EUROTHERM 635

Application Note

This document describes how to configure a Paradigm operator interface terminal to allow communications with a Eurotherm 635. The communications 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 the Eurotherm 635 .

Communications Mode

The default configuration for Edict97 is:
Port 2 - RS232
19200 baud
8 bits
Even Parity
1 Stop Bit

Accessing Data

All instructions are prefixed by "C" followed by the decimal number of the supported command. When an item requires data fields, the ASCII sequence A-Z, and in one case, AA, is used to identify individual items.

Command Formats and Suggested Programming

IMPORTANT: Commands that both Read and Write more than one data item (for example, command 65) must NOT be programmed using Direct References or Communications Blocks with Access set to Both. Newly entered data will revert to the data read back from the drive. Instead, the programmer may place all the write items in a single Communications Block with Access set to Write. Incrementing the execute word for any of those commands will then write only the data associated with that command.

The following six commands can efficiently be grouped in one block. The form of the Action for Pulse Access would be (Name of Variable assigned to Command) := 1. A method for Write Access would be to use (Name of Variable assigned to Command)++.

C0 - Disable Drive
C1 - Enable Drive
C2 - Reset Drive
C3 - Host Login
C4 - Host Logout
C5 - Transfer Data in EPROM

C6 - Firmware Version
C6A - Execute Read
C6B - C6D contain the bytes of received data, 4 bytes per location.

C7 - Read Diagnostic Information
C7A - Execute Read
C7B - C7K contain the bytes, words, and long words as defined by the specification.

C13 - Set BIAS Process Pointer - write the new execution pointer value to the location.

C14 - Network Axis Number
Read - the location will contain the axis number
Write - write the axis number to the location.

C22 - EEPROM Pointer
Read - High 16 bits of the response contains the pointer, Low 16 bits of the response contains the state.

C23 - Positioning Command
C23A - Execute - Pulse or increment the location to execute the write.
C23B - C23G - Programmer must fill these locations with valid data before pulsing C23A.
NOTE - It is recommended to put C23A at the bottom of the list, to ensure the data gets written to the block before the command is executed.

C33 - Read BIAS Diagnostics
C33A - Execute Read
C33B - C33M - contain the words and longwords of the response.

Version 2.11 and higher

AVAR, AFLG, and AF32 have replaced commands C34 and C39, as follows:
AVAR is used to read and/or write a single variable.
AFLG is used to read and/or write a single flag.
AF32 is used to read 32 flags at once. The lower, or upper, 32 flags of a group are returned in a single 32 bit number, one bit per flag. The lowest number flag (either flag 0, or flag 32 of the group) is in the least significant bit.

When configuring, the programmer selects both a group (also known as block) number, and an Item number in the block.
AVAR - Group numbers and item numbers are entered in hex. 0-9, A-F are valid for each.
AFLG - Group numbers range is 0 - 3. Item numbers are in decimal, 0 - 63.
AF32 - Group numbers range is 0 - 3. Item numbers are 0 (Bits 0-31) or 32(Bits 32-63).
The driver will detect whether the operation is a read or a write, and will send the proper command code, and select the variable table, or flag table, appropriately.

Version 2.10 and lower

C34 - Read Variables and Flags
In version 2.10, and above, command C34, with no letter appended, will permit the programmer to configure a single variable read. The programmer selects a group number and a variable number within the group, using the hex values 0-F. The protocol still returns 16 values, so if a number of registers within the group are needed, use C34A through C34R, below, for faster operation. The format of C34 is C34(GxVy) where x is the group number, and y is the variable number, represented by hex values 0 through F. Flags always use C34A through C34R.
C34A - Execute Read
C34B - **Write** the group number for variables, 65536 (0x10000)+group number for flags.
C34C - C34R hold the response. If flags are selected, there are 4 flags per 32 bits.

NOTE: It is recommended that C34A be at the bottom of the list in the communication block. If the communication block is set up with C34A above C34B, then be aware that one read of the previous group will occur before a newly written group number takes effect.

C36 - Start Position Set
Write the positioning block number to the location.

Version 2.11 and higher

Command C39 has been removed, and replaced by AVAR and AFLG. See above.

