



# Instruction

VLT® FC Series Add On Instruction for MCA 121 EtherNet/IP

### 1.1.1 Intended Use

The purpose of this document is to go over the integration of a FC Drive and EtherNet/IP Option Card, MCA 121 into the Logix5000 control Systems (ControlLogix, CompactLogix, FlexLogix). To do this we will go over how to use the Danfoss supplied Add-On Instructions (AOIs). The AOI provides an easy programming task for the end-user. For an example program open the provided sample program "EthIP.acd". Note that when using this version of the AOI, version 20.0 or later of RSLogix 5000. Earlier versions of RSLogix do not support the Danfoss EDS file, and will require additional setup of the module configuration.

### 1.1.2 AOI Features



- Easy handling of FC series drive
- Motor can be started with a single bit
- Speed reference as real value in percentage
- Actual speed of the motor in percentage
- Direct information if Warning or Alarm is present
- Motor current as readout in Amps directly
- If drive is prohibit the start of the motor, it is shown directly

## 2.0 General Configuration of the FC Drive

The following procedure goes over the various parameters required to get the FC drive communicating over EtherNet/IP.

1. When the FC drive is first commissioned the following parameters should be set before any other changes are made to the drive via the Main Menu.

Parameter	Description	Setting
0-03	Regional Settings	[0] International

2. To enter the motor data into the drive, a quick setup should be performed. This function of the drive is accessed from the Quick Menu by pressing the **Quick Menu** button on the display and selecting **Q2 Quick Setup**. This can be performed now or at a later time, but must be done prior to running the motor to ensure proper operation.
3. Verify the setting of the following parameters to ensure that the PLC will have control of the drive.

Parameter	Description	Setting
8-01	Control Site	[0] Digital and ctrl.word, or [2] Control word only
8-02	Control Word Source	[3] Option A

A connection between terminal 12/13 and terminal 27 is required, if parameter 8-01 is set to [0] "Digital and ctrl.word".

4. The default setting of the drive allows the drive to continue operation if the communication is lost to the PLC. If this operation is not desired change the following parameter via the Main Menu.

Parameter	Description	Setting
8-04	Control Word Timeout Function	[0] Off, or [1] Freeze Output, or [2] Stop, or [3] Jogging, or [4] Max Speed, or [5] Stop and trip

5. AOI requires the profile of the control word to be set to FC Profile. If the Control Word Profile is set to ODVA, it will lead to malfunction of the AOI. Verify that following parameter is set correctly via the Main Menu. See the EtherNet/IP manual MG.90.Jx.yy for more information.

Parameter	Description	Setting
8-10	Control Word Profile	[0] FC Profile.

6. Next the IP settings of the drive need to be configured. To do this set the following parameters via the Main menu. If the IP settings are being set via a DIP switches, BOOTP or DHCP Server see the EtherNet/IP manual MG.90.Jx.yy for more information.

Parameter	Description	Setting
12-00	IP Address Assignment	[0] Manual
12-01	IP Address	e.g. 192.168.1.10
12-02	Subnet Mask	e.g. 255.255.255.000

7. For 103/153 the associated additional process data (PCD) words need to be configured. To do this set the following parameters via the Main Menu.

Parameter	Description	Setting
12-21 [0]	Process Data Config Write	[1680] Fieldbus CTW 1
12-21 [1]		[1682] Fieldbus REF 1
12-22 [0]	Process Data Config Read	[1603] Status Word
12-22 [1]		[1605] Main Actual Value [%]
12-22 [2]		[1614] Motor Current
12-22 [3]		[1614] Motor Current
12-22 [4]		[1690] Alarm Word
12-22 [5]		[1690] Alarm Word
12-22 [6]		[1692] Warning Word
12-22 [7]		[1692] Warning Word

### 3.0 Importing the Add-On Instruction

The following steps takes you through the steps to import the AOI.

1. Save the Add-On Instruction file "VLT" on a location on your PC (e.g. your desktop.)
2. Import the Add-On Instruction by selecting 'Add-On Instruction' in the navigation tree and press the right mouse button and select 'Import Add-On Instruction'.

