QUICK START GUIDE

PLEASE READ AND FOLLOW ALL INSTRUCTIONS CAREFULLY. FAILURE TO COMPLY WITH THESE INSTRUCTIONS COULD CAUSE DAMAGE TO THE DEVICE!

OVERVIEW

The **M**ulti-**T**rans **S**mart **E**cosystem (MTSE) is factory configured so it will be ready to read airflow and pressure measurements after following this quick start guide. This guide is intended for field startup of the MTSE only. The full MTSE Installation, Operation, and Maintenance Manual (IO&M) can be downloaded from PCI's website at www.paragoncontrols.com.

INSTALLATION CONSIDERATIONS

Power Requirements	20 - 28VAC/VDC
Power Consumption	8.5 Watts, 15.3 VA Max
Analog Outputs	(3) 12-bit Analog Outputs Field Selectable 0-10V & 4-20mA
Analog Inputs	(3) 12-bit Analog Inputs Field Selectable 0-5V, 0-10V, & 4-20mA
Supported Protocols	Modbus RTU Slave, BACnet MS/TP
Max communication length	4000 ft. (EIA-485)
Operating Temperature	-4°F to 158°F (-20°C to 70°C)

Do not exceed ratings. Only qualified personnel should perform installation. Connection code is located on inside cover.

The MTSE can be custom configured to match most applications to measure, sum, and report up to 3 systems (i.e., Supply Air, Return Air, and Outside Air) and 4 ΔP points of measurement (i.e., pre-filter, final filter, coils, etc.) for a total of up to 10 sensing points in any combination. Depending on how your MTSE was ordered, the system quantity and ΔP quantity will change the appearance of the Main Screen. Shown in the above image is a three-system configuration with no ΔP points of measurement.

INSTALLATION

Before any electrical connections are made, ensure the **POWER SWITCH is in the OFF position**. The MTSE is rated for either indoor or outdoor installation. When installed outdoors, **do not install the MTSE where the screen is in direct sunlight.** Avoid locations that are subject to high vibration.

Step 1. Open the cover by unlatching the stainless-steel clasps.

Step 2. Ensure the Power Switch is in the OFF position.

Step 3. Install the interface wiring for the electrical connectors as described below. The electrical connectors have removable terminal blocks for ease of installing the interface wiring. Shielded 24 AWG (min.) twisted-wire cable is recommended for all connections between the MTSE, temperature transmitter, and network communication. The electrical connection code and example of electrical connections are shown below.

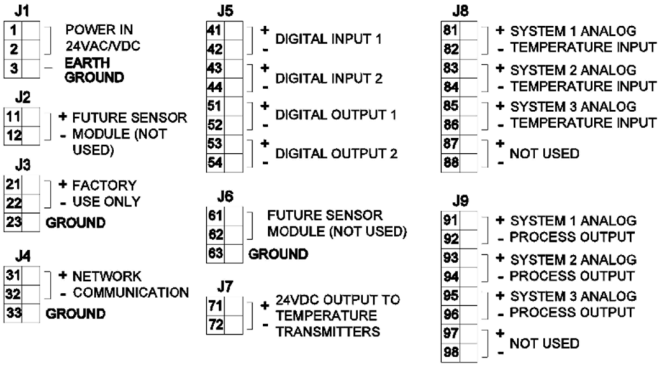
- For network communication, connect Pins 31 and 32 (J4) to the positive and negative connectors on the communication device. Ensure that only one side of the shielding wire is connected to EARTH ground at the building network communication device.
- If a loop powered 4-20mA temperature transmitter (TT) is to be installed for OA, determine which system is OA from the inside label. For System 1 - connect Pins 71 and 81 (J7 and J8) on the MTSE to the positive and negative connectors on the TT, respectively; for System 2 – connect Pins 71 and 83; or for System 3 – connect Pins 71 and 85. The TT must be connected to the correct pins for temperature compensation of corresponding system.

