The BinLogic Remote I/O

User & Installation Manual

IHA Machine Version

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User Manual

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IN 1	IN 2	IN 3	IN 4	IN 5	IN 6	IN 7	IN 8

BinLogic
by Datawrx.com

Status

Flash Code	
x1	Start-up Delay
x2	Fault Control Input
x3	Run Fault
x4	Harvest Fault

RS484		Outputs						Relay			110VAC	
RX	TX	C	1	2	3	4	5	NO	C	NC	N	L

Diagram of the BinLogic

The BinLogic controls your ice maker via the Control Relay. It only has control during a short duration of the icemaker cycle which occurs right after the harvest cycle.

The BinLogic has 8 inputs to provide external control and 5 outputs to provide data signals for remote monitoring. A status light indicates the BinLogic's state via a flash code. The internal logic utilizes timers to prevent transient signals from causing false ON/OFF signals as well as delays to turn the compressor ON and OFF safely.

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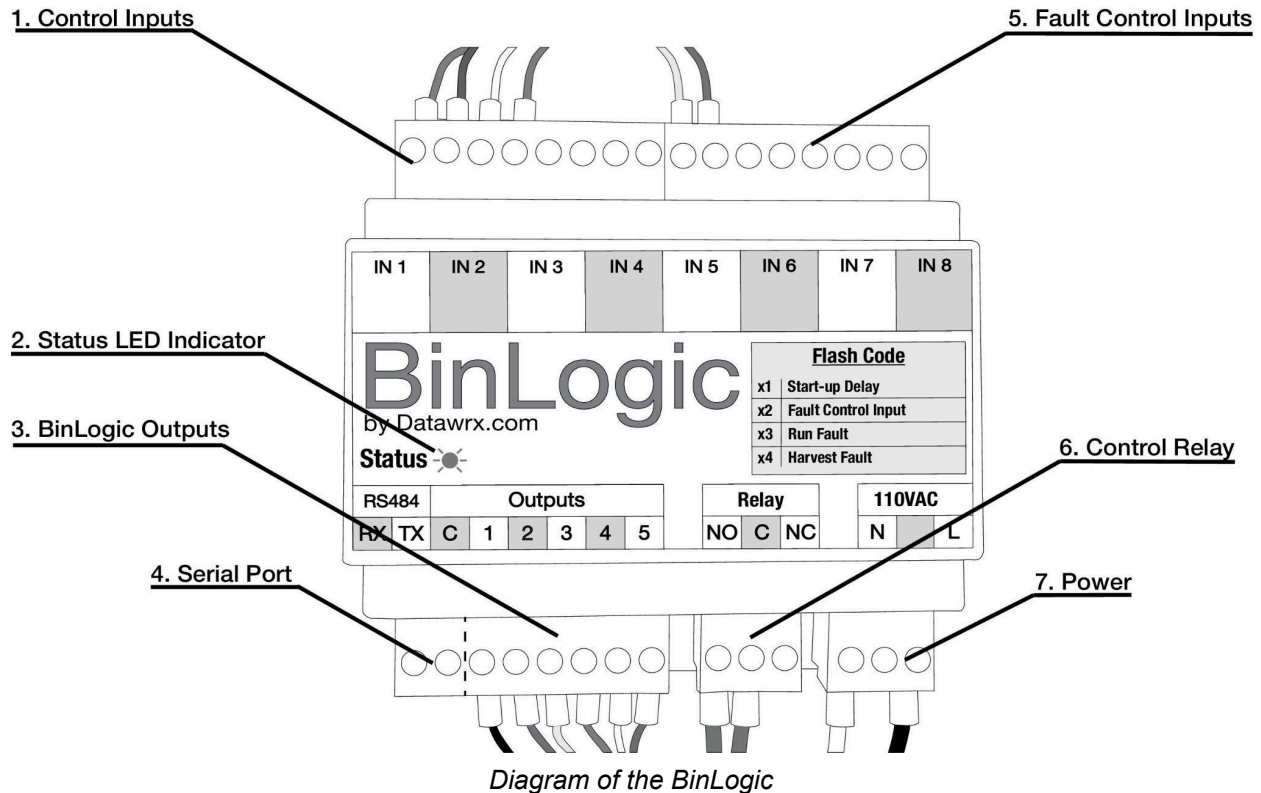
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Operation

On **power up** with all Inputs OFF, the Status LED will display a continuous blink for 5 seconds. During **normal operation** with all Inputs OFF, you should see the Control Relay ON.

