BINMASTER

Taking Control…To A Higher Level

SBR II
SMARTBOB REMOTE UNIT

Troubleshooting Guide
(Rev. A, 9-07)

BINMASTER

General Considerations

This troubleshooting guide offers a flowchart of common problems and symptoms that can occur when BinMaster SmartBob Remote IIs (SBRIIs) are deployed in field applications. Before beginning with the flowchart procedures, it is recommended that you eliminate some common issues that will either correct the problem or help determine the origin of the failure.

This flowchart requires that you have access to the SBRII and its components. Removing the SBRII's covers is required and caution should be used when working with exposed electrical circuits. Listed below are some general considerations for problems that can occur during initial setup and post installation failures. When using the troubleshooting flowchart, it is best to follow the steps in the order directed. The probable failures listed in the troubleshooting flowchart are the most common or logical solution for the given symptoms and may not resolve every failure. If the problems are not resolved with the troubleshooting flowchart or occur intermittently it is recommended that you contact BINMASTER customer support at (800) 278-4241 for further assistance.

General Troubleshooting

- Ensure that the SBRII has power. There is a power indicating LED on the SBRII circuit board. If this LED is not lit, check incoming power to the SBRII, circuit breakers, connections, etc.
- The "CYCLE" button on the SBRII will manually drop and retract the bob. If the SBRII will respond to this control but <u>NOT</u> to remote commands from the interface device, you have a communications error. See the Data Communications Troubleshooting section of the flowchart for further troubleshooting.
- If you are receiving a communications error message on the SBRII control device, the interfaces between the SBRII and the controlling device should be inspected, checking power cables on the interface devices, communications wires and cable connections.
- Mechanical failures and stuck bobs are best resolved by visually inspecting the cable and mechanical bay of the SBRII. After clearing away any debris or obstructions use the "CYCLE" drop and retract the bob or the "RET-HI" button on the SBRII to retract the bob.

New Installation and Setup Troubleshooting

- Ensure all power and communication wiring has been installed, checked and connected to all devices.
- Ensure all connections and ICs (Integrated Circuits) are secure and properly seated on the circuit board.
- Ensure all devices have had protocols set, <u>binary</u> addresses and communication ports assigned using the installation manual. Communications errors during setup are often caused by a configuration error with the controlling device.
- Has the software or console been configured to the SBRII <u>according to the installation manual</u>?
- When using wireless devices, ensure good line of sight between transceivers and separation between antennas and metal structures.
- If the SBRII is taking measurements properly but the data displayed seems inaccurate, verify the "Bin Height" has been accurately set on the controlling device.

Post Installation Troubleshooting

- Ensure that all power and communications wires are still in good, serviceable condition.
- Ensure all devices and controllers are powered. The SBRII has a 1A fuse in the electronics compartment that should also be checked if there is a power failure at the SBRII.
- Inspect all connectors and ICs to ensure that they are secured and properly seated.
- If using wireless devices, ensure that all transceivers are powered and operating correctly.
- When using *IMS 2.2.3* and *eBob* software packages, ensure the device-controlling-PC has the software application running. *eBob* software will not allow measurements to be taken from a remote PC until the device-controlling-PC is running the application software.
- If mechanical failures or a *"BOB STUCK"* failure occurs, first clear material away from the bob and cable, then visually inspect cable path and parts before retracting the cable. Try to cycle the SBRII using the "CYCLE" button and ensure unit is operating correctly before reinstalling covers.

SBRII Troubleshooting Guide

Step	Procedure	Yes	No
1	Does the SBRII respond to control demands?	Go to step 2.	Go to step P1.
2	Are you receiving a fault message on your display?	See appendix B (fault list).	Go to step 3.
3	Do you have any display on control unit?	Go to step 4.	Check power to control unit, MUCM, QUCM and interface box. Contact BM customer support.
4	Has the control unit been configured according to its installation manual? *Note: Installation manuals are available online at www.binmaster.com/techlibrary*	Go to step 5.	Configure control unit using install manual.
5	Is the "bob" stuck or having mechanical problems?	Go to step M1.	Contact BM customer support.

