Leak Detection Sensor

3G

Manual

Document Revision: 1.0

Purpose: Manual (Eng)

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Revision history

Version	Author	Date	Description
1.0	JS Lim	2019-1-29	Initial version

목 차

1. Introduction

누수감지센서(제품)은 상수도관에 부착되어 수도관의 누수 시 발생하는 진동을 측정하기 위한 무선 측정 장치이다.

시에라 3G 모뎀이 내장되어 있으며 측정된 주요 데이터는 무선으로 서버에 전송이 되며, 이 데이터는 모바일 앱 또는 PC 프로그램을 통해 확인 가능하다.
일차 리튬 배터리가 내장되어 있으며 저전력으로 동작하기 위해 평소에는 저전력 상태의 대기 모드로 있으며 정해진 시간에만 깨어나 동작하도록 되어 있다.

The leak detection sensor (product) is a radio measurement device attached to the water supply pipe to measure the vibration occurring when the water pipe leaks.

The Sierra 3G modem is built in, and the main measured data is transmitted wirelessly to the server, which can be viewed via a mobile app or PC program.
It has a built-in primary lithium battery and is normally in standby mode with low power to operate at low power and it wakes up only at a fixed time.

2. Layout

2.1. Product

모델명: **ULD-3G001**
주요 기능

- 케이스 하단에 있는 누수 감지 센서의 정보를 3G 모뎀을 통해 서버에 데이터를 전달하는 IOT 제품
- 하루에 약 4회 통신을 하며 그 외 시간은 대기 모드로 있으며, 이는 저전력 상태를 의미

기타:

- FCC 인증을 위해 자석으로 리드스위치에 터치하여 파워 온을 한 경우 3시간 연속 동작하도록 펌웨어 변경된 시료 전달 예정 (UART 포트로 동작 확인 가능)
- 외부 포트는 UART 통신용이며 일정 시간 주기로 데이터 출력 (115200bps)
- 통신 모뎀은 개통되지 않은 상태로 시료 전달 예정

전원 켜기: 케이스 하단에 둥근 스티커에 자석으로 짧게 터치하면 전원 켜짐
전원이 켜지면 외부 콘넥터를 통해 데이터가 출력 됨. (일정 주기)

Model name: **ULD-3G001**
Main function

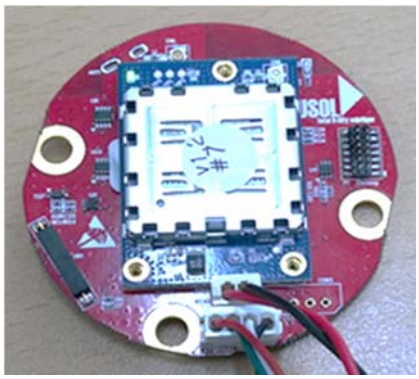
- IOT products that transmit data to the server through the 3G modem for leak detection sensor information at the bottom of the case
- It communicates about 4 times a day and other time is in standby mode, which means low power state

Other

- When the power is turned on by touching the reed switch with the magnet for FCC certification, the changed sample will be delivered for 3 hours continuous operation (UART port can be confirmed)
- External port is for UART communication and data output (115200bps)
- The communication modem will not be opened and the sample will be delivered.

Power on: Touch the circle sticker at the bottom of the case with a magnet to power on
Data is output through external connector when power is turned on. (Fixed cycle)

2.2. Main Board



메인보드에는 외부 인터페이스용 콘넥터와 배터리가 연결이 된다. 보드의 하단에는 누수 감지용 진동 센서의 콘넥터를 연결한다.

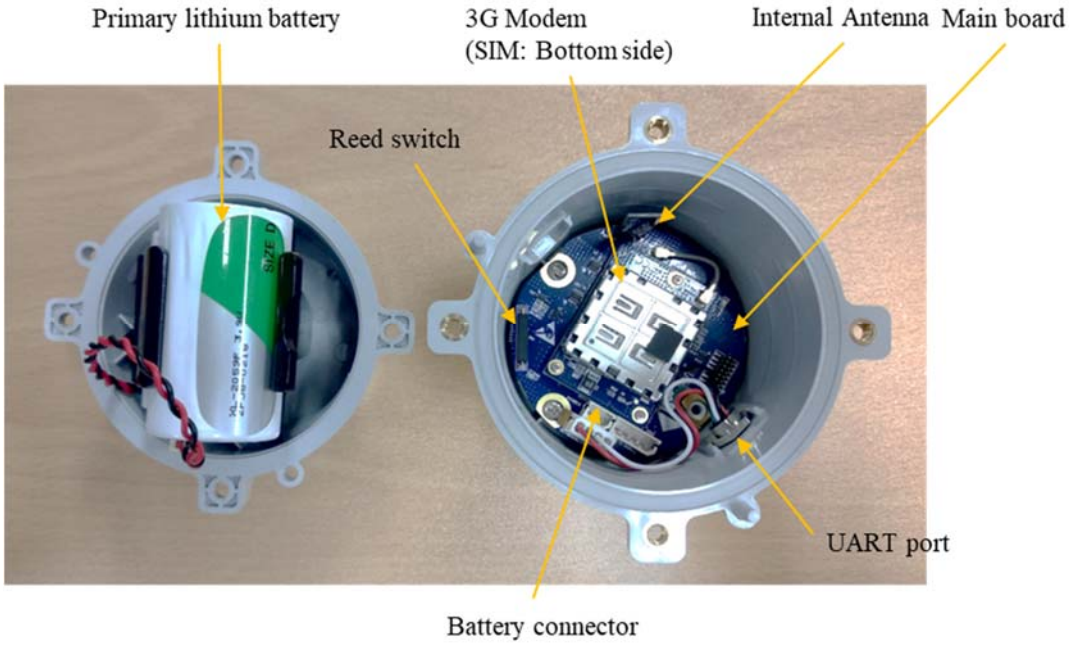
메인보드의 상단에 모뎀 모듈을 체결한다. 모뎀 모듈의 하단에는 유심 콘넥터가 있다.

