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Toshiba Ethernet Driver

Help version 1.020

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Overview

The Toshiba Ethernet Driver provides an easy and reliable way to connect Toshiba Ethernet devices to OPC Client applications, including HMI, SCADA, Historian, MES, ERP and countless custom applications.

Users should understand the data types and the addressing scheme before using the Toshiba Ethernet Driver in an OPC server software project. For more information, refer to **Data Types Description** and **Address Descriptions**.

Device Setup

Supported Devices

T2, T3, S2 and S3 PLCs with Ethernet option.

Communications Protocol

Toshiba ASCII Computer Link

Note: This driver requires Winsock V1.1 or higher.

Connection Timeout

This property specifies the time that the driver will wait for a connection to be made with a device. Depending on network load, the connect time may vary with each connection attempt. The default setting is 3 seconds. The valid range is 1 to 30 seconds.

Request Timeout

This property specifies the time that the driver will wait on a response from the device before giving up and going on to the next request. Longer timeouts only affect performance if a device is not responding. The default setting is 1000 milliseconds. The valid range is 50 to 9999999 milliseconds.

Retry Attempts

This property specifies the number of times the driver will retry a message before giving up and going on to the next message. The default setting is 3 retries. The valid range is 1 to 10.

Device ID

This property specifies the device's IP address.

Hardware Configuration

The hardware must be configured before Ethernet communications is possible. For more information about a specific hardware series, refer to the links below.

S Series Setup

T2 and T3 Setup

S Series Setup

To make a connection to the EN731 BNC, users must have two 50 ohm connectors: one on each end of the cable T connectors. Both ends require a T connector with the 50 ohm terminator.

Connecting to a V Series Using the Engineering Tool 2

A ladder is not required for the V series devices to communicate. For more information, refer to the instructions below.

1. To start, right-click on the **System** folder and select **New**. Name the new project and then doubleclick the newly created project icon. This will create a tree with the topics **Libraries**, **Networks**, **and Stations** in the lower left quadrant of the display.



2. Right-click on **Stations** and then select **New**. Select the model as desired.

Note: For the S3 CPUs, choose model 3000.

Add Station		×
Station <u>N</u> ame:	Station1	<u>0</u> K
Station C <u>a</u> tcode:	model 3000	<u>C</u> ancel

- 3. Right-click on **Units** and then select **New**. In this dialog, choose the main board, backplane and model number (such as BU748). This will create a **Modules** subfolder.
- 4. Next, right-click on **Modules** and select **New**.
- 5. Select the slot number and CPU model and then click **OK**.

Add Module		×
Slot <u>N</u> o.:	0	<u>▼</u> <u>Ω</u> K
Module C <u>a</u> tcode:	CN614	▼ <u>C</u> ancel
	CN614 FL654	G2 RI/O for Optical transmission FL-net G2 Remote I/O station
	L2PU11_X	L2-type1 with 1 SI/O bus (only slot 0) L2-type2 with 3 SI/O buses (only slot 0)
Co <u>m</u> ment:	L2PU22_X	L2 type2 with 3 SI/O bus (DS type) (only C2 Repeate 1/O Centroller
	S2PU22_X	S2-type1 32Kstep with no system bus (or
	S2PU32_X S2PU72_X	S2-type4 64Kstep with no system bus (or S2-type2 64Kstep (Only slot 0)
	S2PU72D_X	S2-type5 64Kstep Duplex Type (only slot

6. Select the Ethernet model and then click **OK**.

Add Module		×
Slot <u>N</u> o.:	2	<u>–</u> <u></u> <u></u> <u></u> <u></u> <u></u> <u></u> <u></u> <u></u>
Module C <u>a</u> tcode:	AN712	✓ <u>C</u> ancel
	C3PU62 C3PU63	C3 NT(English) 64MB, Hard Disk 4.8GB, C3 NT(English) 128MB Hard Disk 4.8GB
	CN711	TC-net 10 LAN card for coxial (Single)
Co <u>m</u> ment:	EN712 EN711	Ethernet LAN card 10BASE5 (Single)
	EN721	Ethernet LAN card 10BASE5 [Double] Ethernet LAN card 10BASE2 (Single)
	EN741 EN751	Ethernet LAN card 10BASE2 (Double) Fast Ethernet LAN card (Single)

- 7. Next, right-click on the CPU module and then click **Module Parameters** | **Tool and Module**. Scroll through the parameters until "Computer Link1 Ethernet Slot" and "...UDP PortNo" are located.
- 8. Enter the Ethernet module's slot number and the desired port number. Then, enter the slot number and port number in both the Tool column and the Module column.

