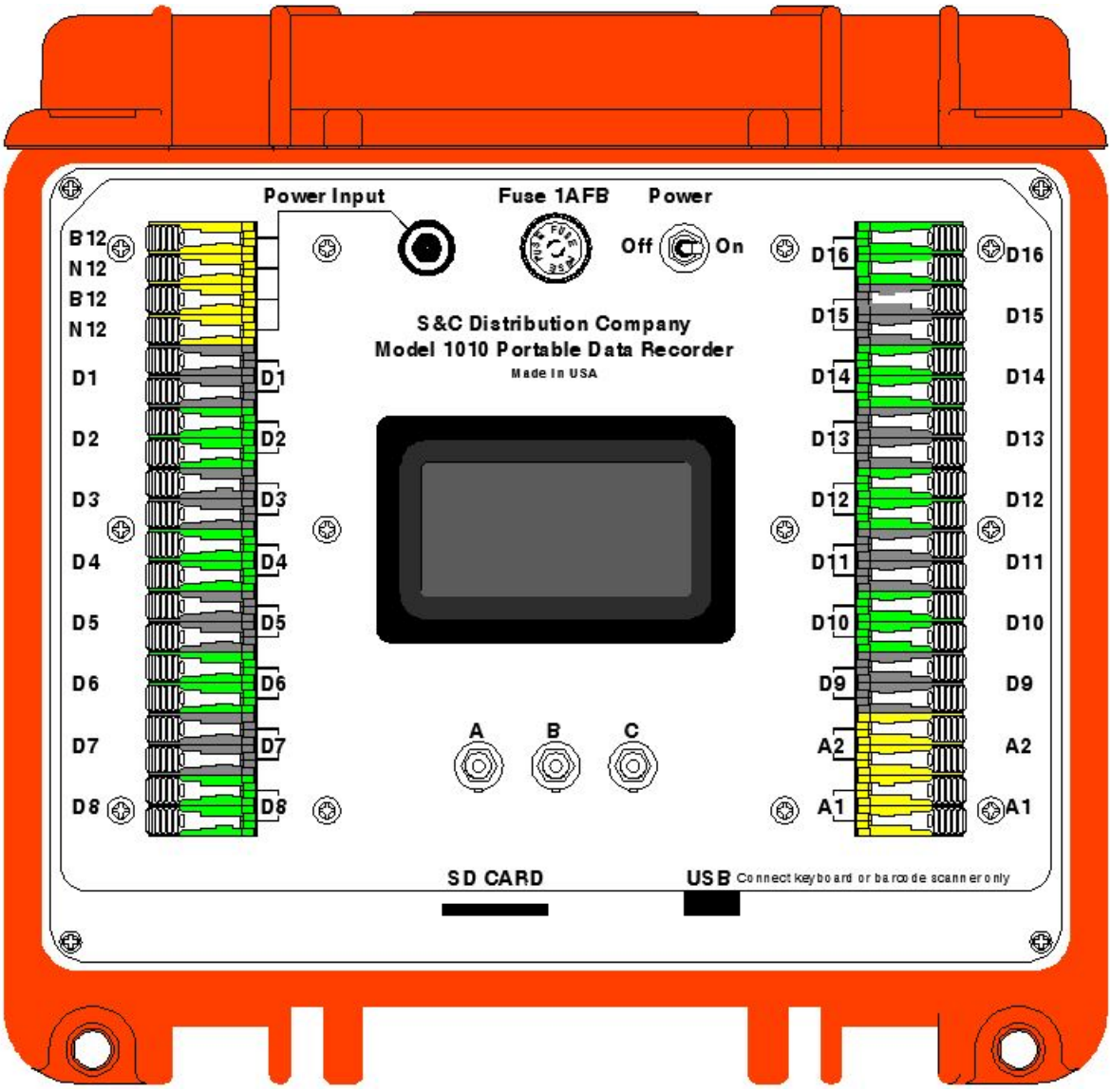
S & C
DISTRIBUTION COMPANY

7225 Duvan Drive
Tinley Park, IL 60477

Model 1010
Portable Data Recorder

Instruction Manual
Revised 10-27-13 JS



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Chapter 1

GENERAL

S&C Distribution Company is pleased to offer a digital data recorder which addresses the needs of railroad signalmen; particularly for addressing clear-on-arrival problems. Our Portable Data Recorder (PDR) provides the means to monitor up to sixteen contact closures and/or floating outputs such as those provided by GCP's ® or VHLC's ®, and two analog inputs for tracking voltages and time/date stamp their activity. The PDR is in a package that is designed to be moved from location to location. The use of an SD card to store data will allow long time intervals to be recorded and then quickly downloaded into a computer to assess the data. Wire size capacity of the cage clamp terminals is No. 20AWG to No. 10AWG.

Live display of the at-the-moment status of the Inputs is presented on the Recording (Live Status) Screen, which is the default screen and is a always present unless you have toggled away from it.

The Preview function of the PDR allows immediate playback of recorded data on the screen of the 1010 Recorder, for those instances where you need to know what caused an event without resorting to the downloading of the data into a computer. Refer to Chapter 3, Section II,2,a, of this manual for details.

Memory capacity is limited only by the size of the SD card. A 8 GB card is furnished. A real time clock/calendar date and time stamps each event. To ensure complete isolation of the equipment under measurement, the Inputs employ opto-coupler interfaces. All sixteen digital Input ports and the two analog ports are provided with isolated commons.

Properly time-stamped data collection can begin within one minute of hook-up. Fast-Track set-up utilizes pushbuttons on the PDR and/or a keyboard or barcode scanner, eliminating the need for a computer for the setup process. Because a limited number of special keys are used in set-up, an ASCII-based, mini-keyboard is all that is required.

The PDR can be powered by any or all of three alternatives: local battery, 120VAC (PN: 324-11 power supply provided with the unit) and an optional, plug-in, rechargeable battery pack (PN: 330-1010A). Current usage is approximately 125mA.

Accessories furnished with the PDR include 120VAC to 12VDC Power Supply (PN:324-11), an 8GB SD Card (PN 1010-15), SD Card to USB Adapter (PN: 1010-18) and a large, heavy-duty Carry Bag (PN: 322/331 BZB).

Optional accessories include Mini-ASCII Keyboard, w/zippered bag (PN: 331-5-19), Barcode Scanner w/zippered bag (PN: 331-5-17) and a Power Input Coupler (PN: 1010-19).

Chapter 1, Continued

SYSTEM REQUIREMENTS

No computer is required to set up the PDR. Port naming and other information to be input is done via keyboard or bar code scanner. The SD card can be read by any computer that has an SD port. For those computers without an SD port, an Adapter (PN: 1010-18) is furnished which will plug into the computer USB 2.0 port and allow the downloading of the SD Card-stored data. Easy data file review can be accomplished by using Microsoft WORD ®, Microsoft EXCEL ®, Corel WORD PERFECT ®, Corel QUATRO PRO ®, or almost any spreadsheet or word processor program

LIMITED AND EXCLUSIVE WARRANTY

THIS LIMITED AND EXCLUSIVE WARRANTY IS GIVEN TO THE PURCHASER BY S & C DISTRIBUTION COMPANY AND IS THE SOLE AND EXCLUSIVE WARRANTY GIVEN IN CONNECTION WITH THE MODEL 1010 PORTABLE DATA RECORDER. ALL OTHER WARRANTIES, EITHER EXPRESS OR IMPLIED ARE EXCLUDED TO THE FULL EXTENT PROVIDED BY LAW.

S&C Distribution Company hereby warrants the Model 1010 Portable Data Recorder, exclusive of batteries, to be free from defects in material and workmanship for a period of one year following the date of shipment. Any manufacturing defects arising during this warranty period shall be corrected at the Manufacturer's expense (except inbound shipping and handling charges).

