atim cloud wireless™
PRODUCT LINE

ATIM Cloud Wireless®

Metering and Dry Contacts DINDxxx

User Guide

Concerned models:

ACW/LW8-DIND160

ACW/SF8-DIND160

ACW/LW8-DIND80

ACW/SF8-DIND80

ACW/LW8-DIND88

ACW/SF8-DIND88

ACW/LW8-DIND44

ACW/SF8-DIND44

LoRaWAN™

sigfox ready

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Table of content

Software version

Product reference	Product version
ACW/SF8-DIND160	B.1
ACW/SF8-DIND80	B.1
ACW/SF8-DIND88	B.1
ACW/SF8-DIND44	B.1
ACW/LW8-DIND160	B.1
ACW/LW8-DIND80	B.1
ACW/LW8-DIND88	B.1
ACW/LW8-DIND44	B.1

Document version history

Version	Date	Description	Author
0.9	10/06/2017	Document creation	AM
1.0	26/06/2017	Corrections	FR
1.1	27/09/2017	Complete Sigfox version	AM
1.2	15/03/2018	SF8/LW8 versions in 8 and 16 inputs Downlink commands addition	AM
1.3	05/04/2018	Inputs decoding precisions	AM
1.4	11/09/2019	Renaming Outputs versions additions (DIND44 and DIND88) Electrical features updates	AM
1.5	07/10/2019	Corrections	AM
1.6	21/02/2020	Clarification of the Downlink summary table	FR
1.7	24/02/2020	Add new uplink frames (output status)	AC
1.8	21/09/2020	Output calendar (downlink and command) Configuration of shock alarm Update of the configuration manual	AC
1.9	08/10/2021	Modification of the Positive Pulse and Negative pulse commands for versions ≥ v1.5.0	YL
1.10	16/06/2022	Corrections	MD

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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

a. 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.

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.*

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 other 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 center closest to your home, contact your closest local government office, your local waste management service or the business from which you purchased the product.

b. 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 authorization required) for industrial, scientific and medical applications.

Prelude

This guide describes the features of the ACW-DINDxxx product. It describes the characteristics of the product, explains its commissioning, its configuration, and its operation.

The ACW-DINDxxx is intended to raise the digital input states (Dry contacts) on an IoT network such as Sigfox or LoRaWAN. These inputs are configurable and can be enabled / disabled as single inputs or as Meter inputs. Versions with dry contact outputs are also available, allowing the remote control of various equipment.

A temperature sensor can be optionally connected. The product also has a shock sensor for issuing an alert in case of tearing of the limp.

Technical features

a. Products features

Dimensions	53 x 67 x 95 mm
Antenna	External via SMA connector
Temperature	-20°C to +55°C (operation) -40°C to +70°C (storage)
Mounts to	DIN rail
Power supply	1x power supply, 10-30 V DC
Consumption	100 mA
Dry contacts Digital inputs (DIND60)	-16 configurable inputs -Change of state alerting -8 configurable meters on whatever input (4 meters before version V1.2.0) -Available configuration of 4 group of inputs
Dry contacts Digital inputs (DIND80 and DIN88)	-8 configurable inputs -Change of state alerting -8 configurable meters on whatever input -Available activation of a group of inputs
Dry contacts Digital inputs (DIND44)	-4 configurable inputs -Change of state alerting -4 meters configurable on whatever input -Available activation of a group of inputs
Dry contacts Digital outputs	-DIND88: 8 outputs driven via downlink -DIND44: 4 outputs driven via downlink
Configuration via	USB Port or Downlink
Alarm	Wrenching / Shock
Frequency	865 – 870 MHz
Power	25 mW (14 dBm)
Transfer rate	Sigfox: 100 bps LoRaWAN: 300 bit/s to 10 kbit/s
LoRaWAN	Class C

b. Electrical features

	Min.	Type	Max.
Power supply (V)	10V		30V
Emission consumption (mA)		Condition: -12V Power supply -Every output is shut down	60mA – Sigfox 60mA – LoRaWAN
		Condition: - 24V Power supply -Every output is shut down	35 mA – Sigfox 30mA – LoRaWAN
Reception consumption (mA)		Condition: -12V Power supply -Every output is shut down	50mA – Sigfox 30mA – LoRaWAN
		Condition: - 24V Power supply -Every output is shut down	30mA – Sigfox 20mA – LoRaWAN
Standby consumption (mA)		Condition: -12V Power supply -Every output is shut down	20 mA – Sigfox N/A – LoRaWAN
		Condition: - 24V Power supply -Every output is shut down	15 mA – Sigfox N/A – LoRaWAN
Input high level voltage (V)	2.8V	with Pull-Down	30V (recommended)
	2.3V	with Pull-Up	
Input low level voltage (V)	0V	with Pull-Down	1.3V
		with Pull-Up	0.15V
Tension of outputs (V)	10V	Power supply tension	30V
Current of outputs (mA)			250 mA

c. Inputs and Meters features

	Min.	Type	Max.
Inputs or meters frequency (Hz)		Condition: - Cyclic report at 50% - Filtering time 1 ms	400Hz
Bounces filtering time	1ms	Note: Configurable value.	255ms
Bounces filtering time precision	-1ms	Note: to guarantee a minimum 1ms of filtering time, the filtering time must be configured to 2ms.	0ms
Meters size		4 bytes	

Temperature sensor features

Optionally, a temperature sensor can be connected to the ACW-DINDxxx. The following ranges refer to the sensor used. Be careful, the product has a smaller operating range than the sensor (see above).

Temperature	
Range	-55°C to +125 °C
Resolution	0,1°C
Precision between -40°C and +80°C	+/- 0.5°C
Precision between -55°C and +125°C	+/- 2°C

Meters back-up

Since version **V1.2.0** the Meters are saved in the memory of the ACW during several events:

- When writing Meters via the USB configurator
- When writing via a downlink command
- During a power failure

Outputs calendar

From **1.4.0** firmware version, it is possible to program outputs state depending on weekday and a time window.

The possible configurable parameters are:

- The start time (1 minute increment)
- The stop time (1 minute increment)
- The weekdays when the program is effective
- Outputs to set
- Outputs to reset

You can configure from 1 to seven programs and several programs can be used the same day.

Once a program is configured, it is automatically enabled but a command is provided to disable it later (several programs can be disabled at once). It will remain disabled while the same command is sent once again.

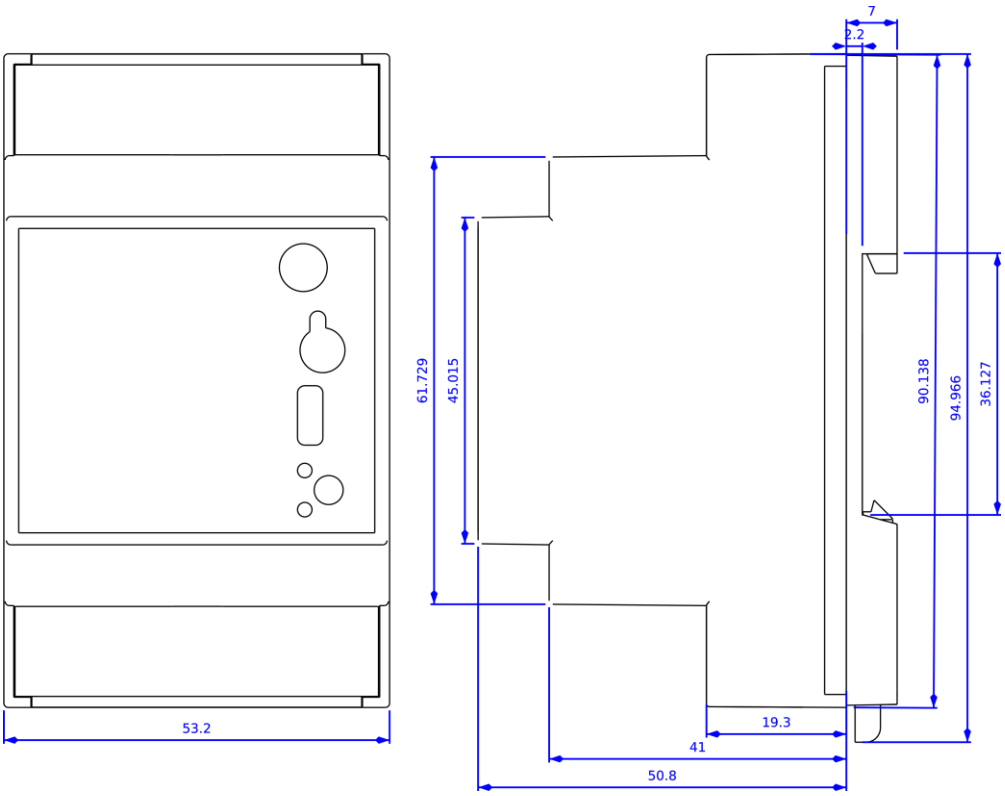
In addition, this command can disable the program(s) for the next day only. The program(s) will be automatically enabled the day after.

