atim cloud wireless™
PRODUCT LINE

ATIM Cloud Wireless

Digital Input and Output
DINDIO

User Guide

Concerned models:
ACW/LW8-DINDIO
ACW/SF8-DINDIO

LoRaWAN™

sigfox ready

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Document version history

Version	Date	Description	Author	Concerned soft version
1.0	20/10/2017	Creation	AM	1.1.1
1.1	12/03/2018	Corrections	FR	1.1.1
1.2	31/01/2019	LW Class C	AM	1.1.0
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1.4	08/04/2019	Corrections	FR	1.0.1

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Declaration of compliance

All ACW Atim Cloud Wireless® products comply with the regulatory requirements of the R&TTE Directive (1999/5/EC), article 3:

CE

1 SAFETY (Article 3.1a of the 1999/5/EC Directive)

NF EN60950-1 Ed. 2006/A1:2010/A11:2009/A12:2011 (health)

EN62479: 2010 (power <20mW) or EN62311:2008 (power > 20mW)

2 Electromagnetic compatibility (Article 3.1b of the 1999/5/EC Directive)

EN 301489-3 v1.4.1, EN 301489-1 V1.9.2

3 Efficient use of the radio frequency spectrum (Art.3.2 of the 1999/5/EC Directive)

ETSI EN300 220-2 v2.4.1 and EN300 220-1 v2.4.1

Environmental recommendations

Explosive atmosphere

Except for the ACW-ATEX line specifically intended for this purpose, do not use ACW radio modems in the presence of flammable gases or fumes. Using the equipment in such an environment constitutes a safety hazard.

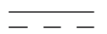
Environment

Respect the temperature ranges for storage and operation of all products. Failing to respect these guidelines could disrupt device operation or damage the equipment. ACW products in IP65 water- and dust-resistant housings may be placed outdoors, but must not, under any circumstances, be submerged.

Follow the instructions and warnings provided below to ensure your own safety and that of the environment and to protect your device from any potential damage.

General hazard *– Failure to follow the instructions presents a risk of equipment damage.*

Electrical hazard *– Failure to follow the instructions presents a risk of electrocution and physical injury.*



Direct-current symbol

WARNING*: do not install this equipment near any source of heat or any source of humidity.*

WARNING*: for your safety, it is essential that this equipment be switched off and disconnected from mains power before carrying out any technical operation on it.*

WARNING*: the safe operation of this product is ensured only when it is operated in accordance with its intended use. Maintenance may only be performed by qualified personnel.*

Waste disposal by users in private households within the European Union. This symbol appears on a product or its packaging to indicate that the product may not be discarded with another household waste. Rather, it is your responsibility to dispose of this product by bringing it to a designated collection point for the recycling of electrical and electronic devices. Collection and recycling waste separately at the time you dispose of it helps to conserve natural resources and ensure a recycling process that respects human health and the environment. For more information on the recycling centre closest to your home, contact your closest local government office, your local waste management service or the business from which you purchased the product.

