checkit

MONITOR
COMPLY
PROTECT

CONNECTED AUTOMATED MONITORING+

Technical Data Sheet

Monitoring and compliance for critical environments

CONTINUOUS MONITORING

REAL-TIME ALARMS

SECURE CLOUD PLATFORM

BUILT FOR REGULATED ENVIRONMENTS

AUDIT-READY DATA

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Overview

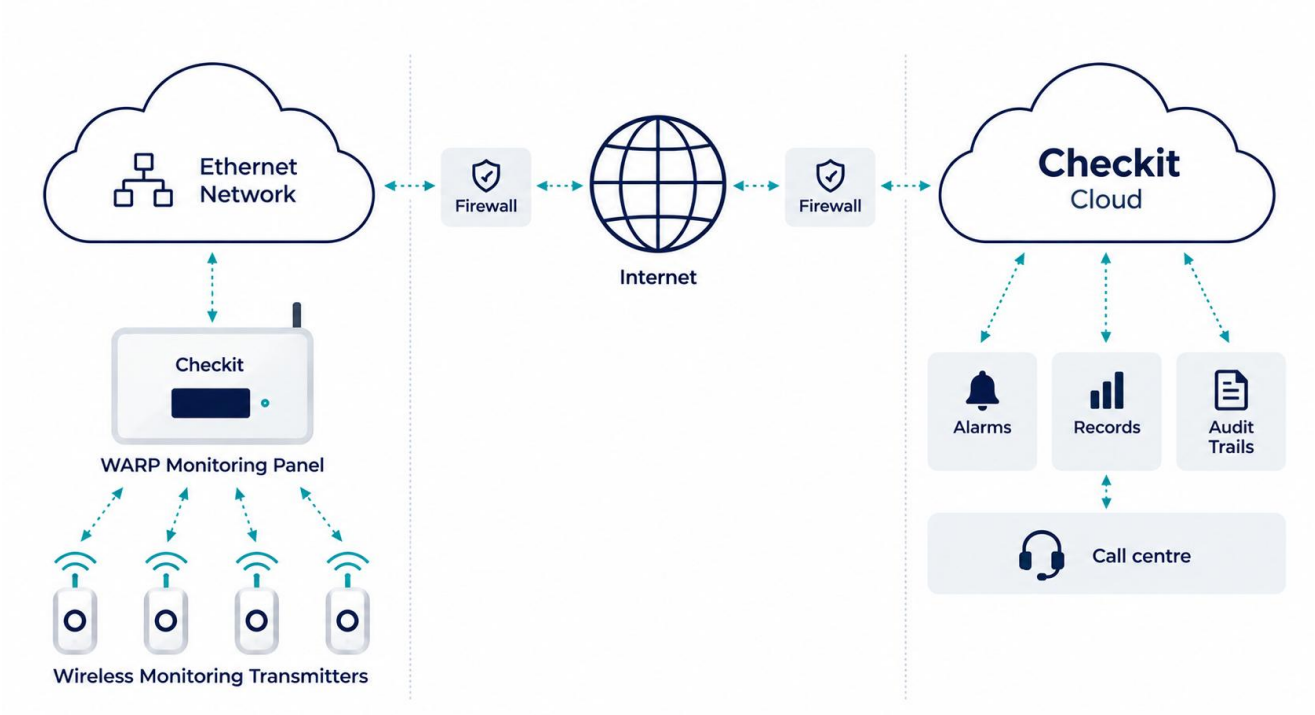
Connected Automated Monitoring+ (CAM+) provides everything you need to monitor and protect your assets in a regulated environment:

- A wide range of sensors, developed to meet the needs of healthcare and life sciences applications for accuracy and compliance
- A reliable and robust radio frequency (RF) network to gather sensor data which can flexibly expand as monitoring requirements grow
- A secure and resilient cloud platform to store data, manage alarms and generate reports

CAM+ is designed for organisations that need to comply with exacting standards including CQC, MHRA, 21CFR, GMP and FDA.

These capabilities are available under an innovative subscription model that spreads costs and provides predictability throughout the term of your contract. For a simple regular fee, our “Peace of Mind” contract model provides both the initial hardware and ongoing calibration, support and hardware failure replacements.

