



Heliotrack Programmable Wind Alarm Switch V1.0

Developed in partnership with Inspeed.com, LLC



IMPORTANT DISCLAIMER:

Niether Heliotrack,LLC nor Inspeed assume any responsibility for damages caused by the use or misuse of our products, either directly or indirectly. Extreme caution should be exercised when using this device. See http://www.inspeed.com/Terms_And_Conditions.asp for additional information on Terms of Use.

Features:

- 9-36 VAC or VDC power supply input
- Wind speed up
- Two alarms with relay or logic outputs
- Display in MPH, KPH, Knots, Ft/sec, M/sec, or user-calibrated
- User-settable wind speed averaging up to 60 seconds
- Each alarm has independent ON and OFF wind speed thresholds
- Each alarm has a latch timer adjustable from 0 – 255 minutes
- Each alarm can be set to latch until manually reset
- 3 digit display indicates wind speed up to 255 units
- Screw terminals for easy connections

Possible Applications:

- Parking solar panel trackers in high wind
- Retracting RV awnings for high wind protection
- High wind alarm for crane operators
- Turn water pumps on or off for outdoor fountains
- Any application that requires some action based on wind speed

Specifications:

Specification	Value
Input Power supply	9 – 36 Volts AC or DC
Idle current drain	.020 Amps
Logic power supply	5.0 Volts DC (.5 amps)
Relay contacts	36V @ 10 AMPS
Operating Temperature	-40C to +150C (PCB and components)

Wind Switch Alarm circuit description:

The wind alarm switch will turn on or off electrical load up to 10 amps at 48VDC based on wind speed.

Display:

The display is 3 digits capable of displaying wind speed up to 255 units (MPH, KPH, Knots, Meters/sec, Feet/sec, or user calibration). The display also shows programming parameters and parameter values while in programming mode.

Installation instructions:

- 1) Mount controller in desired location.
- 2) Mount anemometer sensor in desired location.
- 3) Connect power wires to the controller, making sure they are not energized.
- 4) Connect the anemometer sensor wires: If you have a reed sensor use the SENSOR and GND terminals. If you have a hall sensor you will likely use the +5 terminal as well



- 5) Turn on power supply 9 – 36 volts AC or DC.
- 6) Program controller with desired settings.
- 7) Replace the cover on the control box when you are satisfied that everything is working properly. Do not over-tighten the screws on the lid, this can cause the lid to warp resulting in an improper seal. For permanent outdoor installations it is a good idea to put a bead of caulking around the cable penetrations if watertight grommets are not being used.

Relays:

Relays are rated up to 48 volts @ 10 amps. If you wish to use logic level outputs only then the relay enable jumpers (J1 & J2) should be removed. These jumpers interrupt current to the relay coils.

POWERUP:

When the controller turns on it will display the software version for a couple of seconds “1-0” and then start displaying the current wind speed.

Run Mode: This is the default mode when power is connected or after resetting.

Button 1: Enter Programming mode

Button 2: Turn on Alarm 1 when pressed, display Alarm 1 on-threshold. Alarm 1 Latch is reset when button is released.

Button 3: Turn on Alarm 2 when pressed, display Alarm 2 on-threshold. Alarm 2 Latch is reset when button is released.

Button 4: Step through display modes: 1-Instantaneous wind speed : 2-Average wind speed : 3-Maximum wind speed : 4-Off

Pressing Buttons 1, 2, or 3 will also clear the maximum wind speed

Reset Button: Used with Buttons 1 & 2 for restoring controller to the factory presets. Pressing the reset button may cause the relays to chatter, remove the relay jumpers before resetting if sensitive or high power loads connected to the relay outputs. Holding down Buttons 1 and 2 while powering up or pressing the reset button will restore the controller to the factory presets.

Programming Mode: Press Button 1 to enter programming mode.

Button 1: Exit Programming mode and save changes.

Button 2: Move to next Parameter. Parameters will increase to 255 and then roll over to 0.

Button 3: Add 1 to current parameter.

Button 4: Add 10 to current parameter.

