i^3 Password & Alarms Tutorial

Introduction

The purpose of this tutorial is to demonstrate the password, screen jump, Force / Switch screen, Alarm and compare function in a simple menu-based program.

The i^3 is a powerful combination of Programmable logic and HMI. The HMI programming and Logic programming can be done using a fully integrated package: i^3 Configurator. The HMI screens can be triggered through the logic or can be entered by a user in a menu system. The i^3 can also time stamp when triggers have been activated in the Alarm log function.

Programming Alarms and Password Functions

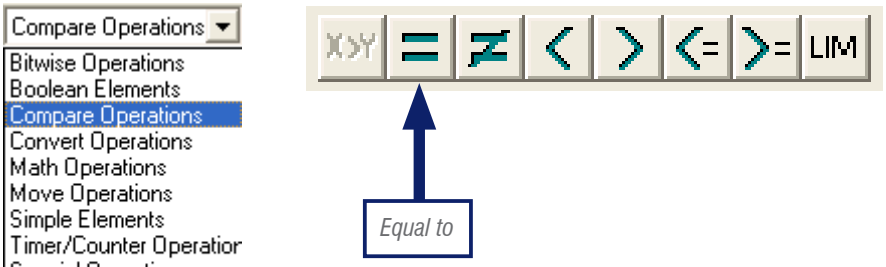
Program a User interface to display the status of inputs and outputs. When input 2 is enabled a warning message should appear for time whilst it is enabled and disappear when disabled. The user will have to enter a password to view a selection menu. However, when %I01 is enabled the password will be reset and the screen will change back to the main entry screen. The pressing of any function key should trigger an alarm and be stored in a Historical Alarm.

Remember to configure the I/O before downloading the program.

Programming the Ladder Logic

Open i^3-Configurator and start a new program. We will first enter the logic for a password protection to the main menu. Insert a N/O contact at A1 and assign it to the Always ON (ALW_ON) system bit, %S07.

Then select the Equal to Function from the Compare Operations.

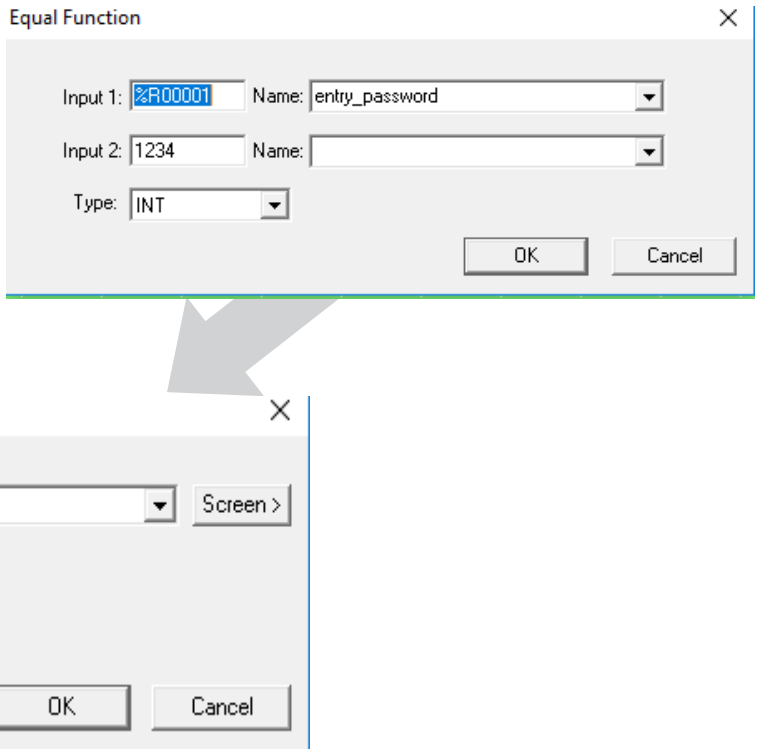


Insert the equal to function on the same Rung as the Always ON (ALW_ON) contact. This ensures that the function is always enabled.

