



OCS Training Workshop LAB11

Working with downloadable protocols
(Toshiba Tosvert example)

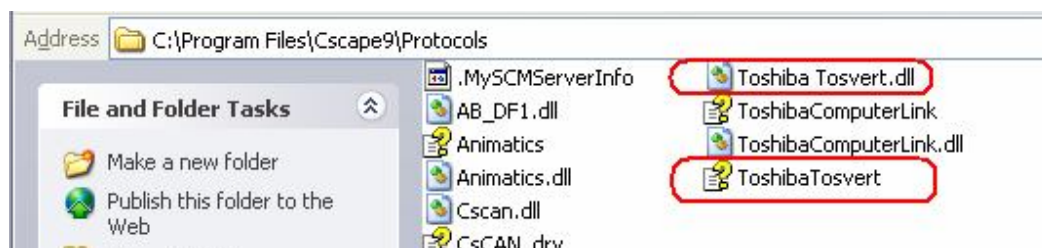
Introduction

The objective of this lab is to provide the skills to develop and trouble shoot communication with Toshiba Tosvert drives.

Overview

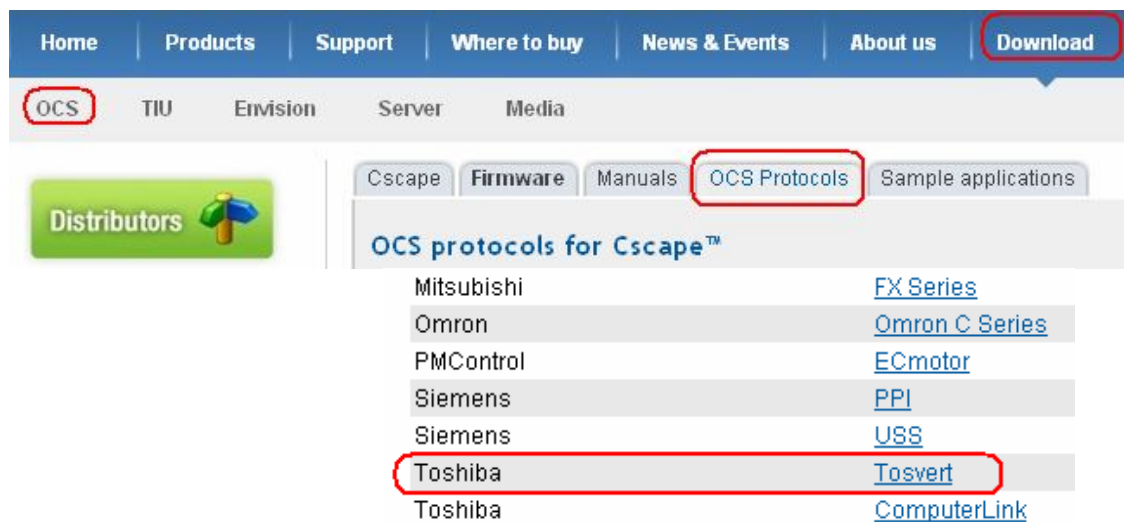
Toshiba Tosvert protocol is one of our serial protocols supported by any X-series OCS.

DLL file and it's respective help file should be installed (by default) within your Cscape directory:



The newest version is also available on our website:

