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SBC-A
CONSOLE

INSTALLATION and OPERATING INSTRUCTIONS

READ THOROUGHLY BEFORE INSTALLING EQUIPMENT

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SBC-A SmartBob Console

I. INTRODUCTION

. The SBC-A is a compact manually operated control console for the BinMaster SBRXII SmartBob system. It can control from 1 to 99 remote SBRXII sensors with the push of a few buttons. The SBC-A enclosure is NEMA 1 rated but is available mounted in a NEMA 4X box. Individual bin heights are programmed into the console and measurements are displayed as distance to product, height of product, and percent of product in the bin. The display also indicates the status of the bob during the measurement cycle, informing the user when the bob is descending, retracting, or retracted. Bin heights and percent of product for each bin are maintained in nonvolatile memory and will not be lost if power is disconnected.

II. INSTALLATION AND WIRING

Refer to Figure 1 for the following installation instructions.

The SBC requires 16VAC power input from a suitable transformer such as Garner part number 388-0039 wall transformer. The 16VAC source should be isolated from ground, that is, neither leg should be connected to electrical ground. The SBC-A draws approximately 0.1 amperes of current and therefore a small wire size such as 16 or 18 gauge is suitable. All wiring should be in accordance local and national electrical codes.

The SBC communicates with the remote SBRXII units over an RS-485 shielded twisted pair cable. A good quality cable such as Belden 9463 should be used. The shield should be connected to the proper terminal on the SBRXII remotes and SBC-A. The RS-485 data cable must run from one remote SBRXII unit to the next and to the SBC-A in daisy-chain fashion as shown in Figure 1. Branch lines are not allowed in RS-485 network wiring. The maximum overall length for the RS-485 cable is 4000 feet. It is important to verify and maintain consistent polarity of the RS-485 wires during installation. Communication will not take place if wires are crossed.

The SBC-A is a stand alone control console and is not intended to be operated in conjunction with other consoles or an IMS computer control on the same RS485 communication line. It is possible, however, to operate the SBC-A along with another controlling device on the same RS485 line as long as simultaneous operation does not occur. If both controlling devices are trying to communicate over the RS485 cable at the same time, data collisions will occur and the system will not function properly. Therefore, this practice is not recommended.

The SBC-A can control up to 99 remote SBRXII sensors and therefore, each SBRXII unit must have a unique address set correctly. The address of each remote sensor must be set to the same number as its corresponding Bin number in the SBC-A console. All SBRXII units are shipped from the factory with their address set to 1. For information on changing the address, refer to the SBRXII manual or the diagram inside the cover of the SBRXII. In addition to the address, **each remote SBRXII must have its PROTO jumper in the A position**. This jumper is located just below the three push button switches on the circuit board of the SBRXII remote sensor unit. When setting the address for an SBRXII verify that this jumper is in the correct position.

III. PROGRAMMING

Refer to the Menu Diagram in Figure 2 for the following instructions.

When power is applied to the SBC-A console an introductory screen will appear stating the version number of the software within. Pressing any key will advance to the MAIN MENU screen from which one of three program branches can be selected. The (+) key enters the SETUP MENU, the (-) key enters the manual VIEW / MEASURE MENU and the Enter key enters the ENABLED BIN MENU.

The following paragraphs briefly describe the operation of each menu branch. The menu screens are designed to be self explanatory but as with most devices, some practice will be necessary for operators to become familiar and comfortable with their operation.

Note: In some of the menus certain keys are progressive, meaning that if held down too long the program will advance to the following menu screens. This may result in operator confusion. Therefore, it is best to **use quick key strokes** rather than slow key entries.

A. SETUP Menu

The Setup Menu is used to select the units of measure, feet or meters, and to program in the height of each bin in your system. A height must be programmed in for each bin used. Measurements are not allowed on a bin that does not have a height entered. Each menu screen is intended to be self explanatory for changing measurement units or programming bin heights. Simply follow the directions on the screens. Programmed bin heights are stored in nonvolatile memory and are retained when power is disconnected.

From the Setup Menu the (-) key enters the Set Bin Height menu. Here, the (+) and (-) keys are used to increase or decrease the selected bin number. The Enter key then moves the cursor to the digits of the bin height. The height digit that is underlined by the cursor can be incremented up or down using the (+) or (-) keys. As each digit is set to the correct value, push the Enter key to advance to the next digit. After the tenths digit has been entered the question “Correct? (+/-)” will appear. If the height is correct push the (+) key to accept the value, if the height is incorrect push the (-) key. When your final bin has been programmed and the “Next Bin?” question is displayed, push the (-) key to return to the SETUP Menu from which the MAIN MENU can be returned to.

