Covidien North Haven Screen Format

Factory Talk - Graphics/Dispalys:

```
Graphics
  Displays
    01 - MAIN
    02 - NAVIGATE
    04 - ADD USER
    05 - ALARM HISTORY
    07 - STATISTICS
    08 - SAFETY STATUS
    09 - SETTINGS
    11 - IO
    12 - IO GENERAL STATION
    13 - IO PIN PRESS
    14 - IO PICK AND PLACE
    21 - IAI SHUTTLE
    30 - STATUS
    31 - PRESS STATUS
    32 - PICK AND PLACE STATUS
    40 - SETUP SELECT
    41 - SETUP IAI
    42 - SETUP GREASE
    42 - SETUP SERVO
    999 - CLEAN SCREEN
```
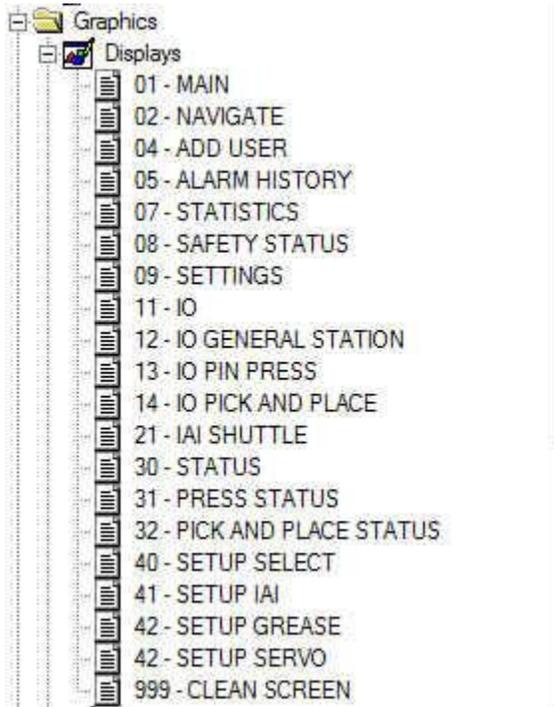
Please map the displays as shown above, with Main listed as 01 and so on.

Main Operation Screen:
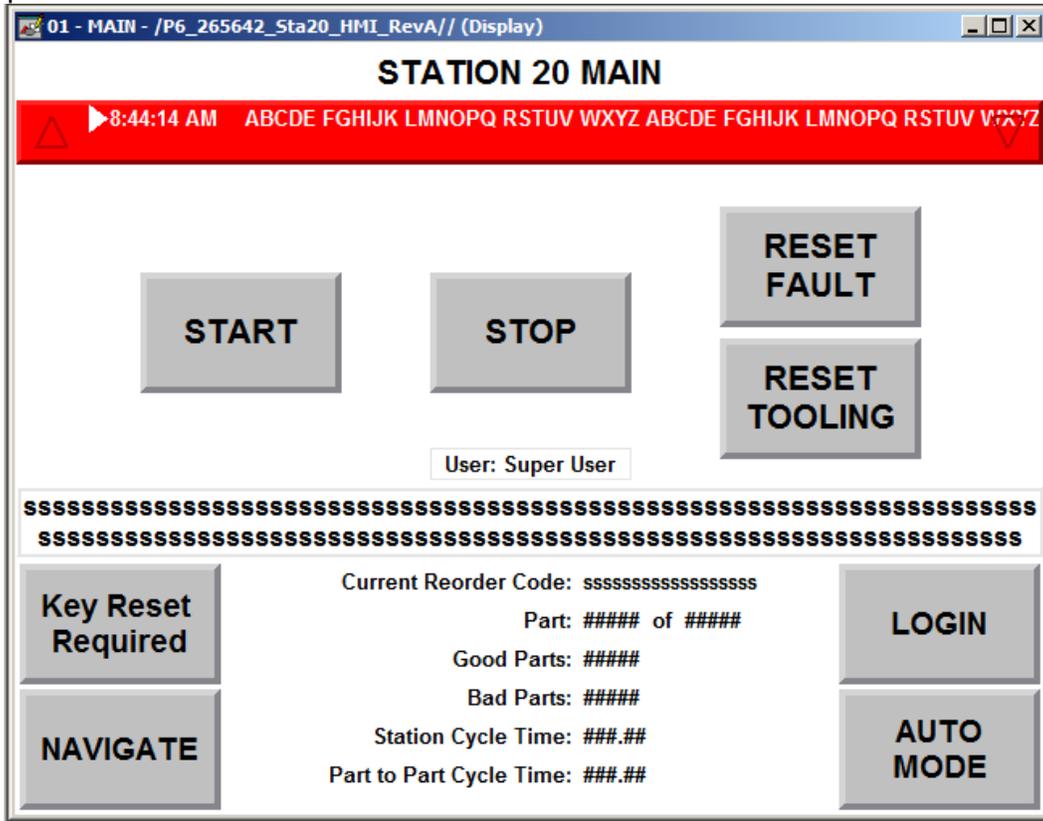
Operator cannot get past this screen without login. The Navigate button is only visible when the current user has the proper access level. This screen contains all info needed to run station. The red banner is the fault message display and button to access the Alarm History. The fault message is only visible when there is a fault. The Key Reset button is only visible when a Key Reset is required. The Fault Reset button behind it is only visible if there is a fault that does not require a Key Reset. The Reset Tooling button puts the machine back to a "home" state. It is only visible when the machine is not cycling and the tooling is not at "home". The white banner is the operator message banner. It is visible when Operator messages, for instance "Place the part in the nest", are available for the operator. Both the Fault message display and Operator message display are made up of strings that are set in the PLC. These two displays shall not be state type displays programmed into the HMI. The reason for using strings is that future messages can be added without modifying the HMI code. The Auto Active button is green when in Auto mode and Gray when not in auto mode. The Login button is visible if the current user access level is zero otherwise a Logout button is visible. The display is set to auto logout and return to this screen if it is idle for 5 minutes. All animations for buttons have been included at the end of this document.

Line Setup Screen:

LINE SETUP

REORDER CODE

Current Reorder Code: sssssssssss

	Good Parts:	Bad Parts:	Part Status:
Station 10	NNNNN	NNNNN	Not Purged
Station 20	NNNNN	NNNNN	
Station 30	NNNNN	NNNNN	
Station 40	NNNNN	NNNNN	Not Purged
Station 50	NNNNN	NNNNN	Not Purged
Station 60A	NNNNN	NNNNN	Not Purged
Station 60B	NNNNN	NNNNN	Not Purged
Station 70	NNNNN	NNNNN	Not Purged
Station 80A	NNNNN	NNNNN	Not Purged
Station 80B	NNNNN	NNNNN	Not Purged
Station 90	NNNNN	NNNNN	Not Purged
Station 100	NNNNN	NNNNN	Not Purged

Reorder code list:
s...s (repeated)

▲ ▼ ↵

BATCH SIZE

NNNNN

SSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS
SSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS

STATION 10 MAIN

This is an optional screen that allows reorder code selection. This example shows the main station of a multi-station line. The Main button returns to the Main Operation Screen. This screen is accessible by the operator or Line leader so there would be a button on the Main Operation Screen to access it.

Navigation Screen:

This screen allows you to navigate the various I/O and status screens available when logged in. The top title is a button that returns you to the Main Operation Screen. The blue boxes are buttons that open the selected screen. The red banner is the fault message display and button to access the Alarm History. The Add User button is only visible when the Access Level is set to Super User. It opens a menu that allows access for new Operators, Line Leaders, Engineers, and Super Users to be added. The Configure HMI button allows access to the Rockwell Display Configuration Menu. It is visible only when the user access level is Engineer level or higher.

