AutomationDirect DirectNET Driver

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AutomationDirect DirectNET Driver

Help version 1.019

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Overview

The AutomationDirect DirectNET Driver provides a reliable way to connect AutomationDirect DirectNet controllers to OPC Client applications; including HMI, SCADA, Historian, MES, ERP and countless custom applications. This driver is intended for use with Automation Direct Logic Programmable Logic Controllers, also known as PLCDirect and Koyo.

Device Setup

Supported Devices
The following PLCs are supported.

DL-05
DL-06
DL-230
DL-240
DL-250(-1)
DL-260
DL-330
DL-340
DL-350
DL-430
DL-440
DL-450

Communication Protocol
Koyo DirectNet Hex Mode Protocol

Supported Communication Parameters*
Baud Rate - 1200, 2400, 9600, 19200 or 38400
Parity - None, Even or Odd
Data Bits - 5, 6, 7 or 8
Stop Bits - 1 or 2

*Some of these configurations may not be supported by all devices.

Ethernet Encapsulation
This driver supports Ethernet Encapsulation, which allows the driver to communicate with serial devices attached to an Ethernet network using a terminal server. Ethernet Encapsulation mode may be invoked through the COM ID property group. in Channel Properties. For more information, refer to the OPC server's help documentation.

Device IDs
Up to 90 devices may be defined. Valid Device IDs range from 1 to 90.

Flow Control
When using an RS232/RS485 converter, the type of flow control that is required depends on the converter's needs. Some converters do not require any flow control and others require RTS flow. To determine the converter's flow requirements, refer to its documentation. An RS485 converter that provides automatic flow control is recommended.

Note: When using the manufacturer's supplied communications cable, it is sometimes necessary to choose a flow control setting of **RTS** or **RTS Always** under the Channel Properties.

Automatic Tag Database Generation
Tag Import Settings

Modem Setup

This driver supports modem functionality. For more information, please refer to the topic "Modem Support" in the OPC server Help documentation.

Tag Import Settings

Tag Import File

This property is used to enter the exact location of the DirectSoft export file from which tags will be imported. It is this file that will be used when Automatic Tag Database Generation is instructed to create the tag database. There are two types of import files: Supported and Not Supported.

Supported Import Files
Program (via Export), .txt extension
Element Documentation (via Export), Standard Format, .csv extension

Import Files Not Supported
Element Documentation (via Export), Standard Format, .txt extension
Element Documentation (via Export), EZ-Touch Format, .csv and .txt extension
Element Documentation (auto created), .esd extension
DirectSoft Project, .prj extension

Display Descriptions

When enabled, this property will import tag descriptions. If necessary, a description will be given to tags with long names that states their original tag name.

See Also: Automatic Tag Database Generation

Automatic Tag Database Generation

Generating a New Tag Database

The AutomationDirect DirectNET Driver uses files generated from DirectSoft via the **Program** or **Element Documentation Export** feature to generate the tag database. Before attempting to automatically create the tag database, a file must be created, selected and exported from DirectSoft. Tags are generated offline, meaning that a connection to the device is not required. Instead, the device driver imports a tag file generated from the DirectSoft export file to create the tag database. For more information, refer to **Importing DirectSoft Elements** and **Tag Import Settings**.

Thus, there are two steps necessary for automatic tag database generation. First, an export file (*.txt or *.csv) must be created from DirectSoft. Second, tags must be generated based on that DirectSoft export file within the OPC server. For more information, refer to **Import Preparation: DirectSoft Steps** and **Import Preparation: OPC Server Steps**.

Generating Tag Database While Preserving Previously Generated Tag Databases

Under certain circumstances, multiple imports into the server are required to import all tags of interest. This is the case with importing VersaPro System variables and non-System variables into the same OPC server project. In the Database Creation property group. under Device Properties, click on the selection **Perform the following action**. The options available are "Delete on create," "Overwrite as necessary," "Do not overwrite" and "Do not overwrite, log error." After the first OPC server import/database creation is done, check that the action is set to "Do not overwrite" or "Do not overwrite, log error" for future imports. This will allow tags to be imported without deleting or overwriting ones that have been imported previously.

Tag Hierarchy

The tags created via automatic tag database generation follow a specific hierarchy. The root level groups (or subgroup level of the group specified in "Add generated tags to the following group") are determined by the tag's memory type referenced (such as X, C, V and etc.). For example, every variable that is of address type "X" will be placed in a root level group called "X".

The only exception applies to counter and timer accumulator addresses CTA and TA respectively. In these cases, the address is converted to a V-memory reference (TA0 = V0) but the tags generated will be assigned to the root level group CTA or TA, not V. But explicit V-memory references to CTA and TA locations will be assigned to the root level group V as intended.

Import File-to-Server Name Conversions

Leading Underscores

Leading underscores (_) in tag names will be removed. This is required since the server does not accept tag names beginning with an underscore.

Invalid Characters in Name

The only characters allowed in the server tag name are A-Z, a-z, 0-9, and underscore (_). As mentioned above, a tag name cannot begin with an underscore. All other invalid characters encountered will be removed from the tag name.

Importing DirectSoft Elements

This driver uses files generated from DirectSoft via the Program or Element Documentation Export feature to generate the tag database. In both methods, the items of interest are the elements (nickname, address and description) created in the DirectSoft Documentation Editor.

Note 1: For information on how to create a DirectSoft tag import file (*.txt or *.csv), refer to **Import Preparation: DirectSoft Steps**.
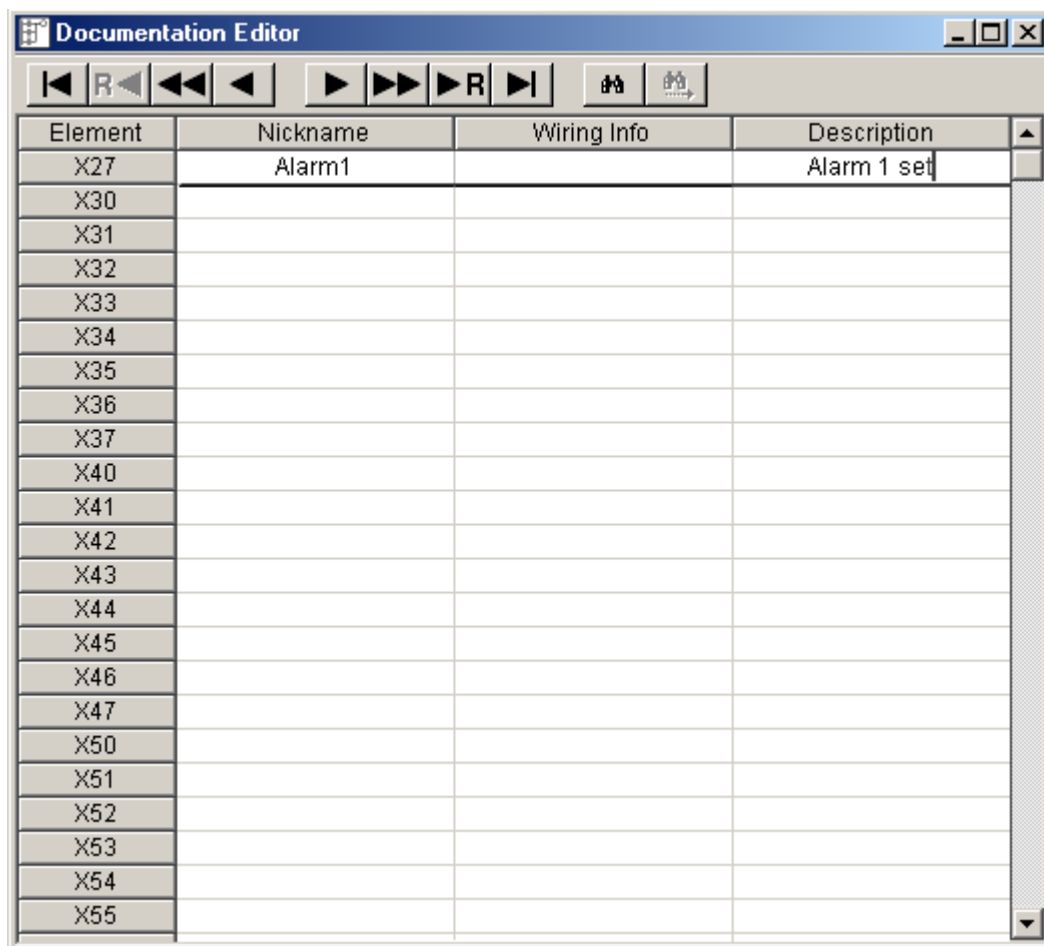
Note 2: For information on how to configure the OPC server to use this import file for Automatic Tag Database Generation, refer to **Import Preparation: OPC Server Steps**.

