Updates the current tag listing.
H. **Control Properties** area: Allows the user to modify the properties of the control associated with the currently selected tag.
I. **Connection:** The connection with which the tag is associated.
J. **Tag:** The tag name.
K. **Panel:** The Panel in which the tag is used.
L. **Control:** The Control in which the tag is used.
M. **Replace Tag** button: Allows the user to replace the currently selected tag with a different defined tag. **NOTE:** This feature should be used with care. Tag replacements cannot be undone.
N. **Tag Management** button: Opens the Tag Management window. See page 12 for more details.
O. **Done** button: Closes the Tag Usage window.

Controls

Compact HMI includes multiple control objects available for use in designing Panels. All controls will have customizable states that can be applied, allowing the user to conditionally change many of the properties of the controls. These states are described in more detail in the "Display Conditions" section.

- The **Indicator Label** is used for creating graphical displays of data. The user can specify the format in which the data will be displayed.
- The **Image Box** is used to display an image on the Panel.
- The **Control Button** is used for controlling the process data. The control button supports the following actions: **Set Bit, Reset Bit, Toggle Bit, Send Value, Ask User and Send Value,** and **Open Menu**.

Once the control is added to the Panel, you can select the control and edit its properties. All of the controls use an offset from the base read defined in the Panel object.

Controls are in the Toolbox on the left side of the visual editor. These controls are what you will use to display data or take action. Adding a Control is as simple as double-clicking the Control you want to add.

Indicator Label

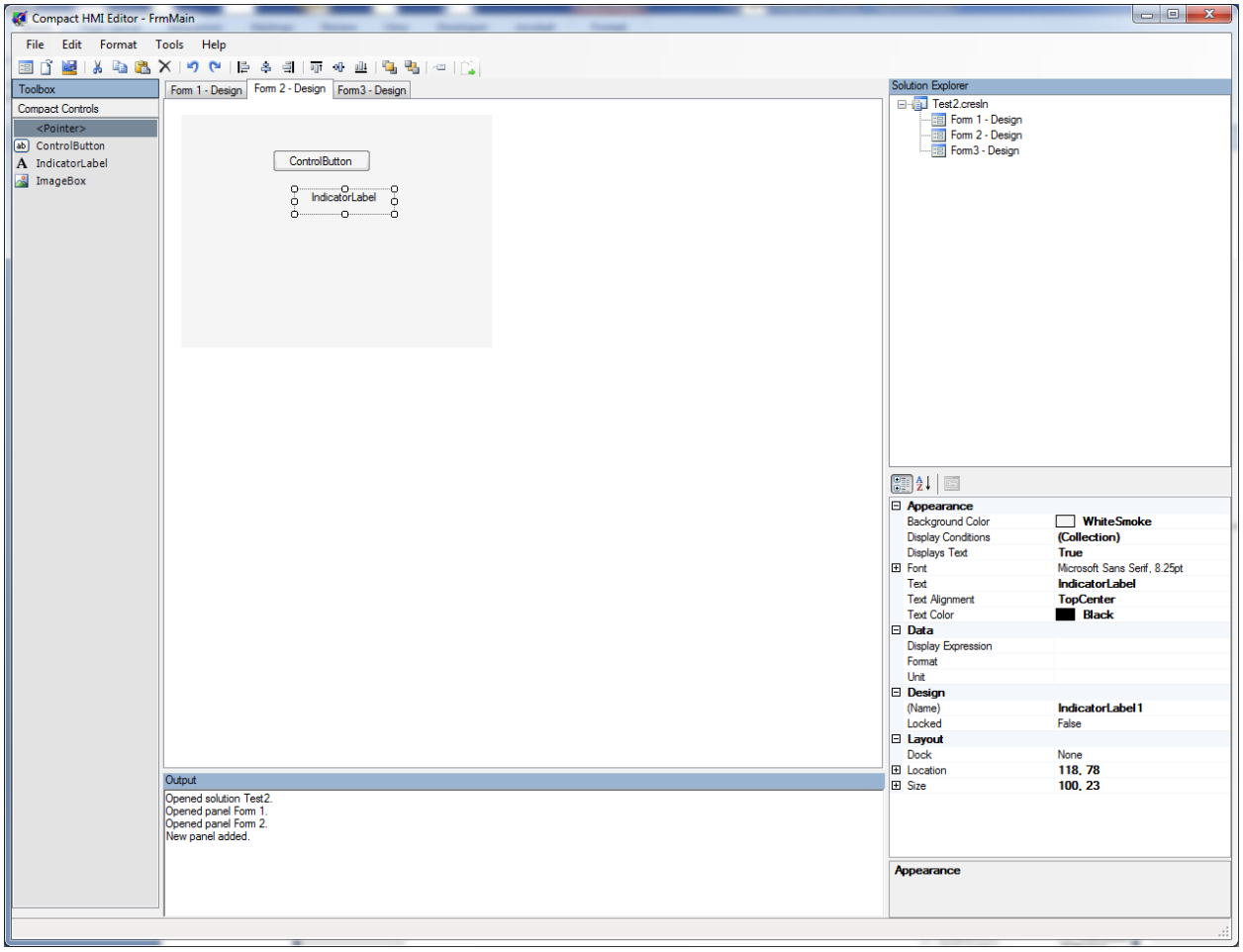


Figure 24 - Indicator Label

The **Indicator Label** provides a display of data or bit state information to the user. More specifically, the **Indicator Label** has the ability to display static text, conditional text based on an expression, raw data, or data formatted from an expression. Select the data device tag in the properties grid at right. Apply a tag from the tags database to the data device tag. See Table 2 for descriptions of Indicator Label properties and an example properties grid in Figure 25.

Appearance	
Background Color	The color to display in the background
Display Conditions	Conditions for changing the way data is displayed. More details are in the "Display Conditions" section.
Displays Text	If true, label will display the text in the 'Text' field by default; otherwise, it will display a data value defined in the Data group
Font	
Name	Name of the font to use
Size	Size of the font, based on the unit specified in Unit
Unit	The unit on which the size of the font is based. See Appendix 2: Font Measurement Units for more information.
Bold	If true, displays text in **Bold**
GdiCharSet	This setting should not be changed without first contacting Super Systems Inc.
GdiVerticalFont	This setting should not be changed without first contacting Super Systems Inc.
Italic	If true, displays text in *Italics*
Strikeout	If true, displays text with ~~Strikeout~~
Underline	If true, underlines text
Text	The default text to display.
Text Alignment	Aligns text based on one of nine available alignment settings
Text Color	The color of the displayed text
Data	
Display Expression	The expression that defines what data is displayed
Format	The format in which to display the data. For example, #.## would format data with a ones place and two decimal places.
Units	The units of the displayed data (°F, for example)
Design	
(Name)	Indicates the name used in code to identify the object
Locked	Determines whether the control can be moved or resized

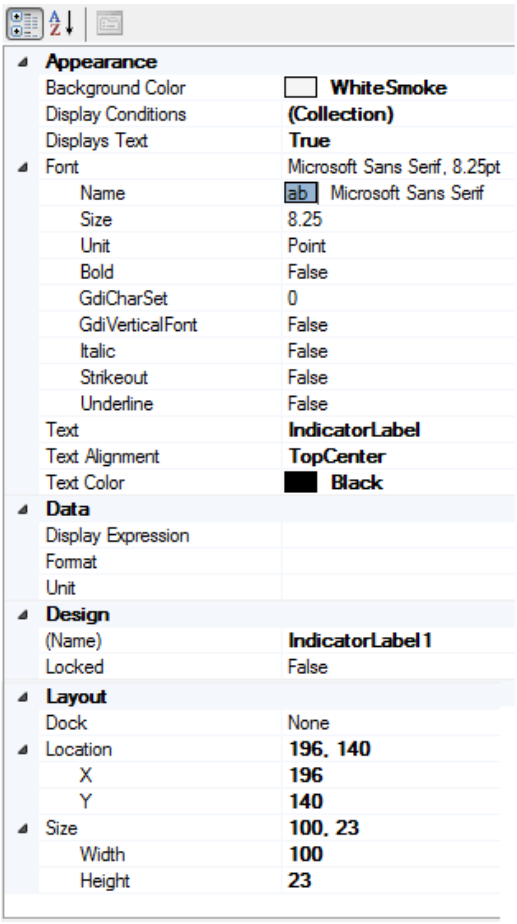


Figure 25 - Indicator Label properties grid

Layout	
Dock	Defines which borders of the control are bound to the container
Location	Coordinates of the upper left corner of the control.
X	X coordinate of upper left corner of control
Y	Y coordinate of upper left corner of control
Size	The size of the control in pixels.
Width	Width of the control in pixels
Height	Height of the control in pixels

Table 6 - Indicator Label properties

Control Button

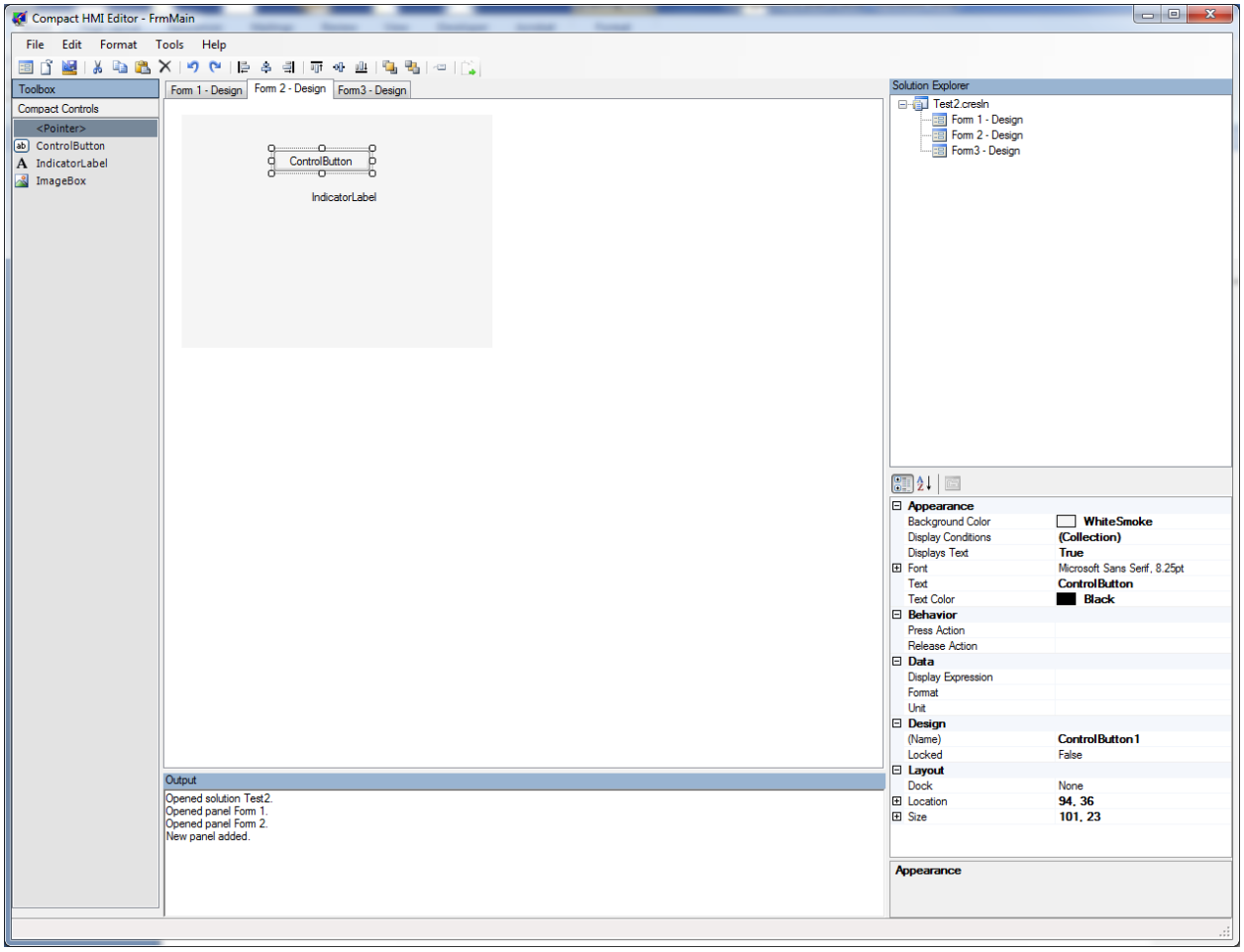


Figure 26 - Control Button

The **Control Button** can display data in exactly the same way as the **Indicator Label** by processing the display tag, but it can also interact with the user and write Control data to the

data device based on the Compact HMI configuration. To configure control action, define the data device tag to write to (also known as the **Destination**). The **Press Action** and **Release Action** controls the behavior of the button. The controls have the following options.

