

# User Manual

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## **ASeries A510**

Interface Converter  
Serial ⇔ Parallel



*The interfacing specialists*

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# A510 User Manual

Version 5.11

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## 1.0 PRODUCT DESCRIPTION

The ASeries A510 is an RS-232 Serial to Centronics Parallel protocol converter. The parallel port may be set for either direction, providing Serial ⇌ Parallel or Parallel ⇌ Serial interface conversion.

The physical layout of the ASeries A510 is as follows:

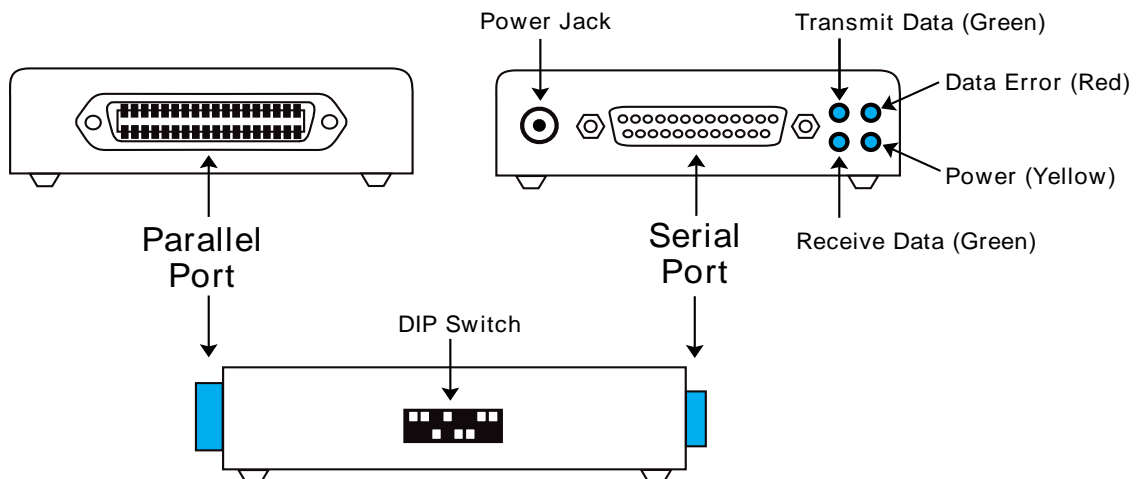


Figure 1 - A510 viewed from both ends and side

## 2.0 INSTALLATION

Before installing the A510 please make sure that the DIP Switch settings are according to your requirements. It is most important to set the direction of the parallel port to either INPUT or OUTPUT as required. *The A510 will not operate unless the direction is set correctly.*

Insert the power plug into the power jack socket, next to the 'Serial' connector. Turn the power ON and observe the LEDs. The 'Power' LED should light up and remain alight, all other LEDs should light up and then extinguish within 2 seconds. After this sequence the A510 is ready for operation.

Power OFF the A510 and connect the correct cables between the A510 and the target devices. Use only cables which you know to have the correct pin configurations to match the A510 to your equipment. Cable requirements and pin assignments are discussed in Sections 7 and 8.

***WARNING:*** All devices must be powered OFF before connecting cables to them.

Incorrect cabling may cause damage to either the A510 or your equipment and is not covered by warranty. If in doubt about pin configurations please have them checked by your dealer.

### 3.0 CHARACTER GENERATION FUNCTION (SELF TEST)

The Character Generation Function in the A510 will output a continuous stream of printable ASCII characters from either the Serial or Parallel ports. This function may be used to confidence test both ports of the A510 or to test the operation of other devices. It is activated in the following manner:

**Step 1:** Take note of the original DIP Switch settings of the A510 then turn the power OFF. Select the output port via the 'Parallel Port Direction' switch, DIP Switch 1, and set it as required:  
Switch 1 is ON = Output from SERIAL port only  
Switch 1 is OFF = Output from both SERIAL & PARALLEL ports

**Step 2:** Select the Character Generation Function (Self Test) on the DIP by setting switch numbers 6, 7 and 8 to 'Self Test' mode as follows:

DIP Switch number	6	7	8
Switch Setting	On	On	Off

Note: If you are sending the output to the serial port there is another setting available. Please refer to Table 4-3 in Section 4 for this alternative setting.

