OCS Training Workshop
LAB19

Basic OCS Programming in IEC ST
and Configuration

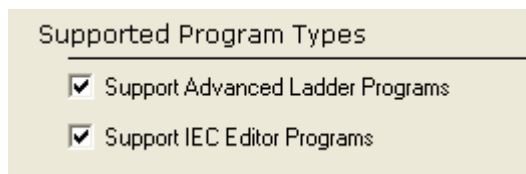# Lab 19: Basic OCS Programming in IEC ST and Configuration
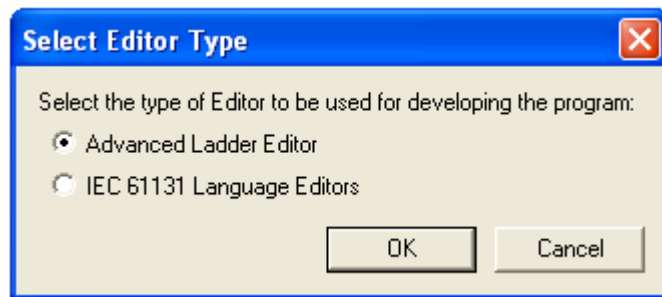
Objective:
The objective of this lab is to give you the knowledge to use Cscape to create a program including hardware configuration, logic design and screen development in IEC 61131-3.

This foundation will then be used to help you expand your skills in the use of Cscape and the OCS.

To start with the selection of Type of program, go to Tools/Application Settings/Supported Types and select both the program types Advanced Ladder Program and IEC Editor Program.

```
Supported Program Types

   ☑ Support Advanced Ladder Programs
   ☑ Support IEC Editor Programs
```

Procedure for IEC Languages: When the New file button is clicked a dialog box opens up with an option to select the editor type as Advanced Ladder Program or IEC 61131 Language Editor. For IEC Language programs select IEC 61131 Language Editors.

```
Select Editor Type                          [X]

Select the type of Editor to be used for developing the program:

   ⦿ Advanced Ladder Editor

   ○ IEC 61131 Language Editors

                          [  OK  ]   [ Cancel ]
```

Programming using IEC Structured Text

Step 1
➢ **Connect the Demo Case to your PC.** Connect the 9 pin connector of programming cable to the USB Adapter provided. Connect the RJ45 connector to the OCS programming port 'MJ1'. Connect the USB adapter to USB port on your PC.
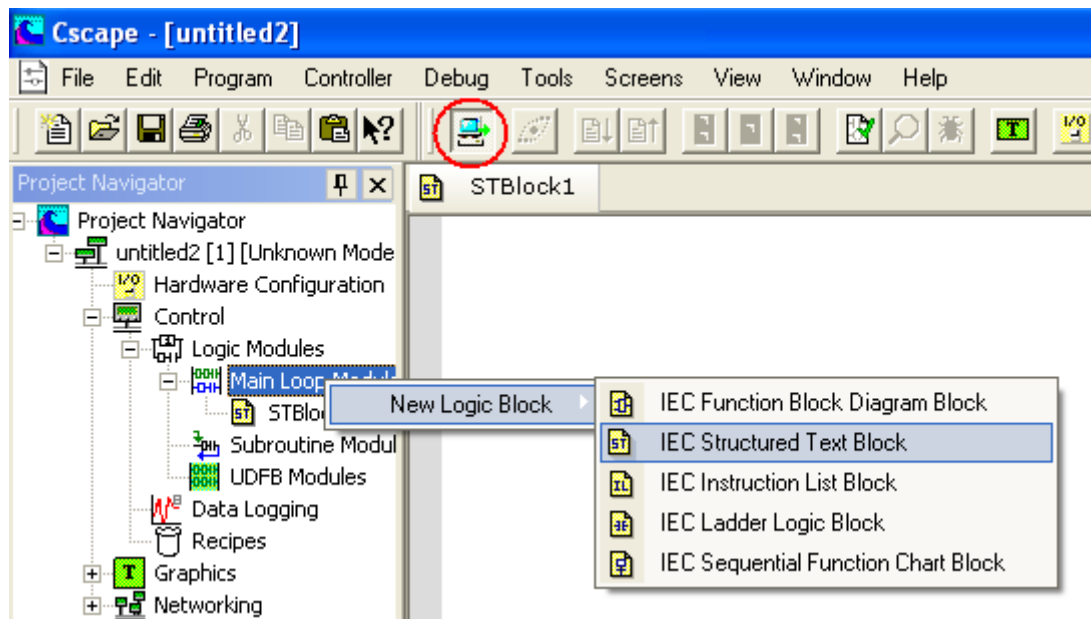
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Step 2

➢ **Power up the OCS and start Cscape on your PC.** Connect power supply to the XL6e. Open Cscape programming software on your PC. When the New file button is clicked a dialog box opens up with the option to select the editor type as Advanced Ladder Program or IEC 61131 Language Editor. Select IEC Language editor. A new, blank program called "untitled1" is opened and should be automatically configured for your XL6e if the serial cable is properly connected.