- **None** is no action.
- **SetBit** writes a value of "1" to the bit identified in the **Target Bit** of the **Destination** register.
- **ResetBit** writes a value of "0" to the bit identified in the **Target Bit** of the **Destination** register .
- **ToggleBit** toggles the bit identified in the **Target Bit** of the **Destination** register.
- **WriteValue** sends the value specified in **Write Value** to the **Destination** register.
- **AskUserAndWriteValue** will present the user with a numeric keypad and will write the user-provided value to the **Destination** register.
- **OpenMenu** will display a menu that allows the user to navigate between other Panels or return to the 9000 Series controller screen. It is important that each Panel include a Control Button with this Action; otherwise, there is no way to navigate away from this Panel once selected.
- **OpenScreen** will open the Panel designated in the **Screen** property

Text in this control object will be centered at the top of the object.

Control Button properties are discussed in Table 7. An example properties grid is shown in Figure 27.

Appearance	
Background Color	The background color
Display Conditions	Conditions for changing the way data is displayed. More details are in the "Display Conditions" section.
Displays Text	If true, label will display the text in the 'Text' field by default; otherwise, it will display a data value defined in the Data group
Font	
Name	Name of the font to use
Size	Size of the font, based on the unit specified in Unit
Unit	The unit on which the size of the font is based. See Appendix 2: Font Measurement Units for more information.
Bold	If true, displays text in **Bold**
GdiCharSet	This setting should not be changed without first contacting Super Systems Inc.
GdiVerticalFont	This setting should not be changed without first contacting Super Systems Inc.
Italic	If true, displays text in *Italics*
Strikeout	If true, displays text with ~~Strikeout~~
Underline	If true, underlines text

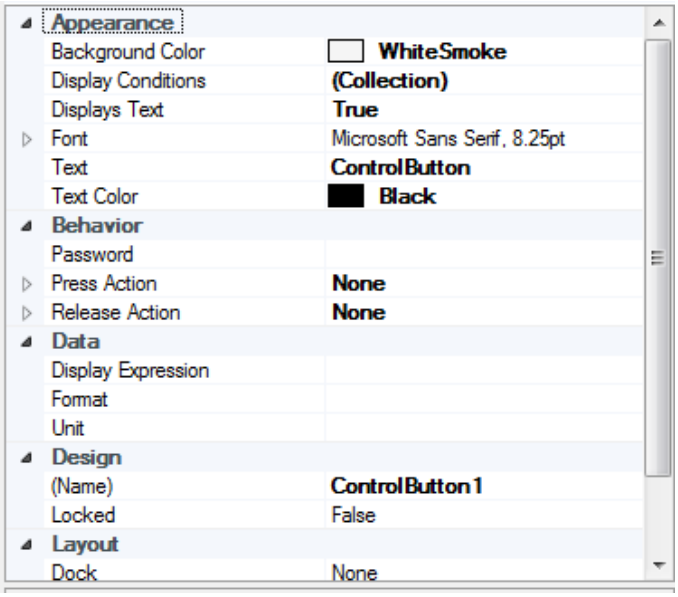


Figure 27 - Control Button properties grid

Text	The default text to display.
Text Color	The color of the displayed text
Behavior	
Password	A password that must be entered to activate the Control Button
Press Action	The action taken when the button is pressed (see above description)
Release Action	The action taken when the button is released (see above description)
Data	
Display Expression	The display tag for the data
Format	The format for the data
Unit	The units of the displayed data (°F, for example)
Design	
(Name)	The name of the control.
Locked	Determines whether the control can be moved or resized.
Layout	
Dock	Defines which borders of the control are bound to the container
Location	Coordinates of the upper left corner of the control.
X	X coordinate of upper left corner of control
Y	Y coordinate of upper left corner of control
Size	The size of the control in pixels.
Width	Width of the control in pixels
Height	Height of the control in pixels

Table 7 - Control Button properties

Image Box

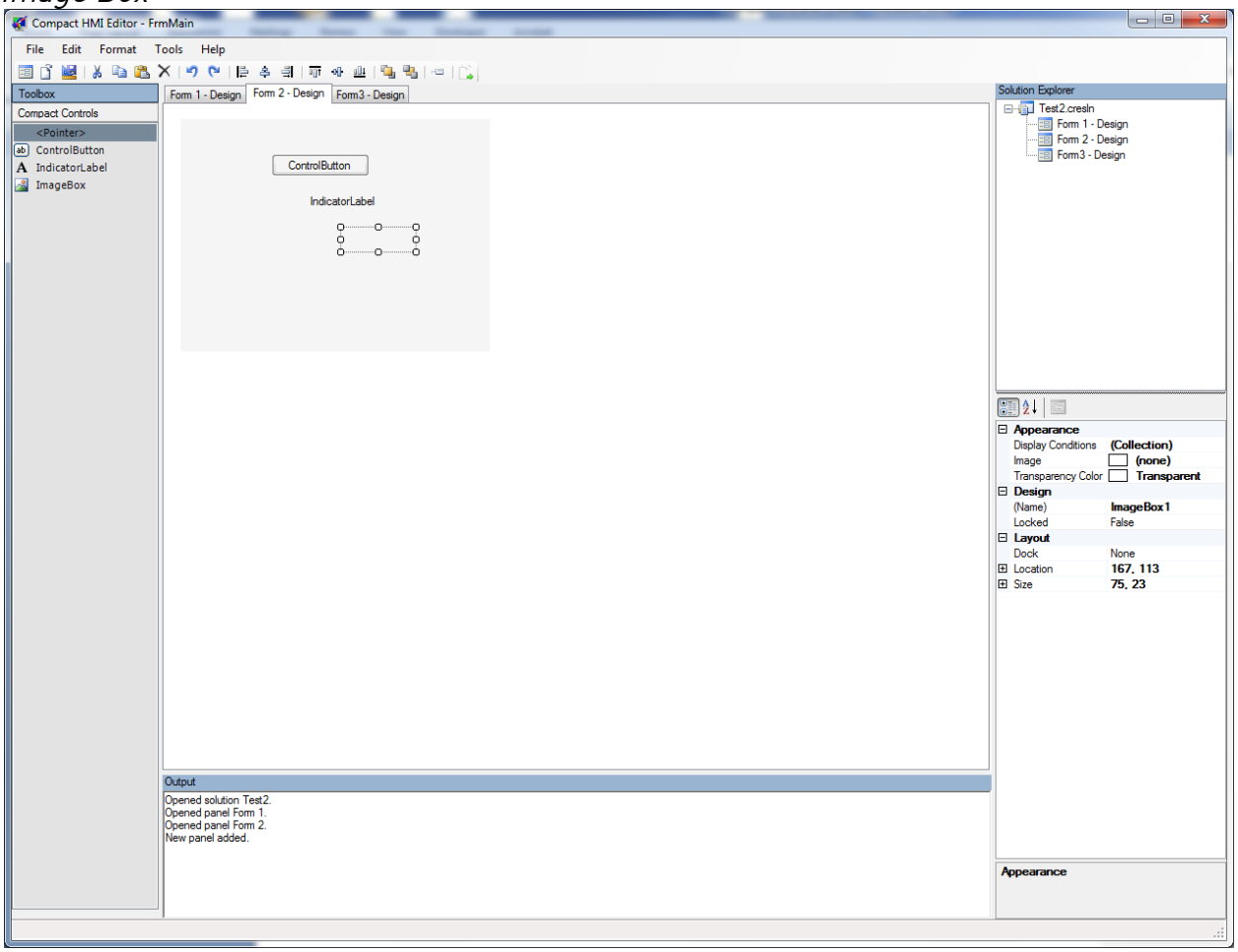


Figure 28 - Image Box

The **Image Box** is used to display graphics on the panel. It will not be tied directly to data. However, like all other controls, its properties can be modified through conditional formatting. Image Box properties are described in Table 8. An example properties grid is shown in Figure 29.

Appearance	
Display Conditions	Conditions under which the image is displayed or not displayed.
Image	The image the control will display. Compact HMI Editor will convert the selected image to a format Compact HMI understands and embed the converted image in the Solution when you save the Solution.
Transparency Color	The color for the transparency behind the image (if chosen by the user).
Design	
Name	The name of the control.
Locked	Determines whether the control can be moved.
Layout	
Dock	Determines the position (alignment) of the image
Location	Coordinates of the upper left corner of the control.
Size	The size of the control in pixels.

Table 8 - Image Box properties

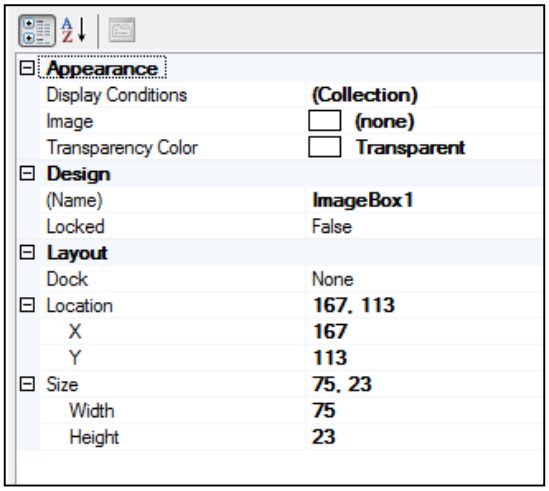


Figure 29 - Image Box properties grid

Exporting for the Touch Screen

When you are ready to export your Solution to the touch screen, select **Tools → Export Device Files** (see Figure 30). This option will create a folder containing all of the Panel and Tag files needed for Compact HMI on the touch screen. These files are saved to a folder on your computer, allowing you to transfer the files to the device manually (by using a flash drive, Compact Flash card, or other compatible data transfer device), back up the files, or perform other tasks with them as necessary. Note that the files saved to the touch screen device are not the Solution files saved on the development computer.

The user has the option of saving certain Panels (and not others) and the runtime executable files (which are used on the touch screen) when exporting the device files the specified path. This will allow the user to create project templates with multiple

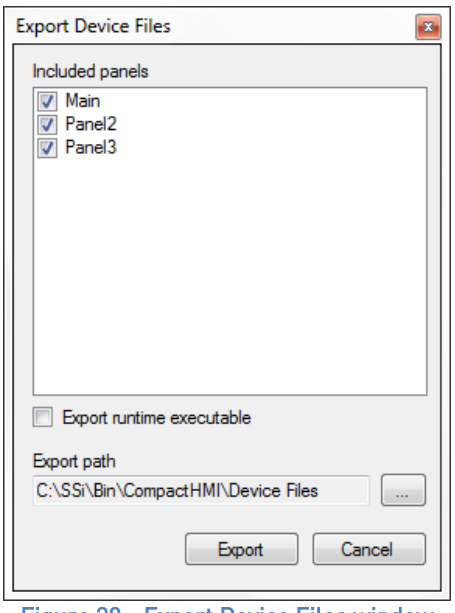


Figure 30 - Export Device Files window

screen layouts, but only use the appropriate Panels at runtime.

Please refer to Appendix 1: Software Best Practices, "Backing Up Touch Screen Files (.cfxml and .tdx)", for information on best practices for backing up touch screen files.

NOTE: The "Use with Compatible Touch Screens" section contains an example of how these files are used.

Interacting with the Touch Screen

NOTE: These features have been tested only on the 5.7 inch touch screen using a USB connection.

