A762
Proximity Locator

for GOJO® LTX® Dispenser

RF Code™

discover. track. monitor.

User Manual

Contents

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CFR Rule – 15.21
Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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Industry Canada Compliance Statement
This Class A digital apparatus meets the requirements of the Canadian ICES-003
Avis de conformité à la réglementation d'Industrie Canada
Cet appareil numérique de la classe A rest conforme à la norme NMB-003 du Canada

The system is design to operate with RFCode Active Tags – Whose operating frequency is 433.92 MHz which have been certified or are in the certification process. These devices comply with part 15 of the FCC rules. Operation is subject to the following two conditions:
(1) these devices may not cause harmful interference, and
(2) these devices must accept any interference received, including interference that may cause undesired operation.

WEEE Compliance

Do Not Dispose Product with Municipal Waste. Special Collection/Disposal Required.

Overview

The A762 Proximity Locator is an embedded module for GOJO® LTX® soap and hand sanitizer dispensers used in conjunction with R142 Proximity Badges to provide a method of locating people and correlating events within tightly-defined coverage areas. Each Proximity Locator transmits an RF pulse pattern containing a unique code when the module is actuated by a dispense event. The A762 also communicates with R142 Proximity Badges that are located near the event (typical coverage is 3 meters) and transmits event payload information to an RF Code reader infrastructure. When used with RF Code's Asset Manager or other 3rd-party software, the solution enables tracking of who did what, when, and where.

Features

- Low-battery indicator
- Field-upgradable firmware
- Communication status indicator LED (optional)

Contents

- A762 Proximity Locator
- Proximity Locator Utility CD
- User Manual

Requirements

- Windows XP, Windows Vista, or Windows 7, Windows 8

A762 People/Event Correlation Process

The A762 Proximity Locator works in conjunction with A750 Room Locators and R142 Proximity Badge tags. A750 Room Locators are positioned to cover specific areas, such as rooms, closets or entire floors. The IR-enabled R142 tags can report specific location data when it transmits its RF location payload to an RF Code reader. As a person moves from one room to another, their badge tag will transmit the location code it detected from the last seen A750. Each A750 Room Locator is assigned a unique ID for distinct room locations. A762 Proximity Locators are also assigned ID's which allow for people and event tracking with sub-room level accuracy. For example, if an LTX soap dispenser is equipped with the A762 embedded module, soap dispense events can be correlated with a wearer of an R142 Proximity Badge. The communication between the solution components is as follows:

1. A762 draws parasitic power from the LTX dispenser and detects soap dispense events.

2. A762 unit and badge tag communicate (send/receive) via low power 915 MHz broadcasts. A762 unit determines closest badge tag if multiple badge tags are within close proximity.

3. Badge tag transmits via 433 MHz RF, broadcasting its unique tag ID, room location, and event payload to the RF Code reader infrastructure.

4. The A762 unit also has a unique ID and signals events via 433 MHz RF to the existing RF Code reader infrastructure.

5. Time stamps, payloads and IDs from the A762 unit and badge tag transmissions are correlated via software to accurately report who did what, when, and where. Because the software system is informed of all nearby badges, it is capable of compiling an inventory of badges that were present for the Proximity Event and not just the badge that was closest.