www.horner-apg.com -> Download -> OCS -> OCS Protocols

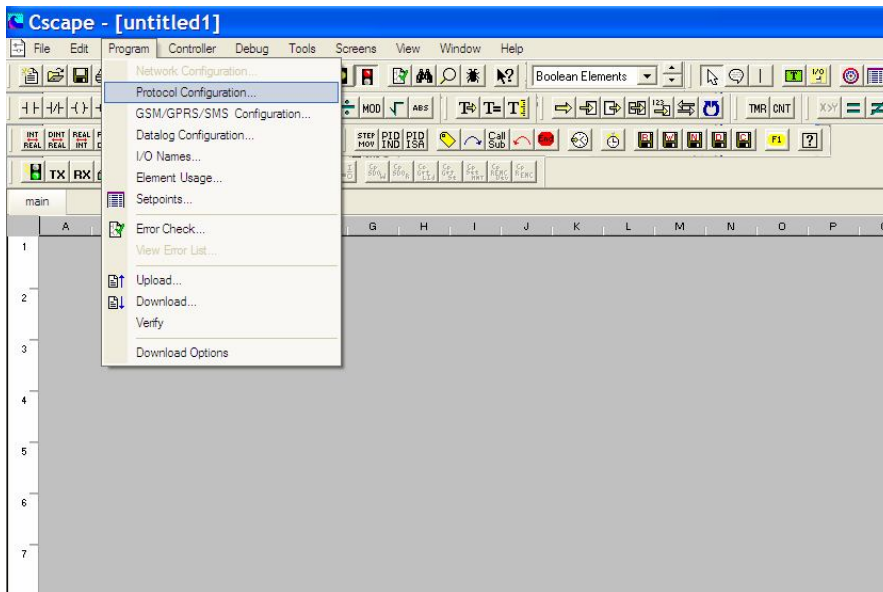


The Toshiba TOSVERT serial protocol is for communication between the Toshiba drives and an OCS. This is a Master/Slave protocol.