If any of the inputs come ON, the Control Relay will turn OFF and the ice maker will stop about 30 seconds after the next harvest cycle.

If all inputs turn OFF again, Control Relay will turn ON and the ice maker should start running again.

Fault State

If one or more of the Fault Inputs 5-8 are ON. Determine and remedy the fault, and once the inputs are all OFF the Control Relay should turn ON and the ice maker should run again.

Control Relay

The Control Relay is a DPST relay which is connected to the icemaker across the Common (C) and Normally Open (NC) contacts. When it is energized the contacts are open and your ice maker should run.

Inputs

The input terminals will provide power to sensors and flow through logic which expects the Input to stay ON or OFF for a few seconds before it will be acted upon. The top switch (#1) settings affect the acceptable duration. If any of these are ON the Control Relay will turn OFF.

Inputs 1 through 4

These are normal control inputs. The following are the typical applications for these but they can be used as you please.

1. **Bin Full sensor** - This will illuminate when the Bin is Full. Output 1 will turn ON when Input 1 has come ON and stayed ON for a set amount of time.

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2. **Manual Switch** - Usually by the door of the ice house. When turned ON it will cause the icemaker to turn OFF. Output 2 corresponds.

3. **Remote Control** - Wire to the PLC's ice maker remote control output. When turned ON it will cause the icemaker to turn OFF. Output 3 corresponds.

4. **Thermometer** - Wired to the Common and Normally Open contacts of the thermometer relay will cause the icemaker to turn OFF when preset temperature is reached. This can be used for Winter or Summer temperature control if the thermometer supports this or by rewiring the thermometer. Output 4 corresponds.

Inputs 5 through 8

These are Fault control inputs and are typically wired in the following manner but you may repurpose as necessary. These inputs will cause the Control Relay to turn OFF and Output 5 will light to indicate a Fault.

5. **Leveler Overload** - normally wired to terminals 97 & 98 NO contacts of the leveler contactor overload. When the leveler overload trips the contact is closed and the Input turns ON Control relay will turn OFF.

6. **Overflow sensor** - if you have the overflow sensor connect it to the Input 6 terminals. Control relay will turn OFF when input 6 is ON.

7. **Optional 1** -

8. **Power to Bin Full Transmitter** - (Sept. 2025 onwards only) If you are using a Bin Flap jumper this input. If you are using the Bin Full beam connect the IFM 0G-0030 transmitter to this Input. It powers the transmitted and checks that it is present. This is a safety feature to prevent the icemaker from running if the transmitter gets disconnected or fails.

Outputs

There are 5 Outputs with one Common terminal. These outputs are self powered and do not need external power.

Typical application is to connect them to a logic input device such as a PLC to provide signals regarding the state of the BinLogic and icemaker.

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Output 1 - Corresponds to Input 1 and will turn ON when Input 1 is ON. Typically used for Bin Full indication.

Output 2 - Corresponds to Input 2 will turn ON when Input 2 is ON. Typically used for the manual control switch.

Output 3 - Corresponds to Input 3 will turn ON when Input 3 is ON.

Output 4 - Corresponds to Input 4 will turn ON when Input 4 is ON

Output 5 - is illuminated when the BinLogic has detected a fault on any one of the 5-8 Inputs

DIP Switches

There are 2 DIP switches on the circuit board. Both are ON by default.

The top switch (#1) controls the duration that an Input must stay ON for it to be accepted as a valid signal. ON = 4 seconds, OFF = 8 seconds.

The bottom switch (#2) is currently unused

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Installing the BinLogic

<u>Important Safeguards</u>

SAFETY FIRST : If you are not comfortable working with high voltages or unfamiliar with electricity please contact a professional. Electricity can be fatal!

