



Contents

Introduction	3
Digital Innovation made real	4
Benefits of algorithms	6
Solutions	
- Driver Safety	8
- Worker Efficiency	10
- Worker Safety	12
- Location Monitoring	14
- Intelligent Care	16
Product Specifications	18

Introduction

Enabling a Human Centric world

A hyperconnected business will be able to exploit the data and insights from IoT to ultimately: see more; act faster; predict rather than react; optimize every aspect of a business; and change the way it creates and delivers value.

Being a Hyperconnected Business means better informed business decisions, faster business growth, significant competitive advantage, individual empowerment and operational efficiencies.

IoT is a core enabler for the future hyperconnected business and a key driver of digital transformation and business innovation. Hyperconnectivity will see the connection of people, information and things in ways that fundamentally change business and society. The World Economic Forum in 2014 stated that Hyperconnectivity will be to the 21st Century what the Combustion engine was to the 20th Century.

Fujitsu aims to create an environment to support innovation on a proven IoT platform, powering digital transformation with IoT solutions and services for the transformative enterprise. Our strong portfolio of our own intellectual property is combined with a broad ecosystem of partners. Our IoT solutions range from enterprise wearable devices, middleware software, cloud platforms to standardized business solutions for customer verticals. They leverage both our own, and partners, expertise in analytics and AI.

Digital Innovation made real

A hyperconnected society is a world where people, information and things / infrastructure are connected together to fundamentally change the way that we live and work.

UBIQUITOUSWARE is Fujitsu's brand for the front-end interface for Human Centric IoT. Ubiquitouswear is a range of solutions designed to convert raw sensor data into valuable business insights.

SoE (System of Engagement) for Digital Business Innovation

Innovation in Business Processes

Creation of new Products / Services

Expansion of Company Ecosystems



SoR (System of Record) for Existing Information System

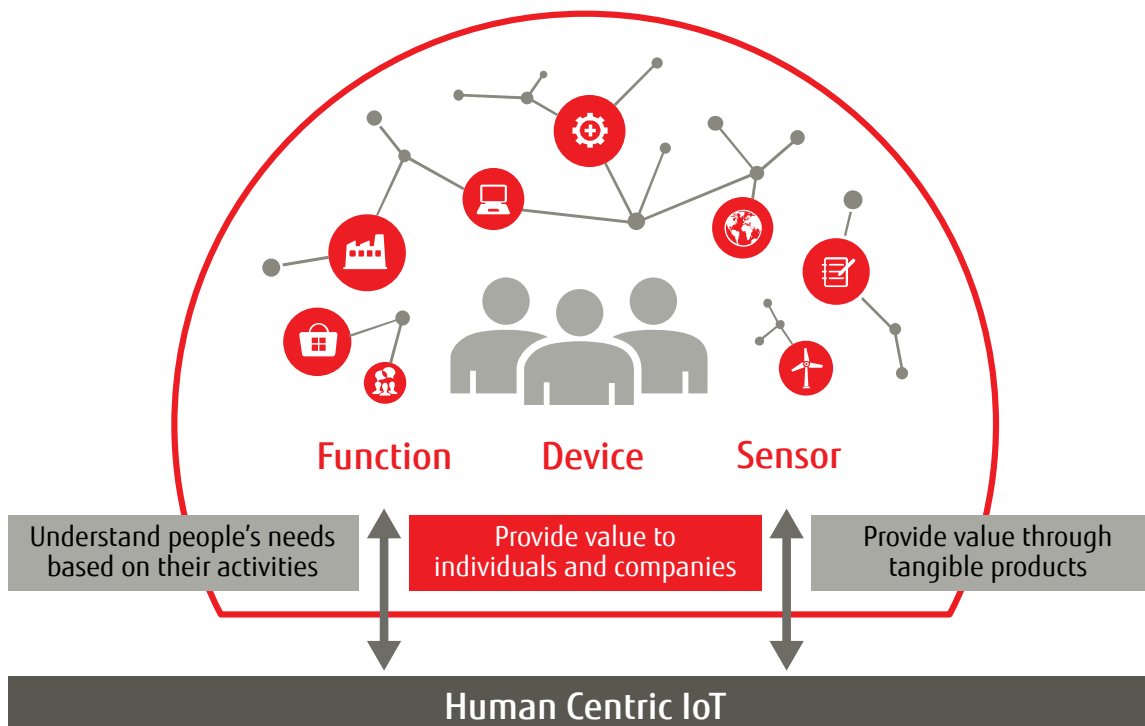
Operational Efficiency

Cost Reduction



Human Centric IoT, Fujitsu's Goal

By implementing IoT, you can understand your users' needs and fulfill them with tangible products. We call this the "Value Proposition Cycle"



The advantages of UBIQUITOUSWARE



Immediate On-site use

As a comprehensive solution, from sensors to software, UBIQUITOUSWARE can be used wherever the customer is located.



Use only what you need

UBIQUITOUSWARE can be provided on-premises via the cloud or through partial incorporation in your products – whatever best meets your needs.

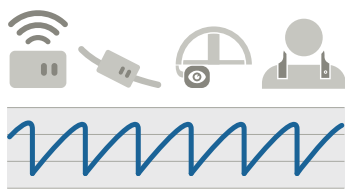


Highly accurate algorithms

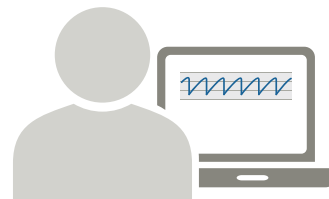
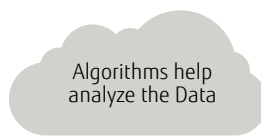
Over 68 rich algorithms can be used to detect the behavior of humans and objects in a highly accurate way. More than 49 patents* have been obtained after proving accurate human centered analysis of falls, heat stress and worker wellbeing etc.

