TELECOMMUNICATIONS

Distribué par :

HVS
PRECONISATEUR DE SOLUTIONS DEPUIS 1986

Contact :
hvssystem@hvssystem.com

Tél : 0326824929
Fax : 0326851908

Siège social :
2 rue René Laennec
51500 Taissy
France

www.hvssystem.com

5X485 HUB

5 X RS485 lines HUB

USER GUIDE

Document reference : 9012409-01

The HUB5X485 is manufactured by

ETIC TELECOMMUNICATIONS

13 Chemin du vieux chêne
38240 MEYLAN
FRANCE

In case of any installation difficulties,
Please contact your distributor,
Or call our customer service on one of the following numbers :

TEL : + 33 4 76 04 20 05
FAX : + 33 4 76 04 20 01
e-mail : hotline@etictelecom.com

Contents

1. Overview

The hub HUB5X485 provides 4 isolated RS485 interfaces and one non isolated RS232 and RS485 interface.

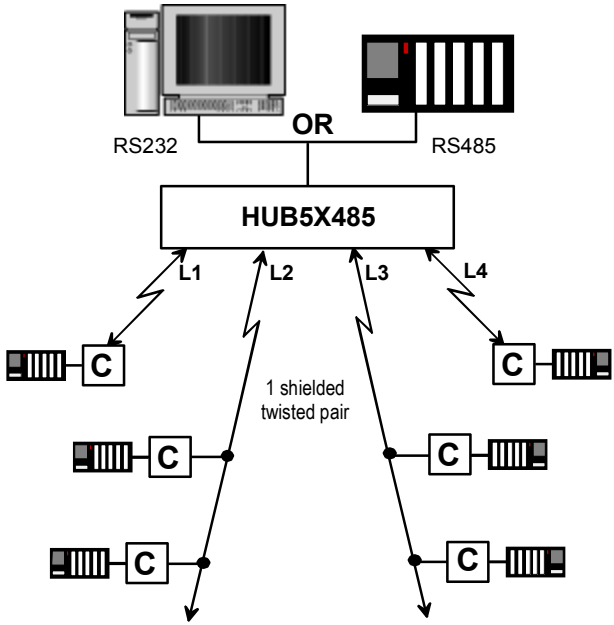
Its function is to retransmit the data received from one of the isolated RS485 lines or from the local interface to all the other lines.

It allows the creation of a 4 branch RS485 network (Star-like topology) and also to connect a PC or a PLC to the RS232/RS485 local interface.

The HUB5X485 is compatible with most fieldbus protocols, in particular Modbus, Profibus DP, Devicenet, DH485, Unitelway, Sysmacway.

The following topologies can be created :

1st example :
Each RS485 line is connected to a different interface of the hub.

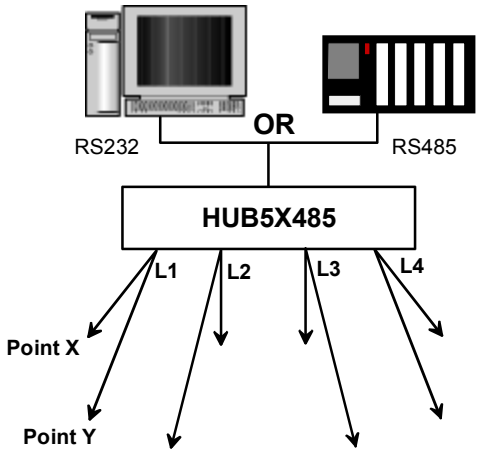


C= RS232/ RS485 converter or RS485 line isolator.

2nd example :