Note: Not all screens will appear as the image shown below.

9. Ensure the device is set to **Halt Mode** by turning the key, and then click **Write** from the module and parameters window. A write successful message will appear upon completion. Close the window.

Module parameters {New Station}-{0):S3PU55}		×
Module <u>n</u> ame: 00:S3PU55 S3-type1 112kstep 128kW Parameter Data			/iew C <u>T</u> ool C <u>M</u> odule Tool <u>a</u> nd Module
Item	Tool	Module	
Nonl/Oless card 2 Slot no.	0		-
Nonl/Oless card 3 Bus no.	0		
Nonl/Oless card 3 Unit no.	0		
Noni/Oless card 3 Slot no.	0		
Noni/Oless card 4 Bus no.	0		
Nonl/Oless card 4 Unit no.	0		
Noni/Oless card 4 Slot no.	0		
Log as Setting Clock by Program	Yes		
Computer Link1 Ethernet SlotNo	1		
Computer Link1 UDP PortNo	2000		
Computer Link 2Ethernet SlotNo	0		
Computer Link 2UDP PortNo	0		
Computer Link 3 Ethernet SlotNo	0		
Computer L.nk 3 UDP PortNo	0		Befresh
Computer Link4 Ethernet SlotNo	0		

- 10. Right-click on the Ethernet module and then select **Module Parameters.**
- 11. Next, click **Tool and Module.** In the Tool column, enter the desired IP and subnet mask. Leave the **IP Address Type** set to Class B.

Iodule parameters {New Station}-{01:EN761}				
Module <u>n</u> ame: 01:EN761 Fast Ethernet LAN card (Double)		. partner Primary Secondary	View C <u>T</u> ool C <u>M</u> odule © Tool <u>a</u> nd Module	
Item	Tool	Module		
IP address type	Class B			
Primary IP address	192.168.1.10			
Primary subnet mask	255.255.255.0			
Secondary IP address	0.0.0.0			
Secondary subnet mask	0.0.0.0			
Total number of multicast	0			

12. Click **Download** in order to write the information to the module. Then, close the window.

13. Click the **Network** folder from the tree and then select **New**. For a 3000 series project using an EN model Ethernet, select "EtherLAN" for the network. This will create a Module subfolder.

🖕 V series Engineeri	ing Tool 2 - {C\D	ocuments and Setti	ngs\Administr	ator\My Documents]
<u>F</u> ile <u>E</u> dit ⊻iew <u>T</u> ool	<u>H</u> elp			
New Project\Network	(\$			
🚞 System		Name	Kind	Updated
		📲 New Project	System	07/09/10 AM 0
Et New Project	Add Network			×
Libraries	Network <u>N</u> o.:	1		<u>▼ <u>Ω</u>K</u>
E Stations E Mew Static E D Units	Network C <u>a</u> tco	ode: EtherLAN Ethernet LAN	(Single)	<u>▼</u> <u>C</u> ancel
É 🚮 00(É 🦳	Co <u>m</u> ment:			

14. Right-click on **Module** and select **New**. Select the Ethernet module and then close the window.

Add Module		×
Node <u>N</u> o.:	1	<u>0</u> K
Module N <u>a</u> me:	New Station (model 3000)_01(EN761) 💌	<u>C</u> ancel

15. To verify that connections have been set up successfully, right-click the first subgroup under the **Stations** folder. For example, test (model 3000) and select "System View" from the list. This will show

the status of the devices.

