Cobalt™ Portable Controller

Operations Manual

BECK Automation, LLC
2323 Weldon Parkway
St. Louis, MO 63146
Phone: (314) 576-9736
Fax: (314) 576-9756
www.beckautomation.com

Rev: 12/07

TABLE OF CONTENTS

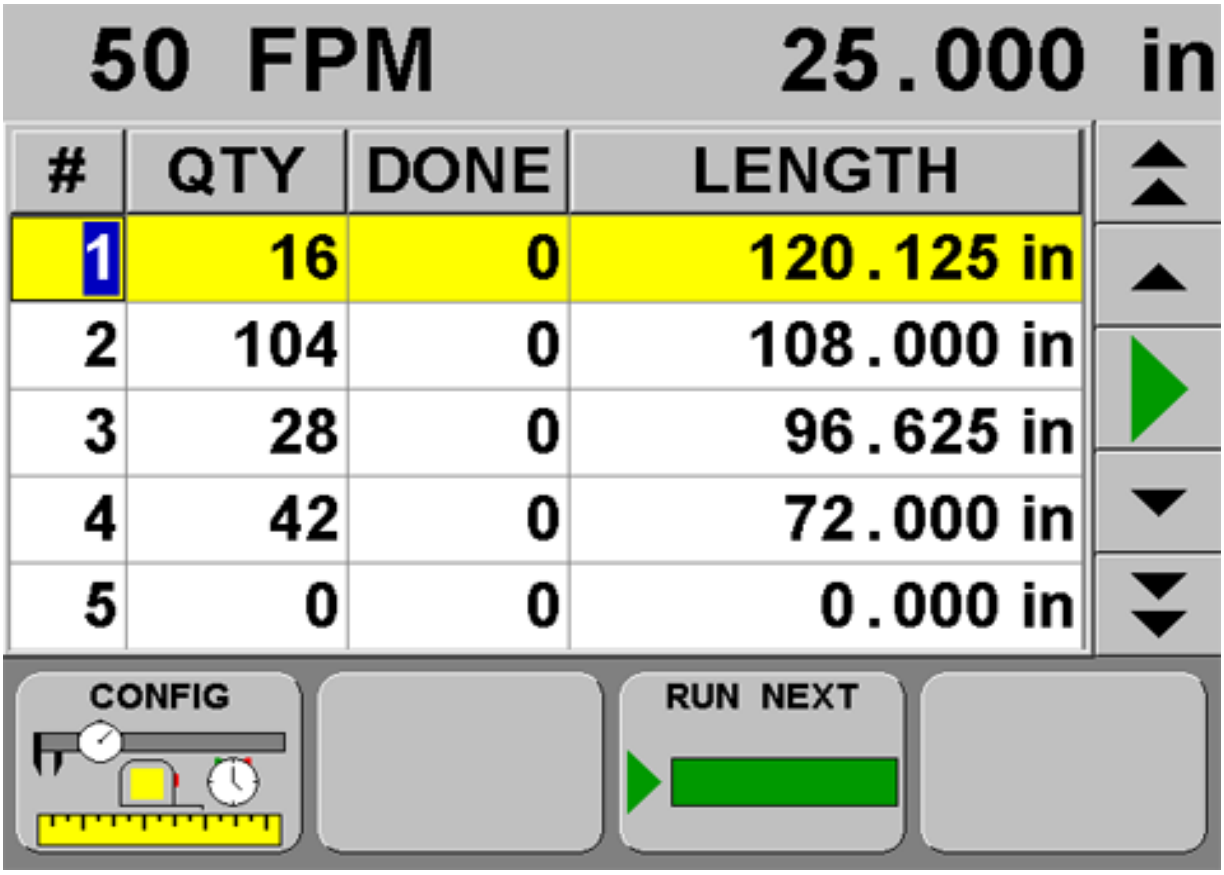
OVERVIEW

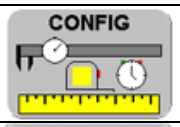
The Cobalt Portable Controller is designed with the portable rollformer in mind. The following features make it the ideal choice for Residential, Commercial, and International versions of these machines:

- Rugged heavy-gauge steel enclosure
- Weather-resistant enclosure with gaskets
- Quick disconnect military grade plugs
- Plugs and keyhole mounting for easy removal for transport or extreme weather
- Open-collector thermally protected outputs interface directly to solenoid valves
- Bright sunlight readable display
- Touch-screen for quick and easy batch programming
- Multiple batches
- Graphics along with text for intuitive setup
- Select from many English and Imperial units

STATUS SCREEN

This screen is used to program batches and select the desired one to run. At the top of the screen, the line speed and length of material beyond the shear are displayed.