Set up the equal to function as follows:

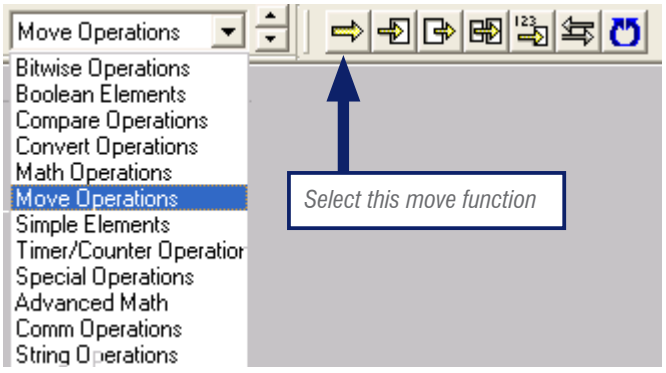
The user will enter the password through the screen into %R1. This will be compared to 1234 and if true they can continue.

Now select a N/O coil and insert it in the same Rung after the 'Equal to' function. This will operate on the output of the function. The coil is going to be addressed to screen 2. Setting the screen to "Switch screen", changes the current screen to the set screen until a further command.



i^3 Password & Alarms Tutorial

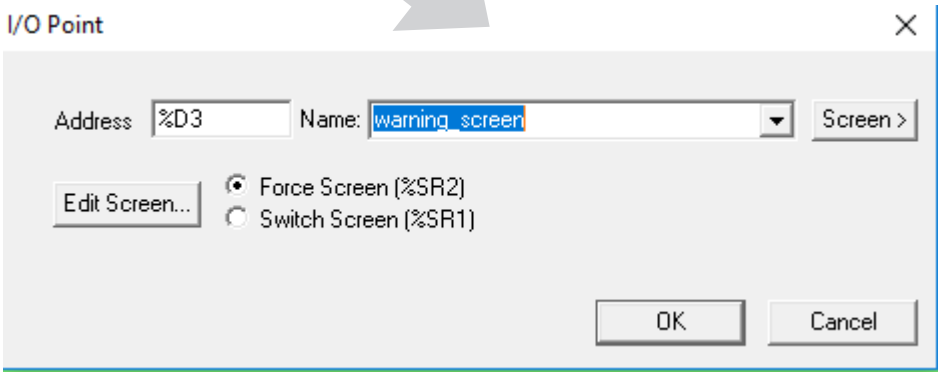
Now we need to insert the logic to reset the entered password. Select a N/O contact and insert it into A5. Address it to %I01. On the same line insert a Move (MOV) function from the Move Operations list and insert it into the same Rung.

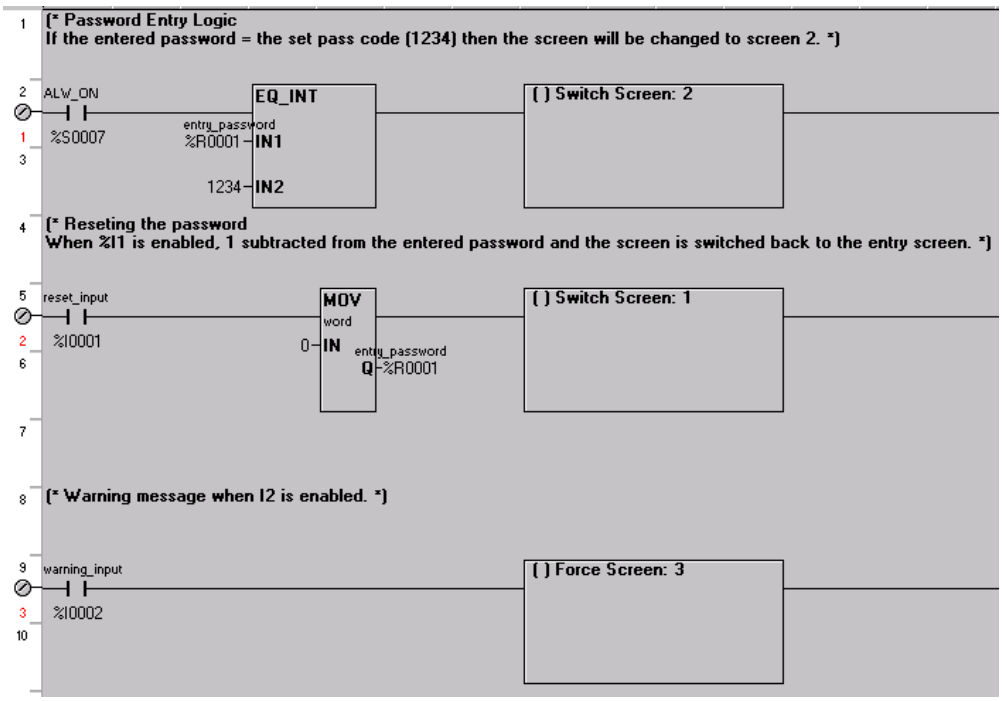


After the Move function (MOV) insert a N/O coil and assign it to the address %D01, with the Switch screen property.

