Dutch IoT Solutions

USER MANUAL & SAFETY REGULATIONS

DIS HALLOWELL C-V2.0

1. OPERATION OF THE DEVICE

1.1 Collection and Transmission of Information

The device gathers and transmits information to, among other things, determine the device's location. This is done through sensor data. Depending on the confugaration, the location can be calculated using GNSS satellite data and network towers from surrounding masts. GNSS satellite (GPS) reception only works when the GNSS antenna is placed in close proximity to the outdoors. In practice, the antenna usually doesn't work indoors due to interference (radiowave disturbance) caused by metal, concrete, bricks, roof tiles, or wood. The transmission of a message is done by using the telecommunications network. It's initially configured to switch to LTE Cat M1, and if that fails, it tries via NB-IoT. The Hallowell C-V2.0 also has an additional feature that, if the location message still can't be sent, it buffers the data and tries again at a later time.

	Sending information	**Collecting information**
Hallowell C-V2.0: (4 radio components)	LTE Cat M1 Narrow Band IoT	GNSS location, Network masts, temperature indication, acceleration sensor.

Figure 1: Overview table: operation of the device

1.2 Possible reasons for failure

There are two possible scenarios where the data wouldn't be able to transmit:

1. There is no telecom tower nearby that can handle the LTE Cat M1/NB IoT protocol.
2. The module is in a so-called 'Faraday cage'. This means that the environment disrupts the signal to such an extent that no radio signals can be transmitted to the telecom tower.

1.3 Triggers

The device only operates when so-called triggers turn active. By default, the device is in 'sleep mode' (this is 99% of the time). The device 'wakes up' and is thus activated by four different types of triggers. When this happens, a message is sent containing information about the status of the device and any sensor data. This data is used to calculate the location.

The four triggers are:

1. Time
A configurable wake-up. Default is once every 24 hours;
In this example, the device wakes up every 24 hours to send a message.

2. Start movement
With a configurable definition of movement (G-forces and duration), the device sends a message;
The basic configuration is 3 events of 1.14 G within 30 seconds.

3. Stop movement
If the status of the device is 'in motion', it doesn't send a message until it has detected no movement for longer than X amount of time;
X time is default 10 minutes; it is however configurable*.

*The device has a configurable message budget. By default, it's 10. If it has made 10 attempts to send something (successful or unsuccessful), it won't try again within the configured wake-up (default 24 hours).

1.4 Receiving Data

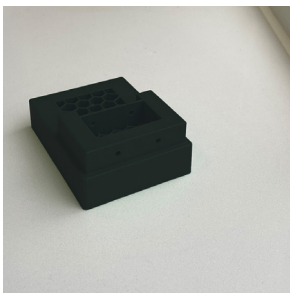
The devices send data that can be received in three ways:

Option 1
The data is sent to the TIP (The IoT Provider) cloud. This data is accessible at http://cloud.theiotprovider.com. You can log in with your credentials. Afterward, you can manage your products, adjust configurations, view information, and utilize the HTTPS API through this platform.

Option 2 (not yet available)
The device is configured to send data to the specified IP address via MQTT. As a customer, you must set up an MQTT server yourself. There is a set of commands to update and configure the product. Refer to the documentation for details on the website, when this service is available.

Option 3 (not yet available)
A Docker container is provided, which needs to be installed on a server. The device is configured to send data to the specified IP address. There is a set of commands to update and configure the device. Refer to the documentation for details on our website (www.dutch-iot.com), when this service is available.

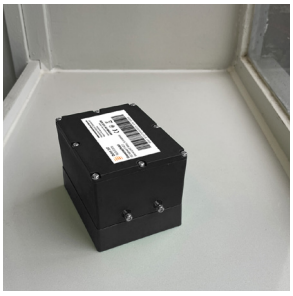
2. MOUNTING INSTRUCTIONS



01 PREPARATION
- Place the contra plate with the screw holes facing forward.

02 PLACE SCREW HOLES TO THE FRONT
- Hold the device with the screw holes facing forward.

03 PLACING THE DEVICE
- The device fits perfectly into the contra plate when the screw holes of the device are also oriented forward in the contra plate.



04 PLACE SCREWS IN SCREW HOLES
- Insert the screws into the screw holes.

05 TIGHTENING SCREWS
- Tighten the screws.

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3. LIFESPAN

3.1 Device Lifespan - Base Configuration

The lifespan of the device in basic configuration is developed in a way that it's capable of being active for 300.000 event seconds. A configuration that doesn't search for GNSS and is near a telecom mast will be awake for approximately 8 event seconds each time. This means that the device can send about 20 messages per day, over a period of 5 years.

3.2 GNSS Lifespan

However, when the device **does** search for GNSS, it has a configurable timeout of 180 seconds. This implies that the device goes to sleep after 180 seconds. In practice, with one message per day, the batteries* will be depleted after 5 years (approximately 1880 messages in total).

*The battery is influenced by temperature. The optimal operating temperature is 20 degrees. The device functions between -20 & +65 degrees.

4. INTENDED USE

- The device is designed in such a way that it doesn't need to be opened. This also isn't reccomended due to safety reasons.
- The code on the sticker at the top of the device must remain visible at any time as it serves as the unique identifier and the radiation direction of the antenna.
- The device is IP67 tested. This means that the device is waterproof at a depth of 1 meter for 30 minutes.

5. DISCLAIMER

As the device is normally in 'sleep mode', it doesn't retain the location information of GNSS satellites or LTE Cat M1 network towers. Consequently, it may occasionally fail to establish a connection and at other times succeed to do so.

The device shouldn't be opened. If it is opened anyway, the warranty will be voided.