



## Interfacing the TSBC with or without a Building Management System

A majority of my tech calls involve customers looking for ways to control their Thermal Solutions boilers with or without a building management system. Here are ways you can use our Thermal Solutions Boiler Control (TSBC) to do either:

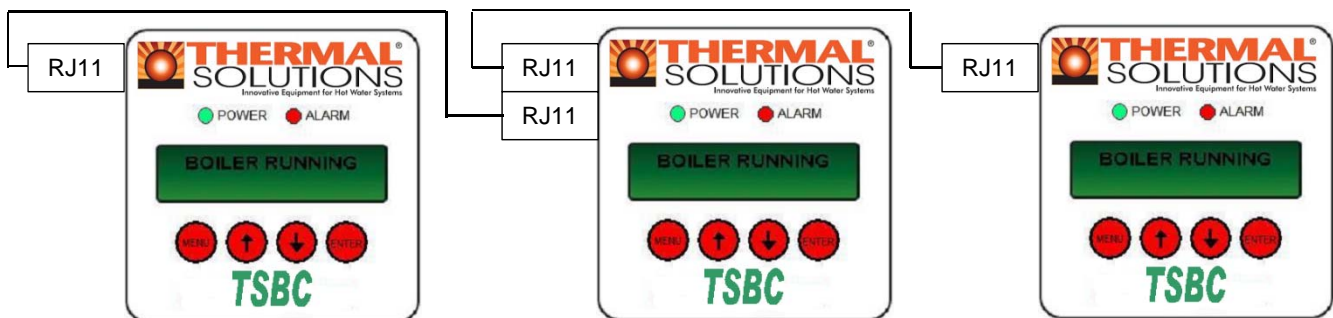
- **Peer-To-Peer** - Allows our boilers to be networked together without a building management system or, in addition to, a 1-9v input for remote modulation or setpoint from a building management system.
- **Modbus** - Allows our boilers to be controlled and monitored by a building management system.
- **Remote Voltage Input Only** - Allows our boilers to be controlled by a building management system.

Below are the details of how to wire & program these control strategies and if you need my assistance, please feel free to call!

### PEER-TO-PEER

#### Wiring the TSBC:

Peer-to-Peer requires a 4 or 6 pin RJ11 phone cord with splitters between the boilers on the top left hand side of the TSBC.



Example of a Three-Boiler Peer-To-Peer Communications Wiring

Do NOT jumper LR to C unless you add a 1-9v input for remote modulation or setpoint.

#### Programming the TSBC:

- Go to *COMMUNICATIONS* menu and program Protocol to “Peer-To-Peer”. Arrow down and address each boiler individually 1, 2, 3, etc.

Notes:

- 1) **Sensor Sharing** - Peer-to-Peer allows you to share a remote sensor or outdoor sensor. Simply wire the Remote sensor to R+ R- on the pull out terminal strip of the TSBC on boiler #1 (the master) and daisy chain to the next boiler and so on down the line. Wire the outdoor sensor to O+ O- on the pull out terminal strip of the TSBC on boiler #1 and daisy chain down the line. You will still need the phone cord connected on the top left side for communication of the Peer-to-Peer language and to share sensors. Sensor sharing is done through hard wiring. However, if you have just two boilers, you can use an RJ45 Ethernet cable between them by connecting on the top right side of the TSBC and this enables both the remote and outdoor sensors without the hard wiring.
- 2) **Analog Signal** - While doing Peer-to-Peer, the TSBC can still accept a remote setpoint or remote modulation signal wired to C+ C- on each boiler independently using a 1-9vDC signal. The control must be programmed from the SYSTEM CONFIG menu, under Remote Control, as either "Remote SP" (setpoint) or "Remote Mod" (modulation) to accept the signal. For "Remote SP", arrow down and fill in the next two parameters. The first will be 1.0 Volt = low end of the temperature range and the other is 9.0 Volt = high end of the temperature range. A jumper must be placed on LR to C on the TSBC to close the local remote switch. You can still share the remote sensor, but do not use an outdoor sensor as it will conflict with the building management system's input.