Parameter 1: 0–1 Measuring Method

Factory Default = 0

0 - Pulse Timer Mode: Wind speed is determined by measuring the time between each reed sensor pulse.

1 - Pulses Per Period Mode: Wind speed is determined by counting the number of pulses per unit of time.

When the Pulses Per Period mode is selected the wind speed refresh rate on the display will be between 2 and 5 seconds depending on the Wind Speed Units parameter value.

Approximate wind speed display refresh rates for Pulses Per Period mode are:

0 - MPH - 2.5 seconds

1 - KPH - 5 seconds

2 - Knots - 2.2 seconds

3 - Feet/Seconds - 5 seconds

4 - Meters/Seconds - 1.5 seconds

5 - User calibrated - Variable

Parameter 2: 0–5 Wind Speed Units

Factory Default = 0

0 - MPH (1-255)

1 - KPH (1-255)

2 - Knots (1-255)

3 - Feet/Second (1-255)

- 4 - Meters per second (1-127)
- 5 - User calibrated

Parameter 3: 0-60 Wind Speed Averaging Time

Factory Default = 0

- 0 - No averaging, instantaneous wind speed is displayed.
- 1-60 - Number of seconds over which the wind speed is averaged.

In Pulses Per Period Mode there is a minimum averaging time of approximately 2 – 4 seconds depending on the “Wind Speed Units” parameter setting.

Parameter 4: 0–3 Alarm Trigger Method

Factory Default = 0

- 0 - Alarm 1 triggered by average wind speed. Alarm 2 triggered by average wind speed.
- 1 - Alarm 1 triggered by instantaneous wind speed. Alarm 2 triggered by average wind speed.
- 2 - Alarm 1 triggered by average wind speed. Alarm 2 triggered by instantaneous wind speed.
- 3 - Alarm 1 triggered by instantaneous wind speed. Alarm 2 triggered by instantaneous wind speed.

Parameter 5: 0–255 Alarm 1 On Threshold

Factory Default = 0

- 0 - Alarm 1 Off
- 1-255 - Alarm 1 turns on when wind speed is equal to this selected value.

Parameter 6: 0–255 Alarm 1 Off Threshold

Factory Default = 0

- 0 - Alarm 1 Latches until reset
- 1-255 - Alarm 1 turns off when wind speed is less than this selected value.

This value may not be greater than Alarm 1 On Threshold, the program will not allow it and will adjust during data save if needed.

Parameter 7: 0–255 Alarm 1 Latch Timer

Factory Default = 0

- 0 - Latch disabled
- 1-255 - Minutes that Alarm 1 Latch will stay on.

The Latch Timer is not entirely precise...
 A setting of 1 will result in a latch time between 0 and 1 minutes.
 A setting of 2 Will result in a latch time between 1 and 2 minutes.
 A setting of 3 Will result in a latch time between 2 and 3 minutes.
 And so on...

Parameter 8: 0–6 Alarm 1 Output Logic - *Available at “AL1” pin on the circuit board

Factory Default = 0

- 0 - On = Ground (Relay 1 on) / Off = +5V (Relay 1 off)
- 1 - On = Ground (Relay 1 off) / Off = Weak pull-up +5V (Relay 1 off)
- 2 - On = +5V (Relay 1 on) / Off = Ground (Relay 1 on)
- 3 - On = Weak pull-up +5V (Relay 1 off) / Off = Ground (Relay 1 on)
- 4 - On = Hi-Z (Relay 1 unpredictable) / Off = +5V (Relay 1 off)
- 5 - On = Hi-Z (Relay 1 unpredictable) / Off = +5V (Relay 1 on)
- 6 - On = Ground (Relay 1 on) / Off = Hi-Z (Relay 1 unpredictable)

*There should always be at least a 1K ohm resistor connected between any external circuitry and the Alarm 1 and Alarm 2 logic pins. Failure to observe this rule may result in damage to the microprocessor chip and voids any warranty.



Parameter 9: 0–255 Alarm 2 On Threshold

Factory Default = 0

- 0 - Alarm 1 Off
- 1-255 - Alarm 1 turns on when wind speed is equal to this value.

