BenchMark Wireline Products
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benchmarkwireline.com

OPERATIONS AND MAINTENANCE MANUAL
WINCH OPERATORS PANEL
AMS4A099

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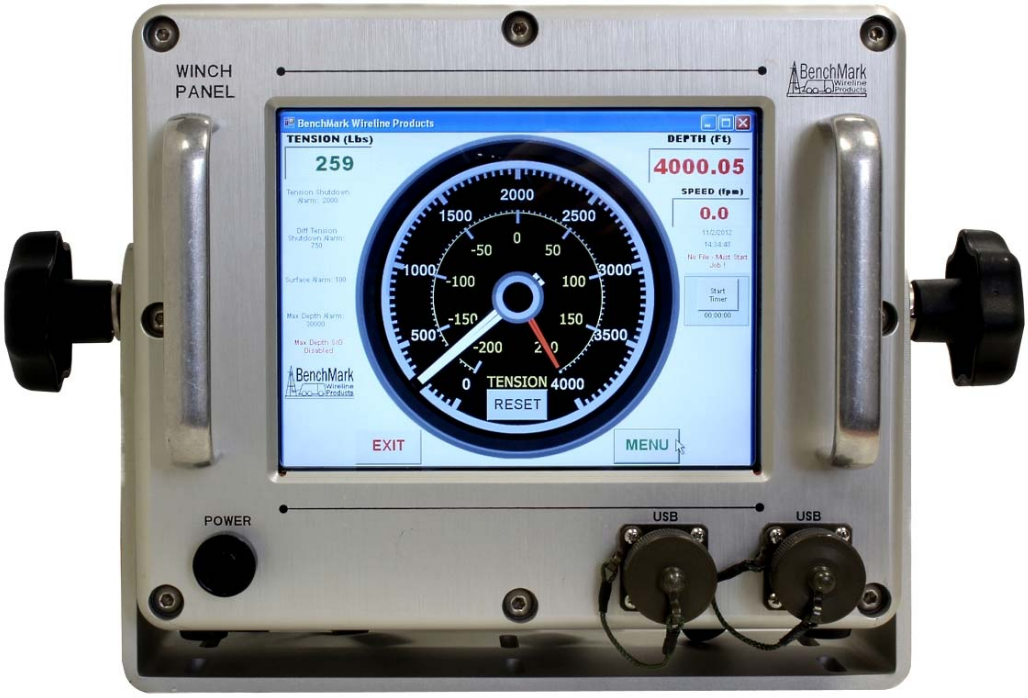
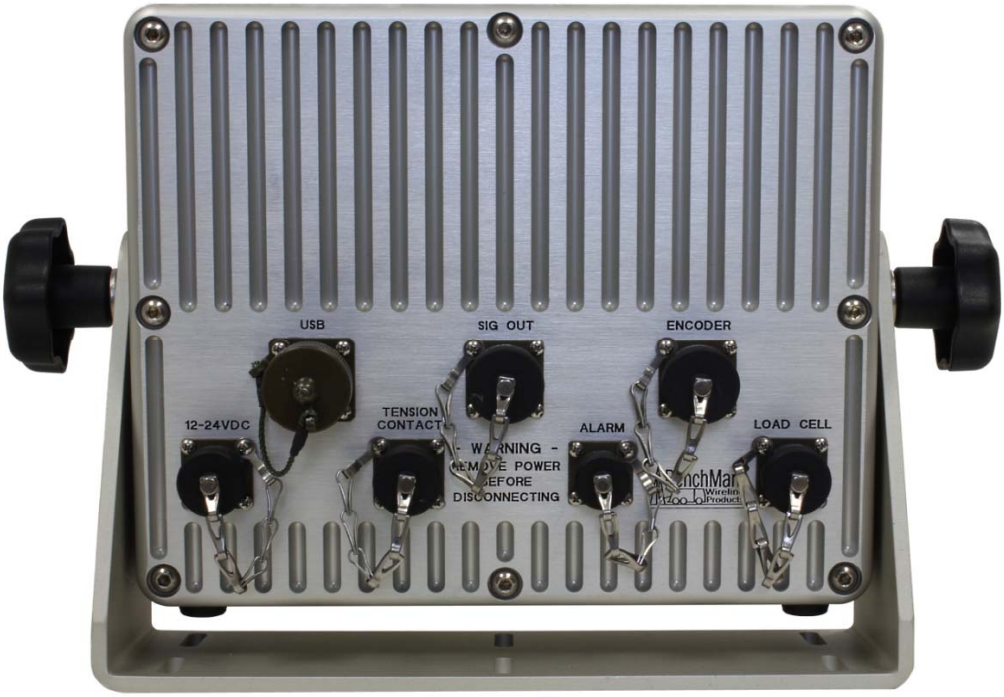
1.0 INTRODUCTION

1.1 GENERAL DESCRIPTION





1.1 GENERAL DESCRIPTION continued

This panel is used to acquire and display depth and tension data from a wireline logging winch unit. The panel provides the operator a means to set and make adjustments to the data as necessary. Depth is displayed from data provided from an encoder mounted on a measuring device. The tension data is provided by a load pin and is also passed through to the acquisition system. The panel will operate with the BenchMark Dual Wheel Measuring Devices for slick line, braided line, and cased hole e-line services.

The system consists of two main components, the real time acquisition board and the PC. The acquisition board provides power to and processes the signals from the encoders, load pin, and magnetic mark detector. This board operates independent from the PC and is instantly on when power is applied.

The PC uses an Intel based high speed processor running MS Windows XP embedded. The PC includes a color touch screen for operator input and command entry. The PC is Ethernet ready for connection to the internet for remote display and control.

1.2 ATEX STANDARDS & REQUIREMENTS

PRODUCT SUMMARY

The AMS4A099 Panel is used to acquire and display depth and tension data from a wireline logging winch unit and panel provides the operator a means to set and make adjustments to the data as necessary.

PRODUCT CERTIFICATION & CODING

II 3 G Ex nR II T6 T_{amb} -20°C to +40°C

INSTALLATION INSTRUCTIONS

Warnings:

- The apparatus is ATEX CAT3, only to be installed in Hazardous Area Zones 2.
- The installer is to ensure that the equipment is located in areas that are known not to have an adverse affect on the housing material.
- Do not modify the enclosure as this will compromise the apparatus certificate.

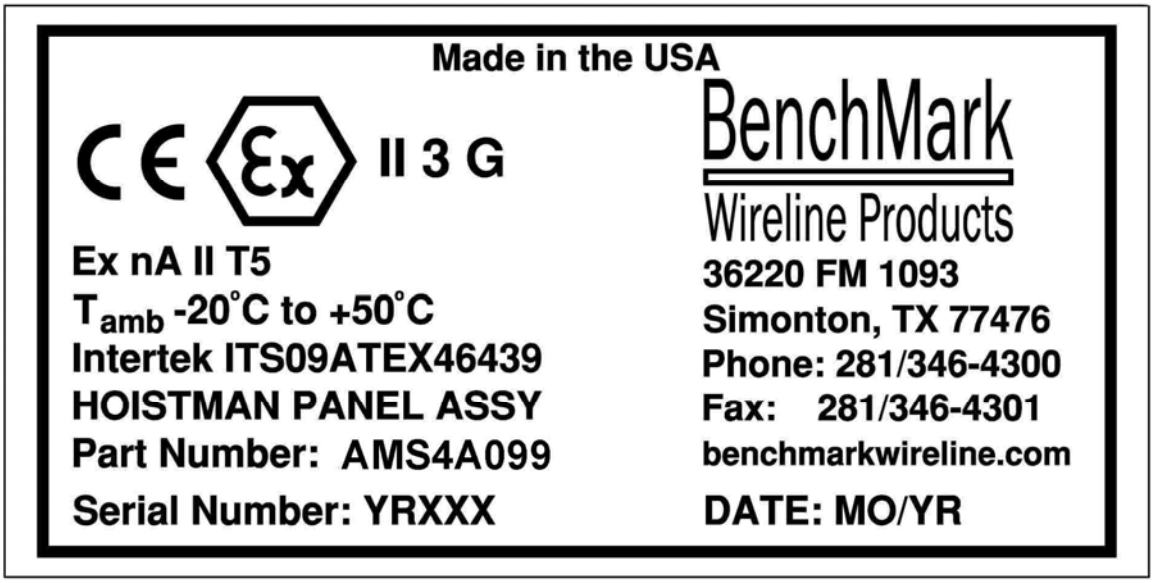
Hazardous Area Installation Standards & Requirements:

The installer should refer to the latest edition of the following standards before operating in a Hazardous Area:

EN 1127-1	Explosive Atmospheres - Explosion prevention and protection, basic concepts and methodology.
EN 60079-14	Electrical apparatus for explosive gas atmospheres Part 14:Electrical installations in hazardous areas (other than mines)
EN 60079-17	Electrical apparatus for explosive gas atmospheres – Part 17:Inspection and maintenance of electrical installations in hazardous areas (other than mines)

Hazardous Area Preparation & Installation - Refer to section 1.7
Operational Parameters - Refer to Section 3.0
Maintenance - Refer to Section 6.0

ATEX Label Details and Information



The following standards have been applied in the certification of this device:

EN60079-0:2006 – Electrical apparatus for explosive gas atmospheres – Part 0: General requirements

EN60079-15:2005 – Electrical apparatus for explosive gas atmospheres – Part 15: Construction, test and marking of type of protection “n” electrical apparatus.

1.3 TYPE EXAMINATION CERTIFICATES

Intertek

Ex

1. TYPE EXAMINATION CERTIFICATE

2. **Equipment or Protective System Intended for use in Potentially Explosive Atmospheres**

3. Type Examination Certificate Number: **ITS09ATEX46439**

4. Equipment or Protective System: **AMS4A090/ AMS4A095/ AMS4A099 Slickline Hoistman's Touch Screen Panel**

5. Manufacturer: **BenchMark Wireline Products**

6. Address: BenchMark Wireline Products, 36220 FM 1093, Simonton, Texas 77476, USA.

7. This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8. Intertek Testing and Certification Limited certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive 94/9/EC of 23 March 1994

   The examination and test results are recorded in confidential Report: 09039450A1, dated August 2009.

9. Compliance with the Essential Health and Safety Requirements has been assured by compliance with standards EN60079-0:2006 and EN60079-15:2005 except in respect of those requirements referred to at item 16 of the Schedule.

10. If the sign "X" is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

11. This Type examination certificate relates only to the design, examination and tests of the specified equipment or protective system in accordance to the directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.

12. The marking of the equipment or protective system shall include the following:-

Ex II 3 G Ex nA II T5 T_{amb} -20°C to +50°C

Intertek Testing & Certification Limited
Deeside Lane, Chester, CH1 6DD
Tel: + 44 (0)1244 882590 Fax: +44 (0)1244 882599
http://www.Intertek.com
Registered No 3272281 Registered Office: 25 Savile Row London W1X 1AA

P Moss
Certification Officer
Date: 23rd November 2009

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Sheet 1 of 3

Type Examination Certificate ITS09ATEX46439 Issue 3 March 2009

SCHEDULE
TYPE EXAMINATION CERTIFICATE NUMBER : ITS09ATEX46439

13. Description of Equipment or Protective System

The AMS4A095 and AMS4A099 Slickline Hoistman's Touch Screen Panel is an interface panel used to acquire, display and transmit tool depth and tension data from a wireline logging winch unit. The panel provides the operator a means to set and make adjustments to the data as necessary.

The AMS4A090 Rig Floor Display Panel is an interface panel used to provide a remote display of logging tool depth, line speed, surface tension, and down hole tension. It is typically placed on the rig floor to provide this information to the driller to monitor this information in real time.

The AMS4A090, AMS4A095 and AMS4A099 share the same enclosure but have different numbers of I/O's. The enclosure measures approximately 275mm x 230mm x 120mm.

14. Report NUMBER

Intertek Report Ref 09039450, dated August 2009.

15. CONDITIONS OF CERTIFICATION:

a. Special Conditions for safe use

There are no special conditions for safe use.

b. Conditions For Use (Routine Tests)

There are no conditions for safe use

16. Essential Health and Safety Requirements (EhsR's)

The relevant EHSR's that have not been addressed by the standards listed in this certificate have been identified and assessed in Intertek Report Ref 09041646, dated August 2009.

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SCHEDULE
TYPE EXAMINATION CERTIFICATE NUMBER : ITS09ATEX46439

17. DRAWINGS

Number	Issue	Date	Description
AMS4A099B	-	08/24/09	AMS4A099B WATERPROOF TOUCH SCREEN BILL OF MATERIALS
AMS4A099	B	8/24/09	PANEL TOUCH SCREEN WATERPROOF PORTABLE SHEET 1 OF 2
AMS4A099	B	8/24/09	PANEL TOUCH SCREEN WATERPROOF PORTABLE SHEET 2 OF 2
AMS4A095C	-	8/20/09	AMS4A095C WATERPROOF TOUCH SCREEN BILL OF MATERIALS
AMS4A095	C	8/20/09	PANEL TOUCH SCREEN WATERPROOF PORTABLE SHEET 1 OF 2
AMS4A095	C	8/20/09	PANEL TOUCH SCREEN WATERPROOF PORTABLE SHEET 2 OF 2
AMS4A090A	-	10/14/09	AMS4A090A DISPLAY RIG FLOOR 8" TOUCH 24VDC CAN BUS BILL OF MATERIALS
AMS4A090	A	10/13/09	DISPLAY RIG FLOOR WATERPROOF Ex nA ITS09ATEX46439 SHEET 1 OF 2
AMS4A090	A	10/13/09	DISPLAY RIG FLOOR WATERPROOF Ex nA ITS09ATEX46439 SHEET 2 OF 2
AMS4M691	A	8/26/09	LABEL HOIST PANEL ITS09ATEX46439 Ex nA SHEET 1 OF 1

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AUTHORIZATION TO MARK

This authorizes the application of the Certification Mark(s) shown below to the models described in the Product(s) Covered section when made in accordance with the conditions set forth in the Certification Agreement and Listing Report. This authorization also applies to multiple listee model(s) identified on the correlation page of the Listing Report.

This document is the property of Intertek Testing Services and is not transferable. The certification mark(s) may be applied only at the location of the Party Authorized To Apply Mark.

Applicant:	Benchmark Wireline Products Inc 36220 FM 1093	**Manufacturer:**	Benchmark Wireline Products Inc 36220 FM 1093
Address:	PO Box 850 Simonton, TX 77476	**Address:**	PO Box 850 Simonton, TX 77476
Country:	USA	**Country:**	USA
Contact:	Mr. Kenneth Dusek	**Contact:**	Mr. Kenneth Dusek
Phone:	(281) 346-4300	**Phone:**	(281) 346-4300
FAX:	NA	**FAX:**	NA
Email:	kdusek@benchmarkwireline.com	**Email:**	kdusek@benchmarkwireline.com

Party Authorized To Apply Mark: Same as Manufacturer
Report Issuing Office: Dallas, TX

Control Number: 4005218 **Authorized by:**

for Thomas J. Patterson, Certification Manager

This document supersedes all previous Authorizations to Mark for the noted Report Number.

This Authorization to Mark is for the exclusive use of Intertek's Client and is provided pursuant to the Certification agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this Authorization to Mark. Only the Client is authorized to permit copying or distribution of this Authorization to Mark and then only in its entirety. Use of Intertek's Certification mark is restricted to the conditions laid out in the agreement and in this Authorization to Mark. Any further use of the Intertek name for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. Initial Factory Assessments and Follow up Services are for the purpose of assuring appropriate usage of the Certification mark in accordance with the agreement, they are not for the purposes of production quality control and do not relieve the Client of their obligations in this respect.

Intertek Testing Services NA Inc.
545 East Algonquin Road, Arlington Heights, IL 60005
Telephone 800-345-3851 or 847-439-5667 Fax 312-283-1672

Standard(s):	Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use — Part 1: General Requirements (ANSI/UL 61010-1,Second Edition, Issued 12th Jul 2004, Revised October 28, 2008 and CAN/CSA-C22.2 No. 61010-1-04, Second Edition, including Amendment 1, Issued 12th Jul 2004, Revised October 28, 2008); Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations (ANSI/ISA-12.12.01-2011, Approved 24 August 2011); and Non-incendive Electrical Equipment for Use in Class I, Division 2 Hazardous Locations (CSA C22.2 No.213-M1987, R2008)

ATM Issued: 1-May-2013

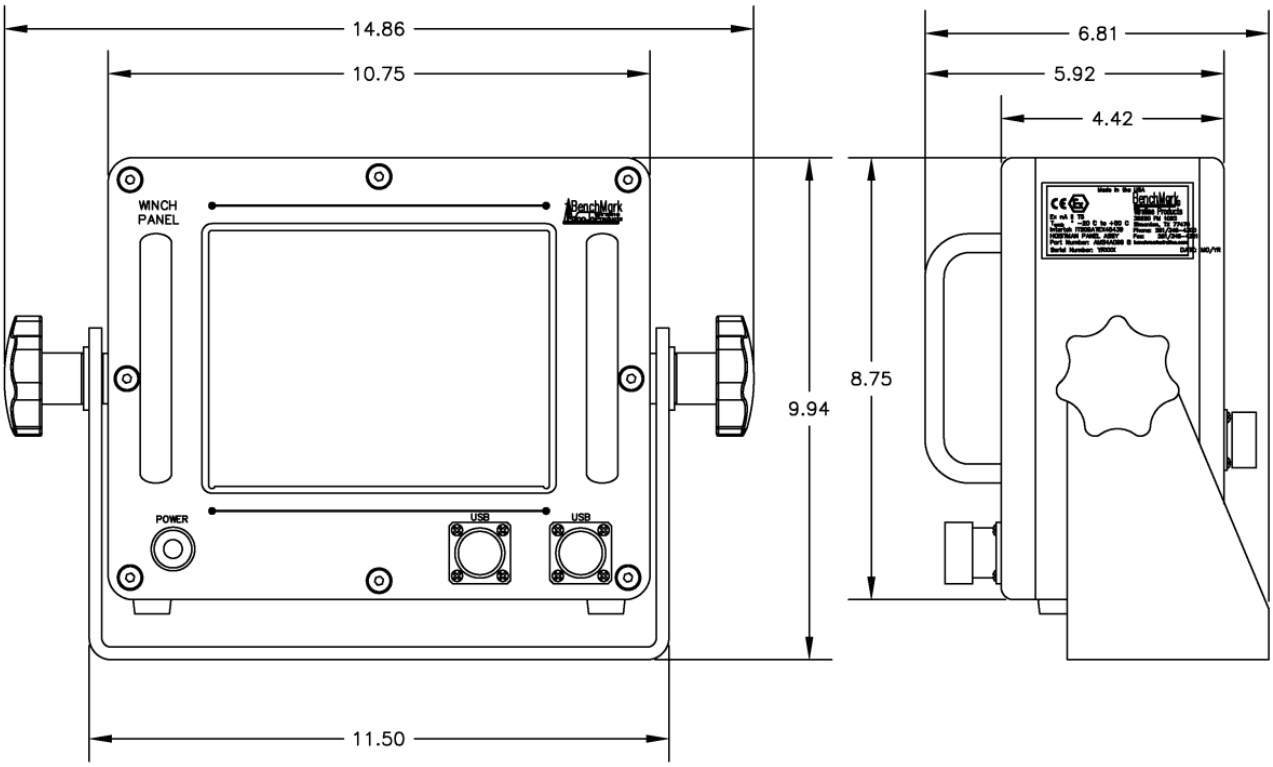
Intertek

AUTHORIZATION TO MARK

Product:	Winch Panel For use in: Class I, Division 2, Groups A, B, C, D Hazardous and Ordinary Locations Temperature Code: T5 Ambient: -20°C ≤ Tamb ≤ 40°C
Models:	AMS4A095, AMS4A099

ATM Issued: 1-May-2013

1.4 TECHNICAL SPECIFICATIONS



WEIGHT:

PANEL ONLY:	10 LBS	4.55 KG

POWER REQUIREMENTS:

INPUT VOLTAGE:	12 – 24VDC
INPUT CURRENT:	4 AMPS STARTUP SURGE
	3 AMPS NORMAL OPERATION

OPERATING TEMPERATURE

Min	Max	
14	149	degrees F
-10	65	degrees C

STORAGE TEMPERATURE

Min	Max	
-22	158	degrees F
-30	70	degrees C

1.5 HARDWARE FEATURES

12 - 24 VDC Power Input

Internal PC board
- Intel based personal computer board
- 4 gb solid state media device
- Embedded windows XP operating system
- Four USB ports (One inside, two in front, and one on brake-out box)
- 1 RS232 port
- RJ 45 Ethernet port
- USB Mouse / Keyboard included

Color Display
- TFT LCD
- Backlit
- 400 NITS Sunlight readable

Touch Screen Interface (replaces current key pad)
- 5 wire resistive
- USB interface

Real Time Acquisition board
- Kerr Measurement Systems proprietary design
- 8051 Microprocessor based
- Provides power to encoders, load cell
- Processes encoder quadrature, load cell
- Runs independent of PC board

Overtension Relay Contact Closure output

Analog output interface
- Encoder quadrature output
- 0 – 10vdc tension output
- 4-20ma tension output

Dual Pressure signal inputs

1.6 USER INTERFACE FEATURES

Total Tension numeric graphic
Incremental or Differential tension meter graphic
Meter reset button graphic (touch screen control)

Over_tension Warnings and Shutdown settings for both Differential and Total Tension readings (touch screen activated)

Tension Calibration Setup Window (touch screen control)

Encoder Resolution Settings (PPR value set by touch screen control)

Approaching Surface

Max Depth

Set Down

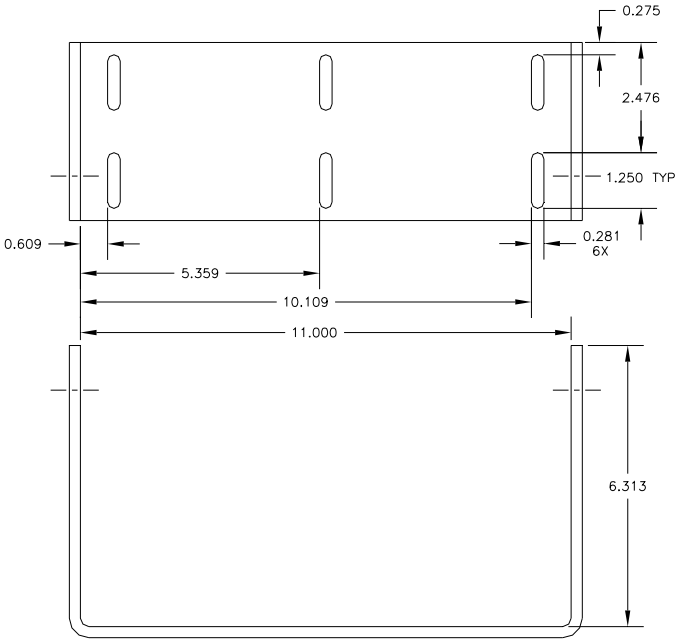
1.7 HAZARDOUS AREA PREPARATION AND INSTALLATION

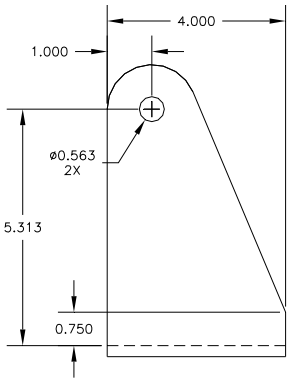
This equipment is to be installed only by suitably trained and qualified personnel to local national codes.

INSTALL PANEL INTO WIRELINE UNIT

Bolt the mounting bracket to the wireline unit.

