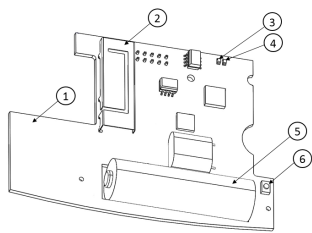# CMi4130
Integrated MCM for Itron CF ECHO II/51/55, LoRaWAN

INTRODUCTION

CMi4130 is an integrated meter connectivity module that is mounted inside an Itron CF ECHO II or CF 51/55 calculator to deliver meter data via a LoRaWAN network. For a complete description of the product or for information in other languages, visit the Elvaco AB website, https://www.elvaco.com.

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

MOUNTING

CMi4130 is mounted in the module slot of an Itron CF ECHO II or a CF 51/55. Grab the device by the outer edges and gently press it into position.

NOTE

Electrostatic-sensitive device. Please observe the necessary ESD protective measures when installing the module.

ANTENNA

CMi4130 is available in two different versions. CMi4130Int uses an internal PCB antenna. CMi4130Ext is equipped with a pigtail to connect an external antenna.

NOTE

Make sure to mount the antenna at least 0.5 meters away from the meter.

ACTIVATION

Upon delivery, CMi4130 is set to passive mode, which means no messages will be transmitted from the module. There are two ways to activate the product:

1. Press and hold down the push button (6) for at least 5 seconds until the green LED lights up.
2. Via the Elvaco mobile application "Elvaco OTC" . Set the Power mode to "Active", place the phone on the front side of the meter and click "Apply settings".

Upon start-up, the green and the red LEDs will lighten up for one second. The module will thereafter attempt to join the LoRaWAN network. The phase is indicated by short blinks on the green LED. Upon a successful join attempt, the green LED will lighten up for 8 seconds.

If the module fails to join the LoRaWAN network 6 times, it will wait for one hour before a new join attempt is performed in order to conserve battery. A new join attempt cycle can be initiated manually by using the push button (2).

INITIAL DATA RATE CALIBRATION

When activated, CMi4130 will initially transmit messages every minute in order to let the LoRaWAN network adjust to an optimal data rate. After three minutes, the module will start using its normal settings where the message transmit interval is determined by the device configuration.

DEVICE CONFIGURATION

Before activating the module, you should make sure to apply the correct configuration profile by using the Elvaco mobile application. Settings are transferred to the device using NFC.

Join EUI – The Join EUI sets the identification number of the application server where data from the module will be delivered. The JoinEUI is by default set to 94193A0309000001 in all CMi4130 modules with internal antenna and to 94193A030A000001 in CMi4130 devices with external antenna.

Activation type – There are two different activation types for LoRaWAN – Over-the-air activation (OTAA) and Activation by personalization (ABP). Elvaco strongly recommends using OTAA, where all network keys are generated each time the module joins the LoRaWAN network. In contrast, for ABP, all keys are set manually and stay constant over time.

Application key – The application key of each CMi4130 device is generated by Elvaco and used in OTAA mode to generate network keys when the module joins the LoRaWAN network. Keys are managed in a secure way using Elvaco's OTC (One Touch Commissioning) solution which includes the mobile application for configuration.

Message format – CMi4130 supports five different message types: Standard, Compact, JSON, Scheduled-daily redundant and Combined heat/cooling. Please refer to the CMi4130 user's manual for more information about the structure and payload of each message format.

Transmit interval – The transmit interval parameter is used to set the module transmits messages.

EcoMode – EcoMode can be enabled to guarantee a battery-life of 11 years. The EcoMode table is then used to determine how often the module is allowed to transmit data for each data rate. If the transmit interval exceeds the limit in the EcoMode table, it will be lowered accordingly.

Configuration lock – CMi4130 has a configuration lock feature which can be used to prevent unauthorized users to access the module. When configuration lock has been enabled, a user needs the device-specific Product Access Key in order to access the device. Keys are managed in a secure way using Elvaco's OTC solution which includes the mobile application for configuration.

After you have set all configuration parameters, place the phone next to the meter and click Apply settings. Hold the phone still until it vibrates three times. This confirms that new settings have successfully been transferred to the device via NFC.

SERVER CONFIGURATION

Before CMi4130 is able to transmit messages on the LoRaWAN network, device information needs to be added to the network server. More specifically, the following parameters needs to be registered (in OTAA mode) in order to enable the network server to receive messages from the module:

- Device EUI (16-digit number printed on the device label)
- Application key
- Join EUI

NOTE

If activation mode is set to "ABP". the application key does not need to be added to the network server. Instead, the following information will be needed: network session key, application session key and device address.

TECHNICAL SPECIFICATIONS

Mechanics

Dimensions	93 x 67 x 20 mm
Weight	36 g
Mounting	In Itron CF ECHO II/51/55
External antenna connector	SMA female (antenna ordered separately)

Electrical connections

Supply voltage	Internal battery

Electrical characteristics

Nominal voltage	3.0-5.0 VDC
Power consumption (max)	40 mA
Power consumption (sleep mode)	2.2 µA

Environmental specifications

Operating temperature	5 °C to 55 °C
Operating humidity	0 - 93 % RH, no condensation
Operating altitude	2000 m
Pollution degree	Degree 1
Usage environment	Indoors
Storage temperature	-20 °C to 60 °C

Radio characteristics

Frequency	868 MHz
Output power	14 dBm
Receiver sensitivity	-135 dBm

LoRaWAN characteristics

Device class	Class A, bi-directional
LoRa version	1.0.2
Activation	OTAA or ABP
Data rate	DR0-DR5 (250 bit/s-5470 bit/s)

User interface

Green LED	Status
Red LED	Error
Push button	Start-up / reboot / switch off device
Configuration	NFC via Elvaco mobile application or downlink data

Approvals

EMC	EN 301 489-1, EN 301 489-3
LoRa Alliance	LoRaWAN® Certified

SAFETY

The warranty does not cover damage to the product caused by usage in any other way than described in this manual. Elvaco AB can not be liable for personal injury or property damage caused by usage in any other way than described in this manual.

CONTACT INFORMATION

Elvaco AB Technical support:

Phone: +46 300 434300
E-mail: support@elvaco.com
Online: www.elvaco.com

elvaco

EU DECLARATION OF CONFORMITY

This declaration of conformity is issued under the sole responsibility of the manufacturer:
Elvaco AB, Kabelgatan 2T, S-434 37 Kungsbacka, Sweden.

Product	Year of CE-marking
CMi4130	2020

The object(s) of the declaration listed above is in conformity with the relevant Community harmonization legislation:
Low Voltage Directive 2014/35/EU
EMC Directive 2014/30/EU
Radio Equipment Directive 2014/53/EU
RoHS 2011/65/EU

And are in conformity with the following harmonization standards or other normative documents:
EN 301 489-1 (EMC standard for radio equipment and services)
EN 301 489-3 (EMC standard for radio equipment and services)
EN 300220-1 (SRD Low power radio equipment)
EN 300220-2 (SRD Low power radio equipment)
EN 55022 (Radiated emission)
EN 61000-4-2 (Immunity to ESD)
EN 61000-4-3 (Immunity to RF field)

Kungsbacka, Sweden, 2020-01-13

Håkan Saxmo, Chief Technology Officer