1. **READ ALL INSTRUCTIONS**

2. IHA machine wiring can vary from one machine to another. Connecting the BinLogic to an incorrect termination point can cause damage to the BinLogic or other equipment.

3. Always have a plan before working with electrical equipment, **especially** near high voltage circuits.

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Materials Required

To install the BinLogic you will need the following tools:
- A small, medium and large flathead screwdriver
- A medium phillips screwdriver
- Wire snip, stripper, and crimper
- A multimeter (to test current and voltage) e.g. from Harbor Freight
- A fine-point Sharpie
- Zip-ties
- Electrical tape
- (*optional*) Voltage Detector

If a Ranco Thermometer was purchased
- An electric drill
- A ⅞" drill bit

If there are 2 icemakers
- PLC input module for MyVends 2.0 monitoring
- 2 BinLogic controllers required

The following will be provided in the BinLogic kit:
- The BinLogic
- Labeling zip ties
- Two 16 AWG crimps
- Four dual-connectors
- A 3.5" din rail with double-sided tape
- An alcohol swab

Before getting started, identify if the ice house has one or two ice makers, as well as what type of ice maker it is – a small ice maker (2- and 4-tube) will require different wiring than a large ice maker (6-tube).

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Turn OFF All Power to the Machine

The ice maker and other systems run on a high voltage and the control panels carry voltage from multiple sources. All power sources need to be turned off. From the *outside* breaker box: flip all the switches to off, turn off all breakers in the control panel and also turn off the large switchgear on the ice makers.

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Check List

☐ The main breaker in outside electrical panel is turned **OFF**

☐ The ice maker breaker beside the icemaker is turned **OFF**

☐ The breakers inside the control panel is turned **OFF**

☐ Test with voltage detector or voltmeter that there **IS NO** live voltage on any terminal

Connect the BinLogic Inputs

Identify and Label the Blue and Black Pairs

Ensure that the power is turned off before continuing!

Open the junction box (beside the control panel) inside the machine, which has several conduits running out from it. Sift through the wires to find a pair of four **blue** and four **black** wires These pairs are wire-nutted and usually taped together. DO NOT REMOVE THE TAPE OR WIRE NUTS YET.

These wires are connected to the leverload overload, the bin full sensor, the icemaker toggle switch, and the ice maker. They can be identified by the conduits they are running through. The easiest pair to identify is the *Ice Maker Toggle Switch*. Trace the conduit running from the ice maker switch by the door back to the junction box. Label the two **blue** and **black** wires "ICEMAKER TOGGLE SWITCH" with the included zip-tie tags.

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The *bin full sensor* pair is in a conduit that runs to the right, leading toward the back of the machine. Trace the conduit back to the junction box and label the two **blue** and **black** wires "BIN FULL SENSOR".

The *leveler overload pair* originates from the leveler contactor overload (97 & 98) inside the control panel OR from the IMS RELAY on newer machines. The pair runs to the bus bar, then into the junction box. Locate the pair and label them "LEVELER OVERLOAD".

Lastly, the *ice maker* wires run up and to the left of the junction box. There is a difference in wiring if you had or have an IHA monitoring system installed after 2020:

Prior to 2020

The **blue** and **black** wires are terminated in the junction box. Trace the conduit back and label the pair "ICE MAKER".

Post-2020

The **blue** and **black** wires are connected to the terminal strip above the PLC, far right.

Disconnect them and pull them back into the junction box label the pair "ICE MAKER".

*If you plan to use the ice maker control features of your monitoring system connect the 2 posts on the terminal strip you removed the **blue** and **black** wire from, to Input 3 of the BinLogic.*

Remove the tape and wire nut only after they are paired and labeled. Attach the four provided wire connectors to the wires. On the bottom of the connectors, a diagram shows how much of the wire should be stripped.

Check List

☐ 4 pairs of wire identified and clearly labeled

☐ Tape and wire nuts are on only these pairs removed and discarded.