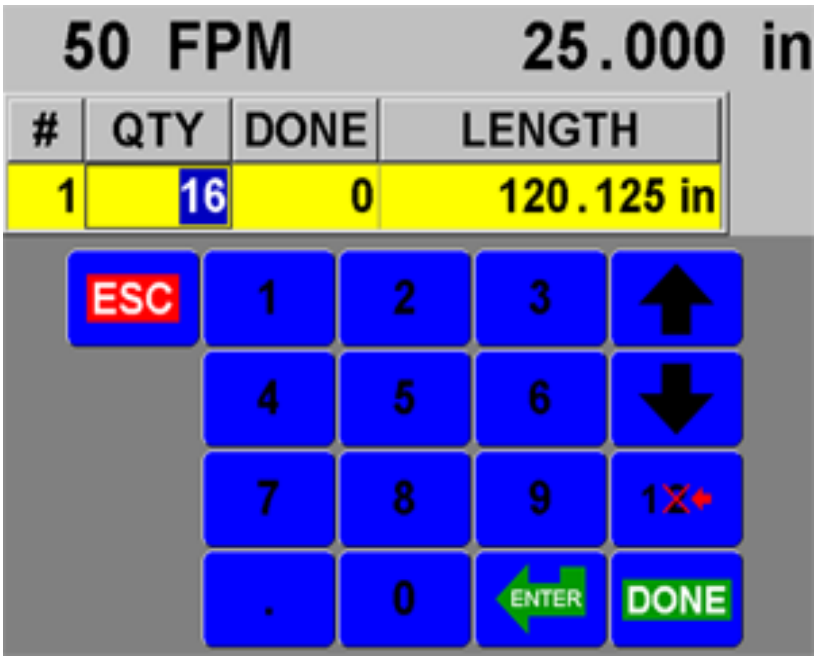


#	Batch Number (50 batches total)
QTY	Quantity (Number of pieces to Make.)
DONE	Number of pieces completed
LENTGTH	Length of pieces. (Length may be entered in a number of units. See configuration for details)
	Switch to configuration screen
	Selects the batch to run next.

	To top of list
	To previous page
	To Next batch
	To next page
	To bottom of list

EDITING BATCH DATA

The controller has 50 batches in which you can enter a quantity and length. Double-touching a batch brings up a keypad allowing you to edit the data. After entering the data on the length field, you will automatically be transitioned to the next batch.