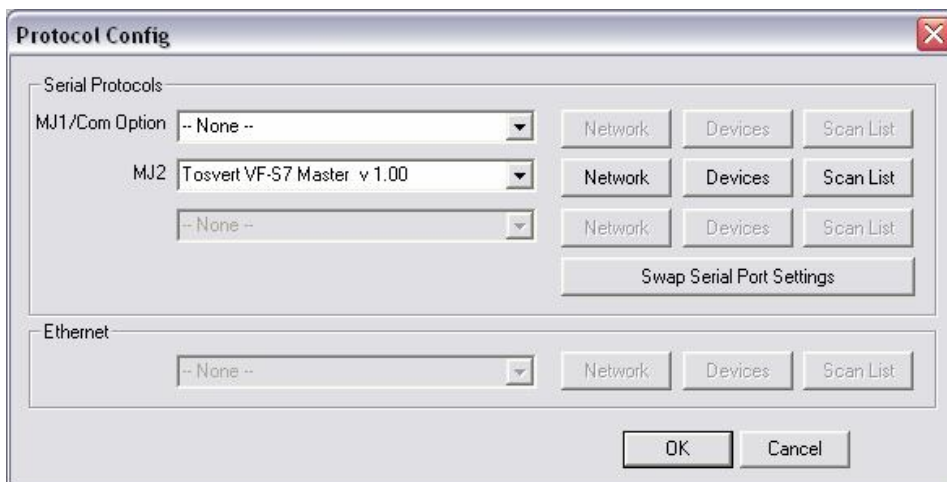
Cscape Configuration

PART 1 – Protocol configuration

1. Click Program -> Protocol Configuration

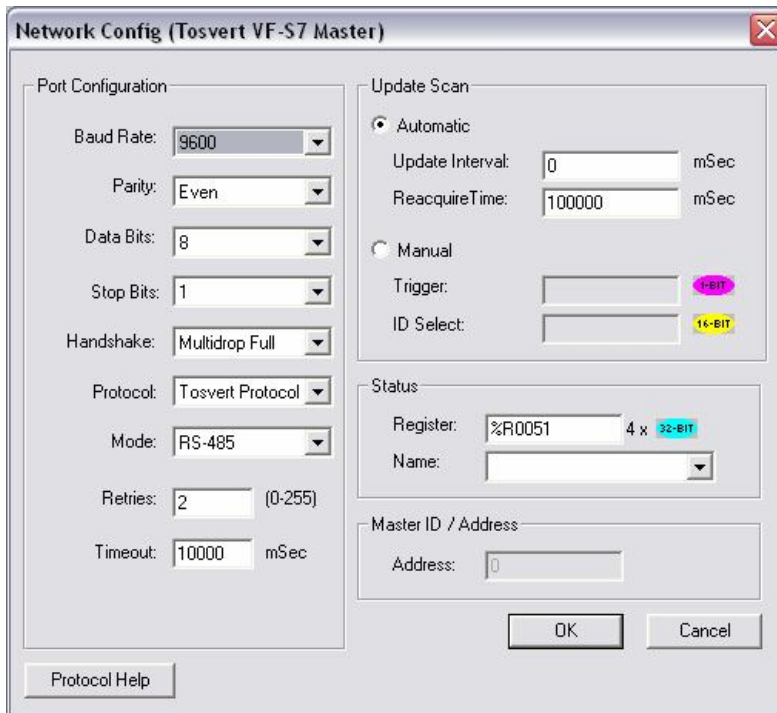


2. Select Tosvert protocol from one of the Serial Protocols Pull Downs



3. Click on the Network button and

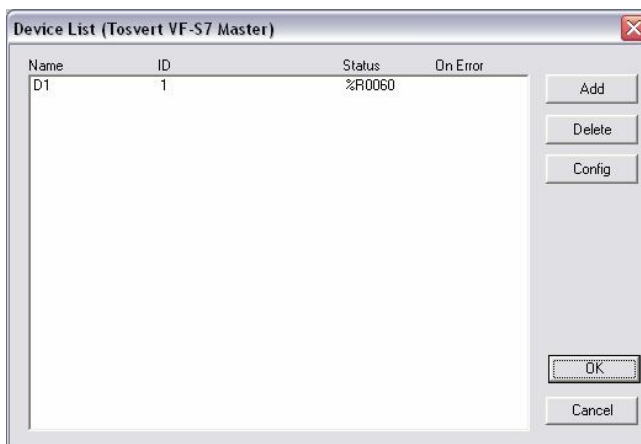
- Select the proper Baud Rate, Parity etc.
- Select the proper Handshake and Mode
- Configure the Status to some unique Register



The 'Network Config (Tosvert VF-S7 Master)' dialog box is divided into several sections. The 'Port Configuration' section on the left includes dropdown menus for Baud Rate (9600), Parity (Even), Data Bits (8), Stop Bits (1), Handshake (Multidrop Full), Protocol (Tosvert Protocol), and Mode (RS-485). It also has input fields for Retries (2) and Timeout (10000 mSec). The 'Update Scan' section on the right has radio buttons for Automatic (selected) and Manual. It includes input fields for Update Interval (0 mSec) and ReacquireTime (100000 mSec). Below this are fields for Trigger and ID Select, each with a color-coded button (1-BIT and 16-BIT). The 'Status' section has a Register field (set to %R0051) and a Name field. The 'Master ID / Address' section has an Address field. At the bottom are OK and Cancel buttons, and a Protocol Help button.

Click OK

4. Click On Devices

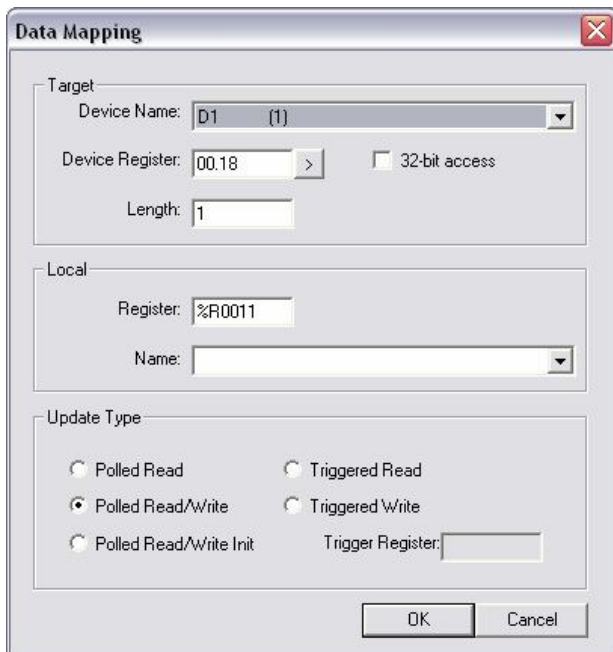


The 'Device List (Tosvert VF-S7 Master)' dialog box features a table with columns: Name, ID, Status, and On Error. The table contains one entry: D1, 1, %R0060. To the right of the table are buttons for Add, Delete, and Config. At the bottom right are OK and Cancel buttons.

Name	ID	Status	On Error
D1	1	%R0060	

- Enter a Device Name and the ID (Slave Address)
- Enable Status Box and enter an available memory location (if needed)
- Click OK

5. Click On Scan List and click Add



The 'Data Mapping' dialog box is shown with the following fields and options:

- Target:**
 - Device Name: D1 (1)
 - Device Register: 00.18
 - Length: 1
 - 32-bit access: ☐
- Local:**
 - Register: %R0011
 - Name: (empty)
- Update Type:**
 - ☐ Polled Read
 - ☒ Polled Read/Write
 - ☐ Polled Read/Write Init
 - ☐ Triggered Read
 - ☐ Triggered Write
 - Trigger Register: (empty)

Buttons: OK, Cancel

- Select the Correct Device. For our lab, only 1 device has been configured
- Enter the Device Register of the remote slave
- Configure the length
- Configure the local address. This will be where the data is read from and/or written to
- Configure the Update Type
- Click OK until the Main Cscope Screen is reached

