

Many screens in LabRecon have a “?” **button** on the title bar at the top right, which opens a help screen. Much of this help information is also in this document. Documents on www.LabRecon.com, which include the “LabRecon - Chip Datasheet” and “Getting Started” documents provide example circuits and step-by-step instructions.

I can't get the software to communicate with the chip.

To connect to the chip one clicks on the top LabRecon Start button and then on “Connect to LabRecon Chip/Hardware” to open the “Chip/Hardware Connection” screen. Then click on “Select Port” to choose the COM Port for the chip.

I'm using a USB to Serial cable/adaptor and the COM Port is Not in the list:

Insure that the adapter is plugged in to the USB port and that its Driver has been installed. Drivers are supplied by the manufacturer of the adapter and may come on a CD with the adapter or may need to be downloaded from the manufacturer's web site. One should follow the manufacturer's directions to install the drivers.

The Windows '**Found Hardware Wizard**' should automatically start when the adapter is first connected to a PC to guide the user in this process. The wizard may also automatically download and install the proper driver.

For troubleshooting the Windows '**Device Manager**' can be open with the lower button of this '**Hardware Connection**' screen. If the adapter has not been installed properly it may show with a '!'. When installed it will appear in the 'Ports (COM & LPT)' group.

I'm using a Bluetooth device and he COM Port is Not in the list:

Review the information above relating to Drivers. Bluetooth drivers are sometimes referred to as a 'Bluetooth Stack'.

Insure that the external Bluetooth 'dongle' is in the PC or that the internal Bluetooth 'radio' is enabled.

Insure that the Bluetooth 'radio' is 'paired' and 'connected' to the hardware and that the hardware is powered.

A Bluetooth device can create multiple COM Ports. When the Bluetooth device successfully connects to the hardware, its software should indicate the COM Port being used. One can also open the Bluetooth manufactures software to determine the COM Port being used.

The Hardware cannot be found:

Insure that the Chip or Hardware is powered.

Check if the proper COM Port is selected. See COM Port help above.

Check the connection from the Chip to the USB to Serial adapter.

If using a LabRecon Chip insure the TX and RX lines are Not reversed. It may at first seem nonintuitive, but the TX pin of the chip should interface to the RX connection of the USB or Bluetooth device. A TX connection of a chip or device should be an output and an RX connection should be an input.

An Open Error occurs:

Insure that no other application is presently using the same COM Port.

I can't get the software to communicate with the chip. (continued)

I'm still having a problem:

Insure that the proper signal swings are being used.

The LabRecon chip uses 0 to 5V CMOS levels. For most TTL/CMOS serial chips and devices, including the LabRecon chip, the TX and RX pin will be logic high (5V) when the signals are idle (no data is transmitting) and “pulse” low (0V) when data is transmitted.

As discussed in the LabRecon chip datasheet, RS-232 levels use both positive and negative voltage levels, with the negative voltage being the idle state. This is why a level converter circuit is needed.

CMOS levels do have a good “safety margin” on input swings, whereas a high level only needs to be above 3.25V for a high logic state and below 1.75V for a low logic state. These voltage levels are based on a chip being powered by 5V ($V_{dd}=5V$), but a part's datasheet should be used to verify its input levels.

If the USB to TTL/CMOS serial or Bluetooth interface uses 0 to 3.3V logic a level translator circuit should be used.

If LEDs are used on the TX and RX lines for diagnostics, insure that current limiting resistors (in series with the LEDs) with a value > 270 ohm are used. If these resistors are not used the LED will limit the swing of the signals.

I get inaccurate voltage readings on analog inputs.

Check the voltage used to power the chip (at Vdd):

The internal A/D (Analog to Digital) converter uses the voltage at the Vdd pin, which should be 5V, as a reference.

Insure the voltage regulator is producing a 5V output.

If powering the chip from USB power (5V) a voltage regulator cannot be used since the regulator must have an input voltage greater than its output. If an unpowered USB hub is being used it can lower the USB voltage especially if other devices are connected to the same hub. Either connect to the computer without the hub or use a powered hub.

Insure low impedance sources are driving inputs:

The analog inputs should be driven by source impedances (resistances) $< 10K$ and the accuracy will be degraded with high source impedances.

An example of a high impedance source would be high value resistors used as a voltage divider, ie two 100K resistors used as a voltage divider, which would result in a 50K source impedance.

To reduce the source impedance either reduce the resistor values or use an op-amp as a buffer. If powering the op-amp with 5V and it is desired to use the full 0 to 5V range, insure the op-amp has “rail-to-rail” inputs and outputs.

Insure decoupling capacitors are used on chip power at Vdd pin:

For best A/D performance, a 0.1uF and 4.7uF capacitor should be across Vdd and Gnd as close to the chip pins as possible.

Some analog inputs are not reading values.

Check the chip configuration options:

From the LabRecon “Start” menu select “View LabRecon Chip Pins” to open the “Chip View” screen.

In the lower “Chip Configuration” section check if the listboxes “Stepper Motor 1 Outputs (pins 2, 9)”, “Stepper Motor 2 Outputs (pins 11, 12)”, or “Quadrature Inputs (pins 17, 18)” are set to options other than that for analog inputs. When stepper motor outputs or quadrature inputs are selected, the associated pins are configured for that functionality and not analog inputs.

Some analog inputs are not covering their full 0 to 5V range.

Check the circuitry driving the analog input:

If an op-amp is used as a buffer or amplifier, insure it is specified in its data sheet as having “rail-to-rail” inputs and outputs. Check the output range specifications since “rail-to-rail” op-amps will still have a limit of how close the output voltage can get to its positive supply.

The chip does not function and is heating up.

Insure the chip is powered properly:

Mistakenly reversing the +5V and Ground of the chip will cause a high current draw and the chip will heat up.

The chip can become damaged, but may survive if the power is current limited and if the power was promptly removed.

Diagonal wires appear on the Wiring Diagram.

Ocassionally when moving objects on the Wiring Diagram, “glitches” will occur resulting in wiring segments becoming diagonal, sometimes leaving “floating” connections.

Note that when this does occur the “logic” of the wiring still functions.

Moving an object at the end of the problem wire may correct the problem. If not, the wire can be deleted and redrawn.

Additional Documents (www.LabRecon.com/Documents.html):

LabRecon - Chip Datasheet (rev2.0).pdf
LabRecon - Getting Started with Measurements (rev1).pdf
LabRecon - Measurement Configuration.pdf
LabRecon - Photovoltaics.pdf
LabRecon - Reflow Oven PID Control.pdf

Instructional Videos:

www.LabRecon.com/Videos.html

Revisions to this Document

Rev 0	Initial document

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