

# SERIAL MODULE MOTHERBOARD USER MANUAL

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Thank you for purchasing the TDK Bluetooth Intelligent Serial Module Motherboard. This board allows the TDK Intelligent Serial Module to be connected to a PC.

Related documents:

- Serial Module Hardware Interface Description
- TDK Bluetooth AT Serial Module Software Description

## ***Circuit Description for Motherboard***

Basically there 3 parts to the motherboard.

**RS232 Serial interface.** This provides a direct interface to any standard RS232 port on a PC or peripheral. Component U2 is a level shifter on the RX, TX, CTS, RTS, DTR, DSR, RI signals that converts between the 3.3V required on the module to the standard RS232 level. 9-way D type connector (J2) is configured so that it will directly connect to the Serial port of a PC.

**Audio interface.** Connector J9 allows a headset or audio source to be connected to the Intelligent Serial Module. The PCM signals from the Serial module are converted by CODEC (U4) to analog output. The Mic input is passed via the CODEC to the PCM input of the module. The circuit is designed to drive a simple mobile phone type headset.

**Flash upgrade interface.** The 25-way D type connector (J1) allows the Intelligent Serial Module to be reflashed using the Bluelab utilities provided by CSR. The connector is organised so that a direct one-to-one cable to the parallel port of a PC will allow the utilities to run.

The Audio and Flash upgrade circuit are on one half of the PCB so that they could be removed in applications using the RS232 interface only. The board is designed so that if the wire links are removed it can be snapped in two parts.

## ***Software***

The motherboard and Intelligent Serial Module will connect to the Serial Port of any PC. The user can simply communicate with the module using any Terminal Emulator software such as Hyper-terminal or Procomm.

An alternative Emulator is included on the CD. "TDK Terminal" is a terminal emulation application capable of running on Windows 98/ME/2000/XP operating systems. It was developed specifically to aid development and testing of TDK's

Bluetooth Serial Module. It allows connection to serial devices using any combination of the following communications parameters:-

Comport: 1 to 255  
Baudrate: 300 to 921600  
Parity: None, Odd, Even  
Data Bits: 7 or 8  
Stop Bits 1 or 2  
Handshaking: None or Cts/Rts

Differentiating features with respect to other terminal emulation applications are:-

Status of DSR, CTS, DCD and RI are continuously displayed  
DTR can be directly controlled via a check box  
RTS can be directly controlled  
BREAK signals can be sent

Finally, there is a "DATA TRANSFER TEST" mode which allows data to be sent as fast as the handshaking will allow. This feature is very useful for testing the bit transfer of a Bluetooth connection.

To run the TDK Terminal expand the file TDKterminal.zip and copy the .exe file into a working directory. Simply run TDKterminal.exe, instructions are provided.

## Interface Specification

### Serial port connector (J2)

Pin	Signal	I/O		Pin	Signal	I/O
1	CD	O		8	CTS	O
6	DSR	O		4	DTR	I
2	RX	O		9	RI	O
7	RTS	I		5	GND	
3	TX	I				

### Parallel port connector (J1)

Pin	Signal	Description		Pin	Signal	Description
1	n/c			14	n/c	
2	SPI_CS			15	n/c	
3	n/c			16	SPI_RST	
4	n/c			17	n/c	
5	n/c			18	n/c	
6	n/c			19	n/c	
7	n/c			20	GND	
8	SPI_MOSI			21	GND	
9	SPI_CLK			22	GND	
10	SPI_MISO			23	GND	
11	n/c			24	GND	
12	n/c			25	GND	
13	n/c					