- Connect Pins 91 and 92 (J9) for System 1 analog process output to the positive and negative connectors on an analog receiving device; connect Pins 93 and 94 for System 2; and connect Pins 95 and 96 for System 3 (if available).
- Connect Pins 1 and 2 (J1) to a 24 VAC or 24 VDC power supply. Ensure that Pin 3 is used to connect the MTSE to EARTH ground.

Step 4. Connect the total (high) pressure and static (low) pressure ports of the MTSE to the high- and low-pressure ports of the Airflow Measuring Station (or fans if multiple systems) using plenum-rated tubing (by others). Transducers in the MTSE are numbered sequentially; therefore, all connections for System 1 must be made in order starting at sensor 1, and then System 2 will start immediately after the last sensor in System 1, and so on. See label inside cover of MTSE for sensor numbering relative to system tagging. An example of this label is shown below.

Step 5. Turn the Power Switch (S1) to the ON position.

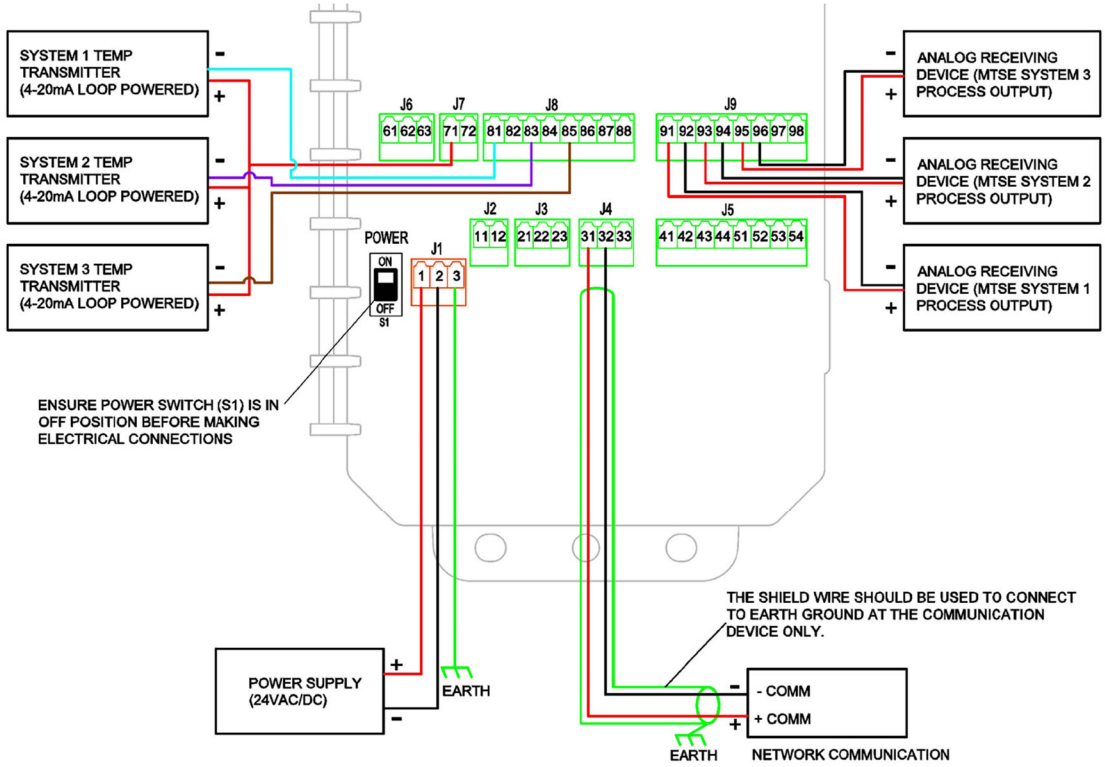
Step 6. Close the cover.



