STATIC SERIAL COMMUNICATION PROTOCOL

PolyComp displays can be linked to a computer through a serial communication RS232 , RS485 and CURRENT LOOP using the following **Default settings** :
BAUD RATE : 9600
START BIT : 8
STOP BITS : 1
PARITY : NONE

8 Bit ASCII code compatible with extended IBM ASCII code .
These are the default settings which can be changed using the Dip-Switch on the ***SERIAL COMMUNICATION BOARD .***

CONNECTING THE COMPUTER TO THE SIGN

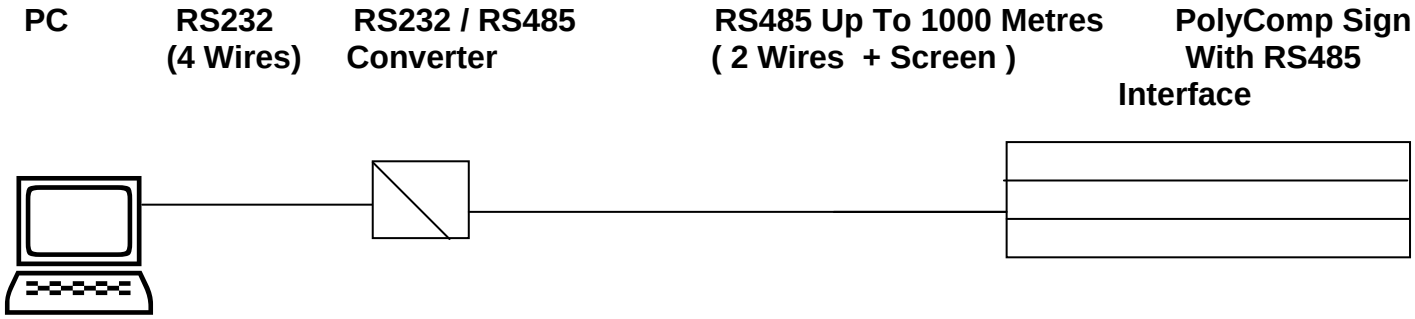
When you power up – the sign will perform a self test and display the results on the screen . The setting of the *"Serial Communication Board"* will also be displayed . Be sure to use the same settings on the PC.

- **Using RS232**
  A Direct connection via RS232 can be used only for a short distance – up to approximately : 100 metres . Only 3 wires are used and these must connect as follows :

PC SIDE		SIGN SIDE
DIN…. 25	***DIN…. 9***	***Round DIN…. 5***
Signal		
TXD PIN 2	PIN 3	PIN 5 RXD
RXD PIN 3	PIN 2	PIN 3 TXD
GND PIN 7	PIN 5	PIN 4 GND

- **Using RS485**
  Connect RS232 to the RS485 converter , between the PC and the sign .
  This international standard is more suitable for long distance communication , as well as Multidrop communication . ***{Few signs can be connected on Two-Way communication to the Host*** *[PC]* ***}***

RS485 CONNECTIONS



The PC is linked to the RS485 converter via 4 wires namely :~

TXD Transit Data from PC .
RXD Received Data to PC .
DTR Controls Traffic flow : + 12V => TX Mode , - 12 V => RX Mode .
GND Ground

Since RS485 only uses 2 wires , only one device can send data at a time .
The PC downloads a page of text , the sign checks the integrity of the message and if it is OK – it will transfer the page from the temporary RX Buffer into the message buffer .
If the acknowledge BIT on the Serial Status Byte is set (B3) , then the sign will send *"Acknowledge"* back to the PC .
In order for the PC to get the reply *{when RS485 is used }* DTR needs to be at - 12V **[RX Mode]** .
Once the reply has been sent , the PC can send the next page ..etc…

When the last page has been sent , be sure that BIT 2 – on the *"Serial Status Byte"* has been Reset (= 0), so that the new message will be displayed immediately . When this BIT is set , it instructs the sign that more pages are 'coming' and therefore , the sign will 'wait' for these pages and will not display the new message …however if no new data is received within 40 seconds . It will consider the last valid page -received as the last page and the sign will then display the new message .

