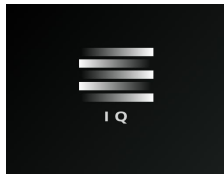




**Biometric Life Detection System (BLDS)**  
**User Booklet**



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## BLDS Specification Sheet

| Vital Sign Performance     |                                                        |       |       |       |            |
|----------------------------|--------------------------------------------------------|-------|-------|-------|------------|
| Heart Rate                 |                                                        |       |       |       |            |
|                            |                                                        | Min   | Nom   | Max   | Units      |
| R <sub>hr</sub>            | Beats Per Minute                                       | 48    |       | 120   | Per Minute |
| D <sub>hr_det</sub>        | Detection Distance @ 20% Error Rate                    | 3     |       |       | Meter      |
| Breathing Rate             |                                                        |       |       |       |            |
| R <sub>br</sub>            | Breaths Per Minute                                     | 6     |       | 30    | Per Minute |
| D <sub>br_det</sub>        | Detection Distance @ 20% Error Rate                    | 3     |       |       | Meter      |
| Sensor                     |                                                        |       |       |       |            |
| RF/Range Performance       |                                                        |       |       |       |            |
|                            |                                                        | Min   | Nom   | Max   | Units      |
| Type                       | FMCW (Frequency Modulated Continuous Wave)             |       |       |       |            |
| Mode                       | Dual Mode MIMO                                         |       |       |       |            |
| Number of TX Antennas      |                                                        |       | 3     |       |            |
| Number of RX Antennas      |                                                        |       | 4     |       |            |
| FOV <sub>Az</sub>          | Field of View In Azimuth                               |       | +/-60 |       | Degrees    |
| Θ <sub>ResAz</sub>         | Angular Resolution In Azimuth                          |       | 29    |       | Degrees    |
| FOV <sub>EL</sub>          | Field of View In Elevation                             |       | +/-60 |       | Degrees    |
| Θ <sub>ResEL</sub>         | Angular Resolution In Elevation                        |       | 29    |       | Degrees    |
| Freq Range                 | Chirp (Fixed Non-Programmable)                         | 60.25 |       | 63.79 | GHz        |
| TX                         | Transmit EIRP Power Per TX Antenna                     | 7     | 10    | 10    | dBm        |
| K                          | Freq Ramp Rate                                         |       | 60    |       | MHz/us     |
| τ <sub>ADC</sub>           | Chirp Duration During ADC Cycle                        |       | 51    |       | uS         |
| BW <sub>ADC</sub>          | ADC Bandwidth                                          |       | 3060  |       | MHz        |
| BW <sub>TX</sub>           | Transmitted Bandwidth                                  |       | 3540  |       | MHz        |
| τ <sub>ChirpTot</sub>      | Total Chirp Profile Time                               |       | 655   |       | uS         |
| N <sub>MIMOChrp</sub>      | MIMO Chirps                                            |       | 3     |       |            |
| N <sub>MIMOChrpFrm</sub>   | MIMO Chirps per Frame                                  |       | 16    |       |            |
| τ <sub>ChrpCycle</sub>     | Total Chirp Cycle Time                                 |       | 31.44 |       | mS         |
| τ <sub>Frame</sub>         | Frame Time                                             |       | 100   |       | mS         |
| τ <sub>Proc</sub>          | Processing Time                                        |       | 68.56 |       | mS         |
| DC <sub>TX</sub>           | TX Duty Cycle                                          |       | 3     |       | %          |
| D <sub>maxFstTime</sub>    | Maximum Unambiguous Range                              |       | 12.5  |       | Meters     |
| D <sub>res</sub>           | Range Bin Resolution                                   |       | 49    |       | mm         |
| V <sub>maxRad</sub>        | Maximum Radial Velocity                                |       | 2.26  |       | km/Hr      |
| V <sub>resRad</sub>        | Radial Velocity Resolution                             |       | .09   |       | km/hr      |
| D <sub>DeltaSlowTime</sub> | Maximum unambiguous distance between chirps            |       | 1.24  |       | mm         |
| D <sub>ResSlowTime</sub>   | Distance Resolution                                    |       | 0.007 |       | mm/degree  |
| Power Requirements         |                                                        |       |       |       |            |
|                            |                                                        | Min   | Nom   | Max   | Units      |
| Type                       | Power Over Ethernet (POE) IEEE 802.3.af (Type 1)       |       |       |       |            |
| V <sub>Inj</sub>           | Injector Voltage (Type 1 Standard)                     | 44    |       | 57    | V          |
| P <sub>Inj</sub>           | Port Power Required @ Injector Input (Type 1 Standard) | 15.4  |       |       | W          |
| P <sub>dev</sub>           | Power At Device                                        |       |       | 2     | W          |



