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USB/PCI Precision Timer Relay Board (PTRB-C) Specifications & Installation Guide

Nov 2011

Configuration:

___USB 4302 (1-2 Loops) P/N 7000-3328-03-USB

___USB 4304 (1-5 Loops) P/N 7000-3319-03-USB

___PCI CTR-05/10/20 (1-10 Loops) P/N 7000-3328-03-PCI

___µLinc PCI CTR-05/10/20 / DIO24 / 4302/4 - Loops ____

____Alarms 8 IN / 8 OUT

External Box Configuration

µLinc Configuration Terminal Blocks

laserlinc
777 Zapata Drive Fairborn, OH 45324 USA 888.707.4852 Fax: 937-318-2445
E-mail: sales@laserlinc.com
www.laserlinc.com

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LaserLinc, Inc. has reviewed this manual thoroughly in order that it will be an easy to use guide to your Precision Timer Relay Box . All statements, technical information, and recommendations in this manual and in any guides or related documents are believed reliable, but the accuracy and completeness thereof are not guaranteed or warranted, and they are not intended to be, nor should they be understood to be, representations or warranties concerning the product described.

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LaserLinc, Inc.
777 Zapata Dr ▪ Fairborn OH 45324
Phone: 937-318-2440 ▪ Fax: 937-318-2445
info@laserlinc.com ▪ www.laserlinc.com

ERRATA: May 25th, 2010

1) Control Loop Timing for USB based PTRB products
NOTE: See Page 7, Item 5 – CLOCK SPEED; change to 1 MHz.

2) MOP AUTO/MANUAL Switch
If using MOP 3 & MOP 4 configurations, The AUTO/MANUAL switch inputs must be defined on DIN 4 & DIN 5 respectively within TotalVu's "Digital Inputs" configuration.

(MOP 1 & MOP 2 AUTO/MANUAL switches are predefined on DIN 6 & DIN 7 respectively).

3) USB Power Management – Disable
In Device Manager select 'USB Root Hub', & uncheck 'Allow Computer to turn off this device to save power' See Page 8 – Disable USB Power Management

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E-mail: sales@laserlinc.com
www.laserlinc.com

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777 Zapata Drive Fairborn, OH 45324 USA 888.707.4852 Fax: 937-318-2445
E-mail: sales@laserlinc.com
www.laserlinc.com

Read Me First: Safety and Electromagnetic Compatibility

This document contains safety instructions and electromagnetic compatibility (EMC) information for the hardware it accompanies. This document is a supplement to the hardware documentation. Read this page before installing and using the hardware.

Safety Information

This section contains important safety information that you **must** follow when installing and using the hardware.

Do not operate the hardware in a manner not specified in this document and in the user documentation. Misuse of the hardware can result in a hazard. You can compromise the safety protection if the hardware is damaged in any way. If the hardware is damaged, return it to LaserLinc for repair
.
Do not substitute parts or modify the hardware except as described in this document. Use the hardware only with the accessories and cables specified in the installation instructions or specifications. You must have all covers installed during operation of the hardware.

Do not operate the hardware in an explosive atmosphere or where there may be flammable gases or fumes.
Prior to connecting or disconnecting external devices from the hardware, always first disconnect the power cord from the Precision Timer Relay Box.

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777 Zapata Drive Fairborn, OH 45324 USA 888.707.4852 Fax: 937-318-2445
E-mail: sales@laserlinc.com
www.laserlinc.com

Preface

This manual is intended for any user, or potential user, of the LaserLinc Precision Timer Relay Box. It is a supplement to the LaserLinc Total Vu™ software manual. The goal of this manual is to cover only items and features specific to the Precision Timer Relay Box. For general features and operation, refer to the Total Vu software manual.

Included is a Quick Start Guide for the Precision Timer Relay Box. This may allow you to get your Precision Timer Relay Box up and running quickly, especially if you are an experienced Precision Timer Relay Box user. It may also be used to answer some questions quickly. But the Quick Start Guide is not intended to replace the full manual and will not address every application.

Software development is always ongoing at LaserLinc. You may encounter a feature in your version of Total Vu software that appears to differ from the description in this manual. If you encounter such a feature and have a question about it or an issue with it, please contact LaserLinc directly for an answer or clarification. Contact information is available at the beginning of this document, or at http://www.LaserLinc.com.

Compliance

Electromagnetic Compatibility Information

This hardware has been tested and found to comply with the applicable regulatory requirements and limits for electromagnetic compatibility (EMC) as indicated in the hardware's Declaration of Conformity (DoC). These requirements and limits are designed to provide reasonable protection against harmful interference when the hardware is operated in the intended electromagnetic environment. In special cases, for example when either highly sensitive or noisy hardware is being used in proximity, additional mitigation measures may have to be employed to minimize the potential for electromagnetic interference

While this hardware is compliant with the applicable regulatory EMC requirements, there is no guarantee that interference will not occur in a particular installation. To minimize the potential for the hardware to cause interference to radio and television reception or to experience unacceptable performance degradation, install and use this hardware in strict accordance with the instructions in the hardware documentation and the DoC.

If this hardware does cause interference with licensed radio communications services or other nearby electronics, which can be determined by turning the hardware off and on, you are encouraged to try to correct the interference by one or more of the following measures:

• Reorient the antenna of the receiver (the device suffering interference).

• Relocate the transmitter (the device generating interference) with respect to the receiver.

• Plug the transmitter into a different outlet so that the transmitter and the receiver are on different branch circuits.

Operation of this hardware in a residential area is likely to cause harmful interference. Users are required to correct the interference at their own expense or cease operation of the hardware. Changes or modifications not expressly approved by LaserLinc could void the user's right to operate the hardware under the local regulatory rules.

The Declaration of Conformity (DoC) contains important EMC compliance information and instructions for the user or installer.

FCC/DOC Radio Frequency Interference Class A Compliance

This equipment generates and uses radio frequency energy and, if not installed and used in strict accordance with the instructions in this manual, may cause interference to radio and television reception. Classification requirements are the same for the Federal Communications Commission (FCC) and the Canadian Department of Communications (DOC). This equipment has been tested and found to comply with the following two regulatory agencies:

Federal Communications Commission

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at user's expense.

Notices to User

> Changes or modifications not expressly approved by LaserLinc could void the user's authority to operate the equipment under the FCC Rules.
>
> This device complies with the FCC rules only if used with shielded interface cables of suitable quality and construction. LaserLinc used such cables to test this device and provides them for sale to the user. The use of inferior or non-shielded interface cables could void the user's authority to operate the equipment under the FCC rules.

If necessary, consult LaserLinc or an experienced radio/television technician for additional suggestions. The following booklet prepared by the FCC may also be helpful: *Interference to Home Electronic Entertainment Equipment Handbook*. This booklet is available from the U.S. Government Printing Office, Washington, DC 20402.

Canadian Department of Communications

This Class-A digital apparatus complies with Canadian ICES-001

Cet appareil numérique de la classe-A est conforme à la norme NMB-001 du Canada

 – This icon denotes a caution, which advises you of precautionary measures to avoid injury, data loss, or a system crash. When this symbol is marked on the product, refer to the Read Me First: Safety and Electromagnetic Compatibility section of this manual for precautions to take.

 This icon denoted a caution, risk of electrical shock, which advises you of precautionary measures to avoid injury. When this symbol is marked on the product, refer to the Read Me First: Safety and Electromagnetic Compatibility section of this manual for precautions to take.

Intended Use of the Equipment

The Precision Timer Relay Box (PTRB) is an input / output device used in conjunction with LaserLinc's micrometers and ultrasonic measurement systems and provides dry contact switches to perform alarming, input indictors and closed loop control. Common connections would include AC or DC lights, audible alarms, switch closures from other devices such as Programmable Logic Controllers (PLC) or extruders.

Installation and Configuration

PTRB — Safety Considerations

The PTRB must be placed in a location where it is easy for the operator to disconnect the power cord from either the PTRB or from where it is plugged into in case of an emergency.

This equipment may contain voltage hazardous to human life and safety, and is capable of inflicting personal injury. To completely remove all power, ALL users' wires entering the PTRB must be removed. This is easily accomplished using the pluggable terminals contained within.

 – Caution: Before undertaking any maintenance procedure, carefully read the following caution notices

- Explosive Atmosphere—Do not operate the box in conditions where flammable gases are present. Under such conditions, this equipment is unsafe and may ignite the gases or gas fumes.

- Part Replacement—Only service this equipment with parts that are exact replacements, both electrically and mechanically. Contact LaserLinc for replacement part information. Installation of parts with those that are not direct replacements may cause harm to personnel operating the PTRB. Furthermore, damage or fire may occur if replacement parts are unsuitable.

- Modification — Do not modify any part of the PTRB from its original condition. Unsuitable modifications may result in safety hazards.

Table of Contents

1 Specifications

Typical for 25°C unless otherwise specified.

1.1 Timer Relay - Control Loop Output Specifications:

- Number of loops:

  PCI CTR-05 – two / PCI CTR-10 – five / PCI CTR-20 - ten

  USB 4302 – two / USB 4304 - five
- Contact configuration FORM C (SPDT) NO, NC and Common available at connector
- Contact rating 5 amperes (A) @ 250 volts AC (VAC) or 28 volts DC (VDC) resistive
- Will support up to (4) LaserLinc Motorized Potentiometers (MOP)
- Contact resistance 100 milliohms max
- Operate time 5 milliseconds (ms) max
- Release time 2 ms max
- Bounce time: 1ms typ. At nom. voltage
- Vibration: 10 to 55 hertz (Hz) (Dual amplitude 1.5 millimeters (mm)
- Shock: 10 G (11 ms)
- Dielectric isolation: 500 V (1 minute)
- Life expectancy: 15 million mechanical operations, min
- Switch Rate: 360-ops/hr. max at rated load
- Power on RESET state: Not energized. NC in contact to Common

1.2 Alarms - Digital Output specifications

- Number of outputs:

  PCI CTR-05 – eight / PCI CTR-10 – eight / PCI CTR-20 – none

  USB 4302 – eight / USB 4304 – eight
- Contact configuration 10 FORM C (SPDT) NO, NC and Common available at connector
- Contact rating 5 amperes (A) @ 250 volts AC (VAC) or 28 volts DC (VDC) resistive

- Contact resistance 100 milliohms (m.) max
- Operate time 5 milliseconds (ms) max
- Release time 2 ms max
- Bounce time: 1ms typ. At nom. voltage
- Vibration: 10 to 55 hertz (Hz) (Dual amplitude 1.5 millimeters (mm))
- Shock: 10 G (11 ms)
- Dielectric isolation: 500 V (1 minute)
- Life expectancy: 15 million mechanical operations, min
- Switch Rate: 360-ops/hr. max at rated load
- Power on RESET state: Not energized. NC in contact to Common

1.3 Digital isolated inputs

- Polarity: Non Polarized, (+/-) 2-30 VDC
- Number of inputs:

  PCI CTR-05 – eight / PCI CTR-10 – eight / PCI CTR-20 – none

  USB 4302 – eight / USB 4304 – eight
- Isolation 500 volts (V)
- Resistance 1.6K ohms
- Input range +/- (2–30) VDC max

1.4 Physical / Electrical

- 10”L (254mm) x 8”W (203mm) (w/o MOP connectors)
- 14”L (356mm) x 8”W(203mm) (w/ MOP connectors)
- Weight: 4lb (1.8kg)
- Power

  PCI version: powered from CTR-05/10/20

  USB : AC wall adapter, Universal power, 100-240 VAC, 50-60 Hz, 5VDC @ 0.5A
- Ambient Temp. 45F–110F, relative humidity 10%-90% non-condensing

2 Precision Timer / Digital I/O Specification / Installation

2.1 Description

The Precision Timer Relay Board (PTRB) integrates the functions of closed loop control and digital I/O (alarming and user inputs) into one compact package for use with Total Vu software.

External alarms and user-supplied input switches allow users a method of connecting external devices such as audible or visual alarms, cutters, sprayers, footswitch inputs etc.

For closed loop control, precision timed, pluggable, FORM C, 5 AMP relay contact closures are provided for "Jog-up" and "Jog-down" functions. Optionally, LaserLinc's MOPs may also be connected (MOPs not included). See Section 3.4 below for MOP testing and installation. For alarming, pluggable, FORM C, 5 AMP relay contact closures are provided. For user inputs, (+/-) 2-30 VDC, non-polarized, pluggable, terminal contacts are provided.

2.2 Configuration

The PTRB is supplied in three different configurations. LaserLinc will automatically supply the appropriate configuration based upon your hardware requirements.