Import Preparation: DirectSoft Steps

There are two supported methods for generating an export file in DirectSoft for the driver to use as a tag import file: Program Export (*.txt extension) and Element Documentation Export, Standard Format (*.csv extension).

Creating Nicknames

1. Open the **DirectSoft** project containing the tags (elements) that will be ported to the OPC server.

2. Open the **Documentation Editor** by clicking **Menu** | **Tools** | **Documentation Editor**.

3. Enter a nickname and description for each memory reference of interest.

Element	Nickname	Wiring Info	Description
X27	Alarm1		Alarm 1 set
X30			
X31			
X32			
X33			
X34			
X35			
X36			
X37			
X40			
X41			
X42			
X43			
X44			
X45			
X46			
X47			
X50			
X51			
X52			
X53			
X54			
X55			

Exporting the Elements Through Program Export (.txt)

1. Open **DirectSoft**.

2. On **Menu**, click **File | Export**.

3. Select **Program**.
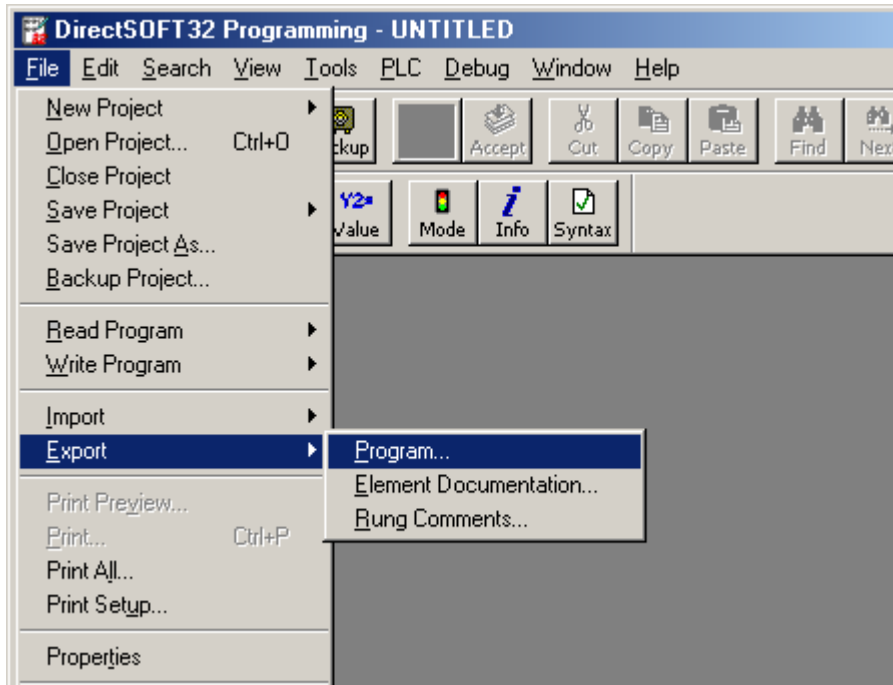
4. The **Save** dialog will show the file in text (*.txt) format.
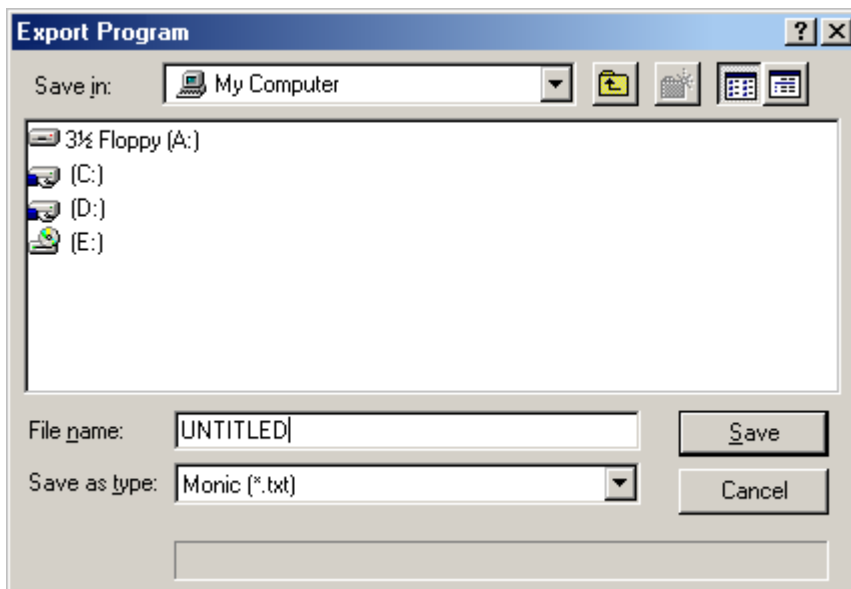
Exporting the Elements Through Element Documentation Export (.csv)