🐹 System View (Station Status) [New Station]					
<u>F</u> ile ⊻iew <u>T</u> ool	<u>H</u> elp				
				Start	Monitor Stop
MainSlotNo.	Module Code	Alarm Status	Program Fallback	Run Mode	Duplex Status
	PS	- [-]		- -	
	ļ				
	i li	i i			
	į į				
	ļ l				
	<u> </u>			[]	
				3	
I/O Bus Cod	e Alarm Status	Open Detail	Run Mode	System Log	Maintenance
Serial Parallel		System			Exit

16. From the **Tool** drop-down list, select **Com. Para. Settings**. In the IP address box at the bottom of the window, enter the PC's IP. Then, choose Ethernet as the form of communications and close the window.

🖄 V series Engineering Tool 2 - {C\Documents and Sel
<u>File E</u> dit <u>V</u> iew <u>T</u> ool <u>H</u> elp
Com. Para. Settings
Log in automatically by the current user
💱 Com. Para. Settings.txt - Notepad 📃 🗖 🗙
<u>File E</u> dit F <u>o</u> rmat <u>V</u> iew <u>H</u> elp
Com. Method
○ RS-232C <u>UK</u>
C BS-485 <u>C</u> ancel
O Network via RS-232C
RS-232C,RS-485
Port COM1 💌
Timeout (s) 5
Ethernet
Timeout (s) 4
Local Station Settings
O Single O Dual
• Single (Free mode)
IP Address 192.168.1.12

17. To test the connection, return to the System View and verify that the devices' statuses are visible without any communication errors.

T2 and T3 Setup

Before this driver can be used, the PLC must be configured with an IP and port number. This can be done using a simple ladder program, which must be run each time the PLC is powered up. An example program that sets IP = 192.168.111.126 and port = 1024 is shown below. Users may wish to modify this program to run automatically whenever the PLC powers up.

	R0601
P0601	
2 [12544 MOV RW000] [00019 MOV RW001]	
[08192 MOV RW002]	
	R0602
R0602	
4	
- [-22336 MOV RW002]{ 32367 MOV RW003]{ 01024 MOV RW004]	
	R0603
6	
- [04144 MOV RW002]	
- [RW000 SEND RW010]{ RST R0503]	
7-[END]	

The first block of code at rung 2 places the PLC in Standby Mode when bit R0501 is set. This must be done before the IP and port can be set. The second block of code at rung 4 sets the IP and port number when bit R0502 is set. The final block of code at rung 6 puts the PLC back in Run Mode when bit R0603 is set.

Each block of code places parameters in memory starting at RW000, issues a SEND command using those parameters, and then resets the corresponding trigger bit. The parameters in each block are defined as shown in the tables below.

Set	Stan	dby	Mode
-----	------	-----	------

Parameter	Value	Description
RW000	0x3100 (12544)	Specifies module.
RW001	0x0013 (19)	Change mode command code.
RW002	0x2000 (8192)	Specifies standby mode.

Set IP and Port

Parameter	Value	Description	
RW000	0x3100 (12544)	Specifies module.	
RW001	0x0012 (18)	Set IP and port command code.	
RW002	User Defined	Specifies upper 2 octals of IP address (network byte order).	
RW003	User Defined	Specifies lower 2 octals of IP address (network byte order).	
RW004	User Defined	Specifies port number.	

The IP address parameters must be in the correct format. In the example IP, the four octals that follow are expressed in hex: 0xC0 (192), 0xA8 (168), 0x6F (111) and 0x7E (126). Therefore, the value placed in RW002 is 0xA8C0 (or -22336 as a signed integer). The value placed in RW003 is 0x7E6F (or 32367 as a signed integer).

Set Run Mode

Parameter	Value	Description
RW000	0x3100 (12544)	Specifies module.
RW001	0x0013 (19)	Change mode command code.
RW002	0x1030 (4144)	Specifies Run Mode.

Optimizing Communications

The Toshiba Ethernet Driver has been designed to provide the best performance with the least amount of impact on the system's overall performance. While the Toshiba Ethernet Driver is fast, there are a couple of guidelines that can be used in order to control and optimize the application and gain maximum performance. This server refers to communications protocols like Toshiba Ethernet as a channel.

