CBF-102 Combiflow

Installation Guide

Operation

The Combiflow Model 102 allows an irrigation controller with one flow sensor input to accurately monitor the flow from two separate flow sensors regardless of size.

The two separate flow sensors may represent two separate points of connection (with separate flow sensors), a compound water meter, or two separate water supplies (potable and reclaimed). The Combiflow combines the flow signals from two flow sensors and produces a single flow value combining the scaled flow rates. Flow sensors may operate one at a time or simultaneously. The flow sensor values are programmed independently so they need not be the same size.

The Combiflow is compatible with all CST flow sensors and most other sensors producing a square wave output proportional to flow rate. It is not compatible with Hunter HFS sensors.

Programming Instructions

Size	Model	K	Offset
1"	FSI-T10-001	0.322	0.200
1 1/2"	FSI-T15-001	0.650	0.750
1 1/2"	FSI-B15-001	0.762	0.126
2 "	FSI-T20-001	1.192	0.940
3"	FSI-S30-001	2.750	1.580
4"	FSI-S40-001	4.530	1.110
6"	FSI-S60-001	10.400	3.308

Prior to installation, the Combiflow Model 102 must be programmed with the appropriate calibration constants (**K and Offset** numbers) for both flow inputs and the pulse output.

Programming software may be downloaded at no cost from the CST website: https://www.creativesensortechnology.com/combiflow

When connecting to CST flow sensors, the constants in this table will auto-load by selecting the model number in the drop down window for each I/O.

For other flow sensor brands, select Custom in the drop down window and enter the numbers manually. For other flow sensor brands, consult the manufacturer for correct programming constants.

We recommend the Combiflow be programmed prior to field installation in a location with internet access. During programming, the on-board processor will automatically search for the latest driver versions.

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Combiflow Programming Software Installation

Creative Sensor Technology's Combiflow signal processor employs the Universal Serial Bus (USB) technology for programming. For each instrument to interface with a computer a USB device driver is needed to create a virtual com port for the Combiflow Programming Software. The Virtual Com Port is initialized when the Combiflow processor is detected on the USB. For best performance of the Combiflow Software, please adhere to the following instructions:

1. To program the Combiflow it must be connected to a 12-24 V power supply.

2. Use a micro USB cable, (same one used to charge an Android cell phone) to connect the computer to the Combiflow.

3. We recommend the Combiflow programmed prior to installation. However, if the unit is installed in an assembly, disconnect the wire leads from the flow output terminals as a Precaution.

4. Remember internet access for the programming computer is required.

5. After programming the Combiflow, reconnect the flow output wiring.

Connect computer to the Internet

1. The Combiflow Programming Software should be downloaded from the CST website and installed. A CST Icon will appear on your desktop after the download is complete. Click it to open.

2. This welcome screen should appear.

3. Click the close button to close the Programmer while you connect the Combiflow.

4. Make sure the internet connection on your computer is active.

5. Apply Power to the Combiflow; be careful to observe the correct polarity. All four LEDs should flash three times and then the Power LED should remain on to indicate the unit is powered.

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6. Attach the other end of the USB cable to any available USB port on your computer.

7. A "Found new hardware" balloon will pop up in the bottom right hand corner of your desktop. It will disappear followed by another balloon saying "Installing device driver software." Let both of these functions finish before attempting to open the programming software.
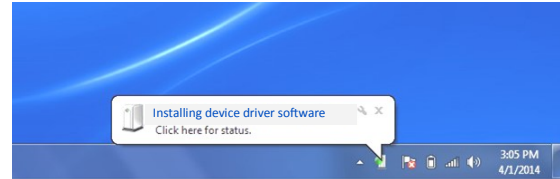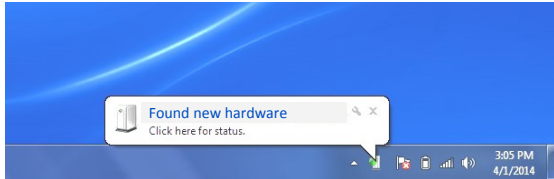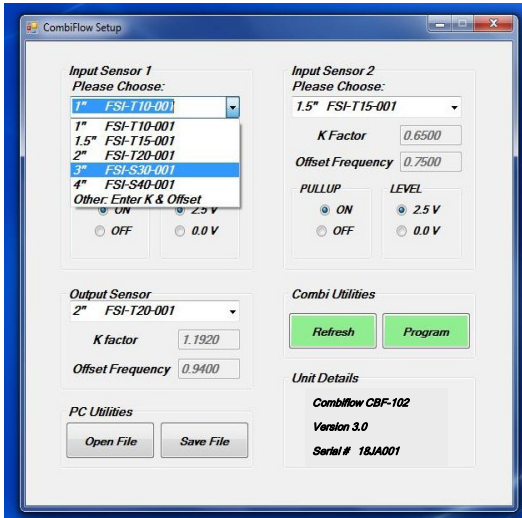

8. The Com Port has now been installed, reopen the Combiflow application and click the *Next* button on the welcome screen. The active comport should appear in the blue box.