Option 1: **(1-2 Control Loops)**, 4302 / PCI CTR-05 Version:
Digital I/O - 8 inputs, 8 alarm outputs
Control - 2 Loops Digital Pulse *Width* or 1 Loop Pulse *Count*

Option 2: (1-5 Control Loops), 4304 / PCI CTR-10 Version:
Digital I/O - 8 inputs, 8 alarm outputs
Control - 5 Loops Digital Pulse *Width,* or
- 2 Loops Pulse *Count* & 1 Loop Digital Pulse *Width*, or
- 1 Loop Pulse *Count* & 3 Loops Digital Pulse *Width*

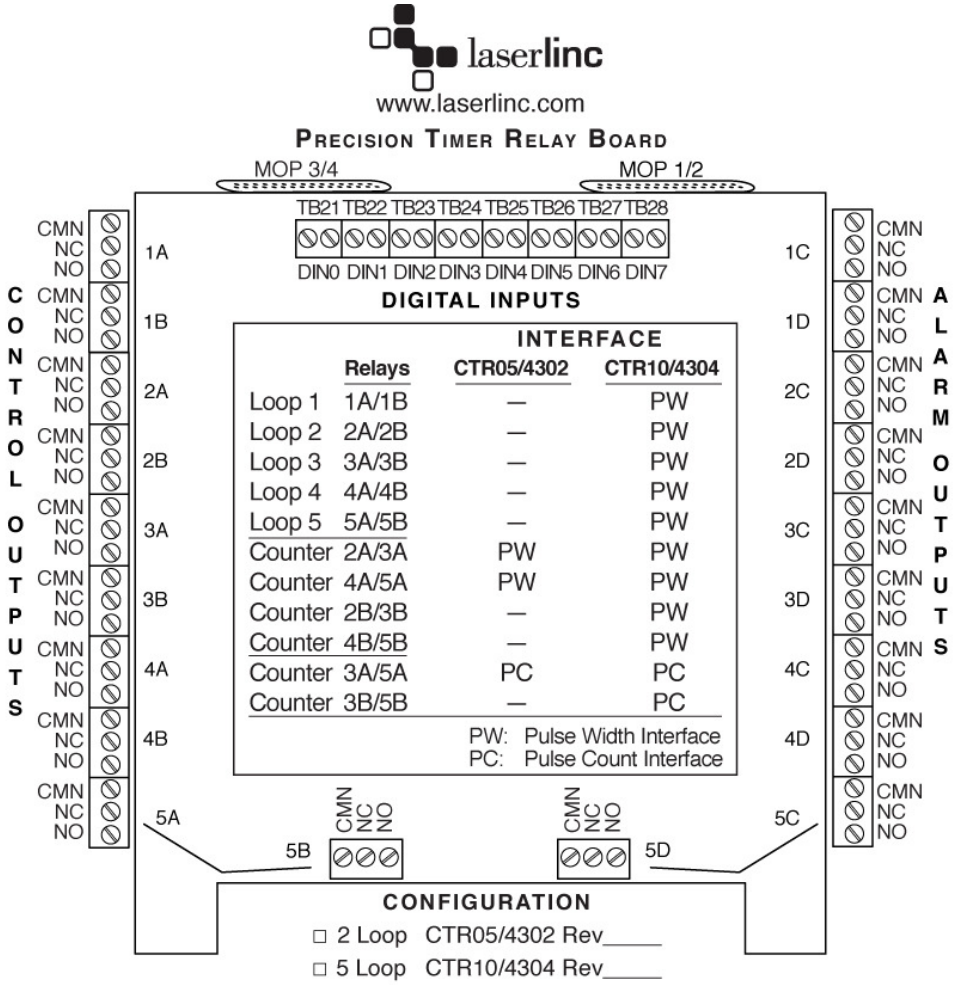
Option 3: **(1 –10 control loops),** (PCI CTR-20, Integral alarming and input functions are not available in this package. An additional USB based I/O device is available).

Digital I/O - Not Available

Control - 10 Loops Digital Pulse *Width,* or

- 1 Loop Pulse *Count* & 8 Loops Digital Pulse *Width*, or
- 2 Loops Pulse *Count* & 6 Loops Digital Pulse *Width, or*
- 3 Loops Pulse *Count* & 4 Loops Digital Pulse *Width, or*
- 4 Loops Pulse *Count* & 2 Loops Digital Pulse *Width*

Configuration – Total Vu Hardware Mapping



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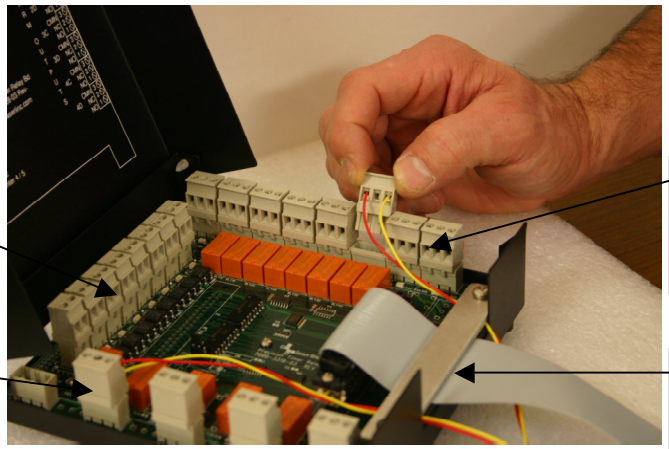
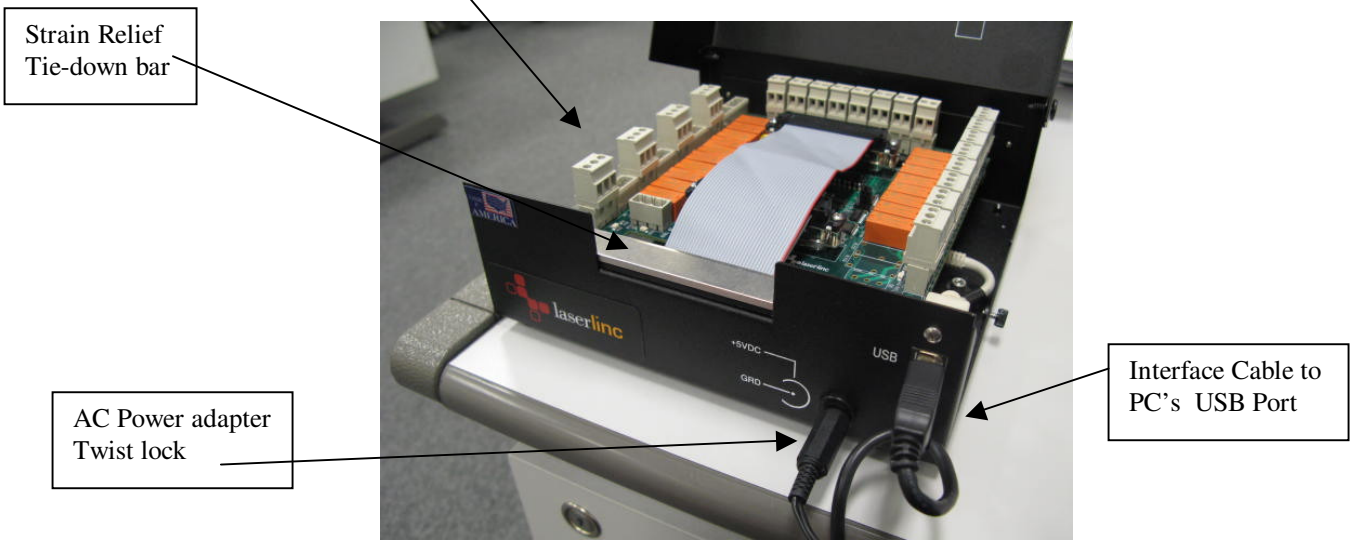


Option 1 - Hardware Configuration Shown
PCI CTR-05



Option 2 - Hardware Configuration Shown
USB 4304
w/AC Power Adapter

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777 Zapata Drive Fairborn, OH 45324 USA 888.707.4852 Fax: 937-318-2445
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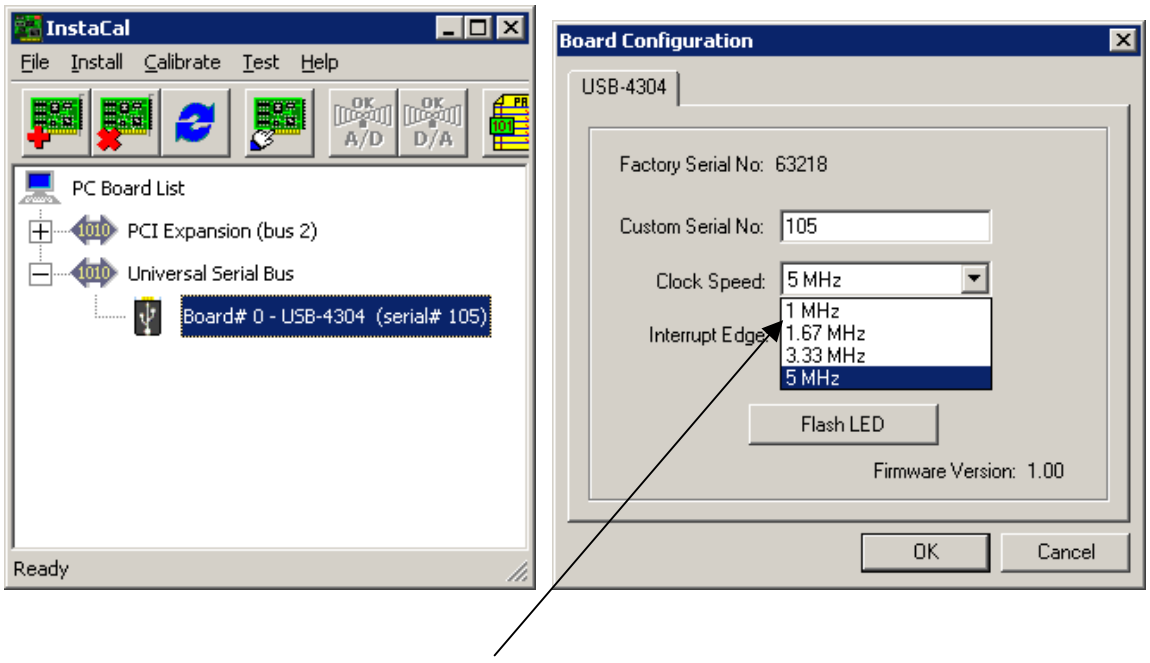
2.3 Installation Procedure USB – add on

This section assumes that the PCI TLAser400 Interface Card and Total Vu software are installed, a scanner is connected and calibrated, and a measurement is defined. Refer to the *Total Vu Operator's Manual* for further details. If you have a PTRB PCI version, skip ahead to section 2.4

1) Install the InstaCal Software by browsing to the InstaCal folder in **"C:\Program Files\LaserLinc\Total Vu"** or the Total Vu CD "***\InstalCal***" and executing "*icalsetup5.85.exe*".
2) Connect the USB cable from the PTRB to any PC USB connection. Connect AC power adapter to front panel. Ensure the 'twist-lock' connector engages.
3) Windows will detect a new Plug-N-Play device. Wait until the message says "*Ready to Use*".
4) Execute the InstaCal software. **INSURE THE USB 4302/4,CTR-05/10/20 CARD IS DETECTED BY INSTACAL.**
5) **IMPORTANT** - For USB-4302/4 ONLY: Double click on the entry USB-4302/4 Select "*Clock Speed*" pull-down menu, and change to *1 MHz*, click "*OK*".

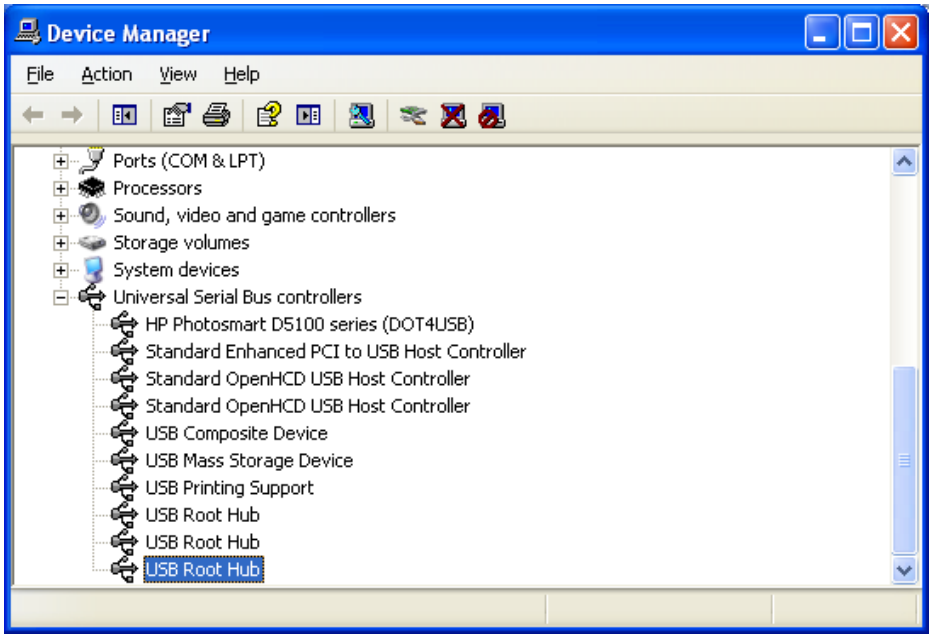


Select 1 MHz Clock Speed

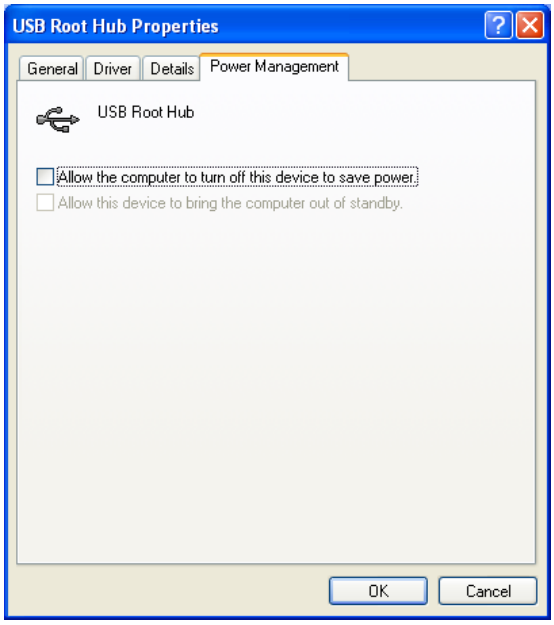
6) Exit InstaCal.