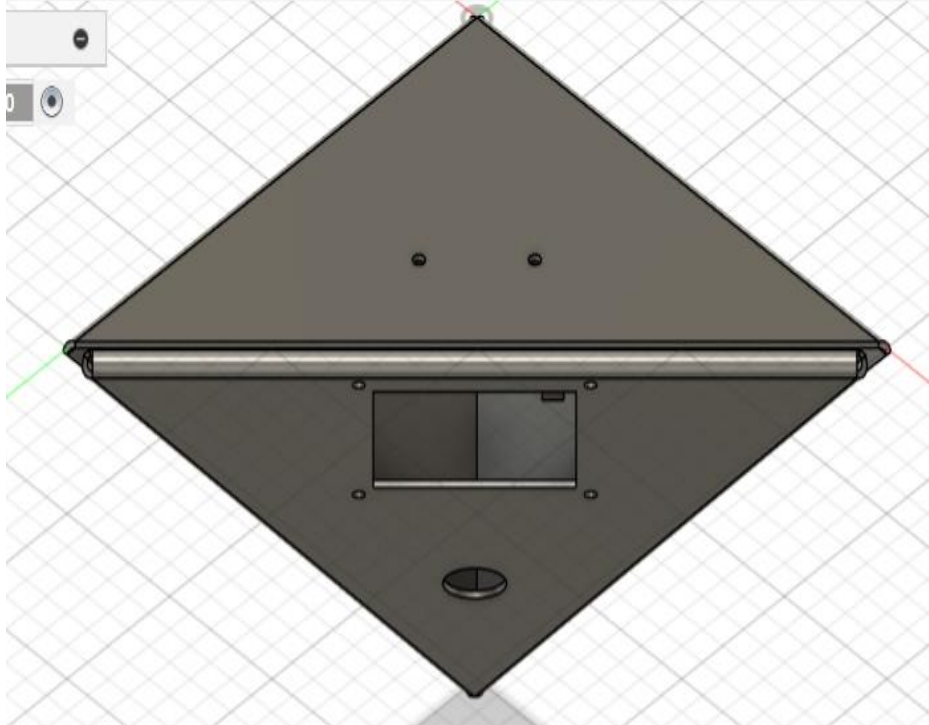
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## BLDS Housing and Installation