Station Status Screen:
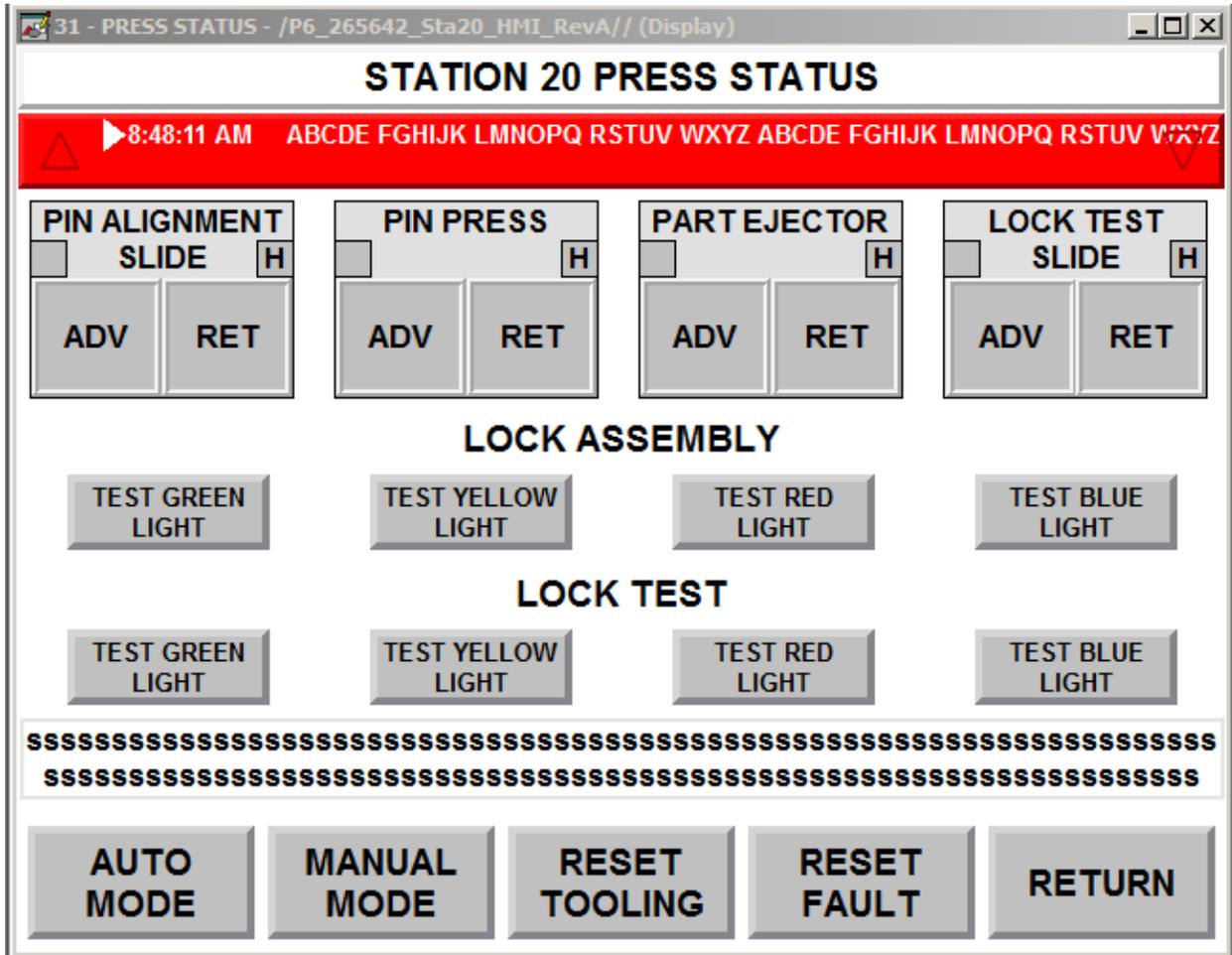
This screen shows the command, indicator and home status of the various machine components that can be manipulated in manual mode. The top title is a button that returns you to the Navigate Screen. The Stop, Start, Adv, Ret, etc. buttons are momentary and issue the HMI request bit. The state of the button is tied to the actual output command state, Gray is an Off state and Green is an On state. The small boxes above the buttons are tied to the indicator or input for each actuator. The states of the indicators are Gray for Off and Yellow for On. This color scheme shall be maintained for consistency across equipment. If the state of the button does not match the state of the indicator it is visually obvious that the commanded motion did not complete. The red banner is the fault message display and button to access the Alarm History. The white banner is the operator message banner. It is visible when Operator messages, for instance "Place the part in the nest", are available for the operator. The Auto Mode button selects Auto mode if the permissives for the station allow it. The Manual Mode button selects Manual mode and allows the command buttons to be active. The Reset Tooling button will return the actuators to their home state. The test light buttons are momentary buttons that force the state of the status indicator to the color selected. The button itself will change to the color that is being tested while the button is held on.

I/O Screen:
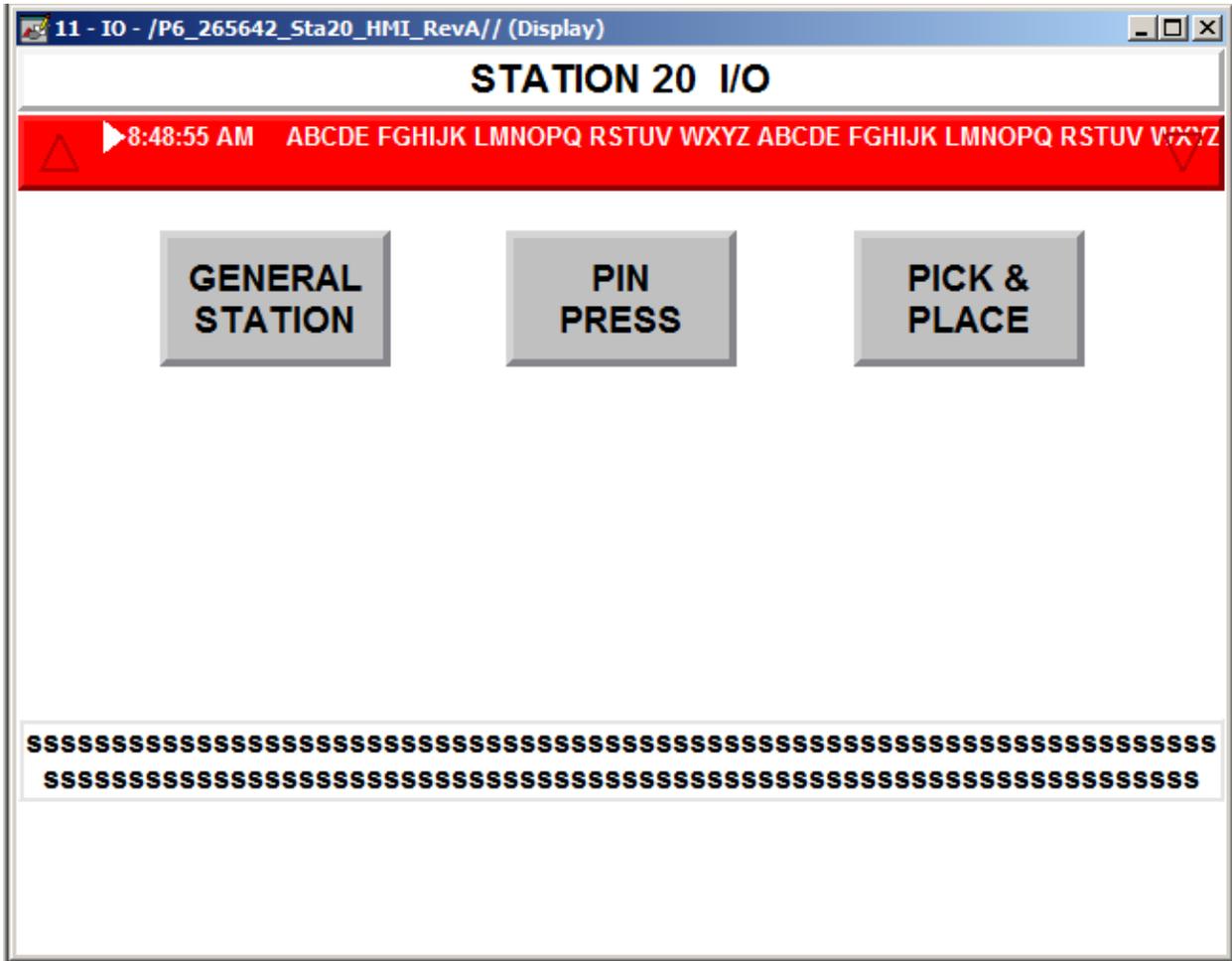
This screen allows you to navigate the various I/O screens available when logged in. The top title is a button that returns you to the Navigate Screen. The buttons open the selected screen. This top level screen can be eliminated on jobs with less I/O that can be displayed on one screen. The red banner is the fault message display and button to access the Alarm History. The white banner is the operator message banner. It is visible when Operator messages, for instance "Place the part in the nest", are available for the operator.