System architecture



Cloud Platform

CAM+ uses the Checkit Cloud Platform to securely store monitoring data and make it available to users through the CAM+ Website. The Checkit Cloud Platform provides the following benefits:

- **Always Up-to-Date**: The cloud platform is maintained and updated by Checkit, so customers benefit from the latest available software without having to manage updates themselves.
- **No Server or Software Required**: CAM+ is cloud-based, so customers do not need to install or maintain an on-premises server or server software. Monitoring data is securely stored and managed within the Checkit Cloud Platform.
- **High Reliability**: The platform is designed to provide reliable storage and access to monitoring data.
- **High Availability**: The cloud platform is designed to maintain continuous access to monitoring data and services.
- **Information Security**: Checkit Europe Ltd is certified to ISO 27001, demonstrating that Checkit maintains an information security management system in accordance with internationally recognised standards.
- **Quality Management**: Checkit Europe Ltd is certified to ISO 9001, demonstrating Checkit's ability to consistently provide products and services that meet customer and regulatory requirements.

Technical Specification

Sensor Data Management	• 1 minute sensor reading intervals (alarming at 60 second precision) • Sensor readings stored securely in replicated cloud stores • Data accessible on CAM+ Website for 36 months • Data stored in database for up to 40 years
Alarming	• Configurable sensor thresholds & alarm delays • System performance alarms (low battery, signal loss, etc.) • Call, SMS, & email alarm notifications • 24/7 alarm call centre & automated alarm calls • 4-stage alarm audit
Reporting	• Tabular and graphical sensor data reports (5 min interval readings) • Live snapshot sensor data report • Alarming reports • Incident Audit report • Configuration and user activity reports • Save to PDF with timestamps & signatures
Analytics	• Optional dashboards on asset availability, asset health and energy saving opportunities

Security	• Password & PIN protected • Automatic password, PIN, & user expiry • Full audit trails of all user actions • Configurable user permissions • Single Sign-On (optional)

System Hardware

Local hardware for data collection, resilience and wireless coverage.



Wireless Alarm Receiver Panel (WARP)

The Wireless Alarm Receiver Panel (WARP) receives and stores data from sensors, sends a copy of the data to the cloud, and triggers alarms.

The WARP is equipped with a screen that displays the latest sensor reading and alarm status of sensors.

Technical Specification

Part number	UK/EU: GENII/WARP/100 US: GENII/WARP/200
AC power range	110/240VAC 50/60HZ
Wireless signal frequency	868MHz Rest of World 915MHz US
Signal range	Up to 70ft
Signal protocol	Mi Wi based T-Mesh™ self-healing protocols
Ethernet connection	Fully configurable IP settings
Network connectivity	Local Ethernet
Rechargeable battery	7 hours standby time from AC power loss
Storage medium	Solid State Drive (SSD)
Storage capacity	40 years, 246 sensing probes, 1 minute frequency
Logging frequency	1 minute
Sensing probe capacity	Up to 246 sensors
Signal repeater capacity	Up to 7 repeaters
Display	Full colour graphical display screen
User interface	Local screen and membrane push buttons
Audible alarm sounder	Optional external alarm

Sensors

Temperature, humidity, gas, pressure and status monitoring for critical environments.



PT1000 Fridge / Freezer Temperature

This temperature transmitter is designed for installation within either a refrigerator or freezer. The wireless transmitter head is mounted outside of the refrigerator or freezer and a pluggable RTD PT1000 temperature probe is installed inside the fixture.

Technical Specification

Part number	UK/EU: GENII/FRZ/101/A US: GENII/FRZ/201/A
Sensor type	RTD PT1000 sensor
Temperature range	-100 to +200°C
Full traceability	Yes
Unique serialization	Yes
Probe cable length	2.0m (6.5ft)
Power source	Battery
Battery life	3-4 years
Local memory storage	7 days
Calibration options	Single-point, two-point, and three-point calibration
Warranty	12 months (unless Peace of Mind applies)

PT1000 LN2 / Cryogenic Temperature

This temperature transmitter is designed for installation within either a LN2 (liquid nitrogen) tank or flask container.

The wireless transmitter head is mounted outside of the fixture and a special pluggable RTD PT1000 temperature probe is installed inside of the tank or flask.