Compact HMI Editor can also write the Panels in your Solution directly to the touch screen using **Tools → Send Solution to Device** when the touch screen is connected via USB using Mobile Device Center (Windows Vista, 7, & 8) or ActiveSync (Windows XP). Compact HMI Editor will clear the .cfxml files from the touch screen's CompactRealtime folder and save the Panels in the Solution to the touch screen.

Please refer to Appendix 1: Software Best Practices, "Backing Up Touch Screen Files (.cfxml and .tdx)", for information on best practices for backing up touch screen files.

Using the Main Menu

The Main Menu in Compact HMI Editor is comprised of five option headings, as shown in Figure 31. The option headings are File, Edit, Format, Tools, and Help. This section describes each of the options under each option heading.

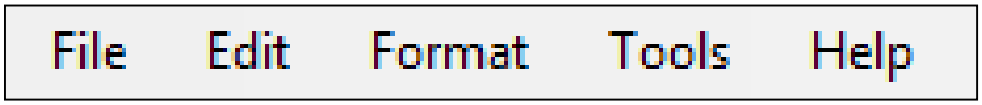


Figure 31 - Main Menu Bar

File

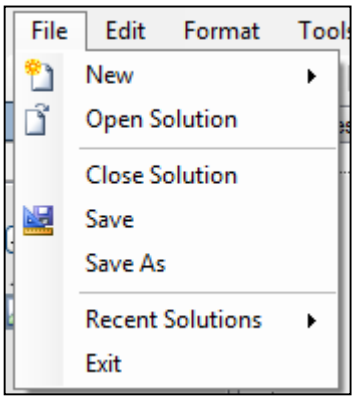


Figure 32 - File menu

The File menu contains the following options:

- **New** is used to create a new Panel or a new Solution. New Panels can also be created in the Solution Explorer. If a new Solution (a collection of Panels) is created and the current Solution has not been saved, Compact HMI Editor will prompt the user with the option to save the current Solution before opening a new one.
- **Open Solution** allows you to open a saved Solution (.cresln) file.
- **Close Solution** allows you to close the currently open Solution. If the Solution has not been saved, you will be prompted with the option to save the current Solution.
- **Save** saves the current Solution.
- **Save As** saves the current Solution with a new file name.
- **Recent Solutions** will bring up a list of Solutions that were recently open in Compact HMI Editor.
- **Exit** exits the program. If the current Solution has not been saved, Compact HMI Editor will prompt the user with the option to save the current Solution before opening a new one.

Please refer to Appendix 1: Software Best Practices, "When Saving Multiple Solutions" and "Backing Up Development Files," for information on best practices for saving and backing up developments files in Compact HMI Editor.

Edit

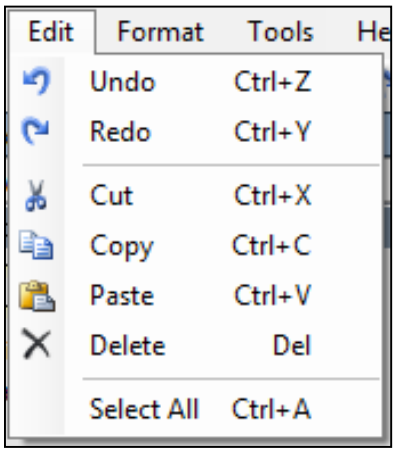


Figure 33 - Edit menu

The Edit menu contains the standard Windows editing options.

- **Undo** will reverse the previous action performed in Compact HMI Editor.
- **Redo** will repeat a previously reversed action.
- **Cut** will remove a selected component and save it to the Clipboard.
- **Copy** will copy a selected component to the Clipboard so that it can be duplicated.
- **Paste** will place the content most recently copied to the Clipboard in the active window or field.
- **Delete** will remove the selected component without copying it to the Clipboard.
- **Select All** will select all of the components that can be selected in the active window or field.

Format

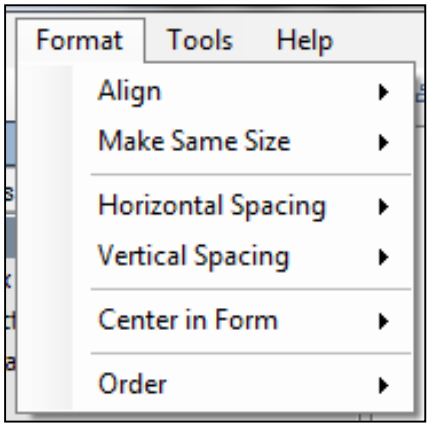


Figure 34 - Format menu

The Format menu contains the following options:

- **Align** contains options to change the alignment of multiple objects.
  - *Align Lefts* moves multiple selected objects so that their left edges are aligned
  - *Align Centers* moves multiple selected objects so that their horizontal centers are aligned
  - *Align Rights* moves multiple selected objects so that their right edges are aligned
  - *Align Tops* moves multiple selected objects so that their top edges are aligned
  - *Align Middles* moves multiple selected objects so that their vertical middles are aligned
  - *Align Bottoms* moves multiple selected objects so that their bottom edges are aligned
- **Make Same Size** contains options to make the width, height, or both width and height of multiple selected objects the same.
- **Horizontal Spacing** contains options to increase, decrease, or equalize the horizontal spacing between multiple selected objects.
- **Vertical Spacing** contains options to increase, decrease, or equalize the vertical spacing between multiple selected objects.
- **Center in Form** allows you to center the selected controls within the form horizontally or vertically.
- **Order** allows you to arrange a selected object so that it appears in front of other objects that overlap it (Bring to Front) or so that it appears behind other objects that overlap it (Send to Back).

Tools

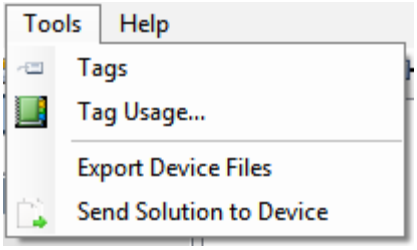


Figure 35 - Tools menu

The Tools menu contains the following options:

- **Tags** will bring up the Tags window. See Tags (Tag Management) for more information.
- **Export Device Files** exports the files that would normally be saved to the touch screen device. See Exporting for the Touch Screen for more details.
- **Send Solution to Device** will send the current Solution to a connected device so that the device can utilize the programmed screens. See Interacting with the Touch Screen for more details.

Help

The Help menu (Figure 36) contains three options: **About**, **Language,** and **Check for Updates...**.

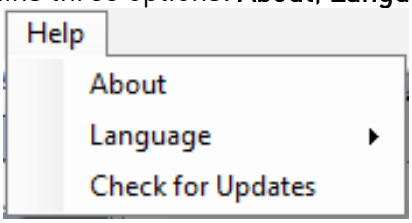


Figure 36 - Help menu

Selecting **About** will bring up the "About" window, which will show version information on the software. See Figure 37 for an example.

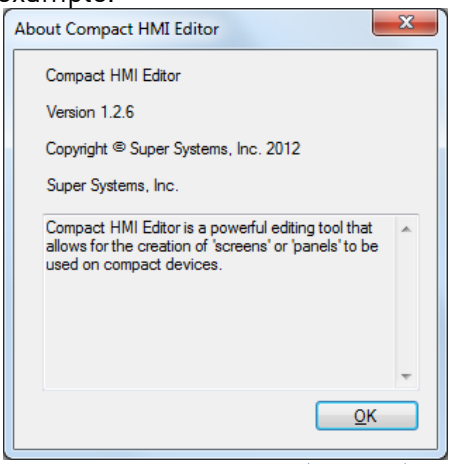


Figure 37 - About screen (example)

Selecting **Language** allows you to set the language in which Compact HMI operates: English or Spanish (Español). See Figure 38.

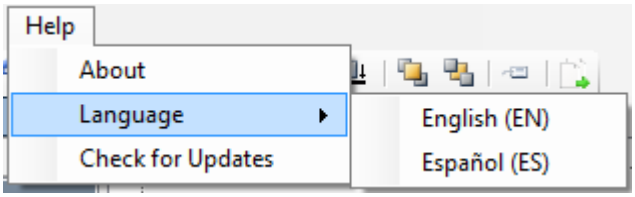


Figure 38 - Language option

Selecting **Check for Updates...** will direct CompactHMI Editor to check for updates to the software and to the executable files that run on the touch screen. An Internet connection from the PC is required in order to do this. **IMPORTANT:** Save all open files before checking for updates. Failure to do so will result in work being lost since the previous save.

If an update is found:

CompactHMI Editor will prompt you on whether you want to download the updates (Yes) or not (No)—see Figure 39.

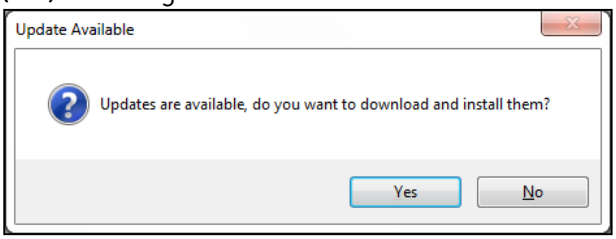


Figure 39 - Download Updates prompt

If you click "Yes", the software will close; updates will be downloaded and then installed. A status window will appear while the updates are being downloaded and installed (Figure 40).

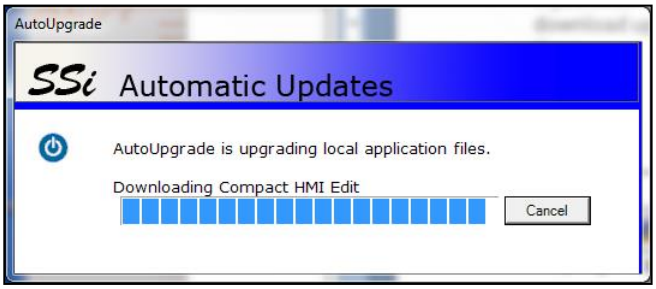


Figure 40 - Update status window

If no updates are found:

CompactHMI Editor will present a window indicating that no updates are available (Figure 41).

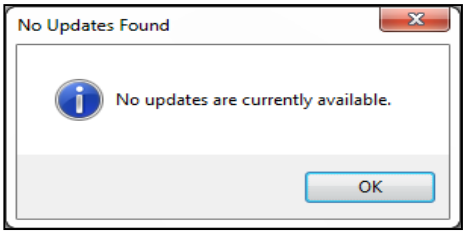


Figure 41 - "No Updates Available" window

Once the updates are installed, CompactHMI Editor will restart.

Touch Screen Files: Automatic Updates include files that will be needed for Compact HMI on the touch screen. In order to copy updated touch screen files to the touch screen, follow the procedure below.

1. Locate the **TouchScreen** subfolder in the folder where Compact HMI Editor is located. An example is shown in Figure 42 (where the subfolder is "C:\SSi\Bin\CompactHMI\TouchScreen").

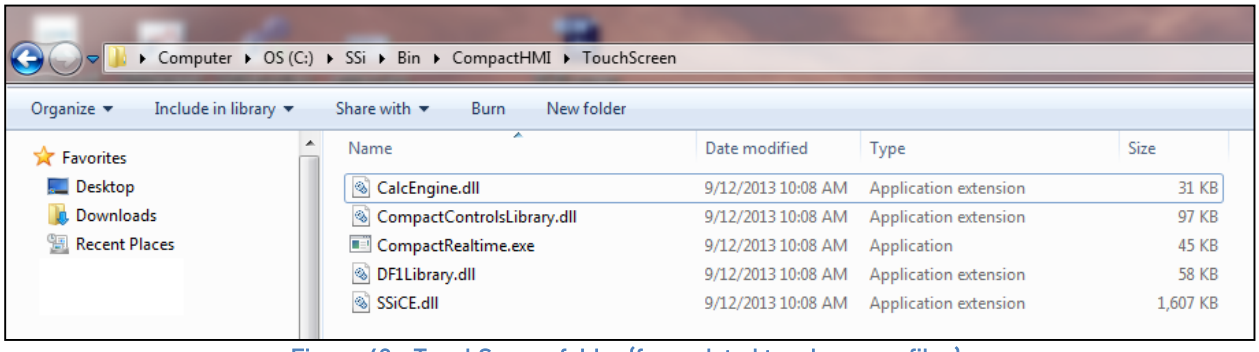


Figure 42 - TouchScreen folder (for updated touch screen files)

2. Insert a USB drive into a USB port on the computer.
3. Copy the files from the "TouchScreen" subfolder to the USB drive.
4. Remove the USB drive by selecting "Eject Mass Storage" from the System Tray options (Figure 43) and then taking the flash drive out of the USB port. If an error appears, make sure that all files have finished copying and that any windows showing the USB drive or its contents have been closed.