9. Click the *Next* button to advance to the programming screen.

10. If this screen appears and the boxes populate, then the Combiflow is communicating and ready to be programmed.

11. When using Creative Sensor Technology and most other two wire flow sensors, leave the "Pull Up" value at the default setting "ON" and the "Level" value at the default setting 2.5 v.

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12. Under **Input Sensor 1**, select the model number of the CST flow sensor wired to the sensor 1 input terminals from the drop down menu. The K And Offset numbers will autofill. For other flow sensors, select *other K & Offset* and manually enter the numbers.

13. Repeat this procedure for **Input Sensor 2**.

14. The **Flow Out** is the virtual sensor output to the controller. It combines the flow rates of the two inputs. It is usually set to the same size as one of the input sensors but may be a third size. Remember to use the same values to set up the
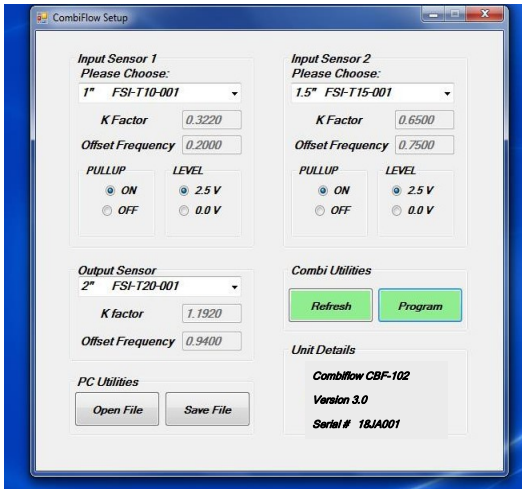
15. If you change any setting, the green *Program* button will turn yellow indicating that a change has been made but not sent. Closing the programmer at this point will not change any programmed settings in the attached Combiflow.

16. When all data has been entered, click the yellow *Program* button to download the settings to the Combiflow. The button will turn pale while downloading and back to green when complete.

17. To review the settings programmed into the Combiflow, click the *Refresh* button. It will turn pale while the data is retrieved and the boxes repopulated, then back to green when complete.

18. The programmed values will be stored in the non-volatile memory of the Combiflow device.

19. The data may be saved on your computer as a **txt** file by clicking the *Save File* button. By saving the data, you can store these values for future reference or rapidly program other Combiflow devices by retrieving this information with the *Open File* button.

20. When finished, click the red X button in the top right corner to close the screen and then click the *Close* button to exit the programmer.

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The Combiflow is now programmed. Disconnect the USB cable. If the Combiflow has been programmed while installed in the field, don't forget to reconnect the **Flow Out** wiring.

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**Remember to match the flow input K & Offsets on your controller to
the numbers programmed into the Combiflow for Flow Out.**

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Mounting Instructions

The Combiflow Model CBF-102 is mounted in an enclosure rated NEMA 1. This enclosure is suitable for indoor use or protected area mounting only. The preferred location is inside a controller pedestal or wall mounted enclosure containing the irrigation controller cabinet and accessory items. If the Combiflow Model CBF-102 must be mounted outside and not in a controller pedestal, then an additional NEMA 4 rated enclosure should be used. The enclosure may be attached to any flat surface, vertical or horizontal, using mechanical hardware or double sided adhesive tape. Consideration should be given to access the device for re-programming or service and for viewing the LEDs for operating status.

Wiring Instructions

Caution: Make sure power is OFF before wiring this device. Mis-wiring this device with power ON may damage components.

1. This device will work on either AC or DC power with nominal voltage between 12 and 24 volts. If using in a control panel application where DC power is supplied, observe circuit polarity.

