Crestron One™ App

Mobile Room Control App

Programming Guide

Crestron Electronics, Inc.

Original Instructions
The U.S. English version of this document is the original instructions.
All other languages are a translation of the original instructions.

Contents

Introduction

The Crestron One™ app is a mobile app for Apple® iPhone® and iPad® devices that allows users to control a Crestron® smart room directly from their mobile devices. The Crestron One app creates a peer-to-peer network over Bluetooth® communications between a mobile device and a TSW-60 or TSW/TS-70 series touch screen in the room. This connection allows mobile-optimized room controls to be pushed to a mobile device from the touch screen. No special in-app or network configuration is required.

To enable mobile control functionality via the Crestron app, system administrators must create and load a configuration file that maps the touch screen controls in the room to the app via joins. This document describes various procedures that are required to configure a mobile control solution using the Crestron One app.

NOTE: The following resources are also available for the Crestron One App:

- For more information on how to use the Crestron One app, refer to the Crestron One App Quick Start (Doc. 8853).
- The Crestron Training Institute (CTI) provides training videos that explain how to configure and use the Crestron One app. For more information, refer to www.crestron.com/Training-Events/Training.

System Requirements

The following system requirements must be met prior to configuring a mobile control solution with the Crestron One app.

Room Requirements

Each smart room configured with the Crestron One app must have the following:

- A supported touch screen model with a loaded Smart Graphics® project
  - A TSW-60 series touch screen running firmware version 3.000.0014.001 or later.
  - A TSW/TS-70 series touch screen running any released firmware version.

  NOTE: TSW-60-NC, TSW-570, TSW-570P, TSW/TS-70-GV, and TSW/TS-70R series touch screens are not supported.
- A 3-Series® control system running firmware version 1.603.0076 or later (excluding the MC3 or TPCS-4SM) or a 4-Series™ control system running firmware version 2.4508.00035 or later

  NOTE: For a list of all supported 3-Series and 4-Series control system models currently supported, refer to the Crestron One App release notes.
- A valid mobility license (SW-MOBILITY) that has been loaded to the control system via Crestron Toolbox™ software (Refer to the Crestron Toolbox help file for more information on how to load a software license.)

  NOTE: A 60-day trial period is included with the control system firmware and activates when you turn the service on for the first time. Once the trial period has expired, a mobility license (SW-MOBILITY) is required. For more information on the licensing structure and pricing, refer to the SW-MOBILITY product page.

Mobile Device Requirements

The end user mobile device must meet the following requirements to download and use the Crestron One app:

- The iPhone or iPad device must be supported and running Apple iOS® version 12.2 (or later). For more information, refer to Crestron Online Help answer ID 5655.
- The user must have an Apple ID.
- Bluetooth must be enabled on the device.
- Access to the camera is recommended for ease of use but not required.

Review the Room Controls

The Crestron One app receives room controls from the touch screen project and displays them in a mobile-optimized user interface on the smart device. This process is accomplished via join mapping, which is captured in a configuration JSON file loaded to the touch screen.

To get started, review the room controls within your Smart Graphics project and determine whether any modifications need to be made to support mobile control.

NOTE: At this time, only buttons, sliders, toggle buttons, and dynamic text (button labels) are supported by the Crestron One app, and certain restrictions exist for some supported controls. For more information on supported controls, refer to Appendix D: Supported Smart Graphics Controls (on page 21).

