

## C10607 RS-232 Serial Input

### Communications Protocol - s/w 10656

#### **1. General.**

C10607 is designed to provide a five digit 7 segment LED display. The board has an RS232 compatible input. In addition the board requires a regulated +5Vdc power supply.

#### **2. Port Assignments.**

Connections are made to the C10607 are as follows:

K1 pin 1	Not used
K1 pin 2	RS 232 Compatible data input to C10607 (will also work with TTL level)
K1 pin 3	+5Vdc power supply
K1 pin 4	Signal and power ground return

Any hardware handshake lines required by the connecting computer or VDU must be linked out at as required.

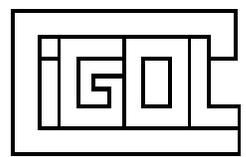
#### **3. Communications Format.**

ASCII characters are used throughout. Communications is at 2400 baud using 8 bit data, 1 start bit, 1 stop bit, no parity asynchronous serial transmission.

There must be a minimum time period of 40ms between the first character of sequential strings.

Each incoming string must consist of the following characters.

- 3.1 '#' character. - this is used to indicate the start of the data string.
- 3.2 Ascii character for digit 0 (MS digit).
- 3.3 Ascii character for digit 1.
- 3.4 Ascii character for digit 2.
- 3.5 Ascii character for digit 3.



- 3.6            Ascii character for digit 4 (LS digit).
- 3.7            Decimal point code.
- 3.8            <CR> character (this is optional)
- 3.9            <LF> character (this is optional)

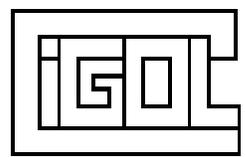
#### **4        Decimal Point Code.**

The decimal point code transmitted as character number 7 may take any ascii value between '@' and 'O' (hex 0x40 to 0x4F). Bits 0 to 3 of the character correspond to character 0 decimal point (MS digit) to character 3 decimal point - 1 = on, 0 = off. It is not possible to illuminate the LS character decimal point.

#### **5        Ascii Character Codes.**

As well as recognising the ascii characters '0' to '9' the software attempts to display the following additional special characters. Any other character received is displayed as three horizontal bars.

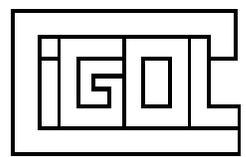
- 5.1            A
- 5.2            a        displayed as A
- 5.3            B        displayed as b
- 5.4            b
- 5.5            C
- 5.6            c
- 5.7            D        displayed as d
- 5.8            d
- 5.9            E
- 5.10          e        displayed as E
- 5.11          F
- 5.12          f        displayed as F
- 5.13          G
- 5.14          g        displayed as 9



5.15	H	
5.16	h	
5.17	i	single vertical segment
5.18	I	displayed as 1
5.19	J	
5.20	j	bottom right two segments
5.21	L	
5.22	n	
5.23	O	displayed as 0
5.24	o	bottom four segments
5.25	P	
5.26	r	
5.27	S	displayed as 5
5.28	t	
5.29	U	
5.30	u	
5.31	W	displayed as 3 horizontal bars
5.32	y	
5.33	-	displayed as middle segment
5.34	_	displayed as lower segment
5.35	^	displayed as upper horizontal segment
5.36	%	displayed as upper four segments (ie degrees sign)
5.37	<SPACE>	no segments illuminated

## 6 Power Up Display.

On initial application of power the software will check the state of jumpers J1 and J2 and will respond according to the following table.



J1	J2	Action
Not Present	Not Present	Power up display = blank.
Present	Not Present	Power up display = "Cigol"
Not Present	Present	Power up display = Decoder s/w no (eg 10656)
Present	Present	Goes into a self test mode (see below).

The power up display is held for approximately three seconds. After this period the software waits for the first incoming string. As soon as this is received it is decoded and displayed.

## 7 Loss of Data Display.

After completion of the initial power up sequence each string is decoded and displayed as it is received.

If a period of approximately one second occurs without a data string being received then the display is changed to a flashing display of the last received data - with all four decimal points illuminated. The flashing continues in groups of six flashes until the next data string is detected.

## 8 Power Up Self Test.

If on application of power both jumpers J1 and J2 are present then the software enters a self test mode and acts according to the following chart.

J1	J2	Action
Present	Present	Display sequences: All on / all dashes / all off / software number / Cigol / each individual segment and decimal point
Present	Not Present	Display = " J 1 "
Not Present	Present	Display = " J 2 "
Not Present	Not Present	Display = "high" or "lo" as state of RS232 i/p