The last part of the ladder logic required is for the warning message when I2 is enabled.

Insert a N/O contact at A9 and assign it to %I02. Insert a N/O coil on the same Rung and assign it to screen address %D03, making it Force Screen.





When the correct password is entered screen 2 is switched to. It will stay at screen 2, unless other logic determines, i.e. the second rung resets (switches back to screen 1). Input 2 Forces screen 3 on whilst it is enabled; when it is disabled the current screen goes back to what it was previously.

The alarm function and further screen functions can be set up through the screen editor.

i^3 Password & Alarms Tutorial

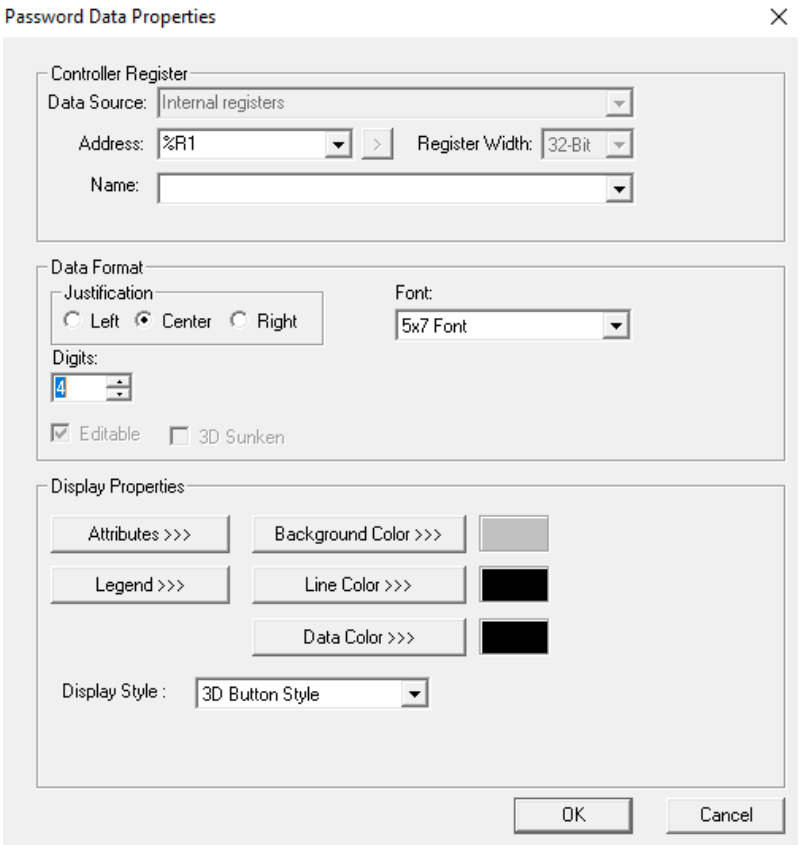
Screen Editor Programming

We need to configure 5 screens and the Alarm history log.

1. Entry screen
    a. Displays a message and has the user password entry
2. Main Menu
    a. Authorised user can select to see particular sub menus
3. Warning message
    a. Input 2 triggers a warning message.
4. Input display screen
    a. Lamps used to illustrate the current status of several inputs
5. Key Press screen
    a. Using a text table to display what key is pressed.
6. Alarm Log
    a. The alarm screen is a system screen that the user doesn't directly edit.

Entry Screen

Use a static text to display the message: "Password & Alarm Tutorial". Select the Password function and click it to the middle of the screen. Then place to where you want.

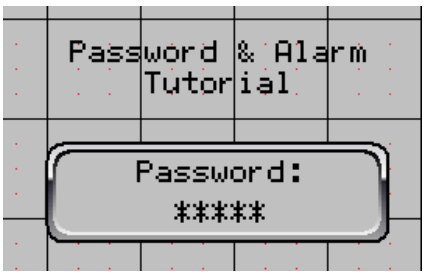


Set the address to the register %R01, the same as we had set in the ladder logic.

