BenchMark Wireline Products
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OPERATIONS AND MAINTENANCE MANUAL
WINCH OPERATORS PANEL
STANDARD CONFIGURATION

40 Series Panels

41 - 141 - 142 - 247

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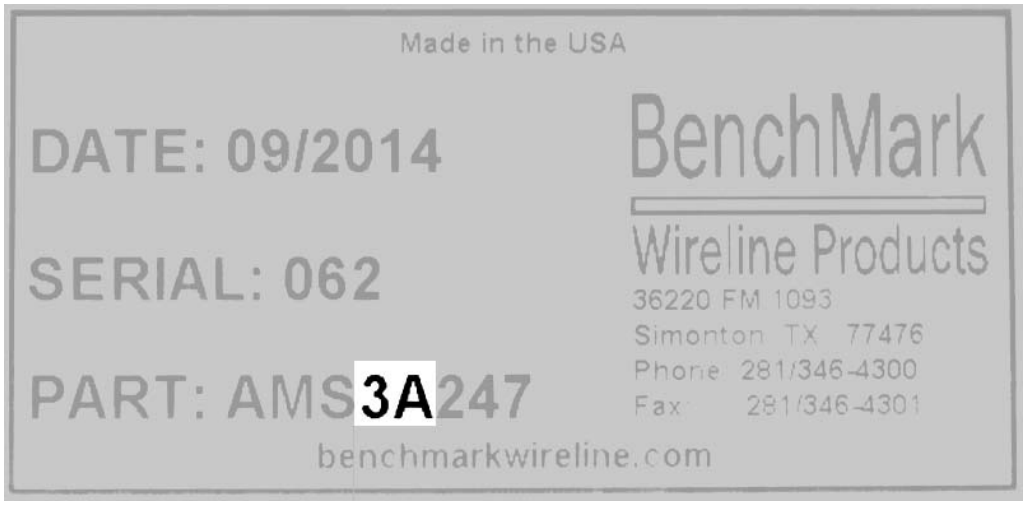
TABLE OF CONTENTS

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.

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 - 40 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 LOCATIONS			
AMS4P020	SWITCH SPDT TOGGLE LOCKING MTL-106D ALCO	1	POWER
AMS5P205	SWITCH SPDT TOGGLE ON-ON	1	INC/DIFF
AMS4P044	SWITCH DPDT TOGGLE MOM OFF MOM PANEL MOUNT C&K 7205SYZQE	1	+ / -
40195	SWITCH SPST PB NO MOM LIGHTED NKK HB15SKW01-5C-CB	1	ALARM RESET
AMS5P191	SWITCH SPDT MOM PUSHBUTTON NKK MB2011SS1W01-RO	5	
AMS5P194	SWITCH DPDT MOM PUSHBUTTON NKK MB2061SS1W01-RO	1	T-CAL
AMS5P192	SWITCH CAP SCREW ON BLACK NKK AT407A	5	
AMS5P193	SWITCH CAP SCREW ON RED NKK AT407C	1	DEPTH ZERO
RECOMMENDED SPARE PARTS FOR REMOTE LOCATIONS			
AM2KP134	PC BOARD AMS2K ACQUISITION BOARD	1	3A PANELS ONLY
AMS4A154	METER 4" SHALLOW HSG CROMPTON DUAL SCALE +/- 500KG 1000LB	1	
AMS4P128	DISPLAY LED RED 0.5" 14 SEGMNT SERIAL 2" x 3.5" 12 PIN HEADER	4	
ACMU1P06	LED RED DIALIGHT 5V	1	METRIC

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:
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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.

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 247 panel contains a newly designed main processor board designated the 2K Board. Because of advances in computer hardware, several small boards on the legacy4A 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 –

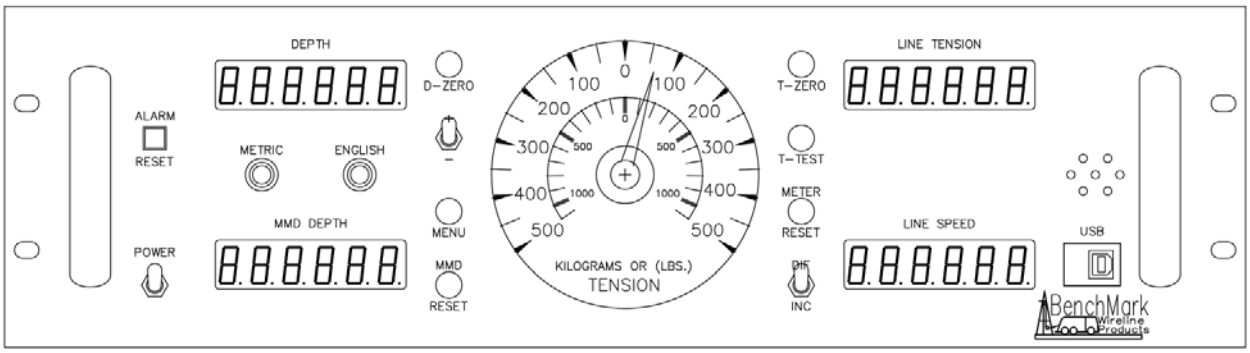
Simplified Software Updates – Updates will be loaded on a thumb drive, inserted into the proper USB port for downloading and by powering the board off then on, the panel will automatically install updates.

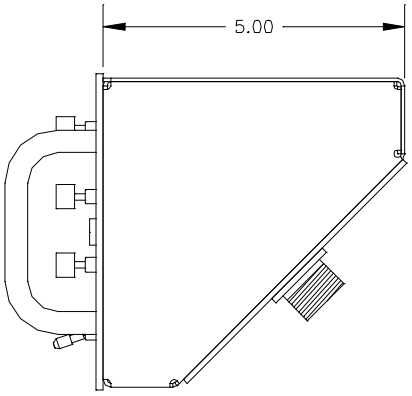
Users will experience almost no difference in user interface, menu selections or function between the new and legacy panels.

2.3 FEATURES

- Digital displays for depth, line speed, tension and magnetic marks (or CCL offset)
- 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 for Magnetic Marks, 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 with records both depth and tension data to a solid state memory device

2.4 GENERAL SPECIFICATIONS

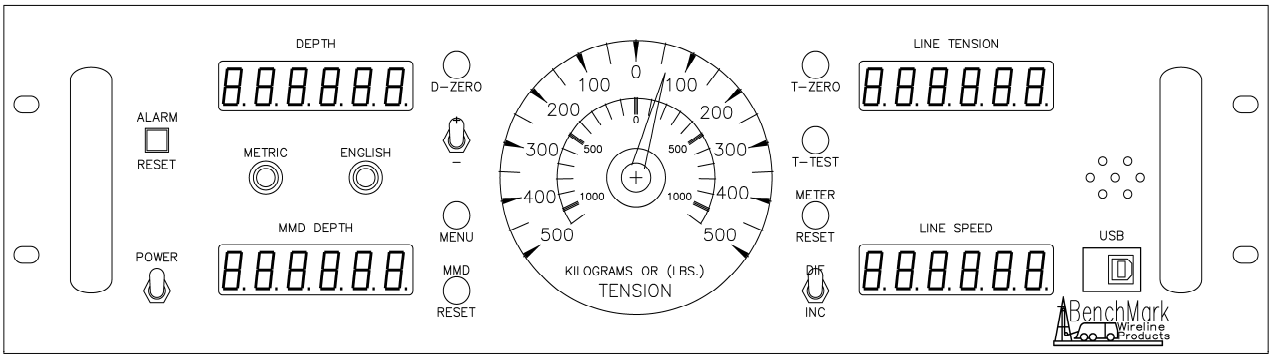




WEIGHT	5.5 LBS (2.5 KG)
TEMPERATURE RATING	-20 to 140 deg F
POWER SUPPLY	9 – 30 VDC @ 2 AMP MAX
MAXIMUM LINE SPEED	3000 FT/MIN @ 600 PULSES/FT
MINIMUM LINE SPEED	.6 FT (.18 M) per MINUTE
MAXIMUM LINE TENSION	25,000 LBS (11,340 KG)
DIGITAL TENSION	6 DIGITS WITH 1 LB OR 1KG RESOLUTION
DIGITAL LINE SPEED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

This meter provides a digital display of the CCL offset depth. This depth can be set to provide a visual indication of the CCL depth in addition to “bull-plug” depth.

If magnetic marks are used, this meter will display the depth of the last mark detected.

2.5.8 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.

2.5.9 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).

2.5.10 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.

2.5.11 + / - 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.

2.5.12 ALARM RESET LED AND ALARM

This LED is lit and an audible alarm is sounded when the depth is less than 200' (61 m) 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.

2.5.13 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.

2.5.14 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.

2.5.15 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.

2.5.16 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, 24vdc 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 MMD IN

DC power is provided to the magnetic mark detector and signal is received from the mark detector on this connector.

2.6.6 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 6 for details on using this port.

2.6.7 SIGNAL OUTPUT

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

2.6.8 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.

2.6.9 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 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.

Note: The options for the AM3K and the AM5K measuring heads are not identical.

Note: The panel can be configured for use with either the AM3K or AM5K measuring head. On the new 3A panel the measuring head is selected within the Menu Commands.

On the legacy 4A panel, this selection is made by moving the Jumpers on the main board. See section 4.13.2 for instructions on moving the Jumpers. 4A panels have software number 247008 and lower.

3.1 TENSION ALARM - AM3K & AM5K

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

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

Indication: **TENALM** will be displayed on the DEPTH display and the value will be displayed on the TENSION display as it is being set.

Selection: 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	AM3K or AM5K
7-32	1500	AM3K or AM5K
1-4	2000	AM3K or AM5K
9-32	2400	AM3K or AM5K
5-16	2400	AM3K or AM5K
3-8	2400	AM3K or AM5K
7-16	2400	AM5K ONLY
15-32	2400	AM5K ONLY
.474	2400	AM5K ONLY
.474DG	2400	AM5K ONLY
.484	2400	AM5K ONLY
.492	2400	AM5K ONLY
.550	2400	AM5K ONLY
.650	2400	AM5K ONLY
Other	2400	AM3K or AM5K

3.2 DELTA TENSION ALARM - AM3K & AM5K

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.

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

Indication: **DTALRM** will be displayed on the DEPTH display and the value being set will be displayed on the TENSION display as it is being adjusted.

3.3 TENSION SHUTDOWN - AM3K & AM5K

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.

Procedure: Use +/- switch to set tension shutdown setting

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

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

Default Values

3-16	2000	AM3K or AM5K
7-32	2000	AM3K or AM5K
1-4	2500	AM3K or AM5K
9-32	3000	AM3K or AM5K
5-16	3500	AM3K or AM5K
3-8	3500	AM3K or AM5K
7-16	3500	AM5K ONLY
15-32	3500	AM5K ONLY
.474	3500	AM5K ONLY
.474DG	3500	AM5K ONLY
.484	3500	AM5K ONLY
.492	3500	AM5K ONLY
.550	3500	AM5K ONLY
OTHER	3500	AM3K or AM5K

3.4 CABLE SIZE - AM3K & AM5K

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

For AM3K heads, wheel size is also automatically set for the selected cable size.

If 'Other' is selected, the Tension Coefficient (TENCOF) value needs to be entered. This value is based on the bend angle of the cable over the tension wheel. This value is empirically derived and must be furnished by the measuring head manufacturer.

Procedure: Use +/- switch to select cable size.

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

Cable Size Values available

3-16	AM3K or AM5K
7-32	AM3K or AM5K
1-4	AM3K or AM5K
9-32	AM3K or AM5K
5-16	AM3K or AM5K - Default for AM3K
3-8	AM3K or AM5K
7-16	AM5K only
15-32	AM5K only
.474	**USE THIS SETTING W/ DEEP GROOVED WHEEL AM5K ONLY**
.474DG	AM5K only
.484	AM5K only
.492	AM5K only
.550	AM5K only
.650	AM3K or AM5K
OTHER	AM3K or AM5K - **DEFAULT VALUE .474 FOR AM5K**

3.4 CABLE SIZE - AM3K & AM5K continued

HIGH TENSION (DEEP GROOVE) WHEEL

The .474DG and larger cable sizes designate the High Tension or deep grooved tension wheel when installed on the AM5K measuring head (refer to AM5K measuring head user manual). This wheel is used for high tension operations or with cable requiring less bend. It can only be used with .474DG or larger cables.

The other tension wheel available on the AM5K measuring head is a shallow groove or flat wheel. This wheel will work with 15-32 and smaller cable sizes.

OTHER

If you select the "OTHER" setting, you will be allowed to change the measuring wheel circumference and the load cell factor. This allows the panel to with a different type of measuring head or a different load cell, such as a derrick mounted load cell.

When "OTHER" is selected, two additional inputs will be required:

CALVAL and WHLCIR.

This setting is for the load cell or load pin shunt value. The default for the AM5K is 10,000 lbs and for the AM3K is 5,000 lbs.

WHLCIR (Wheel Circumference) This value is set to the circumference of the measuring wheel to ensure the depth is measured correctly. Default value is 2.0 ft.

TENCOF (Tension Coefficient) The TENCOF value can be used to adjust the tension reading from the load cell or the load pin. The range for cable ‘Other’ is +/- 0.2 and the range for all other cable sizes is +/- 0.1. This equates to a tension factor of +/- 20% (percent) and +/- 10% (percent), respectively.

3.5 DEPTH ADJUST (Shim) AM3K OR AM5K

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

Procedure: Use +/- switch to set the shim setting.

Indication: 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.
Default value is 0.

3.6 DEPTH ALARM AND SHUTDOWN - AM3K OR AM5K

1. When this value is set, it corresponds to the depth shutdown.

2. The depth alarm is automatically set to 25 feet deeper than the shutdown value.

3. This alarm and shutdown activates when the panel depth is deeper than the set values and the cable is moving uphole. This is known as 'Approaching The Surface Alarm And Shutdown'.

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

5. When shutdown depth value is reached, the alarm will sound again, the LED will continue to flash and the shutdown relay will energize. Pressing the LED switch will turn off the alarm and de-energize the shutdown relay but the light will continue to flash.

6. Procedure: Use +/- switch to set the depth alarm value.

Indication: DPTHSD will be displayed on the DEPTH display and the value will be displayed on the TENSION display as it is being set. Default value is 200'

3.7 MMD or CCL - AM5K ONLY

Either MMD or CCL can be selected. MMD provides a the ability to detect magnetic marks. CCL provides a means to display the offset between the CCL depth and the bull plug depth.

Procedure: Use +/- switch to select either MMD or CCL.

3.7.1 CCL - AM3K OR AM5K

The CCL depth will be displayed on the MMD meter. This makes it easier to monitor CCL depth in addition to bottom of tool depth. The following menu options are available.

CCL OFFSET

The CCL depth will be displayed on the MMD meter. This makes it easier to monitor CCL depth in addition to bottom of tool depth.

Procedure: Use +/- switch to set the CCL offset depth

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

OFFSET

Use +/- switch to set the CCL offset depth

LOG

The following menu options are available:

LOG CCL

Displays latest 100 collars. Will overwrite the oldest collar after 100.

CCL DLY

Use +/- switch to set delay from 1.0 to -0.1 Adds or subtracts to detected collar depth.

