Temperature sensor for COVID-19 automatic screening and real-time data analytics

CoronaSense is a connected terminal that reads users' body temperatures. Based on the average room temperature and the readings of other users according to specific adaptive rules, the terminal warns the current user of his situation by the means of an alert. The alert can be visual (color LCD screen, green = OK, red = alert), audible (alarm), or trigger an event such as sending an email and/or SMS. The temperatures measured are also recorded in a database. The principle is simple:

1. Install the device on a stand or on a wall at human height.
2. Present employees and/or customers in front of the device.
3. Read the result displayed on the terminal

Reliable

The devices use advanced statistical and machine learning functions to establish an accurate result. The sensor (thermal camera) is tested to an accuracy of 0.2° C. The measurement is made from 2 to 30 cm, the exact distance being measured by a LIDAR type detector.

Connected

Each module is Wi-fi compatible. An application gives you access to the main statistics and allows you to remotely manage your machine park. Your data remains your property and is confidential. The device does not depend on an external service for calculations and can operate independently without a connection.

Integrable

Integrate your access system by RFID / NFC cards or badges for a personalized temperature monitoring (anonymized or not). Integrate the measurements into the personnel database and issue daily alerts or reports.

Economical

The device, developed and manufactured in Switzerland, is positioned at an extremely affordable price.

It can be equipped with optional modules (RFID, battery, PoE, automatic door relay...).

Ecological

The plastic used is a compostable polymer made in Switzerland from sugar beet. At the end of the COVID-19 crisis, the module can be recycled for a new life and other uses.

Updated

The module is updated regularly and automatically to add new features. Our team of developers is at your disposal to customize the system.

Principle

Alert after 1 second

4 levels of alert

Visual alert (text and colour), sound, e-mail or SMS

1) If the user has an RFID badge, it must be placed near the device. The badge is then recognized.
2) The user walks towards the detector, with the forehead positioned 2-5 cm from the sensor (optional model available for measurement at 30 cm). If the user is placed incorrectly, the module displays an error message.

3) The sensor detects the user's presence and distance and takes 10 temperature acquisitions in one second.
4) The sensor filters the temperature data in order to limit errors due to head movements.
5) The module compares the temperature data with the database of old measurements. If he has presented his badge before, the comparison data will be for his identity. Otherwise, it will be the measurements in a given time interval (for example, the last 2 hours, or the previous day at the same time).
6) If the measurement deviates too much from the usual median temperature or exceeds a configured threshold, a "fever" alert is given. The user is then prompted to perform further medical tests. The alerts are set up in advance and can respond to complex rules.
7) The measurement as well as other parameters (distance, ambient temperature, divergence of acquisitions, time and date) are stored in the device to improve further alerts.

Data and confidentiality

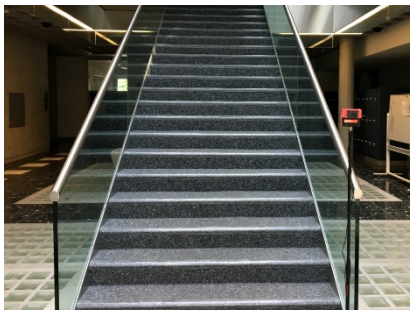
The processing of personal data is a sensitive subject and has recently become the subject of much discussion. Therefore, we have designed this device with care to ensure that data does not circulate outside the company. The raw data is contained inside the box, and there is no way to retrieve it outside the local network (or physically). The only data exported to the cloud are general statistics, as well as configuration parameters for remote control.

For companies that do not want remote configuration, it is possible to completely disconnect the module from the network; the module will then emit a local WI-FI network to which the owner can connect and modify the parameters on the spot.

If the company wishes to use statistics and control of their entire fleet of devices without using the cloud, we can install a version of the program directly at their premises, using Docker type virtual machines.

RFID badges bring additional privacy issues. On our module, the RFID badge is mainly not used to identify a sick person, but to improve tracking over time by comparing previous measurement data for the same person. We have therefore by default made the badge's uses anonymous by applying a one-sided 256-bit encryption algorithm that makes it possible to compare two identities. However, it is impossible when searching the database to retrieve the original profile.

