

The background features a complex network of thin, grey lines and various icons representing IoT and digital technology. Icons include a globe, a smartphone, a laptop, a cloud, a person silhouette, a Wi-Fi symbol, a mail icon, and a gear. A prominent red rectangular overlay is positioned on the left side of the image, containing the text.

# FCL Components IoT Solutions

# FCL Components IoT Solutions Ecosystem



## Asset Tracking

- Track assets
- Maintain stock levels
- Set boundaries
- User patterns
- Info add-on asset profiles



## Sensor Management

- Monitoring of:
  - Temperature
  - Humidity
  - Illuminance
  - CO2 monitoring
  - Barometric
  - 3-axis acceleration
  - Sound levels



## Indoor Navigation

- Guide visitors
- Monitor traffic
- User patterns
- Offer alternative routes
- Offer added information



## Smart Lighting

- Grouping
- Daylight compensation
- Color and intensity
- Set lighting scenes
- Occupancy
  
- Lighting as network structure

## Ecosystem Partners

FCL Components' IoT Solutions are developed in cooperation with ecosystem partners.

Our ecosystem partners are specialists in their own field.

Together with these partners, we provide complete solutions from hardware to software that can suit specific needs with various applications.

FCL Components' wireless modules can be integrated to enable devices to be part of a Wirepas Mesh network, and instantly become part of the FCL Components ecosystem.



# Overview

## IoT Connectivity

### How to establish a future proof IoT Solution

FCL Components' IoT Solution is based on the cutting-edge mesh technology called Wirepas Mesh which is developed by a Finnish company Wirepas.

Whether it is an Anchor (used as position reference), a Tag (used for tracking assets) or Sensors (CO2 or temperature), each FCL Components device communicates with others and forms the network in a smart way.

#### Adaptable and resilient network

The devices constitute the network.

The network is decentralized, requiring no central supervision, self-optimizing, and self-healing. If one device fails, an alternative route ensures the data transmission. If there is interference, alternative communication channels are selected automatically.

There is no limit to the number of anchors, tags, and sensors.

#### Key benefits

- Future-proof and inherently scalable with no limitation on the network size
- Affordable and simple installation, requiring virtually zero wiring
- Extremely low interference with other wireless networks
- Autonomy in the network, no human supervision required
- Self-healing, When a the connection is interrupted, the devices automatically search for another available route, users do not need to intervene



#### Benefits

- Future proof and scalable
- Affordable and simple installation
- Extremely low interference
- Autonomy in the network
- Self-Healing





# Asset Tracking

Manage assets, it's simple and effective



The FCL Components Asset Tracking solution enables live monitoring of thousands of assets in smart buildings across a whole host of industries, from healthcare and manufacturing to hospitality and corporate spaces.

FCL Components mesh-based asset tracking works by employing tags, anchors, and gateways to show the real-time location of assets and related analytics such as a heat map.

Due to low power consumption, the devices can be battery operated and require less cabling, making them easy to install.

## Benefits

- Highly scalable
- Self-healing
- No single point of failure
- Extremely low interference
- Low cost
- Long battery life

## Ultra Slim Asset Tag



Part number	FWM8BLZ08T
Description	FCL Components Ultra Slim Mesh Asset Tag
Size	52.8 x 35.9 x 5.8mm
Operating conditions	-30 to +70 °C
Features	IP67 Push button
Power supply	CR3032 Li coin battery
Qualifications	FCC / ISED / CE / Radio Act

## USB Dongle Asset Tag



Part number	FWM8BLZ09T
Description	FCL Components 2.4GHz USB Dongle Mesh Asset Tag
Size	17.8 x 14.2 x 6.6mm
Operating conditions	-30 to +60 °C
Features	Powered through USB
Power supply	USB type-A
Qualifications	Radio Act / FCC / ISED / CE / UKCA

## Endurance Line Asset Tag



Part number	FWM8BLZ08T
Description	FCL Components 2.4GHz Mesh Asset Tag
Size	76.5 x 74.2 x 29.0mm
Operating conditions	-30 to +60 °C
Features	IP65 with AA battery, long battery life
Power supply	4 AA batteries or USB-C
Qualifications	FCC / ISED / CE / Radio Act

## Asset Tag



Part number	FWM8BLZ07P
Description	FCL Components 2.4GHz Mesh Asset Tag
Size	40 x 31 x 12mm
Operating conditions	-30 to +60 °C
Power supply	CR2450 Li coin battery
Qualifications	FCC / ISED / CE / Radio Act