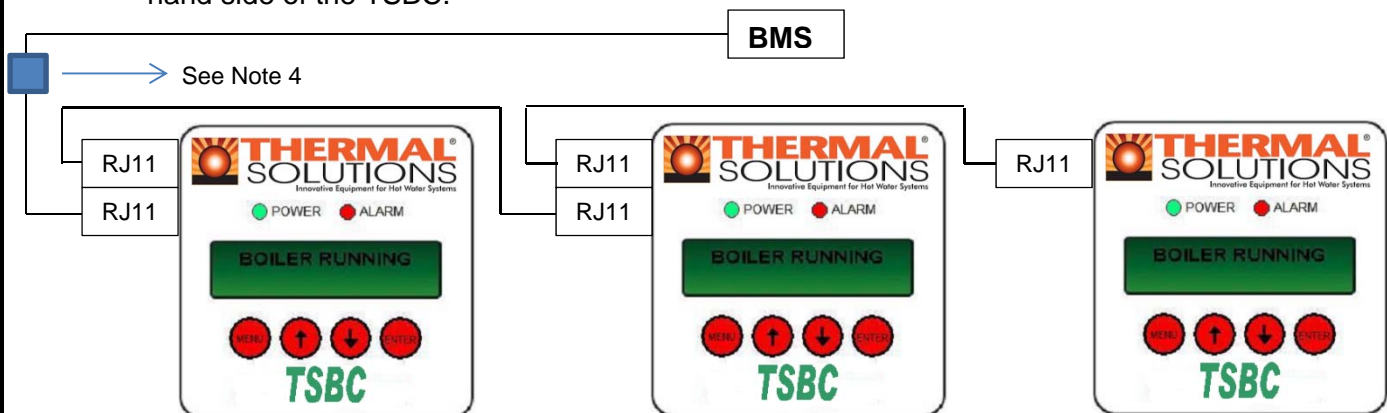


**MODBUS**

Wiring the TSBC:

The TSBC comes standard with RS485 Modbus.

Modbus requires a 4 or 6 pin RJ11 phone cord with splitters between the boilers on the top left hand side of the TSBC.

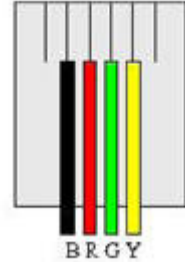


Example of a Three-Boiler Modbus Communications Wiring

Put a jumper from LR to C on the pull out terminal strip of the TSBC to close the local remote switch.

Phone cable signals (4 wire) connect to pin 1 and 2 OR 3 and 4. A is the positive. It has 5vdc through a resistor. B is a resistor to ground.

- 1 A (+) Black
- 2 B (-) Red
- 3 B (-) Green
- 4 A (+) Yellow



Phone cable signals (6 wire) connect to pin 2 and 3 OR 4 and 5. The A represents the active transmission state of the RS485 transmitter.

- 1 no connection
- 2 A (+)
- 3 B (-)
- 4 B (-)
- 5 A (+)
- 6 no connection

#### Programming the TSBC:

- Go to *COMMUNICATIONS* menu and program Protocol to “Modbus”. Arrow down to put in the rest of the parameters to match the building management system’s outputs.
- Go to *SYSTEM CONFIG* menu and program Remote Control to “Modbus SP” (setpoint) or “Modbus Mod” (modulation)

#### Notes:

- 1) **Enable/Disable** - If you want to do a remote enable/disable, it is available through the Modbus if you choose Modbus Modulation. If you choose Modbus SP (setpoint) you must do a hard wire to RO & C on the pull out terminal strip of the TSBC with a rib relay on each boiler individually.
- 2) **Sensor Sharing** - You can NOT share a remote sensor when using Modbus. Each boiler will require its own sensors. Outdoor sensor is not used with Modbus option.
- 3) **Analog Signal** - You can do a 1-9vDC input for remote modulation or remote setpoint to C+ C- on the pull out terminal strip of the TSBC and still get Modbus communication out. Program our control from the COMMUNICATION menu and set Protocol to “Modbus”. Arrow down to put in the rest of the parameters to match the building management system’s outputs. Next, program from the SYSTEM CONFIG menu, under Remote Control, as either “Remote SP” (setpoint) or “Remote Mod” (modulation) to accept the signal. For “Remote SP”, arrow down and fill in the next two parameters. The first will be 1.0 Volt = low end of the temperature range and the other is 9.0 Volt = high end of the temperature range. Place a jumper on LR to C.
- 4) **Optional BACnet, Johnson Controls Metasys, LonWorks Communications** – Thermal Solutions offers as an option a [Protonode communications gateway](#) configured for our TSBC control at an additional cost. One gateway required per bank of boilers. Contact your local Thermal Solutions sales representative for price and availability.

**\*\* You cannot do Peer-to-Peer and Modbus at the same time.  
They are two different languages. \*\***



## REMOTE VOLTAGE INPUT ONLY

### Wiring the TSBC:

The TSBC can also accept a 1-9 vDC signal to C+ C- from a building management system for remote modulation or remote set point.

Again, jumper LR to C on the pull out terminal strip so it looks for the incoming voltage.

### Programming the TSBC:

- Got to *SYSTEM CONFIG* menu and program Remote Control to “Remote Mod” (modulation) or “Remote SP” (setpoint); if you choose this option, you will be required to add 1V = low setpoint and 9V = high setpoint.

If you choose remote modulation, you must do enable/disable of the boiler. Remove the jumper on RO & C of the pull out terminal strip and replace with a rib relay. Open & close the rib relay to start & stop the boiler.

If you want to use a remote sensor, each boiler must be wired with its own sensor. The outdoor sensor should not be used in this control mode as it will conflict with the building management system’s input.