



# APPLICATION NOTE

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**Product Family:** KEPDirect & Do-more

**Number:** AN-KEP-005

**Subject:** Using KEPDirect's DirectLogic Drivers with a Do-more PLC

**Date Issued:** 3-19-2013

**Revision:** Original

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## **Technical**

**Assistance:** If you have questions regarding this Application Note, please contact us at 770-844-4200 for further assistance.



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## Overview

The Do-more PLC emulates four of the DirectLogic memory types (C, V, X, Y) to allow using AutomationDirect ECOM and K-sequence drivers. For integrating with these drivers, Do-more offers DLC, DLV, DLX and DLY memory, addressed in octal.

This allows Do-more to support many of the existing software and HMI currently in the industry that support these protocols, including those in KEPDirect. The table below shows the different Do-more CPUs and modules that support the drivers listed above.

	KEPDirect Drivers	
	AutomationDirect K-Sequence	AutomationDirect ECOM
H2-DM1	✓	
H2-DM1E	✓	✓
H2-ECOM		✓
H2- ECOM100		✓
H2-SERIO	✓	
H2-SERIO-4	✓	

Note: Although Do-more also has C, V, X, and Y memory, they are **not** accessible though the com ports by these client and they are addressed in decimal, not octal. See section: KEPDirect Addressing for details.



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## Setup for ECOM Driver

Do-more listens automatically on Ethernet ports on the CPU and ECOM, port 28784 decimal. The only configuration necessary with Do-more is to configure a valid IP address that is on the same subnet as the PC running the KEPDirect software.

### **CPU Port Settings**

Select menu item PLC / System Information. Click Set Node and IP Configuration on the window that opens, shown below. Configure the port as needed to work with the PC running KEPDirect software.

The screenshot shows the 'System Information' dialog box with the 'Setup Node and IP Address' sub-dialog box open. The 'Setup Node and IP Address' dialog has the following fields:

- Module ID: 0
- Name: H2-DM1x
- Description: Do-more PLCI
- IP Address: 10 . 1 . 25 . 32
- Subnet Mask: 255 . 255 . 255 . 0
- Gateway: 0 . 0 . 0 . 0

Below the 'Setup Node and IP Address' dialog, the 'Node and IP Configuration' section of the 'System Information' dialog is visible, showing the same configuration values. A 'Set Node and IP Configuration' button is present in this section.

### **ECOM Module Port Settings**

Make an Ethernet connection between your PC and the ECOM module. Use the NetEdit utility to configure the module's port settings. A link to NetEdit (and other utilities) is available from within Do-more Designer under the menu item View / Launchpad.

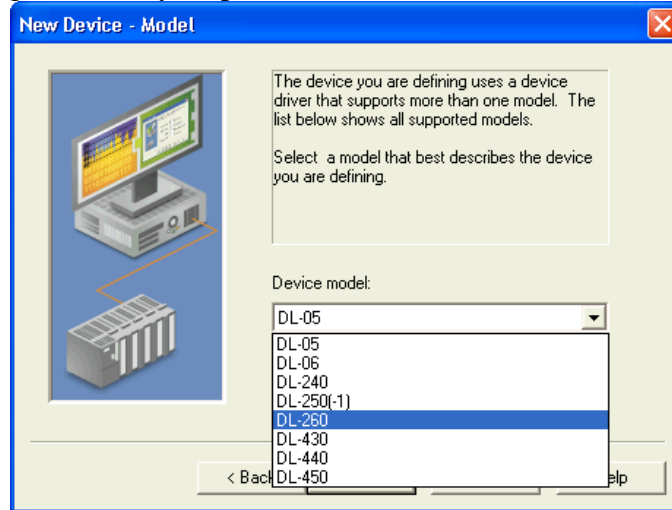


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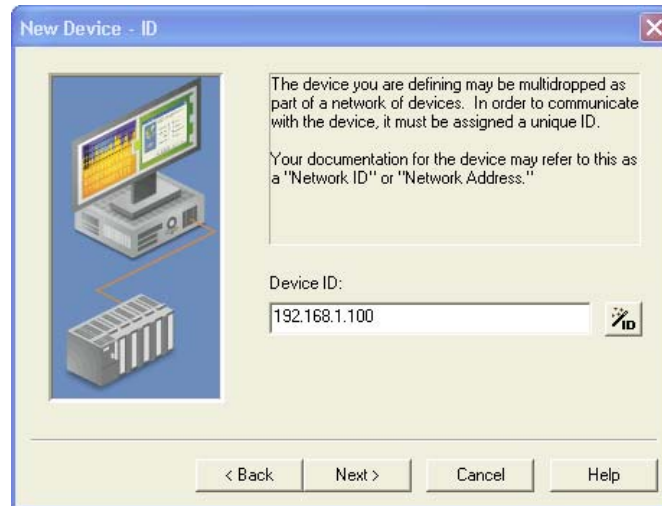
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## KEPDirect Setup for ECOM Driver

