



# APPLICATION NOTE

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**Product Family: D0-DEVNETS**

**Number: AN-MISC-030**

**Subject: How to configure a D0-DEVNETS?**

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**Revision: Original**

## Introduction

This application note will show which parameters need to be set in the D0-DEVNETS to connect to any DeviceNet Master. This application note doesn't replace the manual. The manual should still be used to show all supported commands. Some things mentioned in this document may be firmware bugs, and may need to be changed once the firmware has been fixed.

## Applies to

DL06 & DL05 Family

## DeviceNet Basics

There are basically two types of connections that can be made between a DeviceNet Master and the D0-DEVNETS module: Implicit and Explicit messaging.

Implicit messaging is the 'typical' method of reading and writing I/O data. In the master, setup for Implicit messaging usually involves setting the Input byte size and Output byte size of the slave. Once this is configured, the Master then 'automatically' polls the I/O continuously.

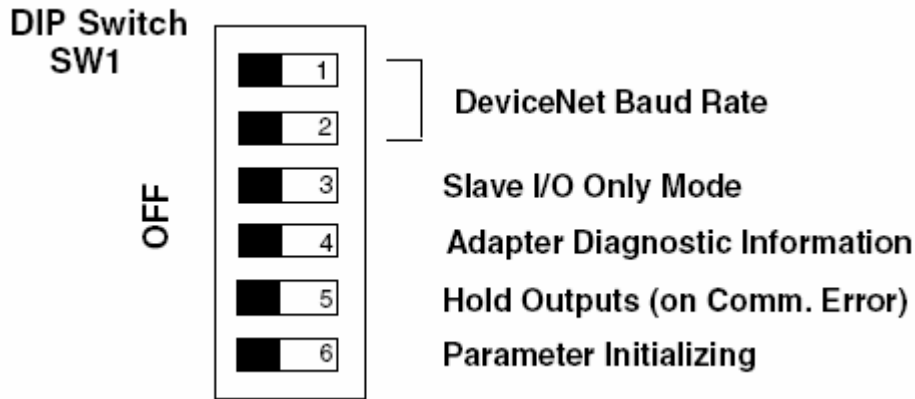
Explicit messaging is typically used for configuration and diagnostics. It usually requires some type of network command in the Master and is triggered programmatically when needed. Each vendor publishes the required SCIA (Service Class Instance Attribute) codes needed to retrieve different types of information for each device. The Explicit message then reads or writes the specified SCIA codes desired. All the supported SCIA codes for the D0-DEVNETS are in the manual.



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## Setting the Dip Switches



**Baud Rate:** The Baud rate is determined by the slowest device on the network. All devices must operate on the same baud rate as the DeviceNet Master. DeviceNet supports 3 baud rates 125kbs, 250kbs, and 500kbs. The baud rate will determine the maximum physical length of the network.

- 125kbs = 500m
- 250kbs = 250m
- 500kbs = 100m

The chart below list the dip switches settings for each baud rate.

**Set SW1-1 and SW1-2 for the DeviceNet baud rate.**

DeviceNet Baud Rate		
Baud Rate	SW1-1	SW1-2
125 kbps	OFF	OFF
250 kbps	ON	OFF
500 kbps	OFF	ON
Reserved	ON	ON

**Slave Mode:** When SW1-3 is ON, the DL05/DL06 can be placed in the RUN mode with the external RUN/TERM/STOP switch (with or without a program in it). If SW1-3 is off, it's up to the user to put an end instruction in the PLC and put the PLC in Run.



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Adapter Diagnostic Information: This is one of the biggest 'gotchas' with this module. **When SW1-4 is off it adds 2 bytes of data to the Input/Output data configured in the PLC.** If SW1-4 is on then it removes those 2 Bytes. It is defaulted to the off position.

Outputs:

Address	Bytes	Data	Comment
+ 0	1	I/O Status	Bit 0: Not used Bit 1: Not used Bit 2: Not used Bit 3: Node Error (Node number has changed) ON: Error/OFF: Normal Bit 4: IDLE (Output is IDLE) ON: Idle/OFF: Normal Bit 7: OUTPUT Status ON: Enable/OFF: Disable
+ 1	1	PLC Mode	00: Mode = STOP 03: Mode = RUN

Inputs:

Address	Bytes	Data	Comment
+ 0	1	No Code	No request
		C3h	Enable OUTPUT
		3Ch	Disable OUTPUT
+ 1	1	PLC Mode	01: RUN request 02: STOP request

Hold Outputs: This determines which state the outputs are in when the module loses communication with the DeviceNet master. The Default position for SW1-5 is off which will turn all outputs off. In the "ON" position the PLC will leave the outputs in their last state.

Parameter Initializing: This determines if the D0-DEVNETS will get its default values from V-memory or use internal default values. View chart below.



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SW-3	SW1-6	V7610	V7611	V7612	V7613	V7614	V7615	V7616	V7617
OFF	OFF	*1	*1	*1	*1	*1	*1	*1	*1
OFF	ON	O40400	2	O40500	2	O3000	128	O3100	128
ON	OFF	O40400	2	O40500	2	O3000	58	O3100	52
ON	ON	O40400	2	O40500	2	O3000	128	O3100	128

\*The parameter value in the EEPROM is moved to a register.

