

User Manual

Eleksen Connected Worker Platform



eLeksen
smart workforce safety



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1. Safety Regulations

1.1 Correct use

The HUB is part of an integrated Eleksen system which incorporates several elements.

The Eleksen Hub does not replace the primary safety devices.

This Hub and associated products and devices are designed to enhance the overall safety of the wearer. By giving local visible and audio alerts/alarms to the wearer and other people within the vicinity, so warning the user and fellow workers of the threat of danger.

Information gathered by the Hub from the associated devices will be transmitted to the control centre. This information is gathered in real time and used to identify any perceived danger areas.

This information can be analysed and presented using a management information system to give tabulated or graphical displays to enhance health and safety for the workforce.

When in use the Hub provides the wearer the ability to alert fellow workers and control centre, they are in distress. The Hub and garment will go into alarm mode:

- Hub will vibrate (Haptic)
- Hub LED lights will flash
- Hub will emit a loud sound
- LED on garment will flash red (colour is configurable at time of order)
- In the control centre the 'Dashboard' will also go into alarm status giving visible and audio alert
- Supervisor phone will be notified
- The Hub (wearer) will be identified and location displayed on the dashboard
- The nature of the alert will be displayed (i.e. SOS – Gas- Noise etc)

Appropriate action can be taken to address the alert – Evacuation, Search and Rescue, supervisory intervention, local worker groups informed via the Eleksen communication system.



1.2 Liability Information

Placeholder

2. Product Description

2.1 Eleksen Connected Worker Solution

The garment has an array of sensors and devices that enable real-time monitoring and data analysis of multiple workers' health, wellbeing, and exposure to potential hazards, and environmental and situational dangers – such as noise, gas, vibration and dangerous proximity or collision. The data is collected and transmitted to the Connected Worker Platform which displays data from all specified workers simultaneously and in real time.

The smart worker platform allows real-time device validation, monitoring of and reporting on of the industrial workforce for health and safety in the field. It also optimizes the gathering of the data collected on a continuous basis for predictive safety improvements and increased productivity. Once the real-time alert, reporting and compliance data has been swiftly and securely acquired and stored, user organizations can interrogate and analyse it to reveal patterns, trends, causes, and opportunities to drive efficiencies.