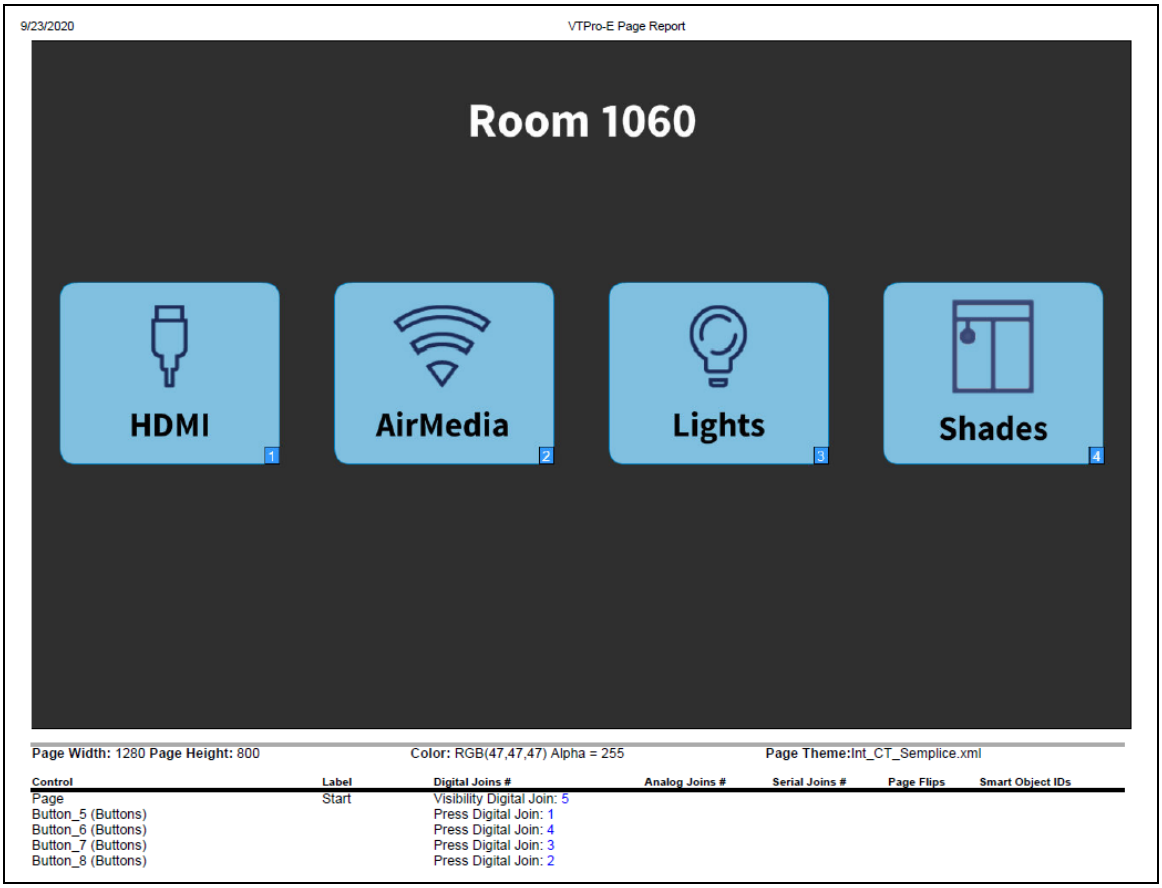
Once you are satisfied with your project, export a list of the joins from the project using one of the following methods:

- Use the **Generate Project Document** function in VT Pro-e® software to generate a list of joins from an open Smart Graphics project. Refer to the VT-Pro-e help file for more information on using this function.
- Use the **Generate Project Document from VTZ** function in VT Pro-e to generate a list of joins from any .vtz file on your workstation. Refer to the VT-Pro-e help file for more information on using this function.

  NOTE: The **Generate Page Document from VTZ** function is available only if using VT Pro-e version 6.2.01 or later.

The image on the following page shows a sample joins output from a Smart Graphics project.

Sample Joins Output



Generate the Configuration File

The following topics describe how to create and load a configuration file that provides the join mapping between the touch screen and Crestron One app.

Download the Configuration Utilities

Crestron provides the following configuration utilities that are used to create the configuration file and load it to the touch screen. The configuration utilities can be downloaded from the **Software & Firmware** page at www.crestron.com/Support as a zipped package file for Windows® and macOS® operating systems.

- **Mobile Room Control Layout**: A Microsoft® Excel® software document for inputting controls and joins
- **Conversion Utility**: A tool for creating the configuration JSON file and loading it to a touch screen
- **Powershell_Batch_Upload**: A PowerShell® utility script used to batch upload the configuration file to multiple touch screens
- **crestron-one-icons**: A folder containing an HTML file that lists the file names for supported Crestron and Font Awesome icons and shows sample renderings of each icon.

These utilities will be referenced throughout the remaining topics where appropriate.

Create the Configuration File

A configuration file can be created using one the following methods:

- Populate your controls and joins in the **Mobile Room Control Layout** document and use the **Excel to Config Conversion Utility** to create a configuration JSON file
- Create a configuration JSON file manually.

Both methods are described below.

NOTE: Observe the following points prior to creating a configuration file:

- The mobile project may take longer to load depending on the size of the configured project. Project load time is also affected by the Bluetooth signal strength and whether the end user device is connected to other Bluetooth devices.
- The recommended limits for mobile projects are 25 navigation pages and 40 controls per navigation page.

Create a Configuration File via Layout Document

The **Mobile Room Control Layout** document allows you to enter controls and joins based on the joins list output from your Smart Graphics project. The data entered into the spreadsheet is used to generate a configuration JSON file via the **Excel to Config Conversion Utility**.