1. Open **DirectSoft**.

2. On **Menu**, click **File | Export**.

3. Select **Element Documentation**.
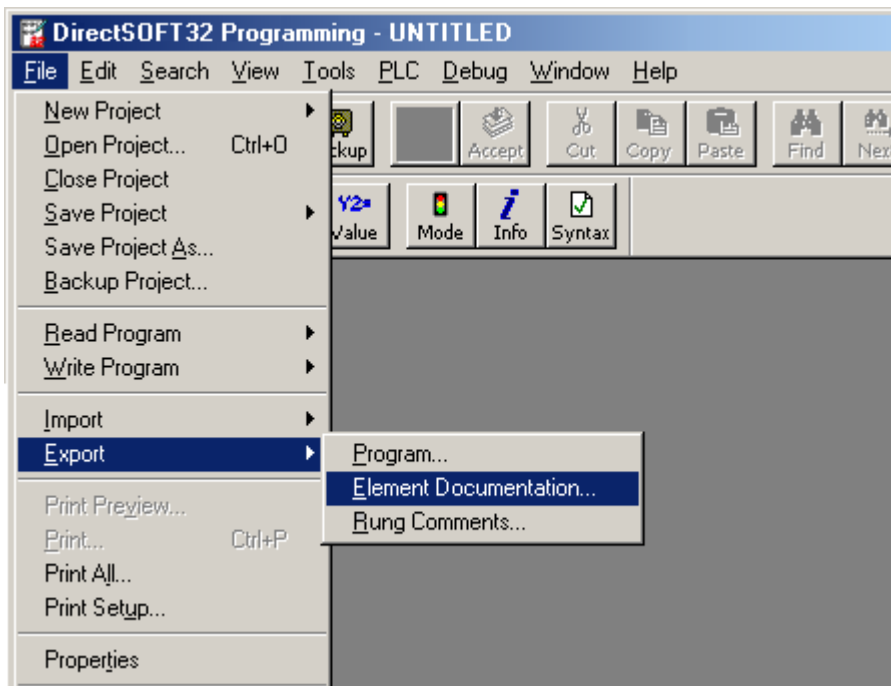
4. In the **Save** dialog, select **Comma Delimited (*.csv)** and **Standard Format**. Any other format or file type will not import properly. The file will be in **comma separated variable format**.
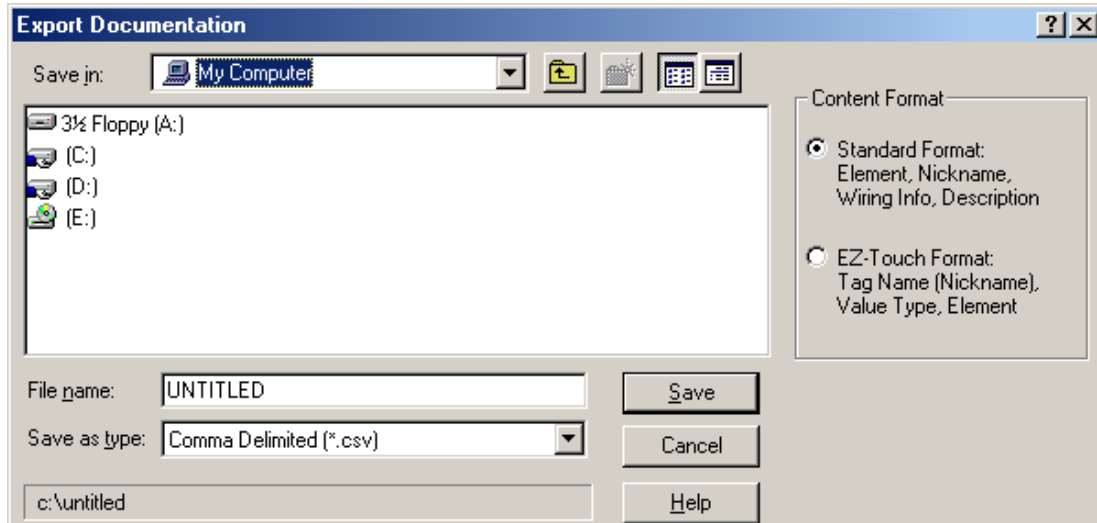
See Also: **Import Preparation: OPC Server Steps**

Import Preparation: OPC Server Steps

Important: An export file from DirectSoft must be created before the following OPC server steps can be completed. For more information, refer to **Import Preparation: DirectSoft Steps**.

1. In the driver, open up the **Device Properties** for the device of interest.

2. Select the **Tag Import Settings** property group.

3. Browse and select the location of the newly created DirectSoft export file. Click **Apply**.

4. Select the **Database Creation** property group.

5. Configure the Database Creation settings.

6. Click **Auto Create** to create the tag database.

Note: The OPC server will then attempt to create the tag database, while posting messages to the event log on the status of the import. When finished, it will state that the tag import has been completed. All elements exported out of DirectSoft will appear in the OPC server in the layout discussed in **Tag Hierarchy**.

The OPC tags generated are given meaningful names in the OPC server and are based on the variables imported. These tags are also placed in meaningful tag groups to provide a structured and manageable interface. The result is a well-organized OPC server project that directly reflects the variable import file.

See Also: Tag Import Settings and **Import File-to-Server Name Conversions**.

Data Types Description

Data Type	Description
Boolean	Single bit
Byte	Unsigned 8 bit value bit 0 is the low bit bit 7 is the high bit
Char	Signed 8 bit value bit 0 is the low bit bit 6 is the high bit bit 7 is the sign bit
Word	Unsigned 16 bit value bit 0 is the low bit bit 15 is the high bit
Short	Signed 16 bit value bit 0 is the low bit bit 14 is the high bit bit 15 is the sign bit
DWord	Unsigned 32 bit value bit 0 is the low bit bit 31 is the high bit
Long	Signed 32 bit value bit 0 is the low bit bit 30 is the high bit bit 31 is the sign bit
Float	32 bit Floating point value. The driver interprets two consecutive registers as a Floating point value by making the second register the high word and the first register the low word.
BCD	Two byte packed BCD Value range is 0-9999. Behavior is undefined for values beyond this range.
LBCD	Four byte packed BCD Value range is 0-99999999. Behavior is undefined for values beyond this range.

Address Descriptions

Address specifications vary depending on the model in use. Select a link from the following list to obtain specific address information for the model of interest.

DL-05

DL-06

DL-230

DL-240

DL-250(-1)

DL-260

DL-330

DL-340

DL-350

DL-430

DL-440

DL-450

DL-05 Addressing

The default data types are shown in **bold**.

I/O	X, Y	**Boolean**
Devices	C, SP, T, CT, S	**Boolean**
Data Words	V	Word, **Short**, DWord, Long, Float, LBCD
		BCD (default for Timers and Counters only)

Bit Access to V Memory

Bit information can be directly accessed within V memory registers. To access a bit within a V memory register, a bit number can be appended to any V memory address. V memory addressing with bit access would appear as follows: V<xxxxx>.<yy> where xxxxx is the V memory register location and yy is the bit number (0 to 15) within that register. If the V memory location is either a Long or DWord, the bit number yy can be (0 to 31).

Array Support for V Memory

This driver supports array notation for V memory addresses. To specify an array, append the array size to the address specification as follows: address[array size] or address[rows][cols]. Array size is limited to 128 elements when referenced as a Word, Short, and BCD, and 64 elements when referenced as a DWord, Long, Float, and LBCD.

Examples

1. V0 [3][4] @ BCD - Array of 12 Timer Values.
2. V1200 [128] @ Word - Array of 128 Words (Maximum allowed) starting at V1200.
3. V1200 [64] @ DWord - Array of 64 DWords (Maximum allowed) starting at V1200.

