

SAFE-DISTANCE

This is a quick start guide to setup and use the system.

For more detailed information and to download the full set of user guides, templates, training videos and other support material click here: <http://www.reactec.com/support>

SAFE-DISTANCE is an added functionality to the Reactec system for monitoring exposure to Hand Arm Vibration (HAV).

SAFE-DISTANCE determines the proximity of other wearers based on the signal strength of Bluetooth radio signals from the other devices within its vicinity. The strength of the received signal increases as the distance to the other device decreases. Reactec have determined a threshold that indicates a proximity contact which is probably unsafe. All radio technology can be compromised by certain environmental conditions and in particular the position and orientation of the device antennas relative to the human body and each other. The human body can act as a barrier to radio signals. Therefore, certain configurations will affect the distance at which the signal strength threshold is met, leading to a variance as to when the alert is raised. The wrist worn nature of SAFE-DISTANCE however makes the device much less susceptible to the limitations outlined above. SAFE-DISTANCE's ability to detect proximity of wearers is less hampered by body blocking than that of torso worn devices or smart phone-based apps which may be carried in a pocket and therefore SAFE-DISTANCE has a greater likelihood of proximity detection.

A HAVwear will determine that a proximity contact has been detected should the signal strength indicate that the other unit is close, and the strength of signal is maintained for a configurable length of time. This approach avoids raising false alarms from devices being close for very short periods - such as briefly walking past colleagues.

In response to a number of customer requests, Reactec have enabled Cohort and SAFE ZONE functionality within its SAFE-DISTANCE offering.

A Cohort facility allows the identification of a small number of individuals to be controlled as a working cohort, meaning that these individuals are allowed to work within close proximity of each other. When in close proximity the individuals will not receive alerts and the time will be recorded separately as cohort time.

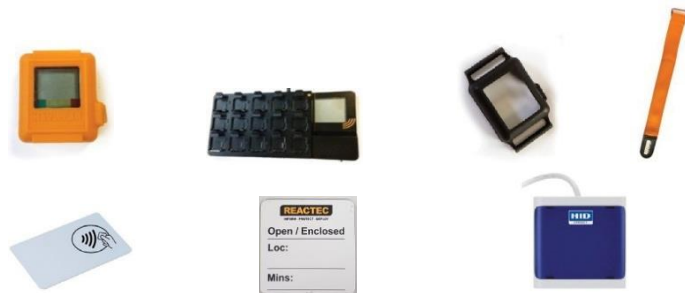
SAFE-ZONES are used to indicate areas where an individual is not at risk from being in contact with germs as the area has physical barriers to prevent transmission. While such physical barriers may prevent virus transmission, they may allow radio signals to pass through and hence create a false proximity detection. SAFE-ZONE tags allow you to switch off detection of proximity.

It should be noted that any device used for social distancing based on Bluetooth is not an accurate or fool-proof measurement system and should only be considered an aid to support implementation of social distancing measures in the workplace.

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01 Checklist of items required

Hardware:**Software:**

- Internet enabled windows computer
- Reactec Analytics Platform Account
- Card Manager Software
- Tag Manager Software
- RFID Read/Writer Driver

02 Downloads

An online Reactec Analytics account is required to log into www.reactecanalyticsplatform.com

The software and driver downloads can all be accessed via the  button at the top right of the screen within Reactec Analytics. You will need your Analytics username and password to login and access this.

Card Manager Software:

The Operator ID Card Manager Software is essential software to program Operator ID Cards.

Tag Manager Software:

The Tag Manager Software is essential software to program SAFE ZONE Tags.

RFID Read/Writer Driver:

When installing the RFID reader/ Writer, please install the driver from the Reactec Analytics Downloads prior to connecting the device. Once downloaded, then connect the device to your PC/ tablet through a USB. **Please note:** If you connect the device prior to installing this driver, dependant on operating system a driver may be installed automatically, but that driver may not work as expected.

03 Gather Information

List of Administrators: Details of personnel who will require to be set up as administrators to:

- Manage access to reports;
- Program operator ID cards.
- Program SAFE-ZONE Tags.