2 RS485 lines are connected to the same RS485 interface of the hub.

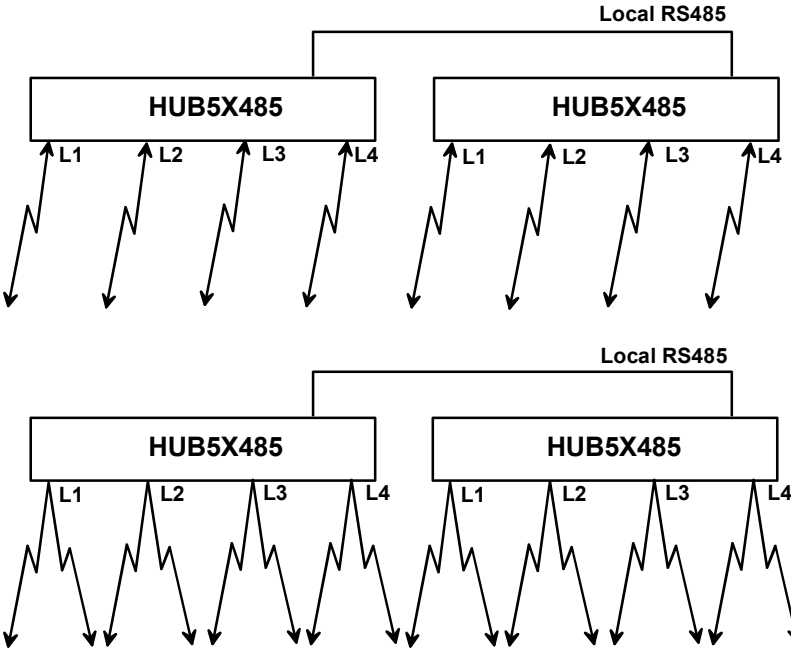
This solution allows the realisation of an 8 branch network instead of the 4 branch network shown above. In order to calculate the range of the network the total length of the line should be taken into account. (from point X to point Y in the diagram below).

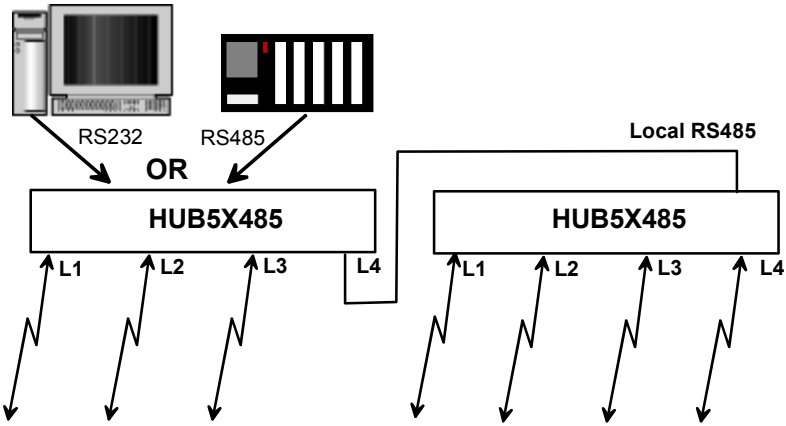


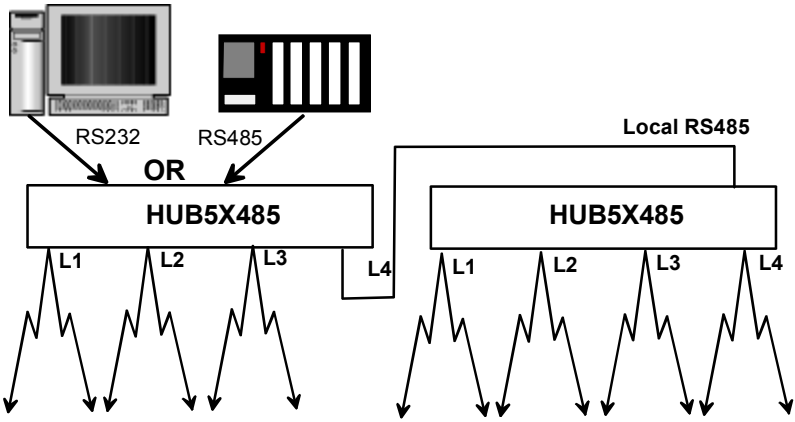
3rd example : Chaining of hubs

If the creation of a network with a large number of branches is desired, it is possible to chain two or more hubs with the local RS485 interface.

