

CCS Handheld VAV Balancing Tool

Technical Bulletin

NS-ATV7003-0

Code No. LIT-12011470

Software Release 1.2

Issued July 15, 2011

Supersedes January 14, 2009

Refer to the [QuickLIT Web site](#) for the most up-to-date version of this document.

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Document Introduction

This document describes how to use the NS-ATV7003-0 Handheld Variable Air Volume (VAV) Balancing Tool for Commercial Comfort System (CCS) applications. This document also describes the VAV Balancing Tool error codes you may encounter.

Related Documentation

Table 1 lists the documentation related to the CCS Handheld VAV Balancing Tool.

Table 1: Related Documentation

For Information On	See Document	LIT or Part Number
Features, Benefits, and Applications of the CCS	<i>Commercial Comfort System (CCS) Product Bulletin</i>	LIT-12011347
Zoning System Application, Design, and Installation for the CCS	<i>Commercial Comfort System (CCS) Changeover Bypass (COBP) Zoning System Design Application Note</i>	LIT-12011512
Configuring Settings and Parameters within the CCS	<i>Commercial Comfort System (CCS) System Manager and Zone Coordinator User's Guide</i>	LIT-12011444
Operating Modes and Strategies of the CCS	<i>Commercial Comfort System (CCS) Application and Sequence of Operation Overview Technical Bulletin</i>	LIT-12011617
Installing and Wiring a VAV Balancing Tool and Network Sensor	<i>Handheld VAV Balancing Tool Installation Instructions</i>	Part No. 24-10211-2
Product Overview, Features, and Benefits of the Handheld Balancing Tool	<i>Handheld VAV Balancing Tool Catalog Page</i>	LIT-1900348

CCS Handheld VAV Balancing Tool Overview

The CCS VAV Balancing Tool Liquid Crystal Display (LCD) shows the operating parameters and/or the VAV parameter values. When the balancing tool is in balancing mode, the features on the face of the tool also control the balancing function (Figure 1). These features include:

- an **Adjustment Dial**, which scrolls through the parameter submenus and adjusts the input parameters
- an **Enter button** (indicated by a return arrow), which accepts selections and allows you to enter into selection submenus
- a **Cancel button** (indicated by an X), which cancels the selected parameter and exits into the previous submenu
- a backlit **LCD**, which activates with any user interaction

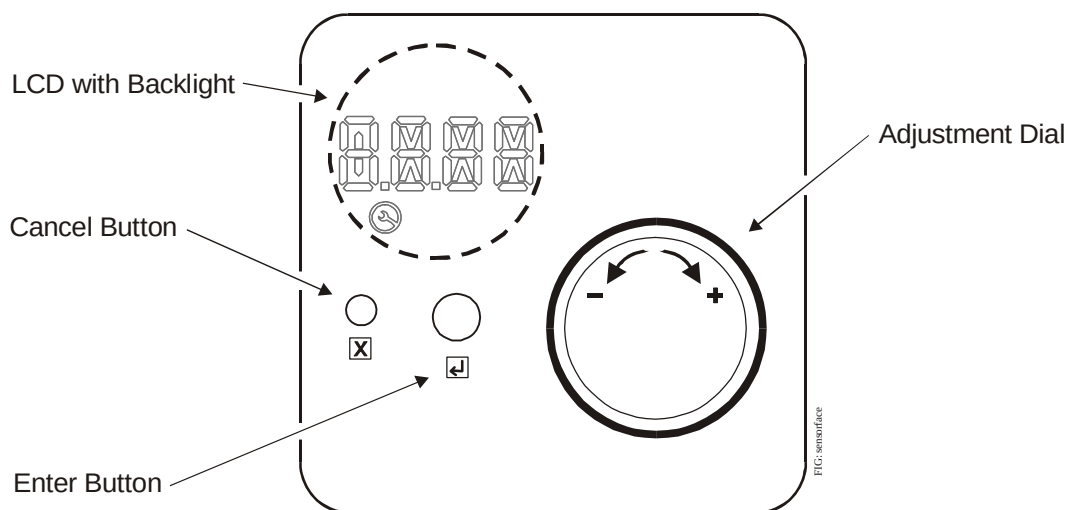


Figure 1: CCS Handheld VAV Balancing Tool

Upon first entering into balancing mode, the display shows the address of the controller you are balancing. From here, you can use the Adjustment dial to scroll through the parameter submenus. If you press Enter, you go into that parameter's submenu. For example, if you press Enter at Balancing Mode [**BAL**], the next submenu options are Supply Duct [**SPLY**] and Exit [**EXIT**].

During longer operations, like Autocalibration, the word Busy [**BUSY**] appears on the display until the operation is complete. Do not push any buttons until the operation is finished.

The balancing tool remains in balancing mode until you exit or the balancing mode inactivity timer expires. To exit balancing mode, press the Enter button when Exit appears on the highest submenu, or hold the Enter and Cancel buttons for 5 seconds. The default timeout value is 60 minutes.