Each channel defined in the application represents a separate path of execution in the server. Once a channel has been defined, a series of devices must then be defined under that channel. Each of these devices represents a single Toshiba Ethernet controller from which data will be collected. While this approach to defining the application will provide a high level of performance, it won't take full advantage of the Toshiba Ethernet Driver or the network. An example of how the application may appear when configured using a single channel is shown below.



Each device appears under a single Toshiba Ethernet channel. In this configuration, the driver must move from one device to the next as quickly as possible in order to gather information at an effective rate. As more devices are added or more The Device2 information is requested from a single device, the overall update rate begins to

If the Toshiba Ethernet Driver could only define one single channel, then the example shown above would be the only option available; however, the Toshiba Ethernet Driver can define up to 100 channels. Using multiple channels distributes the data collection workload by simultaneously issuing multiple requests to the network. An example of how the same application may appear when configured using multiple channels to improve performance is shown below.



Each device has now been defined under its own channel. In this new configuration, a single path of execution is dedicated to the task of gathering data from each device. If the application has 100 or fewer channels, it can be optimized exactly how it is shown here.

The performance will improve even if the application has more than 100 channels. While 100 or fewer channels may be ideal, the application will still benefit from The vicel additional channels. Although spreading the device load across all channels will cause the server to move from device to device again, it can now do so with far less devices to process on a single channel.

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Data Types Description

Data Type	Description
Boolean	Single bit
Word	Unsigned 16 bit value
	bit 0 is the least significant bit
	bit 15 the most significant bit
Short	Signed 16 bit value
	bit 0 is the least significant bit
	bit 14 the most significant bit
	bit 15 is the sign bit
DWord	Unsigned 32 bit value
	bit 0 is the least significant bit
	bit 31 the most significant bit
Long	Signed 32 bit value
	bit 0 is the least significant bit
	bit 30 the most significant 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.
String	Null terminated ASCII string
	Supported on all models, includes HiLo LoHi byte order selection.

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.

- **T2 Addressing**
- **T3 Addressing**
- **S2 Addressing**
- **S3 Addressing**

T2 Addressing

The default data types for dynamically defined tags are shown in **bold** where appropriate.

Address Type	Range	Data Type	Access
Input Devices	X00X0F-X127X127F	Boolean	Read/Write
Direct Input Devices	10010F-11271127F	Boolean	Read Only
Output Devices	Y00Y0F-Y127Y127F	Boolean	Read/Write
Direct Output Devices	00000F-01270127F	Boolean	Read/Write
Input Registers	XW0-XW127 XW0-WW126	Word , Short DWord, Long, Float	Read/Write
Direct Input Registers	IW0-IW127 IW0-IW126	Word , Short DWord, Long, Float	Read/write
Output Registers	YW0-YW127 YW0-YW126	Word , Short DWord, Long, Float	Read/Write
Direct Output Registers	OW0-OW127 OW0-OW126	Word , Short DWord, Long, Float	Read/Write
Link Relays	L00L0F-L2550L255F	Boolean	Read/Write
Link Registers	LW0-LW255 LW0-LW254	Word , Short DWord, Long, Float	Read/Write
Link Registers	W0-W1023 W0-W1022	Word , Short DWord, Long, Float	Read/Write
Link Register relays	Z00Z0F-Z5110Z511F	Boolean	Read/Write
File Registers	F0-F1023 F0-F1022	Word , Short DWord, Long, Float	Read/Write
Auxiliary Devices	R00R0F-R2550R255F	Boolean	Read/Write
Auxiliary Registers	RW0-RW255 RW0-RW254	Word , Short DWord, Long, Float	Read/Write
Special Devices	S00S0F-S2550S255F	Boolean	Read/Write
Special Registers	SW0-SW255 SW0-SW254	Word , Short DWord, Long,	Read Only

Address Type	Range	Data Type	Access
		Float	
Counter Registers	C0-C255	Word, Short	Read/Write
Counter Devices	C.0-C.255	Boolean	Read Only
Timer Registers	T0-T255	Word, Short	Read/Write
Timer Devices	T.0-T.255	Boolean	Read Only
Data Memory	D0-D8191	Word, Short	Read/Write
	D0-D8190	DWord, Long,	
		Float	
Data Memory As String with HiLo Byte Order	D0.2H-D4095.64H	String	Read/Write
	.Bit is string length,		
	range 2 to 64 bytes.		
Data Memory As String with LoHi Byte Order	D0.2L-D4095.64L	String	Read/Write
	.Bit is string length,		
	range 2 to 64 bytes.		

