

USB MOD1 - USB Plug and Play Serial Development Module

The USB MOD1 shown in diagram 1, is a low-cost integrated module for transferring serial data over USB. Based on the FTDI FT8U232AM USB UART IC, the USB MOD1 is capable of transfer rates of up to 920k baud (RS232) and 2000k baud (RS422 / RS485).

The USB MOD1 is ideal for rapid prototyping and development by offering a complete plug and play solution.

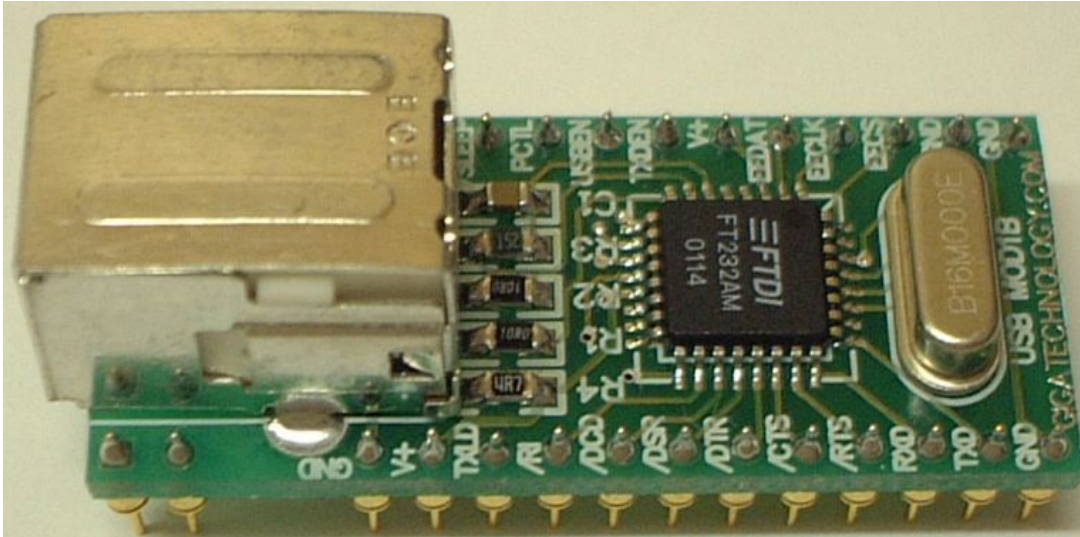


Diagram 1

MODULE FEATURES

- Single module High-Speed USB UART solution
- Based on FTDI FT8U232AM High-Speed USB UART IC
- Integrated Type-B USB Connector
- On-board 6MHz Crystal
- Provision for external EEPROM for USB enumeration data
- No external passive components required
- Module powered from USB bus (up to 450mA from USB for user application)
- 32-pin Dual In-Line Package Ideal for prototyping
- Fits into a standard 32-pin 600mil IC Socket

FT8U232AM IC FEATURES

- Single Chip Multi-Function Data Transfer Solution
- RS2323 link from 300 baud to 920K baud
- RS422/RS485 Link to 3000K baud
- 384 byte receive buffer / 128 byte transmit buffer for high data throughput
- Full hardware assisted or X-On/X-Off handshaking
- Support for Event Characters and Line Break condition
- Auto Transmit Buffer control for RS485
- Compact 32 pin (7mm x 7mm) MQFP package
- Integrated 6Mhz – 48Mhz Clock Multiplier aids emissions compliance
- Integrated 3.3v Regulator – No External Regulator Required
- UHCI / OHCI Compliant
- USB 1.1 Specification Compliant
- USB VID, PID, Serial Number and Product Description Strings in external E2PROM.

VIRTUAL COM PORT (VCP) DRIVERS for

- Windows 98 and Windows 98 SE
- Windows 2000 / ME / XP
- Windows CE **
- MAC OS-8 and OS9
- MAC OS-X
- Linux 2.40 and greater

[** = In the planning or under development]

D2XX

(USB Direct Drivers + DLL S/W Interface)

- Windows 98 and Windows 98 SE
- Windows 2000 / ME / XP

For further information regarding the FTDI FT8U232AM USB UART IC please refer to the FT8U232AM Datasheet. This datasheet can be found on the Elexol website at <http://www.elexol.com>

As mentioned above in module features, the USB MOD1 is in a 32-pin Dual In-Line Package. This allows the module to fit into a standard 32-pin 600mil IC Socket which makes the module ideal for prototyping and development work. Shown in diagram 2 below is the pin out for the USB MOD1.

