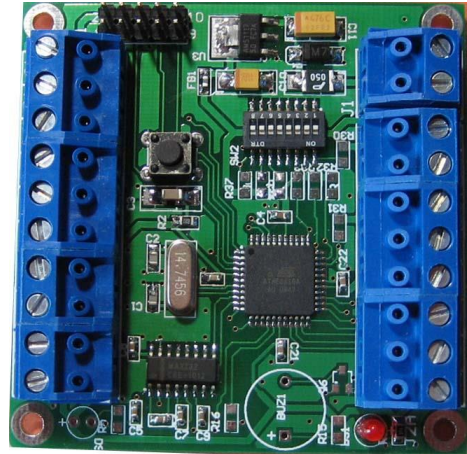


NRZ-L Serial to Biphase-L Converter

MA1483 is a NRZ-L Serial to Biphase-L Converter. The MA1483 receives the NRZ-L encoded data on its RS232 interface. The NRZ-L encoded data, together with the start and stop bits are converted to 10-bit biphase-L encoded format and output on the P1 port. When no serial data is received on the serial port, continues 0's are output from the board.



1. Specification

1.1 Input Serial Data

Configurable bit rate using on board dip switch settings

- 115200 baud, 8 data bits, no parity, 1 stop bit
- 230400 baud, 8 data bits, no parity, 1 stop bit

1.2 Output Data

- Biphase-L encoded format of the input NRZ-L serial data
- 0 – 5V TTL level
- 10-bit one symbol. Corresponding to the start bit, data bit and stop bit of the input serial data
- Configurable bit rate using on board dip switch settings
 - o 115200 with $\pm 5\%$ error rate (When baud rate of serial input is 115200)
 - o 230400 with $\pm 5\%$ error rate (When baud rate of serial input is 230400)
- When no serial data is received on the serial port, continues 0's are output from the board.

1.3 Conversion Format

1.3.1 Input Character Format

Each input character consists of one start bit, 8 data bits and one stop bit, totally 10 bits. The bits are defined as follows:

ST	b0	b1	b2	b3	b4	b5	b6	b7	SP
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ST: Start bit

SP: Stop bit

b7: the most significant bit of data

b6: the 6th bit of data

b5: the 5th bit of data

b4: the 4th bit of data

b3: the 3rd bit of data

b2: the 2nd bit of data

b1: the 1st bit of data

b0: the least significant bit of data

1.3.2 Output Biphase-L Frame Format

The output signal is encoded in 0 – 5V TTL level.

A bit of value 0 is encoded as a transition from 0 V to 5V and is defined as bellow:



A bit of value 1 is encoded as a transition from 5 V to 0V and is defined as bellow:



The output is Biphase-L encoded of the input serial data, it also consists of 10 bits as defined bellow:

ST	b0	b1	b2	b3	b4	b5	b6	b7	SP
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During idle state, no serial data is received on the serial port, the board will output continues 0's. A sample waveform of idle state is shown below:

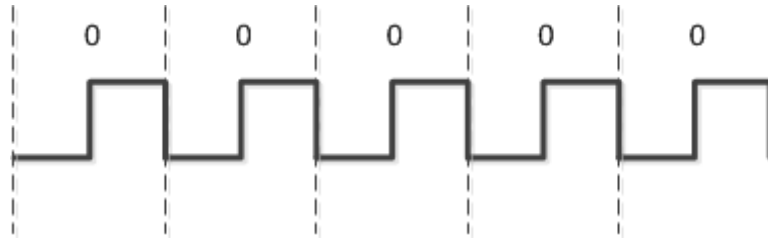


Figure 1 Waveform of idle state.

When serial data is received, the board will first output the start bit, then the 8 data bits in where the MSB (most significant bit) will output first, and the LSB (least significant bit) will be output last. Finally, the stop bit will be output.

The start bit is defined as a bit of value 1, and has a waveform as below:



Figure 2 Waveform of start bit.