List of line Management: Details of personnel requiring access rights to view reports.

List of operators: Names with unique ID for all users of the wearable. (Please use the template)

Populate Operator ID Template:

- Operator ID number, maximum 16 characters to include any numbers and letters from A-F only. This is a unique number used to identify the user within your organisation.
- First name and last name of the user.

04 Reactec Analytics Platform Set-Up - Users

*Further support:
Software Admin Guide*

Types of Reactec Analytics user accounts:

- **Report:** View reports (no ability to add or amend any information within the Analytics).
- **Group Administrator:** Manage Users, Operators and manage data for specified Groups.
- **Administrator:** In addition to the above, manage all User accounts, all Groups, Permissions, Options and Data.

How To:

1. On the top Toolbar, select "Users".
2. Select "Create New".
3. Enter employee's details (The user ID must be unique across the system) and select type of user.
4. In the Modules field, select Social Distancing to provide access to these reports.
5. Select on or off to receive alerts if proximity is detected. The report will be sent after 3am the next day.
6. If setup as an Administrator specify if the User requires access to System and/or Operators
7. Select Create to add the employee to the list of users.

05 Enable SAFE-DISTANCE & Settings

Settings which determine how readily and how quickly a HAVwear will detect a proximity contact are included in the Social Distancing setup options.

Further support available
Software Admin Guide

How To:

- On the top tool bar, select **Data/Project Manager**
- On the side menu select **SETUP > Social Distancing Options**.
- Tick the **Enabled** field

Changing the sensitivity setting from standard to low will result in the HAVwear detecting a proximity when two HAVwear are closer together. The standard sensitivity setting has been optimised for typical workplace environments to provide an alert to the operator of a contact distance of typically 2m. Different environments may require a different setting depending on their effect on the radio signals used in proximity detection, so a limited degree of adjustment is provided through this function. Note the company global settings marked with an Asterix below can be adjusted at a docking station level. See the Reactec Analytics Software Administration guide on how to edit a Docking Stations settings.

- ***Contact Start Period:** After a 5 secs period to detect proximity this setting controls for how much longer the HAVwear waits to confirm the ongoing presence of a signal and start the period of detection. Good alignment between devices or enclosed environments can lead to false positives which are infrequent and short in duration. Extending the start contact from the default of 5secs will reduce these events
- **Contact End Period:** Defines the minimum period of time for which no signal is detected for the HAVwear to end the detection of a proximity record. Reactec recommend 5 secs.
- ***Alert Type:** Choose whether the HAVwear user receives an alert for proximity which is “vibrate and Beep”, “vibrate only” or “none”
- **Max Short Contact Duration:** Defines a period of time where the detected proximity will be considered short and reported as green in the Workforce Contact report.
- **Max Moderate Contact Duration:** Defines a period of time above which the detected proximity will be considered sustained and reported as red in the Workforce Contact report.
- ***Sensitivity:** Reactec recommend a sensitivity of standard to detect a distance of around 2m. A lower setting will cause devices to need to be closer together to detect proximity. A low or very low sensitivity setting may be preferred in enclosed areas such as offices.

06 Data Retention Options

Social Distancing Settings can only be updated by a companywide Administrator.

With appropriate consideration to obligations of GDPR, whereby personal data should only be retained for a period of time that reflects the purpose of the data, the proximity data held within the Reactec Analytics database will be automatically deleted after a period configured by you.

How To:

- On the top tool bar, select **Data/Project Manager**
- On the side menu select **SETUP > Social Distancing Options**.