1. To obtain warranty services, a claim by the purchaser in writing must be made to S&C Distribution Company at the address shown on the front of this Instruction Manual. Such claim must be accompanied by the S & C Distribution Company sales order number, or other proof of purchase.

2. This Limited and Exclusive Warranty only covers repairs of Manufacture's defects and requires that in-bound freight charges be prepaid.

3. S & C Distribution Company shall not be responsible for any injury to persons or damage to property or any of its contents or for any other consequential damages or losses whether arising out of breach of contract, breach of warranty, or otherwise. Some states do not allow this exclusion or limitation of incidental or consequential damage so this limitation or exclusion may not apply to you.

4. This Limited and Exclusive Warranty may give you specific legal rights according to the law of your state.

5. The Warranty contained in this Agreement shall not apply to any Model 1010 Portable Data Recorder which shall have been repaired or altered outside of the Manufacturer's facilities or tampered with in any way, or in the Manufacturer's sole judgment has been subject to misuse, negligence or accident not attributable to the Manufacturer.

6. This Warranty is issued to the original purchaser only and is not transferable.

7. This Warranty replaces and supersedes any and all previous issued warranties.

CHAPTER 2
Specifications

1. PORTS (Channels) – 16 Digital, opto-isolated, Input impedance similar to 15K Ohms. 2 Analog, opto-isolated, Input impedance similar to 500K ohms.

2. INPUT COMMON OPTIONS – All inputs are isolated and can be connected together.

3. DIGITAL PORT INPUT VOLTAGE – 3 to 48VAC or DC through contacts or floating sources from electronic devices, not polarity sensitive.

4. ANALOG PORT INPUT VOLTAGE – 0 to 150 V AC, 0 to 75V DC not polarity sensitive. Will report + or – DC voltages.

5. MEMORY – Up to 32GB SD Cards can be used. Most users will find a 4GB SD card adequate. 8GB Card furnished.

   The below table will give you an idea of how long you can record on different size SD cards:

SD Size in GB (Gigabites)	1 incident per second Days Saved	1 incident every 10 seconds - Days Saved	1 incident every 30 seconds - Days Saved
2	269.2	2691.6	8074.9
4	538.3	5383.3	16149.9
8	1076.7	10766.6	32299.7
16	2153.3	21533.2	64599.5
32	4306.6	43066.3	129199.0

6. VOLATILITY OF TIME SETTING – Time, once set, will be maintained by an internal, button battery which lasts approximately six years.

7. DATA DISPLAY – OLED Graphic display, Format Binary, "X" represents voltage present, "_" represents no input. Reporting rate of the Recorder is 1 event per second. If an input changes more than once per second, the display reports an "M" for multiple. Input port naming through Keyboard or Barcode Scanner. Digital and Analog Input status is reported "live" on this display. The display can be helpful in identifying the "click" of a relay that has changed state or the floating output of a GCP ®, VHLC ®, etc., that has either become active or ceased activity.

8. SAMPLING RATE – Event driven, all inputs recorded with date and time when any digital input changes. Responds to events that are over 50ms in length, and records 1 event per second.

9. OPERATING POWER – 10 to 16VDC. Power consumption will be less than 125mA under normal operation. Setup current will be higher (up to 200mA) when a barcode scanner or keyboard is being used.

10. POWER SOURCES – Case or House Battery (10-16VDC), Rechargeable Battery Pack (12-14VDC) 120VAC to 12VDC, 500mA, Power Supply provided (PN: 324-11).

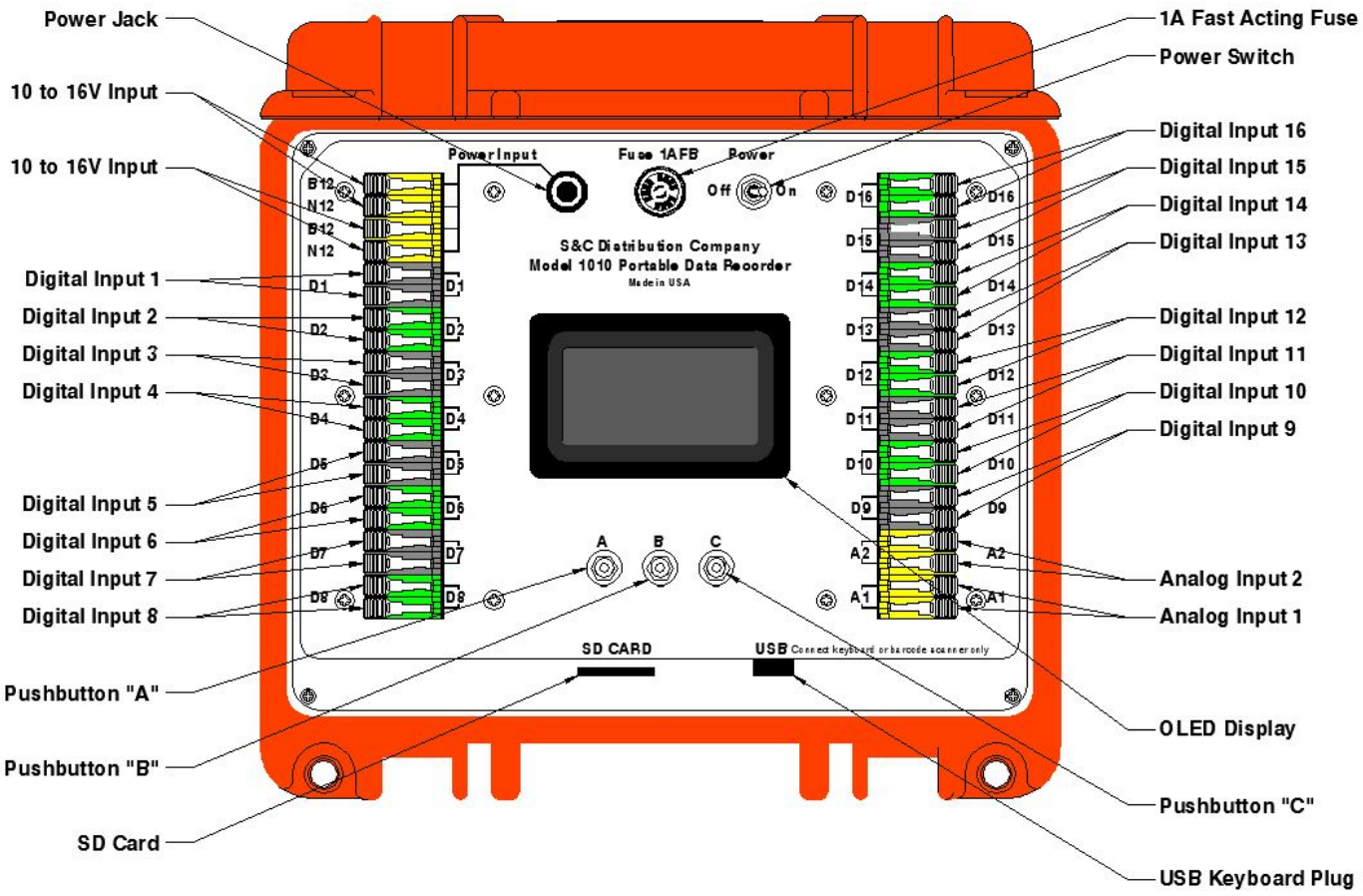
11. ELECTRICAL PROTECTION – Bridge rectifiers on power and digital I/O inputs, not polarity sensitive. 1A Fast Acting Fuse on Power Line.

