P-1000 PENDANT TAG OPERATIONAL DESCRIPTION

Theory of operation

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Overview

STANLEY Healthcare's Patient Safety Monitoring solution is a Class 1 FDA medical device registered, HIPAA-compliant, cloud-based solution that safely and effectively monitors a group of patients at all times while allowing healthcare professionals to perform their daily duties. Rely on us to:

- Reduce the risk of hospital-acquired pressure ulcers by knowing when to turn patients

- Effectively monitor patients at risk for patient falls, reducing need for patient sitters

- Obtain reliable information to determine individual care plans

- Provide patient care with dignity with undetectable technology

- Eliminate patient discomfort with a completely touch-free solution

The STANLEY Healthcare P-1000 Bi-directional Tag is a component of the enterprise-level visibility solution based on standard Wi-Fi communication for location-based applications. The P-1000 Tag adds further flexibility and scalability to locate patients and staff across a wide variety of applications.

Once deployed, the Tag uses Wi-Fi bi-directional communication to receive firmware and configuration updates from MobileView. This removes the need to manually collect, update and re-deploy tags in the field.

P-1000 Tags optionally come with a Call Button and an embedded Low frequency (125KHz) Receiver.

Figure 1: P-1000 Pendant Tag

Tag Descriptions

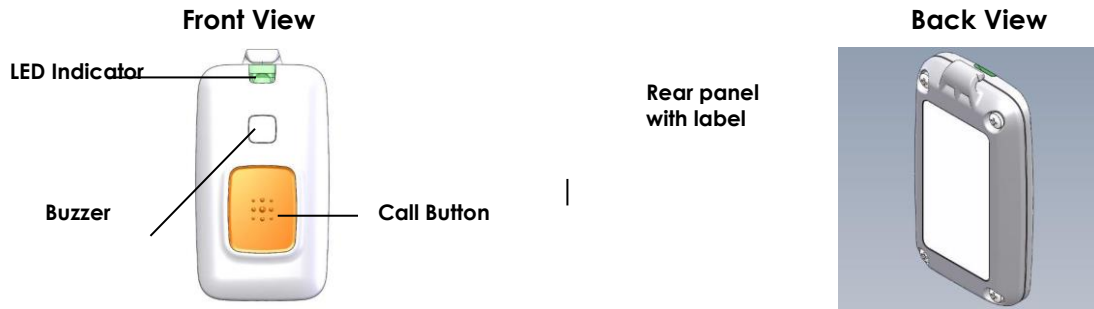The following describes the parts of the P-1000 Tag:

Front View

LED Indicator

Buzzer

Call Button

Back View

Rear panel
with label

Figure 2: P-1000 Tag Descriptions

P-1000 Tag Features

Beaconing and Bi-directional Communication

The P-1000 Pendant Tag utilizes lightweight beaconing communication (for standard messages) and bi-directional Wi-Fi communication with full network association and authentication (for advanced applications). This unique combination provides a flexible and scalable solution for advanced applications. The Tag can operate with up to four different network SSIDs in a secure or non-secure mode and is able to store up to two network IPs. The Tag also supports both static IP configuration and DHCP.

RF Transmitter operation

In normal (regular) mode the Tag sends Wi-Fi beacon – short message includes Tag unique ID. The RF transmission duration is about 60 usec. Beaconing interval varies from up to 5 minutes and depends of following events processing- Motion, Call button pressing or LF receiver activation. The AeroScout Location Engine receives information from Wi-Fi-based Active RFID Tags and standard Wi-Fi networking devices, and applies multiple complex algorithms to produce highly accurate and reliable location and status data in both indoor and outdoor environments.

Battery

The P-1000 Tag has replaceable battery that provides up to one year battery life*. The Tag is able to report its battery level which is displayed in MobileView. The P-1000 Tag also has a motion sensor to conserve battery life when the Tag is not in motion

*Battery life depends on Tag configuration.

Small Form Factor with Ergonomic Design

The P-1000 Tag's small and ergonomic design provides ease of use for patient.

Egress Point Detection

When combined with STANLEY Healthcare Exciters, the P-1000 Tag provides instant notification when a tagged patient passes through an egress point, such as a gate, doorway or other tightly defined area. Additionally the Tags behavior can be automatically modified while passing through an egress point, such as activating / deactivating the Tag or changes transmission rates to accommodate different usage scenarios.

Rugged Performance

The P-1000 Tag enclosure is designed for durability against significant impacts and is water and dust resistant*.

*See product specifications for IP rating.

Visual Indication

P-1000 Tags include a dual-color LED which enables distinct visual indications for specific use cases.