Reactec recommend the default settings as below:

The screenshot shows the Reactec web interface. At the top, there is a navigation bar with the Reactec logo and several menu items: Dashboards, HAVS, Tools, Resources, Location, Notifications, Noise, and Social Distancing. A 'Data/Project Manager' button is highlighted in the top right corner. On the left side, there is a sidebar menu with categories like MANAGE GROUPS, OPERATOR ADMIN, ASSET ADMIN, TOOLS, DATA, and CONTROL MEASURES. Under the 'SETUP' category, 'Social Distancing Options' is highlighted. The main content area is titled 'Social Distancing Options' and contains several settings. The 'Enabled' checkbox is checked. Other settings include 'Contact Start Period' (5 seconds), 'Contact End Period' (5 seconds), 'Alert Type' (Vibrate only), 'Max Short Contact Duration' (30 seconds), 'Max Moderate Contact Duration' (10 minutes), and 'Sensitivity' (Low). Two settings are highlighted with red boxes: 'Contact Tracing Data Retention' (6 weeks) and 'Aggregate Data Retention' (6 months).

- **Contact Tracing Data Retention:** The contact tracing data in the “Contact Tracing” report will be deleted after a period ranging from 2 to 12 weeks. This identifies all other individuals that any one individual has been in contact with.
- **Aggregate Data Retention:** The aggregated proximity data in the ‘Workforce Contact’ report which you may use for social behaviour management of individuals will be deleted after a period of between 2 and 12 months. The aggregated data does not identify the individuals that any one individual has been in contact with.

07

Program Operator ID Cards

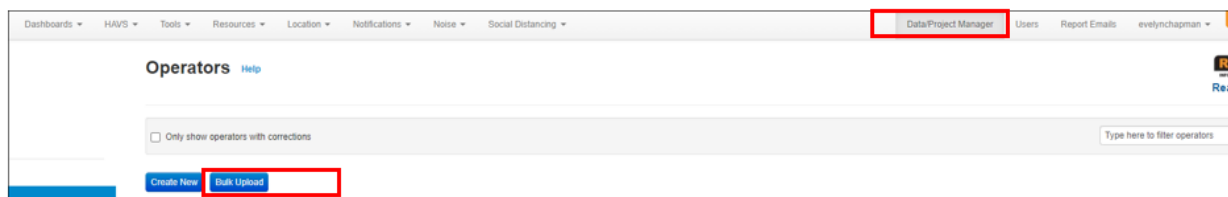
Programming Operator ID Cards can only be carried out by a Group Administrator or companywide Administrator.

Further support available
Card Programming Guide

Activity - Click [here](#) to watch the video on how to program operator ID cards.

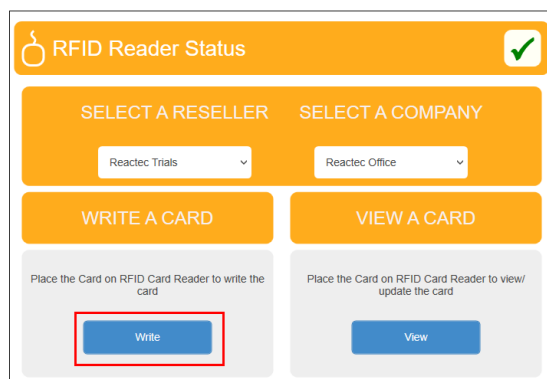
Uploading the Operator ID Card Template

1. Select **Data/Project Manager** from the top toolbar
2. Select **operators** from the side menu
3. Select the **Bulk Upload** button
4. Select **Browse**, locate the saved template, then click **Open**
5. Select **Import**
6. Operators will now be visible in the Analytics Software Operator list



Program Operator ID Cards

1. Open Operator ID Card Manager Software.
2. Login using the Analytics Software account credentials.
3. Connect RFID Read/ Writer to the computer. A green tick will be displayed in the RFID Read/ Writer Status box.
4. Click **Write a Card**
5. Place an Operator ID Card on the RFID card Read/ Writer.
6. A green tick will be displayed in the Card Status.
7. To upload the data to the card, press the appropriate **Write** button.
8. To program another Card, simply remove the previously programmed Card and place new one on the RFID Read/Writer.
9. Select **Close** to exit the Software.