Install the panel into the mounting bracket





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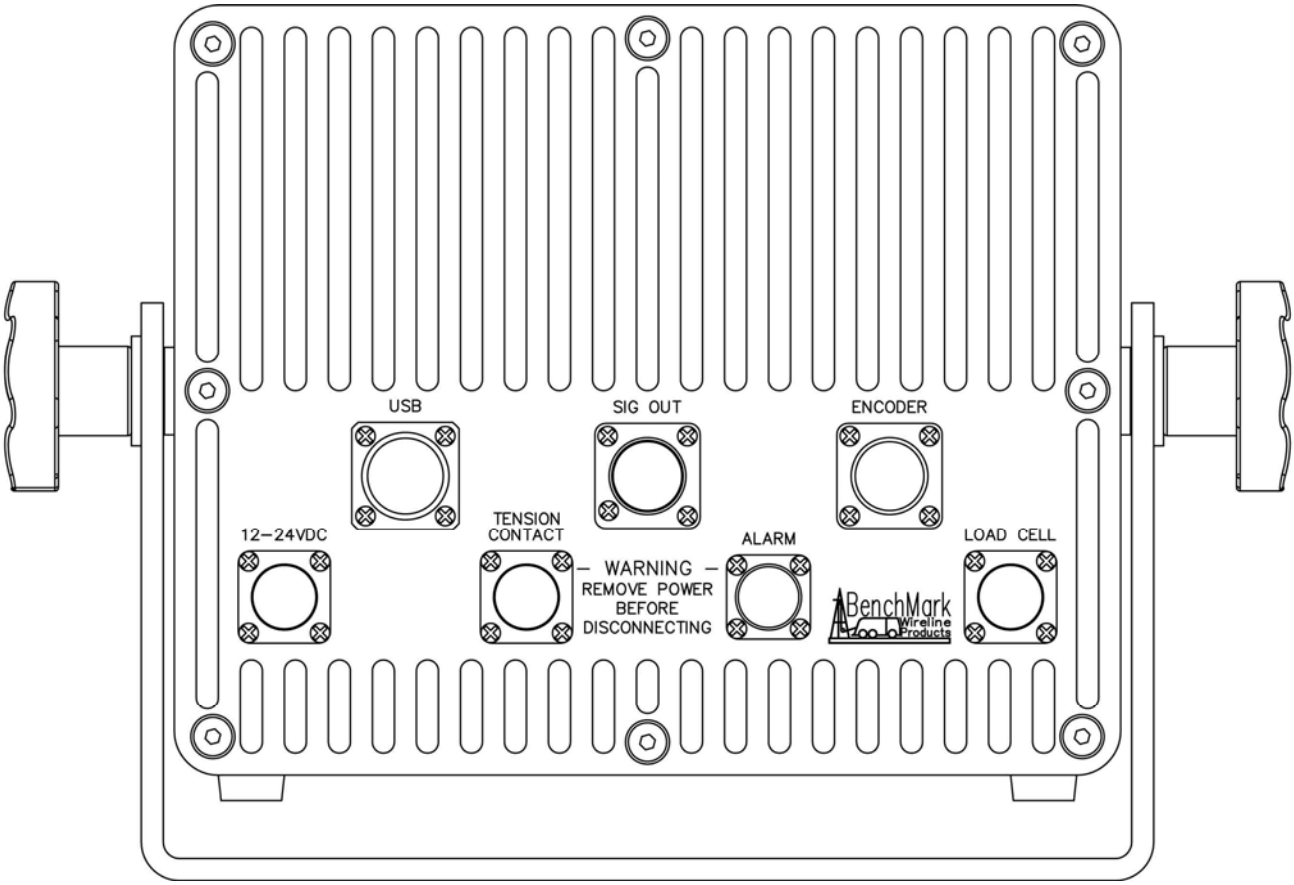
CONNECT INPUT POWER AND SIGNAL CABLES

Connect the cables from the measuring head to the LOAD CELL and ENCODER connectors on the box.



1.8 OBTAINING TECHNICAL ASSISTANCE

Call BenchMark Wireline Products Inc. at +1 281 346 4300
Or contact by email mail@benchmarkwireline.com
Or fax in request at +1 281 346 4301
Information is also available on website www.benchmarkwireline.com
Parts can be ordered by email, phone, or fax
Equipment can be returned for repair and maintenance. Please notify us by Phone, email, or fax before sending any equipment.
To return equipment to BenchMark, ship it to:
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Simonton, Texas 77476
U.S.A.

2.0 WELLSITE OPERATING SUMMARY

2.1 Power up panel and verify it is working properly.

2.2 Press Zero Depth and verify that panel tension reads 0. Verify tension is recorded on acquisition system.

2.3 Set line size to match cable size installed in head (refer to section 3).

2.4 Set Tension Alarm value (refer to section 3).

2.5 Set depth adjust value (refer to section 3).

2.6 Install cable in measuring head and lay it slack on the ground.

2.7 Press Zero Inc. Tension to zero the tension value.

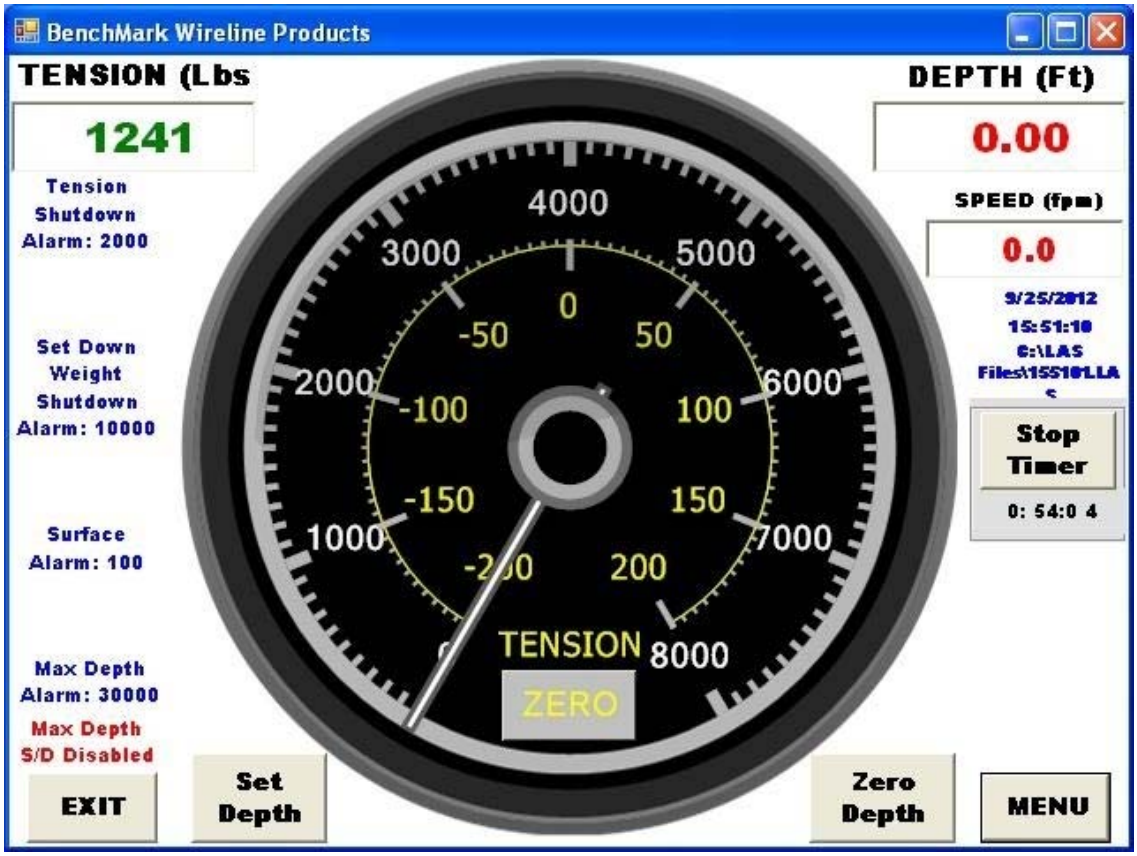
2.8 Press T-Cal and verify that panel tension reads 5000 lbs. Verify tension is being properly recorded on acquisition system.

2.9 Pull tool to depth 0 position. Press D-Zero and verify that panel depth reads 0. Set acquisition system depth to 0 at this time.

Make sure encoder direction is properly set.

3.0 SOFTWARE OPERATING INSTRUCTIONS

When the system first boots up, the main screen will appear.



Most of the commands are accessed through the buttons across the bottom of the screen.

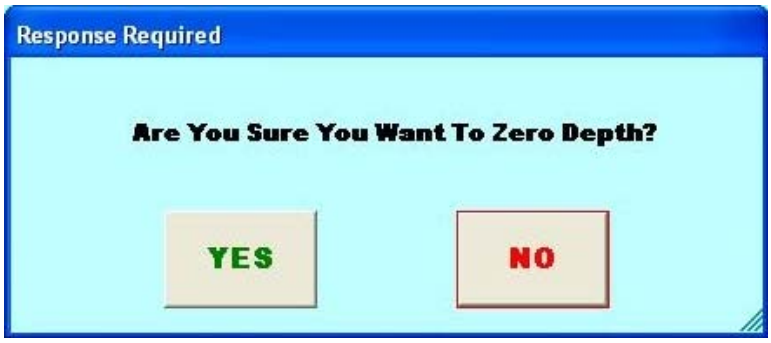
EXIT BUTTON - Exits this program and returns to MS Windows

MENU BUTTON - Invokes a new screen with additional menu options (refer to section 3.1)

ZERO BUTTON - Resets Incremental Tension bar graph to zero

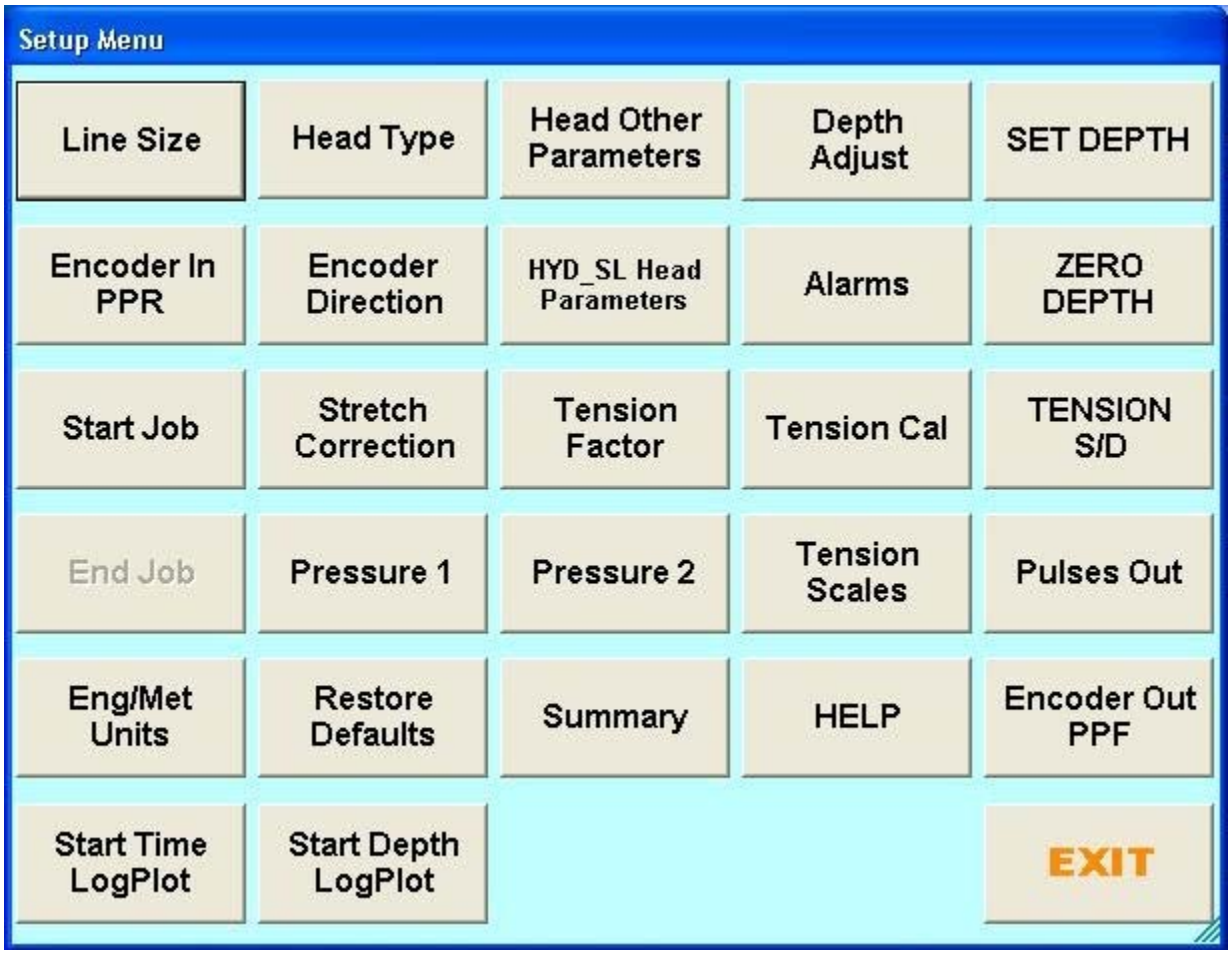
SET DEPTH – Allows operator to set the depth of the tool string

ZERO DEPTH – This button will invoke the following screen.



When the YES button is pressed, the depth value will be set to ZERO. If NO is pressed, the depth value will remain at the current value.

3.1 MENU



Following are the functional descriptions of each of the buttons

3.1.1 HEAD TYPE

If the “Other” head is chosen, the operator has the option of choosing a variety of wheel sizes listed in 3.1.3.

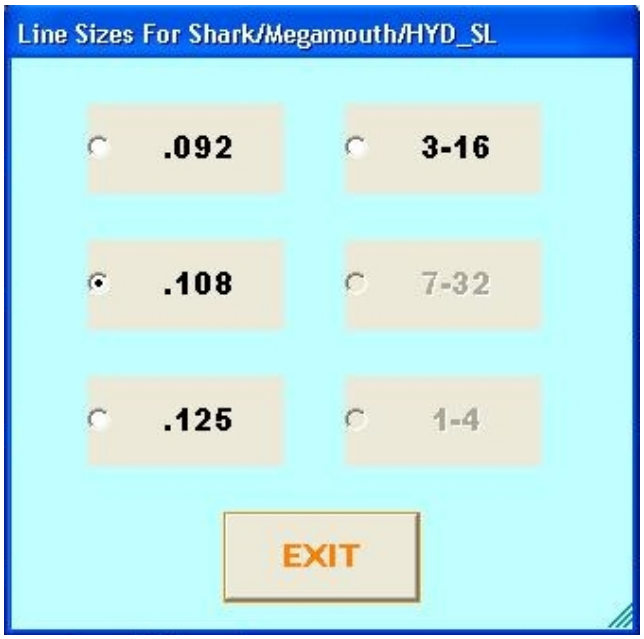
If the “HYD_SL” head is chosen, the operator has the option of choosing from two different wheel sizes listed in 3.1.3.

For all other head selections, the wheel sizes are automatically determined and cannot be changed. The load pin types are also automatically determined by the head selection.

NOTE – it is recommended to check the Line Size AFTER changing Head Types.

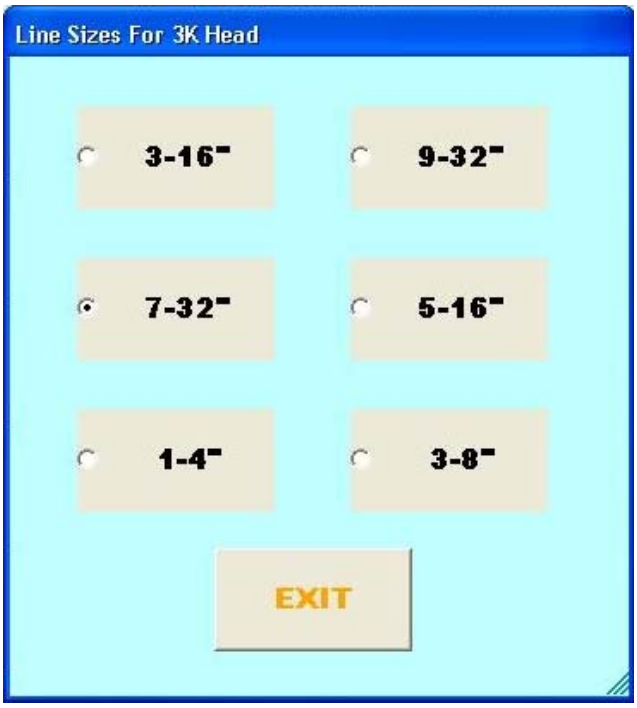
3.1.2 LINE SIZE

SHARK / MEGAMOUTH / HYD_SL



Select the line size by pressing the corresponding gray box. Default is .108

3K



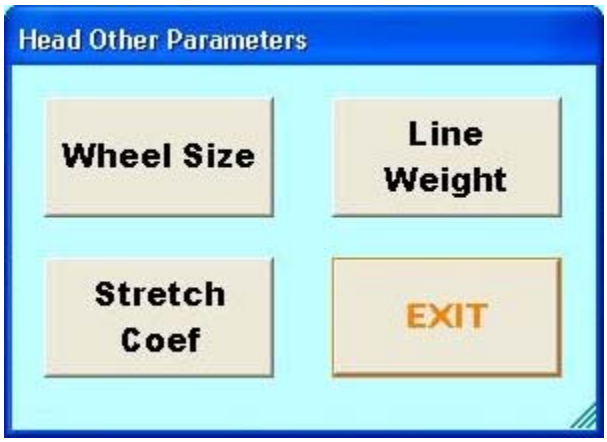
20” Mako

Select the line size by pressing the corresponding gray box. Default is .108

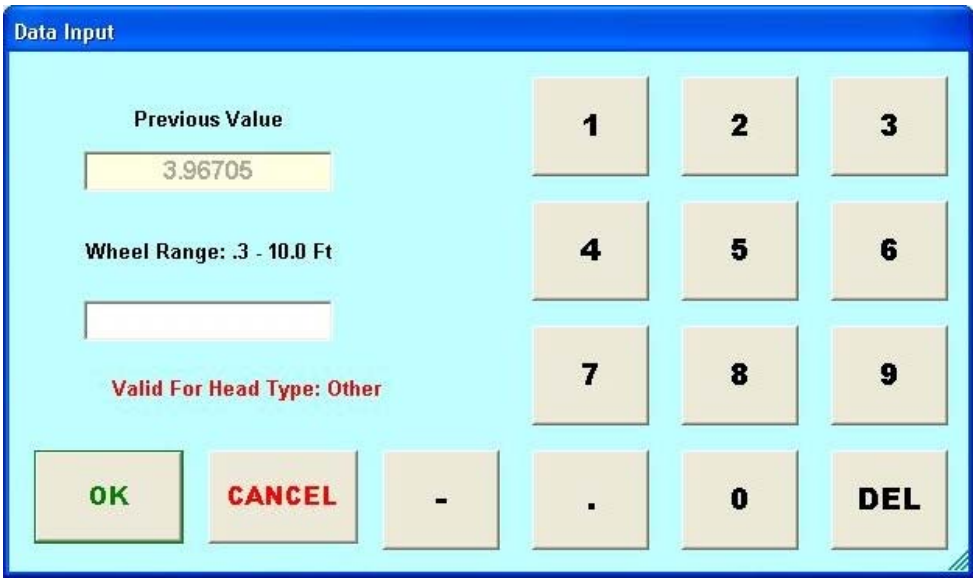
5K (Braided Line):

Select the line size by pressing the corresponding gray box. Default is 5/16

3.1.3 HEAD OTHER PARAMS



WHEEL SIZE (OTHER)

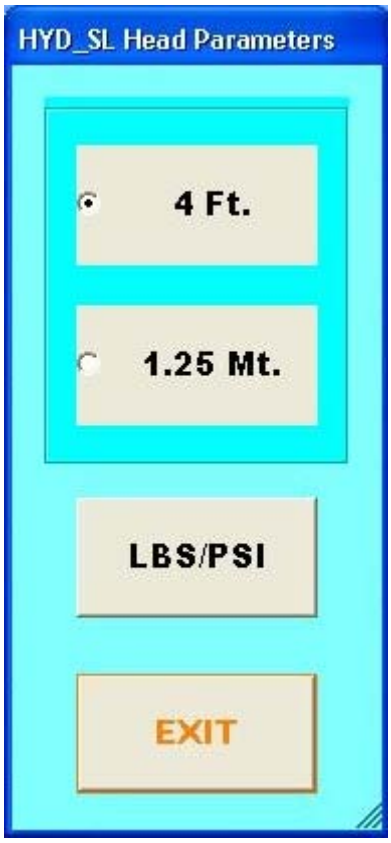


This setting allows you to change the size of the depth measuring wheel that is used to measure depth. To use a different measuring head from the Benchmark head, this setting will need to be changed to match the wheel size of the new head.

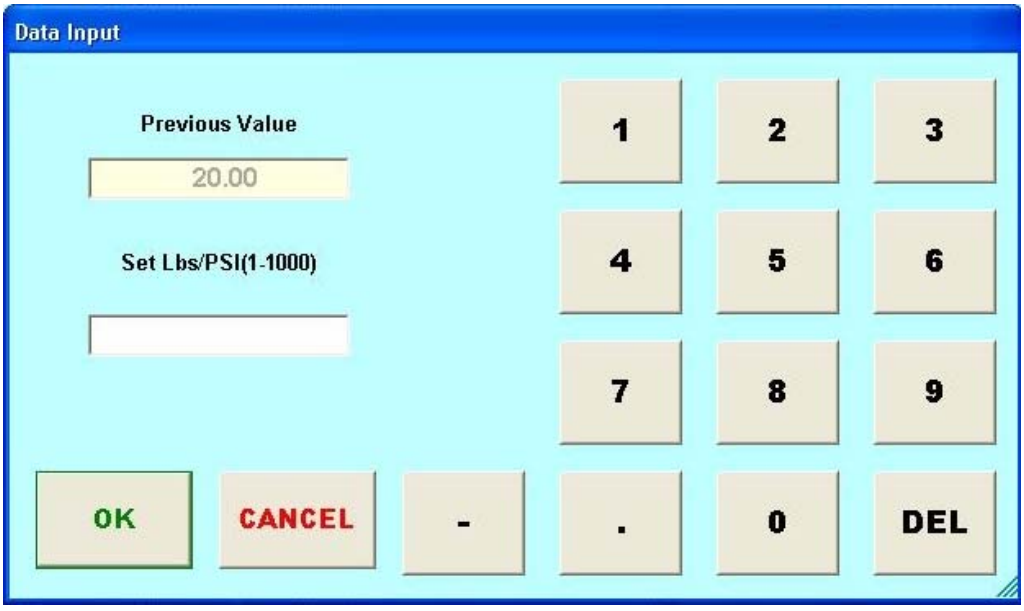
LINE WEIGHT (OTHER)

STRETCH COEFFICIENT (OTHER)

HYDSL PARAMS



LBS / Square Inch



3.1.4 DEPTH ADJUST

The Set Depth Adjust Shim entry screen will appear.
The range is -99 to 99 ft/Kft

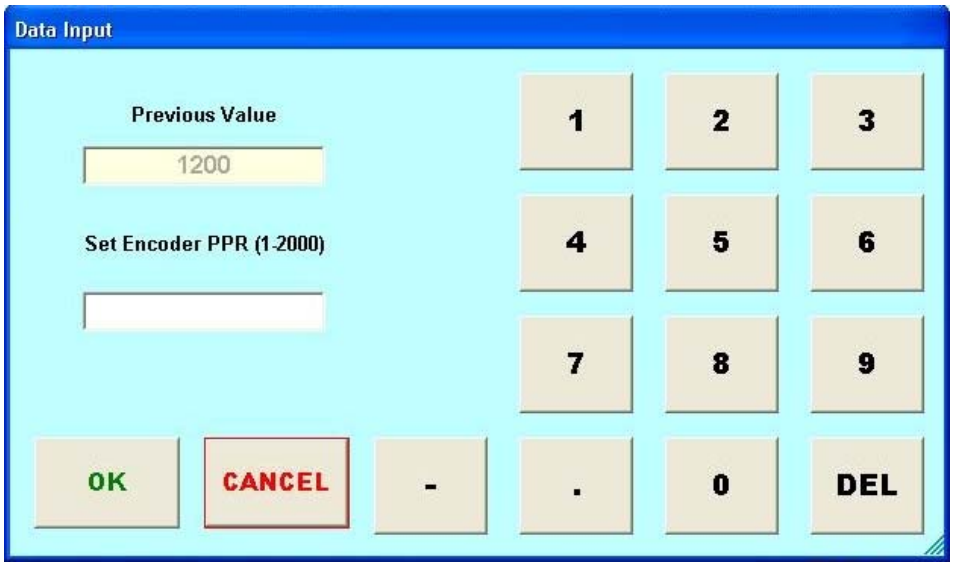
Shim

Adds or subtracts depth continually.
If 1 is entered then 1 foot or 1 meter will be added every 1000 feet or 1000 meters.