Pictures



Technical specifications

Measurement of the temperature between 30 and 45°C
Time for temperature detection: 0.8 seconds
Precision: 0,1°C
Error margin : ≤0,2℃
Precision of distance measurement : 2 mm
Display: LCD color screen
Network: Wi-Fi 802.11 b/g/n, Ethernet 10/100/1000Mbps
Access cards: more than 15 types of RFID badges or cards
Power supply DC 5V ±15% or Power over Ethernet 802.3af
Working temperature: 15-35°C
Size: 198x96x93 mm
Weight: 410 gr (without cable or power supply)
GTIN-13 / EAN : 1115546869116

Availability

A stock of a few pieces is permanently available. Delivery times for options are about one week. Custom modifications are usually deliverable within 10 days.

Features

Users have access to many parameters, which can be remotely modified on the web interface, but pre-configured according to the user's needs and our experience. All parameters are detailed at https://www.coronasense.ch/manual.html.

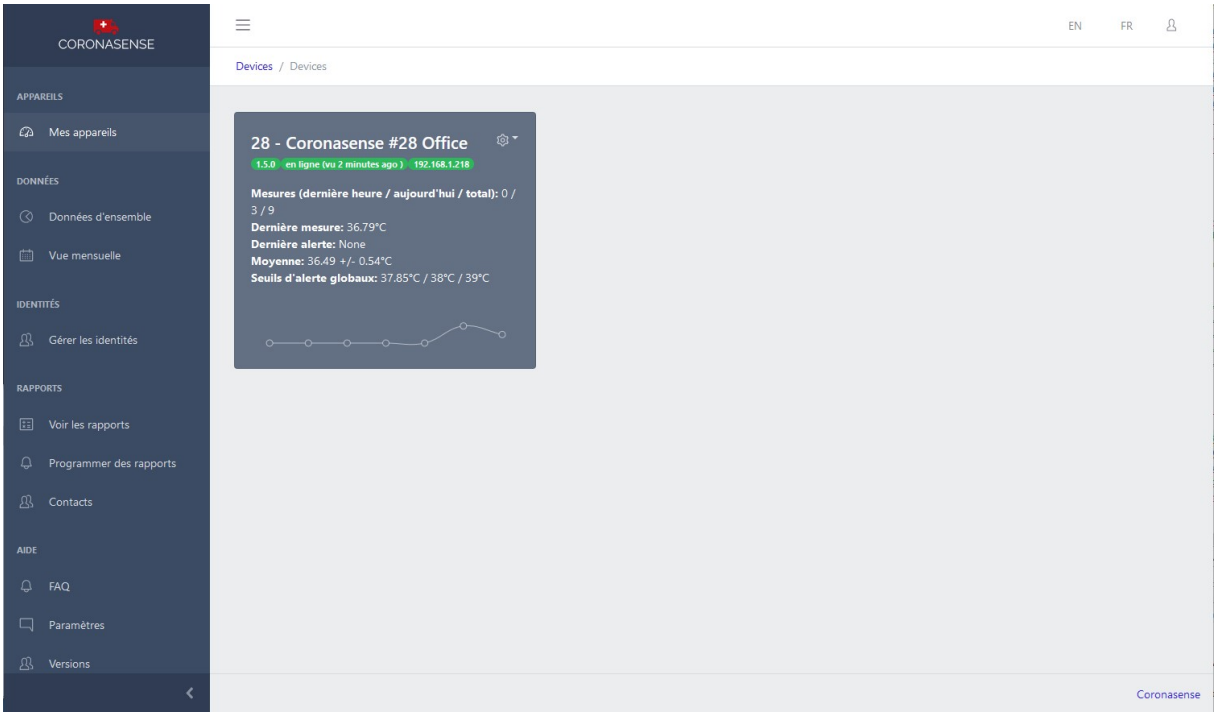


FIGURE 1 REMOTE ADMINISTRATION MODULE. THE USER CAN CONFIGURE THE DEVICES FROM ANY INTERNET CONNECTION OR DEVICE (PHONE, TABLET).

