HAWK

RedHawk 3™ GUIDE

Contents

APPLICATIONS

- Alarm Light Monitoring
- Simplex/Duplex Pump Stations
- Site Power Failure
- Pump Current/Runtime Tracking
- Wetwell & tank level monitoring

DESCRIPTION

The RedHawk 3™ is an affordable all-in-one solution for monitoring your processes. The **external version** of the RedHawk 3™ looks and functions like a standard alarm light and can notify you the moment your system goes into alarm.

The RedHawk 3™ supports multiple power options to work around your solution. Options such as 8-32VDC or 120VAC power, alarm input of 120VAC, or dry closure.

Simply connect your existing alarm light to the alarm input so that you can receive and collect vital alarm information to solve potential problems in your service area.

The RedHawk 3™ includes THREE 4-20mA sensor inputs, ONE alarm input, and TWO status inputs.

The RedHawk 3™ is a cellular-based, device that will monitor your process, collect data, and report any problems to you through a phone call, text, or e-mail.

The **internal version** of the RedHawk 3™ can be easily snapped onto DIN rail, providing all of the same alarming features as the external version

FEATURES

- Available in External or Internal DIN-Mounted models
- External model with or without red alarm light
- Standard alarming includes alarm input, power fail, com fail
- Receive notifications by text, email or phone
- Historical trending of all data from unit
- Supports simplex and duplex pump setups
- 120VAC power input, 120VAC alarm input
- THREE 4-20mA inputs, ONE alarm input, TWO status inputs
- Internal battery keeps unit powered in the event of a brief power failure
- Integrated surge suppression on 120VAC power input & 120VAC Alarm input

HARDWARE

External Version With Alarm Light
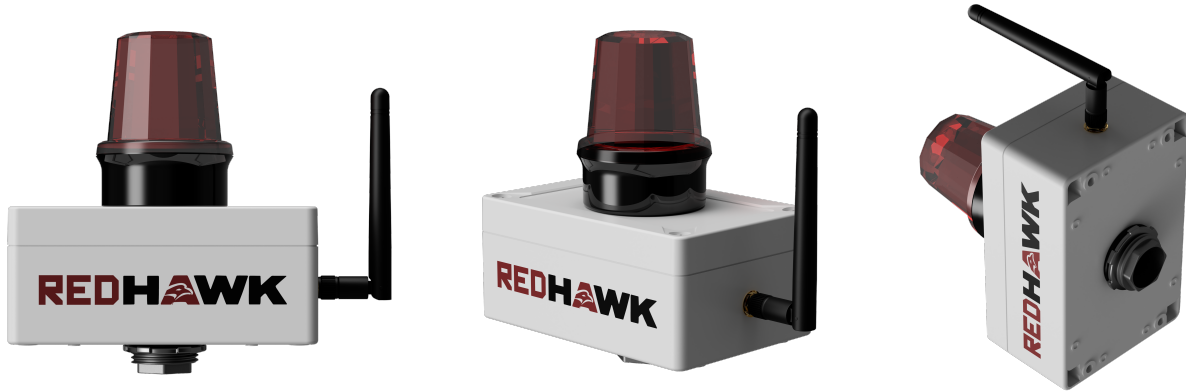
External Version Without Alarm Light

Internal DIN Mount Version

DEVICE SPECIFICATIONS

120VAC/ALARM (5-Pin):

Symbol	PIN #	Parameter	Min	Typ.	Max	Unit
ALARM	1	VAC Alarm Input	0	120	150	Volts (AC)
ALARM	2	VAC Alarm Input	0	120	150	Volts (AC)
EGND	3	VAC Earth Ground		0	0	Volts (AC)
NEUTRAL	4	VAC Neutral		0	120	Volts (AC)
120VAC	5	VAC 120V Input	90	120	150	Volts (AC)

RS485 Connector (4-Pin):

Symbol	PIN #	Parameter	Min	Typ.	Max	Unit
B-	1	RS485 B-	3.0	3.6	14	Volts (DC)
A+	2	RS485 A+	3.0	3.6	14	Volts (DC)
GND	3	VDC Ground		0		Volts (DC)
DCIN	4	VDC Input	8	12-24	32	Volts (DC)

2.3 General Connector (6-Pin):

Symbol	PIN #	Parameter	Min	Typ.	Max	Unit
4-20#1	1	4-20mA Input #1	0	4-20	20	mA
4-20#2	2	4-20mA Input #2	0	4-20	20	mA
GND	3	VDC Ground		0		Volts (DC)
DC+	4	DC Output	8	12-24	32	Volts (DC)
DC+	5	DC Output	8	12-24	32	Volts (DC)
RELAY	6	Relay Driver Current	10	180	200	mA

