

## Airlinq® Online Technical specifications

This document is intended for IT administrators or technical staff responsible for establishing connection from one or more Airmaster Air Handling Units (AHU in the following) to the Airlinq Online cloud service.

### Overview

Airlinq Online is an online Cloud Service consisting of a Device Gateway Server and a Web App.

The Cloud Service is hosted by Microsoft Azure (West Europe).

The Cloud Service handles all AHUs across customers and projects. Access is restricted by user authentication.

All access and communication is encrypted per default (see the encryption section below).

### Device gateway server

The Device Gateway Server handles communication with each AHU.

Each AHU is pre-programmed to communicate with a certain gateway address when an Internet connection is established through the built-in Ethernet module. Subsequently the AHU communicates its status to the same gateway in certain intervals.

Communication is always initiated by the AHUs and no ports need to be opened for inbound communication to the AHUs.

The AHU acts as a TCP Client and opens a connection to the Device Gateway Servers inbound port 55556.

Normally, once the AHU has established the connection, the communication is free to flow both ways until the session is over and is not limited by firewalls. However, some organisations have very strict firewall policies and will not allow any reply from the Device Gateway Server.

In such cases a firewall rule/exception must be added by the customer for the Airlinq Online Cloud Service to work.

During the commissioning phase UDP communication is used for AHU device discovery on the internal network. This is not required to be supported on the network, but it will ease the work for the technicians during the commissioning.

### Web App

The Web App is accessible through <https://online.airlinq.eu> and acts as portal that enables users to access and monitor one or more Airmaster AHUs. The Web App is designed with the principles of responsive web design in mind making it compatible with almost any device form factor and operating system.

### IP Address

Per default the AHU requests a dynamic IP address from a DHCP server.

It is possible to set a static IP address on each AHU using the Airlinq Service Tool PC software.

### Encryption

Encryption is used throughout the system – both between AHUs and the Device Gateway and between end users and the Web App.

The AHU communicates with the Device Gateway Server using a proprietary binary protocol which uses an AES128 encryption with a unique key per AHU.

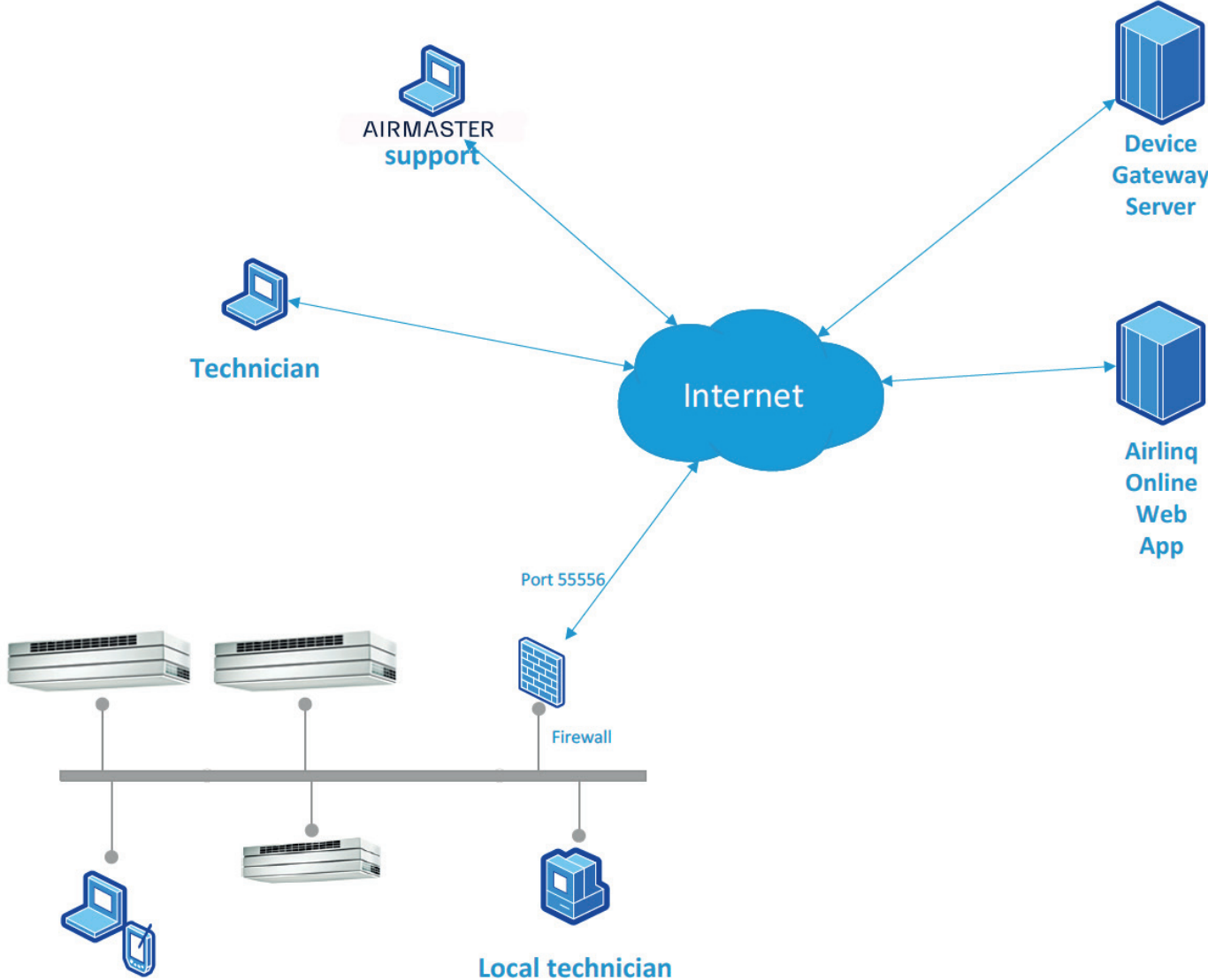
SSL encryption is used between end users and the Web App (HTTPS).

