

BLMC Boiler Control Module

SUPERSEDES: New

EFFECTIVE: August 21, 2012

Plant ID: 001-4112

PURPOSE: This guide is a consolidation of important BLMC information that can be used when installing, commissioning and setting up the controller. It is not meant to replace any other BLMC documents or drawings.

APPLICATION: The application is for controlling up to 4 modulated or staged boilers.

IMPORTANT FACTS

- If an OAT sensor is used on the ASM2, one doesn't have to be connected the BLMC.
- The BLMC can be a stand-alone controller if it is configured using the LCI and there is an OAT sensor connected directly to the BLMC.
- Two BLMCs can be cascaded together allowing for control of up to 8 modulated or staged boilers.
- The BLMC accepts networked demands from BLMC, BZU3 and ZXU1 controllers.
- Non-networked demands can be connected to the RDMD (Reset Demand) and or (AUX demand) inputs; these inputs are dry contact or temperature inputs.
- The AUX demand is commonly used for Domestic Hot Water; with or without priority.
- The RDMD demand input can be connected to Taco Relay panels or similar devices; think of the RDMD input as the TT terminals.
- The Boiler Alarm inputs are typically connected to the dry contact output of the boiler being controlled; this enables one to be informed of a boiler fault without being at the site.
- The System Status input must be closed within 1 minute of a boiler output being enabled otherwise a fault condition occurs and the controller shuts down. This input typically is a flow switch indicating that the primary pump is functioning or it can be tied to the combustion air damper indicating it is open. If the system status input is not used, a jumper *must* be placed across it.
- The System output typically is used on the load side of a hydro separator.
- Under the individual boiler settings in the LCI, if *Boiler Operation* is set to "Enabled," the boiler is enabled and the analog output is set to 50%; the digital output is also turned on. This is a commissioning setting; the normal setting is "Auto."

INSTALLER/ELECTRICIAN CHECKLIST

Task	Verified Yes/No
Ensure that the 24VAC power source is properly connected to terminals 38 & 39 and that the polarity is correct.	
Ensure that terminal 40 GND is connected to a known good earth ground.	
Ensure that the 3 sets of DIP switches are properly set in accordance with the drawing below, installation or application documents. The DIP switches can be accessed by removing the controllers cover. Note the black square for each position indicates the direction the switch needs to be placed.	
Ensure that the 4 sets of jumpers are properly set in accordance with the drawing and your application. The jumpers can be accessed by removing the controllers cover.	

Task	Verified Yes/No
Ensure that the proper wire is used for inputs and the communication trunk. Analog input wiring must be 18 AWG TSP (can also use multi-conductor). Taco part # Wir-018 (1 Pair + shield). Communication wiring must be Echelon approved cable 22 AWG TP. Taco part # WIR-022.	
Ensure that the shielded input wiring is properly grounded. Remember the shield must only be connected at the controller end, at the sensor end it should be cut even with the wire jacket and taped.	
Ensure that the sensors required for this application are properly installed and wired to the controller. Refer to sensor and controller installation sheets for reference.	
If the LCI is connected and powered up, depress the service pin button so that the controller is recognized and added to the LCI's database. This can be verified by logging into the LCI and depressing the Controllers button. The controller appears as Unitx_BLMC, where x is the order in which all controllers' service pin buttons have been depressed.	

COMISSIONING THE CONTROLLER

After the BLMC has had all inputs and outputs properly wired, a point-to-point check should be performed to ensure all terminations have been properly made. Use this checklist to verify all inputs are working correctly and reading properly in the LCI; if a point is not used, simply indicate "not used."