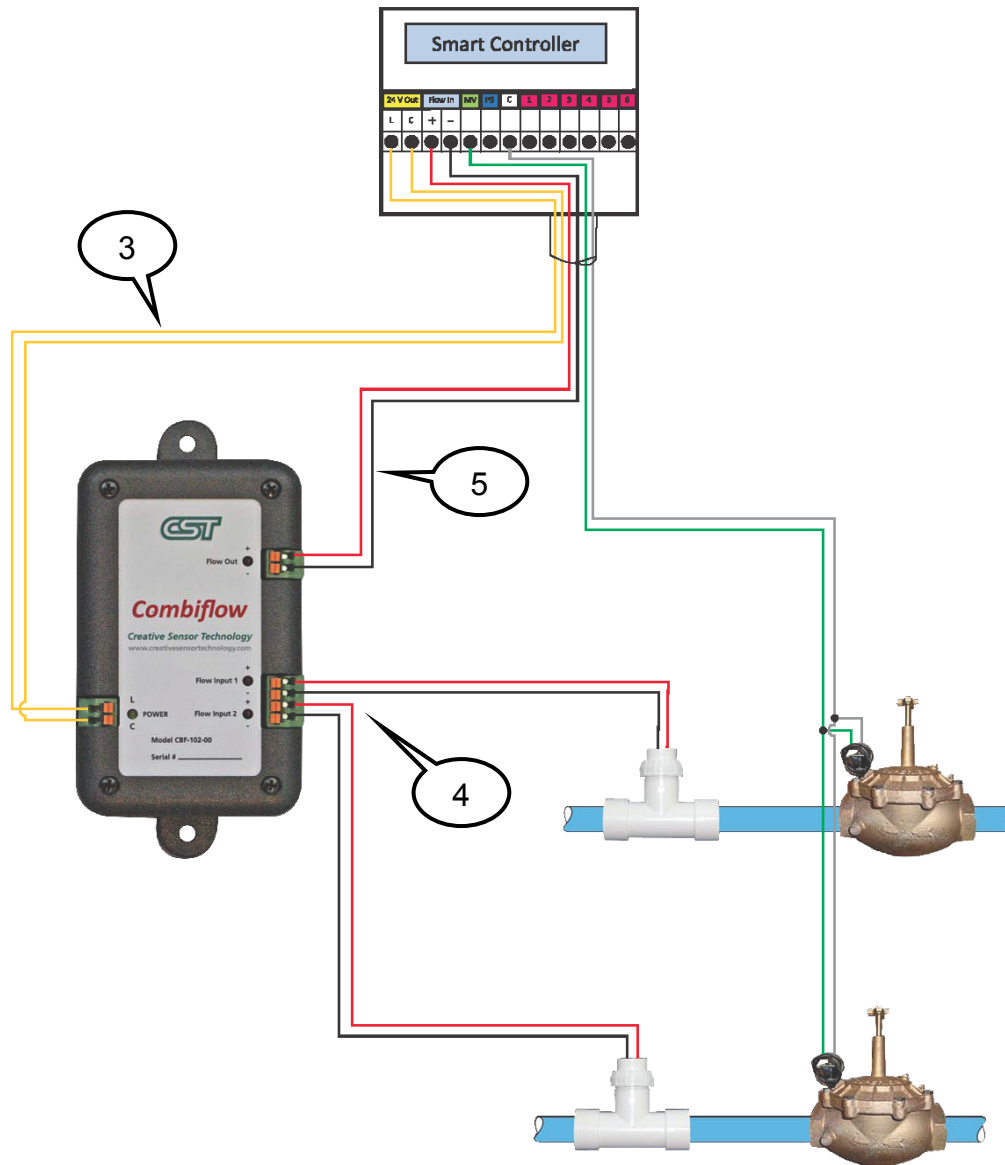2. The CBF-102 uses screwless, spring type terminal connections. Use solid or stranded wire size #14 to #20 gauge.

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Refer to diagrams on next pages for wiring connections

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3. Power Supply: Use the irrigation controller auxiliary 24 VAC output if available. Observe polarity and connect the power supply Hot or (+) terminal to the Power **L** terminal of the CBF-102 and the power supply Neutral or Common to the Power **C** terminal of the CBF-102.

NOTE: If power cannot be provided by the controller, install a separate 24 VAC power supply for the CBF-102. Power supply must be rated at a minimum of 35 mA for the Combiflow. Increase the current rating if you are powering other devices. Wire the auxiliary power supply as described above.

4. Connect both sets of flow sensor leads to the Flow Input terminals on the CBF-102. Observe polarity.

5. Connect the Flow Out terminals of the Combiflow to the flow sensor input terminals of the controller, observing polarity.

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**No connections are made from the Combiflow to the master valves.
Wiring to master valves is shown for reference only.**

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6. Check all connections and power up the Combiflow. All four LEDs will blink three times to indicate circuitry is powered and processor is active. Only the Power LED will remain illuminated.

