EA-MUX-TC1A4I40
## 16 ADDRESSABLE USB/RS485 MULTIFUNCTION CARD

VERY LOW COST MULTIFUNCTION CARD
SINGLE 5 VOLT – 15ma MAX
USB/RS485 ASCII PROTOCOL
15 ADDRESS CODE AVAILABLE
1 X 8 BIT ANALOG INPUT (*)
4 X TTL OUTPUT
4 X TTL INPUT
1 X EMBEDDED TEMPERATURE SENSOR (*)
1 X CLOCK CALENDAR (*)
1 X GSM OPTION CONNECTOR
(*) Depending by Firmware version

With a simple ascii protocol the user can set/read several value useful in many application.
Through the embedded USB or RS485 interface it is possible switch on/off the four digital output signal, read the status of the 4 digital input, read the analog value, read the temperature of the embedded sensor and set/read the clock calendar. The card will addressable through 4 dip-switch so the uses can control up to 4x15 digital output, read up to 4x15 input and 15 analog input.
A broadcast 00 address is provided to control all the card at same time

CARD DESCRIPTION
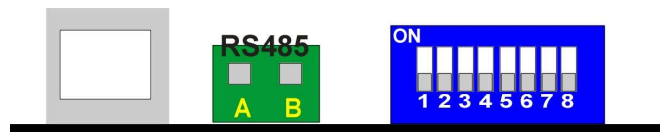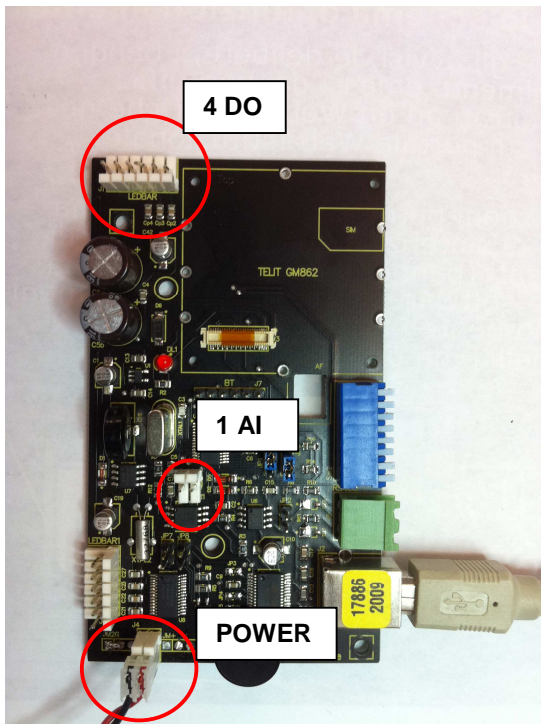
SWITCH	MEANING
8	ADDRESS BIT 0 (ON=1 OFF=0)
7	ADDRESS BIT 1 (ON=1 OFF=0)
6	ADDRESS BIT 2 (ON=1 OFF=0)
5	ADDRESS BIT 3 (ON=1 OFF=0)

If address 00 is selected (all switch in off position) the cpu will consider the address as 01 because the 00 is reserved for broadcast communication.
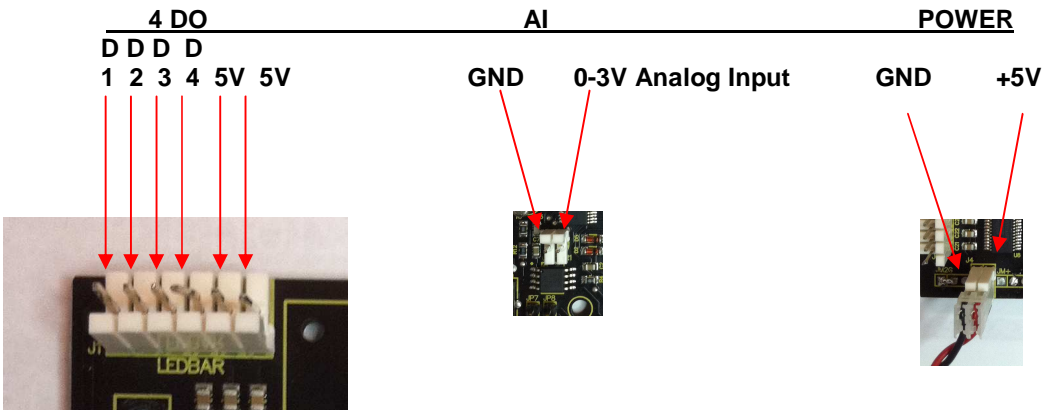
4	DIGITAL INPUT 4
3	DIGITAL INPUT 3
2	DIGITAL INPUT 2
1	DIGITAL INPUT 1