Set the digits to 4 as that is the length of the password.

Enter the text "Password" into legend.

Screen one should now look like:



i^3 Password & Alarms Tutorial

Menu Screen

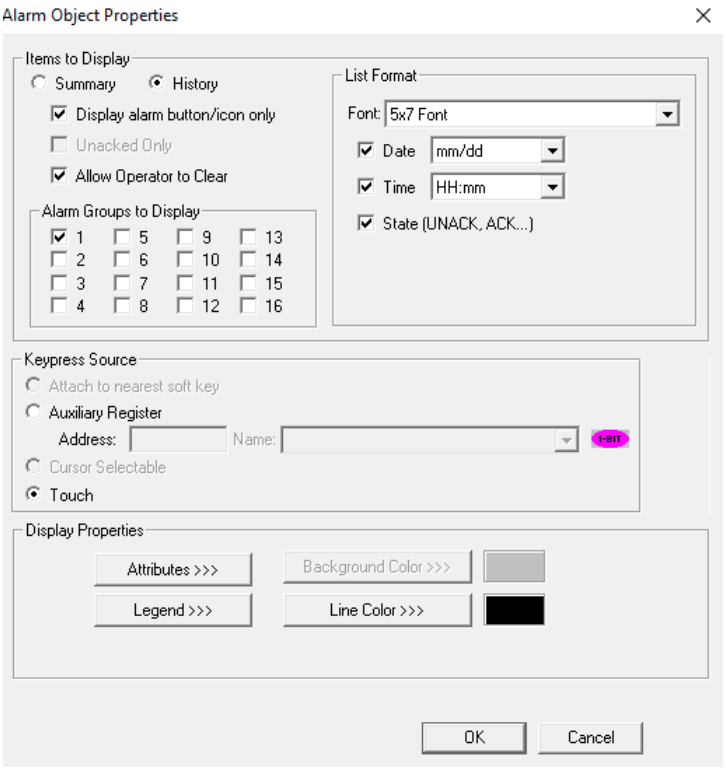
The main menu will have 2 'screen jump' functions to go to screen 4 (inputs) and screen 5 (keys pressed).
It will also contain a static text to display text informing the user of the screen "main menu" and the alarm button.

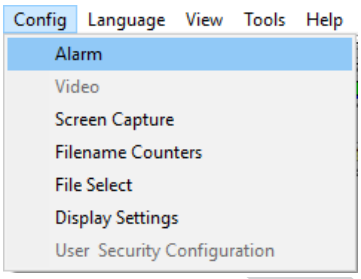
Set up the static text and screens jumps as previously and place the jumps to the left hand side. Insert an Alarm button and move it to the bottom left, double click on the alarm button to edit its properties.

Set the alarm to History and display the icon only.

We only want to see alarm group 1.

This is setting up how the alarm button will look; the actual alarm log is configured separately. When an alarm has been triggered the alarm icon will go to its ON state.