WIRING
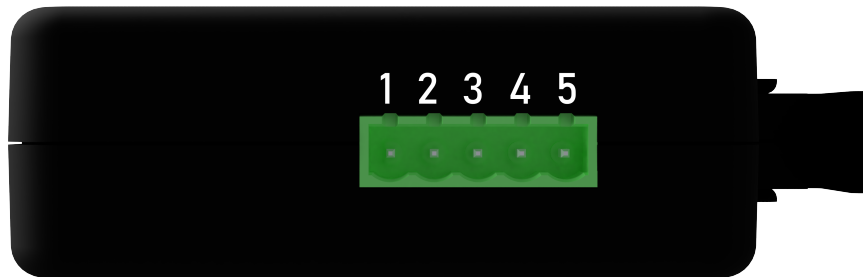
3.1 120VAC/ALARM Connector Pinout (5-Pin)

PIN Name	PIN #	Pin Type	Description
ALARM	1	Input	Alarm Input
ALARM	2	Input	Alarm Input
EGND	3	Input	Earth Ground
Neutral	4	Input	120 VAC Neutral
120VAC	5	Input	120 VAC Input
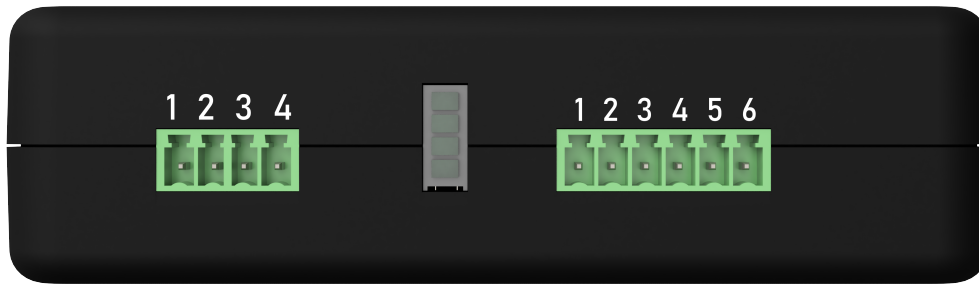
3.2 RS485 Connector Pinout (4-Pin)

PIN Name	PIN #	Pin Type	Description
B-	1	Communication	RS485 B-
A+	2	Communication	RS485 A+
GND	3	Input	DC Ground
DCIN	4	Input	DC Input

3.3 4-20 Connector Pinout (6-Pin)

PIN Name	PIN #	Pin Type	Description
4-20#1	1	Input	4-20mA Input #1
4-20#2	2	Input	4-20mA Input #2
GND	3	Input	DC Ground
DC+	4	Output	DC 12V Out
DC+	5	Output	DC 12v Out
Relay	6	Output	Relay Control Pin