### Power connector (J7)

Pin	Signal	Description
1 (centre pin)	Vcc	Nominal 5V (3.6v-6v)
2,3 (outer)	GND	

### Headset connector (J9)

Pin	Signal	Description
1	GND	
2	MIC IN	Audio Input
3	H/S OUT	Audio output
4	n/c	

### Jumpers

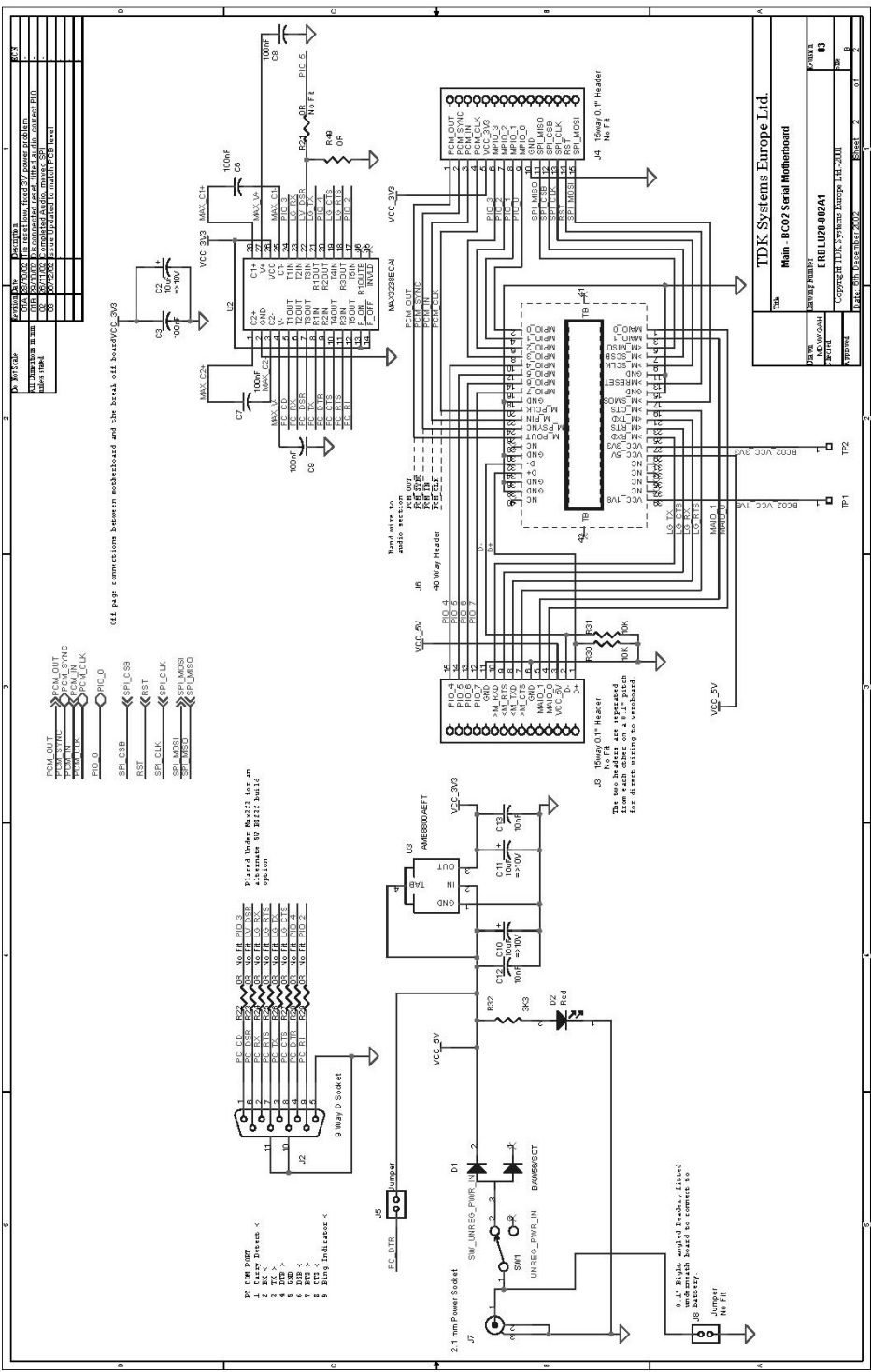
Jumper	Signal	Description
J5	PC DTR	Optional link to power the board from DTR from PC
J8	Power input	No link, used as alternative power input

## Electrical Characteristics

Parameter		Min	Typ	Max	Units	Comments
RS232 Inputs	Voltage range	-25		25		
	Threshold Low	0.8	1.4		V	
	Threshold High		2.0	2.4	V	
	hysteresis		0.6		V	
	I/P resistance	3	5	7	k $\Omega$	
RS232 Outputs	Voltage swing	$\pm 5.0$	$\pm 5.4$		V	Loaded 3k $\Omega$
	O/P resistance	300	50k		$\Omega$	
	O/P short cct		$\pm 40$	$\pm 100$	mA	