Overview

The **Mobile Room Control Layout** document contains multiple spreadsheets, which represent different pages of the Smart Graphics project. Spreadsheets for **Room**, **Lighting**, **Shades**, and **Media** are provided by default. These spreadsheets can be modified, deleted, or copied to create custom pages.

The **Lighting** spreadsheet is shown below.

Mobile Room Control Layout Spreadsheet

	A	B	C	D	E	F	G	H	I	J	K	L
1	Type	Label	Page	Digital Join	Analog Join	Serial Join	Visibility Join	Icon	Min	Max	Enabled Join	Selected Join
2												
3	*Page*	*N/A*		1								
4	Button	HDMI		1				HDMI.svg				
5	Button	AirMedia		2				Wifi.svg				
6	Button	Presentation Lighting		14				fas fa-low-vision				
7	Navigation Card	Lights	Lighting	3				Lightbulb.svg				
8	Navigation Card	Lights 2	Lighting 2					Lightbulb.svg				
9	Navigation Card	Lights 3	Lighting 3					Lightbulb.svg				
10												
11												
12												
13												

Each spreadsheet contains the following columns that align with data from the outputted joins list. Each row represents a unique control from the Smart Graphics project.

- **Type**: The control type, which can be one of the following: **Navigation Card**, **Button**, **Toggle**, **Slider** and **Divider**. Each control has corresponding properties.
- **Label**: A description of the control that appears on or near the control.

  NOTE: Labels are truncated generally after the 30th character, though this can change based on variable character width and screen resolution. As a best practice, keep labels to less than 30 characters to help prevent truncation from occurring. Review the label in the mobile user interface to ensure the label is adequately describing the function without truncation.

- **Page**: A name of another page in the project, which is used when creating controls that support page flips.

  NOTE: The name specified for the page must match the name of the page spreadsheet in the document.

- **Joins**: The join number of the control, which can be programmed by a SIMPL program. For more information on joins, refer to the SIMPL help file.

  The following joins are supported:

  - **Digital Join**: Used primarily for buttons.
  - **Analog Join**: Used for sliders.
  - **Serial Join**: Used for all controls.
  - **Visibility Join**: Used to show or hide the control on the page.

- **Icon**: Used to display a predefined icon on the left side of the button control. For more information on supported icons, refer to Appendix C: Supported Icon Files (on page 20).
- **Min/Max**: Used to specify a range of supported values when using a slider.
- **Enabled Join**: A join that enables or disables the control, used primarily for sequential actions (for example, a slider that only becomes active after enabling a toggle).
- **Selected Join**: Sets the selected state of a button or navigation card.

Create a New Control

To create a new control within a page, either modify one of the existing sample control rows or enter the necessary data within a new row. The data for each control is obtained from the sample joins output from your VT Pro-e project. For more information on obtaining this file, refer to Review the Room Controls (on page 3).

Refer to the following points when creating or modifying controls:

- Some Smart Graphics controls are not supported, and certain restrictions exist for some supported controls. For more information on supported controls, refer to Appendix D: Supported Smart Graphics Controls (on page 21).
- The order of the control rows within each spreadsheet represents the order that the controls will appear on the respective page in the mobile UI. As a best practice, controls should be ordered in a logical sequence when applicable.
- Navigation cards are one-touch controls that load another page in the project. Navigation cards are used primarily on the main page of the project to provide access to subpages, but they also can be added to any other page.
- Dividers are UI elements that are used to divide controls within a page, which is useful when a page contains multiple control groupings. Dividers can have labels (specified in the document or via a join) or can be left blank.

Create a New Page

To create a new page, copy and paste one of the existing spreadsheets in the document and rename it accordingly. Then, modify the **Page** row to reflect the new page information and add controls to the spreadsheet as needed.

NOTE: The page represented by the first spreadsheet in the document is loaded as the main room page within the Crestron One app. The layout document places the **Rooms** page first by default, but any page may be used.