## I/O Configuration

The consumed and produced I/O is user defined in the DL05/06 memory. The DeviceNET available memory in the PLC is basically divided into 2 sets of data pointers. The first set was intended to read and write discrete I/O memory (but other data ranges can be accessed) and is setup through V7610 – V7613. Since this data range was intended to contain discrete I/O, it is limited to 8 bytes of Input and 8 bytes of Output. The other data set is configured through V7614 – V7617 and was intended to contain User V-memory locations. This data set has a much higher range of accessible values (128 bytes In and 128 bytes Out).

If the module is set to slave mode (dipswitch 3), it will be configured for 2 inputs/outputs in the I/O data pointers. If the PLC is not set to Slave mode, then these V-memory locations will need to be configured. The DL05/06 PLCs reserve several V-memory locations for storing the DEVNETS parameters. These special registers store the I/O ranges. The parameters are stored in the DL05/06 systems FLASH memory, and are not lost when the PLC is powered off.

Below is the V-Memory layout for the I/O configuration.

System V-memory	Description of Contents	Factory Default Value	Range
V7610	Input starting address	V40400	V40400 – 40417 (X0-377) V40500 – 40517 (Y0-377) V40600 – 40637 (C0-777) V41000 – 41017 (S0-377) V41100 – 41107 (T0-177) V41140 – 41147 (CT0-177) V41200 – 41237 (SP0-777)
V7611	Input number of bytes	2 Bytes	0 – 8 Bytes
V7612	Output starting address	V40500	V40400 – 40417 (X0-377) V40500 – 40517 (Y0-377) V40600 – 40637 (C0-777) V41000 – 41017 (S0-377) V41100 – 41107 (T0-177) V41140 – 41147 (CT0-177) V41200 – 41237 (SP0-777)
V7613	Output number of bytes	2 Bytes	0 – 8 Bytes
V7614	Input starting V-memory location	V3000	V0 – 7777
V7615	Input V-memory number of bytes	58 Bytes	0 – 128 Bytes
V7616	Output starting V-memory location	V3100	V0 – 7377
V7617	Output V-memory number of bytes	52 Bytes	0 – 128 Bytes

**I/O Data Pointer  
setup registers**

**V-memory Data  
Pointer setup  
registers**



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You can use both sets of data pointers, but if you have configured the I/O set of data pointers (V7610 – V7613), this is the only data available via Implicit messaging. If the I/O set of data pointers are used, then the V-memory set of data pointers (V7614- V7617) is only available via Explicit messaging.

To make the V-memory set of data pointers available via Implicit messaging the I/O set of data pointers need to be zeroed out. Then 128 bytes of Input and 128 bytes of Output data can be accessed through Implicit messaging. If the actual discrete I/O data is needed, this can be mapped over to the V-memory Input and Output blocks using LD and OUT instructions. This can be an easier way to configure this module.

## **EDS File**

The Electronic Data Sheet (EDS) stores all the device information or ID data. It also stores the default I/O count. Note that the EDS file does not hold all the possible I/O configurations: only the default parameters. Some newer EDS files have intelligent code that allow the master software to run a configuration utility for the I/O configuration. This is a feature of the master software but not a requirement. This functionality is not supported with the DEVNETS module and its EDS file.

## **I/O Count**

As mentioned earlier the I/O count is set up in the PLC with ladder. To calculate the actual I/O count to assign in the master there are a few things to consider.

1. What is the position of SW1-4?
2. Are you using I/O data or V-memory Data?
3. Are there any I/O cards in the DL06 expansion slots?
4. What is configured in the PLC memory?

If you are using I/O data then the D0-DEVNETS will automatically add any digital I/O in the expansion slots to the I/O data configured in the PLC. I/O Example:

V7611 = 6

V7613 = 6

Expansion Slot 1 = D0-16ND3 = 2 bytes

Expansion Slot 2 = D0-08ND3 = 1 bytes

SW1-4 = ON

The total I/O Count = 9 bytes input and 6 Output bytes.

When SW1-4 is off it adds 2 bytes to the total Input/Output count. In this example the D0-DEVNETS will error even if you entered these values correctly in the master because you are over the maximum Input/Output count for I/O data. The D0-DEVNETS NS LED will remain solid green for 10 sec and then flash red for 10 sec.



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The solution to this problem is to use V-memory data in the PLC, disable the I/O data and map over the X input/Y output V-memory words to the DEVNETS V-memory data blocks.

The D0-Devnet will allow you to go over 8 bytes in V-memory data mode.

V-memory data setup Example:

V7610 –V7613 = 0

V7615 = 58

V7617 = 52

SW1-4 = off

The total I/O Count = 60 bytes input and 54 Output bytes.

In Slave only mode there are some nuances if using it with a DL06. The DL06 has 20 inputs so the default setting for Slave only mode is 2 input bytes which will only cover 16 of those inputs. If all 20 inputs are required, the PLC will need to be configured manually.

If the I/O Data pointer method is still desired, here are the byte counts for all cards.

Any 8 Point Input card = 1 Input byte

Any 10 Point Input Card = 2 Input Bytes

Any 16 Point Input Card = 2 Input Bytes

Any 4 Point Output card = 1 Output byte

Any 8 Point Output card = 1 Output byte

Any 10 Point Output Card = 2 Output Bytes

Any 16 Point Output Card = 2 Output Bytes

Any Combo card will follow any combination of the above.

**NOTE: there was a hardware bug with using older H0-ECOMs and D0-DEVNETS. It is advised to use more recent H0-ECOMs or H0-ECOM100s when using them concurrently with the D0-DEVNETS.**

This document doesn't go into Master configuration because the manual has examples of how to use the most common ones. This Document is only meant to highlight some of the more detailed aspects of using the D0-DEVNETS.