Evaluation Board (EVB) User's Guide
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ITC232 – A   Evaluation Board (EVB)

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Chapter 1   Introduction

The EVB (Evaluation Board) was designed to allow the easy exploration of the various features of the ITC232-A integrated circuit. The basic concept behind the ITC232-A is to incorporate the most frequently used functions and procedures in the field of data acquisition and control into one chip. Instead of programming these functions from scratch into a microcontroller, all the user now has to do is to call these functions and procedures from the serial port of a computer. This saves a great deal of developing and debugging time while costing the same or less than a programmable device.
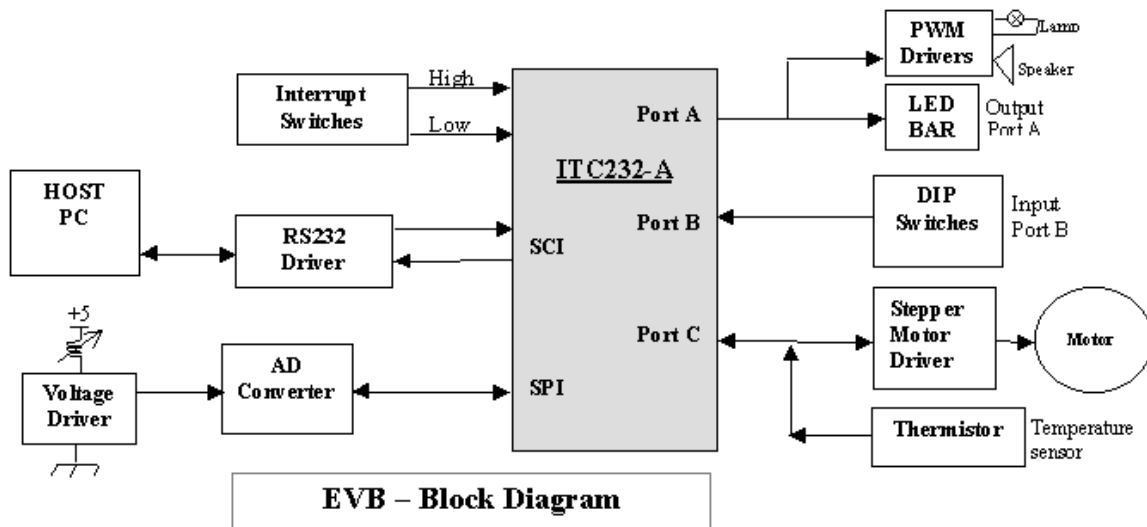

EVB – Block Diagram

Figure 1

Each function programmed inside the ITC232-A can be explored using the EVB and the Windows® evaluation software program which is provided with each Evaluation Board.

With this is hardware and software combination package you can explore the many features of the ITC232-A IC, including:

➢ Reading of a digital 8-bit value set by a DIP switch.
➢ Turning each LED in an LED bar on and off by writing out digital values.
➢ Usage of decimal, hexadecimal and binary notation for the functions above.
➢ Hardware interrupts.
➢ Pulse Width Modulation. Tones can be heard on a small transducer. Duty cycle changes can be seen in the relative brightness of a small incandescent lamp. A transistor driver to show how a small DC motor speed can be controlled by PWM is also included.
➢ Temperature measurement using a thermistor.
➢ Using external resistors and capacitors, the behavior of an RC network can be explored. This also allows the user to measure resistance (if the capacitance is fixed) or capacitance (if the resistance is fixed.)
➢ Analog/Digital conversion. The EVB contains a 10 channel, 8 bit ADC attached to a potentiometer. The voltage on the pot can be read into the computer.
➢ The workings of the ITC232-A serial Synchronic Peripheral Interface (SPI) are explored.
➢ Stepping motors. The board includes a stepper and its driver, which can be easily controlled from a computer.
➢ Remote control over a phone line. This feature is simulated since the board remains attached directly to the computer.

Chapter 2   Connections and Set-Up:

Connect the EVB to a serial port using the serial cable and DB25 connector supplied with the board. Next, power the board by connecting a wall transformer (max. 12V, min. 500mA) with a power jack plug to the power jack receptacle on the Evaluation Board. If the board is properly powered, the red LED light should be on. Press the RESET button on the EVB. Please observe the right polarity! The power jack tip must be the positive terminal.