General I/O Screen:

```
┌─────────────────────────────────────────────────────────────────────────────┐
│ 🖳 12 - IO GENERAL STATION - /P6_265642_Sta20_HMI_RevA// (Display)    _□×    │
├─────────────────────────────────────────────────────────────────────────────┤
│                    STATION 20 GENERAL STATION I/O                            │
│                                                                               │
│              INPUTS                            OUTPUTS                        │
│                                                                               │
│   I0202002_ControlPowerOn            O0202102_LockAssyRedMachStatusLight      │
│   I0202003_MachineAirPressureOK      O0202103_LockAssyYellowMachStatusLight   │
│   I0202004_DoorSafetyCircuitNOK      O0202104_LockAssyGreenMachStatusLight    │
│   I0202005_LockAssyOptoTouch         O0202105_LockAssyNestIndicatorLight      │
│   I0202006_LockTestOptoTouch         O0202106_LockTestRedMachStatusLight      │
│   I0202007_Spare                     O0202107_LockTestYellowMachStatusLight   │
│   I0102108_Spare                     O0202108_LockTestGreenMachStatusLight    │
│   I0102109_Spare                     O0202109_LockTestNestIndicatorLight      │
│   I0202022_Station20EstopActive      O0202122_IAITestShuttleHardFaultReset    │
│   I0202023_BackDoorClosed            O0202123_EnablePartConeyor               │
│   I0202024_Spare                     O0202124_Spare                           │
│   I0202025_Spare                     O0202125_Spare                           │
│   I0202026_Spare                     O0202126_Spare                           │
│   I0202027_Spare                     O0202127_Spare                           │
│   I0202028_Spare                     O0202128_Spare                           │
│   I0202029_Spare                     O0202129_Spare                           │
│                                                                               │
│                           ┌──────────────┐                                    │
│                           │   RETURN     │                                    │
│                           └──────────────┘                                    │
└─────────────────────────────────────────────────────────────────────────────┘
```

This screen displays the I/O address, name, and its status. The I/O address shall match the wire marker assigned to that input or Output. Having the address and wire markers match allows for debugging without schematics and greatly reduces downtime. This screen is available when the current access level is high enough. Off items are displayed in Gray, On items are displayed in Green. The top title is a button that returns you to the Navigation Screen. The Return button brings you back to the calling screen. The top level and return concept can also be used for Station Status on machines that have a large number of actuators requiring multiple screens to manipulate them.

Rotary Indexer Screen:

STATION 10 ROTARY INDEXER

INDEXER STATUS	INDEXER COMMANDS	
Drive Disabled	Active Index	NNNNN
Drive OK	Actual Velocity	NNN.NN
Position Not Locked	Actual Position	NNN.NN
Current OK	Position Command	NNN.NN
No Registration Event Detected	Position Error	NNN.NN
Not Indexing	Motor Current	NNN.NN
Dial In Motion	Registration Position	NNN.NN
Positive Overtravel Detected	Starting Index	NNNNN
Negative Overtravel OK	Reference Source	NNNNN
Velocity at Stand Still	Acceleration Limit	NNN.NN
Velocity Locked	Deceleration Limit	NNN.NN
Power Structure Not Enabled	Command Current/Velocity	NNN.NN
Abort Not Requested	Velocity Limit	NNN.NN
Start Not Requested	Commanded Position	NNN.NN
Define Home Not Requested	Registration Offset	NNN.NN
Drive Enable Not Requested		

Dial Not in Position

MANUAL MODE	RESET FAULT	RESET TOOLING	VELOCITY	INDEX

This screen displays the status of a rotary indexer. It is available when logged in. Overtravel switch and limit switch status are Green when Off or OK and Red when On or Tripped. Numeric displays are dynamic. The top title is a button that returns you to the Navigate Screen. The fault message and the Reset Fault button are only visible when there is a fault. The Reset Tooling button puts the machine back to a "home" state. It is only visible when the machine is not cycling and the tooling is not at "home". The Manual Mode button selects Manual mode and allows the command buttons to be active. The Velocity button allows the velocity of the index to be set when in Manual Mode. The Index button allows the dial to be indexed when in Manual Mode.

Safety Status Screen:
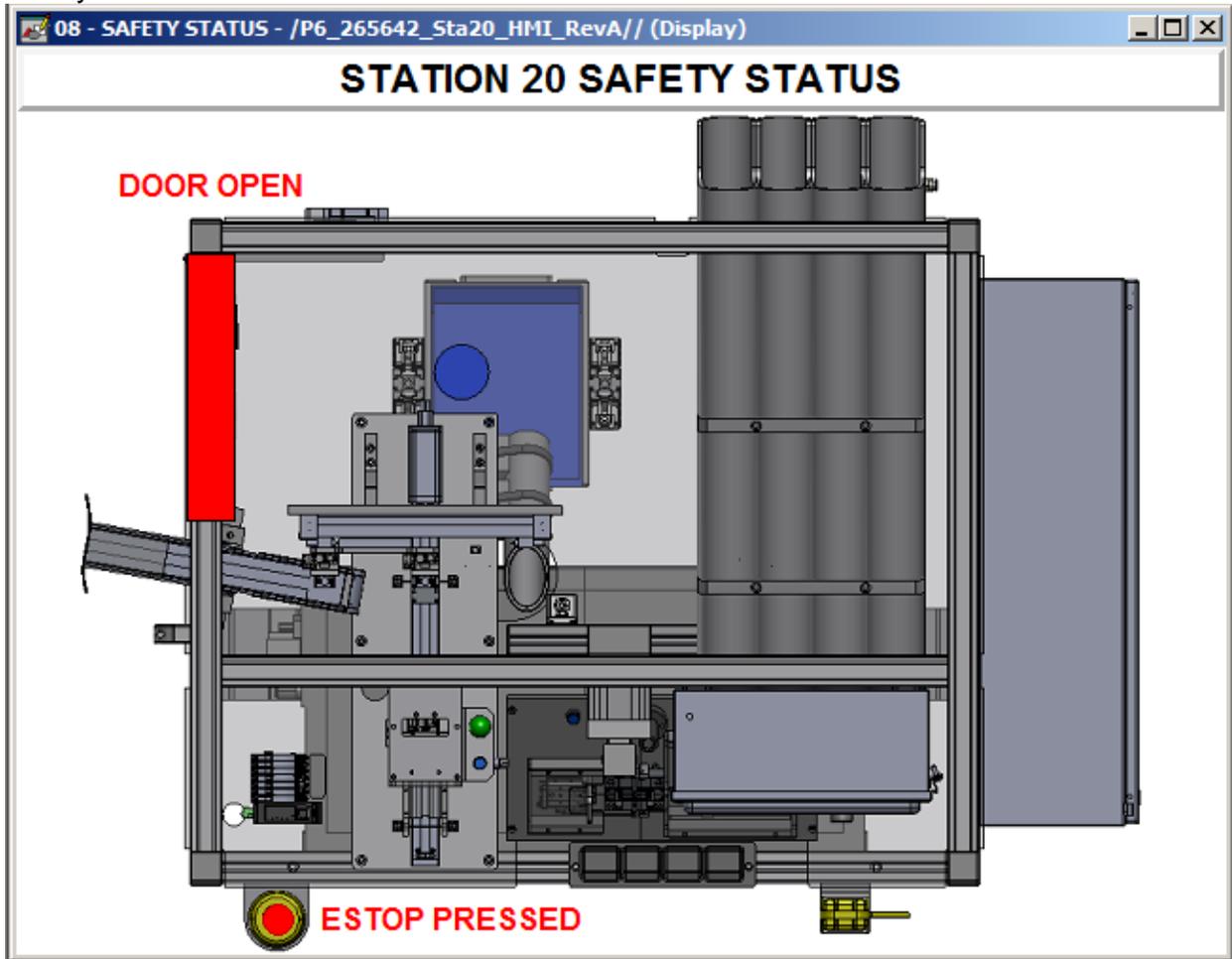
This screen displays the Safety Status of the machine. The items in Red are setup with Visibility Animations that make them visible when the condition is true. Items included on this display are things like: E-stops, Light Curtains, Magnetic and Locking door switches, Safety Edges etc.. It is available when the current access level is high enough. The top title is a button that returns you to the Navigate Screen.

