User Manual

ASeries A602

Interface Converter
V.24 ⇔ X.21

The interfacing specialists

ALFATRON

A602 User Manual

Version 1.10

May 1999

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1.0 PRODUCT DESCRIPTION

The ASeries A602 is a V.24 (RS-232) <> X.21 bis interface converter and provides bi-directional data communication between the V.24 and X.21 communication standards at speeds of up to 128Kbits/second. No changes are made to either data or timing signals and the A602 is transparent to data and any introduced protocol.

Both the V.24 and X.21 ports of the A602 may be configured to either Data Communications Equipment (DCE) or Data Terminal Equipment (DTE) via an internal 50-pin jumper. Internal jumpers are also used for selection of Clock Sources and Handshaking lines. Possible A602 configurations are as follows:

- X.21 (DCE) to V.24 (DTE)

  in this configuration the X.21 Control Signal source is jumper selected between either V.24 Request To Send (RTS) or V.24 Data Terminal Ready (DTR).

- X.21 (DTE) to V.24 (DCE)

  in this configuration the X.21 Signal Timing source is jumper selected between either V.24 Serial Clock Transmit (SCT) or V.24 Serial Clock Receive (SCR).

The physical layout of the ASeries A602 is as follows:

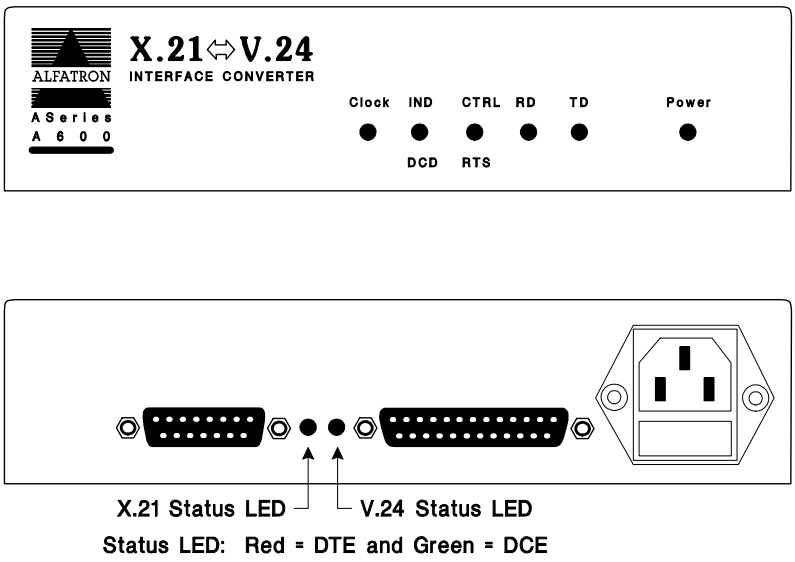


Figure 1-1 A602 viewed from front and rear

Light Emitting Diodes (LEDs) on Rear Panel

The two LEDs shown on the rear panel in Figure 1-1 are a convenient method of identifying the DTE or DCE status of each port:

- Bi-colour LED is 'RED' if corresponding port is 'DTE'.
- Bi-colour LED is 'GREEN' if corresponding port is 'DCE'.

2.0 INSTALLATION

2.1 Selecting DCE or DTE

Before installing the A602 please make sure that the 50-pin jumper is inserted into the correct DCE or DTE position to meet your requirements. In the majority of cases when synchronous serial communications is used, the DCE will provide the 'Clock Signal' to the DTE device, therefore the A602 supports the following two configurations of V.24 and X.21:

(i) V.24-DTE (Terminal) to X.21-DCE (Modem)

(ii) V.24-DCE (Modem) to X.21-DTE (Terminal)

these configurations are selected by removing the cover of the A602 and inserting the 50-pin jumper into the appropriate socket, J201 or J202, located on the Printed Circuit Board (PCB) as shown below:

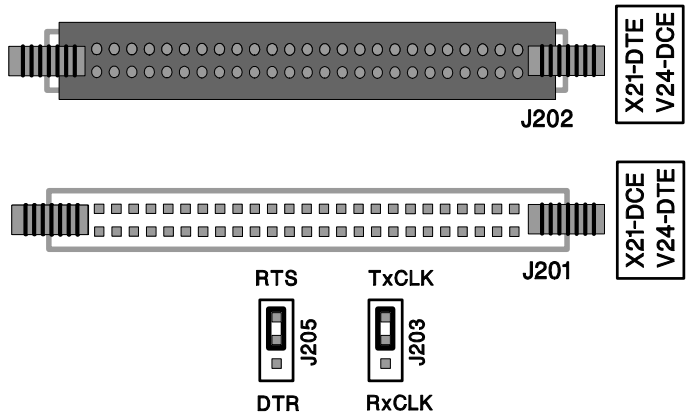


Figure 2-1 Configuration jumper blocks on the A602 PCB

WARNING: *240Volt power must be removed from the A602 before the cover is removed and the 50-pin jumper re-located.*

Two combinations which are NOT supported by the A602 are as follows:

(iii) V.24-DTE (Terminal) to X.21-DTE (Terminal)

(iv) V.24-DCE (Modem) to X.21-DCE (Modem)

In the case of DTE to DTE (iii), no timing source exists for synchronous communications as timing is normally supplied by the DCE device.