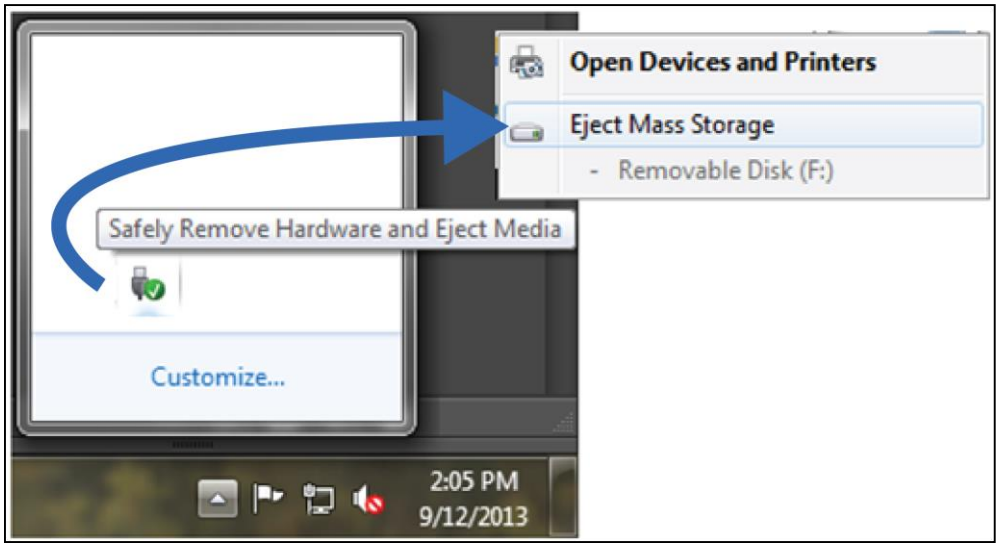


Figure 43 - "Eject Mass Storage" option

5. With the touch screen on, exit the SSi controller application if it is open. (Refer to the controller manual or contact SSi at (513) 772-0060 if you have questions about how to do this.) The operating system screen will appear once the controller application is shut down. It will look similar to the screen pictured in Figure 44.

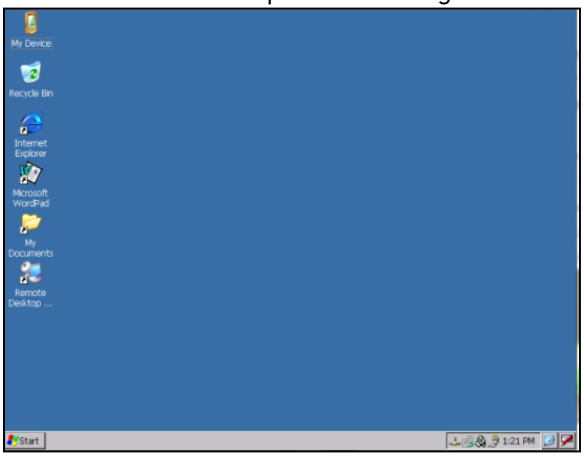


Figure 44 - Touch Screen Operating System Screen

6. Insert the storage medium into an available USB port on the touch screen. Often, a port can be found on the back of the touch screen, as shown in Figure 45.

Figure 45 - Inserting USB Drive into USB Port on Touch Screen Device

7. Double-tap on "My Device" on the touch screen desktop. Then copy the touch screen files from the USB drive to the Compact HMI (destination) folder. The destination folder will be the \CompactRealtime folder on the destination drive.

NOTE: A message will likely appear asking if you want to overwrite existing files. Simply choose "Yes."

Using the Design Environment Toolbar

The Design Environment contains a horizontal toolbar with icons representing many of the common options used in Compact HMI Editor. See Figure 46.

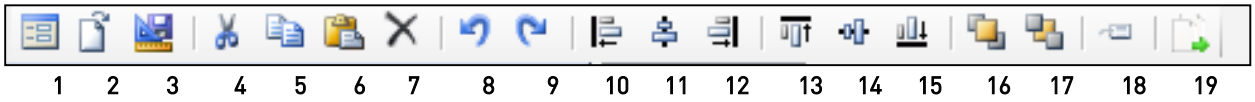


Figure 46 – Toolbar

The table describes the use of each tool in the toolbar.

	Tool Name	Description
1	New Panel 	Opens a new panel for the current Solution, displaying the new panel in the Design Environment
2	Open Solution 	Brings up a dialog box to open a saved Solution (a file saved by Compact HMI Editor with the .cresln extension; described further in Solution Overview)
3	Save 	Saves the current Solution
4	Cut 	Removes a block of text, a control object, or other editable component of a Solution, and saves it to the Windows Clipboard so that it can be pasted elsewhere

	Tool Name	Description
5	Copy 	Copies a block of text, a control object, or other editable component of a Solution, and saves it to the Windows Clipboard so that it can be pasted elsewhere
6	Paste 	Places a block of text, a control object, or other editable component of a Solution in an active field or Design Environment component (i.e., Panel)
7	Delete 	Removes a block of text, a control object, or other editable component of a Solution, but does not save the removed component to the Windows Clipboard
8	Undo 	Reverses the previous action
9	Redo 	Performs an action that was previously reversed
NOTE: All of the "align" options (10 through 15 below) align objects relative to a particular point or axis. For example, Align Lefts will align selected objects so that they share the same left alignment axis, while Align Middles will align selected objects so that they share the same vertical middle. Multiple objects are selected by pressing Ctrl+Left Click or Shift+Left Click as they are selected with a mouse.		
10	Align Lefts 	Moves multiple selected objects so that their left edges are aligned
11	Align Centers 	Moves multiple selected objects so that their horizontal centers are aligned
12	Align Rights 	Moves multiple selected objects so that their right edges are aligned
13	Align Tops 	Moves multiple selected objects so that their top edges are aligned
14	Align Middles 	Moves multiple selected objects so that their vertical middles are aligned
15	Align Bottoms 	Moves multiple selected objects so that their bottom edges are aligned

	Tool Name	Description
16	Bring to Front 	Arranges a selected object so that it appears in front of other objects that overlap it
17	Send to Back 	Arranges a selected object so that it appears behind other objects that overlap it
18	Tag Usage 	Opens the Tag Usage window (see the Tag Usage section on page 27)

Table 9 - Tools in the Toolbar and Their Use

Compact HMI (Use on SSi Touch Screen)

Prerequisites and Installation

An SSi touch screen is required. In order to run Compact HMI Solutions, the SSi touch screen must be Compact HMI-aware (programmed to recognize Compact HMI Solutions).

SSi designs, customizes, and implements Compact HMI for each touch screen.

Use with Compatible Touch Screens
Compact HMI runs on the touch screen in the \CompactRealtime folder. The \CompactRealtime folder should have the following file types present:

- **.cfxml.** Each .cfxml file contains the data for a Panel within the Solution. There will be as many .cfxml files as there are Panels in the Solution.
- **.tdx.** The .tdx file is the tags database file. This contains the data for the tags that have been set up in the Solution.
- **.dll.** DLL files are required in order for Compact HMI to run properly on the touch screen.
- **.exe.** The .exe file is an executable file that is run when Compact HMI is started.

There is no additional configuration necessary other than getting a copy of your primary touch screen interface that supports Compact HMI; your primary touch screen interface will handle starting, stopping and interacting with the Compact HMI application for you.

When your Compact HMI-aware interface is handling your Compact HMI Solution, the Menu button will not take you directly to the Menu. Instead, it will give you the option of going to the Menu or going to the Compact HMI Solution.

Example of Compact HMI Touch Screen Application Design and Rendering

Once a solution is designed in Compact HMI Editor and saved to a Compact HMI-aware SSi touch screen, the interface can be accessed through Compact HMI. This section illustrates examples of Panels that can be set up as part of a solution in Compact HMI in a furnace control system and how those Panels can be saved from Compact HMI Editor and subsequently opened in a Compact HMI-aware touch screen as a Compact HMI application.

Example Designs

In this example, a designer has created four Panels for a furnace control system. These Panels are as follows:

- **Main Panel.** The Main Panel provides an overview of essential furnace statuses (such as combustion status and high/low gas pressure alarms) and allows for control of essential furnace functions (such as locking and unlocking the furnace door). This is the Panel that will appear when the Compact HMI application is first opened on a compatible touch screen. The Compact HMI Editor view is shown in Figure 47; the Compact HMI (Touch Screen) view is shown in Figure 48.

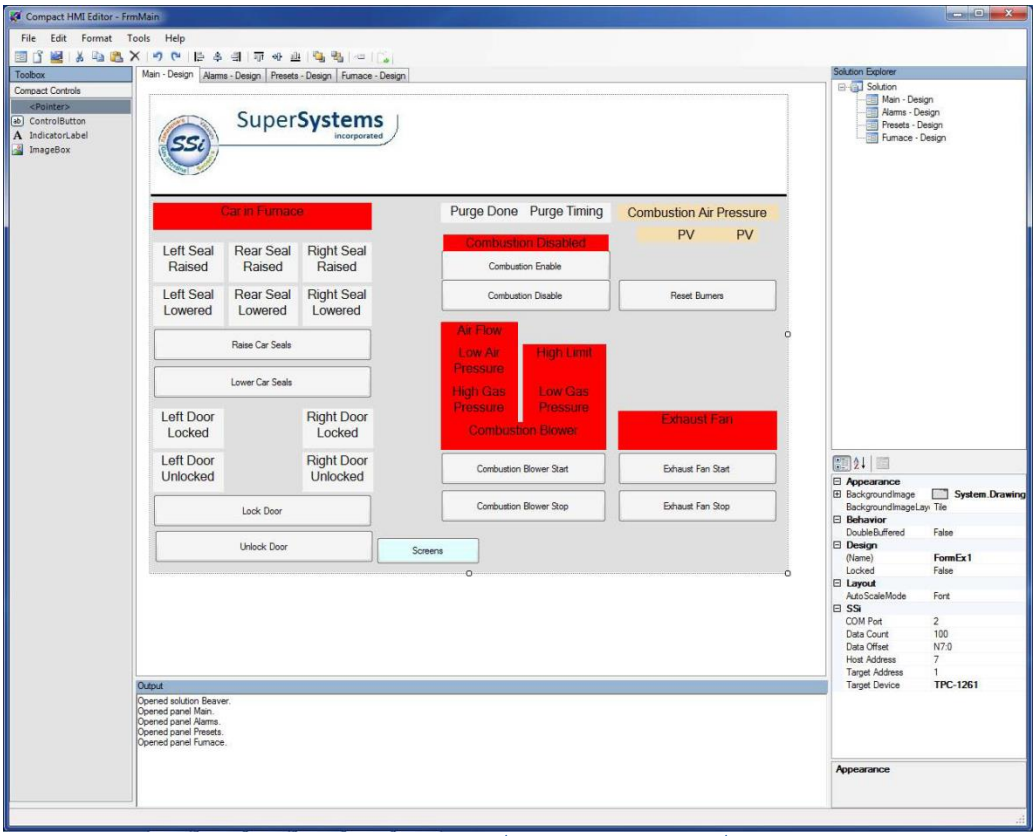


Figure 47 - Main Panel (Compact HMI Editor)

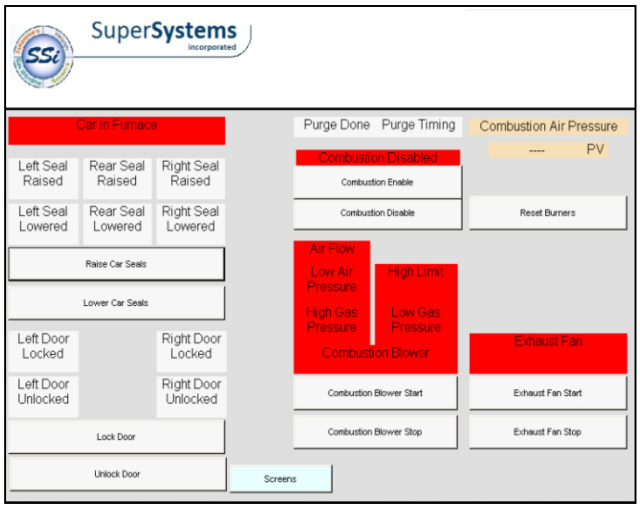


Figure 48 - Main Panel (Compact HMI - Touch Screen)

Note the **Screens** button at the bottom of the Panel. Each Panel has one of these buttons. When pressed, the button will bring up a menu allowing the user to select one of the other panels or to open the controller touch screen main menu. See the example in Figure 49. This menu is programmed into the panel using the **OpenMenu** option as part of the Control Button in Compact HMI Editor (more information on this can be found in the "Control Button" section).