Electrical Connection Code

(LEFT SIDE) LO	-	HI	W.O. No.: 12345 SERIAL No.: 6789 POWER: 20-28 VAC/DC	(RIGHT SIDE) HI	-	LO
•	1	•	SYSTEM #1 AHU-1 SA Sensor(s) 1 to 3	•	6	•
•	2	•	SYSTEM #2 AHU-1 RA Sensor(s) 4 to 5	•	7	•
•	3	•	SYSTEM #3 AHU-1 OA Sensor(s) 6 to 6	•	8	•
•	4	•	ΔP1 Sensor 7	•	9	•
			ΔP2 Sensor 8			
•	5	•	ΔP3 Sensor 9	•	10	•
			ΔP4 Sensor 10			

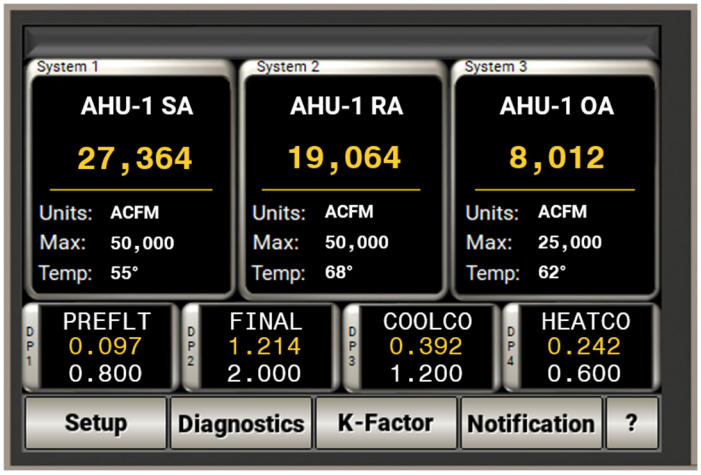
Example Inside Label



Electrical Connections

STARTUP

Upon power up, the Main Screen will show how the MTSE was configured for the application. If one system was ordered, only System 1 will be visible on the Main Screen, and if two systems were ordered then System 1 and System 2 will show on the screen, etc. If ΔP points of measurement were ordered, they will appear at the bottom half of the screen as shown to the right in a fully loaded MTSE with 3 systems and 4 ΔP points of measurement.



MENU CHANGES

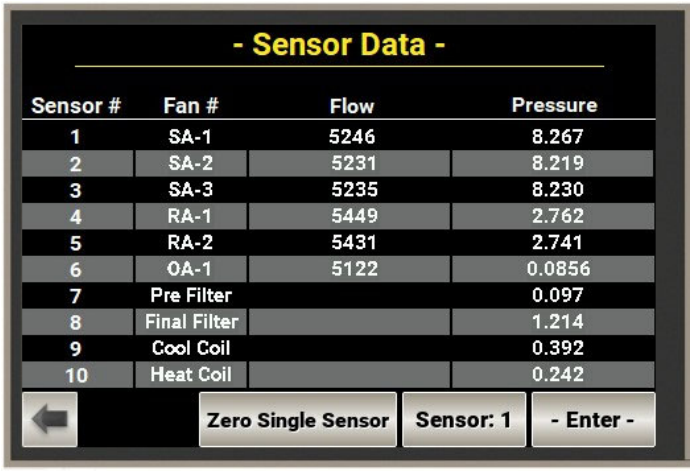
If any values need to be changed, the user can navigate through the Setup Menu to the appropriate screen to make changes by pressing the Setup button on the bottom of the Main Screen. On occasion, system effects will require the MTSE airflow measurement to be corrected with a K-factor to match a balancer or reference airflow rate. See the flow chart of the Setup Menus on page 4 for easy navigation through the Setup Menu or the MTSE Installation, Operation & Maintenance Manual for more information.