☐ 4 pairs attached to the connectors provided

☐ All other wires in the junction box are secure and untouched

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Test the pairs

To verify the wires are paired correctly, a multimeter is required. Set the multimeter to read for resistance (Ω). **Once again, ensure that the power is turned off!**

Flip the ice maker's switch by the door (i.e. the *Ice Maker Toggle Switch*) and connect both of the multimeter's probes to the pair labeled "ICE MAKER TOGGLE SWITCH". Flip the switch on and off. If paired correctly, the multimeter will beep whenever the switch is turned on.

Insert the meter's probes into the pair labeled "LEVELER". Inside the control panel, press the red button for the leverload overload input's contactor. This should close the circuit, causing the meter to beep.

Check List

☐ Pairs and labels match function

Connect the Input Wiring and Purple Wires

The inputs on the BinLogic are self powered with 24VDC and capable of powering the sensors such as the bin full sensor or the overflow sensor. They will not power relays or devices requiring high current to operate.

Push the input wiring and the **purple** wires through the 2" conduit running from the control panel to the junction box. Connect the inputs and **purple** wires (the BinLogic's internal relay) to their respective pairs. Pair them as follows:

- **Input #1 Red** and **Black** to the **Bin Full Sensor**

- **Input #2 Green** and **White** to the **Icemaker Toggle Switch**

- **Input #5 Yellow** and **Brown** to the **Leveler**

- **Control Relay Purple** wires to the **Ice Machine** (These will carry **240VAC**! Make certain the connections are *secure* and you have them connected to the wires leading to the *ice maker*)

- Plug in the 2 green connectors to the inputs block on top of the BinLogic

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Check List

☐ Function and colors match per reference above

☐ Connectors are snapped shut and wires are secure in them

☐ Wires are secure in the connectors

<u>Positioning the BinLogic</u>

The BinLogic comes with a din rail and double-sided tape. Peel the plastic off and secure the BinLogic where it has ample room for the provided wires. The recommended placement is above the PLC.

Making Space

Some control panels may not have enough room for the BinLogic. In this case, making the space depends on the layout of your electrical cabinet. **Remember to take pictures before continuing! These will be useful for troubleshooting any issues that may arise.**

Ice Cube Relays
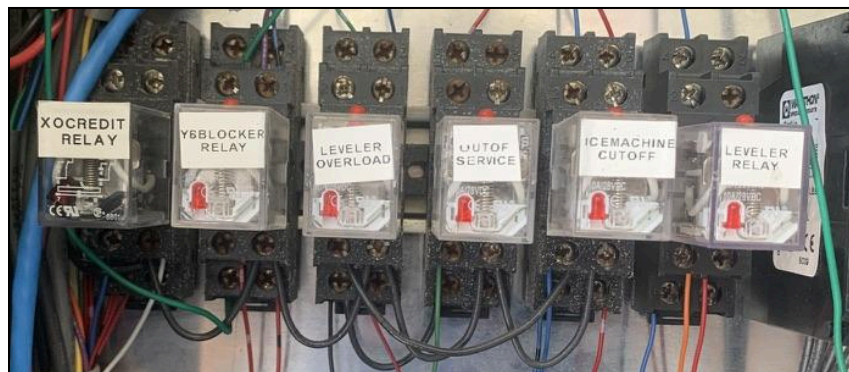
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Several of the ice cube relays underneath the PLC are redundant and can be removed. **Do not rely on the labels!** Test and identify each relay to verify its function:

The X0/Credit Relay is no longer required with an MDBPro. You will need to retain the wire that runs from the credit button to the PLC.

The IMS Cutoff Relay and all its wiring are no longer required with the addition of the BinLogic.