RFID Card Status					
Forename	Surname	CSCS ID	Operator ID	EA#	ELV
Ann	Walker		520202	100	400
Barbara	Bell		520203	100	400
Buzz	Ry		520211	100	400
Claire	Burns		520218	100	400

08 Label Sets / Cohorts

Editing Labels/Labels Sets can only be updated by a Group Administrator or companywide Administrator

Labels and Label Sets are a common mechanism used to add data for arbitrary grouping purposes such as Cohorts

Individuals identified as belonging to a cohort will not be alerted when they come within close proximity of a cohort colleague. They will be alerted if they come into close proximity of any colleagues outside of their cohort. The time that they spend within proximity of a cohort colleague is recorded and reported within the Workforce Contact report and Contact Tracing report as cohort time.

A Cohort Label set has automatically been created in the Analytics, to add Labels to this Label Set follow the steps below:

- On the top tool bar, select **Data/Project Manager**
- On the side menu select **Label Sets**
- **Click Edit**
- Type the name of the new Label
- Click **Add new Label** (if you wish to add more Labels continue this process)
- Click **Update**

Assign operators to the created label set by clicking **assign**

09

Programming SAFE ZONE Tags

An operator tags onto a SAFE-ZONE tag to indicate that they are in a protected area. Tagging in to a SAFE-ZONE tag has the effect of preventing a proximity detection.

Program SAFE ZONE Tags:

1. Open Tag Manager Software.
2. Connect RFID Read/ Writer to the computer. A green tick will be displayed in the RFID Read/ Writer Status box.
3. Click **Edit Tag**
4. Place a Tag on the RFID card Read/ Writer.
5. A green tick will be displayed in the Tag Status. The SAFE-ZONE tag is programmed with the following information
 - I. The **Zone Type** – Open or Enclosed
 - A. When tagged to an “**Enclosed**” SAFE-ZONE, proximity with another HAVwear or RASOR will not be detected and the user will not be alerted.
 - A. When tagged to an “**Open**” SAFE-ZONE, proximity with another HAVwear or RASOR will not be detected and the user will not be alerted if they are also tagged into a SAFE-ZONE. If the approaching individual has not been tagged into any type of SAFE ZONE their proximity will be detected and the user will be alerted.
 - II. The name of the **Location** of the tag (up to 32 characters)
 - III. The number of **Minutes** after which the operator will be automatically tagged out of the Safe Zone (defaults to 10 minutes, can be set to zero if no timeout is required).
 - IV. Optionally, the **latitude** and **longitude** of the location of the tag. (If these fields are completed, then a map icon will be displayed in the Reactec Analytics, a map icon will be displayed to allow the user to view the location of the Tag on Google Maps.
6. To upload the data to the Tag, click **Update**
7. To program another Tag, simply remove the previously programmed Tag and place new one on the RFID Read/Writer.
8. Select **Close** to exit the Software.

Note: Within the Reactec Analytics, SAFE-ZONE tags can be viewed and a sub set of attributes can be managed. SAFE-ZONES will be automatically shown in the analytics after they are first used by a HAVwear user.

The screenshot shows a software window titled "Tag Status" with a green checkmark icon. Inside the window is a form titled "TAG DETAILS". The form contains the following fields:

- Tag Type: SafeZone (dropdown menu)
- Zone Type: Enclosed (dropdown menu)
- Location: Board Room (text input)
- Minutes Valid: 60 (text input)
- Latitude: 55.92603 (text input)
- Longitude: -3.308150 (text input)

At the bottom right of the form are two buttons: "Cancel" and "Update". The "Update" button is highlighted with a red box. A red box also highlights the "Tag Type", "Zone Type", "Location", "Minutes Valid", "Latitude", and "Longitude" fields.

10 Hardware verification

*Further Support Available:
Docking Station Install Guide
Operator Posters*

- Connect 12V DC power supply to a mains power outlet then connect the power supply output connector to the Docking Station.
- Dock the HAVwear Modules into the charging bays of the Docking Station, ensure that the green LED on the charging bays illuminates to indicate that communication between the module and the Docking Station is successful. Failure to communicate will result initially in a flashing red LED followed by a continuous red LED being illuminated on the charging bay.
- Docked modules should be charged for an hour initially before sign out.
- Connect the Ethernet RJ45 connector of the Docking Station to a Local Area Network which has a DHCP server running using a Category 5 or higher ethernet cable (not supplied). Ports 21, 8021, 37729, 37730 and 7000-7099 are used by the Docking Station, network firewalls must be configured appropriately for successful communication between the Reactec Cloud Server and the Docking Station.
- When the Docking Station has communicated with the Reactec Cloud Server the date and time shall be configured and displayed on the Docking Station.