12. ENVIRONMENTAL- Operating temperature -40^{0} F to $+140^{0}$F.

13. PHYSICAL
    Dimensions - 11" L X 10" W X 5" H.
    Cage Clamp Terminal Wire Size: No. 20 AWG to No. 10 AWG

CHAPTER 2, Continued

Specifications Continued



CHAPTER 2, Continued

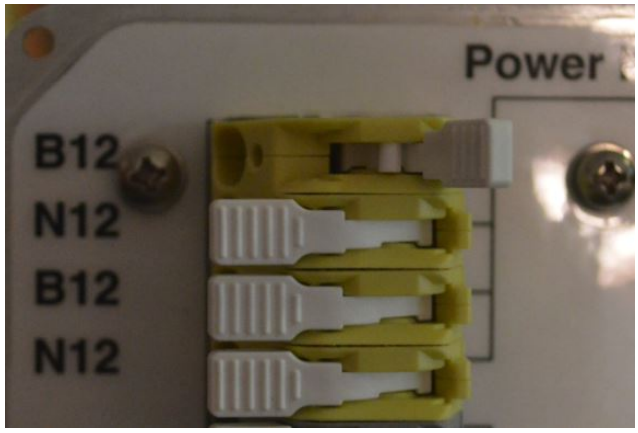
Functions:

Refer to the drawing of the 1010 Portable Data Recorder on preceding page.

1) Power may be applied through:

   a) The Power Jack, a 5.5MM X 2.1MM plug (use S&C Power Supply PN: 324-11, which plugs into this jack for power from the 120 VAC Line)

   b) and/or through either or both of the 10 to 16V inputs.



2) The 10 to 16V inputs are labeled B12 and N12 for convenience, but will accept either polarity input without damage.

   a) 0pen the WAGO Cage Clamp ® connector by pulling up the lever as shown.

   b) Insert the wire stripped about 7/16” into the large hole.

   c) Push the connector lever down and it should snap onto the wire securing it.

3) The wire strip length for this WAGO style connector (used for all inputs to the 1010) is about 7/16” or slightly less than 1/2” .

4) All three inputs may be used at the same time and will not interfere with each other as they are diode isolated.

5) Digital Inputs (1 thru 16) again are not polarity sensitive and will accept either AC or DC inputs without damage. The Recorder will determine that an input is present when the voltage is greater than 3 Volts DC or AC-RMS.

   a) Relays may be hooked up either through a dry contact (Fig. A), or across the coil (Fig. B). Digital input 1 is shown for reference; any input pair may be used.

      i) Remember that Track Circuit relays generally have less than 3V across the coil, and detection of their coil voltage would not work.

      ii) Each Digital Input needs at least 6 to 7 mA at 12V to operate, and will work down to 3V drawing similar current, and up to 48V comfortably also drawing low current. The input impedance is controlled by a constant current regulator to a large extent.

Fig. A

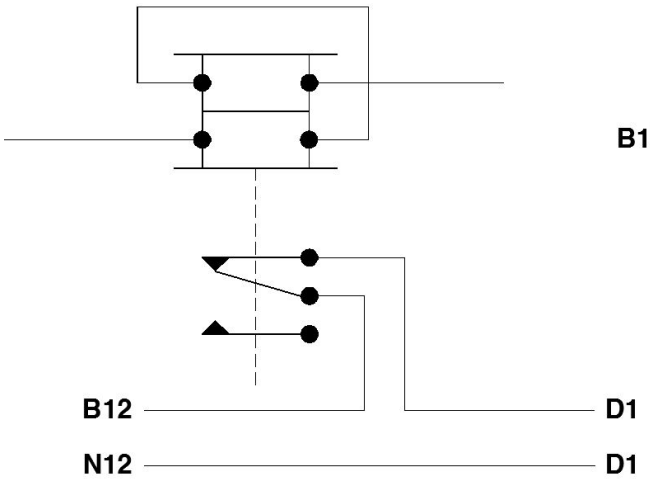
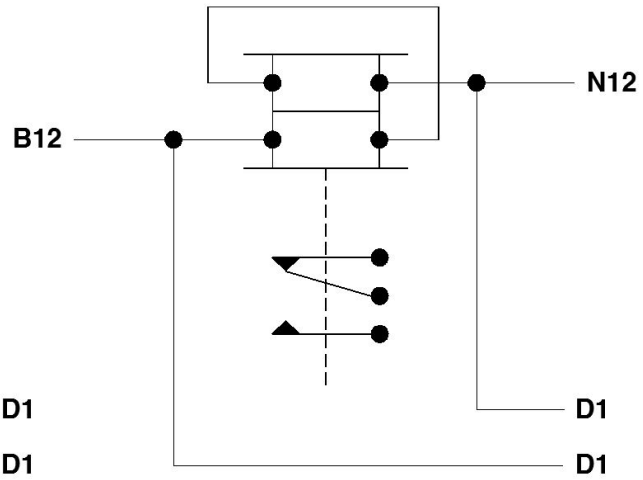


Fig. B



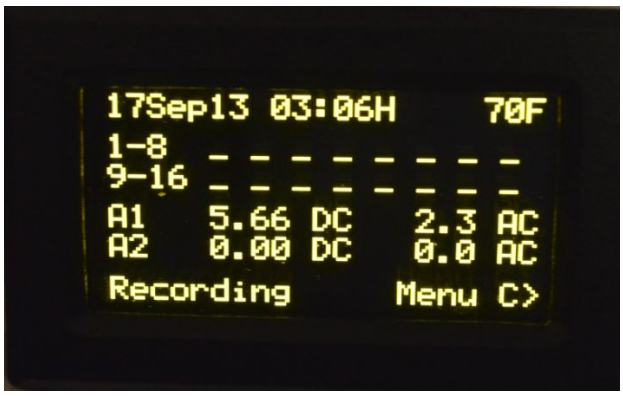
b) Other outputs, commonly referred to as "floating outputs", from electronic devices such as GCP's or HXP's, VHLC (r) or Microlok (r) boxes can also be hooked up as long as their output is 3VDC or greater. To connect the Recorder to such an output simply run two wires from a Digital Input (pair of terminals) to the output pair of the electronic device that you want to monitor, connecting the Recorder in parallel. Polarity is not an issue because the Recorder Inputs are polarity-neutral. Further, the PDR does not draw significant current away from the output's primary function.

6) Analog Inputs (1 and 2)

   a) Will display whatever voltage is applied to their pair of terminals, either AC or DC or both at the same time.

   b) If you hook up DC and notice that it is displaying a "-" in front of the DC reading and it should not, reverse the associated input wires.

c) The below example shows a pair of wires on A1 terminals with both 5.66 Volts DC and 2.3 Volts AC on the wires. (This facility might be useful to demonstrate what is occurring with a style "C" Track Circuit or Slide Fence Circuit, although we would expect the Style "C" to have higher AC than DC.)



7) OLED Display displays all readings, menu options, and pushbutton options. For instance: in the above picture, you are instructed to push Button "C" if you want to move to the Menu.

8) Power Switch is used to turn the instrument on and off.

9) Fuse, 1A fast blow fuse is used to protect instrument.

10) SD Card is used to store all recorded information.

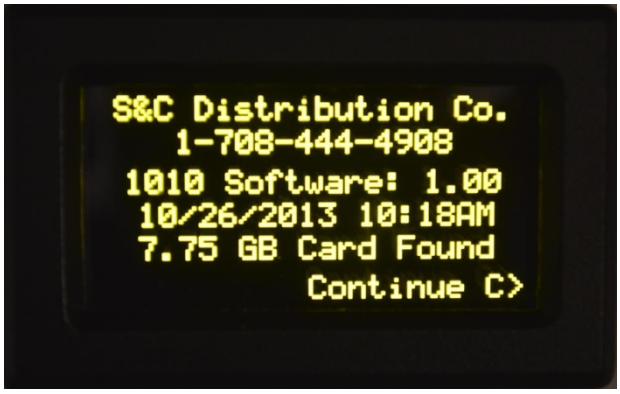
11) USB Port is used **ONLY** to plug in either a Standard Keyboard, (S&C PN: 331-5-19) or a Barcode Scanner (S&C PN: 331-5-17).

