

**UCool<sup>+</sup>**

# Remote Temperature Monitoring Solutions



## Overview







Using the flexible connection offered by 4G GSM & LoRa RF communication technologies, Haier Biomedical provides a range of remote monitoring & control solutions, allowing you to maintain real-time vision of your critical assets' status even when you are not there in person.

Using the UCool EMS browser-based software, users can view historic data, configure sensors, and action alarms from any internet connected device. The automated alarming system - delivered via email, SMS, telephone and push notifications - alerts users to parameter excursions quickly and efficiently, prompting resolution and preventing costly wastage.

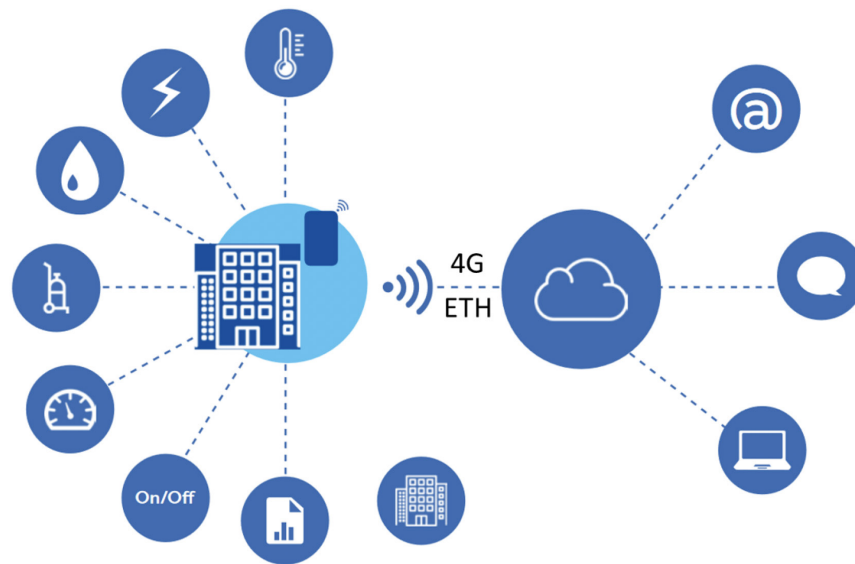
Primarily focused on monitoring temperatures from -200°C to +200°C, the platform also facilitates the monitoring of other key parameters (humidity, status, CO<sub>2</sub> etc.), allowing you to oversee your assets status on a single system. Combined with the advances in built-in IOT monitoring from Haier Biomedical, you can see more information than ever about your equipment to allow users to make educated decisions and maintain business continuity.



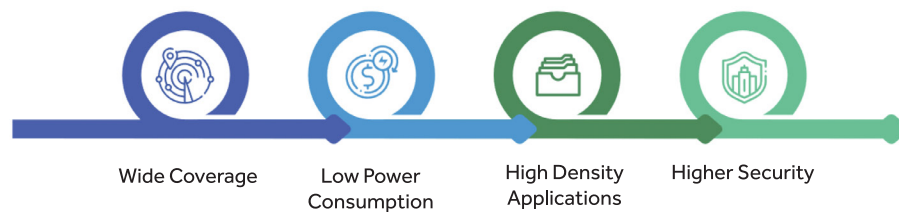
## Fundamental Functions

-  Remote monitoring function via web portal and mobile application
-  Remote alarms: supporting SMS, voice and email alarms
-  Status monitoring (On/Off, Open/Closed etc.) to track key parameters such as power failures and door openings
-  On device storage of up to 10,000 records to keep your data safe
-  Real-time monitoring of your critical assets, using LoRa WAN RF and 4G GSM technologies
-  Location function to allow both real word tracking and digital positioning of sensors





## Why LoRaWAN?



## Key Advantages of LoRaWAN



**Scalability** – Designed to host 1,000's of devices within a single network, there is ample room for future expansions within your system. This will allow you to take advantage of more of Haier Biomedicals smart devices as they are added to the UCool+ range, without additional infrastructure.



**LoRa LP** – Long range and low power, the UCool+ devices can modulate their transmissions to ensure consistent connection to bridges even over longer distances. Those close to a bridge can reduce their transmission power, increasing battery life, whilst those further away can increase transmission strength to ensure strong communications.