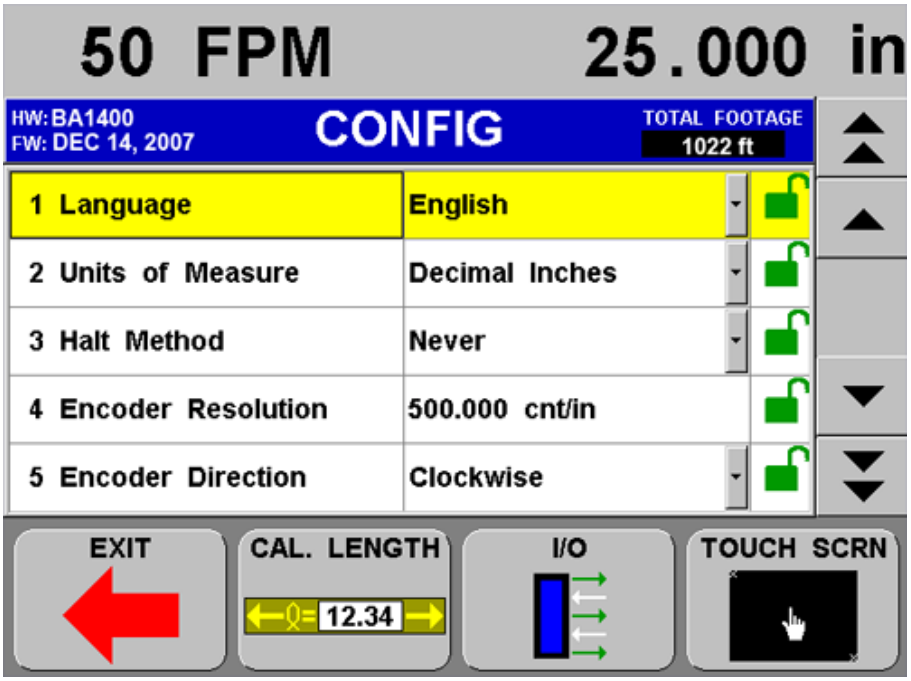


#	Batch Number, 1—50 can be entered.
QTY	Quantity (Number of pieces to make. Upon programming a new quantity, the number completed for this batch is reset to zero).
DONE	Number of pieces already completed. This number automatically increments when the shear fires. This value is reset to zero when a new quantity is programmed.
LENGTH	The desired length of the part. A number of different units are available. See configuration data for details.

3 6	Keys to enter numeric data
↑	Move to previous batch
↓	Move to next batch
1X	Backspace
DONE	Exit edit mode
ENTER	Accept the entered data
ESC	Abort the edit

CONFIGURATION SCREEN

This screen is used to configure the controller to fit a particular machine or desired method of operation.



EXIT	Return to status screen.
CAL. LENGTH 12.34	Bring up length calibration screen.
I/O	Transition to Input/Output status screen.
TOUCH SCRN	Calibrate the Touch Screen.
HW:xxxxxx	The hardware version of your controller.
FW:xxxxxx	The version of firmware installed in your controller.
Total Footage	The life total for your controller.

	To top of list
	To previous page
	To next page
	To bottom of list
	Parameter is unlocked and value may be edited. See Digital I/O for info.
	Parameter is locked and value may NOT be edited. See Digital I/O for info.

CONFIGURATION PARAMETER DESCRIPTIONS

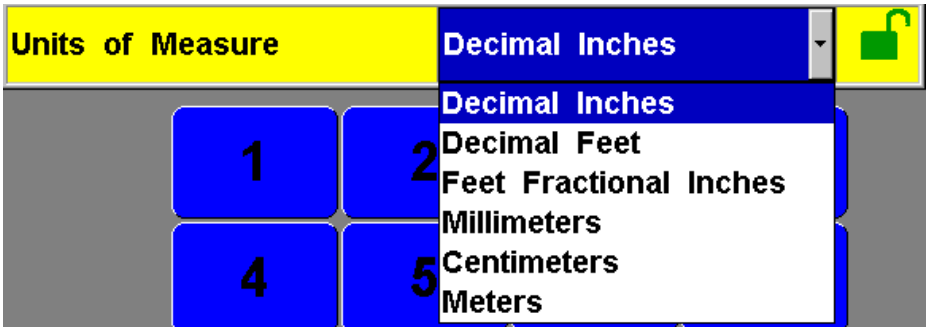
Parameter	Description	Lockable
1 Language	Language of text on the display	No
2 Units of Measure	Determines the unit in which lengths are entered. You may choose between: • Decimal Inches • Decimal Feet • Feet Fractional Inches • Millimeters • Centimeters • Meters If you choose a metric unit, the units on all values will change to metric.	No
3 Halt Method	If set to **Never**, the controller will continue to run batch after batch without stopping. If set to **Line Item**, the controller will halt after every batch. Regardless of this parameter, the controller will also automatically halt for the following: • conditions • Out of tolerance. • A batch with zero quantity.	No
4 Encoder Resolution	Number of encoder counts per unit of travel. For example: 2,000 counts divided by 12 inch wheel equals 166.667.	Yes
5 Encoder Direction	If the encoder wheel is turning forward but the controller is counting backwards, toggle this parameter.	Yes
6 Correction Factor	An adjustment percentage that fixes inaccuracies between the measured lengths and the actual length. This number may be calculated and entered by hand, or you can use the calibrated length screen to automatically adjust this number.	Yes
7 Tolerance	The material must stop within this value before firing the shear. If not, the machine will halt and an error message will be displayed indicating how far out of tolerance the piece is.	Yes
8 Shear Down Time	Time that the shear-down output is turned on for a shear operation. The output will immediately turn off if the shear complete input turns on. If a zero is entered for this parameter, the shear-down output will remain on until a complete input turns on.	Yes
9 Shear Up Time	Time that the shear-up output is turned on for a shear operation. The output will immediately turn off if the shear complete input turns on. If a zero is entered for this parameter, the shear	Yes