Figure 1: A762 People/Event Correlation Process
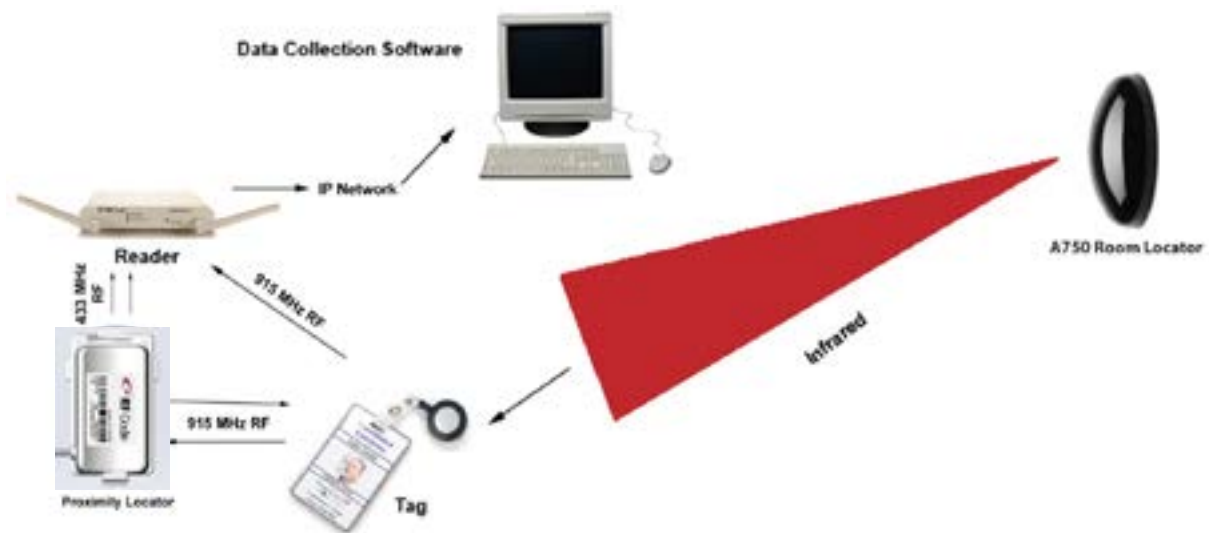
Proximity Logic Details

The antenna pattern of the A762 determines the RF field strength at various points near the A762. Generally, the field strength decreases as you move farther away from the A762 but the rate at which it decreases is relative to the orientation of the A762.

The diagram below (Figure 2) shows an approximation of the A762 antenna pattern. It is designed in such a way that the signal strength will be highest for a person standing directly in front of the A762 (as opposed to a person standing beside or behind the A762).

1. **Zone 1** represents the physical area in which the signal strength from the A762 is above a user-configurable "immediate" threshold. This area is close to the A762 such that, under normal operating conditions, only one person, and therefore only one badge, can be within Zone 1 at any given time. Following a Proximity Event Activation, if a badge's signal strength indicates it is within this zone, then the badge is immediately given credit for the Proximity Event (no additional polling cycles).

2. **Zone 2** represents the physical area in which the signal strength from the A762 is below the "immediate" threshold but above a user-configurable "compete" threshold. Following a Proximity Event Activation, if a badge's signal strength indicates it is within this zone, then the badge is considered a candidate to receive credit for the Proximity Event. Multiple polling cycles will be used to collect responses from badges in Zone 2 to ensure that all badges respond and the badge with the strongest response to any of the polling cycles will receive credit for the Proximity Event.

3. **Zone 3** represents the physical area in which the signal strength from the A762 is below the "compete" threshold but still high enough to allow communication between the A762 and a badge. Badges within this zone, although detectable, are not considered candidates to receive credit for a Proximity Event. Badges in this zone can still report the event to zonal readers even though they do not get credit for the event.

4. **Zone 4** represents the physical area in which communication with badges is possible, but the signal strength from the A762 is below a user-configurable "ignore" threshold such that the badges in this zone ignore (do not respond to) the A762 polling cycles and they do not report the event to the zonal readers.

5. **Beyond Zone 4** the signal strength from the A762 is too weak to allow communication between the A762 and a badge. Badges in this area are unable to detect the A762.

Following a Proximity Event Activation, the A762 begins a series of polling cycles to collect badge responses from all badges in Zone 1 and Zone 2. If a badge in Zone 1 responds to any polling cycle, it is immediately given credit for the Proximity Activation and no further polling cycles are used. Otherwise, the A762 continues polling. After a certain number of polling cycles with at least one badge responding from Zone 2, the A762 gives credit to the badge with the strongest RSSI (received signal strength indication). The strongest RSSI is the maximum RSSI that a given badge reported in any one of the polling cycles. If no badge responds within a certain number of polling cycles, the A762 does not give any credit for the Proximity Event.

These are some of the advantages of this 4-zone method of proximity determination:

1. Badges within Zone 1 are given credit for the Proximity Event very quickly. A quick determination is often needed when the dwell time of the badge is short.

