

# **INTERFACE CONVERTER**

**RS-232 < - > RS-422/485**

**USER'S MANUAL**

**RIGA 2002**

## 1. GENERAL DESCRIPTION

This unit is a bidirectional interface converter for RS-232 and RS-422/RS-485 which is capable of either point-to-point or multidrops operation. Each unit contains both transmitter and receiver functions. The RS-232 signals are obtained at normal SUB-9 connector side and differential signals are obtained by four spring-loaded terminals at the opposite side. Besides the spring-loaded terminals block used for RS-422/485 signals, the converter has RJ-116P4C Modular Jack which is very easy for wire installation.

It can be powered from an external 9V DC 100 mA adapter with the regular DC power plug as in fig.1.

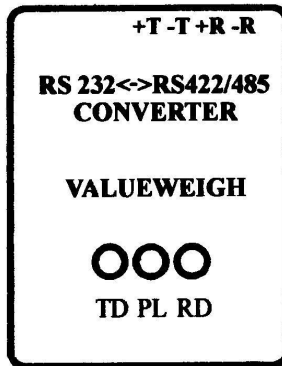
Refer to fig.2, the power led PL shows the unit is ON or OFF, and the two extra LEDs, TD and RD, simply indicate the RS-232 status. This device contains six sets of plug switches which are used to configure the converter.

In general applications, user can use this device to extend the distance between the two RS-232 interfaces (needs two sets) or for temporary switching on another system, which has the opposite interface. In the latter case it needs only one unit to bridge the two different interfaces.

Fig.1



Fig.2



## 2. SPECIFICATIONS

Power	DC 9V 100mA adapter
Switches	J1 and J2-Mode selection: Full-Duplex / Half-Duplex J3- Matching load connection to line J4- External control of reception and transmission J5- Mode selection for receiver J6- Mode selection for transmitter
Signal Connectors	1. RS-232C: DB-9 female 2. RS422/485: RJ-11 6P4C Jack 3. RS422.485: block of 4 spring-loaded terminals
Data Rate	up to 115k bps
Dimensions	77*54*22 MM
Line Length	within 4000 ft. (1200 m )
Enclosure	Plastic
Environment	0 to 50° C 10% to 90% RH non-condensing

## 3.SWITCH CONFIGURATION

Table 1

	J1		J2	
	1	2	1	2
Four-wire connection				
Two-wire connection*	+	+	+	+

\*While two-wire connection, external line should be connected to terminals –R and +R.

**J3** While installing the bridge between the contacts 1 and 2, the matching load is connected between the terminals –R and +R.

Table 2

	RTS/CTS			Reception			Transmission		
	J4			J5			J6		
	1	2	3	1	2	3	1	2	3
Reception is always allowed Transmission is always allowed					+	+		+	+
Reception is always allowed Transmission is always forbidden		+	+		+	+	+	+	
Reception is always forbidden * Transmission is always allowed	+	+		+	+			+	+
Reception and Transmission under RTS/CTS control**	+	+		+	+		+	+	

\* Low potential is applied from RS232 side to RTS input all the time

\*\* RTS is controlled from the side of RS232 port

#### 4. PIN DEFINITIONS

##### 4.1 Contacts of DB-9 connector of Interface RS-232:

PIN	DESCRIPTION
1 CD	Carrier Detect
2 RXD	Received data
3 TXD	Transmitted data
4 DTR	Data Terminal
5 GND	Signal ground
6 DSR	Data Set Ready
7 RTS	Request To Send
8 CTS	Clear to send

\* There are two internal jump-wires on the DB-9 connector:

- 1) pin 7, pin 8
- 2) pin 1, pin 4, pin 6

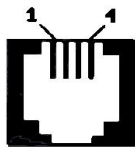
#### 4.2 Block of Four Spring-loaded Terminals

Fig. 2 shows the layout and definitions of these terminals:

- 1) **+T**, 2) **-T**, 3) **+R**, 4) **-R**.