Steps required for verifying inputs on the BLMC

To verify the inputs and outputs, login to the LCI and perform the following steps:

1. Press **Controllers** button from the Home screen.
2. Select the BLMC from the list of controllers.
3. Press **Inputs** and verify that there are realistic temperature readings. It is recommended that the temperature sensors be warmed up or cooled down so a response is seen. To verify digital inputs, change the state of the sensor to see a response.
4. To verify the outputs, press **All Settings**.
5. From the list of settings, select **BLR x Settings** and set it to "Enabled;" this forces the boiler's digital output to turn on and sets the associated Analog Output to 50%.
6. Select **Pri Pump** and **Aux Pump** and set them to "On;" this forces the pump digital output to ON.
7. Verify the output has turned on in the Outputs screen.
8. Verify the physical pump or boiler has turned on.
9. After verification, set all overrides and commissioning settings back to the defaults. Do not leave the outputs in the overridden state.

Inputs	Verified/initials	Outputs	Verified/initials
OA Temp		Boiler 1 Output	
Prim Supply Temp		Boiler 2 Output	
Prim Return Temp		Boiler 3 Output	
Aux Temp or Demand		Boiler 4 Output	
Reset Temp or Dmd		Boiler 1 Pump	
System Status		Boiler 2 Pump	
System Status		Boiler 3 Pump	
Boiler 1 Status		Boiler 4 Pump	
Boiler 2 Status		Aux Pump	

Inputs	Verified/initials	Outputs	Verified/initials
Boiler 3 Status		System Output	
Boiler 4 Status		Alarm Output	
		Primary Pump	

CONFIGURING THE BLMC SETTINGS

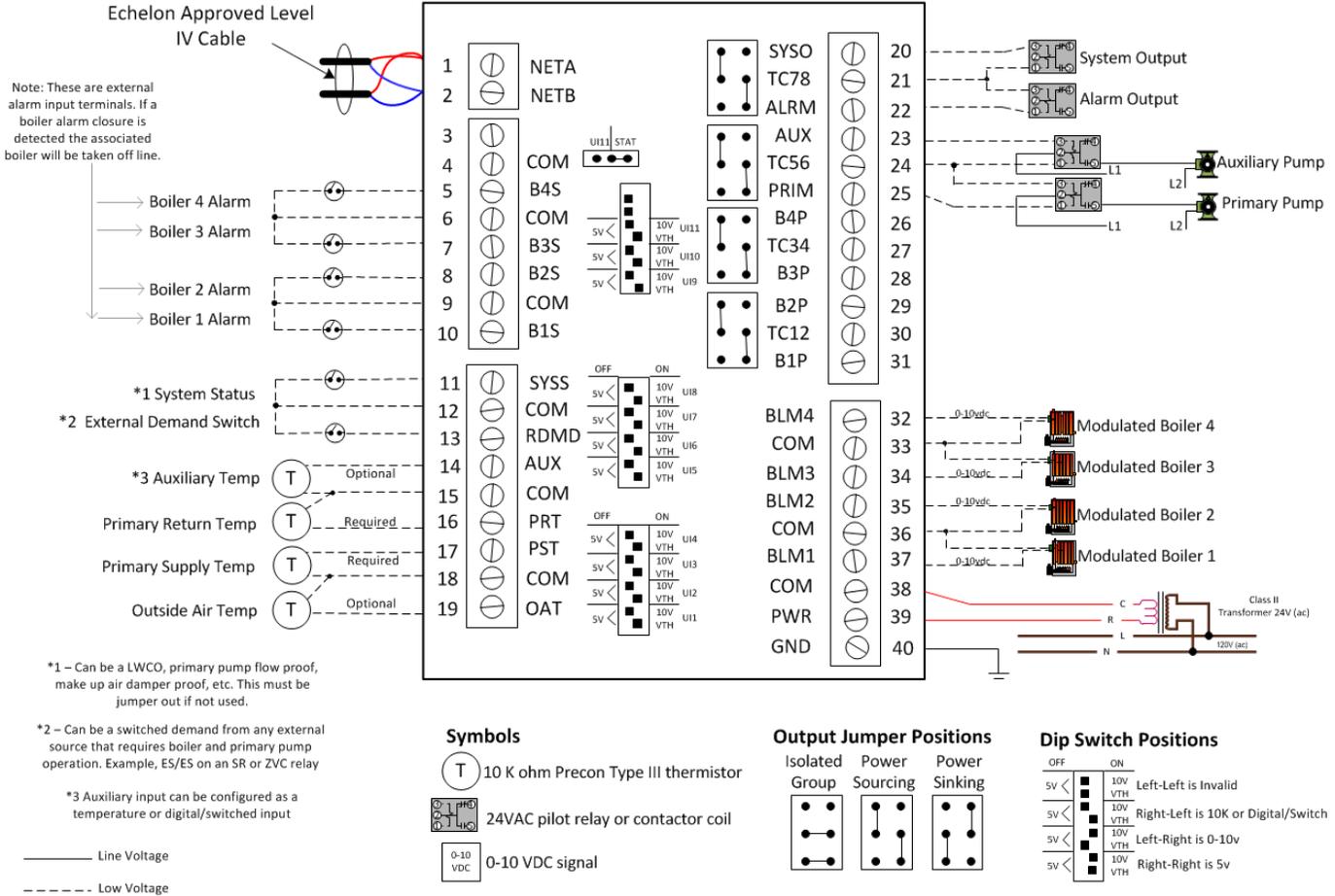
A description of BLMC settings can be found in the Application Guide on pages 27-33. If a copy of the Application Guide is needed, it can be found at www.taco-hvac.com. Once in the web site, select the *Products* tab, and from the drop down list select *iWorx® by Taco Electronic Solutions*. A complete list of links to all documentation is shown on the left side of the web page.