The Leveler Overload Relay is no longer required with the addition of the BinLogic. You will need to rewire NO97 & NO98 from the leveler contactor overload to the BinLogic input.
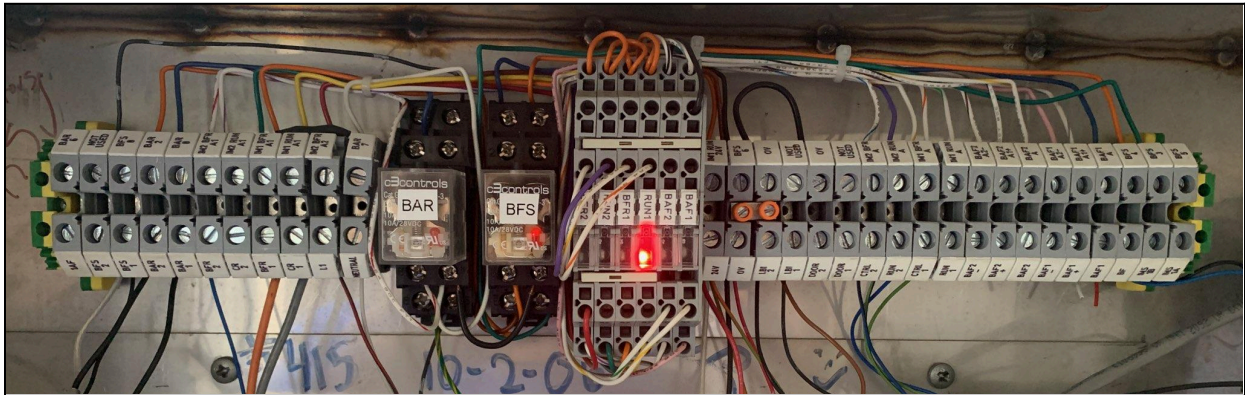
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The Leveler Relay and its wiring can be removed **IF** this machine does **NOT** have a leveler.

After rewiring the ice cube relays, verify that Pin 7 on the remaining relays (**except for the leveler relay**, if it is kept) are daisy-chained together and are wired to "Neutral" on the vertical bus bar.

Smart Ice Wiring

If this machine has a bank of relays/terminals above the PLC, as well as a MDBPro; the addition of the BinLogic will make this upper bank negligible. You can remove this bank entirely OR selectively remove every terminal block and wire to the right of the terminal block "Door 1" (namely CTRL2, RUN2, CTRL1, RUN1, BAF2,...IMS1A). See **Appendix B** for more details on the top bank's wiring.

Check List

☐ Din rail has adhered to panel wall

☐ There is room for the connectors and the wiring for the BinLogic

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Connect Power to the BinLogic

The BinLogic requires 110VAC. The power plug is pre-wired with a **black** and <mark>white</mark> pair. Run the <mark>white</mark> wire to "Neutral" on the bus bar, and the **black** to the 1 amp fuse (located to the right of the PLC and the 4 amp fuse). **DO NOT** turn on power yet!

    Check List

☐ Both wires are secure in their connectors.

☐ The 1A fuse is not blown.

☐ All breakers are still turned off.

Connect the BinLogic Outputs to the PLC

This step is unique to each type of monitoring - these instructions only apply to MyVends.com monitoring systems. Please contact your monitoring service provider to determine if these should be connected and where. If you don't have MyVends, skip to the next step.

The outputs are self powered with 24VDC and have a common ground. They are only suitable for use as signals for discrete logic inputs. **DO NOT** attempt to power a relay or other high current loads as this will damage the BinLogic and voids the warranty.

It is important to know how many ice makers the ice house has. If there are two ice makers, an input module for the PLC is required; one module has enough inputs for 2 BinLogic controllers.

One Ice Maker

If the ice machine only has one ice maker, then the DO-10ND3 input module that was already installed in the PLC for MyVends 1.0 can be repurposed. (*If you have a DO-10ND3 input module from a previous monitoring system that has since been replaced with MyVends 2.0, this too can be repurposed but instructions will differ – please contact support for details.*)

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Disconnect any wires connected to NC, C1, and 5 through 11 on the input module. Cut the ends of these wires, fold them back, and wrap with tape.

