The Fan Model

Overview

The Fan model (Fm) allows you to generate wind for experiments. This is typically used with models like the Wind Turbine model.

Fan Model Features:

- 1 5VDC Fan
- PWM control for fan speed from 0 to max (0-255)
- 1 Touch sensor in front of the fan for manual control
- Adruino ATMega 328 based processor with USB serial-power connector
- Pre-installed Arduino sketch with API commands for monitoring and control

Fan Model (Fm)

Connecting the Fan model

The Fan model (Fm) can be connected directly to your computer's USB connector through a standard USB C connector. Simply plug in a USB cable to your computer and then the USB C connector into the Fm model.

Upon connecting the Fm to your computer the fan is ready to command. You can verify its presence with Windows Device manager.

Quick note: the Fm has a touch sensor located on the horizontal flat surface just in front of the fan. Tap this to turn the fan on and tap it again to turn the fan off.

Monitoring and Controlling the Fan model

The Fm has a set of pre-programmed commands for you to interface with it. When these commands are issued to the Fm, it will carry out the requested action. If you issue a command to the Fm that it does not recognize, that command will be ignored.

There are several ways to send commands and receive responses with the Fm. One way is to address it through a serial terminal like those found in the Arduino IDE or in apps. Other ways to control the model is through programming languages like LabVIEW, Matlab, Python, C, or anything that can send and receive serial strings through a USB serial port.

The first two commands that the Fm recognizes are:

****ID?*** **and** ***getCommands***

The ***ID?** function. Sending the ***ID?** string to the Fm will prompt it to respond with its identification string. The Fm responds with the string "fan".

The **getCommands** function. Sending the **getCommands** string to the Fm will prompt it to respond with a list of the commands that it understands. Below is the

list of functions and their meanings that the Fm will return when it receives **getCommands**

Overview of Fan model Commands

Command	Description	Number of parameters sent or returned
init	Sets the fan to its initial condition	
autoOn	Initiates a random breeze function. The Fm will vary its wind output simulating changes in wind speed	
autoOff	Turns off the auto-breeze function	
fanOn	Turns Fm on to maximum wind value	
fanOff	Turns the Fm off	
setSpeed	Sets the fan speed of the Fm	1 sent
getKW	Returns the kilowatts value the Fm is using. This value will be zero.	1 returned
getCarbon	This returns the about of carbon dioxide the Fm is generating measured in tons. This value will be zero	1 returned
getlAll	This returns seven numbers from the Fan. These are: Fan kilowatt capacity, the current KW level being generated, the load allocated to the Fm, the difference between what's being generated and the load assigned to it, the type of energy (1=renewable, 0=non-renewable, and -1 meaning neither like a house load, and line voltage	7 returned
off	This sets the fan to it's off state. This command is usually issued before disconnecting the fan from USB	
eoc	Indicates end of command list	