Once a program's time slot is done, the outputs affected by the program will be driven at the opposite state (ex: an output to "1" during the program will be at "0" at the end).

WARNING
It is not a good practice to configure several programs at the same time if these ones drive the same outputs.

Casing

a. Space requirements

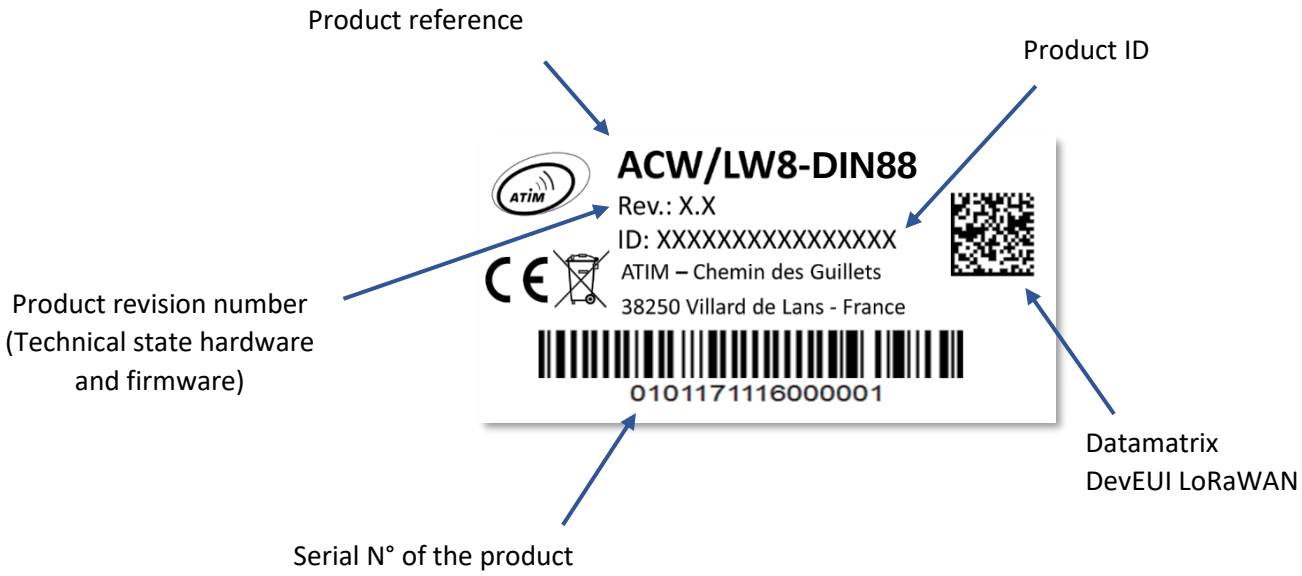


Dimensions are given in mm.

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

b. Identification

The product identifier is visible on the outer label:



ACW-DIND88 label

Each product in ATIM's ACW range has a QR Code label visible either on the side or on the front of the product. This QR Code can be easily read with any 2D barcode reader app on your smartphone.

Reading the QR Code indicates the following information:

ATIM|ACW/LW8-DIND88|A.0|190925|1|1.0|1.3.0|70B3D59BA0009030

Interpretation

ATIM	ACW/LW8-DIN88	A.0	190925	1	1.0	1.3.0	70B3D59BA0009030
Manufacturer name	Product reference	Revision version	Date of manufacture (AAMMJJ)	Manufacturer site	Hardware version	Application firmware version	DevEUI LoRaWAN

Set up

a. Antenna positioning

This version was designed for installation in a cabinet.

If the latter is made of insulating materials (PVC, ABS, fiberglass), it is possible to simply use a small half wave whip antenna (Ref: ANT868-12FSC).

This antenna must be correctly screwed on the SMA connector and positioned vertically, preferably upwards.

For optimal results, it is advisable to deport the antenna in height, clear of any metallic obstacle in a radius of one meter.

IMPORTANT NOTE
In the case of a metal box, it is imperative to deport the antenna to the outside to have good results in radio (avoid the faraday cage).

b. Modem connection

Antenna (SMA connector)

Before powering the product, a 50Ω / 868MHz antenna must be connected, either directly to the SMA connector or via a 50Ω cable in case of antenna offset.

WARNING
It is mandatory to connect the antenna before powering the product. Failure to do so may cause the product to malfunction and become unusable.

Power Supply (Bottom terminal block)

The ACW-DINDxxx module must be powered with a DC power supply between 10V and 30V that can provide a minimum current of 100mA. The POWER pin corresponds to the + terminal and the GND pin to the - **(0V)** terminal.

NOTE
All GND terminals of the ACW-DINDxxx are interconnected internally. Only the GND terminal, bottom right, should be used to connect the power cable.

Jack connector

This connector is used to connect an optional temperature sensor (supplied with a 2m cable).

USB

This connector is used for product configuration via USB interface on PC.

NOTE
The configuration via USB can directly power the ACW-DINDxxx and does not require an external power supply (10 / 30V). But an external power supply can also be present.

c. Terminals' description

Below you will find a table describing the different connection pins:

Name	Designation	Input / Output
GND	Ground (-) for IN1, IN2 and IN3	Ground
IN1	Digital input ALERT 1	Input
IN2	Digital input ALERT 2	Input
IN3	Digital input ALERT 3	Input
GND	Ground (-) and IN4, IN5 and IN6	Ground
IN4	Digital input ALERT 4	Input
IN5[(2)]	Digital input ALERT 5	Input
IN6[(2)]	Digital input ALERT 6	Input
GND	Ground (-) for IN7 and IN8	Ground
IN7[(2)]	Digital input ALERT 7	Input
IN8[(2)]	Digital input ALERT 8	Input
NC	Do not use – Do not connect	
IN9[(1)]	Digital input ALERT 9	Input
OUT1	Digital output 1	Output
IN10[(1)]	Digital input ALERT 10	Input
OUT2	Digital output 2	Output
IN11[(1)]	Digital input ALERT 11	Input
OUT3	Digital output 3	Output
IN12[(1)]	Digital input ALERT 12	Input
OUT4	Digital output 4	Output
GND	Ground (-) for GPIO9, 10, 11 and 12	Ground
IN13[(1)]	Digital input ALERT 13	Input
OUT5[(3)]	Digital output 5	Output
IN14[(1)]	Digital input ALERT 14	Input
OUT6[(3)]	Digital output 6	Output
IN15[(1)]	Digital input ALERT 15	Input
OUT7[(3)]	Digital output 7	Output
IN16[(1)]	Digital input ALERT 16	Input
OUT8[(3)]	Digital output 8	Output
GND	Ground (-) for GPIO13, 14, 15 and 16	Ground
POWER	Power supply between +10V and +30V	Input (Alim +)
GND	Ground (-)	Ground (Alim 0V)

NOTE [(1)]
DIND80, DIND88 et DIND44 versions do not include inputs from IN9 to IN16. Do not connect anything on those pins.