Address Specifications

All address ranges are specified in Octal.

Memory Type	Discrete Memory Reference	Discrete Memory Range	Word Memory Reference	Word Memory Range
Input Points*	X<xxx>	X0-X377	V<xxxxx>	V40400-V40417
Output Points	Y<xxx>	Y0-Y377	V<xxxxx>	V40500-V40517
Control Relays	C<xxx>	C0-C777	V<xxxxx>	V40600-V40637
Special Relays	SP<xxx>	SP0-SP777	V<xxxxx>	V41200-V41237
Timer Status Bits	T<xxx>	T0-T177	V<xxxxx>	V41100-V41107
Timer Current Values	None	None	V<xxxxx>	V0-V177
Counter Status Bits	CT<xxx>	CT0-CT177	V<xxxxx>	V41140-V41147
Counter Current Values	None	None	V<xxxxx>	V1000-V1177
Data Words	None	None	V<xxxxx>	V1200-V7377
Data Words Non-Volatile	None	None	V<xxxxx>	V7400-V7577
Stages	S<xxx>	S0-S377	V<xxxxx>	V41000-V41017
System Parameters	None	None	V<xxxxx>	V7600-V7777

*Read Only.

Examples

1. V40401 - bits 20 - 27 (octal) of X Input.
2. V41100 - Timer status bits 0 - 17 (octal).
3. V7600 - System parameter word 7600.
4. V2000.1 - Bit access to V2000 bit 1.
5. V2000.30 @ Long - Bit access to V2000 as a Long bit 30.

DL-06 Addressing

The default data types are shown in **bold**.

I/O	X, Y, GX, GY	Boolean
Devices	C, SP, T, CT, S	**Boolean**
Data Words	V	Word, **Short**, DWord, Long, Float, LBCD **BCD** (default for Timers and Counters only)

Bit Access to V Memory

Bit information can be directly accessed within V memory registers. To access a bit within a V memory register, a bit number can be appended to any V memory address. V memory addressing with bit access would appear as follows: V<xxxxx>.<yy> where xxxxx is the V memory register location and yy is the bit number (0 to 15) within that register. If the V memory location is either a Long or DWord, the bit number yy can be (0 to 31).

Array Support for V Memory

This driver supports array notation for V memory addresses. To specify an array, append the array size to the address specification as follows: address[array size] or address[rows][cols]. Array size is limited to 128

elements when referenced as a Word, Short, and BCD, and 64 elements when referenced as a DWord, Long, Float, and LBCD.

Examples

1. V0 [3][4] @ BCD - Array of 12 Timer Values.
2. V1200 [128] @ Word - Array of 128 Words (Maximum allowed) starting at V1200.
3. V1200 [64] @ DWord - Array of 64 DWords (Maximum allowed) starting at V1200.

Address Specifications

All address ranges are specified in Octal.

Memory Type	Discrete Memory Reference	Discrete Memory Range	Word Memory Reference	Word Memory Range
Input Points*	X<xxx>	X0-X777	V<xxxxx>	V40400-V40437
Output Points	Y<xxx>	Y0-Y777	V<xxxxx>	V40500-V40537
Control Relays	C<xxx>	C0-C1777	V<xxxxx>	V40600-V40677
Special Relays	SP<xxx>	SP0-SP777	V<xxxxx>	V41200-V41237
Timer Status Bits	T<xxx>	T0-T377	V<xxxxx>	V41100-V41117
Timer Current Values	None	None	V<xxxxx>	V0-V377
Counter Status Bits	CT<xxx>	CT0-CT177	V<xxxxx>	V41040-V41147
Counter Current Values	None	None	V<xxxxx>	V1000-V1177
Data Words	None	None	V<xxxxx>	V400-V677 V1200-V7377 V10000-V17777
Data Words Non-Volatile	None	None	V<xxxxx>	V7400-V7577
Stages	S<xxx>	S0-S1777	V<xxxxx>	V41000-V41077
Remote I/O	GX<xxx> GY<xxx>	GX0-GX3777 GY0-GY3777	V<xxxxx>	V40000-V40177 V40200-V40377
System Parameters	None	None	V<xxxxx>	V700-V777 V7600-V7777 V36000-V37777

*Read Only.

Examples

1. V40401 - bits 20 - 27 (octal) of X Input.
2. V41100 - Timer status bits 0 - 17 (octal).
3. V700 - System parameter word 700.
4. V2000.1 - Bit access to V2000 bit 1.
5. V2000.30@Long - Bit access to V2000 as a Long bit 30.

DL-230 Addressing

The default data types are shown in **bold**.

I/O	X, Y	**Boolean**
Devices	C, SP, T, CT, S	**Boolean**
Data Words	V	Word, **Short**, DWord, Long, Float, LBCD
		BCD (default for Timers and Counters only)

Bit Access to V Memory

Bit information can be directly accessed within V memory registers. To access a bit within a V memory register, a bit number can be appended to any V memory address. V memory addressing with bit access would appear as follows: V<xxxxx>.<yy> where xxxx is the V memory register location and yy is the bit number (0 to 15) within that register. If the V memory location is either a Long or DWord, the bit number yy can be (0 to 31).

Array Support for V Memory

This driver supports array notation for V memory addresses. To specify an array, append the array size to the address specification as follows: address[array size] or address[rows][cols]. Array size is limited to 128 elements when referenced as a Word, Short, and BCD, and 64 elements when referenced as a DWord, Long, Float, and LBCD.

Examples

1. V0 [3][4] @ BCD - Array of 12 Timer Values.
2. V2000 [128] @ Word - Array of 128 Words (Maximum allowed) starting at V2000.
3. V2000 [64] @ DWord - Array of 64 DWords (Maximum allowed) starting at V2000.

Address Specifications

All address ranges are specified in Octal.

Memory Type	Discrete Memory Reference	Discrete Memory Range	Word Memory Reference	Word Memory Range
Input Points*	X<xxx>	X0-X177	V<xxxxx>	V40400-V40407
Output Points	Y<xxx>	Y0-Y177	V<xxxxx>	V40500-V40507
Control Relays	C<xxx>	C0-C377	V<xxxxx>	V40600-V40617
Special Relays	SP<xxx>	SP0-SP117 SP540-SP577	V<xxxxx>	V41200-V41204 V41226-V41227
Timer Status Bits	T<xxx>	T0-T77	V<xxxxx>	V41100-V41103
Timer Current Values	None	None	V<xxxxx>	V0-V77
Counter Status Bits	CT<xxx>	CT0-CT77	V<xxxxx>	V41140-V41143
Counter Current Values	None	None	V<xxxxx>	V1000-V1077
Data Words	None	None	V<xxxxx>	V2000-V2377
Data Words Non-Volatile	None	None	V<xxxxx>	V4000-V4177
Stages	S<xxx>	S0-S377	V<xxxxx>	V41000-V41017
System Parameters	None	None	V<xxxxx>	V7620-V7647 V7750-V7777

*Read Only.