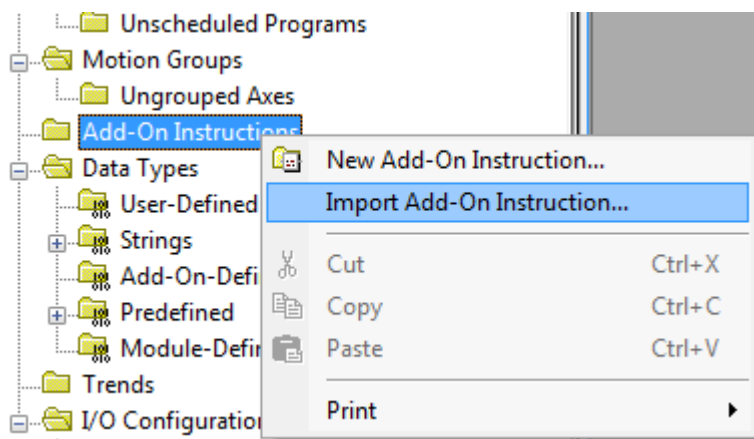


Figure 1 Import Add-On Instruction

3. Select the Add-On Instruction file "VLT", located where you stored the file. The file selection window is illustrated in Figure 1 Import Add-On Instruct

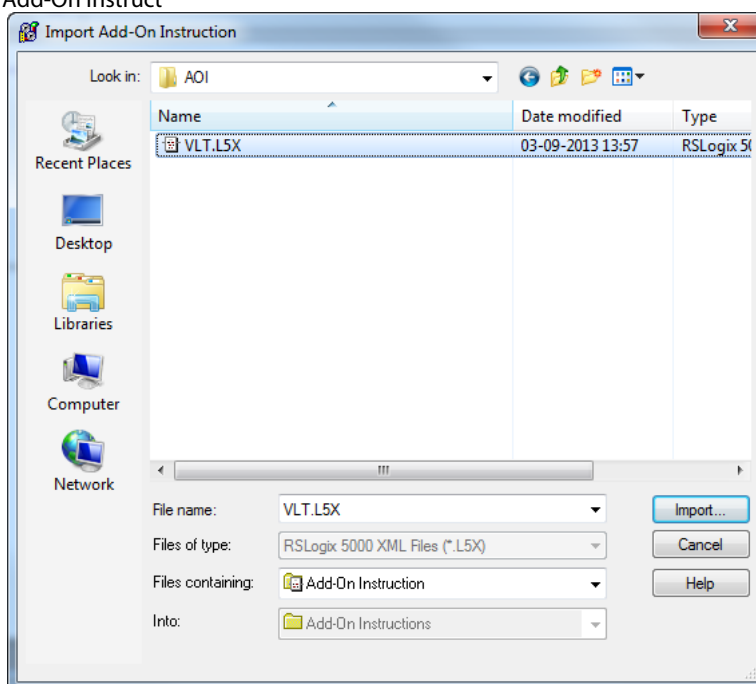


Figure 2 select Add-On Instruction file

4. Press the "Import..." button and the Add-On Instruction will be imported to the RXLogix 5000 tool.

5. Verify that the following screen does not contain any warnings or errors. This is done by selecting the “Error/Warnings” icon in the Import content windows.