If -.2 is entered then .2 feet or .2 meters will be subtracted every 1000 feet or 1000 meters.

Default is 0.0

3.1.5 ENCODER PPR



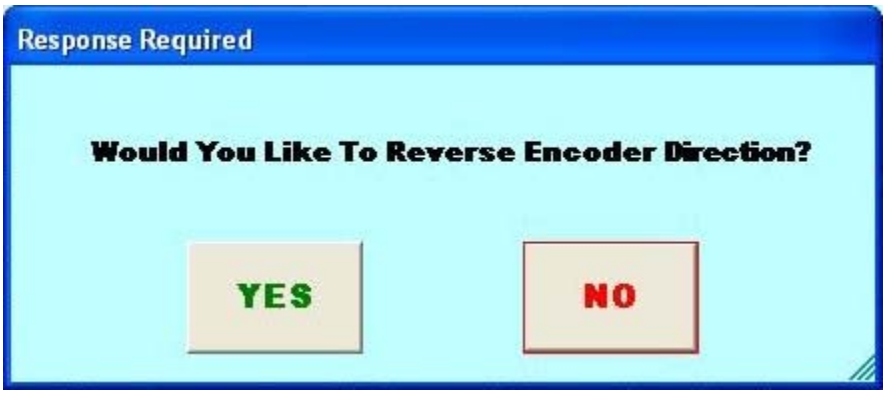
The range is 1-2000

The screen allows you to set the encoder pulses per revolution setting. This number should be printed on the encoder label.

Note: The pulses per foot/meter are not set by this screen, only the encoder input. Pulses per foot/meter are calculated from encoder PPR and Wheel Size.

Default is 1200 PPR

3.1.6 ENCODER DIRECTION



This screen allows you to change the direction of the encoder. If the depth is changing in the opposite direction to which the line is moving, this option can be used to correct it. On a dual wheel measuring device with two encoders, the encoder on one of the wheels will turn in the opposite direction from the other. If you change encoders, this feature can be used to change the encoder direction.

3.1.7 STRETCH CORRECTION

Enabling this allows stretch correction to automatically be applied to the depth. The correction is calculated using line size and mud cable coef. parameters

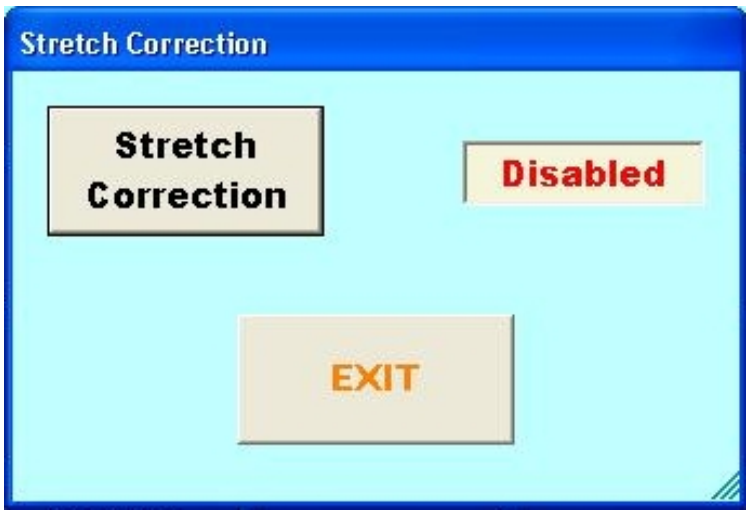
Stretch is calculated by stretch due to cable weight + stretch due to weight at end of cable

stretch due to cable weight = stretch coefficient * depth * cable weight / 2

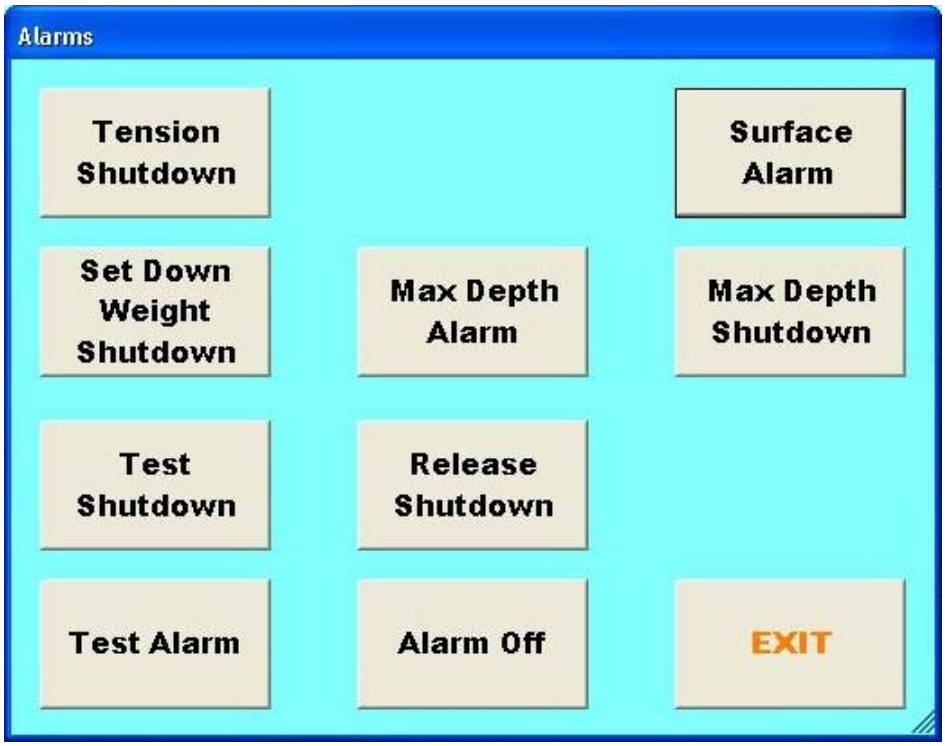
stretch due to weight at end of cable = stretch coefficient * depth * (tension – cable weight)

When tension is less than cable weight, tension measured is due to cable weight alone.

Default is: disabled.



3.1.8 ALARMS



Tension Shutdown: refer to 3.1.8.1

Max Depth Alarm: refer to 3.1.8.2

Surface Alarm: refer to 3.1.8.3

Set Down Weight Shutdown: refer to 3.1.8.4

Max Depth Shutdown: refer to 3.1.8.5

Test Shutdown: refer to 3.1.8.6

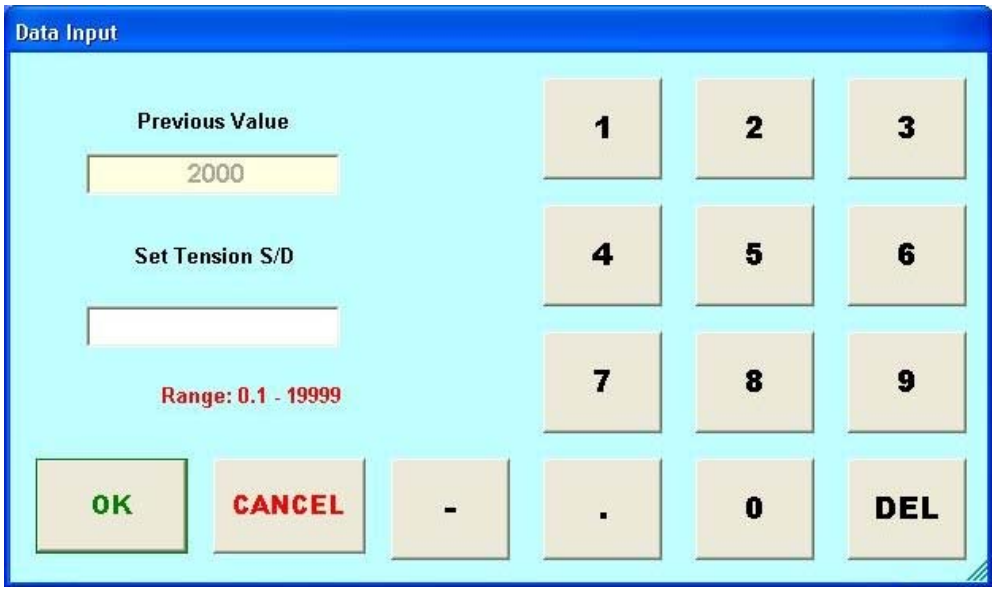
Release Shutdown: refer to 3.1.8.7

Test Alarm: refer to 3.1.8.8

Alarm Off: refer to 3.1.8.9

Note: All shutdowns refer to the relay contact closure. It is the operator's responsibility to connect the relay contacts to the actual reel shutdown mechanism.

3.1.8.1 TENSION SHUTDOWN



The Set Tension S/D entry screen will appear. The range is 0.1 to 19999

When this value is reached, alarm sounds, tension display flashes value, and tension contact closure switch is closed. This can be used to provide a signal to automatically stop the winch.

Each wireline size will have a corresponding Tension Alarm setting. Only the setting for the cable size selected can be adjusted.
Default is 2000 lbs

NOTE – Tension shutdown is also accessible from the Setup Menu.

3.1.8.2 MAX DEPTH ALARM

The Set Max Depth Alarm entry screen (refer to section 3.1.3) will appear. The range is from the surface alarm setting to 30,000 feet.

Allows you to enter in the maximum depth desired. If the tool goes below that depth then an alarm will sound. If max depth shutdown is enabled, then the relay will close (refer to section 3.1.7.5).
Default: 30,000 ft.

3.1.8.3 SURFACE ALARM

The Set Surface Alarm entry screen (refer to section 3.1.3) will appear. The range is 0-304 Mt or 0 to 999 ft.

When this depth value is reached, the alarm will sound warning the operator that you are approaching the surface.
Default value is 100 feet.

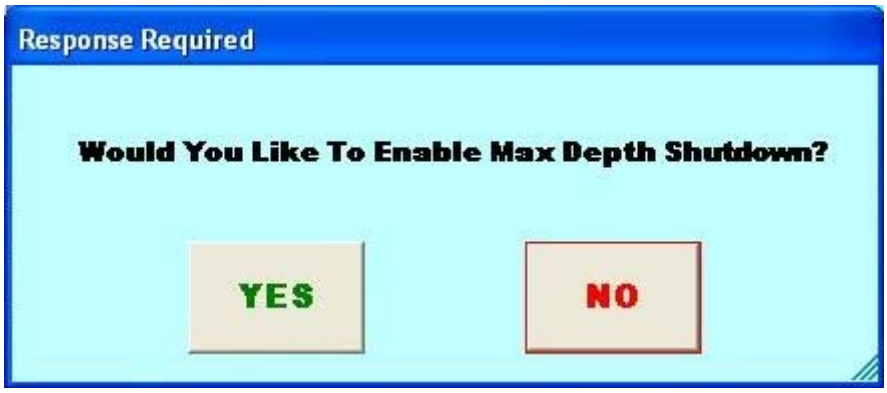
3.1.8.4 SET DOWN WEIGHT SHUTDOWN

The Set Down Weight S/D entry screen will appear (refer to section 3.1.3). The range is 0.1 to 5000

This function is similar to a differential tension shutdown except that it only activates when the value is exceeded. This will occur when tension decreases rapidly in a negative direction.

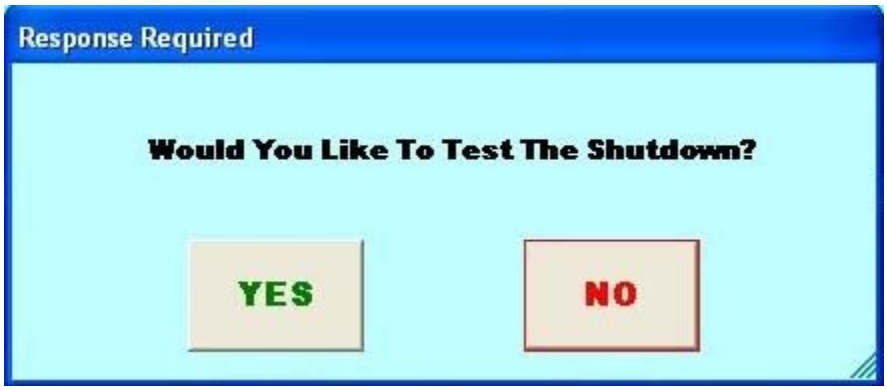
When this event occurs the shutdown relay will close.
Default: 750

3.1.8.5 MAX DEPTH SHUTDOWN



If enabled, the relay will close and the winch will stop when the maximum depth value is reached. The maximum depth value is set on the max depth alarm screen (refer to section 3.1.8.2).
Default: disabled

3.1.8.6 TEST SHUTDOWN

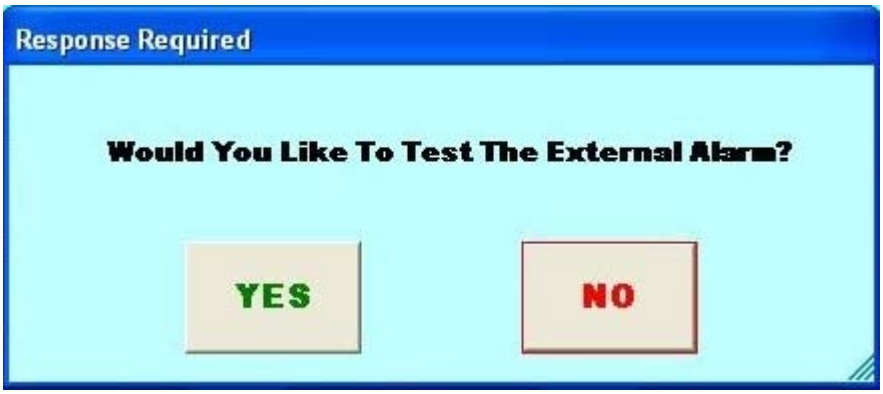


When this button is pressed, the contact closure pins are shorted. This can be used to test the winch shutdown mechanism or any other mechanism that uses these contacts.

3.1.8.7 RELEASE SHUTDOWN

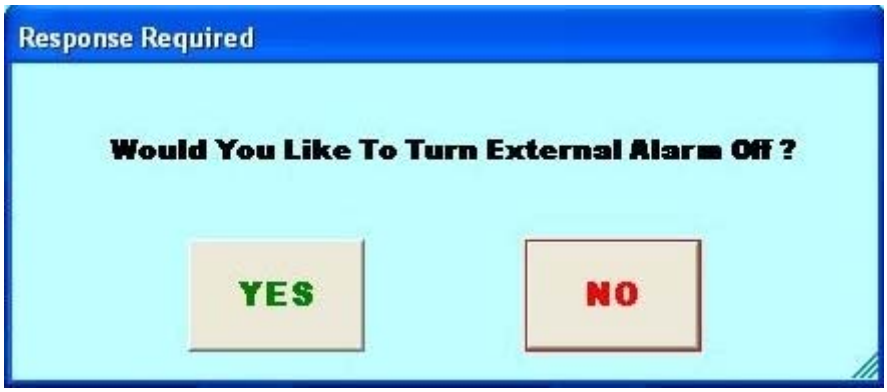
When this button is pressed, the contact closure pins (A and B) on J8 are open.

3.1.8.8 TEST ALARM



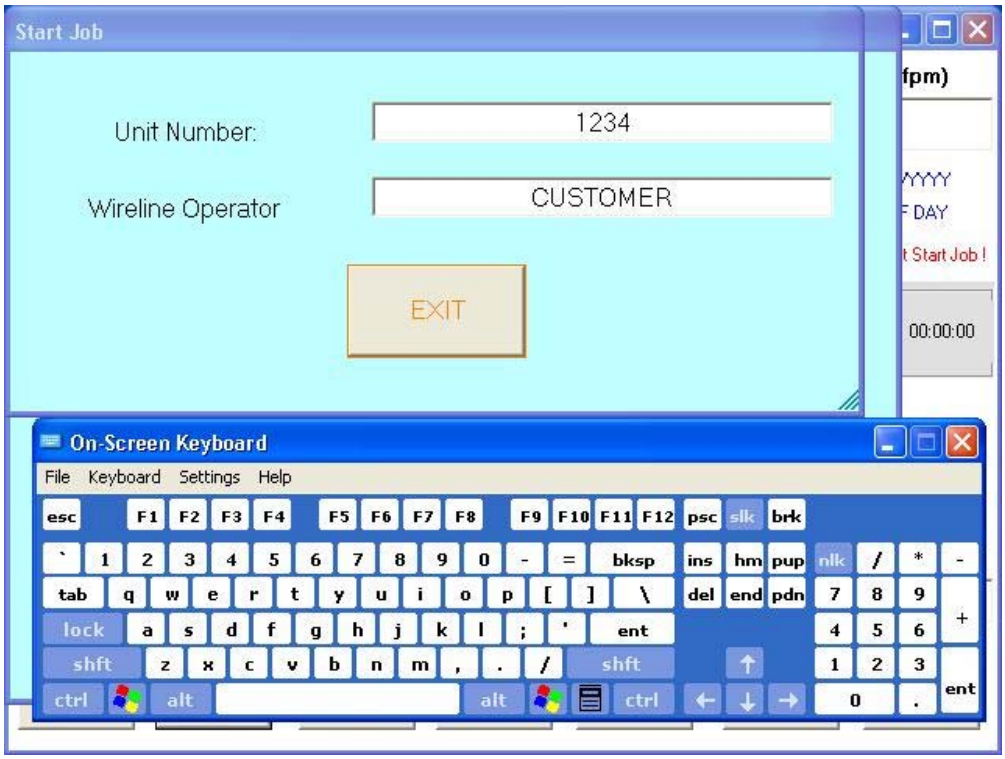
NOTE - There is no internal alarm in the panel and this function is intended for an optional external alarm.

3.1.8.9 ALARM OFF



NOTE - There is no internal alarm in the panel and this function is intended for an optional external alarm.

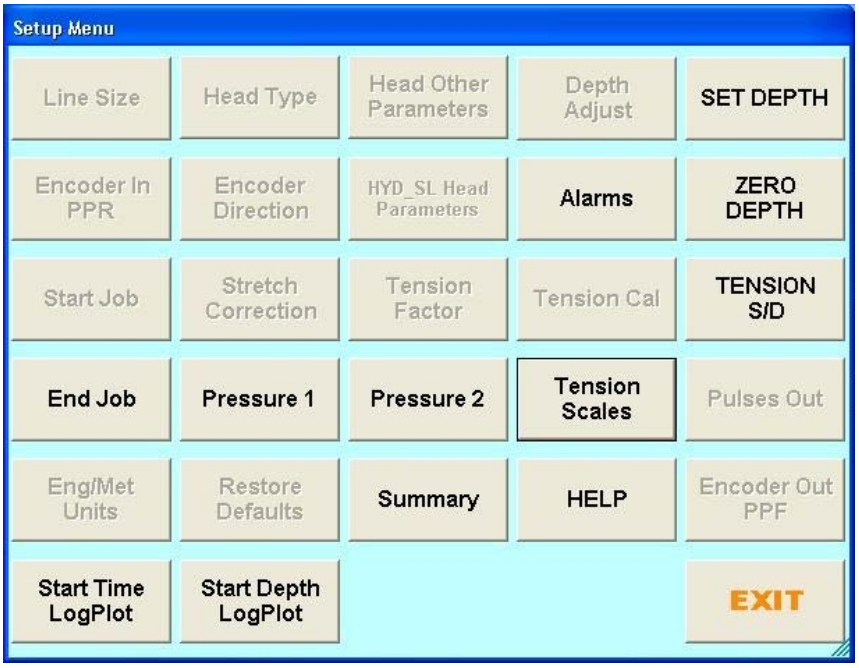
3.1.9 START JOB



An on-screen keyboard is provided automatically for data entry.

Upon closing of the dialog screen a LAS file is created using the time stamp as the name of the file. This file name is displayed on the screen. If job is not started the screen will show no file – must start job!
Note: No LAS file is created until the operator chooses 'start job.'

3.1.9 START JOB continued



NOTE - Many buttons are disabled after a “Job Start” to discourage changing parameters during a job.

3.1.10 END JOB

If the response is “Yes” then the LAS file is closed. The button “Start Job” is enabled once again and all buttons in the Setup Menu are re-enabled.

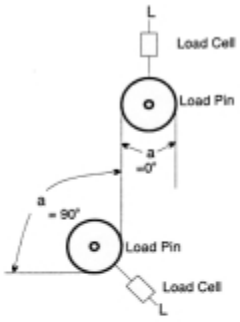
3.1.11 TENSION FACTOR

The Set Tension Factor entry screen will appear. The range is 0.5-2.0 degrees. Default is 1.0.

Explanation: Tension Factor as it relates to Load Cell angle

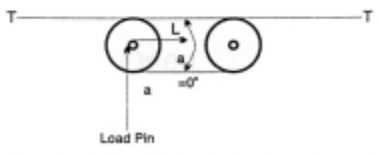
Load cell angle is used to compensate when a load cell is not hung vertically (i.e. bottom sheave). Enter the value derived from the formula:

$$= \frac{1}{\text{Cosine}\left(\frac{\text{Angle}}{2}\right)}$$



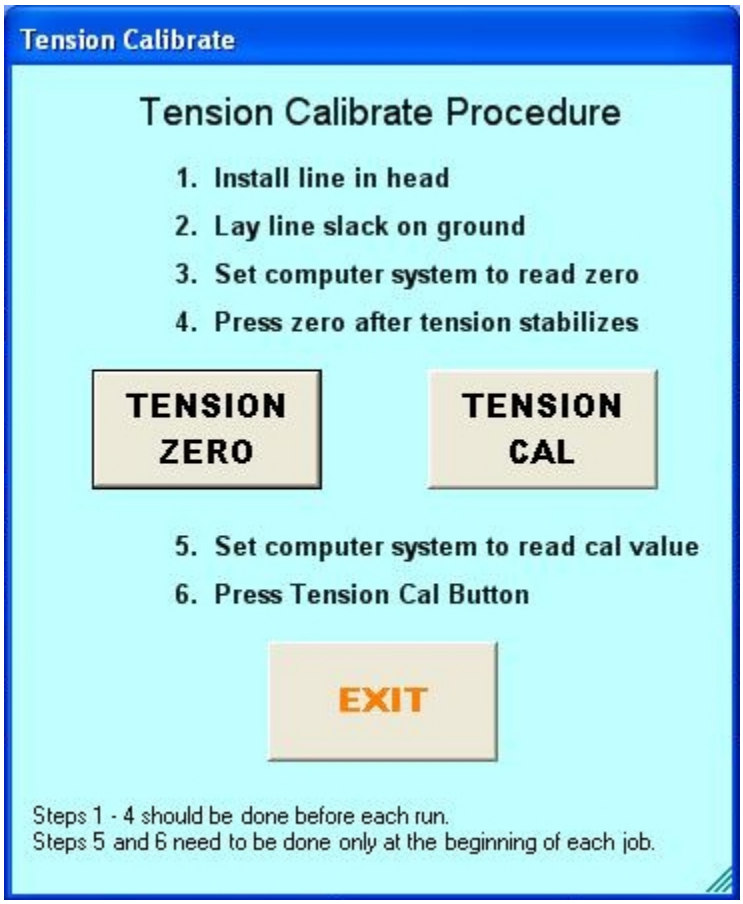
Example 1: Load Cell/Load Pin located at Wireline Lower and Upper Sheave

Examples:
30 degrees = 1.035
45 degrees = 1.082
90 degrees = 1.414
120 degrees = 2.0



Example 2: Combination two wheel counter at wireline unit

3.1.12 TENSION CAL



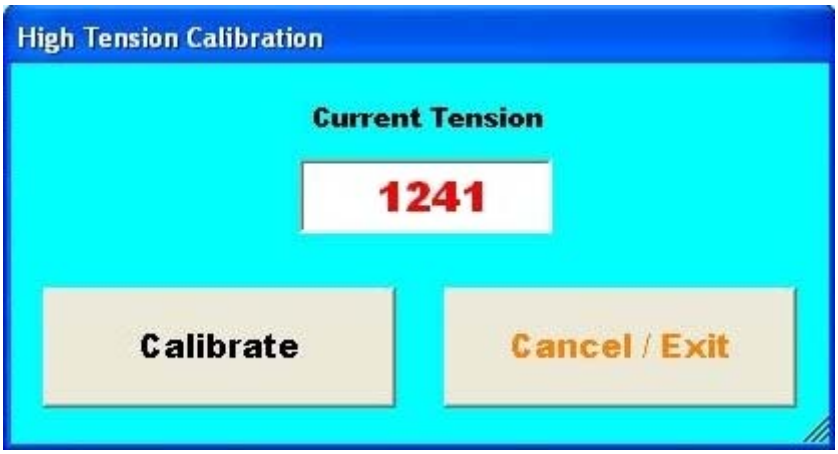
NOTE - Depth value must be zeroed before this menu can be displayed.