Examples

1. V40500 bits 0 - 17 (octal) of Y Output.
2. CT65 Counter contact 65.
3. S57 Stage control bit 57.
4. V2000.1 Bit access to V2000 bit 1.
5. V2000.30@Long Bit access to V2000 as a Long bit 30.

DL-240 Addressing

The default data types are shown in **bold**.

I/O	X, Y	**Boolean**
Devices	C, SP, T, CT, S	**Boolean**
Data Words	V	Word, **Short**, DWord, Long, Float, LBCD
		BCD (default for Timers and Counters only)

Bit Access to V Memory

Bit information can be directly accessed within V memory registers. To access a bit within a V memory register, a bit number can be appended to any V memory address. V memory addressing with bit access would appear as follows: V<xxxxx>.<yy> where xxxxx is the V memory register location and yy is the bit number (0 to 15) within that register. If the V memory location is either a Long or DWord, the bit number yy can be (0 to 31).

Array Support for V Memory

This driver supports array notation for V memory addresses. To specify an array, append the array size to the address specification as follows: address[array size] or address[rows][cols]. Array size is limited to 128 elements when referenced as a Word, Short, and BCD, and 64 elements when referenced as a DWord, Long, Float, and LBCD.

Examples

1. V0 [3][4] @ BCD- Array of 12 Timer Values.
2. V2000 [128] @ Word - Array of 128 Words (Maximum allowed) starting at V2000.
3. V2000 [64] @ DWord - Array of 64 DWords (Maximum allowed) starting at V2000.

Address Specifications

All address ranges are specified in Octal.

Memory Type	Discrete Memory Reference	Discrete Memory Range	Word Memory Reference	Word Memory Range
Input Points	X<xxx>	X0-X177	V<xxxxx>	V40400-V40407
Output Points	Y<xxx>	Y0-Y177	V<xxxxx>	V40500-V40507
Control Relays	C<xxx>	C0-C377	V<xxxxx>	V40600-V40617
Special Relays	SP<xxx>	SP0-SP137 SP540-SP617	V<xxxxx>	V41200-V41205 V41226-V41230
Timer Status Bits	T<xxx>	T0-T177	V<xxxxx>	V41100-V41107
Timer Current Values	None	None	V<xxxxx>	V0-V177
Counter Status	CT<xxx>	CT0-CT177	V<xxxxx>	V41140-V41147

Memory Type	Discrete Memory Reference	Discrete Memory Range	Word Memory Reference	Word Memory Range
Bits				
Counter Current Values	None	None	V<xxxxx>	V1000-V1177
Data Words	None	None	V<xxxxx>	V2000-V3777
Data Words Non-Volatile	None	None	V<xxxxx>	V4000-V4377
Stages	S<xxx>	S0-S777	V<xxxxx>	V41000-V41037
System Parameters	None	None	V<xxxxx>	V7620-V7737

V7746-V7777 |

*Read Only.

Examples

1. V40500 bits 0 - 17 (octal) of Y Output.
2. CT165 Counter contact 165.
3. S57 Stage control bit 57.
4. V2000.1 Bit access to V2000 bit 1.
5. V2000.30@Long Bit access to V2000 as a Long bit 30.

DL-250(-1) Addressing

The default data types are shown in **bold**.

I/O	X, Y	Boolean
Devices	C, SP, T, CT, S	Boolean
Data Words	V	Word, **Short**, DWord, Long, Float, LBCD **BCD** (default for Timers and Counters only)

Bit Access to V Memory

Bit information can be directly accessed within V memory registers. To access a bit within a V memory register, a bit number can be appended to any V memory address. V memory addressing with bit access would appear as follows: V<xxxxx>.<yy> where xxxxx is the V memory register location and yy is the bit number (0 to 15) within that register. If the V memory location is either a Long or DWord, the bit number yy can be (0 to 31).

Array Support for V Memory

This driver supports array notation for V memory addresses. To specify an array, append the array size to the address specification as follows: address[array size] or address[rows][cols]. Array size is limited to 128 elements when referenced as a Word, Short, and BCD, and 64 elements when referenced as a DWord, Long, Float, and LBCD.

Examples

1. V0 [3][4] @ BCD- Array of 12 Timer Values.
2. V1400 [128] @ Word - Array of 128 Words (Maximum allowed) starting at V1400.
3. V1400 [64] @ DWord - Array of 64 DWords (Maximum allowed) starting at V1400.

Address Specifications

All address ranges are specified in Octal.

Memory Type	Discrete Memory Reference	Discrete Memory Range	Word Memory Reference	Word Memory Range
Input Points*	X<xxx>	X0-X777	V<xxxxx>	V40400-V40437
Output Points	Y<xxx>	Y0-Y777	V<xxxxx>	V40500-V40537
Control Relays	C<xxx>	C0-C1777	V<xxxxx>	V40600-V40677
Special Relays	SP<xxx>	SP0-SP777	V<xxxxx>	V41200-V41237
Timer Status Bits	T<xxx>	T0-T377	V<xxxxx>	V41100-V41117
Timer Current Values	None	None	V<xxxxx>	V0-V377
Counter Status Bits	CT<xxx>	CT0-CT177	V<xxxxx>	V41140-V41147
Counter Current Values	None	None	V<xxxxx>	V1000-V1177
Data Words	None	None	V<xxxxx>	V1400-V7377 V10000-V17777
Stages	S<xxx>	S0-S1777	V<xxxxx>	V41000-V41077
System Parameters	None	None	V<xxxxx>	V7400-V7777 V37000-V37777

*Read Only.

Examples

1. V40401 bits 20 - 27 (octal) of X Input.
2. V41100 Timer status bits 0 - 17 (octal).
3. V7400 System parameter word 7400.
4. V2000.1 Bit access to V2000 bit 1.
5. 2000.30@Long Bit access to V2000 as a Long bit 30.

DL-260 Addressing

The default data types are shown in **bold**.

I/O	X, Y	Boolean
Devices	C, SP, T, CT, S	**Boolean**
Data Words	V	Word, **Short**, DWord, Long, Float, LBCD **BCD** (default for Timers and Counters only)

Bit Access to V Memory

Bit information can be directly accessed within V memory registers. To access a bit within a V memory register, a bit number can be appended to any V memory address. V memory addressing with bit access would appear as follows: V<xxxxx>.<yy> where xxxxx is the V memory register location and yy is the bit

number (0 to 15) within that register. If the V memory location is either a Long or DWord, the bit number yy can be (0 to 31).

Array Support for V Memory

This driver supports array notation for V memory addresses. To specify an array, append the array size to the address specification as follows: address[array size] or address[rows][cols]. Array size is limited to 128 elements when referenced as a Word, Short, and BCD, and 64 elements when referenced as a DWord, Long, Float, and LBCD.

Examples

1. V0 [3][4] @ BCD- Array of 12 Timer Values.
2. V1400 [128] @ Word - Array of 128 Words (Maximum allowed) starting at V1400.
3. V1400 [64] @ DWord - Array of 64 DWords (Maximum allowed) starting at V1400.