### BLDS – Housing unit

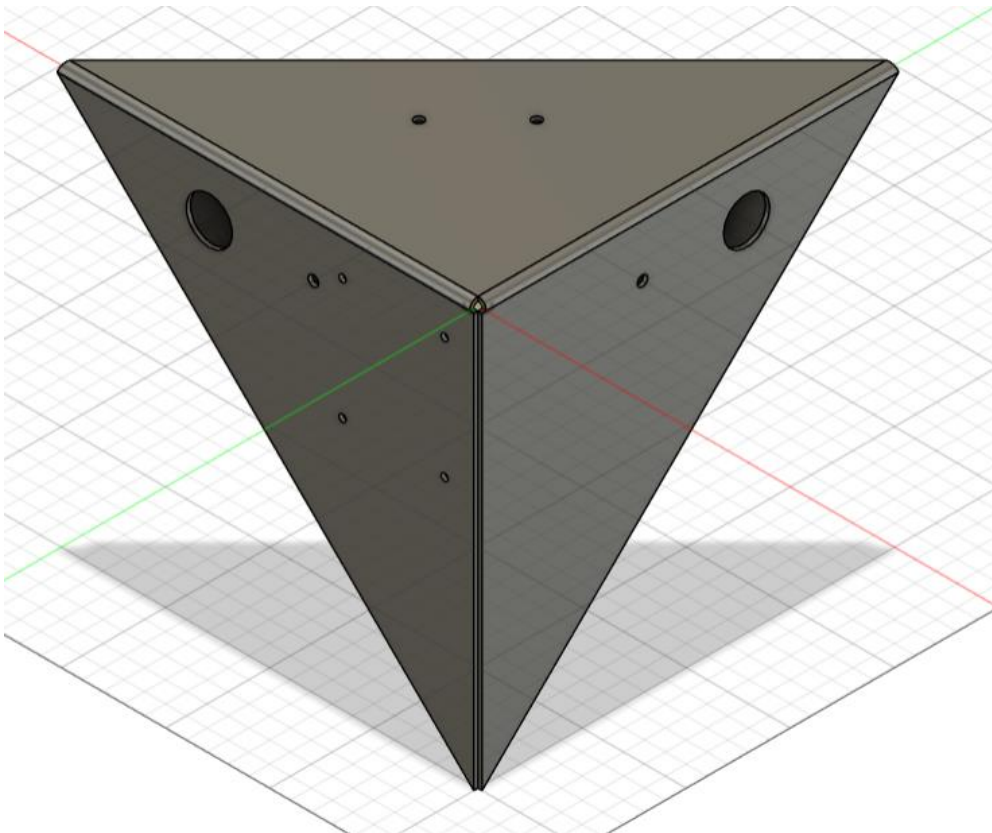
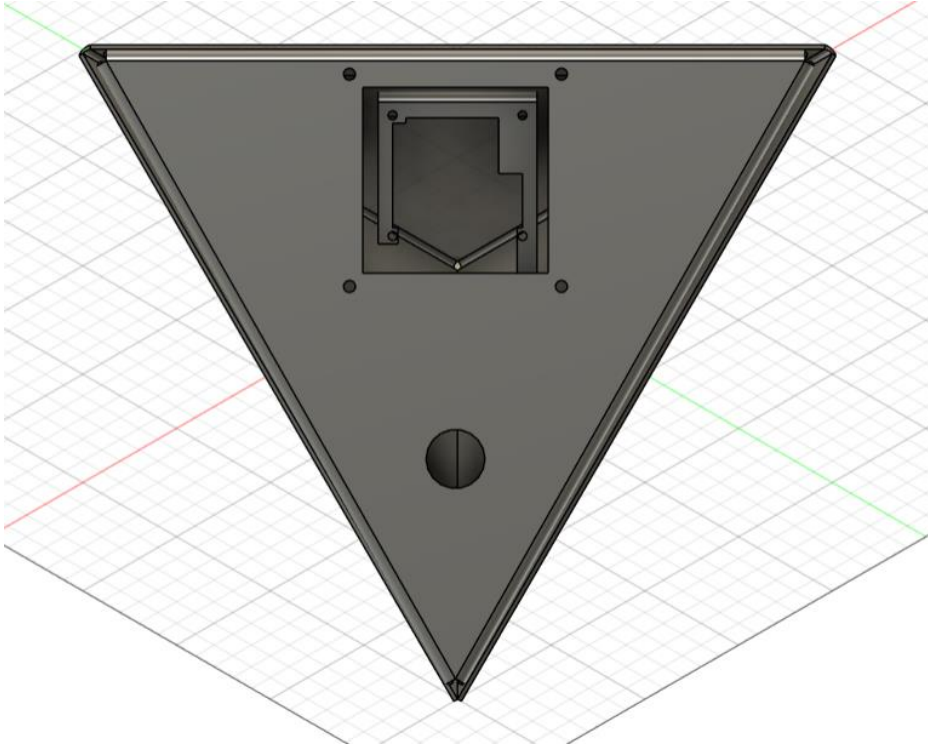
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The edge lengths that contact the wall are 8" x 8" x 8". There are three places for conduit to attach: on either side on the back or directly through the front faceplate. These are ½ trade knockout sizes (the big holes on the back and front). Any unused holes can be plugged with knockout seals. Design below:





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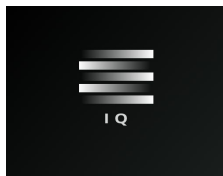


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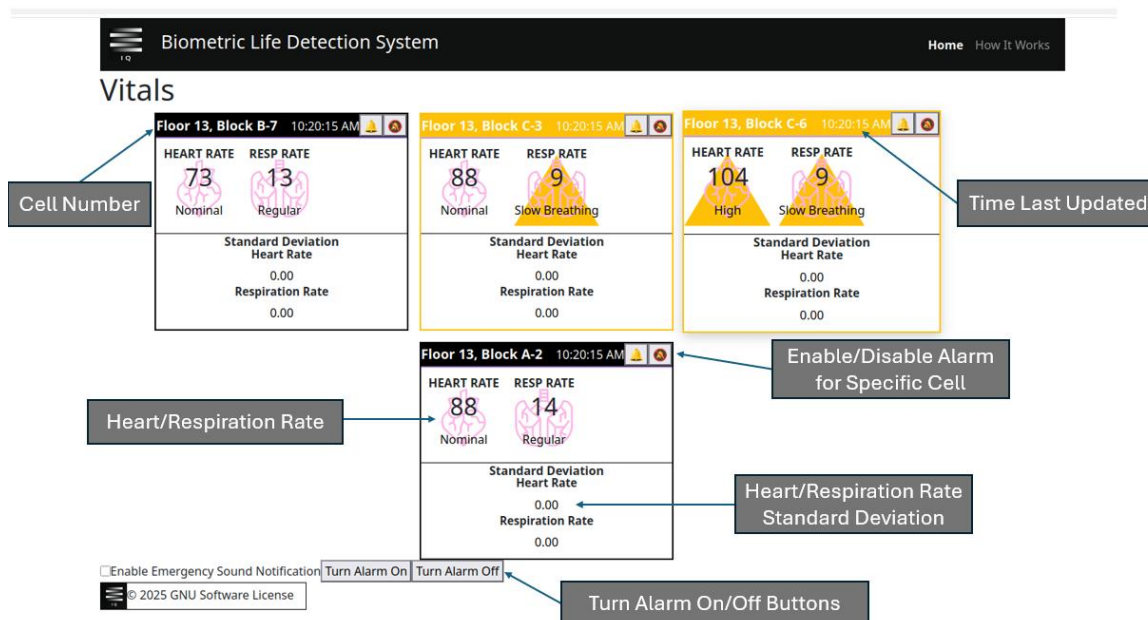
## **IntegrityQ (IQ) Biometric Life Detection System (BLDS) – Installation Guidelines**

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1. Choose ideal conduit penetration points.
2. Remove knockout seal and install conduit.
3. Anchor outer shell to wall.
4. Fasten radar mounting plate to outer shell with two M4 bolts, lock nuts, and sealing washers.
5. Run cable from PoE through conduit into Raspberry Pi.
6. Run USB connection between Raspberry Pi and radar board (if not already connected) contact IQ if needed.
7. Hold faceplate in place and secure it in place with six self-tapping screws, two on each edge.
8. Seal faceplate with weatherproof caulking (advised for increased liquid protection).
9. Ensure all RADAR units are connected to the POE Switch.
10. Connect Webserver to POE Switch.
11. Ensure Webserver is connected to the Internet.
12. Contact IQ to commence remote system setup.