Step	Power Troubleshooting	Yes	No
P1	Will the SBRII operate when "CYCLE" button is pushed?	Go to step D1.	Go to step P2.
P2	Is the power light (DS1) lit? See figure 2 in appendix A for reference.	Go to step D1.	Go to step P3.
P3	Are the SBRII power wires connected according to figure 3, SBRII wire diagram? *Note: Ensure all connections are tight and connectors are fully seated.*	Go to step P4.	Fix connection errors and retest.
P4	Is there 115VAC, 60Hz present at J1? See figure 1 in appendix A for reference.	Check fuse F1, Go to step P5.	Check 115VAC, 60Hz power supply.
P5	Is there 16VAC, 60Hz present at J2? See figure 2 in appendix A for reference.	Contact BM customer support.	Check fuse, connectors and transformer.

Step	Data Connection Troubleshooting	Yes	No
D1	Is this a problem that occurred during setup or installation of the SBRII?	Go to step D2.	Go to step D8.
D2	Are the SBRII data wires connected according to figure 3, SBRII wire diagram? *Note: Ensure RS-485 connector is fully pushed into the board connection on the SBRII and console.*	Go to step D3.	Fix connection errors and retest.
D3	Does the SBRII data wire meet the standards listed in the installation manual?	Go to step D4.	Replace data cable.
D4	Has the SBRII been addressed to its location using the installation manual procedures?	Go to step D5.	Address SBRII.
D5	Is the SBRII controlled by an SBC (not SBCa), RSU, RDU or by using IMS 2.2.3?	Go to step D6.	Go to step D7.
D6	Is the SBRII set to protocol B? See figure 5 in appendix A for reference.	Go to step D8.	Set SBRII jumper to protocol B.
D7	Is the SBRII set to protocol A? See figure 5 in appendix A for reference.	Go to step D8.	Set SBRII jumper to protocol A.
D8	Is the "Override" jumper still in place? See figure 2 in appendix A for reference.	Go to step D11.	Go to step D9.
D9	Is this unit wired for "Override" operation? See figure 2 in appendix A for reference.	Go to step D10.	Replace "Override" jumper.
D10	Is the "Override" relay or switch in NC position?	Go to step D11.	Close "Override" circuit.
D11	Is the SBRII controlled with a wireless device?	Go to step D16.	Go to step D12.
D12	Is this SBRII daisy-chained to one or more SBRIIs?	Go to step D13.	Go to step D16.
D13	Is this the only SBRII in the network not working properly?	Go to step D14.	Go to step D15.
D14	Are there physical signs of a power surge or lightning strike near the SBRII or vessel?	Contact BM customer support.	Go to step D15.
D15	Are the RS-485 cables in the network in good serviceable condition? *Note: It may be necessary to temporarily replace data cable at each networked SBRII to test the integrity of RS-485 cables.*	Go to step D17.	Replace all bad data cables.
D16	Is the wireless device powered and operating correctly?	Go to step D17.	Repair wireless network.
D17	Is the SBRII controlled with IMS 2.2.3 or eBob software?	Go to step D18.	Go to step D19.
D18	Is the software's workstation running on the device controlling PC?	Go to step D19.	Start software workstation on control PC.
D19	Is the "bob" mechanically stuck or physically broken? Visual inspection required.	Go to step M1.	Contact BM customer support.