11 Operator Training

*Further Support Available:
Operator Posters
Training Video*

Note:

The wrist strap is personal and should always be subject to appropriate occupational hygiene procedures regarding cleaning and replacement

Ensure operators can demonstrate;

- Signing out a HAVwear.
- Fitting the HAVwear into the wrist strap and onto the wrist.
- An understanding of the HAVwear screen display and alerts.
- How to Tag into and out of a SAFE ZONE
- An understanding of when to expect a SAFE-DISTANCE warning

12

SAFE-DISTANCE Proximity Detection

- SAFE-DISTANCE contact detection relies on the detection of a Bluetooth (BLE) signal within one device of a signal emitted by a second device.
- The strength of the signal is used to indicate the proximity of the two devices. Field evaluations have resulted in the settings within your device to most likely detect if the distance between the two devices is less than 2m. This is deemed contact by the device.
- Factors can influence the consistency of when proximity is detected including the body significantly blocking the signal between the two devices or a reflective surface creating spurious signals.
- A REACTEC device will determine that it is too close to another device if the signal strength indicates that the other device is close and the strength of signal is maintained for at least 5 secs. This approach avoids devices being close for very short periods such as walking past raising false alarms.
 1. The HAVwear constantly scans for other HAVwear devices
 2. If a HAVwear detects a number of consistent signals that tells it another HAVwear is too close for > 5 secs the HAVwear receives a short buzz
 3. The other HAVwear will only buzz if that HAVwear has also detected that another HAVwear is too close for > 5 secs. This is usually the case but not always as one HAVwear may have a different environment to the other eg how the HAVwear face is orientated relative to the body
 4. Once the short buzz has been emitted if the HAVwear does not detect that you have moved away by 10% of the detected signal, it gives a second longer buzz after 30 secs
 5. A long buzz will be repeated every 30 secs until you move away
 6. There can be a delay until receiving the long buzz – which can therefore be received after you have moved away. The display will return to HAV points or blank when the device has detected that you have moved away
 7. When not detecting a HAVwear too NEAR, the display shows HAV exposure points or is blank for SAFE-DISTANCE only HAVwear.

13

Daily SAFE-Distance Email Alert

Further support available
Software Admin guide

A daily SAFE-DISTANCE email alert will be sent to all users that have the alert enabled. This email will contain counts of aggregated social distance contacts and a link to view the data for the given day on via the Workforce Contact Report.

To enable Users to receive daily alerts, log into the Analytics;

- On the top tool bar, select **Users**
- Click **Edit** on the specific User
- Select **on or off** to receive alerts if employee contact data exceeds the “short” contact period. The report will be sent after 3am the next day.
- Click **Save**

The content of the email will be as follows:

From: reports@reactec.com <reports@reactec.com>
Sent: 28 August 2020 04:02
To: Developer <developer@reactec.com>
Subject: Reactec Analytics Platform - SAFE-DISTANCE Proximity Alert



Reactec Analytics Platform - SAFE-DISTANCE proximity alerts

Alert Summary:

Report Date	27/08/2020
Report Time	03:00
Operators with moderate proximity detections	5
Operators with sustained proximity detections	0

[View the details here](#)

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SAFE-DISTANCE Reporting

The "Social distancing" reports menu will be displayed in the navigation bar of the Reactec Analytics for users that have the Social Distancing report module enabled. Within this menu users will be able to access a number of reports examples of which are shown below.

Further Support Available:
Reports User Guide

To provide Users with access to the new Social Distancing reports, log into the Analytics;

- On the top tool bar, select **Users**
- Click **Edit** on the specific User
- In the Modules field, select **Social Distancing** to provide access to these reports
- Click **Save**

Workforce Contact Report

This report shows social distance contacts for the selected date range and categorises the contact times for each contact as green amber and red depending on whether they are short (<the max short contact duration), Moderate (>the max short contact duration but < max moderate contact duration) or Sustained (> max moderate contact duration).