USB MOD1 PINOUT

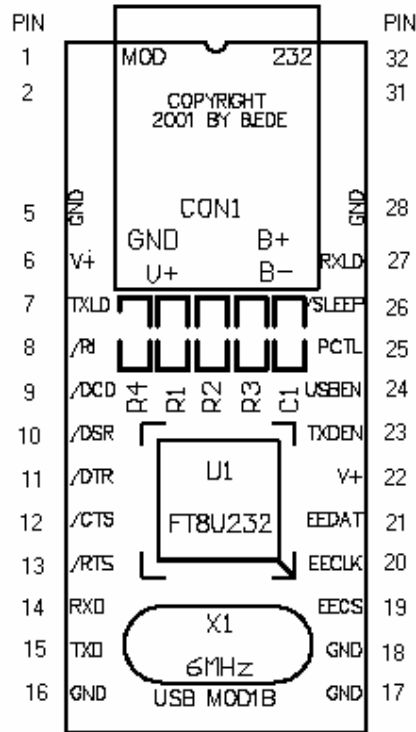


DIAGRAM 2

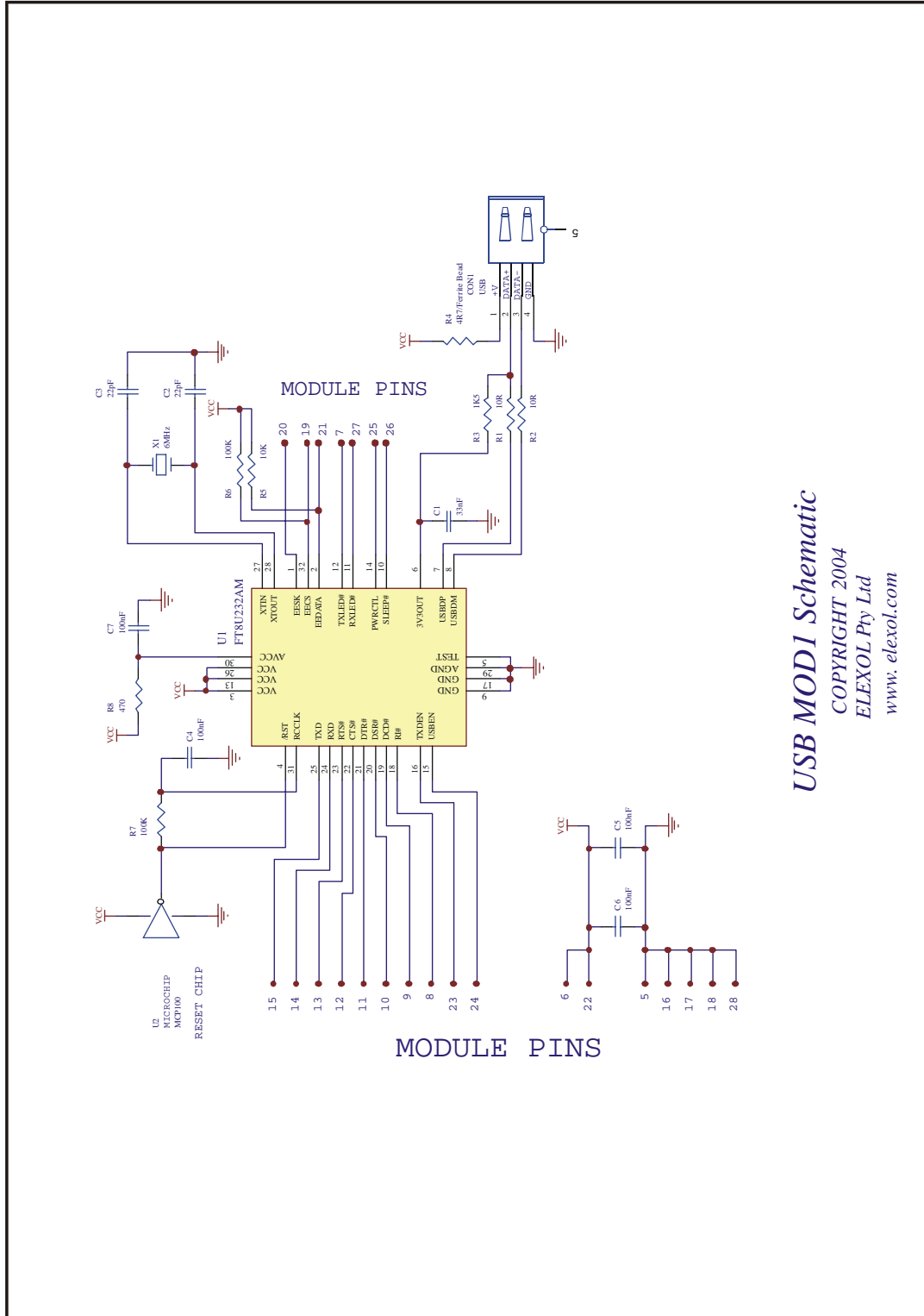
The following page shows the pin out table for the module.