NOTE - Tension value must be less than 1,000 lbs before this menu is displayed.

3.1.12.1 TENSION ZERO

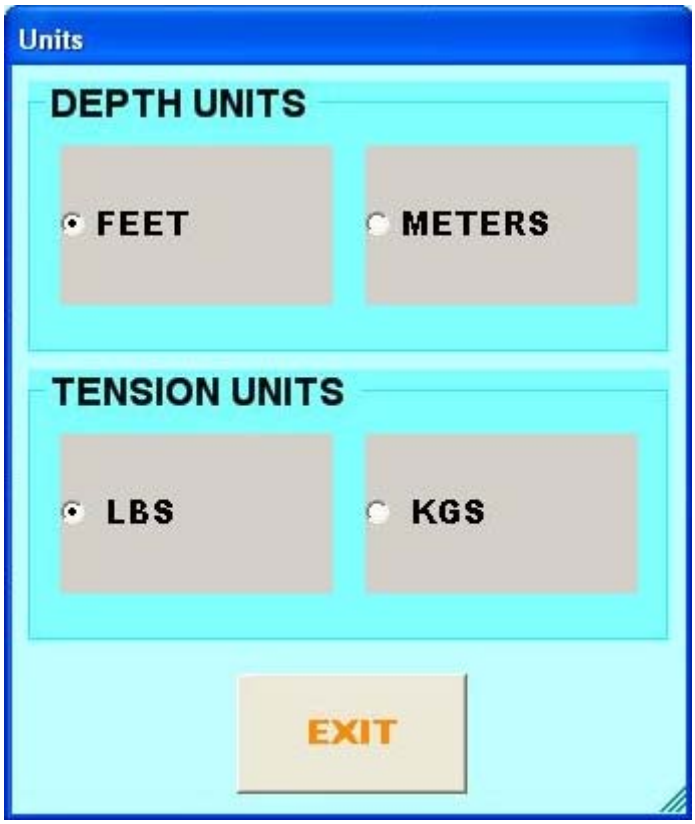
Pressing Tension Zero will null out any tension offset voltage up to 200 lbs (slickline head) or 1000 AM5K braided line head.

3.1.12.2 TENSION CAL



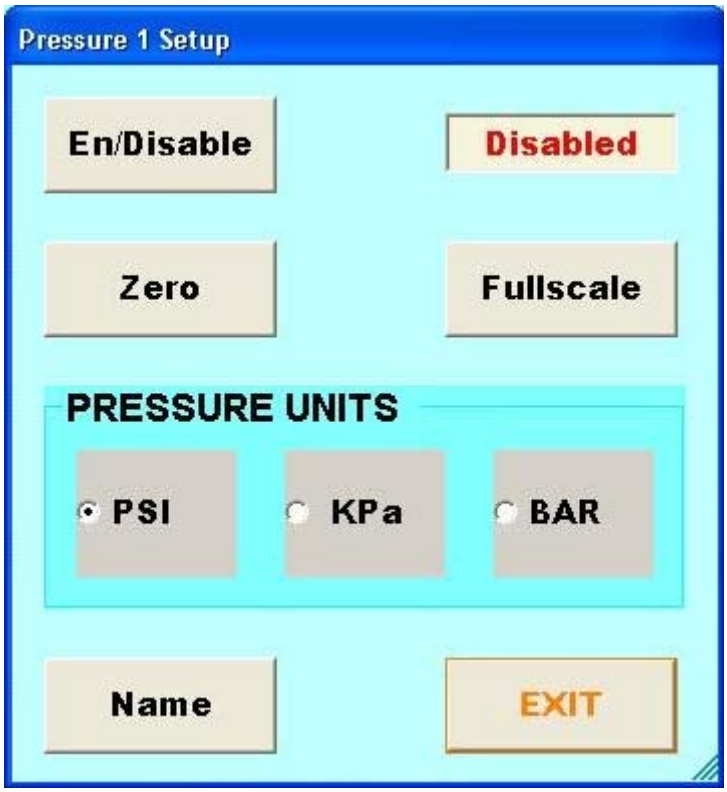
Pressing Tension Cal will activate the tension relay inside the panel. The load pin should then return a calibrated signal that varies depending on the head chosen.

3.1.13 ENG/MET UNITS



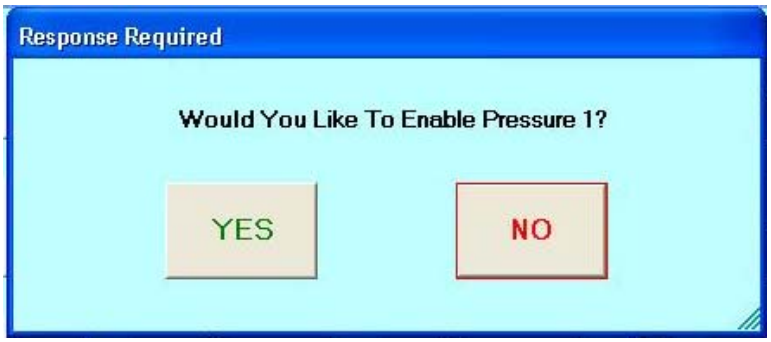
This menu allows you to select the display units for either depth or tension. Default is feet and lbs.

3.1.14 PRESSURE 1



This menu controls pressure 1 values and displays.

3.1.14.1 ENABLE / DISABLE PRESSURE 1



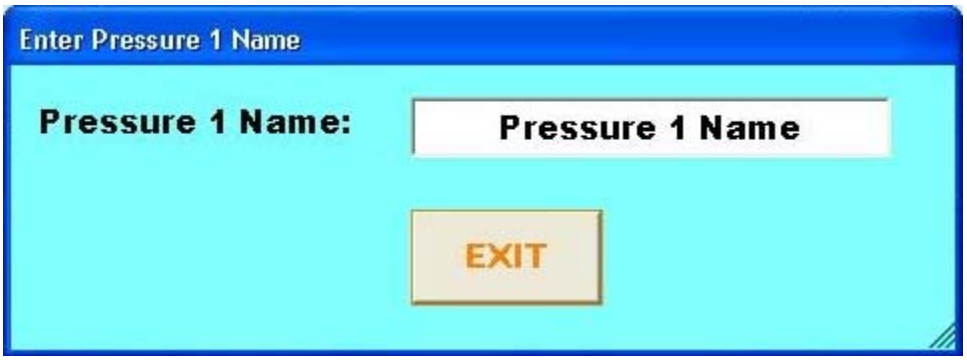
When Pressure 1 and/or Pressure 2 are enabled, the main screen will display these values. Once disabled these values will be removed from the main screen

3.1.14.2 ZERO

Zero - Pressing this button establishes the zero pressure point. This corresponds with 4ma point or a 4-20ma current loop.

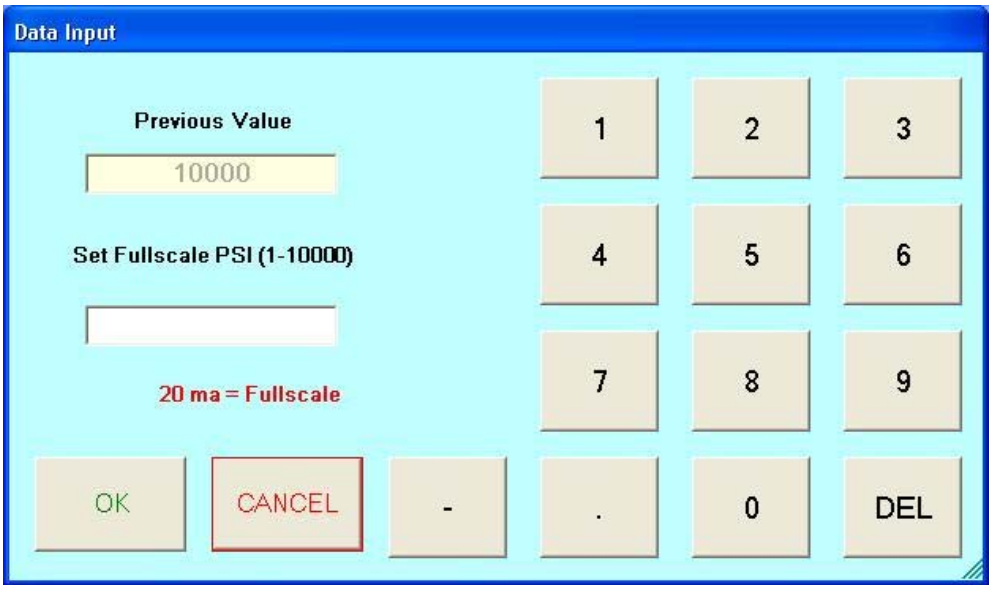
This menu allows the user to zero out the information in Pressure 1

3.1.14.3 NAME



This screen provides a way to enter a descriptive name for the pressure data (i.e. tubing pressure Well 12345)

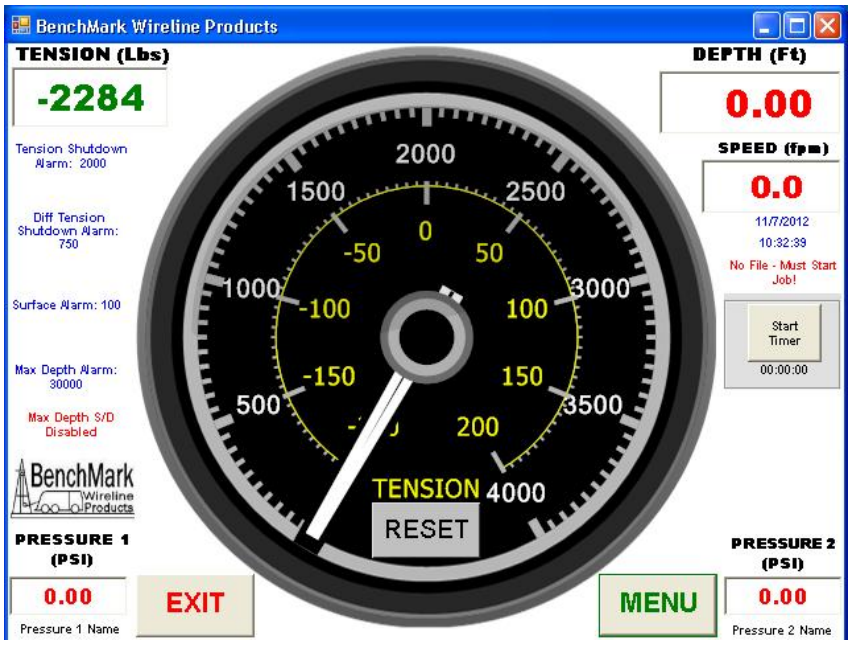
3.1.14.4 FULLSCALE



The menu adjusts the settings for Fullscale PSI. The range is 1-10000, and the default setting is 10000

Fullscale - This value corresponds with the 20ma point of a 4-20ma current loop.

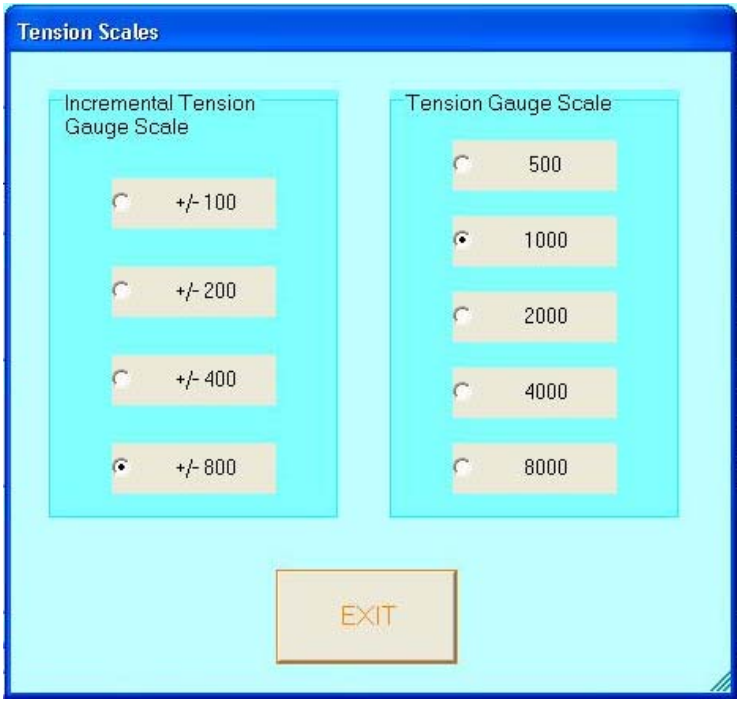
3.1.15 PRESSURE 2



The settings menus for Pressure 2 are identical to Pressure 1. (See sections 3.1.14.1, through 3.1.14.4 for more information.)

NOTE - The main screen image above shows both pressures enabled.

3.1.16 TENSION SCALE



The Tension Scale Screen allows the changing of both Bar Meter Scale near the top and the Needle Gauge Scale at the center of the screen. It also allows the Gauge Scale to be used either in a Differential or Incremental scale.

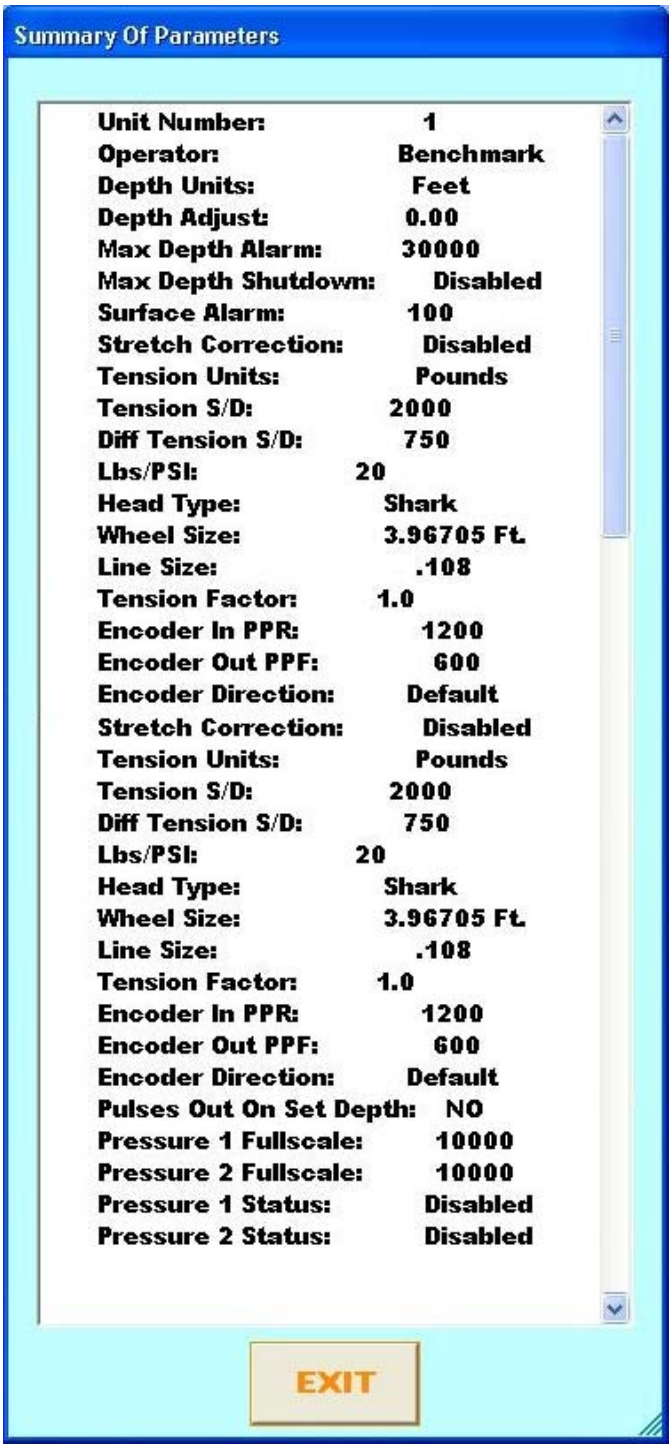
Incremental tension provides a high resolution tension scale. It must be periodically reset as tension increases or decreases to keep it from “pegging out”.

Differential tension provides a delta tension reading. The meter will slowly reset itself to 0 so the reset switch is not necessary.

3.1.17 RESTORE DEFAULTS

When this button is pressed, all the settings will be restored to their default values. This functions as a software reset. Depth will be zeroed.

3.1.18 SUMMARY



The Summary Menu is a quick reference to what parameters are set. This is a static display. All of the defaults are shown.

3.1.19 HELP MENU

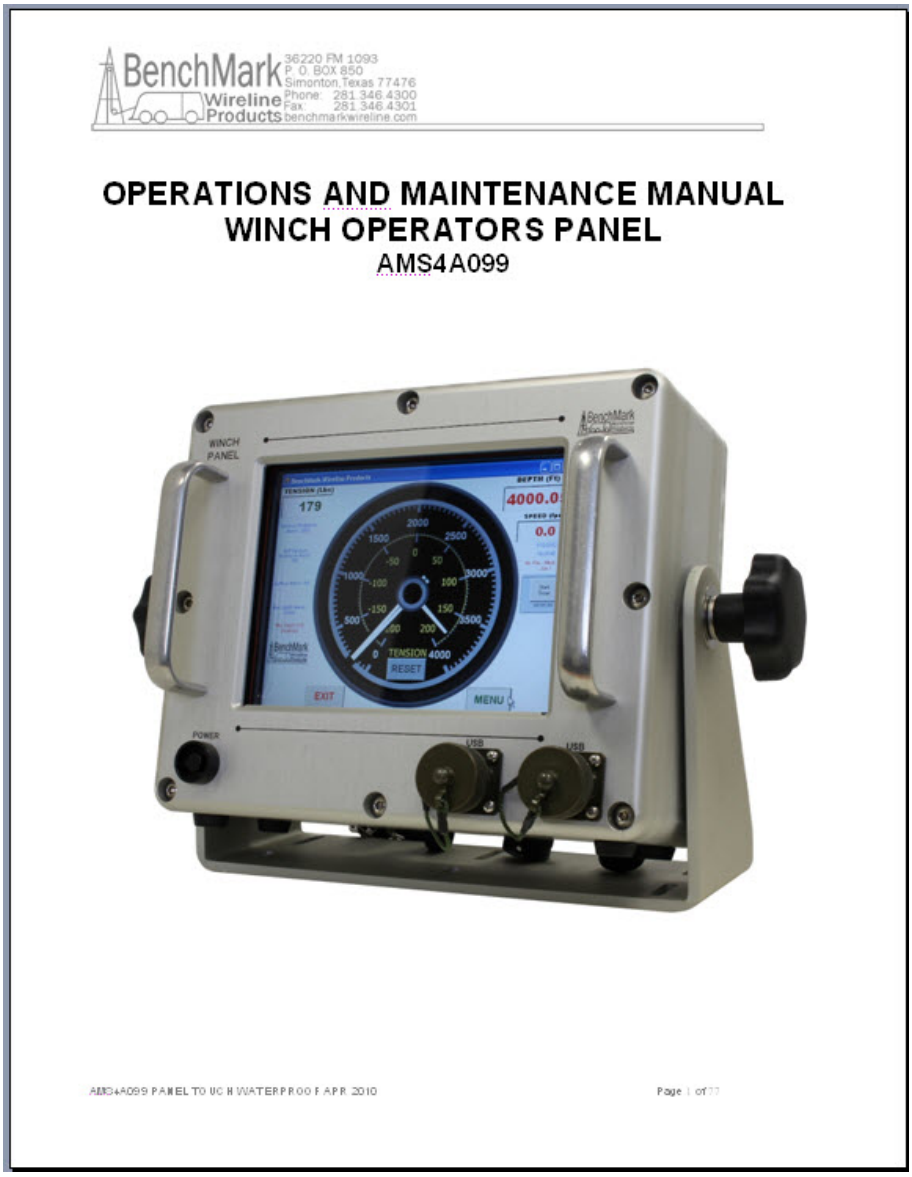
The HELP button will display the four options displayed above.

3.1.19.1 ABOUT SCREEN

The ABOUT button displays the software revisions.

There are two programs that can be updated, the HOISTMAN program which is run by the PC and the ACQUISITION program that is run by the real time board.

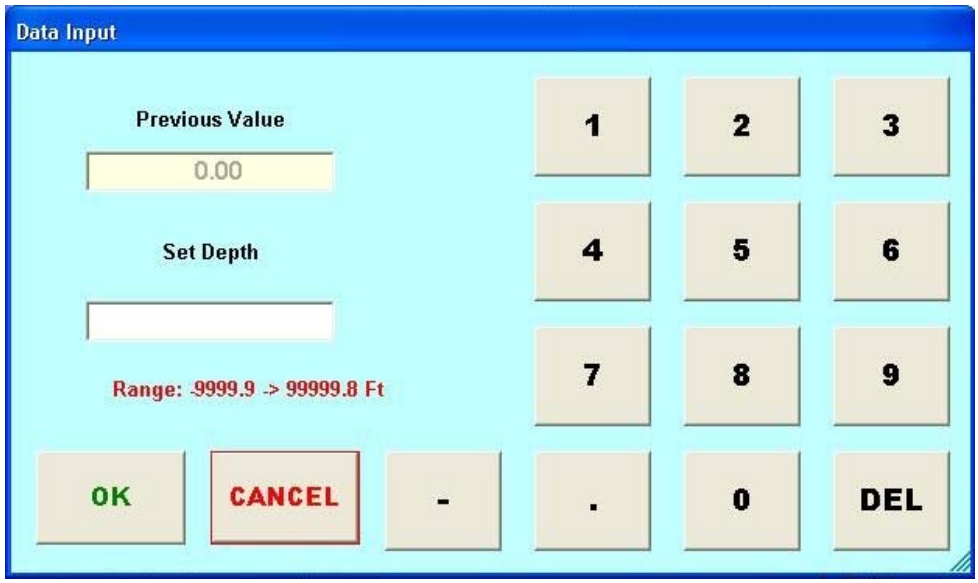
3.1.19.2 HELP MANUAL



MANUAL button invokes the Adobe Acrobat Reader with c:\manual.pdf. It will bring up this manual in pdf format.

