# Omron Host Link Driver Help

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## **Omron Host Link Driver Help**

Help version 1.024

#### CONTENTS

**Overview** 

What is the Omron Host Link Driver?

#### Device Setup

How do I configure a device for use with this driver?

#### **Data Types Description**

What data types does this driver support?

#### **Address Descriptions**

How do I address a data location on an Omron Host Link device?

#### **Error Descriptions**

What error messages does the Omron Host Link Driver produce?

#### **Overview**

The Omron Host Link Driver provides an easy and reliable way to connect Omron Host Link devices to OPC Client applications, including HMI, SCADA, Historian, MES, ERP and countless custom applications. It is intended for use with SYSMAC C-Series devices.

#### Device Setup

#### Supported Devices

C20H C200H CQM1 Open

#### **Communication Protocol**

Omron Host Link

#### **Supported Communication Parameters**

Baud Rate: 9600 Parity: Even or Odd Data Bits: 7 or 8 Stop Bits: 1 or 2

#### **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. It may be invoked through the COM ID dialog in Channel Properties. For more information, refer to the OPC server's help documentation.

#### **Maximum Number of Channels and Devices**

The maximum number of channels supported by this driver is 100. The maximum number of supported devices is 32.

#### **Device IDs**

The Host Link protocol supports up to 32 devices. Each device has its own Unique ID (unit number). The valid range is 0 to 31.

#### **Flow Control**

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

**Note 1:** When using the manufacturer's supplied communications cable, it is sometimes necessary to choose a flow control setting of **RTS** or **RTS Always** in the Channel Properties.

**Note 2:** When running on platforms that do not enforce proper flow control, it may be necessary to set the flow control in the server's communications settings.

#### Cable Diagrams



#### **Old Style**



#### Modem Setup

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

## **Inter-Character Delay**

New Device - Intercharacte	r Delay	
	Specify the delay time the driver should use between each character it sends to the device. Normally this character delay should be set to 0. Some OMRON devices required a small delay when used over a modem.	
	Intercharacter Delay: 🚺 📩 milliseconds	
< <u>B</u> ack <u>N</u> ext > Cancel Help		

Description of the parameter is as follows:

• **Intercharacter Delay:** This parameter specifies the controlled delay between each character that the Omron Host Link Driver sends to an Omron device. The valid range is 0 to 200 milliseconds. The default setting is 0 milliseconds.

**Note 1:** It is generally recommended that this value be left at the default setting; however, users may need to adjust it for successful communications when using the driver over a modem. For a modem connection of 1200 baud, a typical setting would be 30 milliseconds.

**Note 2:** Although this delay is geared toward modem communications, each specific device may not need to use the Inter-Character Delay when communicating via modem. The delay introduced by this value will reduce the communication's speed.

# Data Types Description

Data Type	Description
Boolean	Single bit
Word	Unsigned 16 bit value
	DIE UIS LITE IOW DIE hit 15 is the high hit
Chart	Circled 1C bit volue
Short	Signed 16 bit value
	bit 0 is the low bit
	bit 14 is the high bit
	bit 15 is the sign bit
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 0-00000000 Behavior is undefined for values beyond
	this range
Long	Signed 32 hit value
DWord	Unsigned 32 bit value
Float	32 hit floating point value
Fluar	S2 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 reg-
	ister the low word.
Float Example	If register DM100 is specified as a float, bit 0 of register DM100
	would be bit 0 of the 32 bit float, and bit 15 of register DM101 would
	be bit 31 of the 32 bit float.
String	Null terminated ASCII string.
	Support includes string lengths up to 58 characters, and selection of
	HILO byte order, LoHi byte order, Only High byte, and Only Low byte.

## **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.

#### C20H Addressing C200H Addressing CQM1 Addressing Open Addressing

### C20H Addressing

The default data types are shown in **bold**. For more information, refer to **String Support** and **Array Support**.

Device Type	Range	Data Type	Access
Auxiliary Relay	AR00-AR27	Word, Short, BCD, Long,	Read/Write
		DWord, Float, LBCD	
	ARUU-ARZU		
	ARxx.00-ARxx.15	Boolean	
Auxiliary Relay as String	AR00.56H-AR27.02H	String	Read/Write
with HiLo Byte Order	Lis string length range 2 to 56		
	chars		
Auxiliary Relay as String	AR00.56L-AR27.02L	String	Read/Write
with LoHi Byte Order			
	.l is string length, range 2 to 56		
Auviliary Polay as String using		String	Road /W/rita
Only the High Order byte of	AR00.20D-AR27.01D	String	Redu/ White
each word	.l is string length, range 1 to 28		
	chars		
Auxiliary Relay as String using	AR00.28E-AR27.01E	String	Read/Write
each word	Lis string length range 1 to 28		
	chars		
Data Memory	DM0000-DM0999	Word, Short, BCD, Long,	Read/Write
		DWord, Float, LBCD	
	DM0000-DM0998	Booloon	
	DMxxxx.00-DMxxxx.15	Boolean	
	DM1000-DM1999	Word, Short, BCD, Long,	Read Only
		DWord, Float, LBCD	
	DMxxxx.00-DMxxxx.15	Boolean	
Data Memory as String	DM0000.58H-DM0999.02H	String	Read/Write
with HiLo Byte Order	Lie string length range 2 to 59		
	chars		
		String	Read Only
	DM1000.58H-DM1999.02H		
	Lis string length range 2 to 59		
	chars		
Data Memory as String	DM0000.58L-DM0999.02L	String	Read/Write
with LoHi Byte Order	.l is string length, range 2 to 58		
	chars		
	DM1000.58L-DM1999.02L		
		String	Read Only
	.l is string length, range 2 to 58		