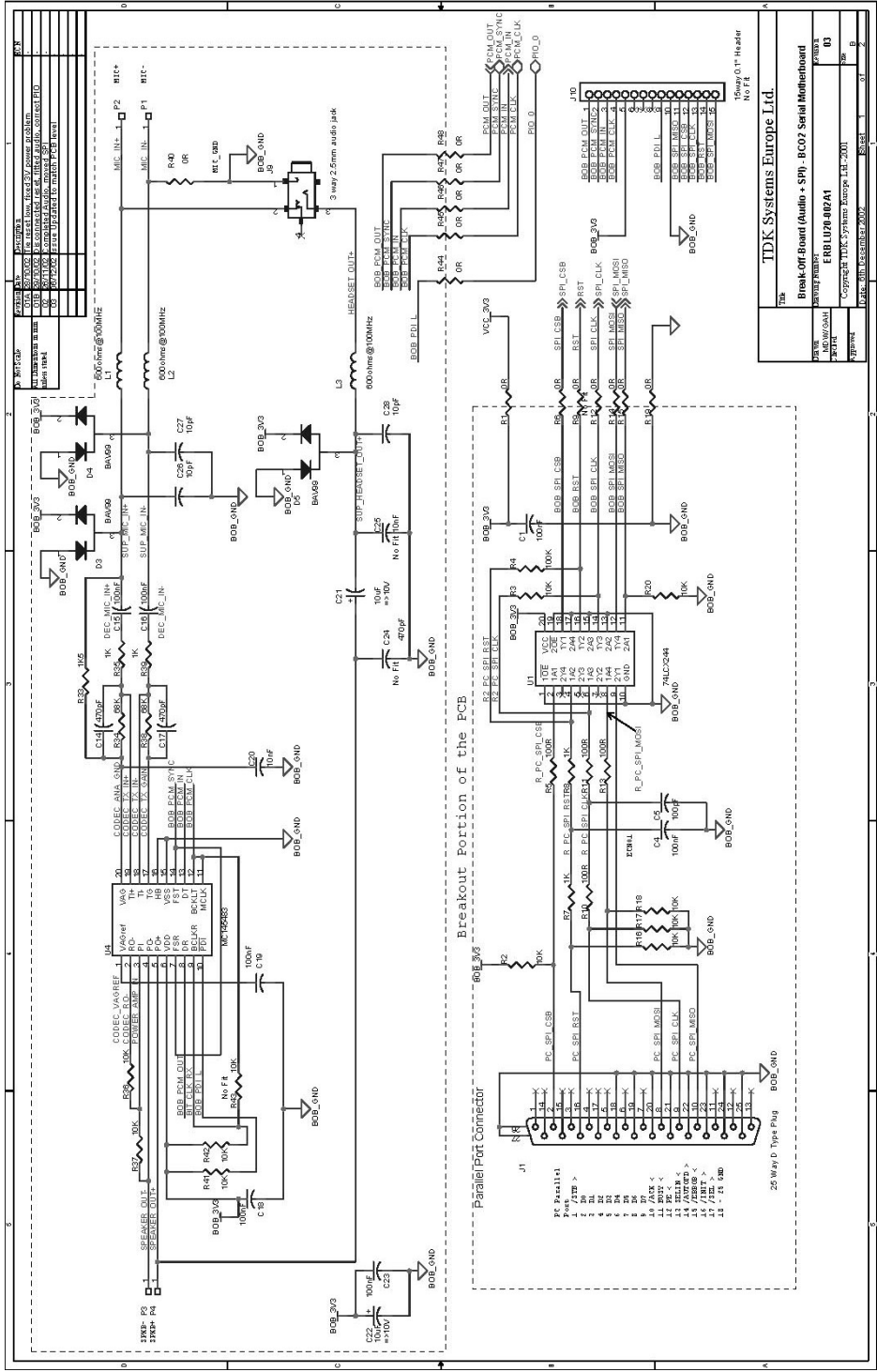
Parameter		Min	Typ	Max	Units	Comments
Power Supply	Input Voltage	3.6	5	6	V	
	Current				mA	

Parameter		Min	Typ	Max	Units	Comments
Audio Interface	Headset Impedance		300		$\Omega$	
	Headset o/p voltage		1.78		V	
	Mic common mode range	1.2		2.1	V	



PC (10M) Power	1	1.5V	<
1.5V	2	3V	>
3V	3	5V	>
5V	4	5V	>
5V	5	5V	>
5V	6	5V	>
5V	7	5V	>
5V	8	5V	>
5V	9	5V	>
5V	10	5V	>
5V	11	5V	>
5V	12	5V	>
5V	13	5V	>
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5V	38	5V	>
5V	39	5V	>
5V	40	5V	>

TDK Systems Europe Ltd.  
 Main - BC02 Serial Motherboard  
 ERLU28-002A1  
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TDK Systems Europe Ltd.  
 Break-off Board (Audio + SPI) - BC07 Serial Motherboard  
 ERB LU28-002A1  
 Rev: 00