3.4 Common Wiring Examples

3.2.1 Powered by 8-30VDC

Battery/VDC—Source

1	Pin1
2	Pin2
3	Pin3
4	Pin4
	Pin5

3.2.2 Powered by 120VAC

GND

NEUT

120
VAC

1	Pin1
2	Pin2
3	Pin3
4	Pin4
5	Pin5
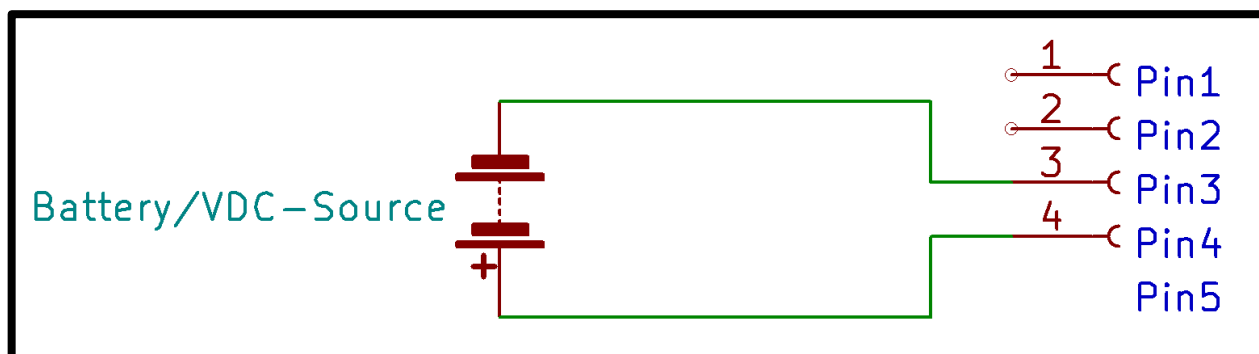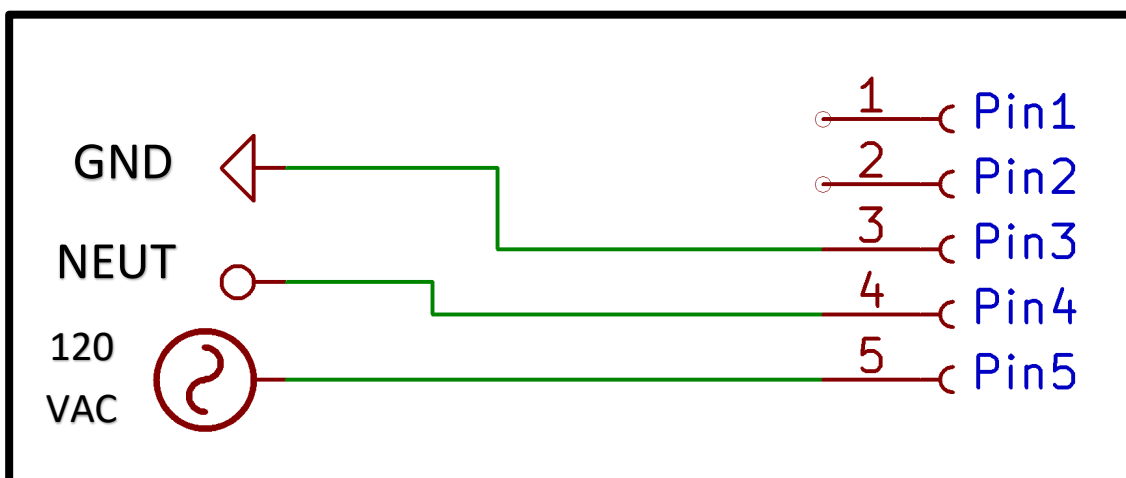
3.2.3 Using One or Two 4-20mA Transmitters:

4-20mA Transmitters

1	Pin1
2	Pin2
3	Pin3
4	Pin4
5	Pin5
6	Pin6
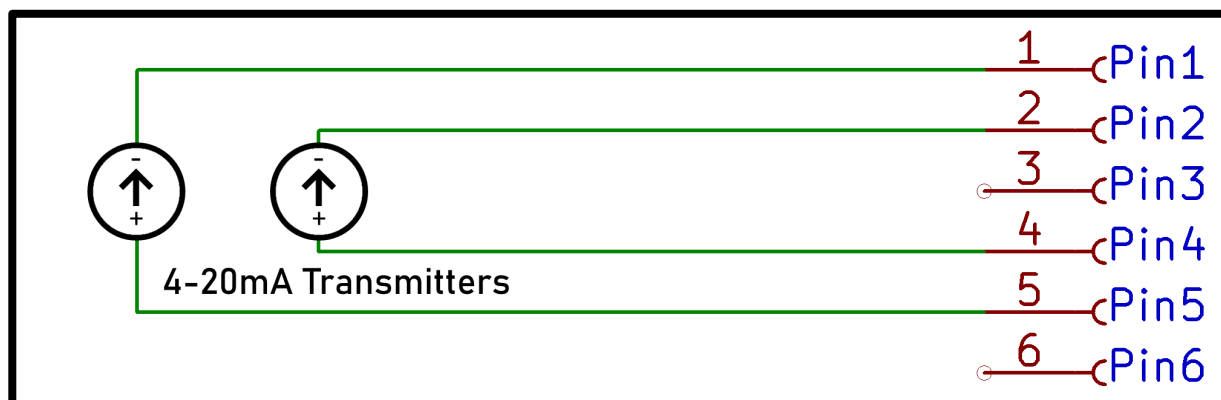
Voltage Should be Chosen to Suit 4-20mA Transmitters (12V In This Example)

RedHawk 3™ OPERATION

4.1 Standard Operation

- A change in run status of either pump, a power fail, or an Alarm status are triggered and sent immediately.
- Every *SyncTime* amount of time, a timed packet is pushed, independent of variance
- Anytime that a 4-20mA signal exceeds the run Threshold value, that pump is flagged as "running", the number of starts is incremented, and a packet is pushed. Each pump has two associated start counters; a lifetime and a per 24hr. The 24hr timer is reset a midnight.
- *deltaStarts* is calculated as P1startsPer24hr – P2startsPer24hr
- Runtimes are also accumulated for each pump, a lifetime, and a "per 24hrs" basis.