Chapter 3

How It Works

I. Initial Screen and Recording Screen Explanations

1. When the unit is first turned on it will display the Initial Screen:



2. The Initial Screen (above) displays:

   a. Company Name and Phone Number,

   b. Software Revision Number,

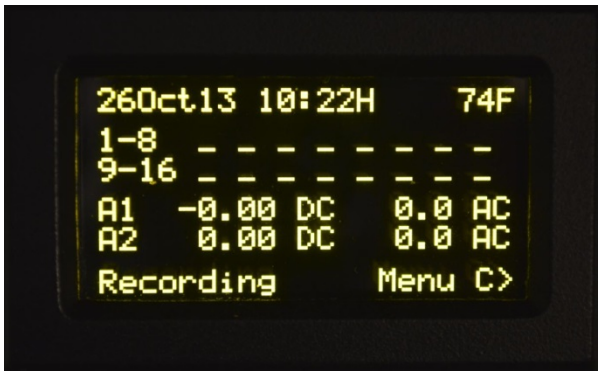
   c. Time and Date

   d. Presence of SD Card and data capacity remaining.

   e. Press Pushbutton "C" to continue.

   f. Note: after 5 minutes this screen will automatically go to the Recording (Live Status) Screen.

3. The second screen (below) is the Recording (Live Status) Screen and will remain displayed unless you press "C" to move to the Menu:



a. Date and Time (Military or 24Hour time) is displayed at the top of the screen as well as the 1010 internal temperature in degrees Fahrenheit. Note: a software method is being developed to toggle the temperature reading from Fahrenheit to Celsius, for those who prefer metric temperature readings. Digital and Analog Input status is reported "live" on this display. The display can be helpful in identifying the "click" of a relay that has changed state or the floating output of a GCP ®, VHLC ®, etc., that has either become active or ceased activity.

b. The second line gives the status of the Digital Inputs 1 thru 8. The "_" signifies that there is no input present or it is below 3V. The Recorder will report at the rate of one event per second. If events occur faster than 1 per second, an "M" will show in the space for that particular input rather than an "X". The "M" stands for "multiple"

c. The third line gives the status of Digital Inputs 9 thru 16. Again, the "_" signifies that there is no input present or it is below 3V. See comment in "b" above for multiple events in the 1 second sampling period.

d. The fourth and fifth lines present the Analog inputs:

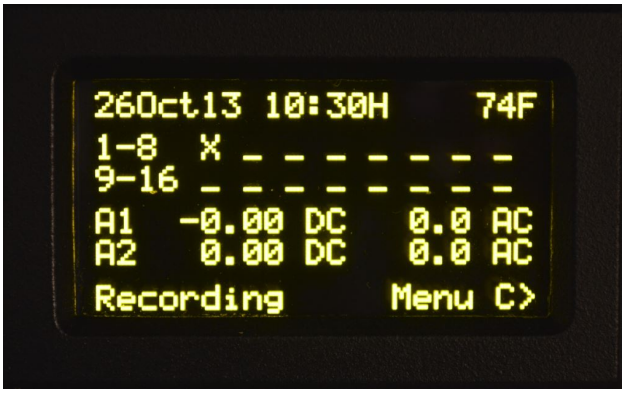
i. Both AC and DC values are displayed at the same time on each input, if the circuit monitored happens to have both types of voltages on it.

ii. Up to 75.00 Volts DC may be read and recorded, and

iii. Up to 150V AC may be read and recorded.

e. The last line tells you that you are "Recording" and that you may push "C" to go to the Menu.

f. Data input display looks like this (see next page):



1. An input has been applied to D1 which is greater than 3V.

2. This change is signified by an "X" on the screen in the position represented by "D1"

3. Any Digital input change, such as this "D1" input will cause a record to be written to the SD Card consisting of:

    i. Time/Date: mm/dd/yyyy hh:mm

    ii. Internal Temperature of the Recorder in Degrees Fahrenheit. (Fahrenheit/Celsius can be toggled by pressing the "A" pushbutton or F1 on the Keyboard if plugged in.)

    iii. All of the data inputs, D1 thru D16

    iv. Both of the Analog Inputs, A1 and A2, will report either AC or DC on their respective inputs. They will also report both AC and DC voltages simultaneously if both are present in the circuit.

4. Analog input changes will not trigger any recording, unless you are using the "Record Interval function.

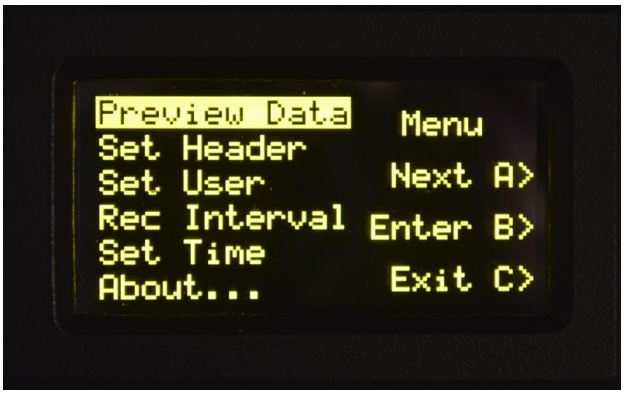
    i. Analog inputs (voltages) are likely to vary somewhat normally.

    ii. In normal use, voltage level on an Analog Input is recorded only when a Digital Input status changes.

    iii. If you want to monitor a voltage for level changes, not tied to the Digital Inputs changing, then set up the Record Interval function. You may capture the voltage level Inputs in one of five different time increments selectable from 10 Minutes to 1 Second. A record of the status of all Analog and Digital inputs will be written each time a time increment is reached. Given the storage capacity of the 8GB SD Card furnished, even the one per second time interval rate is not likely to substantially effect the duration of your recording session, as the chart in the Specifications Section of this manual suggests. For an explanation of how to set the Recorder to record the Analog Inputs on a time increment basis, go to Chapter 3, Section 7, of this Manual.

II. MENU

1. The Menu Options are controlled by the Recorder pushbuttons. You may also use an ASCII-based mini-keyboard to do this (our PN: 331-5-19). Instructions on the use of the mini-keyboard key strokes appear in appropriate sections of this manual.



2. Pressing “C” pushbutton will bring you to the Menu Screen (above). In this screen you can press the "A" pushbutton to go to the "Next" screen, press the "B" pushbutton to enter the information required for the option you have selected, and press the "C" pushbutton to return to the Recording (Live Status) Screen. The below information "walks" you through the Menu options.

    a. **Preview Data**:

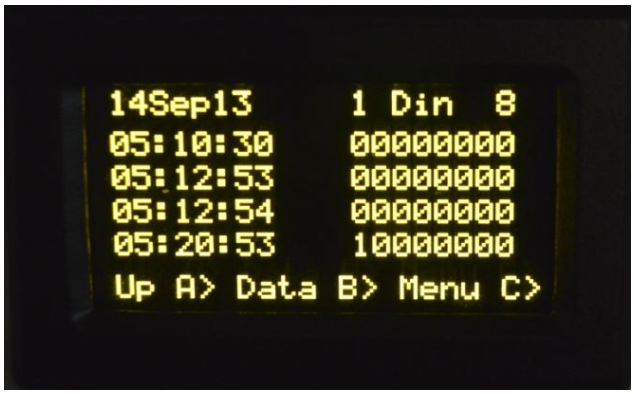
        i. The “Preview Data” option is automatically selected to start with and is displayed inverse (Highlighted) to show that it is selected. Note: "Preview Data" means that you can playback the data already recorded in the SD Card memory, and view it on the display.

        ii. To go to “Preview Data” simply press the “B” Pushbutton.