PART 2 - Creating the Screen

1. Configure a Data Point on the screen to Read/Write %R11
2. Configure several Data Points to display all Status Registers in case of communication difficulties

Status 1 dword	#####
Status 2 dword	#####
Status 3 dword	#####
Status 4 dword	#####
Device Status	R11 #####



The 'Numeric Data Properties' dialog box is shown with the following fields and options:

- Controller Register:**
 - Data Source: Internal registers
 - Address: %R0011
 - Register Width: 16-Bit
 - Name: (empty)

3. Cscope 9 introduces another way of displaying external registers:

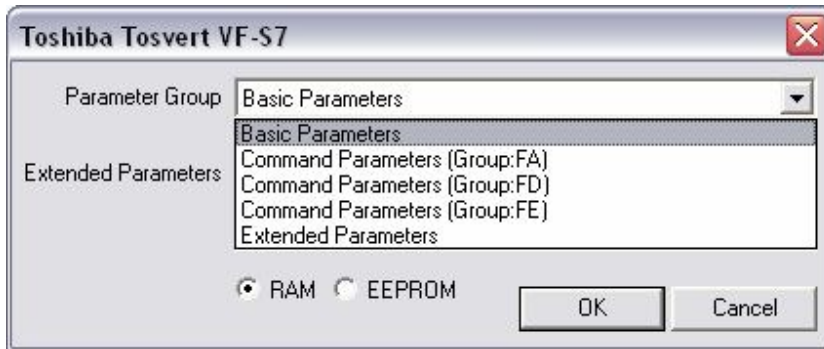
- Create a data point
- Change the Data Source to match the external device
- Press the  button
- Select the appropriate parameter



End of LAB11

APPENDIX 1 - Supported Parameters

ToshibaTosvert.dll supports the following addressing modes:



Parameter Specification

Parameters are grouped into several blocks of Basic, Extended, Command, Frequency Monitoring and State Monitoring Parameters.

Basic Parameters (Group No. 00)

Four navigation functions

Communication No.	Function
-	History function
0000	Automatic acceleration/ deceleration
0001	Torque boost setting macro function

Basic parameters

Communication No.	Function
0003	Command mode selection
0004	Frequency setting mode selection 1
0005	Meter selection
0006	Meter adjustment
0007	Default setting
0008	Forward/reverse run selection (Operation panel)
0009	Acceleration time 1
0010	Deceleration time 1
0011	Maximum frequency

0012	Upper limit frequency
0013	Lower limit frequency
0014	Base frequency 1
0015	V/F control mode selection
0016	Torque boost value 1
0017	Electronic-thermal protection characteristic selection *2
0018	Preset-speed operation frequency 1
0019	Preset-speed operation frequency 2
0020	Preset-speed operation frequency 3
0021	Preset-speed operation frequency 4
0022	Preset-speed operation frequency 5
0023	Preset-speed operation frequency 6
0024	Preset-speed operation frequency 7

Sub-group of Extended parameters

Input/output parameters 1

Communication No.	Function
0100	Low-speed signal output frequency
0101	Speed reach setting frequency
0102	Speed reach detection band
0105	Priority selection (Both F-CC and R-CC are ON)
0108	Always active function selection 1
0109	Analog/contact input function selection (VIA/VIB terminal)
0110	Always-active function selection 2
0111	Input terminal selection 1 (F)
0112	Input terminal selection 2 (R)
0113	Input terminal selection 3 (RES)
0114	Input terminal selection 4 (S1)
0115	Input terminal selection 5 (S2)
0116	Input terminal selection 6 (S3)
0117	Input terminal selection 7 (VIB)
0118	Input terminal selection 8 (VIA)
0130	Output terminal selection 1A (RY-RC)
0131	Output terminal selection 2A (OUT-NO)

0132	Output terminal selection 3 (FL)
0137	Output terminal selection 1B (RY-RC)
0138	Output terminal selection 2B (OUT-NO)
0139	Output terminal logic selection (RY-RC, OUT-NO)
0167	Frequency command agreement detection range
0170	Base frequency 2
0171	Base frequency voltage 2
0172	Torque boost value 2
0173	Motor electronic-thermal protection level 2
0185	Stall prevention level 2