**Performance** – With the increased capacity, the network has been designed to reduce traffic by using a broader range of signals within the regional LoRa WAN range. This translates to reduced downtime, reduced losses, and improved signal strength.



**Security** – By design, the system automatically implements end-to-end encryption between devices and the network. Along with improved authentication methods, you can rest assured your data is secure from prying eyes throughout its journey.

## Product Advantages

-  Tool-free, simple installation without complex network configuration
-  On-device temperature offset available, to allow adjustment following calibration
-  Remote monitoring via the browser software from any internet connected device or via the mobile application
-  Remote alarming via email, SMS, telephone, and App Push notifications
-  Local storage in the event of network disruption of up to 10,000 data records, exportable in anti-tamper PDF
-  Multiple permission levels, allowing administrators to define user access rights
-  Wide temperature range (-200°C to +500°C) for liquid nitrogen through to incubators and autoclaves
-  Fully accredited, CFR Part 11, CE(EU), FC & ISO/IEC 27001
-  LoRa WAN certified communication allows for up to 2,000 sensors on a single system
-  Applicable for the global market, the LoRa WAN spectrum is available specific to your local requirements
-  European hosted server compliant to GDPR for the UK and Europe



## LoRaWAN Infrastructure



Model UG65

### LoRaWAN Bridge

The primary gateway in the range, the UCool+ LoRa WAN Main Bridge connects your compatible UCool+ devices to the UCool+ platform. Operating as a 'packet forwarder', the Bridge allows virtually real-time transmission of data via the 4G mobile network from device to the platform, providing low-latency and faster updates. Comprising of 8 radio transceivers, the Bridge can connect up to 2,000 end devices over a distance of up to 15km LoS.

#### Features

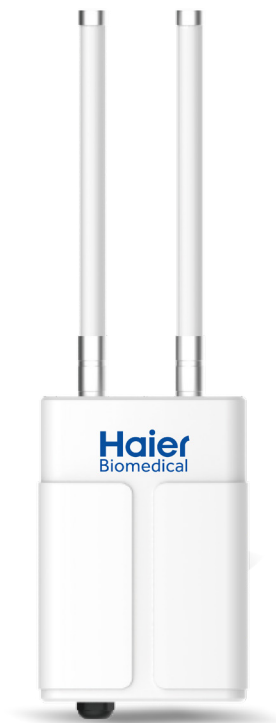
- Up to 2,000 devices
- Optional UPS battery backup
- Built-in network server for direct communication to the UCool+ platform
- Onboard status lights

## LoRaWAN Outdoor Bridge

Supporting external applications, the Outdoor Bridge offers the option to have infrastructure placed centrally on site, even if that is in an exposed area. Offering the same features as the Indoor Bridge along with IP67 protection and extreme temperature operation, the device also has an internal super-capacitor to send an alert to designated users in the event of a power outage.

#### Features

- Up to 2,000 devices
- Built-in network server for direct communication to the UCool+ platform
- Optional twin external hi-gain antennas to improve coverage
- Super-capacitor to facilitate power outage alerts



Model UG67



Model UG63

## LoRaWAN Mini Bridge

Used in the 'Parent-Child' configuration, this Bridge works as a range extender over ethernet networks, communicating to the primary gateway on site to allow data transmission to the platform. A budget friendly option to allow increased site coverage using your network.

### Features

- Requires Main Bridge to function
- Up to 2,000 devices
- Requires an ethernet connection
- Optional UPS battery backup

## LoRaWAN Solar Bridge

Designed for operation in areas with minimal infrastructure, the Solar Bridge is able to operate for up to 4 days on stored solar power without an external power supply. This enables easy deployment in remote, rural areas but can also be used to support urban projects, expanding coverage even in areas without reliable infrastructure.