	chars		
Data Memory as String using Only the High Order byte of	DM0000.29D-DM0999.01D	String	Read/Write
each word	.l is string length, range 1 to 29 chars	String	Dead Only
	DM1000.29D-DM1999.01D	String	Read Only
	.l is string length, range 1 to 29 chars		
Data Memory as String using	DM0000.29E-DM0999.01E	String	Read/Write
Only the Low Order byte of each word	.l is string length, range 1 to 29 chars		
	DM1000.29E-DM1999.01E	String	Read Only
	.l is string length, range 1 to 29 chars		
Holding Relay	HR00-HR99	<b>Word</b> , Short, BCD, Long, DWord, Float, LBCD	Read/Write
	HR00-HR98		
	HRxx.00-HRxx.15	Boolean	
Holding Relay as String with HiLo Byte Order	HR00.58H-HR99.02H	String	Read/Write
	.l is string length, range 2 to 58 chars		
Holding Relay as String with LoHi Byte Order	HR00.58L-HR99.02L	String	Read/Write
	I is string length, range 2 to 58 chars		
Holding Relay as String using Only the High Order byte of	HR00.29D-HR99.01D	String	Read/Write
each word	.l is string length, range 1 to 29 chars		
Holding Relay as String using Only the Low Order byte of	HR00.29E-HR99.01E	String	Read/Write
each word	.l is string length, range 1 to 29 chars		
Internal Relay	IR000-IR255	Word, Short, BCD, Long,	Read/Write
	IR000-IR254	DWord, Float, LBCD	
	IRXXX 00-IRXXX 15	Boolean	
Internal Relay as String with HiLo Byte Order	IR000.58H-IR255.02H	String	Read/Write
,	.l is string length, range 2 to 58 chars		
Internal Relay as String with LoHi Byte Order	IR000.58L-IR255.02L	String	Read/Write
	.l is string length, range 2 to 58 chars		
Internal Relay as String using Only the High Order byte of	IR000.29D-IR255.01D	String	Read/Write
each word	.l is string length, range 1 to 29 chars		
Internal Relay as String using Only the Low Order byte of	IR000.29E-IR255.01E	String	Read/Write
each word	.l is string length, range 1 to 29 chars		
Link Relays	LR00-LR63	<b>Word</b> , Short, BCD, Long, DWord, Float, LBCD	Read/Write
	LR00-LR62		

	LRxx.00-LRxx.15	Boolean	
Link Relays as String with HiLo Byte Order	LR00.58H-LR63.02H	String	Read/Write
	.l is string length, range 2 to 58 chars		
Link Relays as String with LoHi Byte Order	LR00.58L-LR63.02L	String	Read/Write
	.l is string length, range 2 to 58 chars		
Link Relays as String using Only the High Order byte of	LR00.29D-LR63.01D	String	Read/Write
each word	.l is string length, range 1 to 29 chars		
Link Relays as String using Only the Low Order byte of	LR00.29E-LR63.01E	String	Read/Write
each word	.l is string length, range 1 to 29 chars		
Timer/Counter	RC000-RC511	Word, Short, BCD	Read/Write
	RCxxx.00-RCxxx.15	Boolean	
Timer/Counter status	TC000-TC511	Boolean	Read/Write

#### **String Support**

The C20H model supports reading and writing auxiliary relay (AR), data memory (DM), holding relay (HR), internal relay (IR) and link relays (LR) as an ASCII string. When using any of these device types for string data, each register can contain either two bytes (two characters) of ASCII data or one. The order of the ASCII data within a given register, or the byte to use within a given register can be selected when the string is defined.

When using two bytes of ASCII data per register the length of the string can be from 2 to 58 characters (or 2 to 56 for AR) and is entered in place of a bit number. The length must be entered as an even number. The range of registers spanned by the string cannot exceed the range of the device type. The byte order is specified by appending either a "H" or "L" to the address.

When using one byte of ASCII data per register the length of the string can be from 1 to 29 characters (or 1 to 28 for AR) and is entered in place of a bit number. The range of registers spanned by the string cannot exceed the range of the device type. The byte to use within a register is specified by appending either a "D" or "E" to the address.

#### Examples

1. To address a string starting at DM100 with a length of 50 bytes and HiLo byte order, enter: DM100.50H

2. To address a string starting at DM110 with a length of 8 bytes and LoHi byte order, enter: DM110.08L  $\,$ 

3. To address a string starting at DM200 with a length of 15 bytes and Only the High Order byte, enter: DM200.15D

4. To address a string starting at DM220 with a length of 7 bytes and Only the Low Order byte, enter: DM220.07E

### Array Support

Arrays are supported for all data types except Boolean. There are two methods of addressing an array. Examples are given using data memory locations.

DMxxxx [rows] [cols] DMxxxx [cols]\*

\*This method assumes "rows" is equal to one.

Rows multiplied by cols multiplied by data size in bytes cannot exceed 116 bytes. This limit is imposed by the protocol. Since this driver uses an ASCII protocol, there are 4 bytes for each word, short and BCD, and 8 bytes for each DWord, long, LBCD and float. For example, a 4 X 7 array of words results in an array size of 28 words times 4 bytes for each word = 112 bytes, which would fit within the maximum request size of 116 bytes.