Two probe types are available depending on application:

- Type 1: Suitable for mounting in LN2 storage tanks
- Type 2: Suitable for mounting in LN2 storage flasks

Technical Specification

Part number	Tank: UK/EU: GENII/FRZ/101/TNK/A US: GENII/FRZ/201/TNK/A Flask: UK/EU: GENII/FRZ/101/FLK/A US: GENII/FRZ/201/FLK/A
Sensor type	RTD PT1000 sensor
Temperature range	-200 to +40°C
Full traceability	Yes
Unique serialization	Yes
Probe cable length	2.0m (6.5ft)
Power source	Battery
Battery life	3-4 years
Local memory storage	7 days
Calibration options	Single-point, two-point, and three-point calibration
Warranty	12 months (unless Peace of Mind applies)

NTC Thermistor Fridge / Freezer Temperature

This temperature transmitter is designed for installation within either a refrigerator or freezer when extended probe cable lengths are required, for example, in coolers or walk-in freezers.

This transmitter is a single-channel (single-probe) device. The wireless transmitter head is mounted outside of the refrigerator or freezer and a pluggable NTC thermistor temperature probe is installed inside the fixture. The NTC thermistor probe bead characteristic is type 10K3A.

Technical Specification

Part number	UK/EU: GENII/NTC/101/A US: GENII/NTC/201/A
Sensor type	NTC Thermistor type 10K3A
Temperature range	-50 to +40°C
Full traceability	Yes
Unique serialization	Yes
Probe cable length	3.0m (10.0ft), 15.2m (50.0ft)
Power source	Battery
Battery life	3-4 years
Local memory storage	7 days
Calibration options	Single-point, two-point, and three-point calibration
Warranty	12 months (unless Peace of Mind applies)

Instrumentation Transducers (CO_2, O_2 & Differential Pressure)

Instrumentation transducers are used to monitor CO_2, O_2 and differential pressure.

Like other Checkit sensors, they consist of a measuring device connected to a wireless transmitter. The transducer takes the measurement, and the transmitter sends the reading to the Checkit system.

Checkit provides the following transducers & transmitters:

Type	Purpose	Part No.
CO_2 - Incubator	Monitors carbon dioxide levels inside incubators.	GENII/INC/CO2T
O_2 - Incubator	Monitors oxygen levels inside incubators.	GENII/INC/O2T
O_2 - Room	Monitors oxygen levels in rooms and other monitored spaces.	GENII/RM/O2T
Differential Pressure	Monitors the difference in air pressure between two areas, for example, in clean rooms.	GENII/DPT/DSP
4-20 mA Transmitter - Single Channel	Connects to one 24 VDC loop-powered transducer.	UK/EU: GENII/420/101/A US: GENII/420/201/A
4-20 mA Transmitter - Two Channel	Connects to two 24 VDC loop-powered transducers.	UK/EU: GENII/420/102/A US: GENII/420/202/A

The transducer and transmitter are ordered separately.

Technical Specification

Power source	Battery
Local memory storage	7 days
Warranty	12 months (unless Peace of Mind applies)

PT1000 Temperature / Door Contact Dual Monitor

This temperature transmitter is designed for installation within either a refrigerator or freezer to measure temperature whilst, at the same time, monitoring a door status contact.

The wireless transmitter head is mounted outside of the refrigerator/freezer and a pluggable RTD PT1000 temperature probe is installed inside of the fixture. The door status monitor input is connected to a separate magnetic door switch.

Technical Specification

Part number	UK/EU: GENII/DCT/102/A US: GENII/DCT/202/A
Sensor type	RTD PT1000 sensor Digital input magnetic door contact switch
Temperature range	-100 to +200°C
Full traceability	Yes
Unique serialization	Yes
Probe cable length	2.0m (6.5ft)
Door contact cable length	2.0m (6.5ft)
Power source	Battery
Battery life	3-4 years
Local memory storage	7 days
Calibration options	Single-point, two-point, and three-point calibration
Warranty	12 months (unless Peace of Mind applies)

Dual Alarm / Status Contact Monitor

The Dual Alarm / Status Contact Monitor is a wireless sensor that tells Checkit when something important changes on your equipment - for example, when a door opens, power fails, or a machine shows a fault.