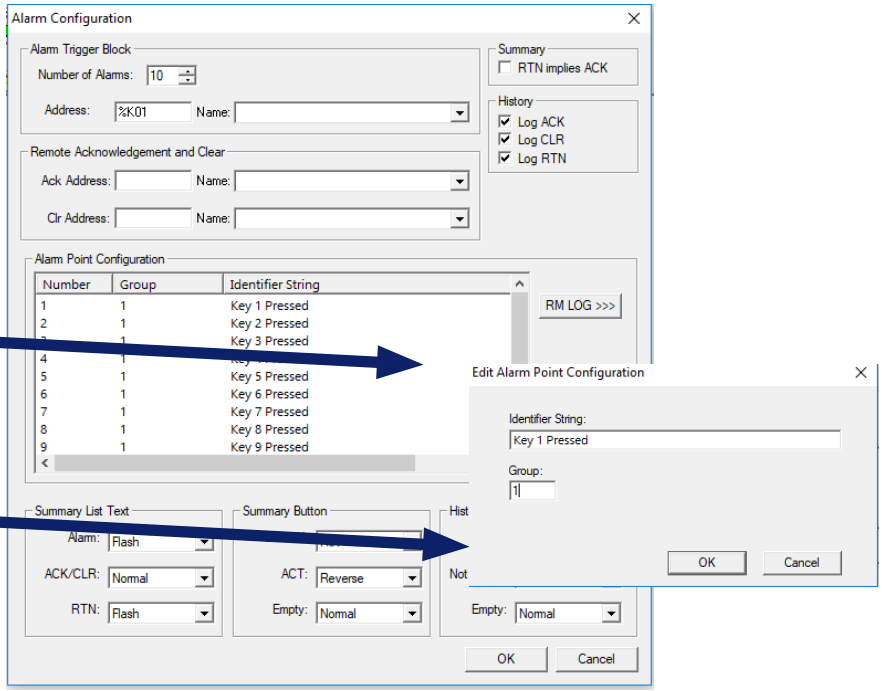


To set up the alarm log, select the alarm option from the Config menu.

Enter the Trigger address as %K01 and the maximum number of alarms to 10.

Double click on an entry value to enter an alarm message and assign the group.

The history button appearance can be defined to user preferences

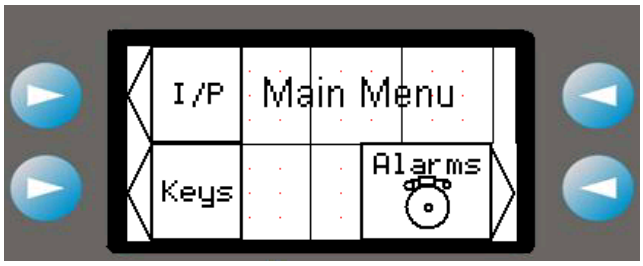


i^3 Password & Alarms Tutorial

The alarms are triggered by bits, but require a 16-bit register as the trigger address. For more than one alarm group you must use consecutive registers.

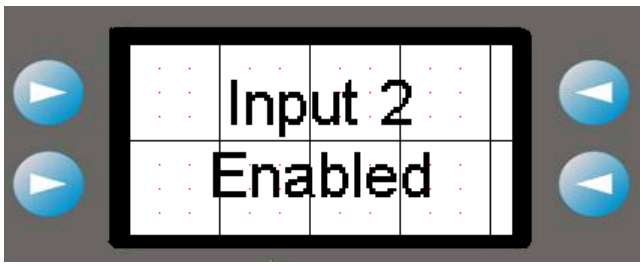
The Alarm History screen displays the alarm message in a list format with the date and time, when it was pressed and the message as defined. It also displays whether or not the alarm has been acknowledged and it is possible to log when it was acknowledged.

Screen 2 should look like this:



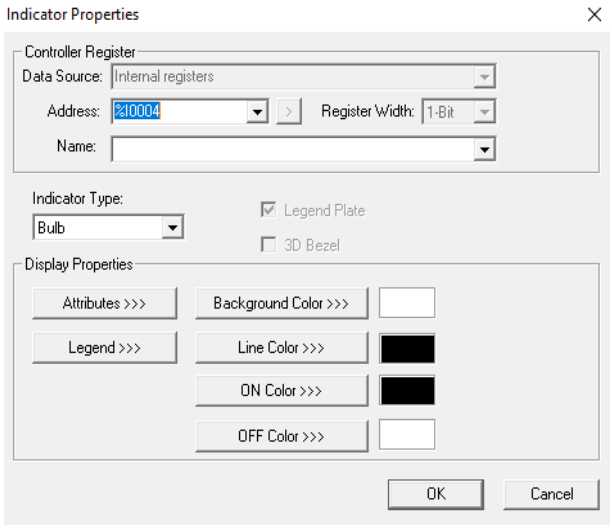
Warning Screen

Screen 3 is a warning screen that is forced on when input 2 is on. A static text message is all that is required. Set the attributes of the static text to have the message flashing for extra effect.



Input Screen

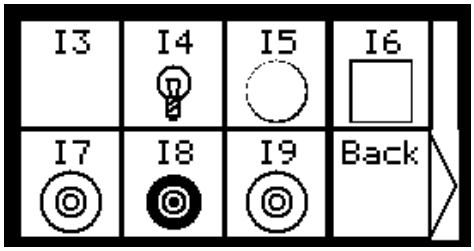
In this screen we are going to use 7 lamps to graphically display the states of some inputs. There will also be a screen jump button to go back to the main menu. Select the lamp button and click it to the screen.