**Note:** Use caution when modifying 32 bit values (DWord, Long, LBCD, and Float). Each address that allows these data types will start at a word offset within the device. Therefore, DWords DM0 and DM1 overlap at word DM1. Writing to DM0 will also modify the value held in DM1. It is recommended that users utilize these data types so that overlapping does not occur. As an example, when using DWords, users may want to use DM0, DM2, DM4 and so on in order to prevent overlapping Words.

## C200H Addressing

The default data types are shown in **bold**. For more information, refer to **String Support** and **Array Support**.

Device Type	Range	Data Type	Access
Auxiliary Relay	AR000-AR999	Word, Short, BCD, Long,	Read/Write
	AR000-AR998	DWord, Float, LBCD	
	ARxxx.00-ARxxx.15	Boolean	
Auxiliary Relay as String	AR000.58H-AR999.02H	String	Read/Write
with Hilo Byte Order	l is string length, range 2 to 58		
	chars		
Auxiliary Relay as String	AR000.58L-AR999.02L	String	Read/Write
with LoHi Byte Order	Lic string longth range 2 to 58		
	chars		
Auxiliary Relay as String using	AR000.29D-AR999.01D	String	Read/Write
Only the High Order byte of			
each word	. I is string length, range 1 to 29		
Auxiliary Relay as String using	AR000.29E-AR999.01E	String	Read/Write
Only the Low Order byte of		-	
each word	.l is string length, range 1 to 29		
Data Memory		Word Short BCD Long	Read/Write
		DWord, Float, LBCD	
	DM0000-DM9998		
	DMXXXX 00-DMXXXX 15	Boolean	
Data Memory as String	DM0000.58H-DM0999.02H	String	Read/Write
with HiLo byte order		-	
	.l is string length, range 2 to 58		
Data Memory as String		String	Read/Write
with LoHi Byte Order			
	.l is string length, range 2 to 58		
Data Momory as String using		String	Pood /W/rito
Only the High Order byte of		String	Redu/ Write
each word	l is string length, range 1 to 29		
	chars		
Only the Low Order byte of	DM0000.29E-DM0999.01E	String	Read/ Write
each word	.l is string length, range 1 to 29		
	chars		
Holding Relay	HKU00-HK999	Word, Short, BCD, Long, DWord, Float, LBCD	Read/Write
	HR000-HR998		
		Deslara	
Holding Rolay as String with	HRXXX.UU-HKXXX.15	String	Read/Write
HiLo byte order	11000.301-110333.0211	String	Ready write
	.l is string length, range 2 to 58		
Helding Delevers Chile H	chars	Chulm a	
LoHi Byte Order	11K000.30L-HK999.02L	String	Redu/ Write

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	.l is string length, range 2 to 58 chars		
Holding Relay as String using Only the High Order byte of each	HR000.29D-HR999.01D	String	Read/Write
word	.l is string length, range 1 to 29 chars		
Holding Relay as String using Only the Low Order byte of	HR000.29E-HR999.01E	String	Read/Write
each word	.l is string length, range 1 to 29 chars		
Internal Relay	IR000-IR999	Word, Short, BCD, Long, DWord, Float, LBCD	Read/Write
	IR000-IR998		
	IRxxx.00-IRxxx.15	Boolean	
Internal Relay as String with HiLo byte order	IR000.58H-IR999.02H	String	Read/Write
	.l is string length, range 2 to 58 chars		
Internal Relay as String with LoHi Byte Order	IR000.58L-IR999.02L	String	Read/Write
	.l is string length, range 2 to 58 chars		
Internal Relay as String using Only the High Order byte of each	IR000.29D-IR999.01D	String	Read/Write
word	.l is string length, range 1 to 29 chars		
Internal Relay as String using Only the Low Order byte of	IR000.29E-IR999.01E	String	Read/Write
each word	.l is string length, range 1 to 29 chars		
Link Relays	LR000-LR999	Word, Short, BCD, Long,	Read/Write
	LR000-LR998		
	LRxxx.00-LRxxx.15	Boolean	
Link Relays as String with HiLo Byte Order	LR000.58H-LR999.02H	String	Read/Write
	.l is string length, range 2 to 58 chars		
Link Relays as String with LoHi byte order	LR000.58L-LR999.02L	String	Read/Write
	.l is string length, range 2 to 58 chars		
Link Relays as String using Only the High Order byte of	LR000.29D-LR999.01D	String	Read/Write
each word	.l is string length, range 1 to 29 chars		
Link Relays as String using Only the Low Order byte of	LR000.29E-LR999.01E	String	Read/Write
each word	.l is string length, range 1 to 29 chars		
Timer/Counter	RC000-RC999	Word, Short, <b>BCD</b>	Read/Write
	RCxxx.00-RCxxx.15	Boolean	
Timer/Counter status	TC000-TC999	Boolean	Read/Write

#### String Support

The C200H model supports reading and writing auxiliary relay (AR), data memory (DM), holding relay (HR), internal relay (IR) and link relays (LR) as an ASCII string. When using any of these device types for string data, each register can contain either two bytes (two characters) of ASCII data or one. The order of the ASCII data within a given register, or the byte to use within a given register can be selected when the string is defined.