**Step 3:** Connect a suitable cable between the A510 and the Output Device. Power ON the Output Device and then power ON the A510.

*The A510 will produce a continuous output as follows:*

```
0123456789;<=>?@ABCDEFGHIJKLMNopQRSTUVWXYZ[\^_`abcdefghijklmnopqrstuvwxyz{|}~  
0123456789;<=>?@ABCDEFGHIJKLMNopQRSTUVWXYZ[\^_`abcdefghijklmnopqrstuvwxyz{|}~  
0123456789;<=>?@ABCDEFGHIJKLMNopQRSTUVWXYZ[\^_`abcdefghijklmnopqrstuvwxyz{|}~  
0123456789;<=>?@ABCDEFGHIJKLMNopQRSTUVWXYZ[\^_`abcdefghijklmnopqrstuvwxyz{|}~  
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0123456789;<=>?@ABCDEFGHIJKLMNopQRSTUVWXYZ[\^_`abcdefghijklmnopqrstuvwxyz{|}~  
0123456789;<=>?@ABCDEFGHIJKLMNopQRSTUVWXYZ[\^_`abcdefghijklmnopqrstuvwxyz{|}~
```

*This output will continue for as long as the A510 is powered ON. To stop the continuous output simply power OFF the A510.*

**Step 4:** Turn OFF the power to the A510 and re-configure it for normal use with the DIP Switch settings which you took note of in Step 1.

## 4.0 HARDWARE CONFIGURATION

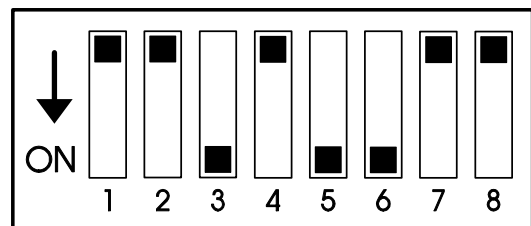
### 4.1 How to set the DIP Switch

Before attempting to change the DIP Switch settings, remove the power plug from the A510. The DIP switches are read only once, when the A510 is powered ON. They are located at the side of the A510 as shown in Section 1, Figure 1.

### 4.2 Default Factory DIP Switch Settings

The A510 is factory pre-set to the following configuration:

- Parallel port as OUTPUT
- 9600 bps
- 8 Data Bits
- No Parity
- DTR/DSR Handshaking
- 1 Stop Bit

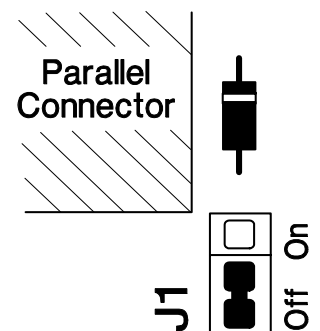


### 4.3 Using and Providing power on the A510 Parallel port

The A510 may be powered directly from pin 18 or alternatively be configured to power a device connected to its parallel port. This is set via an internal jumper (J1) on the printed circuit board. To change the setting remove the cover of the A510, the jumper is located directly beside pin 18 of the Centronics parallel connector.

(1) A510 may be powered directly from pin 18.

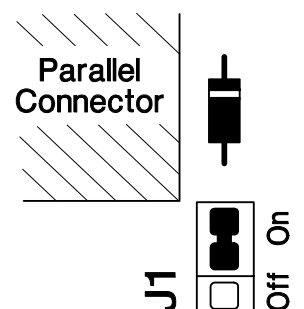
The A510 may be powered through pin 18 by a regulated input of +5V with a current of 200mA. When the jumper (J1) is set as per the diagram shown here, no power is available from pin 18.



**Note:** This is the factory default setting.

(2) Regulated power supplied by A510 on pin 18.

Set the jumper (J1) to the position shown in the diagram here to provide 5V DC regulated power from pin 18 of the parallel connector. This power is limited to a current of 200mA.