*As of July 2017

UBIQUITOUSWARE Components



Sensors collect a range of data



Software confirms detected events

UBIQUITOUSWARE Customization

Fujitsu UBIQUITOUSWARE Solutions, including Cloud based SaaS, are tailored to meet customer needs

UBIQUITOUSWARE Benefits



Worker Safety

Monitoring of workers in harsh environments can realize a safer workplace



Location Monitoring

Analysis of tracking data allows accurate assessment of worker locations and optimization of staffing and layout



Driver Safety

The driver receives support that enhances driver safety



Intelligent Care

By focusing on sounds, resident safety is improved without impacting privacy



Worker Efficiency

Remote Support and AR help improve operational efficiencies

Benefits of algorithms

Analyzing Sensor Data via algorithms



Motion

Fall Detection
Posture Detection



Location

Indoor Location Positioning
Outdoor Location Positioning



Vital

Heat Stress Estimate*¹
Physical Load Estimate*²

*1. Heat stress level is calculate by pulse rate and environment level (Meteorological Society of Japan's' WBGT level in relation to temperature and humidity")

*2. Physical load measurement based on the Karvonen formula and person's pulse.

Sensor algorithm data from the Cloud and learnt from people's behavioural patterns. Data Noise is automatically eliminated to improve Detection Precision



Health Management



Status Confirmation



Danger Avoidance



Work and Progress Management



Tracking Analysis



Site Monitoring

Results can be applied to various services through a combination of Sensors and Algorithms



Take Advantage of Fujitsu's Know-how

Fujitsu sensing data analysis know-how, long cultivated in mobile phones and other devices, can be employed in your products and services. Fujitsu has more than 68 types of rich sensor algorithm and 49* of them received patents.

*As of July 2017



Obtain valuable data from sensor algorithms

The sensor algorithms transform sensor data into valuable event information. For example, acceleration and atmospheric pressure data can be used to determine notifiable events such as how much a person walked or whether he or she fell down.



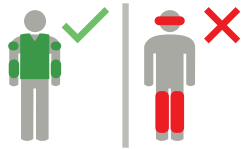
Quickly and easily implementation

Fujitsu's original algorithms can significantly reduce development man hours. Our sensors and solutions can be incorporated into your systems including your own algorithms which can also be developed in the system.

The advantage of Sensor Algorithms

Where the Sensor may be worn

The sensor can be worn in various places on the body, including anywhere on the arm or torso



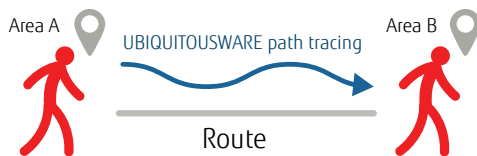
Highly Accurate Step Measurement

Individual walking characteristics such as step timing, speed and stride are taken into account to accurately track personnel in real-time



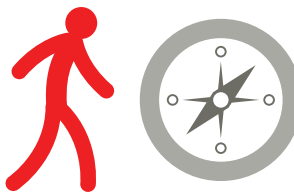
Tracking

Walking speed and direction of movement can be calculated by analyzing individual pace characteristics such as step timing and stride.



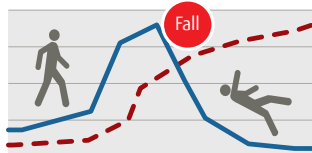
Estimate of orientation when moving

Highly precise direction estimation



Fall Detection

Multiple Sensors estimate worker condition and detect falls. Fall detection takes postural data into account to distinguish between falling and jumping or lying down



Physical posture detection algorithms
Physical posture patterns are learnt through analysis



Erroneous detection is reduced by eliminating extraneous data (noise) when personnel lie down or appear to be falling

Competing solutions

Most competing solutions use acceleration data only, making it difficult to determine if the wearer has fallen or not.

Sensor Functions



- Posture Detection
- Fall Over Detection
- Fall Down Detection
- Activity Amount
- Step Count
- Indoor Location Information
- Outdoor Location Information
- Map Matching
- Geofencing
- Physical Load
- Estimate Hot Environments Index for Body *1
- Estimate Heat Stress Level *1
- Estimate Pulse Rate *1
- Wearing Detection

*1: Not all sensors can measure pulse, temperature and humidity.

Hardware Line-up



Solution

Driver Safety

The Fujitsu Driver Drowsiness Detector is a wearable sensor device that detects when drivers are drowsy based on their pulse. The product, which uses a proprietary algorithm developed by Fujitsu Laboratories, monitors the driver's pulse via a sensor attached to the earlobe, gauges drowsiness based on that and notifies the driver and their vehicle fleet manager.

The device is worn round the neck with a small sensor clip attached to the drivers earlobe which picks up pulse waves, the proprietary algorithm can then detect any sign of drowsiness of which the driver may not be conscious. The device also includes a learning and calibration algorithm meaning an individual's profile accuracy is improved through continued usage.

The product can be used at individual level connecting via the drivers Smartphone in this instance the driver can access an on device dashboard of their current status as well as looking at time logs of a day or journey to identify moments on increased drowsiness.

In an instance where the solution believes the driver is at an increased level of risk the device can vibrate to alert the driver whilst also informing the remote fleet manager/supervisor of the increased risk levels.

Once the data has been captured it is possible to analyze potential routes causing drowsiness using the web application dashboard and plan route swaps to avoid tiredness caused by repetitiveness. From our discussions fleet operators are already using on-board telematics as a way to reduce insurance premiums so the solution will be positioned in this way as well as the immediate Health & Safety benefits to Drivers, other road users and pedestrians.

The sensor is both waterproof and dustproof to stand up to daily usage and has a planned battery life of 45 hours (9hrs per/day x 5 days per/week).

Name of Solution:
Driver Safety

What it does:
A Wearable solution to alert drivers when attention/drowsiness is detected

How is it used: The sensor is worn round the neck of drivers and measures their biorhythms, the device identifies a loss in attention which is part of a drowsiness curve allowing a driver to self-manage their level of drowsiness and in parallel allowing the organization to optimize route planning.

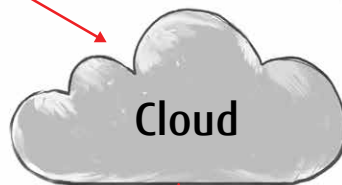
What is the benefit: Driver Health and Safety/Wellness

Who is the customer: Horizontal Transportation Offering

- 1 An HGV Driver is on a long-haul journey. Her Driver Drowsiness Detector has determined that she is starting to show signs of drowsiness, and now looking for somewhere to stop



- 2 As well as acting as a driver aid, all alerts are captured within the web management tool for analysis



- 3 After getting some much needed rest, the driver is able to safely set off on her journey again



- 4 Information can be gathered from multiple drivers that can illustrate which routes are more likely to result in driver drowsiness. Fleet managers can then use this to forewarn drivers of these routes or part of

Fig. 1 - Example Scenario

Driving Safety support features



A user-friendly sensor detects drowsiness

Lightweight 94 gram (approx.) design

The smart design is easy to use. Worn around the neck, it weighs only about 94 grams and includes a sensor on the earlobe that measures vital signs such as pulse.

