

Reference Manual  
JofraCloud  
Remote Calibrator Operation  
for RTC and PTC Series



**Reference Manual**  
**JofraCloud**  
**Remote Calibrator Operation**  
**For RTC and PTC Series**

© Copyright 2017 AMETEK Denmark A/S



## About this manual....

---

- **The structure of the manual**

This reference manual is aimed at users who are familiar with AMETEK Remote Calibrator Operation System - JofraCloud, as well as those who are not. The manual is divided into 10 chapters, which describe how to set up, operate, service and maintain the unit. The technical specifications are described and accessories may be ordered from the list of accessories.

- **Safety symbols**

This manual contains a number of safety symbols designed to draw your attention to instructions, which must be followed when using the instrument, as well as any risks involved.



### **Warning**

Conditions and actions that may compromise the safe use of the unit and result in considerable personal or material damage.



### **Caution...**

Conditions and actions that may compromise the safe use of the unit and result in slight personal or material damage.



### **Note...**

Special situations, which demand the user's attention.

# List of contents

---

<b>1.0</b>	<b>Introduction</b>	<b>4</b>
1.1	Warranty	5
1.2	Receiving the JofraCloud Unit	6
<b>2.0</b>	<b>Safety instructions</b>	<b>7</b>
<b>3.0</b>	<b>Installing the JofraCloud unit</b>	<b>8</b>
<b>4.0</b>	<b>Operating the JofraCloud Unit</b>	<b>10</b>
4.1	Concept of the Gateway	10
4.2	Switching on the unit	10
4.2.1	LED functionality	11
4.2.2	Network setting	11
4.3	Registration	12
4.3.1	Forgotten password	12
4.3.2	JofraCloud locked - unlock	12
4.4	Customer Administration	13
4.5	User administration	13
4.5.1	Adding a new user	13
4.5.2	Roles	14
4.5.3	Edit User	14
4.6	Calibrating Devices	14
4.6.1	Adding a new calibrator	15
4.6.2	Enter new Setpoint	16
4.7	User and device overview	16
4.8	Sign out	17
<b>5.0</b>	<b>Subscriber Identity Module (SIM)</b>	<b>18</b>
5.1	Installing the SIM Card	18
5.1.1	Installing procedure	18
<b>6.0</b>	<b>Security</b>	<b>19</b>
<b>7.0</b>	<b>Maintenance</b>	<b>20</b>
7.1	Returning the JofraCloud Gateway to service	20
7.2	Software update	20
7.3	Storing	22
7.4	Cleaning	22
<b>8.0</b>	<b>Errors</b>	<b>23</b>
<b>9.0</b>	<b>Technical specifications</b>	<b>24</b>
9.1	FX30 Gateway	24
9.2	Power supply	24
<b>10.0</b>	<b>List of accessories</b>	<b>26</b>

## 1.0 Introduction

---

### ***Congratulations on your new AMETEK Remote Calibrator Operation - JofraCloud!***

With the AMETEK Remote Calibrator Operation System – JofraCloud Gateway, you have chosen an extremely effective unit, which we are sure will perform according to your expectations.

This unit enables remote reading and set point adjustment at an unlimited distance. The unit is intended for use with a RTC or PTC series instrument.

During the past several years, we have acquired extensive knowledge of industrial temperature calibration. This expertise is reflected in our products, which are all designed for daily use in an industrial environment. Please note that we would be very interested in hearing from you if you have any ideas or suggestions for changes to our products.

This reference manual applies to the following unit:

- **Remote Calibrator Operation System - JofraCloud**

The JofraCloud System has the following features and functions:

- The user can operate the calibrator at an unlimited distance due to the 3G technology
- Automatic generation of email report when the calibrator reaches stability
- All email reports are time stamped
- Audible notification when the calibrator reaches stability
- Generate email report on demand
- Run Auto step and get mail when stable. Compare with print of UUT value
- Run several calibrators in auto step mode simultaneously
- Concentrate on other jobs until stability mail is received
- Pre-Cool/Heat calibrators when leaving home in the morning
- Forward stability mail to colleague sitting in the office. Documentation done at once
- Start the calibrator when you go home and documentation is ready for you next morning

### **ISO-9001 certified**

AMETEK Denmark A/S was ISO-9001 certified in September 1994 by Bureau Veritas Certification Denmark.

## CE-label



Your new Remote Reading Unit bears the CE label and conforms to the Radio Equipment Directive 2014/53/EU and RoHS Recast (RoHS II) Directive 2011/65/EU.

## **Technical assistance**

Please contact the dealer from whom you acquired the instrument if you require technical assistance.

## **1.1 Warranty**

This unit is warranted against defects in workmanship, material and design for two (2) years from date of delivery to the extent that AMETEK will, at its sole option, repair or replace the unit or any part thereof which is defective, provided, however, that this warranty shall not apply to units subjected to tampering or, abuse, or exposed to highly corrosive conditions.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES WHETHER EXPRESS OR IMPLIED AND AMETEK HEREBY DISCLAIMS ALL OTHER WARRANTIES, INCLUDING, WITHOUT LIMITATION, ANY WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY. AMETEK SHALL NOT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING, BUT NOT LIMITED TO, ANY ANTICIPATED OR LOST PROFITS.