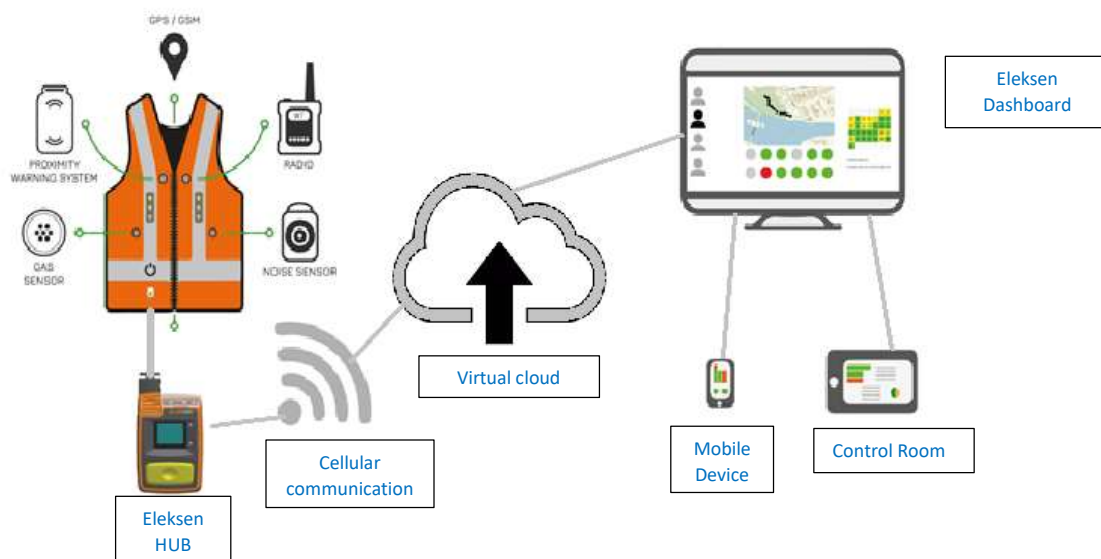


Fig. 1



2.2 HUB overview

The Eleksen™ Smart Connected Hub, acts as both transmitter and receiver, that transmits data at a configurable interval period over a 12-hour shift, working in correlation with the Eleksen™ Connected Worker Platform real-time module. This ensures that both the worker and the control centre are alerted to any imminent danger. If at any point the Hub loses cellular connection, it will continue to gather data and deliver alerts to the “worker”, and it will upload the missed data to the control centre once it comes back into range or alternatively when the HUB is plugged into the Hub Station. The stored data will be transmitted via WiFi to the dashboard.

2.3 Instrument overview



Fig. 2

HUB functionality

1. HUB LED's (4 multi coloured LED's)
2. UP scroll button
3. DOWN scroll button
4. Master button
5. Garment loom connector
6. OLED screen

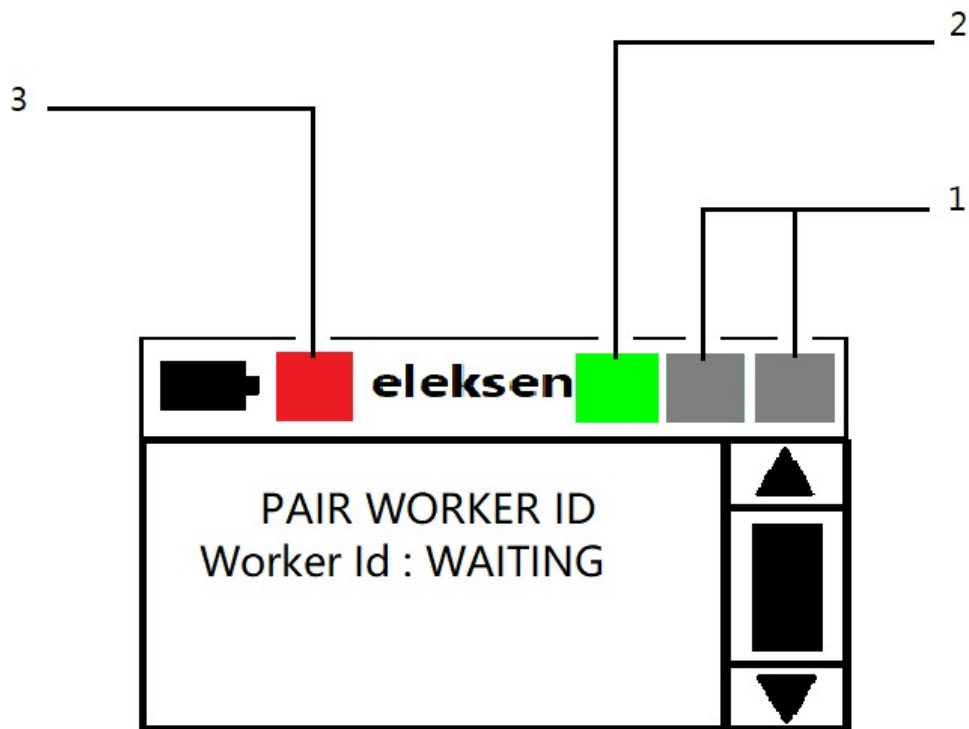


2.4 OLED Screen Overview

Small icon

The top part of the OLED screen displays the Hub communication status.

There are three areas where the icons display/flash/disappear as the communication services are detected and activated. These three sections collectively inform the user the current Hub status.



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Fig. 3

OLED Screen overview [wireframe]

1. Connectivity status area
2. Near Field Communication [NFC] status area
3. Location information area

Note: Under the status bar is the main OLED screen which gives step by step instructions to the user.