Address Specifications

All address ranges are specified in Octal.

Memory Type	Discrete Memory Reference	Discrete Memory Range	Word Memory Reference	Word Memory Range
Input Points*	X<xxx>	X0-X1777	V<xxxxx>	V40400-V40477
Output Points	Y<xxx>	Y0-Y1777	V<xxxxx>	V40500-V40577
Control Relays	C<xxx>	C0-C3777	V<xxxxx>	V40600-V40777
Special Relays	SP<xxx>	SP0-SP777	V<xxxxx>	V41200-V41237
Timer Status Bits	T<xxx>	T0-T377	V<xxxxx>	V41100-V41117
Timer Current Values	None	None	V<xxxxx>	V0-V377
Counter Status Bits	CT<xxx>	CT0-CT377	V<xxxxx>	V41140-V41157
Counter Current Values	None	None	V<xxxxx>	V1000-V1377
Data Words	None	None	V<xxxxx>	V400-V777 V1400-V7377 V10000-V35777
Stages	S<xxx>	S0-S1777	V<xxxxx>	V41000-V41077
Remote I/O	GX<xxx>	GX0-GX3777	V<xxxxx>	V40000-V40177
	GY<xxx>	GY0-GY3777	V<xxxxx>	V40200-V40377
System Parameters	None	None	V<xxxxx>	V7600-V7777 V36000-V37777

*Read Only.

Examples

1. V40401 bits 20 - 27 (octal) of X Input.
2. V41100 Timer status bits 0 - 17 (octal).
3. V7400 System parameter word 7400.

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4. V2000.1 Bit access to V2000 bit 1.

5. V2000.30@Long Bit access to V2000 as a Long bit 30.

DL-330 Addressing

The default data types are shown in **bold**.

I/O	IO	**Boolean**
Devices	C, SP, CT, SR	**Boolean**
8-bit Registers	R	Byte, Char, Word, **Short**, DWord, Long, Float, BCD, LBCD
		BCD (default for Timers and Counters only)

Address Specifications

All address ranges are specified in Octal.

Memory Type	Discrete Memory Reference	Discrete Memory Range	Word Memory Reference	Word Memory Range
Input / Output Points	IO<xxx>	IO0-IO157 IO700-IO767	R<xxx>	R0-R15 R70-R76
Control Relays	C<xxx>	C160-C373	R<xxx>	R16-R37
Special Relays	SP<xxx>	SP374-SP377 SP770-SP777	R<xxx>	R37 R77
Timer / Counter Status Bits	CT<xxx>	CT600-CT677	None	None
Timer / Counter Preset Values	None	None	R<xxx>	R564-R573
Timer / Counter Current Values	None	None	R<xxx>	R600-R677
Data Words*	None	None	R<xxx>	R400-R563
Shift Registers	SR<xxx>	SR400 - SR577	None	None
Special Registers	None	None	R<xxx>	R574-V577

*Only even registers are writable.

Examples

1. R37 bits 374 - 377 (octal) of the special relays.
2. IO157 bit 157 of the I/O points.
3. R16 bits 160 - 167 of the control relays.

DL-340 Addressing

The default data types are shown in **bold**.

I/O	IO	**Boolean**
Devices	C, SP, CT, SR	**Boolean**
Data Words	R	Byte, Char, Word, **Short**, DWord, Long, Float, BCD, LBCD
		BCD (default for Timers and Counters only)

Address Specifications

All address ranges are specified in Octal.

Memory Type	Discrete Memory Reference	Discrete Memory Range	Word Memory Reference	Word Memory Range
Input / Output Points	IO<xxx>	IO0-IO157 IO700-IO767	R<xxx>	R0-R15 R70-R76
Control Relays	C<xxx>	C160-C373 C1000-C1067	R<xxx>	R16-R37 R100-R106
Special Relays	SP<xxx>	SP374-SP377 SP770-SP777 SP1070-SP1077	R<xxx>	R37 R77 R107
Timer / Counter Status Bits	CT<xxx>	CT600-CT677	None	None
Timer / Counter Preset Values	None	None	R<xxx>	R564-R573
Timer / Counter Current Values	None	None	R<xxx>	R600-R677
Data Words*	None	None	R<xxx>	R400-R563 R700-R767
Shift Registers	SR<xxx>	SR400-SR577	None	None
Special Registers	None	None	R<xxx>	R574-V577 R770-R777

*Only even registers are writable.

Examples

1. R37 bits 374 - 377 (octal) of the special relays.
2. IO157 bit 157 of the I/O points.
3. R100 bits 1000 - 1007 of the control relays.

DL-350 Addressing

The default data types are shown in **bold**.

I/O	X, Y	Boolean
Devices	C, SP, T, CT, S	**Boolean**
Data Words	V	Word, **Short**, DWord, Long, Float, LBCD **BCD** (default for Timers and Counters only)

Bit Access to V Memory

Bit information can be directly accessed within V memory registers. To access a bit within a V memory register, a bit number can be appended to any V memory address. V memory addressing with bit access

would appear as follows: V<xxxxx>.<yy> where xxxxx is the V memory register location and yy is the bit number (0 to 15) within that register. If the V memory location is either a Long or DWord, the bit number yy can be (0 to 31).

Array Support for V Memory

This driver supports array notation for V memory addresses. To specify an array, append the array size to the address specification as follows: address[array size] or address[rows][cols]. Array size is limited to 128 elements when referenced as a Word, Short, and BCD, and 64 elements when referenced as a DWord, Long, Float, and LBCD.

Examples

1. V0 [3][4] @ BCD- Array of 12 Timer Values
2. V1400 [128] @ Word - Array of 128 Words (Maximum allowed) starting at V1400
3. V1400 [64] @ DWord - Array of 64 DWords (Maximum allowed) starting at V1400

Address Specifications

All address ranges are specified in Octal.

Memory Type	Discrete Memory Reference	Discrete Memory Range	Word Memory Reference	Word Memory Range
Input Points*	X<xxx>	X0-X777	V<xxxxx>	V40400-V40437
Output Points	Y<xxx>	Y0-Y777	V<xxxxx>	V40500-V40537
Control Relays	C<xxx>	C0-C1777	V<xxxxx>	V40600-V40677
Special Relays	SP<xxx>	SP0-SP777	V<xxxxx>	V41200-V41237
Timer Status Bits	T<xxx>	T0-T377	V<xxxxx>	V41100-V41117
Timer Current Values	None	None	V<xxxxx>	V0-V377
Counter Status Bits	CT<xxx>	CT0-CT177	V<xxxxx>	V41140-V41147
Counter Current Values	None	None	V<xxxxx>	V1000-V1177
Data Words	None	None	V<xxxxx>	V1400-V7377 10000-V17777
Stages	S<xxx>	S0-S1777	V<xxxxx>	V41000-V41077
System Parameters	None	None	V<xxxxx>	V7400-V7777 V36000-V37777

*Read Only.

