



INDUSTRIAL CONTROL COMMUNICATIONS, INC.

Toshiba Computer Link Master Driver Manual



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1 Toshiba Computer Link Master

1.1 Overview

This driver supports the Toshiba Computer Link Master protocol. This driver allows direct connection to Toshiba T-series PLC's that support the Computer Link protocol. Some notes of interest are:

- The driver can execute the following functions:
 - Reading data (register/device value) from PLC
 - Writing data (register/device value) into PLC
 - Monitoring PLC operation status
 - Controlling PLC operation mode
 - Monitoring the latest error status stored in the PLC's event history table
 - Reading PLC clock-calendar data
 - Writing PLC clock-calendar data
- Supported commands are indicated in Table 1.

Table 1: Supported Toshiba Computer Link Master Commands

Command Code	Command
ST	PLC Status Read
EC	PLC Control
ER	PLC Error Status Read
DR	Data Read
DW	Data Write
RT	Clock-Calendar Read
WT	Clock-Calendar Write

- Supports the following register function codes:
 - XW, YW, SW, LW, RW, W, D, F
- Supports the following device function codes:
 - X, Y, S, L, R, Z
- Up to 32 registers/devices can be requested per service object.
- Device data is mapped on a bit-by-bit basis in the database starting with the least significant bit of the database byte. For example, if a service object's function code is "S", starting address is "4", the starting bit position is "0", the number of devices is "19", and the database address is "320", then bits 0 through 7 of device S004 will be mapped to bit 0 through 7, respectively, at address 320, bits 8 through 15 will be mapped to bit 0 through 7, respectively, at address 321, and bits 0 through 2 of device S005 will be mapped to bit 0 through 2, respectively, at address 322. The remaining 5 bits in the byte at database address 322 are unused.



1.2 Master Settings

Baud Rate

Selects the baud rate of the network.

Parity

Selects the parity and number of stop bits.

Timeout

Sets the time in milliseconds that the driver will wait for a response from a PLC after sending a request.

Scan Rate

This is the time in milliseconds the driver will wait between sending requests. This is a useful feature for certain devices or infrastructure components (such as radio modems) that may not be capable of sustaining the maximum packet rates that the driver is capable of producing. The start time for this delay is taken with respect to the moment at which the driver is capable of sending the next packet (due to either reception or timeout of the previous request). If no additional time is required, setting this field to 0 instructs the driver to send its next request packet as soon as possible.

1.3 Service Object Settings

The Toshiba Computer Link master driver uses service objects to describe what services the driver should perform. For each service object, the driver will continually read the parameters defined within the service object from the designated PLC, storing the value(s) in the database (if the Read Command is enabled). When data in the database changes where the parameters are mapped, a write request is generated to the designated PLC notifying it of the changed value(s) (if the Write Command is enabled).

1.3.1 PLC Mode/Status Service Object Settings

Description

This 32-character (max) field is strictly for user reference: it is not used at any time by the driver.

Destination Address

Indicates the destination address (1...32) of the PLC on the network that will be accessed by this service object.

Database Address

Defines the database address where the PLC status will be mapped.

Data Type

Fixed at "16-Bit Unsigned".



Read Command

Select whether or not to allow the service object to issue read requests, and the command to use when enabled. When enabled, the service object will continuously read from the PLC unless a pending write exists.

Write Command

Select whether or not to allow the service object to issue write requests, and the command to use when enabled. When values encompassed by this service object change in the internal database and writes are enabled, these changes will be written down to the targeted PLC. Note that only the PLC mode is written to the PLC, the status bits are read-only.

1.3.2 PLC Error Status Service Object Settings

Description

This 32-character (max) field is strictly for user reference: it is not used at any time by the driver.

Destination Address

Indicates the destination address (1...32) of the PLC on the network that will be accessed by this service object.

Database Address

Defines the database address where the PLC error status will be mapped. The error status shows the latest error status stored in the PLC's event history table.

Data Type

Fixed at "16-Bit Unsigned".

Read Command

Fixed at "PLC Error Status Read (ER)".

1.3.3 Register Data Service Object Settings

Description

This 32-character (max) field is strictly for user reference: it is not used at any time by the driver.

Destination Address

Indicates the destination address (1...32) of the PLC on the network that will be accessed by this service object.

Function Code

Select the desired function code of the register to access with this service object.

Start Address

Defines the starting register address for a range of registers associated with this service object. The range of valid register addresses depends on the selected function code.

Number of Registers

Defines the number of consecutive registers (1...32) to be targeted by this service object.

Database Address

Defines the database address where the first register of this service object will be mapped. The configuration studio will not allow entry of a starting database address that will cause the service object to run past the end of the database. The highest valid database address, therefore, will depend on the number of registers to be accessed.

Data Type

Fixed at "16-Bit Unsigned".

Multiplier

The amount that associated network values are scaled by prior to being stored into the database or after being retrieved from the database. Upon retrieval from the database, raw data is multiplied by the multiplier to produce a network value (to be sent to the PLC). Similarly, network values (read from the PLC) are divided by the multiplier before being stored into the database.

Read Command

Select whether or not to allow the service object to issue read requests, and the command to use when enabled. When enabled, the service object will continuously read from the PLC unless a pending write exists.

Write Command

Select whether or not to allow the service object to issue write requests, and the command to use when enabled. When values encompassed by this service object change in the internal database and writes are enabled, these changes will be written down to the targeted PLC.

1.3.4 Device Data Service Object Settings

Description

This 32-character (max) field is strictly for user reference: it is not used at any time by the driver.

Destination Address

Indicates the destination address (1...32) of the PLC on the network that will be accessed by this service object.

Function Code

Select the desired function code of the device to access with this service object.

Start Address

Defines the starting device address for a range of devices associated with this service object. The range of valid device addresses depends on the selected function code.

Start Bit Position

Select the starting bit position in the corresponding device register for a range of devices associated with this service object.

Number of Devices

Defines the number of consecutive devices (1...32) to be targeted by this service object.

Database Address

Defines the database address where the first device bit of this service object will be mapped. The configuration studio will not allow entry of a starting database address that will cause the service object to run past the end of the database. The highest valid database address, therefore, will depend on the number of devices to be accessed.

Data Type

Fixed at "1 Bit".

Read Command

Select whether or not to allow the service object to issue read requests, and the command to use when enabled. When enabled, the service object will continuously read from the PLC unless a pending write exists.

Write Command

Select whether or not to allow the service object to issue write requests, and the command to use when enabled. When values encompassed by this service object change in the internal database and writes are enabled, these changes will be written down to the targeted PLC.

1.3.5 Clock-Calendar Service Object Settings

Description

This 32-character (max) field is strictly for user reference: it is not used at any time by the driver.

Destination Address

Indicates the destination address (1...32) of the PLC on the network that will be accessed by this service object.

Database Address

Defines the database address where the first byte of the PLC's clock-calendar data will be mapped.

Data Type

Fixed at "8-Bit Unsigned Array". The clock-calendar data consists of 6 bytes, ordered as follows: Year, Month, Day, Hour, Minute, Second.

Read Command

Select whether or not to allow the service object to issue read requests, and the command to use when enabled. When enabled, the service object will continuously read from the PLC unless a pending write exists.

Write Command

Select whether or not to allow the service object to issue write requests, and the command to use when enabled. When values encompassed by this service object change in the internal database and writes are enabled, these changes will be written down to the targeted PLC.

1.4 Diagnostics Object

Each service object can optionally include a diagnostics object for debugging and diagnostics.

Diagnostics Database Address

Enter the database address at which to store the diagnostics information.



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