Step	Mechanical Troubleshooting	Yes	No
M1	Is the "bob" stuck?	Go to step M2.	Go to step M4.
M2	Is the "bob" stuck in the lowered position?	Go to step M3.	Go to step M4.
M3	Is the "bob" stuck on the vessel's structure or in the product?	Clear obstructions, cycle SBRII.	Go to step M4.
M4	Will the SBRII operate when "CYCLE" button is pushed?	Go to step M5.	Go to step M5.
M5	Is the mechanical enclosure and cable cleaning brushes clear of debris?	Go to step M6.	Clear obstructions, cycle SBRII.
M6	Will the SBRII supply pulley turn freely by hand and cable lower into vessel properly?	Replace optical encoder.	Go to step M7.
M7	Is the cable installed and routed correctly? See Appendix B for reference.	Go to step M8.	Install cable properly and cycle SBRII.
M8	Will the supply pulley turn by hand? See Appendix B for reference.	Go to step M9.	Replace motor assembly.
M9	Are the cable and pulley assemblies in good serviceable condition?	Go to step M10.	Replace worn or broken parts.
M10	Is the power light (DS1) lit? See figure 2 in appendix A for reference.	Go to step M11.	Go to step P1.
M11	Will the SBRII respond to commands from the interface device?	Contact BM customer support.	Go to step D1.

Appendix A

Shown below is the location of common areas to inspect when experiencing problems with the SBRII. Following the description is the common inspection or observations for a proper working system. Some minor differences may be seen between SBRII units, however, the general location and procedures will be the same.
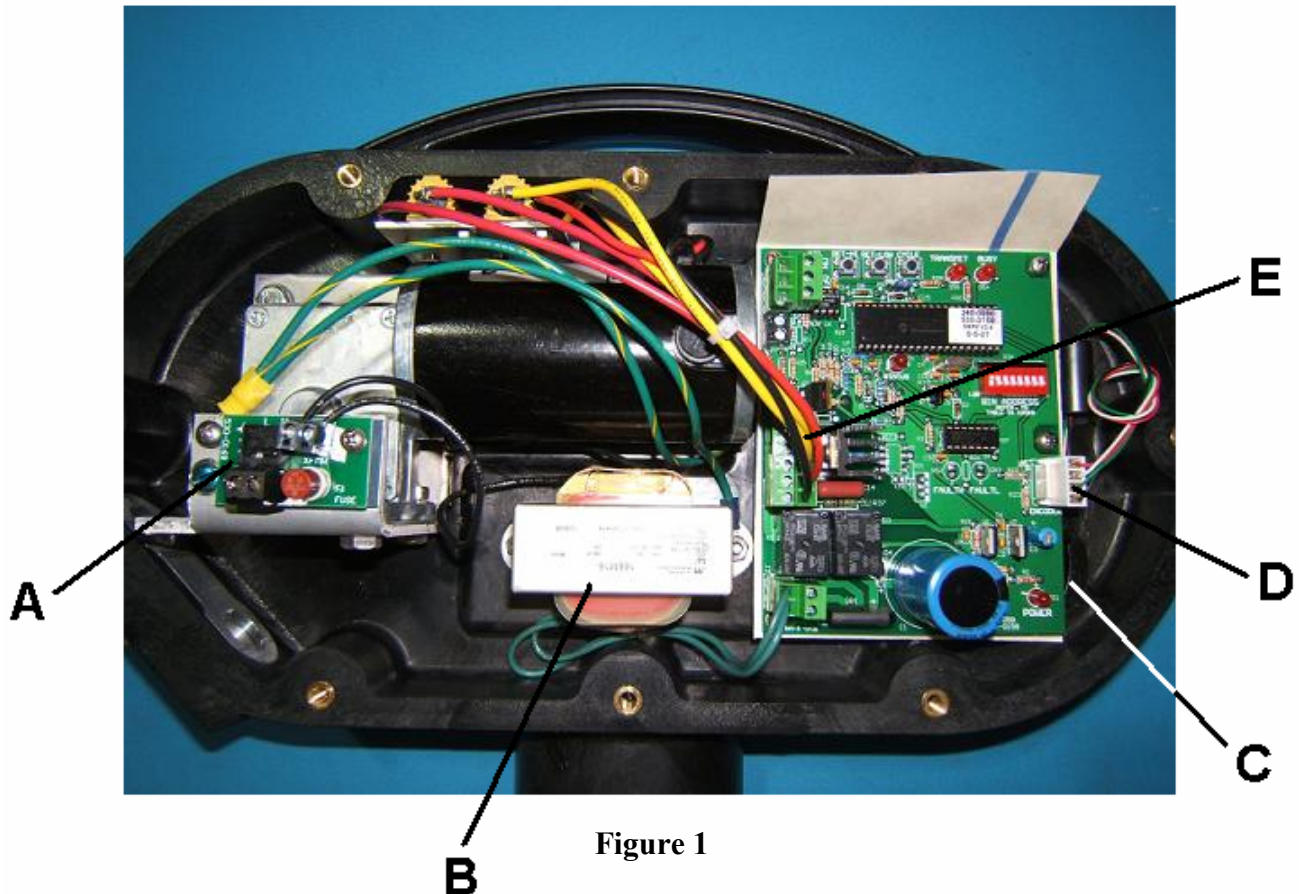

