MiniAD-11-12 is a board-based low speed general-purpose data acquisition and control system that can be embedded into any customised systems.

It features 11 analogue inputs (12-bit resolution) and 5 digital output lines. The system also has a 3-wire RS232 port through which the host system can talk with the system to read all analogue voltages and to set the logic statues of outputs.

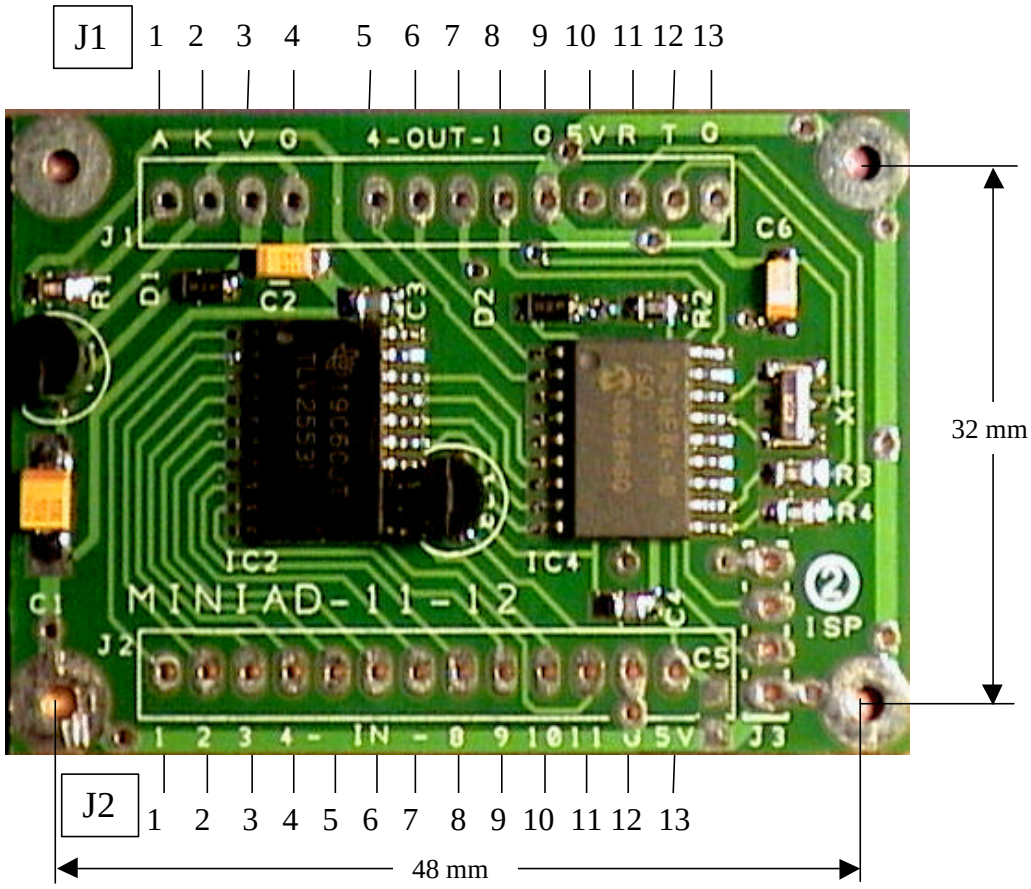
The system accepts three commands sent by the host system: (1) to read 11 analogue voltages in ASCII format, (2) to read analogue voltages in binary format and (3) to set logic status of 4 digital outputs.

The board also an ISP socket for in-circuit series programming. Users can download their own software into the on-board PIC.

Specification

Number of input channels:	11 analogue voltage inputs
Input voltage range:	0 - 2.50V
Resolution:	12-bit (0.0006103V)
Accuracy:	+/- 0.0012V
Update rate for 11 channels:	approx. 8 Hz in ASCII mode and 35 Hz in binary mode
Number of output channels:	4 channels
Output voltage range:	TTL level
Output current source and sink:	20 mA
Communication:	RS232 (TX, RX and Ground, no handshake)
Data packet format:	9600, n, 8,1
Command set:	3 control commands (T, B and O)
Input supply voltage:	5.5 to 10V DC
Power consumption active:	2.0mA maximum
Power consumption idle:	1.5mA maximum

