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SL100 PC-CARD USER'S GUIDE

REVISION HISTORY

ISSUE	PAGES	DATE	NOTES
A	11	08/07/97	FIRST ISSUE
1	11	09/09/97	MINOR CHANGES
2	11	24/07/98	UPDATE COMPATABILITY

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1. OVERVIEW

Before using the SL100, take some time to read the section **"OPERATIONAL PRECAUTIONS".**

The SL100 card is a Chrysler CCD Bus Serial card with the following features:

- DOS, Windows 3.1x, 95 & NT compatible
- Industry standard 16450 register set
- Differential bus for minimal EMI
- High common mode noise rejection
- Data collision detection
- Bus arbitration
- Variable transmission rates including 7812.5 bits/second
- External 5 Volt supply for powering external devices, switchable under software control
- Standard PC IO port decode for COM1 to COM4
- "Any" IO port decode option
- Software controlled power management
- Low power consumption

This guide aims to familiarise you with the way that the SL100 works and so will help you to maximise its performance in your application.

Elan will be happy to quote for either customisation of the SL100 if its exact specifications do not quite meet your needs, or to create complete application software.

2. ABOUT THE SL100

The SL100 card is a Chrysler CCD Bus serial card with 16450 compatible UART. The serial CCD Bus data is buffered using a standard Harris CDP68HC68S1 Serial Multiplexed differential bus interface, clocked at 1MHz. The UART is also driven from the same 1MHz clock meaning that the "normal" industry standard baud rates no longer apply (normally a 1.8432MHz clock is applied to the UART leading to settings like 9600 or 2400 baud)

For further information please refer to a 16450 data sheet (eg National Semiconductor) and the Harris CDP68HC68S1 data sheet.

The SL100 conforms to the industry standard PC card interface (formally known as the PCMCIA interface) that allows direct connection of peripherals to the system bus of a PC (see software section)

3. CONTROLLING THE SL100

3.1 MAIN FEATURES

3.1.1 IO DECODING MODES

Five IO decode modes are supported depending on the value stored in the Config Option Register (COR) (see below). These support the standard COM1 to COM4 IO ranges and an additional "ANY IO" range. In "ANY IO" mode, the card decodes only the first three address lines, this means the card can be accessed on any 8 byte boundary.

3.1.2 INTERRUPTS

The SL100 can generate interrupts if the HOST enables the PC-Card IREQ signal to a PC interrupt channel.

As defined in the PC Card Specification, there are two interrupt modes available; pulse mode and level mode. The appropriate mode may be selected by writing to the PCMCIA Configuration Option Register.

4. SL100 REGISTER INTERFACE

The SL100 decodes the incoming PCMCIA interface. It maps the CIS EPROM to 0_{hex} - $1FF_{hex}$ in attribute space. The range 200_{hex} - 202_{hex} is occupied by the PCMCIA configuration registers.

4.1 CONFIG OPTION REGISTER

The SL100 uses the Config Option Register or COR to enable a particular mode. The COR is at 200_{hex} in attribute space and is 8-bits wide read/write. It is organised as follows:

BIT	MODE
0	Config value LSB
1	...
2	...
3	...
4	...
5	Config value MSB
6	LEVEL mode interrupts (when set)
7	Apply internal RESET when set

The appropriate config values are as follows:

COR Config value	MODE
0	DISABLE CARD
20_{hex}	COM1 (3F8 - 3FF)$_{hex}$
21_{hex}	COM2 (2F8 - 2FF)$_{hex}$
22_{hex}	COM3 (3E8 - 3EF)$_{hex}$
23_{hex}	COM4 (2E8 - 2EF)$_{hex}$
24_{hex}	Any IO 8 byte boundary

The COR is used as a master enable, as defined by the PC Card Standard. That is, when a valid config is written in bits0..5, the card's I/O interface may function. Until this has happened, the card's I/O interface is disabled. A config value of 0 will disable the card (NB this is the state after a reset). Valid CONFIG values are defined above.

Bit6 of the COR selects whether LEVEL or PULSE mode interrupts are generated by the SL100. Setting this bit to 1 selects LEVEL mode interrupts.

Bit7 of the COR acts as a soft reset when set (the reset does not clear bit7 but a subsequent write to the config register to return bit 7 to zero should not attempt to load data into bits 6..0 of the register as they will still clear. This should be done as a separate write operation.) All registers in the SL100 are effected by soft reset.

