CesCom

N400
ACA approved

CE0872
Widget

Isolated USB to RS232/485/422 Interface with VGA and PS/2

Features

- **Isolated USB** UART interface
- **RS-232** serial port
- Dual **RS-485** ports or single **RS-422**
- **P8X32A multicore processor**
- **VGA** output mixed text or graphics up to 128 characters x 64 lines
- **PS/2 Keyboard** port
- **LAN** Ethernet port
- Stand-alone control

Overview

Much more than a USB to serial converter the Widget isolates the USB host from the uncertainties of the target serial port. As well as the standard RS-232 connection the Widget is equipped with dual RS-485 ports which can be configured as a single full-duplex RS-422.

Real-world serial connections are just as likely to be non-standard in that the baud-rate, word format, handshake, or protocol. With it's on-board array processor emulating hardware serial ports the Widget is software configurable to tackle any serial communications task. Access to the configuration and debugging interface is via the host USB port using any standard ANSI Terminal emulator and entering the special control sequence to bypass the data channel.

On-board configuration software allows the user to select the operating parameters of each port as well as default action. Alternatively the customer may specify their own requirements or else program applications directly on the Widget computer using a keyboard and VGA display or via the USB serial port.

The on-board VGA and PS/2 port will emulate an ANSI terminal or can be used for diagnosing communications problems especially over RS-485 buses such as MODBUS.

Applications

- USB to Serial converter
- PC to PLC programming or bus communications
- Networked Operator Terminal
- Multiprotocol Hub
- Application Specific Computer
- Information Terminals

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OPERATION

CPU

Conventional CPUs are interrupt driven single cores with general-purpose peripheral circuits. The Widget is different in that it uses the Parallax Propeller chip which is comprised of eight 20MIP 32-bit CPUs integrated onto a single chip. These CPUs called COGs are capable of emulating hardware peripherals in software in a deterministic real-time manner as well as general processing. As all I/O is general-purpose the ports may be retasked to suit application-specific requirements.

VGA

The standard display mode for VGA is 128 characters by 64 lines which may be changed to a more conventional 80x25. Software emulates standard VT-100 ANSI mode as the VGA is used as a terminal console in conjunction with a keyboard.

USB

A standard type B connection makes connection to USB host devices such as PCs possible. The USB port appears as a communications class device and is assigned a COMPORT by most PC operating systems. The port can be connected at up to 2Mbits/sec full-duplex and is electrically isolated from the external ports.

PS/2

PS/2 interfaces include keyboards and mice as well as other HIDs common to PCs. Although the port IS labelled Keyboard it is totally under software control and in combination with the I2C bus that is tandemed onto the connector it is possible to run I2C or SPI devices straight from these ports.

POWER

The Widget draws it's power directly from the USB port and is fully USB 2.0 compliant. In standalone mode power is supplied via the RS-485 connector and is switch-mode regulated onboard. The input voltage can range from +8V to +28V.

RS232

The enduring method for connecting low-speed devices and implemented in the Widget. This port supports full-duplex operation with or without handshake and in any format. Two hardware handshake lines are available if needed in the form of RTS/CTS or these may also be used as a secondary RS-232 port.

RS485/422

The RS485 can run up to 2Mbits/sec or more, the format of which is totally under software control through serial port emulation by an element or more of the array processor. By selecting RS422 mode both RS485 ports appear as a single full-duplex RS422 port.

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Specifications

Supply Voltage	5VDC
Current	100ma
Physical	78mm x 70mm x 15mm (WLH)
Weight	200g approx
Case	1mm Steel, powder-coated
Environment	0'C to +70'C operating
Standards	IEC 1010; AS/NZS 3548 EMI/EMC; C Tick compliant
CPU	P8X32A 8x32-bit CPU, 48kB RAM, 32kB ROM, 64kB EEPROM

Ports

RS-232	110 – 460.8K baud, all formats supported, DB9
RS-485 (2)	110 – 2M baud, all formats supported, Combicon6
RS-422	110 – 2M baud, all formats supported, multidrop capable
USB	USB 2.0, CP2102 USB UART slave, Standard B connection
LAN	10/100 RJ45, TCP, UDP, TELNET
VGA	32x16 to 128x64, 64 colors, mixed text and graphics
PS/2	Keyboard

CONNECTIONS

RS-232 DB9

1	DCD	R	
2	RXD	I	Receive Data
3	TXD	O	Transmit Data
4	DTR	R	
5	GND		
6	DSR	R	
7	RTS	O	RTS output
8	CTS	I	CTS output
9	RI	R	

RS485 Combicon 6

1	RS485 A	IO	
2	RS485 B	IO	
3	RS485 A	IO	Non-inverted data
4	RS485 B	IO	Inverted data
5	GND		
6	PWR	R	

PS/2 Minidin6

1	DAT	IO	PS/2 DATA I/O
2	SDA	IO	I2C DATA
3	GND		
4	+5V	O	
5	CLK	O	PS/2 CLOCK
6	SCL	IO	I2C CLOCK

VGA RJ45

1	RED	O	VGA Red
2	GREEN	O	VGA Green
3	BLUE	O	VGA Blue
4	HSYN	O	VGA Horizontal synch
5	VSYN	O	VGA Vertical synch
6	TV	O	Composite NTSC or RF
7	AUDIO	O	Line level audio
8	GND		

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