**Caution:** If you attempt to draw more than 200mA from pin 18 of the A510, it will shut itself down.

## 4.4 DIP Switch Settings

Table  
4-1

Switch	Function	OFF	ON
1	Parallel Port Direction	Output	Input
2	Handshaking	DTR/DSR	Robust Xon/Xoff
3	Bits Per Second (refer to Table -2)		
4			
5			
6	Data Bits, Parity & Test Mode (refer to Table -3)		
7			
8			

Table  
4-2

Switch	300	600	1200	2400	4800	9600	19.2K	38.4K
3	Off	On	Off	On	Off	On	Off	On
4	Off	Off	On	On	Off	Off	On	On
5	Off	Off	Off	Off	On	On	On	On

Table  
4-3

Switch			Data Bits	Parity	Stop Bits	Self Test
6	7	8				
On	On	On	8	Even	1	No
On	On	Off	8	None	1	Yes
On	Off	On	8	Odd	1	No
On	Off	Off	8	None	1	No
Off	On	On	7	Even	1	No
Off	On	Off	7	None	2	Yes
Off	Off	On	7	Odd	1	No
Off	Off	Off	7	None	2	No

## 5.0 INTERFACE PORT PIN ASSIGNMENTS

### 5.1 Centronics Parallel Port

<i>Pin</i>	<i>Signal</i>	<i>Description</i>	<i>Pin</i>	<i>Signal</i>	<i>Description</i>
1	Data Strobe	Active Low	19	Ground	-
2	Data Bit 1	Active High	20	Ground	-
3	Data Bit 2	Active High	21	Ground	-
4	Data Bit 3	Active High	22	Ground	-
5	Data Bit 4	Active High	23	Ground	-
6	Data Bit 5	Active High	24	Ground	-
7	Data Bit 6	Active High	25	Ground	-
8	Data Bit 7	Active High	26	Ground	-
9	Data Bit 8	Active High	27	Ground	-
10	Acknowledge	Active Low	28	Ground	-
11	Busy	Active High	29	Ground	-
12	Paper End	Pulled Low	30	Ground	-
13	Select	Pulled High	31	Initialize	Pulled High
14	Autofeed	Pulled High	32	Error	Pulled High
15	Not Connected	-	33	Ground	-
16	Ground	-	34	Not Connected	-
17	Ground	-	35	Not Connected	-
18	+5V DC **	Input & Output	36	Select In	Pulled Low

Note: (a) Pins are Pulled High to +5V via 4K7 resistor.  
 (b) Strobe & Data lines are Pulled High to +5V via 1K resistor.

\*\* (1) The A510 may be powered directly from pin 18.  
 (2) The A510 can supply 200mA +5V DC regulated power from pin 18.  
 Refer to section 4 for complete details.

### 5.2 RS-232 Serial Port

The RS-232 Serial Port of the A510 is configured as **DCE**.

<i>Pin</i>	<i>Status</i>	<i>Signal</i>	<i>Description</i>
1	Used	FG	Frame Ground
2	Input	RD	Receive Data
3	Output	TD	Transmit Data
4	Not used - Pulled High	CTS	Clear To Send
5	Not used - Pulled High	RTS	Request To Send
6	Output	DTR	Data Terminal Ready
7	Used	SG	Signal Ground
8	Not used - Pulled High	DCD	Data Carrier Detect
20	Input - Pulled High	DSR	Data Set Ready
22	Not Used - Pulled High	RI	Ring Indicator

Note: Pins are pulled high to +9V via 10K resistor.

## 6.0 FLOW CONTROL (Handshaking)

### 6.1 Hardware (DTR/DSR) Handshaking

Hardware, DTR/DSR, handshaking uses the Data Terminal Ready (DTR) and Data Set Ready (DSR) signal lines to control the flow of data between devices. This form of handshaking is recommended and is the preferred method of handshaking under the DOS operating system.

### 6.2 Software Handshaking - Robust Xon/Xoff

Robust Xon/Xoff handshaking overcomes limitations in the Standard Xon/Xoff protocol by ensuring that the A510 device repeatedly sends Xon/Xoff characters to the connected device.

For example, without Robust Xon/Xoff if an Xoff is sent from the A510 to the connected device and somehow becomes corrupted, the connected device will not receive the Xoff and will therefore continue to send data to the A510 causing the buffer of the A510 to overflow and resulting in the loss of data.