String Support

The Toshiba Ethernet Driver supports reading and writing Data registers as an ASCII string. When using Data registers for string data, each register will contain two bytes of ASCII data. The order of the ASCII data within a given register can be selected when the string is defined. The length of the string can be from 2 to 64 bytes and is entered in place of a bit number. The length must be entered as an even number. The byte order is specified by appending either an "H" or "L" to the address.

Examples

1. To address a string starting at D200 with a length of 50 bytes and HiLo byte order, enter: D200.50H

2. To address a string starting at D500 with a length of 38 bytes and LoHi byte order, enter: D500.38L

T3 Addressing

The default data types for dynamically defined tags are shown in **bold** where appropriate.

Address Type	Range	Data Type	Access
Input Devices	X00X0F-X5110X511F	Boolean	Read/Write
Direct Input Devices	10010F-151101511F	Boolean	Read Only
Output Devices	Y00Y0F-Y5110Y511F	Boolean	Read/Write
Direct Output Devices	00000F-	Boolean	Read/Write
	O5110O511F		
Input Registers	XW0-XW511	Word, Short	Read/Write
	XW0-XW510	DWord, Long,	
		Float	
Direct Input Registers	IW0-IW511	Word, Short	Read/Write
	IW0-IW510	DWord, Long,	
		Float	
Output Registers	YW0-YW511	Word, Short	Read/Write
	YW0-YW510	DWord, Long,	
		Float	

Address Type	Range	Data Type	Access
Direct Output Registers	OW0-OW511	Word, Short	Read/Write
	000-000310	Float	
Link Relays	L00L0F-L2550L255F	Boolean	Read/Write
Link Registers	LW0-LW255	Word, Short	Read/Write
	LW0-LW254	DWord, Long,	
		Float	
Link Registers	W0-W2047	Word, Short	Read/Write
	W0-W2026	DWord, Long,	
		Float	
Link Register relays	Z00Z0F-Z9990Z999F	Boolean	Read/Write
File Registers	F0-F8191	Word, Short	Read/Write
	F0-F8190	DWord, Long,	
		Float	
Auxiliary Devices	R00R0F-R9990R999F	Boolean	Read/Write
Auxiliary Registers	RW0-RW999	Word, Short	Read/Write
	RW0-RW998	DWord, Long,	
		Float	
Special Devices	S00S0F-S2550S255F	Boolean	Read/Write
Special Registers	SW0-SW255	Word, Short	Read Only
	SW0-SW254	DWord, Long,	
		Float	
Counter Registers	C0-C511	Word, Short	Read/Write
Counter Devices	C.0-C.511	Boolean	Read Only
Timer Registers	Т0-Т999	Word, Short	Read/Write
Timer Devices	Т.0-Т.999	Boolean	Read Only
Data Memory	D0-D8191	Word, Short	Read/Write
	D0-D8190	DWord, Long,	
		Float	
Data Memory As String with HiLo Byte	D0.2H-D8191.64H	String	Read/Write
Order	.Bit is string length,		
	range 2 to 64 bytes.		
Data Memory As String with LoHi Byte	D0.2L-D8191.64L	String	Read/Write
Order	.Bit is string length,		
	range 2 to 64 bytes.		

String Support

The Toshiba Ethernet Driver supports reading and writing Data registers as an ASCII string. When using Data registers for string data, each register will contain two bytes of ASCII data. The order of the ASCII data within a given register can be selected when the string is defined. The length of the string can be from 2 to 64 bytes and is entered in place of a bit number. The length must be entered as an even number. The byte order is specified by appending either a "H" or "L" to the address.