Selectable alert by sound or vibration

Fujitsu's proprietary algorithm determines the drowsiness of each driver, even before the driver realizes it him or herself, and the device uses sound or vibration to alert the driver.

The battery is extremely long lasting

The battery was designed with long-haul driving in mind and supports five continuous days of operation.



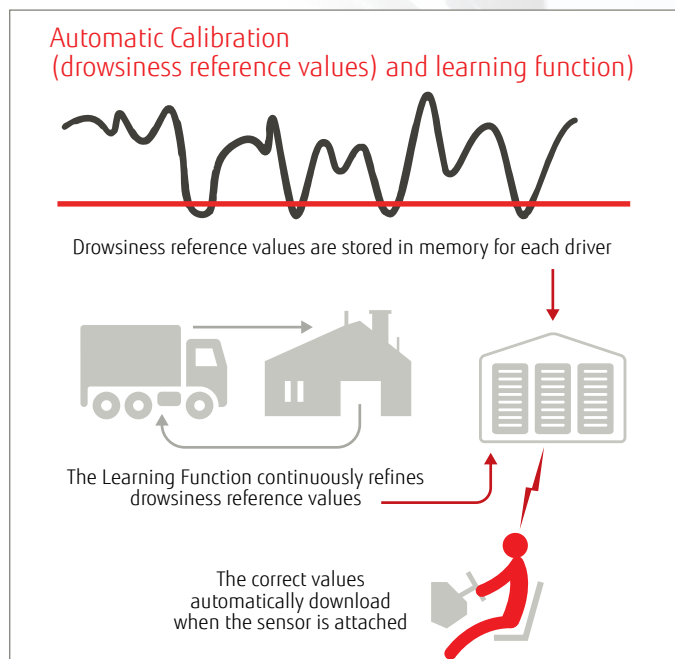
High-precision detection of drowsiness optimized for each driver

The system automatically calibrates reference values for each individual driver. Its learning function adapts to vital signs that vary from day to day for each driver to ensure accurate drowsiness detection.



Effective driving safety management through driver and manager collaboration

Visualization of driver status is realized by linking the driver with the fleet-operation management system. By grasping driver status in real time and employing accumulated data, effective driving management becomes possible for the driver and fleet manager.



Solution

Worker efficiency

When considering worker efficiency for field working specifically there are 2 major issues, firstly related to first time fix rates where 1 in 3 is the average fix rate performance and secondly the significant predicted shortage in field engineers over the next 10 years.

To improve first time fix rates the solution can be used to ensure engineers have either a clearly defined Augmented Reality (AR) Process Flow to follow supporting the more efficient repair and maintenance of equipment. This can also be enhanced by an AR Overlay by enhancing a view of a piece of equipment and supplying the engineer with online stored material such as maintenance records & installation manuals. Both AR Process Flow and AR Overlays additionally allow centrally held information to be updated and stored in real time.

Key for Remote Support is around bridging the engineering skills gap allowing experienced/specialist engineers to support multiple new engineers in the field accelerating the transfer of knowledge and experience. The Remote Support

(Over the Shoulder/See what I can See) can then be utilized for less skilled/experienced engineers plus education/support and remote site evaluations.

HMD & Web application Solution:

The FUJITSU Head Mounted Display (HMD) acts as a communication tool between operators and their supervisor delivering support and sharing remote imagery in real time. Using the web application client we can create/support and enable the workforce with the materials and support they need.

The HMD is the perfect partner for augmented reality environments delivering hands free ease of use to enhance remote support, maintenance and training through the robust industry focused design. It consists of an adjustable non see-through display positioned in front of either eye, wearable keyboard, integrated camera and voice control/command. In addition, the device contains a variety of sensors to detect the users' environment and behavior.

Name of Solution:

Worker Efficiency

What it does:

HMD and Web application Augmented Reality solution

How is it used:

To deliver improved worker efficiency and help bridge the engineering skills gap through the use of Head Mounted Display and web application AR Process Flows/Head Mounted Display and web application AR overlays/Head Mounted Display and Web application Remote support

What is the benefit:

Improved worker efficiency and centralized support functions, bridging the engineering skills gap

Who is the customer:

Horizontal Offering

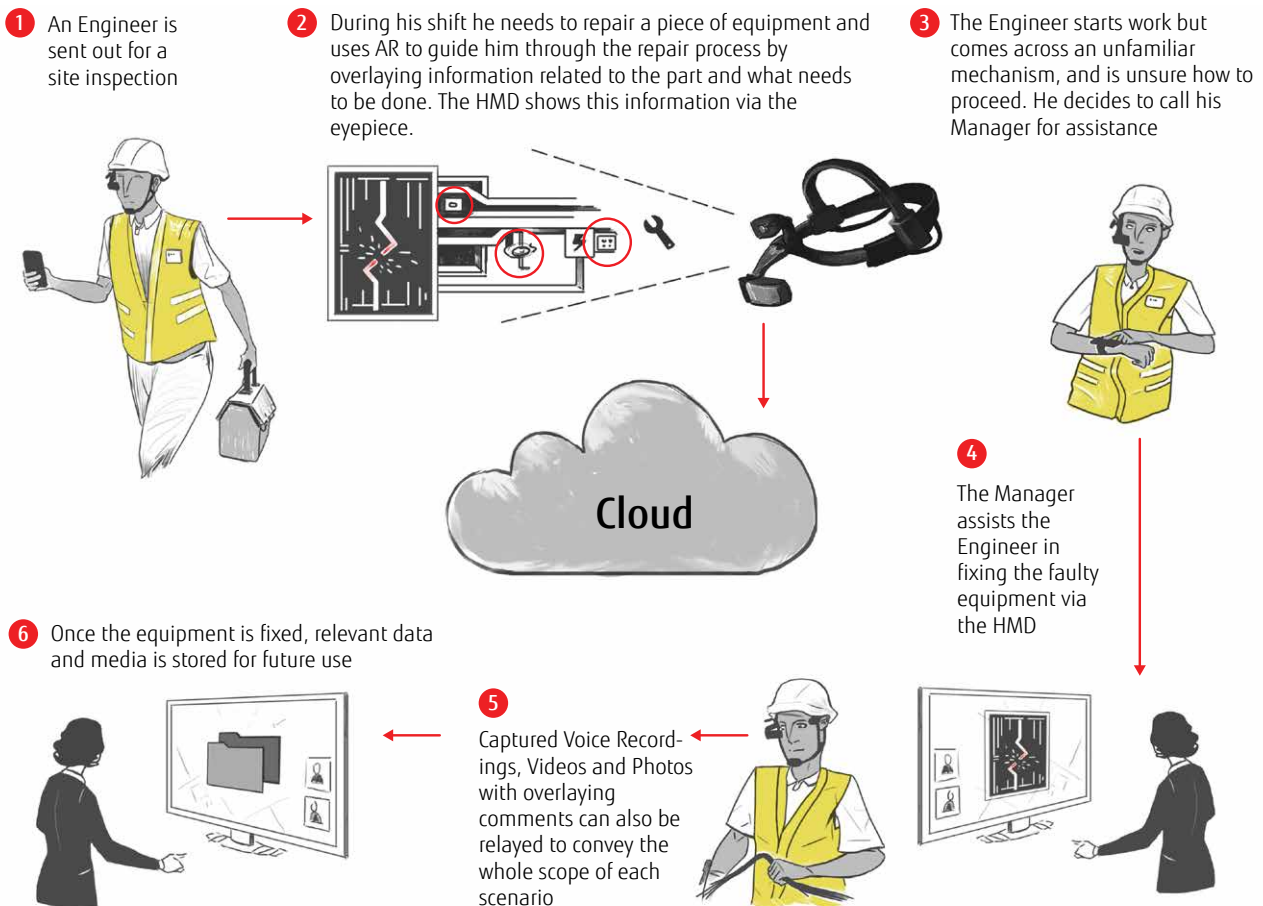


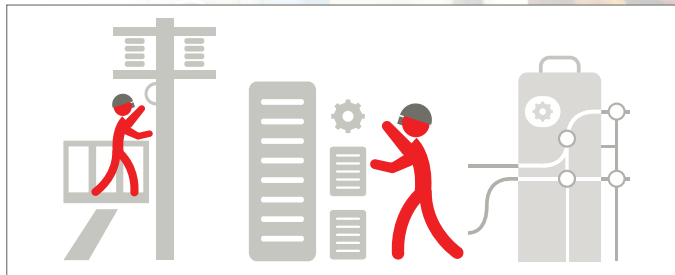
Fig. 2 - Example Scenario

Features of on-site operation support



Usable anywhere, hands free

Even when working at precarious heights where both hands are needed, workers can make voice commands and continue using hands for operation. The headset can be attached to a safety helmet. Readability is assured even at outdoor worksites in sunny weather. With a non-transparent extension positioned in front of one eye, workers can easily check necessary data.



Augmented reality enhancing efficiency

Augmented Reality (AR) can be broken down in 2 defined areas AR Process Flow and AR Overlays. AR Process Flow used to deliver a step by step supported repair process which is a more efficient way to repair and maintain equipment. AR Overlay's can also be used to enhance the view of equipment with online stored material such as maintenance records & installation manuals. Both AR Process Flow and AR Overlays additionally allow centrally held information to be updated and stored in real time.



Remote support delivering experience in every location

Remote Support can be used to bridge the engineering skills gap allowing an experienced engineer to support multiple new engineers in the field accelerating the transfer of knowledge and experience. To compensate for the engineering shortfall over the coming years, organizations can remove experienced engineers earlier from the field with the use of Remote Support. The remote support (Over the Shoulder/See what I can See) can then be utilized for less skilled/experienced engineers plus education/support and remote site evaluations.



Ideal for crucial worksites, whether indoors or out

The sturdy device survives drops from a height of <math><1.5</math> meters. Water- and dust-resistant, it functions reliably in poor weather and at sites exposed to dust or water.

*IP5X/IP7X (water-resistant), IP5X (dust-resistant)



The sensor detects human movements to make quick discovery possible

The built-in sensor captures up and down movements and the image is accurately displayed whether worn under the left or right eye. The light sensor detects surrounding light and automatically adjusts display brightness for optimal visibility.



Solution

Worker Safety

When using IoT solutions to support worker safety we look at 3 key aspects: Predict/Measure/Respond - **Predict** an issue before it happens **Measure** accurately to avoid false alarms and **Respond** ensuring businesses can effectively manage an incident based on accurate location information and details.

Key when managing a workforce is understanding the location of workers to ensure that when an issue arises support can be effectively deployed to the right location. This can be automated using our proprietary algorithms or via the manual emergency button. Typically GPS is used outdoors but when a greater level of accuracy is required or monitoring workers indoors we use the BLE locators allowing real time, low latency, high accuracy location monitoring.

Managing worker safety is paramount especially in the field or when operating alone, so the ability to predict issues such as heat stress or increased levels of risk associated with working at height is crucial. However, incidents still happen so the accuracy of measurement is key. For example, in order to

ensure fall detection is as accurate as possible we take data related to Acceleration / Barometric pressure changes but as important is a period of nothing to determine if the worker has jumped or fallen. If you jump you continue on your way but if you fall you remain for a short period. Once you accurately detect a fall then a response can be sent to the identified location.

Once an individual has support in the field further business support is provided to the individual and also groups/teams. When managing a workforce in the field organizations need to have the ability to monitor/track those individuals as standard or by exception when an instance occurs. The web application dashboard allows all of this from single to multiple users displaying core vital and environmental data/location/event history etc. Whilst allowing this level of control the Interface also allows new devices/sensors to be managed and deployed. Additionally new events and rules can be set for when incidents do occur so that the right response is delivered / Alert on the Map / SMS / Call etc.

Name of Solution:
Worker Safety

What it does:
A Wearable solution for lone/ field workers

How is it used:
This solution is delivered as a combination of Sensor and Algorithm - The Vital Band links through the IoT platform which contains Fujitsu proprietary algorithms to help highlight levels of risk, 'Predict' then 'Measure' any incident as accurately as possible when it happens and then 'Respond' based on this knowledge.