Remember that Panels can be arranged in the order in which you want them to appear in Compact HMI on the touch screen. To reorder Panels, simply click and drag each tab into the order in which you wish it to appear.

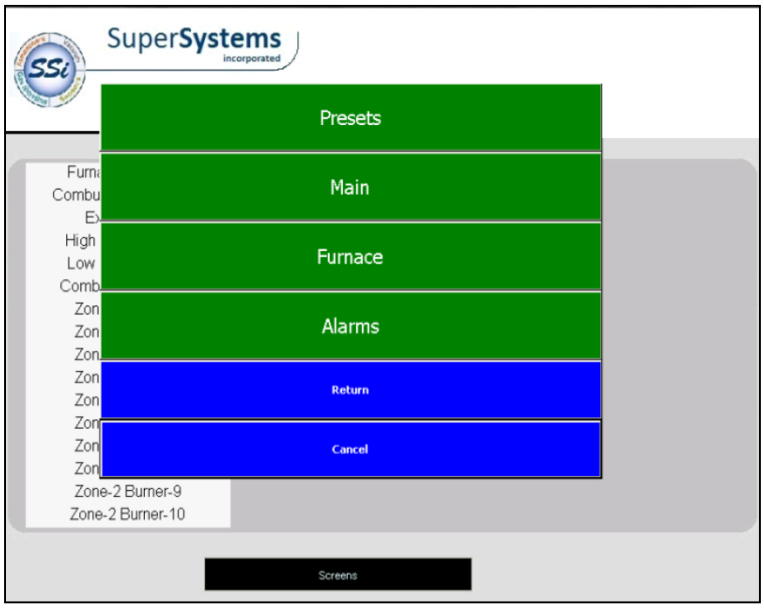


Figure 49 - Screens menu (Compact HMI - Touch Screen)

- **Alarms Panel.** The Alarms Panel shows alarms that have been configured in the system. If an alarm is active, typically the attributes of the alarm display will be programmed to change (for example, color and visibility). In the example, inactive alarms are displayed in black text. If an alarm is active, the operator will be able to acknowledge it or take the appropriate action to correct the alarm condition. The Compact HMI Editor view for the Alarms Panel is shown in Figure 50; the Compact HMI (Touch Screen) view is shown in Figure 51.

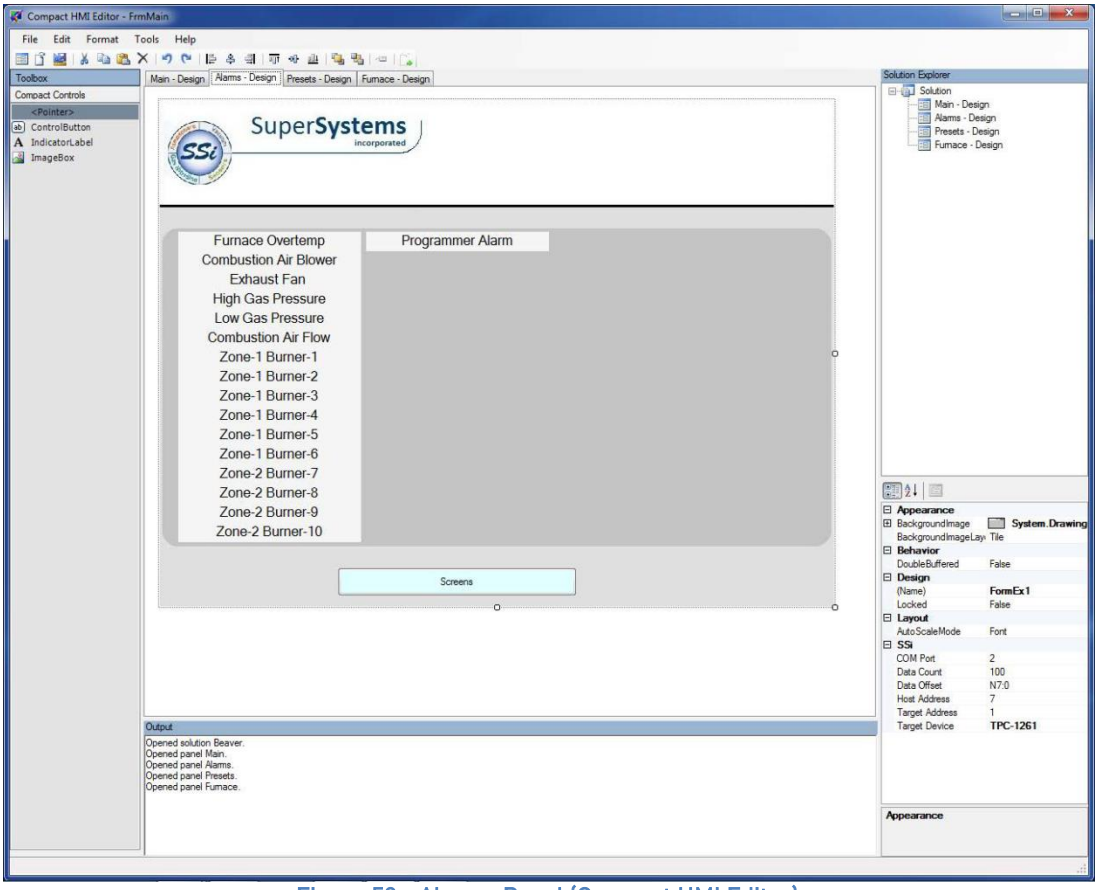


Figure 50 - Alarms Panel (Compact HMI Editor)

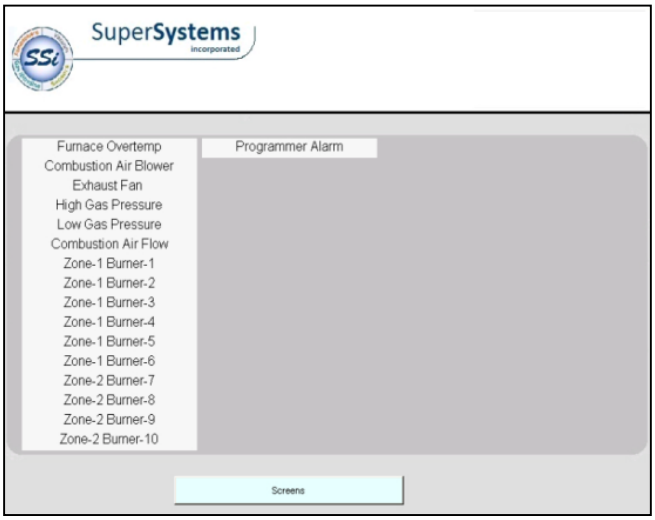


Figure 51 - Alarms Panel (Compact HMI - Touch Screen)

- **Presets Panel.** In the example, this Panel is used to enter furnace control presets. The Panel also displays setpoints and process variables (PVs) for parameters such as combustion air pressure. The Compact HMI Editor view for this Panel is shown in Figure 52; the Compact HMI (Touch Screen) view is shown in Figure 53.

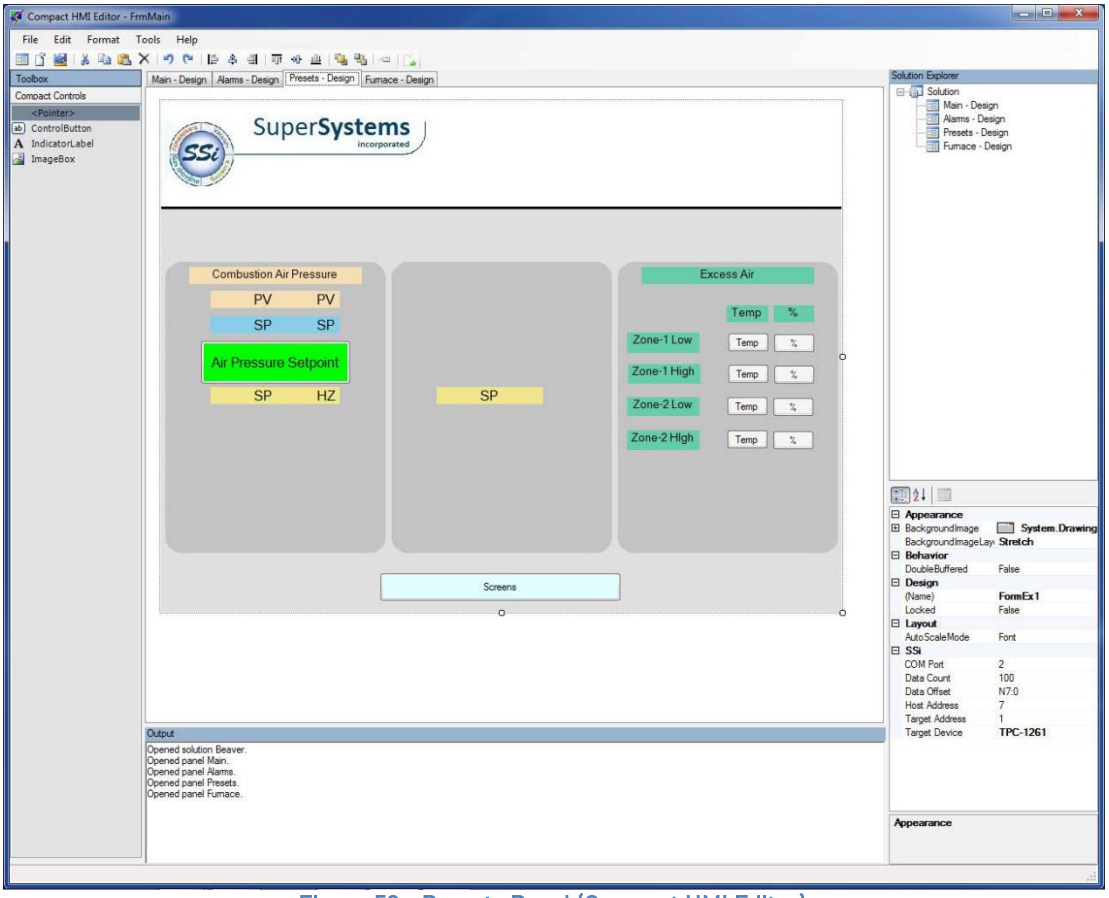


Figure 52 - Presets Panel (Compact HMI Editor)

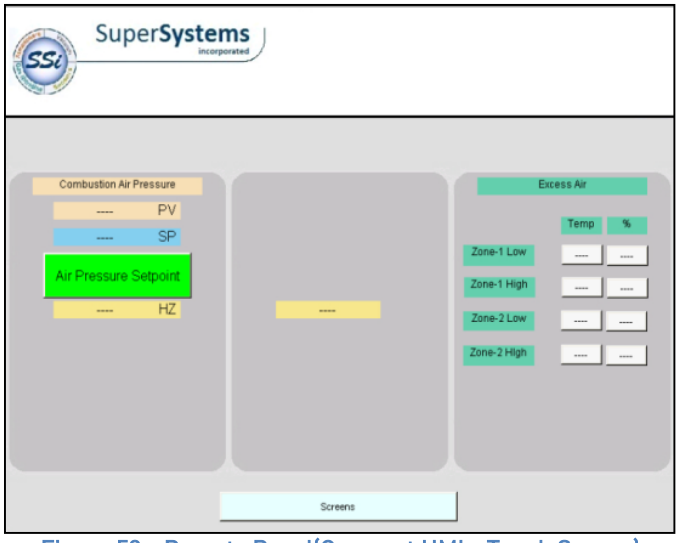


Figure 53 - Presets Panel(Compact HMI - Touch Screen)

- **Furnace Panel.** The Furnace Panel provides furnace status information and allows the operator to control operations such as starting fans, locking and unlocking doors, etc. A visualization depicts the status of the furnace in real time. The Compact HMI Editor view for

this Panel is shown in Figure 54; the Compact HMI (Touch Screen) view is shown in Figure 55.