Tag Management

P-1000 Tags are easily configured and activated wirelessly via the Tag Manager BD application and a Tag Activator device. The Tags can then be reprogrammed using bi-directional communication via MobileView.

Call Button

The Tags includes a call button that can trigger an event in MobileView. MobileView events can be defined according to specific button press patterns, such as long press, short press and double press.

Tag Management

The P-1000 Bi-directional Tag firmware contains pre-defined sets of parameters. Each parameter set is called a static configuration and has a unique number. Static configurations cannot be edited. Only one (1) configuration can be selected and used for the Tag.

Configuring and Updating Tags

P-1000 Tags **must** be initially configured using the TMBD application (Tag Manager Bi-Directional application) before use. The TMBD application allows you to activate and configure the Tags according to your sites infrastructure.

Once the Tags have been initially configured using the TMBD application, future configurations can then be done via MobileView.

For more details on configuring and updating the Tags, see the Tag Manager BD User Guide.

Updating Tag Firmware and Configuration

MobileView supports the option to update the P-1000 Tag configuration and firmware over the air (wirelessly). A group of Tags or Tags associated to a specific category can be configured simultaneously.

For more details see the Tag Manager BD User Guide.

Tag LED Indications

P-1000 Tags include a dual-color LED (red and green) for visual indications. These indications are described in the table below.

The following symbols are used:

- Long blink
- Short blink
- Quick flash

Action		LED Indication
Button Presses	Short Press	1 short green blink (-)
	Long Press	1 long green blink (−)
	Double Press	2 short green blinks (- -)

Action		LED Indication
Low Battery		Alternating red and green short blinks every minute. (-- -- --)
Message received from LF or Ultrasound Exciter		1 quick green flash (.)
Message transmission (periodic or triggered)		1 quick red flash (.)
Bi-directional session	Start	1 short red blink (–)
	End	1 Short red blink followed by 2 quick red flashes. (–..)

Tag Maintenance

Battery Capacity

The Tag's battery capacity is 1200mamp/h.The reduction in capacity is much slower when the battery is partly discharged.

When the operating time of a charged battery is significantly reduced, the Tag should be disposed of according to facility procedures in your jurisdiction.

WARNING: This device contains a lithium battery. Do not force open, heat to 212°F (100°C), or dispose of in fire.

Cleaning the Tag

Cleaning the external surface of the Tag's housing should be done using Alcohol or Chloride based wipers only and dried completely.

Specifications

Tag Specifications

Range

- **Outdoor range**: Up to 200m (650 feet)

- **Indoor range**: Up to 80m (260 feet)

Physical and Mechanical

- **Dimensions**: 2.5 x 1.4 x 0.6 inch (65x 36 X 15 mm)

- **Weight:** 20g (0.7oz)

Radio

- 802.11 radio (2.4 GHz); b/g/n compliant

- Low frequency receiver for chokepoint detection (125kHz)

- **Transmission power**: up to +16.2dBm (~41mW)

- Patented clear channel sensing avoids interference with wireless networks

- **Security protocol**: WPA2 security with AES encryption

Environmental Specifications

- **Temperature**: 0°C to 50°C (32°F to 122°F)

- **Humidity**: 0% to 95% RH non-condensing

- **Atmospheric Pressure**: 80kPa to 120kPa

- **Ingress Protection Rating**: IP-67

- 3V Lithium Manganese Dioxide 1.2Ah

- **Battery life**: up to one year, depending on Tag type and configuration.

Programmability

- Tag configurations

- Transmission channels

- IP Settings

Certification

- **Radio:**

  FCC Part 15, sub-part C class B, sub-part B

  EN 300-328, EN 300-330, EN 301-489, RSS 210 (Canada)

- **Safety:**

  CE, cTUVus (EN60950)

  EN 60601-1-Rev3

Safety, Warnings and Warranty

FCC STATEMENT

Operation is subject to the following two conditions:
a) This device may not cause harmful interference
b) This device must accept any interference received, including interference that may cause undesired operation.

FCC Warning

Modifications not expressly approved by the manufacturer could void the user authority to operate the equipment under FCC Rules.

WARNING: This device complies with Part 15 of the FCC Rules and RSS-210 of Industry and Science Canada. 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.