What is the benefit:
Health and Safety/Wellness

Who is the customer:
Horizontal Offering

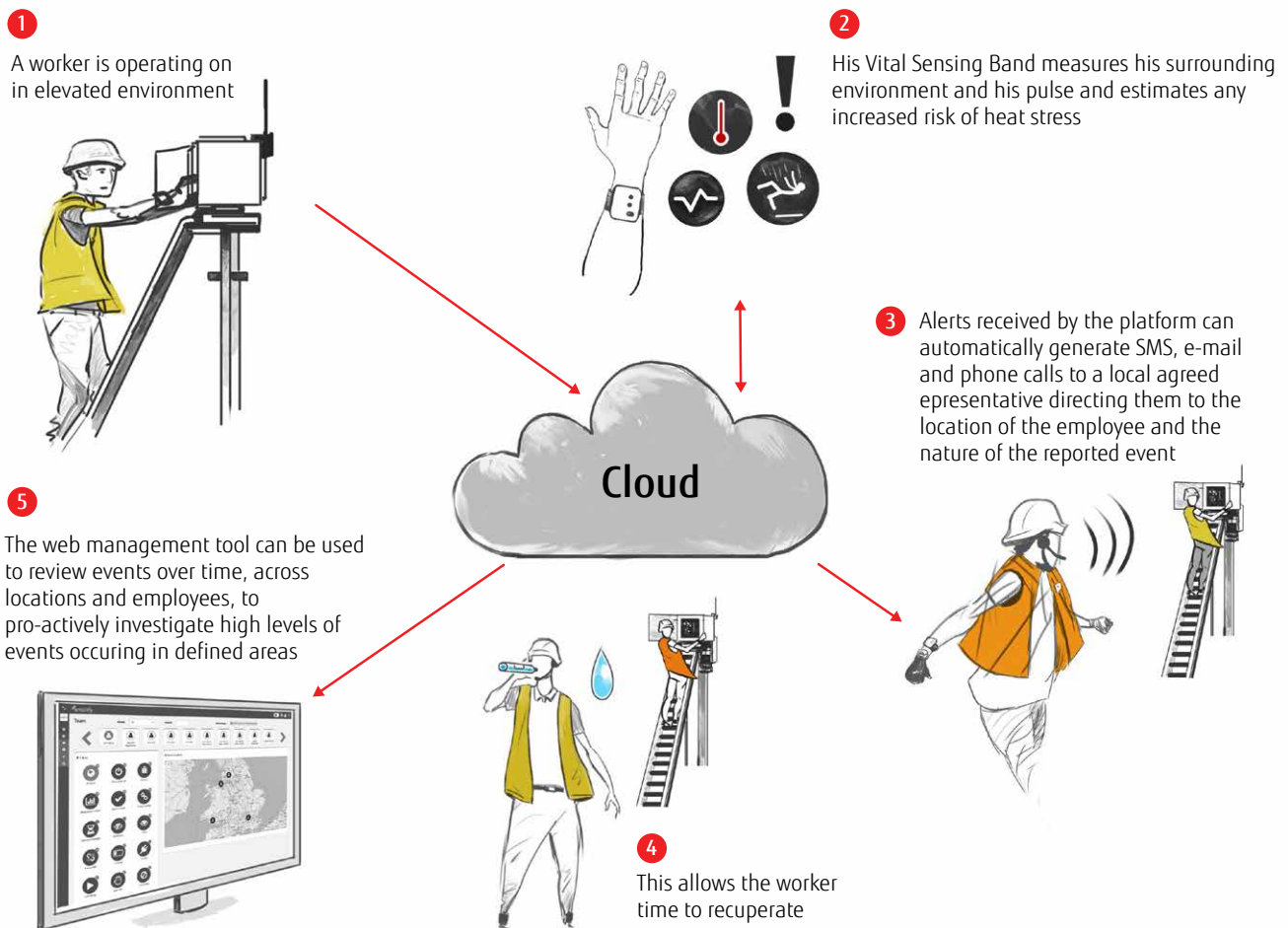


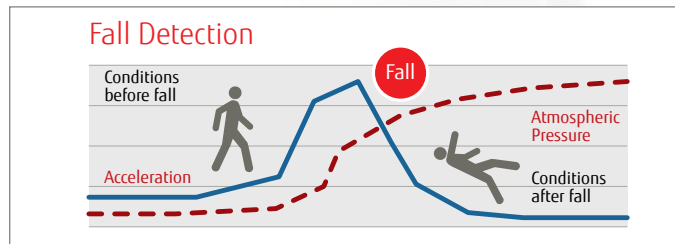
Fig. 3 - Example Scenario

The benefits of safe labor management



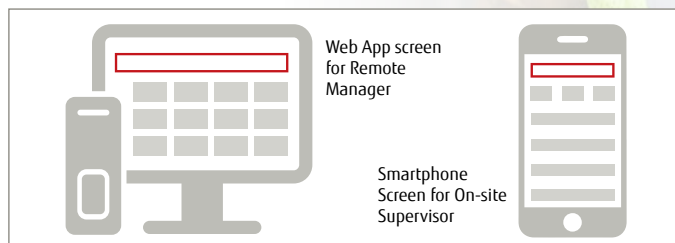
Detection of high and low falls based on analysis of atmospheric pressure and acceleration¹

The movement of tumbling or falling can be determined by a combination of changes in atmospheric pressure and acceleration. This allows for much more accurate detection than when using only acceleration data.



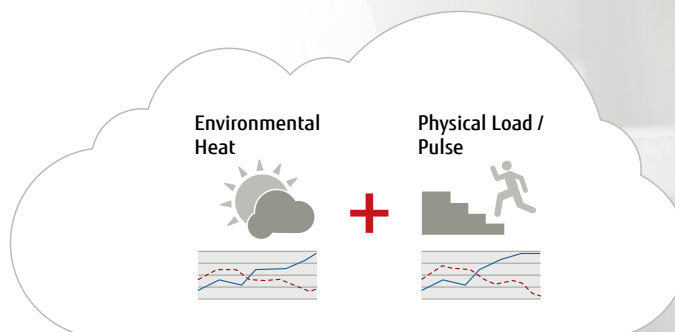
Review onsite status through a web app

Web application allows the remote manager to confirm the conditions of workers on site, determine whether an alarm has been activated and verify whether responsive measures have been taken. The supervisor on site can change the alarm status via smartphone application where available.



The heat stress alarm takes worker physical state into account

Heat stress is evaluated based on more than temperature and humidity². The environmental index and physical state of each wearer of the device are also taken into account and an alert is displayed if predetermined levels are reached.