This warranty is voidable if the purchaser fails to follow any and all instructions, warnings or cautions in the units' Reference Manual.

If a manufacturing defect is found, AMETEK will replace or repair the unit or replace any defective part thereof without charge; however, AMETEK's obligation hereunder does not include the cost of transportation, which must be borne by the customer. AMETEK assumes no responsibility for damage in transit, and any claims for such damage should be presented to the carrier by the purchaser.

## 1.2 Receiving the JofraCloud Unit

### When you receive the unit...

- 1) Unpack and check the unit and the accessories carefully.
- 2) Check the parts according to the list shown below.

If any of the parts are missing or damaged, please contact the dealer who sold you the JofraCloud System.

### You should receive:

- 1 Gateway with bracket and SIM card
- 1 antenna
- 1 cover for unused antenna connection
- 1 power supply
- 1 Ethernet cable – 25 cm
- 1 Ethernet cable – 50 cm
- 1 carrying case
- 1 electronic Reference manual on USB memory stick

When reordering, please specify the part numbers according to the list of accessories, section 10.0

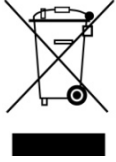
## 2.0 Safety instructions

---



### Read this manual carefully before using the instrument!

Please follow the instructions and procedures described in this manual. They are aimed at allowing you to make the best of your JofraCloud Gateway and avoid any personal injuries and/or damage to the unit.



### Disposal – WEEE Directive

The Remote Reading Unit contains Electrical and Electronic circuits and must be properly recycled or disposed of (in accordance with the WEEE Directive 2012/19/EU).



### Warning

#### To avoid possible electric shock or personal injury:

- Do not apply more than the rated voltage. See specifications for supported ranges.
- Follow all equipment safety procedures.
- Do not use the JofraCloud Gateway if it operates abnormally. Protection may be impaired. When in doubt, have the calibrator serviced.
- Do not operate the JofraCloud Gateway around explosive gas, vapour, or dust.
- When servicing the JofraCloud Gateway, use only specified replacement parts.
- To avoid personal injury or damage to the JofraCloud Gateway, use only the specified replacement parts and do not allow water into the case.



### Note...

The product liability **only** applies if the unit is subject to a manufacturing defect. This liability becomes void if the user fails to follow the maintenance instructions described in this manual or uses unauthorized spare parts.



### 3.0 Installing the JofraCloud unit

---

The Gateway uses the 3G network, and needs coverage. In a building with poor 3G coverage, an external antenna may be needed.



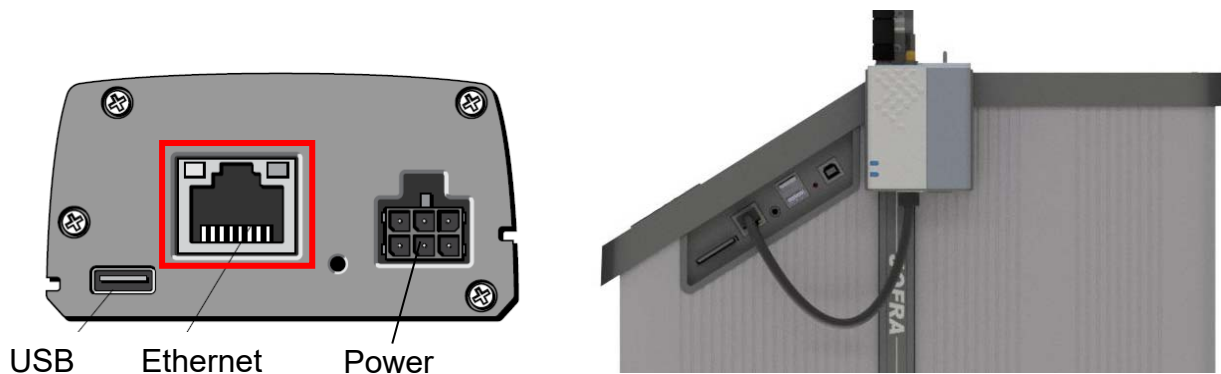
#### Note...

The firmware in the RTC / PTC instrument must be 1.0.1564 or higher.

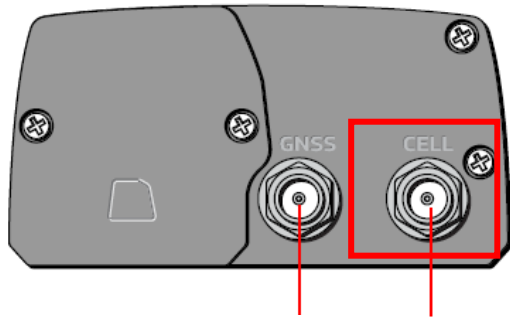
1. Mount the Gateway on the handle on the right side of the calibrator, using the bracket. The Gateway is mounted on the bracket at delivery.