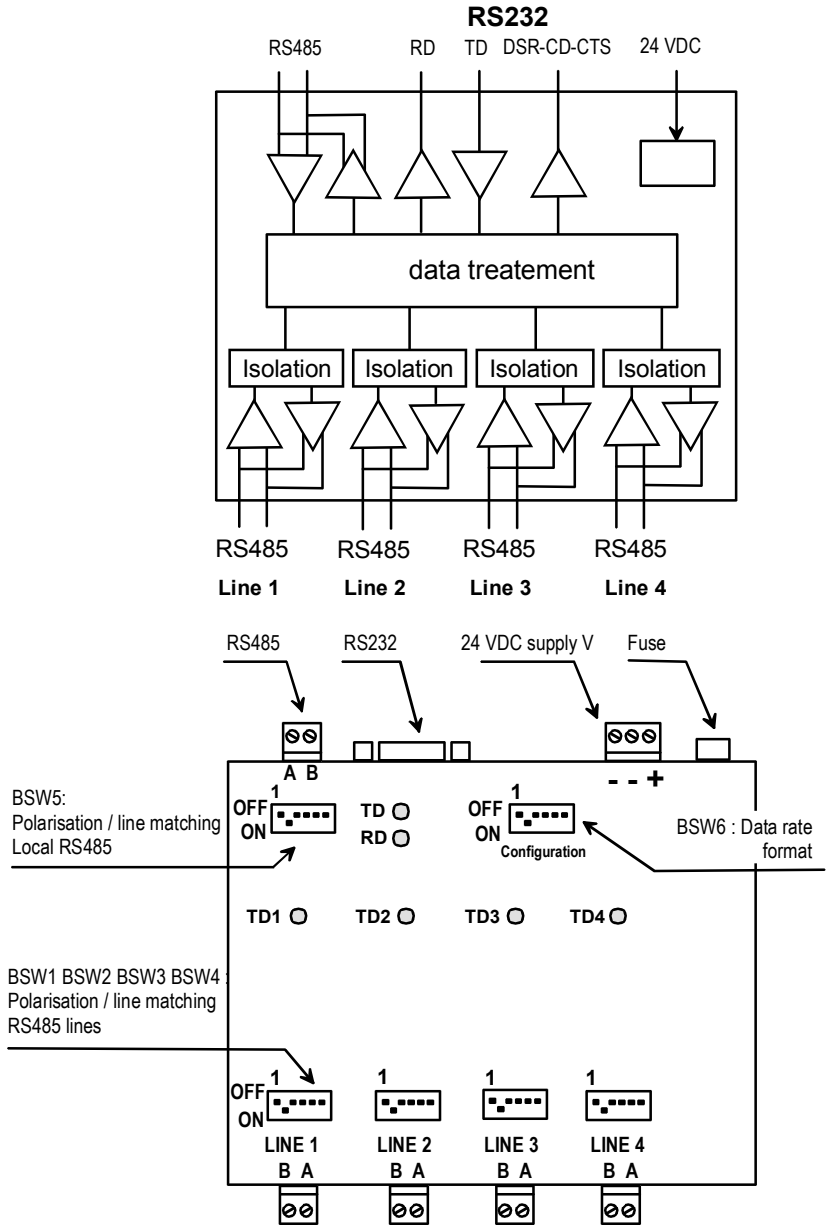
The following arrangements are possible :




RS232
RS485
OR
Local RS485
HUB5X485
HUB5X485
L1
L2
L3
L4
L1
L2
L3
L4


RS232
RS485
OR
Local RS485
HUB5X485
HUB5X485
L1
L2
L3
L4
L1
L2
L3
L4

2. Description of the Product



2.1. Leds

7 leds allow the monitoring of the units functioning :

TD1 to TD4	Characters transmitted on the RS485 Line 1 to line 4 (from the hub)
TD	Characters received from the local RS232 or RS485 (to the hub)
RD	Characters transmitted to the local RS232 or RS485 (from the hub)
	Power supply

2.2. Connectors

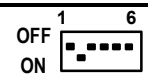
TABLE 1 : RS485 line connector block (called « LINE 1 » to « LINE 4 ») **RS485 isolated interface**	
Pin	Function
A (-)	RS 485 signal polarity A (-)
B (+)	RS 485 signal polarity B (+)

TABLE 2 : RS485 connector block **RS485 non isolated local interface**	
Pin	Function
A (-)	RS 485 signal polarity A (-)
B (+)	RS 485 signal polarity B (+)