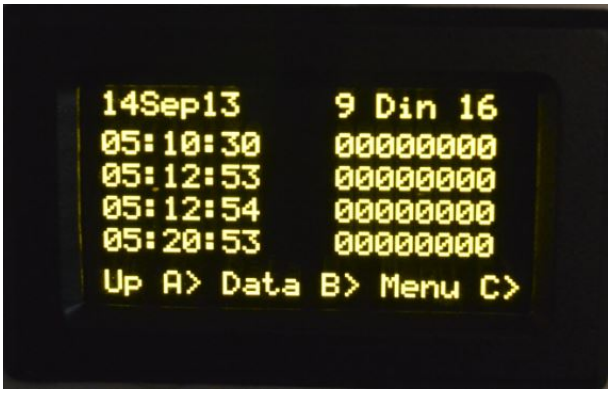
        iii. “Preview Data” is not designed for an in depth analysis of the problem, but rather a quick “in the field” look at what has happened.

        iv. The “Preview Data” is presented on a succession of screens which can be cycled through with the pushbuttons, as discussed in the following manual section. Note, that in any of the Preview Data screens, you can scroll backward (Up) through that particular data group (Inputs 1-8, 9-16, Analog 1, etc.), by pressing the “A” button in succession. See Section “b” of this chapter.

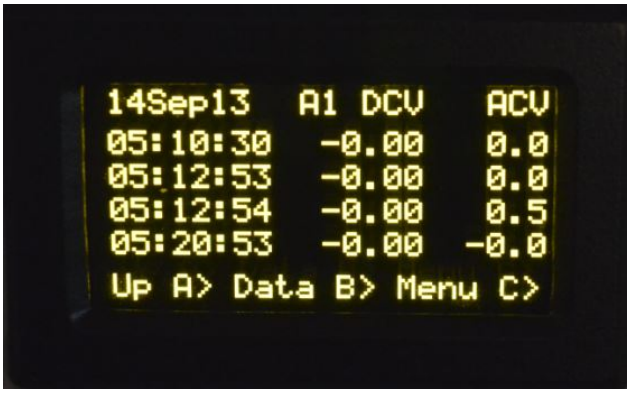
v. Initial Preview Screen (below) gives the date, time and Inputs 1 thru 8 (Note: "Din" means "D In", or Digital Inputs):



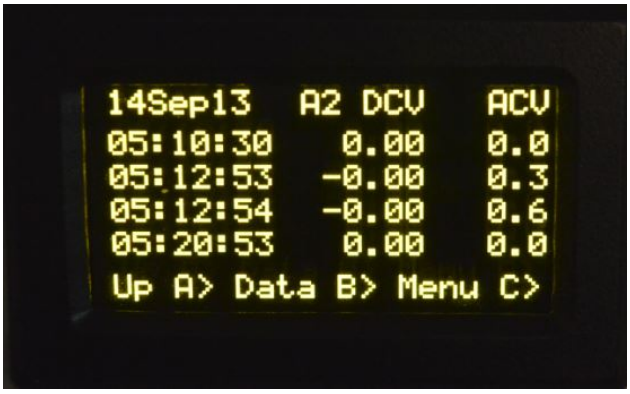
vi. When you press "B" it will scroll to the Inputs 9 thru 16:



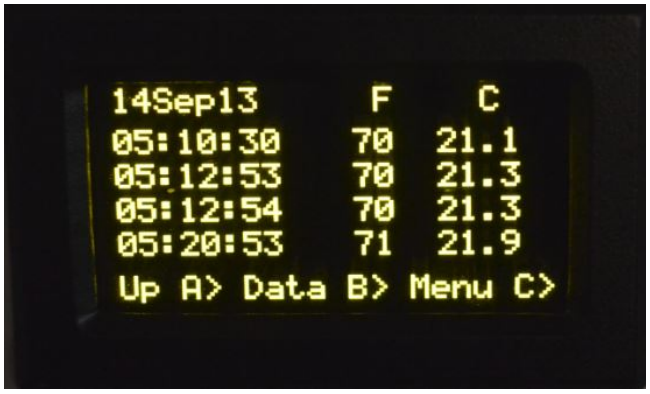
vii. Pressing "B" again scrolls to Analog 1:



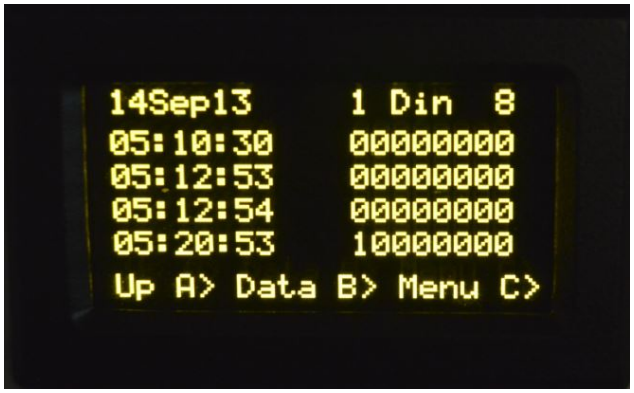
viii. Pressing “B” again scrolls to Analog 2:



ix. Again pressing “B” takes you to the recorded internal temperature of the Recorder, at the time of the occurrence, as shown in the screen below.



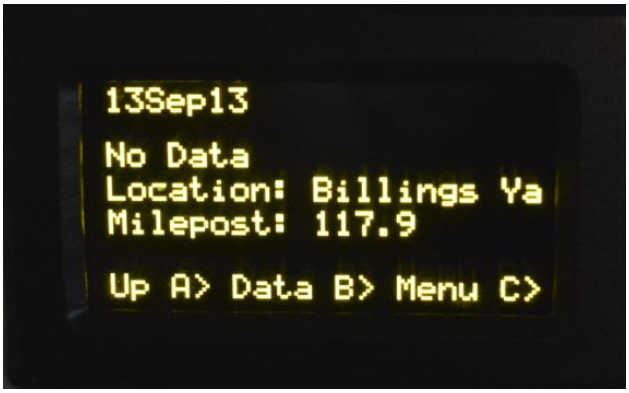
x. Pressing “B” the next time will scroll you back to the initial Preview Screen.



b. **Scrolling Data:**

i. Pressing “A" will scroll backward in time (Up) in increments of four records. If you continue pressing the "A" button, you will eventually reach the header.

1. While "Previewing" data, the pushbutton only allows scrolling in one direction, from the present back to older records. A Keyboard connected to the USB Port on the faceplate of the Recorder will allow scrolling in either direction, using the up and down arrow keys to scroll to individual lines of data, or the Pg Up and Pg Dn keys to scroll in groups of four older or four more recent entries.



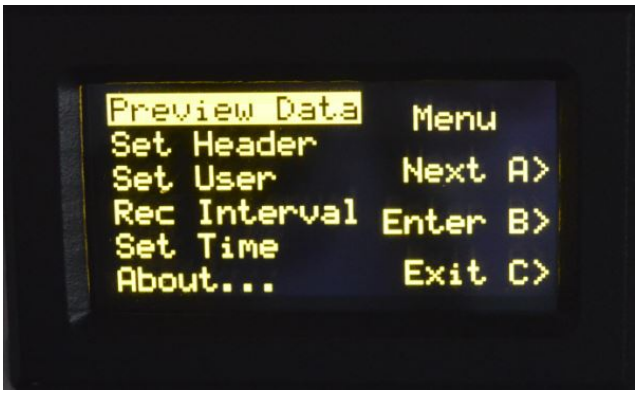
2. Scrolling to the top of the data records, at the top of the screen, the earliest date in this recording sequence is shown. Note, that no data is present in the end record, as is shown above. Further note that from this point, you cannot scroll back to records you have passed, using the push buttons on the Recorder. See Section Preview Data, "a", or, Scrolling Data "b", above.

3. Location is given, and you will note that Billings Yard is truncated in the Preview Display due to limited width of screen.