Figure 1

A. J1 POWER CONNECTION- 115VAC power connection and fuse (F1). All power connections should be tight and fuse (F1) should be firmly seated in the connector.

B. POWER TRANSFORMER- 7:1, 3A transformer. Black primary (115VAC) leads connect at J1 and green secondary (16VAC) leads connect at J2. Ensure all connections are secure and transformer is securely mounted in the SBRII housing.

C. OPTICAL ENCODER AND WHEEL- Located behind the circuit board, the optical wheel should turn smoothly inside the optical encoder when the SBRII is cycled.

D. OPTICAL ENCODER CONNECTION- Ensure that a secure connection is made and all wires are firmly seated in the connector.

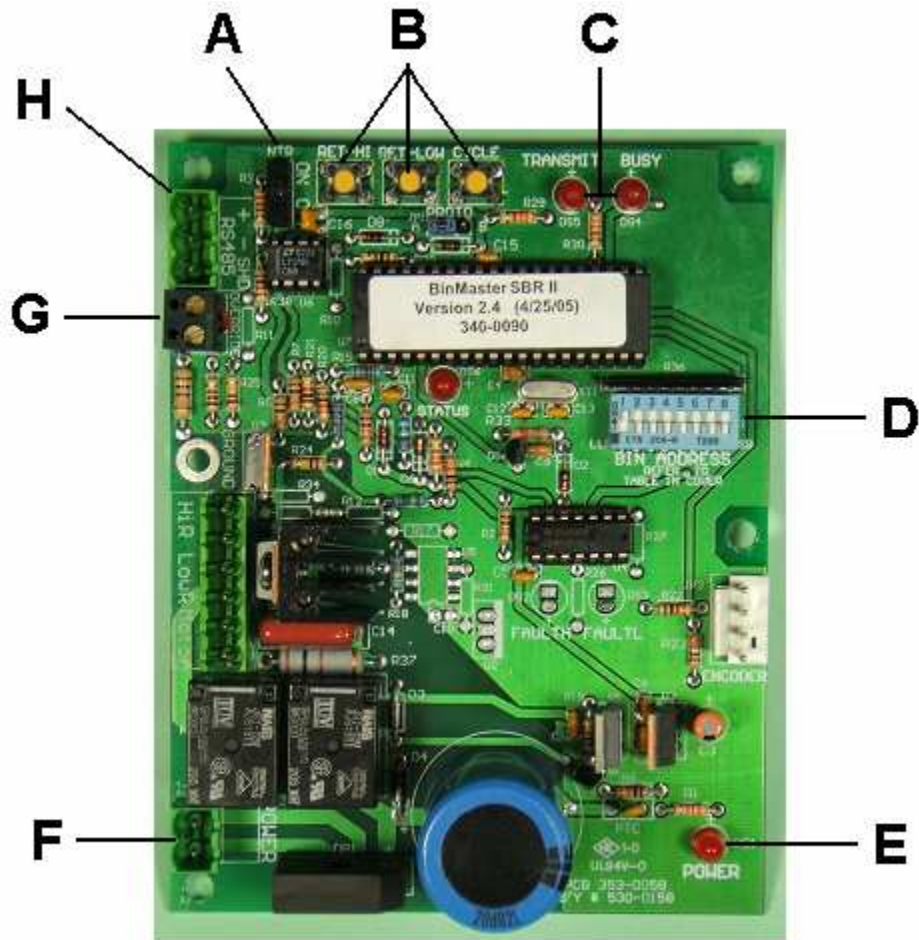**E.** MOTOR CONTROL CONNECTION- Ensure that all wires are secured and fully seated into the connector.

