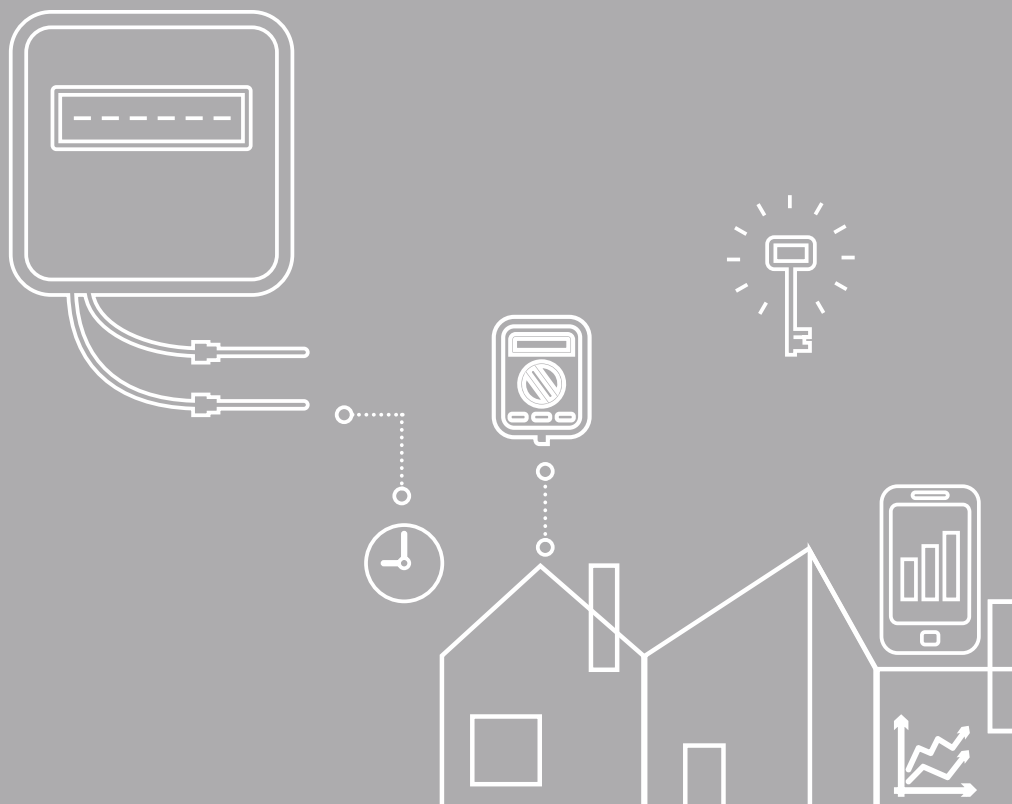




LoRaWAN Network Installation Guide



Introduction



This document is designed to provide guidance on the installation of a LoRaWAN network. The guide will support in selecting the most appropriate set up for your LoRaWAN network and available product details of Internet of things (IoT) accessories.



What is LoRaWAN?

LoRaWAN ("Long Range Wide Area Network") is a standard for wireless communication on the unlicensed frequency spectrum (868MHz in Europe). LoRaWAN is developed for applications where long range and extensive battery life is required.

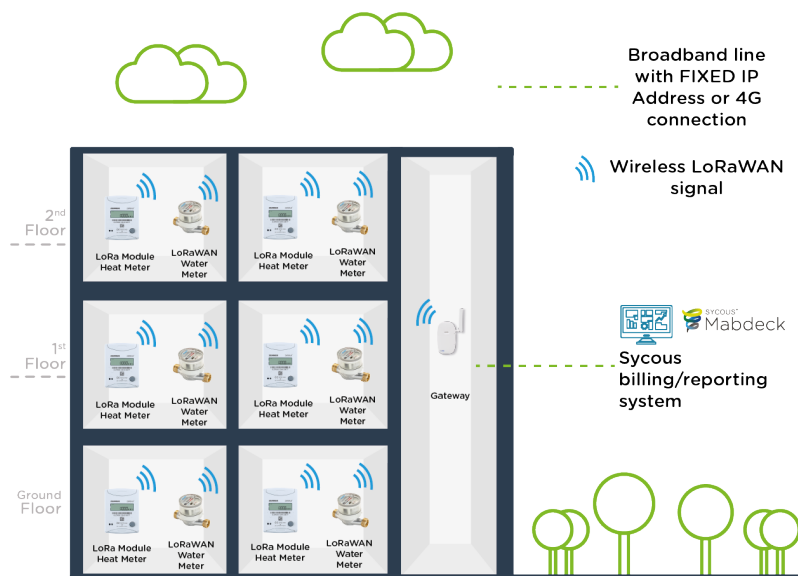


What is IoT?