For Ethernet communications, choose the AutomationDirect ECOM driver and select 'DL-260' in order to gain the largest memory map available:



Enter in the IP address of the Do-more CPU or ECOM module:





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## Setup for K-sequence Driver

### CPU Serial Port Settings

To configure the H2-DM1 or H2-DM1E serial ports for K-sequence, go to the System Configuration and configure the serial port as K-sequence Server and then click on the 'Device Settings' button and configure the settings to match those in KEPDirect.

The screenshot shows the 'H2-DM1E CPU Configuration' dialog box. The 'Serial Port Mode' section has the 'K Sequence Server' radio button selected and highlighted with a red box. Below it is a 'Device Settings...' button. The 'Modbus/TCP Server Configuration' section has 'Enable Modbus/TCP Server' checked, with 'Maximum Concurrent Sessions' set to 4, 'Client Inactivity Timeout' set to 60 seconds, and 'TCP Port Number' set to 502. An 'Edit Serial Port Settings' sub-dialog is open over the top right, showing 'Device Name' as '@IntSerial', 'Station' as 1, and 'Port Settings' including Baud Rate (115200), Data Bits (8), Stop Bits (1), Parity (None), Transmit Control (Unconditional), and RTS Control (Follows Transmitter). The sub-dialog has 'OK' and 'Cancel' buttons.