When using two bytes of ASCII data per register the length of the string can be from 2 to 58 characters and is entered in place of a bit number. The length must be entered as an even number. The range of registers spanned by the string cannot exceed the range of the device type. The byte order is specified by appending either a "H" or "L" to the address.

When using one byte of ASCII data per register the length of the string can be from 1 to 29 characters and is entered in place of a bit number. The range of registers spanned by the string cannot exceed the range of the device type. The byte to use within a register is specified by appending either a "D" or "E" to the address.

#### Examples

1. To address a string starting at DM100 with a length of 50 bytes and HiLo byte order, enter: DM100.50H

2. To address a string starting at DM110 with a length of 8 bytes and LoHi byte order, enter: DM110.08L  $\,$ 

3. To address a string starting at DM200 with a length of 15 bytes and Only the High Order byte, enter: DM200.15D

4. To address a string starting at DM220 with a length of 7 bytes and Only the Low Order byte, enter: DM220.07E

#### Array Support

Arrays are supported for all data types except Boolean. There are two methods of addressing an array. Examples are given using data memory locations.

DMxxxx [rows] [cols] DMxxxx [cols]\*

\*This method assumes "rows" is equal to one.

Rows multiplied by cols multiplied by data size in bytes cannot exceed 116 bytes. This limit is imposed by the protocol. Since this driver uses an ASCII protocol, there are 4 bytes for each word, short and BCD, and 8 bytes for each DWord, long, LBCD and float. For example, a 4 X 7 array of words results in an array size of 28 words times 4 bytes for each word = 112 bytes, which would fit within the maximum request size of 116 bytes.

**Note:** Use caution when modifying 32 bit values (DWord, Long, LBCD, and Float). Each address that allows these data types will start at a word offset within the device. Therefore, DWords DM0 and DM1 overlap at word DM1. Writing to DM0 will also modify the value held in DM1. It is recommended that users utilize these data types so that overlapping does not occur. When using DWords, for example, users may want to use DM0, DM2, DM4 and so on in order to prevent overlapping Words.

#### **CQM1** Addressing

The default data types are shown in **bold**. For more information, refer to String Support and Array Support.

Device Type	Range	Data Type	Access
Auxiliary Relay	AR00-AR27	<b>Word</b> , Short, BCD, Long, DWord, Float, LBCD	Read/Write
	AR00-AR26		
	ARxx.00-ARxx.15	Boolean	
Auxiliary Relay as String with HiLo Byte Order	AR00.56H-AR27.02H	String	Read/Write
	.l is string length, range 2 to 56		
	chars		
Auxiliary Relay as String with	AR00.56L-AR27.02L	String	Read/Write
LoHi Byte Order	.l is string length, range 2 to 56		
	chars		
Auxiliary Relay as String using	AR00.28D-AR27.01D	String	Read/Write
Only the High Order			
byte of each word	.l is string length, range 1 to 28 chars		
Auxiliary Relay as String using	AR00.28E-AR27.01E	String	Read/Write

Only the Low Order byte of each word	.l is string length, range 1 to 28 chars		
Data Memory	DM0000-DM6655 DM0000-DM6654	<b>Word</b> , Short, BCD, Long, DWord, Float, LBCD	Read/Write
	DMxxxx.00-DMxxxx.15	Boolean	
Data Memory as String with HiLo Byte Order	DM0000.58H-DM6655.02H .l is string length, range 2 to 58 chars	String	Read/Write
Data Memory as String with LoHi Byte Order	DM0000.58L-DM6655.02L .l is string length, range 2 to 58 chars	String	Read/Write
Data Memory as String using Only the High Order byte of each word	DM0000.29D-DM6655.01D .l is string length, range 1 to 29 chars	String	Read/Write
Data Memory as String using Only the Low Order byte of each word	DM0000.29E-DM6655.01E .l is string length, range 1 to 29 chars	String	Read/Write
Holding Relay	HR00-HR99 HR00-HR98	Word, Short, BCD, Long, DWord, Float, LBCD	Read/Write
Holding Relay as String with HiLo Byte Order	HR00.58H-HR99.02H .l is string length, range 2 to 58 chars	String	Read/Write
Holding Relay as String with LoHi Byte Order	HR00.58L-HR99.02L .l is string length, range 2 to 58 chars	String	Read/Write
Holding Relay as String using Only the High Order byte of each word	HR00.29D-HR99.01D .l is string length, range 1 to 29 chars	String	Read/Write
Holding Relay as String using Only the Low Order byte of each word	HR00.29E-HR99.01E .l is string length, range 1 to 29 chars	String	Read/Write
Internal Relay	IR000-IR255 IR000-IR254 IRxxx.00-IRxxx.15	<b>Word</b> , Short, BCD, Long, DWord, Float, LBCD Boolean	Read/Write
Internal Relay as String with HiLo Byte Order	IR000.58H-IR255.02H .l is string length, range 2 to 58 chars	String	Read/Write
Internal Relay as String with LoHi Byte Order	IR000.58L-IR255.02L .l is string length, range 2 to 58 chars	String	Read/Write
Internal Relay as String using Only the High Order byte of each word	IR000.29D-IR255.01D .l is string length, range 1 to 29 chars	String	Read/Write