	up output will remain on until a complete input turns on.	
10 Minimum Slow Distance	The controller will switch the material to a slow speed ahead of the target early, this distance, plus the calculated deceleration distance. The minimum slow distance is used to compensate for inaccuracies in predicted deceleration and to insure that the controller stops from a consistent speed. This value has no effect on a single speed line.	Yes
11 Deceleration Rate	The rate at which the controller expects the material to decelerate from fast to slow. This value has no effect on a single speed line.	Yes
12 Stopping Time	The time required for the material to stop after it is commanded to do so. The controller stops motion early by a distance equal to the current velocity times the stopping time. This parameter is automatically updated based upon the next parameter, Max Stop Time Change.	Yes
13 Max Stop Time Change	On each shear, the controller calculates what the additional stopping time should have been to make a perfect part. A percentage of that difference is added to the current stopping time. If that difference is greater than the value in this parameter, no adjustment is made. A small value in this parameter will prevent abnormal adjustments for items such as jam-ups.	Yes
14 Eject Distance	Following a shear the controller move this distance of material past the shear. This allows a part to be removed from the machine.	Yes
15 Touch Sensitivity	An adjustment to control how hard you have to touch the touch-screen to read that a touch was performed. The new value takes effect after a power off and on.	Yes
16 Double-Touch Delay	An adjustment for the amount of time required between consecutive touches for the two separate touches to be considered a double touch. The new value takes effect after a power off and on.	Yes
17 TS X-Cal. Left	Adjustments to align the actual touched point on the touch-screen. These values can be set automatically by the touch-screen calibration screen. The new values take effect after a power off and on.	Yes
18 TS X-Cal. Right		Yes
19 TS Y-Cal. Bottom		Yes
20 TS Y-Cal. Top		Yes
21 Footage Totalizer 1	Running material production totals. These totals can be reset or reinitialized at any time.	Yes
22 Footage Totalizer 2		Yes

EDITING CONFIGURATION PARAMETERS

Double-touching a parameter brings up a keypad allowing you to edit the data. The keypad displayed works the same as it does for entering batch data.

DROP-DOWN LIST PARAMETERS



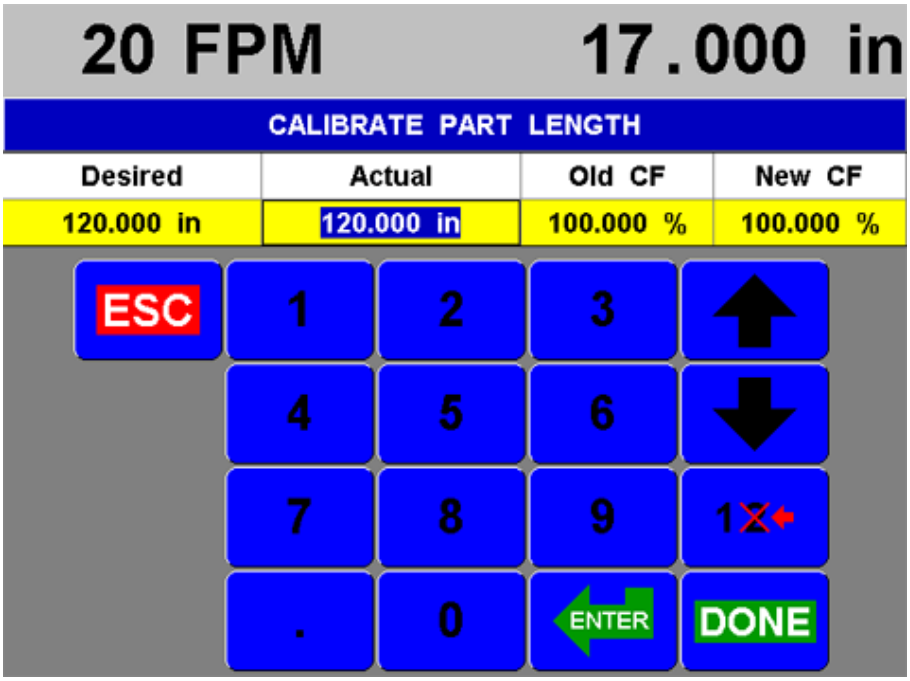
To change the value, you touch the current value to drop down the list of options. Then you touch the new option. You may do this on the configuration screen directly or with the edit mode keypad up.