The external interface connector and battery are connected to the main board. Connect the connector of the vibration sensor for leakage detection to the bottom of the board.

Tighten the modem module to the top of the main board. There is a sim connector at the bottom of the modem module.

2.3. Overall


Case
UART port
Fixing bracket for water piping


Primary lithium battery
3G Modem
(SIM: Bottom side)
Internal Antenna
Main board
Reed switch
UART port
Battery connector

3. Specifications

3.1. Electrical Specifications

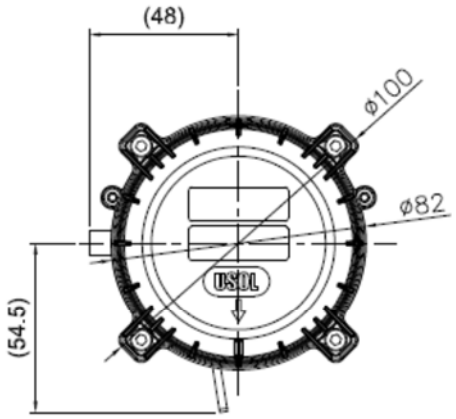
Specifications	
Operation temperature range	-20~55°C
External dimensions	100 x 100 x 130(H) mm
Weight	0.3kg [0.66lbs]
External Interface	UART (LVTTL 3.0~3.3V)
Internal Power source	Internal lithium battery (3.7V)
Communication Modem	Global 3G (sierra)
Antenna	2.7 dBi Internal type (36.5*8*1 mm)

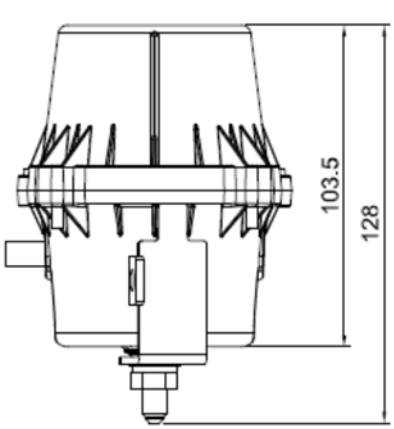
3.2. Pin Map

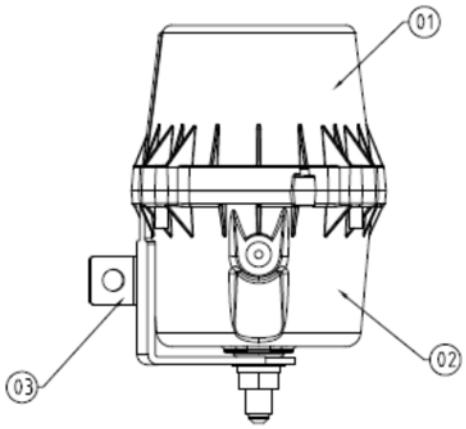
- UART

A universal asynchronous receiver-transmitter (UART) is a computer hardware device for asynchronous serial communication in which the data format and transmission speeds are configurable. The electric signaling levels and methods are handled by a driver circuit external to the UART.

3.3. Dimension







번 호	품 명	수 량
01	Case Uper	1EA
02	Case Lower	1EA
03	Lock	1EA

- A lock is optional part.

Note: 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 particular 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.

§15.21 Information to user.

The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. In cases where the manual is provided only in a form other than paper, such as on a computer disk or over the Internet, the information required by this section may be included in the manual in that alternative form, provided the user can reasonably be expected to have the capability to access information in that form.

FCC Information to User

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 particular 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 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 con-nected.
• Consult the dealer or an experienced radio/TV technician for help.

Caution

Modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC Compliance Information : This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

IMPORTANT NOTE:

FCC RF Radiation Exposure Statement:

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.