Group	Operator ID	Name	Contact Time (Mins)			Contact			Cohort Time (Mins)		Last Seen	Actions	Intervention
			Days	Total	Average	Short	Moderate	Sustained	Total	Average			
Unassigned Resources	520202	Ann Walker	12	4.7	0.4	21	0	0	0	0	16/07/2020	View	+
Unassigned Resources	520203	Barbara Bell	4	6.5	1.6	26	0	0	0	0	16/07/2020	View	+
Unassigned Resources	520216	Clare Burns	1	2.8	2.8	8	0	0	0	0	06/07/2020	View	+
Unassigned Resources	520205	James Robertson	7	16.1	2.3	26	0	0	0	0	15/07/2020	View	+
The Office	520201	Jessica Munro	3	5.3	1.8	18	0	0	0	0	13/07/2020	View	+
Unassigned Resources	520207	Laura Turner	2	26.6	13.3	8	1	0	0	0	16/07/2020	View	+
Unassigned Resources	520219	Monica Dee	6	5.2	0.8	17	0	0	0	0	16/07/2020	View	+
Unassigned Resources	520204	Nico Molloy	2	23.3	11.6	7	1	0	0	0	16/07/2020	View	+
Unassigned Resources	520209	Oliver Solikjaer	14	24.5	1.8	72	0	0	0	0	16/07/2020	View	+
Unassigned Resources	520206	Roger Dickson	1	2.8	2.8	16	0	0	0	0	16/06/2020	View	+
Unassigned Resources	520217	Terence O'Reilly	1	2.2	2.2	6	0	0	0	0	16/07/2020	View	+
Unassigned Resources	520210	Tom Logic	20	21.4	1.1	75	72	0	0	0	17/07/2020	View	+
Unassigned Resources	520221	Visitor Five	2	20	10	6	21	0	0	0	15/07/2020	View	+
Unassigned Resources	520220	Visitor Four	2	6	4	5	21	0	0	0	16/07/2020	View	+
Unassigned Resources	520208	Visitor One	5	31.8	4	14	1	0	0	0	16/07/2020	View	+

Contact Analysis By Contact Report

This report is a drill down report that is accessible from the Workforce Contact Report by clicking the By Contact button for anyone individual. This report shows the details of all contacts for an individual as shown below:

Date	Duration
24/08/2020	2
C No2	1.8
C No3	0.2
26/08/2020	7.2
C No7	2.9
C No13	1.2
C No8	0.9
C No2	0.6
C No11	0.4
C No5	0.3
C No9	0.3
C No12	0.3
C No10	0.2
C No4	0.1
Grand Total	9.2

Data will be recorded for any proximity detected between two devices regardless of which company owns the devices. This report may therefore show contacts for another company with ID information which would allow the other company but not you to identify the individual from the other company.

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FCC Regulatory Information

The following information is related to HAVwear Module device with FCC ID 2YAGFHVW001 and 15 Bay Docking Station (No GPRS) with FCC ID 2AYGFHVWDST001

Warning: Any changes or modifications made to the device not expressly approved by the party responsible for compliance may void the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules. 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 equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Specifications

HAVwear

Operating Temperature	-10C to +35C / +14F to +95F
Power	Rechargeable Lithium Ion (not user serviceable)
Bluetooth	BLE 4.2
RFID Reader	13.56MHz, Near Field
Dimensions	37mm(1.46 inches) x 38mm(1.50 inches) x 15mm(0.60 inches)

15 Bay Docking Station (No GPRS)

Operating Temperature	0C to +40C / +32F to +104F
Power	12V DC, 2.5A
RFID Reader	13.56MHz, Near Field
Ethernet	10 Base T / 100 Base Tx
Dimensions	338mm (13.3 inches) x 180mm (7.1 inches) x 50mm (2 inches)