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# SL332 PC- CARD
# USER’S GUIDE



**REVISION HISTORY**

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# 1. OVERVIEW

The SL332 card is a dual RS232 Serial card with the following features:

- Windows 95 (osr2), 98, 98SE, Me, 2000, XP, CE[1], PocketPC[1] compatible using O.S. standard drivers
- Industry standard 16550 register set for both ports
- Transmission rates up to 921.6KBaud on both channels
- Switchable x1 or x8 baud rate independently per port
- Full hardware modem control line support on both ports
- Standard PC IO port decode for COM1 to COMn
- "Any" IO port and interrupt decode option for best pnp flexibility
- ESD protected RS232 drivers
- Low power consumption
- Supplied with 300mm dual DB9-male terminated cable with "standard" COM port pin-out.

This guide aims to familiarise you with the way that the SL332 works and so will help you to maximise its performance in your application.

Elan will be happy to quote for either customisation of the SL332 if its exact specifications do not quite meet your needs, or to create complete application software.

[1] CE and PocketPC allow operation with one port at a time when using the standard OS driver. The elSerial enhanced PocketPC driver allows concurrent operation of both ports of the SL332. This driver is on the distribution disk supplied with the card.

## 2. ABOUT THE SL332

The SL332 card is a dual port RS232 serial card using Elan's own 16550 compatible UART ASIC device, called the VPU16550. The serial data and control lines on both ports are buffered using ESD protected RS232 drivers.

Industry standard baud rates up to 115.2K baud are supported, together with 16-byte deep TX and RX FIFOs. Additionally DIP switches on the rear of the card allow selection of "x1" or "x8" baud rate multipliers for each port. This feature allows up to 921KBaud operation without needing special device drivers on the host (in x8 mode you simply multiply the setting shown on the host by 8 to get the real serial data rate e.g. 19200 Baud set on host with x8 mode gives 153600Baud true rate in hardware). See section 5 for the switch settings.

Both UARTs run from the same internal clock source and are hence synchronous to each other.

For further information please refer to the VPU16550 data sheet available from our website, http://www.pccard.co.uk

# 3. INSTALLING THE SL332

## *3.1 DOS & Windows 3.1x, NT4*

The SL332 is not suited to use in DOS or Windows 3.1x because it is a true multi-function PC-Card. 3rd party Card and Socket Services drivers for such cards do not exist (multi-function cards were defined sometime during Windows95 roll-out and correspondingly DOS drivers were not updated and were left to support only single function cards). This is simply a function of available software and is NOT a shortcoming of the SL332 hardware.

A similar situation is found with Windows NT4 although it is more likely that 3rd party tools may exist to support this O.S.

## *3.2 Windows 95, 98, 98SE, Me, 2000, XP*

The "generic" serial drivers in these Operating Systems support the SL332. No extra driver software is needed but you will need to install Card Center Pro to get the SL332 registered with the O.S. Simply run SETUP and follow the instructions given. Note that you **must** reboot the PC after installation, to allow the COM ports to be assigned port numbers by the O.S.

Note that for Win9x and Me the port numbers assigned **cannot** be changed and are a function of the other ports you have in your system.

Special Note for Windows2000 and XP:
These O.S.' allow you to change the COM port numbers. Go to the Device Manager and expand the Ports branch. There you will find the "First SL332 Com Port" and "Second SL332 Com Port". Double click on either of these and use the Properties page to adjust the COM port numbering that Windows assigned by default. You will also find that 2000 and XP assign default port numbers that are "backwards" i.e. the "First" port gets the higher COM number…this is because the O.S. enumerates the ports on the SL332 in reverse order. You are free to change these as described however.

### *3.3 Windows CE, PocketPC*

There is no need to install any software for Windows CE or PocketPC. Simply insert the SL332 card and two entries will appear in a list when you go to set up a "Connection". The standard OS drivers allow use of only one port at a time. The elSerial enhanced PocketPC driver allows concurrent operation of both ports of the SL332. This driver is on the distribution disk supplied with the card.

# 4. SL332 REGISTER INTERFACE

Full details of the SL332’s register interface can be found in the VPU16550 data sheet, available at Elan’s website

http://www.pccard.co.uk

# 5. HARDWARE SPECIFICATION

## *5.1 PINOUT*

The SL332 is supplied with a 300mm long Type47 cable that terminates with two DB9 Male connectors with female screwlocks (to match a standard COM port at the back of a PC)

The pin-out below applies to **both** the SL332 DB9 male connectors on the supplied cable.