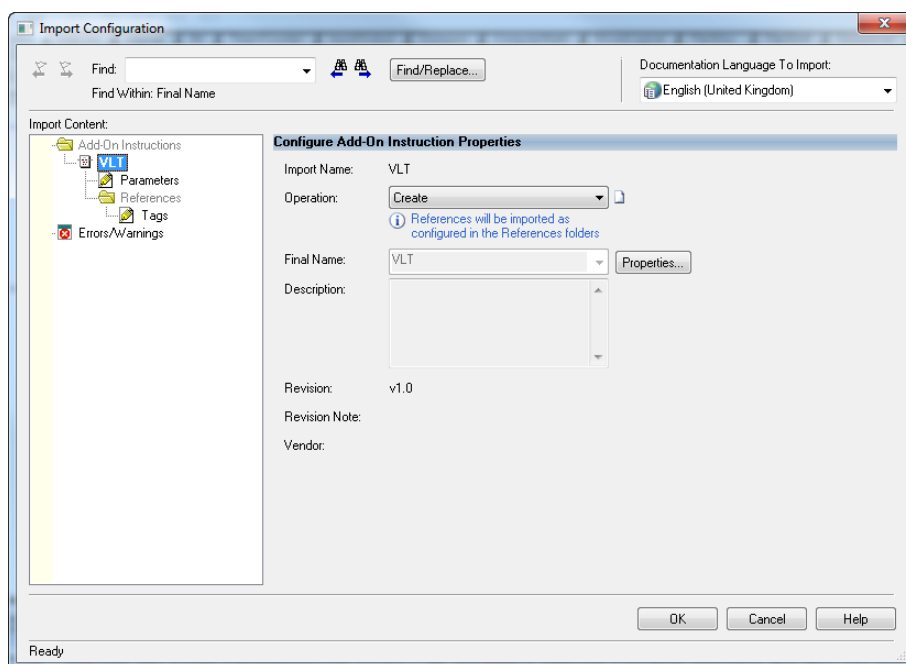


Figure 3

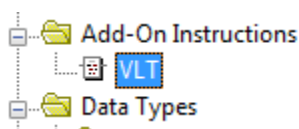


Figure 4

If warnings and/or errors exist, the Add-On Instruction will not work properly. If no Errors/Warnings are present, then the Add-On Instruction can be imported by pressing the “OK” Button. No further settings are required in this menu.

6. Verify the Add-On Instruction is available under the “Add-On Instruction” menu and looks similar to Figure 4. And that the name is the same.

## 4.0 Configure the PLC's I/O.

Previous to the following steps, the EDS file for the Danfoss FC drives has to be installed. Please see MG.90.Jx.yy for detailed information.

Add the VLT FC to the EtherNet/IP scanner module. When the module is added, the following module dialog will appear as in figure 5:

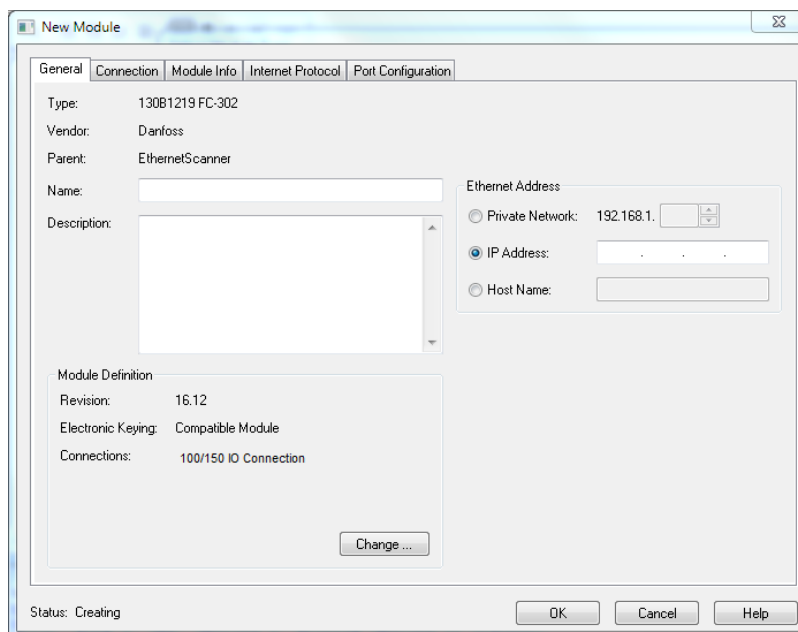


Figure 5

1. Insert the IP address used in Par. 12-01, e.g. 192.168.1.10.  
(All IP addresses must unique for each device connected to the network).
2. Set the Name field to e.g. "FC302". This will be the Tag used for the actual communication between PLC and drive. It is also the In- and Output tag for the Danfoss Add-On-Instruction.
3. Change the module connection instance from 100/150 to 103/153 by clicking on the button 'Change...' and the Module Definition dialogue will appear, as in figure 6.