The output plug for the BinLogic has 6 wires: C and 1 to 5. It is recommended to insert the output plug as it will be easier to determine which wire leads to which output. The wires need to be connected to the input in the following order:

☐   **C** on the BinLogic outputs to **C1** on the Input module

☐   **1** on the BinLogic outputs to **5** on the Input module

☐   **2** on the BinLogic outputs to **6** on the Input module

☐   **3** on the BinLogic outputs to **7** on the Input module

☐   **4** on the BinLogic outputs to **10** on the Input module

☐   **5** on the BinLogic outputs to **11** on the Input module

Two Ice Makers

As mentioned previously, a secondary DO-10ND3 input module will be needed for this step. Plug the module into a free spot in the PLC. The wires need to be connected to the first input bank (C0 to 4 going down on the module) in the following order:

☐   **C** on the BinLogic outputs to **C0** on the Input module

☐   **1** on the BinLogic outputs to **0** on the Input module

☐   **2** on the BinLogic outputs to **1** on the Input module

☐   **3** on the BinLogic outputs to **2** on the Input module

☐   **4** on the BinLogic outputs to **3** on the Input module

☐   **5** on the BinLogic outputs to **4** on the Input module

Check List

☐   Disconnected wires are capped/taped and set aside

☐   Make sure no wires are exposed and will not short

☐   Check that no other wires have been pulled out or gotten disconnected

Thermometer

Since the thermometer has now been removed from the icemaker, it has to be relocated. We recommend that it be installed beside the control panel inside the machine.

If you have an indicator lamp for the icemaker on the left of the panel, this can be removed. Disconnect and remove the wires going to the lamp at the bus bar. This hole can be used to run the thermometer wires through.

Using the Original Bulb Thermometer

Wire the 2 wires from the thermometer to Input #4 of the BinLogic. Next, drill a hole in the wall, and run the bulb outside to read the ambient temperature.

Using a Digital Thermometer

A digital thermometer enables control for winter and summer temperatures and, in effect, turns off the icemaker when the temperature is too hot or too cold. We recommend the **Ranco ETC 111-000** thermometer.

Ranco Thermometer Wiring and Configuration
Thermometers purchased from DataWRX will have already been provisioned with wiring and four self-tapping screws.

Flip the control panel's breakers off. Use a voltage detector to confirm that all power is **OFF**.

Wire the **black** wire (120V) to the 2A fuse (adjacent to the PLC and the 4A fuse) and the **white** wire (COM) to "Neutral" on the bus bar. Connect the **blue** wires (NO & COM) to Input #4 on the BinLogic

Use the "Set" button on the thermometer to confirm the following settings according to the season. (*The following settings are our recommendation. See the Ranco Instruction Manual for specific configurations)*:

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	F°/C°	Temp. Limit	Differential	Heat/Cool
Summer	F	110	Dif 5	C1
Winter	F	45	Dif 5	H1

Ranco Placement

We recommend placing the Ranco to the left of the electrical panel at eye level. Use the placement print-out from **Appendix A** to accurately place the thermometer.

Test the BinLogic

Power up the control panel only:

☐ The power light on the BinLogic should be ON.

☐ The Status light on the BinLogic should be blinking once every 3 seconds.

☐ Flip the Icemaker Toggle Switch. Input #2 should be OFF in one position and ON in the other. If any input is **ON,** the BinLogic will turn **OFF** the icemaker.

☐ Press the red button on the leveler contactor overload. Input #5 should light up when the button is pressed.

☐ The thermometer will turn on Input #4 when the temperature limit is reached.

☐ After 3 minutes, with all inputs **OFF**, the Control Relay will come ON along with Output #3, Status light will turn **OFF**. Turn on power to the ice maker; the ice maker should start running.

☐ About 30-60 seconds after harvest, Output #4 on the BinLogic will turn ON for 30 seconds indicating a harvest was complete.

☐ Flip the ice maker toggle switch so that Input #2 is **ON**. After a 4-8 second delay Output #2 will come **ON** and the Control Relay will turn **OFF**. The ice maker will turn **OFF**

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immediately or after the next harvest. This is based on where the ice maker is in its timed cycle.

☐ If the ice maker turns **OFF** immediately, trying to turn it **ON** within 3 minutes will cause the BinLogic to delay the start. Status light will blink continuously until the delay is complete after which the Control Relay will turn ON.

☐ When the bin full sensor is engaged, Input #1 should come **ON**, after a short delay Output #2 will come **ON** and Control Relay will turn **OFF**.

☐ Ice maker should turn **OFF** when the Control Relay is **OFF**.

☐ If the Status light blinks when Output #4 is ON there is further adjustment necessary. Contact tech support for further instructions.