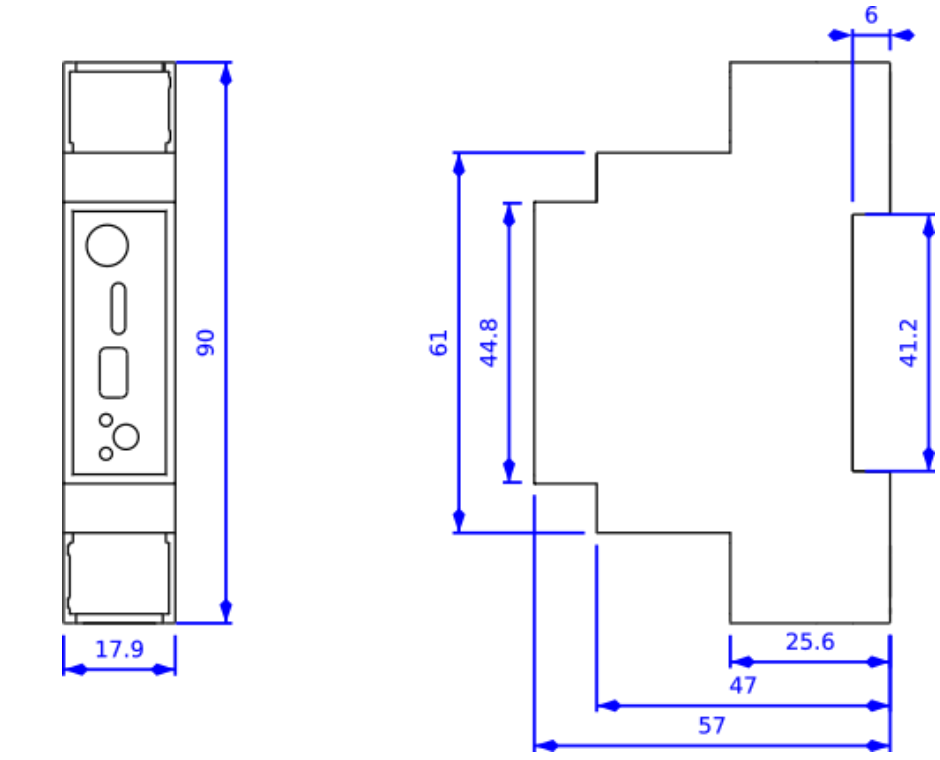
Radio

Modems in the ACW line are radio-communication modems that use the ISM (industrial, scientific and medical) bands, which may be used freely (at no cost and with no authorisation required) for industrial, scientific and medical applications.

Technical specifications

Dimensions	90 x 57 x 67 mm	
Antenna	External (SMA connector)	
Temperature	-20°C to +55°C (operating) -40°C to +70°C (storage)	
Mounts to	DIN-Rail	
Battery	1 x alimentation 10-30Vcc	
Frequency	865 – 870 MHz	
Power	25 mW (14 dBm)	
Rate	Sigfox: 100 bps LoRaWan: 300 bit/s à 10 Kbit/s	
Consumption	Sigfox	LoRaWan
Mode Tx	40 mA	25 mA
Mode Rx	30 mA	10 mA

Footprint and installation



Dimensions given in mm.

ACW modems in ‘breaker’ format are attached to a DIN-rail.

Set up

a. Positioning

This version was designed for installation in an electrical box made of PVC or metal. If the cabinet is made of insulating material (PVC, ABS, fiberglass), it is possible to simply use a small whip-wave antenna: Ref. ATIM ANT868-12FSC. This antenna must be firmly screwed on the SMA connector is positioned vertically, preferably upwards.

➔ In the case of a metal box, it is imperative to deport the antenna to the outside to have good results in radio and thus avoid the effect "Faraday cage! "

For optimal results, it is advisable to move the antenna up and clear of any metallic obstacle in a radius of 1 meter.

b. Modem connection

Terminals:

Name	Designation	Input / Output
GND	Ground	Input
10/30V	Alimentation between 10V and 30V	Input
OUT	Digital output 10-30Vdc	Output
NC	Not connected	/
IN1	Digital input 1	Input
IN2	Digital input 2	Input

Antenna (SMA):

Before powering up the product, connect the antenna (either an ATIM ANT868-12FSC half-wave whip antenna, or a ¼-wave remote antenna (ref ATIM ANT868-14S4.0) with metal ground plane or ½ wave (ref ATIM ANT868-12S3.8) or a roof antenna with a low loss cable (ref ATIM ANT868-BZ or ANT868-08).

Alimentation (Lower terminal):

The ACW-DINDIO must be powered with a continuous power supply between 10V and 30V that can supply a minimum current of 100mA.