Internal Relay as String using Only the Low Order byte of each word	IR000.29E-IR255.01E .l is string length, range 1 to 29 chars	String	Read/Write
Link Relays	LR00-LR63 LR00-LR62 LRxx.00-LRxx.15	<b>Word</b> , Short, BCD, Long, DWord, Float, LBCD Boolean	Read/Write
Link Relays as String with HiLo Byte Order	LR00.58H-LR63.02H .l is string length, range 2 to 58 chars	String	Read/Write
Link Relays as String with LoHi Byte Order	LR00.58L-LR63.02L .l is string length, range 2 to 58 chars	String	Read/Write
Link Relays as String using Only the High Order byte of each word	LR00.29D-LR63.01D .l is string length, range 1 to 29 chars	String	Read/Write
Link Relays as String using Only the Low Order byte of each word	LR00.29E-LR63.01E .l is string length, range 1 to 29 chars	String	Read/Write
Timer/Counter	RC000-RC511 RCxxx.00-RCxxx.15	Word, Short, <b>BCD</b> Boolean	Read/Write
Timer/Counter status	TC000-TC511	Boolean	Read/Write

#### String Support

The CQM1 model supports reading and writing auxiliary relay (AR), data memory (DM), holding relay (HR), internal relay (IR) and link relays (LR) as an ASCII string. When using any of these device types for string data, each register can contain either two bytes (two characters) of ASCII data or one. The order of the ASCII data within a given register, or the byte to use within a given register can be selected when the string is defined.

When using two bytes of ASCII data per register the length of the string can be from 2 to 58 characters (or 2 to 56 for AR) and is entered in place of a bit number. The length must be entered as an even number. The range of registers spanned by the string cannot exceed the range of the device type. The byte order is specified by appending either a "H" or "L" to the address.

When using one byte of ASCII data per register the length of the string can be from 1 to 29 characters (or 1 to 28 for AR) and is entered in place of a bit number. The range of registers spanned by the string cannot exceed the range of the device type. The byte to use within a register is specified by appending either a "D" or "E" to the address.

#### Examples

1. To address a string starting at DM100 with a length of 50 bytes and HiLo byte order, enter:  $\mathsf{DM100.50H}$ 

2. To address a string starting at DM110 with a length of 8 bytes and LoHi byte order, enter: DM110.08L

3. To address a string starting at DM200 with a length of 15 bytes and Only the High Order byte, enter: DM200.15D

4. To address a string starting at DM220 with a length of 7 bytes and Only the Low Order byte, enter: DM220.07E

#### Array Support

Arrays are supported for all data types except Boolean. There are two methods of addressing an array. Examples are given using data memory locations.

DMxxxx [rows] [cols] DMxxxx [cols]\* \*This method assumes "rows" is equal to one.

Rows multiplied by cols multiplied by data size in bytes cannot exceed 116 bytes. This limit is imposed by the protocol. Since this driver uses an ASCII protocol, there are 4 bytes for each word, short and BCD, and 8 bytes for each DWord, long, LBCD and float. For example, a 4 X 7 array of words results in an array size of 28 words times 4 bytes for each word = 112 bytes, which would fit within the maximum request size of 116 bytes.

**Note:** Use caution when modifying 32 bit values (DWord, Long, LBCD, and Float). Each address that allows these data types will start at a word offset within the device. Therefore, DWords DM0 and DM1 overlap at word DM1. Writing to DM0 will also modify the value held in DM1. It is recommended that users utilize these data types so that overlapping does not occur. When using DWords, for example, users may want to use DM0, DM2, DM4 and so on in order to prevent overlapping Words.

#### **Open Addressing**

The following memory map is open for all memory types to support newer devices. Consult the manufacturer's documentation for device specific address ranges. The default data types are shown in **bold**. For more information, refer to **String Support** and **Array Support**.

Device Type	Range	Data Type	Access
Auxiliary Relay	AR0000-AR9999	Word, Short, BCD, Long, DWord, Float, LBCD	Read/Write
	AR0000-AR9998	2	
	ARxxxx.00-ARxxxx.15	Boolean	
Auxiliary Relay as String	AR0000.58H-AR9999.02H	String	Read/Write
WITH HEO BYLE OF DEF	.l is string length, range 2 to 58		
	chars		
Auxiliary Relay as String	AR0000.58L-AR9999.02L	String	Read/Write
with Lorn Byte of dei	.l is string length, range 2 to 58		
	chars		
Auxiliary Relay as String using	AR0000.29D-AR9999.01D	String	Read/Write
each word	.l is string length, range 1 to 29		
	chars		
Auxiliary Relay as String using Only the Low Order byte of	AR0000.29E-AR9999.01E	String	Read/Write
each word	.l is string length, range 1 to 29		
	chars		
Data Memory	DM0000-DM9999	Word, Short, BCD, Long,	Read/Write
	DM0000-DM9998		
	DMxxxx.00-DMxxxx.15	Boolean	
Data Memory as String	DM0000.58H-DM9999.02H	String	Read/Write
WITH HILD BYLE OF DE	.l is string length, range 2 to 58		
	chars		
Data Memory as String with LoHi Byte Order	DM0000.58L-DM99999.02L	String	Read/Write
	.l is string length, range 2 to 58 chars		
Data Memory as String using	DM0000.29D-DM9999.01D	String	Read/Write
Only the High Order byte of each word	Lis string length, range 1 to 29		
	chars		
Data Memory as String using	DM0000.29E-DM9999.01E	String	Read/Write
each word	. I is string length, range 1 to 29		
	chars		
Holding Relay	HR0000-HR9999	Word, Short, BCD, Long,	Read/Write

