BenchMark Wireline Products
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CASED HOLE HOISTMANS DISPLAY PANEL
AMS3A/4A051
AMS3A/4A055
AMS3A/4A056

Operations and Maintenance Manual

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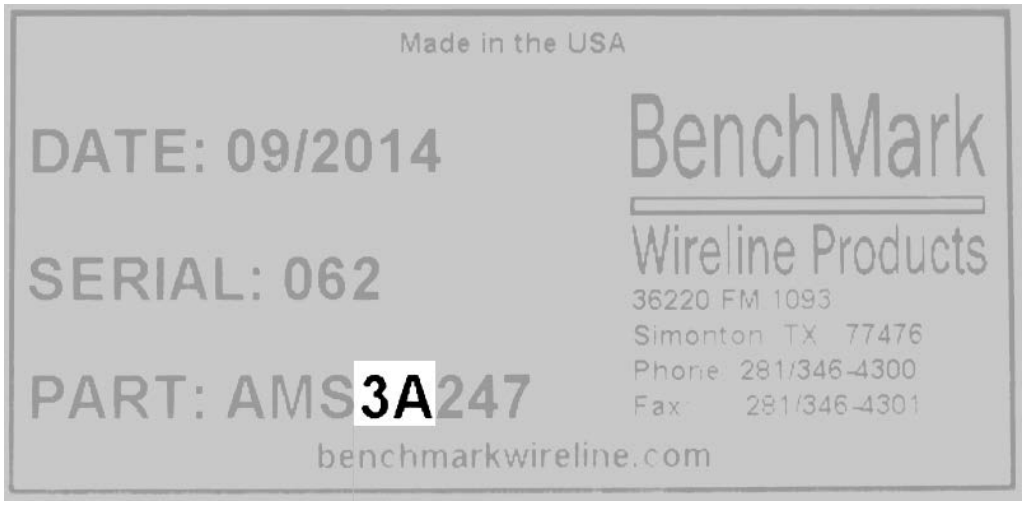
TABLE OF CONTENTS

Note - 3A Panel - The current version of this panel is designated 3A because of its new computer main board. Though the new panel is significantly improved, the user interface and menus are mostly the same as previous models.

4A Panel - All previous versions of this panel were designated 4A. Any specific instructions in this manual that refer ONLY to the 4A panels are highlighted with a Green Background.

You can determine which panel you have by the Part Number on the identification tag on the back of the panel, unless your legacy 4A panel has been recently upgraded with the new board.

If your panel has a 3A in the part number, it's a 3A panel. If it has a 4A in the part number, it's a 4A panel.



1.0 QUICK START PROCEDURES

1.1 Power up panel and verify it is working properly.

1.2 Verify the panel is configured to match the system (Acquisition System, encoder, etc.)

1.3 Set up acquisition system.

1.4 Press T-Zero and verify that panel tension reads 0. Verify tension is recorded on acquisition system.

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

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

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

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

1.9 Press T-Zero to zero the tension value.

1.10 Press T-Test and verify that panel tension reads load pin shunt value. Verify tension is being properly recorded on acquisition system.

1.11 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.

1.12 While logging, depth can be added or subtracted "on the fly by using the +/- switch (refer to paragraph 2.1.11). When stationary, the +/- switch can be used to preset the depth.

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RECOMMENDED SPARE PARTS - 50 SERIES PANELS

All parts listed are Critical Spares and are required to properly maintain this device.

We recommend that all customers stock the quantity indicated in the '**QTY**' column. **IF** you are in a remote location or prefer having immediate availability of all spares, we recommend that you stock at least one of each item.

NOTE – BenchMark may not always have all spares in stock all the time.

P/N	DESCRIPTION	QTY	REF
RECOMMENDED SPARE PARTS FOR ALL LOCATONS			
AMS4P128	DISPLAY LED .5" SERIAL 2"X3.5"	1	D1, D2, D3
40195	LED RED DIALIGHT 5V	1	APPROACHING SURF
AMS4P307	SONALERT #SC628D MALLORY	1	ALARM
AMS4P020	SWITCH MTL-106D ALCO LOCKING	1	POWER ON/OFF
AMS5P191	SWITCH MPA-106F ALCO PUSH MOM	5	MENU, T-ZERO, T-TEST, D-ZERO, METER RESET
AMS4P044	SWITCH TOGGLE DPDT MOM OFF MOM	1	+ / -
AMS5P192	SWITCH CAPS ALCO C-22 BLACK	5	T-ZERO,D-ZERO, METER RESET, T-TEST
AMS5P193	SWITCH CAP ALCO C-22 RED	1	D-ZERO
ACMU1P12	FUSE HOLDER #LF342004	2	FUSE HOLDER
AMS4P107	FUSE SLO-BLO 1/2 A LITTELFUSE	1	F1 - ENCODER
AMS4P125	FUSE 2 AMP 250 VOLT SLO BLO	1	F2 - DC IN
AMS4M004	WINDOW LED SERIAL DCI DISPLAY	1	PLASTIC WINDOW
RECOMMENDED SPARE PARTS FOR REMOTE LOCATONS			
AM2KP134	PC BOARD ASSEMBLY AM2K ACQUISITION	1	PCB ASSY
AMS4P119	METER ANALOG DIFF TENSION (+/- 1000 LBS)	1	M1

NOTE – PC Boards for 4A panels are no longer manufactured or available. Should a board failure occur, a conversion kit and the new board can be ordered.

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 in the form of user manuals and instructional videos are also available on our 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:
BenchMark Wireline Products
36220 FM 1093
Simonton, Texas 77476
U.S.A.

2.0 INTRODUCTION

2.1 GENERAL DESCRIPTION

This panel is designed 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.

2.1 GENERAL DESCRIPTION – BACK PANEL - AMS3A050

Depth is displayed from data provided from an encoder mounted on a measuring device. The encoder quadrature pulses are passed through to the acquisition system. The tension data is provided by a load pin and is also passed through to the acquisition system.

2.2 3A PANEL & NEW 2K BOARD

The new 3A version of the 50 Series panel contains a newly designed main processor board designated the 2K Board. Because of advances in computer hardware, several small boards on the legacy 4A panel have been combined into a single more efficient unit. The limited availability of replacement components on legacy panels necessitated migrating to the newer more efficient design.

Additionally, the new 3A Panel offers several advantages:

2 USB Ports – Software updates and data transfers are now simplified with these input/output devices.

Internal Data Recorder – Log data is recorded on an internal flash memory card. This data can be exported via the USB A “Data” port on the front of the panel.

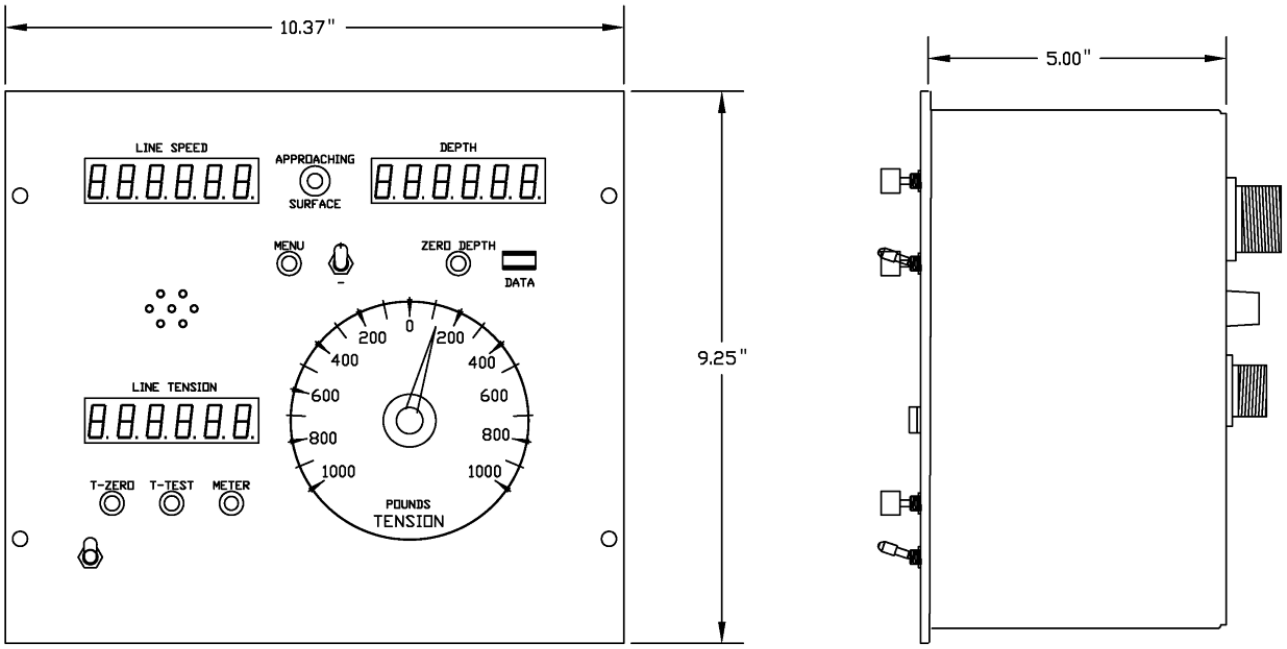
Simplified Software Updates – Updates will be loaded on a thumb drive, inserted into the proper USB port for downloading and by powering the board off then on, the panel will automatically install updates.

Users will experience almost no difference in user interface, menu selections or function between the new and legacy panels.

2.3 FEATURES

- Digital displays for depth, line speed, tension and magnetism.
- Analog incremental tension meter, 4 inch (108 mm) dia., 270 degree.
- Differential or Incremental tension zero push button switch.
- Excessive tension alarm setting allows operator to set tension alarm to a predetermined value. Contact closure is provided for winch shutdown.
- Zero Depth button - sets depth to 0. Depressing button again resets depth to previous setting. Can only be set when line speed is zero.
- Approaching surface alarm and shutdown.
- Depth adjust up or down switches. Can only be set when winch is stopped
- Load pin zero & calibrate controls.
- Depth & tension saved in non-volatile memory at power loss.
- Outputs Tension and Encoder to interface to an acquisition system.
- RS232 Interface for additional control and data outputs.
- USB connectors for software upgrading and for log file downloading.
- Can be configured for any combination of FEET/METERS or POUNDS/KGS.
- Data Recorder which records both depth and tension data to a solid state memory device.

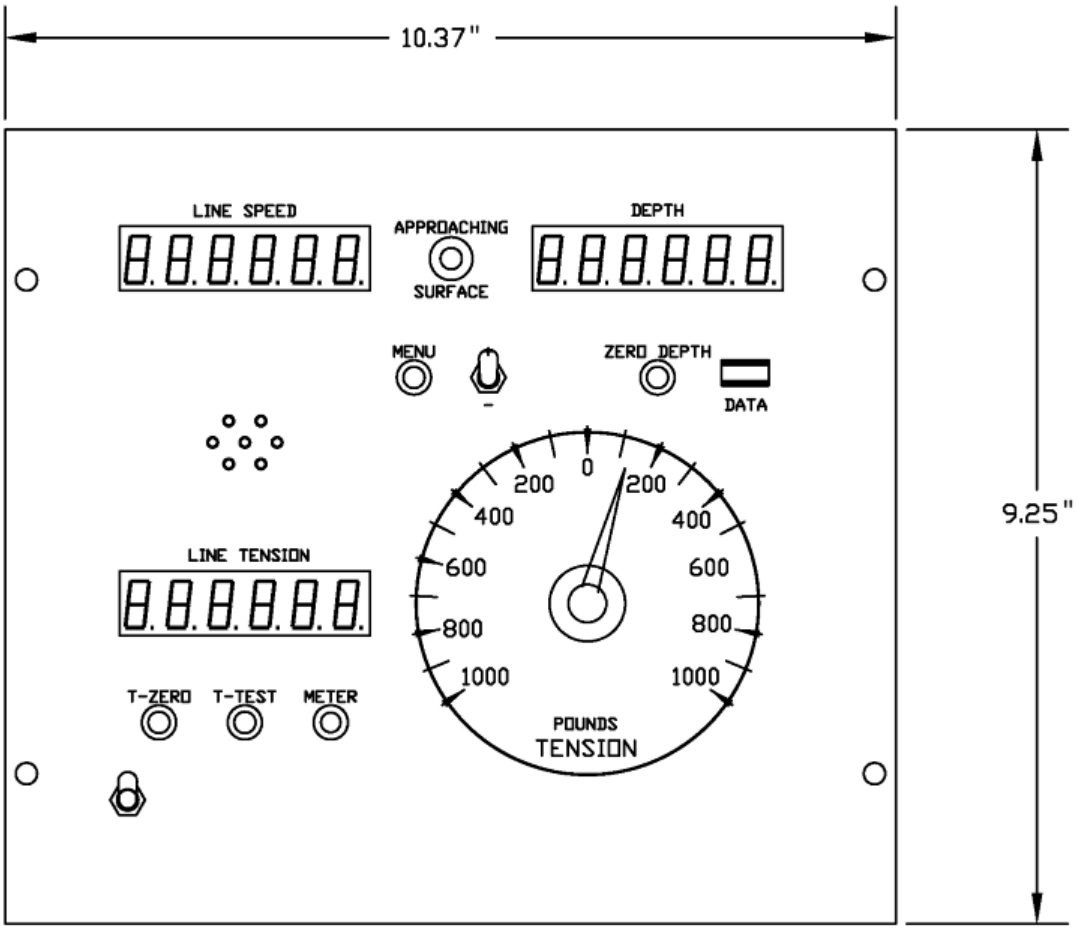
2.4 GENERAL SPECIFICATIONS



WEIGHT	5.5 LBS - 2.5 KG
TEMPERATURE RATING	-20 to 140 deg F - -19 to 60 deg C
POWER SUPPLY	9 – 30 VDC @ 2 AMP MAX
MAXIMUM LINE SPEED	3000 FT - 914 M per MIN @ 600 PULSES/FT
MINIMUM LINE SPEED	.6 FT - .18 M per MINUTE
MAXIMUM LINE TENSION	25,000 LBS - 11,340 KG
DIGITAL TENSION	6 DIGITS WITH 1 LB OR 1KG RESOLUTION
DIGITAL LINE SPEED	6 DIGITS WITH .1 FT OR .1 M RESOLUTION

2.5 DETAILED DESCRIPTION OF FEATURES

FRONT PANEL



2.5.1 ANALOG TENSION METER

This meter displays either differential or incremental tension. This provides a more visual display of tension change.