Statistics Screen:

This screen displays the runtime statistics for the cell. It is available when the current access level is high enough. The Machine cycle time displays the average machine cycle. The P2P cycle time displays the time between Start Cycle signals for example an Opto touch used to run a cycle. The top title is a button that returns you to the Navigate Screen. The Reset Stats button zeros all the statistics for the cell. The red banner is the fault message display and button to access the Alarm History. The white banner is the operator message banner. It is visible when Operator messages, for instance "Place the part in the nest", are available for the operator.

IAI Screen:

STATION 20 IAI SLIDE

S...S

			CURRENT POSITION NNN.NN	TAUGHT POSITION NNN.NN	TAUGHT VELOCITY NNN	ENTERED VELOCITY NNN

Press for Servo ON | Home Complete | No Alarm

Press for Teach Mode | Teach Current Position | Teach Velocity | Enter New Velocity

Manual Mode Selected

Enable Inch Mode | Jog POS(+) | Jog NEG(-)

Hard Reset IAI Alarm | COMMAND POSITION NNN.NN | COMMAND VELOCITY NNN.NN

SSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS

Press for Incremental Move | Move to Command Position | Enter Command Position | Enter Command Velocity

Position 1
Position 2
Position 3
Position 4
Position 5
Position 6

Move to Selected Position

AUTO MODE | MANUAL MODE | RESET TOOLING

SSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS
SSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS

This screen allows jogging and teaching of an IAI linear or rotary actuator. It is available when the current access level is high enough. The top title is a button that returns you to the Navigate Screen. The Entered values allow you to set new values for various parameters. The Teach button then moves that value into the actual variable. The Alarm button highlights in Red. The Servo, Home, and Inch Mode buttons highlight in Green. The top red banner is the fault message display and button to access the Alarm History. The white banner is the operator message banner. It is visible when Operator messages, for instance "Place the part in the nest", are available for the operator. The bottom red banner displays IAI faults that are reported by the IAI controller.

Settings Screen:
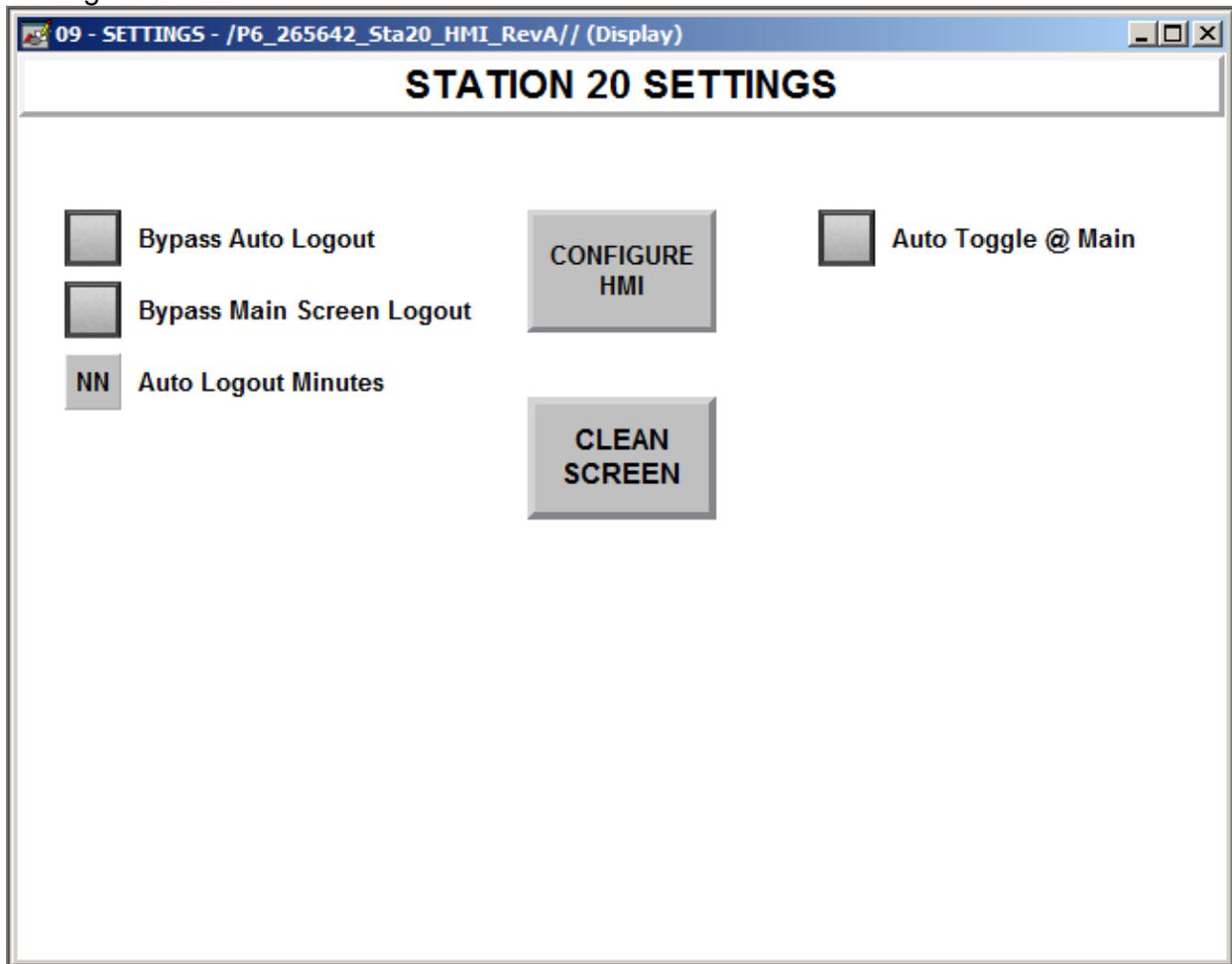
The settings screen allows user to set a logout timer. If user is working on multiple items and does not want to be auto logout to function user can bypass this function. It also takes user to the Factory Talk configuration screens.

