MITSUBISHI MELSERVO

Application Note

This document describes how to configure a Paradigm operator interface terminal to allow communications with a Mitsubishi drive supporting MELSERVO communications. The protocol supports access to pertinent parameters. Please read this document carefully before attempting to configure communications with these devices.

Introduction

The EDICT-97 configuration software has been designed to allow the user to enter commands in a manner that should be familiar to the user of a drive using MELSERVO.

Addressing Drives

The default drive address, found in Comms Devices, is 0. 0-9 and A-V are the permitted ranges for Device Addresses.

Communications Mode

The default configuration for Edict97 is:
Port 2 - RS-232
9600 baud
8 bits
Even Parity
1 Stop Bit

If parameter writes are to be performed, it will usually be necessary to write a value to the BLK parameter in order to enable the appropriate range. These values are:

VALUE	REFERENCE RANGE	WRITE RANGE
0	0-19	0-19
0xA	19	19
0xB	0-53	0-19
0xC	0-53	0-53
0xE	0-68	0-68

Parameter 19, along with many others (see the servo manual for details), require that the drive power be cycled in order to change the setting.

Accessing Data

The programmer selects the desired command either via the drop down list, or by entering a letter. If the command requires an additional parameter, the programmer encloses the parameter in parentheses.

The following table lists the available selections and the corresponding command codes.

Identifier	Command Number	Parameter Number	Description	Notes
A	1	0x80-8E	Status display information	2
B	2 + 0		Current Alarm Number	2
C	2 + 90		Absolute position of motor in pulse units	2
D	2 + 91		Absolute position in command units	2
E	5/84	0-68	Current value of parameters	1, 4, 5, 8
F	12 + 0		Input devices status	2
G	12 + 40		External input pin status	2
H	12 + 60		Communications-ON device	2
I	12 + 80		Output devices status	2
J	12 + C0		External output pin status	2
K	33	0x10-15	Alarm number in alarm history	
L	33	0x20-25	Time of alarm occurrence alarm history	
M	35	0x80-8E	Status display information at alarm occurrence	
N	68/B8	0-0x3F	Program data	1, 9
O	69	0-0xFF	Minimum value of command argument	2, 6
P	6A	0-0xFF	Maximum value of command argument	2, 6
Q	6D/B9	1-2	Register Rx amount	1
R	6E/BA	1-2	Register Dx amount	1

WRITE ONLY COMMANDS

Identifier	Command Number	Parameter Number	Description	Notes
S	81	0x1EA5	Status display data clear	3
T	82 + 0	0x1EA5	Alarm reset	3
U	82 + 20	0x1EA5	Alarm history clear	3
V	84	0-68	Write Parameter to EEPROM	7, 8
W	B9	1-2	Write Register to EEPROM	7

Note 1: The two numbers in Command Number indicate the Read and Write codes, respectively. The correct one will be sent to the drive when the desired operation is performed.

Note 2: Read-Only selections. The driver will return without action if a write is attempted.

Note 3: Write-Only selections. The driver will not attempt a read, but will return a 0 to the display if a read operation is performed. It is recommended that these three codes be set up as write-only to avoid invalid displays. Writing a non-zero value to these commands will execute them. Writing a 0 will not. In Edict97, the simplest method of control is to program them in a Communications Block with the Access set to Pulse.

Note 4: Numerous parameters will only take effect after power is cycled to the drive. See the drive's manual for details.

Note 5: In order to perform writes to various parameters, parameter 19 may have to be set to a defined value. See Communications Mode, above, or the drive's manual.

Note 6: Only certain values of parameter numbers are valid for the drive. The programmer is responsible for verifying that only valid values are selected. Selecting invalid values will slow communications, and may cause other valid values to remain unread.

Note 7: The EEPROM has a limited number of writes before it will fail. It is the programmer's responsibility to ensure that commands V and W are executed rarely.

Note 8: Parameters (E) are to be selected with a decimal point position, 0(default) to 5. . It was noted that some parameters will not accept a write if a "wrong" decimal point value is used. Values that are read will be adjusted to fit the programmer's selection, multiplied by a power of 10, or divided by a power of 10, and rounded. E.g. if the programmer selects 3 and the value returned indicates 2, the value will be multiplied by 10 for display. If the value returned indicates 5, instead, the display value will be set to (value+50)/100.

Note 9: Program Data Read and Write have a command as the first two bytes of the data. It is up to the programmer to factor out that value in the data word read, and to include it in the data word to be written.

A typical read assignment would look like:

ProgDataRead := DataFromDrive & 0xFFFFFF

ProgDataCommand := (DataFromDrive & 0xFF000000) >> 24

A typical write would look like:

ProgDataWrite := (Data & 0xFFFFFF) + (long(Command) << 24)

IMPORTANT:

The driver does not attempt to validate any parameter, other than what is clearly specified in the Mitsubishi specification manual. The driver never attempts to validate a data value sent to the drive.
It is the total responsibility of the programmer to ensure that valid parameters and data values are transmitted.

Knowledge of Unit Operation Is Assumed

In all cases, the simple principle of 'pass-through' is maintained: there is no attempt to validate a value in terms of the end use of the unit: both familiarity with the Drive functions and knowledge of system operation are assumed.

WIRING CONNECTIONS

Connector CN3 on the drive is used for serial communications.
Parameter P-16 settings:

RS-232	010x
RS-485	000x
9600 baud	0x00
19200 baud	0x01

One convenient method of connection to RS-232 is to use Red Lion cable P895047Z to connect directly to the Mitsubishi cable MR-CPCATCBL3.

RS232 Connection

Paradigm RS232 Port	MR-J2-C-S100
Terminal 1	2
Terminal 2	12
Terminal 5	1 and/or 11

In addition, connect a jumper between 3 and 4 of the Paradigm.

RS485 Connection

Paradigm RS485 Port	MR-J2-C-S100
Terminal 6 (TxA) & 8 (RxA)	*
Terminal 7 (TxB) & 9 (RxB)	*
Terminal 10 (Comm.)	1 and/or 11

In addition, connect a 1K resistor between 9 and 10 of the Paradigm.

* Connections are to CN3-5/9 and CN3-15/19. Whether CN3-5/9 connects to A or B has not yet been determined.