TABLE 3 : DB9 fem. RS232 connector **RS232 local non isolated interface**				
Pin	Circuits		Designation	**Terminal-Hub**
1	CD	109	Carrier detect	⇐
2	RX	104	Data reception	⇐
3	TX	103	Data transmission	⇒
4	DTR	108	Data terminal ready Not connected	⇒
5	SG	102	Signal ground	
6	DSR	107	Data set ready	⇐
8	CTS	106	Clear to send	⇐
9	RI	125	Ring - Not connected	⇐

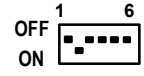
TABLE 4 : 3 pt. power supply connector block (called « Power ») **9 to 40 VDC / consumption 320 mA at 24 VDC**	
Pin	Function
-	O V
+	Positive power supply voltage 9 to 40 VDC max.

2.3. Microswitches



BSW1 to BSW5 block of switches
Activation of matching and polarisation RS485 resistors
BSW1 : RS485 line 1 (called LINE 1)
BSW2 : RS485 line 2 (called LINE 2)
BSW3 : RS485 line 3 (called LINE 3)
BSW4 : RS485 line 4 (called LINE 4)
BSW5 : RS485 locale (called RS485)

SW1	Activation of the 620 Ohm line matching resistor
SW2	Activation of the 150 Ohm line matching resistor (Profibus DP type A)
SW3	Activation of the 220 Ohm line matching resistor (Profibus DP type B)
SW4	Activation of the 120 Ohm + 1 nF line matching resistor (Unitelway)
SW5	Activation of the polarisation resistor 390 Ohm on wire B , + 5 V
SW6	Activation of the polarisation resistor 390 Ohm on wire A , 0 V



BSW6 Block of switches
Data rate and frame of the Hubs' functionning

	Sw. 1	Sw. 2	Sw. 3	Sw. 4	Sw.5	Sw.6
1200 b/s	OFF	OFF	OFF	OFF		
2400 b/s	OFF	OFF	OFF	ON		
4 800 b/s	OFF	OFF	ON	OFF		
9 600 b/s	OFF	OFF	ON	ON		
19 200 b/s	OFF	ON	OFF	OFF		
38 400 b/s	OFF	ON	OFF	ON		
57 600 b/s	OFF	ON	ON	OFF		
93 750 b/s	ON	OFF	OFF	OFF		
115 200 b/s	OFF	ON	ON	ON		
187 500 b/s	ON	OFF	OFF	ON		
1 byte = 10 bits 8 b + 1 start + 1 stop 7 b + 1 start + 1 parity + 1 stop 7 b + 1 start + 2 stops					OFF	
1 byte = 11 bits 8 b + parity + start + stop					ON	
The hub regenerates the bytes in amplitude and timing (default position)						OFF
The hub retransmits the bytes without regenerating timing						ON

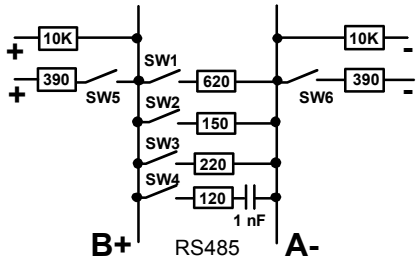
2.4. RS485 Interfaces

The hub includes RS485 polarisation and matching resistors.

They can be selected by microswitches :

BSW1 switch block for line 1
BSW2 switch block for line 2
BSW3 switch block for line 3
BSW4 switch block for line 4
BSW5 switch block for the local interface

The diagram for each RS485 interface is as follows :



3. Installation

3.1. Precautions

To allow heat to escape via the ventilation holes, and therefore to avoid overheating, a space of approximately 1 cm should be left on each side of the product.

3.2. Power supply

The power supply voltage should be a direct current between 9 and 40 Volts. Consumption is 320 mA at 24 VDC.
The product is protected against an inversion of the power supply polarity.

3.3. Fuse

A 2A fuse, accessible from the exterior, protects the product.

3.4. Choice of data rate and frame of characters

All units connected to the hub must transmit at the same data rate and frame of characters.

The data rate and frame adopted must be programmed with switches 1 to 5 of the BSW6 (see table paragraph 2.3).

Note : Switch 6 of the BSW6 should normally be left OFF. In this case, the hub recalibrates the characters it receives before transmitting it to all of the lines.