Examples

1. V40401 bits 20 - 27 (octal) of X Input.
2. V41100 Timer status bits 0 - 17 (octal).
3. V7400 System parameter word 7400.
4. V2000.1 Bit access to V2000 bit 1.
5. V2000.30@Long Bit access to V2000 as a Long bit 30.

DL-430 Addressing

The default data types are shown in **bold**.

I/O	X, Y, GX	**Boolean**
Devices	C, SP, T, CT, S	**Boolean**
Data Words	V	Word, **Short**, DWord, Long, Float, LBCD
		BCD (default for Timers and Counters only)

Bit Access to V Memory

Bit information can be directly accessed within V memory registers. To access a bit within a V memory register, a bit number can be appended to any V memory address. V memory addressing with bit access would appear as follows: V<xxxxx>.<yy> where xxxxx is the V memory register location and yy is the bit number (0 to 15) within that register. If the V memory location is either a Long or DWord, the bit number yy can be (0 to 31).

Array Support for V Memory

This driver supports array notation for V memory addresses. To specify an array, append the array size to the address specification as follows: address[array size] or address[rows][cols]. Array size is limited to 128 elements when referenced as a Word, Short, and BCD, and 64 elements when referenced as a DWord, Long, Float, and LBCD.

Examples

1. V0 [3][4] @ BCD- Array of 12 Timer Values.
2. V1400 [128] @ Word - Array of 128 Words (Maximum allowed) starting at V1400.
3. V1400 [64] @ DWord - Array of 64 DWords (Maximum allowed) starting at V1400.

Address Specifications

All address ranges are specified in Octal.

Memory Type	Discrete Memory Reference	Discrete Memory Range	Word Memory Reference	Word Memory Range
Input Points	X<xxx>	X0-X477	V<xxxxx>	V40400-V40423
Output Points	Y<xxx>	Y0-Y477	V<xxxxx>	V40500-V40523
Control Relays	C<xxx>	C0-C737	V<xxxxx>	V40600-V40635
Special Relays	SP<xxx>	SP0-SP137 SP320-SP617	V<xxxxx>	V41200-V41205 V41215-V41230
Timer Status Bits	T<xxx>	T0-T177	V<xxxxx>	V41100-V41107
Timer Current Values	None	None	V<xxxxx>	V0-V177
Counter Status Bits	CT<xxx>	CT0-CT177	V<xxxxx>	V41040-V41147
Counter Current Values	None	None	V<xxxxx>	V1000-V1177
Data Words	None	None	V<xxxxx>	V1400-V7377
Stages	S<xxx>	S0-S577	V<xxxxx>	V41000-V41027
Remote I/O	GX<xxx>	GX0-GX737	V<xxxxx>	V40000-V40037
System	None	None	V<xxxxx>	V7400-V7777

Parameters				

*Read Only.

Examples

1. V40401 bits 20 - 27 (octal) of X Input.
2. T172 Timer contact 172.
3. GX5 Remote I/O bit 5.
4. V2000.1 Bit access to V2000 bit 1.
5. V2000.30@Long Bit access to V2000 as a Long bit 30.

DL-440 Addressing

The default data types are shown in **bold**.

I/O	X, Y GX	**Boolean**
Devices	C, SP, T, CT, S	**Boolean**
Data Words	V	Word, **Short**, DWord, Long, Float, LBCD
		BCD (default for Timers and Counters only)

Bit Access to V Memory

Bit information can be directly accessed within V memory registers. To access a bit within a V memory register, a bit number can be appended to any V memory address. V memory addressing with bit access would appear as follows: V<xxxxx>.<yy> where xxxxx is the V memory register location and yy is the bit number (0 to 15) within that register. If the V memory location is either a Long or DWord, the bit number yy can be (0 to 31).

Array Support for V Memory

This driver supports array notation for V memory addresses. To specify an array, append the array size to the address specification as follows: address[array size] or address[rows][cols]. Array size is limited to 128 elements when referenced as a Word, Short, and BCD, and 64 elements when referenced as a DWord, Long, Float, and LBCD.

Examples

1. V0 [3][4] @ BCD- Array of 12 Timer Values.
2. V1400 [128] @ Word - Array of 128 Words (Maximum allowed) starting at V1400.
3. V1400 [64] @ DWord - Array of 64 DWords (Maximum allowed) starting at V1400.

Address Specifications

All address ranges are specified in Octal.

Memory Type	Discrete Memory Reference	Discrete Memory Range	Word Memory Reference	Word Memory Range
Input Points*	X<xxx>	X0-X477	V<xxxxx>	V40400-V40423
Output Points	Y<xxx>	Y0-Y477	V<xxxxx>	V40500-V40523
Control Relays	C<xxx>	C0-C1777	V<xxxxx>	V40600-V40677
Special Relays	SP<xxx>	SP0-SP137	V<xxxxx>	V41200-V41205
		SP320-SP617		V41215-V41230

Memory Type	Discrete Memory Reference	Discrete Memory Range	Word Memory Reference	Word Memory Range
		SP620-SP717		V41231-V41234
Timer Status Bits	T<xxx>	T0-T377	V<xxxxx>	V41100-V41117
Timer Current Values	None	None	V<xxxxx>	V0-V377
Counter Status Bits	CT<xxx>	CT0-CT177	V<xxxxx>	V41040-V41147
Counter Current Values	None	None	V<xxxxx>	V1000-V1177
Data Words	None	None	V<xxxxx>	V1400-V7377 V10000-V17777
Stages	S<xxx>	S0-S1777	V<xxxxx>	V41000-V41077
Remote I/O	GX<xxx>	GX0-GX1777	V<xxxxx>	V40000-V40077
System Parameters	None	None	V<xxxxx>	V700-V737 V7400-V7777

*Read Only.

Examples

1. V40401 bits 20 - 27 (octal) of X Input.
2. V41100 Timer status bits 0 - 17 (octal).
3. V700 System parameter word 700.
4. V2000.1 Bit access to V2000 bit 1.
5. V2000.30@Long Bit access to V2000 as a Long bit 30.

DL-450 Addressing

The default data types are shown in **bold**.

I/O	X, Y, GX, GY	**Boolean**
Devices	C, SP, T, CT, S	**Boolean**
Data Words	V	Word, **Short**, DWord, Long, Float, LBCD **BCD** (default for Timers and Counters only)

Bit Access to V Memory

Bit information can be directly accessed within V memory registers. To access a bit within a V memory register, a bit number can be appended to any V memory address. V memory addressing with bit access would appear as follows: V<xxxxx>.<yy> where xxxxx is the V memory register location and yy is the bit number (0 to 15) within that register. If the V memory location is either a Long or DWord, the bit number yy can be (0 to 31).

Array Support for V Memory

This driver supports array notation for V memory addresses. To specify an array, append the array size to the address specification as follows: address[array size] or address[rows][cols]. Array size is limited to 128

elements when referenced as a Word, Short, and BCD, and 64 elements when referenced as a DWord, Long, Float, and LBCD.

Examples

1. V0 [3][4] @ BCD- Array of 12 Timer Values.
2. V1400 [128] @ Word - Array of 128 Words (Maximum allowed) starting at V1400.
3. V1400 [64] @ DWord - Array of 64 DWords (Maximum allowed) starting at V1400.