NUMERIC PARAMETERS

To change numeric parameters, you must have first brought up the keypad by double-touching the parameter. Then press the appropriate buttons on the keypad to edit the numeric values. You must press ENTER for the value to be saved.

LENGTH CALIBRATION SCREEN

This screen is used to adjust the length-measurement-correction scaling.



Enter the desired length (the prompt will be the last part made). Enter the actual length that was measured. Data entry is done by the keypad in the same way in which batches are programmed. The New Correction Factor (CF) will be displayed based on the lengths entered.

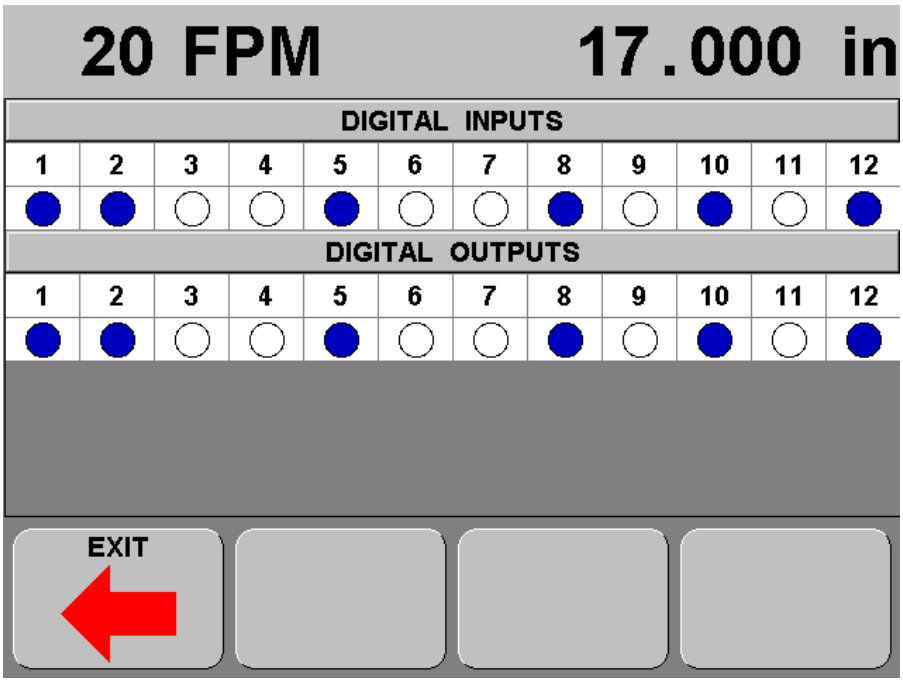
The correction factor must be between 95% and 105%. If a value outside this range must be entered to achieve accurate lengths, check the encoder resolution value. New Correction Factor (CF) will be the color red if the value is outside the limits.

After pressing DONE, the new correction factor will take effect. If you press ESC, the change is aborted.

INPUT/OUTPUT SCREEN

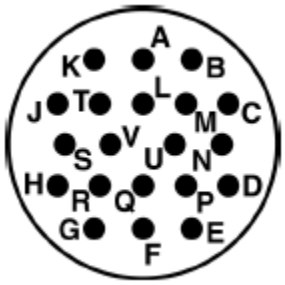
This screen shows a real-time status of the controller's digital inputs and outputs. This is often useful for troubleshooting purposes.

The Cobalt Portable uses only the first eight inputs and outputs.