Internet of things (IoT) networks and connected devices enable a low cost, open protocol way of measuring, monitoring and controlling your heat and utility networks.

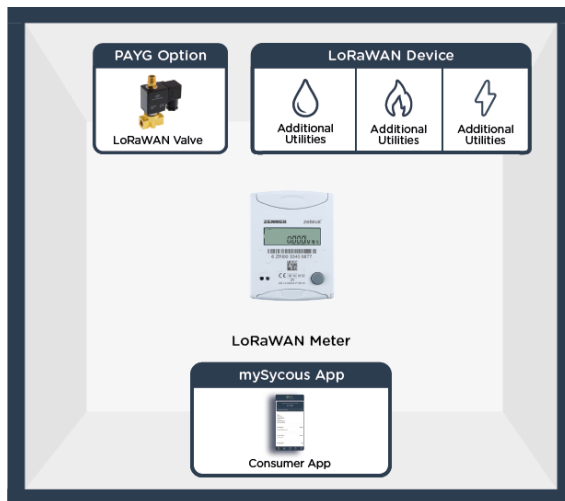
The long range networks enable encrypted and secure two way communication with devices across your entire energy network. The versatile networks can be used to collect data from a huge range of compatible devices, increasing the end use cases and applications beyond the world of conventional metering and billing.

Advised Installation of LoRaWAN network



Sycous provide an on-site RF signal survey to check connection strength from meter locations to communal areas for data collection equipment. This report is designed to be used by 3rd party installers or Sycous engineers for installation or commissioning of a LoRaWAN network. Sycous highly recommend a signal survey is carried out by Sycous engineers to ensure a robust and reliable metering and IoT network.

Optional PAYG Functionality within apartment for LoRaWAN network



Important

- » For commissioning, we recommend at first to do the onboarding of the device on your respective IoT platform by putting in the key information belonging to the device (DevEUI, JoinEUI and AppKey) before activating the device.
- » The devices that can be connected depends on the specifications of the energy meter.
- » Note: System setup may differ from those illustrated, depending on system specification.

Elvaco LoRaWAN Meter Connectivity Module (MCM)



The Elvaco range of Meter Connectivity Modules (MCM) allow flexibility for retrofit or new-build projects.

Sycous are the UK's largest partner of Elvaco and as a Premium Partner can ensure you receive the best solutions at the most competitive prices.



Zenner C5-IUF Heating & Cooling Meter

- » Available as heat, cooling or combined heat/cooling meters
- » LoRa Output
- » Battery Powered - 11 Years



DIEHL LoRa Module (CMi4160)

- » Suitable for Sharky 775 type meter only
- » LoRa Output
- » Battery Powered - 11 years



Landis+Gyr LoRa Module (CMi4110)

- » Suitable for L+G UH50/UC50 meters
- » LoRa Output
- » Battery Powered - 11 years



Itron CF LoRa Module (CMi4130)

- » Suitable for CF 51/55/ECHO II meters
- » LoRa Output
- » Battery Powered - 11 Years (with EcoMode)



Englemann LoRa Module (CMi4170)

- » Suitable for Englemann Senostar S3/S3C meters
- » LoRa Output
- » Internal meter battery (life span up to 10+1 years) or PSU (Englemann External Power Supply)



Kamstrup LoRa Module (CMi4140)

- » Suitable for Kamstrup MULTICAL 403/603/803 meters
- » LoRa Output
- » Battery Powered - 11 Years



Zenner ETKD/ETWD Water Meter

- » Available for cold water up to 30° C and for hot water up to 90° C
- » LoRa Output
- » Battery Powered - 11 years



Zenner C5-IUF Heat & Cooling Meter



Important

The Zenner C5 ultrasonic heating and cooling meter operates with an innovative ultrasonic technology, specially developed for a broad scope of application from submetering to district heating.

