

ASTRA

Toshiba Driver

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⌘ Preface ⌘

This document introduces the user to the [TOSHIBA PLCs Device Driver](#). It contains technical information about the device driver. This document gives you a broad idea of how to use the [TOSHIBA Device Driver](#) with Astra.

This document broadly tell you about the capabilities and technical details of [TOSHIBA Device Driver](#) and the procedure to use the driver.

⌘ Introduction ⌘

This user manual assists the users of the [TOSHIBA Driver](#) in conjunction with the Astra package. The addressing scheme of the [TOSHIBA](#) programming software is explained in the subsequent chapters. Description of the different data types and the various addressing schemes should be understood before attempting to use the driver in an Astra project.

The driver will operate up to 19200 bauds but the driver has been tested at 9600 bauds on [TOSHIBA T1 Model](#) and this baud rate is therefore recommended.

⌘ Technical & Communication Details ⌘

PLC Make :	TOSHIBA Corporation.
PLC Modles :	The driver supports the following TOSHIBA PLC models ... EX 100 EX 200 T1 T1 SUPER T2
Communication Protocol :	Toshiba ASCII Computer Link Protocol.
Communication Parameters :	
Baud Rate -	9600
Parity -	ODD
Data Bits -	8
Stop Bits -	1
Cable Connections :	1)The T1 can be directly connected to the PC COM port using RS232 communications. 2)The EX100, EX200 and T2 can be linked to the PC's RS232 interface.
Device ID :	EX100 : Up to 16 devices numbered from 0 to 15. EX200 : Up to 10 devices numbered from 0 to 9. T1 and T2 : Up to 32 devices numbered from 1 to 32.
Flow Control:	When using an RS232/RS485 converter, the type of flow control that is required will depend upon the needs of the converter. Some converters do not require any flow control and others will require RTS flow. Note: When using T1 devices, RTS always should be specified.



Data Types and Addressing



Data Types :

The following is a description of how the TOSHIBA driver interprets the information from the PLC as different data types.

Data Types	Description
Boolean	Single Bit.
Word	Unsigned 16 bit value Bit 0: Least Significant Bit. Bit 15: Most Significant Bit.
Integer	Signed 16 bit value Bit 0: Least Significant Bit. Bit 14: Most Significant Bit. Bit 15: Sign Bit.
Dword	Unsigned 32 bit value Bit 0: Least Significant Bit. Bit 31: Most Significant Bit.
Long	Signed 32 bit value Bit 0: Least Significant Bit Bit 30: Most Significant Bit. Bit 31: Sign Bit.

This section will describe the addressing scheme used by the SysConScanner driver for the different data types and how to enter the address in ASTRA.

Addressing:

Address specifications vary depending on the model in use. Given below are the addressing modes

EX 100 Addressing:

This Model Supports the Following Datatypes (Defaults are shown in bold):

Devices	X, Y, R, Z	Boolean
Registers	XW, YW, C, T	Word , Integer
Data Memory	D, RW, ZW	Word , Integer, Dword, Long

⌘ Data Types and Addressing ⌘

Type	Format	Range
Input Devices	X <xx> <y> xx: Register Number. y : Bit Number.	X000 – X31F
Output Devices	y <xx> <y> xx: Register Number. y : Bit Number.	Y000 – Y31F
Input Registers	XW <xx> xx : Register Number.	XW00 – XW63
Output Registers	YW <xx> xx : Register Number.	YW00 – YW63
Auxiliary Devices	R <xx> <y> xx : Register Number y : Bit Number.	R000 – R63F
Auxiliary Registers	RW <xx> xx : Register Number.	RW00 – RW63
Link Registers Relays	Z <xx> <y> xx : Register Number. y : Bit Number.	Z000 – Z31F
Link Registers	ZW <xx> xx : Register Number.	ZW00 – ZW31
Counter Registers	C <xx> xx : Register Number.	C00 – C95
Timer Registers	T <xxx> xxx : Register Number.	T000 – T127
Data Memory	D <xxxx> xxxx : Register Number.	D0000 – D1535

Examples Of EX100 Addressing :-

- XW07* : bits 0 - 15 of XW Register 7.
- X57C* : bit C of X Register 57.
- C31* : Counter Register 31.
- D1020* : Data memory location 1020.