Key Icon:  LED's flashing

Fig. 4



2.4.1 Screen icons

Area 1: Connectivity status area

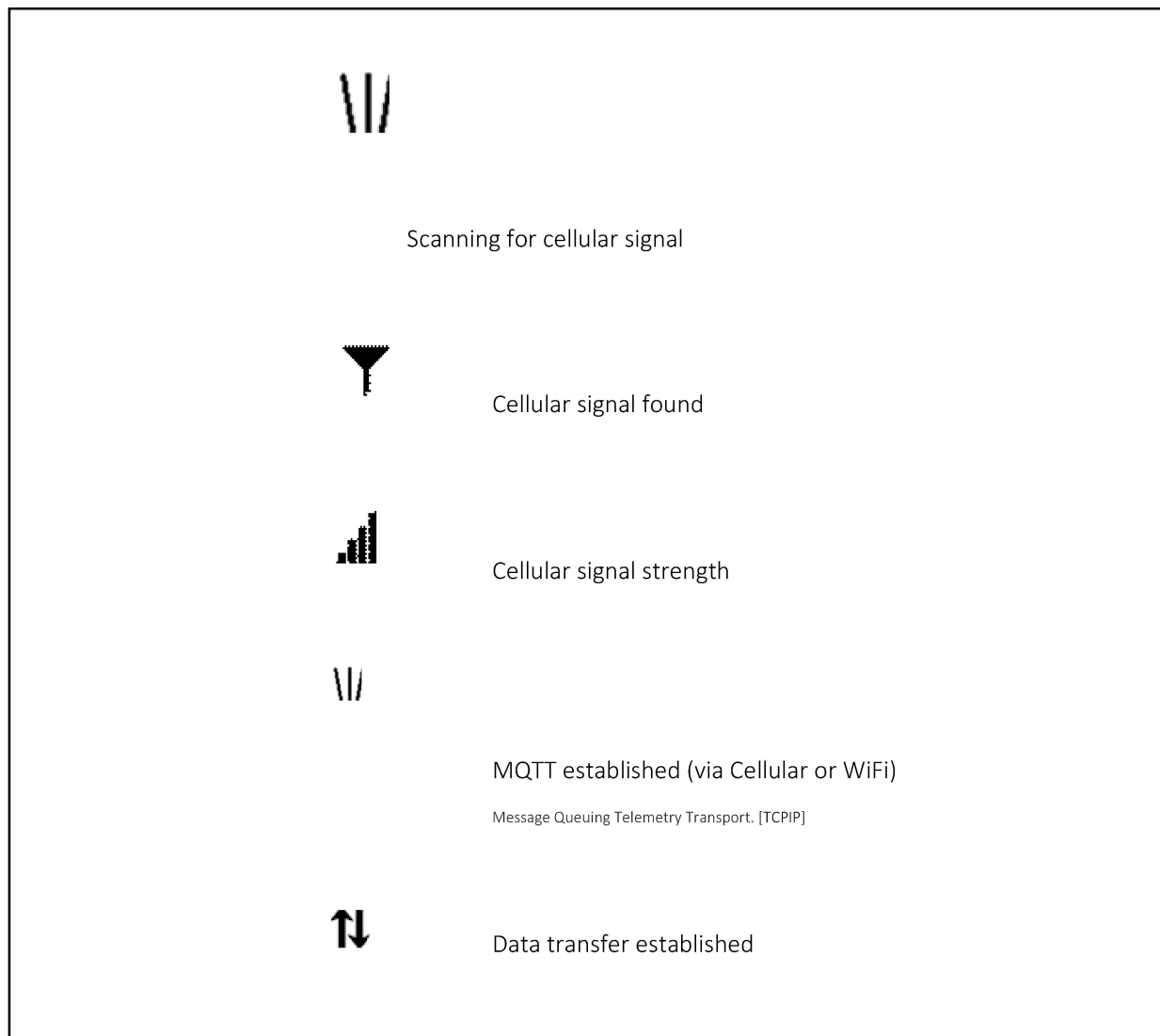


Fig. 5



Area 2: Near Field Communication [NFC] status area

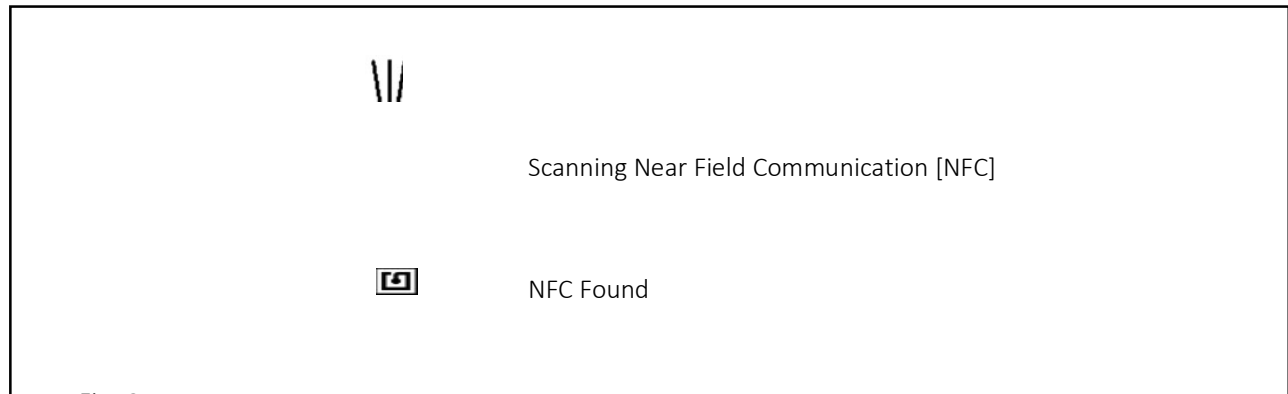


Fig. 6

Area 3: Location information area

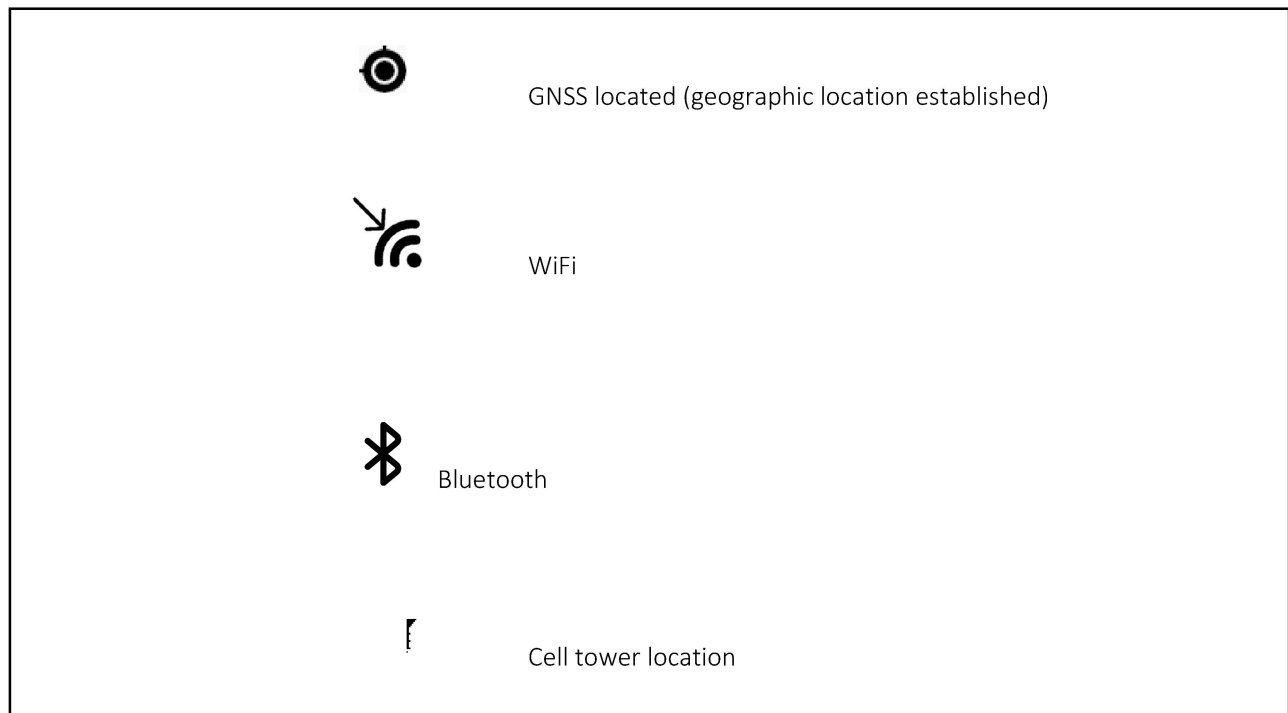


Fig. 7



2.4.2 Typical small icon sequence during initial start up

1. 
- Scanning for NFC
2. 
- Scanning for cellular signal (tower)
3. 
