STATE: 10
Power ON
Start $T_{TOT}$ Timer

STATE: 20
Motor Level 1 Detected

STATE: 21
Motor Level 2 Detected

STATE: 30
Flight Detected
Start T1 Timer

STATE: 31
Await Free Fall

STATE: 34
Report Battery

STATE: 35
Override
Start $T_{OVERRIDE}$ Timer

STATE: 36
Motion Detected

STATE: 40
Arming

STATE: 50
Ready to Fire

STATE: 51
Delay Before Fire

Explode

$B_{OVERRIDE}$ Enabled

(Reached 10 Seconds) or (B34)

Reached $T_{OVERRIDE}$

(Reached P1 for S1) or (B1)

Below P1

(Reached P2 for S2) or (B2)

Below P1

(Reached P21) or (B21)

Below P1 and B0 Enabled

B3 Enabled

Reached $T_{TOT}$

Reached $T_{TOT}$

Reached $T_{TOT}$

Reached $T_{TOT}$

Reached $T_{TOT}$

Reached T1

Free Fall Detected

(Reached P3 for S3) or ($BAT_{LOW}$ is Reached) or (Reached $T_{TOT}$)

Reached $V_{ARM}$

(Reached P4) or (Reached $T_{TOT}$)
or
(B4)

Reached T2

M1a.4 Initializer State Diagram
Firmware Version: 4.02
July 17, 2024

| Parameter | Unit | Description | Default | Min:Max |
|---|---|---|---|---|
| $T_{TOT}$ | minutes | Self Destruct Timer | 30 | 10:300 |
| P1 | level | Motor Spin 1 Detection Sensitivity | 45 | 10:200 |
| S1 | seconds | Motor Spin 1 Detection Sample Interval | 3 | 1:30 |
| P2 | level | Motor Spin 2 Detection Sensitivity | 150 | 50:500 |
| S2 | seconds | Motor Spin 2 Detection Sample Interval | 2 | 1:30 |
| P3 | level | Motion Detection Sensitivity | 45 | 10:500 |
| S3 | seconds | Motion Detection Sample Interval | 1 | 1:30 |
| P21 | m/s | Flight Velocity | 2 | 1:30 |
| T1 | seconds | Delay from Flight Detect to Arming | 30 | 0:600 |
| P4 | level | Impact Level | 1500 | 1000:7900 |
| P5 | milliseconds | Impact Detection Window | 20 | 2:40 |
| P6 | 0.1% | Sample Weight for Impact Detection | 10 | 1:1000 |
| T2 | milliseconds | Delay Before Fire | 0 | 0:65535 |
| B0 | bool | Flight Stop Detection Permission | 1 | 0:1 |
| B1 | bool | Bypass Motor Detection | 0 | 0:1 |
| B2 | bool | Bypass Motor Detection 2 | 0 | 0:1 |
| B21 | bool | Bypass Flight Detection | 0 | 0:1 |
| B3 | bool | Enter State 31 | 0 | 0:1 |
| B34 | bool | Bypass Report Battery | 0 | 0:1 |
| B4 | bool | Ignore Impact Detection | 0 | 0:1 |
| $V_{ARM}$ | 1/10 volts | Arming Voltage | 60 | 40:140 |
| $BAT_{LOW}$ | 1/10 volts | Low Battery Voltage | 22 | 0:23 |
| $B_{OVERRIDE}$ | bool | Motion Detection Trigger | 0 | 0:1 |
| $T_{OVERRIDE}$ | seconds | Motion Detection Safety Delay | 120 | 0:18000 |

| Status LED's | | |
|---|---|---|
| State | Green LED | Red LED |
| Config | 1 Blink then Pause | OFF |
| 10 | Slow Blink | See Note 1 |
| 20 | 2 Blinks then Pause | OFF |
| 21 | Medium Blink | OFF |
| 30,31 | Fast Blink | OFF |
| 34 | 3 Blinks then Pause | See Note 1 |
| 35 | Solid | OFF |
| 36 | See Note 2 | See Note 2 |
| 40 | Fast Blink | Fast Blink |
| 50 | OFF | Fast Blink |
| 51 | OFF | Fast Blink |
| Explode | OFF | OFF |

Note 1: Red LED is OFF, unless the battery is low, then red LED pattern matches the green

Note 2: If State 36 is achieved, all LED's will remain OFF indefinitely