### Features

- Up to 2,000 end devices
- Separate 45W solar panel offers long term operation in low light
- IP67 protection, and -30°C to +70°C operation
- Optional DC power input to use existing solar infrastructure



Model SG50

## Bridge UPS Battery Backup

Designed for the UCool+ Main and Mini Bridge

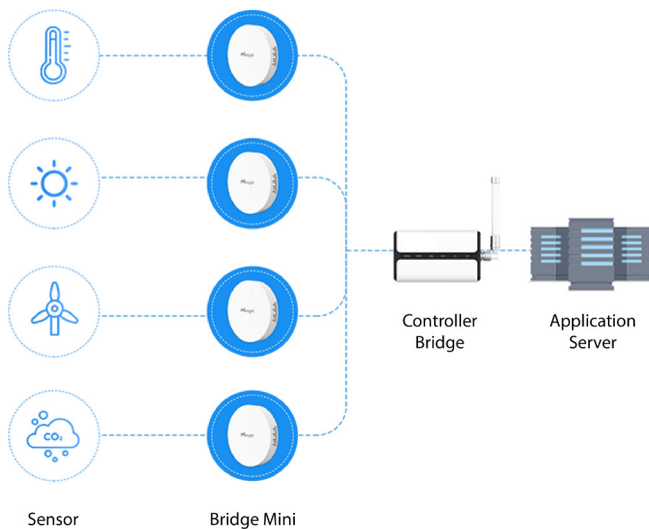
### Features

- Up to 2,000 end devices
- Separate 45W solar panel offers long term operation in low light
- IP67 protection, and -30°C to +70°C operation
- Optional DC power input to use existing solar infrastructure



Model UPS01





Using the UCool+ Bridge system allows for complete coverage of your site, even for larger or more complex projects. Working with your Haier Biomedical representative, you can design a system which either:

- Use single or multiple Bridge Pros to operate completely independently of your building infrastructure
- Use single or multiple Bridge Minis to create a wired network to cover any blind spots, using the buildings ethernet network, feeding back to a central Bridge Pro which is responsible for network transmission

The LoRa WAN system is designed for long distance communication of up to 15Km line of sight (LoS). Of course, in urban centres structures can block these paths, but the communication signal can still travel up to 2Km, ensuring your devices on site are always within range.





Pro Solo



Pro Duo

## UCool Pro Solo & Duo

Offering long battery life and broad functionality, the Pro Solo & Pro Duo models can monitor temperatures from Liquid Nitrogen storage through to Autoclaves and industrial ovens. The large LCD segment screen offers information at a glance, even in the event of network disruption. The large on-board memory allows for long term storage of data, ensuring your data is safe and secure. The Type-C USB connector allows for data download, and can even be used to power the device using a 5V supply. Onscreen indicators show connection status, battery level and alarm status. With single or dual input options, they can be easily adapted to your requirements.

## Features

- Large, always on display
- On board secure data storage with local data download
- Powered via 5V Type-C USB connection (not supplied) or batteries
- Long battery life of up to 10 years
- User serviceable, with replaceable probes and batteries
- Magnetic mounting as standard
- -200°C to +500°C, to a typical accuracy of  $\pm 0.5^{\circ}\text{C}$

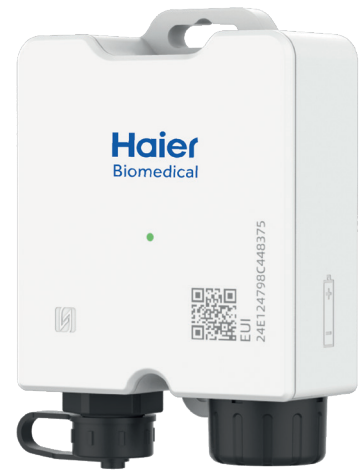


## UCool Lite

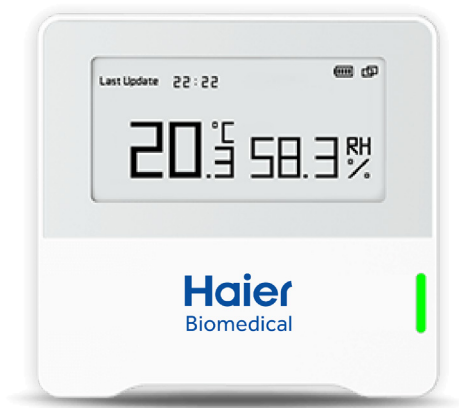
Focusing on the core functionality required, the Lite range offers coverage from -40°C to +125°C via its flying lead probe. Onboard storage keeps your data secure in the event of network disruption, and can be downloaded locally. With an operational range of as low as -25°C, the device can even be placed inside your equipment to prevent disrupting the door seal.