⌘ Data Types and Addressing ⌘

EX 200 Addressing: This Model Supports The Following Data types (Defaults are shown in bold):

Devices	X, Y, R, Z	Boolean
Registers	XW, YW, C, T	Word , Integer
Data Memory	D, RW, ZW	Word , Integer, Dowd, Long

Type	Format	Range
Input Devices	X <xx> <y> xx: Register Number. y : Bit Number.	X000 – X31F
Output Devices	y <xx> <y> xx: Register Number. y : Bit Number.	Y000 – Y31F
Input Registers	XW <xx> xx : Register Number.	XW00 – XW63
Output Registers	YW <xx> xx : Register Number.	YW00 – YW63
Auxiliary Devices	R <xx> <y> xx : Register Number y : Bit Number.	R000 – R63F
Auxiliary Registers	RW <xx> xx : Register Number.	RW00 – RW63
Link Registers Relays	Z <xx> <y> xx : Register Number. y : Bit Number.	Z000 – Z31F
Link Registers	ZW <xx> xx : Register Number.	ZW00 – ZW31
Counter Registers	C <xx> xx : Register Number.	C00 – C95
Timer Registers	T <xxx> xxx : Register Number.	T000 – T127
Data Memory	D <xxxx> xxxx : Register Number.	D0000 – D1535

⌘ Data Types and Addressing ⌘

Examples Of EX200 Addressing :-

- XW07 : bits 0 - 15 of XW Register 7.*
- X57C : bit C of X Register 57.*
- C31 : Counter Register 31.*
- D1020 : Data memory location 1020.*

T1, T1 SUPER Addressing: This Model Supports The Following Datatypes (Defaults are shown in bold):

Devices	X, Y, R, S, C, T	Boolean
Registers	XW, YW, SW, C, T	Word,
Data Memory	D, RW	Word, Integer, Dword,
Long		

Type	Format	Range
Input Devices	X <xx> <y> xx: Register Number. y : Bit Number.	X000 – X31F
Output Devices	y <xx> <y> xx: Register Number. y : Bit Number.	Y000 – Y31F
Input Registers	XW <xx> xx : Register Number.	XW00 – XW31
Output Registers	YW <xx> xx : Register Number.	YW00 – YW31
Auxiliary Devices	R <xx> <y> xx : Register Number y : Bit Number.	R000 – R2559 *See Note1 Below.
Auxiliary Registers	RW <xx> xx : Register Number.	RW00 – RW255
Special Devices	S <xx> <y> xx : Register Number. y : Bit Number.	S000 – S63F
Special Registers	SW <xx> xx : Register Number.	SW00 – SW63F

⌘ Data Types and Addressing ⌘

Type	Format	Range
Counter Registers	C < xx > xx : Register Number.	C00 – C255
Counter Devices	C < xx > xx : Register Number.	C.00 – C.63
Timer Registers	T < xx > xx : Register Number.	T00 – T63
Timer Devices	T < xx > xx : Register Number.	T.00 – T.63
Data Memory	D < xxxx > xxxx : Register Number.	D0000 – D4095

Examples : *XW05* : bits 0 - 15 of XW Register 7.
X052 : bit C of X Register 57.
T16 : counter Register 16.
T.16 : counter Status Device for Counter Register 16.
D1020 : data memory location 1020.



Note 1: Because of a difficulty with the T1 ASCII Protocol, the R devices are not available above the 9th bit. Bits A-F are not directly addressable.

T2 Addressing:

This Model Supports The Following Data types (Defaults are shown in bold):

Devices	X, Y, I, O, R, S, Z, L, C, T	Boolean
Registers	XW, YW, IW, OW, SW, LW, C, T	Word, Integer
Data Memory	D, F, W, RW	Word, Integer, Dword, Long

⌘ Data Types and Addressing ⌘

Type	Format	Range
Input Devices	X <xx> <y> xx: Register Number. y : Bit Number.	X000 – X63F
Output Devices	y <xx> <y> xx: Register Number. y : Bit Number.	Y000 – Y63F
Input Registers	XW <xx> xx : Register Number.	XW00 – XW63
Output Registers	YW <xx> xx : Register Number.	YW00 – YW63
Direct Input Devices	I <xx> <y> xx : Register Number. y : Bit Number.	1000 – 163F
Direct Output Devices	O <xx> <y> xx : Register Number. y : Bit Number.	0000 – 063F
Direct Input Registers	IW <xx> xx : Register Number.	IW000 – IW63
Direct Output Registers	OW <xx> xx : Register Number.	0W00 – 0W63
Auxiliary Devices	R <xxx> <y> xxx : Register Number. y : Bit Number.	R0000 – R127F
Auxiliary Registers	RW <xxx> xx : Register Number.	RW000 – RW127
Special Devices	S <xxx> <y> xxx : Register Number. y : Bit Number.	S0000 – S255F