Figure 2

A. <u>NTR SWITCH</u>- The NTR Switch should be turned on at the last SBRII in the network and the first component in the network, usually the interface device. All other NTR switches should be turned off.

B. <u>MANUAL CONTROL BUTTONS</u>- The manual controls can be used to manually start a cycle or retract the cable in high or low modes.

C. <u>COMMUNICATION LEDs</u>- These LED lights show when the network is busy or when the bob is transmitting on the network.

D. <u>BIN ADDRESS SWITCHES</u>- The bin address must be set using binary code to match the address of the bob in the interface device. An address chart can be found in the installation manual.

E. <u>POWER LED</u>- The power LED indicates there is 16VAC present at the circuit board.

F. <u>J2 POWER CONNECTION</u>- 16VAC connection from the transformer.

G. <u>OVERRIDE CONNECTION</u>- If not used for override operation, factory installed jumper should be left in place.

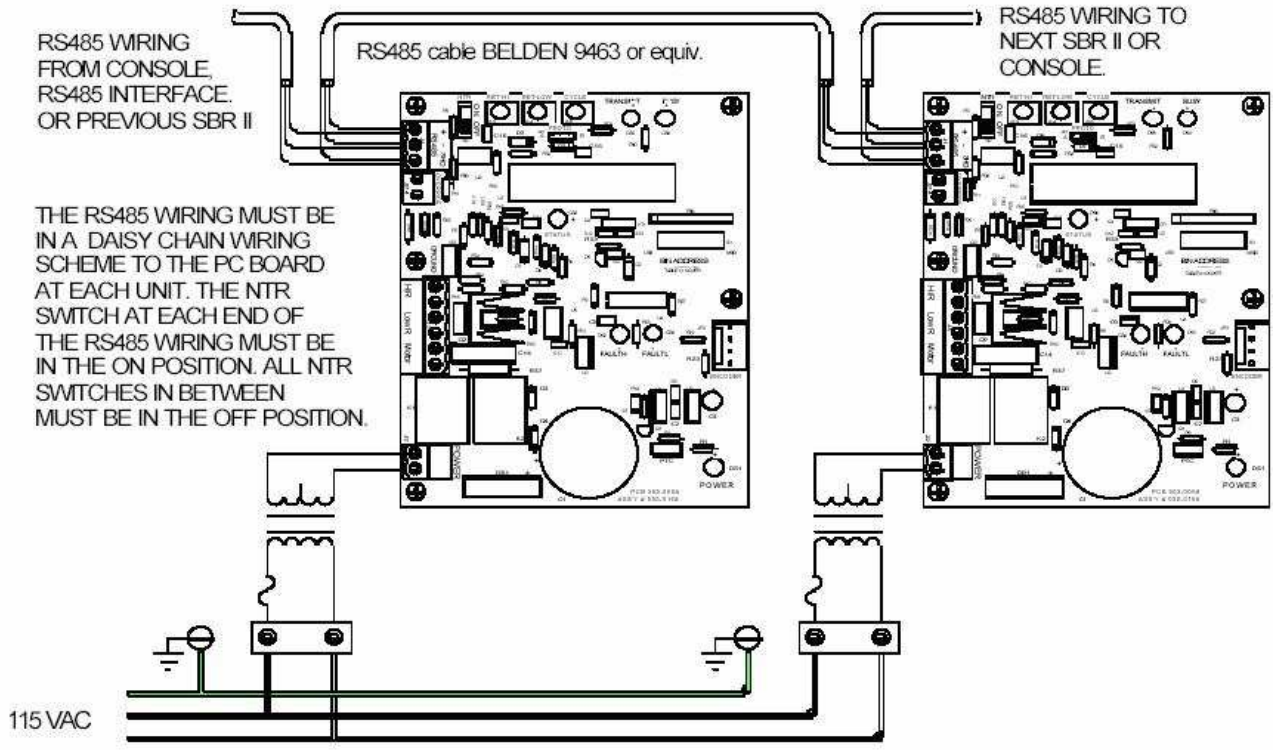**H.** <u>RS485 CONNECTION</u>- Network connection for RS485 "BLUE HOSE" data cable.