4. Milepost is given.

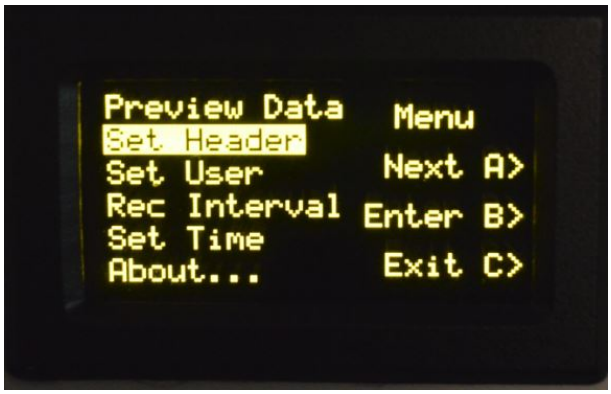
5. Press buttons ("A" to move up the data and "B" to move across the data) to continue with Preview or return to Menu.

ii. Pressing "C" again brings you back to the Menu:



c. **Inputting Header Data**

i. To select “Set Header” press “A”



ii. Then press “B” to start entering the header data with keyboard. To connect the keyboard, use the USB Port at the bottom of the Recorder faceplate. Alternative to using the pushbuttons on the Recorder is using keyboard Function Keys per the following.

Set Header - Key Functions		
Pushbuttons	Keyboard	Action
"A"	"F1" Key	Clears present entry
"B"	"F2" Key or "Enter" key	Saves present data, moves to next field. Exits to Main Menu when saving last entry.
"C"	"F3 or "Esc" (Escape) Key	Ignores present typing and takes you to the Main Menu. All previously entered fields will be saved.
---	"Backspace"	Deletes last character typed.
---	"Characters Typed"	Added to the end of text.

iii. **Naming Inputs**. The 1010 Recorder defaults to the front panel label for input names (Example shown above, the name for Input D1 is "D1").

1. To enter another label for the D1 input, just type the label you wish to see, such as “XR RELAY” (Must use Keyboard for Data Entry).

2. To clear what you have typed, press “A” (“F1” on the keyboard for the whole entry or use the “Backspace” key to remove one digit at a time.)

3. To Accept what you have typed, press “B” to save it (F2 or Enter on the keyboard)

4. To exit and not save what you have typed, press “C” (F3 or Esc on the keyboard).

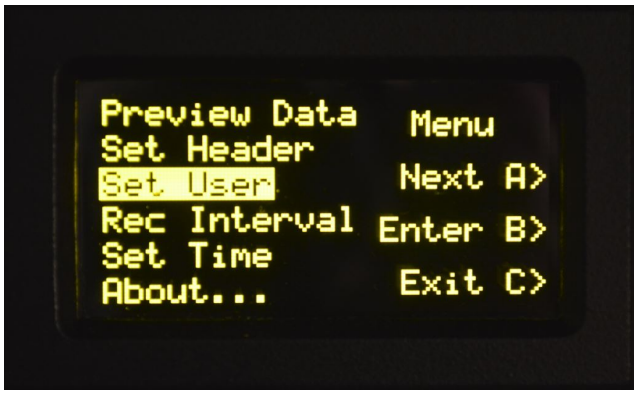
5. The 1010 will prompt you to name each input in order D1 thru D16 and A1 and A2 unless you exit by pressing “C” (F3 or Esc on the keyboard) at one label past the last entry you wished to change or edit.

6. Pressing “C” (F3 or Esc on the keyboard) will not change previous entries. If you have set D1 thru D11 and press “C” at “D12” the 1010 will assume you have all the inputs named that you are using and will leave the entry program.

7. If you wish to use inputs out of order, for instance just D1 and D3 for some reason, then just accept the “D2” label by pressing “B” (F2 or Enter on the keyboard) and then enter the label you desire in “D3” location.

8. When you have completed entering the Header Data (naming Inputs), then press “C” pushbutton (“F3” or Enter on the Keyboard) and go back to the Menu Screen.

iv. **"Set User" Information**. Press “A” pushbutton (“F1” or Down Arrow on the keyboard) to highlight “Set User”. Continue on next page.



Alternative to using the pushbuttons on the Recorder is using keyboard Function Keys per the following.

Set User - Key Functions		
Pushbuttons	Keyboard	Action
"A"	"F1" Key	Clear Present Entry
"B"	"F2" or "Enter" Key	Saves present data, moves to next field. Exits to Main Menu when saving last entry.
"C"	"F3" or "Esc" (Escape) Key	Ignores present typing and takes you to the Main Menu. All previously entered fields will be saved.
---	"Backspace"	Deletes last character typed.
---	"Characters Typed"	Added to the end of text.

1. Press “B” pushbutton (“F2” or “Enter” on the Keyboard) to go to the “Enter Location” screen.

2. The “Location” may have a previous entry in it. To change this entry, just start typing (Must use Keyboard or Barcode Scanner for Data Entry). To use the present entry without change, press “B” pushbutton (“F2” or “Enter” on the Keyboard).

a). To clear all typing, press “A” pushbutton (“F1” on the keyboard), (or use the keyboard “Backspace” key to go back one character at a time).

b). To record your entry and save it, press “B” pushbutton (“F2” or “Enter” key on the keyboard.)

c). To exit and not save your entry Press “C” pushbutton (“F3” or “Esc” key on the keyboard). You will go back to the Menu.

d). Assuming you have pressed “B” pushbutton (“F2” or “Enter” key on the keyboard), you will proceed to the “Enter Milepost” screen. See next page.

3. After you have pressed “B” pushbutton (“F2” or “Enter” key on the keyboard), you will proceed to the “Enter Milepost” screen:

a). The “Milepost” may have a previous entry in it, to change; just start typing (Must use Keyboard for Data Entry). To use the present entry without change, press “B” pushbutton (“F2” or “Enter” key on the keyboard.)

b). To clear all typing, press “A” pushbutton (“F1” on the keyboard), (or use the keyboard “Backspace” key to go back one character at a time).

c). To record your entry and save it, press “B” pushbutton (“F2” or “Enter” key on the keyboard.)

d). To exit and not save your entry Press “C” pushbutton (“F3” or “Esc” key on the keyboard). You will go back to the Menu.

e). Assuming you have pressed “B” pushbutton (“F2” or “Enter” key on the keyboard), you will proceed to the “Enter Operator” screen. See next page.

4. Having pressed “B” pushbutton (“F2” or “Enter” key on the keyboard) you will proceed to the “Enter Operator” screen:

a). The “Enter Operator” may have a previous entry in it, to change; just start typing (Must use Keyboard or Barcode Scanner for Data Entry). To use the present entry without change, press “B” pushbutton (“F2” or “Enter” key on the Keyboard).

b). To clear all typing, press “A” pushbutton (“F1” on the keyboard), (or use the keyboard “Backspace” key to go back one character at a time).

c). To record your entry and save it press “B” pushbutton or “F2” or “Enter” key on the keyboard.

d). To exit and not save your entry Press “C” pushbutton (“F3” or “Esc” key on the keyboard). You will go back to the Menu.

e). Assuming you have pressed “B” pushbutton (“F2” or “Enter” key on the keyboard), you will proceed to the “Enter Company” screen. See next page.