2. Use the appropriate Ethernet cable between the Gateway and the calibrator.



3. Connect the antenna to the SMA connector marked "CELL". The antenna shall point upward.

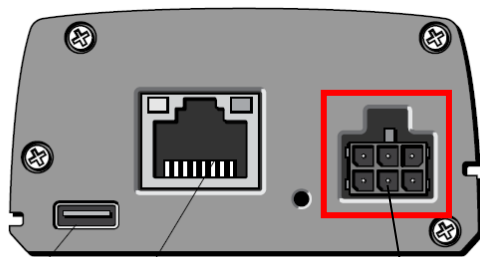


GNSS antenna connector

Cellular antenna connector



4. Connect the Power supply 6-pin connector to the Gateway.



USB

Ethernet

Power



## 4.0 Operating the JofraCloud Unit

---



### Warning

Please inspect the Safety Instructions in section 2.0 before using the instrument.



### Caution...

Please inspect the Safety Instructions in section 2.0 before using the instrument.

## 4.1 Concept of the Gateway

- A 3G Gateway attached to the RTC / PTC Calibrator reads data from the calibrator every 2 seconds
- Data is encrypted and transmitted to the Cloud (AWS)
- The Cloud service is storing the last received data in a database
- The data is presented for the user on a webpage like the display on the calibrator.
- The webpage can be shown on any device (PC, lab top, tablet, smartphone)
- The user can adjust the setpoint

## 4.2 Switching on the unit

1. Turn on the power on both Gateway and calibrator.

It will take a couple of minutes for the Gateway to boot.

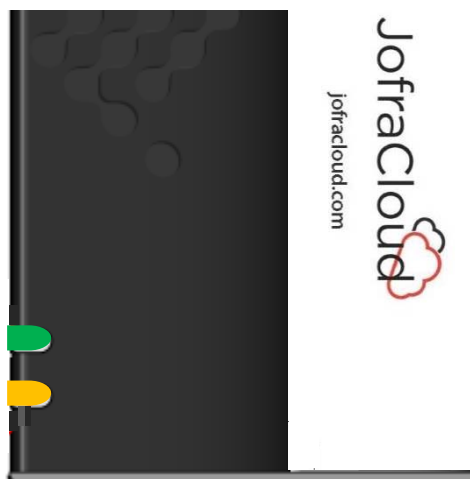
For operating the RTC calibrator is referred to Reference manual 127139.

For operating the PTC calibrator is referred to Reference manual 127915.

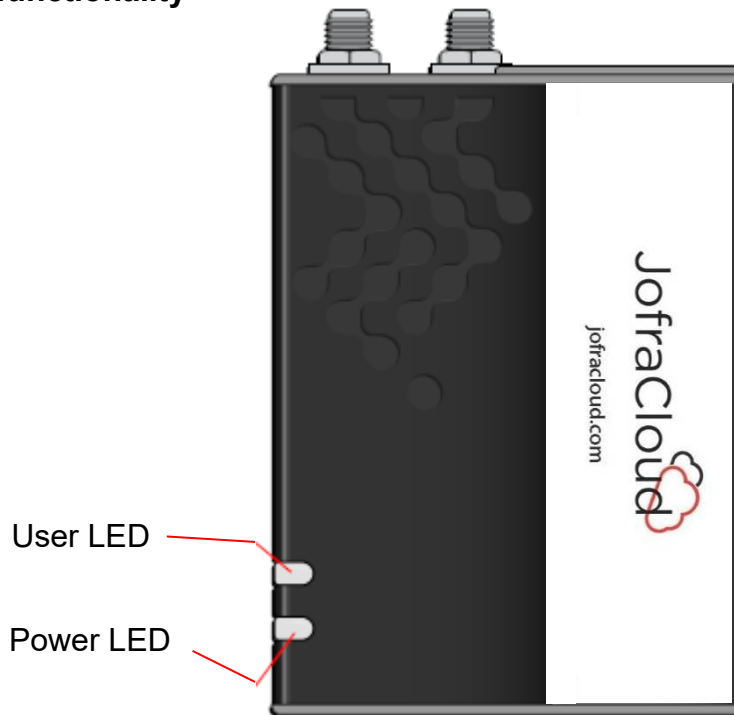
2. Connect to the 3G network and establish Ethernet connection to the calibrator.