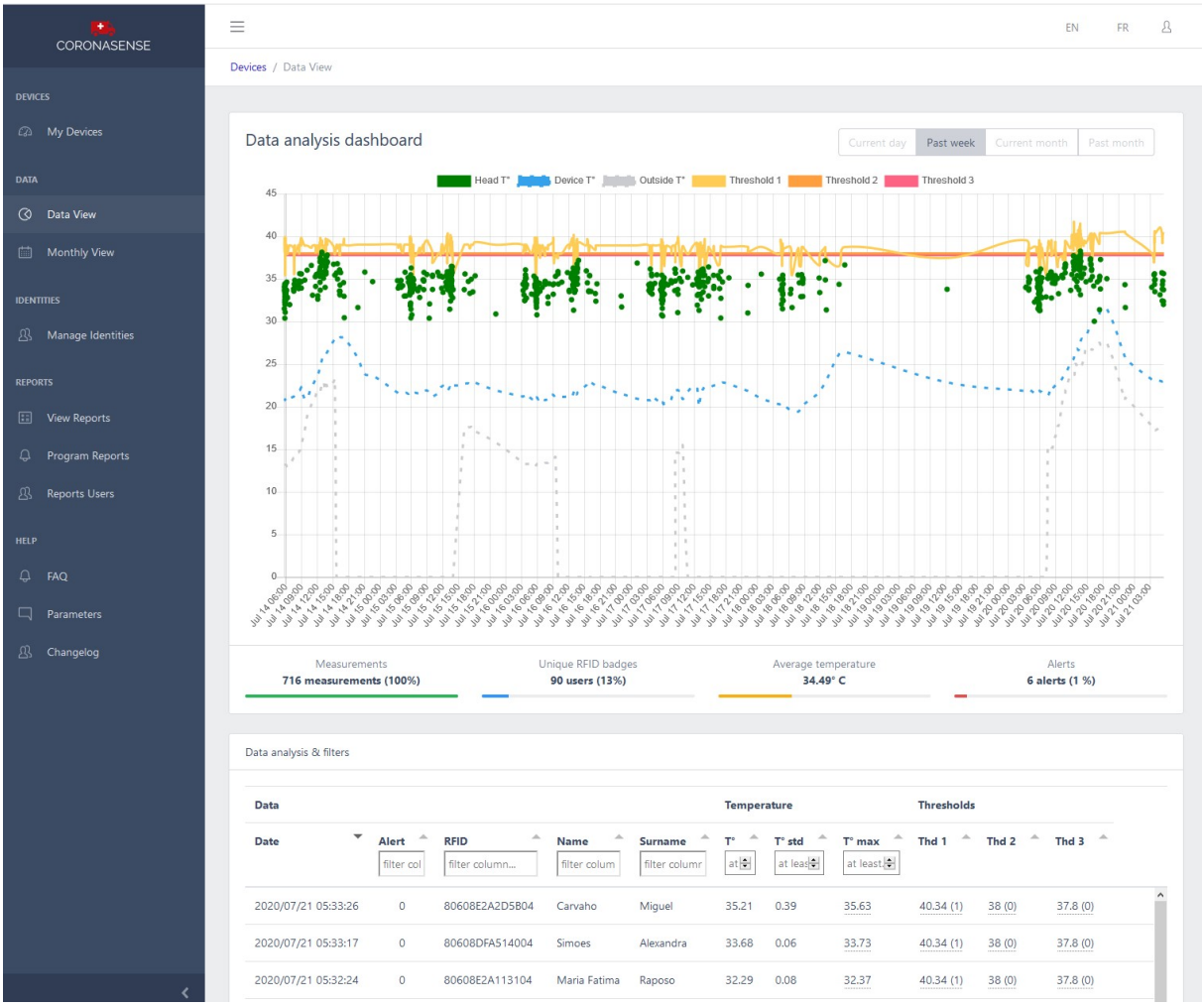


FIGURE 2 MEASUREMENTS AND THRESHOLDS. AFTER 10 TRAINING MEASUREMENTS, THRESHOLD NO. 1 FITS PERFECTLY WITH THE STANDARD DEVIATION OF THE MEASUREMENTS BETWEEN INDIVIDUALS. TWO OTHER THRESHOLDS ARE FIXED.