7. Make sure flow sensor calibration settings for Combiflow output match flow sensor set-up in irrigation controller.

Check operation by flowing water through each flow sensor. The LED adjacent to the active Flow Input will illuminate as will the LED adjacent to the Flow Out terminals indicating that a flow signal is being transmitted out of the unit. The CBF-102 transmits a Flow Out signal if either one or both Flow Inputs are active. Observe the indicated flow rate on controller. Compare with estimates calculated from number of sprinklers operating, pressure readings and nozzle sizes.

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Optional Wiring Instructions   - Connecting Combiflow in Series

Combiflows may be connected in series to combine more than two flow sensors into a single flow signal. Use the same wiring instructions outlined on page five following the diagram below. Size the power supply to handle the load of two CBF-102s; 70 mA @24 VAC + any other accessories.
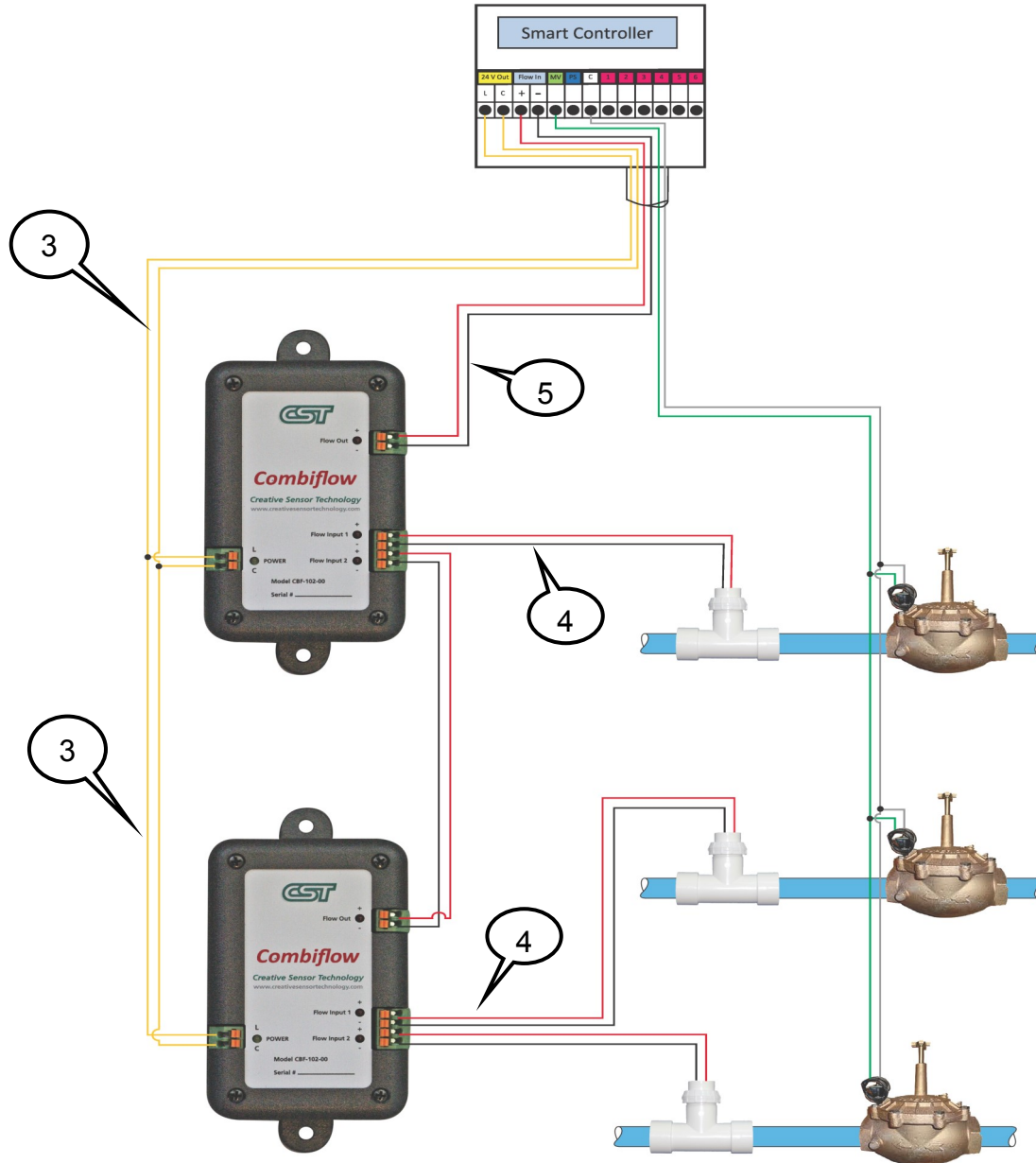
Warranty Statement:

The Creative Sensor Technology Warranty Statement is available on our website under the **About Us** tab. Click this link or paste the address below into your browser to view.