Robust Xon/Xoff overcomes this situation by sending the Xoff character after every character received past the cutoff point of the A510 buffer. Also, when the A510 is receiving data it will send an Xon, every 5 seconds, to the connected device. The behaviour of the A510 Xon/Xoff flow control buffer is as follows:

- An 'Xoff' is issued when there are 35 bytes or less remaining in the buffer.
- An 'Xon' is issued if there are more than 45 bytes available in the buffer.
- The Robust 'Xon' time interval is 5 seconds, this may be observed on the Transmit Data LED when the A510 is powered on.

## 7.0 CABLE REQUIREMENTS

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

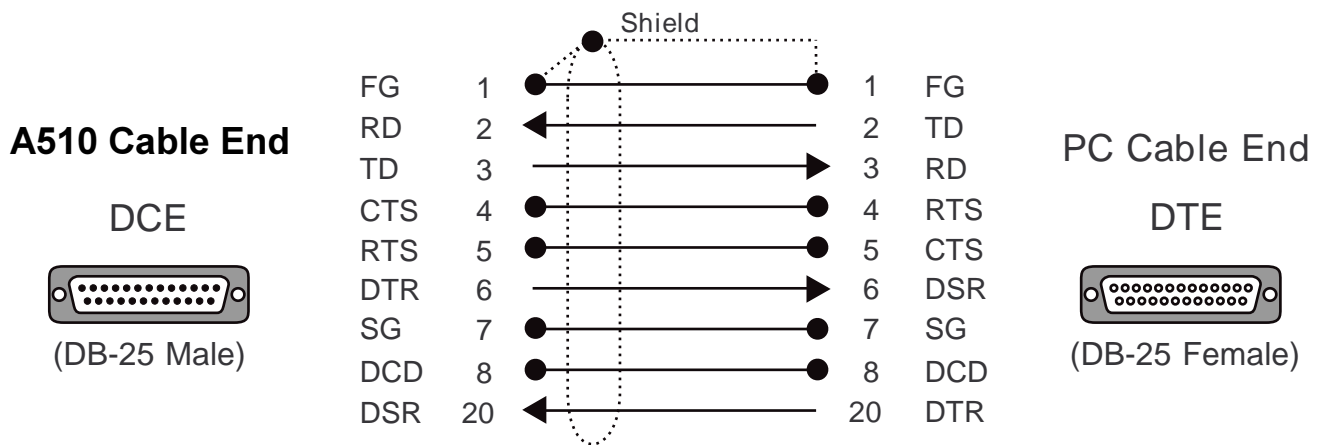
The recommended cable construction is as follows:

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

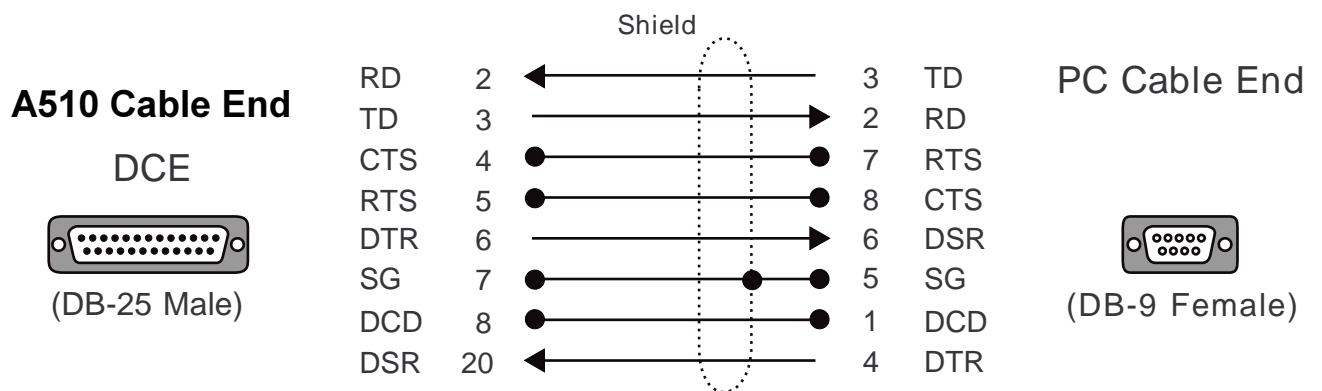


## 8.0 CABLE EXAMPLES

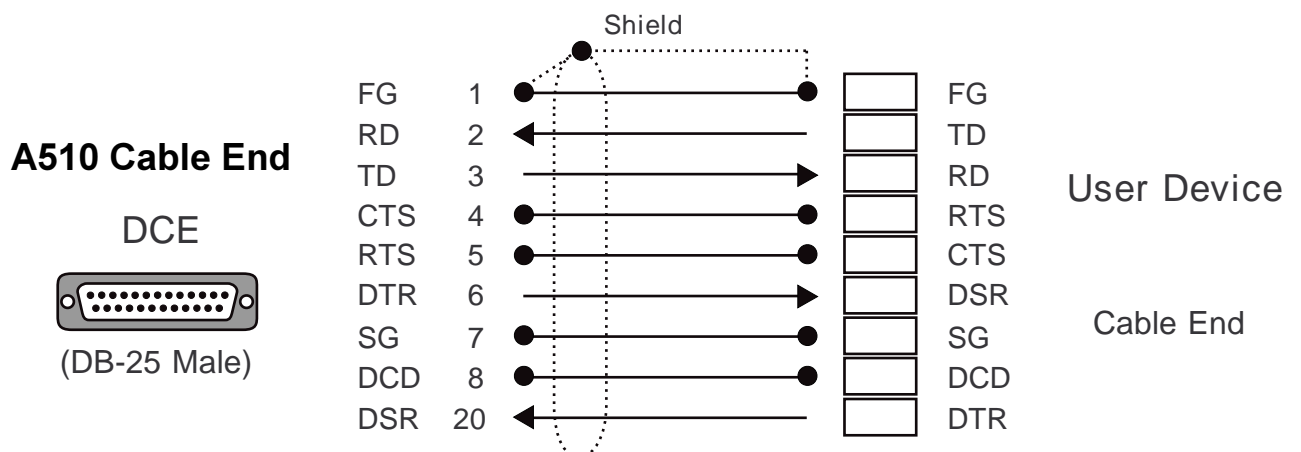
### 8.1 RS-232 Connection to a PC with a DB-25 Serial Connector




### 8.2 RS-232 Connection to a PC with a DB-9 Serial Connector



### 8.3 RS-232 Connection to other RS-232 Devices



## 9.0 SPECIFICATIONS

<b>CPU:</b>	89C51 Microprocessor
<b>Parallel Port:</b>	Centronics Parallel Select as Input or Output 36-pin Centronics female connector
<b>Serial Port:</b>	Asynchronous RS-232D Full duplex communication DB-25 female connector configured as DCE DIP Switch Selection: Baud Rate: 300, 600, 1200, 2400, 4800, (bps) 9600, 19200 and 38400. Data Bits: 7 or 8 Parity: None, Odd or Even Stop Bits: 1 or 2 Handshaking: Software (Robust Xon/Xoff) Hardware (DTR/DSR)
<b>Flow Control Buffer:</b>	60 byte receive buffer
<b>LED Indicators:</b>	Power On (Yellow) Receive Data (Green) Transmit Data (Green) Data Error (Red)
<b>Power Supply:</b>	9V (200mA) DC Power Adapter Fuse & Reverse polarity protection Plug jack - 5.5mm outer/2.5mm inner diameter Outer Negative  A510 may be powered directly from pin 18 of the parallel connector. A regulated 5V DC power supply with a current of up to 200mA is required.
<b>Dimensions:</b>	35mm x 95mm x 110mm
<b>Weight:</b>	350 grams
<b>Operating Temp:</b>	10° to 35° C
<b>Storage Temperature:</b>	0° to 45° C

*All specifications subject to change without notice*



**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.  
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Australian Company Number: ACN: 005 410 819

**declare under sole responsibility that the product:**

Product Name: ASeries RS-232 to Centronics Parallel Interface Converter

Model Number: A510

**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