## Endurance Line Anchor



Part number	FWM8BLZ08A
Description	FCL Components Endurance Line Mesh Anchor Tag
Size / weight	76.5 x 74.2 x 29.0mm
Features	IP65 Long battery life
Power supply	4 AA batteries or USB-C
Qualifications	FCC / ISED / CE / Radio Act

## Gateway



Part number	KS/FWM8GWZ01
Description	FCL Components standard Gateway
Size	12.5 x 8 x 2.8mm
Features	Ethernet, Wi-Fi
Power supply	AC adaptor
Qualifications	CE / FCC / CSE

## USB Dongle Anchor



Part number	FWM8BLZ09P
Description	FCL Components 2.4GHz USB Dongle Mesh Asset Tag
Size	17.8 x 14.2 x 6.6mm
Operating conditions	-30 to +60 °C
Features	Powered through USB
Power supply	USB type-A
Qualifications	Radio Act / FCC / ISED / CE / UKCA

## Gateway 4G



Part number	KS/FWM8GWZ01-4G
Description	FCL Components Gateway 4G
Size	12.5 x 8 x 2.8mm
Features	Ethernet, Wi-Fi, LTE
Power supply	AC adaptor
Qualifications	CE / FCC / CSE







# Environment Monitoring

Healthy, comfortable, optimized buildings

FCL Components' environment sensors yield accurate measures of ambient conditions. FCL Components' environment sensors monitor; CO<sub>2</sub>, temperature, humidity, barometric pressure, illuminance, noise and acceleration.

These conditions can be monitored to automatically control heating, ventilation, and air conditioning (HVAC), for maximum comfort, healthy and safe environments.

## Benefits

- Highly scalable
- Self-Healing
- Low cost
- Various sensors
- Long battery life

## Endurance Line Sensor



Part number	FWM8BLZ08Y
Description	FCL Components Endurance Line Mesh Sensor Unit
Size	76.5 x 74.2 x 29.0mm
Operating conditions	-30 to +60 °C
Features	IP65 Long battery life
Power supply	4 AA batteries or USB-C
Qualifications	FCC / ISED / CE / Radio Act

## Small Sensor



Part number	FWM8BLZ07Y
Description	FCL Components Small Mesh Sensor Unit
Size / weight	40 x 31 x 12mm
Operating conditions	-30 to +60 °C
Features	IP65/ Long battery life
Power supply	CR2450 Li coin battery
Qualifications	FCC / ISED / CE / Radio Act

## Endurance Line Sensor with CO<sub>2</sub> sensor



Part number	FWM8BLZ08C
Description	FCL Components Endurance Line Mesh Sensor Unit With CO2 Sensor
Size	76.5 x 74.2 x 29.0mm
Operating conditions	-30 to +60 °C
Features	IP65 Long battery life
Power supply	USB-C
Qualifications	FCC / ISED / CE / Radio Act

## Environment Monitoring Sensor data

FCL Components sensors in combination with anchors and the gateway form a mesh network. The network allows for unlimited expansions with additional devices without requiring additional programming.

FCL Components Mesh Sensors are able to monitor:

- Temperature
- Humidity
- Illuminance
- Barometric pressure
- 3-axis acceleration
- Sound levels

FCL Components' CO<sub>2</sub> sensor additionally monitors CO<sub>2</sub> levels.

## Endurance Line Anchor



Part number	FWM8BLZ08A
Description	FCL Components Endurance Line Mesh Anchor Tag
Size / weight	76.5 x 74.2 x 29.0mm
Features	IP65 Long battery life
Power supply	4 AA batteries or USB-C
Qualifications	FCC / ISED / CE / Radio Act

## Gateway



Part number	KS/FWM8GWZ01
Description	FCL Components standard Gateway
Size	12.5 x 8 x 2.8mm
Features	Ethernet, Wi-Fi
Power supply	AC adaptor
Qualifications	CE / FCC / CSE

## USB Dongle Anchor



Part number	FWM8BLZ09P
Description	FCL Components 2.4GHz USB dongle Mesh Asset Tag
Size / weight	17.8 x 14.2 x 6.6mm
Operating conditions	-30 to +60 °C
Features	Powered through USB
Power supply	USB type-A
Qualifications	Radio Act / FCC / ISED / CE / UKCA

## Gateway 4G



Part number	KS/FWM8GWZ01-4G
Description	FCL Components Gateway 4G
Size	12.5 x 8 x 2.8mm
Features	Ethernet, Wi-Fi, LTE
Power supply	AC adaptor
Qualifications	CE / FCC / CSE





# Indoor Navigation

## Guide visitors and monitor indoor traffic

Indoor navigation helps to guide visitors through complex buildings, find the location of their appointment, gate or platform while providing operators insight in visitor traffic flows.