Alarm History Screen:
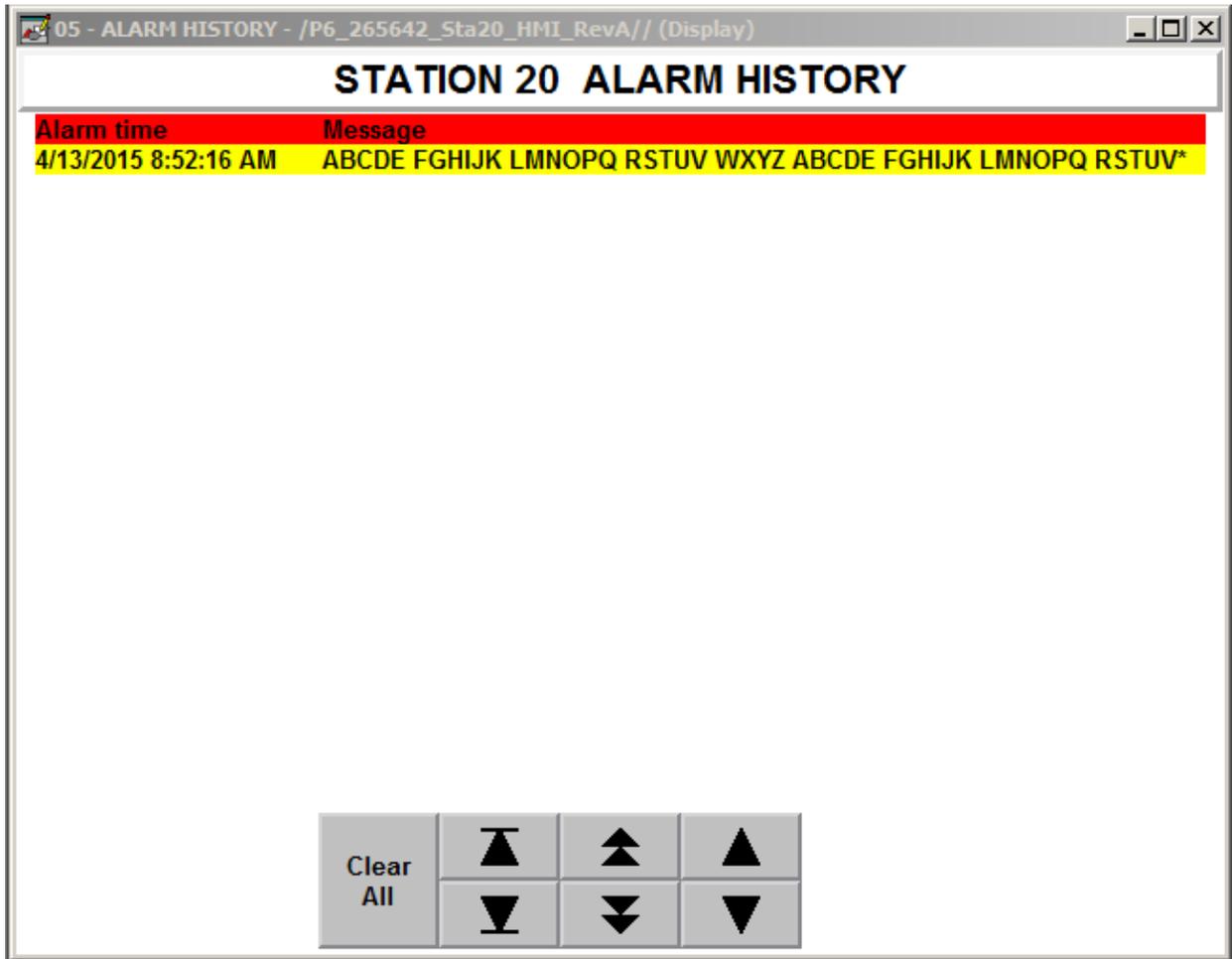
This screen displays the Alarm History. It can be accessed by touching the Alarm banner on any screen. The top banner is a Return button and will return you to the original screen. This screen can also be accessed from the Navigate screen in the event that there is no current Alarm. The buttons at the bottom of the screen allow manipulation of the Alarm data.

Add User Screen:

Select Access Level of New User

NONE

ACTIVATE
BADGE
READER

To add user:
1) Select Access Level of New User by pressing button
2) Press Activate Badge Reader Button
3) Touch badge to RFID reader
4) Select Done when all users have been added

DONE

This screen is utilized to add new user badges to the access list. It can be opened by touching the Add User button on the Navigate screen if the current access level is equal to 4, Super User. The Select Access Level button will toggle through the available access levels incrementing once each time the button is pressed. The Activate Badge Reader button is visible when the set access is greater than zero and opens a string input field that the RFID badge reader fills in. The string read by the badge reader is masked so the value on the badge is not displayed. The done button returns control to the MAIN screen which executes the Reset Password Macro when opened thus setting the current access level back to zero.

Password protecting HMI

The password protection scheme of this HMI package is simple.

Double click the project settings selection from the project explorer in Factory Talk then click the Runtime Tab and setup as follows:

