



INDUSTRIAL CONTROL COMMUNICATIONS, INC.

Toshiba ASD Master Driver Manual



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1 Toshiba ASD Master

1.1 Overview

This driver supports the Toshiba ASD Master protocol. This driver allows direct connection to Toshiba adjustable-speed drives that support the Toshiba protocol, such as the G7/Q7/H7 and AS1/FS1/G9/H9/Q9, etc. families. Some notes of interest are:

- Supported function codes are indicated in Table 1.

Table 1: Supported Toshiba ASD Master Functions

Function Code	Function
R	RAM read for 4-wire RS-485 networks
G	RAM read for 2-wire RS-485 networks
W	RAM & EEPROM write
P	RAM-only write

- Up to 125 parameters can be requested per service object.
- If a 2-wire RS-485 drive network is desired, then the drive(s) must be properly configured for 2-wire RS-485. Note that this may involve hardware configuration in addition to parameter changes. For example, G7/Q7/H7-series drives have duplex selection jumpers located on the drive's control board near the communication ports. For these drives, both jumpers must be placed in the "HALF" position for successful 2-wire operation. Refer to Figure 1 for an example detailed view of correctly-positioned duplex selection jumpers.

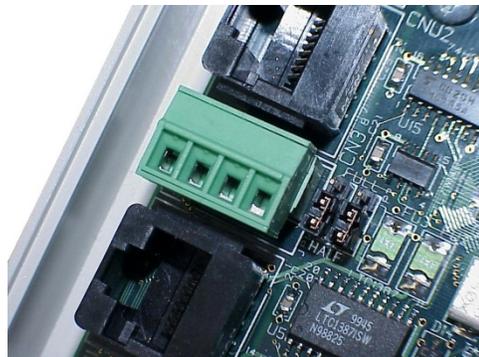


Figure 1: RS-485 Terminal Block (CN3) and Duplex Selection Jumpers

- The Toshiba RS-485 terminal block connections for G7/Q7/H7/W7 drives are shown in Figure 2 for reference only. Because there are several possible RS-485 port configurations & options available for the various Toshiba drives, please refer to the relevant Toshiba documentation for your drive.
- Note that Toshiba 7-series drives (G7/Q7/H7 etc.) configured for 2-wire mode (F821=0) shipped prior to early 2006 may exhibit an issue that can cause their RS-485 ports to stop communicating after some time. Please contact Toshiba technical support to confirm your configuration prior to using 2-wire RS-485 mode on these drives.

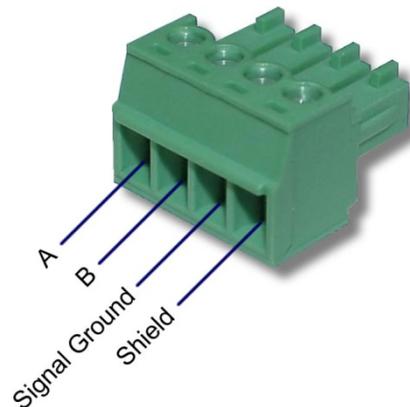


Figure 2: G7/Q7/H7/W7 RS-485 Terminal Block (CN3) Connections



- When using the “W” function code to write drive configuration parameters, be sure to follow Toshiba’s guidelines regarding the number of times a specific parameter can be written without risk of EEPROM damage.
- Drive parameters are mapped in the database as 2-byte (16-bit) values. This means that each parameter in a service object occupies two database addresses. For example, if a service object’s Start Parameter is “FE00”, the Number of Parameters is “5”, and the Database Address is “100”, then parameters FE00 through FE04 will be mapped at database addresses 100 through 109 (parameter FE00 occupies addresses 100 & 101, parameter FE01 occupies addresses 102 & 103, and so on).

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 drive 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 ASD 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 drive, storing the value(s) in the database (if the Read Function is enabled). When data in the database changes where the parameters are mapped, a write request is generated to the designated drive notifying it of the changed value(s) (if the Write Function is enabled).

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 (0...63) of the drive on the network that will be accessed by this service object. A value of 255 can also be entered in this field: address 255 designates the



broadcast address in the Toshiba ASD protocol. If a broadcast service object is configured, then the “Read Function” must be set to “Disabled”, as attempts to read a service object targeting destination address 255 will invariably time out.

Start Parameter

Defines the starting parameter number (0..FF99) for a range of drive parameters associated with this service object. For example, the drive’s output frequency typically resides at parameter FE00.

For configuration parameters (i.e. those parameters which are not used for drive control or monitoring), do not include the leading “F” character which some Toshiba documentation may include. If the leading “F” character is included in the string entered into this field, then the parameter can be read, but the drive will reject writing to the parameter. For example, some Toshiba documentation may indicate that the “deceleration time 1” configuration parameter is “F010”. This should be entered into the “Start Parameter” field as “0010” (or just “10”, as the driver will automatically add “0” characters to the beginning of parameter numbers when necessary).

Number of Parameters

Defines the number of parameters (1...125) to be targeted by this service object. As an example, if you wish to access both “acceleration time 1” and “deceleration time 1” via a single service object, then enter “9” in the Start Parameter field and “2” in the Number of Parameters field. This will cause the service object to access both parameters 0009 and 0010 (which some Toshiba documentation may describe as parameters F009 and F010, respectively).

Database Address

Defines the database address where the first parameter 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 parameters 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 drive). Similarly, network values (read from the drive) are divided by the multiplier before being stored into the database.

Read Function

Select whether or not to allow the service object to issue read requests, and the function code to use when enabled. When enabled, the service object will continuously read from the drive unless a pending write exists. When connected to the drives via a 2-wire RS-485 network, Toshiba recommends use of the “G” read function code. When connected to the drives via a 4-wire RS-485 network, either the “G” or “R” function codes can be used.

Write Function

Select whether or not to allow the service object to issue write requests, and the function code 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 drive. The “P” function code writes to the drive’s volatile RAM memory only, and is typically used when frequently writing to configuration parameters in order to prevent damage to the drive’s EEPROM memory (which has a limited write count lifecycle). The “W” function code writes to both the drive’s volatile RAM memory as well as its non-volatile EEPROM memory. Drive command parameters (command word, frequency command etc.) exist in RAM only, so either write function code can be safely used when writing to them.

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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