NOTE [(2)]
DIND44 version, does not include inputs from IN5 to IN16. Do not connect anything on those pins.

NOTE [(3)]
DIND44 version, does not include outputs from OUT5 to OUT8. Do not connect anything on those pins.

d. Pushbutton

The push button located on the front of the box makes it possible to send a test frame to validate the installation on site by checking the arrival of the message on the ATIM Cloud Wireless® platform.

e. LEDs meaning

The LEDs are used to characterize the proper operation or not of the ACW-DINDxxx. In general, the **GREEN** LED indicates correct operation, and the **RED** LED indicates a critical, non-critical error, alarm, or loss of power.

Failure or success of an operation

Behaviour: The **RED** or **GREEN** light flashes rapidly for about $^1/_2$ second.
A failure is characterized via the **RED** light and a success is characterized via the **GREEN** light.

Events

- When the device is powered on (after a short time), to notify power supply is good
- After configuring or sending a command (USB or Downlink)
- During Radio transfer.

Radio activity

When a radio message is transmitted over the network, the **GREEN** LED flashes every half-second during the sending time. In Sigfox, this can take up to a minute but usually only takes about 10 seconds.

Alarm

When a shock is detected, the **RED**-light blinks rapidly for one second.

Power cut

As of version V1.2.0, a small energy reserve is embedded in the product. When power is lost, the **RED** light stays on until the power supply is exhausted.

Non critic error

Behaviour: the **RED**-light flashes briefly every ten seconds.
Error source*:* The previous radio message could not be transmitted.

Critical error

Behaviour: the **RED**-light flashes briefly every second.
Error source: The product could not start correctly

Normal behaviour at startup

On power-up, after a moment, the **GREEN** LED flashes rapidly for about $^1/_2$ second, to attest to a good start.

1 minute after power up, 3 frames are sent:

- 1 test frame
- 1 keep alive frame
- 1 input frame with the state of every input's states

Then, 4 other test frames are successively sent on the network at a rate of 1 frame per minute for 4 minutes. During this transmission, the **GREEN** LED flashes.

Setup and configuration

a. Setup

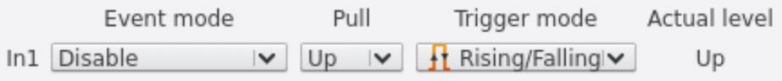
Inputs setup

All inputs are configurable and can be assigned to different operating modes. Each entry can be deactivated or assigned to one of 14 different events available. For each event, a trigger mode is associated among three different modes available, as well as the type of draw of entries.

Available event

- Off (by default)
- Sending an alert frame to the state change if input 1 is open.
- Sending an alert frame to the state change if input 8 is open.
- Send warning frame to status change if input 9 is open (only in ACW-DIN-DIO16 version).
- Send warning frame to status change if input 16 is open (only in ACW-DIN-DIO16 version).
- Sending an alert frame to the state change.
- Incrementation of meter 1
- Incrementation of meter 2
- Incrementation of meter 3
- Incrementation of meter 4
- Incrementation of meter 5 (V1.2.0 and uppers)
- Incrementation of meter 6 (V1.2.0 and uppers)
- Incrementation of meter 7 (V1.2.0 and uppers)
- Incrementation of meter 8 (V1.2.0 and uppers)

Pulling types (from version V1.2.0)



- Pull-up: Suitable for dry contacts connecting the input and ground (0V). This default configuration is used in versions below V1.2.0.
- Pull-down: Suitable for dry contacts connecting the input and the 10 / 30V.

Available trigger modes

- At the change of state of a contact, from "closed" to "open" (rising edge).
- At the change of state of a contact, from "open" to "closed" (falling edge).
- At state change on rising and falling edge (default).

Bounce time parameter

All inputs are affected by an anti-rebound time that can be adjusted between 1 and 250 ms depending on the type of dry contacts used.

Periodic frame parameter

The periodic frames make it possible to regularly go back up the state of the inputs / Meters. This frequency is set to 1 hour by default but can be set from 10 minutes to 45 days, 12 hours, and 15 minutes.

Depending on the setting you have chosen, it is possible that several frames are sent. In this case and only in the Sigfox version the minimum periodicity can be affected:

- If two frames are to be sent, the minimum period is 20 minutes.
- If three frames are to be sent, the minimum period is 30 minutes.
- If four frames are to be sent, the minimum period is 40 minutes.
- If five frames are to be sent, the minimum period is 50 minutes.

Keep alive frame parameters

A life frame can be emitted periodically. This frame will remount the supply voltage of the product.

The available periods are as follows

- Disabled
- Every hour
- Every two hours
- Every four hours
- Every eight hours
- Everyday
- Every two days
- Every three days
- Every four days (by default)
- Every week.
- Every month (30 days)

Temperature parameter (offset)

If a temperature sensor is connected, it is possible to assign an offset value for calibration of the sensor. By default, a value of 0 ° C is affected and the possible values are from -10 to +10 °C in steps of 0.1 °C.

Pairing method setup

In the LoRaWAN version it is possible to choose the method of pairing between OTAA (Over The Air Activation) and ABP (Activation By Personalization).

NOTE
The class of operation LoRaWAN is by default and not configurable, class C. This remains compatible with a network configured for class A.

NOTE
Class C requires a first uplink broadcast before being able to receive downlinks. When starting up, it will take a minute to send downlinks.

Setup of the shock alarm

A shock sensor is embedded in the products allowing a specific frame to be sent when a shock occurs. A configuration parameter is available to enable or disable this feature.

NOTE
By default, this feature is enabled.

b. Configuration via USB

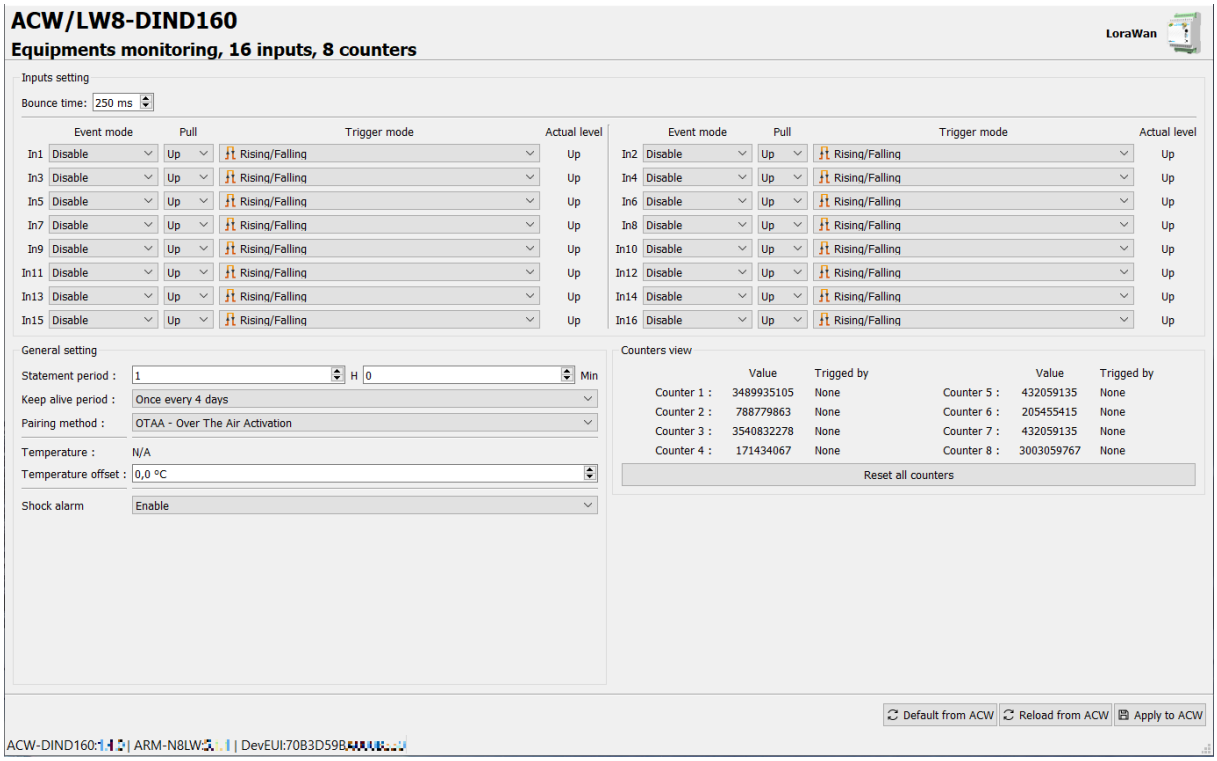
Download and install the "ACW Configurator" software, which you will find at the following address:

https://www.atim.com/wp-content/uploads/documentation/CONFIGURATEUR/ACW/configurateur-acw.exe

NOTE
The configurator is compatible with ACW-DIND160/88/80/44 from version 4.5.4

Connect the ACW to your computer with a micro-USB cable, then launch the software if you have not already done so. When you connect the ACW-DINDIO8 / 16, the software window changes to allow you to access the ACW configuration. Automatically, the current configuration of the connected ACW is retrieved and displayed.