It doesn't measure temperature or power directly. Instead, it connects to your equipment's alarm or status contacts - small on/off connection points built into many commercial fridges, freezers, incubators, and other systems.

The sensor can connect to two contacts at once. When one of these contacts changes - such as a door opening or a fault signal being triggered - the sensor detects it and sends a wireless update to Checkit, so the event can be logged and an alert raised if needed.

Technical Specification

Part number	UK/EU: GENII/CCM/102/A US: GENII/CCM/202/A
Typical monitored contacts	Magnetic Door AC Power Failure Refrigerator/Freezer Fault Incubator Fault Gas Alarmed Systems Incubator CO_2 Alarm Refrigeration Plant Status Refrigeration Plant Alarm BAC-T Alarm
Refrigeration compressor monitored contacts	Fault HP Cutout LP Cutout Run Status Motor Trip
Contact cable length	2.0m (6.5ft)
Power source	Battery
Battery life	3-4 years
Local memory storage	7 days
Warranty	12 months (unless Peace of Mind applies)

Room Ambient Temperature and Humidity

This transmitter is capable of sensing both temperature and humidity levels in an ambient environment. The wireless transmitter is surface mounted on a wall in an appropriate location within the room.

Technical Specification

Part number	UK/EU: GENII/AMB/100/EA/TRH US: GENII/AMB/200/EA/TRH
Sensor type	Sensirion SHT-85 sensor
Temperature range	-40 to +125°C
Humidity range	0 to 100% RH
Full traceability	Yes
Unique serialization	Yes
Power source	Battery
Battery life	3-4 years
Local memory storage	7 days
Calibration options	Single-point, two-point, and three-point calibration for temperature Single-point calibration for humidity
Warranty	12 months (unless Peace of Mind applies)

PT1000 Internal Mapping Temperature Sensor

This temperature transmitter is designed for installation within either refrigerators or freezers or in ambient warehousing applications.

The mapping wireless transmitter is mounted inside the refrigerator/freezer (above -20.0°C) or warehouse area. If installed within a freezer, then the battery operating life of the transmitter will be reduced from 5 years to 18 months. An RTD PT1000 temperature probe is contained inside the transmitter.

Technical Specification

Part number	UK/EU: GENII/MAP/101/A US: GENII/MAP/201/A
Sensor type	RTD PT1000 sensor
Temperature range	-100 to +200°C
Full traceability	Yes
Unique serialization	Yes
Power source	Battery
Local memory storage	7 days
Warranty	12 months (unless Peace of Mind applies)

Signal Repeaters

Signal repeaters relay data from sensors to the WARP if there is poor signal due to distance or obstructions. There are two types:



Wireless Signal Repeater

Receives sensor data and relays them to the WARP via wireless signal.

Technical Specification

Part number	UK/EU: GENII/SRPT/100 US: GENII/SRPT/200
AC power range	110/240VAC 50/60HZ
Battery life	7 hours standby time from AC power loss
Signal range	Up to 70ft
Signaling protocols	Mi Wi based T-Mesh™ self-healing protocols
Warranty	12 months (unless Peace of Mind applies)

Gigabit Ethernet Signal Repeater

Receives data from sensors wirelessly and sends them to the WARP via Ethernet cable. Supports both standard and gigabit network speeds.

Technical Specification

Part number	UK/EU: GENII/SRPT/100G US: GENII/SRPT/200G
Power source	110/240VAC 50/60HZ
Battery backup	Rechargeable Li-Ion 3.6V, 3350mAh
Signal range	Up to 70ft
Ethernet standard compatibility	1000Base-T (Gigabit Ethernet) 100Base-T (Fast Ethernet) 10Base-Te (Energy-Efficient Ethernet)
Signaling protocols	Mi Wi based T-Mesh™ self-healing protocols
Warranty	12 months (unless Peace of Mind applies)

Tactical Temperature Monitoring Unit (TTMU)

The Tactical Temperature Monitoring Unit (TTMU) is a portable, standalone temperature logger for monitoring refrigerated and ambient products in transit. When a journey is started, the TTMU records temperature readings to its internal memory and monitors them against configurable alarm limits. During the journey, the LCD screen displays the current temperature and alarm status. At the end of the journey, users can review key journey information on the screen, download and print a PDF journey report, and export the recorded data to CSV for further analysis.