2.5.2 INCREMENTAL/TOTAL TENSION SWITCH

This switch will change the analog meter from Incremental tension to Differential tension.

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 it is not necessary to periodically press the reset switch.

2.5.3 METER RESET SWITCH

This switch will reset the meter to the 0 (center) position.

2.5.4 DEPTH DISPLAY

This meter provides a digital display of depth.

2.5.5 LINE TENSION DISPLAY

This meter provides a digital display of total line tension.

2.5.6 LINE SPEED DISPLAY

This meter provides a digital display of line speed.

2.5.7 MAGNETIC MARK RESET

Pressing the MMD reset button clears the last mark setting. The next mark detected will be used to set the window for any subsequent marks.

2.5.8 ZERO DEPTH

Pressing this button will reset the depth to 0. Depressing the button again will reset the depth to the previous setting. The Zero Depth button will only work when the line speed is zero (i.e. winch not moving).

2.5.9 MENU

Pressing this button will activate the menu software. The software feature to be set will be displayed on the DEPTH display. The features can be toggled through by pressing the menu button until the desired feature is displayed.

2.5.10 + / - SWITCH

This switch is used for different functions. It is used to change the depth setting in either an up or down direction. The winch must be stopped before the depth can be set. In menu mode (see section 3.0) the switch is used to set menu parameters.

During logging this switch can also be used to add or subtract depth while moving. Pressing the switch up one time will add .1 feet if in feet mode or .1 meters if in metric mode. Pressing the switch down will subtract depth (depth will be shallower).

The rate that the depth is added or subtracted is .1 foot per foot or .1 meter per meter.

If the switch is depressed longer, the amount of depth to add or subtract will be increased. This amount to be added or subtracted will be displayed on the depth display. Example – if you continue to hold the switch until .5 is displayed, then .5 feet will be added over the next 5 feet.

2.5.11 ALARM RESET LED AND ALARM

This LED is lit and an audible alarm is sounded when the depth is less than 200' (61 m) the system default or whatever value the user has set. This provides a warning to the hoist operator that they are approaching surface and should take care to get the equipment safely out of the well. When the LED is depressed, the alarm will stop but the LED will continue to blink. Once the depth reading is greater than the set value, both the alarm and the LED will turn off.

This switch also has a second function. In the event of an overtension condition that sets the overtension relay, this button must be pressed to reset the relay (refer to section 3.1).

This switch also resets the shutdown relay due to the depth shutdown value as set by the operator.

2.5.12 ENGLISH / METRIC UNITS

These LEDs will indicate if the panel is in English (FEET) or metric (METERS) mode. If the depth is set to English, the English LED will be lit. If the depth is set to Metric the Metric LED will be lit. The tension can be set to English (LBS) or Metric (KG) but it will not light the LED.

2.5.13 T-ZERO SWITCH

Use this switch to set the tension to 0 at the start of a logging run. This will zero out the tension circuit. The line should be slack through the head at this time.

2.5.14 T-TEST SWITCH

Press T-TEST and verify that the panel tension reads 10000 lbs. (4535 kg) for 5K and 5000 lbs. (2267 kg) for 3K. This can also be used to verify tension is being properly recorded on acquisition system.

2.5.15 USB CONNECTOR

Provides means to download data and set internal clock. Included in later models plus modification for earlier models available.

2.6 REAR PANEL CONNECTIONS

NOTE – not all panels have all these connectors
Refer to Section 6.1 for Pin Out information.

2.6.1 12 – 24 VDC

This connector supplies dc power for the panel operation (9 VDC min, 30 VDC max). The panel can operate on either 12 or 24 VDC (12 VDC is North American truck standard voltage, 24 VDC is European truck standard voltage). Pin A is positive, pin B is negative.

2.6.2 ENCODER 1 IN

+5 VDC power is provided to encoder 1 and signal is received from encoder 1 on this connector.

2.6.3 ENCODER 2 IN

+5 VDC power is provided to encoder 2 and signal is received from encoder 2 on this connector.

2.6.4 LOAD CELL IN

Load Cell excitation voltage is provided to the load pin and signal is received from the load pin on this connector

2.6.5 RS232 SERIAL INTERFACE

This connector provides an RS232 interface from the panel to the acquisition system. This provides a means to control the panel and read data from the panel using a PC.

Refer to section 4 for details on using this port.

2.6.6 SIGNAL OUTPUT

Encoder, tension, and magnetic mark signals, processed and some unprocessed are passed through this connector to the acquisition system

2.6.7 OVER TENSION CONTACT

This connector provides a connection to the overtension circuit relay. When an overtension condition is active, the two pins are connected together. In normal position the two pins are open. This feature can be used to interface to the winch unit control system to provide automatic hoist shutdown when an overtension condition is reached.

2.6.8 USB ONLY ON 3A PANELS

USB-A and USB-B connectors available on panel for:

USB-A – upgrading panel software – Refer to section 4.10 thru 4.13

USB-B – copying the panel log file to a laptop – Refer to section 4.4.8

3.0 MENU COMMANDS

This panel has internal software which allows it to be set for various configurations. To change the settings, press the MENU button. The feature to be set will be displayed on the DEPTH display. Press the MENU button again until the feature you want to set is displayed.

The parameters for each feature will be displayed on the LINE TENSION display. Press the +/- switch (SW7) to cycle through all the available parameters. When the value you want to select is displayed, press the MENU button. ACCEPT will then be displayed. Press + for yes, - for no.

Following is a listing of all the available settings.

3.1 OVER TENSION ALARM

When preset tension value is reached, alarm sounds and tension display flashes value.

Use +/- switch to set the tension alarm setting.

TANALM will be displayed on the DEPTH display and the value will be displayed on the TENSION display as it is being set.

Each cable size will have a corresponding Tension Alarm setting. Only the setting for the cable size selected (see menu option 1) can be adjusted.

Default Values

3-16	1500
7-32	2000
1-4	3000
9-32	4000
5-16	4000
3-8	4000
OTHER	4000

3.2 CABLE SIZE

This parameter adjusts the wheel for the proper circumference and the load pin factor for the proper angle. Since the AM3K measuring head is a circumferential device, the cable size will affect both the depth and tension measurements.

Use +/- switch to select size.

CABLE will be displayed on the DEPTH display and the selections will be displayed on the LINE TENSION display.

Cable size selection automatically sets load pin angle and wheel size setting for the selected cable size.

Selection: Cable Size Values available
3-16
7-32
1-4
9-32
5-16
3-8
OTHER

When OTHER is selected, two additional options will be made available. Load Cell Angle (LCFCT) and Wheel Size (WHSZ).

LCFCTR is used to provide for different load cell sensitivities. The tension input is multiplied by the Load Cell Factor number entered.

WHL SZ is used to change the circumference of the measuring wheel. This option allows the panel to be set for a measuring head that uses different sized measuring wheels. Options are .5 to 4'.

3.3 DELTA TENSION ALARM

When the delta tension setting is reached the alarm sounds. In incremental mode, you must periodically press meter reset or this alarm will sound when the tension reaches the set value. In differential mode, the meter will reset itself and the alarm will only sound on a quick change of tension. The Alarm Reset switch must be pressed to reset the over tension relay.

Use +/- switch to set the Delta Tension setting.

DELTEN will be displayed on the DEPTH display and the value being set will be displayed on the TENSION display as it is being adjusted.

3.4 DIFF / INC TENSION

Incremental tension provides a high resolution tension scale. It must be periodically reset as tension increases or decreases to keep it from pegging out. Incremental tension is useful when working in the well to watch for tool set down or pickup.

Differential tension provides a delta tension reading. The meter will slowly reset itself to 0 so the reset switch is not necessary. Differential tension is useful when running in and out of the well at higher speeds so It is not necessary to continually press the meter reset button.

Use +/- switch to change the analog meter from Incremental tension to Differential tension.

DIFTEN will be displayed on the DEPTH display and either DIFF or INC will be displayed on the TENSION display.

3.5 TENSION SHUTDOWN

When 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.

Note: This parameter is derived from the reading on the analog meter. If the T_SHDN value is set to 500 then whenever the tension reading on the meter is 500 greater than the Tension Alarm setting, the winch shutdown relay will be activated.

Use +/- switch to set tension shutdown setting.

T_SHDN will be displayed on the DEPTH display and the value will be displayed on the TENSION display as it is being set.

Each cable size will have a corresponding Tension Alarm setting. Only the setting for the cable size selected can be adjusted.

Default Value = 500

3.6 DELTA TENSION SHUTDOWN

When 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.

Use +/- switch to set tension shutdown setting.

D_SHDN will be displayed on the DEPTH display and the value will be displayed on the TENSION display as it is being set.

Note: This parameter is derived from the reading on the analog meter. If the D_SHDN value is set to 500 then whenever the tension reading on the meter is greater than 500 the winch shutdown relay will be activated.

Note: The RESET or Approaching Surface button needs to be depressed before the winch shutdown relay will de-energize.

3.7 DEPTH ADJUST (Shim)

This feature provides a means to apply an automatic depth correction. This is typically used to compensate for line or wheel wear. Depth can automatically be added or subtracted as it is being acquired.

Use +/- switch to set shim setting.

DP_ADJ will be displayed on the DEPTH display and the value will be displayed on the TENSION display as it is being set. The values are feet / thousand.

Each cable size will have a corresponding shim value. Only the value for the cable size selected (see menu option 3.1) can be adjusted. Default value is 0.

The shim amount selected will automatically be added or subtracted from the depth input.

3.8 DEPTH ALARM

This feature provides the operator a means to set a depth alarm. This is typically used as an approaching surface warning to alert the operator to be ready to stop the winch.

Use +/- switch to select the depth when a warning alarm will be sounded.

DP-AL will be displayed on the DEPTH display and the value will be displayed on the TENSION display as it is being set.

Available settings are from 0 - 99999. Default value is 100’ (30.5m).

When Alarm depth value is reached, alarm will sound and light will flash. Pressing the Cancel Alarm button will turn off alarm but light will continue to flash.

3.9 ENCODER PULSES PER REVOLUTION

The value selected will automatically be used as the encoder input pulses per revolution (PPR) setting.

Use +/- switch to set the ENCODER Pulse Per Revolution setting.

ENCPPR will be displayed on the DEPTH display and the value will be displayed on the LINE SPEED display as it is being set.

Default value is 1200.

3.10 ENCODER DIRECTION

The value selected will toggle the encoder direction between UP and Down.

Use +/- switch to set the ENCODER direction setting.

ENCDIR will be displayed on the DEPTH display and either UP or DN value will be displayed on the TENSION display.
Default value is UP.

3.11 STRETCH CORRECTION

This command will turn the STRETCH CORRECTION setting ON or OFF.

Use +/- switch to toggle between ON and OFF.

STRTCH will be displayed on the DEPTH display and either ON or OFF will be displayed on the LINE SPEED display.

Default value is OFF.

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.

3.12 SYSTEM PULSES PER FOOT

The value selected will be the encoder output to the computer system Pulses Per Foot setting.

Use +/- switch to set the ENCODER Output setting.

SYSPPF will be displayed on the DEPTH display and the value will be displayed on the LINE SPEED display as it is being set.

Default value is 120.

3. 13 ENCODER PULSE OUT

This setting determines which encoder pulses that will be output to the acquisition system.

PLSOUT will be displayed on the DEPTH display and either RAW, CORRECTED, or UPDATED value will be displayed on the TENSION display.

Default value is UP.

Three options are available, RAW, CORRECTED or UPDATED pulses.

RAW will send out encoder pulses identical to the uncorrected pulses coming from the encoder. None of the corrections applied by the panel will be sent to the acquisition system.

CORECT will send out encoder pulses to the acquisition system that include all the corrections that the panel applies such as Depth Adj (shim), Wheel Size, etc.

UPDATE will send out the same pulses as in CORRECT mode. This mode will also update the computer depth when depth is added or subtracted using the +/- switch or pressing the depth zero button.

Use +/- switch to switch between RAW, CORRECT, UPDATE.

RAW or **CORECT** or **UPDATE** will be displayed on the DEPTH display.

3.14 DEPTH UNITS

The depth values will be displayed in the units selected.

Use +/- switch to set the DEPTH UNITS setting.

DEPTH will be displayed on the DEPTH display. The selection can be toggled between FEET or METERS. The selection will be displayed on the TENSION display. The ENGLISH (green) LED display will be lit when FEET is selected and the METRIC (red) LED will be lit when METERS is selected.

3.15 TENSION UNITS

The tension value will be displayed in the units selected.

Use +/- switch to set the TENSION UNITS setting.

TNSION will be displayed on the DEPTH display. The selection can be toggled between POUNDS and KILOGM. The selection will be displayed on the TENSION display.