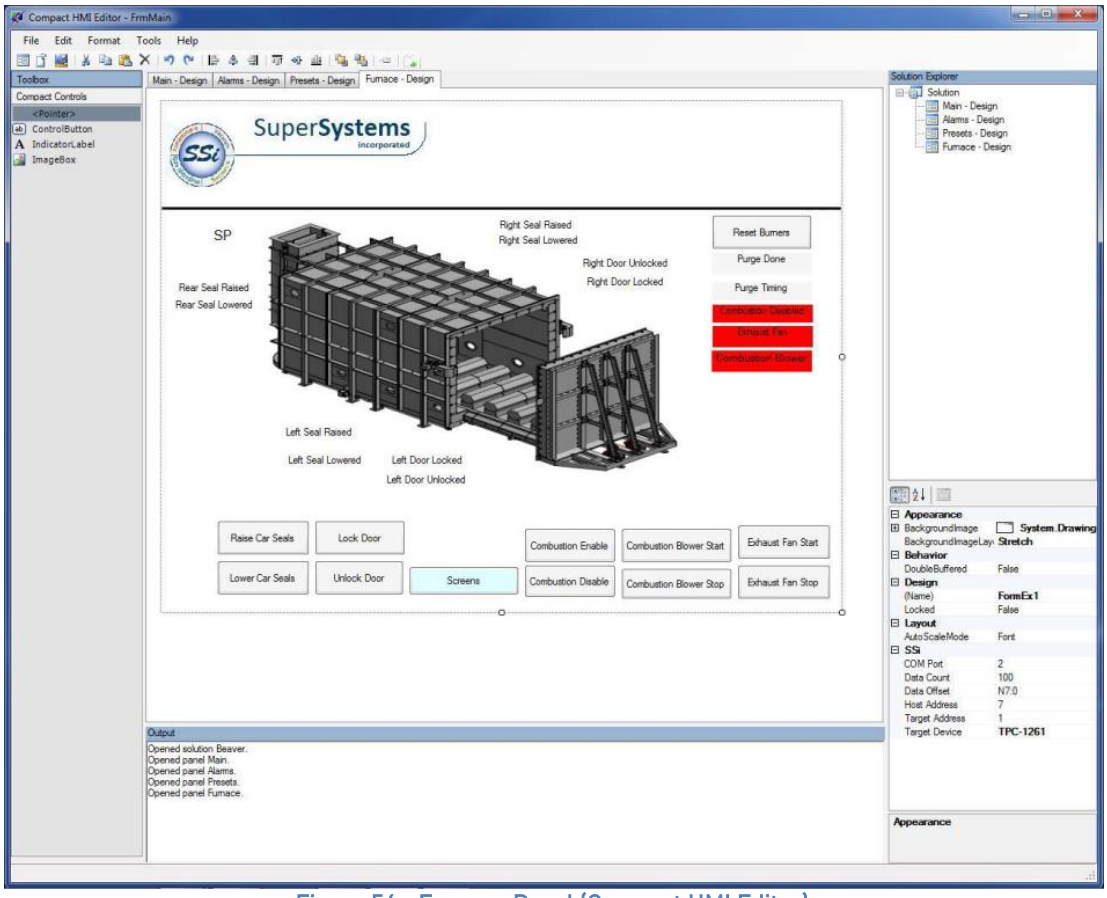


Figure 54 - Furnace Panel (Compact HMI Editor)

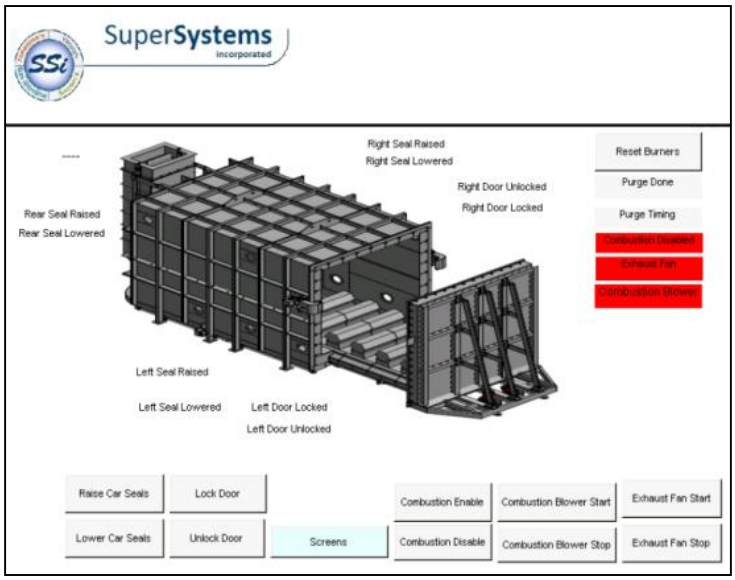


Figure 55 - Furnace Panel (Compact HMI - Touch Screen)

Preparing Solution for Touch Screen

There are two main ways to prepare the Solution to be run on the SSi touch screen:

1. Sending the Solution from Compact HMI Editor directly to the touch screen device; and
2. Exporting the device files to a storage device and copying the device files to the CompactRealtime on the touch screen's storage medium.

These methods are described in more detail in the Exporting for the Touch Screen and Interacting with the Touch Screen sections.

Once the designer has verified that all of the Panels have been set up properly, the designer can prepare the Solution for use on an SSi touch screen. (The Solution can also be implemented on the touch screen for testing purposes, when needed.)

Suppose the designer decides to utilize method #2 (exporting and copying the device files to the touch screen's storage medium). The designer follows these steps:

1. Save Solution in Compact HMI Editor (using **File → Save** or **File → Save As**).
2. Using the **Tools → Export Device Files** option, export the device files to a USB drive or other storage medium. This process is depicted in Figure 56.

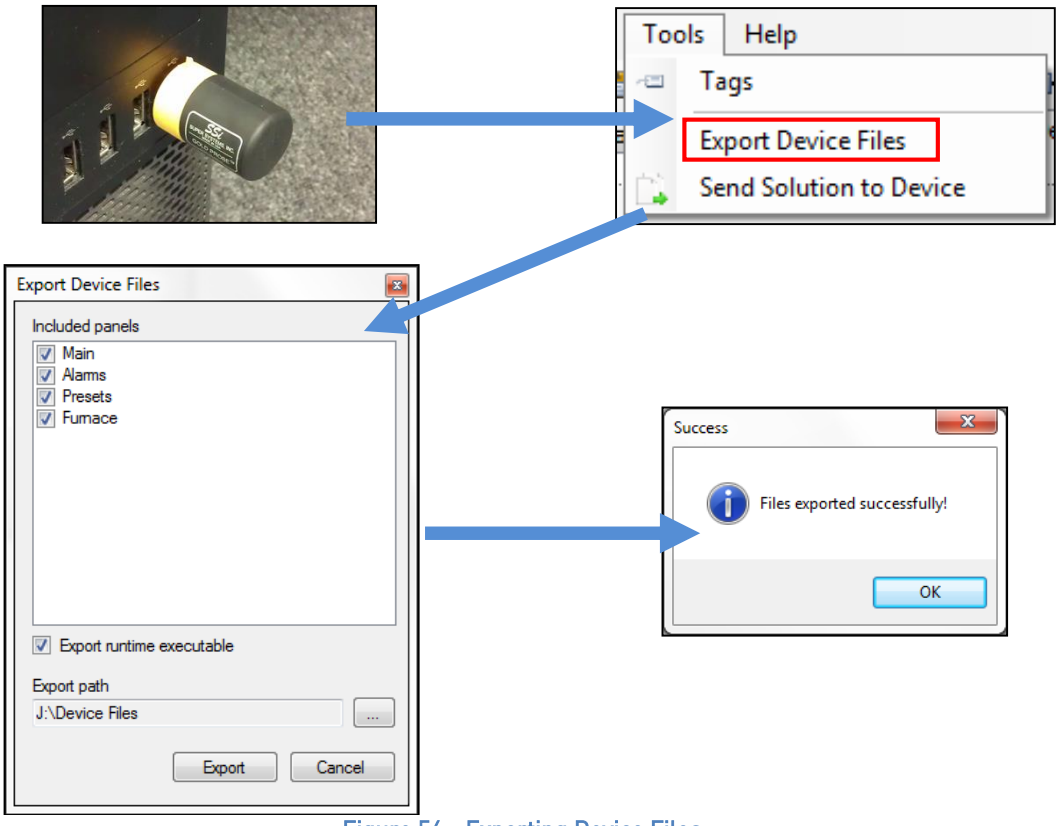


Figure 56 - Exporting Device Files

3. Once the files are successfully exported, eject the storage medium by using the "Safely remove hardware" option in Windows (typically found by expanding the system tray and selecting the "remove hardware" icon, an example of which is shown in Figure 57).

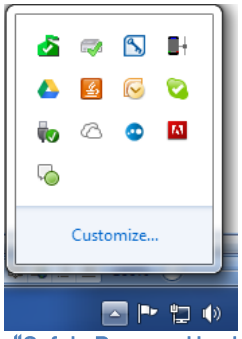


Figure 57 – "Safely Remove Hardware" icon

4. Turn on the touch screen.
5. Once the touch screen is on and the startup has completed, exit the SSi controller application. (Refer to the controller manual or contact SSi at (513) 772-0060 if you have questions about how to do this.) The operating system screen will appear once the controller application is shut down. It will look similar to the screen pictured in Figure 58.

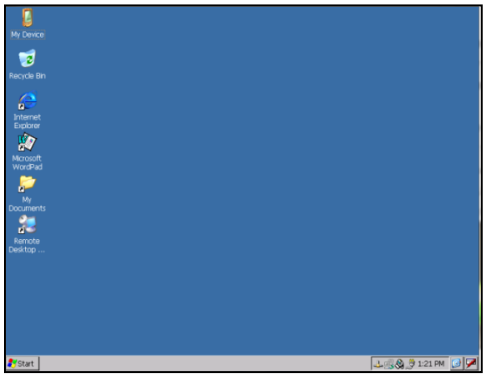


Figure 58 - Touch Screen Operating System Screen

6. Insert the storage medium into an available USB port on the touch screen. Often, a port can be found on the back of the touch screen, as shown in Figure 59.

Figure 59 - Inserting USB Drive into USB Port on Touch Screen Device

NOTE: SSi recommends that you back up touch screen files onto a USB drive or other storage medium before overwriting those files (which is part of the procedure described in Step 7). Touch screen files are the .cfxml and .tdx files contained in the \CompactRealtime folder. If your organization has a backup system in place, these files should be backed up using that system.

7. Double-tap on **My Device** on the touch screen desktop. Remove any .cfxml and .tdx files from the \CompactRealtime folder. Then copy the device files from the storage medium to the drive from which the touch screen runs Compact HMI (this is typically the drive from which the touch screen runs the SSi controller application). The destination folder will be the \CompactRealtime folder on the destination drive. An example of this procedure is depicted in Figure 60.

