

AEROTECH AUTOMATION1

Automation1 HMI Builder for Windows PCs **MachineApps**

Turn Your HMI Dreams Into Reality

Quickly develop custom, effective HMI screens for your precision machine or motion system. The Automation1 MachineApps HMI builder develops and deploys custom HMIs for machines and motion systems controlled by the Automation1 iSMC controller – bringing your brand to your machine or motion system in minutes.

Each controller can have one or several MachineApps, with each customized to a unique process or user. Use the Automation1 Studio MachineApps Workspace to develop each custom MachineApp, then activate them on the appropriate Automation1 iSMC controller. Access MachineApps via Windows using the MachineApps software application (connected to each controller's "Launchpad") or with a Windows shortcut.

Automation1

MachineApps is a part of the user-friendly Automation1 motion control platform, which includes the following:

- ◆ **Development Software**
- ◆ **Controls**
- ◆ **Motor Drives**
- ◆ **Fiber-Optic HyperWire® Communication Bus**



KEY FEATURES:

- ◆ Quickly build a **CUSTOM HMI** for any machine or system controlled by the Automation1 iSMC controller
- ◆ Use predefined layouts & modules with the **GRAPHICAL DESIGN** tool
- ◆ Deploy flexible capabilities to each MachineApp with **CUSTOMIZABLE MODULES**
- ◆ Spent more time **FOCUSED ON YOUR PROCESS** by simplifying your HMI development

AUTOMATION1 MACHINEAPPS FEATURES

MACHINEAPPS WORKSPACE	
Summary	Description
MachineApps Builder	<p>The MachineApps builder is a module for creating a new MachineApp, editing an existing MachineApp and managing existing MachineApps. The builder enables MachineApps to be built with the settings and modules specified in the “MachineApps Settings & Modules” section below.</p> <p>This module also has a “Manage” section for managing all MachineApps for the connected controller (when connected) or for an MCD file (when not connected to a controller). From the “Manage” screen you can:</p> <ul style="list-style-type: none"> • Create a new MachineApp • Edit an existing MachineApp • Delete an existing MachineApp • Manage the status of a MachineApp (Active or Inactive) • View the name, layout, modules being used, the version number and last modified date for each MachineApp • Configure the MachineApps Launchpad Branding
New MachineApp Creator	<p>Module for quickly creating a new MachineApp for configuration, including specifying the primary and secondary module layout.</p> <ul style="list-style-type: none"> • Primary Module Layouts: A set of predefined arrangements for the placement of primary MachineApps modules • Secondary Module Layouts: Independently select left, right, top and bottom locations for secondary MachineApp modules
How to Order	Order the MachineApps Workspace development tool as part of your Automation1-MDK configuration.

MACHINEAPPS APPLICATION	
Summary	Description
Connection Screen	<p>The connection screen presents a list of controllers to which you may connect. The connection screen is the first screen presented when you open the MachineApps application.</p> <p>If the controller you are connecting to has access control enabled, you must enter your username and password to connect to the controller. If Automation1 Studio is configured to connect automatically to a specific controller, the MachineApps application automatically connects to that controller.</p> <p>Bypass the Connection Screen by selecting the ‘Connect Automatically’ setting in Automation1 Studio. This Studio setting also applies to the MachineApps application.</p>
MachineApps Launchpad	When connected to a controller, the MachineApps application displays the Launchpad screen for that controller. The Launchpad screen contains the complete set of active MachineApps for that controller, based on the group’s or user’s Access Control settings (when enabled, see below) for that specific controller. From the Launchpad, any active MachineApp available to that group or user can be opened. When opened, it will display the MachineApp as configured in the MachineApps workspace. This includes all MachineApp settings, modules, module settings and branding elements.
Creating a Shortcut	Create a Windows shortcut for the MachineApps Application and add command-line arguments to bypass the Launchpad and open a specific MachineApp.
Launchpad Branding	Customize the MachineApps Launchpad’s look and feel using the MachineApps Workspace in Automation1 Studio. When the Automation1 MachineApps application connects to a controller, it looks for the Launchpad branding customizations and automatically applies them to the Launchpad.

chart continued on next page

AUTOMATION1 MACHINEAPPS FEATURES

MACHINEAPPS APPLICATION	
Summary	Description
Access Control for MachineApps	<p>In Automation1 Studio's Configure workspace, Administration section and Access Control helper module, Windows groups and users are given default access to all MachineApps. Modify to limit any configured group's or user's ability to access any MachineApp, including removing access for all MachineApps.</p> <p>Access Control enables developers to build MachineApps targeted for different groups/users or for different use cases. Access can be granted based on group/user permissions or the need to access a user interface for a specific use case. For example, a facility engineer may require a different machine interface than a machine operator.</p>
How to Order	Order the MachineApps Workspace development tool as part of your Automation1-iSMC configuration.