**Double click the Runtime Security selection from the project explorer as setup as follows:**
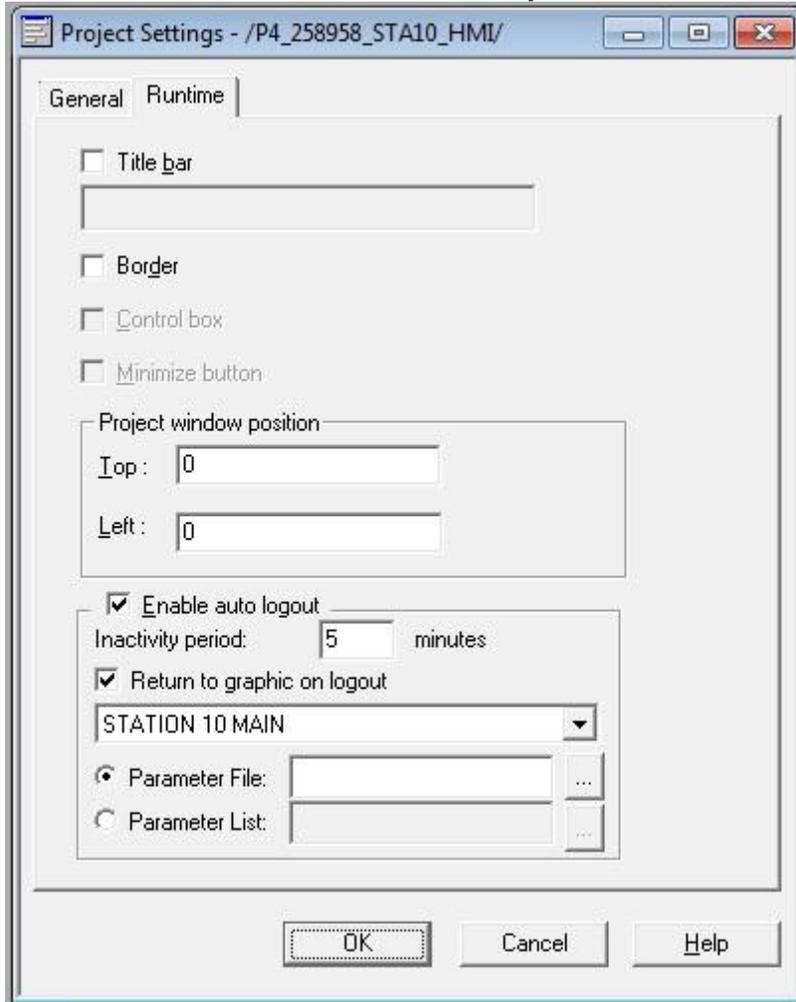
**Open the Main screen and set the Animation Visibility for the Navigate button as follows:**
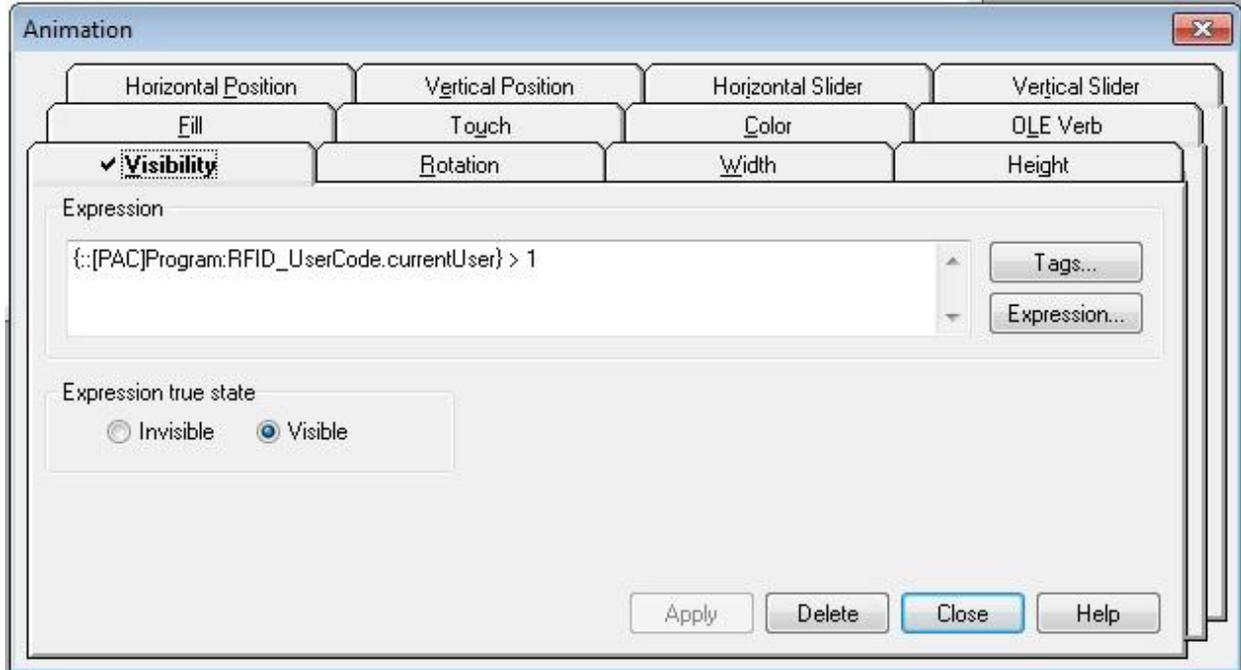
**Set the Animation Visibility for the Login button as follows:**
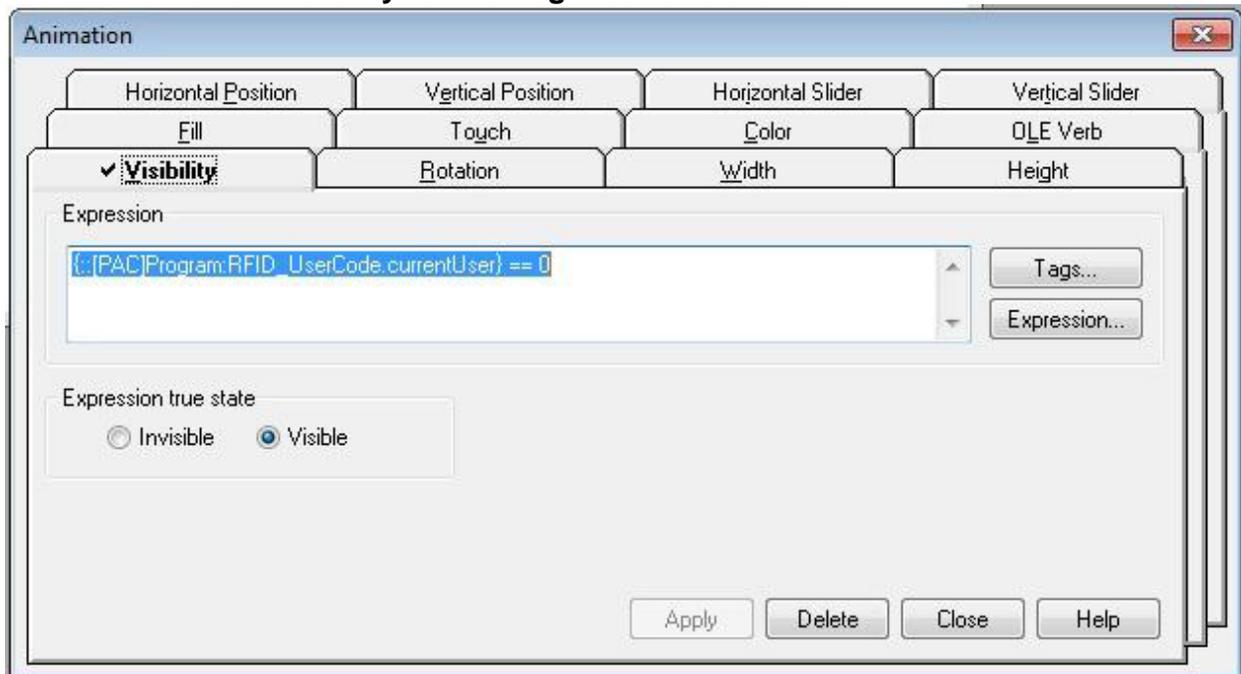
**Set the Animation Visibility for the Logout button as follows:**
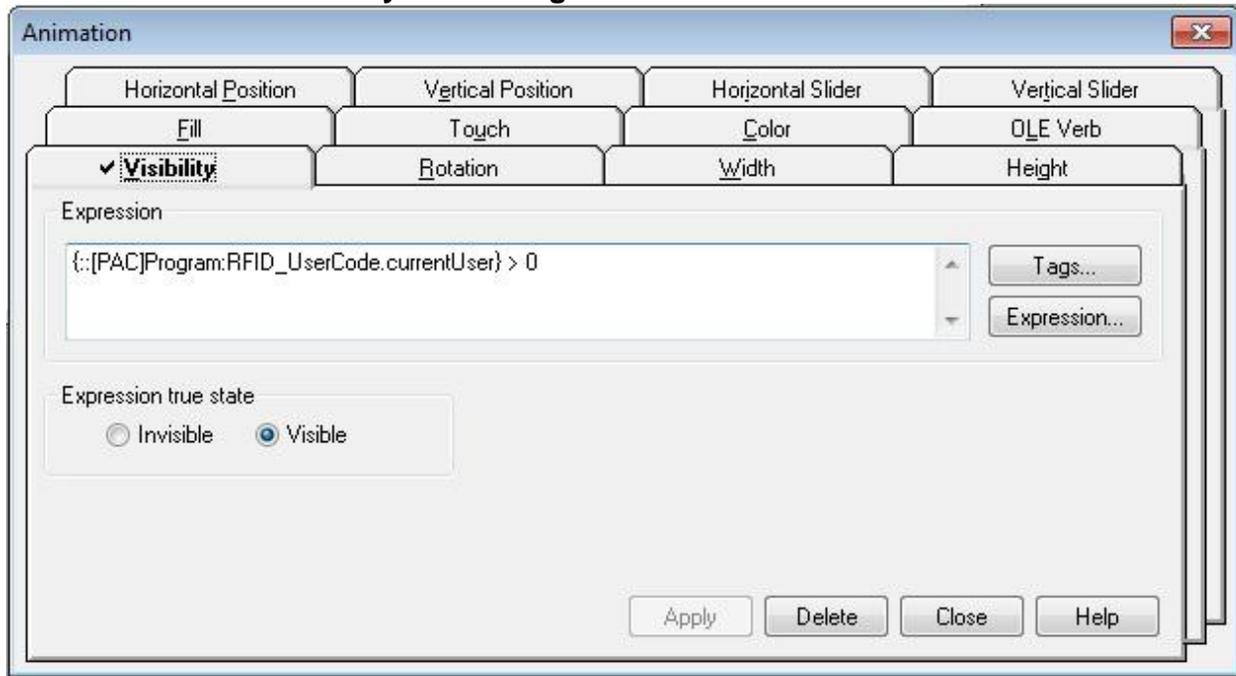
**Set the Animation Visibility for the Key Reset button as follows:**
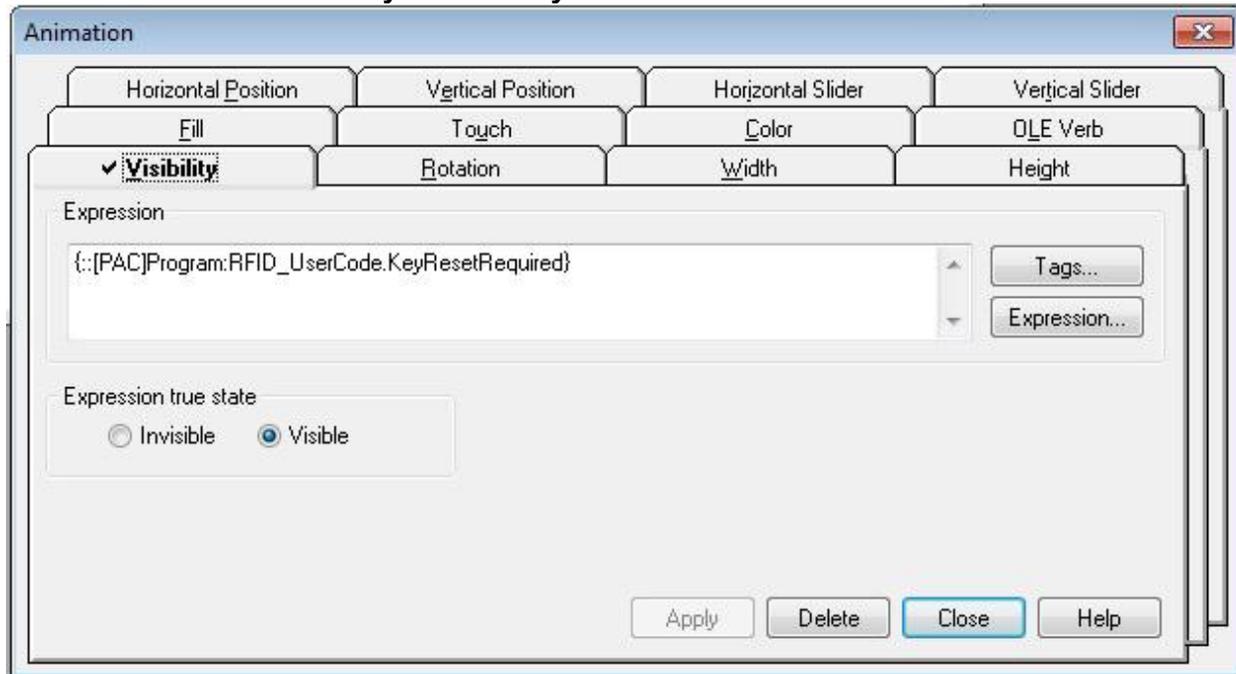
**Set the Animation Visibility for the Fault Reset button as follows:**

