

# Allegro Cellular

## CAT-M PIT Module

### User Guide

**FCC ID: 2A7AA-CM5PIT4G**  
**Contains FCC ID: N7NHL78**  
**IC: 28664-CM5PIT4G**  
**Contains IC: 2417C-HL78M**

Publication: 10060026, Rev 05  
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#### **CAUTION**



This device complies with part 15 of the FCC Rules. The User and the Installer should be aware that changes and modifications to the equipment not expressly approved by Master Meter could void warranty and the user's authority to operate the equipment. Professionally trained personnel should install the equipment.

The antenna used for this transmitter must be installed to normally provide minimum separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

### **ATTENTION**



This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

## Industry Canada (IC) Compliance Notice

This device complies with FCC Rules Part 15 and with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (EIRP) is not more than that necessary for successful communication.

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

Le dispositif doit être placé à une distance d'au moins 20 cm à partir de toutes les personnes au cours de son fonctionnement normal. Les antennes utilisées pour ce produit ne doivent pas être situées ou exploitées conjointement avec une autre antenne ou transmetteur.

- This Class B digital apparatus complies with Canadian ICES-003.
- Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

## Introduction

The Allegro cellular PIT Module is a battery-operated radio module designed for automated water meter reading. The Allegro cellular is capable of reading water consumption data from residential and commercial water meters equipped with an Encoder or Solid-State Register. It uses CAT-M cellular radio for relaying water consumption data to the utility.



Figure 1 – Allegro Cellular PIT Module

## Electrical Characteristics

Battery:

- Battery type: Lithium-Thionyl Chloride
- Nominal voltage: 3.6 V
- Capacity: 8500 mAh

**DC Characteristics:**

- Operating voltage range: 3.0 V – 3.6 V
- Typical Sleep Current: 10  $\mu$ A

**Radio Characteristics:**

- RF/Antenna:
  - Typical Antenna Gain: 0dBi
  - LTE Cat-M1, Power Class 3 (Pout = 23dBm)
  - Typical Sensitivity TIS = -100dBm
  - Typical TRP = +20dBm
  - Software based radio allowing support of extra bands for worldwide operation (B2, 4, 12, 13, 26)
- SIM Interface: eSIM
- Protocol Stack Cat-M1:
  - 3GPP Rel. 13
  - Half-duplex
  - Channel bandwidth 1.4MHz
  - LTE carrier bandwidth 1.4 / 3 / 5 / 10 / 15 / 20 MHz
  - Up to 375kbit/s uplink, 300 kbit/s downlink
  - Extended Coverage Mode A
  - PSM (Power Save Mode)
  - I-DRX (Idle Mode Discontinuous Reception)
  - C-DRX (Connected Mode Discontinuous Reception)
  - Idle mode mobility
  - Connected mode mobility
  - eDRX (Extended Discontinuous Reception)

## Functional Description

The Allegro cellular PIT Module is battery endpoint for the application of automatic water meter reading. The primary function of the module is to record consumption of a water meter from an Encoder register. The count from the action of the meter advances the register and passed serially to the radio.

Several operational modes are available based on production configuration, standard mode transmit daily 24-hourly meter reads.

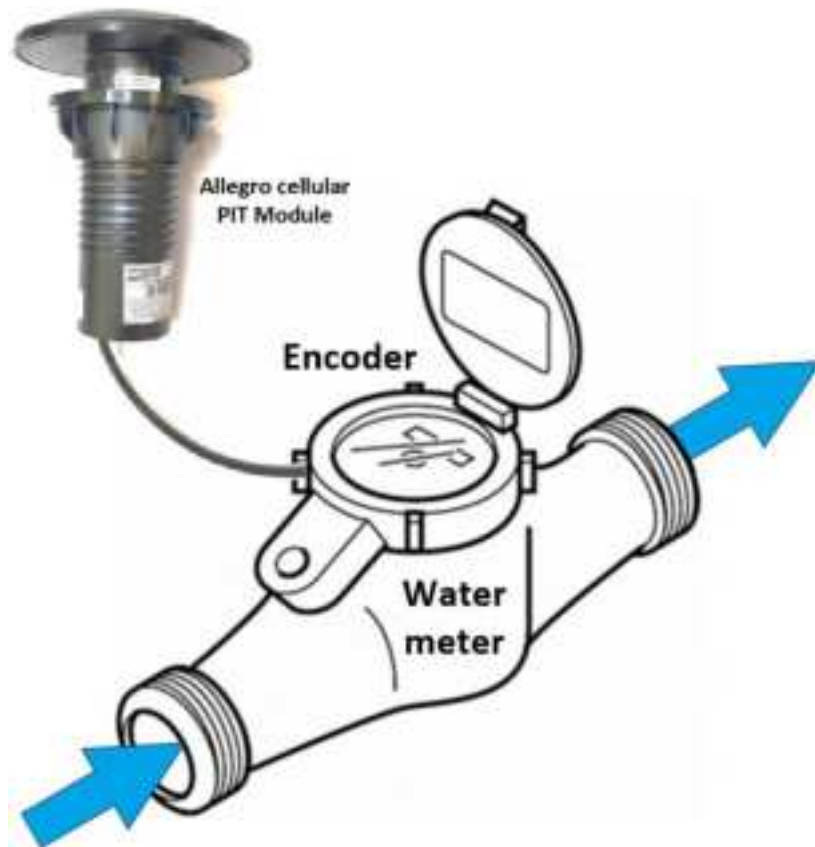


Figure 2 – Operation setup illustration

## Installation

1. Remove PIT lid, Figure 3.



Figure 3

2. Pass the cable through the Lid hole and Install the PIT Module into the Pit-Set Lid, Figure 4.



Figure 4

3. Fasten the PIT Module to the Pit-Set Lid using the fixing nut provided, Figure 5.






Figure 5

4. Connect PIT Module cable to water meter inside the Pit-Set, make sure both arrows located in front of each other and tight together, Figure 6.



Figure 6

	<p style="text-align: center;"><u><b>Pay attention!</b></u></p> <p>PIT Module may come with variety of cables, plugs, in case of bare wire connect the wires according to Meter manufacturer guidance</p>
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5. Place magnet on PIT Module top as illustrated in Figure 7.





Figure 7

6. On PIT Module bottom LED will indicate (Figure 8) process as described below.
7. When magnet is sensed LED blinks several times slowly.



Figure 8

8. When LED start to blink fast (~after 10 seconds) magnet should be removed.
9. After PIT Module was magnet activated, it will automatically be ready to transmit based on production schedule configuration.