The mesh network formed for asset tracking or environment monitoring can be utilized for indoor navigation without requiring any additional hardware.

Our ecosystem partner's navigation application helps to guide visitors through the building on their smart devices.

### Benefits

- Highly scalable
- Long battery life
- Easy add-on to the other FCL Components IoT solutions

## Endurance Line Anchor



Part number	FWM8BLZ08A
Description	FCL Components Endurance Line Mesh Anchor Tag
Size / weight	76.5 x 74.2 x 29.0mm
Features	IP65 Long battery life
Power supply	4 AA batteries or USB-C
Qualifications	FCC / ISED / CE / Radio Act

## USB Dongle Anchor



Part number	FWM8BLZ09P
Description	FCL Components 2.4GHz USB dongle Mesh Asset Tag
Size / weight	17.8 x 14.2 x 6.6mm
Operating conditions	-30 to +60 °C
Features	Powered through USB
Power supply	USB type-A
Qualifications	Radio Act / FCC / ISED / CE / UKCA

FCL Components' USB dongles are used as anchor or tag by simply sliding the dongle into a USB port.

Devices featuring a USB port such as Wi-Fi routers are commonly available throughout buildings and can function as a power source for an anchor.

The anchor is powered over USB and does not require any batteries.

## Gateway



Part number	KS/FWM8GWZ01
Description	FCL Components standard Gateway
Size	12.5 x 8 x 2.8mm
Features	Ethernet, Wi-Fi
Power supply	AC adaptor
Qualifications	CE / FCC / CSE

## Gateway 4G



Part number	KS/FWM8GWZ01-4G
Description	FCL Components Gateway 4G
Size	12.5 x 8 x 2.8mm
Features	Ethernet, Wi-Fi, LTE
Power supply	AC adaptor
Qualifications	CE / FCC / CSE







# Smart Lighting

## Healthy and comfortable buildings

Smart Lighting helps to develop comfortable and sustainable spaces while improving productivity by implementing lighting schemes for designated areas, daylight compensation and occupancy sensing.


FCL Components' ecosystem partners' lighting solutions feature integrated FCL Components' mesh modules that function as mains powered anchors, and create the low latency mesh network. Allowing easy add-on of sensors and tags for asset tracking and environment monitoring.

### Benefits

- Energy saving
- Daylight compensation
- Occupancy sensor
- Easy add on; Asset tracking, Environment monitoring, Indoor navigation

Make your devices IoT ready and instantly become part of the FCL Components ecosystem using FCL Components Mesh Modules

## Mesh Module

Part number	FWM7BLZ23W	
Used IC	256KB RAM, 1MB Flash	
Type	Mesh Module	
Size	15.7x9.8x1.7mm	
Operating Temperature	-40 to +85 °C	
Attachment	SMT	
Antenna	Pattern Antenna	
External Interface	NFC, UART, GPIO, I2S, PDM, SWDCLK, SWDIO, nRESET, QSPI, TWI, ADC	
Number of GPIO's	30	
Qualifications/ Certifications	Radio Act / FCC / ISED / CE / UKCA	



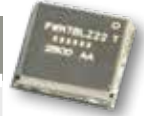
## Mesh Module

Part number	FWM7BLZ20W
Used IC	64KB RAM, 512KB Flash
Type	Mesh Module
Size	15.7x9.8x1.7mm
Operating Temperature	-40 to +85 °C
Attachment	SMT
Antenna	Pattern Antenna
External Interface	NFC, UART, GPIO, SWDCLK, SWDIO, nRESET, SPI, TWI, ADC
Number of GPIO's	30
Qualifications/ Certifications	Radio Act / FCC / ISED / CE / UKCA



## Mesh Module Tag

Part number	FWM7BLZ22T
Used IC	128KB RAM, 512KB Flash
Type	Mesh Module
Size	7.5x7.9x1.7mm
Operating Temperature	-40 to +85 °C
Attachment	SMT
Antenna	Not Embedded
External Interface	NFC, UART, GPIO, SWDCLK, SWDIO, nRESET, USB, ADC
Number of GPIO's	20
Qualifications/ Certifications	Compatible with FCC / ISED / CE / RCM / RSM / Radio Act with appropriate antenna