4.0 OPERATION, SETUP & MAINTENANCE

4.1 PROCESSOR REBOOT

In the event of a panel "lock up" or other malfunction, the processor in the panel can be rebooted by turning off the panel, depressing the T-ZERO and T-TEST buttons at the same time then turning the power back on while the buttons are depressed. Keep buttons the depressed for at least five seconds after power is restored.

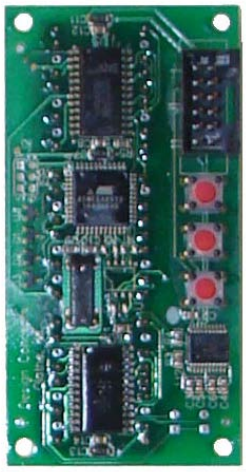
When the panel is rebooted, all the menu settings will be returned to the factory default settings.

The panel should always be rebooted after new software (eprom) has been installed.

4.2 DIGITAL DISPLAY SETUP

The four digital displays can be set for address, baud rate, and brightness

Three buttons are located on the rear of the display which are used to change these settings.



The button nearest the connector selects the parameter (address, baud rate, brightness).
The center button increments the parameter up
The end button increments the parameter down.

After the parameter is set, press the parameter button again to store it.

The addresses should be set as follows:

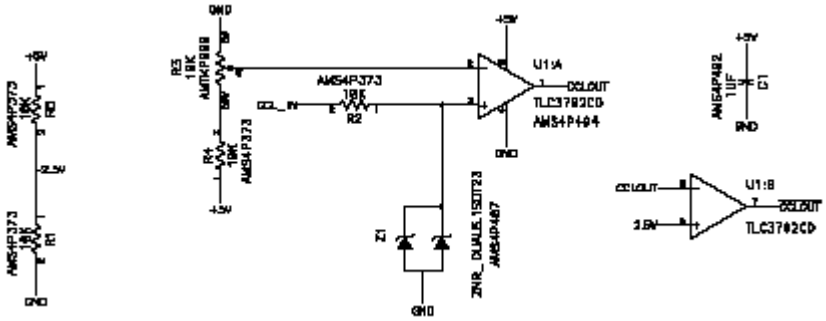
- Line Tension = 1
- Line Speed = 2
- Depth = 3
- MMD/CCL = 4

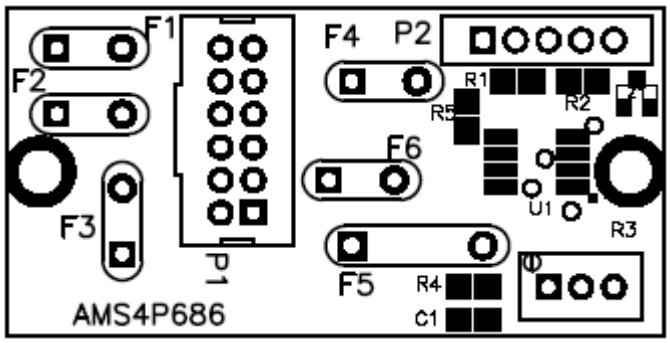
Set Baud Rate to 9600
Set Brightness to 15
Digital Display Pinout

PINS 1, 2, 7, 9	GND
PINS 4, 6, 8, 10	+5 VDC
PIN 3	TXD
PIN 5	RXD

4.3 CCL BOARD SETUP - 4A panel

To test the operation of the panel, adjust R3 on the CCL/Fuse board to receive satisfactory collars if needed. The boards were set to a threshold value of approximately +1.5V input to the CCL circuit during testing. Setting the input to +1.5V would be a good starting point to set up the circuit before installing the panel in a unit. CCW adjustments of R3 will raise the threshold voltage required to acquire a CCL mark (less sensitive). Example: If CCL marks are constant as the tools go down hole, adjust R3 CCW until CCL marks are on depth. Example #2: If no CCL marks are found, turn R3 clockwise. An oscilloscope across CCL/Fuse board P2 pin 2 (signal) and 40 board TP1 (ground) will allow you to see the input signal as you make your adjustments.





4.4 INTERNAL DATA RECORDER

4.4.1 DATA FORMAT - 3A panel

Data is stored as:
DATE (yyyymmdd)
TIME (hhmmss.ss
UNITS (E=English, M=Metric)
DIRECTION (U=Up, D=Down, S=Stopped)
DEPTH nnnnn.n
SPEED nnnn.n
TENSION nnnnnn

F10
File # Date/Time Size (bytes)
10 14/09/05 11:38:06 28400

11:38:50 E S + 0.0 0.0 41 0 0
11:38:51 E U + 0.0 0.2 41 0 0
11:38:52 E S + 0.0 0.0 41 0 0
11:38:53 E S + 0.0 0.0 41 0 0
11:38:54 E D + 0.1 14.0 30 0 0
11:38:55 E D + 0.6 30.2 46 0 0
11:38:56 E D + 1.1 30.6 61 0 0
11:38:57 E D + 1.7 31.2 62 0 0
11:38:58 E D + 2.4 51.0 50 0 0
11:38:59 E D + 3.3 51.4 58 0 0
11:39:00 E D + 4.1 51.4 56 0 0
11:39:01 E D + 4.9 39.2 56 0 0
11:39:02 E S + 4.9 0.0 31 0 0
11:39:03 E S + 4.9 0.0 2 0 0
11:39:04 E D + 4.9 0.2 1 0 0
11:39:05 E S + 4.9 0.0 1 0 0
11:39:06 E S + 4.9 0.0 3 0 0
11:39:07 E S + 4.9 0.0 12 0 0
11:39:08 E S + 4.9 0.0 14 0 0
11:39:09 E S + 4.9 0.0 26 0 0
11:39:10 E S + 4.9 0.0 29 0 0
11:39:11 E S + 4.9 0.0 28 0 0
11:39:12 E S + 4.9 0.0 28 0 0
11:39:13 E U + 4.9 0.2 28 0 0
11:39:14 E S + 4.9 0.0 29 0 0

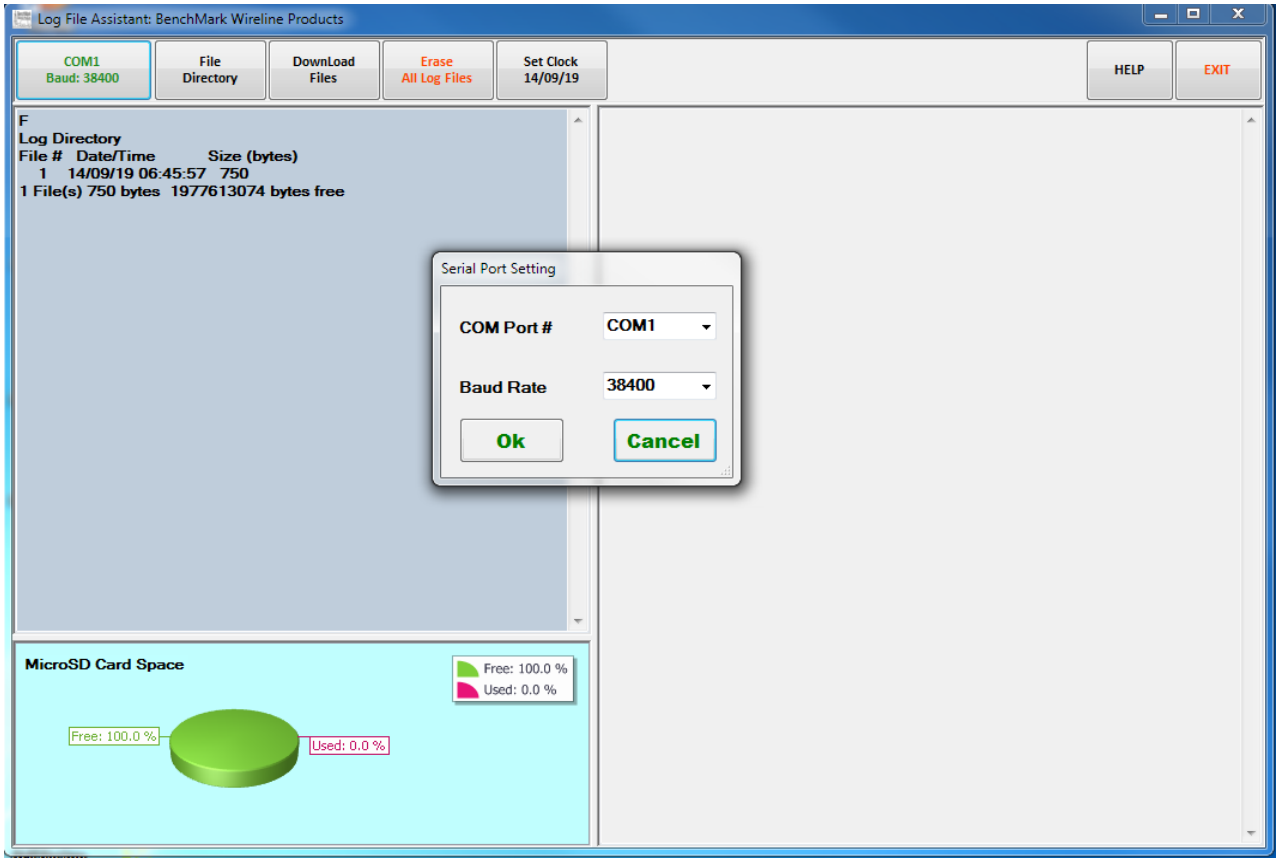
11:39:15 E U + 4.3 53.8 42 0 0
11:39:16 E U + 3.4 55.6 31 0 0
11:39:17 E U + 2.5 57.2 32 0 0
11:39:18 E U + 1.5 57.2 30 0 0
11:39:19 E U + 0.5 57.4 30 0 0
11:39:20 E U - 0.4 57.6 29 0 0
11:39:21 E U - 1.4 58.6 29 0 0
11:39:22 E U - 2.4 59.6 28 0 0
11:39:23 E U - 3.4 59.6 28 0 0
11:39:24 E U - 4.4 59.2 26 0 0
11:39:25 E U - 5.3 59.4 26 0 0
11:39:26 E U - 6.3 54.0 25 0 0
11:39:27 E U - 7.2 54.4 24 0 0
11:39:28 E U - 8.0 43.2 12 0 0
11:39:29 E D - 8.0 0.2 12 0 0
11:39:30 E U - 8.4 38.6 9 0 0
11:39:31 E U - 8.8 17.8 5 0 0
11:39:32 E S - 8.8 0.0 14 0 0 <EOF>

4.4.2 DATA EXPORT - LOG FILE - USING USB PORT - 3A Panel

The new 3A panels require a Log File Assistant program to help extract the log files from the flash drive for use in Windows based software. Download this file from our website onto the laptop that will extract the data from the panel.

The AMS3A panels have a USB connector labelled ‘DATA’ that can be connected to a laptop computer USB port with a standard cable with type ‘A’ to type ‘B’ connectors. The laptop computer may require a “FTDI Virtual COM Port” driver installation if it does not recognize the USB COM Port when the cable is plugged in with power applied to the AMS3A panel.

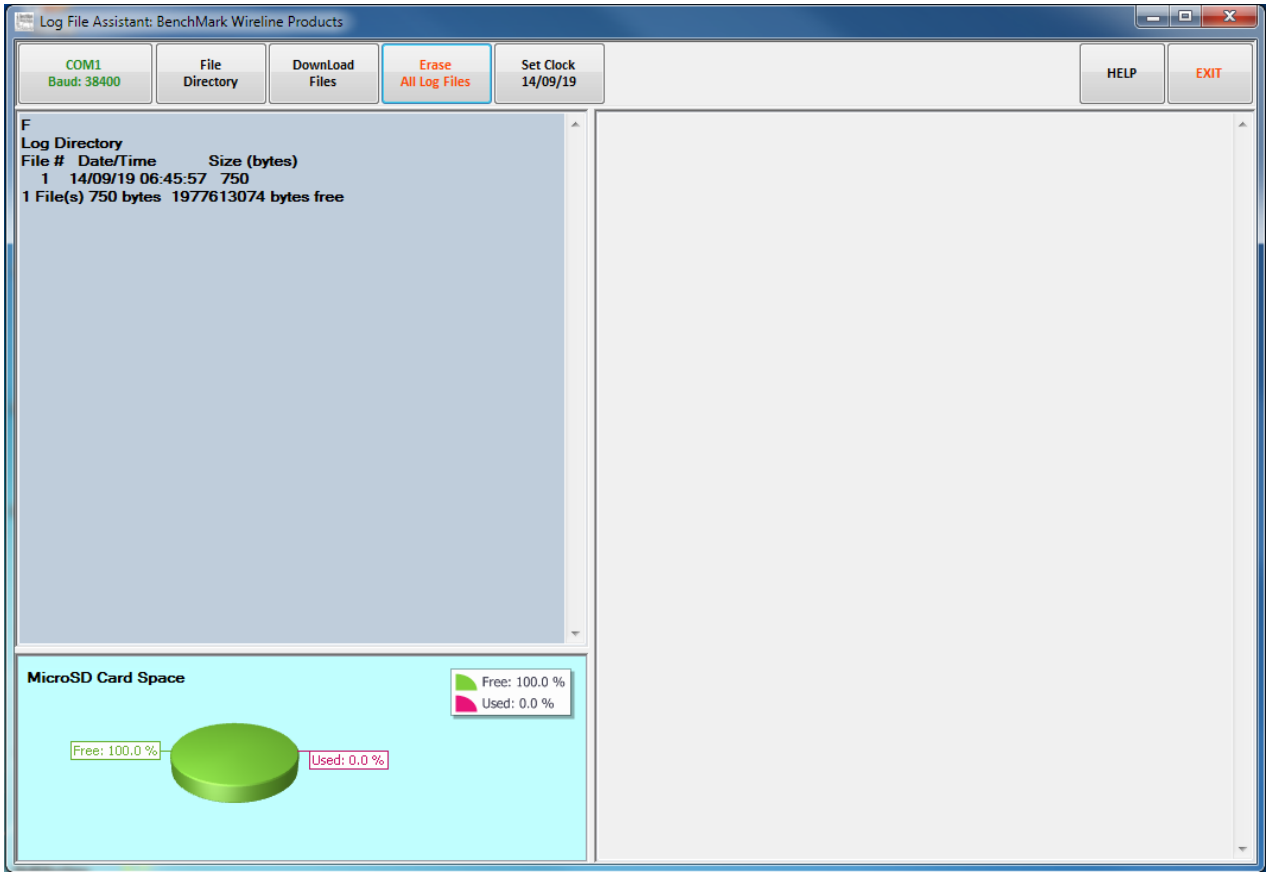
This data file download is available at www.BenchMarkWireline.com/support



Upon program start the available laptop computer COM Ports are searched for availability. If the COM Port button text reports that no connection is made, click on the button and then pull down the COM Port # list box and choose the proper COM Port.