HR0000-HR9998 Boolean   HR0000-JR9002.15 Boolean   HR0000-SBI-HR9990.02H String Read/Write   J1 is string length, range 2 to 58 chars String Read/Write   Holding Relay as String using with LoHi Byte Order J1 is string length, range 2 to 58 chars String Read/Write   Holding Relay as String using Only the High Order byte of each word HR0000.29D-HR9990.01D String Read/Write   Holding Relay as String using Only the High Order byte of each word HR0000.29E-HR9999.01E String Read/Write   Holding Relay as String using Only the Low Order byte of each word HR0000.29E-HR9999.01E String Read/Write   J1 is string length, range 1 to 29 chars HR0000-HR9998 Word, Short, BCD, Long, DWord, Float, LBCD Read/Write   Internal Relay IR0000-SBH-IR9999.02H Word, Short, BCD, Long, DWord, Float, LBCD Read/Write   Internal Relay as String with HLD Byte Order J1 is string length, range 2 to 58 chars String Read/Write   J1 is string length, range 2 to 58 chars J1 is string length, range 1 to 29 chars String Read/Write   J1 is string length, range 1 to 29 chars J1 is string length, range 1 to 29 chars String Read/Write   J1 is string length, range 1 to 29 chars J1 is string length, range 1 to 29 chars String Read/Write			DWord, Float, LBCD	
HR0000.15BooleanHolding Relay as String with HL0 Byte OrderHR0000.58H-HR9999.02H .1 is string length, range 2 to 58 .1 is string length, range 1 to 29 .1 is string length, range 2 to 58 .1 is string length, range 1 to 29 .1 is string length, range 2 to 58 .1 is string length, range 2 to 5		HR0000-HR9998		
Indiding Relay as String with HiLo Byte Order   InB000.581-HR999.02H .1 is string length, range 2 to 58 chars   String   Read/Write     Holding Relay as String with LoHi Byte Order   InB000.581-HR999.02L .1 is string length, range 2 to 58 chars   String   Read/Write     Holding Relay as String using Only the High Order byte of each word   InB string length, range 1 to 29 chars   String   Read/Write     Holding Relay as String using Only the Low Order byte of each word   InB string length, range 1 to 29 chars   String   Read/Write     Holding Relay as String using Only the Low Order byte of each word   InB string length, range 1 to 29 chars   String   Read/Write     Internal Relay with HiLo Byte Order   IR0000.789-HR9999.02H .1 is string length, range 2 to 58 chars   Word, Short, BCD, Long, DWord, Float, LBCD   Read/Write     Internal Relay as String with LoHi Byte Order   IR0000.780-HR9999.02H .1 is string length, range 2 to 58 chars   String   Read/Write     Internal Relay as String using Only the Low Order byte of each word   In string length, range 1 to 29 chars   String   Read/Write     Is string length, range 1 to 29 chars   I.1 is string length, range 1 to 29 chars   String   Read/Write     Unit Relays as String with HiLo Byte Order   I.8 string length, range 2 to 58 chars   Boolean   Read/Write <t< td=""><td></td><td></td><td>Declear</td><td></td></t<>			Declear	
Induity Reary & Suffing   Induotor, Safe Tringspace, 11   String   Read/Write     Indiang Relay, as String   It is string length, range 2 to 58   String   Read/Write     Holding Relay, as String unit   It is string length, range 2 to 58   String   Read/Write     Holding Relay, as String using Only the High Order byte of each word   It is string length, range 1 to 29   String   Read/Write     Holding Relay, as String using Only the Lot Roder byte of each word   It is string length, range 1 to 29   String   Read/Write     Internal Relay   IR0000-SBH-IR9999.01D   Jt is string length, range 1 to 29   DWord, Short, BCD, Long, DWord, Float, LBCD   Read/Write     Internal Relay   IR0000-SBH-IR9999   String   Read/Write     Internal Relay as String using Only the Low Dorder   IR0000-SBH-IR9999.02H   String   Read/Write     Internal Relay as String using Only the High Order byte of each word   It is string length, range 2 to 58   String   Read/Write     Internal Relay as String using Only the High Order byte of each word   It is string length, range 1 to 29   String   Read/Write     It is string length, range 1 to 29   It is string length, range 2 to 58   String   Read/Write     It is string length, range 2 to 58   Char	Holding Bolov as String		String	Dood /Write
	with HiLo Byte Order	1160000.3611-1169999.0211		Redu/ White