- Establishing MQTT protocol (Data transfer over TCP/IP protocol via Cellular or WiFi)
4. 
- Data transfer established
5. 
- GNSS Located (Geographical Location)

Fig. 8



OLED Screen icons



Data archive in progress



Hub on charge



Battery full



WiFi

Fig. 9

3. Operation

3.1 Removing HUB from Hub Station

3.1.1 – Only remove the Hub from the HUB Station when all LED's are green.

Green status: HUB fully charged and ready for use.

 Hub LED status



OLED Screen Icon - Device fully charged

3.1.2 – Status RED: **Do not** remove Hub

Battery is not fully charged

Hub is undergoing a firmware update

Hub is uploading user data

 Hub LED status



OLED Screen Icon – Device charging



3.2 HUB Removed from Hub Station

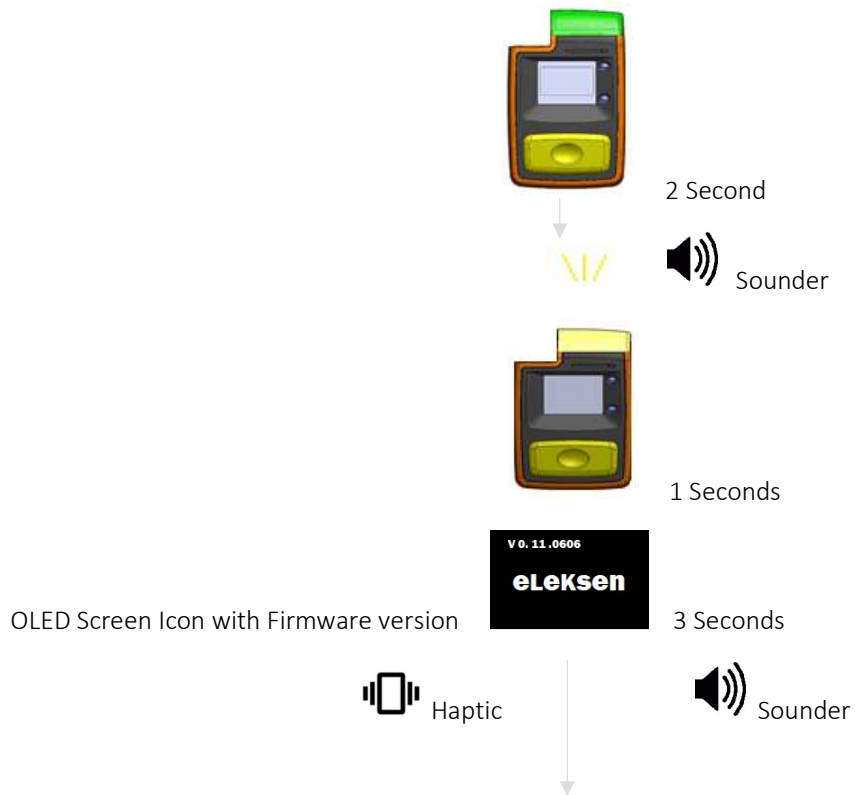
3.2.1 HUB behaviour when removed from HUB Station

When the Hub has been removed from the Hub station the OLED will be blank while the Hub performs a POST (power on self-test). During the POST the Hub will perform a range of LED/Haptic/Sounder test cycles as detailed below.