2. Badges within Zone 2 are given multiple polling cycles to respond. This ensures the most accurate RSSI is determined so that the correct badge is given credit for the Proximity Event.

3. A badge that starts in Zone 1 or Zone 2 and then moves into Zone 3 or Zone 4 can still communicate with the A762 and therefore still receive credit for the Proximity Event even if it is in Zone 3 or 4 at the time when the winner is decided and communicated to the system.

4. Because the "immediate", "compete", and "ignore" thresholds as well as the polling cycle requirements are user-adjustable, the A762 can be adapted to monitor a variety of different Proximity Events depending on the range and dwell time requirements of each situation.

Figure 2: A762 Antenna Pattern
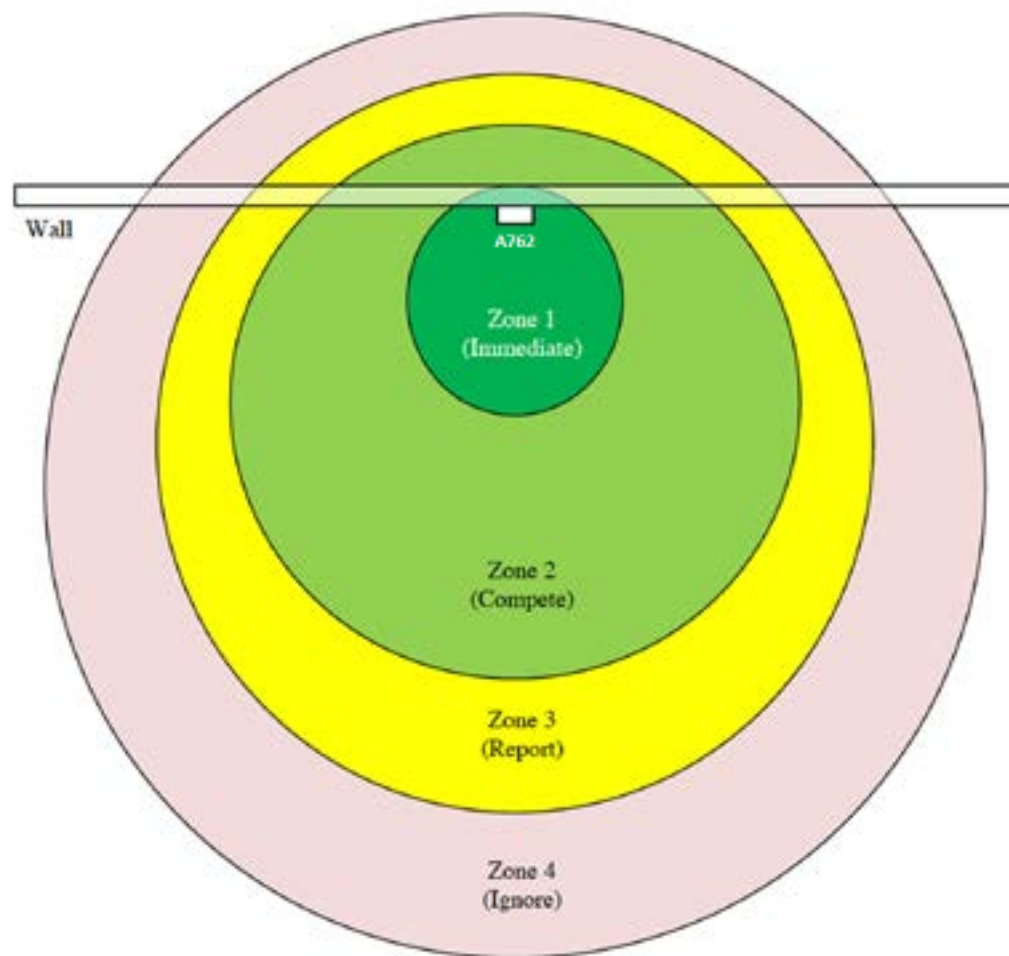
Notes for A762 Proximity Locator and Tag Deployment

Note If there is IR interference in a deployment area, the tag's RF signal will not be affected but the IR location code will not be received by the tag. To avoid any IR interference refer to the following notes:

- IR-enabled active tags are NOT designed to work outdoors. In direct sunlight, the IR tags will not detect the A750 transmissions.
- Do not cover the IR sensor by wearing the badge under a jacket or in a pocket. This will affect the ability of the tag to read A750 signals.
- A Room Locator's transmissions can interfere with other Room Locators operating within the same location. The A750 Room Locators have a team operating mode to allow multiple room locators to synchronize their IR transmissions at unique times.