Animation

Horizontal Position	Vertical Position	Horizontal Slider	Vertical Slider
Fill	Touch	Color	OLE Verb
✓ Visibility	Rotation	Width	Height

Expression

{::[PAC]Program:Station10.Faulted} AND NOT {::[PAC]
Program:RFID_UserCode.KeyResetRequired}

Tags...
Expression...

Expression true state
○ Invisible   ◉ Visible

Apply   Delete   Close   Help
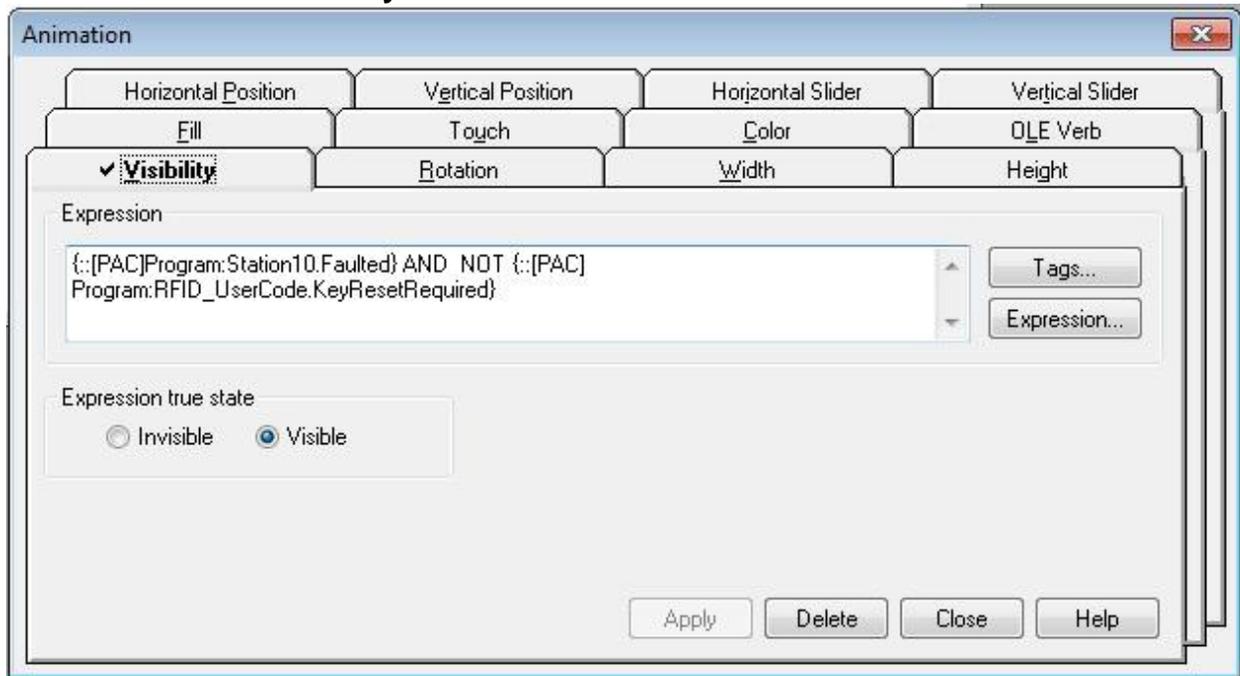
Open the Navigate screen and set the Animation Visibility for the Add User button as follows:

Animation

Horizontal Position	Vertical Position	Horizontal Slider	Vertical Slider
Fill	Touch	Color	OLE Verb
✓ Visibility	Rotation	Width	Height

Expression

{::[PAC]Program:RFID_UserCode.currentUser} == 4

Tags...
Expression...