Examples

1. To address a string starting at D200 with a length of 50 bytes and HiLo byte order, enter: D200.50H

2. To address a string starting at D500 with a length of 38 bytes and LoHi byte order, enter:

D500.38L

S2 Addressing

The default data types for dynamically defined tags are shown in **bold** where appropriate.

Address Type	Range	Data Type	Access
Input Devices	X0 0X0 F-X3071 0X3071 F	Boolean*	Read/Write
Direct Input Devices	I0 0I0 F-I3071 0I3071 F	Boolean*	Read Only
Output Devices	Y0 0Y0 F-Y3071 0Y3071 F	Boolean*	Read/Write
Direct Output Devices	O0 0O0 F-O3071 0O3071 F	Boolean*	Read/Write
Input Registers	XW0-XW3071 XW0-XW3070	Word , Short DWord, Long, Float	Read/Write
Direct Input Registers	IW0-IW3071 IW0-IW3070	Word , Short DWord, Long, Float	Read/Write
Output Registers	YW0-YW3071 YW0-YW3070	Word , Short DWord, Long, Float	Read/Write
Direct Output Registers	OW0-OW3071 OW0-OW3070	Word , Short DWord, Long, Float	Read/Write
Auxiliary Devices	R0 0R0 F-R4095 0R4095 F	Boolean*	Read/Write
Auxiliary Devices	D[0].B[0]-D[4095].B[F]	Boolean*	Read/Write
Auxiliary Registers	RW0-RW4095 RW0-RW4094	Word , Short DWord, Long, Float	Read/Write
Auxiliary Registers	DW[0]-DW[4095] DW[0]-DW[4094]	Word , Short DWord, Long, Float	Read/Write
Special Devices	S0 0S0 F-S511 0S511 F	Boolean*	Read/Write
Special Registers	SW0-SW511 SW0-SW510	Word , Short DWord, Long, Float	Read Only
Data Memory	D0-D4095 D0-D4094	Word , Short DWord, Long, Float	Read/Write
Data Memory As String with HiLo Byte Order	D0.64H-D4095.2H .Bit is string length, range 2 to 64 bytes.	String	Read/Write
Data Memory As String with LoHi Byte Order	D0.64L-D4095.2L .Bit is string length, range 2 to 64 bytes.	String	Read/Write

*The last character in the address is the bit identifier and is represented in hexadecimal format.

String Support

The Toshiba Ethernet Driver supports reading and writing Data registers as an ASCII string. When using Data registers for string data, each register will contain two bytes of ASCII data. The order of the ASCII data within a given register can be selected when the string is defined. The length of the string can be from 2 to 64 bytes and is entered in place of a bit number. The length must be entered as an even number. The byte order is specified by appending either an "H" or "L" to the address.

Examples

1. To address a string starting at D200 with a length of 50 bytes and HiLo byte order, enter: D200.50H

2. To address a string starting at D500 with a length of 38 bytes and LoHi byte order, enter: D500.38L

S3 Addressing

The default data types for dynamically defined tags are shown in **bold** where appropriate.

Address Type	Range	Data Type	Access
Input Devices	X0 0X0 F-X5119 0X5119 F	Boolean*	Read/Write
Direct Input Devices	I0 0I0 F-I5119 0I5119 F	Boolean*	Read Only
Output Devices	Y0 0Y0 F-Y5119 0Y5119 F	Boolean*	Read/Write
Direct Output Devices	O0 0O0 F-O5119 0O5119 F	Boolean*	Read/Write
Input Registers	XW0-XW5119 XW0-XW5118	Word , Short DWord, Long, Float	Read/Write
Direct Input Registers	IW0-IW5119 IW0-IW5118	Word , Short DWord, Long, Float	Read/Write
Output Registers	YW0-YW5119 YW0-YW5118	Word , Short DWord, Long, Float	Read/Write
Direct Output Registers	OW0-OW5119 OW0-OW5118	Word , Short DWord, Long, Float	Read/Write
Auxiliary Devices	R0 0R0 F-R4095 0R4095 F	Boolean*	Read/Write
Auxiliary Devices	D[0].B[0]-D[4095].B[F]	Boolean*	Read/Write
Auxiliary Registers	RW0-RW4095 RW0-RW4094	Word , Short DWord, Long, Float	Read/Write
Auxiliary Registers	DW[0]-DW[4095] DW[0]-DW[4094]	Word , Short DWord, Long, Float	Read/Write