CCL_BP

Turns detected CCL audio on or off.

3.7.1 CCL - AM3K OR AM5K continued

STRCOR (stretch correction) - AM3K OR AM5K

Use +/- switch to toggle between ON or OFF

When STRETCH Correction is on, the panel will automatically correct depth to compensate for cable stretch. The following information will then be requested:

TOOLWT - AM3K OR AM5K

The weight of the tool string at the end of the cable. Default value is 1000 lbs.

FLUIDW- AM3K OR AM5K

The fluid weight of the well bore fluids. Default value is 8.3 lbs.

Stretch in the wireline is compensated in the following manner:

As the tool is lowered into the well the depth traveled is measured using the optical encoders 10 times a second. The tension is used to “back out” the stretch on the wireline for that segment and a non stretched depth is calculated by keeping a tally of all of the segments. This summed value is used in the following manner to calculate the depth:

If the tension is less than the calculated line weight the tool is assumed to be floating or supported in some other manner. The tension is due to the line weight so the stretch added is = summed depth * tension * Ks * 1/2 where Ks is the stretch coefficient. If the tension is greater than the line weight the stretch due to the line weight is calculated as above and all other weight is assumed to be acting over the entire length of the cable or = sum depth *((line weight * ½) + (tension-line weight)) * Ks

CCL LOG

Press the +/- switch and you will be able to see the depth at which each casing collar was detected. The MMD/CCL display will display the depth of each collar when the switch is pressed.

3.7.2 MMD - AM3K OR AM5K

The following menu options are available.

MMDCOR (MMD Correction)

Use +/- switch to toggle between ON or OFF

If MMD is set to ON the panel will automatically correct depth to correspond to magnetic mark spacing. When depth is automatically added or subtracted it will be done evenly at a rate of 1' per 10'.

STR CORR (Stretch Correction)

Stretch Correction works differently depending if MMD correction is ON or OFF.

If MMD Correction is ON and STRCORR is ON, the panel will automatically correct the MMD WINDOW depth to compensate for cable stretch. The Mark Window will change as the cable stretches to make sure the window is always set properly.

STRCORR can be turned off by selecting OFF. No stretch will be added in this case.

If MMD Correction is OFF or STRCORR is off, no stretch will be calculated.

If STRCORR is turned ON, the following information will be requested:

TOOLWT - The weight of the tool string at the end of the cable. Default value is 1000 lbs.

FLUIDW - The fluid weight of the well bore fluids. Default value is 8.3 lbs.

SPACNG

This is to set the spacing at which the magnetic marks were installed on the wireline.

Use +/- switch to toggle between 100, 25 M, 50 M.

WINDOW

The MMD window determines when the next mark can be detected. The cable must travel at least the distance of the mark spacing (100', 50m or 25m) – the window setting, before a mark can be detected. Marks can only be detected if they occur within this window. If the window is set for 5' and the mark spacing is 100', the cable must travel no less than 95' and no more than 105' from the last mark before a new mark can be detected.

The MMD Depth display will blink when the depth is within the mark Window.

The Window is disabled after the MMD Reset button is pressed and will not be enabled until the first mark is detected.

Procedure: Use +/- switch to change MMD window value.

Indication: MMD will be displayed on the DEPTH display and the window value will be displayed on the TENSION display as it is being set.
Pressing the MMD reset button clears the last mark setting.

MMD LOG

The depth of the first 25 detected marks is stored in memory and can be displayed.

Procedure: Use +/- switch to toggle through all of the marks that have been detected. This starts from the last mark detected. Pressing depth 0 will clear all the stored marks.

Indication: MMD DP will be displayed on the DEPTH display and the mark depth will be displayed on the TENSION display.

3.8 ENCODER SELECT - AM3K OR AM5K

This function allows the user to change encoders by selecting a different encoder connected to the panel.

Procedure: Use +/- switch to select which encoder input on the rear panel will be used.

Indication: ENCSEL will be displayed on the DEPTH display and the encoder selected appears on the Depth display.

a. ENC 1
b. ENC 2
c. BOTH - AM5K ONLY

If BOTH is selected, the depth will be a composite of ENC 1 or 2. The two encoders are compared 10 times per second and the encoder that moves the furthest at each comparison will be used to increment the composite depth.

Note: Encoder 1 will always turn the opposite direction from encoder 2. In direct mode (see section 3.11), the encoder output will be in the same direction as encoder 1.

3.9 ENCODER PULSES PER REVOLUTION - AM3K OR AM5K

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

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

Indication: ENCDOR will be displayed on the DEPTH display and the value will be displayed on the TENSION display as it is being set. Default value is 1200.

3.10 ENCODER DIRECTION- AM3K OR AM5K

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

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

Indication: 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 ENCOUT - ENCODER PULSES OUT CORRECTED OR DIRECT - AM3K OR AM5K

This setting determines whether the encoder output pulses reflect either corrected depth or raw depth from encoder #1 only.

Procedure: Use +/- switch to set mode.

Indication: ENCOUT will be displayed on the DEPTH display and the options: CORECT or DIRECT will be displayed on the TENSION display.

NOTE: Encoder #2 will not output pulses in DIRECT mode.

3.12 SYSTEM PULSES PER FOOT- AM3K OR AM5K

This setting determines the encoder pulse rate that will be output to the acquisition system.

Procedure: Use +/- switch to set the encoder output value.

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

3.13 DEPTH UNITS - AM3K OR AM5K

The depth values will be displayed in the units selected.

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

Indication: 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.

3.14 TENSION UNITS - AM3K OR AM5K

The tension value will be displayed in the units selected.

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

Indication: TENSION 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 simultaneously 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:

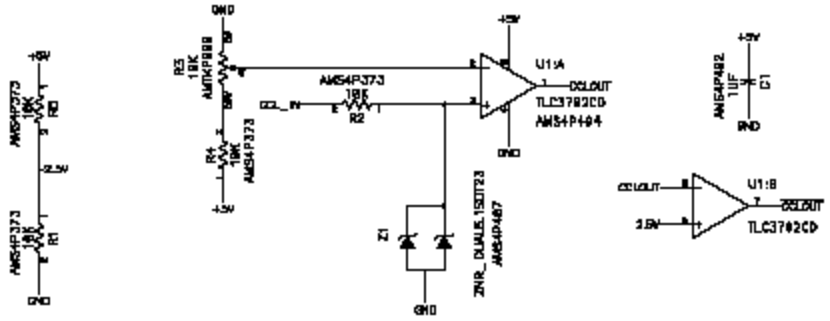
- Line Tension = 1
- Line Speed = 2
- Depth = 3
- MMD/CCL = 4

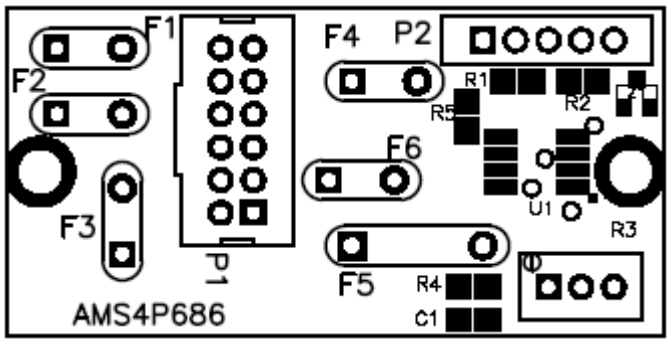
Set Baud Rate to 9600
Set Brightness to 15
Digital Display Pinout

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 - 4A panel

This device records depth and tension data along with other job parameters onto a compact flash card.

4.4.1 DATA FORMAT - 4A 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
<CR> - CARRIAGE RETURN, <LF> - LINEFEED

See following example

20091202 151415.00 E S + 41.7 0.0 2317
20091202 151416.00 E S + 42.7 0.0 2317
20091202 151417.00 E S + 43.7 0.0 2317
20091202 151418.00 E S + 44.7 0.0 2317
20091202 151419.00 E S + 45.7 0.0 2317
20091202 151420.00 E S + 52.1 0.0 2317
20091202 151555.00 E S + 57.1 0.0 2317
20091202 151556.00 E S + 57.6 0.0 2317
20091202 151557.00 E S + 57.7 0.0 2317
20091202 151558.00 E S + 58.7 0.0 2317
20091202 151559.00 E S + 59.7 0.0 2317
20091202 151600.00 E S + 60.7 0.0 2317
20091202 151601.00 E S + 61.7 0.0 2317
20091202 151616.00 E S + 64.7 0.0 2317

4.4.2 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
<CR> - CARRIAGE RETURN, <LF> - LINEFEED

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>

4.4.3 WELL NAME / UNIT NUMBER HEADER DATA - 4A panel

If a header containing information about the well, location, hoist unit number, etc. is desired on the file, connect a PC to the USB connector on the recorder face. When the directory is displayed right click the mouse and choose new file. Enter the data you wish and save the file as “unitdata.txt”. When the recorder board boots up it will look for the file “unitdata.txt” and put whatever is in the file in the new file that will record the data.

4.4.4 DATA RECORD - 4A panel

Data is written to the board 1 time per second. Data is stored in ASCII TEXT format. Each line terminates with CR and LF characters. To minimize the amount of data written to the board, the panel can be set (see 3.1) to write data only when depth is changed by more than 0.1' or when tension changes by more than 10 pounds. Interpolation can be used to fill in non written records since a DATE and TIME stamp is recorded as a part of each data record.

The panel can also be set to write data continuously so that no interpolation is necessary. This is recommend when if you want to correlate surface depth and tension readings with memory gauge readings.

The RECORD LED on the front of the DATA RECORDER board indicates that it is in RECORD mode.

The DATA LED flashes each time a data record is written.

Before removing the CompactFlash card, turn the panel power off. There is a delay when turning off the power while the data files are being closed. After a short delay, the panel will power itself off.

To continue recording on a new flash card, insert the card then turn the panel off then on. This will put the panel into record mode and write a new header file on the CompactFlash card.

New File – created or power up
YYMMDDXX where XX=0 - 99

4.4.5 DATA EXPORT - 4A panel

Early model 40 Series panels did not have a data collection capability. Log data was passed to the logging system with no data recording taking pace.

Later models recorded date on an internal CompactFlash card. The card could be accessed via an external slot on the panel. The memory board can be removed and data moved onto a PC using a standard CompactFlash Media Reader. The data can be imported into programs such as MS Excel or MS Access.

To remove the compact flash card, Press the release button to eject the flash card.

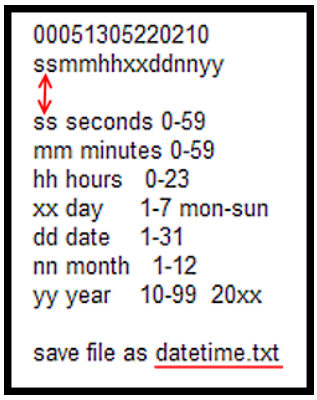
4.4.6 MEDIA CARD - 4A panel

The CompactFlash media device used in the data recorder may be ordered using part number AMS4P232. Additionally it may be acquired from any number of other retail sources. 2 GB is the minimum recommended size.

4.4.7 SETTING DATA RECORDER TIME AND DATE - 4A panel

To change the time and date of the panel follow this procedure:

1. Turn the panel on and make sure there is a flash card plugged into the panel.
2. Connect a PC to the panel using the USB program port on the panel.
3. On the PC, in Windows Explorer you will see the panel shown as an additional drive on the PC. Autoplay may show the card in the panel and click 'explore'.
4. Look for the file/folder 'howtosettime' and open it. Inside you will see the file 'datetime.txt'. Click on that file to open it. It will likely open in either Microsoft Wordpad or Notepad. The file will look like this without the red notations.



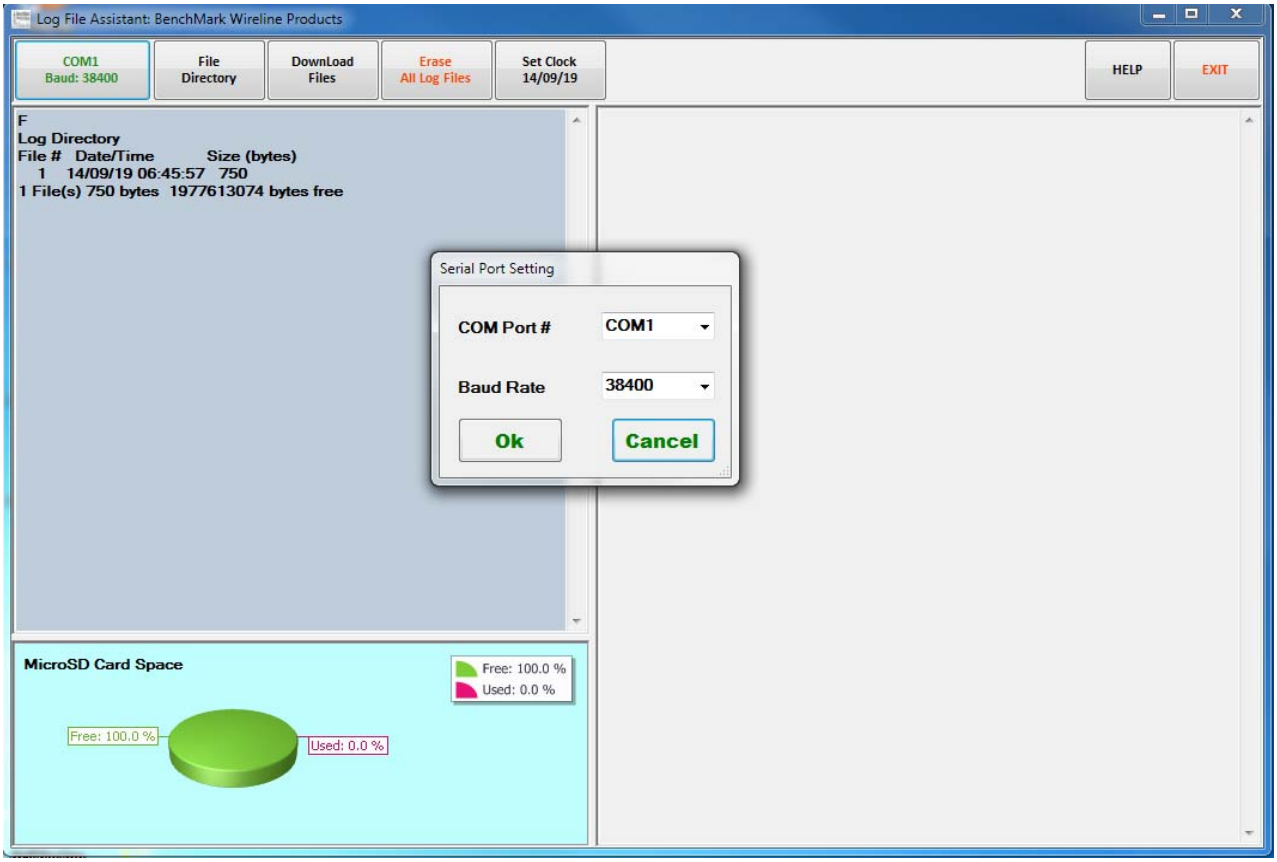
5. Following the pattern shown in the example above, change the number on the 'Top Line' to provide the correct time and date information.
6. When finished, save the updated text file as…'datetime.txt'. Remember you are saving these changes to the flash card located in the display panel.
7. Disconnect the USB cord from the panel, power the panel off then on and the proper time and date will be loaded into the panel. It is now ready to record data.