7) Disable USB Power Management

Enter Windows Device Manager - Select *START\CONTROL PANEL\SYSTEM*, Select *HARDWARE* tab, select *Device Manage*r, select *Universal Serial Bus Controller*



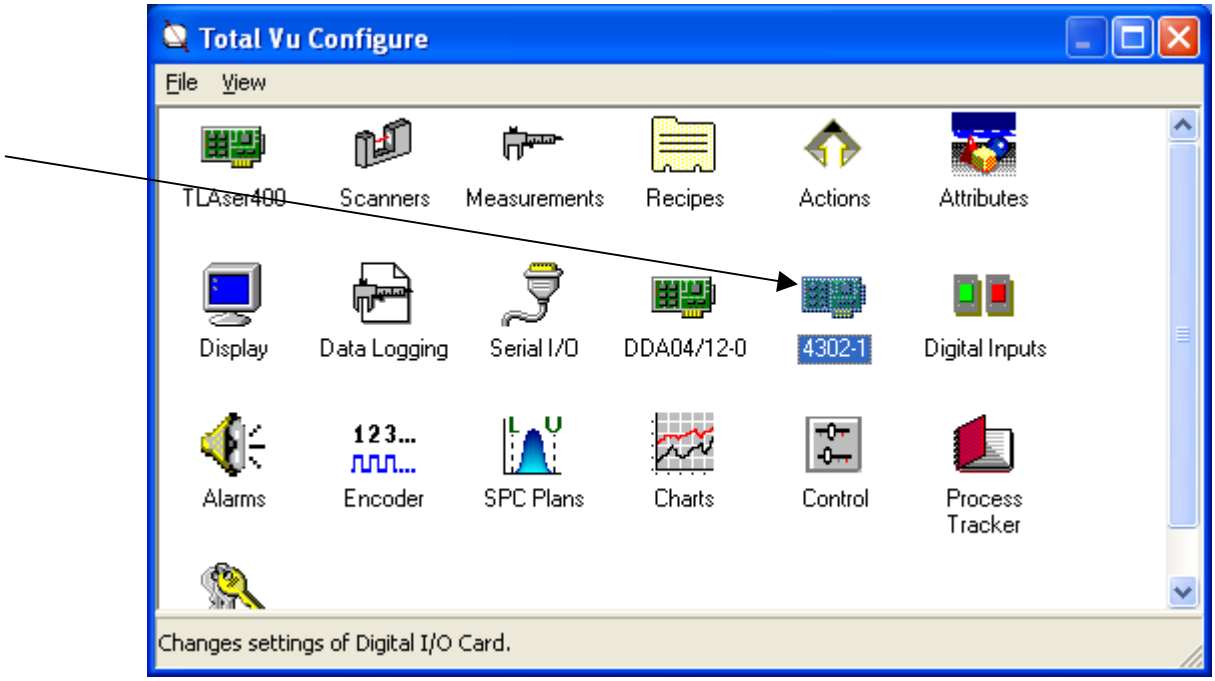
Select *USB Root Hub, Power Management* tab – uncheck "Allow the computer to turn off this device to save power" (If there are more than one *USB ROOT HUBS* ,repeat for each occurrence)



8) If the CONTROL and/or DIO option was purchased as an “add-on”, after, the original Total Vu installation, copy the file *TotalVu.bin* from the CD or USB flash drive to your Total Vu folder (default is c:\program files\LaserLinc\Total Vu). This file enables the CONTROL and/or DIO option in your software.

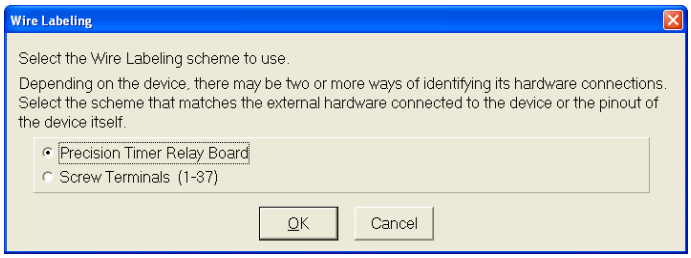
9) Execute Total Vu.

10) Select the *Configure/Full Configuration* screen and verify the appropriate icon; “4302/4-1”, icon now appears.



11) Double Click on the 4302-1 icon

- highlight *Wiring Label Style*
- Select *Change Setting* button
- Select *Precision Timer Relay Board* and hit *OK* to close

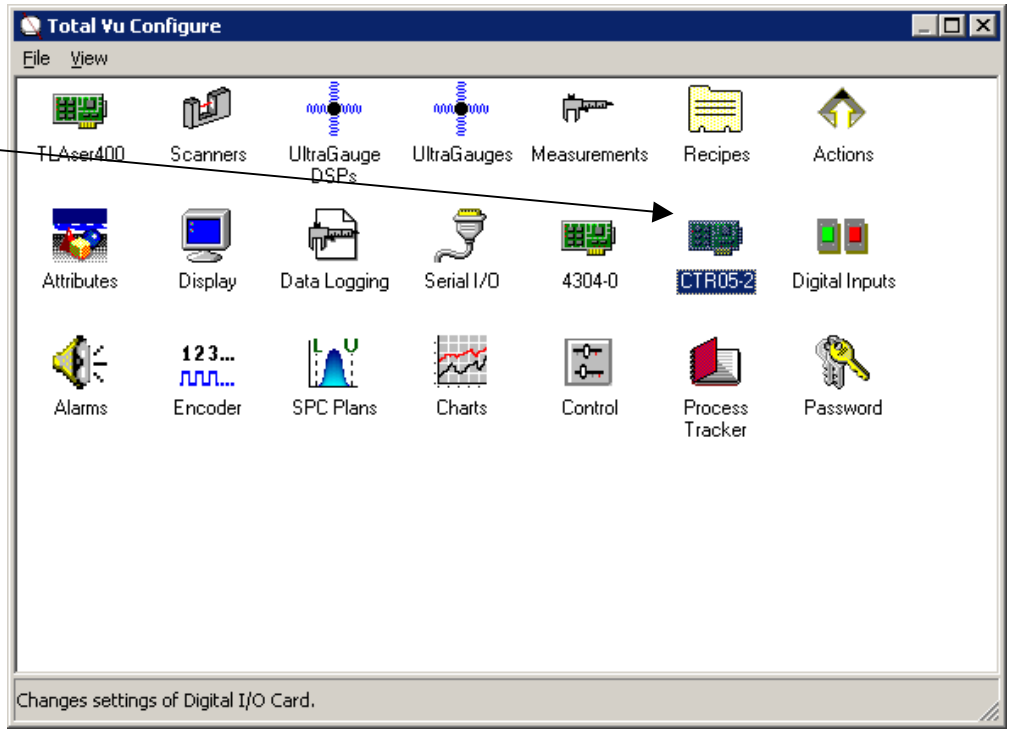


The PTRB should now be working.

2.4 Installation Procedure PCI – add on

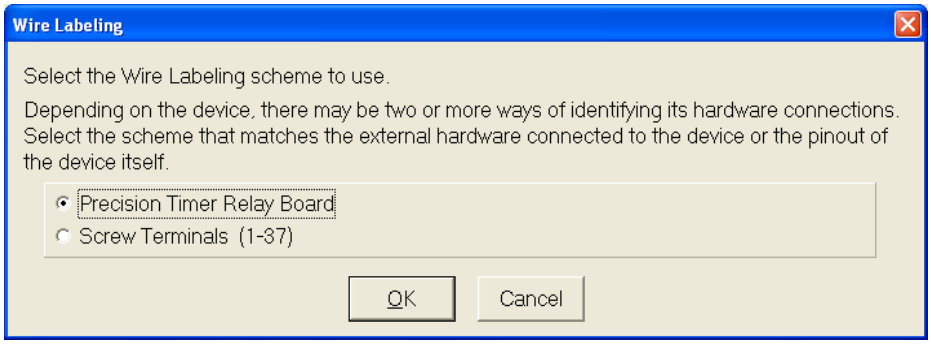
This section assumes that the PCI TLAser400 Interface Card and Total Vu software are installed, a scanner is connected and calibrated, and a measurement is defined. Refer to the *Total Vu Operator's Manual* for further details. If you have a PTRB USB version, go back to section 2.3

1) Power down the PC.
2) Install the PCI CTR-05/10/20 into any available PCI slot in the PC.
3) Connect the cable from the PTRB to the PC backpanel PCI CTR-05/10/20 connector.
4) Restart computer and boot Windows.
5) Windows will detect a new *Plug-N-Play device*, place the Total Vu CD into the CD drive and let Windows automatically find the driver. Follow the Window's prompts until finished.
6) Install the InstaCal Software by browsing to the Total Vu CD \InstalCal folder and executing "*SETUP.EXE*".
7) After rebooting, execute the InstaCal software; **INSURE THE PCI CTR-05/10/20 CARD IS DETECTED BY INSTACAL**, then exit.
8) If the CONTROL and/or DIO option was purchased as an "add-on", after, the original Total Vu installation, copy the file *TotalVu.bin* from the CD or USB flash drive to your Total Vu folder (default is c:\program files\LaserLinc\Total Vu). This file enables the CONTROL and/or DIO option in your software.
9) Execute Total Vu.
10) Select the *Configure/Full Configuration* screen and verify the appropriate icon; CTR-05/10/20 *icon* now appears.



11) Double Click on the CTR-05/10/20-1 icon

- highlight *Wiring Label Style*
- Select *Change Setting* button
- Select *Precision Timer Relay Board* and hit *OK* to close



The PTRB should now be working.

3 Wiring Procedure

3.1 Digital Input

Both the PTRB and the PDIS08 have (8) digital input terminals. In order for these devices to receive a digital input the voltage difference between the two contacts on one of the terminals needs to change by a specified amount. There are two methods of producing this change in voltage difference for the PTRB as described below (3.1.1 and 3.1.2). The PDIS08 is only able to use the option described under 3.1.1.

3.1.1 Using an External Voltage Source

In order to transmit a digital signal a complete electrical circuit must be formed. That is why we provide two contacts on each digital input terminal. Two separate wires are needed to make an electrical connection between these two contacts on the terminal and the voltage source provided by the customer. The two leads on a voltmeter can be used to measure the voltage difference between these two wires. For digital applications the voltage difference between these two wires can either be *equal* (Voltage = 0 V) or *different* (Voltage = 2-30 V). It is the change between these two states that transmits the digital signal. Within this simple change in voltage are three variables that can be potentially reversed. In foresight our product developers made each variable *reversible*. You may connect the wires to the terminal in any order you prefer (polarity does *not* matter). You can also set the ON signal to trigger on either the change to equal voltage (0 V)(negative logic) or on the change to a difference in voltage (2-30 V)(positive logic). Lastly you can configure only an ON action (Momentary) or an ON and an OFF action (Maintained). At this point all you need to know is that just as long as you involve only one terminal you can connect these two wires in any order you desire.

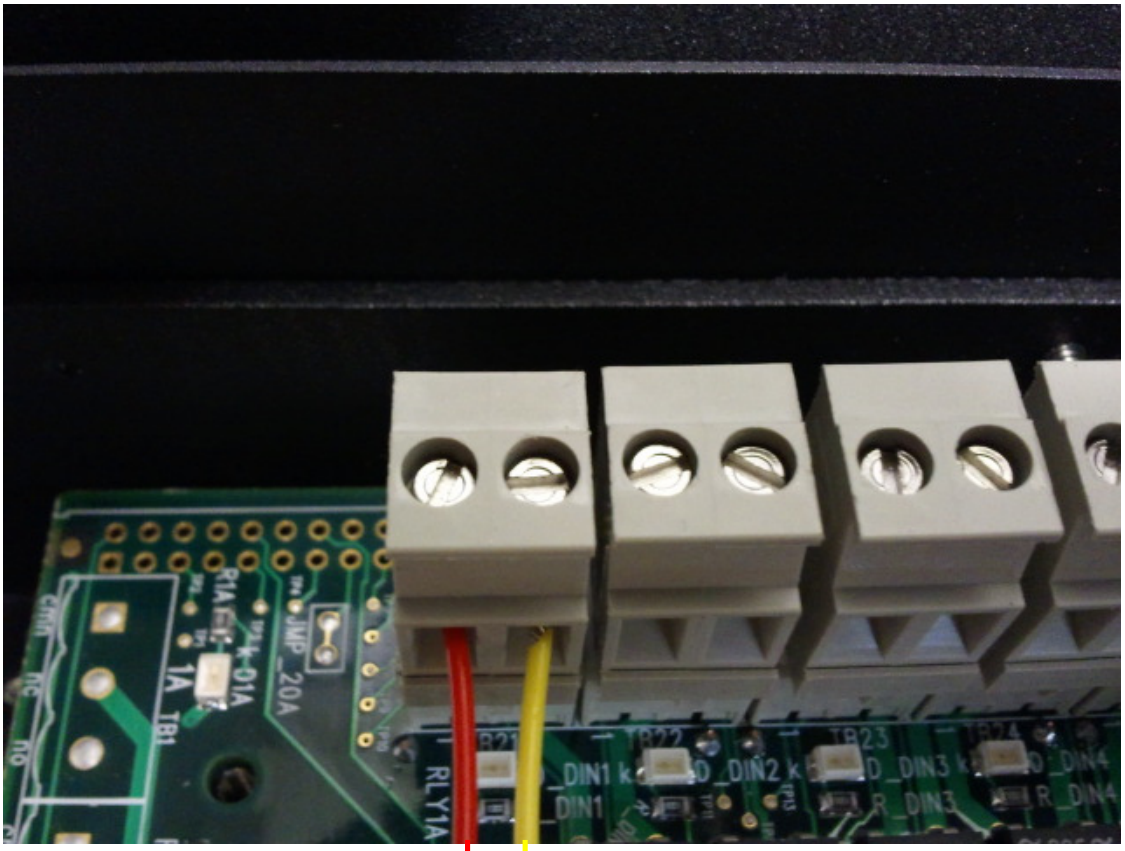
The following describes how to connect the two wires to the digital input terminal. First select one of your eight inputs (DIN0 – DIN7) (PTRB) or (IP0 – IP7) (PDIS08). Take a screwdriver and turn the screw shown in the following picture counterclockwise until opening below for the wire is all the way open. Strip the last 0.25 inch of insulation off the wire and insert the bare portion into this opening. Then turn the screw clockwise until the opening is closed and snug. Give each wire a small tug to ensure they are not going to slip out.

With your wires connected to your PTRB or PDIS08 you now have two methods of providing a switched voltage source on the other end of your wires. The method you choose is dependent on the device you plan to receive the digital signal from.