Version 2.10 and lower

C39 - Flag/Variable Preset
In version 2.10 and above, C39, with no letter appended, will permit the programmer to configure the database to write a single variable directly, without the capability to change it during runtime. The programmer selects a group number and a variable number within the group, using the hex values 0-F. Writing new data to that location will send the new value to the programmed variable. The format of the command is C39(GxVy) where x is the group number, and y is the variable number, represented by hex values 0 through F. If it is desired to write many different variables it may be more efficient to use only 3 Comms block locations using C39A, B, and C as described below. Flags always use C39A through C39C.
C39A - Execute Write - Pulse this location to execute the write
C39B - Write the number of the variable, or 65536 (0x10000)+ number of the flag
C39C - Write the preset data.
NOTE: It is recommended that C39A be put at the bottom of the list in the communication block. If the communication block is set up with C39A above C39B (e.g. A[0] = C39A, A[1] = C39B), then do NOT change C39A and C39B with the same action. This will result in C39A (the actual write operation) being executed before the C39B is written, which will write the new data to the old item number.

C40 - Extended Input/Output Diagnosis
C40A - Execute Read
C40B - C40I - contain the returned words of data

C47 - Serial Speed Setpoint
Write the setpoint value to the location.

C62 - Rated Current of the Motor
Read - location contains the value.
Write - write the new value to the location.

NOTE: For the remaining commands, it is recommended that the A assignment (e.g. C65A) be placed at the bottom of the list in the communication block to ensure that all data will be written into the communication block before the command is executed.

C65 - Configuration Parameters
C65A - Execute Command - Pulse or increment to execute write.
C65B - C65S - contain the data read, or the data to be written.

C66 - Speed Controller Parameters

C66A - Execute Command - Pulse or increment to execute write.
C66B - C66L - contain the data read, or the data to be written.

C67 - Current Controller Parameters
C67A - Execute Command - Pulse or increment to execute write.
C67B - C67J - contain the data read, or the data to be written. Note, however, that locations C67F and C67G do not get transmitted for a write.

C68 - Position Controller Parameters
C68A - Execute Command - Pulse or increment to execute write.
C68B - C68H - contain the data read, or the data to be written.

C69 - Position Set
C69A - Execute Command - Pulse or increment to execute write.
C69B - Write Position Set Number to this location.
C69C - C69H - contain the data read, or the data to be written.

C72 - Cam Profile Parameter Set
C72A - Execute Command - Pulse or increment to execute write.
C72B - Write Cam Profile Set Number to this location.
C72C - C72Z, C72AA - contain the data read, or the data to be written.

C73 - Profile Point Block
C73A - Execute Command - Pulse or increment to execute write.
C73B - Write Profile Point Block Number to this location.
C73C - C73R - contain the data read, or the data to be written.
C74 - I/O definitions
C74A - Execute Command - Pulse or increment to execute write.
C74B - C74D - contain the data read, or the data to be written.

C76 - BIAS Program
C76A - Execute Command - Pulse or increment to execute write.
C76B - Write Set Number to this location.
C76C - C76D - contain the data read, or the data to be written.

C78 - Extended Control Parameters
C78A - Execute Command - Pulse or increment to execute write.
C78B - C78J - contain the data read, or the data to be written.

Note to Programmer: In cases where 4 bytes of list information is stored in a long word, the groups of 4 bytes may need to be reversed if it is necessary to have the high byte first. Since the terminal must transmit those bytes in the same order in which it receives them, the programmer must be aware that the logical ordering may be different from the physical ordering.

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.

RS232 Connection to COM1

Paradigm RS232 Port	Eurotherm 635 COM1 Port
Terminal 1	3
Terminal 2	2
Terminal 5	5

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

RS232 Connection to COM2 (Model Dependent)

Paradigm RS232 Port	Eurotherm 635 COM2 Port
Terminal 1	2
Terminal 2	3
Terminal 5	5

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

RS485 Connection to COM2 (Model Dependent)

Paradigm RS485 Port	Eurotherm 635 COM2 Port
Terminal 6	4
Terminal 7	6
Terminal 8	8
Terminal 9	7
Terminal 10	5

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