COMMUNICATION SETTINGS
BAUD RATE	= 9600
STOP	= 1
PARITY	= NONE

Address code examples:

Address #	Switch Status (ON=UP – OFF=DOWN)
1	5=OFF, 6=OFF, 7=OFF, 8=ON
7	5=OFF, 6=ON, 7=ON, 8=ON
10	5=ON, 6=OFF, 7=ON, 8=OFF
15	5=ON, 6=ON, 7=ON, 8=ON

CONNECTOR DESCRIPTION

4 DO	AI	POWER
D D D D		
1 2 3 4 5V 5V	GND 0-3V Analog Input	GND +5V

PROTOCOL DESCRIPTION

The ascii based protocol allows the user to executed all the I/O operation through a simple ascii string from terminal program like HyperTerminal or similar softwares.

All the commands have a ^ character followed by six address prefix.

To address the card 02 the address will be written as ^000002.

^ 0000AA cmd Out1 Out2 Out3 Out4 #CR

^	= Start command always present			
0000	= Fixed zeros for address code always present			
AA	= Address code. From 01 to 15. 00 = For broadcast comm.			
Cmd	= Command Id.	O	= Set digital output	
		I	= Read digital input	
		T	= Read Temperature	
		A	= Read the Analog Input	
		D	= Read the card address code	
		C	= Read the internal clockcalendar	
		K	= Set the internal clockcalendar	
		F	= Firmware revision	

Note: Command Id must be in Uppercase

Outx	= (1/0) The status (ON/OFF) of the relative digital output
#CR	= Carriage return

When a right command (and password) are sent to the controller an ACK (**!**) character will be returned otherwise a NACK (**?**) will be returned. A short beep indication will be also emitted to indicate a right command received. The address code of the card is read only at the power on: a 3 beep sequence will indicate the correct internal self test execution, the address acquisition and the ready status.

COMMAND DESCRIPTION FOR EA001 FIRMWARE REVISION
The following command description are referred to specific firmware revision.
Some other command can be implemented in future revisions.

1)   SET DIGITAL OUT
It is possible to set/clear 4 digital output at the same time. With a broadcast command (Address = 00) it is possible to set/clear up to 16 x 4 digital output at the same time.
Example:
- The user need to set the digital output 1 & 3 of the card #01 .   The command is: **^000001O1010**
- The user need to set the digital output 1,2 & 3 of the card #01. The command is: **^000001O1110**
*The card will be response with **!** if the command is executed ok*

2)   READ DIGITAL INPUT
The user need to read the digital input port of the card #03. The command is: **^000003I**
The card will respond with: **0101!** as the D1 D2 D3 D4 input status.
*Note that **!** is the command executed ok character*

3)   READ THE UNKNOW CARD ADDRESS
For the user who need to know the unique card address connected to the com port the command will be: **^000000D**
Note that in the broadcast mode all the card can execute the command.
The card will be respond with: **0000aa!** Where aa= card address
*Note that **!** is the command executed ok character*

4)   READ THE FIRMWARE REVISION
For the user who need to know the firmware revision of the card #1 the command will be: **^000001F**
The card will be respond with: **EAxxx!** Where xxx=is the firmware revision.
*Note that **!** is the command executed ok character*