

3.4

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MQTT

Fieldbus Configuration Manual



DELÉGO SERVER

Visualisation webserver

EK-DEL-SRV01 / EK-DEL-SRV01-M

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1 Introduction

1.1 Scope of this manual

DELÉGO can connect as a client to one or more MQTT brokers for publishing and receiving data in real time. This functionality is useful for interacting with devices or systems operating on cloud services other than the native EKINEX ones.

DELÉGO can also in turn function as an MQTT broker, thus performing the role of "star center" for communication with devices in the local network using the MQTT exchange protocol. This prerogative can also be used to make two or more DELÉGOs communicate with each other.

This document contains all the information for the integration of DELÉGO SERVER, the multiprotocol webserver for the connected buildings by EKINEX, with other devices or services, based on the popular MQTT communication protocol.

The present user manual is part of the suite of application manuals dedicated to the DELÉGO SERVER, available on the section dedicated to this product in the EKINEX website. Before reading this document, it is recommended to consult the following application manuals:

REF	DOCUMENT	DESCRIPTION
[D1]	DOCUMENTATION PLAN	Overview of the application manuals of DELÉGO SERVER
[D2]	GENERAL FUNCTIONS - APPLICATION USER MANUAL	General installation manual of the webserver
[D3]	AUTOMATIONS - APPLICATION USER MANUAL	Methodologies for creating automations through the relationship between objects (TRIGGERS, CONNECTIONS and LOGICS).
[D4]	KNX - APPLICATION USER MANUAL	Configuration and visualisation of a KNX automation system in DELÉGO SERVER

These documents are available for download in the area of the EKINEX website dedicated to the webserver.

1.2 Conventions

The following conventions are used in this manual:

[KEY]	The keyboard keys that the installer must press are shown in square brackets
<i>Courier</i>	Software messages generated by the DELÉGO SERVER configuration software are reported in the "courier" font
<i>Function name</i>	Names of buttons, table fields or other graphic elements of the user interface of the DELÉGO SERVER configuration software are shown in italics

[KEY] The keyboard keys that the installer must press are shown in square brackets



Information note



Important note that requires particular attention

1.3 Safety information

DELÉGO SERVER is a product intended for trained and specialized personnel only; anyone who interacts with the device must first read this documentation, especially this safety information. This document supplements and does not replace any legislation or legal directives on safety.

The device has been developed following the safety regulations currently in force; however, it is not possible to exclude with certainty possible damage or interactions with other devices during its operation. The device complies with EMC guidelines and harmonized European standards; any modifications to the device may affect EMC compatibility.

The supply voltage must be strictly within the range indicated in the GENERAL FUNCTIONS application manual and on the device; risk of fire or explosion if powered outside this range. The CE declaration of conformity of the device can be requested from EKINEX®, at the references on the site www.ekinex-delego.com.



In compliance with Directive 2002/96/EC the DELÉGO SERVER electronic device must be disposed of in the appropriate facilities and not in the collection of solid urban waste.

1.4 Warnings

- This application manual is aimed at installers, system integrators and designers.
- The assembly, electrical connection, configuration and commissioning of the appliance can only be carried out by specialized personnel in compliance with the applicable technical standards and the laws in force in the respective countries
- Opening the appliance case causes the immediate interruption of the warranty period
- In the event of tampering, compliance with the essential requirements of the applicable directives for which the appliance has been certified is no longer guaranteed.
- EKINEX defective appliances must be returned to the manufacturer at the following address:

Ekinex S.p.A. Via Novara 37, 28010 Vaprio d'Agogna (NO)

1.5 Copyright

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This application manual, the DELÉGO SERVER software and the DELÉGO iOS and Android apps are subject to copyright; all rights are reserved. Copying, reproduction, translation and/or modification, even partial, are expressly prohibited unless approved in writing by EKINEX®.

1.6 Open Source Licenses

DELÉGO SERVER contains open source software, such as the Linux operating system and its kernel. These software components are subject to various open-source licenses, including:

- GNU General Public License (GPL), <https://www.gnu.org/licenses/gpl-2.0.html>
- GNU Lesser General Public License (LGPL), <https://www.gnu.org/licenses/lgpl-2.0.en.html>

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1.7 More information

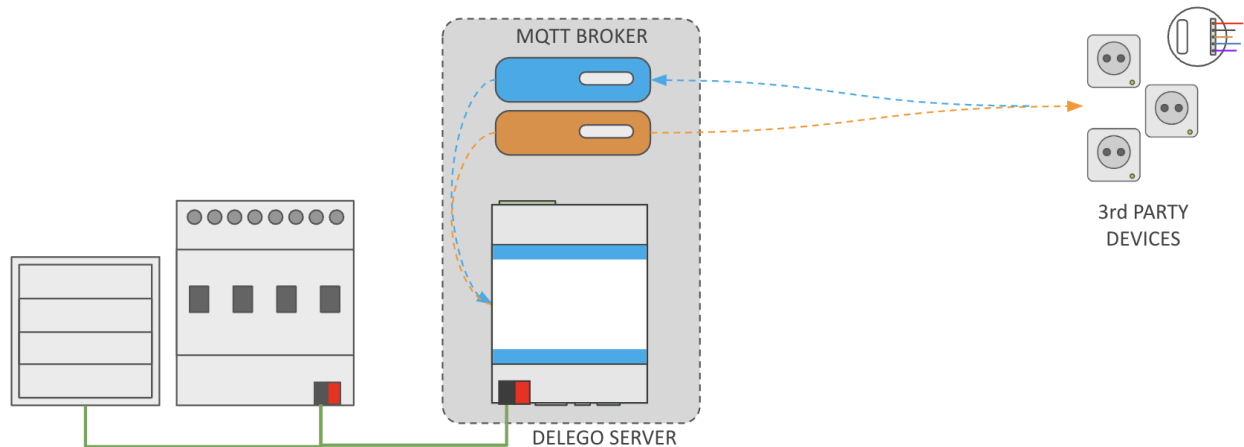
- For further information on the product, you can contact EKINEX technical support® to the e-mail address: support@EKINEX.com or consult the website www.EKINEX.com
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1 MQTT Broker

1.1 Introduction

DELÉGO provides an MQTT broker, to which it is possible to connect not only the same web server, but also third-party devices that support this protocol, or other DELÉGOs as long as they are in the same LAN network.