### Features

- Small size for flexible installation, with multiple mounting options
- Onboard secure data storage with local data download
- User replaceable battery
- Battery life of up to 3 years (reduced in sub-ambient conditions)



Model TS201



Model AM102

## UCool Lab

Displaying the current ambient conditions in your space, the UCool Lab sensor immediately identifies when conditions are outside of specification using the built-in light bar indicator. The large display shows key information at a glance, including battery and connection status.

### Features

- Measuring range of -20°C to +60°C (device dependent)
- User replaceable battery
- Battery life up to 9 years
- Built-in alarm indicator



Model EM-320TH

## UCool Lite TH

Designed to monitor temperature and humidity to a high degree of accuracy, this internal sensor device is suitable for ambient or non-condensing humidity environments. Capable of operating down to 0°C and up to +60°C, the Lite TH is a great option for cell incubation or archive storage.

### Features

- Long battery life of up to 5 years
- User replaceable battery
- High accuracy ( $\pm 0.2^{\circ}\text{C}$ ,  $\pm 2\% \text{ RH}$ )
- IP67, food-safe enclosure

## UCool Max

For operating in the toughest conditions, the Max sensor can measure temperatures from  $-200^{\circ}\text{C}$  to  $+800^{\circ}\text{C}$  to an accuracy of  $\pm 0.5^{\circ}\text{C}$ . The IP67 body is suitable for low exposure external operations, and with up to 10-year battery life the device can be deployed with minimal maintenance required.

### Features

- Measuring range of  $-200^{\circ}\text{C}$  to  $+800^{\circ}\text{C}$
- User replaceable, long-life battery
- Onboard secure data storage
- Multiple mounting options



UCool Max

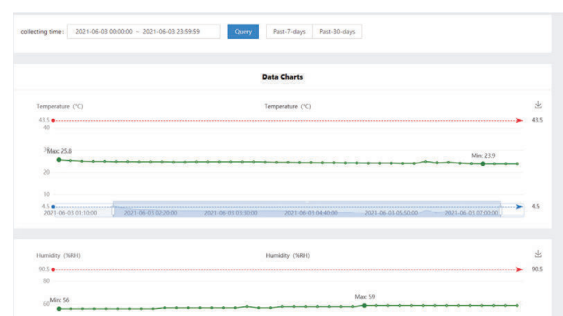
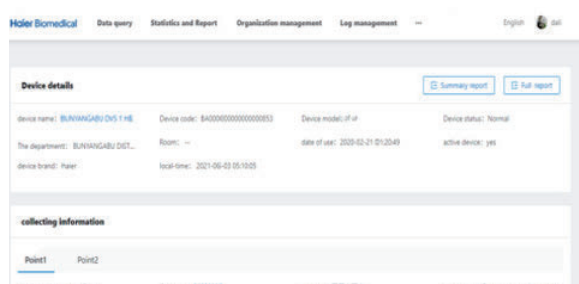


## UCool+ Specifications

Features	Lab	Lite	LiteTH	Pro Solo	Pro Duo	Max
<b>Measuring parameter</b>	Temperature & Humidity	Temperature	Temperature & Humidity	Temperature or Status	Temperature and/or status	Temperature
<b>Measuring range</b>	"-20°C to +60°C 0%RH to 100% RH"	-40°C to +125°C	"-25°C to +60°C 0%RH to 95%RH"	-200°C to +500°C	-200°C to +500°C	-200°C to +800°C
<b>Probe type</b>	Internal	Class B	Internal	Class B, A or PT100	Class B, A or PT100	PT100
<b>Probe material</b>	NA	TPE	NA	PVC, Silicon, Teflon	PVC, Silicon, Teflon	Teflon
<b>Flying lead length</b>	NA	1.5m	NA	1.5m	1.5m	1.5m
<b>Accuracy</b>	"±0.2°C ±2%RH"	"±0.5°C(-10°C ~ 85°C) ±2°C(-40°C ~ -10°C, 85°C ~ 125°C)"	"±0.2°C ±2%RH"	Up to ±0.5C	Up to ±0.5C	±0.5°C
<b>Battery life</b>	<9 years	<3 years	<5 years	"Temperature: <5 years Status only: <10 years"	"Temperature: <5 years Status only: <10 years"	<10 years
<b>Alternative power source</b>	N	N	N	5V via Type-C USB	5V via Type-C USB	N
<b>User replaceable probe</b>	N	Y	N	Y	Y	N
<b>User replaceable battery</b>	Y	Y	Y	Y	Y	Y
<b>Display</b>	Option available	N	N	Y	Y	N
<b>Dimensions (LxWxH, mm)</b>	68 x 65 x 21	85 x 58 x 25	85 x 60 x 20	110 x 75 x 30	111 x 75 x 30	106 x 71 x 70
<b>Operating temperature</b>	"Screen: 0°C to +40°C No screen: -20°C to +60°C"	-25°C to +60°C	-25°C to +60°C	0°C to +60°C	0°C to +60°C	-25°C to +60°C
<b>Operating humidity</b>	0%RH to 95%RH (Non-Condensing)					
<b>Onboard data storage</b>	N	2,800 records	3,000 records	<10,000 records	<10,000 records	1,000 records
<b>Local data download</b>	NA	Y	N	Y	Y	N
<b>On board alarm indicator</b>	Y	N	N	Y	Y	N