When ready to use the LEDS are:

- User LED: **Green**
- Power LED: **Amber**



## 4.2.1 LED functionality



### User LED

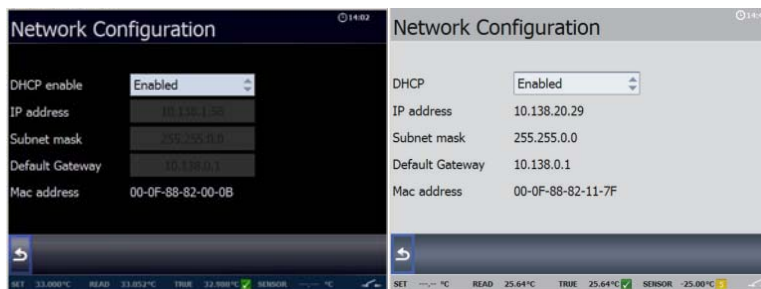
- **Red** : Not connected to the calibrator
- **Green** : Connected to the calibrator

### Power LED

- **Red** : Powered but not connected to the network
- **Amber** : Powered and connected to the network

## 4.2.2 Network setting

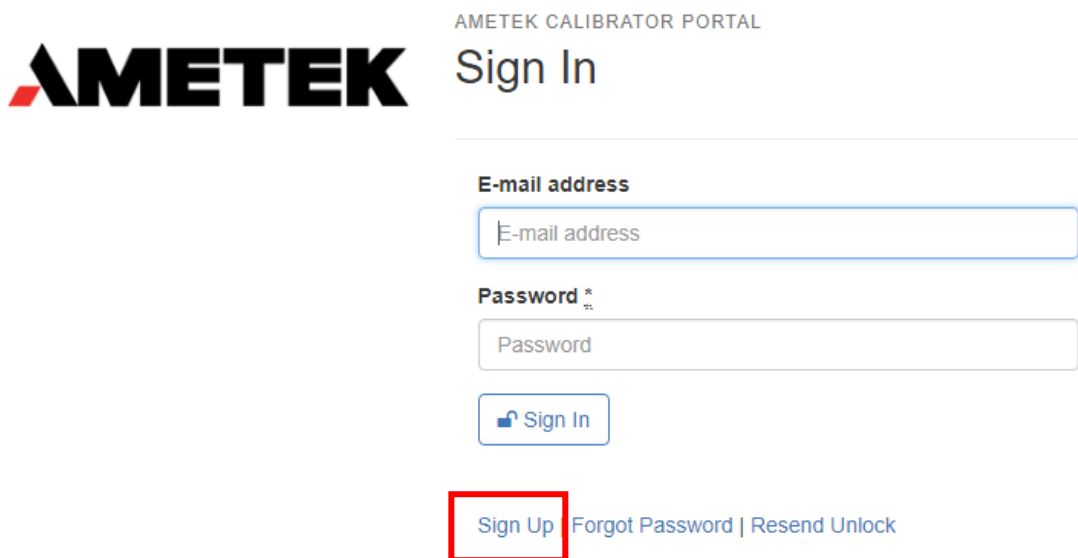
1. Access the Network Configuration function by selecting “Network” from the Calibrator Setup menu.



DHCP shall be set to Enabled for communication with the JofraCloud Gateway. If the Gateway is connected and turned on, the IP address will be updated when leaving the network menu.

## 4.3 Registration

1. Go to [jofracloud.com](http://jofracloud.com) and select “Sign Up”



AMETEK CALIBRATOR PORTAL

# Sign In

**E-mail address**

**Password \***

[Sign In](#)

[Sign Up](#) | [Forgot Password](#) | [Resend Unlock](#)

2. Fill in the form with company details and contact information.  
This will be used for future login and for addition of more users.
3. Press “Sign Up”. The account just created will be with the role: Administrator

### 4.3.1 Forgotten password

1. If the password is forgotten it is possible to reset the password by pressing “Forgot Password” and follow the instructions.

[Sign Up](#) | [Forgot Password](#) | [Resend Unlock](#)

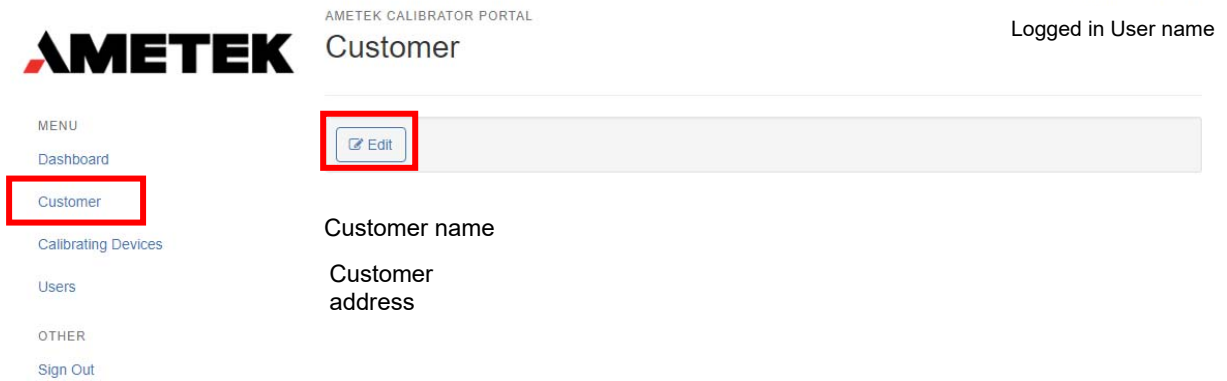
### 4.3.2 JofraCloud locked - unlock

1. After 5 failed attempts to sign in, the portal will be locked.
2. To regain access press “Resend Unlock”. You will receive an e-mail with a link to follow.