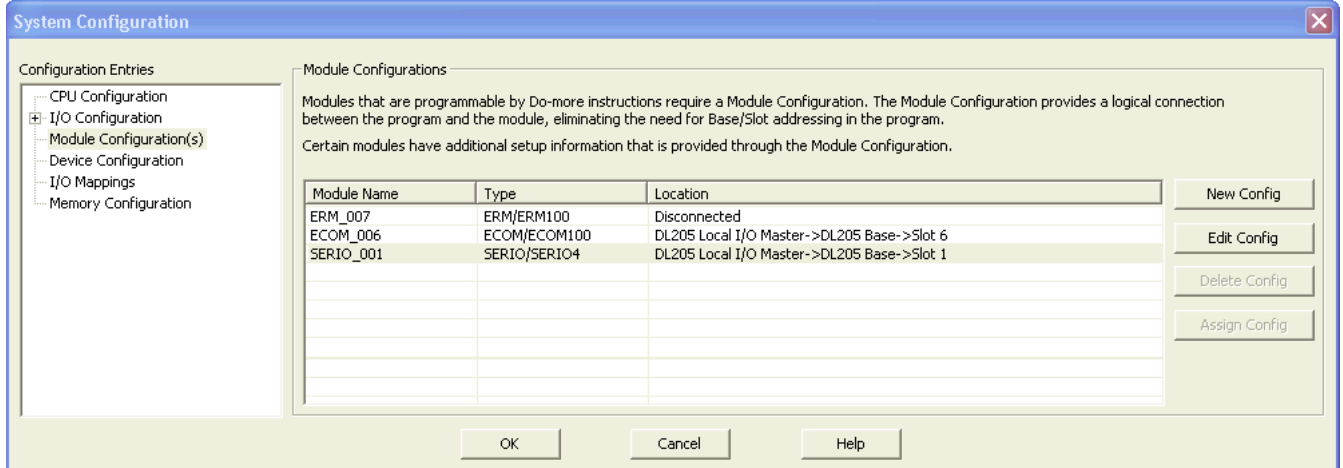


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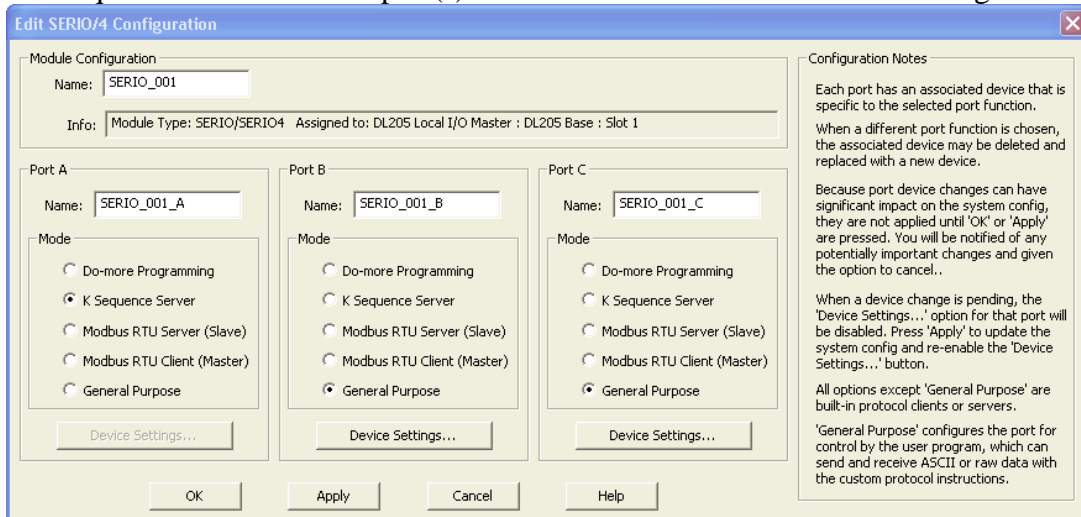
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## SERIO Module Serial Port Settings

To configure the H2-SERIO or H2-SERIO-4 module, go to the System Configuration and click on the 'Module Configuration' option in the left hand pane. Click on the SERIO module and choose Edit Configuration.



Select 'K-Sequence Server' for the port(s) that will be connected to the PC running KEPDirect.

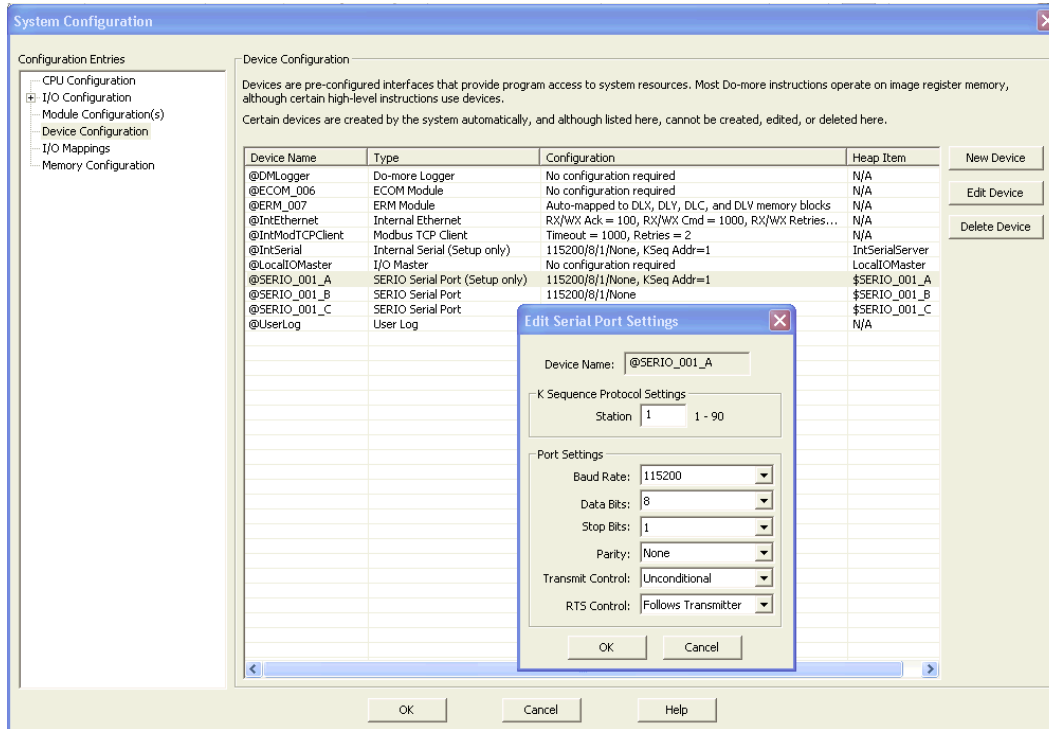




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Go back to the left pane in the System Configuration window and choose the 'Device Configuration' option. Select the SERIO port that will be connected to the PC running KEPDirect and then choose Edit Device. Match the settings to the setup in the KEPDirect K-sequence driver.