The *first* method is if your signal source has its own internal power supply you will connect your two wires directly to the signal output of the device. If the signal source is only supplying one signal wire connection, the return wire may need to connect to the device's ground. Ensure that the source signal is +/- 2-30 V DC using documentation and/or a voltmeter.

The *second* more common method is used when all that is provided as a source signal is a dry contact switch closure. This method will work with both the PTRB and the PDIS08. This method consists of wiring the dry contact switch and a voltage source in *series* between your two wires. If you don't have a voltage source find a DC power supply from any household electronic. It is identified with a distinctive box shape either midway (for laptops) or at the plug end. Look on the box and verify it indicates a voltage between 2 and 30 V DC (just about any power rating (W) will suffice). Cut the end off and you will have your two wires with voltage source included. The PDIS08 also has a power out plug identical to the power in plug for the device power supply. This power out plug may be used for your voltage source as shown below in Figure 3-3 and Figure 3-4. If you are using a dry contact switch with a PTRB and do not have a voltage source see section 3.1.2 for information on using the device's internal power supply.

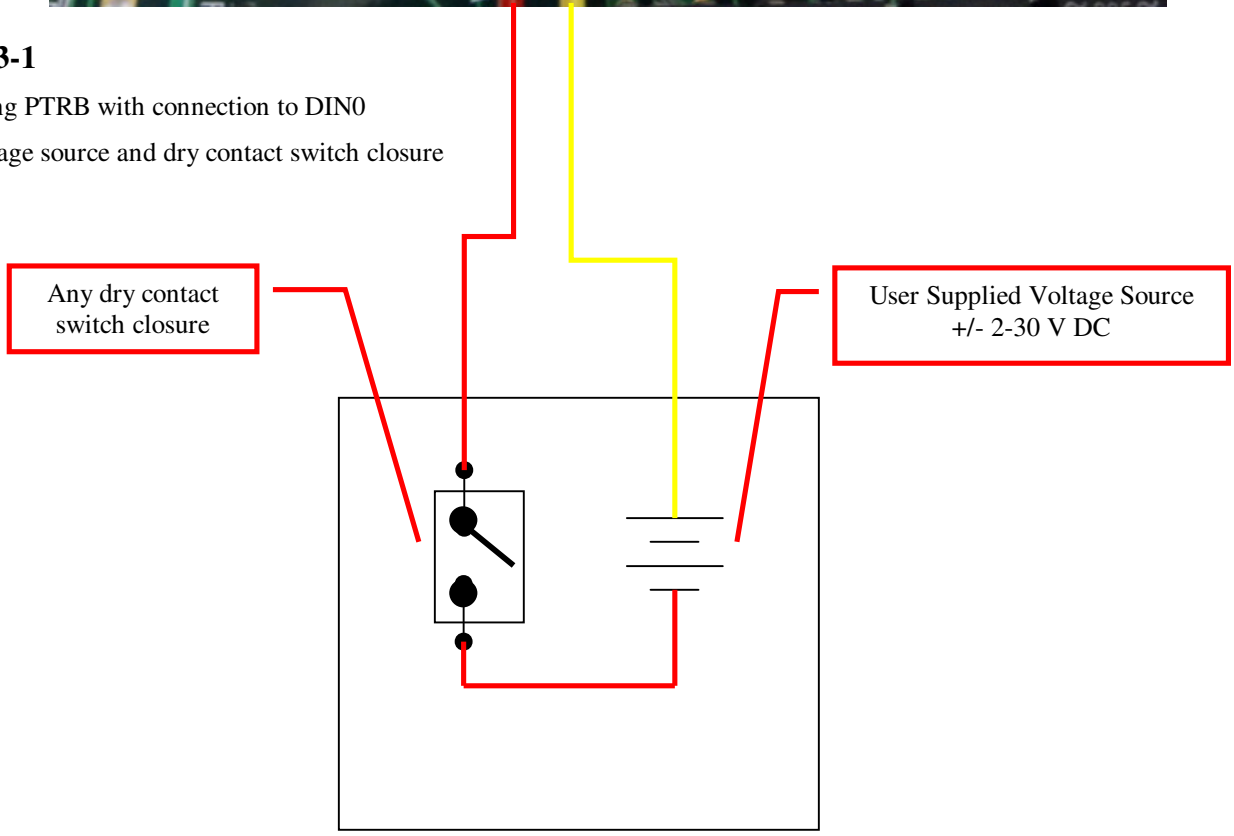
The following figures illustrate the second method of wiring a voltage source and a dry contact switch in series between your two signal wires first for the PTRB (Figure 3-1) and then for the PDIS08 (Figure 3-2)