# Haier Global Equipment Monitoring System

Data secured by devices is transmitted to our central server, located in Frankfurt, Germany, and is then accessed via our browser-based software and mobile applications. The software allows for the complete administration of the monitoring system, from viewing collected data to configuring alarm thresholds. Users will be able to completely self-manage their systems, allowing them to add and remove devices and users as required. The software has automatic reporting functionality, allowing data to be sent to key parties via email at daily, weekly and monthly intervals to keep users informed. Alerts for sensors performing outside of set thresholds are delivered via email, SMS and telephone to assigned users. Customisable alarm logic allows users to define the time, day and how alerts are delivered.



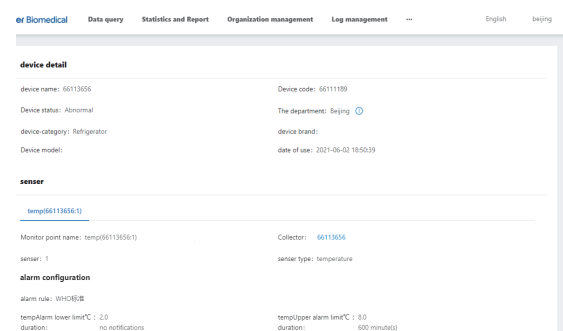
historical data			<a href="#">Export PDF</a> <a href="#">Export CSV</a>	
Data Information	Alarm Information	historical event		
senser	Data information		collecting time	
Point1	23.9°C/61%RH		2021-06-03 08:00:00	
Point1	23.9°C/61%RH		2021-06-03 07:50:00	

**alarm-config-info**

apprise notification: ☐

**alarm receiver**

Serial number	name	level	notification method	mobile phone number	Email address	Account Name
---------------	------	-------	---------------------	---------------------	---------------	--------------



# Haier Global Equipment Monitoring System

## Alarm query

Haier Biomedical | Data query | Statistics and Report | Organization management | Log management | English | User

### AlarmList

department:  code query:  time range:

Status	device name	alarm type	alarm time	Recovery time	Device	operation
Recovery		low temperature alarming	2021-06-04 09:40:00	2021-06-04 09:50:00	BA000000000	notice-recorder
Alarm		high temperature alarming	2021-06-04 08:40:00		BA000000000	notice-recorder

notification time | notification type | contact | notification method | notification result | notification content

No Data

Alarm	500000000	temperature alarming	2021-06-04 08:10:00		BA000000000	notice-recorder
Recovery	600000000	high temperature alarming	2021-06-04 07:55:30	2021-06-04 08:00:00	BA000000000	notice-recorder
Recovery	Haier Refrigerator R2002	high temperature alarming	2021-06-04 07:50:00	2021-06-04 08:10:00	BA000000000	notice-recorder

## Alarm receiver configuration

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### Basic Information

response notification: ☐

alarm receiver

Serial number | name

Account Name | operation

name:

level:

notification method:

mobile phone number:

Email address:

Account Name:

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### Basic Information

response notification: ☐

alarm receiver

Serial number | name | level | notification method | mobile phone number | Email address | Account Name | operation

1 | 2 | 3

## Department and user management

Haier Biomedical Data query Statistics and Report Organization management Log management English SuperCell