You can then see a window like the one below (eg for an ACW-DIND160, previously ACW-DINDIO16):



In the upper left corner of the page is the product reference and a short description of its functionality.

In the upper right corner, the type of radio embedded in the product is indicated (LoRa or Sigfox)

In the "Input settings" tab, it is possible to change the bounce time of the inputs as well as to configure the mode of each input, its resting state, and the triggering state.

In the "General settings" tab, it is possible to:

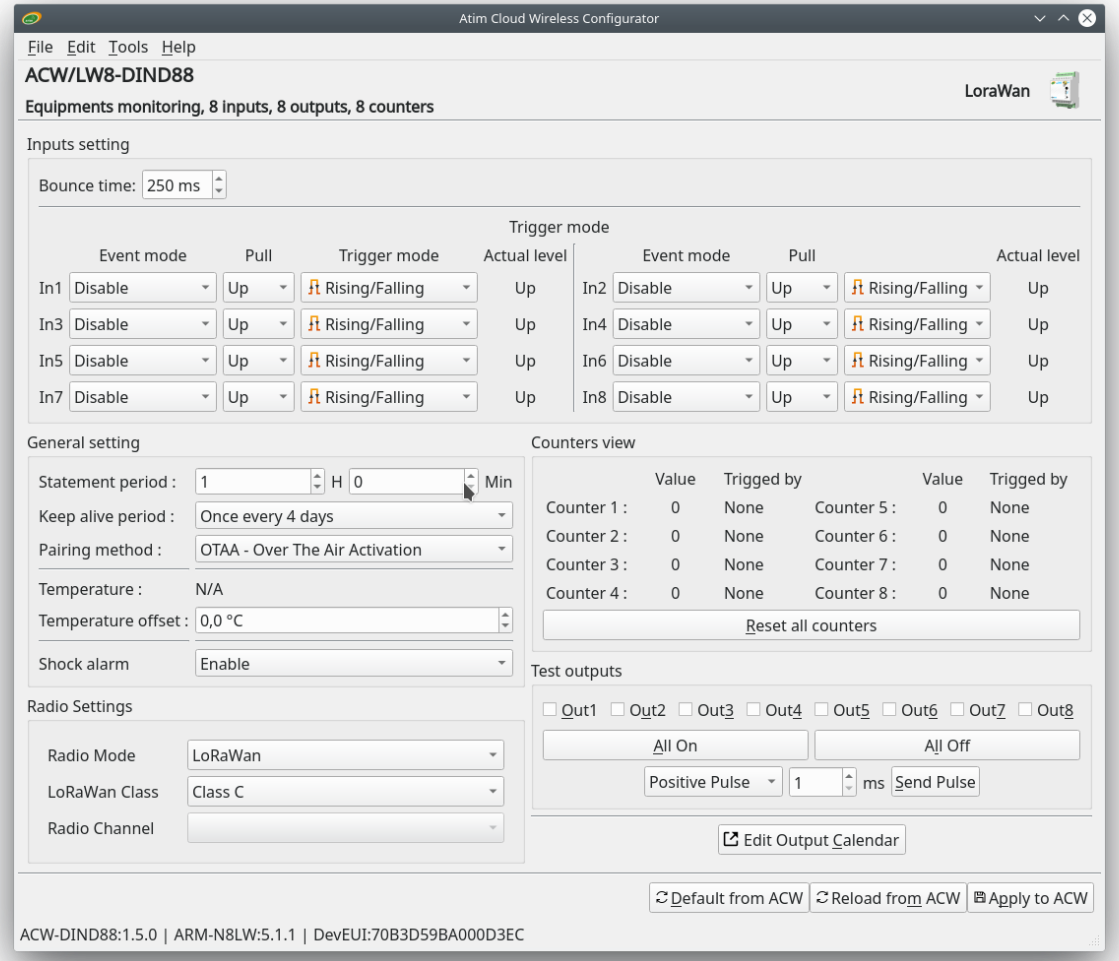
- Configure the **statement period** and the **keep alive period**
- Display the temperature if the sensor is connected and apply a temperature offset
- Activate/deactivate the sending of an alert frame following a shock (**Shock Alarm**)

In the “**Meters view**” tab, you can visualize the Meters indexes and the associated input. In addition, the “**Reset all Meters**” button set the value of all the Meters to “0”.

In the lower left corner, the firmware version of the product and radio module plus the radio ID will be listed.

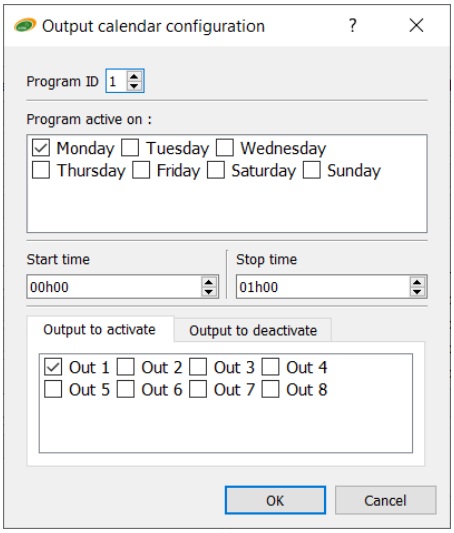
In the lower right corner, there is three buttons to set to default parameter the product configuration, apply the configuration from the application to the device and load the configuration from the device to the application.

The window below refers to a version with outputs, an ACW-DIND88:



On this page there is an additional tab called "**Test outputs**" where you can test the outputs of the product by checking one or more boxes, which will activate the relevant output(s) of the product. It is also possible to activate or deactivate all outputs at once.

It is also possible to configure the output management programs by clicking on the Edit Output Calendar give an access to the output calendar configuration tools:



This window allows you to configure each program (the program number is indicated by "Program ID") by selecting the days on which the program will be activated, the start and end time of the program and the inputs to be activated or deactivated during the program.

In addition to having access to all the parameters described in the "Parameterization" section, you have access to a visualization on the state of the inputs, the meters, and the temperature (if the sensor is connected). The display of all these parameters is refreshed every 2 to 3 seconds. In versions with outputs (DIND44 and DIND88), there is also the possibility of controlling the outputs.

NOTE
The configuration must be applied to increment and visualize the Meters.

NOTE
It is possible during the first connection that the values of the Meters are random. In this case, you will need to click on the "Reset all Meters" button to reset all the Meters to 0.

Uplinks on IoT networks (Sigfox/LoRaWAN)

a. Test frame

This frame is sent to the network every minute for five minutes when the product is started. It can also be triggered via the push button on the front of the ACW-DINDxxx. Each time this frame is sent, a Meter is incremented and inserted in the frame.

Byte	0	1
Data	0x05	Cnt

Cnt deals with the meter value.

b. Keep alive frame

This frame is sent to the network periodically (configurable) and after transmission of the first 5 test frames.