## BLDS Radar Monitoring Dashboard – User Guidance



### Key Principle

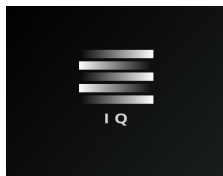
- This system provides passive monitoring only
- It is not for diagnosis or medical decision-making
- Always seek guidance from qualified medical personnel
- Use this dashboard as a supplemental tool, not a substitute for direct observation

### Heart Rate Monitoring

- Displays beats per minute (BPM)
- Alert triggers can be set for individual cells. The standard thresholds are:
  - Below 40 BPM – low heart rate
  - Above 130 BPM – elevated heart rate

### Respiration Rate Monitoring

- Shows breaths per minute
- Alert triggers can be set for individual cells. The standard thresholds are:
  - Below 10 RPM – low respiratory rate
  - Above 25 RPM – elevated respiratory rate



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### **Staff Presence in Room**

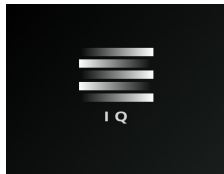
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- Feature currently disabled
- Coming soon: passive detection of staff activity in the monitored space

### **Movement Detection**

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- Feature currently disabled
- Coming soon: movement tracking for safety and behavior monitoring



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## **Regulatory Statements**

### **FCC Compliance**

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This device, number 2BBDH-BLDS60-A, complies with part 15 of the FCC Rules. Operation is subject to the two following conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Per section 15.21 of the FCC Rules, users are advised that any changes or modifications not expressly approved by the party responsible for compliance could void their authority to operate this equipment.

Per section 15.225(b) of the FCC Rules, this device may only be used in aircraft when on the ground.

### **Innovation, Science, and Economic Development Canada Compliance**

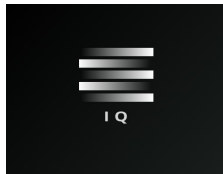
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This device, number 33819-BLDS60A, contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science, and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions: (1) this device may not cause any interference, and (2) this device must accept any interference, including interference that may cause undesired device operation.

Cet appareil, numéro 33819-BLDS60A, contient des émetteurs/récepteurs exemptés de licence qui respectent les normes RSS exemptes de licence d'Innovation, Sciences et Développement économique Canada. Son utilisation est soumise aux deux conditions suivantes : (1) cet appareil ne doit pas causer d'interférences, et (2) cet appareil doit accepter toute interférence, y compris les interférences pouvant entraîner un fonctionnement indésirable de l'appareil.

Per RSS-210 Annex J, this device may not be used on satellites, and may only be used in aircraft when on the ground.

Conformément à l'annexe J de la norme RSS-210, cet appareil ne peut pas être utilisé sur des satellites et ne peut être utilisé dans des aéronefs que lorsqu'il est au sol.



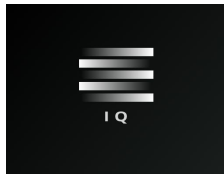
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## **FCC/ISED RADIATION EXPOSURE STATEMENT**

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This equipment complies with FCC and ISED radiation exposure limits set forth for an uncontrolled environment. To comply with the FCC and ISED RF exposure compliance requirements, the separation distance between the antenna and a person's body (including hands, wrists, feet, and ankles) must be at least 20cm (8 inches). This transmitter must not be co-located, or operating in conjunction with, any other antenna or transmitter. The availability of specific channels and/or operational frequency bands are country-dependent and are programmed in firmware at the factory to match the intended destination. The firmware settings are not accessible by the end-user.

Cet équipement est conforme aux limites d'exposition aux radiations définies par la FCC et l'ISED pour un environnement non contrôlé. Pour se conformer aux exigences de conformité à l'exposition RF de la FCC et de l'ISED, la distance de séparation entre l'antenne et le corps d'une personne (y compris les mains, les poignets, les pieds et les chevilles) doit être d'au moins 20 cm (8 pouces). Ce transmetteur ne doit pas être installé, ni fonctionner conjointement avec, une autre antenne ou un autre transmetteur. La disponibilité de canaux spécifiques et/ou de bandes de fréquence opérationnelles dépend du pays et est programmée dans le micrologiciel à l'usine pour correspondre à la destination prévue. Les paramètres du micrologiciel ne sont pas accessibles par l'utilisateur final.



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**IntegrityQ**

**"Supplemental Eyes, Saves Lives"**