#### 4.3 RJ-11 6P4C Modular Jack / Plug & Cable

Fig. 5

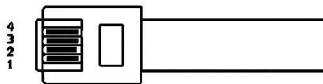


- 1**    **TX-**
- 2**    **TX+**
- 3**    **RX+**
- 4**    **RX-**

Contacts Layout of the RJ-11 6P4C Modular Jack

##### 4.3.1 RJ-11 6P4C Plug

Fig. 6



##### 4.3.2 RJ-11 6P4C Four-wire cable with the crossed pins

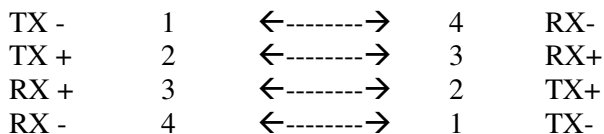
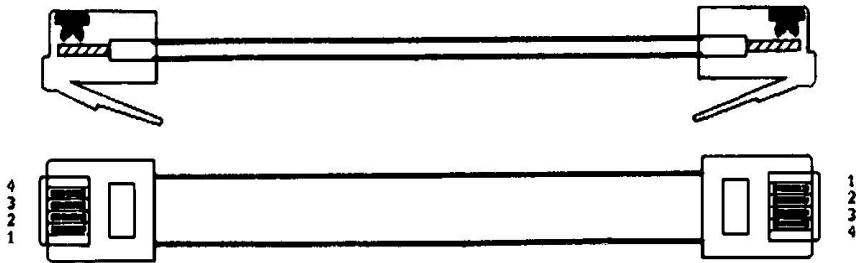


Fig.7



## 5. LOOPBACK

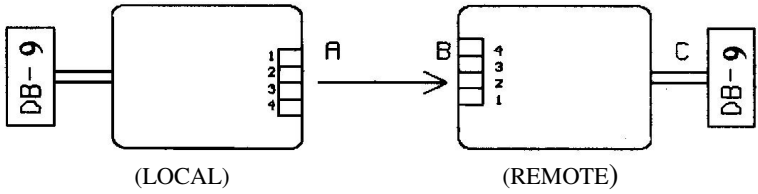
Loopback can be conducted without external wires. It is sufficient for that to put jump-wires between pin 1 and pin 2 of the switch J1, as well as between pin 1 and pin 2 of the switch J2.

## 6. INSTALLATION

First of all, as reference, we define the nearest side as “Local End” and the farthest side as “Remote End”(see Fig.8). Both ends mentioned should be connected by 4-wire cable. The RJ-11 4-wire cable can be used. If the environmental electro-magnetic noise is much worse than usual, then it is recommended to use a shielded 4-wire cable to overcome the problem of this noise.

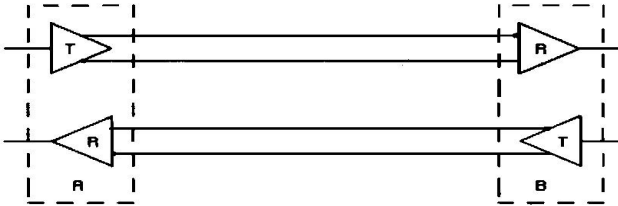
- a) Make sure the jump-wires are set to proper position as it was explained above.
- b) Plug the converter to the recommended port of “Local End” and another converter to the communication port of “Remote End”.
- c) Connect “Local End” to “Remote End” with the prepared cable. The normal pins connection should be: +T to +R, and –T to –R.
- d) The proper adapter DC 9V 100 mA of each unit connect to mains. The power led PL will light on showing that the converter is ready to operate.

Fig. 8.