4.4.8 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.

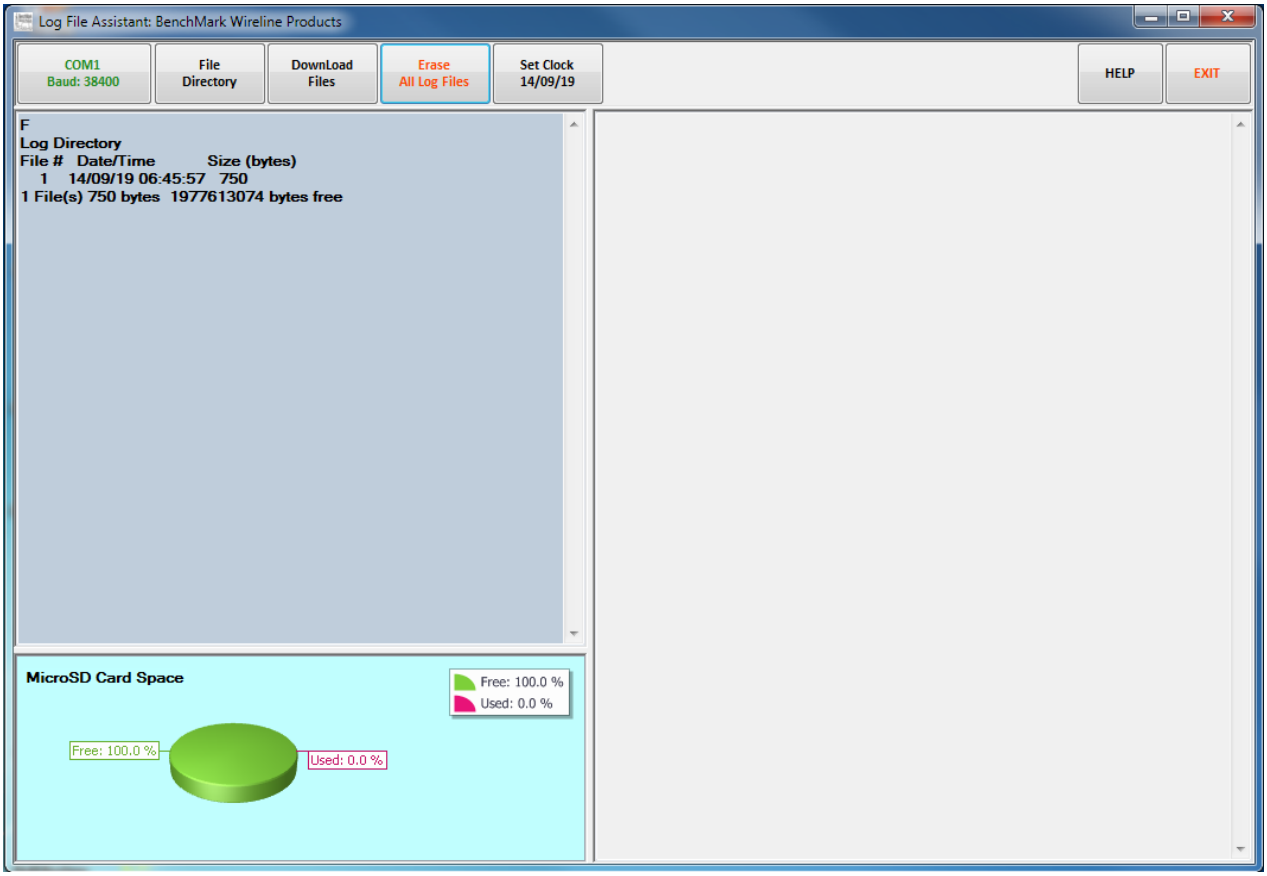
This data file download is available at www.BenchMarkWireline.com/support



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.

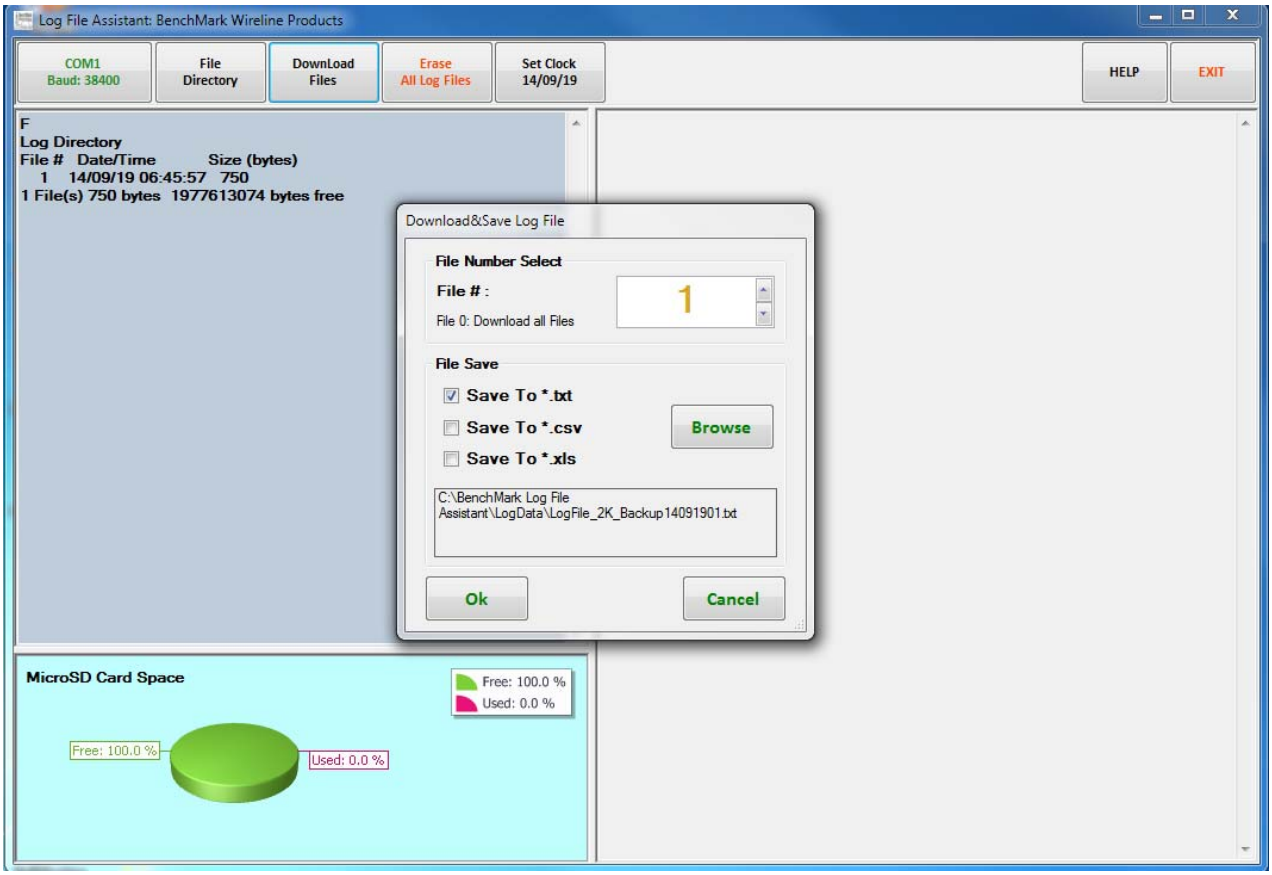
Note that the lower left pane displays the MicroSD card usage – this is where the AMS3A panel’s Log Files are stored.

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



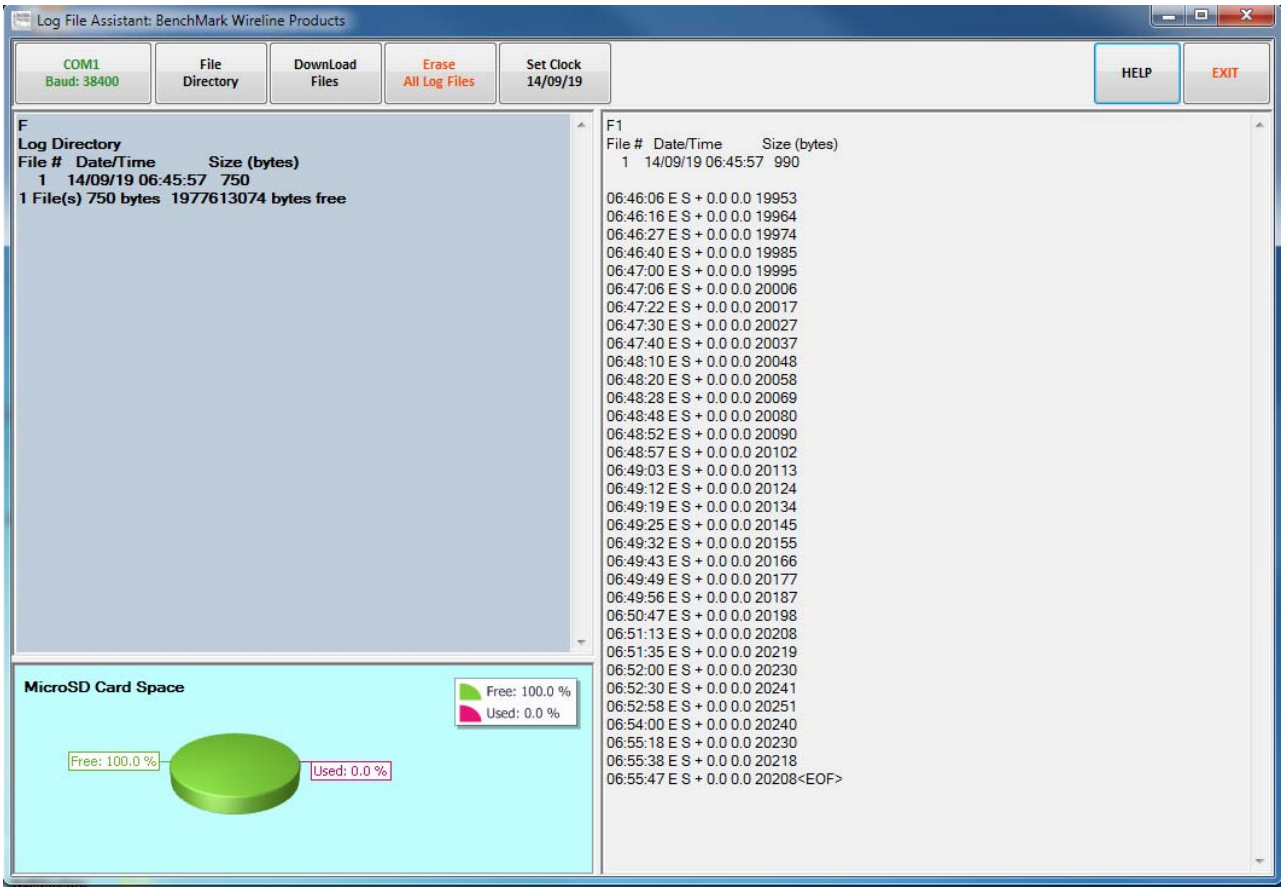
Clicking on the ‘File Directory’ button results in the listing of all log files in the left pane.

4.4.8 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.

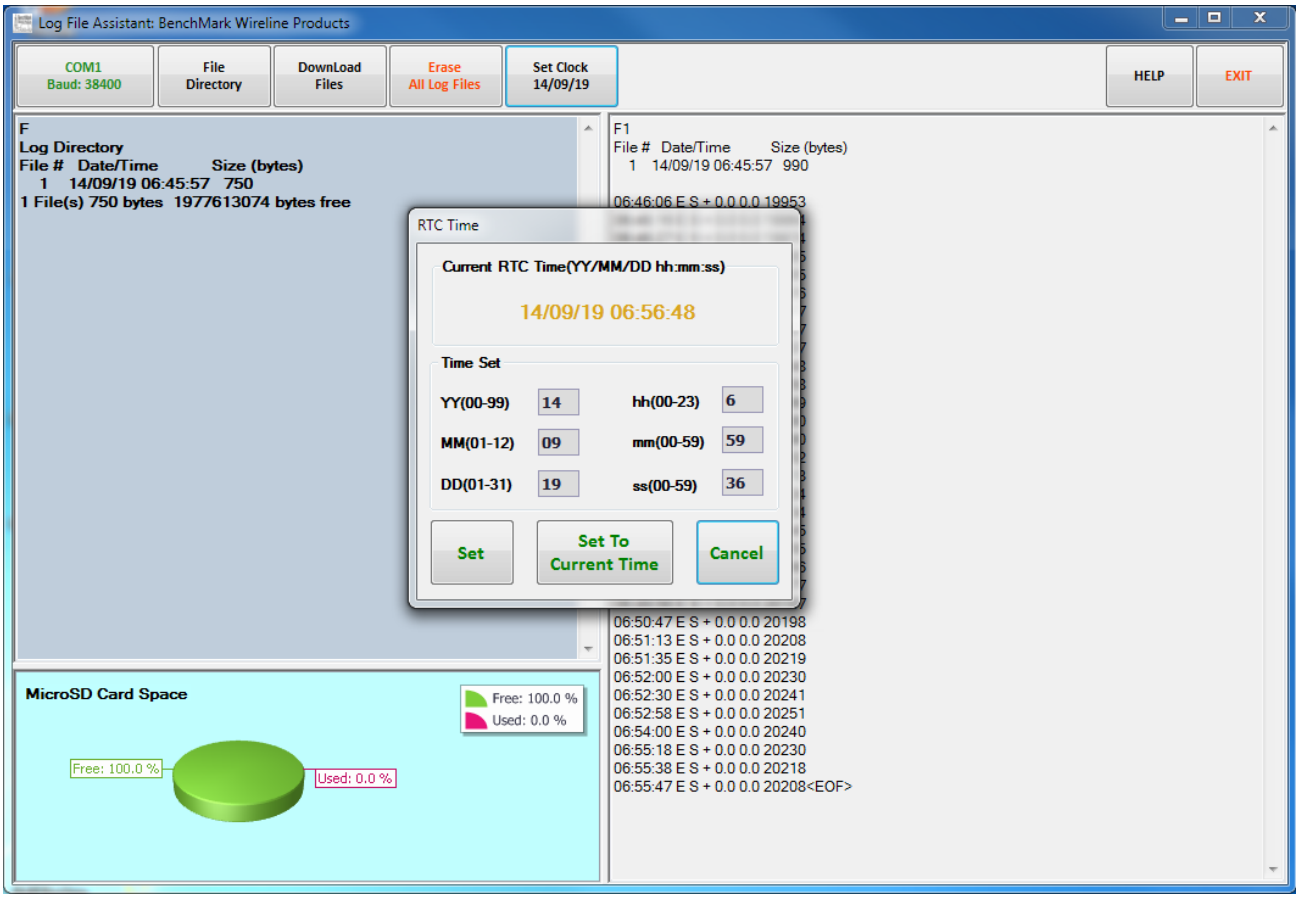
4.4.8 SOFTWARE UPDATES USING - USB PORT - 3A panel - continued