PROPER INSTALLATION CHECK PROCEDURE

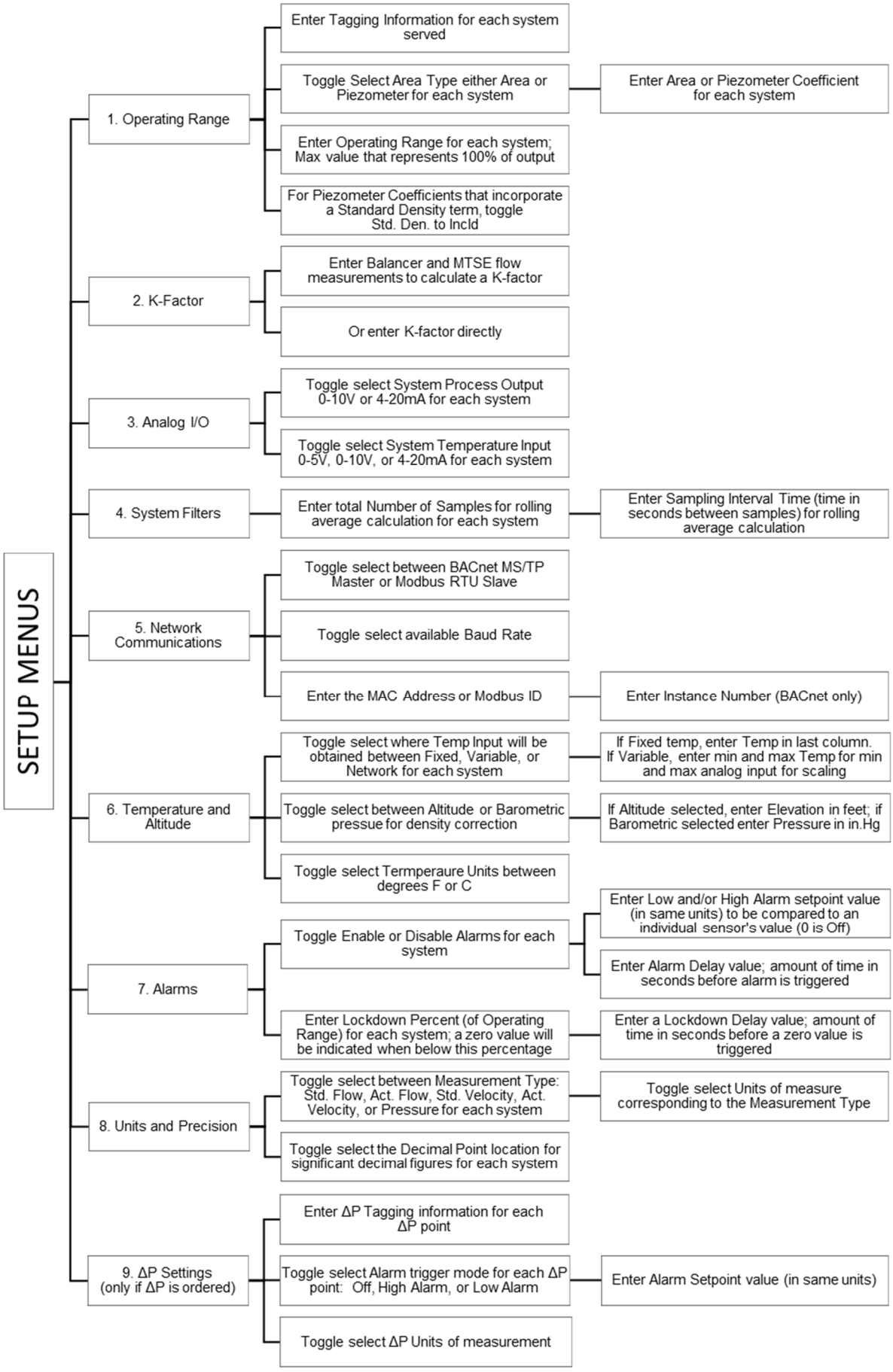
Upon power up, a form of the Main Screen as discussed in the Startup Section above will appear. A check for proper installation can be made by navigating to the Sensor Data page from the Main Screen by pressing DIAGNOSTICS **»** SENSOR DATA to confirm individual sensor flow and pressure and then checking the following:

1) A negative pressure reading indicates reversed tubing to a sensor (other than a very small negative pressure value from possible zero drift); swap the low and high signal tubing for that sensor number.
2) S_Err in the Pressure column indicates a “sensor acknowledge error” from an unresponsive sensor. Cycle power to reset the sensor. Contact the Factory if this is not resolved.
3) If flow and pressure are being displayed on Sensor Data page but there is no system flow displayed on Main Screen, the MTSE is in lockdown for that system; reduce the lockdown percent (SETUP MENU **»** 7.ALARMS).
4) If a single fan in a system array is reading near zero or very different from other fans in the same system, this could indicate either fan failure, closed fan backdraft damper, or a problem with the pneumatics (e.g., kinked or blocked signal tubing, etc.), please check for these issues.

The MTSE is user friendly with many help screens available in the menus. The “?” button available at the bottom right corner on most pages will provide an explanation of the parameter configurations and available options for each menu selection. The “?” button on the Main Screen shows Factory contact information and firmware revision levels; pressing the right arrow will bring up a series of troubleshooting steps the user should perform before contacting the Factory. Continue pressing the right arrow for additional troubleshooting steps, such as, no flow or incorrect flow readings, analog output, and communication issues. Consult Factory for additional information, technical questions, or repair. Do not disassemble or repair unit unless directed by Factory.



SETUP MENUS


SETUP MENUS
1. Operating Range
Enter Tagging Information for each system served
Toggle Select Area Type either Area or Piezometer for each system
Enter Area or Piezometer Coefficient for each system
Enter Operating Range for each system; Max value that represents 100% of output
For Piezometer Coefficients that incorporate a Standard Density term, toggle Std. Den. to Incld
2. K-Factor
Enter Balancer and MTSE flow measurements to calculate a K-factor
Or enter K-factor directly
3. Analog I/O
Toggle select System Process Output 0-10V or 4-20mA for each system
Toggle select System Temperature Input 0-5V, 0-10V, or 4-20mA for each system
4. System Filters
Enter total Number of Samples for rolling average calculation for each system
Enter Sampling Interval Time (time in seconds between samples) for rolling average calculation
5. Network Communications
Toggle select between BACnet MS/TP Master or Modbus RTU Slave
Toggle select available Baud Rate
Enter the MAC Address or Modbus ID
Enter Instance Number (BACnet only)
6. Temperature and Altitude
Toggle select where Temp Input will be obtained between Fixed, Variable, or Network for each system
If Fixed temp, enter Temp in last column. If Variable, enter min and max Temp for min and max analog input for scaling
Toggle select between Altitude or Barometric pressue for density correction
If Altitude selected, enter Elevation in feet; if Barometric selected enter Pressure in in.Hg
Toggle select Termperaure Units between degrees F or C
7. Alarms
Toggle Enable or Disable Alarms for each system
Enter Low and/or High Alarm setpoint value (in same units) to be compared to an individual sensor's value (0 is Off)
Enter Alarm Delay value; amount of time in seconds before alarm is triggered
Enter Lockdown Percent (of Operating Range) for each system; a zero value will be indicated when below this percentage
Enter a Lockdown Delay value; amount of time in seconds before a zero value is triggered
8. Units and Precision
Toggle select between Measurement Type: Std. Flow, Act. Flow, Std. Velocity, Act. Velocity, or Pressure for each system
Toggle select Units of measure corresponding to the Measurement Type
Toggle select the Decimal Point location for significant decimal figures for each system
9. ΔP Settings (only if ΔP is ordered)
Enter ΔP Tagging information for each ΔP point
Toggle select Alarm trigger mode for each ΔP point: Off, High Alarm, or Low Alarm
Enter Alarm Setpoint value (in same units)
Toggle select ΔP Units of measurement