Address Specifications

All address ranges are specified in Octal.

Memory Type	Discrete Memory Reference	Discrete Memory Range	Word Memory Reference	Word Memory Range
Input Points*	X<xxx>	X0-X1777	V<xxxxx>	V40400-V40477
Output Points	Y<xxx>	Y0-Y1777	V<xxxxx>	V40500-V40577
Control Relays	C<xxx>	C0-C3777	V<xxxxx>	V40600-V40777
Special Relays	SP<xxx>	SP0-SP137 SP320-SP717	V<xxxxx>	V41200-V41237
Timer Status Bits	T<xxx>	T0-T377	V<xxxxx>	V41100-V41117
Timer Current Values	None	None	V<xxxxx>	V0-V377
Counter Status Bits	CT<xxx>	CT0-CT377	V<xxxxx>	V41040-V41157
Counter Current Values	None	None	V<xxxxx>	V1000-V1377
Data Words	None	None	V<xxxxx>	V1400-V7377 V10000-V37777
Stages	S<xxx>	S0-S1777	V<xxxxx>	V41000-V41077
Remote I/O	GX<xxx>	GX0-GX3777	V<xxxxx>	V40000-V40177
	GY<xxx>	GY0-GY3777	V<xxxxx>	V40200-V40377
System Parameters	None	None	V<xxxxx>	V700-V737 V7400-V7777

*Read Only.

Examples

1. V40401 bits 20 - 27 (octal) of X Input.
2. V41100 Timer status bits 0 - 17 (octal).
3. V700 System parameter word 700.
4. V2000.1 Bit access to V2000 bit 1.
5. V2000.30@Long Bit access to V2000 as a Long bit 30.

Error Descriptions

The following messages may be generated. Click on the link for a description of the message.

Address Validation

Missing address

Device address '<address>' contains a syntax error

Address '<address>' is out of range for the specified device or register

Device address '<address>' is not supported by model '<model name>'

Data Type '<type>' is not valid for device address '<address>'

Device address '<address>' is Read Only

Serial Communications

COMn does not exist

Error opening COMn

COMn is in use by another application

Unable to set comm properties on COMn

Communications error on '<channel name>' [<error mask>]

Device Status Messages

Device '<device name>' is not responding

Unable to write to '<address>' on device '<device name>'

Device Specific Messages

Bad address in block [<start address> to <end address>] on device '<device name>'

Automatic Tag Database Generation Messages

Unable to generate a tag database for device <device name>

Unable to generate a tag database for device <device name>

Missing address

Error Type:
Warning

Possible Cause:
A tag address that has been specified statically has no length.

Solution:
Re-enter the address in the client application.

Device address '<address>' contains a syntax error

Error Type:
Warning

Possible Cause:

A tag address that has been specified statically contains one or more invalid characters.

Solution:
Re-enter the address in the client application.

Address '<address>' is out of range for the specified device or register

Error Type:
Warning

Possible Cause:
A tag address that has been specified statically references a location that is beyond the range of supported locations for the device.

Solution:
Verify the address is correct; if it is not, re-enter it in the client application.

Device address '<address>' is not supported by model '<model name>'

Error Type:
Warning

Possible Cause:
A tag address that has been specified statically references a location that is valid for the communications protocol but not supported by the target device.

Solution:
Verify the address is correct; if it is not, re-enter it in the client application. Also verify that the selected model name for the device is correct.

Data Type '<type>' is not valid for device address '<address>'

Error Type:
Warning

Possible Cause:
A tag address that has been specified statically has been assigned an invalid data type.

Solution:
Modify the requested data type in the client application.

Device address '<address>' is Read Only

Error Type:
Warning

Possible Cause:
A tag address that has been specified statically has a requested access mode that is not compatible with what the device supports for that address.

Solution:
Change the access mode in the client application.

COMn does not exist

Error Type:
Fatal

Possible Cause:
The specified COM port is not present on the target computer.

Solution:
Verify that the proper COM port has been selected.

Error opening COMn

Error Type:
Fatal

Possible Cause:
The specified COM port could not be opened due an internal hardware or software problem on the target computer.

Solution:
Verify that the COM port is functional and may be accessed by other Windows applications.

COMn is in use by another application

Error Type:
Fatal

Possible Cause:
The serial port assigned to a device is being used by another application.

Solution:
Verify that the correct port has been assigned to the channel.

Unable to set comm properties on COMn

Error Type:
Fatal

Possible Cause:
The serial properties for the specified COM port are not valid.

Solution:
Verify the serial properties and make any necessary changes.

Communications error on '<channel name>' [<error mask>]

Error Type:
Serious

Error Mask Definitions:
B = Hardware break detected.
F = Framing error.
E = I/O error.
O = Character buffer overrun.
R = RX buffer overrun.
P = Received byte parity error.
T = TX buffer full.

Possible Cause:

1. The serial connection between the device and the Host PC is bad.

2. The communications properties for the serial connection are incorrect.

Solution:

1. Verify the cabling between the PC and the PLC device.

2. Verify that the specified communications properties match those of the device.

Device '<device name>' not responding

Error Type:
Serious

Possible Cause:

1. The serial connection between the device and the Host PC is broken.

2. The communications properties for the serial connection are incorrect.

3. The named device may have been assigned an incorrect Network ID.

4. The requested address is not available in the device.

5. The response from the device took longer to receive than the amount of time specified in the "Request Timeout" device setting.

Solution:

1. Verify the cabling between the PC and the PLC device.

2. Verify the specified communications properties match those of the device.

3. Verify the Network ID given to the named device matches that of the actual device.

4. Verify that the device supports the requested address.

5. Increase the Request Timeout setting so that the entire response can be handled.

Unable to write to '<address>' on device '<device name>'

Error Type:
Serious

Possible Cause:

1.   The serial connection between the device and the Host PC is broken.

2.   The communications properties for the serial connection are incorrect.

3.   The named device may have been assigned an incorrect Network ID.

Solution:

1.   Verify the cabling between the PC and the PLC device.

2.   Verify the specified communications properties match those of the device.

3.   Verify the Network ID given to the named device matches that of the actual device.

Bad address in block [<start address> to <end address>] on device '<device name>'

Error Type:
Serious

Possible Cause:
An attempt has been made to reference a nonexistent location in the specified device.

Solution:
Verify the tags assigned to addresses in the specified range on the device and eliminate ones that reference invalid locations.

Unable to generate a tag database for device <device name>

Error Type:
Warning

Possible Cause:
Memory required for database generation could not be allocated. The process is aborted.

Solution:
Close unused applications and/or increase the amount of virtual memory and try again.

Unable to generate a tag database for device <device name>

Error Type:
Warning

Possible Cause:

The file specified as the Tag Import File in the Database Settings property group in Device Properties is an improperly formatted txt or csv file.

Solution:

If importing Element Documentation, verify that the export file was saved in "Standard Format" with a .csv extension. If the problem resumes, try re-exporting the file.

See Also:

Importing DirectSoft Elements

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