MACHINEAPPS SETTINGS & MODULES	
Summary	Description
Settings	<p>The following settings can be specified for a MachineApp:</p> <ul style="list-style-type: none"> ● Name the MachineApp ● Configure Display Settings ● Configure Controller Settings ● Configure Application Settings
Jog Pad Module	<p>The Jog Pad module provides a customizable user interface for jogging a selected group of axes. Additionally, several jog groups can be configured. For each jog group, you can customize:</p> <ul style="list-style-type: none"> ● The jog group name ● Number of joggable axes (from one to four axes) ● The jog pad position of each axis — horizontal, vertical and two diagonals ● A low speed, high speed and jog distance setting for each axis <p>When using the jog pad module in a MachineApp, based on the configuration, you can control:</p> <ul style="list-style-type: none"> ● Which jog group is displayed ● Positive and negative jogging of each displayed axis ● Jog speed as low speed or high speed ● Jog mode as freerun, distance and distance hold ● Override jog settings for each axis ● Enable/disable keyboard jogging controls
Data Visualizer Module	<p>The Data Visualizer module provides a customizable user interface for collecting and visualizing data. The data visualizer can be configured to:</p> <ul style="list-style-type: none"> ● Collect 1D, 2D or 3D data streams and display this data in 1D, 2D or 3D plots ● Open and save these data plots ● Allow a user to compute a fast Fourier transform (FFT) of collected data ● Allow a user to change plot options <p>When using the data visualizer module in a MachineApp, based on the configuration you can control:</p> <ul style="list-style-type: none"> ● Data collection items ● Starting and stopping data collection ● Opening, closing and saving data collection files ● Zoom level ● Dual cursor placement ● Panning ● Data views including 1D, 2D, 3D, combined 1D/2D, combined 1D/3D and FFT ● Plot settings ● Overlapping multiple plots ● Computing FFTs

chart continued on next page

AUTOMATION1 MACHINEAPPS FEATURES

MACHINEAPP SETTINGS & MODULES	
Summary	Description
Programming Module	<p>The Programming module provides a customizable user interface for developing and executing real-time application code for machine and motion control. The Programming module can be configured to:</p> <ul style="list-style-type: none"> ● Allow users to create, save, edit and build files ● Allow users to load and run programs ● Show or hide the message log ● When shown, configure the message log functionality <p>When using the Programming module in a MachineApp, based on the configuration you can use or access:</p> <ul style="list-style-type: none"> ● AeroScript syntax highlighting ● Intelligent autocomplete in the text editor ● Task assignments including assign programs to new tasks ● Code snippets ● Real-time build error checking ● View task status and error messages ● View message log ● Open, close and save program and library files ● Program editing and building ● Loading programs on the controller ● Running programs on the controller ● Debugging tools such as Run, Stop, Step Over, Step Into, Step Out and breakpoint.
Task Status Module	<p>The Task Status module provides a user interface for seeing the status of the controller tasks.</p>
Variables & I/O Module	<p>The Variables & I/O module provides a customizable user interface for seeing the status of all global integer and real variables, the drive I/O for each configured axis, all configured industrial ethernet I/O and a listing of Favorites from the aforementioned categories. The Variables & I/O Module can be configured to turn on or off the user's ability to view the following categories:</p> <ul style="list-style-type: none"> ● Global Variables ● Drive I/O ● Industrial Ethernet ● Favorites <p>Favorites are configured in Automation1 Studio. To create a static listing of favorite I/O points, use the Studio application to establish the desired listing, then click Copy Favorites when configuring the Variables & I/O module in MachineApps workspace. Any item added to Favorites can be viewed as a favorite even if its originating category has been disabled.</p> <p>When using the Variables & I/O module in a MachineApp, based on the configuration you can:</p> <ul style="list-style-type: none"> ● View the Global Variables tabbed listing ● View the Drive I/O tabbed listing ● View the Industrial Ethernet tabbed listing ● View the Favorites tabbed listings (with the list of favorites displayed statically as per the last time Copy Favorites was selected) <p>Note: It is not possible to modify Industrial Ethernet settings from a MachineApp.</p>