## KEPDirect Setup for K-sequence Driver

For serial communications, choose the AutomationDirect K-sequence driver and select 'DL-260' in order to gain the largest memory map available:



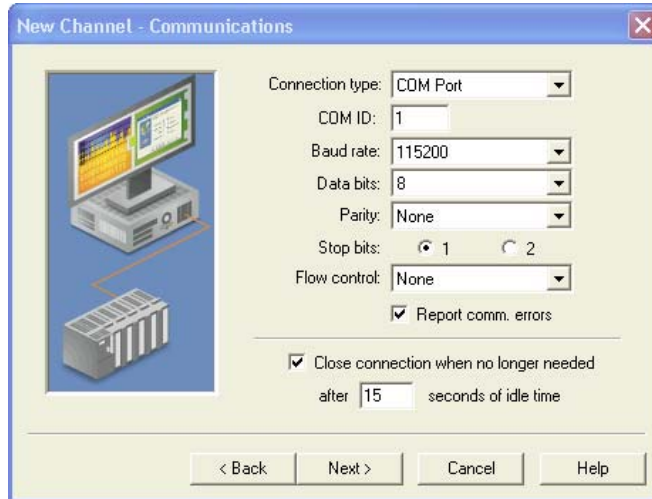




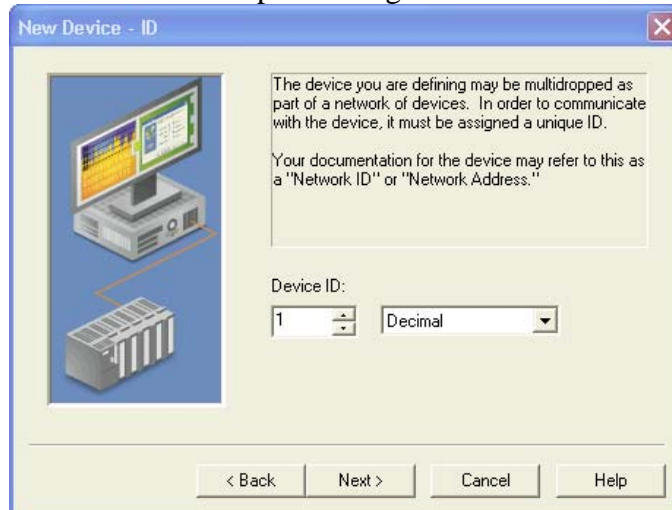
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Match the serial port settings to the H2-DM1, H2-DM1E, H2-SERIO or H2-SERIO-4 port settings:



In the Device Settings, choose the Device ID that matches the Station number of the H2-DM1, H2-DM1E, H2-SERIO and H2-SERIO-4 port settings.





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## KEPDirect Addressing

The biggest change in setup between configuring KEPDirect for a DL-260 PLC and the Do-more is the variance in addressing syntax. This is the area where you must be careful.

When KEPDirect targets a DL-260, it reads and writes directly into the CPU's C, V, X and Y memory.

Although the Do-more CPU *has* C, V, X and Y memory types, these are *NOT* accessible from the KEPDirect AutomationDirect drivers. KEPDirect can only access the DLC, DLV, DLX and DLY memory types in Do-more. See the image below.

This table shows more clearly the correlation between the KEPDirect driver memory selection and the Do-more memory types accessed. For example, when KEPDirect attempts to access X memory in a Do-more, it will actually access Do-more's DLX memory.

Memory Type	
KEPDirect/DirectLogic	Do-more
X	DLX
Y	DLY
C	DLC
V	DLV

NOTE: Version 1.0.2 of Do-more designer limits the ranges for DLV memory available from KEP to DLV0-DLV7777. DLX/DLY/DLC ranges are not affected. Future revisions will not have this limitation.