(For a schematic view of the EVB please refer to the diagram at the end of this guide.)

Insert diskette 1 of the EVB software into the floppy drive of your computer. Double click on the 'Setup.exe' icon. The EVB evaluation program will be installed on your hard drive. Insert disk 2 as instructed. When installation is completed, double click on the 'RMV – Tutor2' icon to start the program.

By default this program starts on COM2 at 9600 baud. The EVB is preset at 9600 baud with the baud rate jumper on the 2 leftmost pins.

Chapter 3   Communications

The normal procedure is to develop and test the commands you want to send to the peripheral using a terminal emulation program, such as the ones listed below. Once the program has been outlined, the user can write an application code in a higher level language (C, Pascal, QBASIC, Visual BASIC, etc.) for the task(s) to be performed

You can operate the EVB board from a custom written program or you can do it from any commercial communications software (PROCOMM®, Terminal® for Windows®, MAC240®, etc).

Make sure that the COM port you select in your program corresponds to the one to which the EVB is connected. Choose 300 or 9,600 Bauds on the terminal according to the BAUD pin level Bauds (according to the speed selected with JP1. High = 9600, Low = 300). The other

parameters are always N,8,1 (no parity, 8 bits and 1 stop bit). The Baud rate can be changed later to any standard value between 300 and 115200 Bauds.

When using a commercial communications software package select no CR translation to CR/LF (Carriage Return/Line Feed). LF is ignored by the ITC232-A but it still takes some time to be sent. Enable the local echo if you are using a communications package.

Important: Make sure the Backspace key on your terminal sends out ASCII(#8), otherwise you will not be able to correct a command without retyping it entirely (in some terminal emulator programs, such as the one included in Windows®, a backspace is generated with a Ctrl key (e.g. under VT-100 terminal emulation, backspace is Ctrl- H)).

While with commercial software packages the CRAB (Bin), CRAD (Dec) or CRAH (Hex) configurations work best, the CRAP (Program) configuration is optimized for controlling the ITC232-A from within your own programs.

Chapter 4   Trouble Shooting

If the message: Welcome to the ITC232-A
                        ? or h for help
                        >
does not appear on your screen upon resetting the EVB.

Proceed as follows:

(1) Check that there is power on the board (~5 V).

(2) Check that the serial link is working. The most frequent problems here are:
        (2.a) The COM port in use is not the selected one in the program.
        (2.b) The communication parameters are incorrect.
        (2.c) The RX and TX lines are inverted.

 Serial drivers are sturdy and normally stand some electrical abuse. You could just invert the cables going to RX and TX and try again. NOTE THAT EVEN THOUGH IT IS UNLIKELY THAT YOU WILL INFLICT ANY DAMAGE TO YOUR COMPUTER OR THE EVB BOARD, YOU ARE WORKING AT YOUR OWN RISK AND RMV ELECTRONICS INC. WILL NOT BE HELD RESPONSIBLE FOR ANY DAMAGE. If you want to test the cables before connecting them again, send any file out the serial port. With a tester on the AC voltage scale you should read a variable voltage between 0 and -12 volts coming into the RX line on the board. Conversely, testing the TX line on the board should result in a brief AC voltage appearing after releasing the RESET button (resulting from the Welcome... message). If the latter does not happen then there is a problem in the EVB board (see below).

(3) Verify the board again and in particular the positioning of the ICs. To determine whether the problem is in U3 (a MAX232 used to generate the voltages required for the RS232C standard) or in U5 (the ITC232-A IC), repeat the last test for an AC voltage on U5, pin 29 (when sending from the computer) and U5, pin 30 after releasing the RESET button. A failure of the latter means:
        (3.a) The ITC232-A has no power (measure supply voltages on the chip pins).
        (3.b) The ITC232-A has not been properly reset (or the RST pin is always Low). Check the reset circuit.
        (3.c) The IC is not oscillating (check pins 39 and 38 with an oscilloscope).
        (3.d) The IC is gone... In that case, call RMV ELECTRONICS INC. for a replacement.