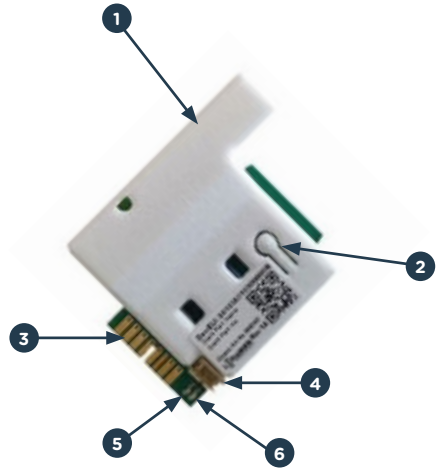


Features

- » Available as heat, cooling or combined heat/cooling meters
- » DN15-DN40
- » Low design height – perfect for HIU's
- » MBus, Wireless MBus or LoRaWAN available as an option
- » 3 inlets or 2 pulse inputs or outputs (optional)
- » Any installation position (even overhead)
- » 11-year battery service life – Meter is powered by MBus line once connected
- » New battery can be retrofitted if required
- » Precise, long-term stable, wear-free
- » MID Class 2

DIEHL LoRa Module (CMi4160)

1. NFC antenna
2. Push Button
3. Meter interface
4. Power Connector
5. Green LED
6. Red LED
7. *Ribbon cable, not shown in figure



Important

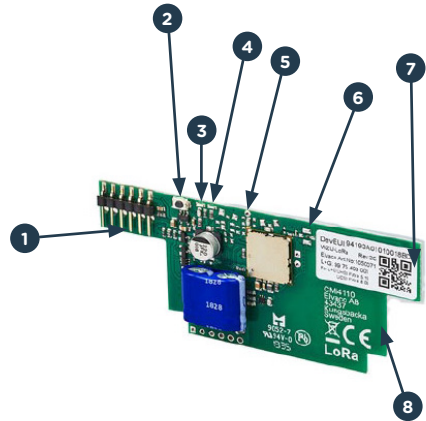
The CMi4160 is mounted inside a Diehl Sharky 775 to deliver meter data to a receiving server via a LoRaWAN network.

The product has 11 years of battery life, is energy-efficient, has a long communication range and is easily retrofitted inside an already installed meter.

CMi4160 is easily configured through Elvaco OTC (via NFC).

Landis+Gyr LoRa Module (CMi4110)

1. Meter Interface
2. Push Button
3. Green LED
4. Red LED
5. Tamper Switch (optional)
6. External antenna connector (optional)
7. LoRaWAN antenna
8. NFC antenna



Important

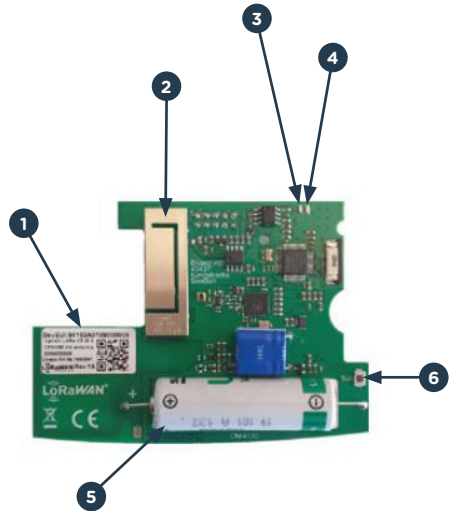
CMi4110 is mounted inside a L+G UH/50/UC50 to deliver meter data to a receiving server via a LoRaWAN network.

The product is energy-efficient (battery-life of at least 11 years), has a long communication range (up to 25km) and is easily retrofitted inside an already-deployed meter.

With CMi4110, Elvaco offers an MCM designed for customers that require a cost-effective solution with lesser demand for bandwidth.

Itron CF LoRa Module (CMi4130)

1. NFC antenna
2. LoRa antenna
3. Green LED
4. Red LED
5. Battery
6. Push button



Important

CMi4130 is mounted inside an Itron CF 51/55/ECHO II to deliver meter data to a receiving server via a LoRaWAN network.