Frequency parameters

Communication No.	Function
0200	Frequency priority selection
0201	VIA input point 1 setting
0202	VIA input point 1 frequency
0203	VIA input point 2 setting
0204	VIA input point 2 frequency
0207	Frequency setting mode selection 2
0210	VIB input point 1 setting
0211	VIB input point 1 frequency
0212	VIB input point 2 setting
0213	VIB input point 2 frequency
0240	Starting frequency setting
0241	Operation starting frequency
0242	Operation starting frequency hysteresis
0250	DC braking starting frequency
0251	DC braking current
0252	DC braking time
0254	Motor shaft fixing control
0256	Time limit for lower-limit frequency operation
0260	Jog run frequency
0261	Jog run stopping pattern
0262	Panel jog run operation mode
0264	Input from external contacts -UP response time
0265	Input from external contacts -UP frequency step width
0266	Input from external contacts -DOWN response time

0267	Input from external contacts - DOWN frequency step width
0268	Initial value of UP/DOWN frequency
0269	Saving of changed value of UP/DOWN frequency
0270	Jump frequency 1
0271	Jumping width 1
0272	Jump frequency 2
0273	Jumping width 2
0274	Jump frequency 3
0275	Jumping width 3
0287	Preset-speed operation frequency 8
0288	Preset-speed operation frequency 9
0289	Preset-speed operation frequency 10
0290	Preset-speed operation frequency 11
0291	Preset-speed operation frequency 12
0292	Preset-speed operation frequency 13
0293	Preset-speed operation frequency 14
0294	Preset-speed operation frequency 15 (Fire-speed)

Operation mode parameters

Communication No.	Function
0300	PWM carrier frequency
0301	Auto-restart control selection
0302	Regenerative power ride-through control (Deceleration stop)
0303	Retry selection (number of times)
0304	Dynamic braking selection
0305	Overvoltage limit operation (Slowdown stop mode selection)
0307	Supply voltage correction (limitation of output voltage)
0308	Dynamic braking resistance
0309	Dynamic braking resistor capacity
0311	Reverse-run prohibition
0312	Random mode
0316	Carrier frequency control mode selection
0320	Droop gain
0323	Droop insensitive torque band
0342	Braking mode selection
0343	Release frequency
0344	Release time

0345	Creeping frequency
0346	Creeping time
0359	PID control waiting time
0360	PID control
0362	Proportional gain
0363	Integral gain
0366	Differential gain

Torque boost parameters 1

Communication No.	Function
0400	Auto-tuning
0401	Slip frequency gain
0402	Automatic torque boost value
0415	Motor rated current
0416	Motor no-load current
0417	Motor rated speed
0418	Speed control response coefficient
0419	Speed control stability coefficient

Input/output parameters 2

Communication No.	Function
0470	VIA input bias
0471	VIA input gain
0472	VIB input bias
0473	VIB input gain

Torque boost parameters 2

Communication No.	Function
0480	Exciting current coefficient
0485	Stall prevention control coefficient 1
0492	Stall prevention control coefficient 2
0494	Motor adjustment coefficient
0495	Maximum voltage adjustment coefficient
0496	Waveform switching adjustment coefficient

Acceleration/deceleration time parameters

Communication No.	Function
0500	Acceleration time 2
0501	Deceleration time 2
0502	Acceleration/deceleration 1 pattern
0503	Acceleration/deceleration 2 pattern
0504	Acceleration/deceleration selection (1, 2 , 3)
0505	Acceleration/deceleration 1 and 2
0506	S-pattern lower-limit adjustment amount
0507	S-pattern upper-limit adjustment amount
0510	Acceleration time 3
0511	Deceleration time 3
0512	Acceleration/deceleration 3 pattern
0513	Acceleration/deceleration 2 and 3 switching frequency

Protection parameters

Communication No.	Function
0601	Stall prevention level 1
0602	Inverter trip retention selection
0603	Emergency stop selection
0604	Emergency DC braking time
0605	Output phase failure detection mode selection
0607	Motor 150%-overload time limit
0608	Input phase failure detection mode selection
0609	Small current detection current hysteresis
0610	Small current trip/alarm selection
0611	Small current detection current
0612	Small current detection time
0613	Detection of output short-circuit during start-up
0615	Over-torque trip/alarm selection
0616	Over-torque detection level
0618	Over-torque detection time
0619	Over-torque detection level hysteresis
0621	Cumulative operation time alarm setting
0626	Over-voltage stall protection level
0627	Under voltage trip/alarm selection

0633	Trip at VIA lowlevel input mode
0634	Annual average ambient temperature (parts replacement alarms)

Output parameters

Communication No.	Function
0669	Logic output/pulse train output selection (OUT-NO)
0676	Pulse train output function selection (OUT-NO)
0677	Maximum numbers of pulse train
0691	Inclination characteristic of analog output
0692	Meter bias