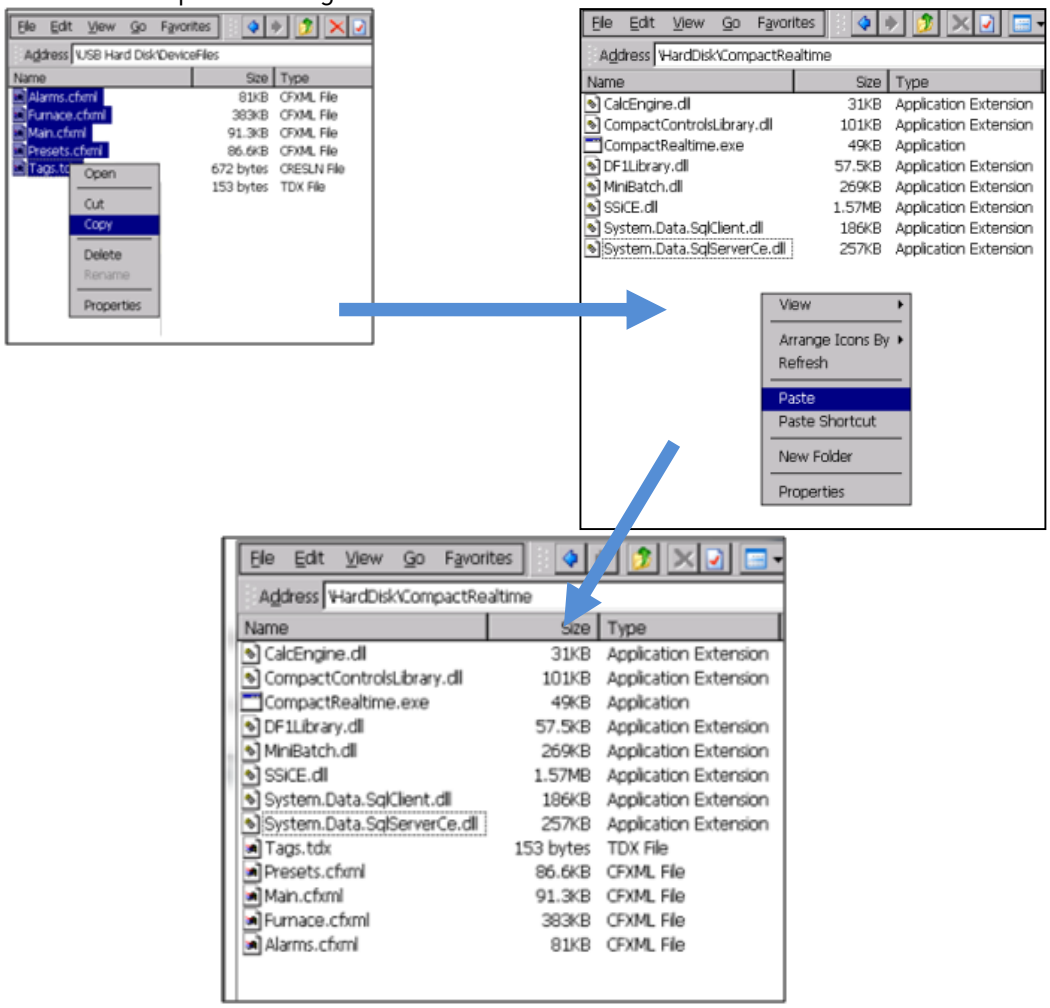


Figure 60 - Copying Device Files to CompactRealtime Folder

The Solution should now be ready.

Running the Compact HMI Solution

Once the designer has set up the Solution to be run on the touch screen, the designer restarts the touch screen to load the SSi controller application. When started, each SSi controller touch screen has a standard screen that will first be displayed. As explained in the "Use with Compatible Touch Screens" section, if the touch screen is Compact HMI-aware and has Compact HMI screens saved to the proper location on the storage card, a menu like the one shown in Figure 61 will be displayed on the standard screen.

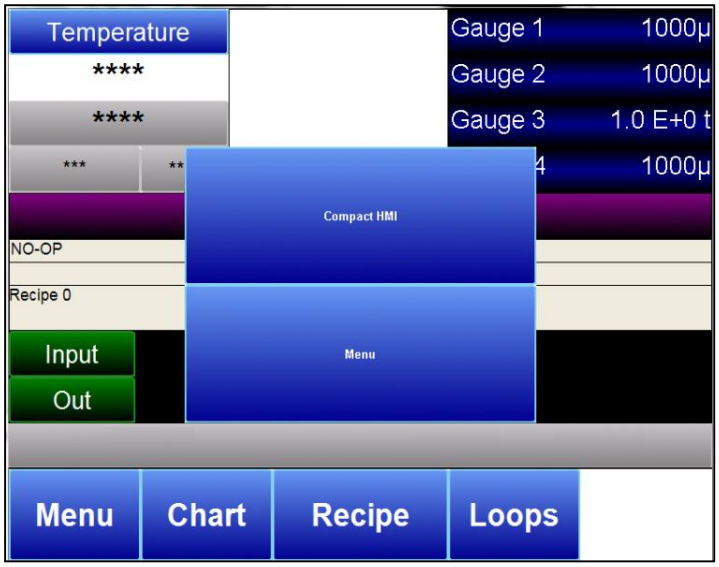


Figure 61 - Compact HMI Menu on Example Screen

Selecting **Compact HMI** will cause the touch screen software to open the Compact HMI application.

Revision History

Rev.	Description	Date	MCO #
New	Initial release	10/22/2013	2127
A	Added Modbus communications capabilities as well as program menu changes; added 3.5" screen/Compact HMI wiring diagram	4/30/2014	2137
B	Added Tag Usage section; replaced Compact HMI Editor screen images as needed; added connection options; added revised wiring diagrams.	11/23/2015	2169

Appendix 1: Software Best Practices

This appendix is intended to provide guidelines for setting up and using the Compact HMI platform. SSi recommends observing these guidelines, as they have been found to enhance the usability and functionality of the software.

When Configuring Connections and Tags in Compact HMI Editor

When configuring Connections and Tags, the following principles should be followed:

- Make sure that the Connection Type (DF1, ModbusRTU, or ModbusTCP) is configured correctly, preferably before tags are added and named.
- Make sure that the Data Offsets are configured correctly. Remember that the Data Offset must be set individually for each Tag.
- Make sure that the Connection Name is easily associated with the connection to the data device.
- Make sure that each Tag Name allows for easy identification of a Tag's register location. However, avoid making a Tag Name so specific that it could create confusion. For example, a tag name of "N7:1" would allow for easy identification of the Tag's register location (provided that the Data Offset and Address Offset are configured correctly). On the other hand, a tag name of "Motor A On" could create confusion if the Data Offset does not align with the correct register.

Relevant Section: "Tags (Tag Management)", page 12

Backing Up Touch Screen Files (.cfxml and .tdx)

SSi recommends that you back up touch screen files onto a USB drive or other storage medium. Touch screen files are the .cfxml and .tdx files contained in the \CompactRealtime folder. If your organization has a backup system in place, these files should be backed up using that system.

Relevant Sections: "Exporting for the Touch Screen," page 35; "Interacting with the Touch Screen," page 36

When Saving Multiple Solutions

When creating multiple Solutions, it is important to maintain a meaningful sub-folder hierarchy. This hierarchy will assist with differentiating between multiple Solutions, as well as prevent errant Panels from being transferred to the touch screen. The following suggestion will become more apparent as you progress through this manual. As an example, let's assume a Solution has been created for FURNACE #1. The following hierarchy is recommended:

C:
    SSi:
        Bin:
            CompactHMI:
                FURNACE #1

In the above example, the User must create the FURNACE #1 sub-folder. The Solution files will be saved in that folder and include the .cresln, .tdx and .xml files.

Relevant Section: "Using the Main Menu" → *"File," page 36*

Backing Up Development Files

SSi recommends that you back up development files onto a USB drive or other storage medium. If your organization has a backup system in place, these files should be backed up using that system.

Relevant Section: "Using the Main Menu" → *"File," page 36*

Appendix 2: Font Measurement Units

The following are font measurement units used in determining how fonts are sized.

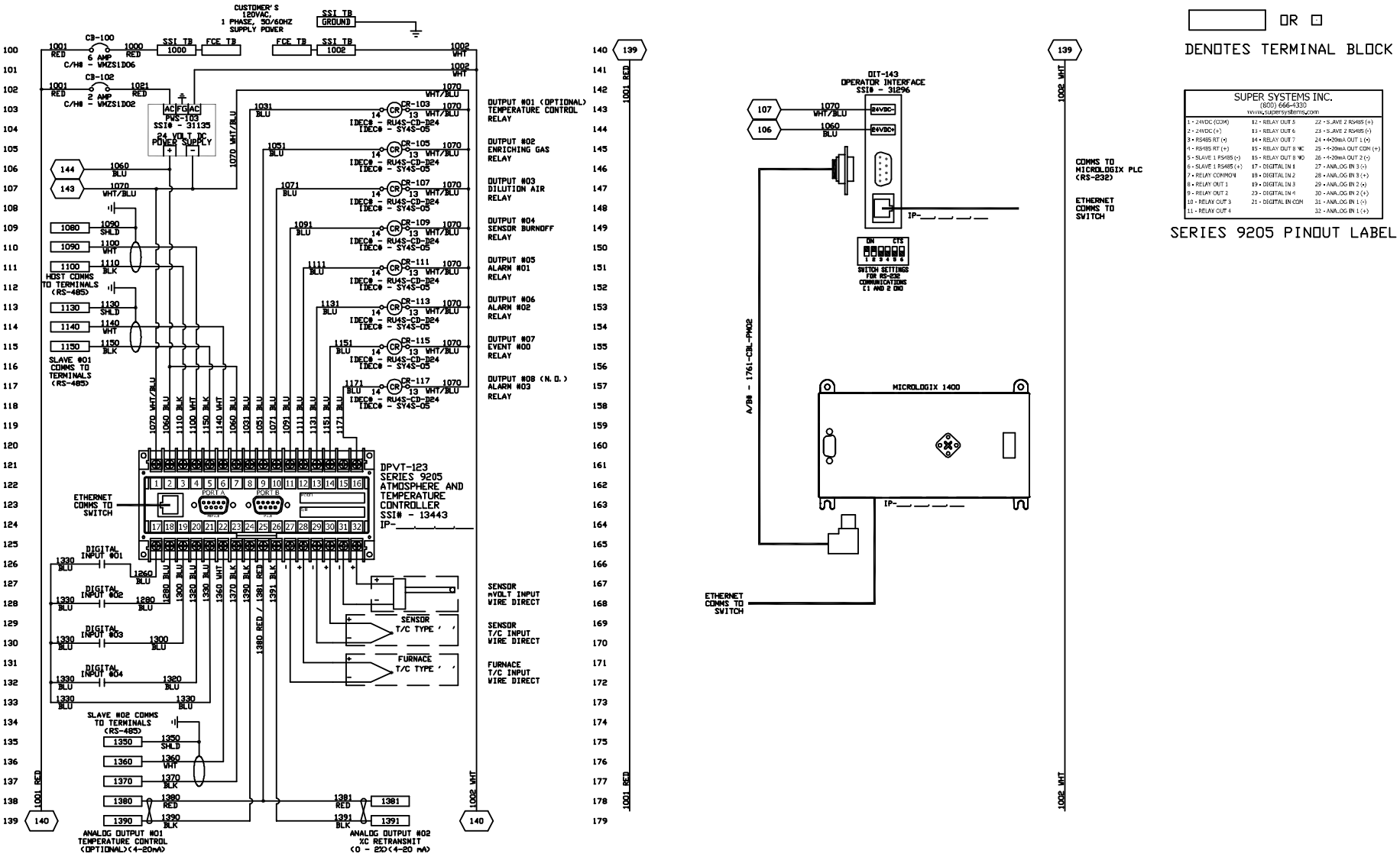
Unit Type	Description
World	Specifies the world coordinate system unit as the unit of measure.
Pixel	Specifies a device pixel as the unit of measure.
Point	Specifies a printer's point (1/72 inch) as the unit of measure.
Inch	Specifies the inch as the unit of measure.
Document	Specifies the document unit (1/300 inch) as the unit of measure.
Millimeter	Specifies the millimeter as the unit of measure.