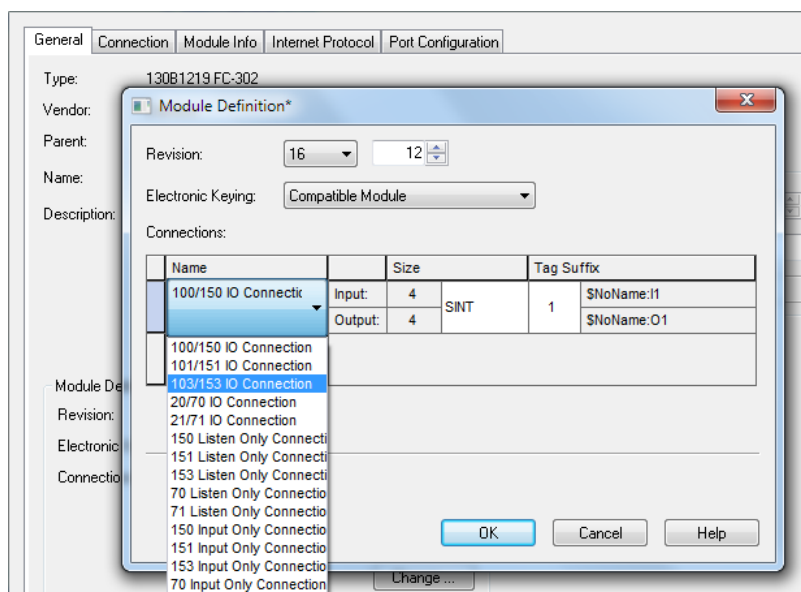


Figure 6

4. Select the "103/153 IO Connection" and press the "OK" button to accept the new setting. Please note that the size field must be fixed to SINT, because of the EDS-AOP definition in RSLogix 5000.
5. The warning message that follows has to be accepted by pressing the "Yes" button.
6. Confirm the setting by pressing the "OK" button.

The basic communication setting of the drive and the RXLogix 5000 is now configured and the next chapter describes the configuration of the Add-On Instruction.

## 5.0 Setting up the Add-On Instruction.

The Danfoss Add-On Instruction can be copied to the PLC's rung. This is done by opening the Add-On Instruction folder and drag and drop the VLT AOI into a rung in the PLC. When the AOI has been placed the GUI should look like in figure 7.

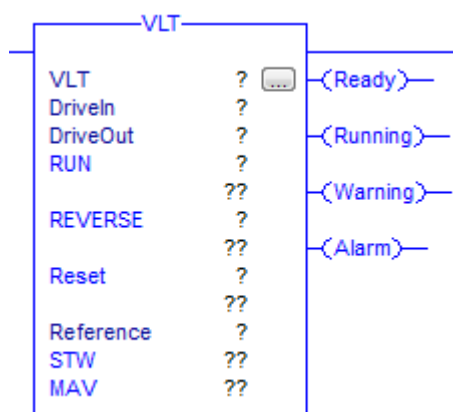


Figure 7

Now select the field "VLT" in AOI, right click and select "New Tag.." the new tag window will appear as shown in figure 8

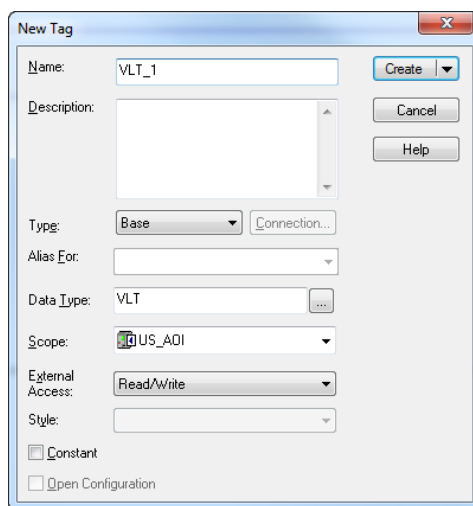


Figure 8

Keep the new tag in the Controller Scope of the PLC, that way the status of the drive will be available in the entire project.