In the case of DCE to DCE (iv), two timing sources exist and this would create an ambiguous situation.

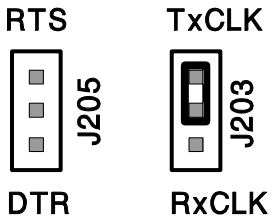
2.2 Selecting X.21 Clock Source

Valid only for X.21-DCE and V.24-DTE. The V.24 interface has two differential clock sources, Serial Clock Transmit (SCT) and Serial Clock Receive (SCR). One of these clock sources must be selected as a source for the X.21 interface Signal Element Timing signal.

To select V.24 (SCT) as the clock source, move the of jumper to the 'TxCLK' position. To select V.24 (SCR) as the clock source, move the of jumper to the 'RxCLK' position.

The factory default setting is V.24 (SCT) with the jumper in the 'TxCLK' position.

Figure 2-2



2.3 Selecting V.24 Handshaking Lines

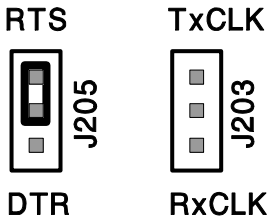
The X.21 interface Control line is used to drive the V.24 interface DTR or RTS handshaking lines. The J205 jumper block has two positions to define which of the handshaking lines, DTR or RTS, is driven by the X.21 Control line.

The setting for J205 is shown in Figure 2-3 and is used if the A602 is set for X.21-DCE and V.24-DTE then the jumper in J205 may be set for either DTR or RTS position.

The line which is not selected is pulled to +12V via a 4.7KΩ resistor.

The factory default for jumper J205 is the RTS position.

Figure 2-3



Note: Jumpers J203 and J205 are ignored when the A602 is configured for X.21-DTE and V.24-DCE

2.4 Front Panel LED Indicators

The LED indicators in the A602 provide a function similar to that of a breakout box. They show the level of the appropriate TTL signal rather than a level directly present on the communications line. The signal names correspond to the port which is selected as DTE. For example, if the A602 is configured as V.24 (DTE) / X.21(DCE) and the 'RD' LED is active then this refers to the activity on the V.24 port 'RD' line.

The advantage of this approach is that all communication line signals are converted internally by the A602 to TTL levels and then converted to a level specific to either the X.21 or V.24 interface. The TTL level signals therefore provide a common reference to both ends of the converter and show the signals as seen by the converter regardless of the type of interface configuration.

The A602 has six LED indicators on its front panel. The LED marked 'Power' is Yellow and indicates that the A602 has operating power. The other five LEDs are Red / Green bi-colour indicators with the following meaning:

- Clock - Clock Source
- Indicator (IND) - X.21 and Data Carrier Detect (DCD) - V.24
- Control (CTRL) - X.21 and Request To Send (RTS) - V.24
- Receive Data (RD) - valid for both X.21 and V.24 interfaces
- Transmit Data (TD) - valid for both X.21 and V.24 interfaces

The convention used on the bi-colour LEDs is as follows:

- Bi-colour LED is 'RED' if corresponding TTL signal is 'HIGH'.
- Bi-colour LED is 'GREEN' if corresponding TTL signal is 'LOW'.

2.5 Rear Panel LED Indicators

The two bi-colour LEDs on the rear panel are shown in Figure 1-1. They identify the DTE or DCE status of the port closest to that LED and are determined by the internal 50-pin jumper. These LEDs provide a convenient method of identifying the status of each port without opening the case:

- Bi-colour LED is 'RED' if corresponding port is 'DTE'.
- Bi-colour LED is 'GREEN' if corresponding port is 'DCE'.

3.0 CABLE REQUIREMENTS

Alfatron Pty Ltd recommends the use of shielded cable with all of its products. Shielding reduces Electro Magnetic Radiation and improves noise immunity. This helps minimise interference to other equipment and will improve communications reliability.

The recommended cable construction is as follows:

- Take the shield (surrounding cable wires) and solder it to the Frame Ground (FG) pin. If FG is not available, use Signal Ground (SG) but in this case always use a separate wire for ground which is connected at both ends.