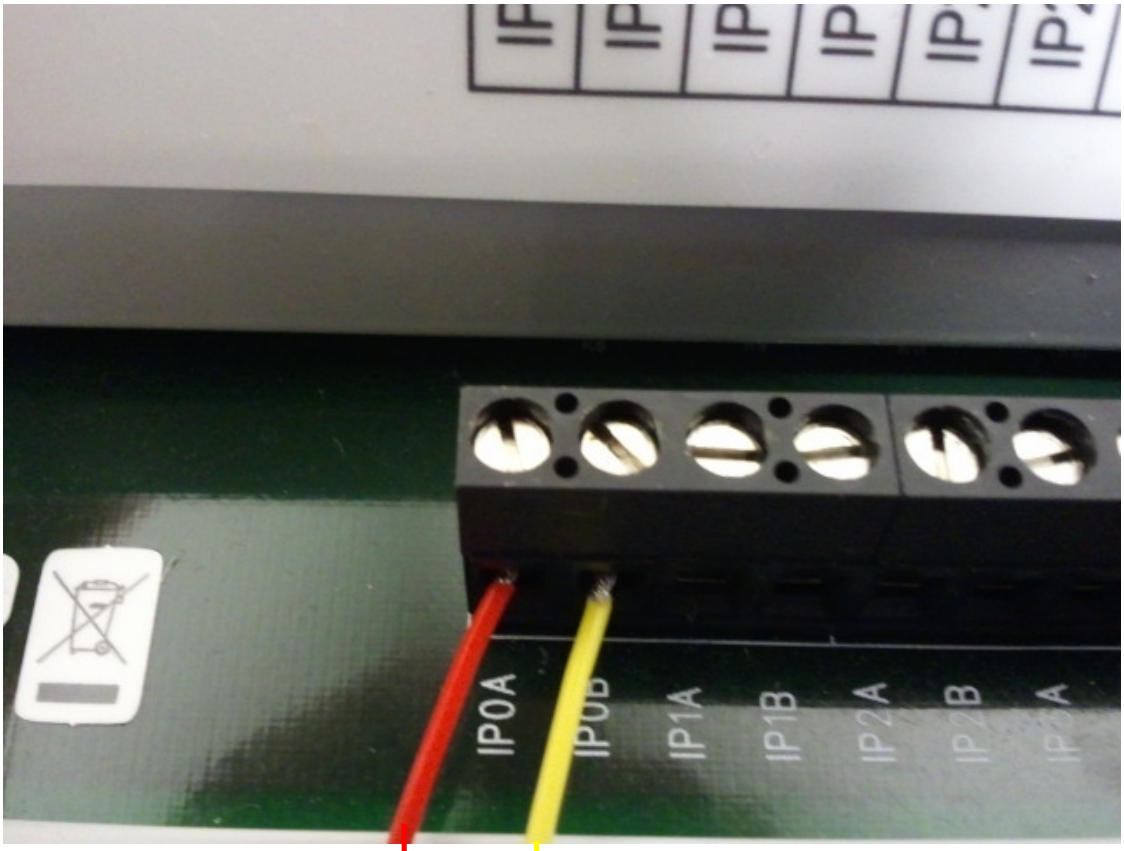


1. **Figure 3-1**

Illustration showing PTRB with connection to DIN0

Connected to Voltage source and dry contact switch closure

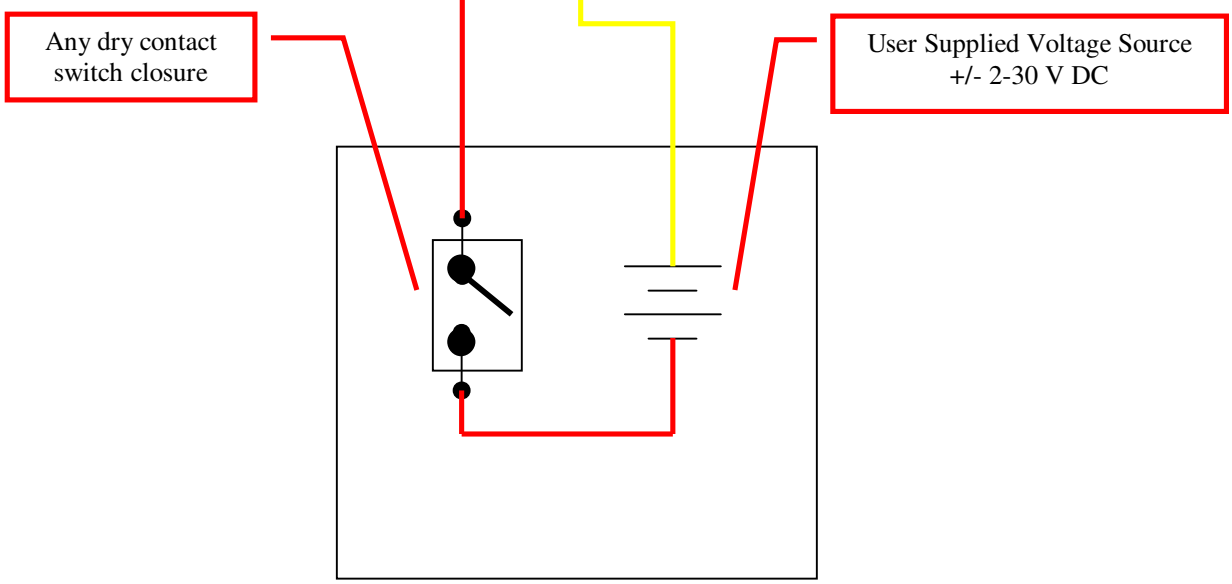


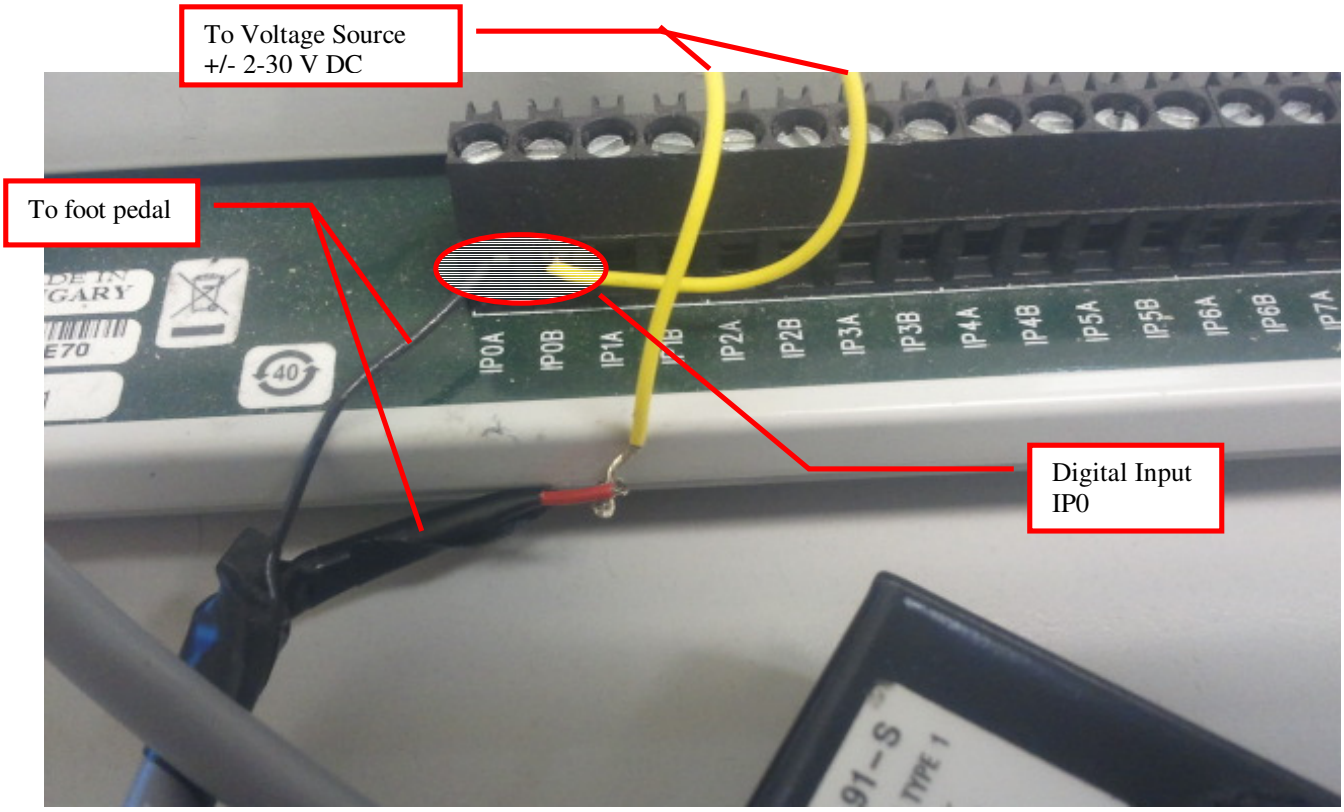


2. Figure 3-2

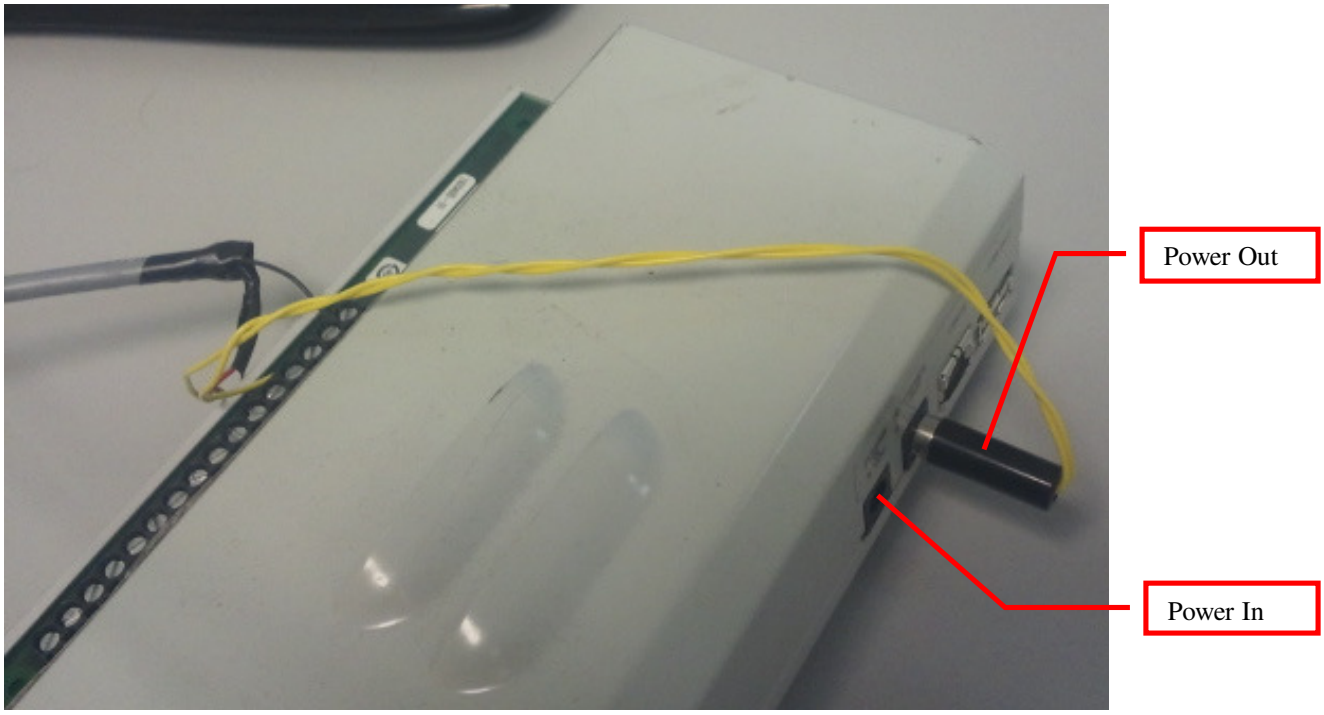
Illustration showing PDIS08 with connection to IP0

Connected to Voltage source and dry contact switch closure





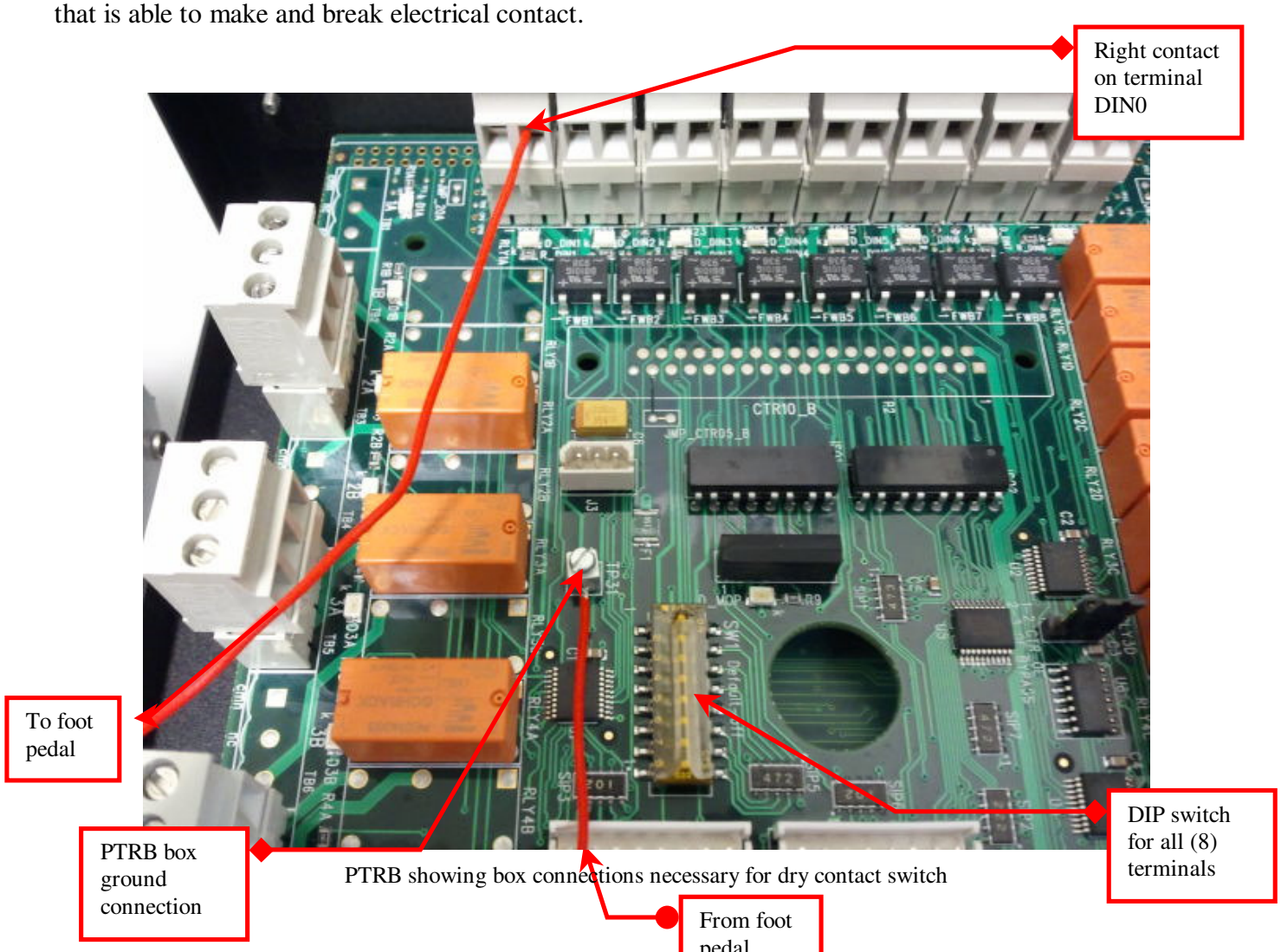
3. **Figure 3-3 PDIS08 Showing use of Power Out and Foot Pedal**



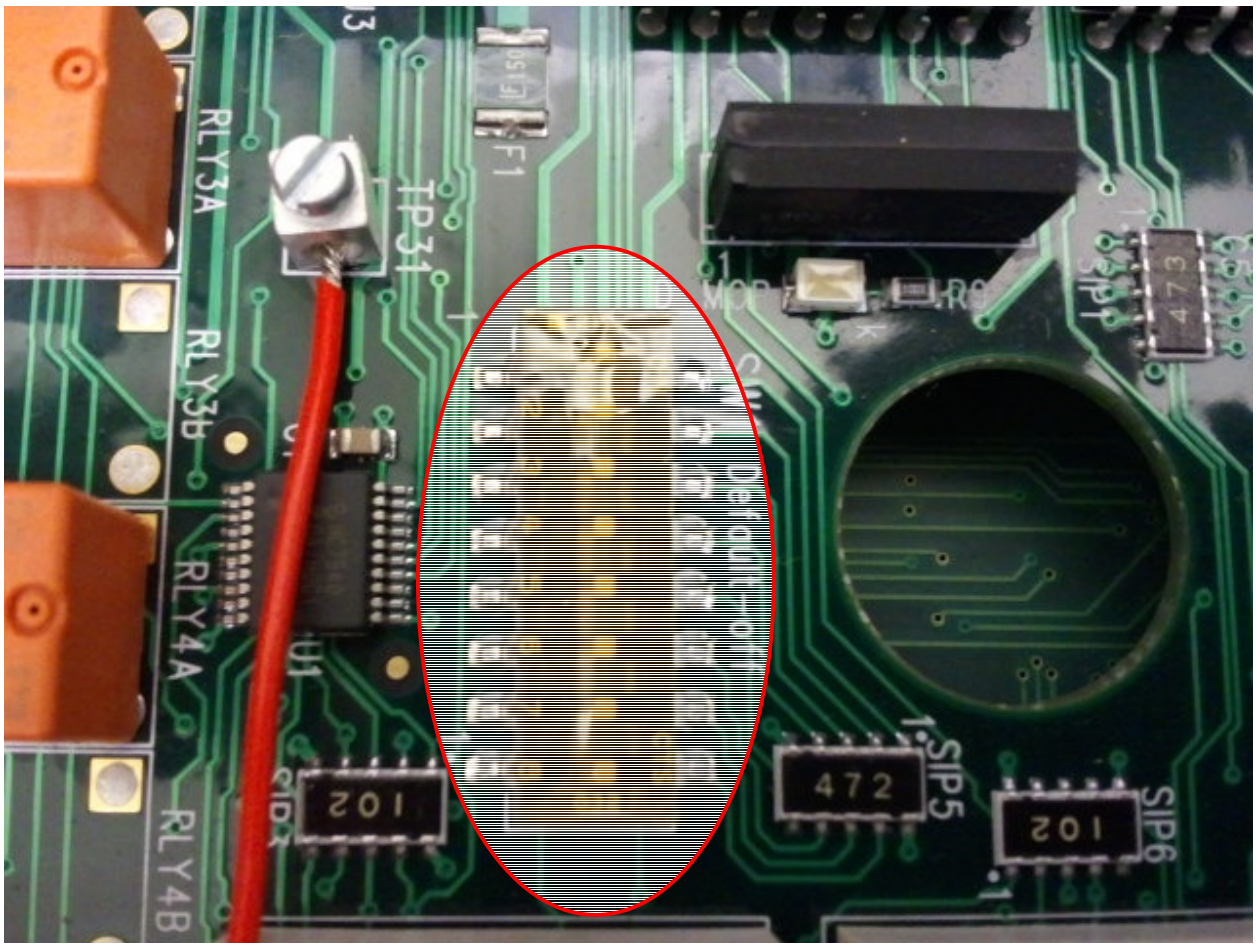
4. **Figure 3-4**

3.1.2 Using an Internal Voltage Source (PTRB only)

For customers using a PTRB an external voltage source is no longer required as it now comes pre wired with an internal voltage source. One pole of this internal voltage source has been connected through a DIP switch to the left contact on each of the (8) terminals. The other pole is connected to the box ground. This means that if the DIP switch is turned on; the left contact of each terminal has our needed voltage difference with respect to the box ground. To place this voltage difference across a terminal all that is needed is a connection between the right terminal contact and box ground. A digital input signal is now generated by making or breaking this contact. In the illustration below the right contact of DIN0 is connected to a foot pedal and then to box ground. It can be connected in series with any electrical switch that is able to make and break electrical contact.



PTRB showing box connections necessary for dry contact switch



Closeup of DIP switch (all on) showing switches 1 through 8 for DIN0 through DIN7 respectively

For instructions on how to configure the software to use a digital input refer to Total Vu Manual pg. 152. To test your digital input, refer below to section 4.2. For example digital input configurations see section 5.

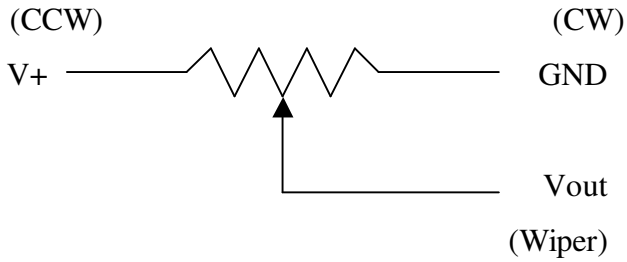
3.2 MOP Connections

The terminal strip's three connections are :

V+ one end of potentiometer

Vout WIPER

Ground other end of potentiometer



Resistance will increase when the dial is turned CW between Vout and Grd

Motorized Potentiometer (MOP) – Rear View

Total Vu will pre-define the AUTO / MANUAL switch and assign to Digital Input 6 (MOP1) and Input 7 (MOP 2).

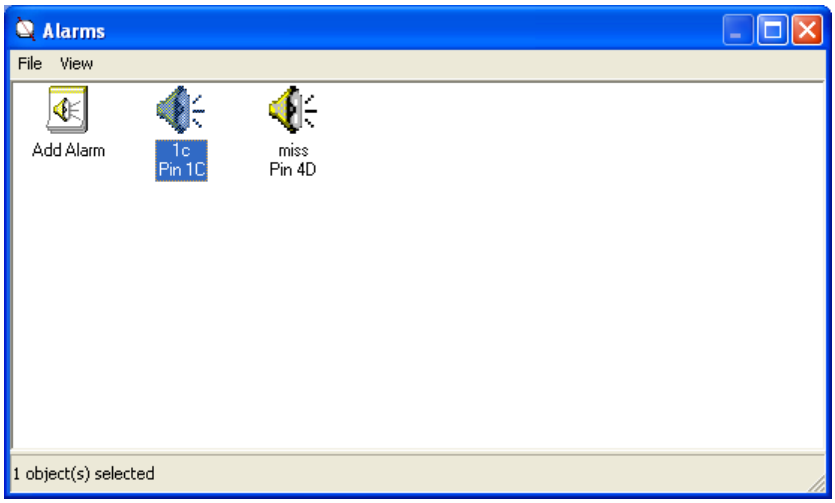
3.3 Counter (Encoder) Inputs

A standard PTRB will only have Digital Inputs, Digital outputs, and Process Control outputs using the counters. A custom PTRB can be wired to have one or more of the digital input terminals wired to make use of the Process Control counters. This modification is signified by an orange connector in place of one of your Digital Inputs (DIN0-DIN7). Wire your encoder signal wires to the orange Digital Input terminal as shown for a standard digital input in section 3.1.