Pin function



Size
55 mm long
38 mm width
10 mm high

Pin function table

J1 connector			J2 connector		
	Mark	**Descriptions**		**Mark**	**Descriptions**
1	A	LED* anode	1	1	Analogue input 1, 0-2.5V range
2	K	LED* Cathode	2	2	Analogue input 2, 0-2.5V range
3	V	Supply voltage 5.5 to 10V DC @ 5mA maximum	3	3	Analogue input 3, 0-2.5V range
4	G	Ground	4	4	Analogue input 4, 0-2.5V range
5	4	Output 4, TTL level sink/source: 20mA	5	5	Analogue input 5, 0-2.5V range
6	3	Output 3, TTL level sink/source: 20mA	6	6	Analogue input 6, 0-2.5V range
7	2	Output 2, TTL level sink/source: 20mA	7	7	Analogue input 7, 0-2.5V range
8	1	Output 1, TTL level sink/source: 20mA	8	8	Analogue input 8, 0-2.5V range
9	G	Ground	9	9	Analogue input 9 0-2.5V range
10	5V	Regulated +5V output	10	10	Analogue input 10, 0-2.5V range
11	R	RS232 RX line (PC side)**	11	11	Analogue input 11, 0-2.5V range
12	T	RS232 TX line (PC side)**	12	G	Ground
13	G	Ground	13	5V	Regulated +5V output

Notes:
* LED should be low current LED
** RX line is Pin 2 and TX line is Pin 3 of the 9-pin female D-type connector. Ground is Pin 5

Command set

The MINIAD card accepts three commands. Each command consists of one or several ASCII characters. After the card accepts that command, it will send an echo back to the computer and then carries out the corresponding operation. The echo is the command character plus a Carriage return (binary 13) and New Line (binary 10).

Command set (ASCII)	Descriptions
T,t	Tigger –To get 11 analogue inputs in ASCII format from channel 1 to channel 11. Each voltage is represent by 7 digits and reads micro volt (μV) and is ended with a Return (binary 13) and a New Line (binary 10).
B,b	Binary –To get 11 analogue inputs in binary format. Each channel is represented by 2 bytes. Upper 4 bits first and the lower 8 bits next. In total, the module will transmit 22 bytes to the host PC
$OX_1X_2X_3X_4$ X_x=0 or 1	To upgrade 4 outputs. X_1 X_2 X_3 X_4 are logic state (=0 or 1) for OUTPUT #1, #2, #3 and #4, respectively. For example: O0101 will make OUTPUT #2 and #4 high and OUTPUT #1 and #3 low

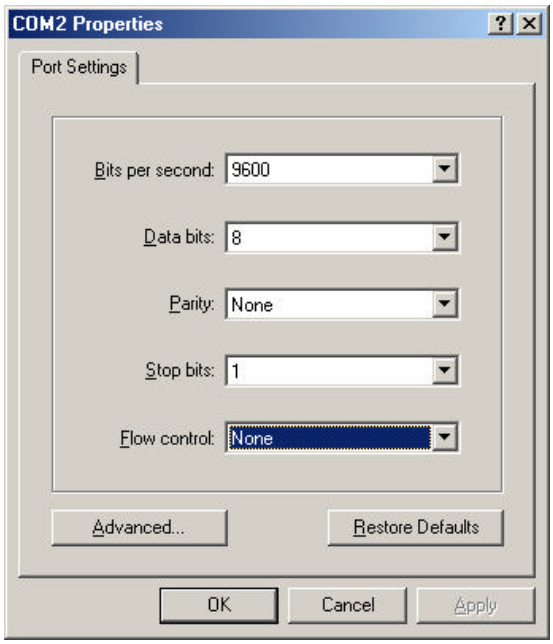
Difference between command “T” and command “B”

The command will alter the way the data is output from the card. In the “T” mode, the data are in ASCII format. Although you can see the data in HyperTerminal, this is not efficient. One complete transmission consists of 102 bytes and will take approx 0.11 second. Obviously, the data logging rate will be not higher than 8 Hz (taking into the account of command transmission).

In the “B” mode, the data are in binary format. You can not see the data in HyperTerminal. One transmission consists of 25 bytes and it will take approx 0.026 second. The maximum data logging rate will be around 35Hz (taking into the account of command transmission).

Appendix A
Control the card using HyperTerminal

Step 1: The Baud rate, data bits, parity, stop bits and flow control are set as follows:



Step 2: Input T command, O command and B command to control the module.