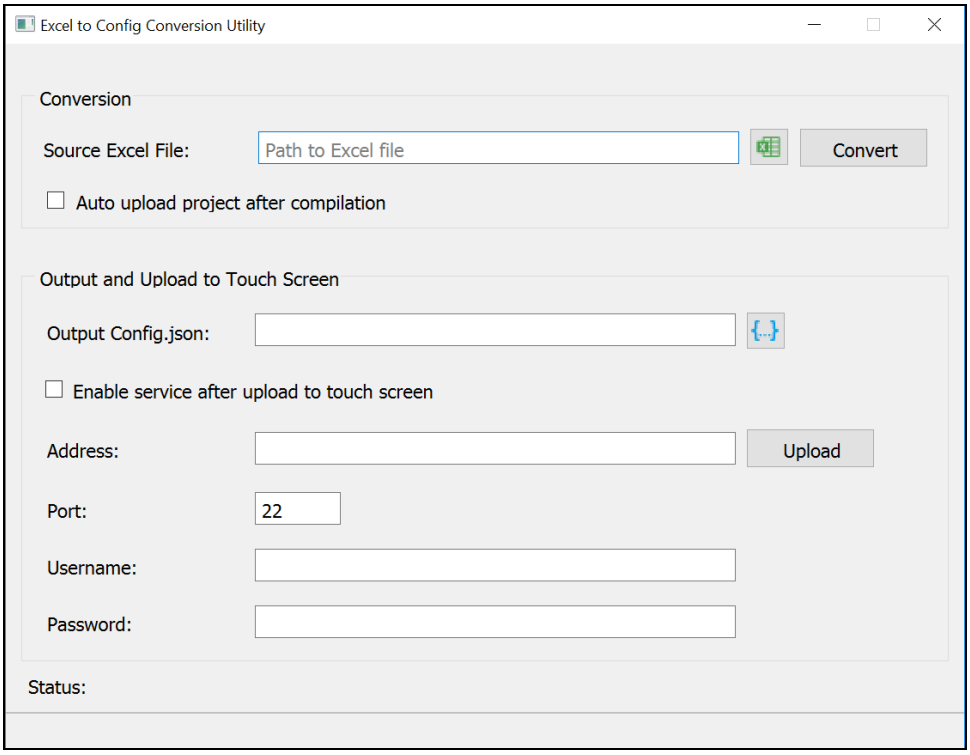
Convert the Layout Document

Once the **Mobile Room Control Layout** document has been finalized, use the **Excel to Config Conversion Utility** to convert the document into a configuration JSON file.

To convert the **Mobile Room Control Layout** document to a configuration file:

1. Open the **Excel to Config Conversion Utility** by double-clicking the **Conversion Utility** shortcut (Windows) or by double-clicking the **Conversion Utility.app** file (macOS).

Excel to Config Conversion Utility

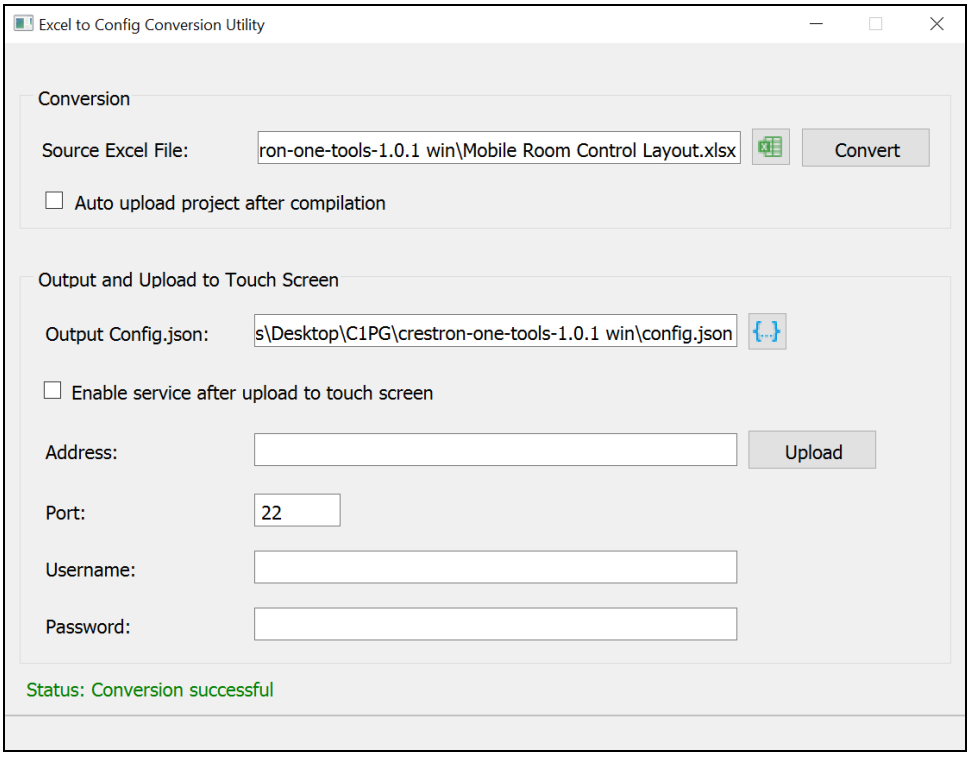


2. Enter the path of the **Mobile Room Control Layout** document into the **Source Excel File** text field, or click the **Excel** icon to browse for the document on your workstation.
3. (Optional) Fill the **Auto upload project after compilation** check box to upload the outputted configuration JSON file to the touch screen after it is generated.