  If a metalised backshell is used then it is preferred that the cable shield make 360^{o} contact with the backshell at the point of entry.

- The shield must be connected at both ends of the cable.

4.0 FACTORY SETTINGS

The A602 is factory pre-set to the following configuration:

- X.21 (DCE) to V.24 (DTE)
- X.21 Clock Source (J203) is set to 'TxCLK'
- V.24 Handshaking Line (J205) is set to RTS

5.0 INTERFACE PIN ASSIGNMENTS

5.1 V.24 Interface Pin Assignments

The direction of the signal lines depends on whether the A602 V.24 port is configured as DTE or DCE, refer to Section 2.1.

Pin No.	Signal Name	Full Signal Name	A602 Port V.24 - DTE	A602 Port V.24 - DCE
1	FG	Frame Ground	-	-
2	TD	Transmit Data	Output	Input
3	RD	Receive Data	Input	Output
4	RTS	Request To Send	Output	Input
5	CTS	Clear To Send	Input	Output
6	DSR	Data Set Ready	Input	Output
7	SG	Signal Ground	-	-
8	DCD	Data Carrier Detect	Input*	Output*
15	SCT	Transmit Clock	Input	Output
17	SCR	Receive Clock	Input	Output
18	LL	Local Loop Back	Output*	Input*
20	DTR	Data Terminal Ready	Output	Input
21	RL	Remote Loop Back	Output*	Input*
24	SCTE	Transmit Signal Timing (DTE)	Output*	Input*
25	TM	Test Mode	Input*	Output*

Note: * This signal is not passed through and is not supported by the A602.

5.2 X.21 Interface Pin Assignments

The direction of the signal lines depends on whether the A602 X.21 port is configured as DTE or DCE, refer to Section 2.1.

Pin No.	Signal Name	Full Signal Name	A602 Port X.21 - DTE	A602 Port X.21 - DCE
1	FG	Frame Ground	-	-
2	Ta	Transmit (a)	Output	Input
3	Ca	Control (a)	Output	Input
4	Ra	Receive (a)	Input	Output
5	Ia	Indicator (a)	Input	Output
6	Sa	Signal Clock (a)	Input	Output
7	-	Byte Timing (a)*	-	-
8	SG	Signal Ground	-	-
9	Tb	Transmit (b)	Output	Input
10	Cb	Control (b)	Output	Input
11	Rb	Receive (b)	Input	Output
12	Ib	Indicator (b)	Input	Output
13	Sb	Signal Clock (b)	Input	Output
14	-	Byte Timing (b)*	-	-
15	-	Not assigned	-	-

Note: * This converter does not support Byte Timing which is an optional signal specified in the X.21 bis standard.

6.0 SPECIFICATIONS

V.24 Port:	CCITT V.24 / EIA RS-232C Select as DTE or DCE DB-25 female connector	
X.21 Port:	X.21 bis Select as DTE or DCE DB-15 female connector	
Front LED Indicators:	Clock	(Bi-colour Red/Green)
	X.21 (IND) / V.24 (DCD)	(Bi-colour Red/Green)
	X.21 (CTRL) / V.24 (RTS)	(Bi-colour Red/Green)
	Receive Data X.21 and V.24	(Bi-colour Red/Green)
	Transmit Data X.21 and V.24	(Bi-colour Red/Green)
	Power Indicator	(Yellow)
Rear LED Indicators:	V.24 Port Status, DTE or DCE	(Bi-colour Red/Green)
	V.35 Port Status, DTE or DCE	(Bi-colour Red/Green)
Power Supply:	240V AC 50Hz Standard IEC male socket	
Dimensions:	45mm x 120mm x 190mm	
Weight:	920 grams	
Operating Temperature:	0° to 40° C	
Stroage Temperature:	-20° to 70° C	

All specifications subject to change without notice

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DECLARATION OF CONFORMITY

according to the European Commissions EMC Directive 89/336/EEC

We,	Name of Manufacturer:	ALFATRON PTY. LTD
of,	Address of Manufacturer:	UNIT 9, 36 NEW ST. RINGWOOD VIC 3134 AUSTRALIA
	Australian Company Number:	ACN: 005 410 819

declare under sole responsibility that the product:

Product Name:	ASeries V.24 to X.21 Interface Converter
Model Number:	A602

to which this declaration relates is in conformity with the following standards:

CISPR-22 / EN 55022 class B	EMI from Information Technology Equipment (ITE)
IEC 801-2 / prEN55024-2	Electro Static Discharge Immunity
IEC 801-3 / prEN55024-3	Radiated RF Immunity
IEC 801-4 / prEN55024-4	Electrical Fast Transients Immunity