Installation and Configuration

To configure the A762 Proximity Locator you will need to use the Proximity Locator Utility which is provided on the CD that came with the A762 Proximity Locator. A USB Type A to micro-B cable (not provided) is needed to connect the A762 Proximity Locator hardware to a Windows platform running the Proximity Locator Utility.

Hardware Installation

When first connecting the A762 Proximity Locator to a PC, the A762 driver will need to be installed. This is performed through the Found New Hardware Wizard that should automatically load when the Proximity Locator is connected to the PC. Follow the steps in the wizard to locate the driver software for the A762 Room Locator. This software is located on the Proximity Locator CD that came with the unit.

Figure 3: A762 Hardware Installation Wizard
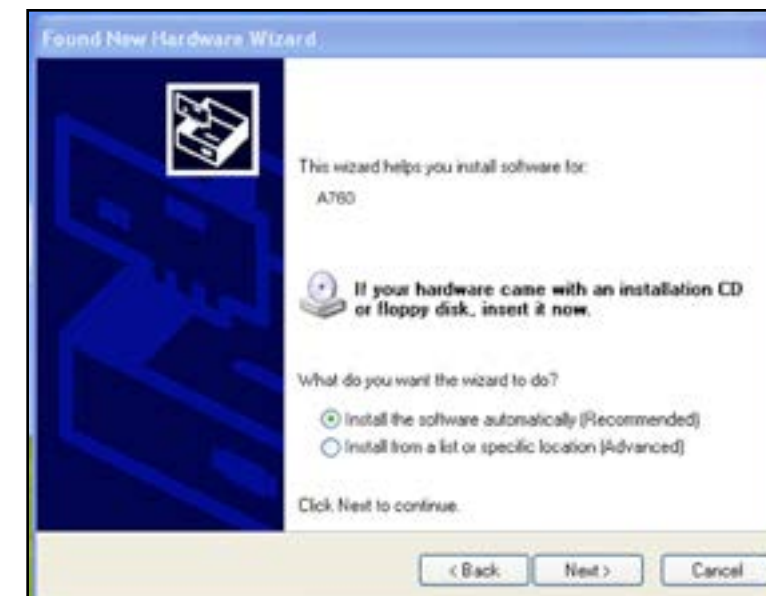
Utility Software Installation

To install the Proximity Locator Utility insert the CD into the CD-ROM drive and click on Install Proximity Locator Utility to begin. Alternatively, the Proximity Locator Utility can be installed directly by double clicking on the setup. exe file. This will launch the install wizard. Follow the prompts to install the utility.

Figure 4: Proximity Locator Utility Installation Wizard

Launching the Proximity Locator Utility

After installing the application from the CD, select **Start > All Programs > RF Code > Proximity Locator Utility** to launch the application and display the main screen. The A762's USB cable needs to be plugged into an available USB port on the computer on which the utility software is running.

Configuration

It is suggested that you use the utility to configure your Proximity Locator before mounting the LTX dispenser to the surface. The steps for initial configuration of an A762 Proximity Locator are described below:

1. **Launch the Utility**: Ensure that the A762 Proximity Locator is connected to the PC through the USB cable and launch the Proximity Locator Utility software.

2. **View Manufacturing Default Settings:** The Proximity Locator Utility GUI will open and the Device Details section should display the status, model number, the version of the firmware installed on the device, and the device's serial number. If the Status reports Disconnected, the device may need to be discovered by selecting the **Device > Select device** menu item. A window will appear. Click the **Discover** button. The utility will discover any A762's that are connected to the PC. Select the device from the drop-down list and click the **OK** button. The A762 will display default values for Proximity Code and other settings set during manufacturing time.

> **Note** If the utility does not show any A762's connected, unplug the USB cable to the device(s), wait 10 seconds and plug the USB cable back into the device.