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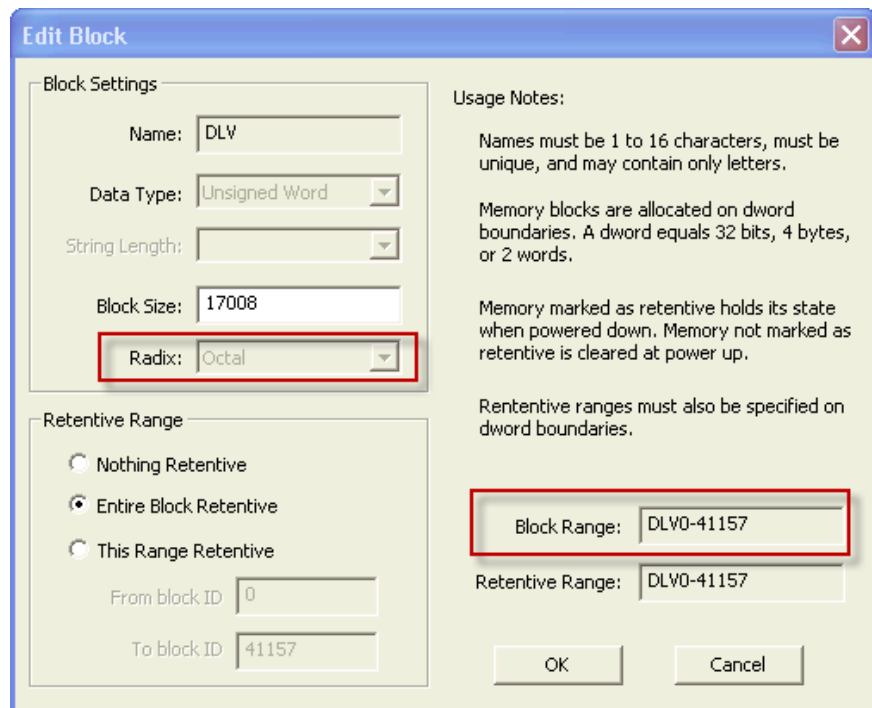
The full ranges supported by the KEPDirect AutomationDirect drivers are also supported in Do-more as is illustrated in the images below.

**Note:** The references are in Octal format.

Memory Type	Discrete Memory Reference	Word Memory Reference
Input Points	X0-X1777	V40400-V40477
Output Points	Y0-Y1777	V40500-V40577
Control Relays	C0-C3777	V40600-V40777
Special Relays	SP0-SP777	V41200-V41237
Timer Status Bits	T0-T377	V41100-V41117
Timer Current Values	N/A	V0-V377
Counter Status Bits	CT0-CT377	V41140-V41157
Counter Current Values	N/A	V1000-V1377
Data Words	N/A	V400-V777 V1400-V7577 V10000-V35777
Data Words String Access HiLo Byte Ordering	N/A	V400.2H-V777.126H V1400.2H-V7577.126H V10000.2H-V35777.126H .Bit is string length, range 2 to 126 bytes.
Data Words String Access LoHi Byte Ordering	N/A	V400.2L-V777.126L V1400.2L-V7577.126L V10000.2L-V35777.126L .Bit is string length, range 2 to 126 bytes.
Remote I/O	GX0-GX3777 GY0-GY3777	V40000-V40177 V40200-V40377
Stages	S0-S1777	V41000-V41077
System Parameters	N/A	V7600-V7777 V36000-V37777

NOTE: In Do-more Designer, the ranges are configurable to allow the user to add and remove from memory types needed or not used. The Edit Block window is found under the menu item PLC / Memory Configuration. Select the memory block and click Edit Memory Block.

The Do-more PLC can support the highest range of addressing that the KEPDirect drivers support. Also note that the DL memory ranges in Do-more are in Octal format to match the KEPDirect memory range format.





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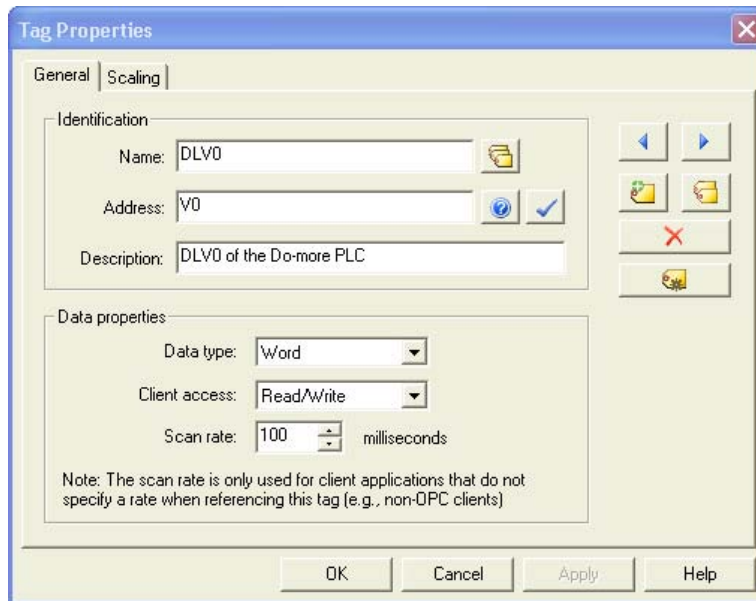
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Another important distinction to note in designing a system using these 2 products together is that the DLV memory type in Do-more is in Unsigned Word format (shown in the image above). In the DL-260 PLC, the default format is BCD, so take care when configuring the tags in the KEPDirect software.