Notes: (1) To obtain the most efficient operation of the SBC-A, use bin numbers starting with 1 and incrementing upward in order. Each remote SmartBob sensor needs to have its address set the same as that of its corresponding SBC-A bin number.

(2) The SBC-A will not accept a bin height of less than 001.0 feet.

B. VIEW MEASURED MENU

This menu is entered from the Main Menu by pushing the (-) key. The (+/-) keys are used to increment or decrement the bin number to view other bins. The first time a bin is viewed following a change of its height in the Setup Menu, its measurement will display “No Data”. This indicates that a measurement has not been performed on the bin at the new height and a measurement is needed to obtain valid information. If a measurement has been performed on a bin, the % full and enabled or disabled status of the bin will be shown. The enabled and disabled status will be explained in the section on ENABLED Menu.

A manual measurement of any bin can be taken from the VIEW MEASURED MENU by pushing the Enter key to accept the selected bin number and then pushing the (+) key in answer to the MEASURE? (+/-) question. As the measurement is being taken, the screen will indicate the status of the bob in that it will show (DESCENDING) as the bob drops, ^RETRACTING^ as the bob returns upward, and RETRACTED when the bob stops at the top. Following the manual measurement the screen will display the % full,

height of product in the bin, and the distance to the product (head room) in the bin. Pushing any of the keys will bring up the question “Measure Again? (+/-)”, from which the (+) key will take another measurement on the same bin or the (-) key will bring up the question “Different Bin? (+/-)”. From this question the (+) key will advance to the next bin number or the (-) key will return to the MAIN MENU.

To exit from the VIEW MEASURED MENU without having taken a manual measurement, the Enter key is pushed as if to accept a bin and the (-) is pushed two times to get back to the MAIN MENU.

C. ENABLED MENU

This menu branch permits designating bins as either enabled or disabled and taking a group measurement of all enabled bins. The designation of enabled or disabled only pertains to the simultaneous group measurement of enabled bins. When the “Measure ENABLED” (+) key is pushed from the ENABLE BIN MENU, all of the enabled bins will take a measurement. The individual bin measurements can then be manually reviewed by pushing the (-) key to enter the VIEW OR ENABLED BIN menu and then the (+) key to View Bins in the VIEW MEASURED MENU. In this menu the bins can be reviewed up or down in number by using the (+/-) keys. The View screen shows the % full for each bin selected. If the distance to product or height of product is needed on a particular bin, a manual measurement can be performed using the Enter key to select the desired bin and then the (+) key to take the measurement. The manual measurement will show distance to and height of product as well as % full for the bin.

When the VIEW MEASURED MENU has been entered from the VIEW OR ENABLE BIN menu rather than from the MAIN MENU, as described in the preceding section, the exit sequence of key strokes to get back to the MAIN MENU is different. From the VIEW MEASURED MENU the Enter key is pushed and then the (-) key is pushed two times as before, but this sequence returns to the VIEW OR ENABLE BIN menu rather than the MAIN MENU. From the VIEW OR ENABLE BIN menu one push of the Enter key will return to the ENABLED BIN MENU and a second push of the Enter key will then return to the MAIN MENU. This different exit sequence allows users who often use the group measurement feature to remain in that menu branch after they finished viewing bin levels.

To enable or disable bins, enter the ENABLED MENU by pushing the Enter key from the MAIN MENU. Then push the (-) key to enter the VIEW OR ENABLE menu, and push the (-) key again to open the ENABLE/DISABLE BINS menu. From this menu, the desired bin number is selected using the (+/-) keys and then the Enter key is pushed. The Enter key brings up the question Continue? (+/-) which allows a decision either to proceed or go back to the ENABLED BIN menu. Pushing the (+) key to proceed then moves to a screen that allows the selected bin to be Enabled (+), Disabled (-), or remain unchanged using the Enter key. Any of these selections bring up a screen where the Next (+) key returns to the ENABLED/DISABLE BINS menu where another bin number can be selected, or the (-)/E keys quit the process and returning to the ENABLED BIN MENU. From the ENABLED BIN MENU a measurement of all enabled bins can be made using the (+) key or another selection such as returning to the MAIN MENU can be made.

