



**Automated Ceiling  
Registers, LLC**

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## MICROFLOW 2000™ INSTALLATION INSTRUCTIONS Automated Registers

Thank you for purchasing the MicroFlow 2000™ product. Please check your shipping boxes and make sure you have the components listed below by model number. If you are missing any item, please contact ACR at 1-800-451-6539, 8 AM to 5 PM central time zone, weekdays.

	<u>Model 100A</u>	<u>Model LS</u>	<u>Model 101</u>	<u>Model 102</u>
Automated register -----	1		1	1
Black 6-pin 7' cable -----	1	1		
Black 6-pin 25' cable -----	1		1	1
Register cable T connector -----	1			
Local switch T connector -----		1		
Local switch assembly -----		1		
Silver 4-pin 17.5' cable -----		1		
Silver 4-pin 35' cable -----			1	2
Model 101 PowerHub™ -----			1	
Model 102 PowerHub™ -----				1
ACR plug-in transformer -----			1	1
Master wall switch kit -----			1	2
Register mounting screws -----	2		2	2
PowerHub™ mounting screws -----			2	2

***For installation of Automated Registers, perform the following steps:***

STEP 1 - Locate or install a 117 VAC electrical outlet for the plug-in transformer.

STEP 2 - Mount the PowerHub™ in a location that is close enough to the electrical outlet for the six foot long transformer cable to reach. Use the two mounting screws provided.

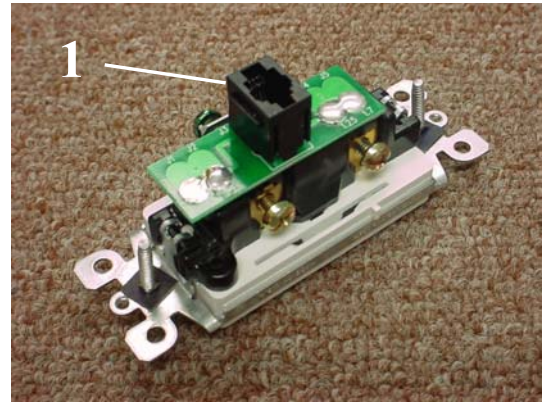
STEP 3 - Install an electrical switch box (not supplied) so each 35 foot long silver cable will reach between the switch box and the PowerHub™. The most convenient location in a room is near the entrance. **It is recommended that the switch be mounted higher than conventional light switches to reduce confusion.** For model 101 there is one independent switch and zone. For model 102 there are two independent switches and zones.

STEP 4 - Locate the master wall switch(es) shown in Figure 1. Route the appropriate silver switch cable through the switch box and connect to the modular jack **1** on the switch board. Install the switch assembly inside the switch box and attach the supplied ACR switch cover plate.

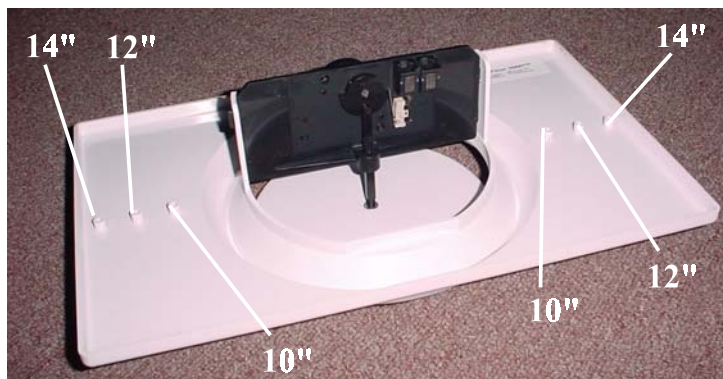
**Make sure the switch is oriented so that the “top” indicator is up.** Plug the other end of the 2512

silver cable into the PowerHub™ at the appropriate S1 or S2 terminal.  
S1 controls R1 registers and S2 controls R2. registers.

STEP 5 - Plug a 25 foot black cable into the appropriate R1 or R2 PowerHub™ terminal. If only one register is being installed, connect the other end directly to the automated ceiling register. The cable should be pushed through the wall of the duct near the register boot and into the "box" so that it might be connected to the register from the room side. There are two connectors on the ceiling register circuit board, one labeled NO for normally open and one labeled NC for normally closed. These notations refer to the position of the register with the master control switch positioned off. If additional registers are being installed refer to Step 7 below.



**Figure 1.. Master control wall switch**



**Figure 2. Automated Ceiling Register**

selected before drilling, e.g. drill the two 10" holes for a 10" register box, the two 12" holes for a 12" box, and the two 14" holes for a 14" box. Use the two supplied white mounting screws to attach the register to the box. For smaller register boxes, drill any appropriate two reference bosses and install ceiling anchors for the #10 mounting screws supplied. **For wall-mounted or sloped-ceiling mounted registers, orient the register so that the round motor is facing upward to provide optimum tracking of the plunger as the register is opened**

**Important:** Tighten screws so that a small gap (approximately 1/32 in.) is maintained between the turned down edge of the register plate and the ceiling surface. It is important that the register "float" on the inside foam and that the plastic not make contact with the ceiling. Over tightening the mounting screws will bind the plastic which might cause objectionable "popping" sounds as the plastic expands and contracts during heating and cooling cycles.

STEP 7 - Additional automated registers may be added using **Model 100A** kits, which include an automated register, a modular T connector, a black seven foot drop cable, a 25 foot black extension cable and mounting screws as shown in Figure 3. Additional registers are connected in serial fashion using the 25' black modular extension cable, the modular T connector, and the black 7' drop cable.