3.1.19.3 DRIVE SPACE

3.1.20 SET DEPTH

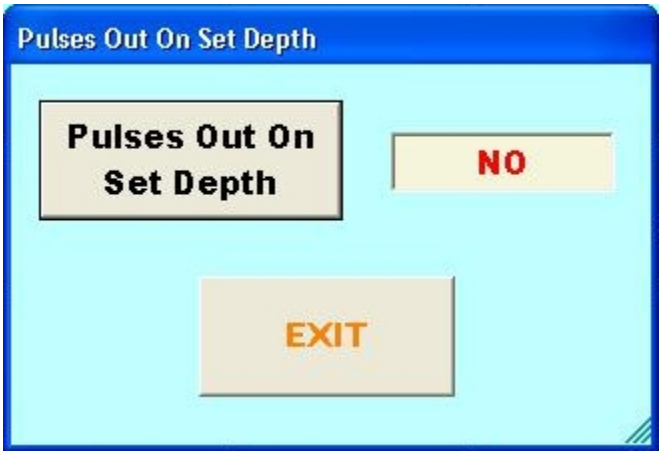


NOTE - A Set Depth command may send encoder pulses to the logging system. Refer to 3.1.22 - Pulses Out

3.1.21 ZERO DEPTH

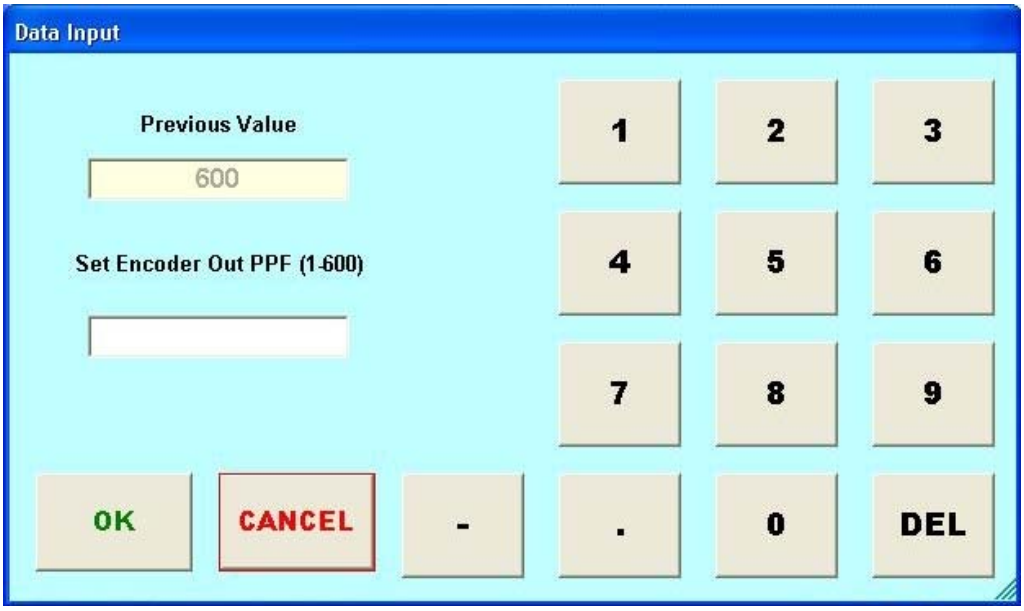
NOTE - A Zone Depth command may send encoder pulses to the logging system. Refer to 3.1.22 - Pulses Out

3.1.22 PULSES OUT



NOTE - This menu determines whether encoder pulses are sent to the logging system when the operator performs a “set depth” or a “zero depth” action.

3.1.23 ENCODER OUTPUT PPF

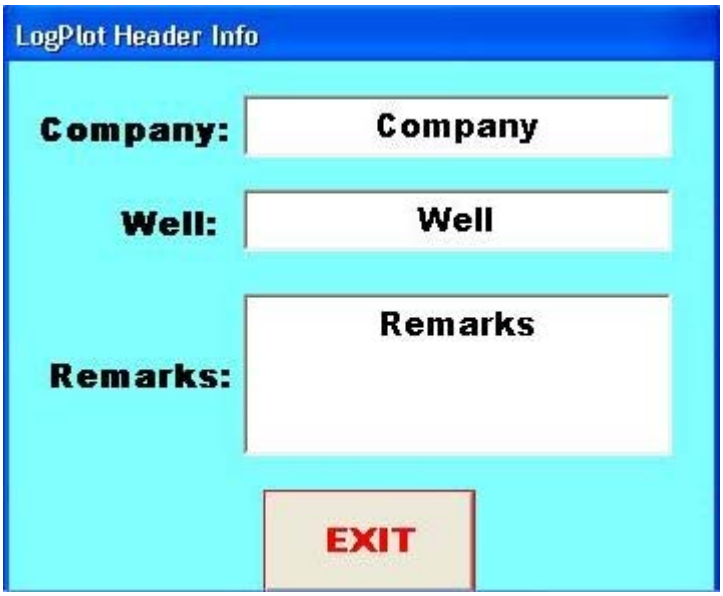


This determines the encoder pulses out per foot and is independent of the encoder in pulses per revolution.

3.1.24 START TIME LOGPLOT

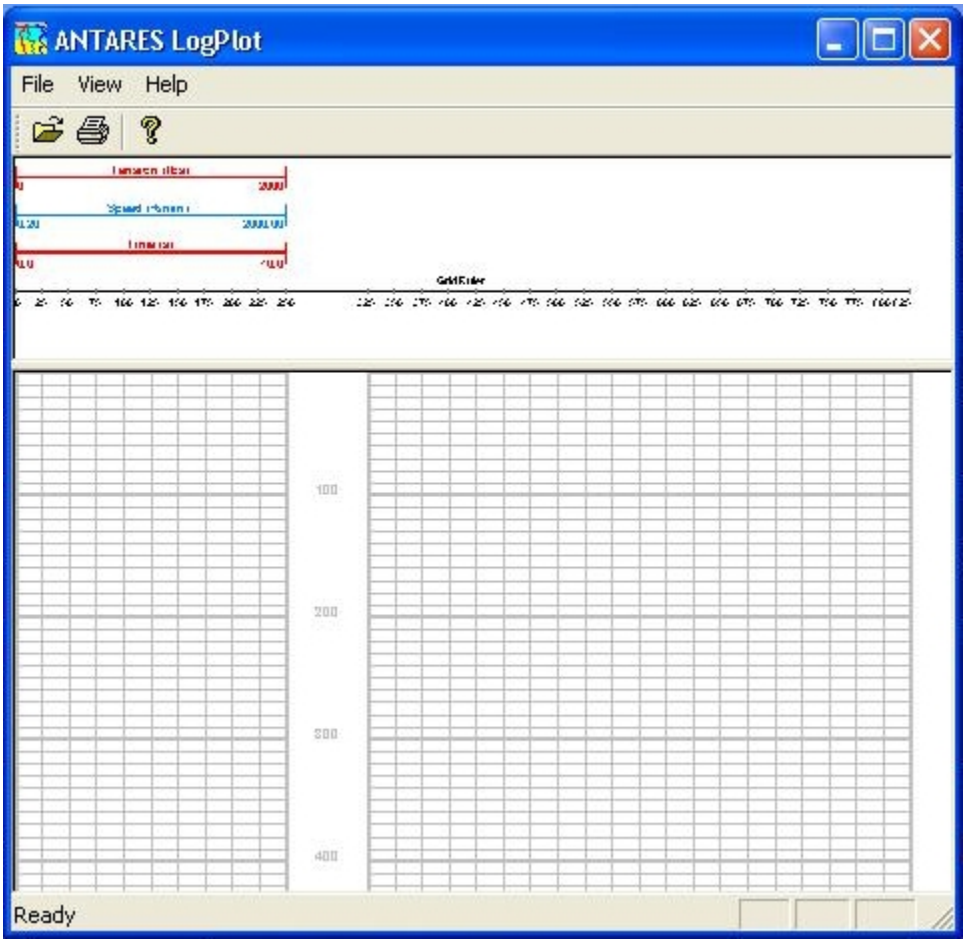
The LogPlot is a third-partly plotting program that can invoked from this menu. A time-stamp named file is automatically created in c:\logplotfiles\ subdirectory.

3.1.25 LOGPLOT HEADER INFO



The operator has the option of editing these three fields and this information is then included in the header of the LogPlot file.

3.1.26 LOGPLOT



NOTE - the Start Depth Logplot button is similar to the Start Time Logplot button except the Depth Logplot is depth driven and the Time Logplot is time driven

4.0 SOFTWARE UPDATE PROCEDURE

4.1 HOISTMAN PROGRAM UPDATE (PC BASED PROGRAM)

4.1.1 Close all running programs in Windows XP Embedded.

4.1.2 Copy Hoistman Display.EXE to the directory C:\ Program Files\Kerr\ or the C:\Program Files\BenchMark\ directory. This depends on the location of the installation directory.

4.1.3 Shutdown Windows XP Embedded, and cycle power. When the Hoistman Display program comes up check the HELP – ABOUT menu and confirm that both software versions are at the latest revision.

4.1.4 Copy this file (manual.pdf) to C:\. This manual can then be evoked from the help menu.

4.2 REAL TIME BOARD PROGRAM UPDATE (AMS40 BOARD)

The following Instructions for programming the DS89C450 MicroController's internal Flash memory with the real-time data acquisition program.

NOTE: the rear panel screws need to be removed to gain access to the switches on the CPU piggy-back PCB.

4.2.1 Close all running programs in Windows XP Embedded.

4.2.2 Copy the file S99XXXX?.HEX to the root directory C:\

Transfer these files to the CompactFlash (C:\) root directory
via Ethernet or USB connection using the Windows Explorer

Double click on the software update icon on the desktop screen of if no image exists, see 4.2.3.

4.2.3 Depending on your setup a Hyperterminal session may need to be opened manually. Use the following settings:
Serial Port: COM1
Baud Rate: 57600
Data Bits: 8
Parity: None
Stop Bits: 1
Flow Control: None

4.2.4 Set the switches on the piggy-back PCB to PROGRAM mode as follows:
SW1 - position away from CPU
SW2 - position away from CPU
SW3 - position towards CPU

4.2.5 Press the keyboard ENTER key. The MicroController ROM Loader will respond with a banner and then a '>' prompt.

4.2.6 Type an uppercase 'K' and then the Enter Key for Klean and Erase. When complete the prompt should appear. If the prompt does not appear, cycle the switches and repeat steps 4.2.4 and 4.2.5

4.2.7 Type an uppercase 'L' and then the Enter Key and the ROM Loader will wait to Load a HEX file.

4.2.8 Pull down the Transfer menu and choose: Send Text File & Files of Type (*.*) The file browser will open and then go to the C:\ root directory and choose the new revision HEX file to transfer.

4.2.9 The ROM Loader will begin programming the Flash and will report a GOOD status for the duration of the programming procedure (about 5 minutes) as follows:

GGGG

4.2.11 After the ROM Loader is finished programming the Flash and the MEMDISK program is complete set the switches on the piggy-back PCB as follows:

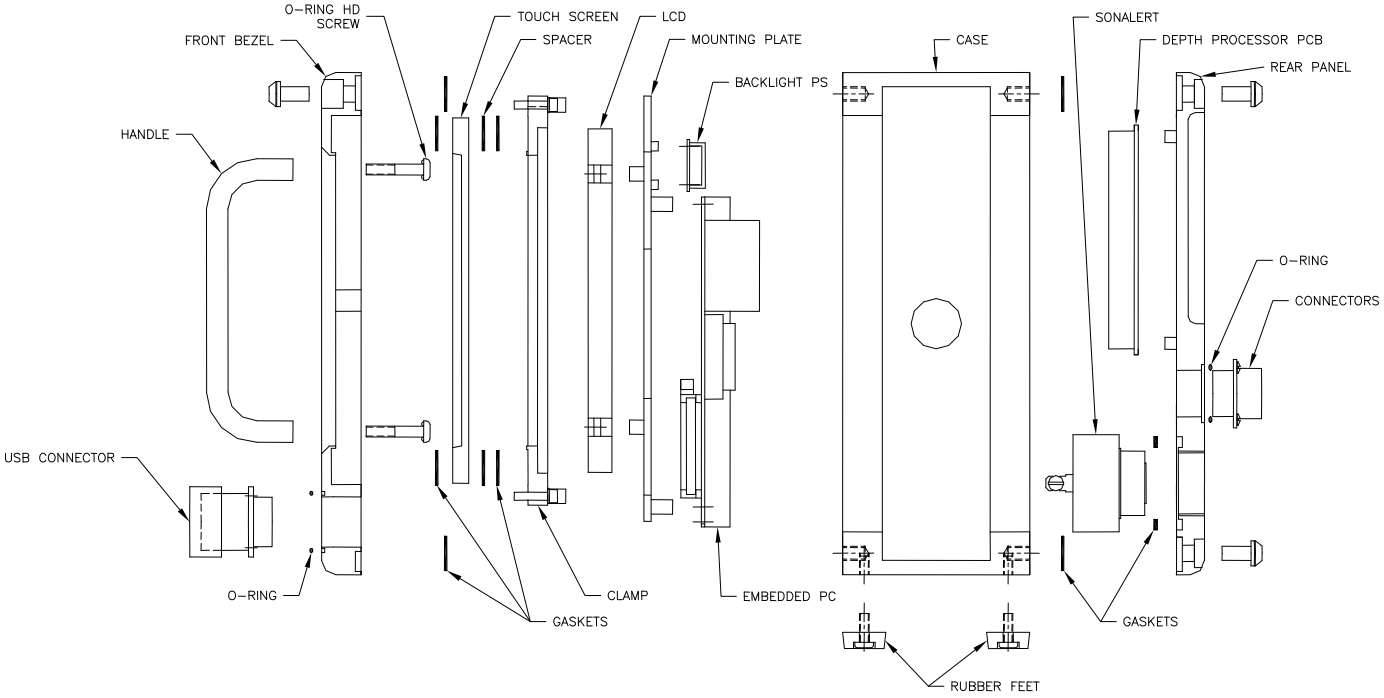
SW1 - position towards CPU
SW2 - position towards CPU
SW3 - position away from CPU

The real-time data acquisition program will start.

4.2.12 HyperTerm uses the same serial port as the Hoistman program, so close it before opening the Hoistman program. Always perform a – Restore Defaults – from the menu screen immediately after re-programming the acquisition board cpu flash.

5.0 MAINTENANCE & ASSEMBLY DRAWINGS AND PARTS LIST

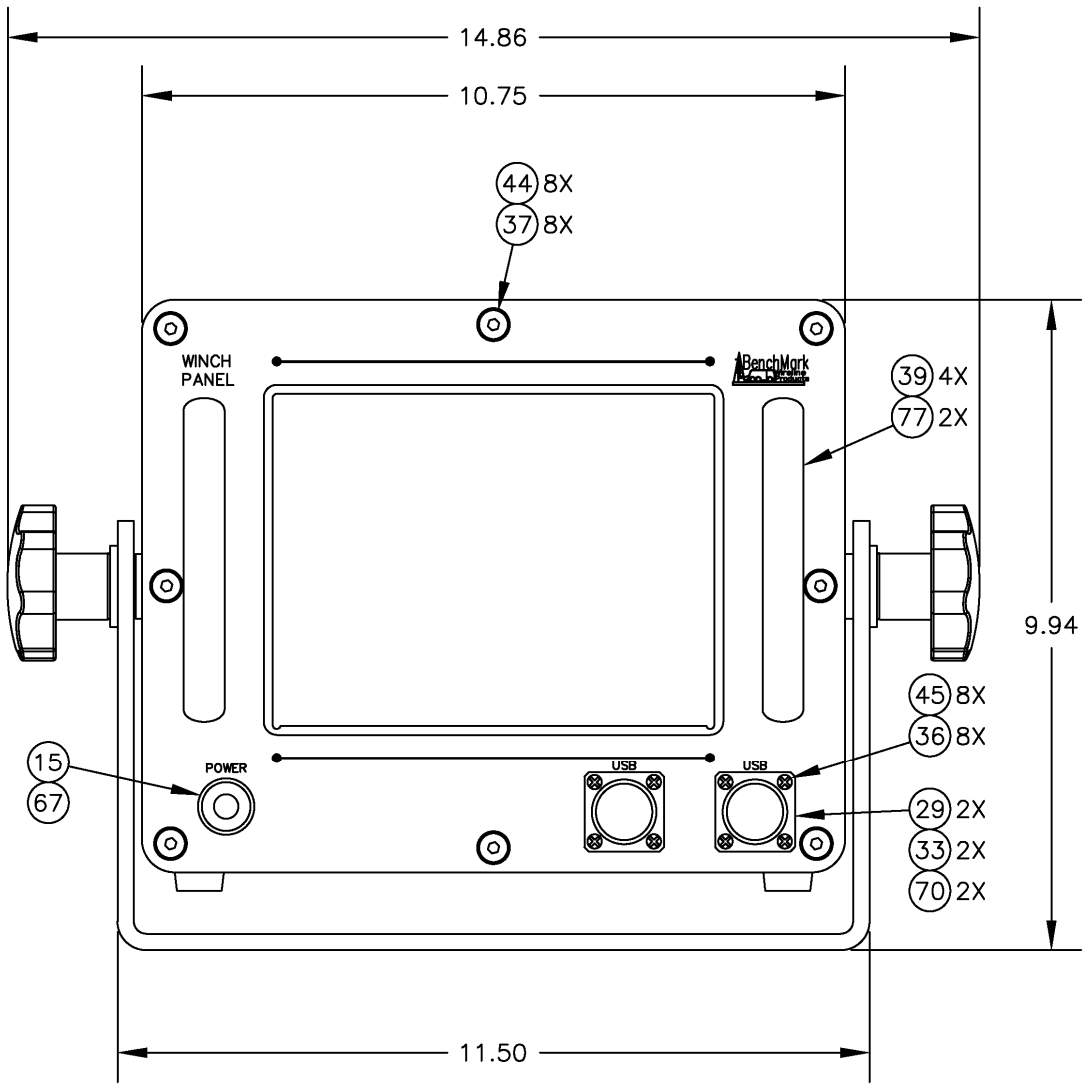
5.1 ASSEMBLY / DISASSEMBLY DRAWING



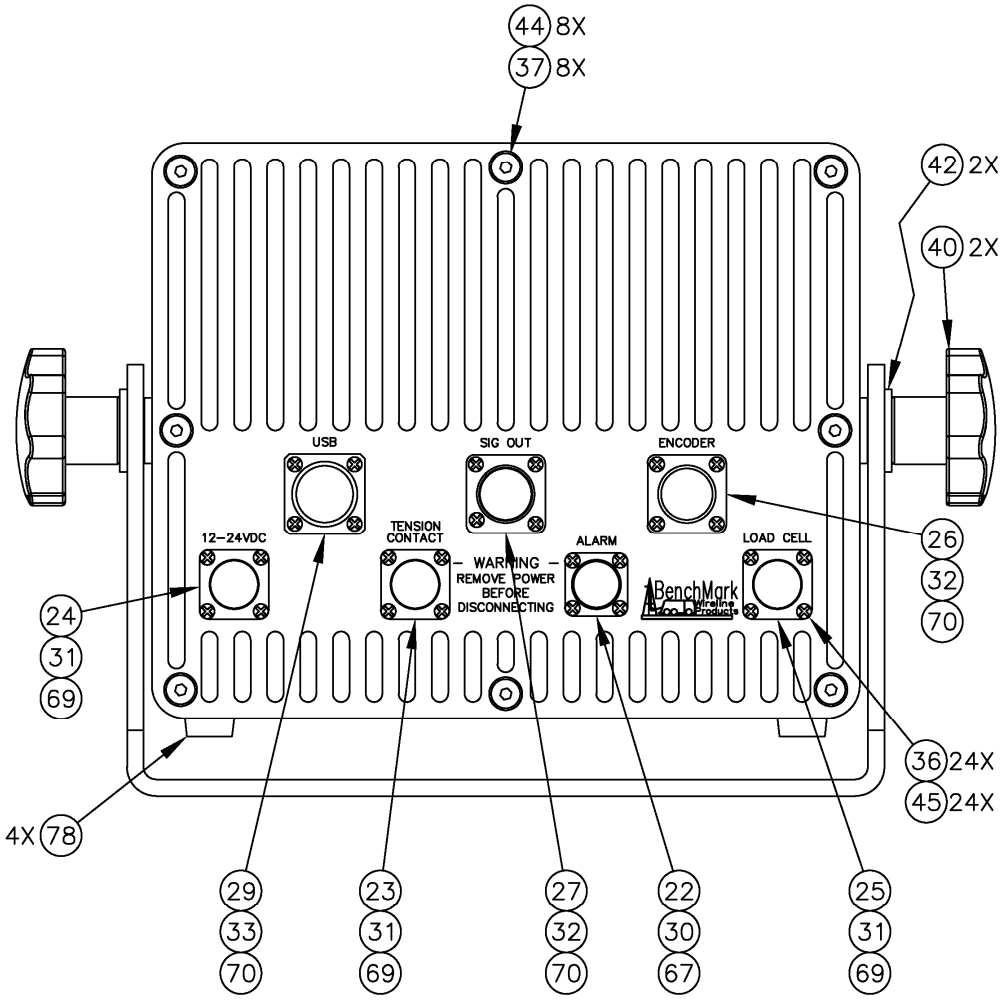
TORQUE SPEC'S:

1/4-20 = 75.2 IN-LB
10-32 = 31.7 IN-LB

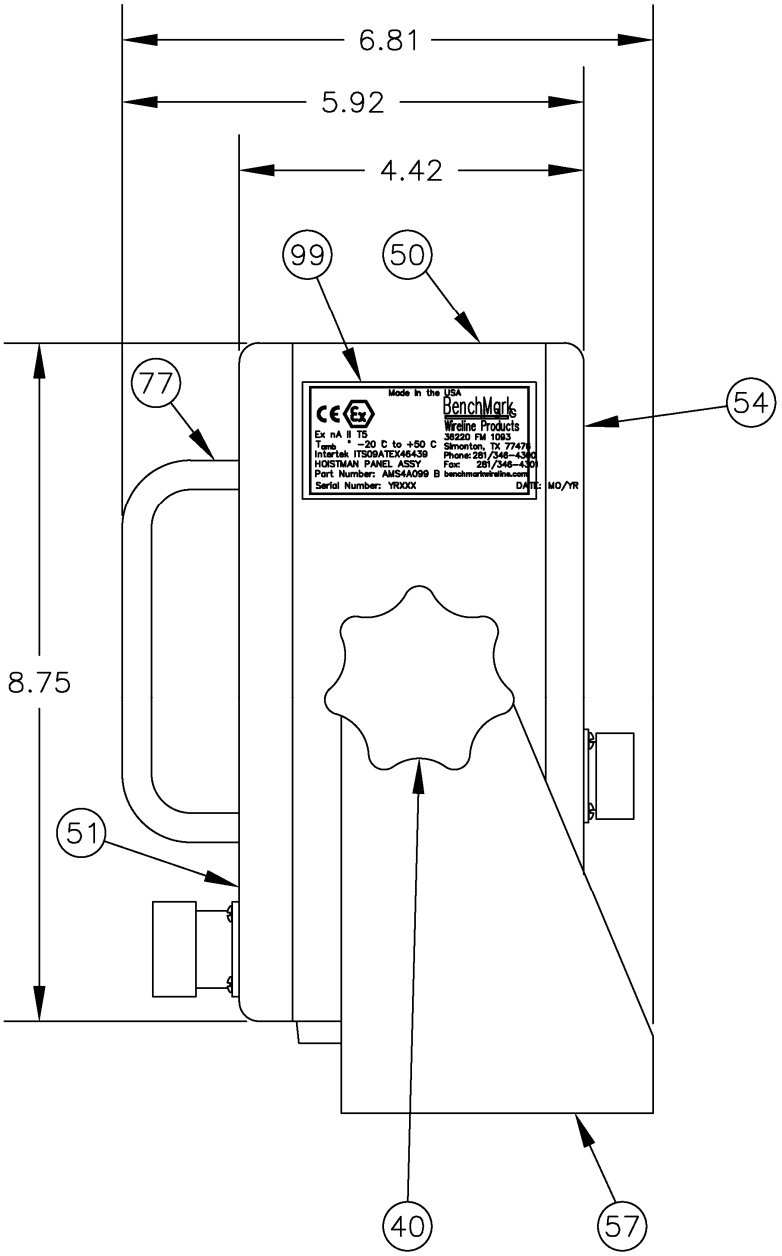
5.2 FRONT VIEW



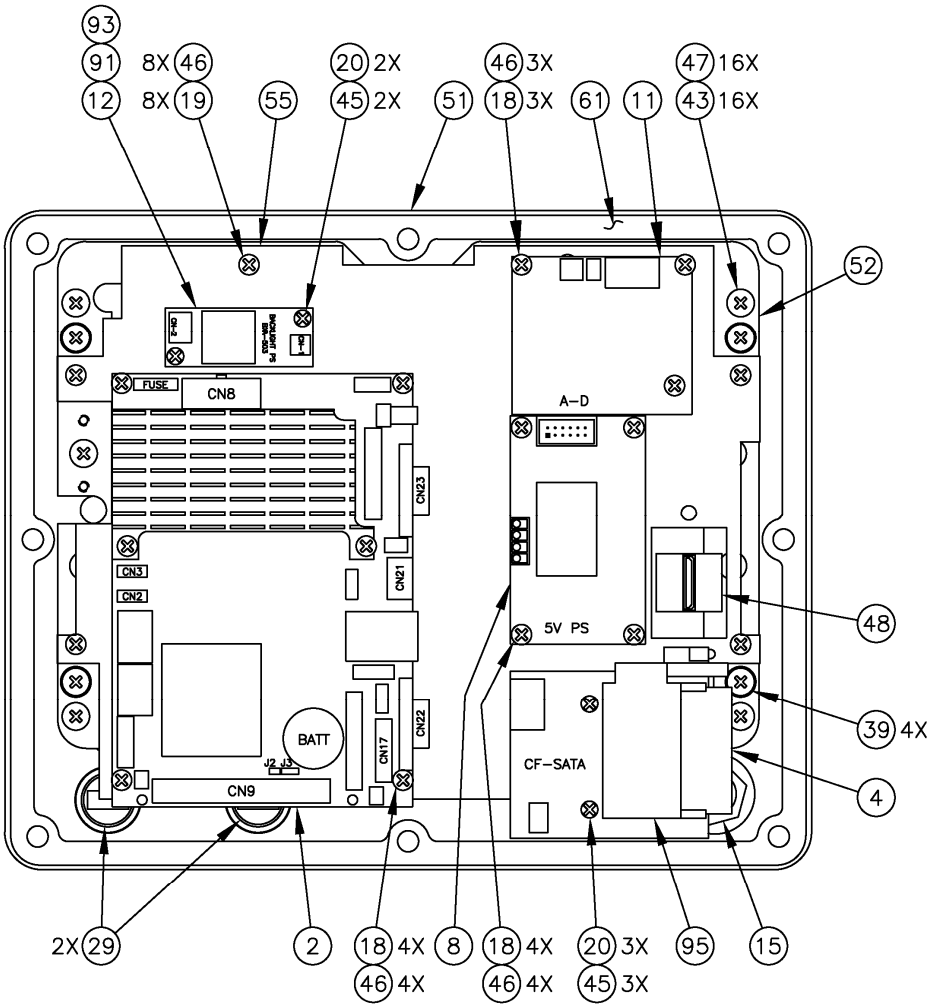
5.3 REAR VIEW


44 8X
37 8X
42 2X
40 2X
USB
SIG OUT
ENCODER
12–24VDC
TENSION CONTACT
– WARNING –
REMOVE POWER
BEFORE
DISCONNECTING
ALARM
LOAD CELL
BenchMark
26
32
70
24
31
69
36 24X
45 24X
4X 78
29
33
70
23
31
69
27
32
70
22
30
67
25
31
69