USB MOD1 PINOUT TABLE

PIN #	SIGNAL	TYPE	DESCRIPTION
1	N/C	MOUNT	Mounting Pin for module USB connector support
2	N/C	MOUNT	Mounting Pin for module USB connector support
3	NO PIN	NO PIN	
4	NO PIN	NO PIN	
5	GND	PWR	Device – Ground Supply Pin
6	V+	PWR	Device - +4.4 volt to +5.25 volt Power Supply Pin
7	TXLD	O.C	LED Drive – Pulses Low when Transmitting Data via USB
8	/RI	IN	UART – Ring Indicator Control Input
9	/DCD	IN	UART – Data Carrier Detect Control Input
10	/DSR	IN	UART – Data Send Ready Control Input
11	/DTR	OUT	UART – Data Terminal Ready Control Output
12	/CTS	IN	UART – Clear To Send Control Input
13	/RTS	OUT	UART – Request To Send Control Output
14	RXD	IN	UART – Receive Data Input
15	TXD	OUT	UART – Transmit Data Output
16	GND	PWR	Device – Ground Supply Pin
17	GND	PWR	Device – Ground Supply Pin
18	GND	PWR	Device – Ground Supply Pin
19	EECS	I/O	Optional EEPROM – Chip Select
20	EECLK	I/O	Optional EEPROM – Clock
21	EEDAT	I/O	Optional EEPROM – Data I/O
22	V+	PWR	Device - +4.4 volt to +5.25 volt Power Supply Pin
23	TXDEN	OUT	UART – Enable Transmit Data for RS485
24	USBEN	OUT	USB Enabled – High after device is configured via USB
25	PCTL	IN	Bus Powered – Tie Low / Self Powered – Tie High
26	SLEEP	OUT	Goes Low during USB Suspend Mode
27	RXLD	O.C	LED Drive – Pulses Low when Receiving Data via USB
28	GND	PWR	Device – Ground Supply Pin
29	NO PIN	NO PIN	
30	NO PIN	NO PIN	
31	N/C	MOUNT	Mounting Pin for module USB connector support
32	N/C	MOUNT	Mounting Pin for module USB connector support

The following page shows the schematic for the USB MOD1.

USB MOD 1 SCHEMATIC

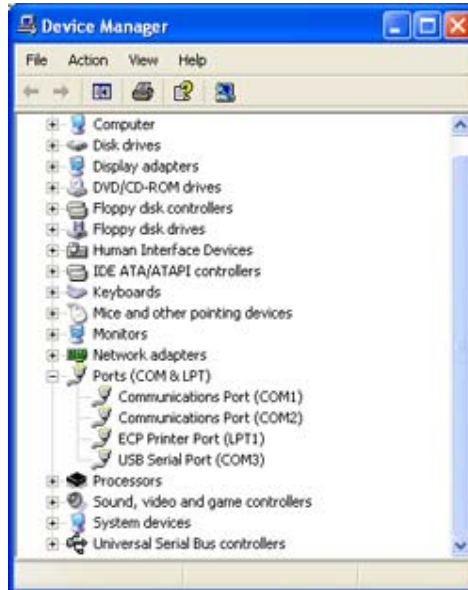


USB MOD1 Schematic
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Driver Installation

Your first choice when using the USBMOD is whether you want to use the Virtual Com Port driver or the Direct DLL driver.

For programming simplicity the best driver is the Virtual Com Port and when installed the USBMOD will appear in the System Properties / Device Manager as an USB Serial Port (COMn) as follows.



The Com port number will vary depending on the number of existing com ports on your computer and the number of USBMODs connected to your system.