4 Testing Procedure

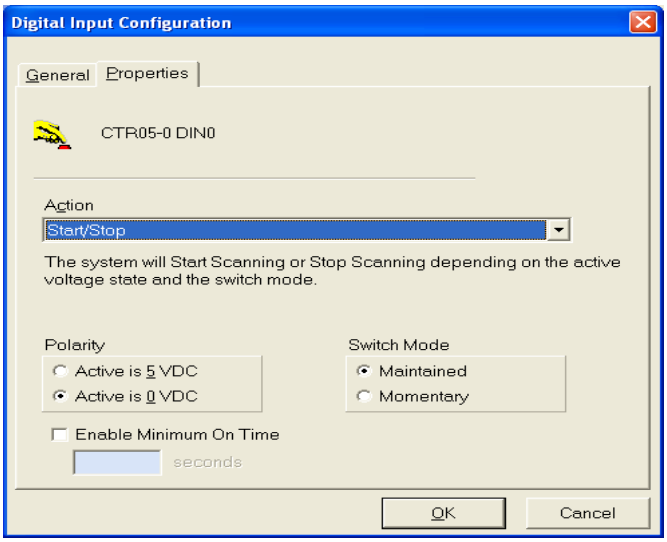
4.1 Testing Alarms

Configure an *External Alarm* and "force" an "on" condition by right-clicking on the alarm icon you've just defined (Refer to Total Vu manual pge. 185). Select *Turn-On / Turn Off*. Ensure the corresponding LED within the PTRB turns-on/off for the selected alarm.



4.2 Testing Digital Inputs

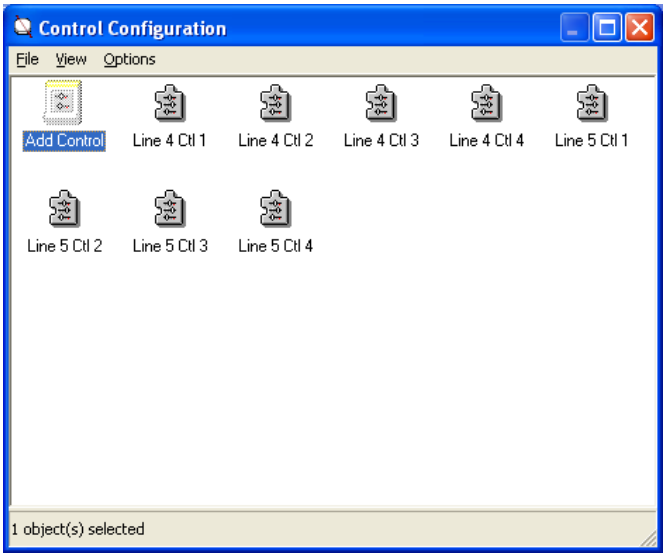
Configure a *Digital Input* to perform a *Start/Stop* Action (Refer to Total Vu manual pg. 152).



Apply a voltage differential of between 2 and 30 volts DC between the terminals of the selected input. Ensure the *Start/Stop F2* icon toggles between Red and Green indicating the input is working.

4.3 Testing Closed Loop Control (Relays)

Configure a C*ontrol Loop* and associated A*ctions* and *Jog buttons*. (Refer to Total Vu manual pge. 202) Activate the *Jog* buttons and ensure the corresponding LEDs within the PTRB turn on/off for the selected control loop.



4.4 Testing Closed Loop Control (MOP)

Power down PC and remove the AC power adapter from the PTRB. Plug the 1st MOP interface cable into the PTRB connector labeled *MOP 1 / 2,* the other end into MOP 1 connector *From Computer.* Perform the steps for configuring a *Control Loop* in section 3.3 above. Re-power the PC and PTRB box, activate the *JOG UP & JOG DOWN* buttons. The dial on MOP 1 should move CW & CCW per your configuration in TotalVu. MOP 2 plugs into *Next Device* connector on MOP 1. MOP 3 plugs into the PTRB connector labeled *MOP 3 / 4,* the other end into MOP 3 connector *From Computer.* MOP 4 plugs into *Next Device* connector on MOP 3. Configure control loops accordingly.

PTRB Rear View – MOP Connectors

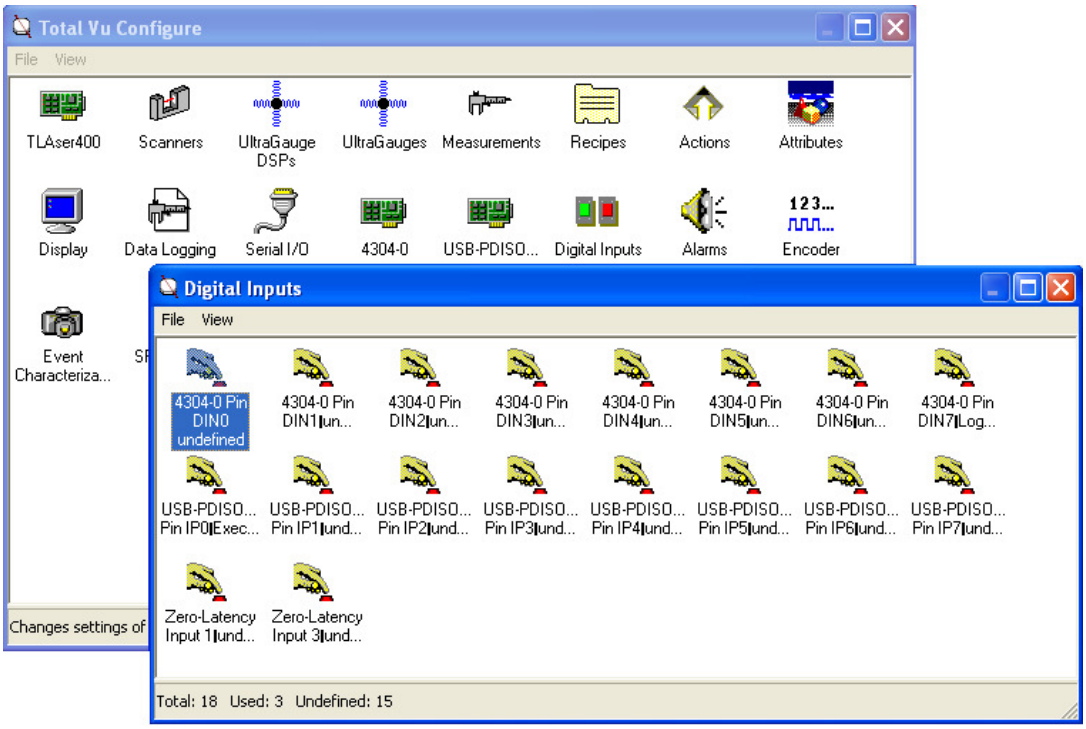
Motorized Potentiometer (MOP) – Front View

5 Example Configurations

5.1 Digital Inputs

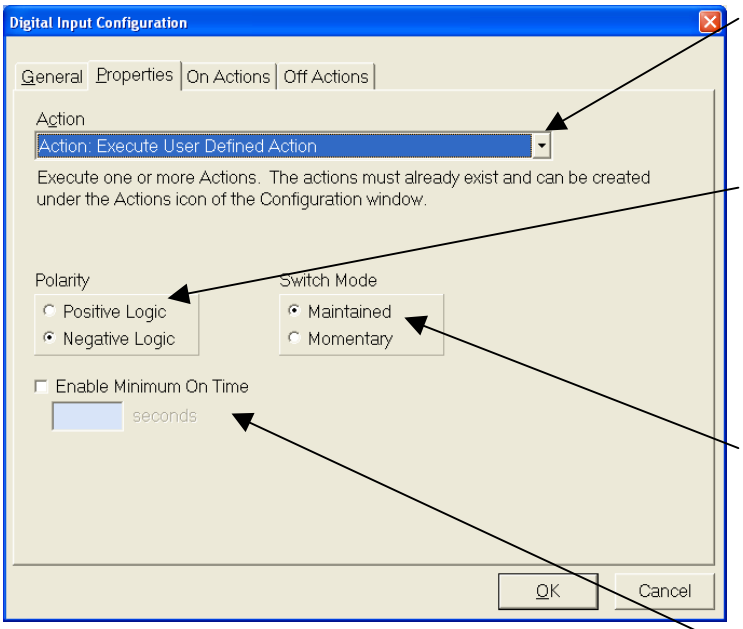
The following applies to all Digital Input Examples, Illustrating generic Digital Input configuration. In these examples several buttons and attributes will appear on the main program window workspace. It is up to the user to decide how to arrange them for most efficient use.

Identify which input terminal you have connected your digital input signal to (i.e. DIN0, IP3). Open Total Vu Configure (Ctrl-C) and double click on Digital Inputs as shown below in **Error! Reference source not found.**.



1. **Figure 5-1 Digital Inputs window**

The inputs are labeled in order of device, input terminal and action. To find your specific terminal first identify your device (4302 or 4304 for PTRB and PDIS08-1 or USB-PDIS08-1 for PDIS08) and then your terminal pin. For this example my digital input is connected to a 4304 PTRB on DIN0. Double click on your Digital Input terminal pin to bring up Digital Input Configuration as shown in Figure 5-3.



1. **Figure 5-2 Digital Input Configuration**

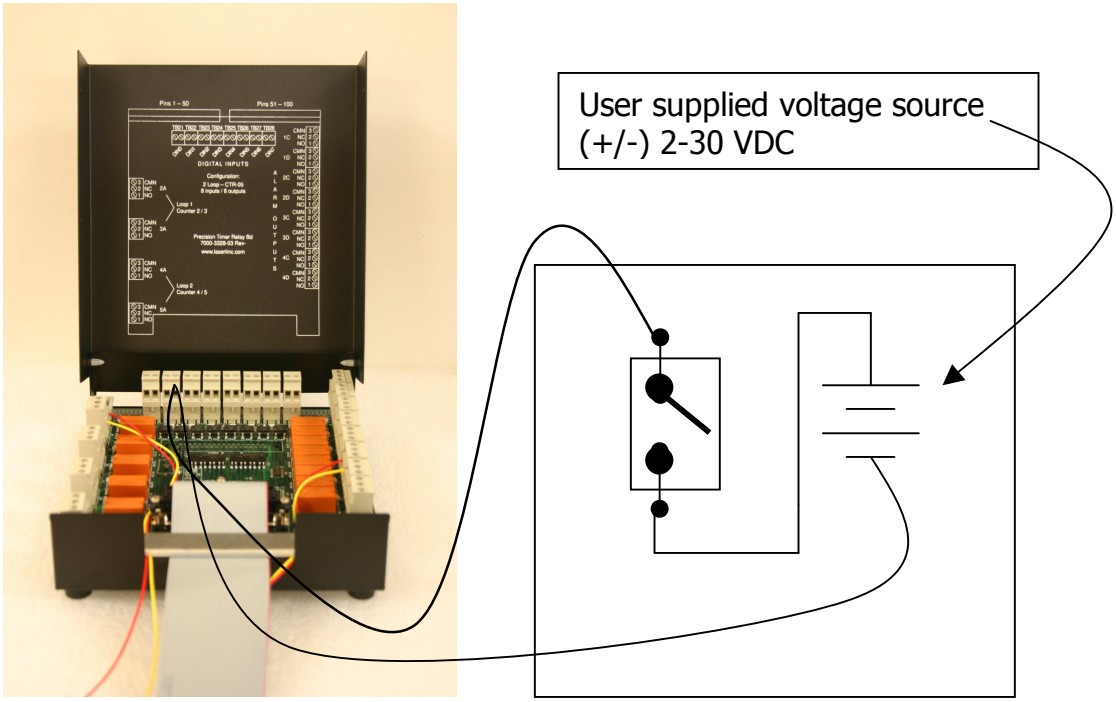
Click on the Properties tab and select your desired action

Next decide what Polarity you desire. If you want the action to occur when the voltage difference between your input wires is *different* select Positive Logic. If you want your action to occur when the voltage difference between your input wires is *equal* select Negative logic.

If your desired action consists of an on event and a possible off event you will have a 'Switch Mode' choice. This will specify when this off event occurs. If you want it to occur when the on logic is no longer valid select 'Maintained'. If you want it to happen immediately (or set time for relays) select 'Momentary'.

Next decide how long your signal needs to be sustained before the signal is considered valid. If you want the action to fire with any detected signal (minimum of about 180 ms depending on system) then leave the checkbox next to 'Enable Minimum On Time' blank. If you want it to wait until it receives a signal of a certain length then check the box and input this amount of desired signal length in seconds.

5.1.1 Reset Footage Counter Example



Example of how to externally "Reset the Footage Counter" in Total Vu™.

Wire as illustrated.
Now go to Total Vu software.
Click on Configure, then Full Configure.
Click on "Digital Inputs".
Choose any input. For this example, double-click on "DIN1 undefined".
Follow and complete the set up wizard to assign the "Reset Encoder" to this input pin.
Activate switch – encoder count should reset to zero

5.1.2 Using Digital Input to Trigger an Action

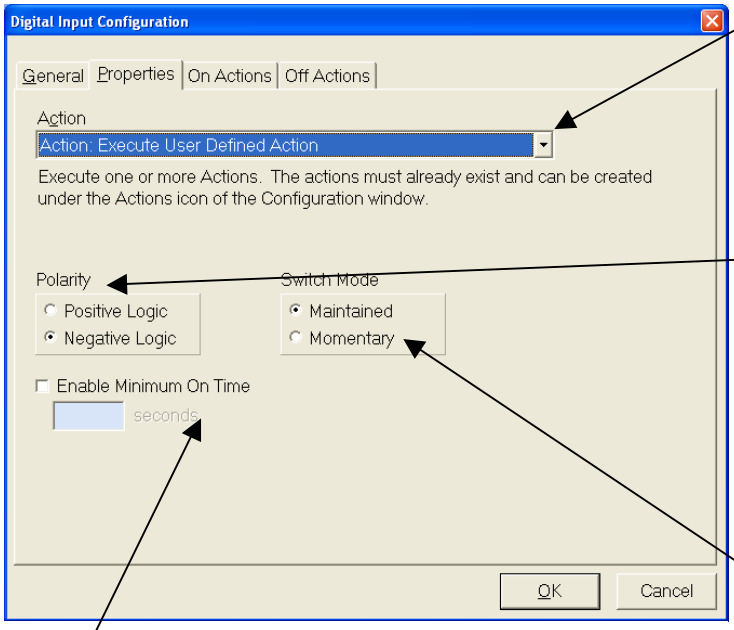


Figure 5-3 Digital Input Configuration

Define an action to be triggered by referring to Total Vu Manual Pg. 70. Bring up the Digital Input Configuration for this digital input as described in 5.1 above. Click on the Properties tab and select your previously programmed action from the dropdown menu under Action.