### Department management

department name:  Country:

department name	Country	Time zone	operation
Shandong	China	UTC+08:00	<a href="#">add a Subordinate Department</a> <a href="#">view</a> <a href="#">Delete</a>
Dai	China	UTC+08:00	<a href="#">add a Subordinate Department</a> <a href="#">view</a> <a href="#">Delete</a>
Jiao	China	UTC+08:00	<a href="#">add a Subordinate Department</a> <a href="#">view</a> <a href="#">Delete</a>
Qingdao	China	UTC+08:00	<a href="#">add a Subordinate Department</a> <a href="#">view</a> <a href="#">Delete</a>
Wenling	China	UTC+10:00	<a href="#">add a Subordinate Department</a> <a href="#">view</a> <a href="#">Delete</a>

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Haier Biomedical Data query Statistics and Report Organization management Log management English SuperCell

### Create a department

superior department:  department name:  Department type:

Language:  Time zone:  Country:

longitude and latitude:  detail address:

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department:  Account Name:  mobile phone number:  Email address:

Account Name	Nickname	The department	Role	mobile phone number	Email address	Status	operation
Isoshan	Isoshan	Laoshan	Dep-Admin	18513509525		<input checked="" type="checkbox"/>	<a href="#">reset Password</a> <a href="#">view</a>
liuj	liuj	Shandong	Dep-Admin			<input checked="" type="checkbox"/>	<a href="#">reset Password</a> <a href="#">view</a>
panchangli	panchangli	Shandong	Dep-Admin			<input checked="" type="checkbox"/>	<a href="#">reset Password</a> <a href="#">view</a>
qingdao	qingdao	Qingdao	Dep-Admin		ai@q.com	<input checked="" type="checkbox"/>	<a href="#">reset Password</a> <a href="#">view</a>
SuperCell	SuperCell	Shandong	Dep-Admin			<input checked="" type="checkbox"/>	<a href="#">reset Password</a> <a href="#">view</a>

### add user

Account Name:  Role:  name:

mobile phone number:  Email address:  Status:

gender:

## Reporting function

Haier Biomedical Data query Statistics and Report Organization management Log management English Tomato

### Periodic report

department:  device name:  time range:

device number: 24 Monitor time: 48

Serial number	Device status	duration	time % (percentage)	alarm number
1	Temperature Normal	21 d 22 h 29 min	100 %	
2	High Temperature Alarm	4 d 14 h 18 min	17 %	29
3	Low Temperature Alarm	0 min	0 %	0

department	device name	collector name	normal	High temperature Alarm	Low temperature Alarm	total number of alarming
UNICEF PAKISTAN	6060239	6060239-Pak02	27%	1 (2%)	0 (0%)	1
		6060239-Pak01	87%	3 (3%)	0 (0%)	3
		6060571-Pak01	100%	0 (0%)	0 (0%)	0

sent time	subscriber information	department	report period	report type	operation
2021-05-04 09:00:35	Tomato	Haier Pakistan	Daily Report	Department Report	<a href="#">Download</a>
2021-05-03 09:00:21	Tomato	Haier Pakistan	Daily Report	Department Report	<a href="#">Download</a>
2021-05-02 09:00:16	Tomato	Haier Pakistan	Daily Report	Department Report	<a href="#">Download</a>
2021-05-01 09:00:16	Tomato	Haier Pakistan	Daily Report	Department Report	<a href="#">Download</a>
2021-05-31 09:00:15	Tomato	Haier Pakistan	Daily Report	Department Report	<a href="#">Download</a>
2021-05-30 09:00:15	Tomato	Haier Pakistan	Daily Report	Department Report	<a href="#">Download</a>
2021-05-29 09:00:21	Tomato	Haier Pakistan	Daily Report	Department Report	<a href="#">Download</a>
2021-05-28 09:00:17	Tomato	Haier Pakistan	Daily Report	Department Report	<a href="#">Download</a>
2021-05-27 09:00:19	Tomato	Haier Pakistan	Daily Report	Department Report	<a href="#">Download</a>
2021-05-26 09:00:17	Tomato	Haier Pakistan	Daily Report	Department Report	<a href="#">Download</a>



Haier Biomedical Data query Statistics and Report Organization management Log management English

### subscriber-add

\* subscriber:   
 \* subscriber email:   
 \* department:   
 \* report period:   
 \* report type:

Haier Biomedical Data query Statistics and Report Organization management Log management English