Source: Microsoft Developer Network.

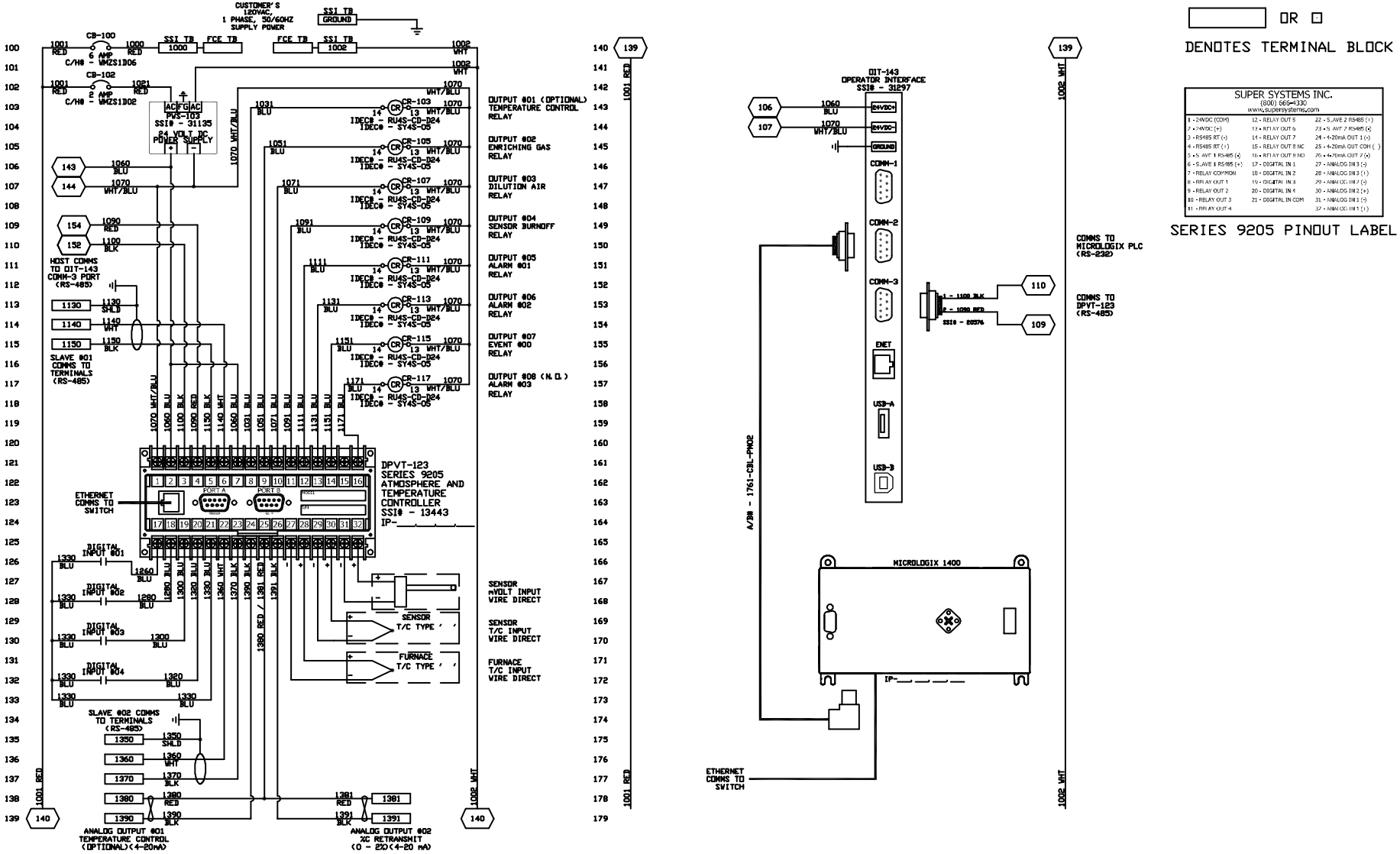
Appendix 3: Typical Wiring Diagrams

This appendix contains typical wiring diagrams for Compact HMI-configured touch screens in the 3.5", 5.7", 12.1", 15", and 17" sizes that are connected to a compatible data device and 9000 Series controller. Different touch screens may require different connection methods based on their configuration. Call SSi at (513) 772-0060 with any questions.

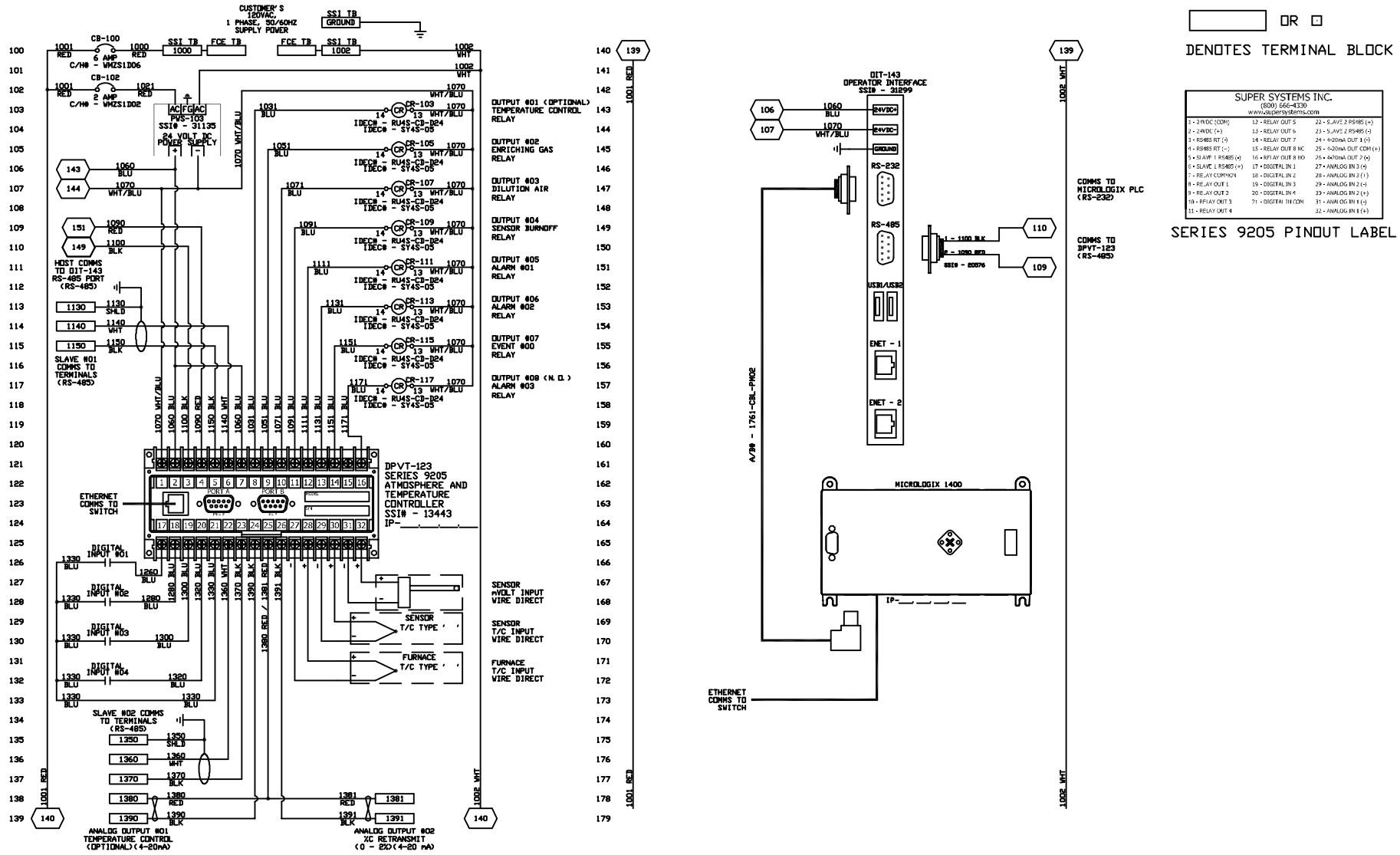
3.5" Touch Screen



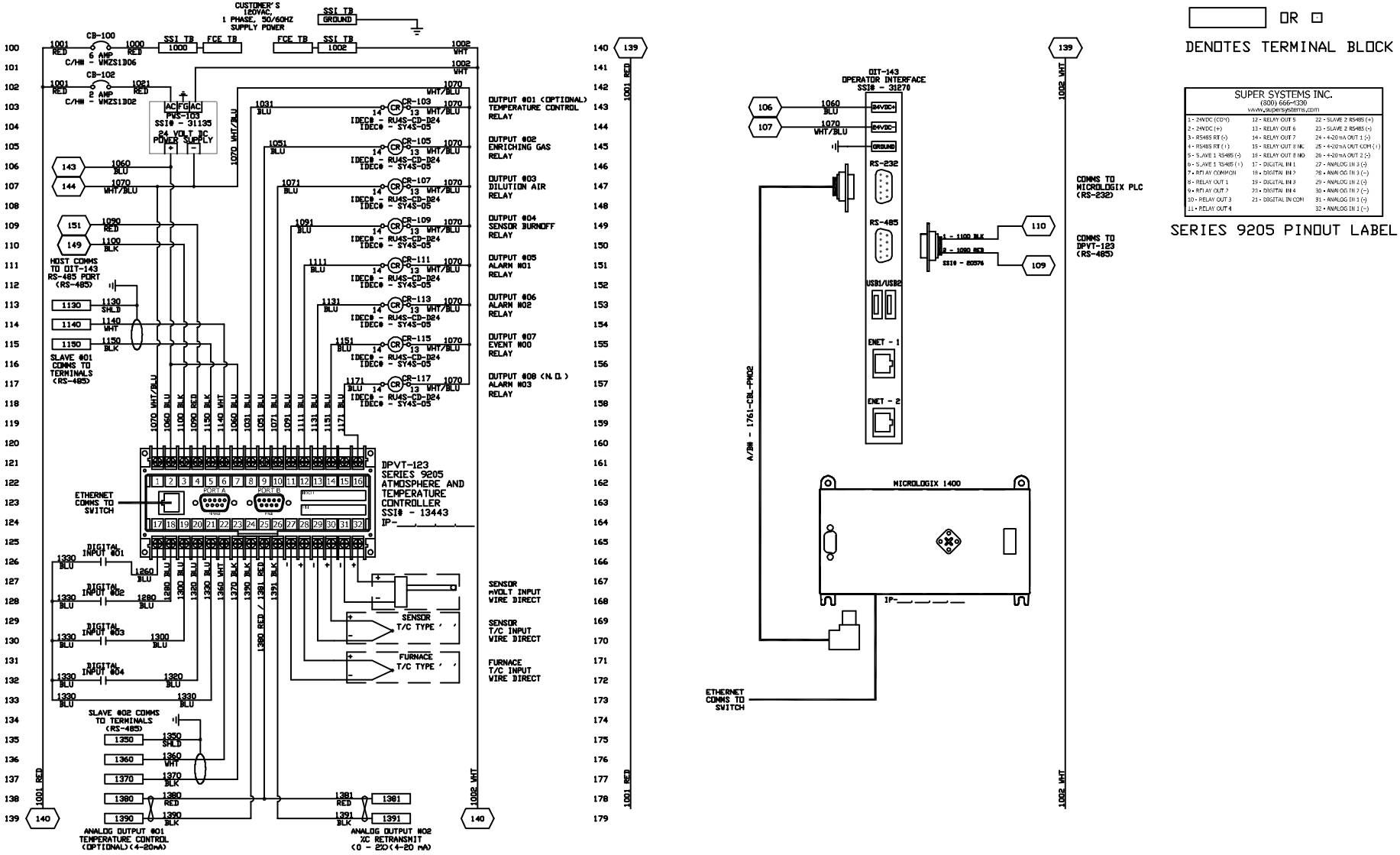
5.7" Touch Screen



12.1" Touch Screen



15" Touch Screen



17" Touch Screen