***BOTH DB9 COM PORT PINOUTS (MALE)***

| PIN | NAME | FUNCTION |
|---|---|---|
| 1 | DCD | Data Carrier Detect input |
| 2 | RX | Receive Data input |
| 3 | TX | Transmit Data output |
| 4 | DTR | Data Terminal Ready output |
| 5 | GND | GROUND |
| 6 | DSR | Data Set Ready input |
| 7 | RTS | Request To Send output |
| 8 | CTS | Clear To Send input |
| 9 | RI | Ring Indicate input |

## 5.2 ELECTRICAL

All figures quoted are typical parameters @ 25° C

RS232 SIGNALS: Typical output level ±5.5V

ESD PROTECTION: All RS232 signal lines on the SL332 card are protected against electrostatic discharge (ESD)

- 15kv - human body model
- 8kv - IEC1000-4-2,contact discharge
- 15kv - IEC1000-4-2,air-gap discharge

UART CLOCK SPEED: Switch selectable Baud rate multiplier per port:
x1: UART CLOCK is 1.8432MHz ->115.2KBaud max.
x8: UART CLOCK is 14.7456MHz->921.6KBaud max.

## 5.3 POWER CONSUMPTION

All figures quoted are typical parameters @ 25° C

VCC CURRENT: 25mA typical at 5V with no connections
40mA typical at 5V, 115KBaud TX & RX both ports
55mA typical at 5V, 921KBaud TX & RX both ports

## 5.4 MECHANICAL

MASS: 12g typical.
FORM FACTOR: TypeII PC-Card

## 5.5 ENVIRONMENTAL

HUMIDITY: <80% non-condensing
TEMP: 0-50° C ambient

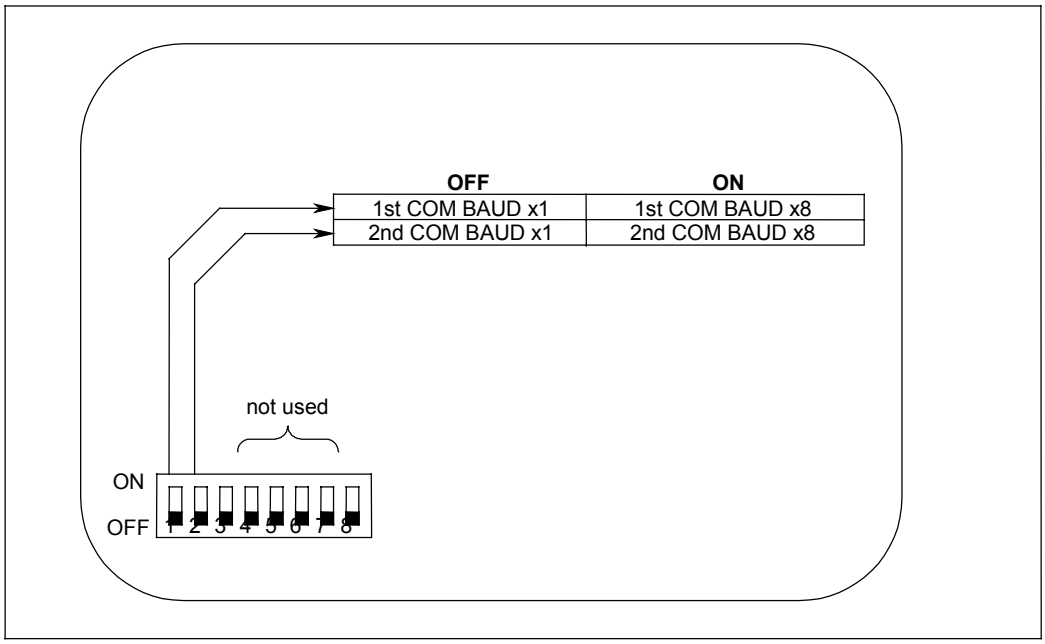
## 5.6 NOTES ON SERIAL DATA THROUGHPUT

The maximum serial baud rate of 921KBits/sec does not imply that the maximum sustained throughput rate of the serial port will be as high. The actual throughput rate that can be achieved depends on many factors including the host PC speed, the serial data source's data block size and whether the block are "back-to-back", whether the interrupt in use on the host is being shared by other devices leading to increased latency etc.

As a simple rule of thumb, using the standard serial drivers on a fast PC will allow throughput rates of 400-600KBits/sec although these rates can't be guaranteed and will be application specific.

## *5.7 SL332 MODE CONFIGURATION*

The SL332 can be configured using a small bank of DIP switches arranged at the rear of the PC-Card. The diagram below shows the function of each switch. The switches should be set to the desired




mode of operation before the card is inserted and used.

**Figure 5.7-1 SL332 DIP Switch Settings**

## *5.8 BAUD RATE SETTINGS*

The table below illustrates the common baud rate values available for each of the baud rate multiplier switch positions:

| HOST SETTING | SWITCH = x1 | SWITCH = x8 |
|---|---|---|
| 300 | 300 | 2400 |
| 1200 | 1200 | 9600 |
| 2400 | 2400 | 19200 |
| 4800 | 4800 | 38400 |
| 9600 | 9600 | 76800 |
| 19200 | 19200 | 153600 |
| 38400 | 38400 | 307200 |
| 57600 | 57600 | 460800 |
| 115200 | 115200 | 921600 |