In the "Name field" insert a name for the drive to be controlled (e.g. VLT\_1) and press the "Create" button.

This will generate a list of tags for this AOI. The tags generated will look like shown in figure 9.



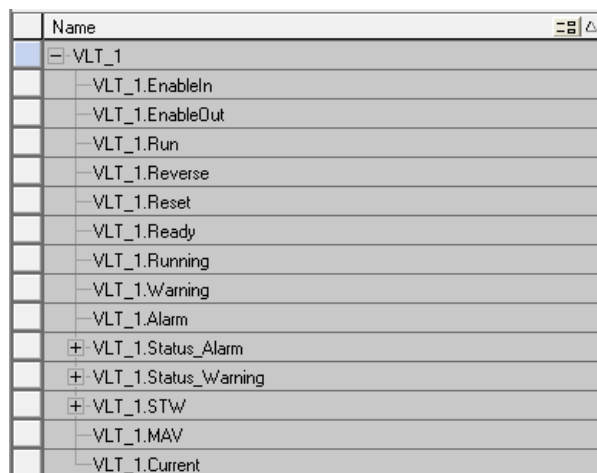


Figure 9

The functions of the input tags are:

Name	Type	Description
EnableIn	Boolean	Activates the AOI if set to true (1)
Run	Boolean	Set to true (1), starts the Motor
Reverse	Boolean	Set to false (0); set the Motor direction to clockwise (CW). Set to true (1); Reverses the Motor direction to counter clockwise (CCW) If the motor has to run in CCW, parameter 4-10 must be set to "Both directions".
Reset	Boolean	In transition from 0 to 1, a fault trip can be reset
MRV	Real	Main Reference Value. Speed set point in % of nominal motor speed

The function of the output tags are:

Name	Type	Description
Ready	Boolean	If true (1) the motor can be started. If false (0) the drive has a local stop signal activated (e.g. LCP stop, terminal 27=0) or an alarm that prevents the drive from being ready.
Running	Boolean	If true (1) motor is energized
Warning	Boolean	If true (1) the drive has a active warning
Alarm	Boolean	If true (1) the drive has a active alarm
MAV	Real	Main Actual Value. Actual motor speed in % of nominal motor speed
Current	Real	Motor current in Amps

By Double clicking the field "DriveIn" of the VLT AOI in the PLC's rung, the corresponding input tags (located in the Controller Scope of the PLC) will appear as shown in figure 10.

From the drop down list select the input tag that corresponds to the actual drive (e.g. FC302:I1.Data).

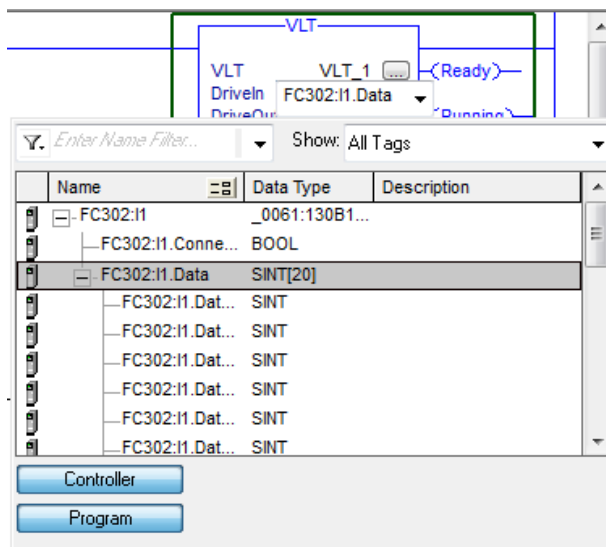


Figure 10

New tags can be created by right clicking in the desired field and selecting New tag.

The same procedure must be done with the "DriveOut" field in order to control the drive (e.g. FC302:O1.Data).

After assigning tags to "Run" and "MRV" the Drive can now be controlled in a very easy way, by just calling the AOI, and setting the RUN bit to true and setting the MRV to a value between 0.0 and 100.0%. If MRV is set to a negative value the motor will run in CCW (If parameter 4-10 is set to "Both directions")



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