To install the Virtual Com Port drivers, download the driver from our website and unzip the files to a local directory. Then connect the USBMOD and windows will automatically ask for the driver, select to specify a location and browse to the directory where you have unzipped the files. (Use the Non Plug & Play driver for the USBMOD to avoid a delay on connecting the USBMOD)

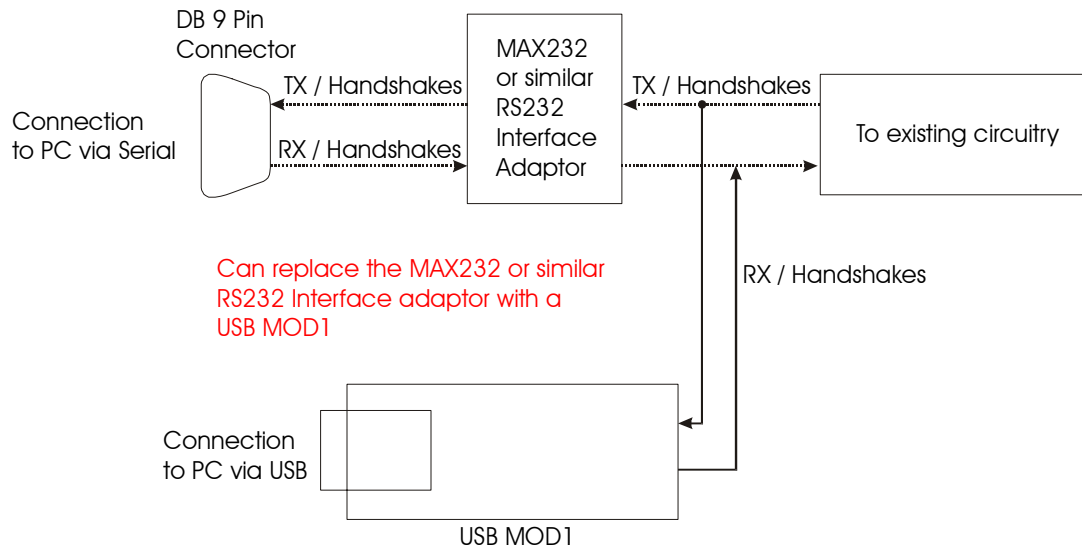
Once the Virtual Com Port is installed it can be programmed exactly as a regular serial com port using the MSComm control from Visual Basic or API calls from C or other languages. Set the com port to the same number as appears in the Device Manager, the baud rate, stop bits, parity etc are not used as the device always runs at full speed.

The Direct DLL driver is installed in a similar manner but using the alternative download from the website.

Programming the Direct DLL driver is by call to the DLL Library functions. Please download the Direct DLL programmers guide from the Elexol website.

Application Notes

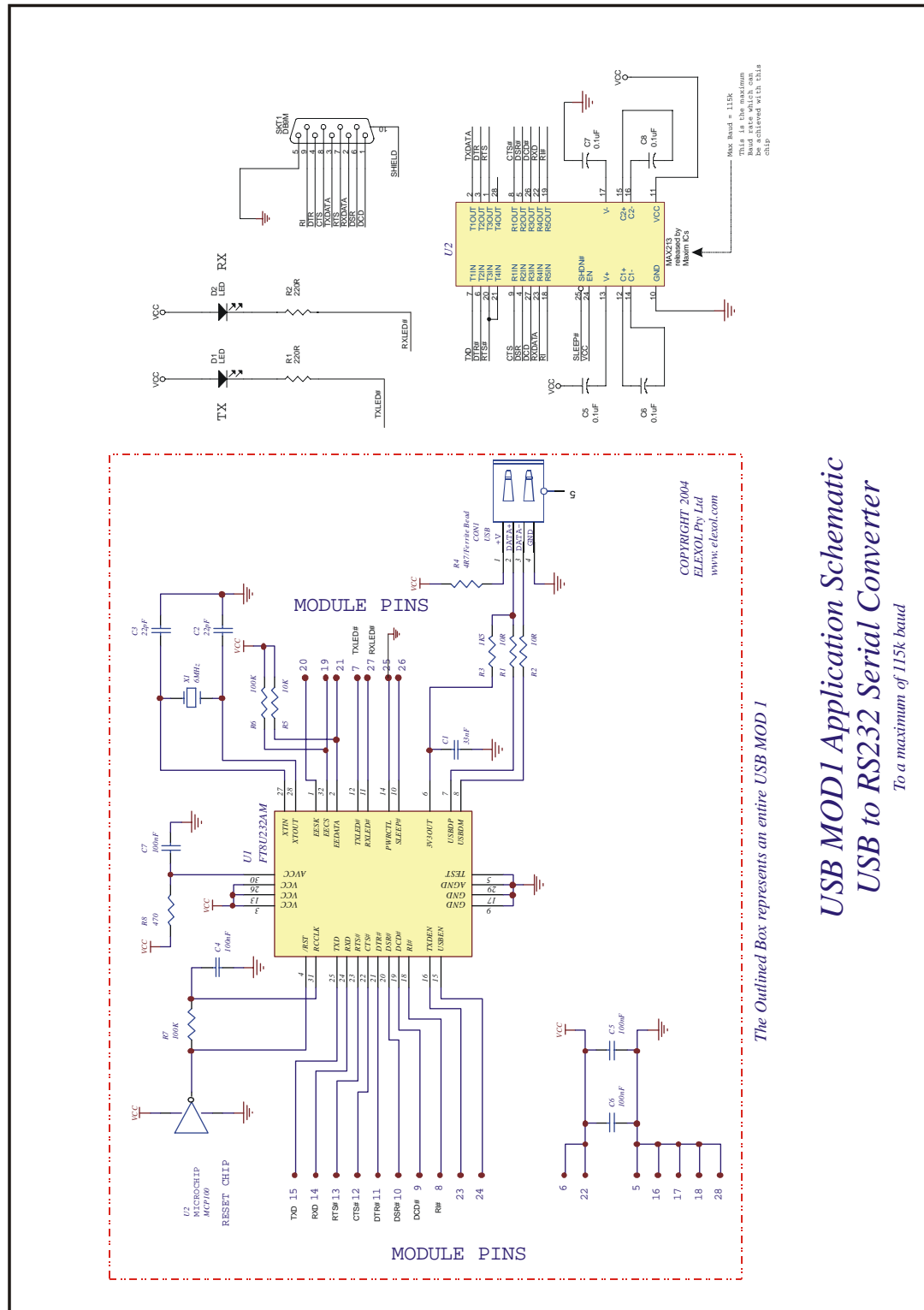
The USB MOD 1 is a quick and simple way of changing RS232 with USB. The existing RS232 interface adaptor can be replaced with a USB MOD1.