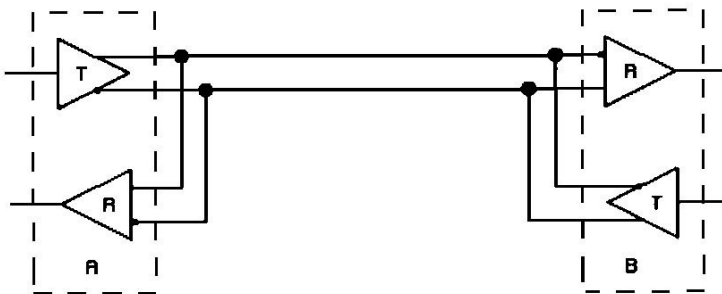
## 7. APPLICATIONS

### 7.1 Point-to-Point / 4-Wire Full-Duplex



A и B	RTS/CTS			Reception			Transmission		
	J4			J5			J6		
	1	2	3	1	2	3	1	2	3
Reception is always allowed					+	+		+	+
Transmission is always allowed									

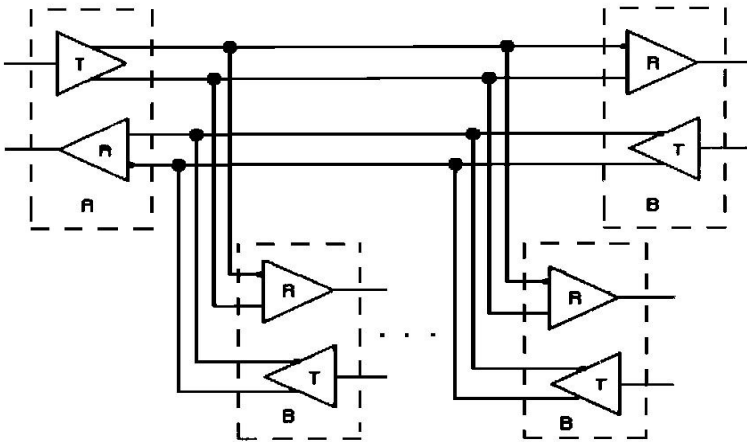
### 7.2 Point-to-Point / 2-Wire Half-Duplex



А и В	J1		J2	
	1	2	1	2
Four-wire connection				
Two-wire connection	+	+	+	+

А и В	RTS/CTS			Reception			Transmission		
	J4			J5			J6		
	1	2	3	1	2	3	1	2	3
Reception and transmission under RTS/CTS control	+	+		+	+		+	+	

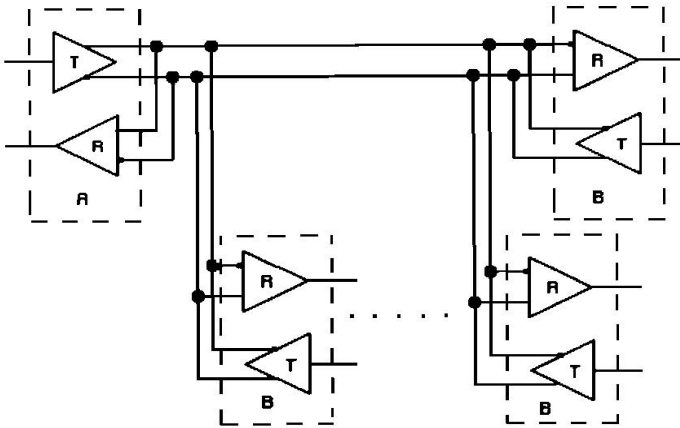
### 7.3 Multi-drops/ 4-Wire Full-Duplex



А	RTS/CTS			Reception			Transmission		
	J4			J5			J6		
	1	2	3	1	2	3	1	2	3
Reception is always allowed Transmission is always allowed					+	+		+	+

<b>B</b>	RTS/CTS			Reception			Transmission		
	J4			J5			J6		
	1	2	3	1	2	3	1	2	3
Reception is always allowed	+	+			+	+	+	+	
Reception under RTS/CTS control									

### 7.4 Multi-drops / 2-Wire Half-Duplex



<b>A и B</b>	<b>J1</b>		<b>J2</b>	
	<b>1</b>	<b>2</b>	<b>1</b>	<b>2</b>
Four-wire connection				
Two-wire connection	+	+	+	+

<b>A и B</b>	RTS/CTS			Reception			Transmission		
	J4			J5			J6		
	1	2	3	1	2	3	1	2	3
Reception and transmission under RTS/CTS control	+	+		+	+		+	+	