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

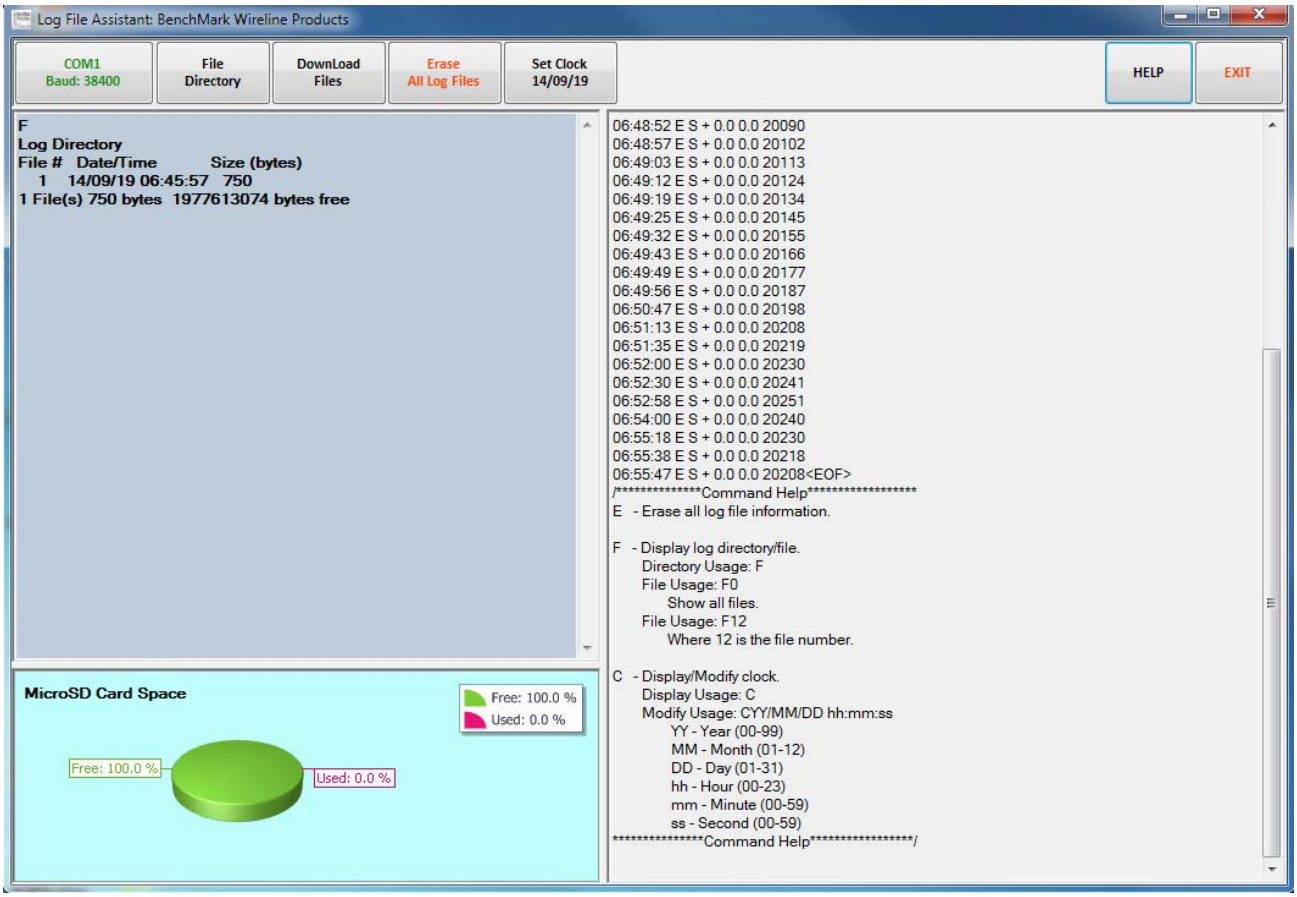
Erase All Log Files Button: Clicking on this button will open a dialog box asking for confirmation to erase all log files.

4.4.8 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.

4.4.8 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

* * * AMS4AXXX Help Screen * * *

H,? - This screen.
D - Display units, direction, depth, speed, and tension.
L - Modify load cell angle (factor) Usage: L1.2
P - Modify encoder pulses/revolution. Usage: P600
V - Verify setup status.
W - Modify wheel size (line other) (feet) Usage: W4.0
Z - Preset depth.Usage: Z0.0 |_|--> New depth.
U - Modify units of measure UF(feet);UM(meters);UP(pounds);UK(kg)
A - Depth Alarm. Usage: A100 |_|--> Depth Alarm.
N - Line Size N0 7/32; N1 9/32; N2 5/16; N3 3/8;N4 7/16;
N5 15/32; N6 15/32HT; N7 SLAM N8 SLAMHT; N9 SSLAM
M - Tension Alarm. Usage: 'M2500' for 2500 pound alarm.
J - Depth Adjust. Usage: 'J-1' for -1 ft per 1000 feet
S - System PPF Usage: 'S125' for 125 PPFoot to system
B - Enter Mud Weight B12.3 lbs/gal
T - Enter Tool Weight T1000 lbs
k - Toggle stretch correction on/off
p - Display depth and stretch data
m - Use MMK Correction

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

* * * AMS3AXXX Help Screen * * *

H,? - This screen.
D - Display units, direction, depth, speed, and tension.
L - Modify load cell angle (factor) Usage: L1.2
P - Modify encoder pulses/revolution. Usage: P600
V - Status Verification
W - Modify wheel size (line other) (feet) Usage: W4.0
Z - Preset depth.Usage: Z0.0 |_|--> New depth.
U - Modify units UF (feet), UM (meters), UP (pounds), UK (kilograms)
A - Depth Alarm. Usage: A100 |_|--> Depth Alarm.
N - Line Size N0 9/32; N1 3/8; N2 7/16; N3 15/32; N4 SLAM; N5 SSLAM; N6 OTHER
J - Depth Adjust. Usage: 'J-1' for -1 ft per 1000 feet
S - System PPF Usage: 'S125' for 125 PPFoot to system
k - Toggle stretch correction on/off
p - Display depth and stretch data
C - Toggle D string depth/ccl display
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.
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-AMS3A041 1-AMS3A141 2-AMS3A142 3-AMS3A247

F
Log Directory
File # Date/Time Size (bytes)
1 00/00/00 00:00:00 0
2 14/09/19 06:04:46 12630
2 File(s) 12656 bytes 1977601168 bytes free

C - 14/09/19 06:45:42

E - Log file(s) erased.

F - Log Directory
File # Date/Time Size (bytes)
1 14/09/19 06:45:57 0
1 File(s) 0 bytes 1977613824 bytes free

F# - File # Date/Time Size (bytes)
1 14/09/19 06:45:57 60

06:46:06 E S + 0.0 0.0 19953
06:46:16 E S + 0.0 0.0 19964<EOF>

4.7 RS232 SERIAL INTERFACE – VERIFICATION - 4A panel

Press V to display the Verification Screen

* * * AMS4A247 Setup Status * * *

Software revision	S4100.01
Line Size =	slam
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
Cable volume =	2118 cubic inches per 1000 feet
Cable weight =	1.0
Weight fluid =	8.300
Cable weight fluid =	1.000
Tool weight =	1000
Stretch Corr is	OFF
MMK correction is	OFF
Line stretch tool =	8.3