### Subscription report

department:  subscriber information:  report period:

subscriber information	department	report period	report type	operation	subscriber history
verging	Burkina Faso	Weekly Report	Department report	<a href="#">view</a> <a href="#">Delete</a>	<a href="#">details</a>
zdf	Ukraine	Daily Report	Department Report	<a href="#">view</a> <a href="#">Delete</a>	<a href="#">details</a>
Tamato	Pakistan-Haier Pakistan	Daily Report	Department Report	<a href="#">view</a> <a href="#">Delete</a>	<a href="#">details</a>

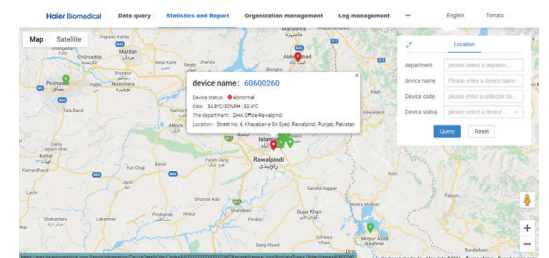
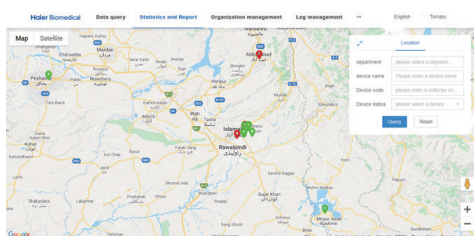
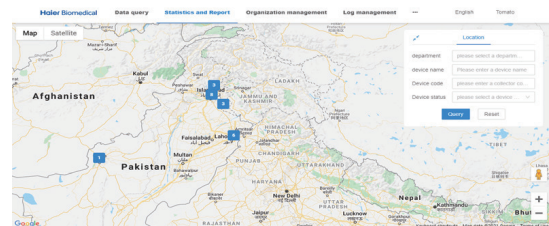
Haier Biomedical Data query Statistics and Report Organization management Log management English Tamato

### Subscription history

department:  subscriber information:  sort time:

sort time	subscriber information	department	report period	report type	operation
2021-05-04 09:00:00	Tamato	Haier Pakistan	Daily Report	Department Report	<a href="#">Download</a>
2021-05-03 09:00:00	Tamato	Haier Pakistan	Daily Report	Department Report	<a href="#">Download</a>
2021-05-02 09:00:00	Tamato	Haier Pakistan	Daily Report	Department Report	<a href="#">Download</a>
2021-05-01 09:00:00	Tamato	Haier Pakistan	Daily Report	Department Report	<a href="#">Download</a>
2021-05-01 09:00:00	Tamato	Haier Pakistan	Daily Report	Department Report	<a href="#">Download</a>

## Map display



## Service guarantee

Haier Biomedical offers a local support team who can provide pre-sale site surveys, on-site installation, training and after-sales service of your monitoring equipment. The service team are available during business hours (Mon-Fri, 0900-1700) to respond to your queries.

# Your Trusted Laboratory Maintenance Partner

## Laboratory Maintenance Service and Support

At Haier Biomedical, we understand that your laboratory equipment plays a crucial role in the success of your work. That's why we offer a comprehensive range of maintenance services designed to keep your equipment in peak condition, ensuring maximum uptime, compliance, and long-term reliability.

Haier Biomedical UK offers three levels of service contracts tailored to suit your individual service and maintenance needs. We have a dedicated UK based service support team and factory trained engineers.

Haier Biomedical UK can also provide flexible bespoke contracts and include services additional preventative maintenance visits, annual calibrations, temperature mapping and IQ/OQ/PQ services.

## Product Covered

- Cryogenic Freezers (-150°C)
- ULT Freezers (-80°C)
- Freezers (-20°C to -40°C)
- Refrigerators (+2°C to +8°C)
- Blood Refrigerators
- Plasma Freezers
- Liquid Nitrogen Storage (-196°C)
- Cold Rooms
- Freezer Rooms
- CO<sub>2</sub> Incubators
- Standard Incubators
- Climate Chambers
- Class II Safety Cabinets
- Laminar Flow Cabinets
- Fume Hoods
- Autoclaves
- Sterilisers
- Temperature Monitoring



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Haier Biomedical  
UK



Haier Biomedical  
International



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Haier Biomedical  
UK



@haierbiomedical2934

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