Parameter 10: 0–255 Alarm 2 Off Threshold

Factory Default = 0

- 0 - Alarm 1 stays on until manually reset.
- 1-255 - Alarm 1 turns off when wind speed is less than this value.

This value may not be greater than Alarm 2 On Threshold, the program will not allow it and will adjust during data save if needed.

Parameter 11: 0–255 Alarm 2 Latch Timer

Factory Default = 0

- 0 - Latch disabled
- 1-255 - Minutes that Alarm 1 Latch will stay on.

The Latch Timer is not entirely precise...
A setting of 1 will result in a latch time between 0 and 1 minutes.
A setting of 2 Will result in a latch time between 1 and 2 minutes.
A setting of 3 Will result in a latch time between 2 and 3 minutes.
And so on...

Parameter 12: 0–6 Alarm 2 Output Logic - *Available at “AL2” pin on the circuit board

Factory Default = 0

- 0 - On = Ground (Relay 2 on) / Off = +5V (Relay 2 off)
- 1 - On = Ground (Relay 2 off) / Off = Weak pull-up +5V (Relay 2 off)
- 2 - On = +5V (Relay 2 on) / Off = Ground (Relay 2 on)
- 3 - On = Weak pull-up +5V (Relay 2 off) / Off = Ground (Relay 2 on)
- 4 - On = Hi-Z (**Relay 2 unpredictable) / Off = +5V (Relay 2 off)
- 5 - On = Hi-Z (**Relay 2 unpredictable) / Off = +5V (Relay 2 on)
- 6 - On = Ground (Relay 2 on) / Off = Hi-Z (**Relay 2 unpredictable)

*There should be a 1K ohm or greater resistor connected between any external circuitry and the Alarm 1 and Alarm 2 logic pins. If current through these pins exceeds 50 milliamps the microprocessor can be damaged. This failure is not covered by warranty.

** These modes are used for logic level interface, the relay coil jumpers should be removed.

Parameter 13: 0–255 Pulse Timer Clock (Low Byte)

Factory Default = 213

- 0-255 - Pulse timer clock that determines wind speed scale.
- Factory Preset Values are...
- 213 MPH (Pulse Timer Clock High Byte = 255 / Pulse Timer Scale = 255)
- 173 KPH (Pulse Timer Clock High Byte = 255 / Pulse Timer Scale = 255)
- 220 Knots (Pulse Timer Clock High Byte = 255 / Pulse Timer Scale = 255)
- 185 Feet/Second (Pulse Timer Clock High Byte = 255 / Pulse Timer Scale = 255)
- 220 Meters/second (Pulse Timer Clock High Byte = 255 / Pulse Timer Scale = 127)

Parameter 14: 0–255 Pulse Timer Clock (High Byte)

Factory Default = 255

- 0-255 - Pulse timer clock that determines wind speed scale.

Values below about 250 have very long timing periods and usually result excessive rollovers of the wind speed display making it look confused.

Parameter 15: 0–255 Pulse Timer Scale**Factory Default = 255**

0-255 - Pulse timer clock that divides wind speed scale. This value is also the maximum value of the display.

- 255 – Full scale
- 127 - 1/2 scale
- 63 - 1/4 scale
- 31 - 1/8 scale
- 16 - 1/16 scale
- 8 - 1/32 scale
- 4 - 1/64 scale
- 2 - 1/128 scale
- 1 - 1/256 scale
- 0 - Display = 0

Parameter 16: 0–255 Pulses Per Period Timer**Factory Default = 68**

0-255 - This Parameter sets the pulse counting time period.

Factory Preset Values are...

- 68 MPH
- 108 KPH
- 56 Knots
- 100 Feet/Second
- 30 Meters per second

Parameter 17: 0–31 Oscillator Fine Tune**Factory default = 16**

0-32 - This parameter adjusts the frequency of the internal oscillator of the microcontroller. Increasing value will decrease wind speed measurements. This parameter also affects the Real Time Clock, an increase in oscillator frequency will decrease the time that the latch timers are on.

- 0 = -12%
- 16 = 0%
- 31 = +12%