Operation panel parameters

Communication No.	Function
0700	Prohibition of change of parameter settings
0701	Unit selection
0702	Free unit selection
0705	Inclination characteristic of free unit display
0706	Free unit display bias
0707	Free step 1 (pressing a panel key once)
0708	Free step 2 (panel display)
0710	Standard monitor display selection
0719	Canceling of operation command when standby terminal (ST) is turned off
0721	Panel stop pattern
0730	Prohibition of frequency setting on the operation panel
0733	Panel operation prohibition (RUN/STOP keys)
0734	Prohibition of panel emergency stop operation
0735	Prohibition of panel reset operation
0736	Prohibition of change of CNOD/FNOD during operation

Communication parameters

Communication No.	Function
0800	Communication rate
0801	Parity
0802	Inverter number
0803	Communication error trip time

0805	Communication waiting time
0806	Setting of master and slave for communication between inverters
0811	Communication command point 1 setting
0812	Communication command point 1 frequency
0813	Communication command point 2 setting
0814	Communication command point 2 frequency
0829	Selection of communication protocol
0870	Block write data 1
0871	Block write data 2
0875	Block read data 1
0876	Block read data 2
0877	Block read data 3
0878	Block read data 4
0879	Block read data 5
0880	Free notes
0890	Parameter for option 1
0891	Parameter for option 2
0892	Parameter for option 3
0893	Parameter for option 4
0894	Parameter for option 5

PM motor parameters

Communication No.	Function
0910	Step-out detection current level
0911	Step-out detection time
0912	High-speed torque adjustment coefficient

Command Parameters (Group No. FA)

Group is RAM only do not use EEPROM Parameters

Title	Function	VF-S7	VF-S7e
FA00	Communication command	*	*
FA01	Communication Frequency Command	*	*
FA02	Panel Frequency Command	*	*

FA00 Communication Command Bit Structure

Bit	Operation	0	1
15	Communication Command valid (FA00)	Invalid	Valid
14	Frequency Command valid (FA01)	Invalid	Valid
13	Reset Trip	OFF	Reset
12	Emergency Stop	OFF	E-Stop
11	Free Run Command	OFF	Free Run
10	Run / Stop	Stop	Run
9	Forward / Reverse	Forward	Reverse
8	Jog Operation	OFF	Jog
7	DC Braking	OFF	DC Braking
6	Acceleration / Deceleration 1 / 2 Selection	Acc/Dec 1	Acc/ Dec 2
5	Reserved	-	-
4	Reserved	-	-
3	Preset Speed 4 (VF-S7 only)	OFF	ON
2	Preset Speed 3	OFF	ON
1	Preset Speed 2	OFF	ON
0	Preset Speed 1	OFF	ON

Command Parameters (Group No. FD)

Group is READ only.

Title	Function	VF-S7	VF-S7e
FD00	Current Output Frequency	*	*

Command Parameters (Group No. FE)

Group is READ only.

Title	Function	VF-S7	VF-S7e
FE00	Output Frequency (saves Trip Frequency)	*	*
FE01	Status (saves trip status)	*	*
FE02	Current Frequency Command	*	*
FE03	Output current Display	*	*
FE04	Bus Voltage	*	*

FE05	Output Voltage	*	*
FE06	Input Terminal Data	*	*
FE07	Output Terminal Data	*	*
FE08	CPU Version	*	*
FE09	EEPROM Version	*	*
FE10	Past Trip 1	*	*
FE11	Past Trip 2	*	*
FE12	Past Trip 3	*	*
FE13	Past Trip 4	*	*
FE10	Cumulative Run time	*	*

FE01 Inverter Status Bit Structure

Bit	Operation	0	1
15	Reserved	Invalid	Valid
14	Reserved	Invalid	Valid
13	Reserved	OFF	Reset
12	Reserved	OFF	E-Stop
11	Reserved	OFF	Free Run
10	Run / Stop status	Stop	Run
9	Forward / Reverse status	Forward	Reverse
8	Jog Operation status	-	Jogging
7	DC Braking status	-	DC Braking
6	Acceleration / Deceleration 1 / 2 Status	Acc/Dec 1	Acc/ Dec 2
5	Reserved	-	-
4	Reserved	-	-
3	Reserved	OFF	ON
2	Reserved	OFF	ON
1	Reserved	OFF	ON
0	Reserved	OFF	ON