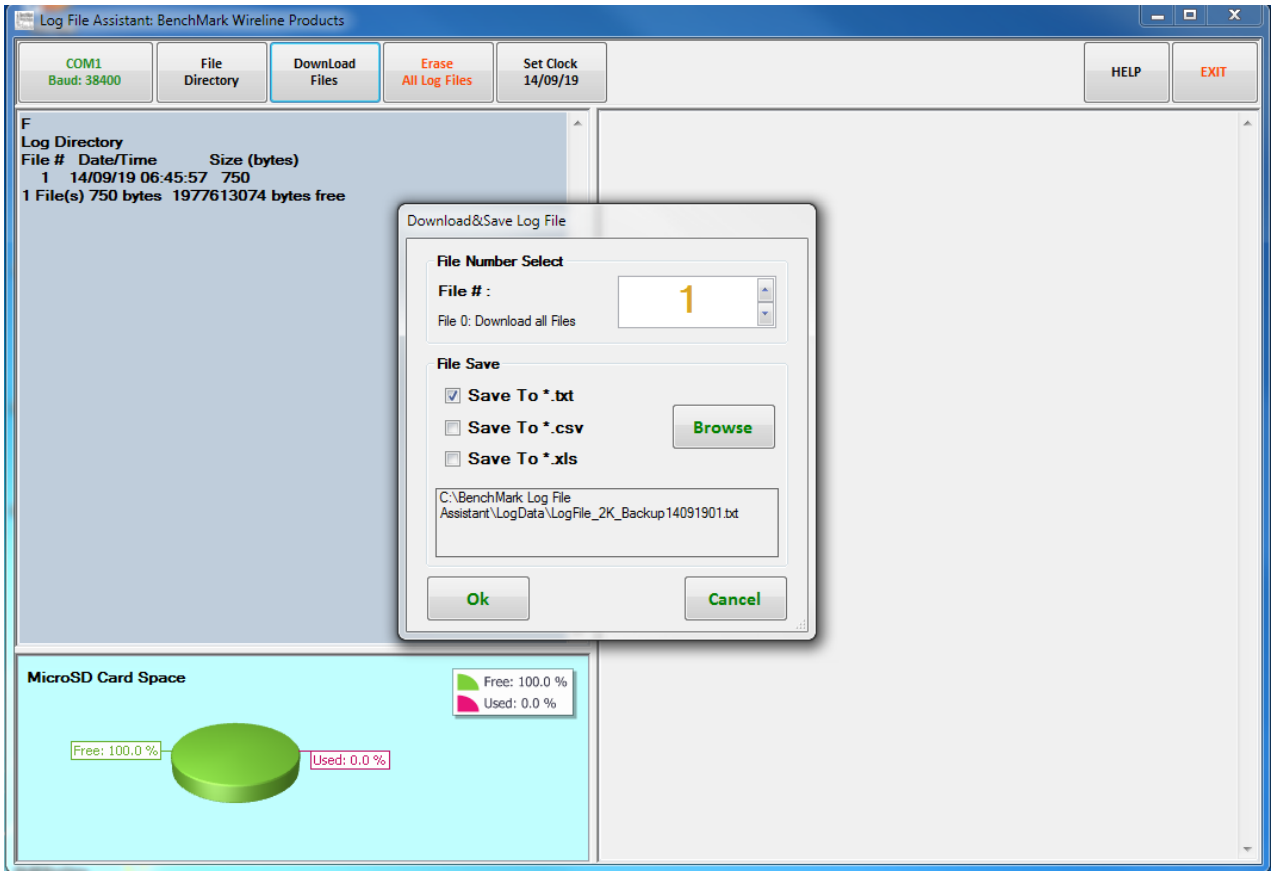
Note that the lower left pane displays the MicroSD card usage – this is where the AMS3A panel’s Log Files are stored.

4.4.2 SOFTWARE UPDATES USING - USB PORT - 3A panel - continued



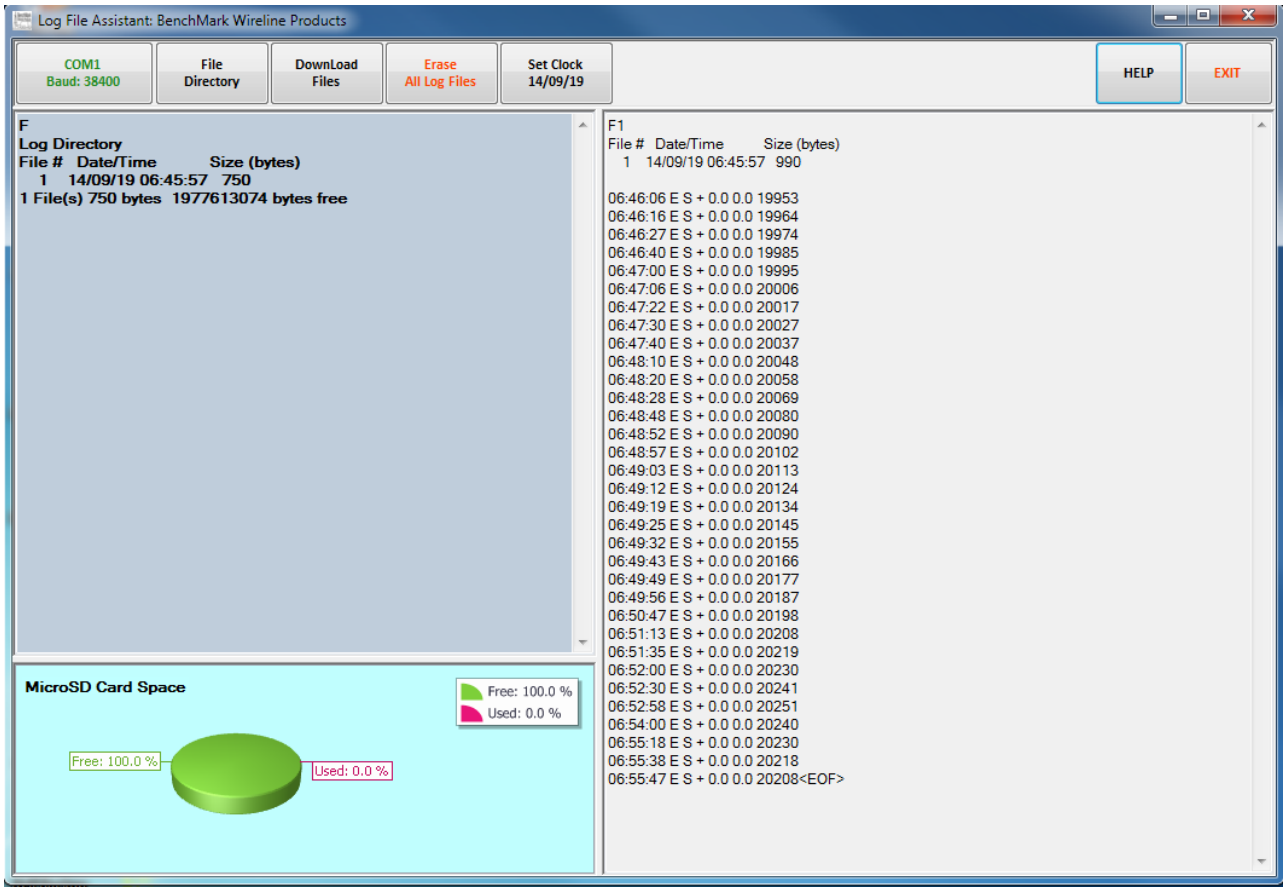
Clicking on the ‘File Directory’ button results in the listing of all log files in the left pane.

4.4.2 SOFTWARE UPDATES USING - USB PORT - 3A panel - continued



Clicking on the ‘Download Files’ button will open a new dialog window. A specific log file is then chosen from the list box and the Operator has the option of saving the file in three different file extension formats; and re-naming and re-locating the file using the ‘Browse’ button.

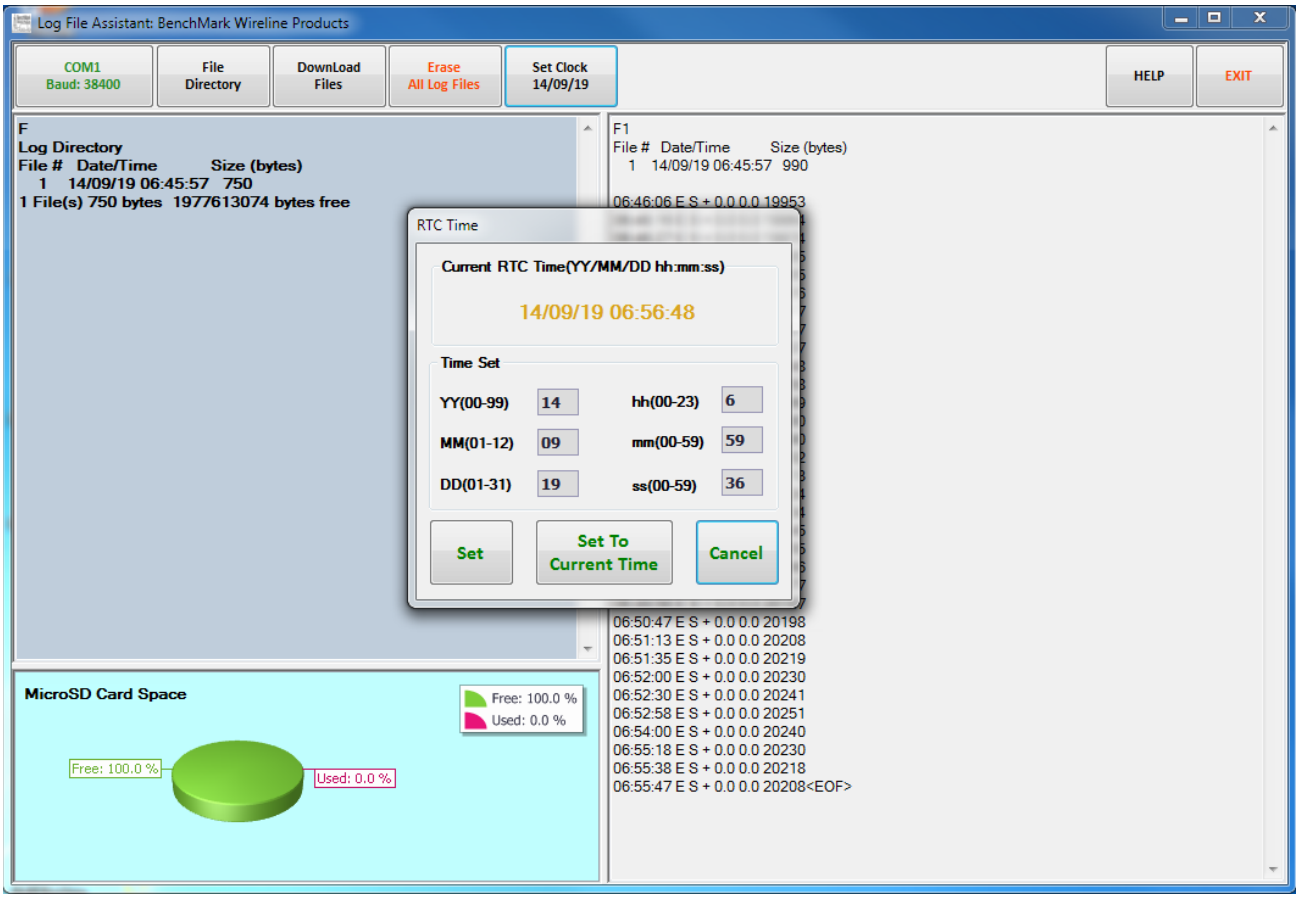
4.4.2 SOFTWARE UPDATES USING - USB PORT - 3A panel - continued



The content of the selected log file is displayed in the right pane.

Erase All Log Files Button: Clicking on this button will open a dialog box asking for confirmation to erase all log files.

4.4.2 SOFTWARE UPDATES USING - USB PORT - 3A panel - continued



Clicking on the ‘Set Clock’ button will open a dialog that allows the Operator to set the Date/Time clock to the current Date/Time or to any Date/Time desired.