Firmware release format:

Release level	DD/MM
V0.11	06 06

Hub removed from Hub station.



Hub LED Status



OLED Screen



NOTE: The NFC icon will flash



Press the master button to re initiate the NFC process



3.2.2 Connecting the worker ID to the Eleksen Hub

Worker ID (ICEid)



Rear of Hub



1. **Touch** ICEid tag against rear of Hub in area shown
2. **Hub screen** Displays worker ID



NOTE: If worker ICE id is not performed within approximately eight minutes the Hub will go into sleep mode to preserve battery life. If the Hub enters sleep mode please refer to 3.2.6 to re-activate the Hub and then return to 3.2.3

3.2.3 Connect devices to Hub using device ICEid tag/s

Continue to add devices as shown above.

The Screen will identify the devices attached and count the total number of devices paired with the Hub. When all devices are attached then attach the garment to the Hub.

3.2.4 Connecting Hub to garment

When garment is plugged into the Hub LED's will flash green



OLED Screen



This screen is dependant on worker profile on Eleksen dashboard



3.2.6 Worker not connected to Hub (not ICEid) for 8 minutes Hub enters sleep mode.



To 'wake up' the Hub press the master button continually



Haptic



Sounder

Go to **3.2.2** Connecting the worker ID to the Eleksen Hub



4. Maintenance

4.1

Placeholder

5. Tech Spec

5.1

Connectivity

4G LTE: Cat M1/NB-IoT
 GPRS 4-Band
 Wi-Fi 802.11 b/g/n
 Dual mode
 Bluetooth® 4.2 incl.
 BLE (Bluetooth low energy)
 GPS / A-GPS /
 GLONASS / BeiDou /
 Galileo
 NFC
 ISM (SRD) Receive only

Cellular
Frequency
Bands

LTE Cat M1 Half-Duplex
 LTE CAT NB1 Half-Duplex
 Bands 2, 3, 4, 5, 8, 12, 13, Band 20
 2G GPRS/EGPRS
 GSM 850MHz, E-GSM 900 MHz, DCS 1800MHz, PCS 1900MHz

Dimensions

101*69*25mm

Weight

161g

Ports

Eleksen™ Connector

Dedicated
Keys

Alarm/ Man-Down / Active
 Visibility / Menu “Big
 Button” functionality

Display

High Contrast OLED

Battery

Re-chargeable Lithium Polymer

12 hours use in normal operating mode

Charge Time

<5 Hours

Housing

Hi-Vis
 Polycarbonate/Silicone
 Rubber

IP Rating

IP65 in normal operating mode

Operating
Temp

0 to 40

Storage Temp

-5 to 40

Audible Alarm

90dB

Vibrating
Alarm

Standard

Visual Alarm

4 ultra-bright multicolor
 LEDs when used standalone



6. Regulatory

6.1 FCC and ISED Canada Compliance

Manufacturer: Wearable Technologies Ltd

Country of origin: United Kingdom

This device complies with part 15 of the FCC Rules and ISED Canada licence-exempt RSS standard(s). Operation is subject to the following two 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.

6.2 EU Compliance

Wearable Technologies Ltd. hereby declares that this wireless device is in compliance with Directive 2014/53/EU.

A copy of the EU Declaration of Conformity, including device frequency bands and maximum radio-frequency power, is available at <https://eleksen.com/regulatory>



6.3 Modules used within this design

Cellular module:

FCC ID: XPYUBX18ZO01

ISED ID: 8595A-UBX18ZO01

BT/WiFi module:

FCC ID: 2AC7Z-ESPWROOM32

ISED ID: 21098-ESPWROOM32



6.4 SAR

The highest reported FCC and ISED SAR for stand-alone body exposure conditions and simultaneous transmission exposure conditions are 0.98 W/kg and 1.04 W/kg, respectively.