> **NOTE:** The required **Output and Upload to Touch Screen** fields must be filled in to upload the configuration JSON file to the touch screen. Refer to Load the Configuration File (on page 11) for more information.

4. Click **Convert**. If the conversion is successful, a **config.json** file is generated and outputted to the directory where the **Mobile Room Control Layout** document is located, and a **Conversion Successful** status is shown at the bottom of the utility.

Excel to Config Conversion Utility - Config File Created



The path to the **config.json** file is also added to the **Output config.json** text field in the utility automatically.

To view a sample of the outputted **config.json** file, refer to Appendix A: Sample Configuration JSON File (on page 14).

Create a Configuration File Manually

A configuration JSON file can also be created manually using the outputted joins list from your VT Pro-e project. For more information on obtaining the joins list, refer to Review the Room Controls (on page 3).

The configuration JSON file must be named config.json and must follow a specific format. Refer to Appendix A: Sample Configuration JSON File (on page 14) for a sample config.json file that should be referenced when creating a configuration JSON file manually.

Load the Configuration File

The configuration JSON file can be loaded to the touch screen using one of the following methods:

NOTE: The configuration file must be created via the **Mobile Room Control Layout** document or manually first. For more information, refer to Create the Configuration File (on page 6).

- Use the provided **Excel to Config Conversion Utility**.
- Use the provided PowerShell script (recommended for batch uploading the configuration file to multiple touch screens).
- Transfer the configuration file to the touch screen over SFTP, then upload the file and turn on the service using console commands.

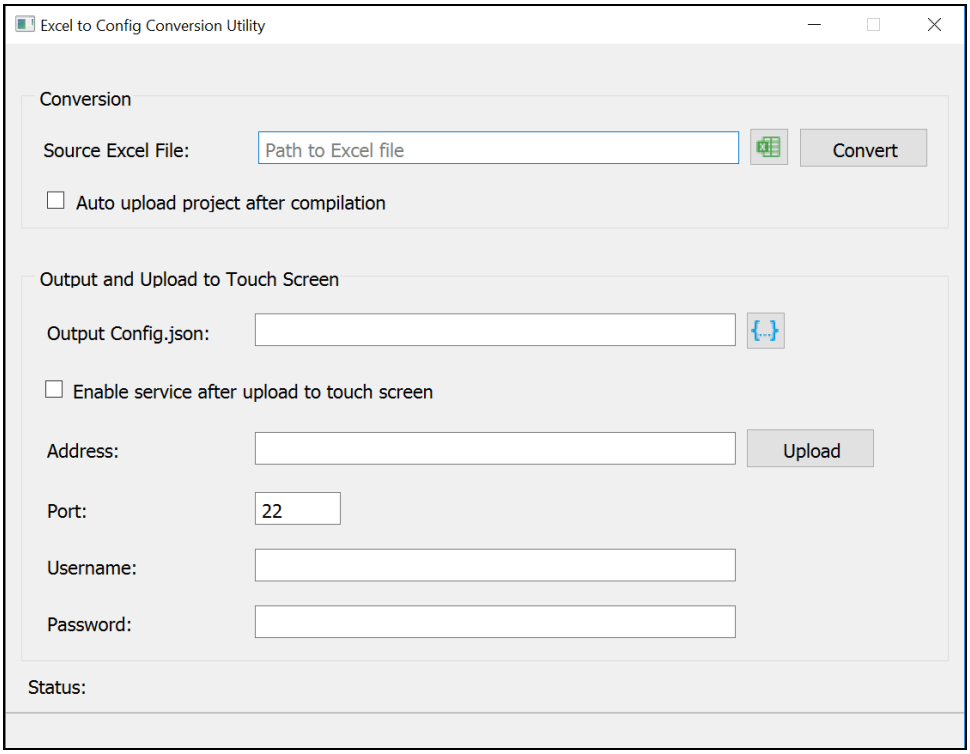
Each method is described in the sections that follow.

Load via Conversion Utility

To load the configuration JSON file via the **Excel to Config Conversion Utility**:

1. Open the **Excel to Config Conversion Utility** by double-clicking the **Conversion Utility** shortcut (Windows) or by double-clicking the **Conversion Utility.app** file (macOS).