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### Half-duplex

The AHU uses half-duplex communication. It is required that the switches for the AHUs can handle half-duplex communication.

### Schematic diagram



## Airlinq® Online Troubleshooting:

This description contains several bullet points for troubleshooting the communication of the AHU. It is recommended to have an IT specialist/professional to set up the communication and go through the troubleshooting.

### List of terms:

- AHU = Air Handling Unit
- Ethernet module = a small circuit board integrated in the main box (controller) inside the AHU. To access it you need to open the AHU service door(s)

### Troubleshooting:

#### Connection:

- Is the AHU supplied with power? And, is the power of the AHU turned on?
- Is a CAT 5e Ethernet cable connected to the Ethernet module in the AHU?
- Ideally, the Ethernet wiring to the AHU must be checked for ensuring no broken cables.
  - Check for Internet access by connecting a PC to the Ethernet cable connected to the AHU and check if it gets online.
- Check the LEDs on the Ethernet module. The orange LED lights when the AHU is supplied with power. The green LED indicates communication and lights when it is connected to a switch with a CAT 5e Ethernet cable. The green LED does not light when there is no communication, even though it is connected to a switch with a CAT 5e Ethernet cable.
  - NB! The green LED does not indicate that port 55556 is open.

#### Communication:

- Reboot the AHU, i.e. turn off the power and switch it back on.
  - The AHU requires a reboot for every change of network settings directly affecting the specific ventilation unit. This is also valid when static IP addresses are used.
  - The AHU requests an IP address when booting up (power is supplied).
- The AHU is by default set to receive a dynamic IP address from a DHCP server.
  - Does the unit receive a dynamic IP address?
    - This can be verified in the DHCP server.
  - The MAC address of the unit is labeled on the main box (controller) inside the AHU.
- Does the local firewall allow the AHU to communicate with the Airlinq® Gateway server through port 55556?
  - Note! Port 55556 does NOT need to be permanently opened inbound to the AHU. All communication is initiated from the AHU in an outbound direction.
  - But the AHU must be allowed to initiate the creation of a socket connection with the Airlinq® Gateway server – outbound port 55556 – after which the gateway must be allowed to reply back using this connection (all communication on this connection is encrypted).
  - To ensure that only AHU devices on the network can communicate on port 55556 it may be necessary to assign a static IP address to each AHU (This can be done either through the DHCP server or by Airlinq® Service Tool).

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- The address of communication for the ventilation units is gw1.airlinq.eu (port 55556).
- To check if the network generally allows communication to gw1.airlinq.eu through port 55556 you can do the following:
  - o Connect a PC to the same network as the AHU through an Ethernet cable
  - o Open a new Command Prompt
    - In windows this can be done by typing "cmd.exe" in the Run-menu
  - o In the command prompt enter the following command: telnet gw1.airlinq.eu 55556.
    - Note! This requires that the Telnet service is enabled on the PC.
- This can be done under Control Panel→Programs→Add/Remove Windows components (requires administrative rights).
- Check the communication of the AHU by connecting an independent Internet source, such as a 4G router or a GSM module.
- The AHU uses half-duplex data transmission. Most network equipment automatically detects whether a device operates in half-duplex or full-duplex. But manually configuring the switch port that the AHU is connected to may result in unexpected behavior.

In case the bullet points of the above troubleshooting do not get the AHU online, please contact Airmaster.