IV. ERROR MESSAGES

If a system malfunction occurs during a measurement cycle an error message will be displayed on the view screen of the bin on which the malfunction occurred. When taking a manual measurement a statement will be displayed stating the actual type of error. When a group measurement is made of all enabled bins using the Measure All feature, an error message will be displayed as a number. This error number can be cross referenced to the type of error using the chart below, or a manual measurement can be tried on the affected bin which will then display the actual type of error.

The SmartBob remote sensors measure distance during both descending and retracting of the bob. If the retract distance is less than the descend distance, a **DID NOT RETRACT** message will appear indicating

that the bob did not retract as far as it went down. If however, the retract distance is greater than the descend distance, the SmartBob will assume that the bob was not fully retracted when it started its descend. The measured distance to the product for the bin will be displayed as the longer retract distance. Thus the bob will give a correct distance reading even if it was not fully retracted when it started.

If the bob fails to drop when called upon to take a measurement the readout will indicate a **BOB DID NOT DROP** error message.
If a problem occurs with the RS485 communication between a SmartBob remote and the SBC-A console, a **COMMUNICATION ERROR** will be displayed and the measurement will be aborted.

An error message **BIN IS IN OVERRIDE** is not actually a fault with the system but indicates that the OVERRIDE feature is in operation and that SBRXII remote sensor is not allowed to take a measurement. This feature is described in the manual for the SBRXII remote unit. It is a connection between terminals on the circuit board of the remote SBRXII sensor unit that can be opened during a fill process to prevent the sensor from taking a measurement.

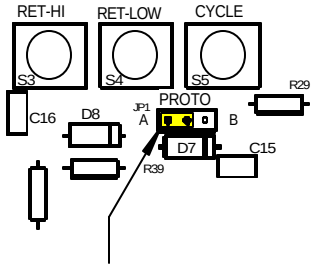
Cross reference for ERROR message numbers displayed when using the “Measure All” feature.

#13 BOB DID NOT DROP
#16 DID NOT RETRACT
#18 COMMUNICATION ERROR
#19 BIN IS IN OVERRIDE

V. CUSTOMER SERVICE

For technical support call BinMaster at 800 278-4241.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.



The Protocol Jumper on the SBRXII circuit boards must be in **A** position to be used with the SBC-A Console.