[Sign Up](#) | [Forgot Password](#) | [Resend Unlock](#)

## 4.4 Customer Administration

1. Select “Customer” from the Menu on the left side of the screen, and press “Edit”



Here you can change the information shown in the top right corner of the screen and on reports.

## 4.5 User administration

1. Select “Users” from the Menu.  
A list of the users signed up is shown on the screen.
2. To see the information of a user, select the user.  
A detail view is now shown.

Here you see:

- E-mail address
- Time Zone
- Role(s)
- Last Sign In

3. From this view, it is possible to change the password, edit user details and delete the user by pressing either the “Edit” or the “Delete” button.  
You can only change your own password.

### 4.5.1 Adding a new user

Administrators can add, edit and delete users.

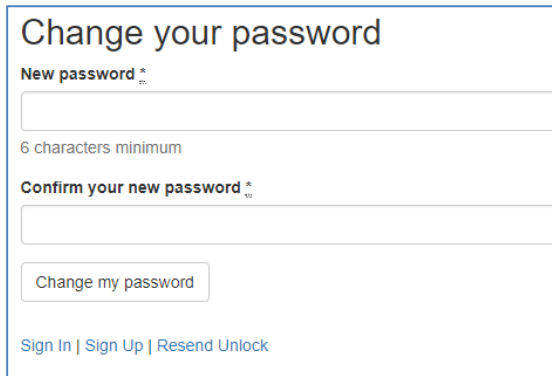
1. Select “Users” from the Menu and press the button “+ Add User”
2. Fill in the details, assign the Role(s) and press the button “Save”.  
The new user will receive an email with a link to set the password.



#### Note...

The email address is unique and can only exist once in the system.

3. By clicking on the link sent by E-mail, you are directed to the page shown below. Enter a password with minimum 6 characters. There are no requirements for capital letters, numbers or special characters.



Change your password

New password \*

6 characters minimum

Confirm your new password \*

Change my password

[Sign In](#) | [Sign Up](#) | [Resend Unlock](#)

## 4.5.2 Roles

Currently there exist two roles:

### Administrator:

- can change company details
- can create new users
- can create instruments

### User:

- can edit his own details
- can see instruments

## 4.5.3 Edit User

1. Select “Users” from the Menu and select the user to be changed. The User Account Details will be shown on the screen.
2. Press the “Edit” button. You can change the Name, Time Zone and Role(s). The E-mail address, which is used for sign-in, can also be changed here. Remember to press the “Save” button when done.
3. The user can be deleted by pressing the “Delete” button. A confirmation dialog box allows you to undo.

## 4.6 Calibrating Devices

1. Select “Calibrating Devices” from the Menu. If devices have been added, they will appear on the list. If the text is red the device is offline.
2. To see the Calibration Device Details, select a device. The actual data on the selected device is now shown.
3. It is possible to add notes to the screen using the “Notes” box. Remember to press the “Save” button.
4. From this view it is also possible to edit or delete the Calibration Device Details. And send an E-mail report.

## 4.6.1 Adding a new calibrator

Before adding a new calibrator, the device must be connected to the Gateway. Both the Gateway and calibrator must be powered up.

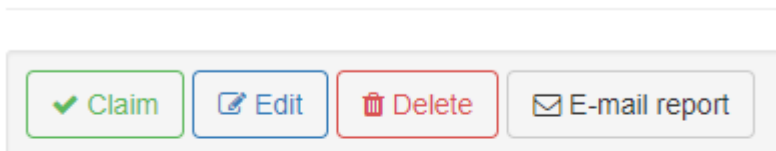
Lights on the Gateway shows good status (see chapter 4.2.1).



### Note...

Only Administrators can add new calibrating devices.

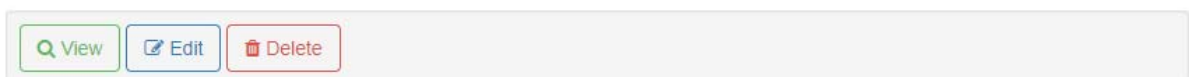
1. Select “Calibrating Devices” from the Menu.
2. Press the button “+ Add Device”
3. Find the serial number for the calibrator either on the label or on the device, or by pressing the menu button on the calibrator and select “About”.  
The serial number format is nnnnnn-nnnnn and is unique.
4. Type in the serial number.
5. Give the calibrator a name (for example RTC-157 No. 1) and optional a note.
6. Press the “Save” button.  
The calibrator is now ready for claiming