On the following pages there are schematic drawings showing various sample applications for the USB MOD1.

The first application is a USB to RS232 converter which is capable of achieving a maximum of 115k baud. The RS232 interface chip that we are using is a MAX213 chip.

SAMPLE APPLICATION No. 1
USB to RS232 Serial Converter



Absolute Maximum Ratings

Storage Temperature	-65°C to + 150°C
Ambient Temperature (Power Applied).....	0°C to + 70°C
VCC Supply Voltage	-0.5v to +6.00v
DC Input Voltage - Inputs	-0.5v to VCC + 0.5v
DC Input Voltage - High Impedance Bidirectionals	-0.5v to VCC + 0.5v
DC Output Current – Outputs	24mA
DC Output Current – Low Impedance Bidirectionals	24mA
Power Dissipation	500mW

DC Characteristics (Ambient Temperature = 0°C .. 70°C)

	Description	Min	Max	Units	Condition
VCC	Operating Supply Voltage	4.4	5.25	V	
Icc1	Operating Supply Current		50	mA	Normal Operation
Icc2	Operating Supply Current		250	uA	USB Suspend
Ioh1	Digital IO Pins Source Current	4		mA	Voh = VCC – 0.5V
Iol1	Digital IO Pins Sink Current	8		mA	Vol = +0.5V
Voh1	Input Voltage Threshold (Low)		0.6	V	
Vol1	Input Voltage Threshold (High)	2.7		V	
VDif	USB Differential Input Sensitivity	0.2		V	
VCom	USB Differential Common Mode	0.8	2.5	V	
URxt	USB Single Ended RX Threshold	0.8	2.0	V	
UVh	USB IO Pins Static Output (Low)		0.3	V	RI = 1.5k to 3.6V
UVI	USB IO Pins Static Output (High)	2.8		V	RI = 15k to GND

Technical Support and Further Information

For any questions relating to the USBMOD1 please contact us by Email, Fax or Phone.

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Product Use Limitations, Warranty and Quality Statement.

The USBMOD1 should not be used in any situation where it's failure or failure of the PC or software controlling it could cause human injury or severe damage to equipment. This device is not designed for or intended to be used in any life critical application.

The USBMOD1 is warranted to be free from manufacture defects for a period of 12 months from the date purchase.

Subjecting the device to conditions beyond the Absolute Maximum Ratings listed above will invalidate this warranty.

The USBMOD1 is a static sensitive device, anti static procedures should be used in the handling of this device.

All USBMOD1 units are extensively tested at time of manufacture to be free of defects.

Elexol is committed to providing products of the highest quality. Should you experience any product quality issues with this product please contact our quality assurance manager at the above address.

Disclaimer.

This product and its documentation are provided as-is and no warranty is made or implied as to their suitability for any particular purpose.

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