EXIT	Return to configuration screen

POWER CONNECTIONS



Controller Box: Amphenol No.: 97-3102A-28-16P
Mating Connector: Amphenol No.: 97-3106A-28-16S

Pin	Function	Color	Signals
A	PWR	Red	CPU Power (12 to 24 VDC)
B	GND	Blk	CPU Ground
C	Input 1	Org	Emergency Stop
D	Input 2	Org/Blk	Run
E	Input 3	Org/Red	Jog Forward
F	Input 4	Wht	Jog Reverse
G	Input 5	Blu	Manual Shear
H	Input 6	Blu/Blk	Setup Lockout ‡
J	Input 7	Blu/Red	Shear Complete
K	Input 8	Blu/Wht	
L	Output 1	Grn	Run
M	Output 2	Grn/Blk	Fast
N	Output 3	Grn/Wht	Slow
P	Output 4	Wht/Blk	Reverse
Q	Output 5	Wht/Red	Shear Down
R	Output 6	Red/Grn	Shear Up
S	Output 7	Red/Blk	
T	Output 8	Blk/Red	
U	PWR	Red/Wht	I/O Power (12 to 24 VDC)
V	GND	Blk/Wht	IV GND

‡ If ON, you cannot edit lockable parameters. See “Lockable” column for “Configuration Screen Parameter Descriptions” on Configuration Screen page. Touch Screen Calibration is also locked when this input is on.

Digital Outputs are Open-collector. They are sinking, meaning they take a load to ground when turning it on.

Digital inputs are sourcing, meaning you must pull them to ground to turn them on.

ENCODER CONNECTIONS

Controller Box: Amphenol No.: 97-3102A-18-IS
Mating Connector: Amphenol No.: 97-3106A-18-IP

Pin	Signals
A	A+
B	B+
C	
D	+5 VDC power for encoder
E	
F	GND
G	
H	A-
I	B-
J	

Encoder signals are expected to be RS422 compatible. The controllers interface is equivalent to a 26LS33 receiver.

UPGRADING FIRMWARE

1. Copy the “Autorun.s19” and “Cobalt.S19” files from Beck Automation onto a Compact Flash (CF) card into a folder named “BA1400.” The compact flash card must be formatted as FAT and not FAT32.

2. Insert the CF card into the cobalt controller.

3. Power on the controller.

4. A progress bar will appear as the controller loads and programs the new applications.

5. When programming is complete, the screen will turn green and wait.

6. Turn off the controller.

7. Remove the CF Card.

8. Turn on the controller.

9. Verify the application-build date by going to the CONFIGURATION SCREEN and looking in version in the blue title bar.

SETTING THE TOTAL FOOTAGE COUNTER

The "TOTAL FOOTAGE" meter is a counter that keeps track of the total number of feet that have been run through the machine. Every time a shear occurs--either running or a manual shear--the distance past the shear is added to this value. Dashes or parentheses should be used where I've shown two hyphens.

The only provision made available to change this meter is to use a specific program supplied by the manufacturer. This program can be put onto a compact flash card and inserted into the controller to set this value.

To set this meter, follow the procedure below:

1. Obtain the "AUTORUN.S19" & "SetMeterValue.txt" files for setting the "TOTAL FOOTAGE" meter.
   Note: This "AUTORUN.S19" file for setting the footage meter IS NOT the same one that is used for updating the application code, even though the file names are the same. This is a special program and must be kept separate from the standard "AUTORUN.S19" file.

2. A directory named "BA1400" should be created on a compact flash card off of the root directory (if it doesn't already exist). Then copy the "AUTORUN.S19" and "SetMeterValue.txt" files to the "BA1400" directory.