☐ If Output #4 does not come ON over 2 cycles the BinLogic will go into Fault mode. In Fault Mode the Control Relay goes OFF, Output #5 comes ON and the Status LED will blink to indicate what the fault is. Contact tech support for further instructions.
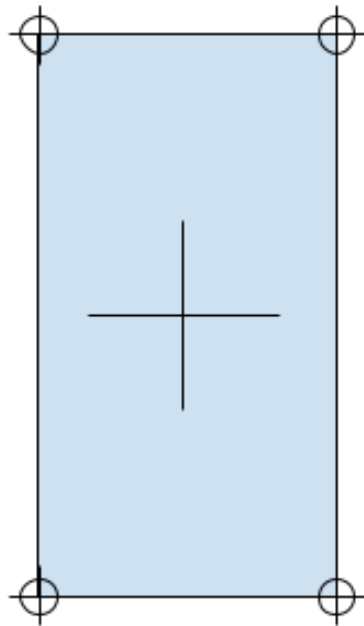
Consolidate/Clean Up Wiring

☐ Power everything down immediately after a harvest cycle is complete

☐ In the ice maker, zip tie any loose wiring

☐ Close the timer control panel and the icemaker

☐ In the gray junction box, neatly arrange the wires and re-attach the cover

☐ In the control panel, zip tie and tidy any loose wiring

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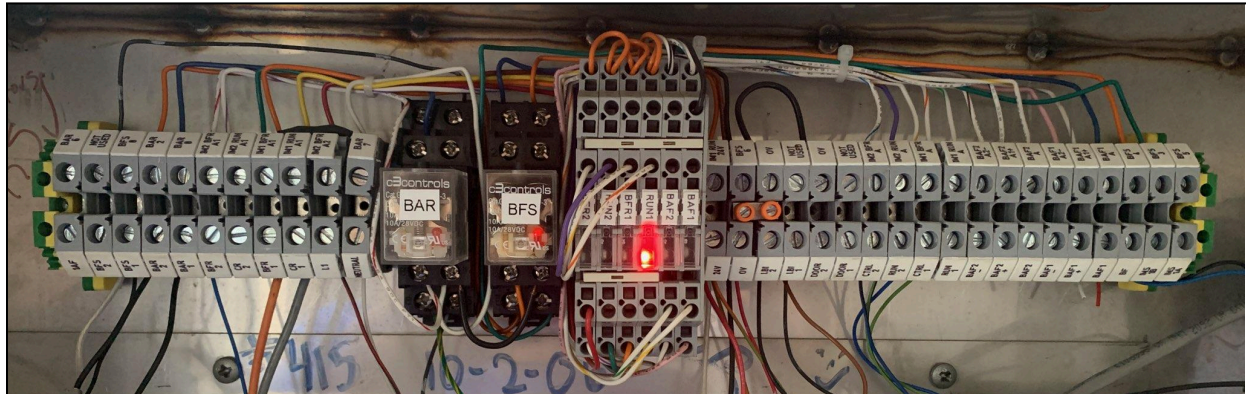
Appendices

Appendix A: Ranco Thermometer Print-Out

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Appendix B: SmartIce Wiring

Starting from the left:

Top	Destination	Bottom	Destination	Purpose
BAR6	Bill Acceptor Reset relay pin 6	1AF	1A Fuse	Power MDBPro through BAR relay
NOT USED		BFS2	Bin Full Sensor	Tied to 110VAC Line
BFS8	Bin Full Sensor Relay pin 8	BFS1	Bin Full Sensor	Energizes relay when Bin Full Flap is up triggering sensor
BAR2	Bill Acceptor Reset Relay pin 2	BAR2	Bill Acceptor Reset	Power MDBPro through BAR relay
BAR8	Bill Acceptor Reset Coil #8	BAR1	Bill Acceptor Reset	Energize viaY2 to turn OFF power to MDBPro
IM2 BFR A1	Blade Relay Coil	BFR2	IM Contactor	Energize via BFS relay to provide monitoring input when full
IM2 RUN A1	Blade Relay Coil	CR2	Current Relay	Energize relay to provide monitoring input when running
IM1 BFR A1	Blade Relay Coil	BFR1	IM Contactor	Energize via BFS relay to provide monitoring input when full