charscharsHR0000.58L-HR9990.02L with LoHi Byte OrderHR0000.58L-HR9990.02L i is string length, range 2 to 58 charsStringRead/WriteHolding Relay as String using Only the Low Order byte of each wordHR0000.29D-HR9990.01D . I is string length, range 1 to 29 charsStringRead/WriteHolding Relay as String using Only the Low Order byte of each wordHR0000.29E-HR9999.01E . I is string length, range 1 to 29 charsStringRead/WriteHolding Relay as String using Only the Low Order byte of each wordHR0000.29E-HR9999.01E . I is string length, range 1 to 29 charsWord, Short, BCD, Long, DWord, Float, LBCDRead/WriteInternal RelayIR0000.5RH-IR9999.02H . Is string length, range 2 to 58 charsBooleanRead/WriteInternal Relay as String using Only the Low Order wordIR0000.58L-IR9999.02H . I is string length, range 2 to 58 charsStringRead/WriteInternal Relay as String using Only the Low Order byte of each wordIR0000.29D-IR9999.01D . I is string length, range 1 to 29 charsStringRead/WriteInternal Relay as String using Only the Low Order byte of each wordIR0000.29E-IR9999.01E . I is string length, range 1 to 29 charsStringRead/WriteInternal Relay as String using Only the Low Order byte of each wordIR0000.29E-IR9999.02H . I is string length, range 1 to 29 charsStringRead/WriteInternal Relay as String using Only the Low Order byte of each wordIR0000.58L-IR9999.02H . I is string length, range 1 to 29StringRead/Write <td< td=""><td></td><td>.l is string length, range 2 to 58</td><td></td><td></td></td<>		.l is string length, range 2 to 58		
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with Lotil Byte Order   . I is string length, range 2 to 58 chars   String   Read/Write     Only the High Order byte of each word   . I is string length, range 1 to 29 chars   String   Read/Write     Only the Low Order byte of each word   . I is string length, range 1 to 29 chars   String   Read/Write     Internal Relay as String using   IR0000.29E-HR9999.01E   String   Read/Write     Internal Relay as String using   IR0000.1R9998   Boolean   Read/Write     Internal Relay as String using   IR0000.58H-IR9999.02H   String   Read/Write     Internal Relay as String using   IR0000.58H-IR9999.02L   String   Read/Write     . I is string length, range 2 to 58 chars   String   Read/Write     Internal Relay as String using Only the Low Order byte of each word   IR0000.29E-IR9999.01D   String   Read/Write     . I is string length, range 1 to 29 chars   IR0000.29E-IR9999.01D   String   Read/Write     Internal Relay as String using Only the Low Order byte of each word   IR0000.29E-IR9999.01D   String   Read/Write     . Lis string length, range 1 to 29 chars   I k String length, range 1 to 29 chars   String   Read/Write     . Link Relays as String using Only the Low Order byte of each word	Holding Relay as String	HR0000.58L-HR9999.02L	String	Read/Write
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Only the High Order byte of each word   .1 is string length, range 1 to 29 chars   String   Read/Write     Holding Relay as String using Only the Low Order byte of each word   .1 is string length, range 1 to 29 chars   String   Read/Write     Internal Relay   IR0000-IR9999   Word, Short, BCD, Long, DWord, Float, LBCD   Read/Write     Internal Relay as String with HILD Byte Order   IR0000-IR9999.02H   String   Read/Write     Internal Relay as String with HILD Byte Order   IIs string length, range 2 to 58 chars   String   Read/Write     Internal Relay as String with Low Order byte of each word   IIs string length, range 2 to 58 chars   String   Read/Write     Internal Relay as String using Only the Low Order byte of each word   IIs string length, range 1 to 29 chars   String   Read/Write     Internal Relay as String using Only the Low Order byte of each word   IIs string length, range 1 to 29 chars   String   Read/Write     Internal Relay as String using Only the Low Order byte of each word   IIs string length, range 1 to 29 chars   String   Read/Write     Internal Relays as String with HILD Byte Order   IIs string length, range 1 to 29 chars   String   Read/Write     Internal Relays as String with HILD Byte Order   IIs string length, range 2 to 58 chars   String   Re	Holding Relay as String using	HR0000.29D-HR9999.01D	String	Read/Write
each word	Only the High Order byte of		_	
Indiding Relay as String using Only the Low Order byte of each word   If B0000.29E-HR9999.01E .1 is string length, range 1 to 29 chars   String   Read/Write     Internal Relay   IR0000-IR9999   Word, Short, BCD, Long, DWord, Float, LBCD   Read/Write     Internal Relay   IR0000.58H-IR999.02H   Word, Float, LBCD   Read/Write     Internal Relay as String with HiLo Byte Order   IR0000.58H-IR999.02H   String   Read/Write     Internal Relay as String using Only the High Order byte of each word   IR0000.59D-IR9999.02L   String   Read/Write     Internal Relay as String using Only the High Order byte of each word   IR0000.29D-IR9999.01D   String   Read/Write     Internal Relay as String using Only the High Order byte of each word   IR0000.29E-IR9999.01E   String   Read/Write     Internal Relay as String using Only the Low Order byte of each word   Is string length, range 1 to 29 chars   String   Read/Write     Link Relays   LR0000-LR9999   Word, Short, BCD, Long, DWord, Float, LBCD   Read/Write     Link Relays as String with HiLo Byte Order   Is string length, range 2 to 58 chars   String   Read/Write     Link Relays as String with LoHi Byte Order   Is string length, range 2 to 58 chars   String   Read/Write     Link Relays as String with LoHi B	each word	.l is string length, range 1 to 29		
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	RCxxxx.00-RCxxxx.15	Boolean	
Timer/Counter Status*	ТС0000-ТС9999	Boolean	Read/Write