Expression true state
○ Invisible   ◉ Visible

Apply   Delete   Close   Help
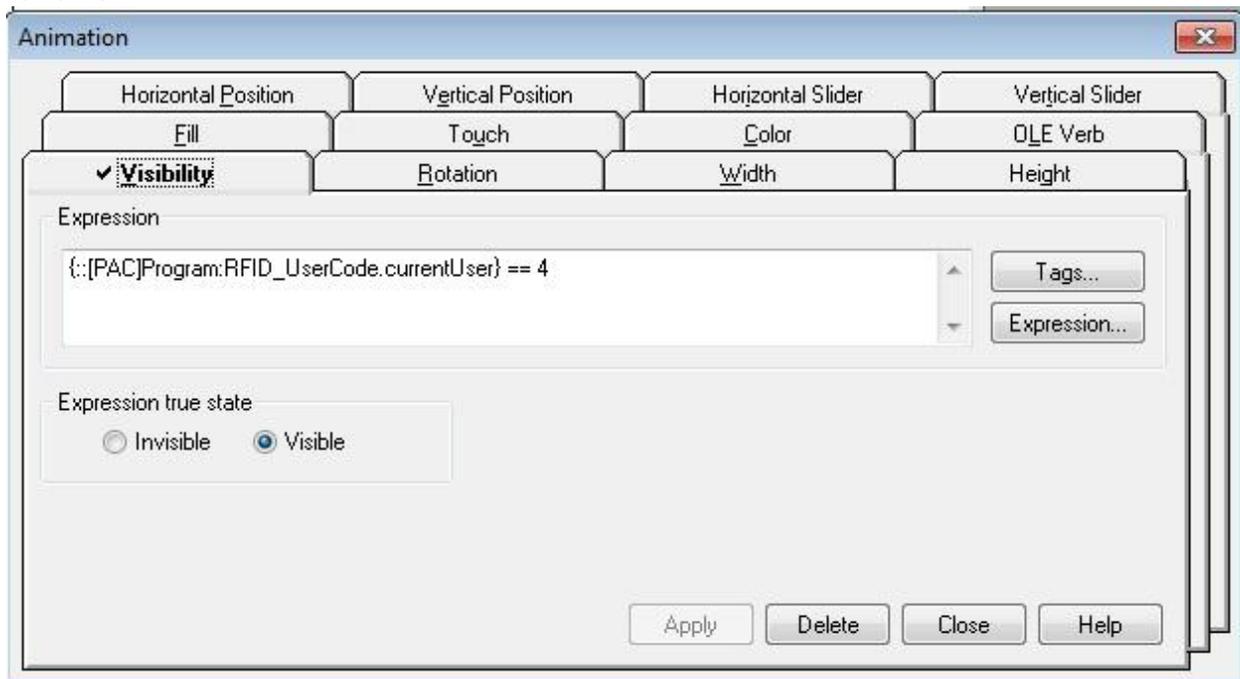
Set the Animation Visibility for the Config HMI button as follows:
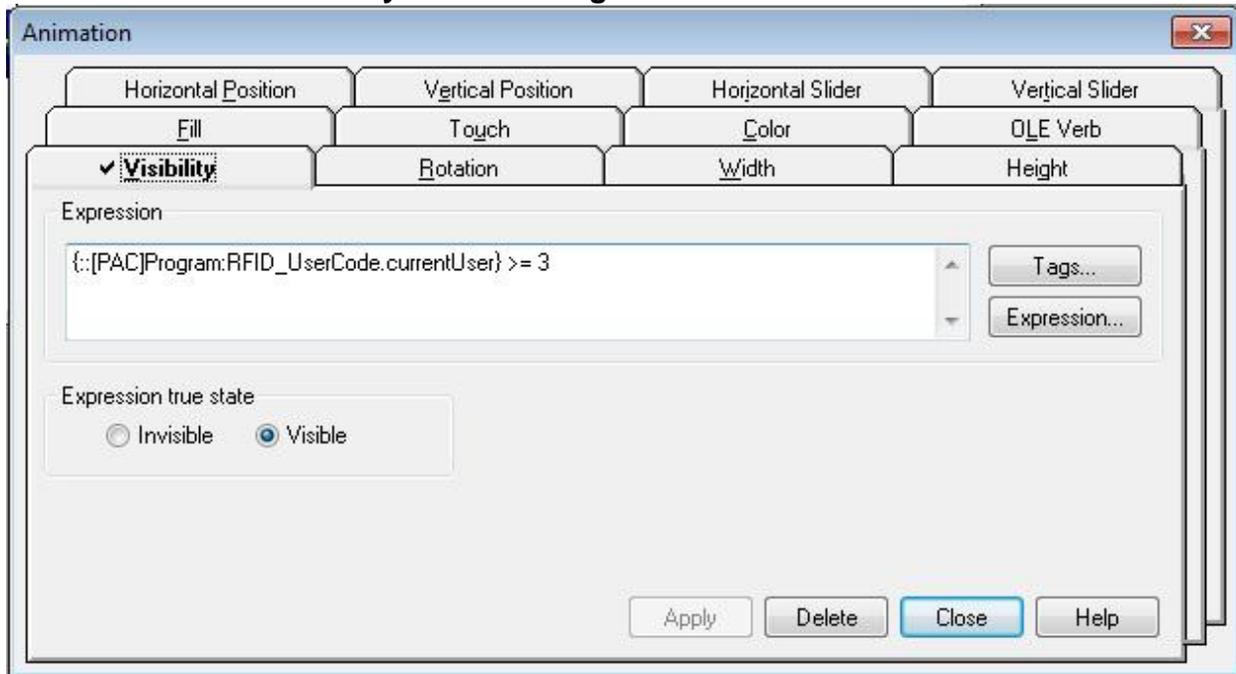
Open the Add User screen and set the Animation Visibility for the Activate Badge Reader button as follows:
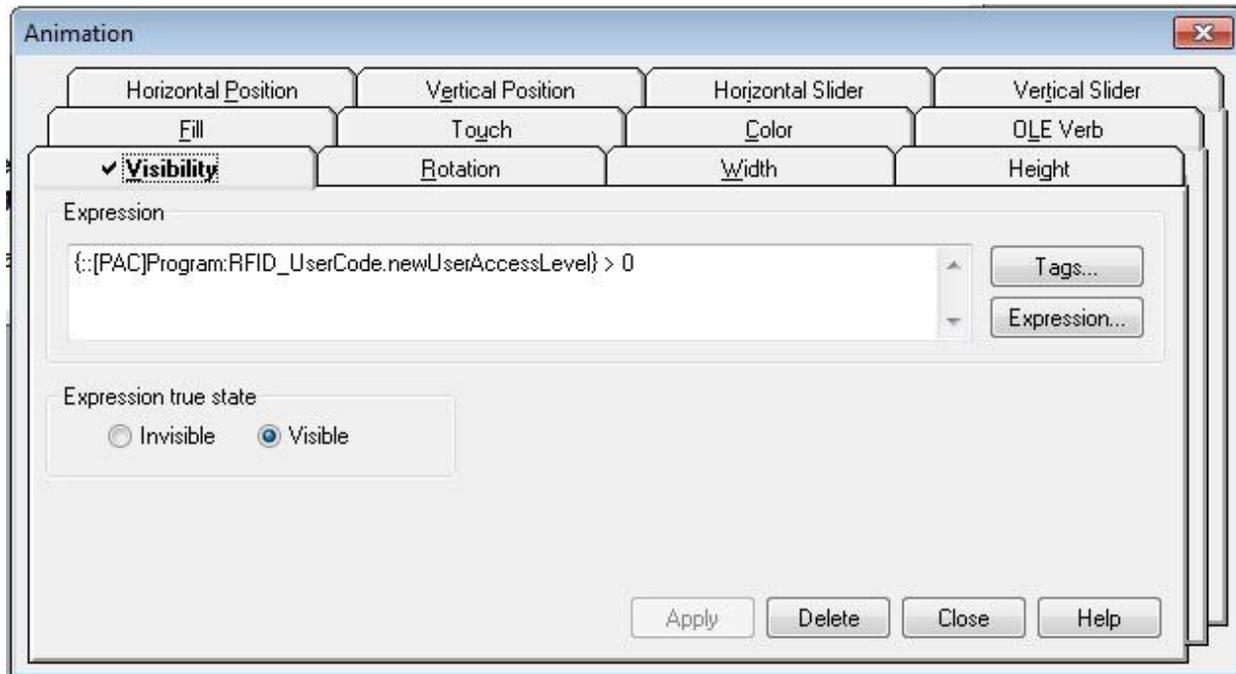
First, verify that the Reset Password macro exists in the Macro section of the project navigator in Factory Talk. Save the project and create the runtime version. When the current access level is zero the Login button will be visible and the Logout & Navigate buttons will not be visible. When the current access level is greater than or equal to 2, the Navigate button will be visible. When the current access level is greater than zero, the Logout button will be visible and the Login button will not be visible. All screens will be accessible from the Navigate screen. If the screen is idle for more than 5 minutes the HMI will automatically logout to an access level of zero and the MAIN screen will become active.

Revision History
Rev. – - Initial Release of Document
Rev. A - Added clarification of button functions on various screens. Changed appearance of "top of page" navigation buttons and Alarm banner/Alarm History button on most screens.
Rev. B – Added description at end of document for setup of password protection scheme.
Rev. C – Added this Revision History page to document changes.
Rev. D – Revised this document to incorporate RFID badge reading instead of manual login and password entry and Key Reset functionality. Added new "Add User" screen to screen descriptions section. Updated the I/O screen description to use wire markers for I/O addresses. Added illustrations to show button animations used with new RFID scheme.

Rev. E – Added in Settings screen, moved HMI Config from Navigate screen to Settings Screen. Added listing of Displays configurations.

Rev. F – Changed name to Medtronic