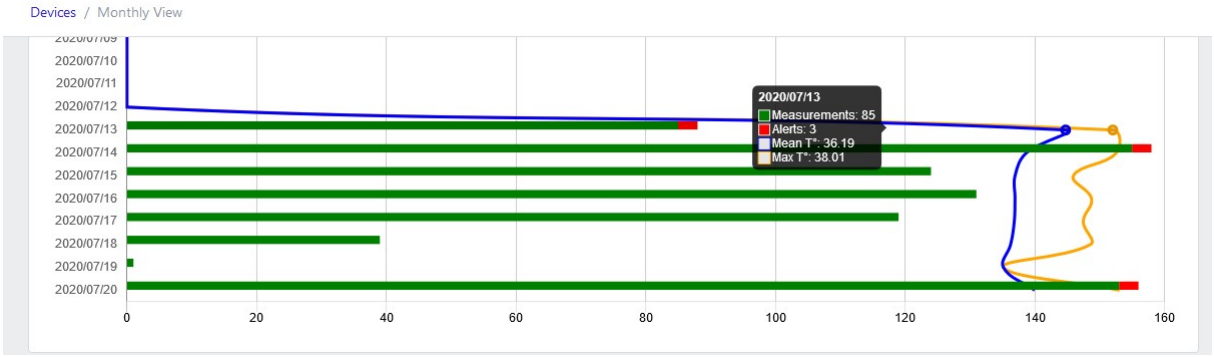


FIGURE 3 MONTHLY REPORTS

The device can be equipped with an RFID antenna allowing you to monitor the temperature of your employees anonymously or compare it to a personnel database. Statistically comparing the temperature to an individual baseline is more accurate than comparing with all users.

Indeed, depending on the individual, the forehead temperature can vary by -/+ 1 degree depending on their physiology, but for the same individual, under the same conditions, the variation is only about +/- 0.2 degrees Celsius. It is therefore possible to increase the accuracy of the threshold by defining it for each individual. The data is usually stored on our own servers, but a local solution can be installed for confidentiality purposes.

We have listed below most of the features that are standard, optional, or available on a custom basis.

Features	Standard	Optional	On request
Admin interface			
Local control interface	•		
Remote control interface	•		
Phone and tablet interface	•		
Detailed statistics and analytics	•		
English/French/German language	•		
Graph of temperatures and thresholds	•		
Detailed reports per day/week/month			•
JSON/CSV/XLSX/PDF database export	•		
SQL database export		•	
Automatic data backup	•		
Remote update	•		
Send data to remote server		•	•
Remote control on client server		•	•
High temperature alerts			
Fixed alert thresholds	•		
Adaptive alert thresholds	•		
Intelligent alert thresholds			•
Custom alert thresholds	•		
Visual Alert	•		
Sound Alert	•		
Mail alert	•		
SMS alert	•		
Identity Recognition			
RFID badge reader		•	
Personal alert threshold	•		
RFID Anonymisation	•		
Add RFID Identity	•		
Identity database integration	•	•	
Per user report	•		
Per user language			•
Hardware options and connectivity			
RJ45 Ethernet Port		•	
PoE (Power-over-ethernet) Port		•	
Standalone mode	•		
Wi-Fi	•		
Hardware options and connectivity			
Internal UPS battery		•	
GPS			•
4G/LTE connection		•	
External power supply (USB)	•		
Electrical relay		•	
Housing in RAL colour (Swiss Made)			•
5° optic for measurement at 30 cm		•	
LIDAR distance sensor	•		
Color display	•		

Rear LCD display		•
Cast iron base foot 100-170cm	•	
Wall bracket	•	

Pricing

The public price for a CoronaSense device is 890 CHF, including a cast iron base tripod, a 3m cable and a power supply; it includes a remote control interface and update subscription for 12 months. We undertake to buy the device back after 12 months for the sum of 100 CHF for recycling. The module continues to work after 12 months. Prices are available in Euros at the rate of 1 EUR = 1.03 CHF.

Extras :

- On-site installation, training, and configuration
- RFID module
- 4G/LTE module
- GPS module
- Battery module (UPS)
- Relay module (door control, etc
- Ethernet module
- Ethernet module + POE (power over ethernet)
- Optical module to capture at 30 cm
- Customized reports and access control, custom module development: hourly pricing

Contacts

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