¹A location badge enables fall detection and a vital sensing band enables fall probability assessments.

²Development and evaluation are jointly performed by Ohara Memorial Institute of Labor Sciences and a Public Interest Foundation.

Solution

Location Monitoring

Challenges

Key when managing a workforce is understanding the location of the workers to ensure that when an issue arises any response can be effectively sent to the right location, this can be automated using our proprietary algorithms and delivered seamlessly between Outdoor and Indoor locations.

Location monitoring is an effective tool when assessing operational efficiency and work flow optimization. The solution has been developed to help you understand where people or assets are; for example shared equipment on site, in addition where a business needs to understand how many workers are on site or they enter restricted or dangerous areas. All allowing responses to be made when needed or analytics and insights to be gathered from the flow of workforces to improve process and optimization within the work environment.

Name of Solution:

Location Monitoring

What it does:

A wearable location solution for lone/field workers

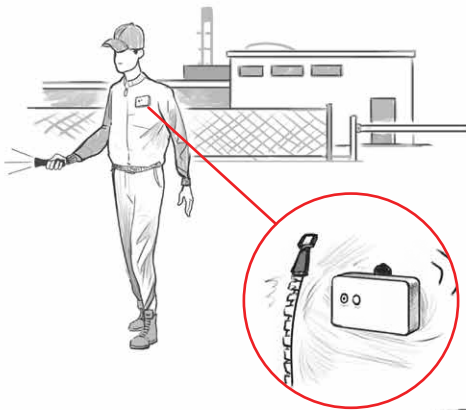
How is it used:

The location monitoring solution is delivered as a combination of Sensor and Algorithms - The solution uses both GPS for Outdoor monitoring and RTLS or Beacons indoors allowing worker location to be accurately monitored or used to 'Respond' when an incident occurs

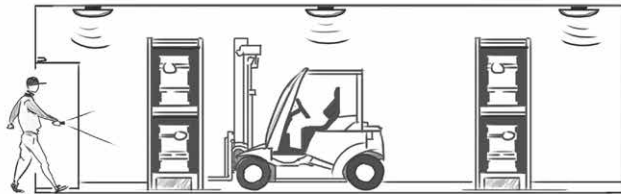
What is the benefit:

Health and Safety/Wellness

- 1 A security guard at a chemical storage facility does a routine patrol round the site perimeter. The Location Badge is used to confirm his status



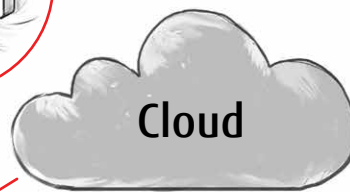
- 2 As the security guard moves indoors, the Locator (placed on the ceiling) activates, this allows for seamless movement from one environment to the next



- 3 A guard, unfortunately slipped on a liquid that had leaked



- 5 A specialist is given the exact location of the guard and is sent in response



- 4 Alerts received by the web management tool can automatically generate SMS, e-mail and phone calls to a local agreed representative directing them to the location of the employee and the nature of the reported event

Fig. 4 - Example Scenario

The advantages of monitoring



Two positioning methods are combined for efficiency

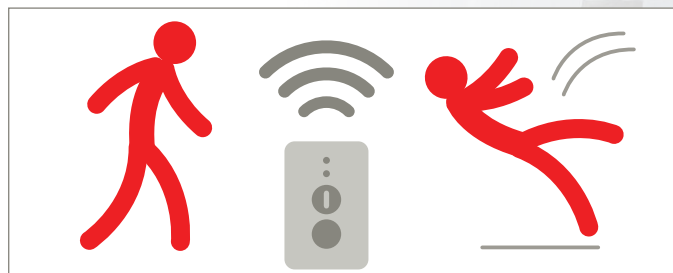
Extensive positioning tracks people and things with minimal equipment via movement path reckoning technology that uses unique algorithms (PDR). In Addition High-Precision real-time positioning tracks the location of staff members, customers and objects with a High level of accuracy and low level of latency (an accuracy of approximately $> 30\text{cm}$). Where Real Time Location Solutions (RTLS) are not required beacons can be used as a lower cost / lower precision option.

Geofencing is a valuable feature, this is when specific location areas can be identified and alerts given when objects or individuals move into or out of these defined areas.



Fall detection can be combined with location detection

Falls can be detected with the location badge, prompt measures can be taken when accidents occur during patrolling and other duties. With the optional notification button on the location badge, employees can request help from a supervisor or central support who can monitor anything out of the ordinary.



Tracking data (including time spent stationary) is accumulated in the cloud and analyzed

In combination with sensor algorithms, the sensor learns behavioral patterns from the accumulated data. The efficiency of operations can be raised by detecting abnormalities and adding them to tracking analysis data. It is also possible to incorporate pinpointed data in a production line simulator and connect it to the logistics system to perform the analysis*.

*A separate connecting system/service is required.

Solution

Intelligent care

Challenges

Today's care solutions are created based on fixed time schedules and with the knowledge and understanding of the last visit. For these residents or vulnerable individuals at home this means the care they are given is targeted based on their general needs and in care homes there is the challenge of a residents privacy. The Remote Monitoring Station has been developed to help deliver a more intelligent solution. The Intelligent Care Solution works to capture and analyse live sound speech, coughs, breathing using Fujitsu's proprietary sound-analysis. The real time environmental data temperature and humidity can also be monitored.

By having this level of insight, care givers can tailor solutions to the specific needs of an individual to avoid intruding on their privacy when everything is ok but being able to react based on changing circumstances or environment. This enables alerts to be given intelligently to carers and family members all helping to keep people at home longer, be less intrusive and help to reduce overall costs but most importantly promote a healthier and more intelligently supported lifestyle.