Byte	0	1	2	3	4	5
Data	0x01	Power supply tension (millivolt)		Power supply tension (millivolt)		0x64

c. State frame

The state of the inputs and Meters, as well as the temperature (if connected) are sent either periodically or on change of state of a previously configured input.

To raise the status of all inputs and Meters, it is possible that several frames are sent.

The frames below will be sent depending on the configuration.

NOTE
Disabled pins ("Disable" in the configurator) are replaced by 1 in bytes going back (byte 2 and byte 3) the state of the inputs.

NOTE
The inputs logical state sent in the data bytes (byte 2 and byte 3) is inverted from the real logical state. For example, for an input configured as a pull-up and a dry contact connected between the input and the GND, the bit of this input will be 1 when the dry contact is closed, and it will be 0 when the dry contact is open. For a pull-down and a dry contact connected between the input and the power supply, it is the opposite, the input will be at 1 when the dry contact is open, and it will be at 0 when the dry contact is closed.

Digital inputs frame

In case the temperature sensor is disconnected and Meter 1 and Meter 2 are deactivated.

Byte	0	1	2
Data (for DIND160 or DIND80)	0x42	State of digital inputs	
Data (for DIND44 or DIND88)	0x62	State of digital inputs	State of digital outputs

Frame of digital IN/OUT and temperature

In case the temperature sensor is connected, and all the Meters are deactivated.

Byte	0	1	2	3	4
Data (for DIND160 or DIND80)	0x41	State of digital inputs		Temperature in $^{1}/_{10}$ of °C	
Data (for DIND44 or DIND88)	0x61	State of digital inputs	State of digital outputs	Temperature in $^{1}/_{10}$ of °C	

Digital IN/OUT frame, temperature, and Meter 1

In case only Meter 1 is activated and the temperature sensor is connected.

Byte	0	1	2	3	4	5	6	7	8
Data (for DIND160 or DIND80)	0x4e	State Digital inputs		Temperature in $^{1}/_{10}$ of °C		Meter 1			
Data (for DIND44 or DIND88)	0x6e	State of digital inputs	State of digital outputs	Temperature in $^{1}/_{10}$ of °C		Meter 1			

Frame of digital IN/OUT, Meter 1 and Meter 2

In case the Meter 1 or / and 2 is / are activated and the temperature sensor is disconnected.

Byte	0	1	2	3	4	5	6	7	8	9	10
Data (for DIND160 or DIND80)	0x4f	Digital inputs states		Meter 1				Meter 2			
Data (for DIND44 or DIND88)	0x6f	State of digital inputs	State of digital outputs	Meter 1				Meter 2			

Frame of digital IN/OUT and Meter 1

In case only Meter 1 is activated and the temperature sensor is disconnected.

Byte	0	1	2	3	4	5	6
Data (for DIND160 or DIND80)	0x52	Digital inputs states		Meter 1			
Data (for DIND44 or DIND88)	0x72	State of digital inputs	State of digital outputs	Meter 1			

Meters 1 & 2 frame

In case the meter 2 is activated and the temperature sensor is connected.

Byte	0	1	2	3	4	5	6	7	8
Data	0x50	Meter 1				Meter 2			

Meters 3 & 4

In the case where the Meter 3 and / or the Meter 4 are / is activated.

Byte	0	1	2	3	4	5	6	7	8
Data	0x51	Meter 3				Meter 4			

Meters 5 & 6

In the case where the Meter 5 and / or the Meter 6 are / are activated.

Byte	0	1	2	3	4	5	6	7	8
Data	0x5f	Meter 5				Meter 6			

Meters 7 & 8

In the case where the Meter 7 and / or the Meter 8 are / is activated (s).

Byte	0	1	2	3	4	5	6	7	8
Data	0x60	Meter 7				Meter 8			

Frame of digital IN/OUT, temperature and Meters 1 to n (only LoRaWAN)

In the case where Meters are activated, and the temperature sensor is connected.

Byte	0	1	2	3	4	5	6	7	8	…
Data (for DIND160 or DIND80)	0x5d	Digital inputs states		Temperature in $^{1}/_{10}$ of °C		Meter 1				Meter 2 to n
Data (for DIND44 or DIND88)	0x7d	State of digital inputs	State of digital outputs	Temperature in $^{1}/_{10}$ of °C		Meter 1				Meter 2 to n

NOTE
If there are 8 Meters to send the 0x60 frame will also be sent.

Frame of digital IN/OUT and Meters 1 to n (only LoRaWAN)

In the case where Meters are activated, and the temperature sensor is disconnected.

Byte	0	1	2	3	4	5	6	…
Data (for DIND160 or DIND80)	0x5e	Digital inputs states		Meter 1				Meter 2 to n
Data (for DIND44 or DIND88)	0x7e	State of digital inputs	State of digital outputs	Meter 1				Meter 2 to n

d. Alarm of shock frame

This frame is sent to the network during the detection of a shock on the case. This feature is disabled for 10 minutes after this frame is sent.

Byte	0	1
Data	0x43	Cnt

Cnt is the value of a Meter that increments each time this frame is sent.

e. Format/decoding of data/frames

State of digital inputs (for DIND160 and DIND80)

The layout of the digital inputs in bytes 2 and 3 for frames 0x41, 0x42, 0x4e, 0x4f, 0x5d, 0x5e and 0x52 are described in the table below.

Bit	0	1	2	3	4	5	6	7
Byte 2	Input 1	Input 2	Input 3	Input 4	Input 5	Input 6	Input 7	Input 8
Byte 3	Input 9(1)	Input 10(1)	Input 11(1)	Input 12(1)	Input 13(1)	Input 14(1)	Input 15(1)	Input 16(1)

NOTE (1)
In the DIND80, DIND88 and DIND44 versions these inputs are not used and are replaced by high level.

State of digital inputs/outputs (for DIND88 and DIND44)

The layout of the digital inputs in bytes 2 and 3 for frames 0x61, 0x62, 0x6e, 0x6f, 0x7d, 0x7e and 0x72 are described in the table below.

Bit	0	1	2	3	4	5	6	7
Byte 2	Input 1	Input 2	Input 3	Input 4	Input 5(2)	Input 6(2)	Input 7(2)	Input 8(2)
Byte 3	Out 1	Out 2	Out 3	Out 4	Out 5(2)	Out 6(2)	Out 7(2)	Out 8(2)

NOTE (2)
In the DIND44 version these entries are not used and are replaced by high level.

Metering

All Meters are in 32 bits or 4 bytes, they are sent with the most significant byte (MSB) first. It's up to you to convert your physical value according to the type of impulse counted.

Temperature in $^{1}/_{10}$ of °C

The temperature is sent in 10th of degrees Celsius on two bytes coded in complement two. The most significant byte (MSB) is sent first.

Power supply tension (millivolt)

The supply voltage is sent in millivolt on two bytes, the most significant byte (MSB) is sent first.