5. Having pressed “B” pushbutton (“F2” or “Enter” key on the keyboard) you will proceed to the “Enter Company” screen:

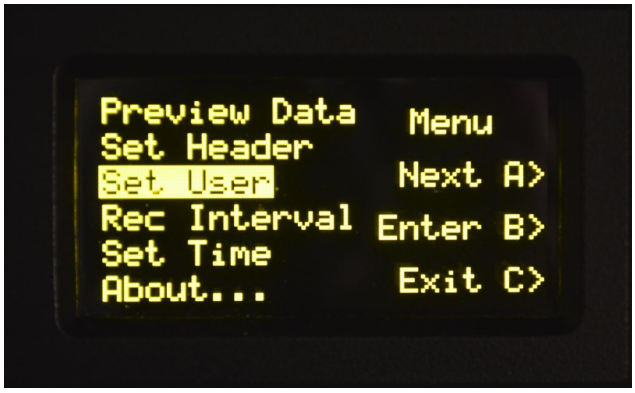
a). The “Enter Company” may have a previous entry in it, to change; just start typing (Must use Keyboard or Barcode Scanner for Data Entry). To use the present entry without change, press “B” pushbutton (“F2” or “Enter” key on the keyboard.)

b). To clear all typing, press “A” pushbutton (“F1” on the keyboard, or use the keyboard “Backspace” key to go back one character at a time).

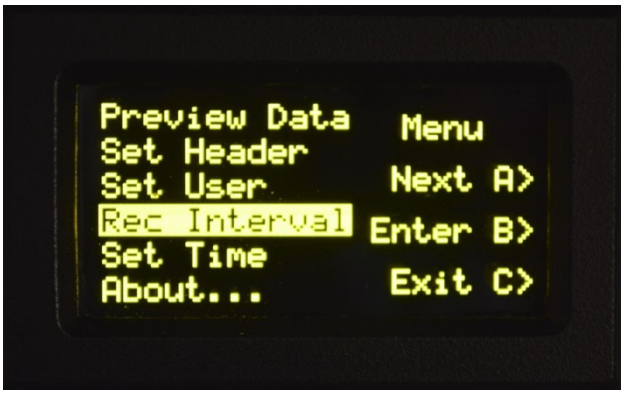
c). To record your entry and save it, press “B” pushbutton (“F2” or “Enter” key on the keyboard.)

d). To exit and not save your entry Press “C” pushbutton (“F3” or “Esc” key on the keyboard). You will go back to the Menu.

e). Assuming you have pressed “B” pushbutton (“F2” or “Enter” key on the keyboard), this will have completed the "Set User" process and you will be returned to the Menu.



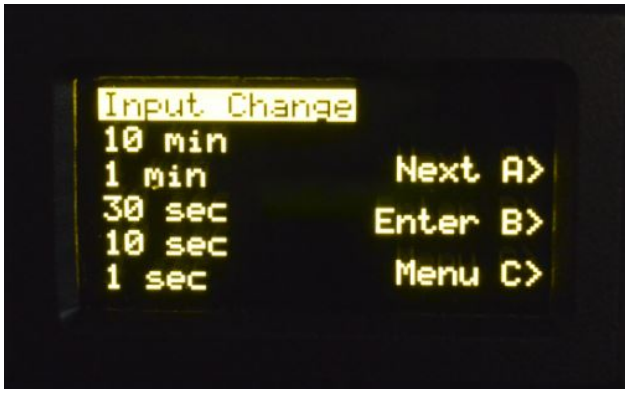
d. **Setting Record Interval (Analog Inputs**). Pressing "A" will bring you to "Rec Interval" (Record Interval).



i. This is the "Pen Recorder" function of the 1010 and will allow, on the Analog Inputs, recording of the AC and/or DC voltages at specific time intervals (along with time and date, and all other data present on the Digital Inputs.). Using this feature creates a record that reflects changes in the voltage connected to the Input over a period of time. For instance, if you think that your problem stems from commercial power brown-out, you can record the voltage by date and time. Graphing this data will quickly identify any fluctuations.

ii. It is recommended that you install an S&C Power Input Coupler (PN: 1010-19) between the commercial power input and the Recorder to help protect the Recorder from voltage surges and to provide a floating output for a Digital Input on the Recorder. This Digital Input will provide a date/time stamped record any time the voltage exceeds 150VAC or current greater that 60mA flows in the protection circuit. See separate literature piece for technical details Power Input Coupler.

iii. To set the interval, press "B" and you will come to the selection screen for setting the recording time interval.



1. When this screen comes up, "Input Change" is the default. This option sets the Recorder to make a recording of an Analog Input(voltage level) only when any Digital Input changes state. If you are tracking the status of a voltage, you will want, instead, to select one of the interval options shown on the screen below the "Input Change" option.

With an SD Card that has an 8GB capacity, it is unlikely that any of the time interval options will affect the length of your monitoring session. See Specifications Section of the manual for Days Saved details.

2. The Interval Options available as listed on the screen are: 10 min, 1 min, 30 sec, 10 sec and 1 sec.

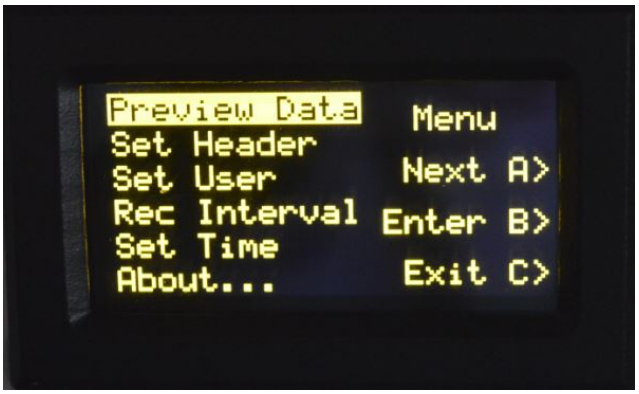
3. To move to a listed interval, use the “A” Pushbutton to scroll dow

4. Press “”B” Pushbutton to select the interval.

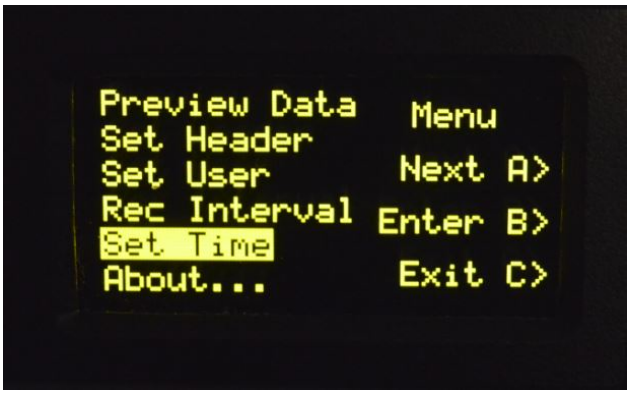
5. You have set the recording interval for your Analog Inputs. Now you should return to the Menu by pressing Button "C".

e. **Setting The Date/Time**

i. From the Menu screen:



ii. Referencing above picture, use pushbutton “A” to move the cursor (highlighted text) down to “Set Time”. See screen, below.



iii. Press pushbutton "B" to select. The Set Time screen will come up:

iv. To change the date or time:

1. If you do not want to change anything, press the “C" button to exit

2. To change information in the date/time field, use the “B” pushbutton to move the cursor (Highlighted Character) to the numbers you wish to change.

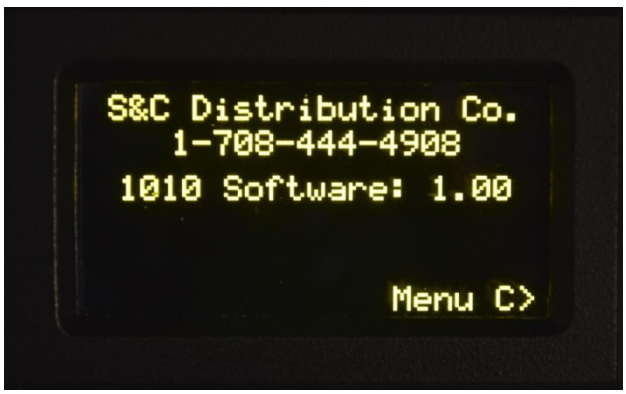
3. Use the “A” pushbutton to change the number. Push the "A" button to cycle through the options until you reach the number you want.