   Excel to Config Conversion Utility



2. Enter the following information under **Output and Upload to Touch Screen**:
   - **Output Config.json**: Enter the path of the **config.json** file, or click the ellipses icon to browse for the file on your workstation.

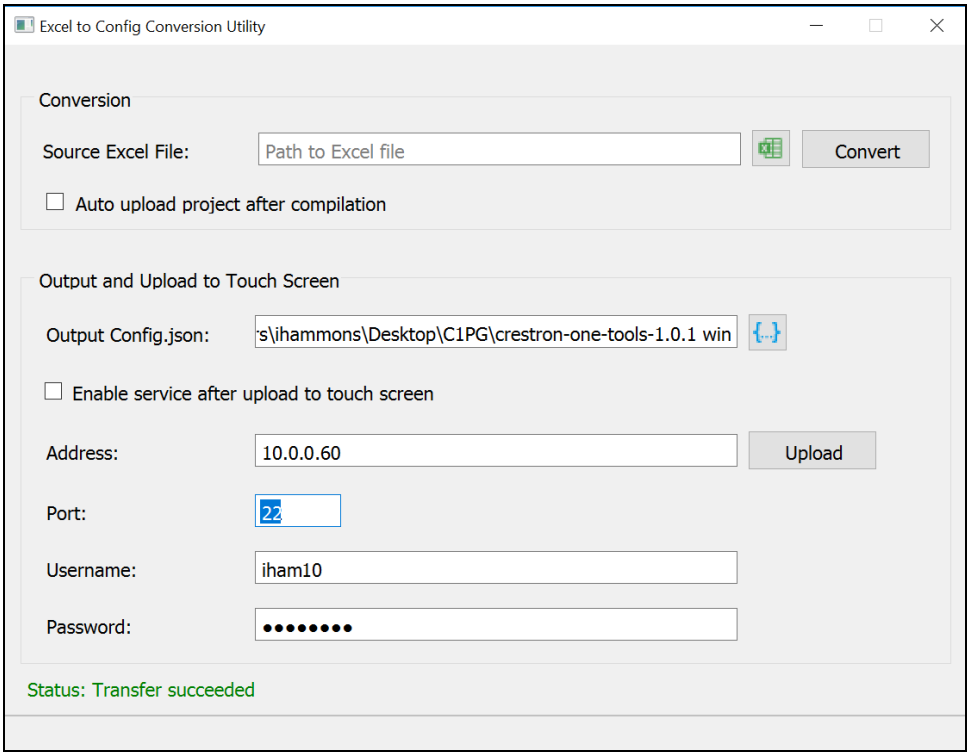
     NOTE: The path to the **config.json** file is added automatically after converting a **Mobile Room Control Layout** document to a configuration JSON file.

   - **Enable service after upload to touch screen**: Fill this check box to enable the mobile room control service on the touch screen after the configuration JSON file is uploaded.

     NOTE: To enable or disable the service using console commands, refer to Appendix B: Console Commands (on page 18).

   - **Address**: Enter the IP address or hostname of the touch screen on the network.
   - **Port**: Enter the port number used to connect to the touch screen (**22** is entered by default).
   - **Username**: If authentication is enabled on the touch screen, enter the administrator username.
   - **Password**: If authentication is enabled on the touch screen, enter the administrator password.
3. Click **Upload**. If the upload is successful, a **Transfer Succeeded** status is shown at the bottom of the utility.

Excel to Config Conversion Utility - Transfer Succeeded



4. If **Enable service after upload to touch screen** was selected, additional **Service enabled** and **Configuration successfully loaded** statuses are displayed if their respective tasks are successful.

Load via PowerShell Script

To load the configuration JSON file via the included PowerShell script, open the **PowerShell_Batch_Upload** file, and then follow the commented instructions within the script.

Load via SFTP and Console Commands

To load the configuration JSON file over FTP using console commands:

1. Use an SFTP or SCP client to upload the **config.json** file to the **\User** directory of the touch screen.
2. Issue the following console commands using an SSH client or the **Text Console** tool in Crestron Toolbox software:
   - `ruiconfigimport`: Use to import the config.json file from the **\User** directory to internal storage on the touch screen.
   - `ruisvc on`: Use to turn the mobile control service on for the touch screen (optional).

Additional console commands are provided for managing the mobile control service. For more information, refer to Appendix B: Console Commands (on page 18).