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

STANLEY Healthcare ("STANLEY") Standard Warranty and Disclaimer
For STANLEY Healthcare AeroScout® Products ("Products")

Limited Warranty and Disclaimer. STANLEY warrants that commencing from the date of delivery to Customer and continuing for a period of one (1) year thereafter (the "Warranty Period"), the hardware components of STANLEY Healthcare AeroScout® Products (the "Hardware") will be free from defects in material and workmanship under normal use subject to the terms hereof. The date of shipment of the Hardware by STANLEY is set forth on the packaging material in which the Hardware is shipped. This limited warranty extends only to the original user of the Hardware. Customer's sole and exclusive remedy and the entire liability of STANLEY and its suppliers under this limited warranty will be, at STANLEY's or its service center's option, shipment of replacement Hardware components within the Warranty Period or a refund of the purchase price if the Hardware is returned to the party supplying it to Customer, if different than STANLEY, freight and insurance prepaid. STANLEY replacement parts used in Hardware repair may be new or equivalent to new, and STANLEY reserves the right to provide replacement Hardware components of similar form and function, as long as the functionality is equal or better than Customer's original Hardware components. STANLEY's obligations hereunder are conditioned upon the return of affected Hardware in accordance with STANLEY's then-current Return Material Authorization (RMA) procedures. Notwithstanding the foregoing, the warranty for TAG Hardware specifically designated for sterilization via autoclave or other sterilization methods shall have a warranty period of 350 sterilization cycles from the date of delivery; provided, however, that sterilization outside of environmental specifications approved in any applicable user documentation voids all warranties.

Extended Warranty: STANLEY offers an extended warranty, for a fee, on AeroScout products. Within the one (1) year of the standard warranty, additional warranty of two (2) years may be purchased. Additional warranty years may only be purchased once within the first one (1) year, or prior to warranty expiration. A maximum of three (3) total warranty years are available for Hardware.

Exclusions: The warranty set forth above will not apply if the Hardware or the Product (i) has been altered, except by STANLEY, (ii) has not been installed, operated, repaired, or maintained in accordance with instructions supplied by STANLEY, (iii) has been subjected to abnormal physical or electrical stress, misuse, negligence, or accident; or (iv) is provided for beta, evaluation, testing, or demonstration purposes for which STANLEY does not receive a payment of purchase price or license fee.

In addition, this warranty shall not cover the following:
- Batteries (other than DOA -Dead On Arrival).
- Plastics (including defects in appearance, cosmetics, decorative or structural items including framing and non-operative parts).
- Tag Calibration.
- Expenses related to removing or reinstalling the Products.
- Defects or damage that result from the use of Non-STANLEY certified Products, Accessories, Software or other peripheral equipment.
- Defects or damages resulting from service, testing, adjustment, installation, maintenance, alteration, or modification in any way by any party other than STANLEY, or its authorized service partners.
- **All software contained in or otherwise part of STANLEY Healthcare AeroScout® Products, which is covered by STANLEY's separate software warranty contained in the separate software license agreement with respect to such Products.**

The warranty set forth above shall not be enlarged and no obligation or liability shall arise out of STANLEY's rendering of technical advice, facilities or service in connection with Customer's purchase of the STANLEY Healthcare AeroScout® Products.

Except for the foregoing warranties, which shall be the exclusive warranties with respect to any Products, STANLEY MAKES NO WARRANTY OR REPRESENTATION OF ANY KIND, EXPRESS OR IMPLIED, WRITTEN OR ORAL, REGARDING INFORMATION GIVEN OR THE PRODUCTS OR SERVICES SUPPLIED AND EXPRESSLY DISCLAIMS ALL EXPRESS AND IMPLIED WARRANTIES, REPRESENTATIONS AND CONDITIONS, INCLUDING WITHOUT LIMITATION ALL WARRANTIES AND CONDITIONS OF QUALITY, NON-INFRINGEMENT, MERCHANTABILITY AND SUITABILITY OR FITNESS FOR A PARTICULAR PURPOSE TO THE EXTENT PERMITTED BY LAW. STANLEY WILL NOT BE LIABLE FOR CONSEQUENTIAL, INCIDENTAL, INDIRECT OR PUNITIVE DAMAGES FOR ANY CAUSE OF ACTION, WHETHER IN CONTRACT, TORT OR OTHERWISE. Consequential, incidental and indirect damages include, but are not limited to, lost profits, lost revenue and loss of business opportunity, whether or not STANLEY was aware or should have been aware of the possibility of these damages.

About STANLEY Healthcare

STANLEY Healthcare provides over 5,000 acute care hospitals and 12,000 long-term care organizations with enterprise solutions that transform safety, security and operational efficiency. The STANLEY Healthcare solution set enables customers to achieve organizational excellence and superior care in five critical areas: Security & Protection, Safety, Environmental Monitoring, Clinical Operations & Workflow, and Supply Chain & Asset Management. These solutions are complemented by consulting, training, implementation and integration services. STANLEY Healthcare is proud to be part of Stanley Black & Decker, Inc. For more information, visit: www.stanleyhealthcare.com

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