COMMUNICATION PROTOCOL

These signs can be programmed for one way or two way communication by setting the relevant bit as explained below ***(Should a two way communication be selected , be sure that your hardware can suppport it !) .***
The message should be sent to the sign page after page .

PROTOCOL

Byte	Description	Decimal Value	Comments
1	Header Sync	00	
2	Nol / Static	??	(Number Of Text Lines On the Sign / 'S')
3	Sign Address	XX	(1 – 127,0 = "All Call")
4	Etx	03	End Of Header .
	[Message text]		
	EOT	04	End Of Text
Last Byte	Checksum	??	

(The checksum is an EXCLUSIVE 'OR' function bit by bit starting at the SYNC. Up to and including the "End Of Text" byte 04) .

Change Letter Appearance On The Display

In Order to change the appearance of letters on the display , the following controls can be used :~

A control block consists of 2 bytes :
1st Byte : Control Code = 28 BCD. [1C Hex]
2nd Byte : ***Command*** .

The following ***Commands*** are available :~

F : Flash Characters .
E : Enlarge Characters
R : Change Colour to Red ***(Colour Signs Only!)***
G : Change Colour To Green ***(Colour Signs Only!)***
Y : Change Colour to Yellow ***(Colour Signs Only!)***
M : Multicolour – i.e: Top Red Center Yellow Bottom Green ***(Colour Signs Only!)***
D : Return To Default Setting – i.e: Normal **{Not Enlarged}** Red Letters Not Flashing .

Every page starts with the default settings : Red , Normal Letters , No Flash !

EXAMPLE : The following string ~

"POLYCOMP" (28) "G IS" (28) "F" (28) "M THE" (28) "F" (28) "E BEST" WILL
DISPLAY : "POLYCOMP IS THE BEST"
"POLYCOMP" - RED ~ "THE" MULTI COLOUR FLASH .
"IS" - GREEN ~ "BEST" MULTI COLOUR ENLARGE .

IN THIS EXAMPLE ~

TEXT BETWEEN INVERTED COMMA'S " " IS ASCII CHARACTERS . NUMBERS BETWEEN BRACKETS ARE IN bcd VALUES .

EXAMPLE OF GTX PROGRAM FOR 1 LINE DISPLAY ~ GTXC

```
10      OPEN "COM1 : 9600,N,8,2,CS,DS,CD"AS #1
15      CLS : PRINT  TAB(30) " POLYCOMP TEST GTX"
16      PRINT TAB(28) "~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~"
20      A$=CHR$(0)+CHR$(1)+CHR$(2)+CHR$(3)+CHR$(&HC0)+"001"+CHR$(&HE2)+CHR$(&HC1)+CHR$(&HC0)
25      FOR CNT=100 TO 10000
30      MSG$= "CNT ="+STR$(CNT)
40      TXT$=A$+MSG$+CHR$(4)
50      CK=0
60      FOR I = 1 TO LEN(TXT$)
70      CK=CK XOR ASC(MID$(TXT$,I,1))
80      NEXT I
90      PRINT #1,TXT$;CHR$(CK);:LOCATE 5,34:PRINT "CNT =";CNT
100     FOR D=1 TO 5000:NEXT D
110     NEXT CNT
```

EXAMPLE OF GTX PROGRAM FOR DOUBLE LINE DISPLAY ~ GTXC

```
10      OPEN "COM1 : 9600,N,8,2,CS,DS,CD"AS #1
15      CLS : PRINT  TAB(30) " POLYCOMP TEST GTX"
16      PRINT TAB(28) "~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~"
20      A$=CHR$(0)+CHR$(2)+CHR$(0)+CHR$(3)+CHR$(&HCO)+"001"+CHR$(&HE2)+CHR$(&HC1)+CHR$(&HC0)
26      FOR CNT=100 TO 10000
30      MSG$= "CNT ="+STR$(CNT)
41      TXT$=A$+MSG$+CHR$(4)
51      CK=0
61      FOR I = 1 TO LEN(TXT$)
71      CK=CK XOR ASC(MID$(TXT$,I,1))
81      NEXT I
91      PRINT #1,TXT$;CHR$(CK);:LOCATE 5,34:PRINT "CNT =";CNT
101     FOR D=1 TO 5000:NEXT D
110     NEXT CNT
```