4.8 RS232 SERIAL INTERFACE - VERIFICATION - 3A panel

* * * AMS3A247 Status Verification* * *

Software Revision 4100.24
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

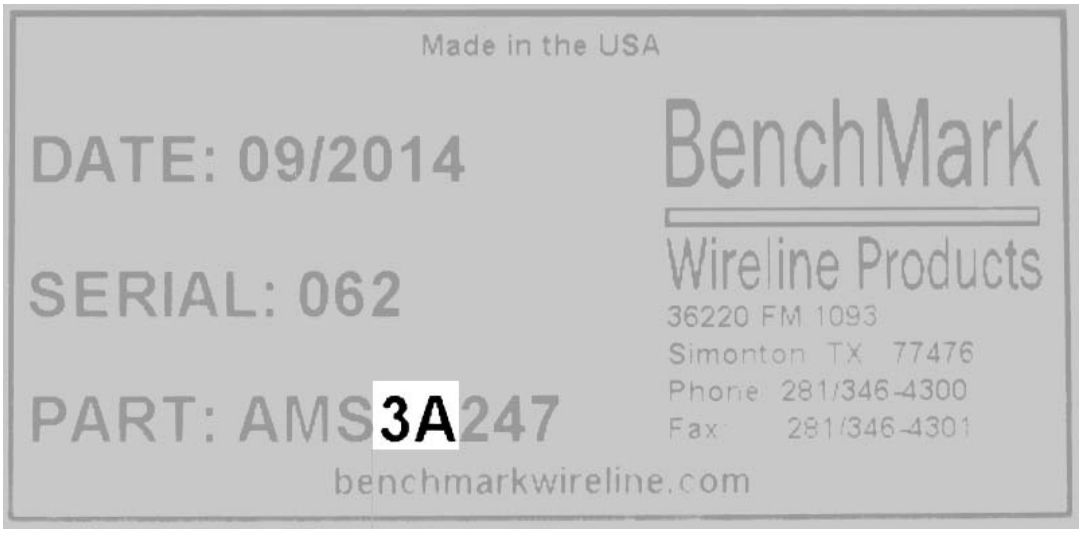
```
DATA STRING DESCRIPTION
12345678901234567890123456
U D Zddddd.d ssss.s tttttt<CR><LF>

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.



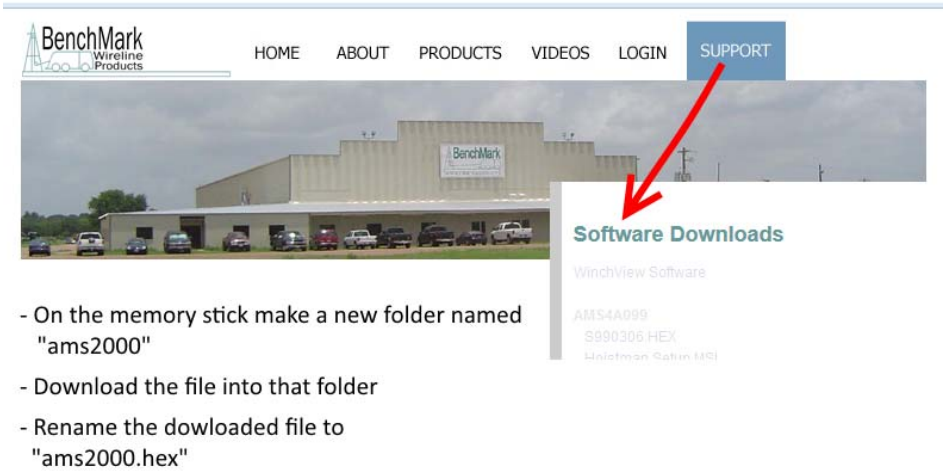
3A panels contain a new generation computer board that simplifies the process of software updates.

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.

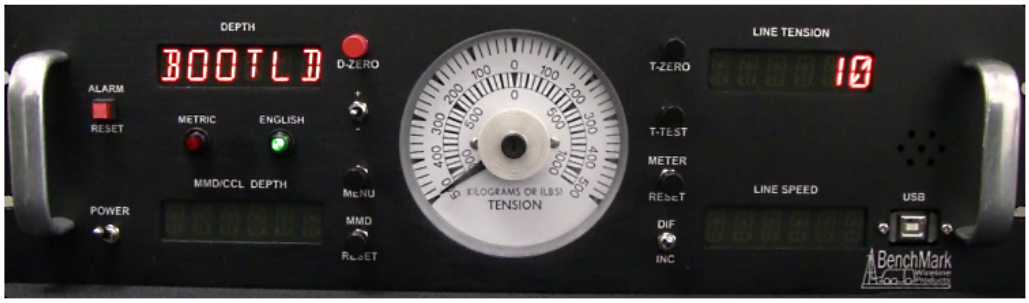
You will need a common USB memory stick also called a thumb or flash drive.

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.

Now Power ON the panel and it will go through an automatic boot cycle.
Very quickly it will recognize the presence of the memory stick and will begin a 10-0 countdown on the Line Tension screen.



When it hits zero, the panel will automatically erase the current software on the panel. 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:

GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG

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

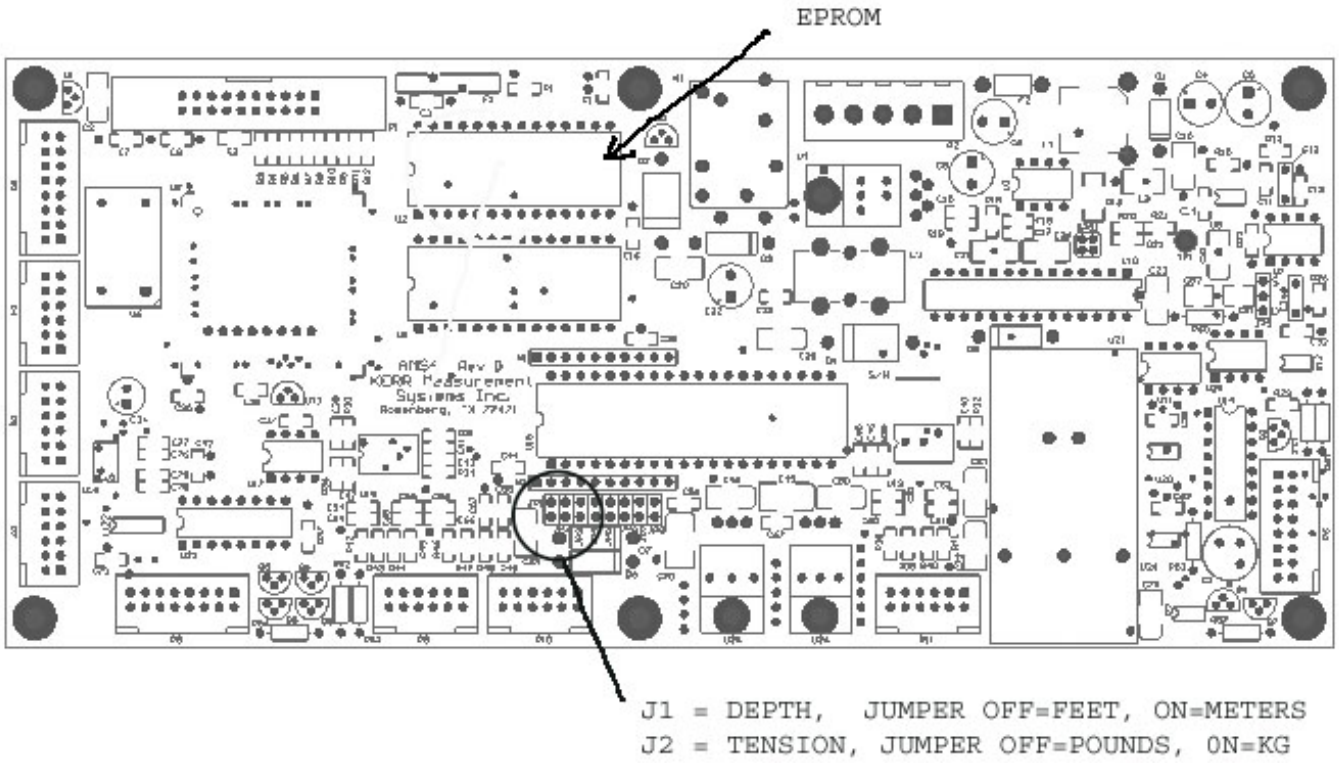
For older panels without CPU piggyback PCB w/3 switches, the software that controls this panel is stored in an EPROM Integrated Circuit (see drawing below). To upgrade the software to a new version, simply remove the eprom I.C. and install a new eprom I.C. (be careful not to bend the legs during installation).