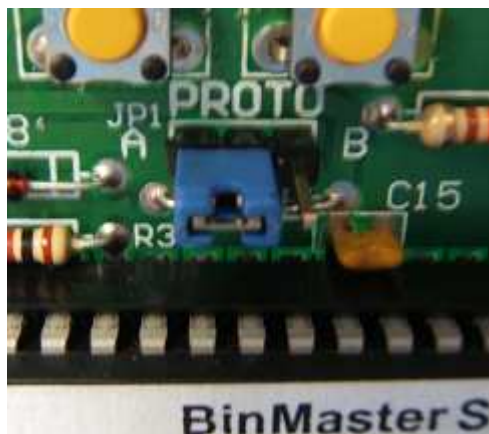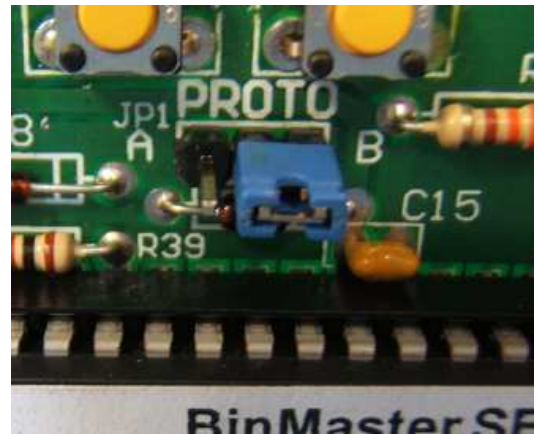**Figure 3**

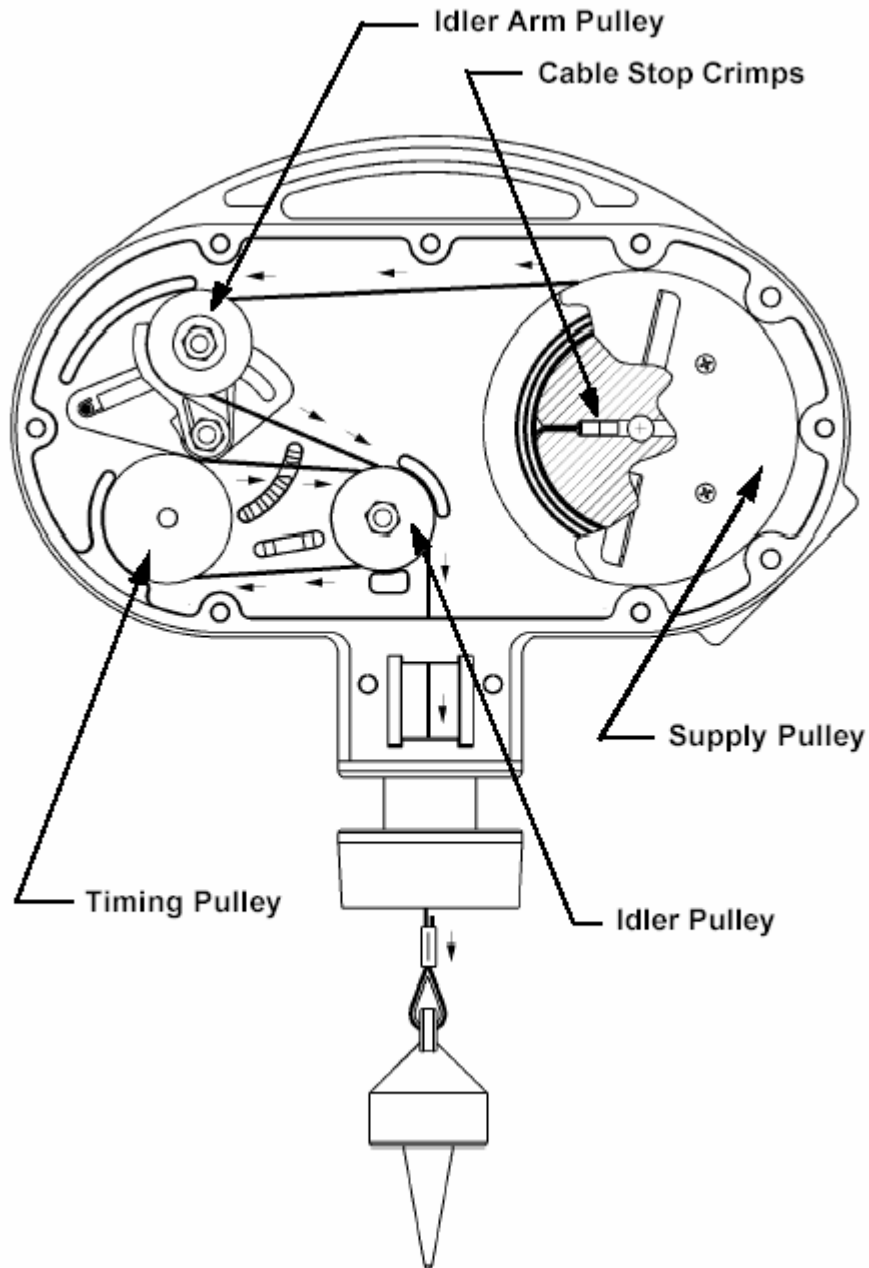Jumper in A Protocol   Jumper in B Protocol