Whether the device is communicating with your developing software Cscape can be known from the communication icons present at the tool bar. If the Connect/Disconnect icon is not visible then go to Tools/Application Settings/ Communications/ Configure and check you communication settings.

NOTE: Only the controller is automatically configured as described above. Any I/O will still have to be configured as described later in this lab.
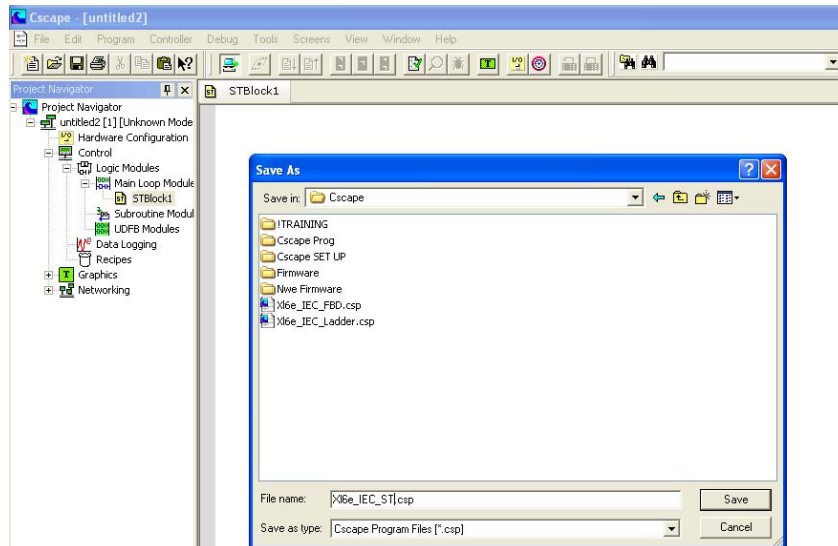

From the Project Navigator select Control/ Logic Modules/ Main Loop Modules/ New Logic Block/ IEC Structured Text Block

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Step 3
➢ Save the 'untitled2' program with a new name.

Click on the **File** menu and select **Save As.** In the dialog box, type your program name, such as XL6e_IEC_ST.csp, in the File Name dialog box and click the Save button.
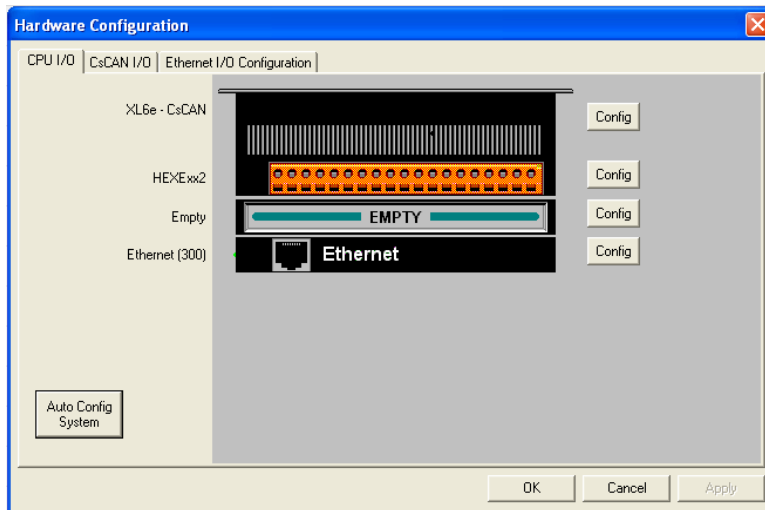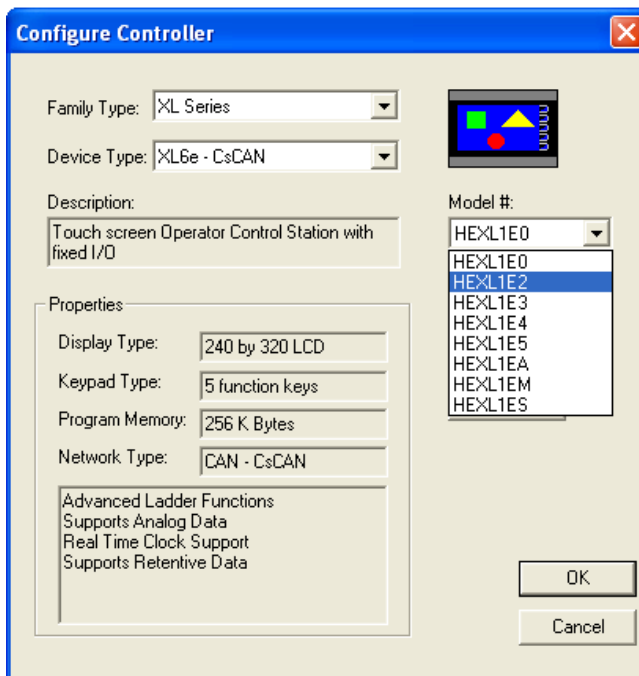