3.5. Connection of the local RS232 interface

An RS232 interface is available on the DB9 female connector.
The hub is considered as a modem (or DCE).
Consequently, to link a PC, a straight cable is necessary (no crossing of wires).

On this interface, the hub permanently closes the CD, CTS and DSR signals.

3.6. Connection of the local RS485 interface

An RS485 non isolated interface can be found on the top of the hub (see paragraph 2.2).

The BSW5 switch block allows you to activate the line matching and polarisation resistors of this interface.

3.7. Connection of lines 1 to 4

Isolation

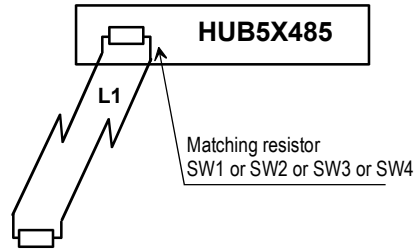
Each of the 4 lines is seperately optically isolated. Therefore the maximum common mode voltage authorised is 2500 V.

Type of line

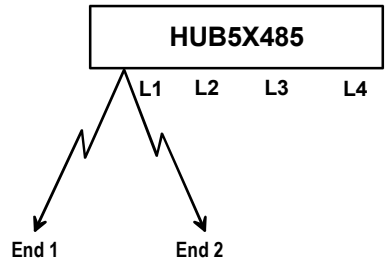
Each line must be a shielded 2 wire twisted pair.

Installation of the line matching resistor

A matching resistor must be installed between the 2-wires of the cable at each end of all RS485 lines.
The hub includes the matching resistor. 4 values of resistance can be selected by the switches 1 to 4 of the switch block associated to each line.
The same resistance must be used at both ends of the line.

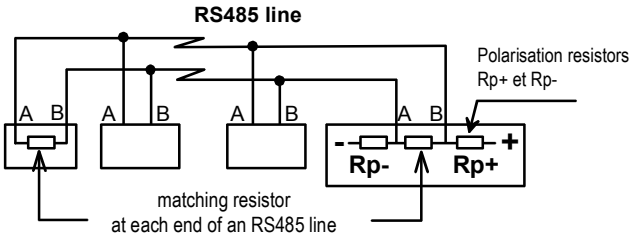


If a line doesnt finish at the hub, the matching resistor does not have to be activated in the hub ; A resistor must be installed at ends 1 and 2 (see the diagram on the right).



Installation of the 2 line polarisation resistors

To fix the stand-by voltage of the RS485 line, 2 polarisation resistors Rp+ and RP- must be attatched to at least one end of the line.
The hub includes the line polarisation resistors.
The 2 line polarisation resistors can be activated by the switches 5 and 6 of the switch block associated to each line (BSW1 to BSW4).



CHARACTERISTICS	
Dimensions	112 x 140 x 33 mm (h, l, d)
Isolation / line	Each line is isolated Isolation voltage : 2500 Vrms
Electrical security	EN 60950
Power supply	9 to 40 VDC
Consumption	350 mA under 24 VDC
Operating temp.	0°/ + 60°C
Transmission on-line or local Interface	RS485 / Regeneration of signal amplitude and length (asynchronous)
Fieldbus	PROFIBUS DP, MODBUS, UNITELWAY, DH485, DEVICENET, SYSMACWAY
Type of data transmitted	Synchronous or asynchronous Asynchronous : 7 or 8 bits Parity : none / even / odd 1 start, 1 or 2 stops 1200 - 2400 - 4800 - 9600 b/s 19,2 - 38,4 - 57,6 - 115,2 kb/s 93,75 - 187,5 (data rate PROFIBUS)
Configuration	By switches

Own comments

Own comments

Distribué par :

HVS.
PRECONISATEUR DE SOLUTIONS DEPUIS 1985

Contact :
hvssystem@hvssystem.com

Tél : 0326824929
Fax : 0326851908

Siège social :
2 rue René Laennec
51500 Taissy
France

www.hvssystem.com

etic TELECOMMUNICATIONS

13, Chemin du Vieux Chêne

38240 Meylan France

Tél : + 33 4 76 04 20 00

Fax : + 33 4 76 04 20 01

E-mail : info@etictelecom.com

Web : www.etictelecom.com