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

40 SERIES PANELS BILL OF MATERIALS

PART	DESCRIPTION	QTY	REF
AMS3A247	PANEL HOIST OPERATOR DISPLAY 2mV/V NON AMP LOAD PIN USB		
AM2KP134	PC BOARD AMS2K ACQUISITION BOARD	1	
SW-247012	SOFTWARE FOR 247 DEPTH PANEL	1	
AMS4A154	METER 4" SHALLOW HSG CROMPTON DUAL SCALE +/- 500KG 1000LB	1	
AMS4P128	DISPLAY LED RED 0.5" 14 SEGMNT SERIAL 2" x 3.5" 12 PIN HEADER	4	
ACMU1P06	LED RED DIALIGHT 5V	1	METRIC
AMS4P307	SONALERT SC616N MALLORY 4-16V 6-22mA	1	
AMS7M002	BRACKET SONALERT MOUNTING	1	
AMS4P020	SWITCH SPDT TOGGLE LOCKING MTL-106D ALCO	1	POWER
AMS5P205	SWITCH SPDT TOGGLE ON-ON	1	INC/DIFF
AMS4P044	SWITCH DPDT TOGGLE MOM OFF MOM PANEL MOUNT C&K 7205SYZQE	1	+ / -
AMS7P068	SCREW JACK D-CONNECTOR KEYSTON E 7231	4	
AMS4P198	SPACER UNTHREADED RND NYLON #4 5/16L x 3/16 OD (100/PK)	16	
AMS4M076	WINDOW LED RECESSED SERIAL DCI DISPLAY	4	
F244889000	HANDLE OVAL 1-1/2 X 3 AL	2	205090-1

PART	DESCRIPTION	QTY	REF
C276P152	LED GREEN DIALIGHT 12V	1	ENGLISH
40195	SWITCH SPST PB NO MOM LIGHTED NKK HB15SKW01-5C-CB	1	ALARM RESET
AMS4P738	DUSTCAP PLUG CAPUSB-A	1	102398-4
AMS5P191	SWITCH SPDT MOM PUSHBUTTON NKK MB2011SS1W01-RO	5	
AMS5P194	SWITCH DPDT MOM PUSHBUTTON NKK MB2061SS1W01-RO	1	T-CAL
AMS5P192	SWITCH CAP SCREW ON BLACK NKK AT407A	5	
AMS5P193	SWITCH CAP SCREW ON RED NKK AT407C	1	DEPTH ZERO
AMS4P139	CABLE ASSY USB TYPE A TO B 3 METERS	1	
AMS5P225	DUSTCAP PLUG CAPUSB-B	1	USB CONN DUST CAP

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RECOMMENDED SPARE PARTS - 40 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.