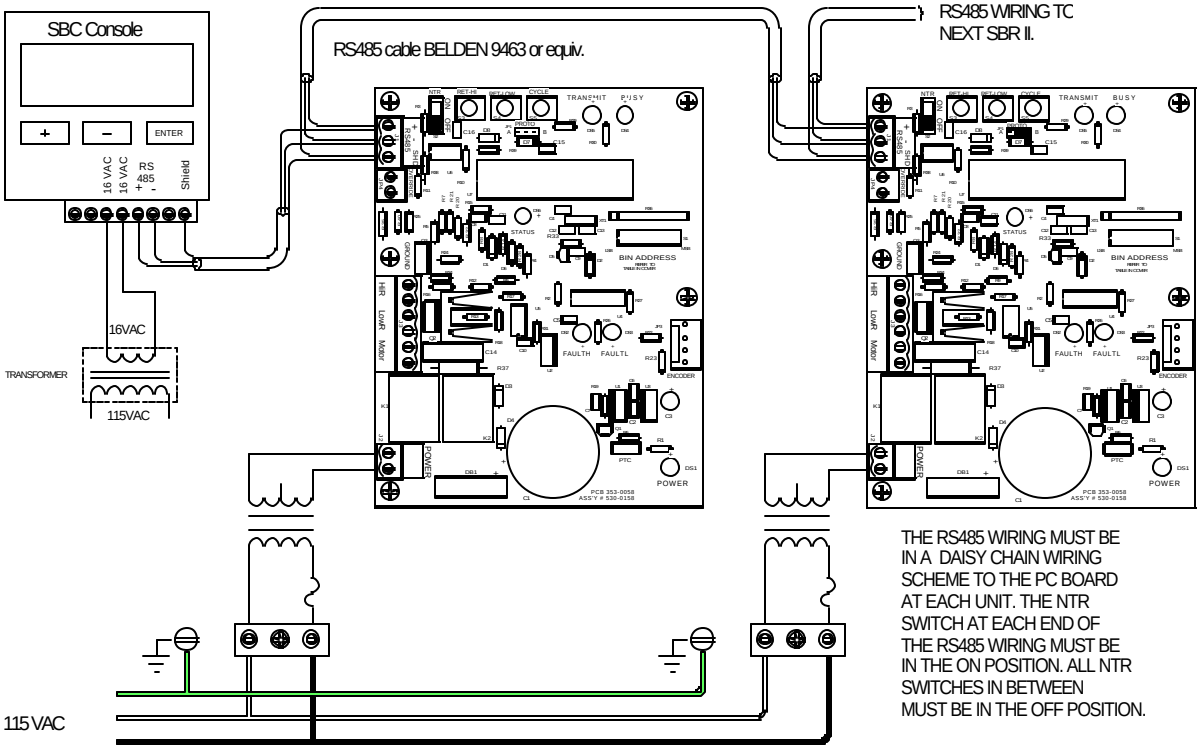


Figure 1

BINMASTER SBC-A MENU DIAGRAM

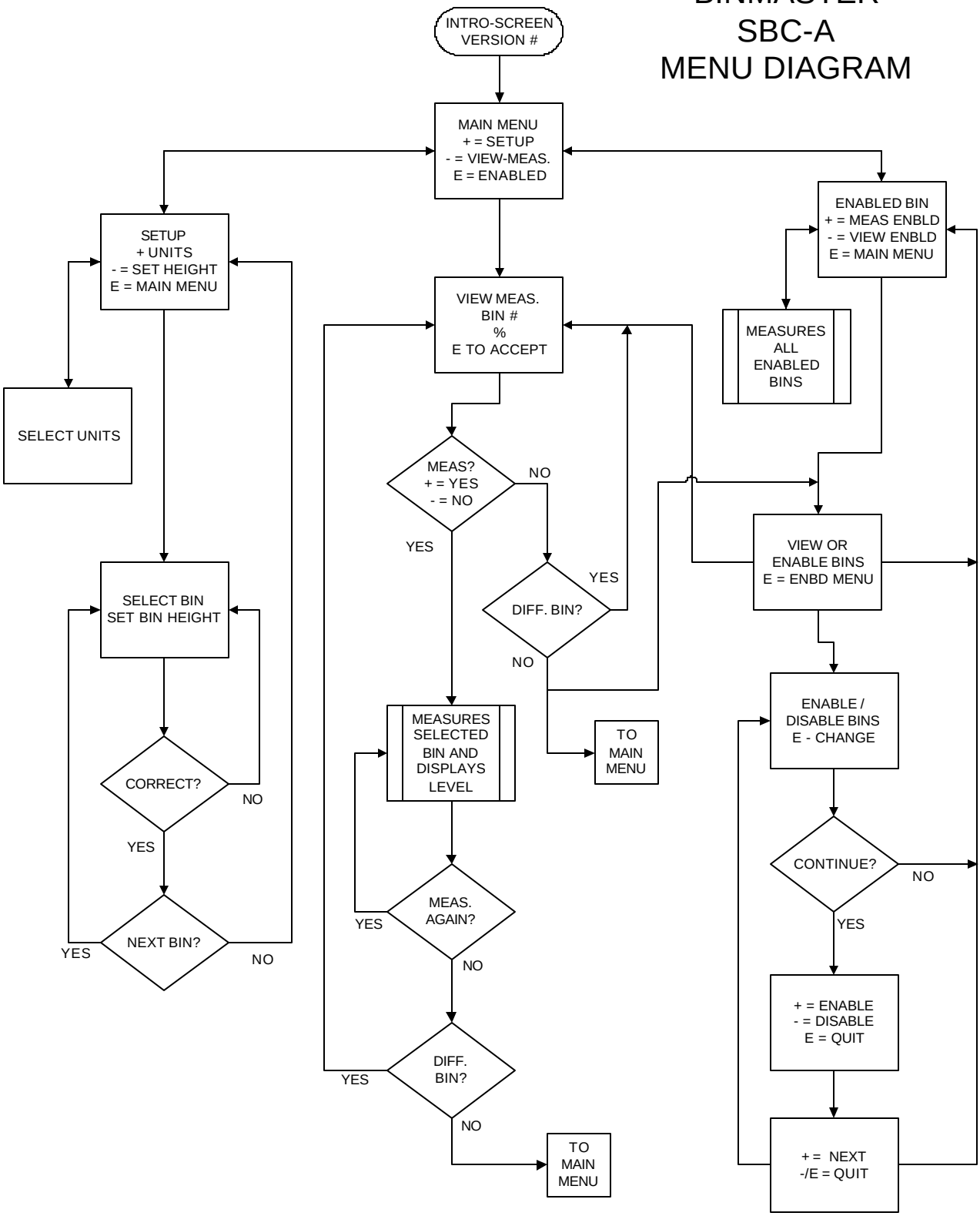


FIGURE 2