\***Note:** Some models do not support writes to Timer/Counter status (TCxxxx).

#### String Support

The Open model supports reading and writing auxiliary relay (AR), data memory (DM), holding relay (HR), internal relay (IR) and link relays (LR) as an ASCII string. When using any of these device types for string data, each register can contain either two bytes (two characters) of ASCII data or one. The order of the ASCII data within a given register, or the byte to use within a given register can be selected when the string is defined.

When using two bytes of ASCII data per register the length of the string can be from 2 to 58 characters and is entered in place of a bit number. The length must be entered as an even number. The range of registers spanned by the string cannot exceed the range of the device type. The byte order is specified by appending either a "H" or "L" to the address.

When using one byte of ASCII data per register the length of the string can be from 1 to 29 characters and is entered in place of a bit number. The range of registers spanned by the string cannot exceed the range of the device type. The byte to use within a register is specified by appending either a "D" or "E" to the address.

#### Examples

1. To address a string starting at DM100 with a length of 50 bytes and HiLo byte order, enter:  $\rm DM100.50H$ 

2. To address a string starting at DM110 with a length of 8 bytes and LoHi byte order, enter: DM110.08L  $\,$ 

3. To address a string starting at DM200 with a length of 15 bytes and Only the High Order byte, s enter:  $\rm DM200.15D$ 

4. To address a string starting at DM220 with a length of 7 bytes and Only the Low Order byte, enter: DM220.07E

#### Array Support

Arrays are supported for all data types except Boolean. There are two methods of addressing an array. Examples are given using data memory locations.

DMxxxx [rows] [cols] DMxxxx [cols]\*

\*This method assumes "rows" is equal to one.

Rows multiplied by cols multiplied by data size in bytes cannot exceed 116 bytes. This limit is imposed by the protocol. Since this driver uses an ASCII protocol, there are 4 bytes for each word, short and BCD, and 8 bytes for each DWord, long, LBCD and float. For example, a 4 X 7 array of words results in an array size of 28 words times 4 bytes for each word = 112 bytes, which would fit within the maximum request size of 116 bytes.

**Note:** Use caution when modifying 32 bit values (DWord, Long, LBCD, and Float). Each address that allows these data types will start at a word offset within the device. Therefore, DWords DM0 and DM1 overlap at word DM1. Writing to DM0 will also modify the value held in DM1. It is recommended that users utilize these data types so that overlapping does not occur. When using DWords, for example, users may want to use DM0, DM2, DM4 and so on in order to prevent overlapping Words.

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## **Error Descriptions**

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

#### Address Validation

Address '<address>' is out of range for the specified device or register Data Type '<type>' is not valid for device address '<address>' Device address '<address>' contains a syntax error Device address '<address>' is not supported by model '<model name>' Device address '<address>' is Read Only Missing address

#### Serial Communications

Communications error on '<channel name>' [<error mask>] COMn does not exist COMn is in use by another application Error opening COMn Unable to set comm parameters on COMn

#### **Device Status Messages**

Bad address in block [<start address> to <end address>], tag '<tag name>' on device '<device name>' Device '<device name>' is not responding Unable to write to '<address>' on device '<device name>'

#### Address Validation

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

#### Address Validation

Address '<address>' is out of range for the specified device or register Data Type '<type>' is not valid for device address '<address>' Device address '<address>' contains a syntax error Device address '<address>' is not supported by model '<model name>' Device address '<address>' is Read Only Missing address

## 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 that the address is correct; if it is not, re-enter it in the client application.

## 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>' 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.

#### 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:

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

2. Verify that the selected model name for the device is correct.

#### 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.

#### 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.

#### **Serial Communications**

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

#### Serial Communications

Communications error on '<channel name>' [<error mask>] COMn does not exist COMn is in use by another application Error opening COMn Unable to set comm parameters on COMn

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

Error Type: Serious

#### **Error Mask Definitions:**

- **B** = Hardware break detected.
- **F** = Framing error.
- $\mathbf{E} = I/O \text{ error}.$
- **O** = Character buffer overrun.
- **R** = RX buffer overrun.

 $\mathbf{P}$  = Received byte parity error.

 $\mathbf{T} = \mathsf{TX}$  buffer full.

#### Possible Cause:

- 1. The serial connection between the device and the Host PC is bad.
- 2. The communications parameters for the serial connection are incorrect.

#### Solution:

- 1. Verify the cabling between the PC and the PLC device.
- 2. Verify that the specified communications parameters match those of the device.

#### 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.

#### 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.

#### Error opening COMn

# Error Type:

Fatal

#### Possible Cause:

The specified COM port could not be opened due to 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.

#### Unable to set comm parameters on COMn

## Error Type:

Fatal

#### Possible Cause:

The serial parameters for the specified COM port are not valid.

#### Solution:

Verify the serial parameters and make any necessary changes.

#### **Device Status Messages**

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

#### Device Status Messages

Bad address in block [<start address> to <end address>] on device '<device name> Device '<device name>' is not responding Unable to write to '<address>' on device '<device name>'

# Bad address in block [<start address> to <end address>], tag '<tag name>' 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. Eliminate ones that reference invalid locations.

#### Device '<device name>' is not responding

**Error Type:** 

Serious

#### **Possible Cause:**

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

- 2. The communications parameters for the serial connection are incorrect.
- 3. The named device may have been assigned an incorrect Network ID.

4. 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 that the specified communications parameters match those of the device.
- 3. Verify that the Network ID given to the named device matches that of the actual device.

4. 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 parameters 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 that the specified communications parameters match those of the device.
- 3. Verify that the Network ID given to the named device matches that of the actual device.

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Unable to set comm parameters on COMn	21
Unable to write tag ' <address>' on device '<device name="">'</device></address>	22

# W

Vord
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