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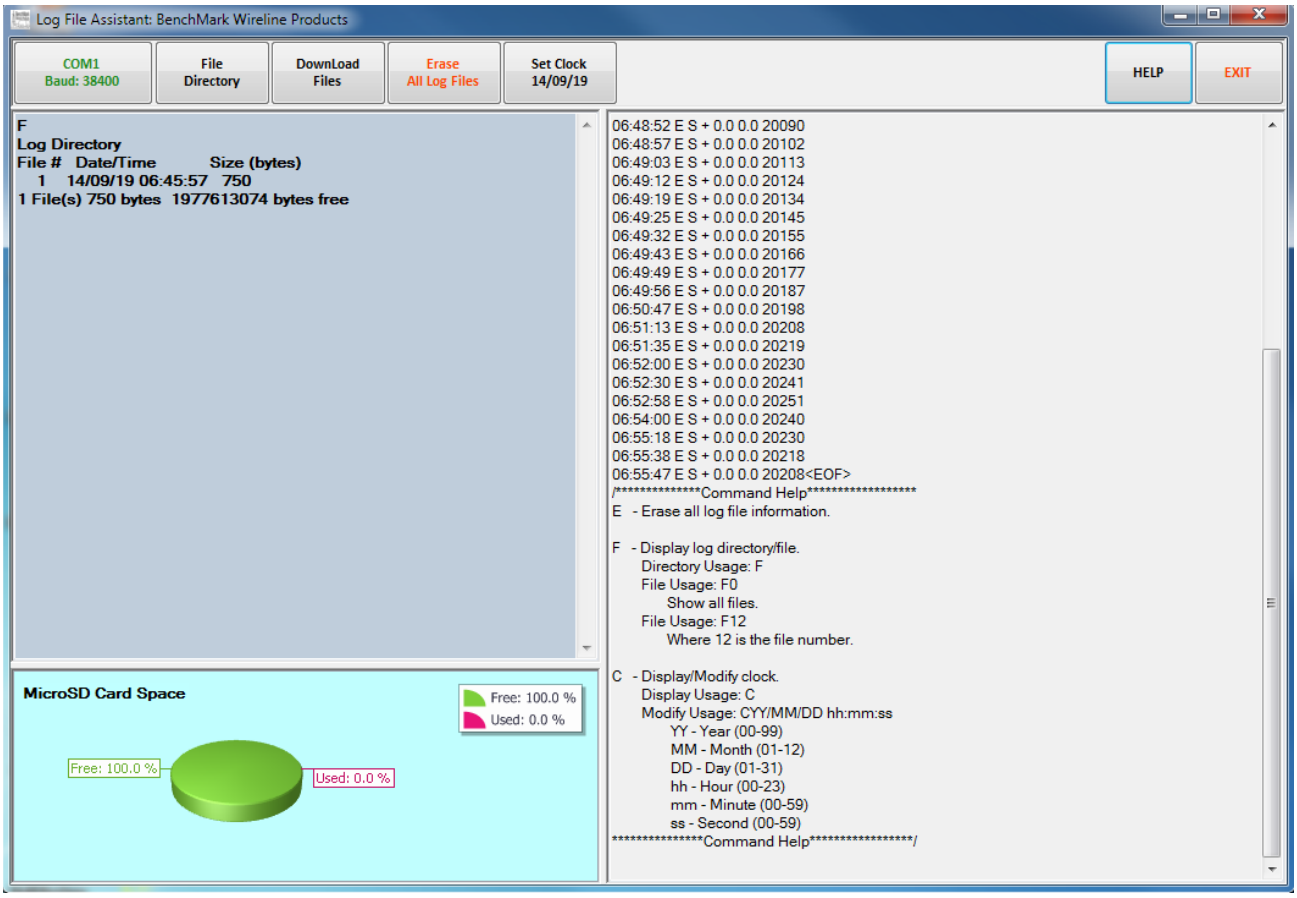
4.4.2 SOFTWARE UPDATES USING - USB PORT - 3A panel - continued



Clicking on the ‘Help’ button results in the display of the log file related commands for informational purposes only.

Exit Button: Clicking on the ‘Exit’ button will open a dialog box asking for confirmation to exit the Log file Assistant program.

4.5 RS232 SERIAL INTERFACE – HELP - 4A panel

To connect the panel to a computer, connect a serial cable from the PC to J6 on the rear of the panel. The wiring is as follows:

DB9 PIN OUT: 2 = TRANSMIT, 3 = RECEIVE, 5 = GROUND

Run a program such as MS Windows HyperTerm using the following parameters

BAUD	38,400
BITS	8
PARITY	N
STOP	1

Press H or ? to display the help screen

* * * AMS4A5XX Help Screen * * *

H,? - This screen.
D - Display units, direction, depth, speed, and tension.
P - Modify encoder pulses/revolution. Usage: P600
V - Verify AMS4A06X setup status.
Z - Preset depth.Usage: Z0.0 |_|--> New depth.
A - Depth Alarm. Usage: A100 |_|--> Depth Alarm.
N - LineSize,N0-092,N1-108,N2-125,N3-3/16,N4-7/32,N5-1/4,N6-9/32,N7-5/16,N8-140,N9-160,N10-OTHR
K - Stretch Coeff(in/100#/100ft) Usage:'K.456' for .456 in/100#/100ft
l - Line weight (#/1000ft) Usage: 'l25 for 25#/1000ft
W - Enter Wheel Dia for Other Usage: W3.5 for 3.5 foot circ wheel
L - Enter line dia (inches) Usage: 'L.25' for .25 in diameter line
U - Units Usage: 'UF' ft/lbs 'UM' meter/kg 'UG' ft/kg 'UF meter/lb
M - Tension Alarm. Usage: 'M2500' for 2500 pound alarm.
J - Depth Adjust. Usage: 'J-1' for -1 ft/Meter per 1000 feet/Meter)
X - Encoder Direction. X+ or X-
0 - Tension Zero Cal
T - Tension Shunt Cal
I - Enable/Disable Stretch Correction
E - Erase all log file information.
F - Display log directory/file.
Directory Usage: F
File Usage: F0
Show all files.

4.5 RS232 SERIAL INTERFACE – HELP - 4A panel continued

File Usage: F12
Where 12 is the file number.
a - Display analog values.
C - Display/Modify clock.
Display Usage: C
Modify Usage: CYY/MM/DD hh:mm:ss
YY - Year (00-99)
MM - Month (01-12)
DD - Day (01-31)
hh - Hour (00-23)
mm - Minute (00-59)
ss - Second (00-59)
#n where n = 0-AMS3A062 1-AMS3A063 2-AMS3A064 3-AMS3067
mTH Total Meter Hi scale Usage:mTH20000<rtn> for 20k# or 20000kg
mTL Total Meter Hi scale Usage:mTL4000<rtn> for 4000# or 4000kg
mDH Diff Meter scale Hi Usage:mDH2000<rtn> for 2000# or 2000kg
mDL Diff Meter scale Lo Usage:mDL200<rtn> for 200# or 200g

```
E S +  17.5   0.0    8
E S +  17.5   0.0    8
E S +  17.5   0.0    8
E S +  17.5   0.0    8
V
```

4.6 RS232 SERIAL INTERFACE - HELP - 3A panel

To connect the panel to a computer, connect a serial cable from the PC to J6 on the rear of the panel. The wiring is as follows:

DB9 PIN OUT: 2 = TRANSMIT, 3 = RECEIVE, 5 = GROUND

Run a program such as MS Windows HyperTerm using the following parameters

BAUD	38,400
BITS	8
PARITY	N
STOP	1

Press H or ? to display the help screen

* * * AMS3A5XX Help Screen * * *

H,? - This Screen.
D - Display Units, Direction, Depth, Speed, and Tension.
e - Set 3K Measuring Head.
f - Set 5K Measuring Head.
G - Set Other Measuring Head.
I - Set LEE Measuring Head.
P - Modify Encoder Pulses/Revolution, Usage: P600.
V - Verify Panel Setup Status.
Z - Set Depth.Usage: Z0.0 --> New Depth.
A - Depth Alarm. Usage: A100 --> New Depth Alarm.
N - Line Size N0 N1 N2 ...
M - Tension Alarm. Usage: 'M2500' For 2500 Lbs Alarm.
J - Depth Adjust. Usage: 'J-1' For -1 Ft Per 1000 Ft.
S - System Pulses Per Ft Out Usage: 'S125' For 125 PPF Out To System.
B - Length Mt/Ft Usage: 'BM'Meters, 'BF' Feet.
c - Weight Kg/Lbs Usage: 'CK' Kilograms 'C#' Pounds.
X - Encoder Direction. X+ or X-.
E - Erase All Log File Information.
F - Display Log Directory/File.
Directory Usage: f
File Usage: f0
Show All Files.
File Usage: f12
Where 12 Is The File Number.
a - Display Analog Values.

4.6 RS232 SERIAL INTERFACE - HELP - 3A panel continued

C - Display/Modify Clock.
Display Usage: c
Modify Usage: cYY/MM/DD hh:mm:ss
YY - Year (00-99)
MM - Month (01-12)
DD - Day (01-31)
hh - Hour (00-23)
mm - Minute (00-59)
ss - Second (00-59)

#n - where n = 0-AMS3A051 1-AMS3A054 2-AMS3A055 3-AMS3A056

4.7 RS232 SERIAL INTERFACE – VERIFICATION - 4A panel

Press V to display the Verification Screen

* * * AMS4A05X Setup Status * * *

Software revision AMS5AXXX
Line Size = 5-16
Depth Units = Feet
Depth Units = Pounds
Depth alarm = 100 ft
Tension alarm = 2400 lbs
Tension shutdown = 3500 lbs
Encoder PPR = 1200
Depth Adjust = 0.0
Wheel Circumference = 2.000 feet
Load Cell Angle Factor = 1.00
System Pulse per Foot = 600.0

Press D to display the Data Screen

DATA STRING DESCRIPTION
123456789012345678901234 56
U D Zddddd.d ssss.s ttttt<CR><LF>

WHERE:
U – UNITS (Depth, Tension)
'E' - English, English,
'G' - English, Metric,
'M' - Metric, Metric,
'F' - Metric, English
D - DIRECTION ('U' - UP; 'D' - DOWN; 'S' - STOPPED)
Z - ZERO DEPTH REF. ('+' BELOW GROUND; '-' ABOVE GROUND)
d - DEPTH
s - LINE SPEED
t - TENSION
<CR> - CARRIAGE RETURN, <LF> - LINEFEED

4.8 RS232 SERIAL INTERFACE - VERIFICATION - 3A panel

* * * AMS3A5XX Status Verification* * *

Software Revision 50XXX.X
Line Size = .474
Depth Units = Feet
Depth alarm = 200 ft
Tension Units = Pounds
Tension alarm = 2400 lbs
Encoder PPR = 1200
Depth Adjust = 0.0
Wheel Circumference = 2.000 feet
Load Cell Angle Factor = 1.00
System Pulse per Foot = 600.0
H

4.9 RS232 SERIAL INTERFACE- DATA SCREEN - 4A panel & 3A panel

Press D to display the Data Screen

DATA STRING DESCRIPTION
123456789012345678901234 56
U D Zddddd.d ssss.s tttttt<CR><LF>

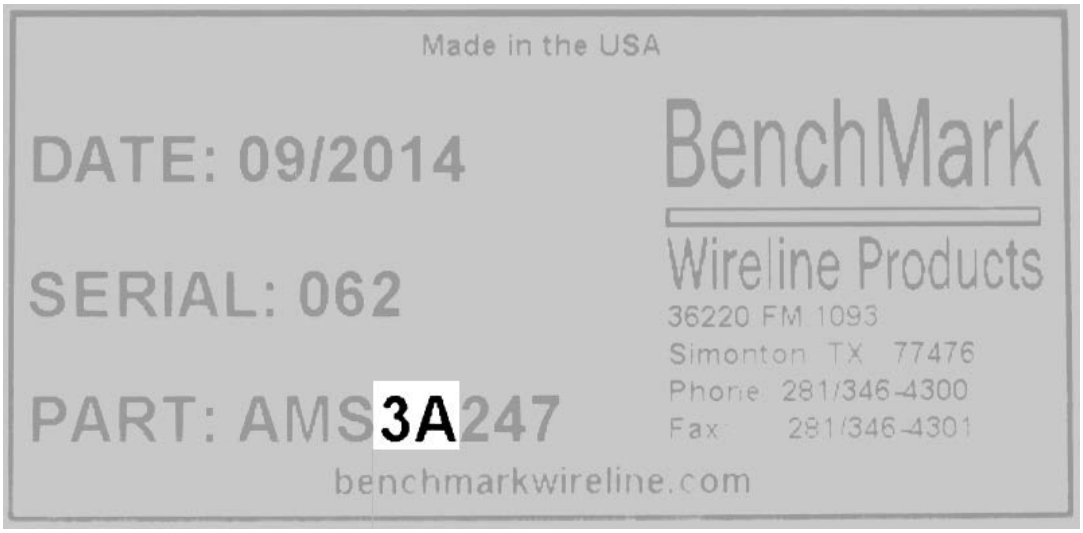
WHERE:
U – UNITS (Depth, Tension)
'E' - English, English, 'G' - English, Metric,
'M' - Metric, Metric, 'F' - Metric, English
D - DIRECTION ('U' - UP; 'D' - DOWN; 'S' - STOPPED)
Z - ZERO DEPTH REF. ('+' BELOW GROUND; '-' ABOVE GROUND)
d - DEPTH
s - LINE SPEED
t - TENSION
<CR> - CARRIAGE RETURN, <LF> - LINEFEED

4.10 SOFTWARE UPDATES - USING USB PORT - 3A panel

This procedure is for periodic software updates on Benchmark wireline display panels. It pertains to 40 series, 50 series, and 60 series display panels with the new 3A board.

You can easily tell if you have a 3A series panel by looking at the silver identification tag on the panel. If there is a 3A in the part number it is a 3A panel.