TROUBLESHOOTING & TECHNICAL TIPS

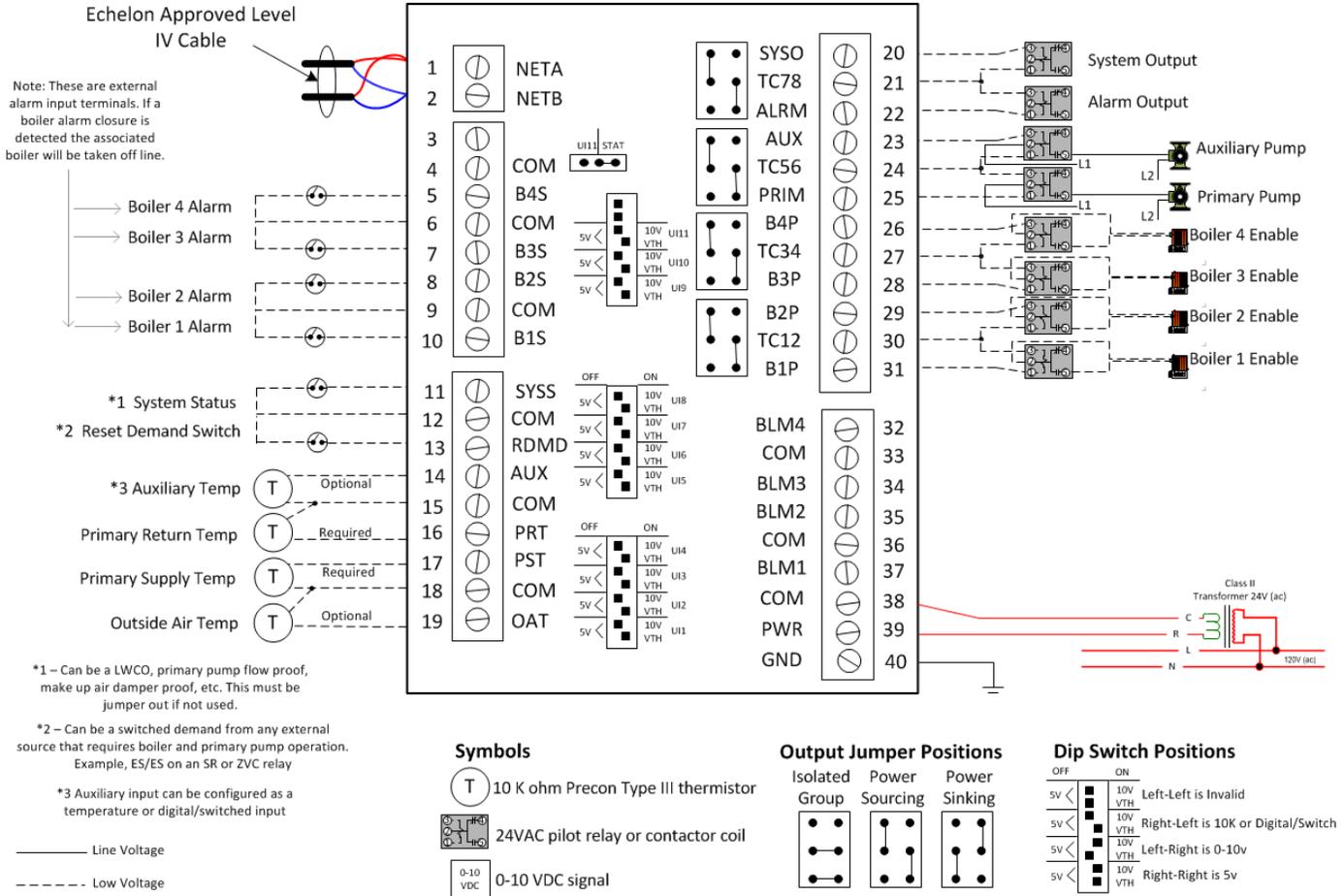
Problem	Solution
Controller is not running and Status LED is not illuminated.	No power to controller. Verify the voltage on the controller's power connector (24 VAC).
How do I reset the controller?	The controller can be reset by the LCI, or you can cycle power to the controller. Refer to the LCI documentation for more information on resetting the controller using the LCI.
A boiler or pump pilot relay will not come on even though the LCI indicates it is on.	Ensure that the controller and output pilot relay have been powered with 24 VAC and the output has been correctly wired to the coil of the pilot relay. Also ensure that the pilot relay has a 24 VAC coil. Ensure that the output jumper is configured for how the output is wired; for example Power Isolated vs Power Sourcing.
There is a "Temperature Sensor Alarm" on the LCI.	The input is either shorted or open. Check the wiring for the indicated sensor.
Thermistor readings fluctuate rapidly, sometimes by several degrees.	The controller may not be properly grounded. The controller's ground (GND) pin (T40) must be connected to earth ground. Also ensure that the controller's digital inputs are dry contacts and that no voltage is being applied or switched to the inputs.