OUT (Lower terminal):

The logic output is MOSFET current source (N channel), 10-30Vdc. The maximum charging current is 0.2A.

IN1/IN2 (Upper terminal):

You can connect up to two inputs in 10-30Vdc positive logic. The filter of the input is 250 ms. The maximum recommended cable length is 1 meter.

USB:

The USB connector is not used in the current version.

c. Lights meaning

The green LED flashes during a radio activity.
The red LED flashes to indicate any malfunction.
On power-up, the green LED will come on for 0.5s to prove that it is working, otherwise the red LED will flash.

d. Pushbutton

The push button located on the front of the box makes it possible to emit a test frame in order to validate the installation on site.

Uplinks on IoT networks (Sigfox / LoRaWAN)

a. Test frame

This test frame is sent to the network 5 times every minute when the product is started. It can also be triggered via the push button on the front of the ACW. Each time this frame is sent, a counter is incremented and inserted in the frame.

Frame format

Octet	1	2
Data	0x05	Cpt

Cpt deals with the metering value.

b. Keep alive frame

This frame is sent to the network every 6 hours and on power up to certify that the ACW is still running.

Frame format

Octet	1	2	3	4	5	6
Data	0x01	Standby radio power supply voltage (millivolt – typically 3.3V)		Supply voltage of the radio heart in emission (millivolt – typically 3.3V)		0x64

Note
In Sigfox, this frame activates a downlink and it is only then that it is possible to define the state of the output from the server (from the web platform).

c. Periodic frame (or input state change detection)

This frame is sent to the network every hour or in the event of a change of state on the Dry Contacts inputs.

Octet	1	2	3
Data	0x09	Numerical outputs state. Bit0: OUT1	Numerical inputs state. Bit0: IN1 Bit1: IN2

Downlinks on IoT networks (Sigfox/LoRaWAN)

The descent information (commonly called "DOWNLINK") is used here only to affect the state of the output (OUT).

Note
In LoRaWan, class C is supported

a. Assign a state to the output

To assign a state to the output, it will send the frame below:

Octet	1	2	3
Data	0x01	0x0A	state

You must specify the state of the output in byte 3 (state). It will be necessary to specify 0 for the low state and another value for the high state (the high state corresponds to the supply voltage).

Order confirmation / acknowledgment

If everything went well, a confirmation frame is sent back to the network. This frame is in the following format:

Octet	1	2	3
Data	0x07	0x0A	0

b. Generate a positive impulse

To generate a positive pulse (that is, to drive the output high for a certain time) the next frame will have to be sent.

Octet	1	2	3
Data	0x01	0x0B	Time *4 (ms)

You must specify the pulse time (in milliseconds and divide by 4) in byte 3. For example, for a pulse of 12 milliseconds you must write the value 3 in byte 3. The min value of the pulse is therefore 4 ms and the max value is 1020 ms.

Oder confirmation / acknowledgment

If everything went well, a confirmation frame is sent back to the network. This frame is in the following format:

Octet	1	2	3
Data	0x07	0x0B	0

c. Generate a negative impulse

To generate a negative pulse (that is, to drive the output low for a certain time) the following frame must be sent.

Octet	1	2	3
Data	0x01	0x0C	Time *4 (ms)

You must specify the pulse time (in milliseconds and divide by 4) in byte 3. For example, for a pulse of 12 milliseconds you must write the value 3 in byte 3. The min value of the pulse is therefore 4 ms and the max value is 1020 ms.

Oder confirmation / acknowledgment

If everything went well, a confirmation frame is sent back to the network. This frame is in the following format:

Octet	1	2	3
Data	0x07	0x0C	0

d. Invalid downlink frame

If the downlink frame is not valid, the following frames can be reassembled:

Octet	1	2
Data	0x08	0x02

or

Octet	1	2
Data	0x08	0x01

Technical Support

For any information or technical problems, you can contact our technical support by e-mail and phone:

www.atim.com/fr/technical-support