RTC-157 No. 1 Online

Serial No.: 354155-00004

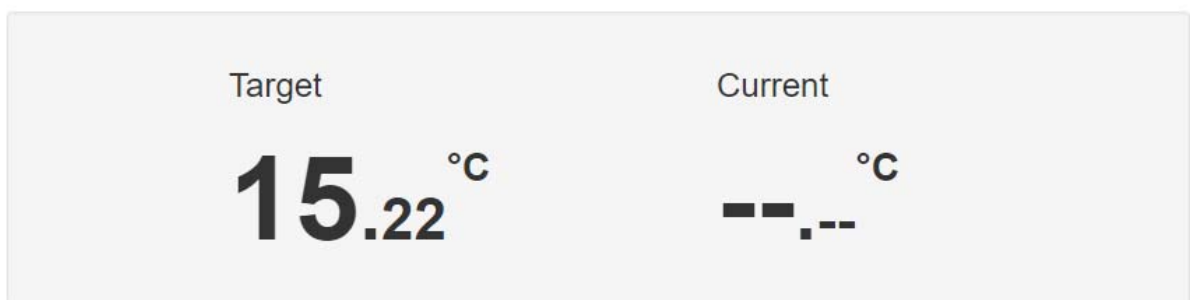
7. Press the “Claim” button. You can also change the information by pressing “Edit” or you can delete the device by pressing “Delete”.
8. When the device connection status is “Online”, press the “Claim” button.
9. The system now asks you to set the target temperature on the device.



RTC-157 No. 1 Online

Serial No.: 354155-00004

Confirm ownership of device RTC-157 No. 1 with serial number **354155-00004** by setting the target temperature on the device to **15.22 °C** within the next **60 seconds**.



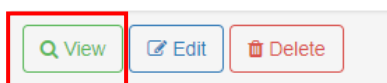


The temperature is a random number between 10°C and 40°C, and uses the decimals set on the instrument.



- ! You have 60 seconds to set the setpoint.  
If you miss it; repeat the claim procedure.

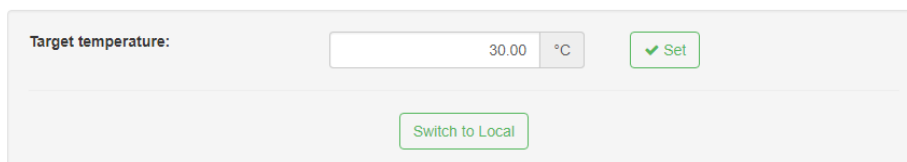
10. After ownership is confirmed, press “View”



The actual data on the instrument will be shown.

#### 4.6.2 Enter new Setpoint

1. Select “Calibrating Devices” from the Menu.
2. Select a device from the list.
3. When in the “Calibration Device Details” view, press the button “Switch to Remote”.  
The instrument is now in remote control mode, and cannot be controlled locally.
4. Enter a new target temperature and press “Set”



5. If local control is needed, press the “Switch to Local” button.

#### 4.7 User and device overview

It is possible to get an overview of all the devices and users added to the JofraCloud system using the Dashboard view.

1. Select “Dashboard” from the Menu.
2. Two lists are shown:
  - a list of calibrating devices
  - a list of users

The Calibration Device Details view can be accessed by selecting from the list of devices.

The User Account Details view can be accessed by selecting from the list of users.

## 4.8 Sign out

1. To sign out of the JofraCloud system select “Sign Out” from the “Other” menu on the left side of the screen.  
You are now in the Sign In mode and it is safe to close the jofracloud.com.

## 5.0 Subscriber Identity Module (SIM)

---

The Gateway is delivered with a Smart SIM card locked to work in the region of purchase.

Instead of using a limited, predefined list of roaming networks, network selection is based on the best available network and data connection.

The Smart SIM card delivered with the Gateway actively monitors data connections, re-establishing connectivity when required.

Data is limited to 100 Mbyte pr. month, giving approximate 100 hours operating time.

The subscription period is 12 months.

For subscription renewal please see our datasheet JofraCloud on [www.ametekcalibration.com](http://www.ametekcalibration.com).

### 5.1 Installing the SIM Card

If you need to replace the Smart SIM card, the procedure below must be followed.



#### Note...

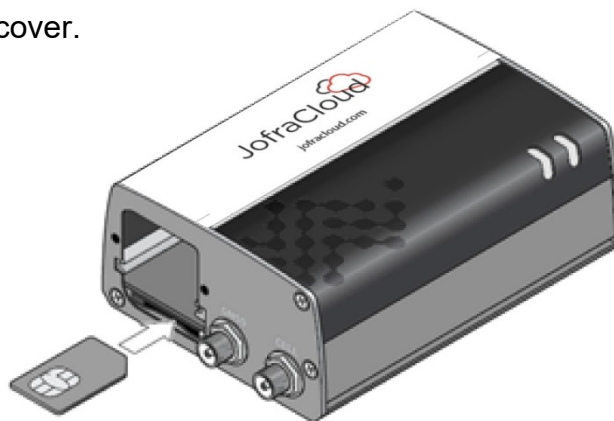
The FX30 must be installed by a qualified technician.

#### Tools and Materials Required

- mini-SIM card (provided by your mobile network operator)
- #1 Phillips screwdriver

#### 5.1.1 Installing procedure

1. Use a Phillips screwdriver to remove the cover.
2. Orient the SIM card, as shown in the figure below. The gold contacts on the SIM card face up.
3. Gently slide the SIM card into the slot until it clicks into place.  
To remove a SIM card, press the SIM card in, and release it. Gently grip the SIM card and pull it out.
4. Re-mount the cover.