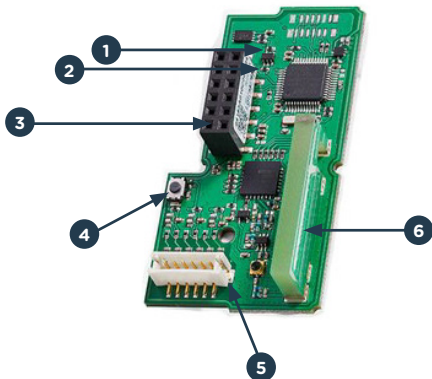
The product has 11 years of battery life, is energy-efficient, has a long communication range and is easily retrofitted inside an already deployed meter.

CMi4130 is easily configured through Elvaco OTC app (via NFC). With CMi4130, Elvaco offers a meter communication module designed for customers that require a user-friendly and cost-effective solution.

Englemann LoRa Module (CMi4170)

1. Green LED
2. Red LED
3. Interface Connector
4. Push Button
5. Pulse Input
6. LoRaWAN Antenna

Note: The NFC antenna is located in the edge of the PCB



Important

CMi4170 is mounted inside an Englemann Sensostar S3/S3C to deliver meter data to a receiving server via a LoRaWAN network.

The product can achieve up to 10+1 years of battery life, and can also be powered via PSU.

It is energy-efficient, has a long communication range and can be retrofitted inside an already deployed meter.

CMi4170 is easily configured through Elvaco OTC app (via NFC).

With CMi4170, Elvaco offers a meter communication module designed for customers that require a user-friendly and cost-effective solution.

Kamstrup LoRa Module (CMi4140)

1. Pulse Inputs
2. Power Connector
3. Antenna Connector



Important

CMi4140 is mounted inside a Kamstrup MULTICAL 403/603/803 to deliver meter data to a receiving server via a LoRaWAN network.

The product has 11 years of battery life, is energy-efficient, has a long communication range and is easily retrofitted inside an already deployed meter.

CMi4140 is easily configured through Elvaco OTC mobile app (via NFC). With CMi4140, Elvaco offers a meter communication module designed for customers that require a user-friendly and cost-effective solution.

Zenner ETKD/ETWD Water Meter



Important

The EDC-communication module (Electronic data capture module) with LoRaWAN® or wireless M-Bus interface is a clip-on module for secure remote reading to integrate water meters into LoRaWAN® or wireless M-Bus readout systems.

The Electronic Data Capture (EDC) module is designed for non-reactive, electronic pulse detection of all the ZENNER water meters with modulator disc.



Performance characteristics in overview

- » Configurable radio technology (wM-Bus or LoRaWAN®)
- » Battery powered
- » Tampering detection
- » Protection class IP68
- » Retrofittable without destroying seals
- » Flow direction recognition
- » Secure data collection without the use of reed switches
- » Optical interface for configuration purposes



Smart Metering functions

- » Self monitoring
- » Tampering detection
- » Dismounting detection of the module
- » Reverse water flow detection
- » Leakage detection
- » Meter stop detection
- » Meter oversized detection
- » Meter undersized respectively pipe burst detection

Expanding Past the Meter



LoRaWAN systems provide an added value benefit of expanding the network to connect a wide range of alternative sensors and devices.

By transferring data from all sensors through the same gateway and same application, the amount of equipment required can be minimized whilst providing simultaneous and instantaneous readings and changes.



Below are some examples of the devices Sycous can provide to add-on to a LoRaWAN network.

Zenner Smoke Alarm

- » Visual detection procedure with additional temperature sensor for reliable identification of all fire classes
- » Built-in, non-removable long-life battery with a service life of 10 years
- » Modern design 130 mm in diameter and 40 mm in depth
- » Loud alarm with min. 85 dB (A)
- » Event log with all key equipment parameters
- » Self-monitoring with error signal
- » LoRaWAN radio interface for remote inspection



Multi room sensor for indoor climate measurement

- » Sensors for: indoor climate (temperature, humidity)
- » Ranges up to 8km
- » NFC for flexible configuration via Android app
- » accuracy: $\pm 0.5^{\circ}\text{C}$, $\pm 2\%\text{rh}$
- » Resolution: 0.1°C , $0.1\%\text{rh}$
- » Battery life approx. 5-10 years (depending on interval configuration)
- » 1 x 3.6V AA lithium battery
- » Size 86x86x26mm



Air Quality sensor with Display

- » Measures CO2 Levels, Temperature & Humidity
- » Equipped with Display
- » Access to real time information
- » 2.13 Display
- » Fahrenheit or Celsius
- » Scandinavian design
- » Long Battery time (up to 10 years)
- » Easy access to Batteries
- » Batteries Not included - This product requires 2 x AA 3.6V Lithium Batteries (ER14505).



