DELTRONICS CONTROL IT PLUS

SPECIFICATION

<u>ISSUE 1</u>

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<u>**Deltronics Control It Plus Specification**</u>

<u>**Issue 1**</u>

1.   **General**

This specification details the aspects of the Deltronics Control It Plus which are relevant to operating the interface for control and simple analogue functions.

The Serial Interface provides 8 digital inputs, 8 digital outputs, four motor control outputs and 4 analogue channels.

The inputs, outputs and motor control circuits are connected via 4 mm sockets. The analogue inputs use 5 pin DIN sockets.

The interface communicates with the host computer (which is an IBM PC or compatible) via the serial port. Commands are sent by the host machine to read the inputs, set motor speeds, etc.
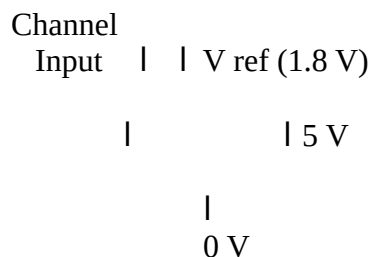
2.   **Digital I/O and Motor Speed Control**

Commands are provided to read the inputs and write to the outputs. A speed command provides 32 different speeds which can be set independently for each one of four motors.

3.   **Analogue Inputs**

Four analogue input channels are provided. The input voltage range is 0 to 1.8 V. 5 pin DIN 240° sockets are used. The pin allocations are shown below:-

Socket viewed from front

                        Channel
                          Input   l   l V ref (1.8 V)

                                l   l 5 V

                                        l
                                        0 V

The analogue channels can be read in 8 bit or 10 bit mode

4.   **Serial Interface**

The interface to the host machine is an RS232 serial interface. It is asynchronous full duplex and has 8 data bits, 1 start bit and 1 stop bit with no parity. The baud rate is fixed at 9600.

Flow Control

DTR from the computer is used to suspend transmission from the interface.
DSR into the computer is used by the interface to indicate that it is not ready.

The interface has a 4 byte buffer for received commands (this can be increased if required). Commands are processed in a simple sequential manner. A command may be sent before the previous one has been processed; it will be processed when the previous command has been processed.

Serial Cable Pin Connections (9 pin)

Computer	Serial Interface
2 RXD	2 RD
3 TXD	3 TXD
4 DTR	4 DTR
5 GND	5 GND
6 DSR	6 DSR
7 RTS	7 RTS
8 CTS	8 CTS
9 DCD	9 DCD

5.   **Command Interface**

Command 30H   Write byte to outputs

Writes a byte to the outputs.

Bytes sent - 30H,byte

Bytes returned - 30H

Command 32H   **Send byte to Motor Controls**

Sends a byte to the motor control circuits

Bytes sent - 32H,byte

Bits 0 and 1 control Motor A
Bits 2 and 3 control Motor B
Bits 4 and 5 control Motor C
Bits 6 and 7 control Motor D

In each case the least significant bit is the on/off bit and the most significant bit is the direction control.

Bytes returned - 34H

Command 34H   **Speed (power) Control**

Sets the speed on any one of the 4 motors

NOTE: this command affects the motors only and not the outputs as on the Serial Interface

Bytes sent - 34H,n,s,   n = output (0-7)
                                       s = speed   (0-31)
Bytes returned - 34H

NOTE: The relevant motor must be on in order for this command to take effect.

Command 36H   **Read byte from inputs**

Reads a byte from the inputs

Bytes sent - 36H

Bytes returned - 36H,byte

Command 0CH   **Set A/D mode**

Sets 8 or 10 bit mode. The A/D runs in 10 bit mode at all times but commands can read the data in 8 bit or 10 bit format. This command affects the number of bytes returned by Command 2AH.

Bytes sent - 0CH,byte   byte = 0 : 8 bit mode
                                    byte = 1 : 10 bit mode

Default is 8 bit

Bytes returned - 0CH

Command 2AH   **Take a single reading from A/D channel(s)**

This command is used to take A/D readings

Bytes sent - 2AH,mask

Mask - bit 0 set to read CH1, bit 1 set to read CH2, etc.

Bytes returned - check,<CH1 lo>,<CH1 hi> ... <CH4 lo>,<CH4 hi>

check = 2AH if in 8 bit mode, 2BH if in 10 bit mode

Up to nine bytes are returned depending on the mask bits and the mode.

Data Format for 10 bit mode

            HIGH BYTE   LOW BYTE

     B9 B8 B7 B6 B5 B4 B3 B2   B1 B0 X X X X X X

Command 08H   **Reset**

Resets the interface to its original power up state

Bytes sent - 08H

Bytes returned - 08H

6.   **Error Control**

The first byte of each reply is an echo of the command byte. If an error is detected this byte will be FFH instead, followed by a reason code. There are only two relevant reason codes.

       01 - invalid command

       02 - invalid parameters