4. Use the "B" - "A" button sequence to continue across the date/time field until all the information is correct.

5. Use the “C” pushbutton to save the time/date you have changed.

f. **“About” Screen**. The last Menu option is The “About…” screen.

i. To read the information provided in the "About. . ." screen, select “About…” (the "About" screen is displayed below)



ii. This screen tells you:

1. Our name, S&C Distribution Co.

2. Our phone number 1-708-444-4908

3. The software version installed.

III. Information About Recording.

a. Any time that the SD card is not present there will be a notification on the screen:

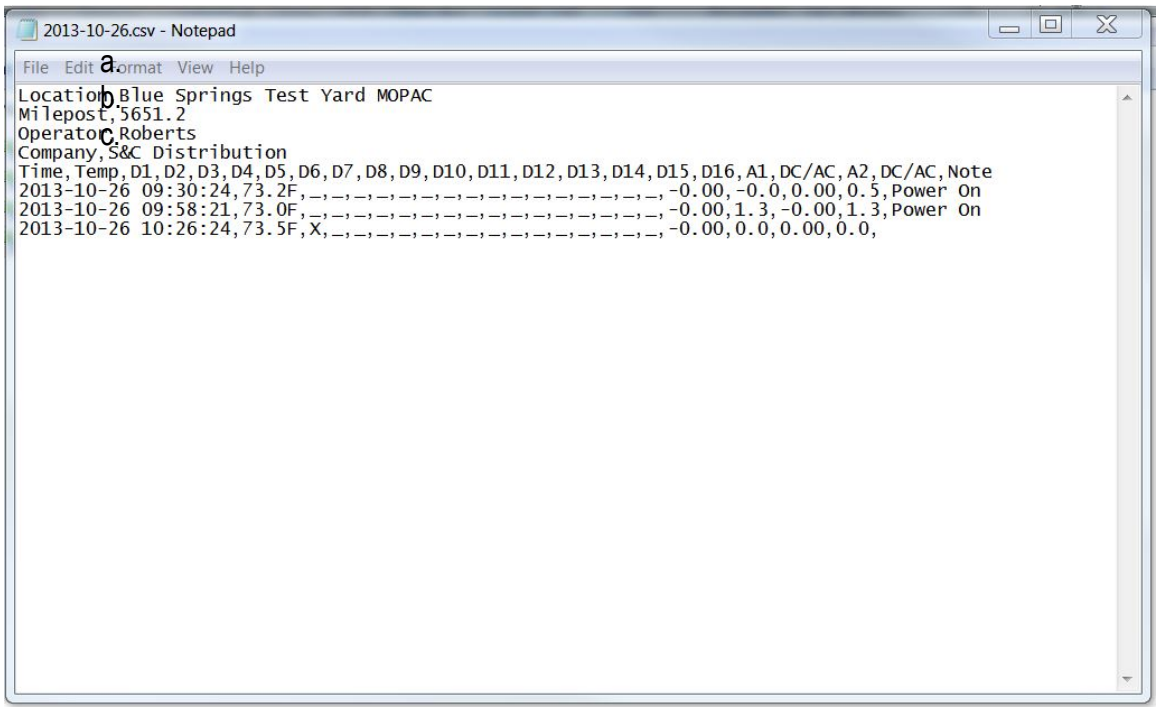
b. An SD card must be present to record data, or do any data entry.

c. A check before you leave the location is always in order to see that the Recording (Live Status) Screen is displayed.

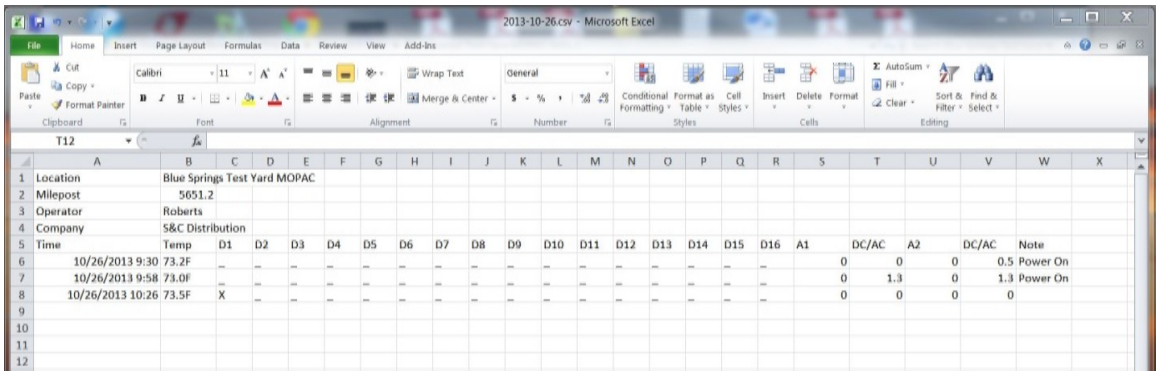
d. When the Recorder is recording the format of the data saved is as follows:

1. The Recorder saves a .csv (Comma Separated Values) file which can be viewed on a computer several ways.

2. The raw .csv file looks like this (see next page):



3. In Excel (a spread sheet) it looks like this:



CHAPTER 4

Trouble-Shooting Guide

A. General

There are limited measures that can be taken to trouble-shoot the 1010 Recorder. They are described below. Instructions for returning the 1010 Recorder to the factory for repair are supplied at the end of this chapter.

B. Trouble Shooting Procedures:

1. Unit fails to "Power Up" when turned on.
    i. Check the 1A Fast Acting fuse on the front panel.
    ii. Try Checking the power connections.
    iii. Recorder needs technician-level repair.
2. Digital Input does not work:
    i. Check to see if the wires are connected properly to the Wago connectors and to the source output.
    ii. Ensure that voltage produced by the source is greater than 3V..
    iii. Check leads for opens.
    iv. Recorder needs technician-level repair.
3. Analog Input does not read voltages.
    i. Wires plugged into wrong jack.
    ii. Wires not making connection.
    iii. Wires defective.
    iv. Recorder needs technician-level repair.

CHAPTER 4, CONTINUED.

Trouble-Shooting Guide, continued.

C. Returning the 1010 Recorder or Accessories for repair at the factory.

1. Call S&C Distribution Company for a Return Goods Authorization and shipping instructions.

2. Pack the item being returned for repair carefully and ship it prepaid to the address provided.

S&C Distribution Company
7225 Duvan Drive
Tinley Park, IL 60477

Phone: 1-708-444-4908
Fax: 1-708-444-4962
Email info@sandcco.com

CHAPTER 5

Accessories/Replacement Parts

A selected number of Accessories and Replacement Parts have been developed for the Recorder in response to customer suggestions. They are detailed below. If you would like further information or pricing, contact S&C Distribution Company.

REF	DESCRIPTION	PART NUMBER
1	Optional Battery Pack, 7.0AH Batt, Charger, Connectors	330-1010A
2	Optional Mini-ASCII Keyboard for data entry, w/Case	331-5-19
3	Optional Barcode Scanner, low temp	331-5-17
4	Optional Power Input Coupler w/overvoltage indicator	1010-19
5	Replacmt, Power Supply, 120VAC to 12VDC, 500mA	324-11
6	Replacmt, SD Card to USB Adapter for data download	1010-18
7	Replacmt, SD Card, 8GB	1010-15
8	Replacmt, Batt/Charger/Recorder Connector Set (2 pcs)	330-1010-2
9	Replacmt, Battery for Battery Pack, 7.0AH, 12VDC	7500-6-4
10	Replacmt, Large, HD, Carry Bag	322/331BZB
11	Replacmt, Mini-Keyboard Case	331-5-12

ORDER FROM

S&C Distribution Company
7225 Duvan Drive
Tinley Park, IL 60477

Voice: 708-444-4908
Fax: 708-444-4962
e-mail: info@sandcco.com