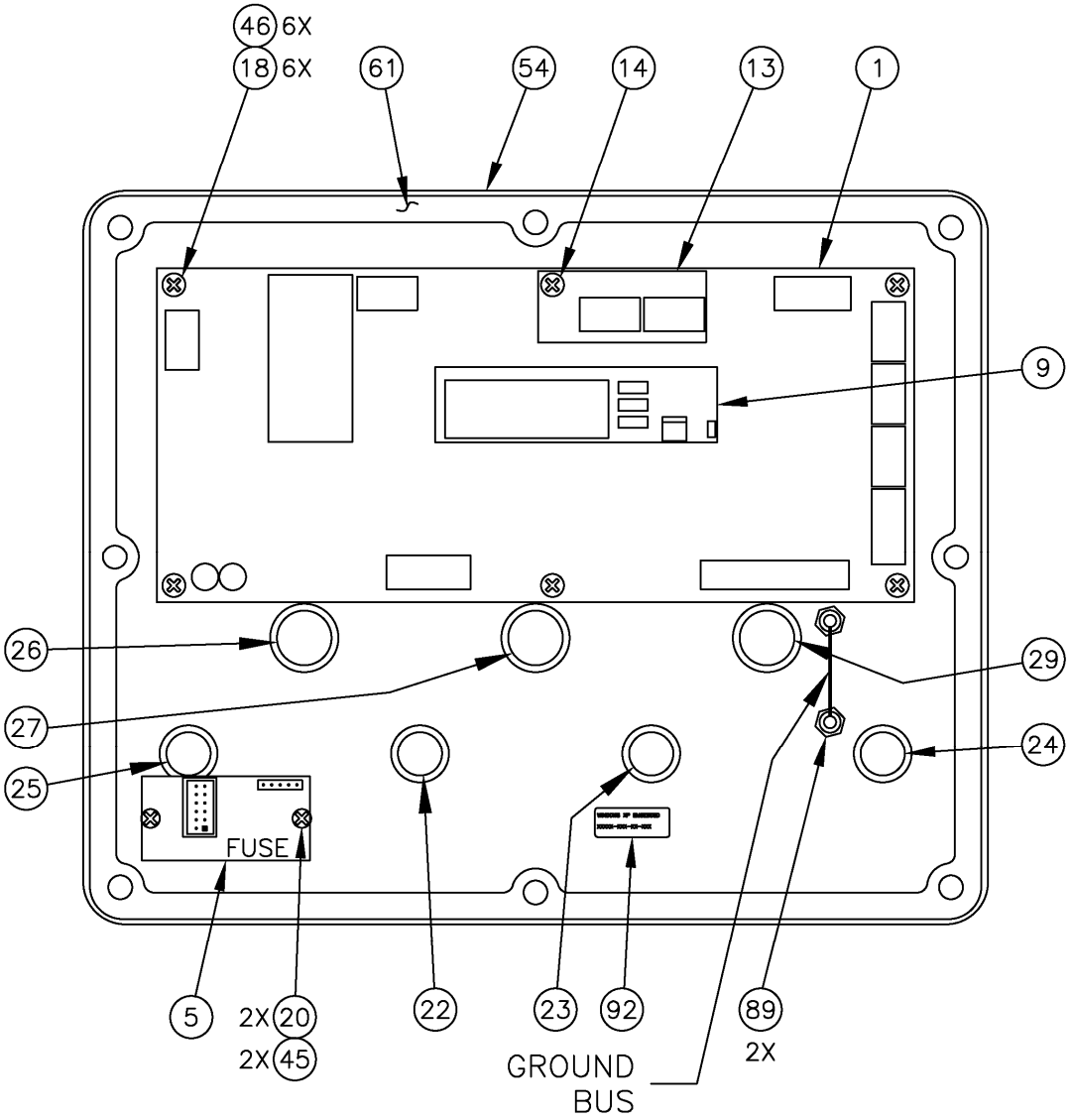
5.4 SIDE VIEW


6.81
5.92
4.42
99
50
77
54
8.75
51
40
57
Made in the USA
BenchMark
Wireline Products
Ex nA II T5
T amb -20 C to +50 C
Intertek ITS09ATEX46439
HOISTMAN PANEL ASSY
Part Number: AMS4A099 B
Serial Number: YRXXX
DATE: MO/YR

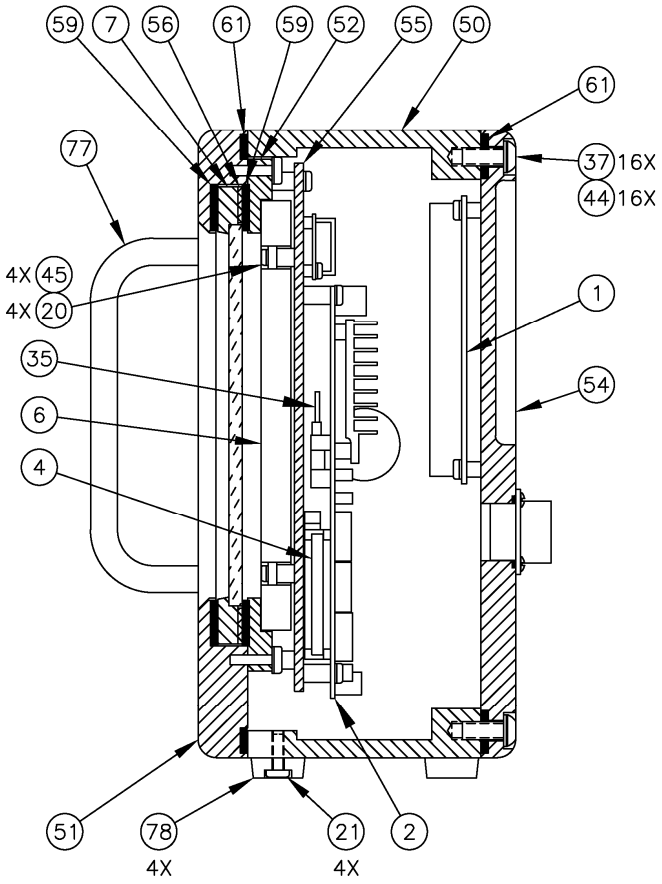
5.5 INTERNAL VIEW – FRONT



5.6 INTERNAL VIEW – REAR



5.7 INTERNAL VIEW – SIDE



5.8 BILL OF MATERIALS

ITEM	P/N	DESCRIPTION	QTY
	AMS4A099C	PANEL PORTABLE HOIST OP 8" WATERPROOF TOUCH SCREEN	
1	AMS4P134E	PC BOARD AMS40 REV E W/2xRS232 RS485 4WIRE, MMD, DIFF WEIGHT	1
2	AMS5P015	COMPUTER SINGLE BOARD 1.6GHZ 2GB RAM INTEL ATOM PROCESSOR	1
3	ALS4P015	CONN HOUSING CRIMP 3CKT .100	2
4	AMS5P221	MEMORY COMPACT FLASH 8.0GB FMJ	2
5	AMS4A102	PCB ASSY FUSE BOARD	1
6	AMS4P843	LCD 8.4 COLOR TFT TRANSFLECTIV BACKLIT SUNLIGHT RDBLE NEC	1
7	AMS4P845	SCREEN TOUCH 8.4" INFRARED USB 5MM STRENGTHENED GLASS	1
8	AMS4A855	PCB ASSY PWR SPLY 5V 9-36V IN	1
9	ALS4A204	PCB ASSY N CKT PROG W CAN	1
11	AMS7A077	PCB ASSY A-D CAN 9X PANEL 2X PRESSURE IN CAN OUT	1
12	AMS4P906	INVERTER CCFL 5V IN 1200V OUT JKL COMPONENTS	1
13	AMS4A889-C	PCB ASSY LD CELL 10V REGULATOR	1
14	AMS4P918	STANDOFF HEX M/F #6 7/16 LENGT	1
15	AMS4P919	SWITCH PUSHBUTTON WATER PROOF MAINTAINED SHROUD	1
16	AMS4P441	CONN 50-57-9005 SNGL RW 5CKT P SINGLE ROW CRIMP HOUSING	1
17	AMS4P446	CONN 16-02-0097 CRIMP TERMINAL 24-30AWG, 15u" GOLD FEMALE	5
18	AMS1P040	SCREW 6-32 X 3/8 PHIL PAN SST	17
19	C276P331	SCREW 6-32 X 1/2 PHIL PAN SST	8
20	AMS8P091	SCREW 4-40 X 1/4 PHIL PAN SST	6
21	AM5KP184	SCREW 8-32 X 3/8 PHIL PAN SST	4
22	AMS4P263	CONN KPSE02E10-6P RECEPTACLE MS3122	1
23	AMS4P179	CONN KPSE02E12-3S RECEPTACLE 3 SOCKETS	1
24	AMS4P169	CONN KPSE02E12-3P RECEPT	1
25	AMS4P171	CONN KPSE02E12-10S RECEPTACLE 10 SOCKETS	1
26	AMS4P172	CONN KPSE02E14-12S RECEPTACLE 12 SOCKETS	1
27	AMS4P875	CONN KPSE02E14-19S RECEPTACLE 19 SOCKETS	1
28	ALS4P019	CONN HOUSING CRIMP 2CKT .100	1
29	AMS4P990	CONN USB MS TYPE PNL MNT PCB	3
30	AM5KP034	DUST CAP KPT8110C RECEPT MS3181-10CA	1
31	AMS4P188	DUST CAP KPT8112C RECEPT MS3181-12CA	3
32	AMS4P191	DUST CAP KPT8114C RECEPT MS3181-14CA	2
33	AMS4P924	DUST CAP USB CONN MS TYPE	3
34	C276P165	FERRULE 18 AWG WHITE ALTECH H0.75/14	21
35	AMS5P076	MEMORY RAM 2GB DDR2 SODIMM NON-ECC 200 PIN ADVANTECH	1
36	C276P143	SCREW 4-40 X 3/8 PHIL PAN SST	32
37	AM5KP117	SCREW 1/4-20 X 5/8 BTN HD SST	16
37	C276P138	SCREW 1/4-20 X 1/2 FH SOC SST	6

5.8 BILL OF MATERIALS continued

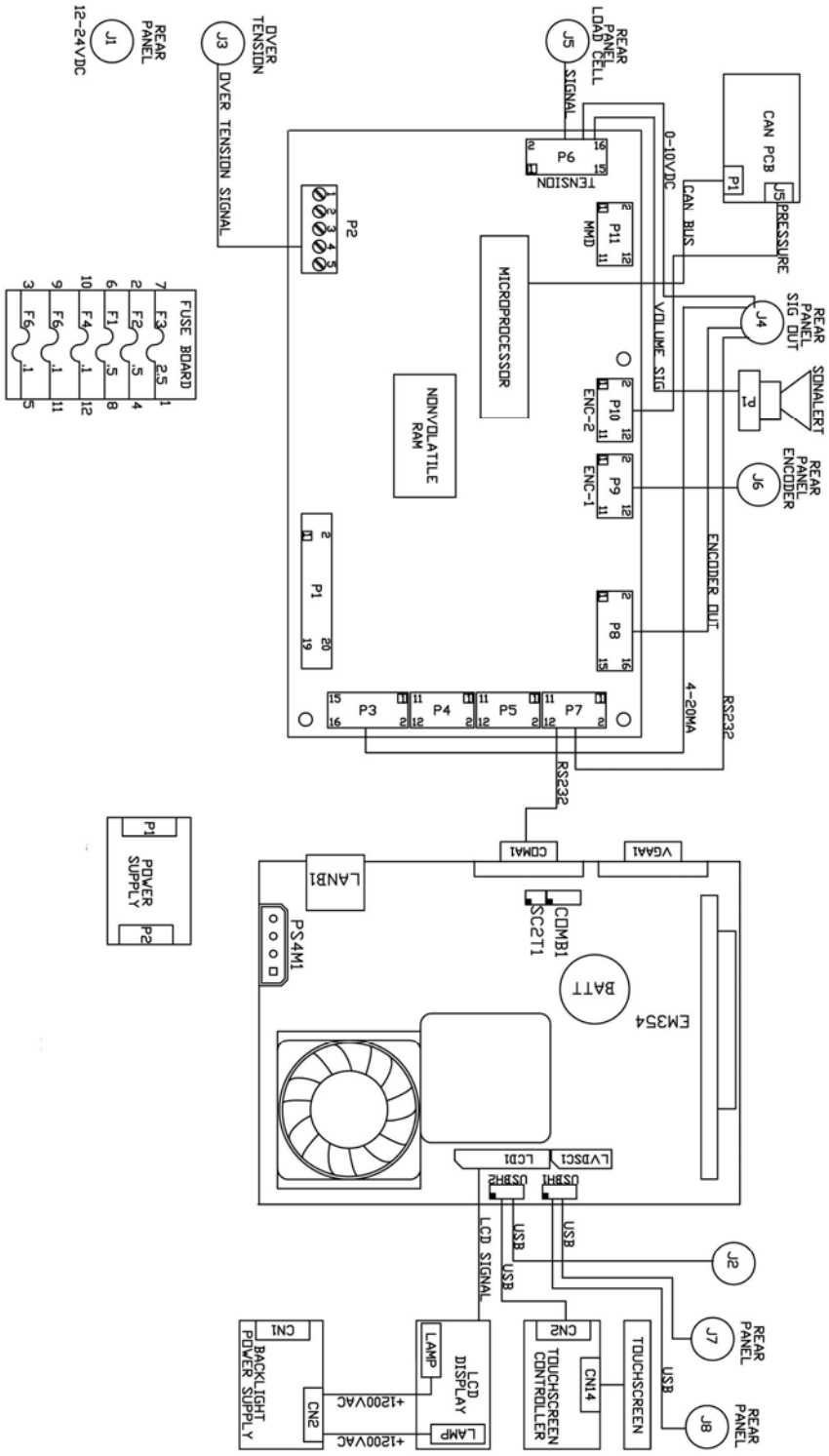
ITEM	P/N	DESCRIPTION	QTY
39	AMS4P872	SCREW 10-32 X 1 PHIL PAN SST O-RING SEAL	4
40	ALS6P050	KNOB HAND BLACK 1/2-13 SST PLASTIC KNOB	2
41	AMS1P066	WASHER 1/2 LOCK SS	2
42	C276P037	WASHER 1/2 FLAT SST	2
43	AMS8P093	SCREW 10-32 X 5/8 PHIL PAN SST	16
44	AMS5P025	WASHER 1/4 FLAT NYLON 6/6 .05 THK X 0.472 OD	16
45	AMS8P036	WASHER #4 LOCK SST	36
46	C276P046	WASHER #6 LOCK SS	25
47	C276P035	WASHER #10 LOCK SS	16
48	AMS4A374	CABLE ASSY ADVANTECH VIDEO 8.4" LCD DISPLAY	1
49	AMS5P044	WASHER NYLON 6-32 .140 IN	8
50	AMS4M195	ENCLOSURE WLDMT PORTABLE SL 95	1
51	AMS4M196	PANEL FRONT LCD BEZEL PORTABLE 99 PANEL	1
52	AMS4M161	CLAMP TOUCH SC PRTBL SL 95	1
54	AMS4M194	PANEL REAR PORTABLE SL 99	1
55	AMS4M121	PLATE MT CF ADPTR SATA	0
55	AMS4M163	PLATE MT PCB PORTABLE 95	0
55	AMS4M263	PLATE MT PCB PORTABLE 95/99 DUAL BOOT	1
56	AMS4M171	SPACER GLASS TS PRTBL SL 95	1
57	AMS4M098	YOKE PIVOT 8.75 X 10.75 PNL	1
59	AMS4M159	GASKET TOUCH SCREEN PRTBL 95	2
60	C276P228	WASHER #8 FLAT SST	8
61	AMS4M097	GASKET FRONT & REAR 95 PANEL	2
67	C276P041	O-RING 2-017 BUNA N 11/16 X 13/16 X 1/16	2
69	AM5KP219	O-RING 2-019 BUNA N 70D	3
70	AMS4P921	O-RING 2-021 BUNA N 70D	5
77	F244888000	HANDLE OVAL 1-1/2 X 4-9/16 AL	2
78	ALS3P030	BUMPER RECESSED 3/4OD X 9/32H THERMOPLASTIC ELASTOMER	4
80	AMS2P023	CONN 102540-3 AMP 10 POS FRONT COVER	1
81	AMS2P022	CONN 102536-3 AMP 10 POS BACK COVER	1
82	AMS4A999	SOFTWARE IMAGE 99 PNL VER 3.00 4GB LOW TEMP CF	0
83	AMS7P021	CONN 102398-4 AMP 12 POS PCB HARNESS BODY	8
83	AMS4M691	LABEL HOIST PNL Z2 Ex Na ITS09ATEX46439	1
84	AMS7P023	CONN 102536-4 AMP 12 POS BACK COVER	8
85	AMS7P024	CONN 102681-1 AMP 12 POS FRONT COVER	8
86	AMS7P026	CONN 102536-6 AMP 16 POS BACK COVER	2
87	AMS7P022	CONN 102398-6 AMP 16 POS PCB HARNESS BODY	2
88	AMS7P025	CONN 102681-3 AMP 16 POS FRONT COVER	2
89	AMS4P861	TERMINAL INSULATED SOLDR 6-32M	2
90	AMS4A568	CABLE ASSY LANNERPC TO HIRSE31	0
91	AMS4P907	CABLE INVERTER 5V CCFL INPUT USED WITH AMS4P906	1
92	AMS4P319	LICENSE WINDOWS XP EMBEDDED MICROSOFT	1

5.8 BILL OF MATERIALS continued

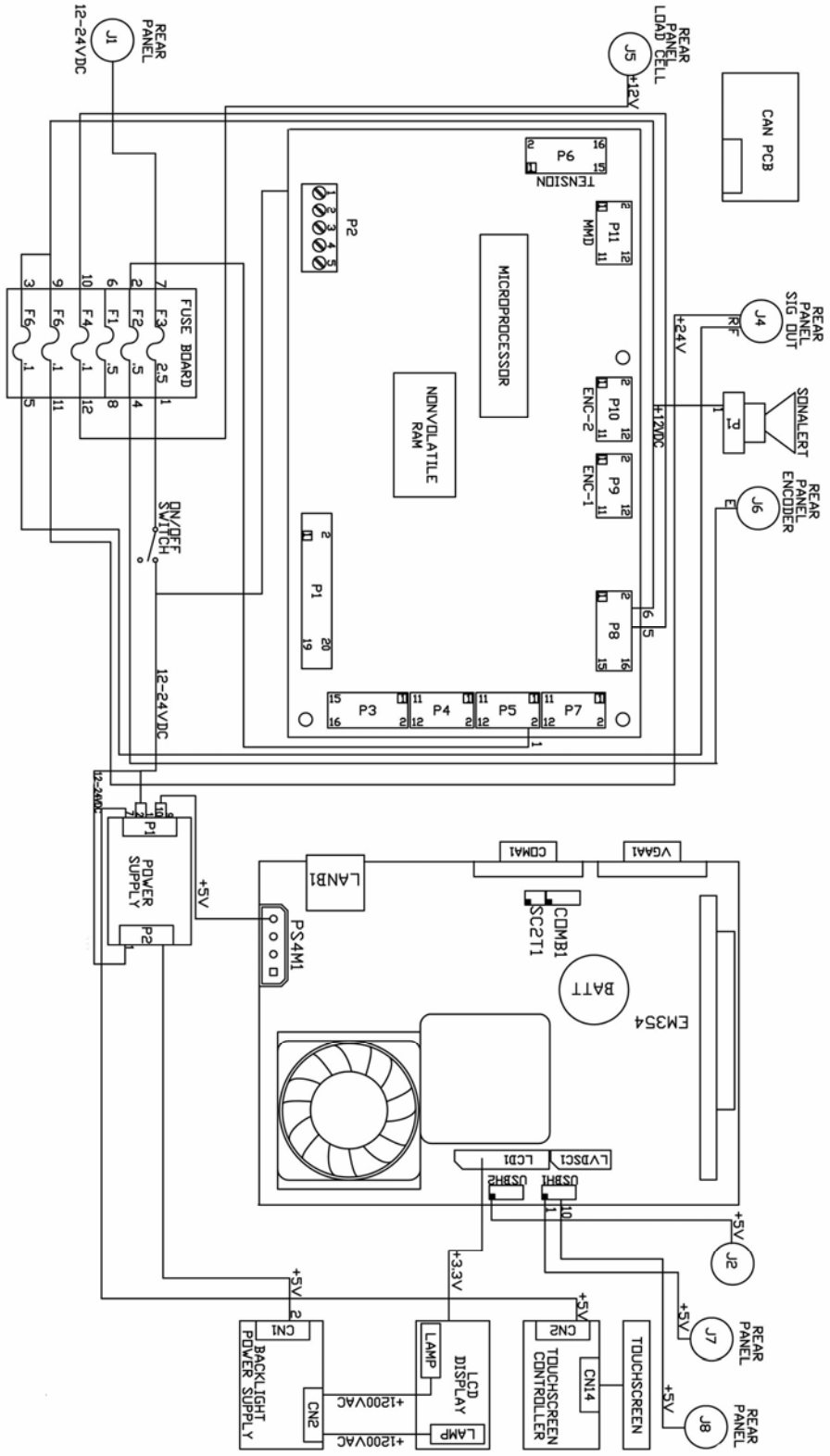
ITEM	P/N	DESCRIPTION	QTY
93	AMS4P908	CABLE INVERTER CCFL OUTPUT 5V INPUT INVERTER AMS4P906	1
94	AMS4A590	KEYBOARD ASSY COVER LABEL	1
94	AMS4P590	KEYBOARD USB MINI TOUCH BLACK	0
95	AMS5P202	COMPACT FLASH ADAPTER SATA ADDONICS ADSACFB	1
96	AMS5P241	CABLE ASSY SATA 18 IN.	1
99	SW-990301	SOFTWARE FOR 99 PNL 40 PCB	1