The stop bit is defined as a bit of value 0, and has a waveform as below:



Figure 3 Waveform of stop bit.

The 8-data bits are inverted version of the original serial data. That is, if a bit in the original serial data is of value 0, the output bit will be encoded as a 1 and has the waveform as below:



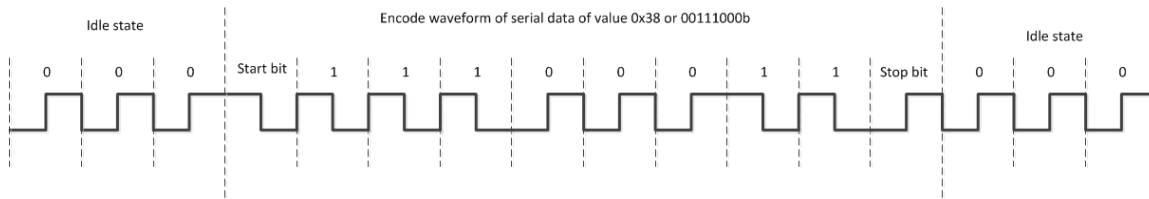
Figure 4 Waveform of encoded bit of bit of value 0 in the original serial data.

If a bit in the original serial data is of value 1, the output bit will be encoded as a 0 and has the waveform as below:



Figure 5 Waveform of encoded bit of bit of value 1 in the original serial data.

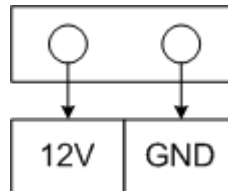
For example, if the original serial data is 0x38 in hex value or 00111000 in binary format, the output waveform will be:



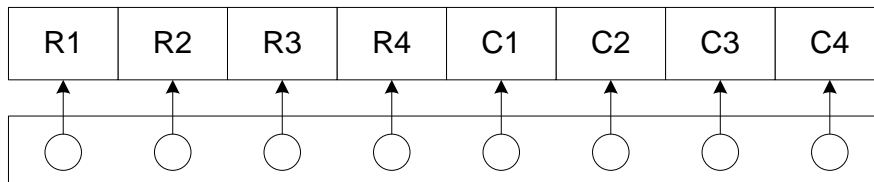
2. Connectors:

2.1 Connector J1

Connector J1 Port Assignment	
Designator	Description
12V	12V DC Power Supply In
GND	Power Supply Ground

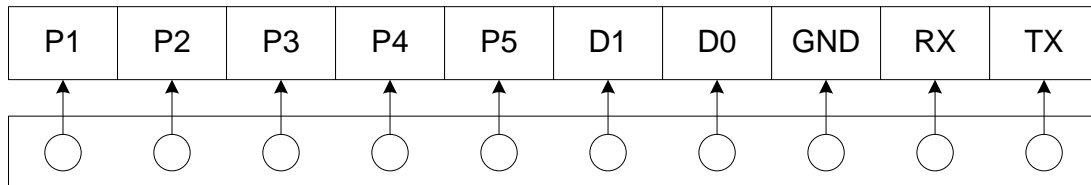


2.2 Connector J2A



Connector J2A Port Assignment	
Designator	Description
R1	Not used
R2	Not used
R3	Not used
R4	Not used
C1	Not used
C2	Not used
C3	Not used
C4	Not used

2.3 Connector J2B



Connector J2A Port Assignment	
Designator	Description
P1	Biphase-L output
P2	Not used
P3	Not used
P4	Not used
P5	Not used
D1	Not used
D0	Not used
GND	Ground
RX	RX data to terminal
TX	TX data from terminal

2.4 Biphase-L Output bit rate settings

Dip Switch Settings								Input Baud Rate	Output Bit Rate (±5% error rate)
1	2	3	4	5	6	7	8		
OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	115200	115200
OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF	230400	230400
Other Values								NA	No output generated

3. Mechanical Drawing