If it has a 4A in the part number use the software update method described in the manual for that panel.



3A panels contain a new generation computer board that simplifies the process of software updates.

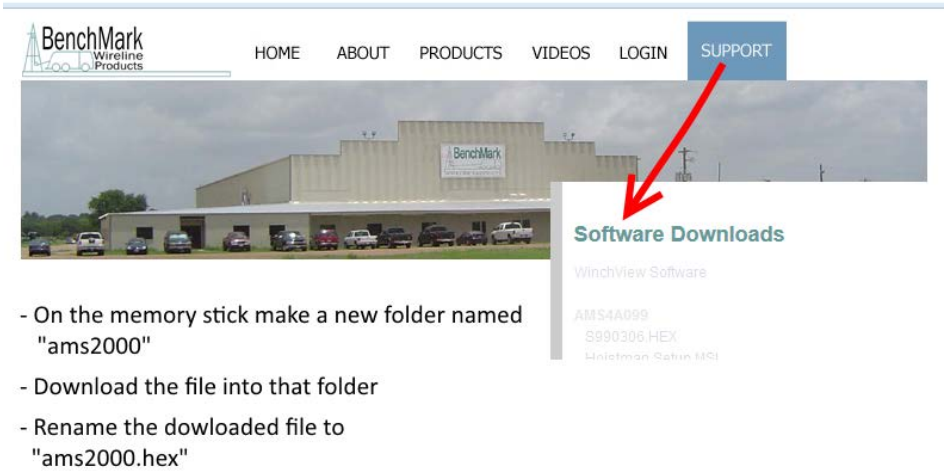
NOTE – if you have a legacy 4A panel that has been upgraded with the new 3A board, use the 3a panel instructions.

The 3A panels have 2 usb ports, an “A” and a “B”. The B is for data collection. The A is for updating software and that is one we’ll be using.

Depending on the model of panel the “A” USB port may be on either the front or back of the panel.

You will need a common USB memory stick also called a thumb or flash drive.

Go to the BenchMarkWireline.com website and then Support and Software Downloads. Insert the memory stick in that computer. On the memory stick make a new folder named “ams2000” in lower case. Locate the software update file for your panel. Then download the file into the new folder on the memory stick. Then rename the downloaded file “ams2000.hex” all lower case.



Make sure the panel is turned OFF.
On your panel then locate the USB “A” port…and plug the USB stick into it. Note - the position of the USB “A” on the back of your panel may be different from this picture.

Now Power ON the panel and it will go through an automatic boot cycle on the **Depth Display**. Very quickly it will recognize the presence of the memory stick and will begin a 10-0 countdown on the **Line Tension** display. Note – these 2 displays may be in different positions on your panel.

When it hits zero, the panel will automatically erase the current software from memory.. It will also automatically upload the necessary files from the memory stick to the panel. This may take up to 5 minutes.

When the update process is complete it will briefly show a PASS notification. This means that the update process is complete and was successful.

Now power the display panel OFF.

Remove the memory stick.

Now power the display panel back ON and the update will be complete.

Periodically check the BenchMark website for software updates.
Use this same software update process for all 40, 50 and 60 series 3A panels.

4.11 SOFTWARE UPDATES - USING THE RS232 SERIAL PORT - REPROGRAMMING CURRENT CHIP - 4A panel

PROCEDURE:

1. Transfer the new revision HEX file to a PC with a serial port or a USB to serial adapter.

2. Turn power on to the Hoistman's panel.

3. Connect your PC to the serial port at the rear of the panel.

4. Open a Hyperterminal session. Use the following settings:

Serial Port: COM1
Baud Rate: 57600
Data Bits: 8
Parity: None
Stop Bits: 1
Flow Control: None

5. Set the switches on the CPU PCB to PROGRAM mode as follows:

1 - AWAY FROM CPU
2 - AWAY FROM CPU
3 - TOWARD CPU

6. Open the Hyperterminal connection and then press the keyboard ENTER key. The MicroController ROM Loader will respond with a banner and then a '>' prompt.

7. Type an uppercase 'K' and the ENTER key and the ROM Loader will Klean-erase the Flash.

8. Type an uppercase 'L' and the ENTER key and the ROM Loader will wait to Load a HEX file.

9. Pull down the Hyperterminal TRANSFER menu and choose: Send Text File. The file browser will open, so ensure that the file filter is set to:
Files of type - All files (*.*) and then go to the C:\ root directory and choose the new revision HEX file to transfer.

10. The ROM Loader will begin programming the Flash and will report a GOOD status for the duration of the programming procedure as follows:

GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
GGGGGGGGGGGGGGGGGGGGGGGGGGGG

11. After the ROM Loader is finished programming the Flash set the switches on the CPU piggy-back PCB as follows:

1 - TOWARD CPU
2 - TOWARD CPU
3 - AWAY FROM CPU

12. To operate from an EPROM instead of the Micro-Controllers internal memory, set the switches on the CPU piggy-back PCB as follows:

1 - TOWARD CPU
2 - TOWARD CPU
3 - TOWARD CPU

4.12 SOFTWARE UPDATES – INSTALLING PRE-PROGRAMMED REPLACEMENT CHIP - 4A panel

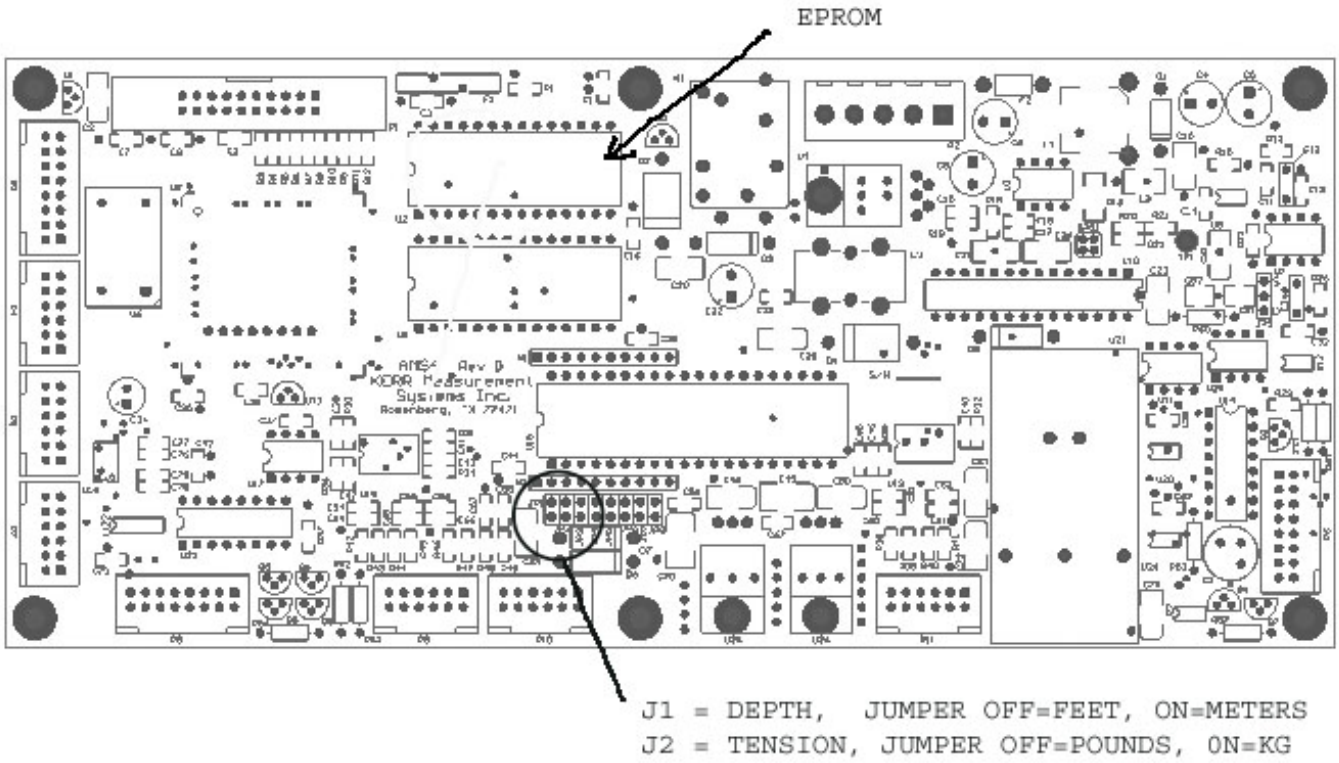
For older panels without CPU piggyback PCB w/3 switches, the software that controls this panel is stored in an EPROM Integrated Circuit (see drawing below). To upgrade the software to a new version, simply remove the eprom I.C. and install a new eprom I.C. (be careful not to bend the legs during installation).

After new software is installed, make sure and "reboot" the panel (refer to step 6.7.3).

NOTE: For newer panels with the cpu piggyback PCB with 3 switches (refer to section 6.8 and 7.2.22 programming procedures).

4.13 CHANGING ADDITIONAL SETTINGS WITH PROCESSOR BOARD

In addition to updating software, for older software that does not have menu selections for TENSION, DEPTH, HEAD TYPE AND LOAD PIN TYPE, you can also change these values by changing jumpers on the board.



Jumpers are used to select default depth and tension units as well as Head Type and Load Pin type.. These units can also be set with the menu commands (see section 3) but when the panel is rebooted, it will be reset to the Jumper settings.

DEPTH - Jumper J1 determines the depth units

A shorting bar across J1 will set the units to meters
No shorting bar will set the units to feet

TENSION - Jumper J2 determines the tension units

A shorting bar across J2 will set the units to Kilo Grams
No shorting bar will set the units to pounds

HEAD TYPE - Jumper J3 determines the type of measuring head

A shorting bar across J3 will configure the panel for an AM3K
No shorting bar will configure the panel for an AM5K

LOAD PIN TYPE - Jumper J4 determines the type of load pin

A shorting bar across J4 will configure the panel for a non amplified non linearized load pin
No shorting bar will configure the panel for an amplified and linearized load pin

5.0 BILL OF MATERIALS & SPARES PARTS

BILL OF MATERIALS - 50 SERIES PANELS - AMS4A051

P/N	DESCRIPTION	QTY	REF
AMS3A051	PANEL HOIST OPERATOR DISPLAY CASED HOLE CONFIGURATION		
SW-512K06	SOFTWARE FOR MODEL 51-56 DEPTH AND TENSION PANELS AM2K PCB	1	
AMS4P119	METER ANALOG DIFF TENSION +/- DUAL SCALE 500 KG - 1000 LBS BLACK NEEDLE	1	
AM2KP134	PC BOARD AMS2K ACQUISITION BOARD	1	
AMS4P128	DISPLAY LED RED 0.5" 14 SEGMNT SERIAL 2" x 3.5" 12 PIN HEADER	3	
AMS3A051-900	HARNESS WIRE AMS3A051 PANEL AM2K PCB	1	
ACMU1P06	LED RED DIALIGHT 5V	1	APPROACHING SURF
AMS4P307	SONALERT SC616N MALLORY 4-16V 6-22mA	1	
AMS4M012	BRACKET SONALERT TWO LEG	1	
AMS4P020	SWITCH SPDT TOGGLE LOCKING MTL-106D ALCO	1	POWER
AMS4P044	SWITCH DPDT TOGGLE MOM OFF MOM PANEL MOUNT C&K 7205SYZQE	1	T-ZERO, D-ZERO, REST
ACMU1P12	FUSE HOLDER #LF342004	2	F2 - LOAD PIN
AMS4P107	FUSE 0.5 A SLO-BLO LITTELFUSE 313.500	1	F1 - ENCODER
AMS4P125	FUSE 2 AMP 250 VOLT SLO BLO	1	F2 - DC IN
AMS7P013	CONN MS3102E18-9P LOAD CELL 7PIN	1	J2 - LOAD PIN IN
ACMU3P01	CONN MS3102E14S-9P RECEPT DETECTOR	1	J5 - POWER IN
ACMU3P02	CONN MS3102E14S-9S RECEPT MAG MARKER	1	J7 -OVER TENSION OUT
AMS4P037	CONN MS3102E16S-1P 7 PIN RCP	1	J3 - ENCODER OUT
AMS7P068	SCREW JACK D-CONNECTOR KEYSTON E 7231	2	
AMS4P038	CONN MS3102E16S-1S 7 SOC RCP	1	J1 - ENCODER IN
AMS4P198	SPACER UNTHREADED RND NYLON #4 5/16L x 3/16 OD (100/PK)	12	
AMS4M076	WINDOW LED RECESSED SERIAL DCI DISPLAY	3	

BILL OF MATERIALS - 50 SERIES PANELS - AMS4A051 continued

P/N	DESCRIPTION	QTY	REF
AMS4P039	CONN MS3102E14S-5P	1	J4 - TENSION OUT
AMS4M150	PANEL FRONT CASED HOLE WINCH OPERATOR KMS	1	
AMS4M051	CHASSIS WINCH OP PNL CASED HOL	1	
AMS4M052	PANEL TOP WINCH OP CASED HOLE	1	
AMS4M053	PANEL REAR CASED HOLE OP PNL	1	
40195	SWITCH SPST PB NO MOM LIGHTED NKK HB15SKW01-5C-CB	1	APPROACHING SURFACE
FSU1P028	NUTPLATE SHELL 14 4-40 AMPHENOL	3	
FSU1P029	NUTPLATE SHELL 16 4-40 AMPHENOL	2	
FSU1P030	NUTPLATE SHELL 18 4-40 AMPHENOL	1	
AMS4A925	PCB ASSY RF FLTR BD AMS4A050	1	
AMS4P164	CONN DB9S CRIMP AMP USED WITH SOCKET 205090-1	1	J6 - RS232
AMS5P191	SWITCH SPDT MOM PUSHBUTTON NKK MB2011SS1W01-RO	5	
AMS5P192	SWITCH CAP SCREW ON BLACK NKK AT407A	4	
AMS5P193	SWITCH CAP SCREW ON RED NKK AT407C	1	DEPTH ZERO
AMS4P139	CABLE ASSY USB TYPE A TO B 3 METERS	1	