Multi room sensor for air quality, light and motion movement

- » Sensors for: air quality (CO2, temperature, humidity), light and motion (PIR)
- » Ranges up to 8km
- » NFC for flexible configuration via Android app
- » accuracy: $\pm 0.5^{\circ}\text{C}$, $\pm 2\%\text{rh}$
- » Resolution: 0.1°C , $0.1\%\text{rh}$
- » Battery life approx. 5-10 years (depending on interval configuration)
- » 1 or 2 x 3.6V AA lithium batteries
- » Size 86x86x26mm



The LoRaWAN Gateway



Sycous utilise the Kerlink Wirnet iStation LoRaWAN Gateway for the remote collection of data from meters and alternative sensors across IoT networks.

With a strong and robust design, Wirnet iStation can support your smart city, smart industry, or any other smart project, combining simplicity of outdoor installation, unique superior coverage and operational excellence.

The gateway can be used to deploy evolutive and reliable networks, connect high volumes of end-devices, and manage millions of bidirectional messages every day.



Features

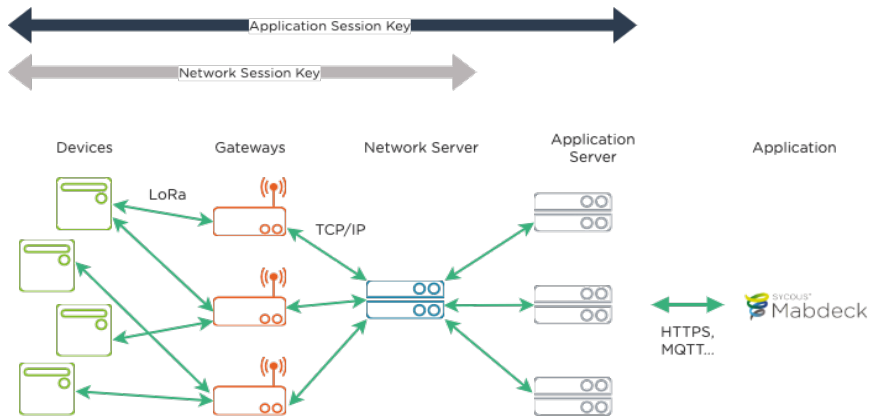
- » Backhaul connectivity: 4G Worldwide module with 3G/2G fallback, and Ethernet (RJ45)
- » Fully integrated and internal antennas GPS, 4G, LoRa
- » Outdoor LoRa gateway
- » Carrier grade (IP67) casing for industrial use
- » 8ch RX (125 kHz, multi Spreading Factor) + 1ch RX (250kHz or 500kHz, mono Spreading Factor) + 1ch RX (FSK) to get 10ch RX + 1ch TX,
- » Mounting kit allowing simple and quick installation without opening the casing
- » Built-in high-rejection filters to ignore other radio devices and enabling strong interference resistance
- » Mains Powered



Important

Sycous can provide full training on the installation of the device prior to any works taking place. The gateway will be pre-configured by Sycous before delivery. Commissioning of the gateway can be performed remotely and doesn't require a Sycous engineer to attend site. This not only reduces the timescale associated with commissioning and travel but also provides a cost saving compared to on-site commissioning.

LoRaWAN Security: Full End-To-End Encryption



To ensure all of the information is protected and in-line with data protection standards LoRa WAN networks have two layers of security.

These two layers of security are controlled through session keys. Session keys are provided by the manufacturer of the devices and only to the purchasing party.

The **network key** protects the data from the devices to the gateways. This ensures that a gateway which is not part of the system, cannot get the data from the devices without the associated session key.