Detailed Procedures

To balance your Commercial Comfort System:

1. Connect the balancing tool to the NS Series Network Sensor associated with the controller you want to balance.
2. Press and hold the **Enter** and **Cancel** buttons together for at least 5 seconds until the word Busy [**BUSY**] appears on the display.
3. Use Table 2 to navigate through the VAV Balancing Device menus.
4. Press the Enter button when Exit [**EXIT**] appears on the highest submenu to exit.

Note: We recommend that you exit the balancing mode before removing power from the handheld balancing tool. This returns the VAV controller to normal operation. Otherwise, there may be a 60-minute delay if you reconnect and try to enter the balancing mode.

Table 2: Single Duct Balancing Sequence (Part 1 of 2)

Submenu 1	Submenu 2	Submenu 3	Data Range	Editable	Description
Controller Address [25]	—	—	000–127	No	DIP switch address of the controller. Enter button moves to next action.
Balance Mode [BAL]	Supply Duct [SPLY]	dP Offset [dPO]	00.00–99.99	No	Absolute value of offset in %. If greater than 10%, the damper may not be closing completely. Verify that the damper shaft has not slipped and is moving freely. Then autocalibrate the dP.
		Auto Calibrate dP [ACAL]	No [NO] Yes [YES]	Yes	Selecting Yes closes the box and recalibrates the dP Offset.
		Flow Setpoint Override [FLSP]	None [NONE] Cooling Max [CMAX] Cooling Min [CMIN] Heating [HTg] Closed [OFF]	Yes	Once entered, the controller drives to the selected setpoint. The override remains active for 30 minutes. Select None to remove the override.
		Actual Flow [FLOW]	0001–9999	Yes	Displays measured flow until adjusted by user. When adjusted and entered, it triggers the controller to recalculate the Gain. The range is limited to a maximum value of 9999.
		Box Gain - K Factor [K]	0.001–9.999	No	If actual flow is entered, this displays the new current gain (K).
		Exit [EXIT]	—	No	Press the Enter button to return to the previous menu. Turn the knob to loop through the current menu.
	Exit [EXIT]	—	—	No	Press the Enter button to return to the previous menu. Turn the knob to loop through the current menu.
Parameter Mode [PARM]	Flow Setpoints [FLSP]	Cooling Max Flow [CMAX]	0001–9999	Yes	Occupied Setpoint Only.
		Cooling Min Flow [CMIN]	0000–9999	Yes	Occupied Setpoint Only.
		Heating Flow [HTg]	0000–9999	Yes	Occupied Setpoint Only.
		Exit [EXIT]	—	No	Press the Enter button to return to the previous menu. Turn the knob to loop through the current menu.

Table 2: Single Duct Balancing Sequence (Part 2 of 2)

Submenu 1	Submenu 2	Submenu 3	Data Range	Editable	Description
Parameter Mode [PARM] (Cont.)	Supply Duct [SPLY]	Box Area [AREA]	0.001–9.999	Yes	Square Feet
		Pickup Gain - K Factor [K]	0.001 - 9.999	No	—
		dP Offset [dPO]	00.00 - 99.99	No	Absolute value of offset in percent
		Exit [EXIT]	—	No	Press the Enter button to return to the previous menu. Turn the knob to loop through the current menu.
	Exit [EXIT]	—	—	No	Press the Enter button to return to the previous menu. Turn the knob to loop through the current menu.
EXIT [EXIT]	—	—	—	No	Press the Enter button to return the Network Sensor to normal operation and release the Flow Setpoint override (if required). Turn the knob to loop through the current menu.

Error Codes

Table 3 describes the CCS VAV Balancing Tool error codes and recovery actions.

Table 3: CCS VAV Balancing Tool Error Codes

Error Number	Cause	Recovery Action
ERR0 [ERR0]	Firmware revision mismatch	Replace the balancing tool with an updated version.
ERR1 [ERR1]	Commissioning session locked - unable to enter Balancing Mode because another tool/session is currently active.	Check to see if a commissioning session has already been started from another VAV Balancing Tool.
ERR2 [ERR2]	Communication error on the Sensor Actuator Bus (SA Bus)	Check cables and connection between Balancing Tool and the VAV controller (LC-ZEC200-0).
ERR3 [ERR3]	Control sequence is currently disabled.	N/A
ERR4 [ERR4]	Another operation (Auto Calibration or Gain Calculation) is currently being performed in the Balancer Primitive.	Wait for the other operation to finish and retry the desired operation. It may take a couple minutes to finish.
ERR5 [ERR5]	No flow override has been selected.	You must select a Flow Setpoint Override. Then, allow the flow to settle (watch the value displayed on the balancing tool) and then retry calculating the gain.
ERR6 [ERR6]	Flow reading is unreliable.	The DP sensor is giving an unreliable value. Check connections/integrity of the pneumatic tubing. Check the pickup tubes for a possible obstruction.
ERR7 [ERR7]	Value out of range	Try increasing or decreasing the value slightly.
ERR8 [ERR8]	Autocalibration timed out	Check stroke time settings.
ERRX [ERRX]	Unknown application error	Reboot controller. If problem persists, get a replacement controller and/or replace the balancing tool with an updated version.



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