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benchmarkwireline.com

BILL OF MATERIALS - 50 SERIES PANELS - AMS4A055

P/N	DESCRIPTION	QTY	REF
AMS3A055	PANEL HOIST OPERATOR DISPLAY 4-20ma TEN TRANSDUCER INPUT		
AMS3A055-900	HARNESS AMS3A055 PANEL AM2K BD	1	
AMS4P119	METER ANALOG DIFF TENSION +/- DUAL SCALE 500 KG - 1000 LBS BLACK NEEDLE	1	
AM2KP134	PC BOARD AMS2K ACQUISITION BOARD	1	
AMS4P128	DISPLAY LED RED 0.5" 14 SEGMNT SERIAL 2" x 3.5" 12 PIN HEADER	3	LINE SP,DEPTH,TENS
SW-512K06	SOFTWARE FOR MODEL 51-56 DEPTH AND TENSION PANELS AM2K PCB	1	
ACMU1P06	LED RED DIALIGHT 5V	1	POWER LIGHT
AMS4P307	SONALERT SC616N MALLORY 4-16V 6-22mA	1	
AMS4M012	BRACKET SONALERT TWO LEG	1	
AMS4P020	SWITCH SPDT TOGGLE LOCKING MTL-106D ALCO	1	T-Z,T-TS,RES,Z-DP,ME
AMS4P044	SWITCH DPDT TOGGLE MOM OFF MOM PANEL MOUNT C&K 7205SYZQE	1	D-ZERO
ACMU1P12	FUSE HOLDER #LF342004	2	F2 - LOAD PIN
AMS4P107	FUSE 0.5 A SLO-BLO LITTELFUSE 313.500	1	F1 - ENCODER
AMS4P125	FUSE 2 AMP 250 VOLT SLO BLO	1	F2 - DC IN
AMS7P021	CONN 102398-4 AMP 12 POS PCB HARNESS BODY	10	102398-4
AMS7P023	CONN 102536-4 AMP 12 POS BACK COVER	10	
AMS7P024	CONN 102681-1 AMP 12 POS FRONT COVER	10	
AMS7P026	CONN 102536-6 AMP 16 POS BACK COVER	2	AMP 102536-6
AMS7P022	CONN 102398-6 AMP 16 POS PCB HARNESS BODY	2	
AMS7P025	CONN 102681-3 AMP 16 POS FRONT COVER DCI DISPLAY	2	DCI DISPLAY

BILL OF MATERIALS - 50 SERIES PANELS - AMS4A055 continued

P/N	DESCRIPTION	QTY	REF
C276P366	CONN MS3102E14S-5S	1	J2 - LOAD PIN IN
ACMU3P01	CONN MS3102E14S-9P RECEPT DETECTOR	1	J5 - POWER IN
ACMU3P02	CONN MS3102E14S-9S RECEPT MAG MARKER	1	J7 -OVER TENSION OUT
AMS7P015	CONN DE-9S RS232	0	
AMS4P037	CONN MS3102E16S-1P 7 PIN RCP	1	J3 - ENCODER OUT
AMS7P068	SCREW JACK D-CONNECTOR KEYSTON E 7231	2	
AMS4P038	CONN MS3102E16S-1S 7 SOC RCP	1	J1 - ENCODER IN
AMS4P198	SPACER UNTHREADED RND NYLON #4 5/16L x 3/16 OD (100/PK)	12	
AMS4M076	WINDOW LED RECESSED SERIAL DCI DISPLAY	3	
AMS4P039	CONN MS3102E14S-5P	1	J4 - TENSION OUT
AMS4M150	PANEL FRONT CASED HOLE WINCH OPERATOR KMS	1	
AMS4M051	CHASSIS WINCH OP PNL CASED HOL	1	
AMS4M052	PANEL TOP WINCH OP CASED HOLE	1	
AMS4M053	PANEL REAR CASED HOLE OP PNL	1	
40195	SWITCH SPST PB NO MOM LIGHTED NKK HB15SKW01-5C-CB	1	APPROACHING SURFACE
FSU1P028	NUTPLATE SHELL 14 4-40 AMPHENOL	4	
FSU1P029	NUTPLATE SHELL 16 4-40 AMPHENOL	2	
AMS4P164	CONN DB9S CRIMP AMP USED WITH SOCKET 205090-1	1	J6 - RS232
AMS5P192	SWITCH CAP SCREW ON BLACK NKK AT407A	4	T-ZER,T-TST,RES,MENU
AMS5P191	SWITCH SPDT MOM PUSHBUTTON NKK MB2011SS1W01-RO	5	T-Z,T-TS,RES,Z-DP,ME
AMS5P193	SWITCH CAP SCREW ON RED NKK AT407C D-ZERO	1	D-ZERO

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BILL OF MATERIALS - 50 SERIES PANELS - AMS4A056

P/N	DESCRIPTION	QTY	REF
AMS3A056	PANEL HOIST OPERATOR DISPLAY LOW VOLTAGE TENSION SIGNAL		
SW-512K06	SOFTWARE FOR MODEL 51-56 DEPTH AND TENSION PANELS AM2K PCB	1	
AM2KP134	PC BOARD AMS2K ACQUISITION	1	
AMS4P119	METER ANALOG DIFF TENSION +/- DUAL SCALE 500 KG - 1000 LBS BLACK NEEDLE	1	
AMS4P128	DISPLAY LED RED 0.5" 14 SEGMNT SERIAL 2" x 3.5" 12 PIN HEADER	3	
ACMU1P06	LED RED DIALIGHT 5V	1	APPROACHING SURF
AMS4P307	SONALERT SC616N MALLORY 4-16V 6-22mA	1	
AMS4M012	BRACKET SONALERT TWO LEG	1	
AMS4P020	SWITCH SPDT TOGGLE LOCKING MTL-106D ALCO	1	POWER
AMS4P044	SWITCH DPDT TOGGLE MOM OFF MOM PANEL MOUNT C&K 7205SYZQE	1	+ / -
ACMU1P12	FUSE HOLDER #LF342004	2	
AMS4P107	FUSE 0.5 A SLO-BLO LITTELFUSE 313.500	1	F1 - ENCODER
AMS4P125	FUSE 2 AMP 250 VOLT SLO BLO	1	F2 - DC IN
AMS3A056-900	HARNESS WIRE AMS3A056 PANEL AM2K PCB	1	
AMS4P164	CONN DB9S CRIMP AMP USED WITH SOCKET 205090-1	1	
AMS4P171	CONN KPSE02E12-10S RECEPTACLE 10 SOCKETS	1	

BILL OF MATERIALS - 50 SERIES PANELS - AMS4A056 continued

P/N	DESCRIPTION	QTY	REF
AMS4P139	CABLE ASSY USB TYPE A TO B 3 METERS	1	
AMS4P169	CONN KPSE02E12-3P RECEPT	1	J5 - POWER IN
AMS4P179	CONN KPSE02E12-3S RECEPTACLE 3 SOCKETS	1	J7 -OVER TENSION OUT
AMS7P015	CONN DE-9S RS232	0	
AMS4P037	CONN MS3102E16S-1P 7 PIN RCP	1	J3 - ENCODER OUT
AMS7P068	SCREW JACK D-CONNECTOR KEYSTON E 7231	2	
AMS4P038	CONN MS3102E16S-1S 7 SOC RCP SCHB=8536.69.4020	1	J1 - ENCODER IN
AMS4P198	SPACER UNTHREADED RND NYLON #4 5/16L x 3/16 OD (100/PK)	12	
AMS4M076	WINDOW LED RECESSED SERIAL DCI DISPLAY	3	
AMS4P039	CONN MS3102E14S-5P	1	J4 - TENSION OUT
AMS4M150	PANEL FRONT CASED HOLE WINCH OPERATOR KMS	1	
AMS4M051	CHASSIS WINCH OP PNL CASED HOL	1	
AMS4M052	PANEL TOP WINCH OP CASED HOLE	1	
AMS4M053	PANEL REAR CASED HOLE OP PNL	1	
40195	SWITCH SPST PB NO MOM LIGHTED NKK HB15SKW01-5C-CB	1	APPROACHING SURFACE
FSU1P028	NUTPLATE SHELL 14 4-40 AMPHENOL	1	
FSU1P029	NUTPLATE SHELL 16 4-40 AMPHENOL	2	
FSU1P027	NUTPLATE SHELL 12 4-40 AMPHENOL	3	J6 - RS232
AMS5P191	SWITCH SPDT MOM PUSHBUTTON NKK MB2011SS1W01-RO	5	
AMS5P192	SWITCH CAP SCREW ON BLACK NKK AT407A	4	
AMS5P193	SWITCH CAP SCREW ON RED NKK AT407C	1	DEPTH ZERO

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RECOMMENDED SPARE PARTS - 50 SERIES PANELS

All parts listed are Critical Spares and are required to properly maintain this device.

We recommend that all customers stock the quantity indicated in the '**QTY**' column. **IF** you are in a remote location or prefer having immediate availability of all spares, we recommend that you stock at least one of each item.

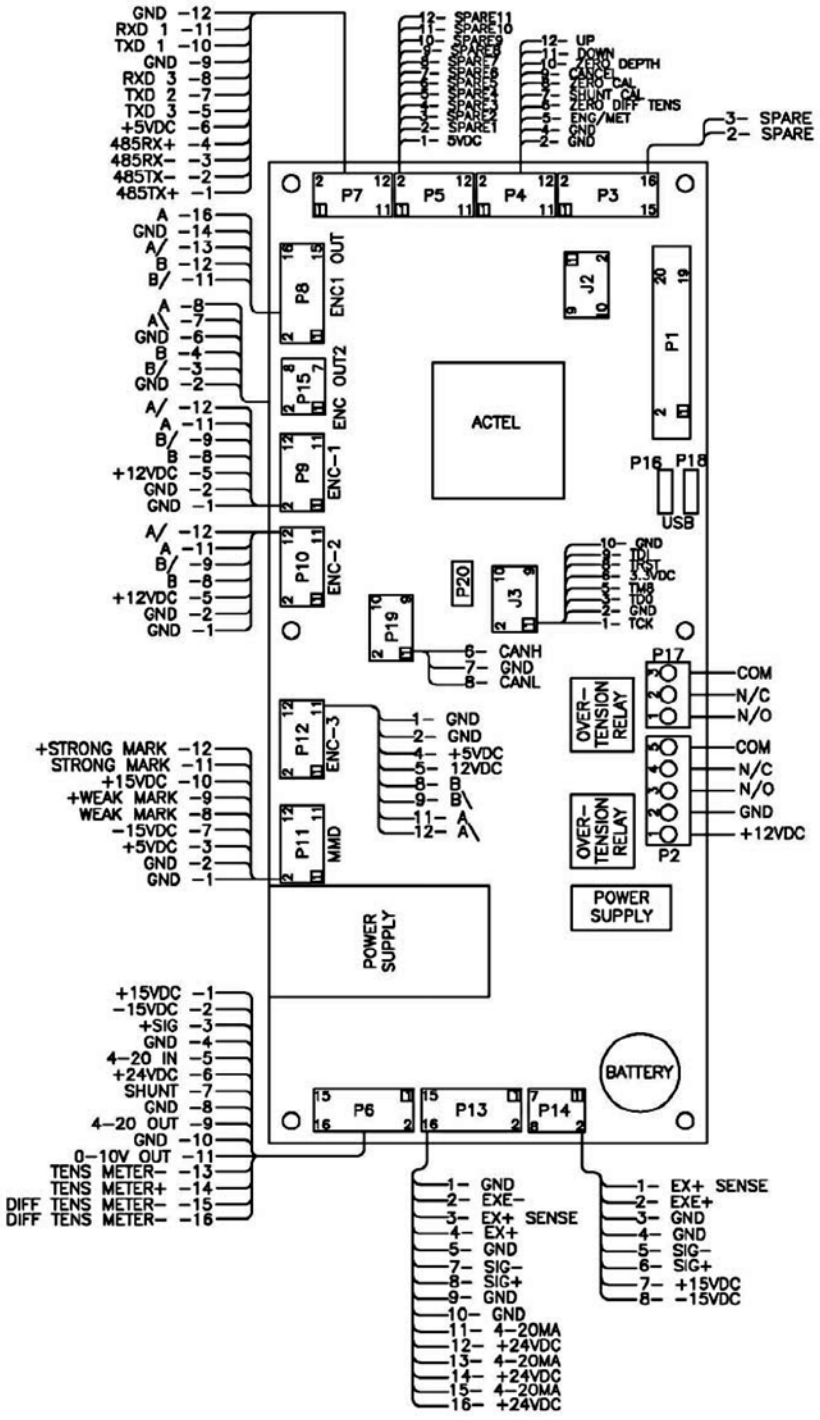
NOTE – BenchMark may not always have all spares in stock all the time.