The TTMU comes with an internal temperature probe. External PT1000 probes are also available to purchase separately for specialist monitoring applications.

Probes Options

Device	Description	Temperature Range	Part No.
TTMU (Including Internal Probe)	Integrated temperature probe for ambient monitoring	-10°C to +40°C	GENII/TTMU/102
External Flask Temperature Probe (H-1)	PT1000 probe for flask temperature monitoring.	-200°C to +40°C	GENII/CTFA/500
External Cryogenic LN_2 Standard Temperature Probe (H-2)	PT1000 probe for cryogenic LN_2 monitoring.	-200°C to +200°C	GENII/CTFB/500
External Cryogenic LN_2 Tank Temperature Probe (D-4)	PT1000 probe for LN_2 tank monitoring.	-200°C to +200°C	GENII/CTFC/500
External Bullet Probe (K-6)	PT1000 probe designed for suspension in liquids for temperature monitoring.	-100°C to +200°C	GENII/RTSB/500

Technical Specification

Log frequency	Every 5 seconds to 24 hours
Display	Monochrome LCD
Display units	°C or °F
Display resolution	0.1°C (0.1°F)
Temperature alarms	Up to 6
Power source	Battery (SAFT Lithium pack CPS1680, 3.6V, 2.45 Ah)
Full traceability	Yes
Unique serialization	Yes
Battery life	3 years at 0°C to +40°C ambient
Local memory storage	32,000 data points
Size	115mm x 50mm x 20mm / 4.5” x 1.9” x 0.78”
Moisture protection	IP52
Ambient operating conditions	-10°C to +40°C
Compliance	EN 12830:1999
Certification	CE, UKCA, FCC
Calibration options	Single point, and multi-point options available
Warranty	12 months (unless Peace of Mind applies)

Calibration

CAM+ temperature and humidity sensors are calibrated to provide traceable measurement performance for use in regulated and controlled environments.

Depending on the sensor and application, calibration may be performed at a single point or at multiple points across the required measurement range. The calibration uncertainty varies according to the sensor type, measurement range and calibration method, as shown below.

Calibration certificates provide the results for the individual sensor, including the calibration points, measured values and associated measurement uncertainty. This allows the measurement performance of the specific device to be assessed against the requirements of the application.

Calibration Uncertainty

CAM+ sensor	Sensor type	Measurement	Calibration range / point	Single-point uncertainty	Multi-point uncertainty
PT1000 Fridge / Freezer Temperature PT1000 LN_2 / Cryogenic Temperature PT1000 Temperature / Door Contact Internal Mapping Temperature	PT1000	Temperature	-196°C	0.27°C	N/A
			-100 to -80°C	0.29°C	0.37°C
			-80 to +50°C	0.24°C	0.31°C
			+50 to +90°C	0.30°C	0.46°C
NTC Fridge / Freezer Temperature	NTC Thermistor 10K3A	Temperature	-50 to +40°C	0.24°C	0.31°C
Room Ambient Temperature & Humidity	Sensirion SHT-85	Temperature	-40 to +50°C	0.24°C	0.62°C
		Humidity	10% to 95% RH	3.2% RH	N/A

The values shown above are the measurement uncertainties associated with Checkit's calibration process. Where a sensor is calibrated at multiple points, the applicable calibration certificate provides the results for the individual device.

Third-Party Calibration

Some specialist CAM+ monitoring devices are calibrated by approved third-party laboratories rather than by Checkit.

This applies to the CO_2, O_2 and differential pressure instrumentation transducers, as well as the Tactical Temperature Monitoring Unit (TTMU) and its associated temperature probes.

As these devices are externally calibrated, their measurement uncertainty is determined by the calibration performed by the applicable third-party laboratory rather than by the Checkit calibration uncertainties shown in the table above. The calibration certificate supplied for the individual device provides the applicable calibration points, results and measurement uncertainty.

This allows the measurement performance of these specialist devices to be assessed using the calibration information specific to the device and its application.

Resources

Customers have access to the following self-service training and guidance resources:

- **Checkit Help Centre** – Product guidance, instructions and troubleshooting information for CAM+.
- **Training videos** – Video demonstrations covering common CAM+ Website tasks.
- **Training packages** – SCORM 1.2-compatible packages for import into compatible learning management systems.

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