Name of Solution:

Intelligent Care

What it does:

A Remote Monitoring device to support home living

How is it used:

The Remote Monitoring Station is delivered as a combination of Sensors and Algorithms - The solution monitors the environment using sensors and based on this real time information it allows care givers to respond intelligently based on the needs of residents

What is the benefit:

Health and Safety/Wellness

- 1 A Remote Monitoring Station monitors a resident's daily routine. This information can be used to form a basis that determines whether or not a resident is in a stable condition
- 2 At one point, the resident develops unusual behavioral patterns. The monitor identifies an increased risk and highlights this to a central location

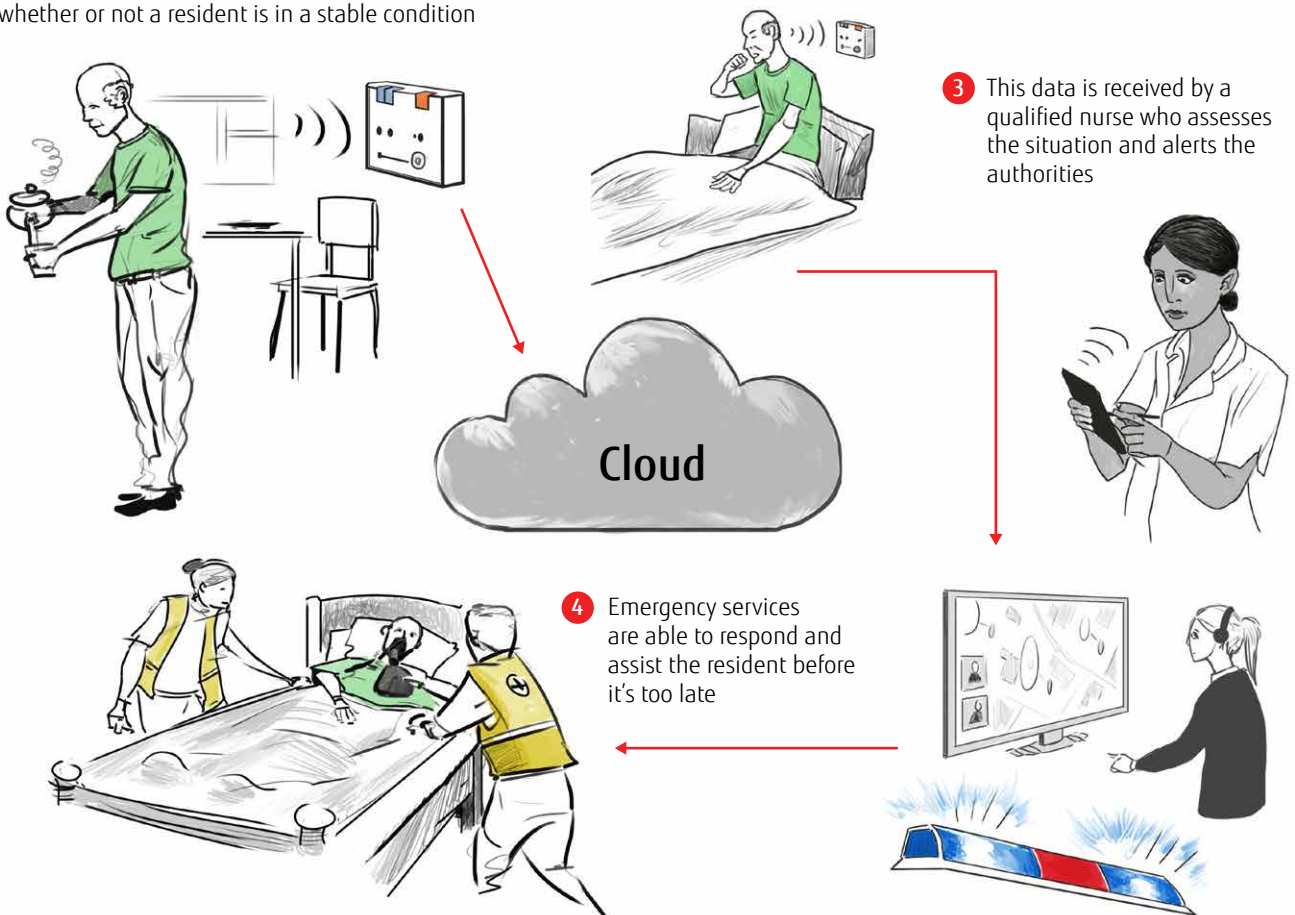


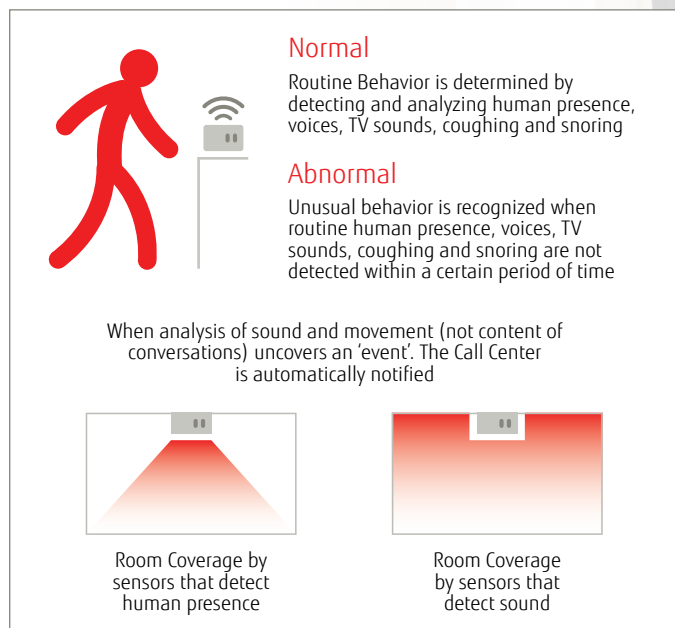
Fig. 5 - Example Scenario

Monitoring features



Original sound analysis technology maintains privacy

Fujitsu's remote monitoring system employs original sound analysis and sensing technology developed for smartphones to enable monitoring of a large living-room-size (>50-square-meter) area from a single unit. The camera-free system recognizes "events" through sound analysis, while maintaining privacy and preventing the leakage of personal information.



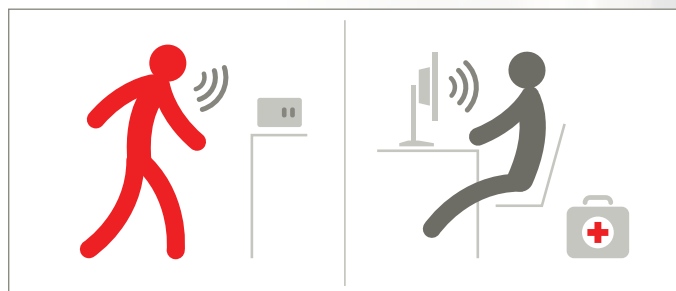
Various types of monitoring via sensing technology

The system detects behavioral and health anomalies by analyzing data from various sensors. Data from a microphone helps determine the frequency and loudness of coughing and snoring and the presence of extraordinary noise, etc. Data from human presence sensors helps determine the location of residents, temperature and humidity sensors help determine room conditions that may affect health.