Step 4
➢ Configure the OCS Controller

Click on the **Controller** menu and select **Hardware Configuration.**
If you are online with the OCS, use the **Auto Config System** button. Clicking it will automatically, configure the controller and any attached I/O if you are connected to the OCS properly.

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Else, to do it manually:
1. Double click on the controller picture or click the 'Config' button next to it to open Configure Controller window
2. Select XL6e from the list and select the type of I/O card from Model#
3. Click OK

4. Click OK again to exit the I/O configuration.

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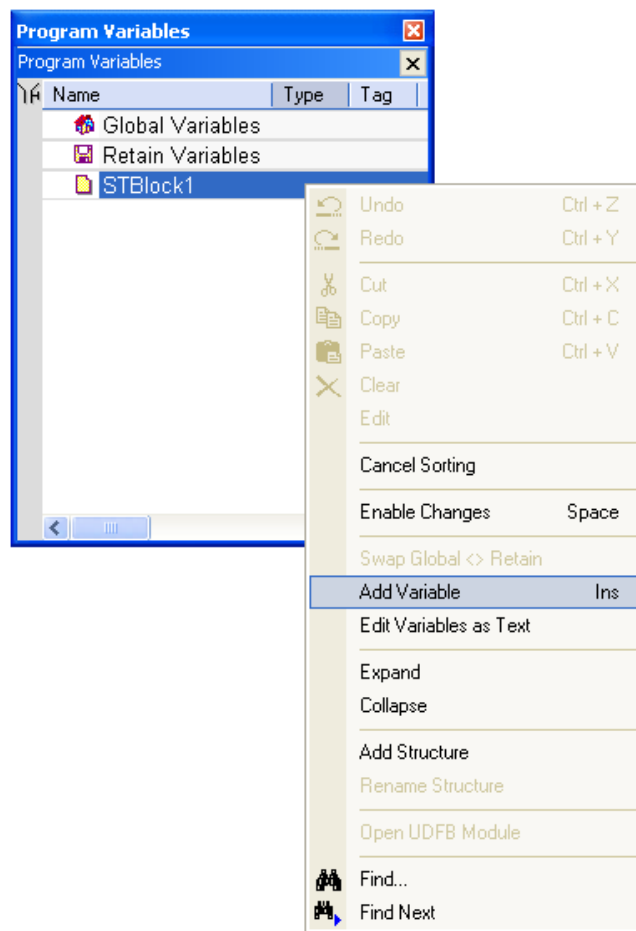
Step 5
➢ **Save the program.**
 Click on the **File** menu and select **Save**.

Step 6
➢ **Name some I/O points.**

 Click on the **Tools/ Program Variables**
 This opens a Program Variables window. Right click on the ST Block for your
 program STBlock1 and click Add variable.

• **Add** I/O points by clicking the 'Add variable' button and filling in the Type and
   Tags (addresses).
• **Edit** an existing I/O point by finding it in the list and double-clicking it.

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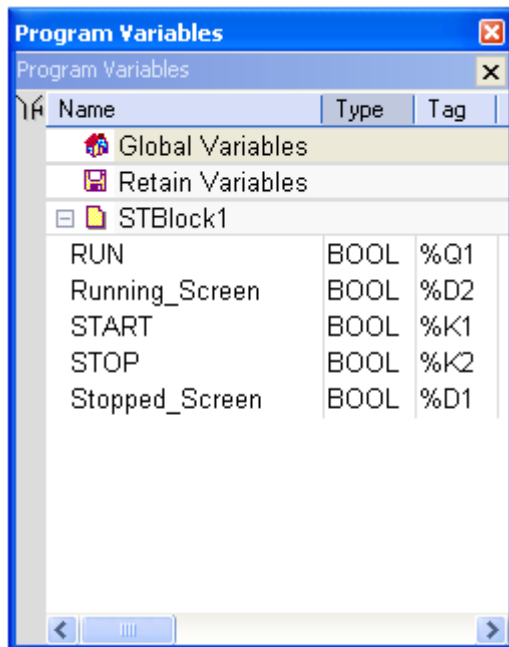
Add the following I/O points:

<u>%K1</u>   *START*: %K1 is named 'F1_KEY' by default so it will need to be edited instead of added. Configure for 1 bit.