Appendix A: Sample Configuration JSON File

A sample configuration JSON file for the mobile control service is provided below. This file should be referenced when creating a **config.json** file manually or when troubleshooting an outputted **config.json** file. At a high level, the JSON file is structured as follows and references data from the joins list outputted from VT Pro-e. For more information obtaining the joins list, refer to Review the Room Controls (on page 3)

- `projectproperties`: Specifies the touch screen project properties.
  - `name`: The touch screen project name.
  - `version`: The touch screen project version.
- `pages`: Specifies the project pages to be included in the mobile UI.

  NOTE: The first page specified in the JSON is loaded as the main room page within the Crestron One app.

  - `collection` > `items`: Specifies the items within each page.
    - `type`: The control type, which can be one of the following: **Navigation Card**, **Button**, **Toggle**, **Slider** and **Divider**. Each control has corresponding properties.
    - `label`: A description of the control that appears on or near the control.
    - `page_flip`: A name of another page in the project, which is used when creating controls that support page flips.
    - `digital_join`: A digital join number, used primarily for buttons.
    - `analog_join`: An analog join number, used for sliders.
    - `serial_join`: A serial join number, used for all control types.
    - `visibility_join`: A join number used to show or hide a control on a page.
    - `iconurl` and `iconclass`: Used to display a predefined icon on the left side of the button control. For more information on supported icons, refer to Appendix C: Supported Icon Files (on page 20).
    - `min`: Used to set a minimum value when specifying a value range for a slider.
    - `max`: Used to set a maximum value when specifying a value range for a slider.
    - `digital_join_enabled`: A digital join that enables or disables the control, used primarily for sequential actions (for example, a slider that only becomes active after enabling a toggle).
    - `selected_join`: A digital join that sets the selected state of a button or navigation card
  - `description`: A description for the page.
  - `title`: The page title.

Refer to the following sample JSON for a touch screen project.

```
{
   "projectproperties": {
         "name": "Touchless Project",
         "version": "1.0.0"
   },
   "pages": [
         {
            "collection": {
                  "items": [
                     {
                           "type": "Navigation Card",
                           "label": "Lighting",
                           "digital_join": "2",
                           "iconurl": "Arrow Down.svg"
                     },
                     {
                           "type": "Navigation Card",
                           "label": "Shades",
                           "digital_join": "3",
                           "iconurl": "Arrow Down.svg"
                     },
                     {
                           "type": "Navigation Card",
                           "label": "Media",
                           "page_flip": "Media",
                           "iconurl": "Arrow Down.svg"
                     }
                  ]
            },
            "description": "",
            "title": "N/A",
            "digital_join": "1"
         },
         {
            "collection": {
                  "items": [
                     {
                           "type": "Button",
                           "label": "Increase",
                           "digital_join": "21",
                           "serial_join": "11",
                           "iconurl": "Arrow Down.svg",
                           "digital_join_enabled": "12"
                     },
                     {
                           "type": "Button",
                           "label": "Decrease",
                           "digital_join": "22",
                           "serial_join": "12",
```

```
                        "iconurl": "Arrow Down.svg",
                        "digital_join_enabled": "13"
                    },
                    {
                        "type": "Divider",
                        "label": "Presets"
                    },
                    {
                        "type": "Button",
                        "label": "Light 75%",
                        "digital_join": "23"
                    },
                    {
                        "type": "Button",
                        "label": "Light 25%",
                        "digital_join": "24"
                    }
                ]
            },
            "description": "",
            "title": "Lighting",
            "digital_join": "2",
            "serial_join": "10"
        },
        {
            "collection": {
                "items": [
                    {
                        "type": "Button",
                        "label": "Raise",
                        "digital_join": "31",
                        "iconurl": "Arrow Down.svg"
                    },
                    {
                        "type": "Button",
                        "label": "Lower",
                        "digital_join": "32",
                        "iconurl": "Arrow Up.svg"
                    }
                ]
            },
            "description": "",
            "title": "Shades",
            "digital_join": "3"
        },
        {
            "collection": {
                "items": [
                    {
```

```
                              "type": "Slider",
                              "label": "Raise",
                              "analog_join": "20"
                        },
                        {
                              "type": "Toggle",
                              "label": "Lower",
                              "digital_join": "42"
                        }
                  ]
            },
            "description": "",
            "title": "Media"
         }
   ]
}
```

Appendix B: Console Commands

As of TSW-60 series firmware version 3.000.0014.001, console commands have been added that allow configuration JSON files of touch screen projects to be loaded to the touch screen over SFTP. These commands are supported out of box on TSW/TS-70 series touch screens.