⌘ Data Types and Addressing ⌘

Type	Format	Range
Special Registers	SW < xxx > xxx: Register Number.	SW000 – SW255
Link Registers Relays	Z < xxx > < y > xxx: Register Number. y : Bit Number.	Z0000 – Z511F
Link Registers	W < xxxx > xxxx : Register Number.	W0000 – W1023
Link Relays	L < xxx > < y > xxx : Register Number. y : Bit Number.	L0000 – L255F
Link Registers	LW < xxx > xxx : Register Number.	LW000 – LW255
File Registers	F < xxxx > xxxx : Register Number.	F0000 – F1023
Counter Registers	C < xxx > xxx : Register Number.	C000 – C255
Counter Devices	C < xxx > xxx : Register Number.	C.000 – C.255
Timer Registers	T < xxx > xxx : Register Number.	T000 – T255
Timer Devices	T. < xxx > xxx : Register Number.	T.000 – T.255
Data Memory	D < xxxx > xxxx : Register Number.	D0000 – D4095

Examples: *LW050* : bits 0- 15 of Link Register 50.

L0508 : bit 8 of Link Register 50.

C140 : counter Register 140.

C.140 : counter Status Device for Counter Register 140.

⌘ Data Types and Addressing ⌘

In addition to the standard device addresses, a special address is available in the driver. This address is not taken from the device but is maintained solely in the driver. Whenever the communications to a device times out with no response three times in succession, the value of the address is set to TRUE (1) indicating an error condition exists. When communication is reestablished with the device, the value of the address is set to FALSE (0).

To use the ERROR address for a given device, simply define a Read Only, Boolean tag that references address "ERROR." Only one ERROR tag is allowed per device.

⌘ Optimizations ⌘

No Optimization is present for this driver.



Errors



Errors At Config:

When an Astra project is configured, that time care is generally taken for address validation and also handles conditions when a read-only segment is configured as a read-write segment. Under such circumstances, error messages get displayed displaying the type of error and the possible solution for that particular error. A sample error message will look as shown below,

Errors At Runtime:

The entire time an Astra project is running, the Event Logger displays the status and any errors that the program generates. The driver utilizes the Event Logger to display all the driver error messages. Below are the error messages, the probable causes and most likely solution to all the errors the driver can generate. Error numbers are displayed in the event logger in case an error is generated.

Driver Error Messages :-

Expansion Unit Power Failure:	Error Type	0012
	Possible Cause	Expansion Unit Power Failure.
	Solution	Check The PLC connections and Expansion Hardware.
Communication Busy:	Error Type	0051
	Possible Cause	PLC is busy in processing for other peripheral communications.
	Solution	Consult your PLC vendor.
Format Error:	Error Type	0052
	Possible Cause	Received text format is illegal.
	Solution	Check the communication line and it's parameters.



Errors



Password Protect:

Error Type	0106
Possible Cause	Requested operation is protected by password.
Solution	Contact PLC vendor.

Comment Space Full:

Error Type	0108
Possible Cause	Comment memory is insufficient for the requested command.
Solution	Contact PLC vendor.

Memory Type Error:

Error Type	0109
Possible Cause	Memory capacity type mismatch.
Solution	Check the project and refer user manual.

Memory Full:

Error Type	0113
Possible Cause	Program memory is insufficient for the requested command.
Solution	Contact PLC vendor.

Mode Mismatch:

Error Type	0114
Possible Cause	Received command is invalid in current PLC mode.
Solution	Check PLC model and project.



Errors



Register Address/Size Error:

Error Type	0115
Possible Cause	Specified register range exceeds the limit.
Solution	Contact PLC vendor and verify address range for PLC hardware.

Memory Protect:

Error Type	0117
Possible Cause	Writing operation is protected.
Solution	Avoid writing a read-only tag.

Checksum Is Incorrect:

Possible Cause	There is probably incorrect checksum.
Solution	Contact your software supplier.



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