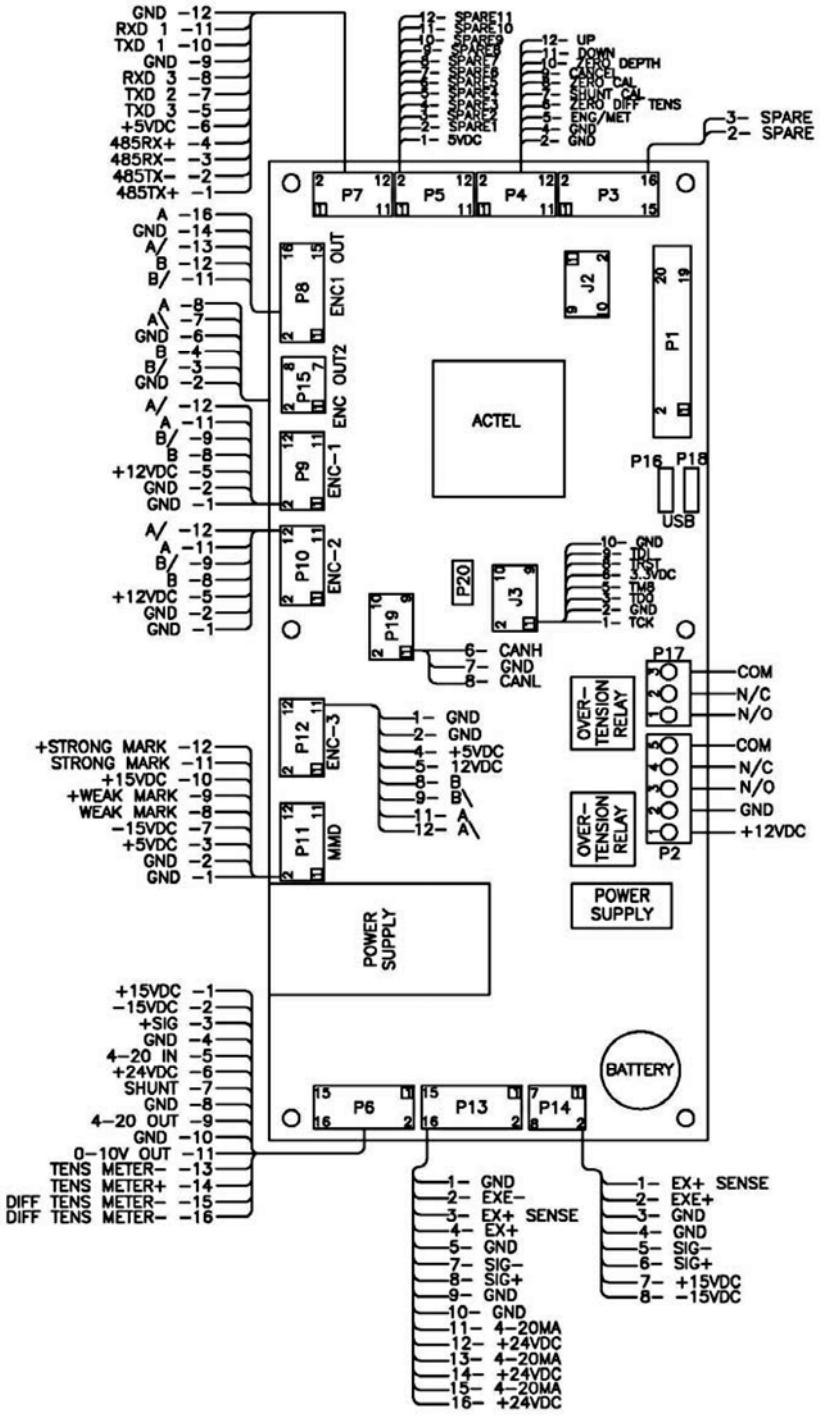
NOTE – BenchMark may not always have all spares in stock all the time.

6.0 P/N	DESCRIPTION	QTY	REF
RECOMMENDED SPARE PARTS FOR ALL LOCATIONS			
AMS4P020	SWITCH SPDT TOGGLE LOCKING MTL-106D ALCO	1	POWER
AMS5P205	SWITCH SPDT TOGGLE ON-ON	1	INC/DIFF
AMS4P044	SWITCH DPDT TOGGLE MOM OFF MOM PANEL MOUNT C&K 7205SYZQE	1	+ / -
40195	SWITCH SPST PB NO MOM LIGHTED NKK HB15SKW01-5C-CB	1	ALARM RESET
AMS5P191	SWITCH SPDT MOM PUSHBUTTON NKK MB2011SS1W01-RO	5	
AMS5P194	SWITCH DPDT MOM PUSHBUTTON NKK MB2061SS1W01-RO	1	T-CAL
AMS5P192	SWITCH CAP SCREW ON BLACK NKK AT407A	5	
AMS5P193	SWITCH CAP SCREW ON RED NKK AT407C	1	DEPTH ZERO
RECOMMENDED SPARE PARTS FOR REMOTE LOCATIONS			
AM2KP134	PC BOARD AMS2K ACQUISITION BOARD	1	3A PANELS ONLY
AMS4A154	METER 4" SHALLOW HSG CROMPTON DUAL SCALE +/- 500KG 1000LB	1	
AMS4P128	DISPLAY LED RED 0.5" 14 SEGMNT SERIAL 2" x 3.5" 12 PIN HEADER	4	
ACMU1P06	LED RED DIALIGHT 5V	1	METRIC

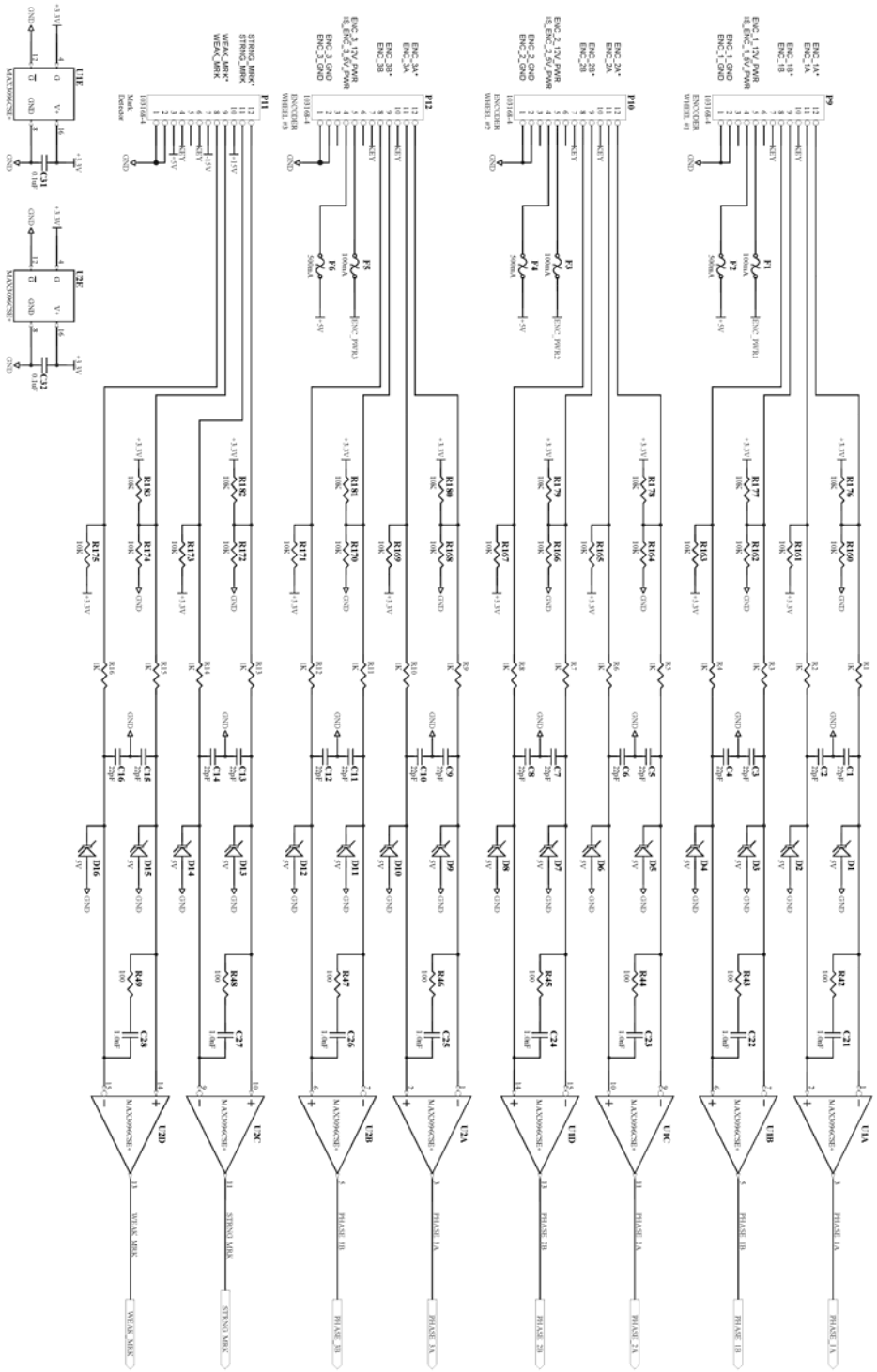
NOTE – PC Boards for 4A panels are no longer manufactured or available. Should a board failure occur, a conversion kit and the new board can be ordered.

6.0 DRAWINGS, DIAGRAMS & LISTS

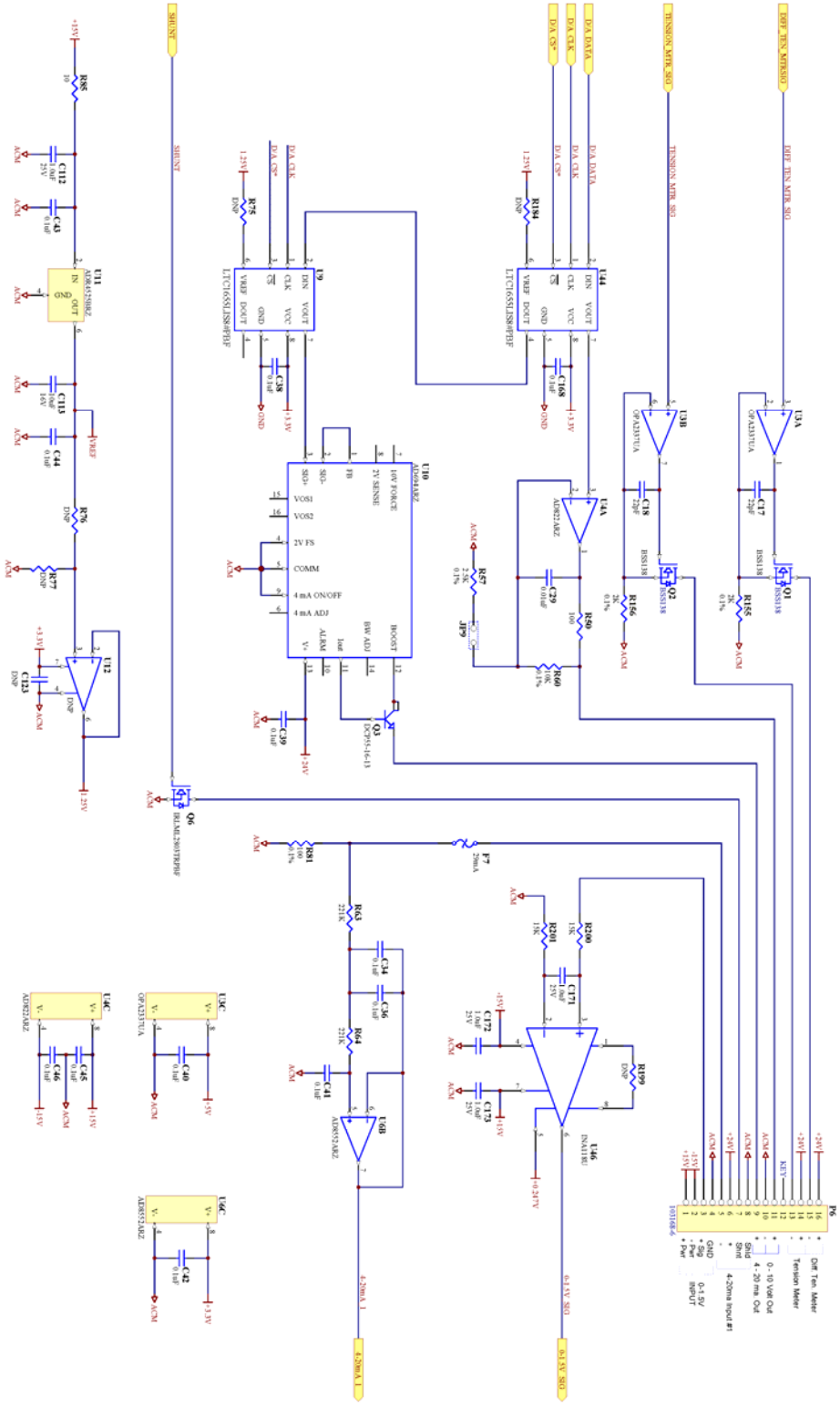
6.1 AM2KP134 ACQUISITION BOARD SCHEMATIC



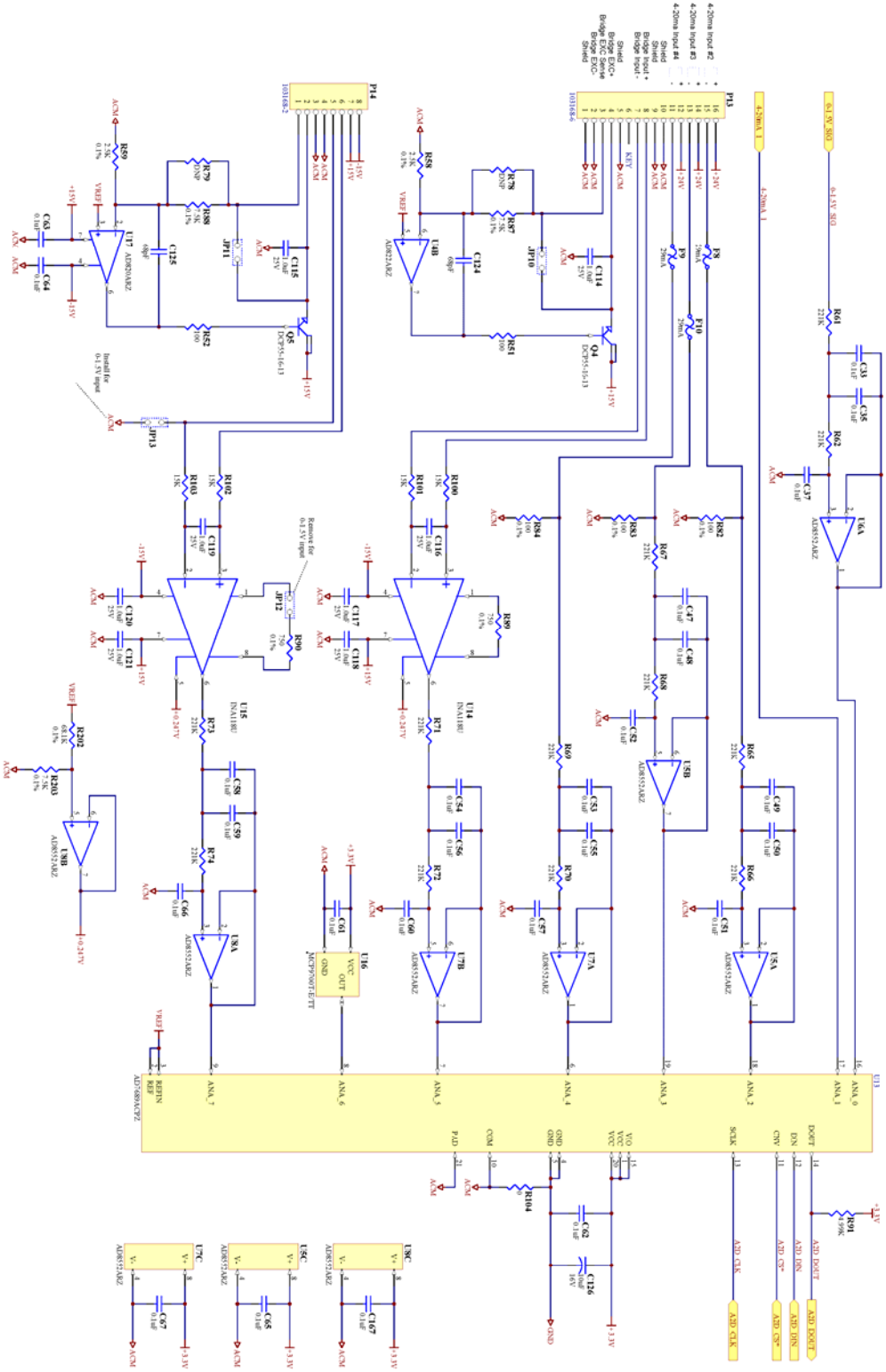
6.1 AM2KP134 ACQUISITION BOARD SCHEMATIC



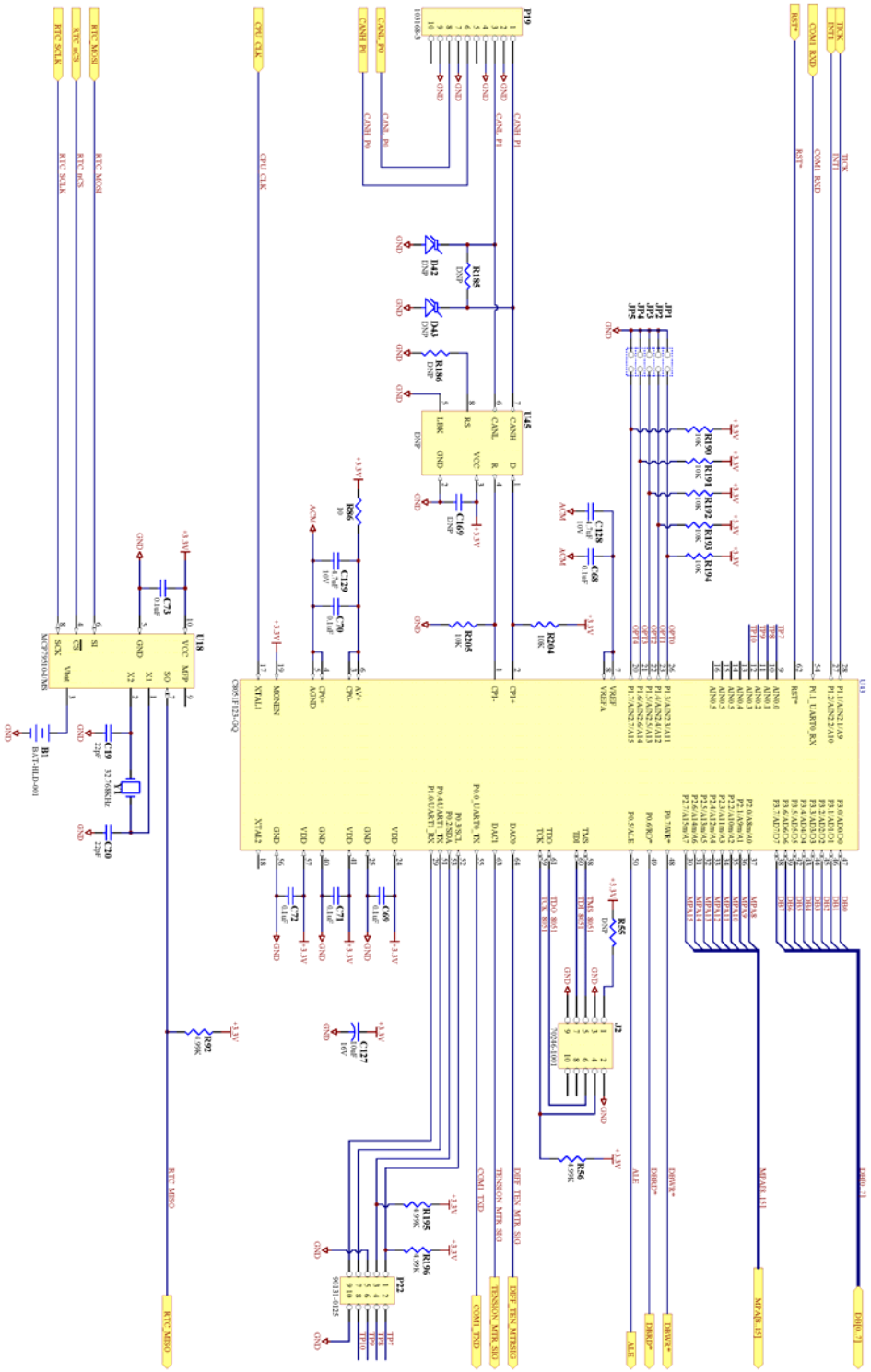
6.1 AM2KP134 ACQUISITION BOARD SCHEMATIC



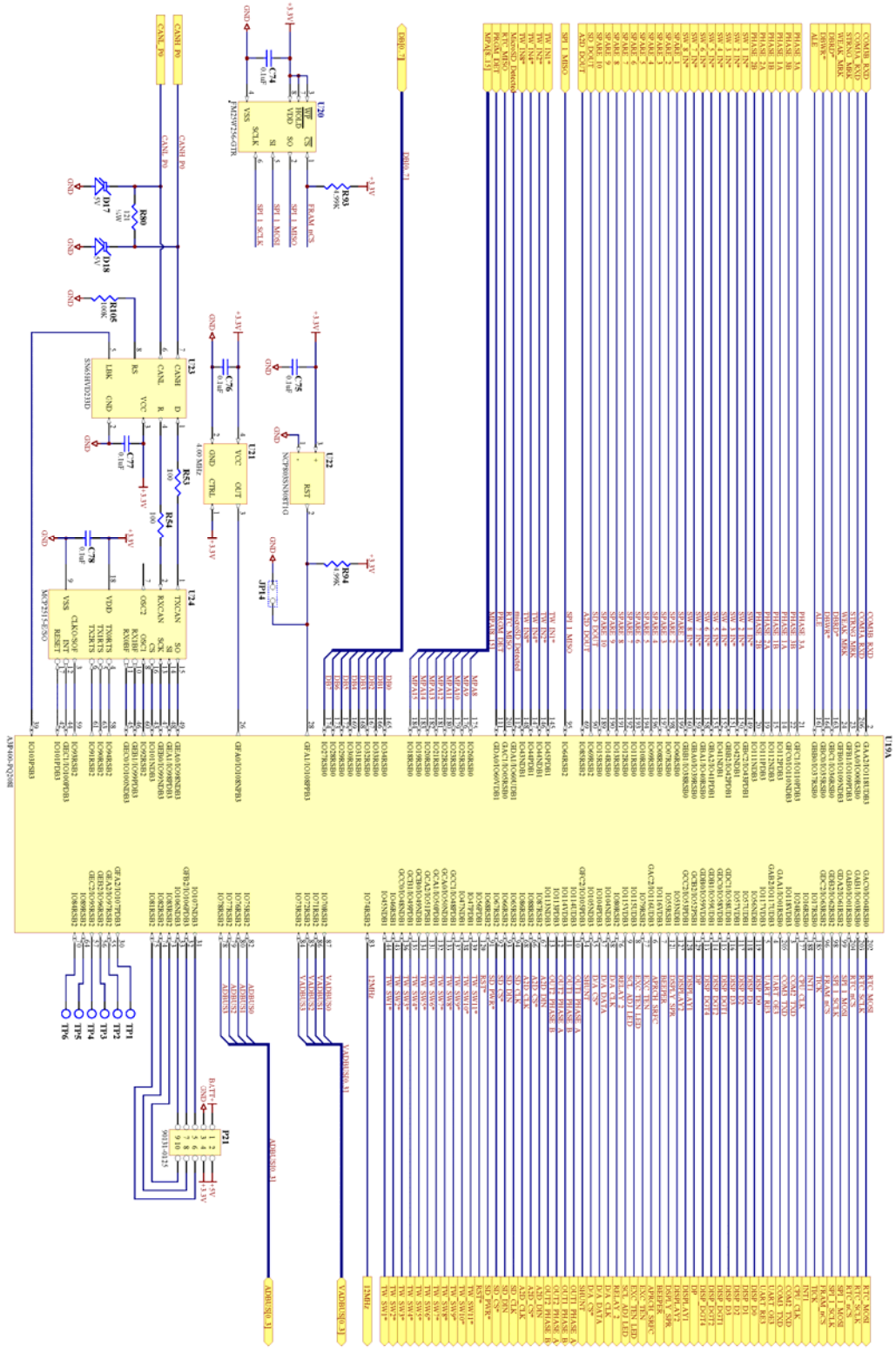
6.1 AM2KP134 ACQUISITION BOARD SCHEMATIC



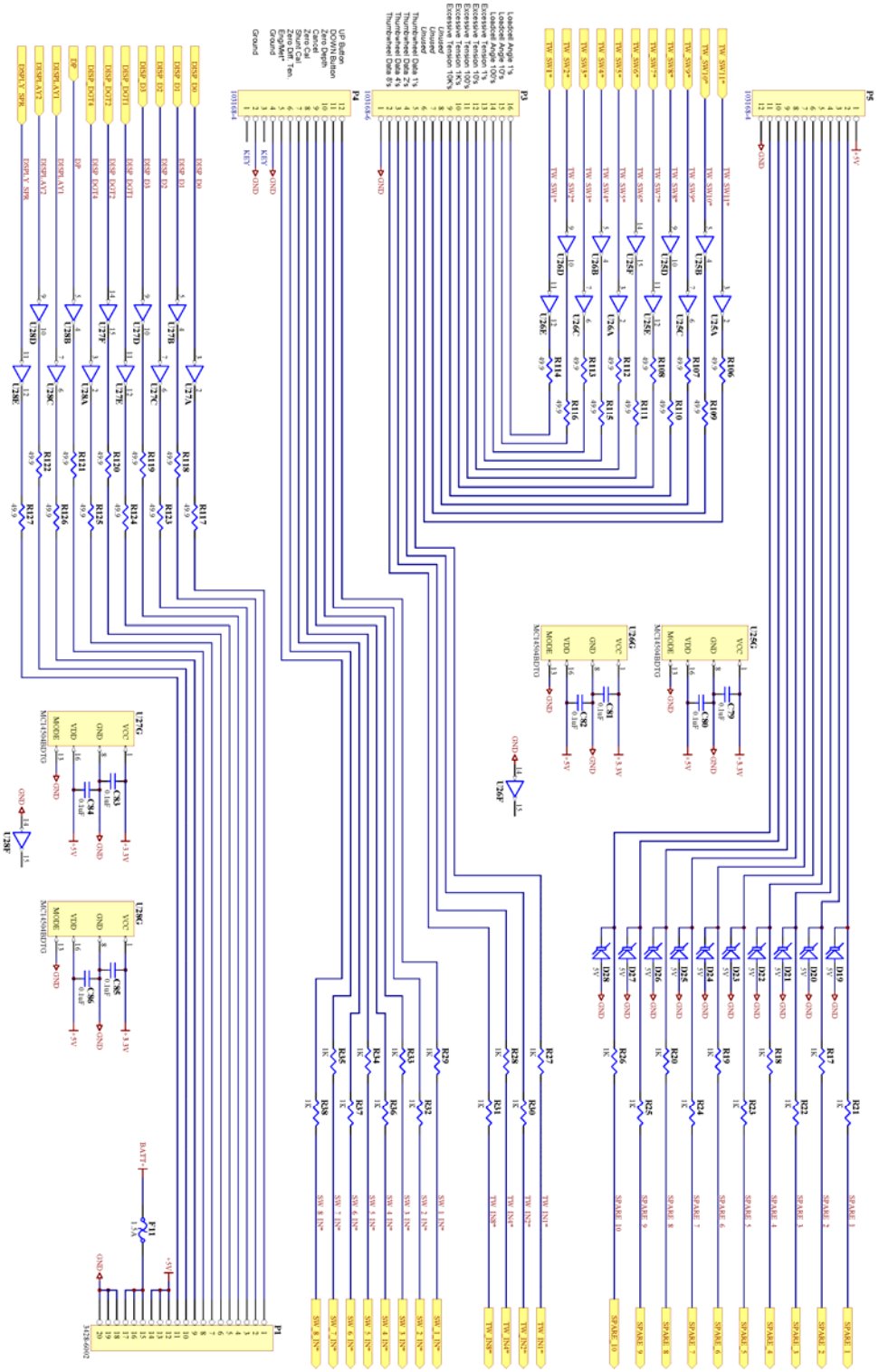