chart continued on next page

AUTOMATION1 MACHINEAPPS FEATURES

MACHINEAPP SETTINGS & MODULES	
Summary	Description
<p>Axis Dashboard Module</p>	<p>The Axis Dashboard module provides a customizable user interface for controlling axes of motion and seeing status and data items associated axes of motion. The Axis Dashboard can be configured to allow the user axes to:</p> <ul style="list-style-type: none"> ● Enable and disable axes ● Home axes ● Jog axes ● Configure two data signals <p>When using the Axis Dashboard module in a MachineApp, based on the configuration you can:</p> <ul style="list-style-type: none"> ● Enable/Disable axes ● Home axes ● Jog axes ● View status items and data
<p>Customizable Buttons & Indicators Module</p>	<p>The Customizable Buttons & Indicators module provides a customizable user interface for custom software buttons and software indicator lamps. Customizable buttons enable configured custom functionality to be accessed from any MachineApp. Customizable indicators enable special attention to be given to MachineApp users based on defined logic or operational states. Buttons and indicators are organized together into pages and can be arranged into sensible groups. Each page holds a maximum of 12 buttons and/or indicators filling one or two columns depending on available screen space. Each page can be named and each specified page can be displayed based on defined logic or operational states. Customizable buttons and indicators are enabled by the power of the AeroScript programming language, including AeroScript library files, Program Automation, Application Indicator functions and Application Message functions.</p> <p>For each button, you can define a button name and also define one or several states for the button, including a default state and states/inhibited states displayed based on conditional logic. For each unique state, you can define:</p> <ul style="list-style-type: none"> ● The state's name ● The display text ● The foreground and background color (not available for inhibited states) ● The AeroScript function to execute on a specified task (not available for inhibited states) ● The conditional logic enabling the state (not available for the default state) <p>For each indicator, you can define an indicator name and also define one or several states , including an off state and states displayed based on conditional logic. For each unique state of each indicator, you can define:</p> <ul style="list-style-type: none"> ● The state's name ● The display text ● The indicator's animation (solid, flash, two-color flash and color sweep) (not available for off states) ● The foreground and background color ● The conditional logic enabling the state (not available for off states) <p>When using the Customizable Buttons & Indicators module in a MachineApp, based on the configuration, you can:</p> <ul style="list-style-type: none"> ● Observe the page of buttons and indicators change based on defined conditional logic ● Observe buttons and indicators change states based on defined conditional logic ● Execute defined custom functionality by interacting with custom buttons ● Page through multiple pages of buttons and indicators

chart continued on next page

AUTOMATION1 MACHINEAPPS FEATURES

MACHINEAPP SETTINGS & MODULES	
Summary	Description
Camera Module	<p>The Camera module provides a Camera interface with a customizable user interface for displaying the video feed from a USB camera in your MachineApp. The video feed can include an optional crosshair overlay of configurable line thickness, color, crosshair type, size, open or closed center, and with or without extended guide lines. Another option is to include an optional grid overlay of configurable line thickness, color, and vertical and horizontal grid density. The Camera module also includes an Axis Positions table view for viewing the position feedback of defined axes and a Capture Image button for capturing images of the camera feed (including storing the positions of the defined axes as part of the captured images' metadata).</p> <p>The Camera module also provides a "Gallery" interface meant for viewing past captured images, deleting selected captured images and viewing the axis positions saved with each captured image. Camera settings can be managed directly from the Camera module, including camera selection, resolution setting and selection preview. The Camera module can be configured to:</p> <ul style="list-style-type: none"> ● Enable/disable capturing images ● Selecting which axes to save position data for when an image is captured ● Configure an overlay for the video feed including no overlay, a crosshair overlay or a grid overlay <p>When using the Camera Module in a MachineApp, based on the configuration, you can:</p> <ul style="list-style-type: none"> ● View the camera display as configured with optional overlay ● View axis positions that are configured to be saved with each captured image ● Capture an image with associated axis positions ● Modify camera settings ● View captured images through the Gallery feature ● Delete selected captured images ● View axis positions saved with each captured image
Message Log Viewer Module	<p>The Message Log Viewer module provides a customizable user interface for viewing messages stored to the Message Log with the AeroScript Message Log functions. The Message Log Viewer module can be configured to:</p> <ul style="list-style-type: none"> ● Automatically scroll so the most recent messages remain in view ● Show/hide timestamps ● Show/hide message severity ● Show messages only with a specified severity ● Limit the number of message displayed <p>When using the Message Log Viewer module in a MachineApp based on the configuration you can:</p> <ul style="list-style-type: none"> ● View messages logged to the Message Log ● View the timestamp of the logged messages ● View the message severity of the logged messages ● View messages of a certain severity ● View a configured limited number of messages

MACHINEAPPS CUSTOM MODULES	
Summary	Description
Custom Modules	<p>The Custom Module functionality of MachineApps lets you develop new modules that you can integrate and deploy alongside standard modules in a MachineApp. Custom Modules are written in C# and use Windows Presentation Foundation (WPF) UI technology. Custom modules allow you to integrate the capabilities of the full Automation1 .NET API, third party APIs and custom software into the MachineApps HMI.</p>