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Top	Destination	Bottom	Destination	Purpose
IM1 RUN A1	Blade Relay Coil	CR1	Current Relay	Energize relay to provide monitoring input when running
IM2 BFR A2	Blade Relays Common Coil	L1	110VAC Line	Power to Blade Relays
BAR7	Bill Acceptor Reset Relay pin 7	NEUTRAL	110VAC Neutral	BAR coil neutral
BAR Relay	See above for BAR pinouts			Resets MDBPro when energized
BFS Relay	See above for BAR pinouts			Energized when Bin Full Sensor is triggered
BFR2 Relay	See above for BFR2 pinouts			Energize relay to provide monitoring input when IM2 bin full
RUN2 Relay	See above for RUN2 pinouts			Energize relay to provide monitoring input when IM2 runs
BFR1 Relay	See above for BFR1 pinouts			Energize relay to provide monitoring input when IM1 bin full
RUN1 Relay	See above for RUN1 pinouts			Energize relay to provide monitoring input when IM1 runs
BAF2 relay	See above for BAF2 pinouts			Energize relay to provide monitoring input when Bill2 Fault
BAF1 relay	See above for BAF1 pinouts			Energize relay to provide monitoring input when Bill1 Fault
IM1 RUN 24V	Blade Relays Common	24V	PLC 24V	
BFS6	Bin Full Sensor Relay Pin 6	0V	PLC Input Module	Provide monitoring input when Bin is full
0V		LB1 2	Low Bag Sensor power	Power low bag sensor

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Top	Destination	Bottom	Destination	Purpose
NOT USED		LB1 1	Low Bag Sensor return	Provide monitoring input when Bag is low
0V		DOOR 2	Door Sensor power	Power door sensor
NOT USED		DOOR 1	Door Sensor return	Provide monitoring input when Door is open
IM2 BFR A		CTRL 2		Provide monitoring input
IM2 RUN A		RUN 2		Provide monitoring input
IM1 BFR A		CTRL 1		Provide monitoring input
IM1 RUN A		RUN 1		Provide monitoring input
BAF2 A2-	Bill Acceptor Fault	BAF2 +	Bill Acceptor Fault	
BAF2 A1+	Bill Acceptor Fault	BAF2	Bill Acceptor Fault	
BAF1 A2-	Bill Acceptor Fault	BAF1 -	Bill Acceptor Fault	
BAF1 A1+	Bill Acceptor Fault	BAF1 +	Bill Acceptor Fault	
BAF1 A	Bill Acceptor Fault	BAF1	Bill Acceptor Fault	
BFS4	Bill Full Sensor Relay	BF		
BFS3	Bill Full Sensor Relay	IMS 1B		
BFS5	Bill Full Sensor Relay	IMS 1A		

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Control Inputs: 1 - 4 are normal control inputs | 5 - 8 are fault indicators

Note: All inputs have a delay before it energizes their corresponding output.

1. **Bin Full Sensor -** This will illuminate when the bin is full. When **Input 1** comes ON, **Output 1** will turn ON.
2. **Toggle Switch** - The switch by the door of the ice house that controls the ice maker. When the toggle switch is off, **Input 2** will illuminate, turning **Output 2** on, and the BinLogic's control relay off.
3. **Remote Control** - Wired to the PLC's ice maker remote control output. When **Input 3** turns on, **Output 2** will turn on, and will turn off the BinLogic's control relay off
4. **Thermometer -** Wired to the Common and Normally Open contacts of the thermometer relay. When the preset temperature is reached, **Input 4** and **Output 2** will turn on, turning off the ice maker. (See page 16 for thermometer configuration.)
5. **Leveler Overload** - wired to 97 & 98 NO contacts of the leveler contactor overload. When the leveler overload trips, **Input 5** and **Output 5** turns on, turning the BinLogic's control relay off.

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By referring to this document you accept that you understand all the terminology and accept any risk associated in performing this work yourself. If you have any concerns or questions please contact a professional installer.

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