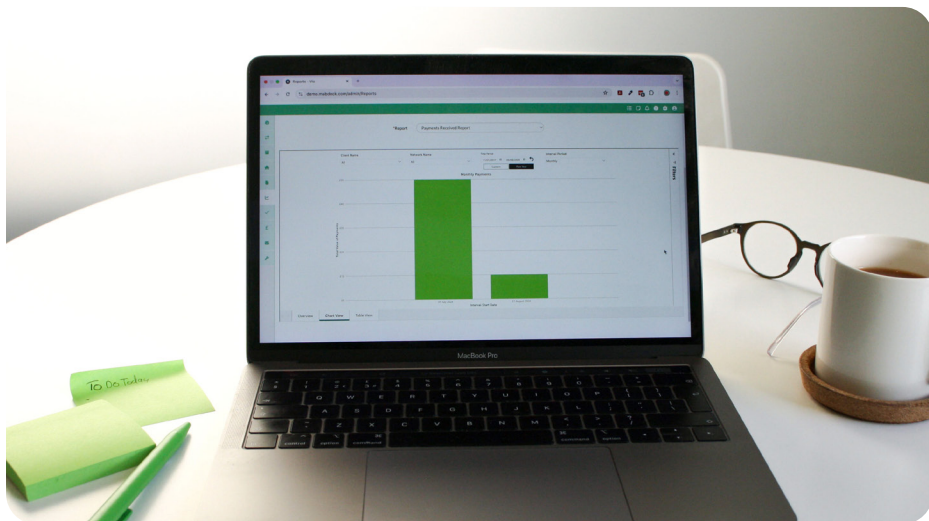
The **application key** protects the data from the network to the application server. You can only access the data on your application if you have the correct application key.

For example, if one site is owned by two companies, they would not be able to gain each other's data as they will not have the correct application key.

SYCOUS* Mabdeck for reading LoRaWAN



Mabdeck can be used to decrypt the data from the meters, send commands to the meters and display reads and connections.



What is Mabdeck?

Mabdeck is our Sycous online software platform that is designed for heat network operators, private utility suppliers and metering and billing companies.

It offers an off-the-shelf solution ready to allow you to automate and manage your metering systems, as well as your consumer interactions, payments, billing and much more.

Mabdeck also gives you the functionality to offer and operate PAYG solutions, as well as operating your own 'open-protocol' PAYG Cloud.

As a cloud-based platform, we're constantly developing and giving greater functionality to our customers, we can also provide bespoke functionality to meet your specific business requirements.

Notes

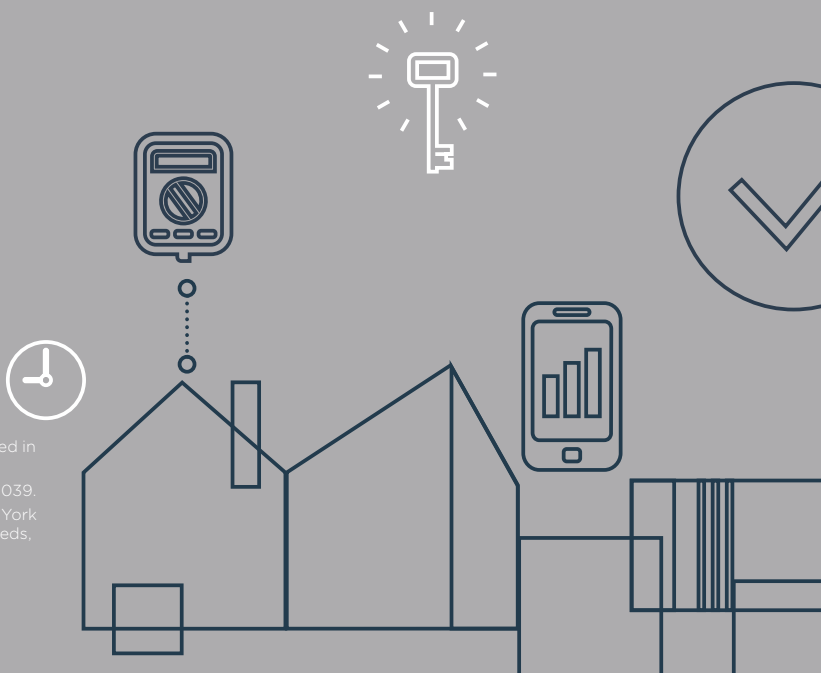
Notes

Notes

Need Help?

Contact our team on
01133604776 or email
info@sycous.com

Our offices are open
Monday to Friday
8:30 am to 5:30pm
excluding bank holidays.



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