<u>%K2</u>   *STOP*: %K2 is named 'F2_KEY' by default so it will need to be edited instead of added. Configure for 1 bit.

<u>%Q1</u>   *RUN*: Configure for 1 bit

<u>%D1</u>   *Stopped_Screen*: Configure for 1 bit

<u>%D2</u>   *Running_Screen*: Configure for 1 bit

Program Variables

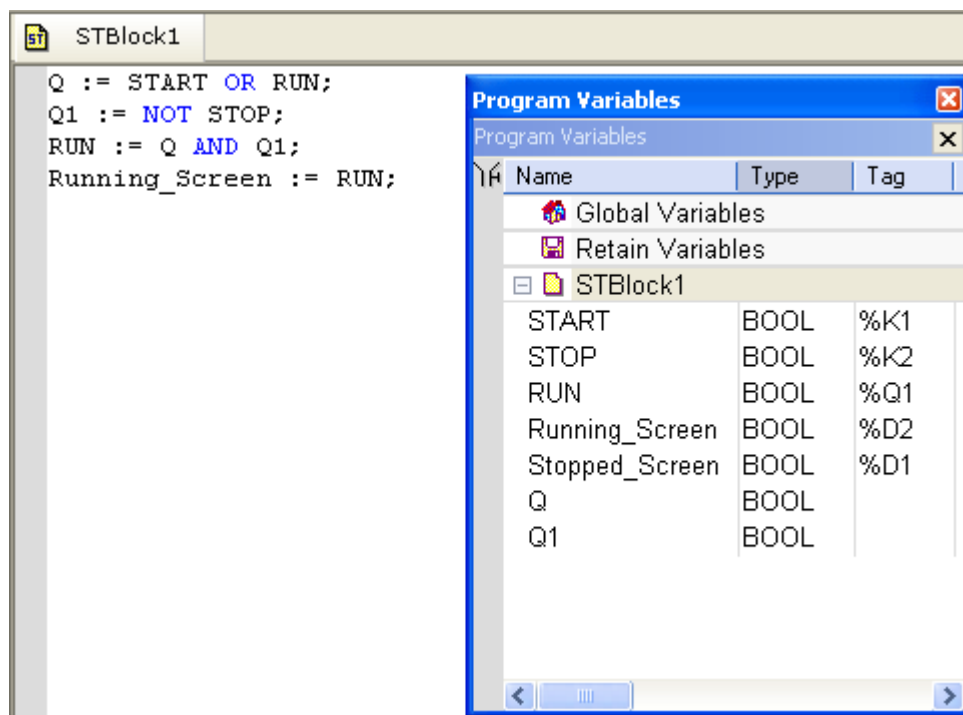| Name	Type	Tag
🏠 Global Variables		
💾 Retain Variables		
🗋 STBlock1		
RUN	BOOL	%Q1
Running_Screen	BOOL	%D2
START	BOOL	%K1
STOP	BOOL	%K2
Stopped_Screen	BOOL	%D1

A variable can be created to be used locally without attributing a 'Tag' or a memory address to it. However the variable value will be stored in any random memory area by the OCS for referencing.

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Step 7

➢ **Developing the block diagrams:**

Add the required identifiers in the Program Variables and type in the Program code

Structured Text Block configuration is completed.

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Step 8

➢ **Add words to Screen 2.**
1. The Graphics Editor can be opened by double clicking the graphics editor icon in the ladder logic.
2. Insert Static Text at the top center of the screen. Edit the text to display MACHINE RUNNING
3. Note that the size of the box will need to be stretched and the font sized should be increased from the default.
4. Close the graphics editor.
5. Click OK

Step 9

➢ **Add Screen 1**
1. Click on the **Screens** menu and select **View / Edit Screens…**
2. Repeat points 2 – 5 from above. Change text to display MACHINE STOPPED

Step 11

➢ **Save the program.**

CONGRATULATIONS! You have finished writing your first IEC Structured Text program.