P/N	DESCRIPTION	QTY	REF
RECOMMENDED SPARE PARTS FOR ALL LOCATONS			
AMS4P128	DISPLAY LED .5" SERIAL 2"X3.5"	1	D1, D2, D3
40195	LED RED DIALIGHT 5V	1	APPROACHING SURF
AMS4P307	SONALERT #SC628D MALLORY	1	ALARM
AMS4P020	SWITCH MTL-106D ALCO LOCKING	1	POWER ON/OFF
AMS5P191	SWITCH MPA-106F ALCO PUSH MOM	5	MENU, T-ZERO, T-TEST, D-ZERO, METER RESET
AMS4P044	SWITCH TOGGLE DPDT MOM OFF MOM	1	+ / -
AMS5P192	SWITCH CAPS ALCO C-22 BLACK	5	T-ZERO,D-ZERO, METER RESET, T-TEST
AMS5P193	SWITCH CAP ALCO C-22 RED	1	D-ZERO
ACMU1P12	FUSE HOLDER #LF342004	2	FUSE HOLDER
AMS4P107	FUSE SLO-BLO 1/2 A LITTELFUSE	1	F1 - ENCODER
AMS4P125	FUSE 2 AMP 250 VOLT SLO BLO	1	F2 - DC IN
AMS4M004	WINDOW LED SERIAL DCI DISPLAY	1	PLASTIC WINDOW
RECOMMENDED SPARE PARTS FOR REMOTE LOCATONS			
AM2KP134	PC BOARD ASSEMBLY AM2K ACQUISITION	1	PCB ASSY
AMS4P119	METER ANALOG DIFF TENSION (+/- 1000 LBS)	1	M1

NOTE – PC Boards for 4A panels are no longer manufactured or available. Should a board failure occur, a conversion kit and the new board can be ordered.

6.0 DRAWINGS, DIAGRAMS & LISTS

6.1 AM2KP134 ACQUISITION BOARD SCHEMATIC



6.1 AM2KP134 ACQUISITION BOARD SCHEMATIC

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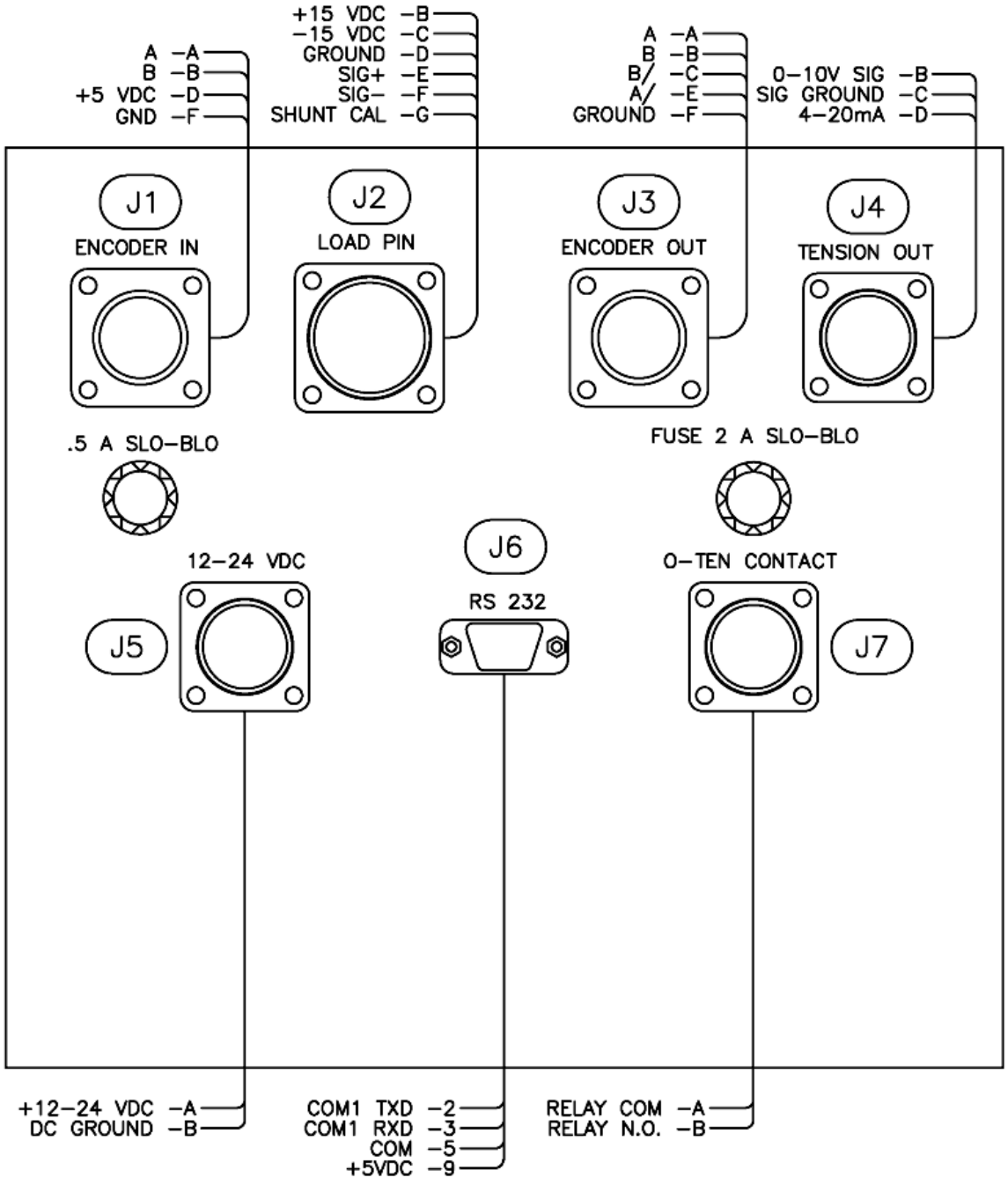
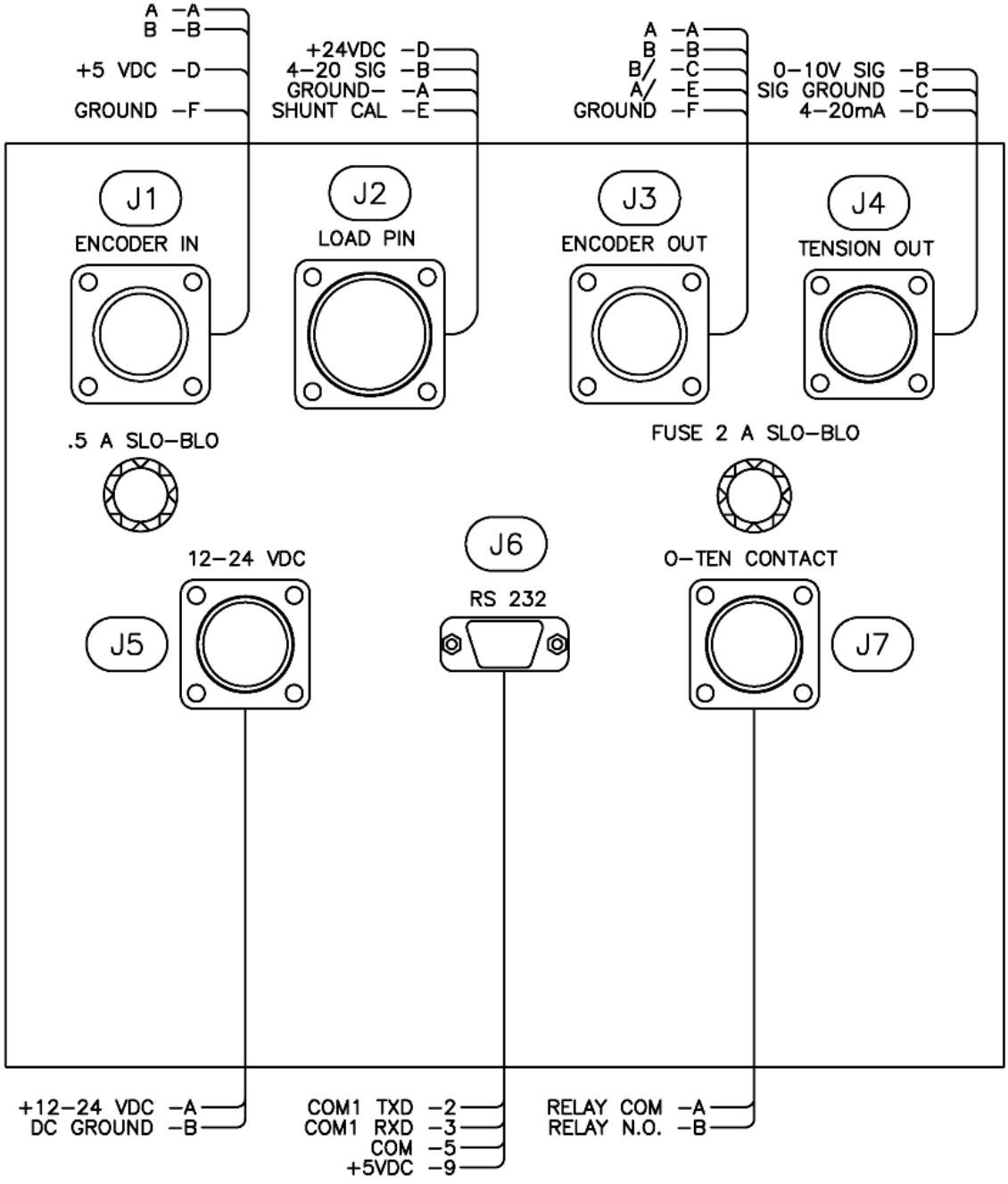
6.1 AM2KP134 ACQUISITION BOARD SCHEMATIC

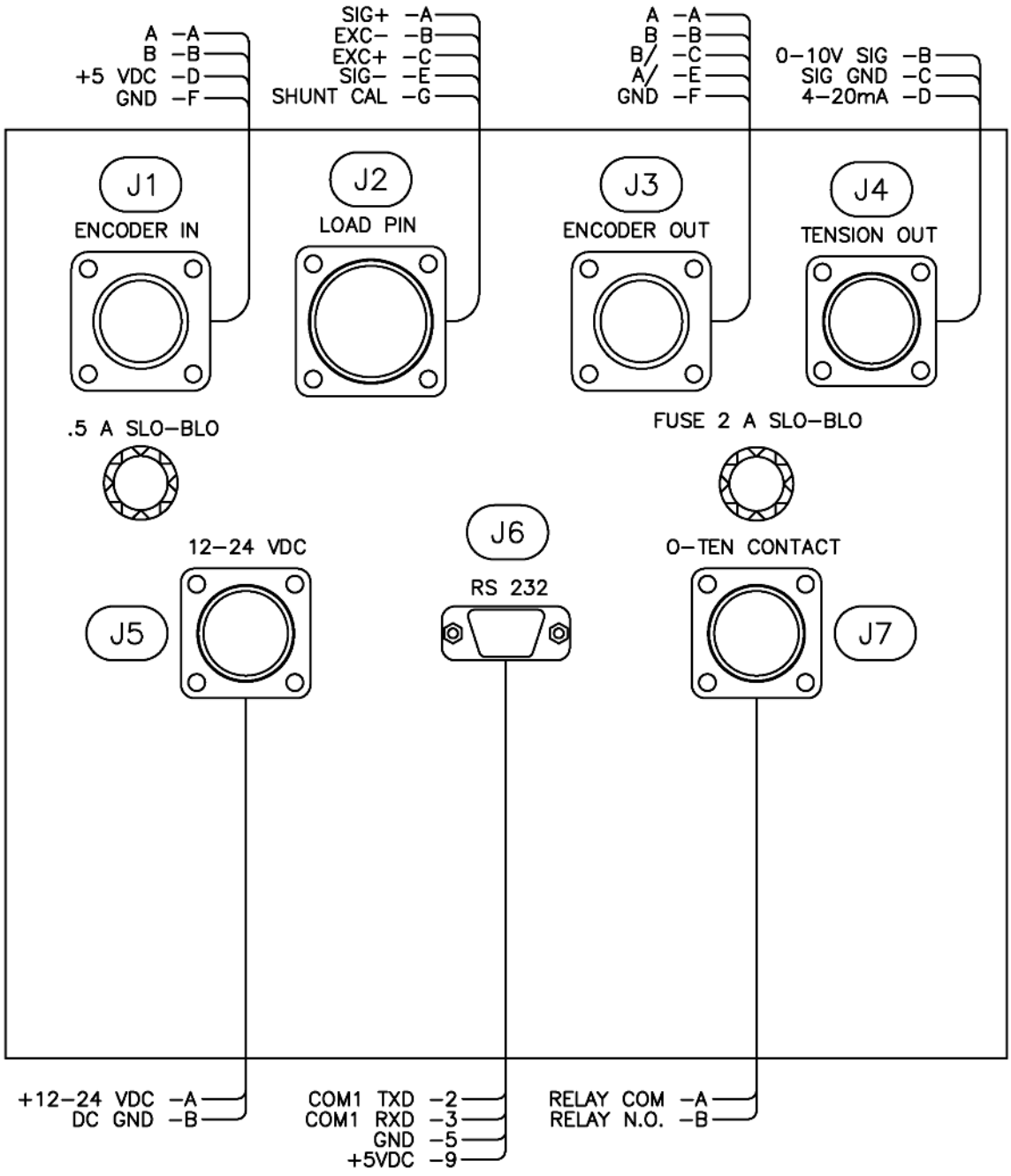
6.2 REAR PANEL WIRING – AMS3A051



6.2 REAR PANEL WIRING – AMS3A055



6.2 REAR PANEL WIRING – AMS3A056



7.0 CABLES

NOTE – View equipment system diagrams to identify the specific cable desired.

For technical questions, please make inquiries below:

OBTAINING TECHNICAL ASSISTANCE

Call BenchMark Wireline Products Inc. at +1 281 346 4300
Or contact by email mail@benchmarkwireline.com
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Information in the form of user manuals and instructional videos are also available on our 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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