Direct conversation with the Call Center in emergencies

In emergencies, guests can press the "emergency" or "consultation" button to speak hands-free with someone at the Call Center. Call Center staff can also speak through the equipment whenever behavioral anomalies are detected to check on resident status.



Product Specifications

Head Mounted Display IOT001

Description	Processor: Qualcomm APQ8026 Quad Core 1.2GHz Operating System: Android 4.4.4
Wireless connection	Bluetooth® Version 3.0 compatibility Profiles: HFP v1.1 (HS only); HID v1.1 Bluetooth® Class 2 Wi-Fi Display: Miracast, HDCP 2.2 Wi-Fi WEP, WPA/WPA 2, 802.1x EAP Wi-Fi protocol IEEE802.11 a/b/g/n (2.4GHz, 5GHz)
Audio	Mono speaker Dual-Mic Headphone Jack: 3.5 mm, 4-conductor
External storage	Form: microSD, microSDHC, up to 32 GB Bus interface: High Speed UHS-I File system: FAT16, FAT32
Chemical resistance	Ethanol, IPA, sodium hypochlorite
Dustproof	IP5X
Water resistant	IPX5 / IPX7
Resilience	MIL-STD 810G
Form	Monocular, non see-through
Sensors	Ambient Light Sensor Gyroscope Accelerometer Magnetic Field Sensor
Memory	2GB
Storage	8GB
USB	micro USB (Type A/B) USB 2.0 High Speed MTP mode USB Host (USB On-The-Go)
Dimension details	400 x 350 x 37 mm (W x D x H) display arm extended 290 x 180 x 60 mm (W x D x H) display arm retracted
Weight	Main unit & battery: approx. 315 g Belts: approx. 72 g Helmet attachment clip: approx. 66 g
Operating ambient temperature	5 - 35 °C
Operating relative humidity	20 - 80 % (relative humidity, non-condensing)

Location Unit

	Location Unit (S) IOT004	Location Unit (L) IOT005
Notes	The product is not for medical use and requires additional software to provide functionality	
Wireless connection	Bluetooth® Smart GPS	
Chemical resistance	Ethanol, IPA, sodium hypochlorite	
Dustproof	IP5X	
Waterproof	IPX5 / IPX7	
Resilience	MIL-STD 810G	
Sensors	Accelerometer Gyroscope Geomagnetic Barometric pressure	
Indicator	Colored LED x 1	
Operation	Button x 3 ■ Power ON/OFF ■ Notification button 1 (Configurable) ■ Notification button 2 (Configurable)	Button x 1 Power ON/OFF
Battery Charger	Battery Type: Li-ion 290mAh (non removable battery) Battery Life: Continuous working time approx. 50hr (approx. 6 days for 8hr usage per day) * *battery life will vary depending on the usage Charging method: Charging Terminal connecting to a dedicated charging cradle. Charing time = approx. 150mins	Battery Type: Li-ion 1470mAh(non removable battery) Battery Life: Continuous working time approx. 487hr (approx. 60 days for 8hr usage per day)* *battery life will vary depending on the usage Charging method: Charging Terminal connecting to a dedicated charging cradle. Charing time = approx. 395mins
Dimension details	approx. 30 x 59 x 10.4mm	approx. 51 x 82 x 10.4mm
Weight	approx. 22 g	approx. 61 g
Operating ambient temperature	0 - 50 °C	
Operating relative humidity	20 - 80 %	

Driver Drowsiness Detector FPCDVR77

Notes	This product is not for medical use and requires additional application to provide functionality
Wireless connection	Bluetooth® 4.0 Low Energy
Chemical resistance	IPA
Sensors	Pulse Sensor
Indicator	Indicator, Colored LED x1
Operation	Button x1
Vibrator	Built-in
Battery Charger	Electric supply: AC adapter (Input: AC 100-240 V 50/60 Hz, 0.3 A) (Output: DC 5 V, 2 A) Charging time: 4 hours with AC adapter above Battery Life: Continuous working time approx. 45hr (approx. 5 days for 9hr usage per day)
Dimensions (W x D x H)	330 x 170 x 24 mm
Weight	94 g
Operating ambient temperature	0 - 45 °C
Operating relative humidity	10 - 90 % (relative humidity)

Vital Sensing Unit IOT003

Notes	The product is not for medical use and requires additional software to provide functionality
Wireless connection	Bluetooth® Smart
Chemical resistance	Ethanol, IPA, Hypochlorite
Dustproof	IP5X
Waterproof	IPX5 / IPX7
Resilience	MIL-STD 810G
Sensors	Accelerometer Gyroscope Geomagnetic Barometric pressure Temperature/Humidity Pulse
Indicator	Button x 1
Operation	8GB
Vibration	Built-in
Battery Charger	Battery Type: Li-ion 145mAh (non removable battery) Battery Life: Continuous working time approx. 35hr (approx. 4 days for 8hr usage per day) * *battery life will vary depending on the usage Charging method: Charging Terminal connecting to a dedicated charging cradle. Charging time = approx. 150mins
Dimension details	approx. 36 × 38 × 10.7 mm
Weight	approx. 18 g
Operating ambient temperature	0 - 50 °C
Operating relative humidity	20 - 80 %

Locator / Focusing Locator

Notes	The product is not for medical use and requires additional software to provide functionality
Description	RF transceiver using the 2.4 GHz frequencies
Radio transmission	Bi-directional
Number of channels	81 channels (1 MHz) but only one at the same time
Operating frequency range	2401...2481MHz
Modulation	GFSK
Transmission Power	2.5mW
Antenna	Integrated printed patch antenna with -6 dBi gain
Antenna connector	N/A
Operating voltage when using PoE	48V
Typical power consumption	2 W
Indicator	Colored LED x 1 *Refer to the Instruction Manual for the details
Dimension details	Approx. Ø: 202 mm, h: 40 mm Dimensions Locator mounting bracket: Approx. Ø: 120 mm, h: 5 mm
Weight	approx. 500 g
Operating temperature range	0°C...+60°C
Storage temperature range	1-10°C...+70°C



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