Next decide what Polarity you desire. If you want your On action to occur when the voltage difference between your input wires is *different* select Positive Logic. If you want your On Action to occur when the voltage difference between your input wires is *equal* select Negative logic.

Next decide which Switch Mode you want. If you want only one action to occur (On action), then select Momentary. If you want two action to occur (On action and Off action) then select Maintained.

Next decide how long your signal needs to be sustained before the signal is considered valid. If you want the action to fire with any detected signal (minimum of about 110 ms depending on system) then leave the checkbox next to 'Enable Minimum On Time' blank. If you want it to wait until it receives a signal of a certain length then check the box and input this amount of desired signal length in seconds. Note that this only works for the 'On Action' as the 'Off Action' will always fire immediately when the on conditions are no longer met.

Click on the 'On Actions' tab and select your desired On Action(s) in the list of available actions as shown in Figure 5-4.

Lastly if you specified a 'Switch Mode' of 'Momentary' one more tab labeled 'Off Actions' will appear enabling the user to choose the action to be fired when the on conditions are no longer met. Be sure to exit out of all configurations before testing your newly configured action triggering digital input.

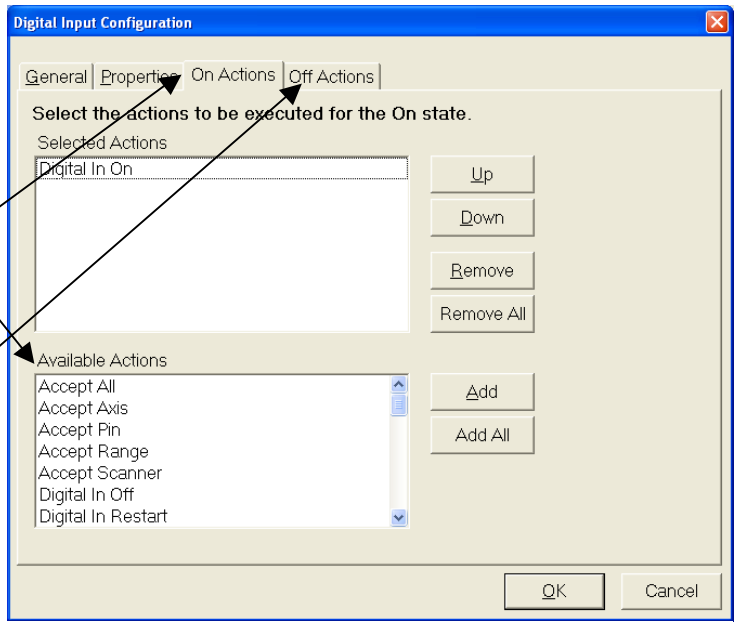
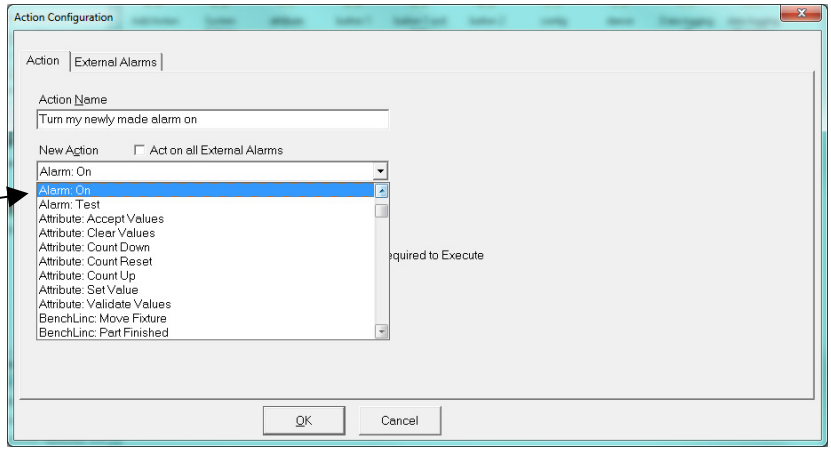


Figure 5-4 On Actions Tab

5.1.3 Using Digital Input to Trigger an Alarm

Configure an Alarm using Total Vu Manual pg. 185. If you want the alarm to remain active until the user clears it, make this change within this alarm configuration.

Next configure an action according to Total Vu Manual pg. 70 setting your action as 'Alarm: On' as shown in Figure 5-5.



4. **Figure 5-5 Action Alarm: On**

On the External Alarms tab select the Alarm you would like to trigger out of the list of Available External Alarms.

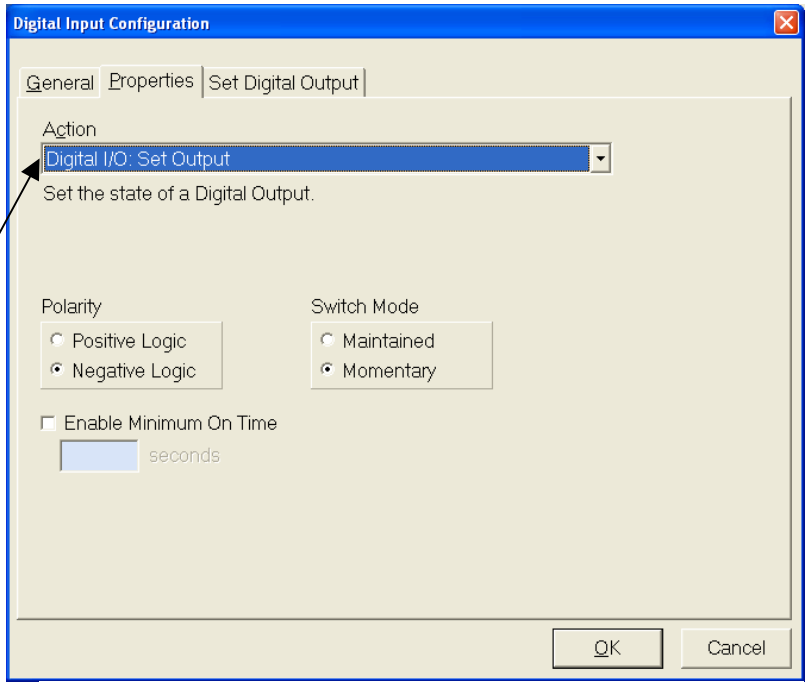
If you want the digital input to also clear the alarm create another action in the same manner selecting action 'Alarm: Clear'. Under the External Alarms tab select the same desired Alarm.

Finally setup your digital input according to Section 5.1.2 above. For your On Action select the action created above for Alarm: On. If you want the digital input to also clear the alarm select the action created above for 'Alarm: Clear' for your Off Action.

Note that any minimum on time as specified in the alarm configuration will not be followed.

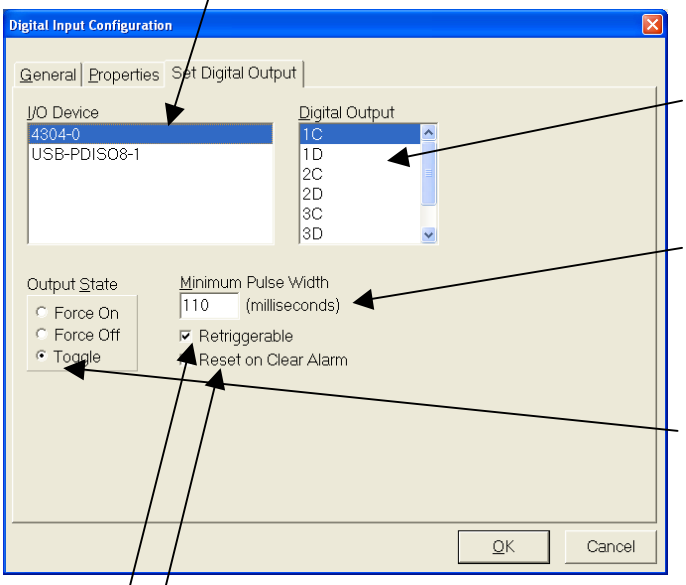
5.1.4 Using Digital Input to Trigger a Relay (Digital Output)

Bring up the Digital Input Configuration as described in 5.1 above. For Action select 'Digital I/O: Set Output' as shown in Figure 5-6.



5. **Figure 5-6 Digital I/O: Set Output**

Next select the next tab 'Set Digital Output'. Under I/O Device select the device containing the relay you would like to trigger as shown in Figure 5-7 (4302-0 or 4304-0 for PTRB and PDIS08-1 or USB-PDIS08-1 for PDIS08).



6. **Figure 5-7 Set Digital Output**

Next under Digital Output select the relay of the eight (8) you would like to trigger.
((1C – 4D) for PTRB or (0 – 7) for PDIS08)

Next decide if you would like the relay to remain triggered for a minimum amount of time. If so insert this time in milliseconds.

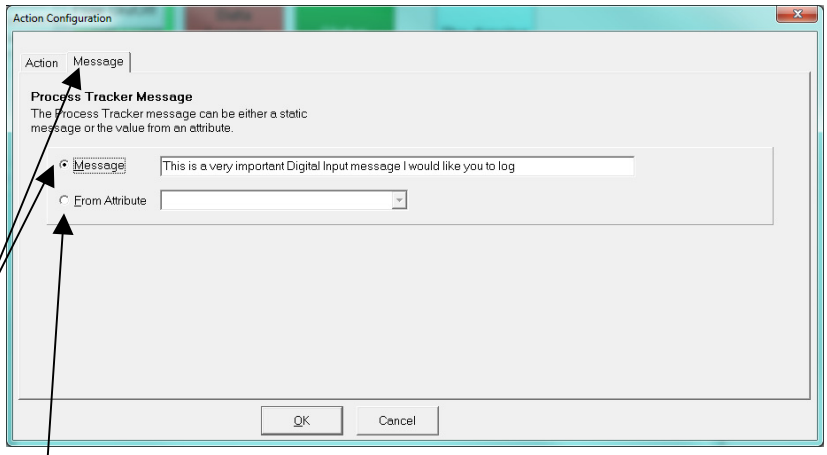
Next decide what you would like the Output State to be. If you want the relay to activate when the Digital Input is valid then select Force On. If you would like the relay to deactivate when the Digital Input is valid then select Force Off. If you selected Momentary on the previous tab you will also see a 'Toggle' option. This will activate the relay followed by deactivation at a minimum of 50 ms as specified by the Minimum Pulse Width.

Next decide if you want the program to ignore all further Digital Inputs on the selected terminal until the specified Minimum Pulse Width time has expired. Otherwise another trigger will reset the elapsed time. If so leave the checkbox next to 'Retriggerable' blank.

Finally if you want an action to be able to reset your relay, check the box next to 'Reset on Clear Alarm'. Configure an action for 'Alarm: Clear' to use this option.

5.1.5 Record Digital Input in Process Tracker

Define a new action by referring to Total Vu Manual Pg. 70. Under 'New Action' specify 'Process Tracker: Log Message'.



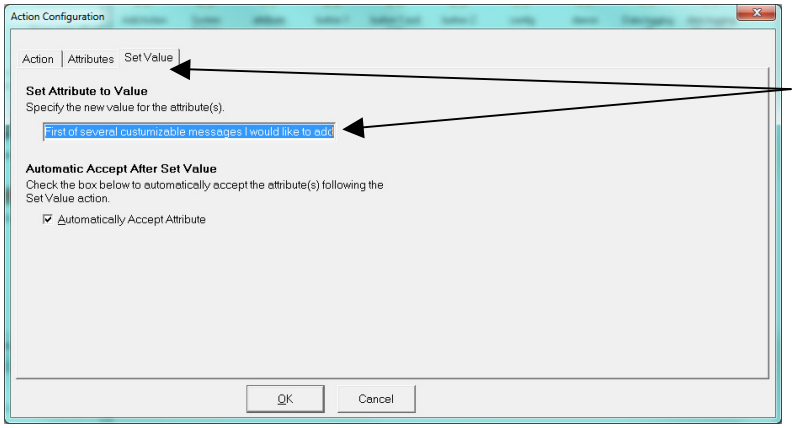
7. **Figure 5-8 Process Tracker: Log Message**

Next decide if you want the system to log the same message with every Digital Input event or a customizable message. If you want the same message each time type that message in the blank following 'message' under the 'message' tab as shown in Figure 5-8. Define a digital input according to 5.1.2 above setting your logging action as the 'On Action'.

If you want a customizable message define an 'Edit Box' attribute according to Total Vu Manual pg. 87. Go back to your new action and select the radio button next to 'From Attribute' and select your newly defined attribute.

Next decide if you want to manually set the attribute's value for each new log message or if you want to define actions to make the changes automatically. To set the attribute's value manually see Total Vu Manual pg. 106 to learn how to accept an attribute's value. Finally customize a digital input according to section 5.1.2 above adding your message log action as the 'On Action'.

To make use of actions define an action 'Attribute: Set Value' for each customizable message you would like to add. Under each action's 'Attributes' tab select your recently defined edit box attribute. Under the 'Set Value' tab write each of your customizable messages as desired for each action you define as shown in Figure 5-9. Be sure to check the box next to 'Automatically Accept Attribute'. You can use this action in any of your action macro scripts to change your logged message according to system changes.