5. Contact AMETEK Denmark A/S for configuration of the Gateway to the new SIM card.

## 6.0 Security

---

To ensure data security we have implemented the following:

The communication between the user's browser and the portal are encrypted using the standard https (SSL/TLS)

Passwords are stored encrypted in the database.

## 7.0 Maintenance

---



### Warning

To avoid possible electric shock or personal injury, review “Safety Instructions” Section 2.0 before proceeding.

Only qualified service personnel should perform calibration, repairs, or service not covered by this manual.

For maintenance procedures not described in this manual, or if the JofraCloud Gateway needs repair, please contact AMETEK Denmark Service Department as described below in section 7.1 “Returning the JofraCloud Gateway to service”.

### 7.1 Returning the JofraCloud Gateway to service

If the JofraCloud Gateway continuously malfunctions, verify that the system is being operated as described in this manual and return it to the manufacturer for repair/service.

If the JofraCloud Gateway needs repair and is under warranty, see the warranty statement section 1.1 for terms. If the warranty has lapsed, the JofraCloud Gateway can be repaired and returned for a fixed fee.

When returning the unit please enclose a fully completed service information form. Simply copy the “Service info” form from the following page and fill in the required information. The JofraCloud Gateway should be returned in the original packing.



### Note...

AMETEK Denmark’s liability ceases if:

- parts are replaced/repared using spare parts, which are not identical to those recommended by the manufacturer.
- non-original parts are used in any way when operating the unit.

AMETEK Denmark’s liability is restricted to errors originated from the factory.

### 7.2 Software update

When new software for the JofraCloud Gateway is available, the software can be downloaded from the JofraCloud webpage.

You will be directed to a download area where further instructions will guide you towards a successful download.

# Service info

**Customer data:**

**Date:**

Customer name and address: \_\_\_\_\_

Attention and dept.: \_\_\_\_\_

Fax no./phone no.: \_\_\_\_\_

Your order no.: \_\_\_\_\_

Delivery address: \_\_\_\_\_

Distributor name: \_\_\_\_\_

---

**Instrument data:**

Model and serial no.: \_\_\_\_\_

Warranty claimed Yes: \_\_\_\_\_ No: \_\_\_\_\_ Original invoice no.: \_\_\_\_\_

**This instrument is sent for  
(please check off):**

Check

Service

Repair

---

**Diagnosis data/cause for return:**

Diagnosis/fault description: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Special requests: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Safety precautions:** if the product has been exposed to any hazardous substances, it must be thoroughly decontaminated before it is returned to AMETEK Denmark A/S. Details of the hazardous substances and any precautions to be taken must be enclosed.

## 7.3 Storing

It is not necessary to store away the JofraCloud Gateway after use.  
The unit can be part of a continuous set-up, as long as it is kept in a dry, clean place.

## 7.4 Cleaning



### Caution...

Before cleaning the JofraCloud Gateway, you **must** switch it off.

Periodically wipe the case of the JofraCloud Gateway with a damp soft cloth. A mild detergent can be used with the water.



### Caution...

- The soft cloth must be firmly wrung to avoid any water penetrating the JofraCloud Gateway and causing damage.
- **Do not** use solvents or abrasive cleansers. They might damage the case.

## 8.0 Errors

---

GENERAL ERRORS	
Error description	Solution
Power LED : <b>Red</b>	<ul style="list-style-type: none"><li>• The Gateway is not connected to a network</li><li>• Move the Gateway to a place where mobile coverage (3G) is good</li><li>• Check that the antenna is fastened and pointing upwards</li></ul>
User LED : <b>Red</b>	<ul style="list-style-type: none"><li>• The Gateway is not getting data from the calibrator</li><li>• Check that the calibrator is set to get an IP address via DHCP</li><li>• Check the Ethernet cable</li><li>• Check the LEDs at the Gateway Ethernet connector: Green constant on, yellow flashing</li><li>• Power cycle both the calibrator and the Gateway</li></ul>
Both LEDs on the Gateway shows good status, but calibrator is offline	<ul style="list-style-type: none"><li>• Refresh the browser window</li><li>• Contact AMETEK Denmark A/S or your local dealer</li></ul>