## Mesh Module Anchor

Part number	FWM7BLZ22P
Used IC	128KB RAM, 512KB Flash
Type	Mesh Module
Size	7.5x7.9x1.7mm
Operating Temperature	-40 to +85 °C
Attachment	SMT
Antenna	Not Embedded
External Interface	NFC, UART, GPIO, SWDCLK, SWDIO, nRESET, USB, ADC
Number of GPIO's	20
Qualifications/ Certifications	Compatible with FCC / ISED / CE / RCM / RSM / Radio Act with appropriate antenna



## Mesh Module Sink

Part number	FW7BZ22W
Used IC	128KB RAM, 512KB Flash
Type	Mesh Module
Size	7.5x7.9x1.7mm
Operating Temperature	-40 to +85 °C
Attachment	SMT
Antenna	Not Embedded
Host I/F	USB, UART
External Interface	NFC, GPIO, ADC, SWDCLK, SWDIO, nRESET
Number of GPIO's	20
Qualifications/ Certifications	Compatible with FCC / ISED / CE / RCM / RSM / Radio Act with appropriate antenna



# Test and experience Asset Tracking and Environment Monitoring

## **FCL Components' IoT Solution Evaluation Kits**

FCL Components evaluation kits provide everything required to test and evaluate asset tracking and environment monitoring.

The kits are available in two versions and are supplied ready-to-start including a gateway, manual and a three months evaluation license.

The on-line installation film is available to guide you through the set-up and our team is available for questions and support.

## FCL Components Evaluation Kit

Part number	FWM-WMKIT
Description	FCL Components Evaluation Kit
Size	255 x 332 x 76 mm
Power supply	Nodes:battery Gateway:AC adaptor
Qualifications	Nodes:FCC/ISED/CE/Radio ACT Gateway:CE/FCC/CSA
Content	<p>5x WM8BLZ07Y Mesh sensors, incl. temperature, humidity, barometric pressure, accelerometer, luminance and sound level sensors</p> <p>5x FWM8BLZ07P Mesh asset tags</p> <p>20x FWM8BLZ07P Mesh anchor nodes for location awareness</p> <p>1x FWM8GWZ01 Wi-Fi Ethernet gateway with two mesh sinks to connect the mesh network to the cloud service</p> <p>1x Concise manual explaining the usage and installation of the included hardware and software package</p> <p>The kit launches with a three-month software evaluation license</p>



## FCL Components Evaluation Kit 4G

Part number	FWM-WMKIT-4G
Description	FCL Components Evaluation Kit with 4G
Size	255 x 332 x 76 mm
Power Supply	Nodes:battery Gateway:AC adaptor
Qualifications	Nodes:FCC/ISED/CE/Radio ACT Gateway:CE/FCC/CSA
Content	<p>5x WM8BLZ07Y Mesh sensors, incl. temperature, humidity, barometric pressure, accelerometer, luminance and sound level sensors</p> <p>5x FWM8BLZ07P Mesh asset tags</p> <p>20x FWM8BLZ07P Mesh Anchors for location awareness</p> <p>1x FWM8GWZ01 LTE Wi-Fi Ethernet gateway with two mesh sinks to connect the mesh network to the cloud service</p> <p>1x Concise manual explaining the usage and installation of the included hardware and software package</p> <p>The kit launches with a three-month software evaluation license</p>





## About us

With over 100 years of experience in design and development, FCL Components' customer centric approach has resulted in high quality products fully adapted to customer and market requirements

We collaborate with in-house specialists and have a team of experts supporting customers around the globe.

Our overall product portfolio covers IoT solutions, wireless modules, touch panels, printers and relays.

FCL Components' design team is strongly focused on the development of IoT Mesh based devices which already cover a wide range of industries such as healthcare, retail, logistics and various public and private smart buildings.

Through our solutions we hope to contribute to a healthy and sustainable future.

# FCL Components IoT Solutions

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The background of the page is a light blue and white composition. On the right side, there is a vertical strip containing a blurred image of a laptop keyboard and a telephone handset. Overlaid on this are several thin, grey, curved lines that suggest a network or data flow. A large, solid red rectangle is positioned in the lower-left and center of the page, containing the website URL.

[www.fcl-components.com/en](http://www.fcl-components.com/en)