Lamps operate on a bit. So the address must be either a direct bit or a bit of a register, i.e. %R123.4

Choose whatever type of indicator and change the display properties as you wish.

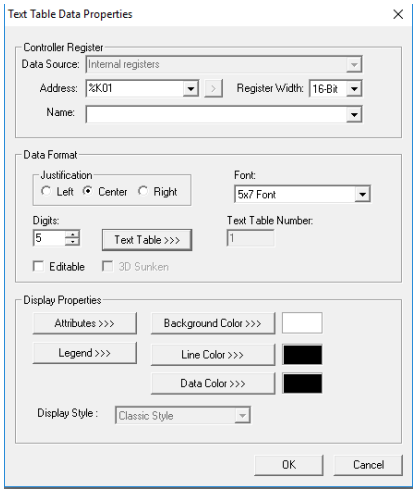
The screen should now look like this:



i^3 Password & Alarms Tutorial

Key Pressed Screen

This screen (screen 5) is similar to the input display screen but instead of lamps to display the input state, we are going to use a text table. There will also be a screen jump button to go back to the main menu.



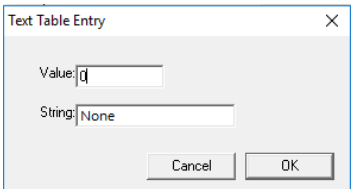
A text table will display a text message instead of the corresponding value.

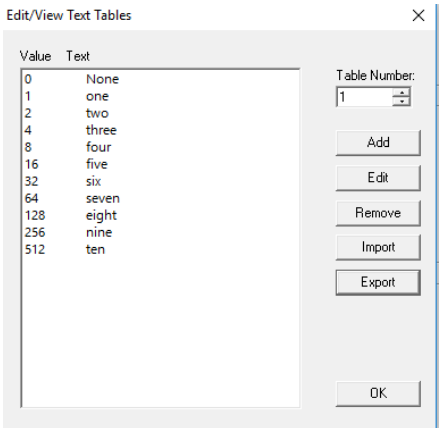
Set the address to %K01 and the width to 16-bit to include all of the keys.

Set the digits to the maximum length of the message to be displayed

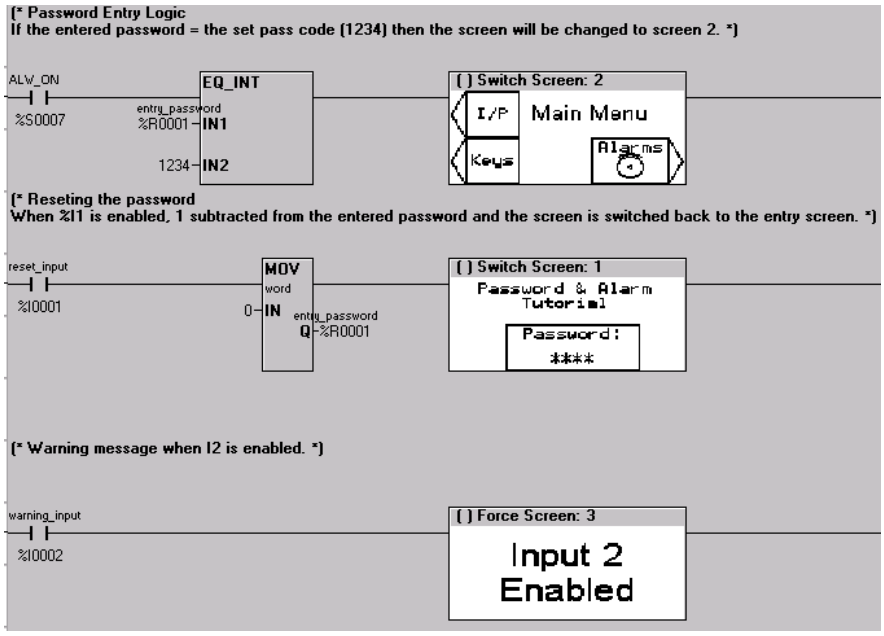
Click Add to add a new text message.

Enter the value and the corresponding text message.





Once the screens have been edited, any used in the ladder logic can now been seen in the ladder editor.



Please see the program file: “pass_alarms_tut.csp”