4.2 RGB Status LED

Once Powered, The LTE Board Status LED will begin to pulse:
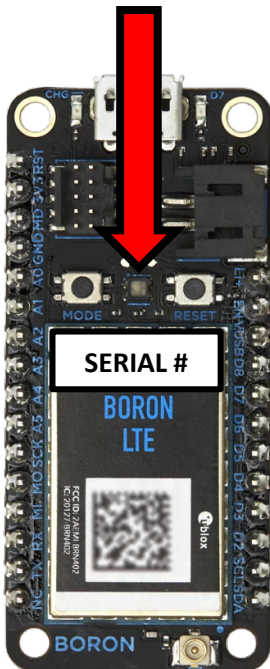
The Status LED Follows the following Pattern:

1. White – Pulse During Initialization

2. Green – Fast Flashing When Looking For A Cellular Connection*

Poor/Insufficient Signal Strength If Device Is Stuck In This State

3. Cyan – Rapid Flashing When Connecting to Cloud

4. Cyan – Breathing During Normal Operation

4.3 Charging Status LED

The Charge Status LED Follows the following colors when the charger is plugged in:

1. Yellow/Amber – Battery is Connected and Charging

2. OFF – Battery is Charged

4.4 Packet Structure

- The RedHawk 3™ can send one of two packets.
    - "Short Packet": A short packet only contains the beginning of a full packet. This is always the packet that is sent when a variance trigger is tripped. The short packet contains the most pertinent data.
        - [P1run,P2run,PowerFail,Alarm,deltaStarts]
    - "All Packet": An all packet contains all data from the device. This packet is sent whenever *syncTime* elapses and a timed push occurs. This packet can also be remotely queried at any time that the RedHawk 3™ has an active cellular connection.
        - [P1run,P2run,PowerFail,Alarm,deltaStarts,RSSI,RT1,RT2,P1starts, P2starts,P1startsPer24hr,P2startsPer24hr,4-20#1,4-20#2,Batt,PSU,Charge]

4.5 Command Structure IDs

- Operational parameters are remotely adjustable via the "setParameters" function, "SP"
- The formatting of the new parameter change function is ID#+space+someNewNumber
  - ID# someNewNumber
  - Depending on the parameter being altered, Integers and *Floats are available.
    Note that floats are limited to 6-7 significant digits. I.e., 1234.567 or 12345.67

ID#	Parameter Name	Default Value	Description
00	SysSetup.sync_time	20	Controls the amount of time (in minutes) between "heartbeat" packets being sent.
04	SysSetup.PSU_variance	0.5	Establishes the variance in power supply voltage before a packet is immediately sent. (Send packet only when variance between two PSU readings are greater than or equal to this number.)
08	SysSetup.Product	0 = Informer 1 = RedHawk 999 = Master Reset	Determines which device is currently operating.
09	SysSetup.A1var	10.0	Variance of Ch1 4-20 Not Implemented
10	SysSetup.A1_rawLo	615	Establishes the raw calibration point for the ADC looking at an input of 4mA. (Value is used in the calibration point calculations)
11	SysSetup.A1_rawHi	3094	Establishes the raw calibration point for the ADC looking at an input of 20mA. (Value is used in the calibration point calculations)
12	SysSetup.A1_calLo	0.0	Calibrated value corresponding to a 4mA input. (Default values correspond 4-20mA to 0-100%)
13	SysSetup.A1_calHi	100	Calibrated value corresponding to a 20mA input. (Default values correspond 4-20mA to 0-100%)
14	SysSetup.A1_runThres	12.0	Motor running threshold value
15	SysSetup.A2var	10.0	Variance of Ch2 4-20 Not Implemented

16	SysSetup.A2_rawLo	615	Establishes the raw calibration point for the ADC looking at an input of 4mA. (Value is used in the calibration point calculations)
17	SysSetup.A2_rawHi	3094	Establishes the raw calibration point for the ADC looking at an input of 20mA. (Value is used in the calibration point calculations)
18	SysSetup.A2_calLo	0.0	Calibrated value corresponding to a 4mA input. (Default values correspond 4-20mA to 0-100%)
19	SysSetup.A2_calHi	100	Calibrated value corresponding to a 20mA input. (Default values correspond 4-20mA to 0-100%)
20	SysSetup.A2_runThres	12	Motor running threshold value
21	SysSetup.RT1	0	Lifetime run timer for motor 1 This variable contains the amount of time motor 1 has been in the running state.
22	SysSetup.P1starts	0	Lifetime start counter for motor 1 This variable contains the number of times motor 1 has started up from rest.
23	SysSetup.RT2	0	Lifetime run timer for motor 2 This variable contains the amount of time motor 2 has been in the running state.
24	SysSetup.P2starts	0	Lifetime start counter for motor 2 This variable contains the number of times motor 2 has started up from rest.