Figure 5: Proximity Locator Utility

Figure 6: Device Discovery

3. **Proximity Code:** Under the Settings section the Proximity Code field will determine what will be transmitted from the A762 to the RF Code reader infrastructure. It can be configured to transmit proximity code values ranging from decimal 0001 to 7167.

4. **Proximity Cycles**

   Maximum Communication Attempts: after an event is detected, this is the number of times that the A762 attempts to communicate with a nearby badge tag. Note that setting this value too high may result is inaccurate reporting. That is, if the A762 unit continues trying to communicate with a badge after a detected event, then someone with a badge tag may move within range and incorrectly will receive "credit" for the detected event. Also note that the LED on the A762 unit will light green at the beginning of each communication attempt.

   Maximum Successful Cycles: this is the maximum number of times that the A762 and the R142 Badge tag will communicate. A smaller number will result in faster reporting to the system, but may also reduce accuracy if other badge tags are nearby.

5. **A762 Signal Strength Thresholds**

   Combined Minimum For Immediate Success: this is a measurement of the combined signal strength detected between the badge tag and the Proximity Locator. When this number is exceeded by an A762/badge combination, the A762 will not perform any more attempt/cycles and will immediately declare a "winner" (based on the strongest RSSI or in the case of a tie, the first badge that responded). Setting this value to a higher number will require that the "winning" badge will need to be closer to the A762 unit when compared to other badges that are farther away.

   Combined Minimum to Compete: this is a measurement of the signal strength needed for a nearby badge to be considered to be associated with an event.

   Minimum At Tag To Report: this is a measurement of the signal strength detected at the badge tag for it to be considered to be associated with an event. Setting this to a smaller value will consider badges that are farther away from the A762 unit.

6. **Tag Signal Strength Thresholds**

   Minimum At Tag To Compete: this is a measurement of the signal strength detected at the badge tag for it to be considered to be associated with an event. Setting this to a smaller value will consider badges that are farther away from the A762 unit.

   Saving Device Configuration File: The Proximity Locator Utility allows saving a set of device settings for backup purposes. To save the currently connected Proximity Locator's set of device settings, select the **File > Save or File > Save As** menu option. This will prompt a file browser window. Select a location and a name for this device configuration file and click the **Save** button. The Proximity Locator's configuration file is saved with a .rlc extension.

   Upgrade Device Firmware: To upgrade the firmware for the A762 unit, access the **Device > Upgrade device firmware menu** option. A dialog prompt will appear. Next click the **Start** button to begin the upgrade process. A message indicating the firmware upgrade is complete will be displayed. Click the **Done** button to finish this process. If the Proximity Locator already has the latest firmware installed, a message will display indicating that an upgrade is not necessary.

> ⚠ Do not disconnect the device during the upgrade process. Doing so may cause problems with the device and its ability to upgrade the firmware properly.

7. Device Diagnostics: To utilize the diagnostics tool, access the **Device > Diagnostic** menu option. The diagnostics window will appear. This tool can be used to help adjust your device settings to better suit your deployment scenario. In the diagnostics window there will be three options available for you to test the function of the unit with the badge tags.

The **Test Continuously** check-box, when selected, will continuously display the latest Tag IDs, Tag RSSI, Device RSSI and Combined RSSI readings of the tags that are in proximity to the Proximity Locator device.

The **Test Once** button will take a snapshot of the moment and display the tag data for the badge tags that are in proximity to the locator at that particular point-in-time.

The **Add** button will prompt a dialog box to enter in a tag ID number. One or more tag IDs can be entered to test for proximity data readings. Once tag IDs are entered, click either the **Test Once** button or the **Test Continuously** check-box to enable the diagnostic testing. If more than one tag is entered, the tag with the closest proximity to the locator will appear as highlighted.

> **Note**
>
> Using the Diagnostic mode of the Proximity Locator Utility temporarily disables the reed switch correlation function of the Proximity Locator device until diagnostic testing is complete.