Examples of frames

For a digital input frame with temperature and Meter 1 of a DIND80 with the following values:

- Digital inputs = 0xF5FF (Inputs 1 and 3 at 0; inputs 0,2,4,5,6,7 at 1; inputs 8 to 15 not used for this reference)
- Temperature 55.8°C => 558 tenths of a °C = 0x022E
- Meter value = 97510 = 0x 00017CE6

The frame will be as below

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8
Header	State Inputs/Outputs		Temperature in $^{1}/_{10}$ of °C		Meter 1			
0x4E	0xF5	0xFF	0x02	0x2E	0x00	0x01	0x7C	0xE6

For one digital I/O frame and two Meters of a DIND88 with the following values:

- Digital inputs = 0xF50A (Inputs 2 and 4 at 0; inputs 1,3,5,6,7,8 at 1; outputs 8 to 5, 3 and 1 at 0; outputs 2 and 4 at 1)
- Meter 1 = 25478 = 0x00006386
- Meter 2 = 873556 = 0x000D5454

The frame will be as below

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8	Byte 9	Byte 10
Header	State Inputs/Outputs		Meter 1				Meter 2			
0x6F	0xF5	0x0A	0x00	0x00	0x63	0x86	0x00	0x0D	0x54	0x54

f. Frames summary

Type	Description	Frame format										
		byte 0 (hex)	byte 1 (hex)	byte 2 (hex)	byte 3 (hex)	byte 4 (hex)	byte 5 (hex)	byte 6 (hex)	byte 7 (hex)	byte 8 (hex)	byte 9 (hex)	byte 10 (hex)
Keep Alive	Keep alive frame	01	Power supply tension (mV)		Power supply tension (mV)		64					
Test	Test frame	05	Meter									
Inputs	Digital inputs frame	42	Digital inputs state									
Inputs	Frame of digital inputs and temperature	41	Digital inputs state		Temperature (1/10 of °C)							
Inputs + Temperature + Meters	Frame of digital inputs, temperature and Meter 1	4E	Digital inputs state		Temperature (1/10 of °C)		Meter 1					
Inputs + Meters	Frame of digital inputs, Meters 1 & 2	4F	Digital inputs state		Meter 1				Meter 2			
Inputs + Meter	Frame of digital inputs and Meter 1	52	Digital inputs state		Meter 1							
Meters	Frame of Meters 1 & 2	50	Meter 1				Meter 2					
Meters	Frame of Meters 3 & 4	51	Meter 3				Meter 4					
Meters	Frame of Meters 5 &t 6	5F	Meter 5				Meter 6					
Meters	Frame of Meters 7 e& 8	60	Meter 7				Meter 8					
Inputs + Temperature + Meters	Frame of digital inputs, temperature and Meters	5D	Digital inputs state		Temperature (1/10 of °C)		Meter 1				Meters... n	
Inputs + Meter	Frame of digital inputs and Meters	5E	Digital inputs state		Meter 1				Meters... n			
Shocks	Alarm and shock frame	43	Meter									
Inputs/outputs	Digital inputs/outputs frame	62	Digital inputs state	Digital outputs state								
Inputs/outputs	Frame of digital inputs/outputs and temperature	61	Digital inputs state	Digital outputs state	Temperature (1/10 of °C)							
Inputs/outputs + Temperature + Meters	Frame of digital inputs/outputs, temperature and Meter 1	6E	Digital inputs state	Digital outputs state	Temperature (1/10 of °C)		Meter 1					
Inputs/outputs + Meters	Frame of digital inputs/outputs, Meters 1 & 2	6F	Digital inputs state	Digital outputs state	Meter 1				Meter 2			
Inputs + Meter	Frame of digital inputs and Meter 1	72	Digital inputs state	Digital outputs state	Meter 1							
Inputs/outputs + Temperature + Meters	Frame of digital inputs/outputs, temperature and Meters	7D	Digital inputs state	Digital outputs state	Temperature (1/10 of °C)		Meter 1				Meters... n	
Inputs/outputs + Meter	Frame of digital inputs/outputs and Meters	7E	Digital inputs state	Digital outputs state	Meter 1				Meters... n			

Downlinks from IoT networks (Sigfox ou LoRaWAN)

If your product has a compatible radio version, you can benefit from this feature.

- Sigfox radio firmware: Version **5931** or forward
- LoRaWAN radio firmware: Version **2.3.3** or forward

The operation of the exchange frames of this function is explained in the document "ATIM_ACW-DLConfig_UG_EN_Vx.x.pdf" This document is available for download at

https://www.atim.com/wp-content/uploads/documentation/Protocole%20DOWNLINK/ENGLISH/ATIM_ACW-DLConfig_UG_EN.pdf

a. Parameters

Below is a description of all the downlink modifiable parameters:

Keep alive frame parameters (Code 03)

Size and Code (Byte 0)	Value (Byte 1)
0x00|03=0x03	0x00 = Disabled. 0x05 = Every hour. 0x0a = Every two hours. 0x0b = Every four hours. 0x0c = Every eight hours. 0x06 = Every day. 0x0d = Every two days. 0x0e = Every three days. 0x0f = Every four days. 0x07 = Every week. 0x08 = Every month (30 days).

Inputs parameters (Code 10 to 25)

Size and Code (Byte 0)	Value (Byte 1)
Input 1: 0x00|10=0x0a Input 2: 0x00|11=0x0b Input 3: 0x00|12=0x0c Input 4: 0x00|13=0x0d Input 5: 0x00|14=0x0e Input 6: 0x00|15=0x0f Input 7: 0x00|16=0x10 Input 8: 0x00|17=0x11 Input 9: 0x00|18=0x12 Input 10: 0x00|19=0x13 Input 11: 0x00|20=0x14 Input 12: 0x00|21=0x15 Input 13: 0x00|22=0x16 Input 14: 0x00|23=0x17 Input 15: 0x00|24=0x18 Input 16: 0x00|25=0x19	0xYY

The value (0xYY) is composed of an event, a trigger mode and a draw type. The value (0xYY) is thus divided into three concatenated parts.

NOTE
The 8-input version (ACW-DINDIO8) does not have codes 18 to 25.

NOTE
The type of print and available only from version V1.2.0.

Events - bits 0 to 4

The possible values in the byte for these bits are:

- 0x00 = Disabled.
- 0x01 = Sending an alert frame to the state change if input 1 is high.
- 0x13 = Sending an alert frame to the state change if input 8 is high (Available only in version DIND80, DIND88 and DIND160)
- 0x14 = Sending an alert frame to the state change if input 9 is high. (Available only in version DIND160)
- 0x15 = Sending an alert frame to the state change if the input 16 is in the high state. (Available only in version DIND160)
- 0x02 = Sending an alert frame to the state change
- 0x03 = Meter increment 1
- 0x04 = Meter increment 2
- 0x05 = Meter increment 3
- 0x06 = Meter increment 4
- 0x07 = Meter increment 5 (V1.2.0 and forward; Available only in version DIND80, DIND88 and DIND160)
- 0x08 = Meter increment 6 (V1.2.0 and forward; Available only in version DIND80, DIND88 and DIND160)
- 0x09 = Meter increment 7 (V1.2.0 and forward; Available only in version DIND80, DIND88 and DIND160)
- 0x0A = Meter increment 8 (V1.2.0 and forward; Available only in version DIND80, DIND88 and DIND160)

Pull types - bits 5 (from V1.2.0)

The possible values in the byte for these bits are:

- 0x00 = Pull-up (by defaults for lower versions of V1.2.0).
- 0x20 = Pull-down

Trigger modes - bits 6 to 7

The possible values in the byte for these bits are:

- 0x40 = At the change of state, from the low state to the high state (rising edge).
- 0x80 = At the change of state, from the high state to the low state (falling edge).
- 0xc0 = At the change of state (rising and falling edge).

EXAMPLE
If you want to configure the input 10 (code 19) on the Meter 3 (0x05) on the rising edge only (0x40 and a pull up (0x00), the following parameterization must be generated:

BSize and Code (Byte 0)	*Value (Byte 1)*
0x00 | 19=0x13	*0x05 | 0x40 | 0x00=0x45*

The answer of the ACW will be:

Byte 0	*Byte 1*	*Byte 2*	*Byte 3*
0x07	*0x10*	*0x0F*	*0x00*

Rebound time parameter (Code 30)

Size and Code (Byte 0)	Value (Byte 1)
0x00|30=0x1e	0xYY

The value (0xYY) is encoded in milliseconds. From 5 (for 5 milliseconds) to 255 (for 255 milliseconds).

Parameter of the periodic frame (Code 31)

Size and Code (Byte 0)	Value (Byte 1)	Value (Byte 2)
0x40|31=0x5f	0xYY	0xZZ

The value (0xZZYY) is coded in minutes. From 10 (for 10 minutes) to 15300 (for 45 days, 12 hours and 15 minutes). The low byte (0xYY) is first in the frame.

NOTE
In versions less than or equal to V1.2.3, the max value is 255min (for 0 days, 4 hours and 15 minutes). This bug has been fixed since version V1.3.0.