The image below illustrates how the tags might be configured for the KEPDirect AutomationDirect drivers when connecting it to Do-more:

Tag Name	Address	Data Type	Scan Rate	Scaling	Description
DLCO	C0	Boolean	100	None	DLCO of the Do-more PLC
DLV0	V0	Word	100	None	DLV0 of the Do-more PLC
DLX0	X0	Boolean	100	None	DLX0 of the Do-more PLC
DLY0	Y0	Boolean	100	None	DLY0 of the Do-more PLC

In the example above, the Tag Name is defined as DLxx to help give a better indication of the memory type in Do-more that the KEPDirect Address is mapped to. An example of configuring one of these tags is shown below:



To reiterate, the Data type when configuring tags mapped to the DLV memory area of Do-more should be changed to 'Word'. If it is left as 'Default', it will be configured as BCD (the default data type of DL-260 PLCs) and the values will not match between KEPDirect and Do-more.

It is currently not possible to export tag names from the Do-more project and import them into the KEP project.



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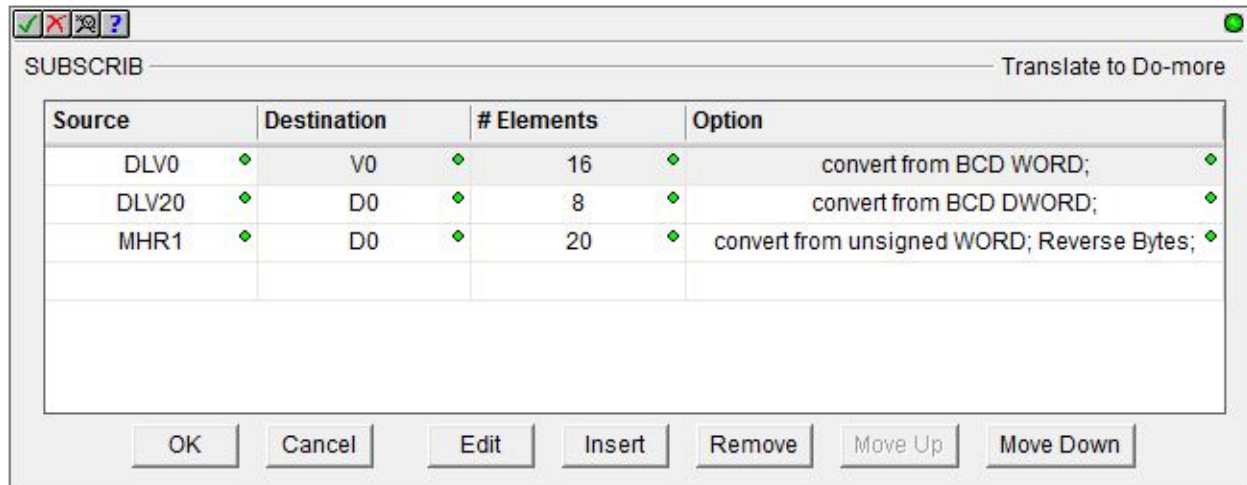
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## Do-more Programming Considerations

Although DL memory could be used directly in ladder, that's most likely only feasible with bits. It's usually desirable instead to use the PUBLISH and SUBSCRIB instructions to manage formatting and synchronizing the data to internal memory.

Note: the PUBLISH and SUBSCRIB instructions allow conversion to and from BCD. The conversion can be done here, or in KEPDirect Tag Properties as shown in the example above.

Do not do it in both.



Typically, a SUBSCRIB instruction is placed near the top of the ladder program to pull in any data received from KEPDirect since the last scan ended. Near the bottom of the ladder program, a PUBLISH instruction is used to push any new data out into the memory available to KEPDirect.

See Do-more Designer help file topics DMD0073 (PUBLISH) and DMD0074 (SUBSCRIB) for details on these two instructions.