## 9.0 Technical specifications

### 9.1 FX30 Gateway

Description	Value
<b>Frequency bands :</b>	B1 / B2 / B5 / B6 / B8 / B19
<b>Approvals :</b>	EU Directive 2014/53/EU Radio Equipment Directive: Article 3.1 (a) Protection of health and safety EN 60950-1:2006/A1:2010/A11:2009/A12:2011/A2:2013; EN 62311:2008 Article 3.1 (b) Electromagnetic compatibility EN 301 489-1 V1.9.2; EN 301 489-7 V1.3.1; EN 301 489-24 V1.5.1 Article 3.2 Effective use of the spectrum EN 301 511 V9.02; EN 301 908-1 V11.1.1; EN 301 908-2 11.1.1; EN 300 440 V1.4.1  EU Directive 2011/65/EU "RoHS" EU Directive 2012/19/EU "WEEE" REACH FCC/IC, RCM, UL Listed, E-Mark, GCF, PTCRB
<b>Power Voltage :</b>	4.75 V to 32 V
<b>Idle mode:</b>	<1 W
<b>Max :</b>	7.2 W
<b>Ethernet :</b>	10/100 Base-T RJ45
<b>USB :</b>	USB V2.0 Micro-B connector (for configuration)
<b>Weight :</b>	158 g
<b>Humidity :</b>	95 % relative humidity over a temperature range of +20 °C to +60°C
<b>Operational temperature :</b>	-30°C to +75°C
<b>ESD :</b>	8KV contact discharge, 15KV air discharge

### 9.2 Power supply

Description	Value
<b>Input Voltage</b>	
Minimum :	90 VAC
Maximum :	264 VAC
<b>Input Frequency</b>	
Minimum :	47 Hz
Maximum :	63 Hz
<b>Output Voltage :</b>	12.0 VDC
<b>Output Current :</b>	1.5 A
<b>Approvals :</b>	EU Directive 2014/30/EU: Electromagnetic Compatibility: The power supply meets the radiated and conducted emission requirements for EN55022, FCC Part 15, Class B, GB9254 EU Directive 2011/65/EU "RoHS" EU Directive 2012/19/EU "WEEE" REACH

<b>Description</b>	<b>Value</b>	(continued)
<b>Humidity :</b>	10% ~ 90%	
<b>Operational temperature :</b>	0°C ~ 40°C (operates normally)	
<b>Storage Temperature :</b>	-30°C ~ 70°C	
<b>International Efficiency Level</b>		
115 VAC, 60 Hz :	VI	
230 VAC, 50 Hz :	V	

## 10.0 List of accessories

---

All parts listed in the list of accessories is available from the factory through our dealers. Please contact your dealer for assistance if you require parts, which do not appear in the list.

---

### List of accessories

---

<b>Accessories</b>	<b>Part no.</b>
Padded soft case for JofraCloud	129893
Bracket for Gateway	129882
Antenna	129880
Cover for unused antenna	129907
Power supply 12VDC	129881
Ethernet cable – 25 cm	129884
Ethernet cable – 50 cm	129885

#### **AMETEK Sensors, Test & Calibration**

A business unit of AMETEK Measurement & Calibration Technologies Division offering the following industry leading brands for test and calibration instrumentation.

#### **JOFRA Calibration Instruments**

##### *Temperature Calibrators*

Portable dry-block calibrators, precision thermometers and liquid baths. Temperature sensors for industrial and marine use.

##### *Pressure Calibrators*

Convenient electronic systems ranging from -25 mbar to 1000 bar - fully temperature-compensated for problem-free and accurate field use.

##### *Signal Instruments*

Process signal measurement and simulation for easy control loop calibration and measurement tasks.

#### **M&G Deadweight Testers & Pumps**

Pneumatic floating-ball or hydraulic piston deadweight testers with accuracies to 0.015% of reading. Pressure generators delivering up to 1,000 bar.

#### **Crystal Pressure**

Digital pressure gauges and calibrators that are accurate, easy-to-use and reliable. Designed for use in the harshest environments; most products carry an IS, IP67 and DNV rating.

#### **Lloyd Material Testing**

Material testing machines and software that guarantees expert materials testing solutions. Also covering Texture Analysers to perform rapid, general food testing and detailed texture analysis on a diverse range of foods and cosmetics.

#### **Davenport Polymer Test Equipment**

Allows measurement and characterization of moisture-sensitive PET polymers and polymer density.

#### **Chatillon Force Measurement**

The hand held force gauges and motorized testers have earned their reputation for quality, reliability and accuracy and they represent the de facto standard for force measurement.

#### **Newage Hardness Testing**

Hardness testers, durometers, optical systems and software for data acquisition and analysis.



[www.ametekcalibration.com](http://www.ametekcalibration.com)

#### **United Kingdom**

Tel +44 (0)1243 833 302  
caluk.sales@ametek.com

#### **France**

Tel +33 (0)1 30 68 89 40  
general.lloyd-instruments@ametek.fr

#### **Germany**

Tel +49 (0)2159 9136 510  
info.mct-de@ametek.de

#### **Denmark**

Tel +45 4816 8000  
jofra@ametek.com

#### **USA**

*Florida*  
Tel +1 (800) 527 9999  
cal.info@ametek.com

#### *California*

Tel +1 (800) 444 1850  
crystal@ametek.com

#### **India**

Tel +91 22 2836 4750  
jofra@ametek.com

#### **Singapore**

Tel +65 6484 2388  
jofra@ametek.com

#### **China**

*Shanghai*  
Tel +86 21 5868 5111

#### *Beijing*

Tel +86 10 8526 2111  
jofra-china.sales@ametek.com.cn