For additional local control, use a **Model LC** kit, which contain an additional seven foot drop cable,

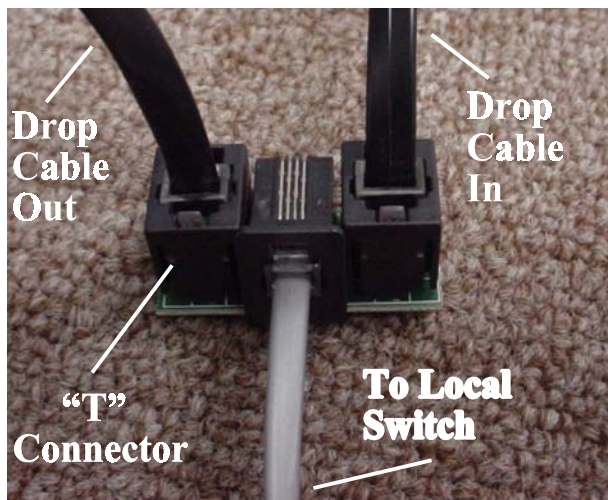


**Figure 3. Model 100A (add-a-register) kit**

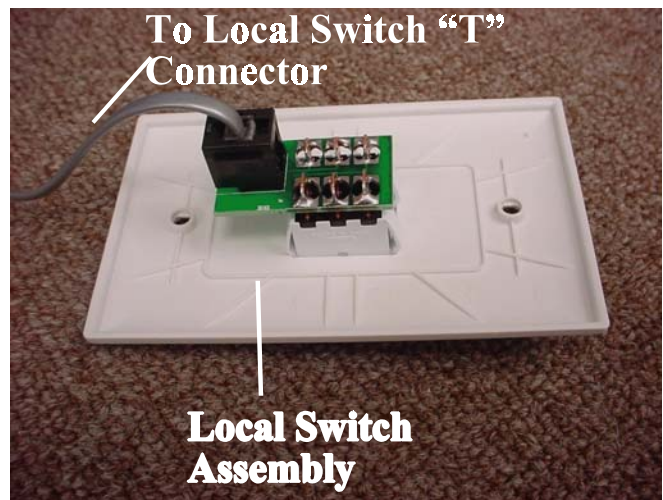
a local switch "T" connector( Figure 4 ), a 17.5 ' local switch cable, and a local switch assembly as shown in Figure 5. This connection allows two levels of control; **master** control from the switch connected to the PowerHub™ and **local** (override) control from the local switch. The local "T" connector is inserted in the "drop" line to the register (or registers) to be provided with local control. Refer to Attachment C in the **MICROFLOW 2000 PLANNING GUIDE**, which shows a typical floor plan wiring diagram for a complete installation using master

day/night zoning with several local control drops.

STEP 8 - Plug the transformer into the electrical outlet and connect it's cable to the PowerHub™ at



**Figure 4. Local switch T assembly**



**Figure 5. Local switch assembly**

either AC power jack. With the associated **master** wall switch in the OFF position and all **local** switches in the AUTO position, all normally open (NO) registers will open and all normally closed (NC) registers will close. Place the **master** wall switch in the ON position and the NO registers will close and the NC registers will open. If any register does not move or assume the correct position, check cable connections to the registers and switches.

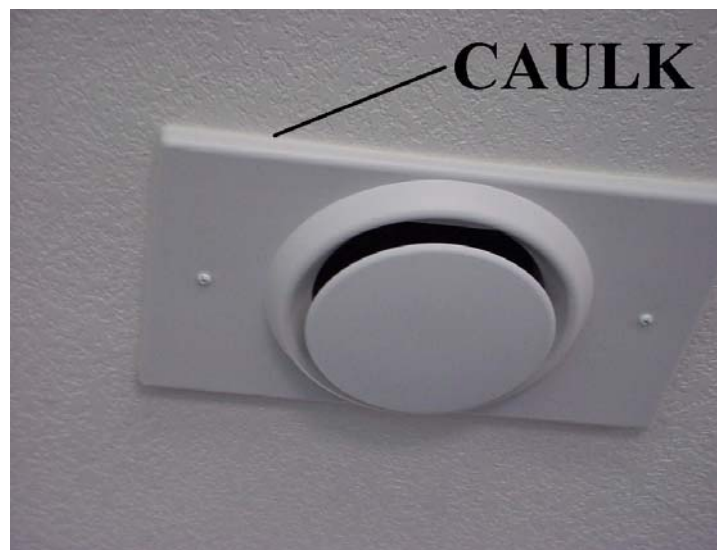
STEP 9 - Turn the **master** switch ON and observe the movement of all the register(s). While the registers are moving, reverse the switch to OFF to stop the register(s) at any desired opening. To continue opening or closing the register, move the switch back to the original position..

STEP 10 - AT each local switch, note that all registers connected downstream from the local switch "T" connector move when the local switch is momentarily depressed to its "ADJUST" position and stop when the local switch is released to its "STOP" position. Place the switch in its "AUTO" position and note that control returns to the master ( PowerHub™ connected) wall switch.

STEP 11 - Set all local control switches to the "AUTO" position. Turn blower on and close all

normally closed registers (master switch set to OFF) and check each one for a good seal around the perimeter of the plunger (round disk). If an adjustment is necessary, rotate the round plunger counterclockwise until it rattles in the seat when it is rocked from side to side. Next, rotate the plunger clockwise until no rocking is felt and the rattling stops. Do not over tighten as this could damage the mechanism. Close all normally opened register (master switch set to ON) and repeat this process on these registers. **Caution: Do not adjust round plunger clockwise unless the register is in a fully closed position.**

STEP 12 -Once all system tests are satisfactorily completed, apply a smooth bead of matching white caulk around the perimeter of each register faceplate to seal the 1/32" gap as shown in Figure 6..



**Figure 6. Installed register with caulk applied**

Revised 07/09