Settings on temperature - Offset (Code 32)

Size and Code (Byte 0)	Value (Byte 1)
0x00|32=0x20	0xYY

The value (0xYY) is coded in addition to two and tenths of ° C. From -100 (for -10 ° C) to 100 (for + 10 ° C).

Output calendar configuration (code 34 to 40)

Size and Code (Byte 0)	Frame size (Byte 1)	Start | Stop time (Byte 2 -4)			Weekday (Byte 5)	Output to set (Byte 6)	Output to reset (byte 7)
Program 1: 0xc0|0x22 (34) = 0xE2 Program 2: 0xC0|0x23 (35) = 0xE3 Program 3: 0xC0|0x24 (36) = 0xE4 Program 4: 0xC0|0x25 (37) = 0xE5 Program 5: 0xC0|0x26 (38) = 0xE6 Program 6: 0xC0|0x27 (39) = 0xE7 Program 7: 0xC0|0x28 (40) = 0xE8	0x06	0xAA	0xAB	0xBB	0xCC	-	-

Bytes 2 to 4 contains the start and stop time. Both times are coded on 12 bits (12 most significant bits for start time and 12 least significant bits for stop time) as the time in minutes from midnight. The formula to calculate this value is:

(Hour x 60) + minute

EXAMPLE
*With a start time at 12h30 and a stop time at 13h24, the start time in minutes is 12*60 + 30 = 750, the stop time in minutes is 13*60 + 24 = 804.*
So 0xAAA = 2EE and 0xBBB = 324 (byte 2 = 0x2E, byte 3 = 0xE3, byte 4 = 0x24).

Byte 5 represent the weekday during which the program is active. Each bit stands for one day of the week as follows:

Byte 5							
Bit 0	**Bit 1**	**Bit 2**	**Bit 3**	**Bit 4**	**Bit 5**	**Bit 6**	**Bit 7**
Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	-

If the bit is set to “0”, the program is inactive for the corresponding day and vice versa.

WARNING
At least, one bit should be set to 1 to enable the program.

The last two bytes contains the output to set or reset during the program.

Each output corresponds to a bit in these bytes as follows:

Byte 6/7							
Bit 0	**Bit 1**	**Bit 2**	**Bit 3**	**Bit 4**	**Bit 5**	**Bit 6**	**Bit 7**
Output 1	Output 2	Output 3	Output 4	Output 5	Output 6	Output 7	Output 8

To drive an output, the corresponding bit should be set to “1” in the corresponding byte (whether the output should be set or reset).

EXAMPLE
If outputs 1,3,5,7 have to be set at "0" and outputs 2,4,6,8 to "1", the value of byte 6 will be 0xAA (0b10101010) and byte 7 will be 0x55 (0b01010101).

NOTE
To let output undriven during a program, the corresponding bit in byte 6 and 7 should be set to "0".

Shock alarm configuration (code 41)

Size and Code (Byte 0)	Value (Byte 1)
0x00|0x29=0x29	0xYY

Byte 1 possible values are :

- 0x00 => shock alarm radio frame disabled
- 0x01 => shock alarm radio frame enabled

b. Commands

Command	Frame format							
	Byte 0 (hex)	Byte 1 (hex)	Byte 2 (hex)	Byte 3 (hex)	Byte 4 (hex)	Byte 5 (hex)	Byte 6 (hex)	Byte 7 (hex)
Restart	0x01	0x01						
About	0x01	0x02						
Reconfiguration with default settings	0x01	0x03						
Get configuration	0x01	0x04						
Get the protocol version	0x01	0x07						
Apply a value to meters	0xC1	0x06	0x0A	Meter Index	Meter(s) value			
Assign a state to the outputs	0x41	0x10	States of outputs					
Recovery of output status	0x01	0x20						
Assign a state to an output group	0xC1	0x03	0x11	Mask / Group	States of outputs			
Generate a positive impulse to a group of outputs (Version < V1.5.0)	0xC1	0x03	0x12	Mask / Group	Pulse duration			
Generate a positive impulse to a group of outputs (Version ≥ V1.5.0)	0x81	0x12	Masque / Groupe	Durée de l'impulsion (LSB)	Durée de l'impulsion (MSB)			
Generate a negative impulse to a group of outputs (Version < V1.5.0)	0xC1	0x03	0x13	Mask / Group	Pulse duration			
Generate a negative impulse to a group of outputs (Version ≥ V1.5.0)	0x81	0x13	Masque / Groupe	Durée de l'impulsion (LSB)	Durée de l'impulsion (MSB)			
Enable/Disable output calendar	0x41	0x0B	Output calendar state					
Get output calendar state	0x01	0x0C						

Restart (Command 0x01)

To restart the ACW-DIND80|160 remotely, you will need to send the following command:

Byte 0	Byte 1
0x01	0x01

The ACW will restart and not send confirmation.

About (Command 0x02)

To obtain the information about the ACW-DIND80|160 it will be necessary to send him the following command:

Byte 0	Byte 1
0x01	0x02

The ACW will return the information in the following format:

	Description and Value
Byte 0	Answer to command frames: 0x07
Byte 1	About command: 0x02
Byte 2	DIND160: 9 DIND80: 11 DIND88: 15 DIND44: 14
Byte 3	ACW version (LSB)
Byte 4	ACW version (MSB)
Byte 5	Radio type: 1. Sigfox only uplink - 0x03 2. Sigfox uplink/downlink - 0x04 3. LoRaWan - 0x05
Byte 6	Radio version (LSB)
Byte 7	Radio version (MSB)
Byte 8 to n	Serial number (devEUI|sfx) (MSB first).

Reconfiguration with default settings (Command 0x03)

To reconfigure the parameters to the default values, it will be necessary to send him the following command:

Byte 0	Byte 1
0x01	0x03

The ACW will return a confirmation in the following format:

	Description and Value
Byte 0	Answer to command frames: 0x07
Byte 1	Configuration command by default: 0x03
Byte 2	Indicates whether the reconfiguration went well: – Returns 0x00 to indicate that the configuration went smoothly. – Returns a value other than 0x00 to indicate that the configuration failed.

Obtain the complete configuration (Command 0x04)

To obtain the complete configuration of the ACW, it will be necessary to send him the following command:

Byte 0	Byte 1
0x01	0x04

The ACW will return several frames with all its parameters:

	Description and Value
Byte 0	Answer to command frames: 0x07
Byte 1	Configuration command by default: 0x04
Byte 2 to n	The parameters are encapsulated in the configuration frames.

Obtain the version of the used protocol (Command 0x07)

To obtain the version of the Downlink ATIM protocol implemented in the ACW, the following command must be sent:

Byte 0	Byte 1
0x01	0x07

The ACW will return the version in the following format:

	Description and Value
Byte 0	Answer to command frames: 0x07
Byte 1	Command version of the protocol: 0x07
Byte 2	Protocol version LSB
Byte 3	Protocol version MSB

Apply a value to the Meters (from version V1.2.0) (Command 0x0A)

To write the value of one or more Meters, it will be necessary to send him the following command:

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4
0xC1	Frame size - 0x06	0x0A	Meter Index	Meter(s) value

The value of one or more Meters is defined in bytes 5 to 8. The value is on 32 bits with the LSB first (byte 5).

Byte 4 is the index of the Meter where the value is to be applied.

For example, 4 for Meter 4, 7 for Meter 7, etc ... An index of 255 (0xff) will affect all Meters. For example, to put all Meters at 256, the following frame should be sent:

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
0xC1	0x06	0x0A	0xff	0x00	0x01	0x00	0x00

If the Meter (s) may have been affected by the value, the ACW will save the value in its memory and return the following confirmation frame:

	Description and Value
Byte 0	Answer to command frames: 0x07
Byte 1	Command, meter: 0x0A

NOTE
From version V1.3.0, if the index is not between 1 and 8 for a DIND80 or a DIND88 an error frame will be returned, and the Meters will remain unchanged. If the index is not between 1 and 4 for a DINd44 an error frame will be returned, and the Meters will remain unchanged.