6.1 AM2KP134 ACQUISITION BOARD SCHEMATIC



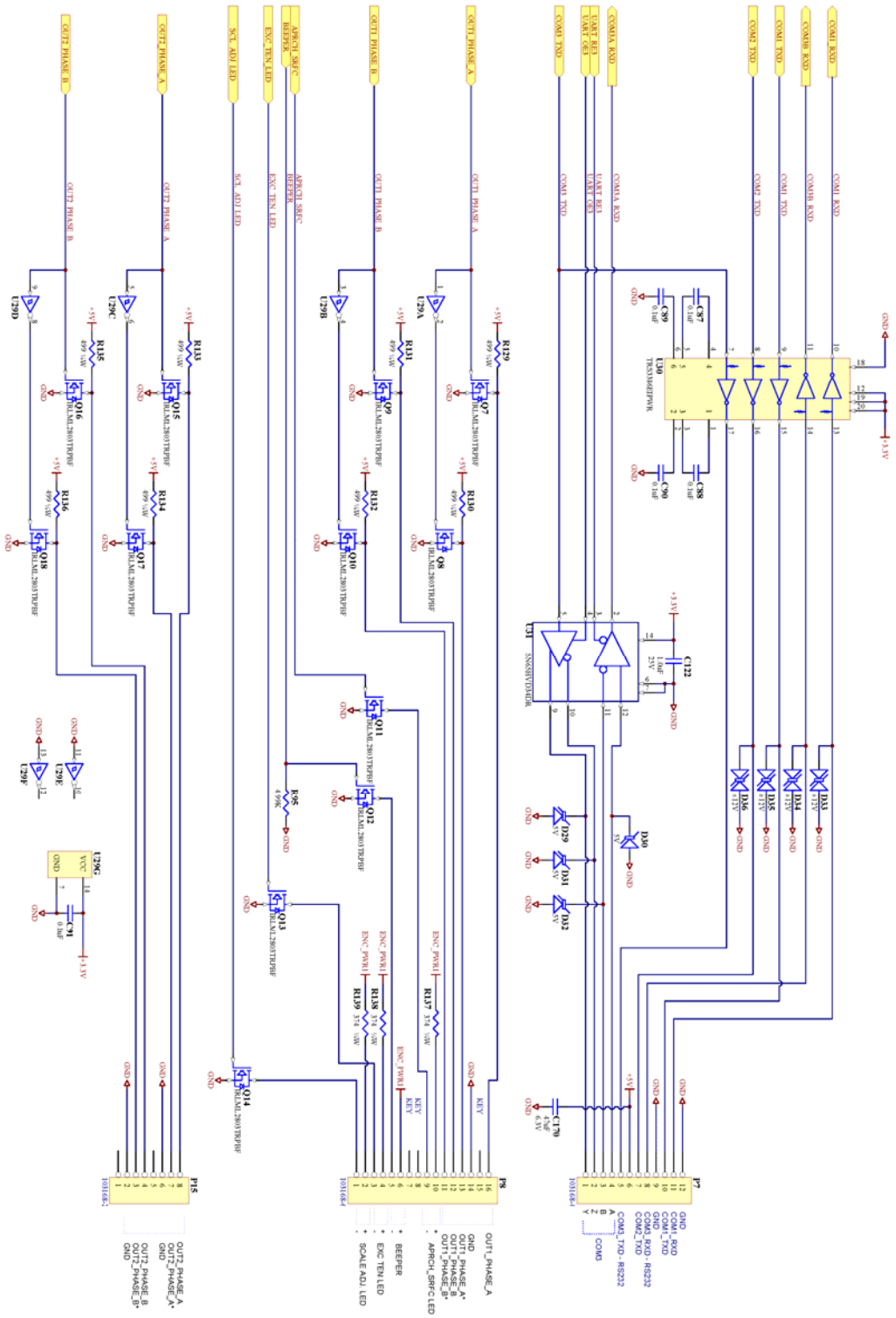
6.1 AM2KP134 ACQUISITION BOARD SCHEMATIC



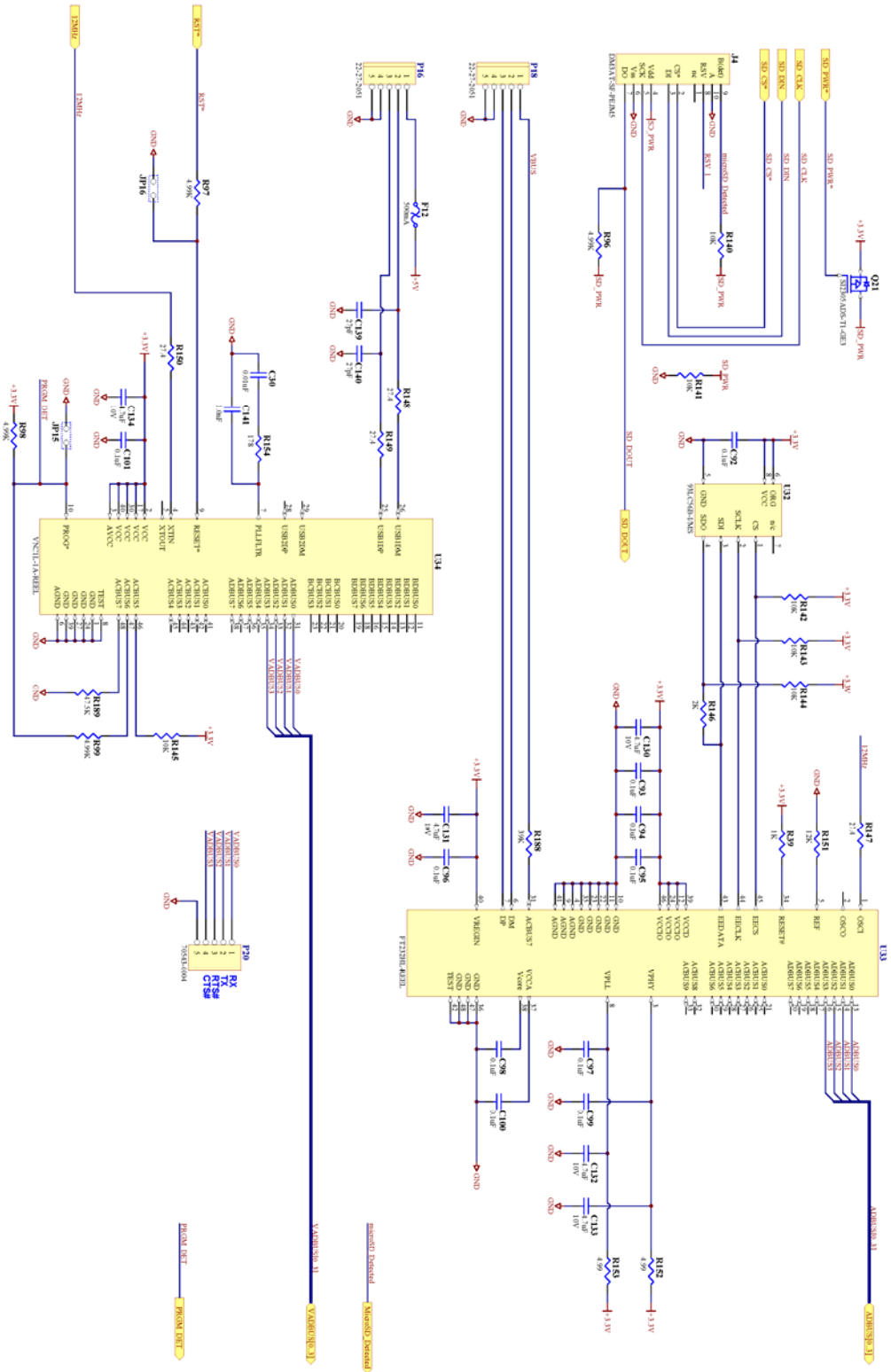
6.1 AM2KP134 ACQUISITION BOARD SCHEMATIC



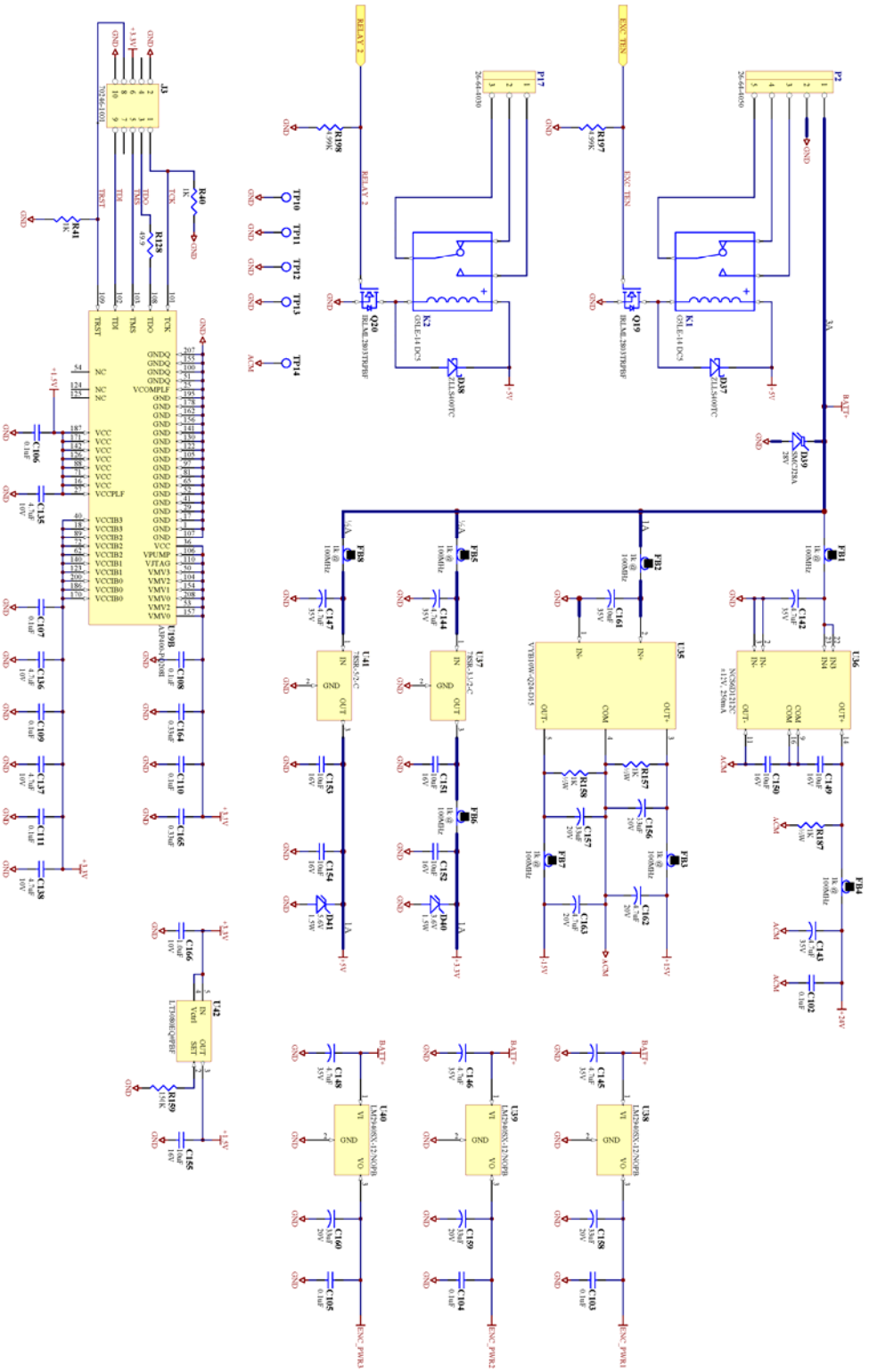
6.1 AM2KP134 ACQUISITION BOARD SCHEMATIC



6.1 AM2KP134 ACQUISITION BOARD SCHEMATIC



6.1 AM2KP134 ACQUISITION BOARD SCHEMATIC



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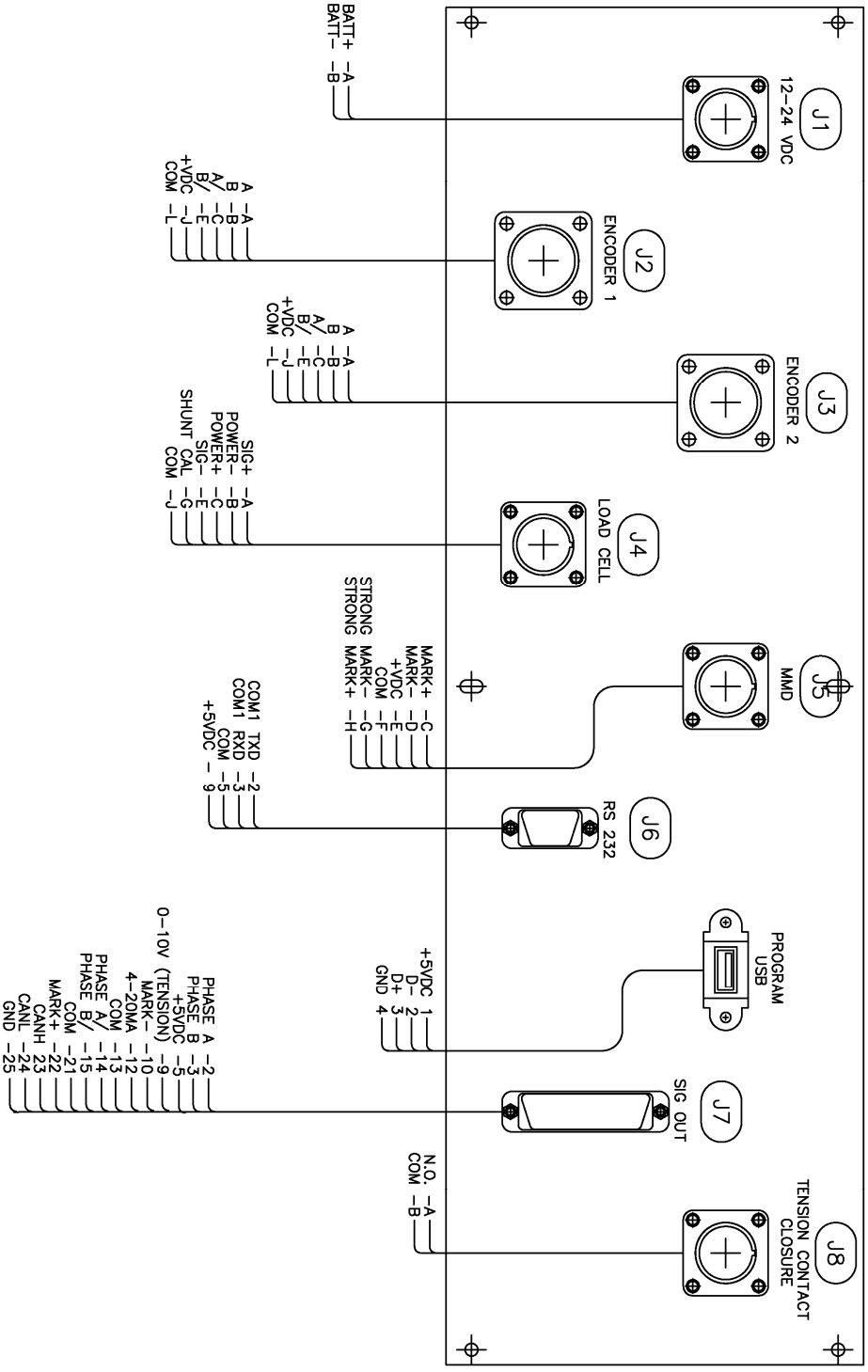
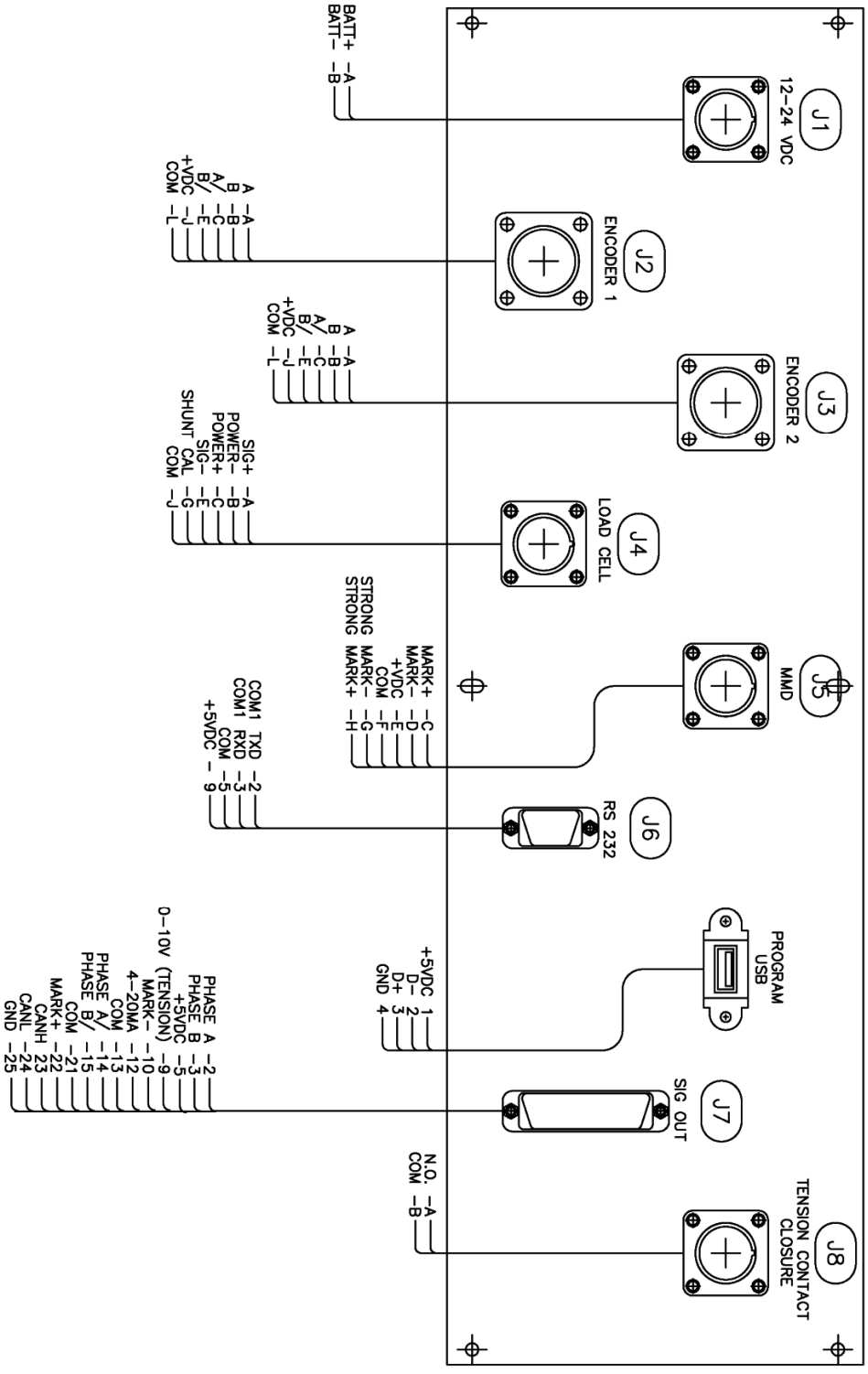
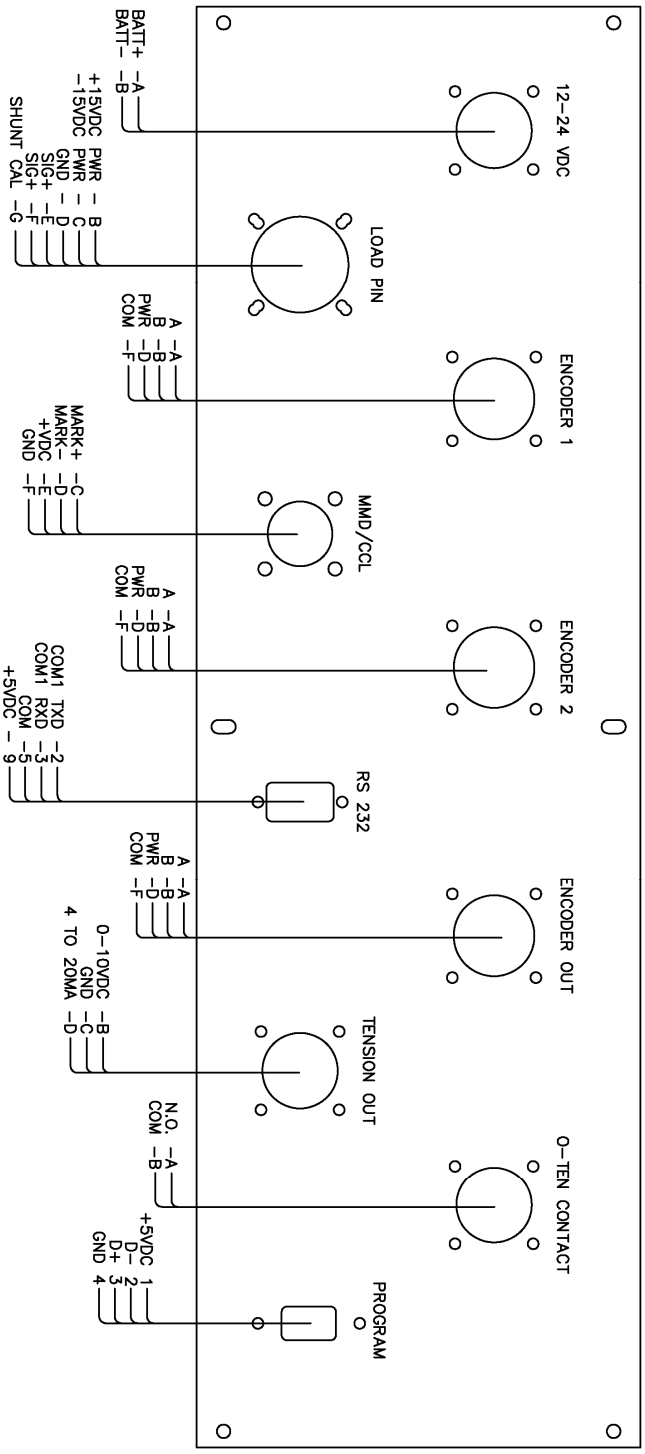
6.2 REAR PANEL WIRING – AMS3A247



6.2 REAR PANEL WIRING – AMS3A041



6.2 REAR PANEL WIRING – AMS3A141



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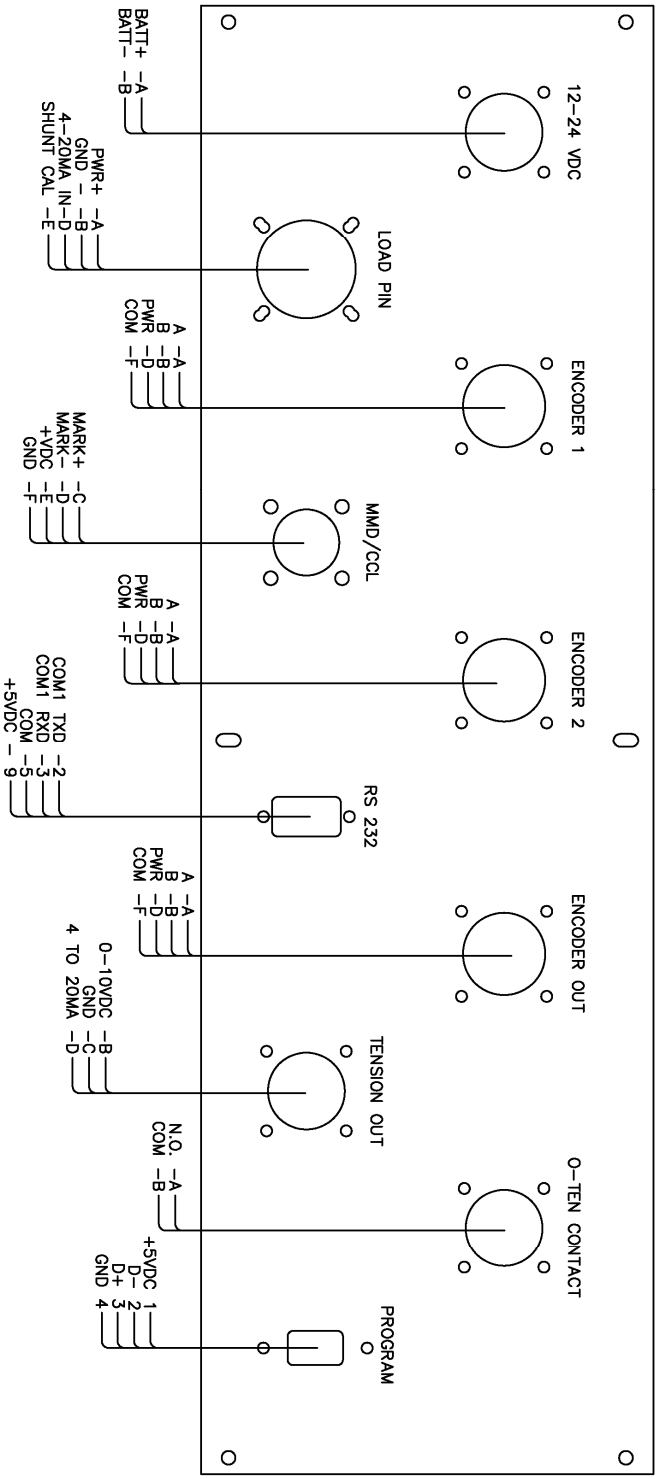
6.2 REAR PANEL WIRING – AMS3A142



6.3 INTERNAL WIRING LIST

NOTE – For technical assistance, please make inquiries below:

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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:
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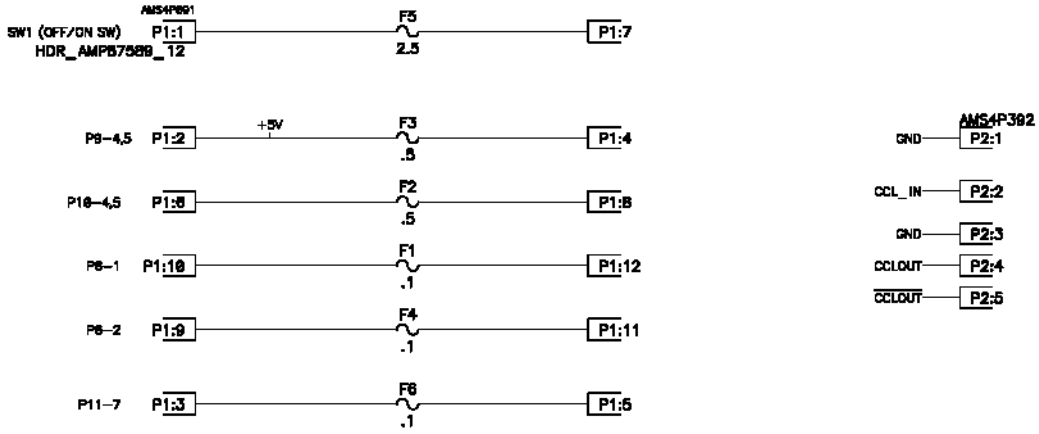
36220 FM 1093
Simonton, Texas 77476
U.S.A.

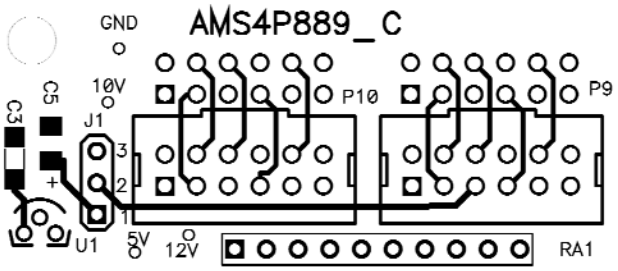
6.4 FUSE BOARD - 4A panel

AMS4A686

Refer to 6.3 for wirelist



6.5 ENCODER PULLUP BOARD - 4A panel



7.0 CABLES

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

For technical questions, please make inquiries below:

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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.

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7.1 247 SYSTEM DIAGRAM