4.2 CONFIG STATUS REGISTER

The SL100 uses the Config Status Register or CSR to control the power down modes of the card

BIT	DESCRIPTION
0	UNDEFINED
1	IRQ (Read Only)
2	AUDIO (Read / Write)
3	POWERDOWN (Read / Write)
4	UNDEFINED
5	UNDEFINED
6	UNDEFINED
7	UNDEFINED

Bits 0,4,5,6 & 7 are not defined and should be cleared (0) for writes, they always read back as 0.

Bit 1 of the CSR (IRQ) indicates the current status of the IRQ line, a value of 1 in this location indicates an IRQ is pending.

Bit 2 of the CSR (AUDIO). This bit is set to one (1) to enable audio information on the PCMCIA SPKR# line when the card is configured.

Bit 3 of the CSR (POWERDOWN) puts the card into power down mode. Software can set this bit to 1 to switch off the external 5 volt supply.
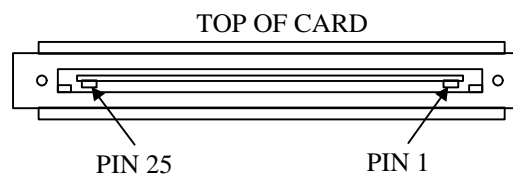
5. HARDWARE SPECIFICATION

5.1 PINOUT

MATING CONNECTOR TYPE: HIROSE NX30TA-25PAA + NX-25TA-CV1 + NX-25T-BS

PIN	NAME	FUNCTION
1	GND	DIGITAL GROUND
2	BUS+	Differential bus positive terminal
3	BUS-	Differential bus negative terminal
4	NC	NO CONNECTION
5	NC	NO CONNECTION
6	NC	NO CONNECTION
7	GND	DIGITAL GROUND
8	NC	NO CONNECTION
9	NC	NO CONNECTION
10	NC	NO CONNECTION
11	NC	NO CONNECTION
12	NC	NO CONNECTION
13	NC	NO CONNECTION
14	NC	NO CONNECTION
15	NC	NO CONNECTION
16	NC	NO CONNECTION
17	NC	NO CONNECTION
18	NC	NO CONNECTION
19	NC	NO CONNECTION
20	NC	NO CONNECTION
21	NC	NO CONNECTION
22	NC	NO CONNECTION
23	NC	NO CONNECTION
24	NC	NO CONNECTION
25	5V	Switchable VCC 5V external supply output *

* Total VCC current available is 200mA. Exceeding this value could damage the SL100

TOP OF CARD

PIN 25   PIN 1

5.2 ELECTRICAL

ALL PARAMETERS @ 25°C

INTERRUPTS: PULSE MODE: 800nS PULSE GENERATED
                         LEVEL MODE : LOW LEVEL GENERATED

BUS TERMINATION   THE DIFFERENTIAL BUS IS TERMINATED WITH
                         120 OHM TERMINATION AND 13K OHM BIAS
                RESISTORS WITHIN THE SL100 CARD.

UART CLOCK SPEED   1.000MHz

5.3 POWER CONSUMPTION

ALL PARAMETERS @ 25°C

VCC   CURRENT: 25mA avg.
      POWER DOWN MODE : 10mA avg.

VPP CURRENT: ZERO (NOT USED)

5.4 MECHANICAL

MASS: 30g
FORM FACTOR: TYPE II PC-CARD

5.5 ENVIRONMENTAL

HUMIDITY: <80% NON-CONDENSING
TEMP: 0-50°C AMBIENT

6. OPERATIONAL PRECAUTIONS

Unless otherwise stated, all voltage levels are referenced to the SL100's DIGITAL GROUND PINS.

- Don't draw excessive current from VCC. The limit is shown in the pinout table. Doing so will adversely effect the SL100's performance and could cause damage.
- The 25 way IO connector is quite delicate. Don't stress it unduly.
- Don't apply signals to any input greater than 7v. Levels above this will damage the SL100 card.
- Don't short circuit any of the SL100's outputs to ground or to other outputs. This will damage the SL100
- Ensure that the card's main 5v power input on the PCMCIA 68 way connector does not exceed 6.0v as this will damage internal devices. This is normally not a factor that the user of a "standard" PCMCIA slot needs to consider. However, under fault conditions or an embedded design this condition may need to be given some thought to avoid damaging the SL100