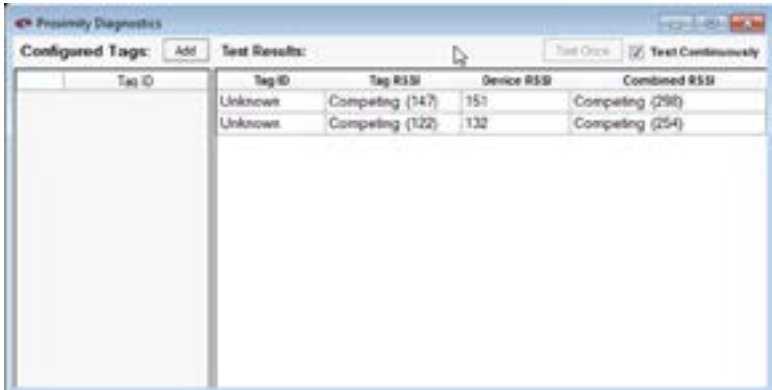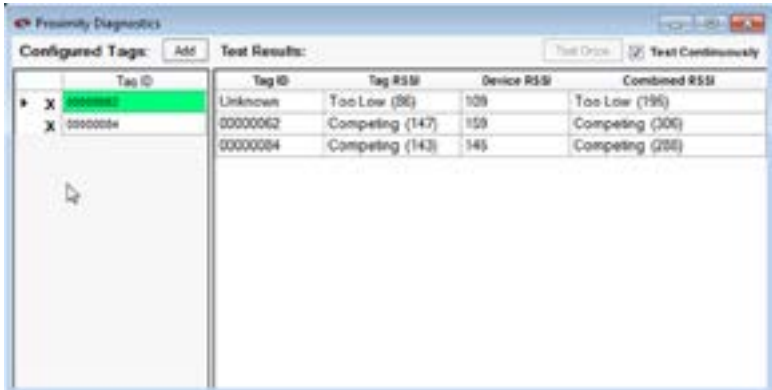**Figure 7: Test Continuously Diagnostic Reading**

Figure 8: Closest Tag Proximity Diagnostic Reading

Install the A762 Proximity Locator inside the GOJO LTX Dispenser per GOJO instructions and procedures.

Install the GOJO LTX Dispenser per GOJO instructions and procedures.

Environmental Limits

The A762 unit is approved for use within the ranges set forth below.
- Operation: -20 to +70 degrees Celsius
- Humidity: 10% to 90% RH non-condensing

Standard Warranty Limitations

Except as provided herein, the entire liability of RF Code and its suppliers under this limited warranty will be that RF Code will use reasonable efforts to repair or replace, without charge, all defective Products returned to RF Code by Customer, all as more particularly described in the End User Warranty. Except for the express warranties STATED HEREIN, RF Code makes no other representations or warranties and RF Code hereby disclaims all other warranties, express, implied, statutory, or otherwise, including without limitation, any warranty of merchantability, non-infringement of third party intellectual property rights, fitness for a particular purpose, performance, satisfactory quality, or arising from a course of dealing, usage or trade practice.

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For in-warranty service, customers have several options. Customers having difficulty with RF Code products should attempt to solve those problems through RF Code's Technical Support Problem Escalation Process:

First, contact the RF Code representative or other distributor from whom the RF Code product was purchased for information on how to obtain local support.

Second, contact the RF Code Customer Support via e-mail.

Third, contact the RF Code Customer Support via the Support Line.

For product returns, the support engineer will give you a return material authorization (RMA) number. No returns will be accepted without an RMA number. If the warranty expired, there is a charge for repair or replacement per RF Code's out-of-warranty policy. For full details of the RF Code RMA policy, please review the "RF Code Warranty, RMA, and Extended Warranty Policy" document.

RF Code Customer Support

RF Code Customer Support gives entitled customers and partners the ability to contact RF Code about installation and usage-related questions as well as make defect inquiries about eligible products that are covered under RF Code warranty agreements. A team of technical specialists can be contacted electronically or via phone.

The Support Line is available to provide General Support during normal business hours: Monday through Friday, 8:00 am to 5:00 pm Central time, excluding national holidays.

E-mail: support@rfcode.com
Support form: http://www.rfcode.com
Voice: 512.439.2244 or toll-free at 866.830.4578