Controller has a demand and the Supply Temperature is well below calculated Setpoint, but the boilers are not coming on.	Are you using a flow check that needs to be wired in to the Status Input? In case you are not using a Boiler Status verification, you must have a jumper across UI6 and Com. Is the system in WWSD? Is the number of boilers in your system set to a value >0?
Controller sees an Aux and a Pri call coming in at the same time, but only the Aux call gets serviced.	Is your system set to Aux Priority? Then check if the Priority Timeout is set to a value >0. Otherwise, the Priority call never expires.
My system has a demand, but the boilers are not reacting fast enough.	You can adjust the reaction time in the system settings - Gain parameter. Increase the Gain for faster reaction, decrease to slow it down.
My system is configured for parallel mode, but not all boilers are running.	The demand is not enough for all boilers and the system automatically adjusts to the right number of boilers needed to satisfy the demand. Is one of the boilers in an alarm situation? Check the alarm Output.

TYPICAL BLMC WIRING

BLMC Power Sourced 'Modulated Boilers'



BLMC Power Sourced 'Boiler Controller' Enable Configuration



CONTROLS MADE EASY®

Taco Electronic Solutions, Inc., 1160 Cranston Street, Cranston, RI 02920
Telephone: (401) 942-8000 FAX: (401) 942-2360.

Taco (Canada), Ltd., 8450 Lawson Road, Unit #3, Milton, Ontario L9T 0J8.
Telephone: 905/564-9422. FAX: 905/564-9436.

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