Additional touch screen commands are provided to configure the mobile control service on the touch screen. Each console command is described in the sections that follow.

ruiconfigimport

The `ruiconfigimport` command is used to transfer a configuration JSON file from the **\User** directory of the touch screen to internal storage. For more information on transferring a configuration JSON file to the touch screen, refer to Load via SFTP and Console Commands (on page 13).

ruiconfigexport

The `ruiconfigexport` command is used to transfer a configuration JSON file from touch screen internal storage to the **\User** directory. This command is useful for exporting a configuration JSON file so it can be modified or transferred to another touch screen.

ruisvc

The `ruisvc [on|off]` command is used to turn the mobile control service on or off for the touch screen. If the mobile control service is turned off, the touch screen will not be discovered by the Crestron One app.

ruitimeout

The `ruitimeout` command is used to set a reconnection timeout (0–720 minutes) after a user connects to the room via the Crestron One app. Once the timeout expires, the touch screen will require reauthentication via a QR code or four-digit passcode.

NOTE: The QR Code and four-digit passcode are generated automatically from the touch screen firmware and change each time a user connects to the room or when reauthentication is required. For more information on the authentication workflow, refer to the Crestron One App Quick Start (Doc. 8853).

- For example, if `ruitimeout` is set to 30, the touch screen will require reauthentication after a 30-minute period has elapsed following a prior authentication.
- If `ruitimeout` is set to 0, the touch screen will always require reauthentication.

ruiname

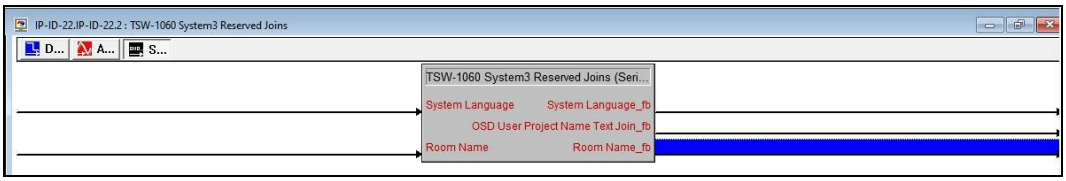
The `ruiname` command is used to set the room name as it will appear in the Crestron One app when the room is discovered. There is a 14-character limit for TSW-60 and TSW/TS-70 series touch screens.

NOTE: Do not use "Crestron" as the room name. This is a reserved name.

The Crestron One app obtains the room name using one of the following methods. These methods are listed in hierarchical order: The app will always attempt to use the first method to obtain the room name before moving to the second and third methods.

1. A reserved join from the touch screen project. This name is set using the **System3 Reserved Join (Serials) : <Room name>** extender in SIMPL. For more information, refer to the SIMPL help file.

   SIMPL System3 Reserved Join

2. The name set using the `ruiname` console command.
3. The touch screen hostname.

ruirestart

The `ruirestart` command is used to disconnect all prior user connections to the Crestron One app and to restart the service on the touch screen.

Appendix C: Supported Icon Files

Icons can be added to controls that display in the Crestron One app. Icons can help to add context to a control or can be used primarily as a graphical element.

The Crestron One app supports icons from Crestron and Font Awesome. For a list of all currently supported icons, including the icon file names and sample renderings, refer to the **crestron-one-icons** HTML file included in the utilities package. When specifying an icon for a control, the icon file name ([icon].svg) must be included in the JSON for that control. Refer to Create the Configuration File (on page 6) for more information.

NOTE: The Crestron One app supports Font Awesome version 5.*x.x*. Be sure to download and use this version when specifying Font Awesome icons in your project.

Appendix D: Supported Smart Graphics Controls

The following Smart Graphics controls are supported by the Crestron One app. Any restrictions are listed next to the control type.

- **Buttons**
  - **Supported**
    - Simple Buttons
    - Advanced Buttons, without a Mode Analog Join set
    - Multimode Buttons, without a Mode Analog Join set and with the number of modes set to "1"
  - **Not Supported**
    - Checkbox Buttons
- **Sliders**
  - **Supported**
    - Fader Slider (Horizontal and Vertical), without a Digital Press Join, with Analog and Min/Max values
    - Advanced Slider, without an On/Off Digital Join, Raise Press Digital Join, Lower Press Digital Join, On Press Digital Join, or On/Off Only Join.
  - **Not Supported**
    - Range
    - Swiper
    - Knob
- **Dividers**
  - **Supported**
    - Simple Text Label, with Indirect Serial Join, without Enable Digital Join or Visibility Digital Join
- **Toggle (Toggle Button)**
  - Refer to **Buttons** above for supported types and limitations

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Specifications subject to
change without notice.