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Address Type	Range	Data Type	Access
Special Devices	S0 0S0 F-S511 0S511 F	Boolean*	Read/Write
Special Registers	SW0-SW511	Word, Short	Read Only
	SW0-SW510	DWord, Long,	
		Float	
Data Memory	D0-D4095	Word, Short	Read/Write
	D0-D4094	DWord, Long,	
		Float	
Data Memory As String with HiLo Byte	D0.64H-D4095.2H	String	Read/Write
Order	.Bit is string length,		
	range 2 to 64 bytes.		
Data Memory As String with LoHi Byte	D0.64L-D4095.2L	String	Read/Write
Order	.Bit is string length,		
	range 2 to 64 bytes.		

*The last character in the address is the bit identifier and is represented in hexadecimal format.

String Support

The Toshiba Ethernet Driver supports reading and writing Data registers as an ASCII string. When using Data registers for string data, each register will contain two bytes of ASCII data. The order of the ASCII data within a given register can be selected when the string is defined. The length of the string can be from 2 to 64 bytes and is entered in place of a bit number. The length must be entered as an even number. The byte order is specified by appending either an "H" or "L" to the address.

Examples

1. To address a string starting at D200 with a length of 50 bytes and HiLo byte order, enter: D200.50H

2. To address a string starting at D500 with a length of 38 bytes and LoHi byte order, enter: D500.38L

Error Descriptions

The following error/warning 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

Device Status Messages

Winsock initialization failed (OS Error = n) Winsock V1.1 or higher must be installed to use the Toshiba Ethernet device driver Device '<device name>' is not responding Unable to write to '<address>' on device '<device name>' Device '<device name>' responded with error code 'n' (Tag '<tag name>') Deactivating tag block. Bad address in block [<start address> to <end address>] on 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.

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Solution:

Verify that 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:

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

Winsock initialization failed (OS Error = n)

Error Type:

Fatal

OS Error	Indication	Possible Solution
10091	Indicates that the underlying network subsystem is not ready for network communication.	Wait a few seconds and restart the driver.
10067	Limit on the number of tasks supported by the	Close one or more applications that may be using Winsock and restart the driver.

OS Error	Indication	Possible Solution
	Windows Sockets implementation has been	
	reached.	

Winsock V1.1 or higher must be installed to use the Toshiba Ethernet device driver

Error Type:

Fatal

Possible Cause:

The version number of the Winsock DLL found on the system is less than 1.1.

Solution:

Upgrade Winsock to version 1.1 or higher.

Device '<device name>' is not responding

Error Type:

Serious

Possible Cause:

- 1. The named device may not be connected to the PLC network.
- 2. The named device may have been assigned an incorrect Network ID.
- 3. The response from the device took longer to receive than the amount of time specified in the "Request Timeout" device setting.

Solution:

- 1. Check the PLC network connections.
- 2. Verify that the Network ID given to the named device matches that of the actual device.
- 3. Increase the Request Timeout setting so that the entire response can be handled.

Unable to write to address '<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:

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- 1. Verify the cabling between the PC and the PLC device.
- 2. Verify that the specified communications properties match those of the device.
- 3. Verify that the Network ID given to the named device matches that of the actual device.

Device '<device name>' responded with error code 'n' (Tag '<tag name>')

Error Type:

Warning

Possible Cause:

The device responded with specified error code.

Solution:

Consult the Toshiba documentation for explanation of code and suggested solution.

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

Error Type:

Warning

Possible Cause:

The driver is requesting a block of data with one or more invalid addresses.

Solution:

Verify that all addresses in specified range are valid for the device.

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