Figure 4

The Protocol Jumper should be set to match the interface device. These jumpers are set at the factory; however the interface device's installation manual should be consulted to ensure proper setting.

Appendix B

Idler Arm Pulley

Cable Stop Crimps

Supply Pulley

Timing Pulley

Idler Pulley

Mechanical Drawing

Ensure the cable is properly routed. The cable should route over the post located next to the supply pulley. When routing through the Idler Pulley route to the outside (nearest you) pulley first then the inside pulley and down.

SmartBob Remote II Error Messages

Communications Error- Interface device cannot communicate with the SmartBob Remote at the selected address. Ensure that the address is correct, the SBRII is powered and the RS-485 connections are fastened securely. See Data Communications Troubleshooting section of the flowchart for further troubleshooting.

Bob Stuck Top- Bob is unable to descend when measurement is requested. Ensure that the motor and encoder connectors are firmly seated on the PCB of the SBRII. Clear all obstructions from below the SBRII and use the "CYCLE" button on the SBRII to lower and retract the bob. If the bob will not descend to the product in the vessel before retracting when the CYCLE button is pressed, replace the optical interrupter. See Mechanical Troubleshooting section of the flowchart for further troubleshooting.

Bob Stuck Bottom- Bob has not fully retracted (may not be at the bottom of the cycle). Ensure the bob assembly and cable is clear of obstructions and debris. Press and hold the "RET-LOW" button on the SBRII. If the "RET-LOW" button will not retract the bob, ensure the motor connections on the PCB are fully seated. See Mechanical Troubleshooting section of the flowchart for further troubleshooting.

Invalid Data- Data received during the last measurement cycle was incorrect. Restart the measurement cycle from the interface device. See Data Communications Troubleshooting section of the flowchart for further troubleshooting.

Override Activated- Override jumper has been removed or control device has been activated. First be sure that it is safe to take measurements on this vessel. If the OVERRIDE function is not used on this SBRII, ensure the OVERRIDE jumper is securely fastened in place. See Data Communications Troubleshooting section of the flowchart for further troubleshooting.

Bob Not Fully Retracted- Last measurement was taken when bob was not fully retracted. Retake the measurement with the interface device. See Mechanical Troubleshooting section of the flowchart for further troubleshooting.