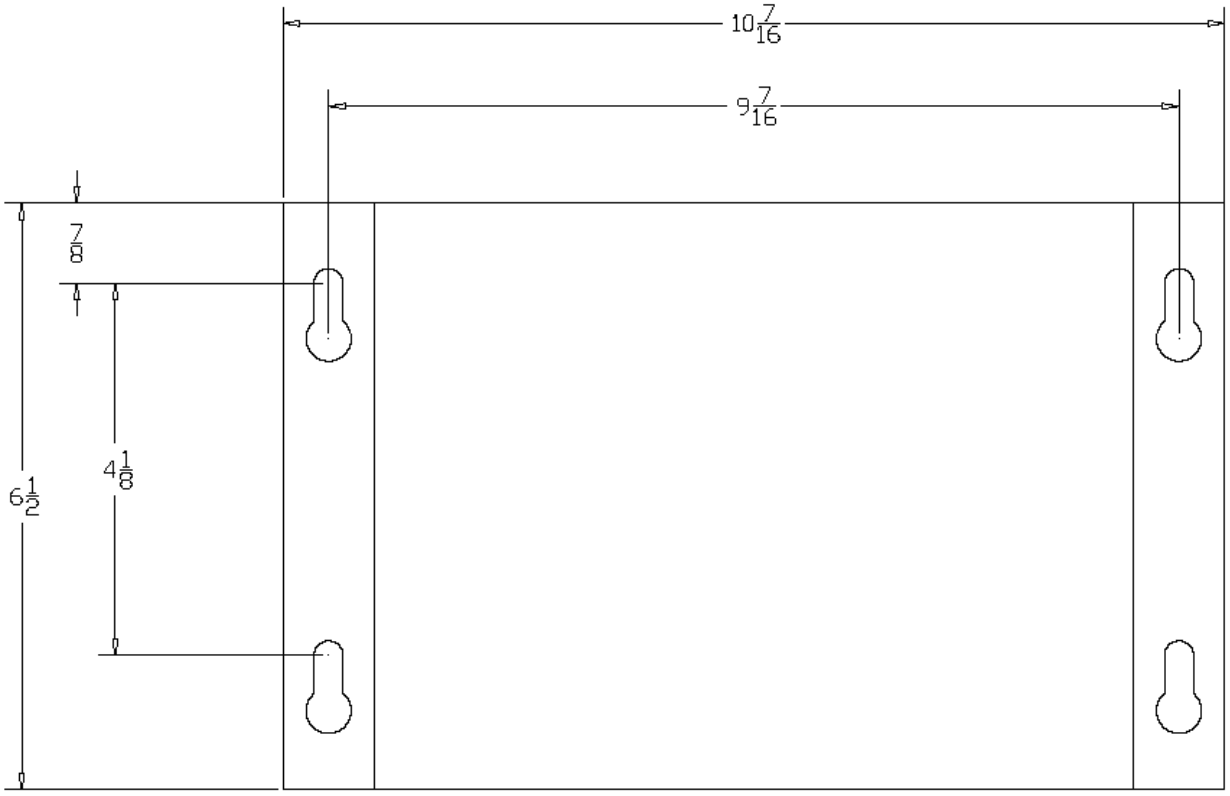
3. The directory structure should look like this:
   E:\BA1400 ('E' is the compact flash card drive letter. BA1400 is the directory name.)
   AUTORUN.S19 (This file is contained in the BA1400 directory...)
   SetMeterValue.txt (...and so is this one.)

4. The "SetMeterValue.txt" file is a standard text file that can be edited with notepad or other text editor. The numeric value in this file is the value that will be programmed into the "TOTAL FOOTAGE" meter. If you want the meter to be cleared to 0, simply edit the number in the file to a 0. If you want the meter to be 1024, simply edit the number in the file to 1024. Remember to save the file back to the compact flash card after editing.

5. With these files on the compact flash card, insert it into the controller and power on the controller. When the controller powers up, a progress bar will appear on the bottom of the controller's screen. If the meter was set successfully, the screen will turn GREEN and wait. If the meter was NOT set successfully, the screen will turn RED and remains static. Turn off the controller, remove the card, and power the controller back on.

MECHANICAL INFORMATION

The controller is designed with key-hole cutouts to be mounted over 5/16” cap screws. If desired, these screws could be left loose for easy removal before transporting the machine, or use in inclement weather.



PARAMETERS SHEET

PARAMETER	VALUE
1 Language	
2 Units of Measure	
3 Halt Method	
4 Encoder Resolution	
5 Encoder Direction	
6 Correction Factor	
7 Tolerance	
8 Shear Down Time	
9 Shear Up Time	
10 Minimum Slow Distance	
11 Deceleration Rate	
12 Stopping Time	
13 Max Stop Time Change	
14 Eject Distance	
15 Touch Sensitivity	
16 Double Touch Delay	
17 TS X-Cal. Left	
18 TS X-Cal. Right	
19 TS Y-Cal. Bottom	
20 TS Y-Cal. Top	
21 Footage Totalizer 1	
22 Footage Totalizer 2	