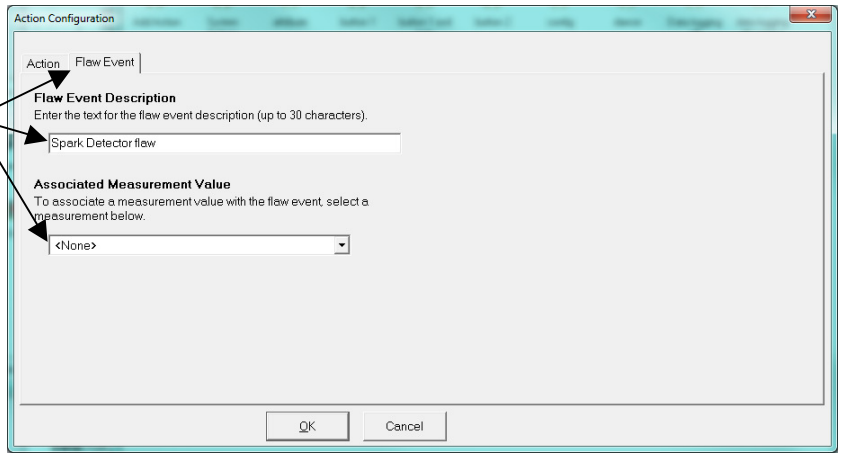


8. **Figure 5-9 Customizable Message**

An easy example to make use of this capability is to log one message for a digital 'high' input and another message for a digital 'low' input. To do this, define two Macros for each new message using an action 'Action Macro: Execute List of Actions'. In the Macro under the 'Actions' tab select your respective set attribute action containing your desired message. In the same list next in order select your log message action. Define a digital input according to 5.1.2 above selecting your 'high' input Macro as your 'On Action' and your 'low' input Macro as your 'Off Action'.

5.1.6 Record Digital Input as Flaw Detection Event

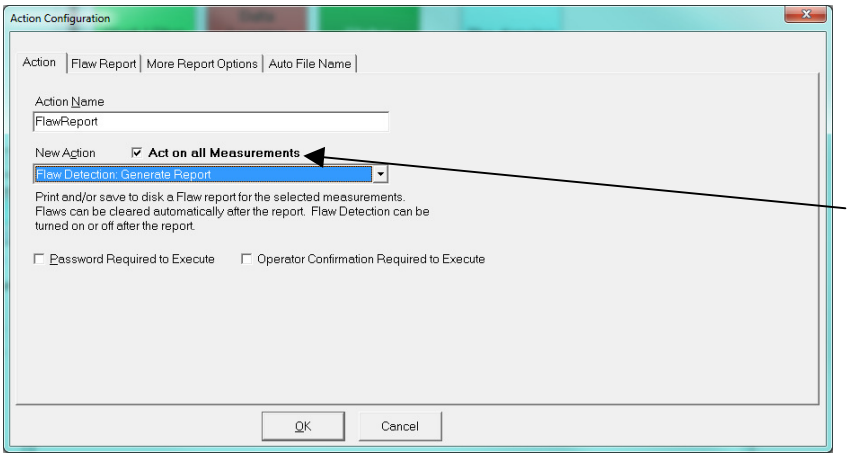
Define a new action according to Total Vu Manual pg. 70. Under 'New Action' specify 'Flaw Detection: Record Event'. Click on the 'Flaw Event' Tab as shown in Figure 5-10 and input a 'Flaw Event Description'. If you want a measurement value to show up in the flaw report next to your triggered flaw event select it under 'Associated Measurement Value'.



9. **Figure 5-10 Flaw Detection Event**

If you do not want an onscreen counter skip to the next paragraph. Create a counter attribute according to Total Vu Manual pgs. 81 and 101. Create a new action 'Attribute: Count Up'. Under the 'Counter Attributes' tab select your newly created counter. Create a new action 'Action Macro: Execute List of Actions' and name it Macro: Digital Input Flaw. Under the 'Actions' tab select your FlawEvent action and your CountUp action in any order.

Define a Digital Input according to 5.1.2 above. Under the 'On Actions' tab select your FlawEvent action if you did not choose a counter or Macro: Digital Input Flaw if you did choose a counter.



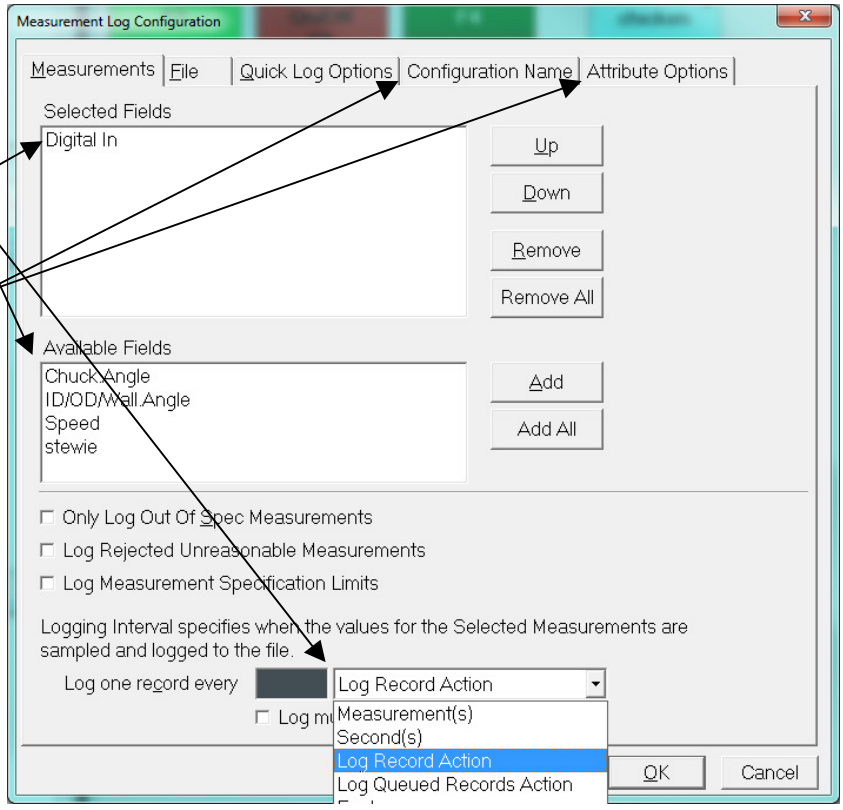
The digital Input will now be recorded as a Flaw Detection Event and can be added to the flaw report using the following procedure. Define a new action 'Flaw Detection: Generate Report'. Check the box next to 'Act on all Measurements' as shown in Figure 5-11. Define the rest of the flaw report as described in Total Vu Manual pg. 78. Then create a button for the report as described in Total Vu Manual pg. 107.

10. **Figure 5-11 Generate Flaw Report**

5.1.7 Record Digital Input in Data Log file

Create an edit box attribute by referring to Total Vu Manual pg. 87. Name this attribute 'Digital In'. Define a new action 'Attribute: Set Value' in reference to Total Vu Manual pg. 70 and name it 'Digital Set Start'. Under the 'Attributes' tab select 'Digital In'. Under the 'Set Value' tab type 'Start' followed by the name of the digital signal equipment origin (e.g. Start Spark Tester). Check the box next to 'Automatically Accept Attribute'. Create an identical action with name 'Digital Set Stop' and Set Attribute to value 'Stop' followed by equipment name.

Create a new Data Log in reference to Total Vu Manual pg. 138. Under the 'Measurements' tab select 'Digital In' from 'Available Fields so it appears in the 'Selected Fields' as shown in Figure 5-12. In the drop down menu next to 'Log one record every' select 'Log Record Action'. Under the 'Configuration Name' tab type 'Digital In' for 'Configuration Name'. Under the 'Attribute Options' tab select the radio button next to 'Log "blank" for un-updated attributes and type 'error' in the "blank". Refer to the manual for other tab options including how to name and place the data log file.



11. **Figure 5-12 Digital Input Log**

Create a new action 'Log: Write Record' and name it 'Log Digital Record'. Under the 'Measurement Logs' tab select 'Digital In'. Create a new action 'Log: Start Selected' and name it 'Digital Log Start'. Under the 'Measurement Logs' tab select 'Digital In'. Create a new action 'Log: Stop Selected' and name it 'Digital Log Stop'. Under the 'Measurement Logs' tab select 'Digital In'.

Create a new action 'Action Macro: Execute List of Actions' and name it 'Digital In On'. Under the 'Actions' tab select in order 'Digital Set Start' and 'Log Digital Record'. Create a new action 'Action Macro: Execute List of Actions' and name it 'Digital In Off'. Under the 'Actions' tab select in order 'Digital Set Stop' and 'Log Digital Record'.

Create two new buttons in reference to Total Vu Manual pg. 107. Use these buttons to trigger actions 'Digital Log Start' and Digital Log Stop'.

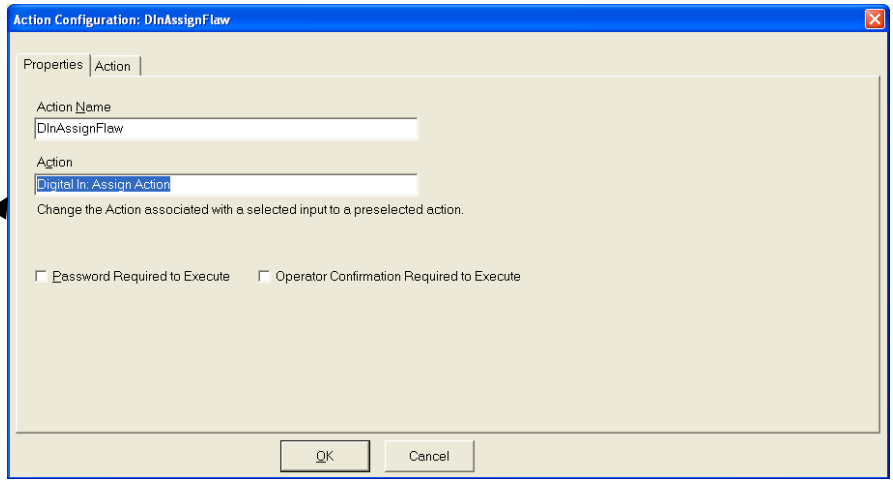
Define a digital input according to 5.1.2 above. Under the 'On Actions' tab select the macro 'Digital In On'. Under the 'Off Actions' tab select the macro 'Digital In Off'. Remember to start the log with your new button before you try the new logging feature out.

5.1.8 Switch between Digital Input Associated Actions using a Button

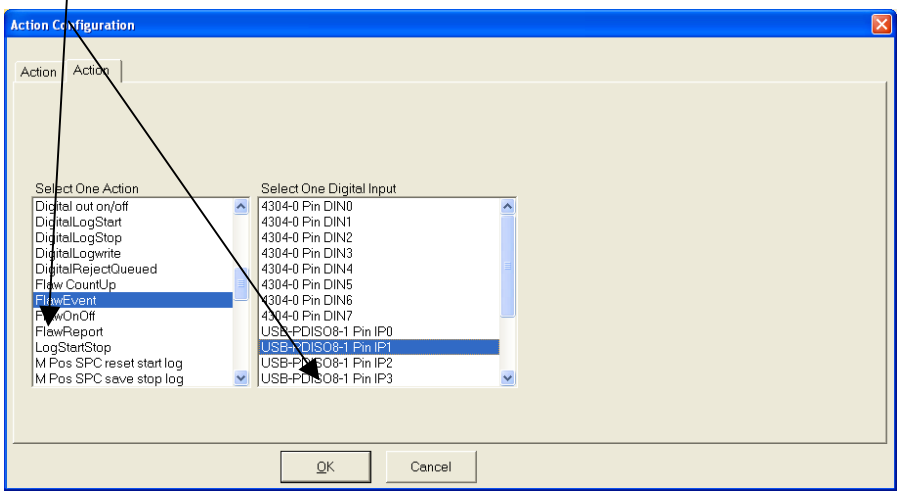
For this example I want to switch an input from recording a log in process tracker to recording a log as a flaw event. I am using IP1 on my USB PDIS08 and my actions are 'Flaw event' and 'Process Tracker'.

Create two new buttons in reference to Total Vu manual pg. 107 and place them in exactly the same location naming them 'Logging as Flaw event' and 'Logging to Process Tracker'.

Create a new action according to Total Vu Manual pg. 70 for action 'Digital In: Assign Action' and name it 'DlnAssignFlaw'as shown in Figure 5-13. Under the 'Action' tab select 'FlawEvent' in the left column and 'USB-PDISO8-1 Pin IP1' in the right column as shown in Figure 5-14. Create an identical action naming it 'DlnAssignTracker' and selecting 'Process Tracker' in the left column under the 'Action' tab. Create a new action 'Button: Show' and name it 'Show Flaw On'. Under the 'Buttons' tab select 'Logging as Flaw event'. Create an identical action naming it 'Show Tracker On'. Under the 'Buttons' tab select 'Logging to Process Tracker'. Create a new action 'Button: Hide' and name it 'Hide Flaw On'. Under the 'Buttons' tab select 'Logging as Flaw event'. Create an identical action naming it 'Hide Tracker On'. Under the 'Buttons' tab select 'Logging to Process Tracker'.



12. **Figure 5-13 Digital In: Assign Action**



13. **Figure 5-14 'Actions' tab**

Create a new action 'Action Macro: Execute List of Actions' naming it 'Macro: Digital Flaw On'. Under the 'Actions' tab select 'DlnAssignTracker', 'Hide Flaw On' and 'Show Tracker On'. Create an identical action (Macro) and name it 'Macro: Digital Tracker On' listing actions 'DlnAssignFlaw', 'Hide Tracker On' and 'Show Flaw On' under the 'Actions tab.

Assign action (Macro) 'Macro: Digital Flaw On' to button 'Logging to Flaw event'. Assign action (Macro) 'Macro: Digital Tracker On' to button 'Logging to Process Tracker. Uncheck the checkbox next to button 'Logging to