Outputs monitoring

It is possible to control the state of the outputs via downlink in different ways. Either by affecting the state of each output, or by affecting the state of a group of outputs or by generating a positive or negative pulse on a group of outputs.

Apply a state to outputs (Command 0x10)

To assign the status of all outputs to a value, the following command must be sent:

Byte 0	Byte 1	Byte 2
0x41	0x10	States of outputs

Each output is represented by a bit in byte 3. Byte 0 of byte 3 corresponds to output 1, bit 7 of byte 3 corresponds to output 8.

In the version of the ACW with 4 outputs, the 4 most significant bits must be 0. Or, in other words, the outputs (which do not exist) 5, 6, 7 and 8 must be controlled at 0. In the opposite case (if at least 1 of the 4 most significant bits is at 1) an error will be returned by the ACW and none of the outputs will be driven. See the response frames below.

Following this command, the ACW will return a response in the following format:

	Description and Value
Byte 0	Answer to command frames: 0x07
Byte 1	Command 'Apply a state to outputs': 0x10
Byte 2	Outputs states after command execution
Byte 3	States of outputs to command, but which does not exist.

Byte 4 attests an error if that if not null. If byte 4 is null, byte 3 should have the same value as the requested state when sending the command (byte 3 in the control frame). If byte 4 is non-zero, it indicates which output cannot be controlled because it does not exist. For example, on a DIND44 if the 0xFF value is sent (byte 3 of the 0x10 control frame) the value 0xF0 will be returned and none of the outputs will be driven by the ACW.

EXAMPLE 1
For controlling all DIND44 outputs to 1, the following command must be sent:

Byte 0	*Byte 1*	*Byte 2*
0x41	*0x10*	*0x0F*

The answer of the ACW will be:

Byte 0	*Byte 1*	*Byte 2*	*Byte 3*
0x07	*0x10*	*0x0F*	*0x00*

EXAMPLE 2
For controlling all DIND44 outputs to 1, the following command must be sent:

Byte 0	*Byte 1*	*Byte 2*
0x41	*0x10*	*0x80*

The answer of the ACW will be:

Byte 0	*Byte 1*	*Byte 2*	*Byte 3*
0x07	*0x10*	*State of outputs*	*0x80*

WARNING
Byte 3 being different from 0, this indicates a pilot error and raises the bit of the invalid output (in this case the output 8). The command is ignored, and no output will be commanded!

Obtain the state of outputs (Command 0x20)

In the same way as to affect the state of the outputs it is possible to recover their current state. For this it will be necessary to send the following command:

Byte 0	Byte 1
0x01	0x20

Following this command, the ACW will return a response in the following format:

	Description and Value
Byte 0	Answer to command frames: 0x07
Byte 1	Command 'state of outputs' : 0x20
Byte 2	Current states of outputs

Apply a state to outputs' group (Command 0x11)

It is possible to assign the state of a group of outputs to a value without affecting the state of the other outputs, it will be necessary to send the following command:

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4
0xc1	3	0x11	Mask/Group	States of the outputs

Each output is represented by a bit in byte 4 and byte 5. Byte 0 of these bytes corresponds to output 1, ..., bit 7 corresponds to output 8.

Byte 5 has the same role as byte 3 of the 0x10 command, the only difference being that the outputs specified in byte 4 will be driven by the ACW.

Following this command, the ACW will return a response in the following format:

	Description and Value
Byte 0	Answer to command frames: 0x07
Byte 1	Command 'Apply a state to outputs': 0x11
Byte 2	Outputs states after command execution
Byte 3	States of outputs to command, but which does not exist.

The constituted frame has the same behavior as with the 0x10 command. The difference is that the errors are based on byte 4 of the (control) frame 0x11. On DIND44 outputs 5 to 8 can not be controlled, bits 4 to 7 of byte 4 of frame 0x11 must therefore be 0 to avoid errors. In the case of an error, none of the outputs will be controlled.

Generate a positive pulse to an outputs group (Command 0x12)

It is possible to generate a positive impulse (0-> 1-> 0), for that, it will be necessary to send the following command:

For Version < V1.5.0

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4
0xc1	3	0x12	Mask/Group	Pulse time

Each output to be controlled is represented by a bit in byte 3. Bit 0 of byte 3 corresponds to output 1, ..., bit 7 corresponds to output 8.

Byte 5 corresponds to the pulse time in milliseconds with a ratio of 4. The minimum value is therefore 4 ms and the maximum value is 1020 ms.

For Version ≥ V1.5.0

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4
0x81	0x12	Mask/Group	Pulse time (LSB)	Pulse time (MSB)

Each output which will have to be controlled is represented by a bit in byte 2. Bit 0 of byte 2 corresponds to output 1, ..., bit 7 corresponds to output 8.

Bytes 4 and 5 correspond to the pulse time in milliseconds. The minimum value is therefore 1 ms and the maximum value is limited to 5sec. If Pulse time exceeds 5sec in command, it will be truncated to 5sec by product

Following this command, the ACW will return a response in the following format:

	Description and Value
Byte 0	Answer to command frames: 0x07
Byte 1	Command 'Apply a state to outputs': 0x12
Byte 2	Current states of outputs
Byte 3	States of outputs to command, but which does not exist.

The constituted frame has the same behavior as the response of the 0x11 command. In the case of an error, none of the outputs will be controlled.

Generate a negative pulse to an outputs' group (Command 0x13)

It is possible to generate a negative impulse (1-> 0-> 1), for this it will be necessary to send him the following command:

For Version < V1.5.0

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4
0xc1	3	0x13	Mask/Group	Pulse time

Each output to be controlled is represented by a bit in byte 3. Bit 0 of byte 3 corresponds to output 1, ..., bit 7 corresponds to output 8.

Byte 5 corresponds to the pulse time in milliseconds with a ratio of 4. The minimum value is 4 ms and the maximum value is 1020 ms.

For Version ≥ V1.5.0

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4
0x81	0x13	Mask/Group	Pulse time (LSB)	Pulse time (MSB)

Each output which will have to be controlled is represented by a bit in byte 2. Bit 0 of byte 2 corresponds to output 1, ..., bit 7 corresponds to output 8.

Bytes 4 and 5 correspond to the pulse time in milliseconds. The minimum value is therefore 1 ms and the maximum value is limited to 5sec. If Pulse time exceeds 5sec in command, it will be truncated to 5sec by product

Following this command, the ACW will return a response in the following format:

	Description and Value
Byte 0	Answer to command frames: 0x07
Byte 1	Command 'Apply a state to outputs': 0x13
Byte 2	Current states of outputs
Byte 4	States of outputs to command, but which does not exist.

The constituted frame has the same behavior as the response of the 0x11 command. In the case of an error, none of the outputs will be controlled.

Enable/Disable Output calendar (0x0B)

At any time, it is possible to turn one or more programs at once on/off with the following command:

Byte 0	Byte 1	Byte 2
0x41	0x0B	Output calendar state

Each program is represented in byte 2 as follows:

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
Program 1 state	Program 2 state	Program 3 state	Program 4 state	Program 5 state	Program 6 state	Program 7 state	Skip a day

If the state bit of a program is at "1," the program will be activated, if the state bit is at "0," the program will be disabled.

In addition, by forcing bit 7 to "1," all activated programs will be inactive the next day and will become active again the following day.

For example, if the 0x410B83 command is sent on a Tuesday, programs 1 and 2 will only be activated from Thursday (programs 3,4,5.6 and 7 will be deactivated on right after the command).

Get output calendar state (0x0C)

The following command allows to get the output calendar state at any time:

Byte 0	Byte 1
0x01	0x0C

Following this command, the ACW will return a response in the following format:

	Description and Value
Byte 0	Response to command frames: 0x07
Byte 1	“State of output calendars” command: 0x0C
Byte 2	Output calendar states

The byte 2 in the response frame has the same format as byte 2 In the command frame.

Technical support

For any further information or technical question, you can open a ticket on our technical support dedicated webpage.