6.0 WIRING DIAGRAMS AND SETUP PROCDURES

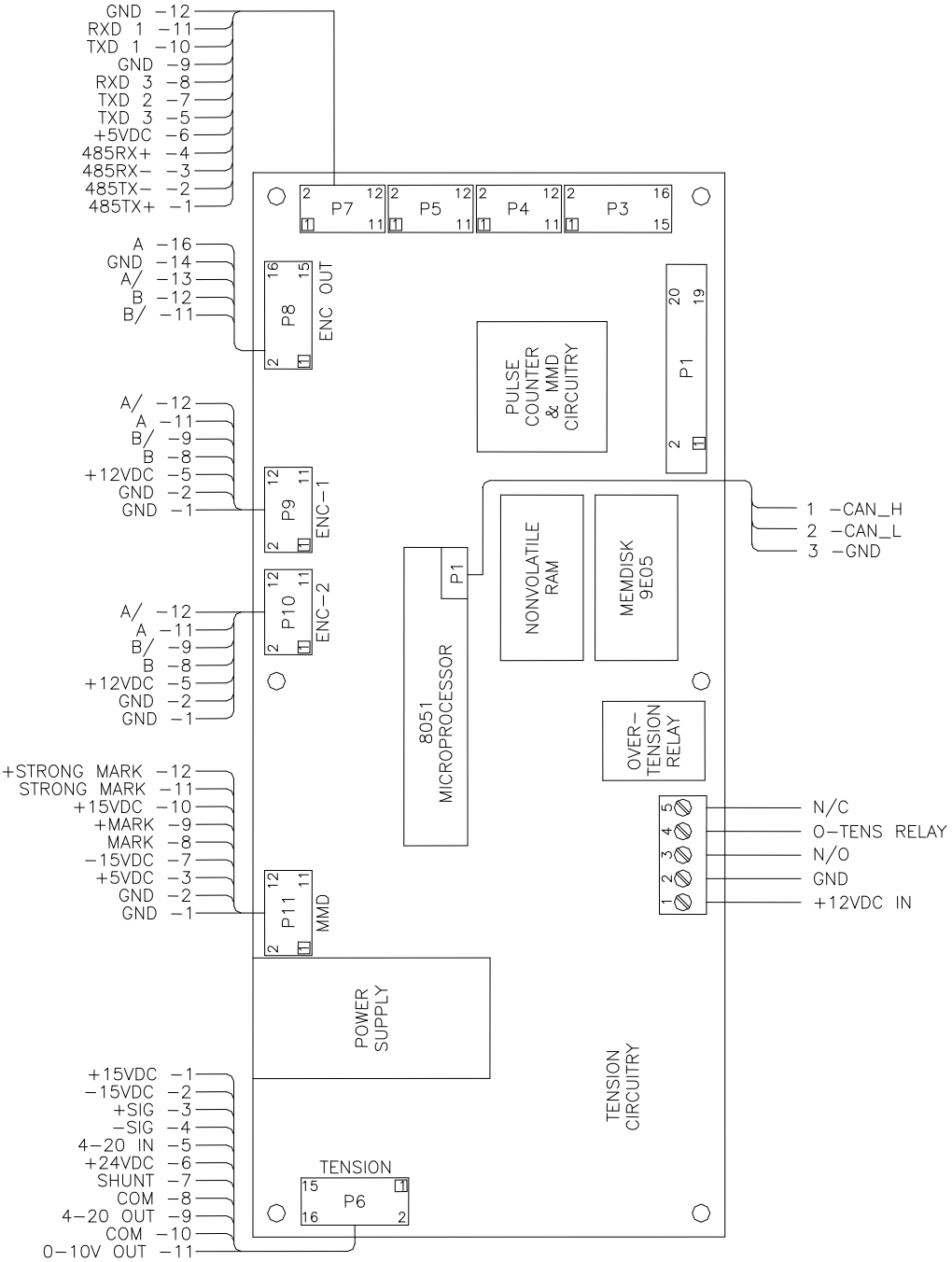
6.1 SIGNAL WIRING DIAGRAM



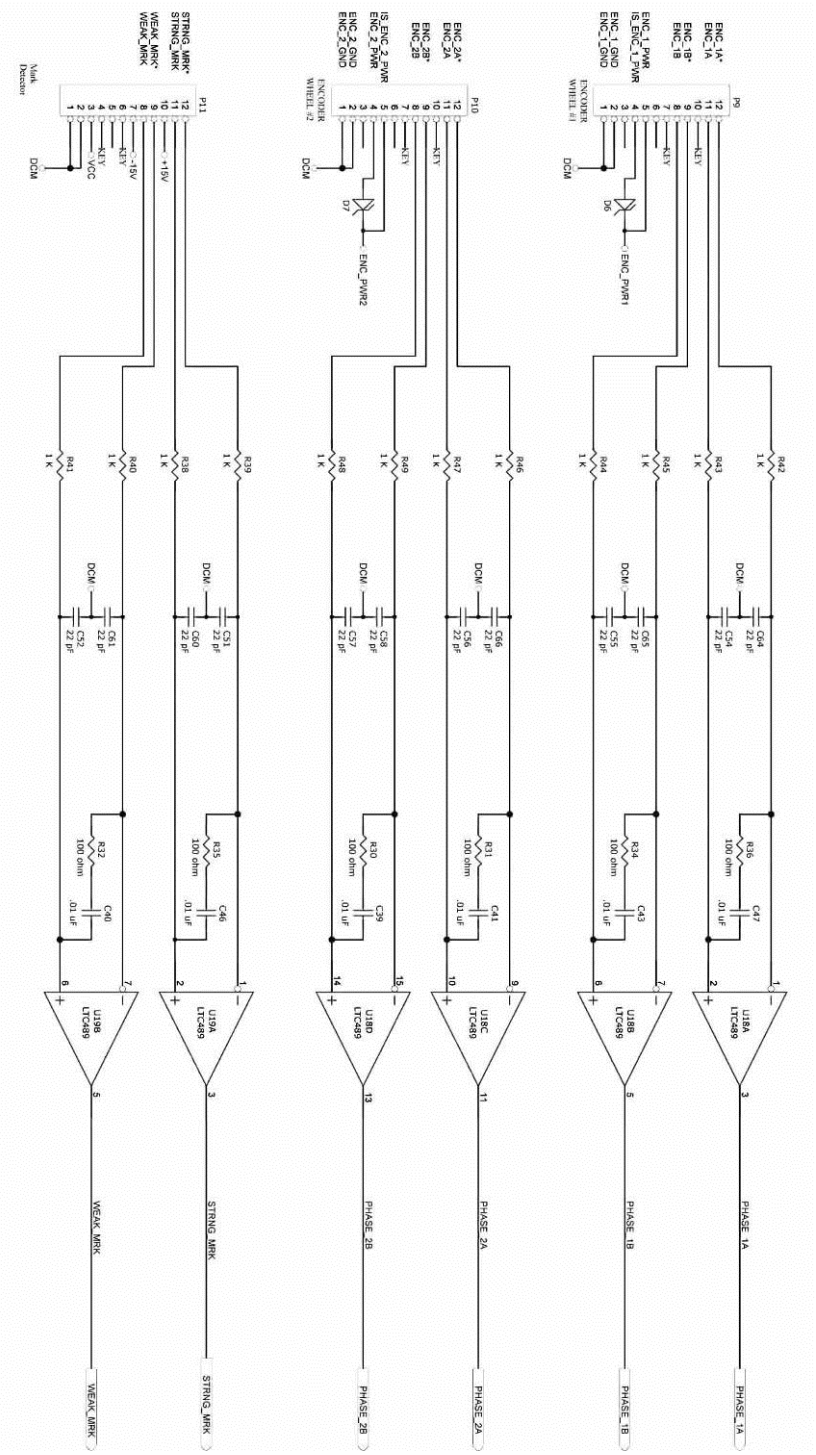
6.2 POWER WIRING DIAGRAM



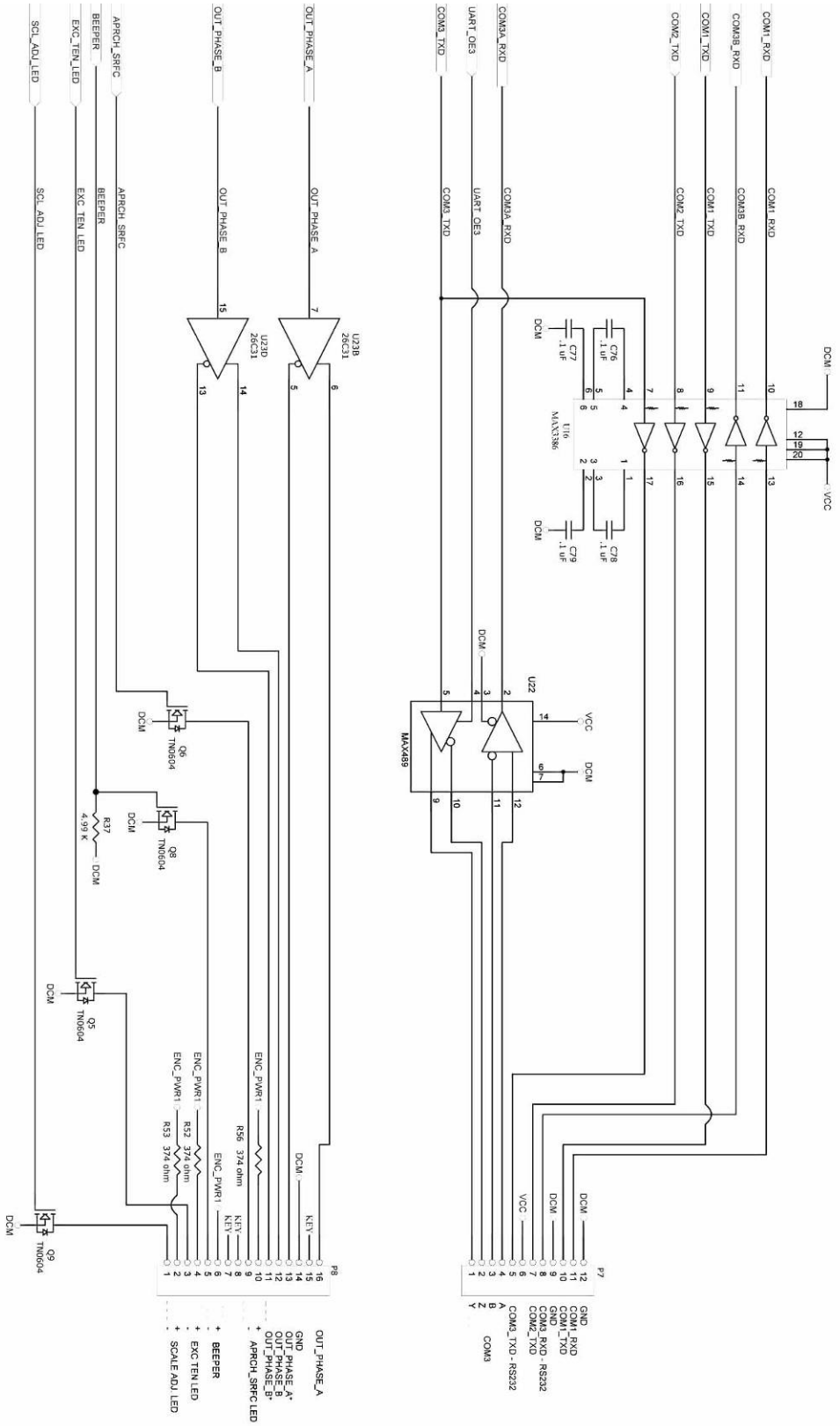
6.3 Real Time Processor Board Pin Out



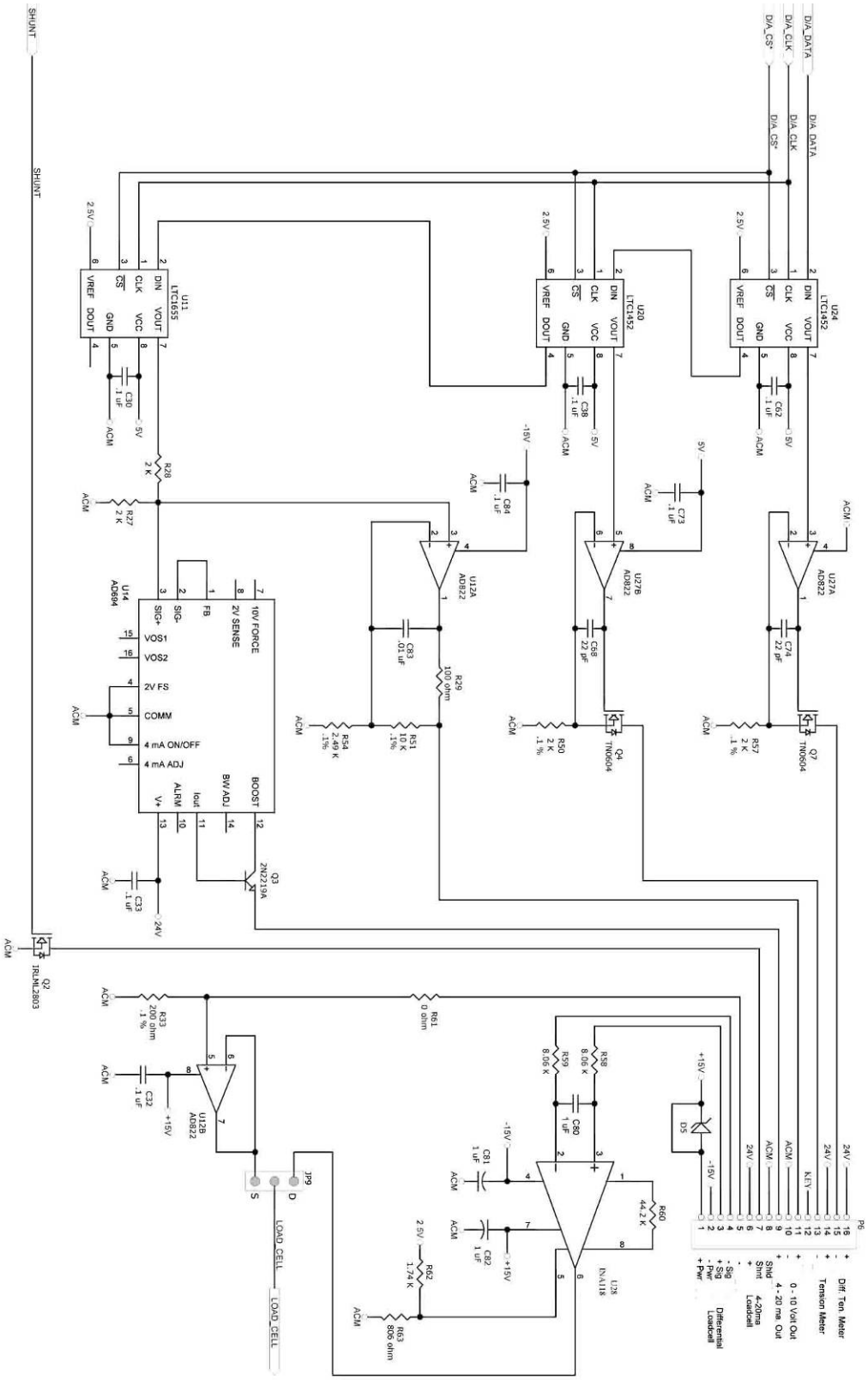
6.4 ENCODER INPUTS



6.5 ENCODER OUTPUT AND COM PORT I/O



6.6 LOAD PIN AND TENSION I/O



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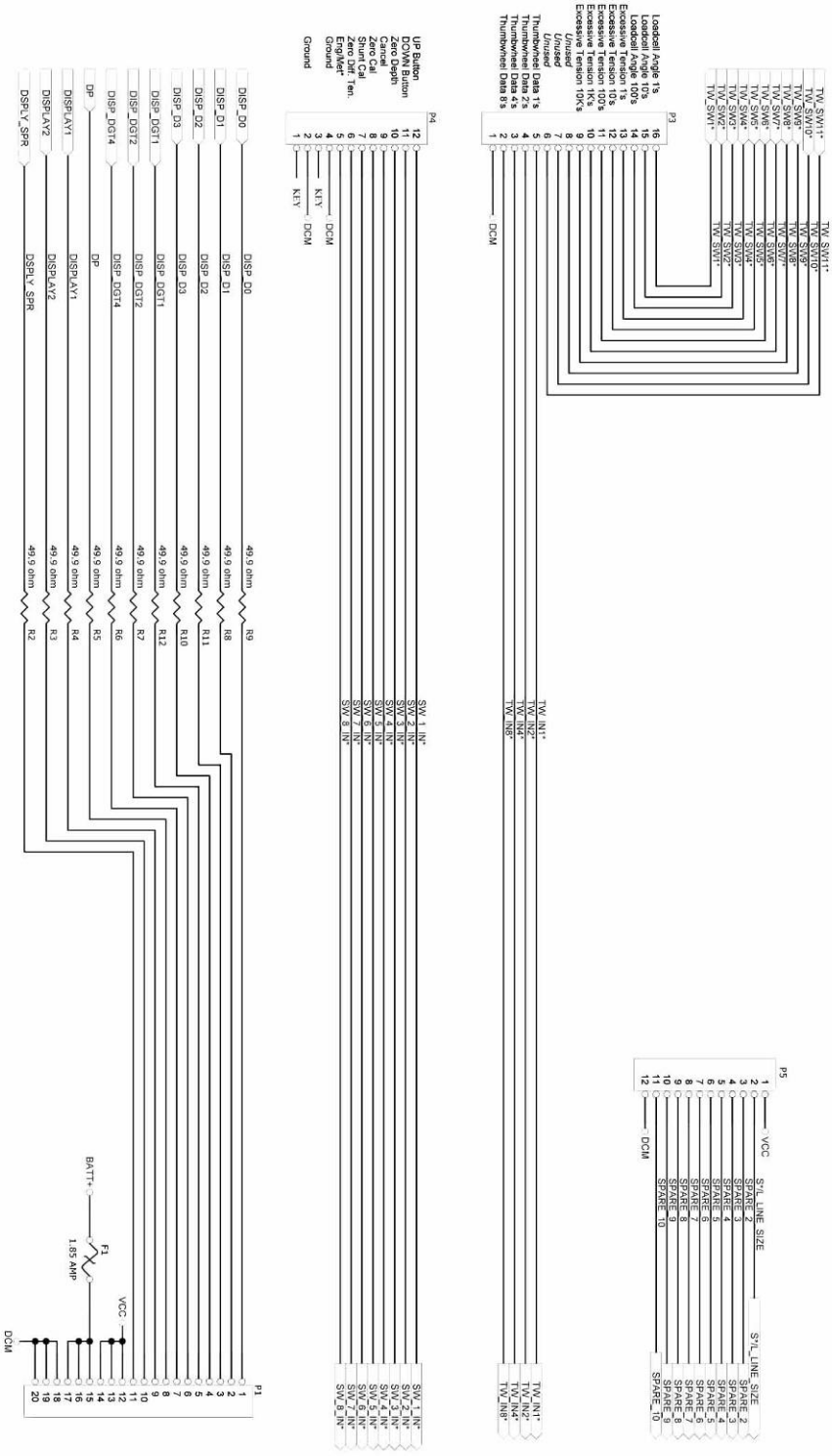
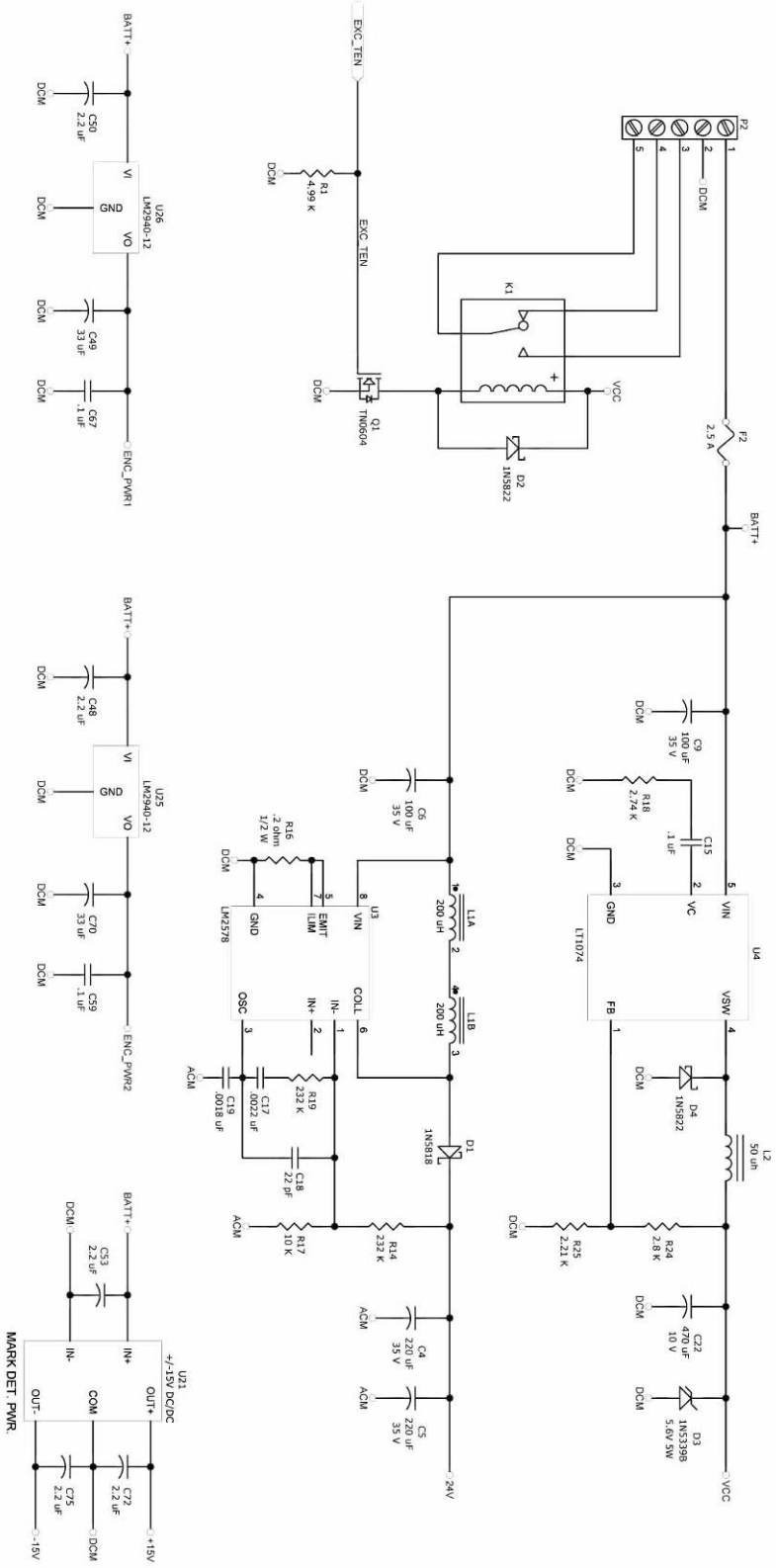
6.7 JUMPERS – BUTTONS



6.8 POWER SUPPLIES



6.8 WIRELISTS

REV. A	KD	9/9/2008	NEW RELEASE
REV. B	KD	11/19/2008	ADDED WIRING FOR 4-20MA PRESSURE TRANSDUCERS
REV. C	KD		CHANGED WIRING FOR ADVANTECH PROCESSOR
REV. D	KD	8/21/2009	CHANGED ENCODER 12 WIRING AND REAR SIG I/O CONNECTOR.
REV. E	KD	12/15/2009	CORRECTED USB WIRING ON THE ADVANTECH PCB
REV. F	KD	2/4/2010	
REV. G	KD	2/8/2010	CORRECTED PRESSURE WIRING TO J4 - K & L
REV. H	KD	9/7/2010	ADDED WIRING FOR 4-20MA TRANSDUCER TO J5 LOAD CELL CONNECTOR AND 4-20MA OUT TO J4 SIG OUT CONNECTOR

S1	POWER SWITCH
J1	12 - 24VDC POWER IN
J2	USB REAR PANEL
J3	TENSION CONTACT
J4	SIGNAL OUT
J5	LOAD CELL
J6	ENCODER
J7	USB ON FRONT PANEL
J8	USB ON FRONT PANEL
J9	ALARM

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P2 - SCREW TERMINALS, AMS40 PCB						
FROM				TO		SIGNAL NAME
P2 - 1	SPLICE AT P1 - 1 & P1 - 2 OF THE DC TO DC CONVERTER PCB	WHT	20	S1 - 2	**POWER SWITCH** ON THE FRONT PANEL	12 - 24VDC FUSED
P2 - 1	SPLICE AT P1 - 1 & P1 - 2 OF THE DC TO DC CONVERTER PCB	WHT	20/22	P1 - 1	**DC TO DC CONVERTER PCB** AMS4A855	12 - 24VDC FUSED
P2 - 1	SPLICE AT P1 - 1 & P1 - 2 OF THE DC TO DC CONVERTER PCB	WHT	20/22	P1 - 2	**DC TO DC CONVERTER PCB** AMS4A855	12 - 24VDC FUSED
P2 - 1	SPLICE AT P1 - 1 & P1 - 2 OF THE DC TO DC CONVERTER PCB	WHT	20/22	P2 - 1	**DC TO DC CONVERTER PCB** AMS4A855	12 - 24VDC FUSED
P2 - 2		BLK	20	GND	G**ND BUS BAR**	GND
P2 - 3		GRN	20	J3 - A	**TENSION CONTACT** CONNECTOR ON THE REAR PANEL	RELAY N.O.
P2 - 5		BRN	20	J3 - B	**TENSION CONTACT** CONNECTOR ON THE REAR PANEL	RELAY COMMON

P6 - ANALOG IN/OUT, AMS40 PCB						
FROM				TO		SIGNAL NAME
P6 - 3		YEL	22	J5 - A	**LOAD CELL** CONNECTOR ON THE REAR PANEL	LOAD PIN SIG+
P6 - 4		WHT	22	J5 - E	**LOAD CELL** CONNECTOR ON THE REAR PANEL	LOAD PIN SIG-
P6 - 5		BLU	22	J5 - H	**LOAD CELL** CONNECTOR ON THE REAR PANEL	4-20MA IN
P6 - 6		WHT	22	P1 - 6	**AMS4A102 FUSE BOARD**	4-20MA, 24VDC UNFUSED
P6 - 7		GRY	22	J5 - G	**LOAD CELL** CONNECTOR ON THE REAR PANEL	SHUNT CAL
P6 - 8		BLK	22	J5 - B	**LOAD CELL** CONNECTOR ON THE REAR PANEL	LOAD PIN EX-

P6 - 9		BRN	22	J4 - R	**SIG OUT** CONNECTOR ON THE REAR PANEL	4-20MA TENS OUT
P6 -10		BLK	22	J4 - P	**SIG OUT** CONNECTOR ON THE REAR PANEL	GND
P6 - 11		ORN	22	J4 - N	**SIG OUT** CONNECTOR ON THE REAR PANEL	0 - 10VDC OUT TENS
P6 - 13		GRN	22	J9 - B	**ALARM** CONNECTOR ON THE REAR PANEL	VOLUME SIGNAL

P7 - COMMUNICATIONS, AMS40 PCB -- 12 PIN						
FROM				TO		SIGNAL NAME
P7 - 5		YEL	22	J4 - T	**SIG OUT** CONNECTOR ON THE REAR PANEL	40 PCB COM PORT 3 TX
P7 - 8		BLU	22	J4 - U	**SIG OUT** CONNECTOR ON THE REAR PANEL	40 PCB COM 3 PORT RX
P7 - 9		BLK	22	J4 - V	**SIG OUT** CONNECTOR ON THE REAR PANEL	40 PCB COM 3 PORT GND
P7 - 10		YEL	22	CN22 - 2	**ADVANTECH PROCESSOR PCB** DB9 CONNECTOR	40 PCB COM 1 PORT TX
P7 - 11		BLU	22	CN22 - 3	**ADVANTECH PROCESSOR PCB** DB9 CONNECTOR	40 PCB COM 1 PORT RX
P7 - 12		BLK	22	CN22 - 5	**ADVANTECH PROCESSOR PCB** DB9 CONNECTOR	40 PCB COM 1 PORT GND

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P8 - QUADRATURE OUT, AMS40 PCB -- 16 PIN						
FROM				TO		SIGNAL NAME
P8 - 6		WHT	22	J9 - A	**ALARM** CONNECTOR ON THE REAR PANEL	ALARM VOLTAGE
P8 - 11		ORN	22	J4 - D	**SIG OUT** CONNECTOR ON THE REAR PANEL	PHASE B\ OUT
P8 - 12		BLU	22	J4 - B	**SIG OUT** CONNECTOR ON THE REAR PANEL	PHASE B OUT
P8 - 13		GRY	22	J4 - C	**SIG OUT** CONNECTOR ON THE REAR PANEL	PHASE A\ OUT
P8 - 14		BLK	22	J4 - E	**SIG OUT** CONNECTOR ON THE REAR PANEL	QUADRATURE GND
P8 - 16		YEL	22	J4 - A	**SIG OUT** CONNECTOR ON THE REAR PANEL	PHASE A OUT

P9 - ENCODER 1 INPUT ON AMS4A889 PULLUP PCB -- 12 PIN						
FROM				TO		SIGNAL NAME
P9 - 1		BLK	22	J6 - L	**ENCODER** CONNECTOR ON THE REAR PANEL	ENCODER GND
P9 - 5		WHT	22	P1 - 10	**AMS4A102 FUSE BOARD**	LC 12VDC UNFUSED
P9 - 8		BLU	22	J6 - B	**ENCODER** CONNECTOR ON THE REAR PANEL	PHASE B IN
P9 - 9		ORN	22	J6 - E	**ENCODER** CONNECTOR ON THE REAR PANEL	PHASE B/ IN
P9 - 11		YEL	22	J6 - A	**ENCODER** CONNECTOR ON THE REAR PANEL	PHASE A IN
P9 - 12		GRY	22	J6 - C	**ENCODER** CONNECTOR ON THE REAR PANEL	PHASE A/ IN

P10 - ENCODER 2 INPUT ON AMS4A889 PULLUP PCB -- 12 PIN						
P10 - 1		BLK	22	J5 - 2	**PRESSURE INPUT/OUTPUT PCB**	GND
P10 - 5		WHT	22	J5 - 1	**PRESSURE INPUT/OUTPUT PCB**	12VDC
P10 - 5		WHT	22	P1 - 2	**AMS4A102 FUSE BOARD**	ENCODER PWR12VDC UNFUSED

P1 - IN-CIRCUIT- PROGRAMMING PCB/CAN INTERFACE ON 40 PCB						
P1 - 1		YEL	22	P1 - 1	**PRESSURE INPUT/OUTPUT PCB**	CAN TX
P1 - 2		VIO	22	P1 - 2	**PRESSURE INPUT/OUTPUT PCB**	CAN RX
P1 - 3		BLK	22	P1 - 3	**PRESSURE INPUT/OUTPUT PCB**	CAN GND

P1 - AMS4A102 FUSE PCB -- 12 PIN						
FROM				TO		SIGNAL NAME
P1 - 1		WHT	20/22	S1 - 1	**POWER SWITCH** ON THE FRONT PANEL	+12-24VDC IN FUSED
P1 - 4		WHT	22	J6 - J	**ENCODER** CONNECTOR ON THE REAR PANEL	ENCODER P0WER FUSED
P1 - 7		WHT	22	J4 - F	**SIG OUT** CONNECTOR ON THE REAR PANEL	+24VDC FUSED
P1 - 7		WHT	22	J1 - A	**12 - 24VDC** CONNECTOR ON THE REAR PANEL	+24VDC FUSED
P1 - 7		WHT	22	J4 - G	**SIG OUT** CONNECTOR ON THE REAR PANEL	+24VDC FUSED
P1 - 8		WHT	22	J5 - K	**LOAD CELL** CONNECTOR ON THE REAR PANEL	+24VDC FUSED
P1 - 12		WHT	22	J5 - C	**LOAD CELL** CONNECTOR ON THE REAR PANEL	LOAD CELLPOWER FUSED 12 VDC

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P1 - DC TO DC CONVERTER PCB, AMS4A855 -- 12 PIN						
FROM				TO		SIGNAL NAME
P1 - 3	GND	BLK	22	GND	**GND BUS BAR**	GND
P1 - 4	GND	BLK	22	GND	**GND BUS BAR**	GND
P1 - 7	CUT OFF CONNECTOR OF TOUCHSCREEN CABLE.	RED	22	RED 26	SPLICE TO RED WIRE OF TOUCH SCREEN CABLE	USB2 +5VDC
P1 - 8	CUT OFF CONNECTOR OF TOUCHSCREEN CABLE.	BLK	22	BLK 26	SPLICE TO BLK WIRE OF TOUCH SCREEN CABLE	USB2 GND
P1 - 9	SPLICE AT P1 - 9 & P1 - 10 OF THE DC TO DC CONVERTER PCB	RED	22	P1 - 10	**DC TO DC CONVERTER PCB** AMS4A855	5VDC OUT
P1 - 9	SPLICE AT P1 - 9 & P1 - 10 OF THE DC TO DC CONVERTER PCB	RED	22/20	CN8 - 2	**ADVANTECH PROCESSOR PCB**	5VDC OUT
P1 - 9	SPLICE AT P1 - 9 & P1 - 10 OF THE DC TO DC CONVERTER PCB	RED	22/20	CN8 - 3	**ADVANTECH PROCESSOR PCB**	5VDC OUT
P1 - 9	SPLICE AT P1 - 9 & P1 - 10 OF THE DC TO DC CONVERTER PCB	RED	22/20	CN8 - 5	**ADVANTECH PROCESSOR PCB**	5VDC OUT
P1 - 9	SPLICE AT P1 - 9 & P1 - 10 OF THE DC TO DC CONVERTER PCB	RED	22/20	CN8 - 6	**ADVANTECH PROCESSOR PCB**	5VDC OUT
P1 - 11		BLK	22/20	GND	**GND BUS BAR**	GND
P1 - 12		BLK	22/20	GND	**GND BUS BAR**	GND

P2 - DC TO DC CONVERTER PCB, AMS4A855						
P2 - 2	GND	BLK	20	GND	**GND BUS BAR**	GND
P2 - 3	GND	BLK	20	CN1 - 1	**CCFL INVERTER PCB**	GND
P2 - 4	5VDC	RED	20	CN1 - 2	**CCFL INVERTER PCB**	5VDC

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CN8 - ADVANTECH PROCESSOR PCB						
FROM				TO		SIGNAL NAME
CN8 - 1		BLK	20	GND	GND BUS BAR	GND
CN8 - 4		BLK	20	GND	GND BUS BAR	GND
CN8 - 7		BLK	20	GND	GND BUS BAR	GND
CN8 - 8		BLK	20	GND	GND BUS BAR	GND
CN8 - 11		BLK	20	GND	GND BUS BAR	GND

CN2 - ADVANTECH PROCESSOR PCB USB						
FROM				TO		SIGNAL NAME
CN2 - 1	USE SMALL 10 PIN CONNECTOR	RED	22	J7 - 1	**USB** CONNECTOR ON THE FRONT PANEL	USB1 +5VDC
CN2 - 2	USE SMALL 10 PIN CONNECTOR	RED	22	J8 - 1	**USB** CONNECTOR ON THE FRONT PANEL **RIGHT CORNER**	USB1 +5VDC
CN2 - 3	USE SMALL 10 PIN CONNECTOR	WHT	22	J7 - 2	**USB** CONNECTOR ON THE FRONT PANEL	USB1 D0-
CN2 - 4	USE SMALL 10 PIN CONNECTOR	WHT	22	J8 - 2	**USB** CONNECTOR ON THE FRONT PANEL **RIGHT CORNER**	USB1 D0-
CN2 - 5	USE SMALL 10 PIN CONNECTOR	GRN	22	J7 - 3	**USB** CONNECTOR ON THE FRONT PANEL	USB1 D0+
CN2 - 6	USE SMALL 10 PIN CONNECTOR	GRN	22	J8 - 3	**USB** CONNECTOR ON THE FRONT PANEL **RIGHT CORNER**	USB1 D0+
CN2 - 7	USE SMALL 10 PIN CONNECTOR	BLK	22	J7 - 4	**USB** CONNECTOR ON THE FRONT PANEL	USB1 GND
CN2 - 8	USE SMALL 10 PIN CONNECTOR	BLK	22	J8 - 4	**USB** CONNECTOR ON THE FRONT PANEL **RIGHT CORNER**	USB A GND

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CN3 - ADVANTECH PROCESSOR PCB USB						
FROM				TO		SIGNAL NAME
CN3 - 1	USE SMALL 10 PIN CONNECTOR. INSERT A RED 22 AWG INTO CN3 - 1 AND SOLDER THE OTHER END TO PIN 1 OF THE PCB ON J5 CONNECTOR ON THE FRONT PANEL.	RED	22	J2 - 1	SOLDER TO PIN 1 OF THE PCB ON J2 **CONNECTOR ON THE REAR PANEL**.	USB3 +5VDC
CN3 - 3	USE SMALL 10 PIN CONNECTOR. INSERT A WHT 22 AWG INTO USBA2 - 5 AND SOLDER THE OTHER END TO PIN 2 OF THE PCB ON J5 CONNECTOR ON THE FRONT PANEL.	WHT	22	J2 - 2	SOLDER TO PIN 2 OF THE PCB ON J2 **CONNECTOR ON THE REAR PANEL.**	USB3 D0-
CN3 - 4	USE SMALL 10 PIN CONNECTOR. INSERT THE WHT WIRE OF THE TOUCH SCREEN CABLE INTO CN3 - 4	WHT	22		TO WHT WIRE OF TOUCH SCREEN CABLE.	USB4 D0-
CN3 - 5	USE SMALL 10 PIN CONNECTOR. INSERT A GRN 22 AWG INTO USBA2 - 7 AND SOLDER THE OTHER END TO PIN 3 OF THE PCB ON J5 CONNECTOR ON THE FRONT PANEL.	GRN	22	J2 -3	SOLDER TO PIN 3 OF THE PCB ON J5 **CONNECTOR ON THE FRONT PANEL**.	USB3 D0+
CN3 - 6	USE SMALL 10 PIN CONNECTOR. INSERT THE GRN WIRE OF THE TOUCH SCREEN CABLE INTO CN3 - 6	GRN	22		TO GRN WIRE OF TOUCH SCREEN CABLE.	USB3 D0+
CN3 - 7	USE SMALL 10 PIN CONNECTOR. INSERT A BLK 22 AWG INTO USBA2 - 9 AND SOLDER THE OTHER END TO PIN 4 OF THE PCB ON J5 CONNECTOR ON THE FRONT PANEL.	BLK	22	J2 - 4	SOLDER TO PIN 4 OF THE PCB ON J2 **CONNECTOR ON THE REAR PANEL**.	GND

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LCD1 CONNECTOR - ADVANTECH PROCESSOR PCB						
FROM				TO		SIGNAL NAME
LCD1	USE CABLE AMS4A374				LCD DISPLAY	

CN2 - 5VDC CCFL INVERTER PCB						
FROM				TO		SIGNAL NAME
CN2 - 1		WHT	22		CONNECT TO 2 PNK WIRES COMING FROM THE DISPLAY	DISPLAY POWER
CN2 - 4		WHT	22		CONNECT TO THE BLK WIRE COMING FROM THE DISPLAY	DISPLAY POWER GND

HDR3 - PRESSURE INPUT/OUTPUT PCB -- 12 PIN						
HDR3 - 1	SPLICE AT HDR3 ON PRESSURE INPUT/OUTPUT PCB	BLK	22	J4 - M	**SIG OUT** CONNECTOR ON THE REAR PANEL	4 - 20MA 1 LOOP GND
HDR3 - 2	SPLICE AT HDR3 ON PRESSURE INPUT/OUTPUT PCB	BLK	22	J4 - M	**SIG OUT** CONNECTOR ON THE REAR PANEL	4 - 20MA 2 LOOP GND
HDR3 - 3		ORN	22	J4 - K	**SIG OUT** CONNECTOR ON THE REAR PANEL	4 - 20MA LOOP 1
HDR3 - 4		GRN	22	J4 - L	**SIG OUT** CONNECTOR ON THE REAR PANEL	4 - 20MA LOOP 2

J1 - REAR PANEL CONNECTOR 12 - 24 VDC						
FROM				TO		SIGNAL NAME
J1 - B		BLK	20	GND	**GND BUS BAR**	GND

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J4 - SIG OUT REAR PANEL						
FROM				TO		SIGNAL NAME
J4 - H		BLK	20	GND	**GND BUS BAR**	GND
J4 - J		BLK	20	GND	**GND BUS BAR**	GND

J5 - LOAD CELL REAR PANEL						
FROM				TO		SIGNAL NAME
J5 - J		BLK	22	GND	**GND BUS BAR**	SHIELD

J9 -ALARM CONNECTOR ON THE REAR PANEL						
FROM				TO		SIGNAL NAME
J9 - C		BLK	22	GND	**GND BUS BAR**	GND

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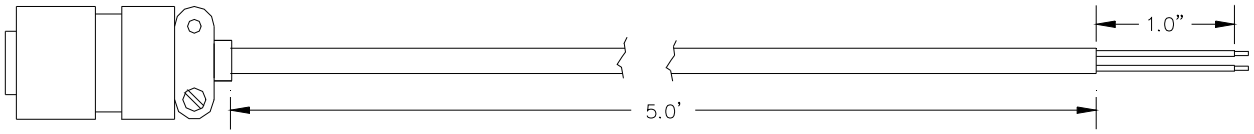
7.0 CABLES

7.1 AMS4A827 CABLE ASSEMBLY – DC POWER IN



A – WHITE
B – BLACK

A = +
B = -

P/N	DESCRIPTION	QTY.	REF
AMS4P177	CONN KPSE06J12-3S STR PLUG SOCKET	1	
AMS7P061	CABLE 16-2 SJ CORD	25 feet	

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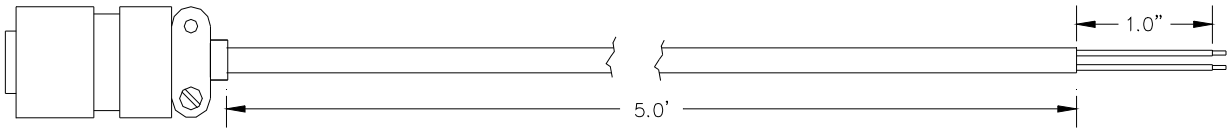
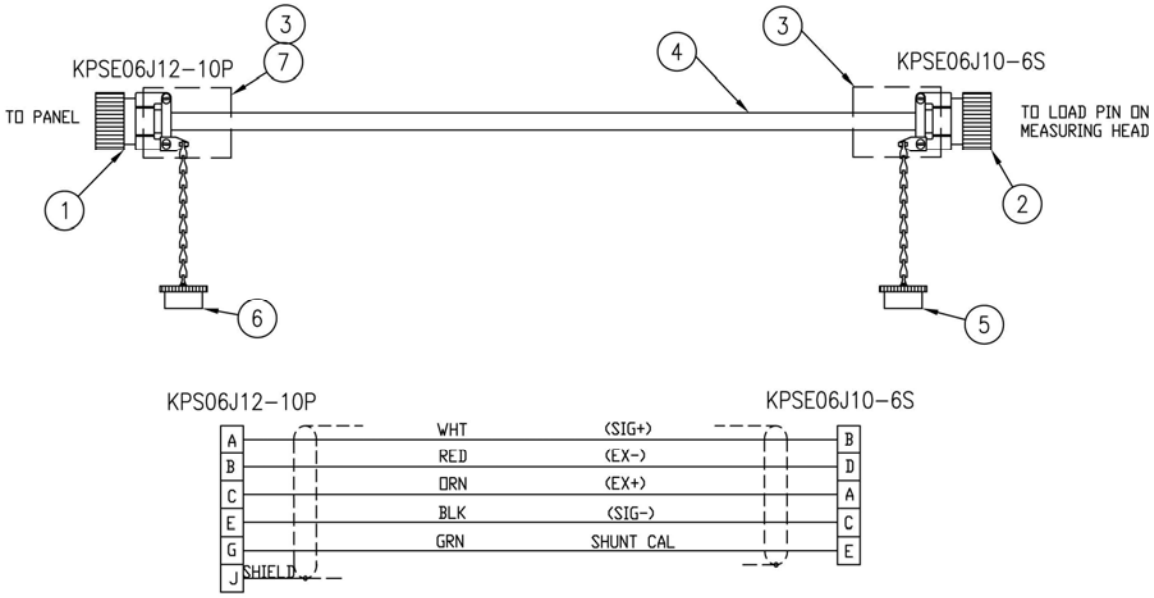
7.2 AMS4A826 CABLE ASSEMBLY – OVER TENSION SHUTDOWN



A – WHITE
B – BLACK

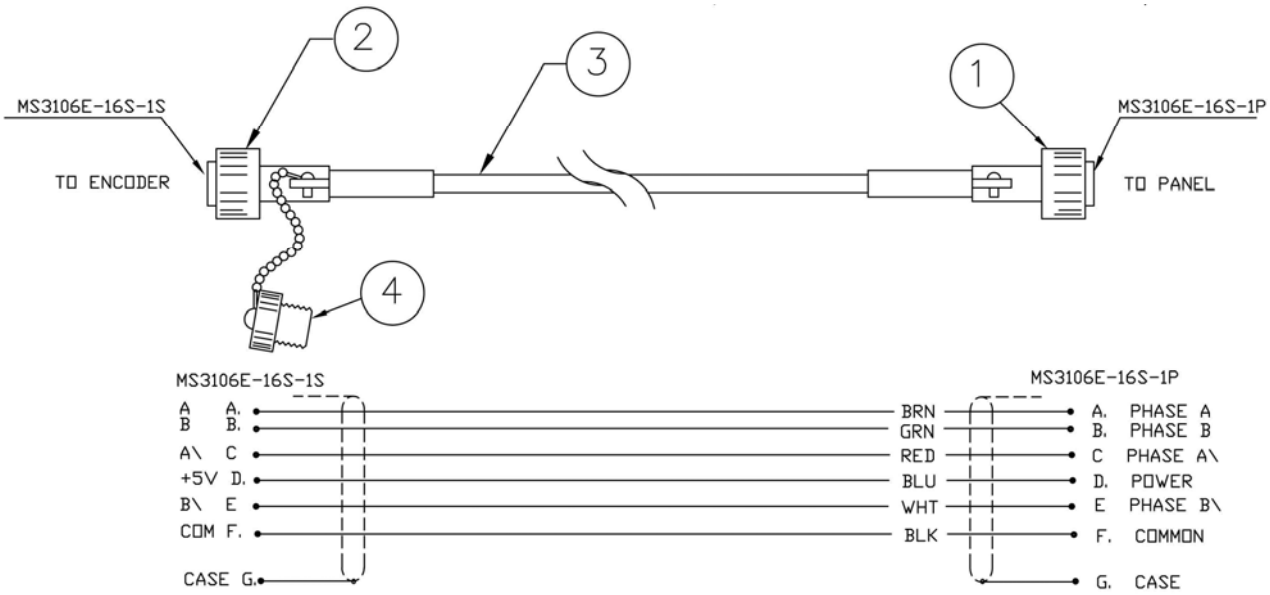
P/N	DESCRIPTION	QTY.	REF
AMS4P178	CONN KPSE06J12-3P STR PLUG PINS	1	
AMS7P061	CABLE 16-2 SJ CORD	30 feet	

7.3 ALS8A013 LOAD PIN IN CABLE



P/N	DESCRIPTION	QTY.	REF
AMS4P181	CONN KPSE06J12-10P	1	
AMS4P266	CONN KPSE06J10-6S	1	
AMS4P221	CABLE 20/8C ALPHA 25468 BLACK	30 feet	
AM5KP059	DUST CAP KPT8010C	1	
AM5KP070	DUST CAP KPT8012C	1	

7.4 AMS4A127 ENCODER IN CABLE



P/N	DESCRIPTION	QTY.	REF
AMS4P183	CONN MS3106F-16S-1P	1	
AMS4P184	CONN MS3106F-16S-1S	1	
AMS4P221	CABLE 20/8C ALPHA 25468 BLACK	30 feet	
AM5KP113	DUST CAP MS25042-16DA	1	