This chapter illustrates how to set up DELÉGO's integrated MQTT broker; after carrying out the operations described, it is typically necessary to:

- Configure third-party devices to work with the broker
- Configure DELÉGO itself to make its supervision objects interact with the broker (internal client connection)
- Configure other DELÉGOs to “point” to the broker

For the first point, you need to refer to the documentation of the devices you intend integrate with the broker.

The second and third points are described vice versa in the following chapter; if you do not want to use DELÉGO's integrated broker but only configure a connection to an external broker, we recommend moving directly to the next chapter.

1.2 Broker settings

Select item:

FIELD TECHNOLOGIES > MQTT > MQTT BROKER > BROKER SETTINGS

to set the following:

RUN AT STARTUP	Enable this option to start the broker when the system is powered up
AUTHENTICATION	Enable this option to verify the credentials of connecting clients. Strongly recommended option.

To start the broker press the START button; after each subsequent change, press UPDATE so that it enters into circulation correctly.

1.3 Users

If you enable authentication, you must set up a user for each client device that will connect to the broker.



It is also necessary to prepare a set of credentials for the same DELÉGO when connecting to your broker, as better described in the following chapter.

Pressing the ADD button inserts a new line in the USERS section:

NAME	Label that represents the user within the system
USERNAME	Username to enter in the MQTT client to authenticate
PASSWORD	Password to specify in the MQTT client to authenticate
ABILITY	Clear the selection to keep the user's credentials in memory but not enable them to connect

After each operation on the user list, press UPDATE. Once the users have been set up and the broker has been started, continue following the instructions in the next chapter for configuring the client connection.

2 MQTT Client

2.1 Introduction

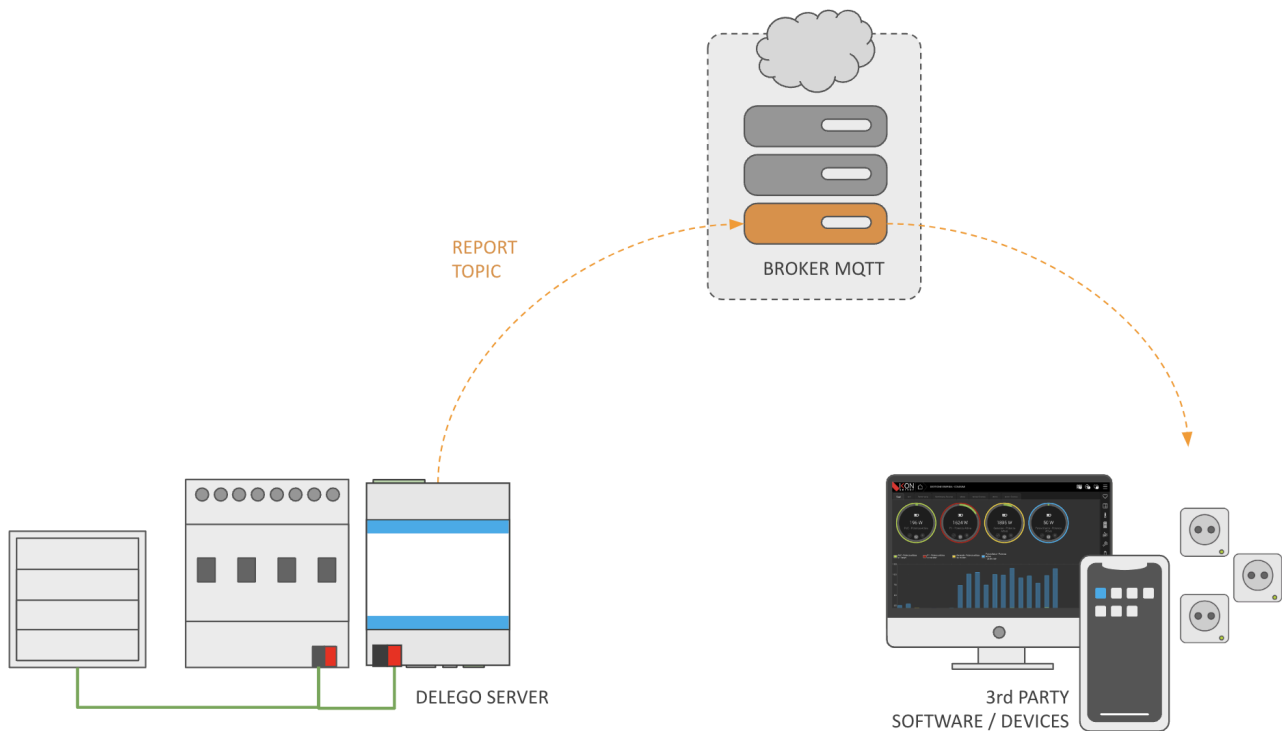
DELÉGO allows connection to more than one MQTT broker simultaneously; it is advisable to limit the number of such connections as much as possible, so as not to overload system resources.

It is possible to associate one or more supervision objects with each MQTT connection; in this way:

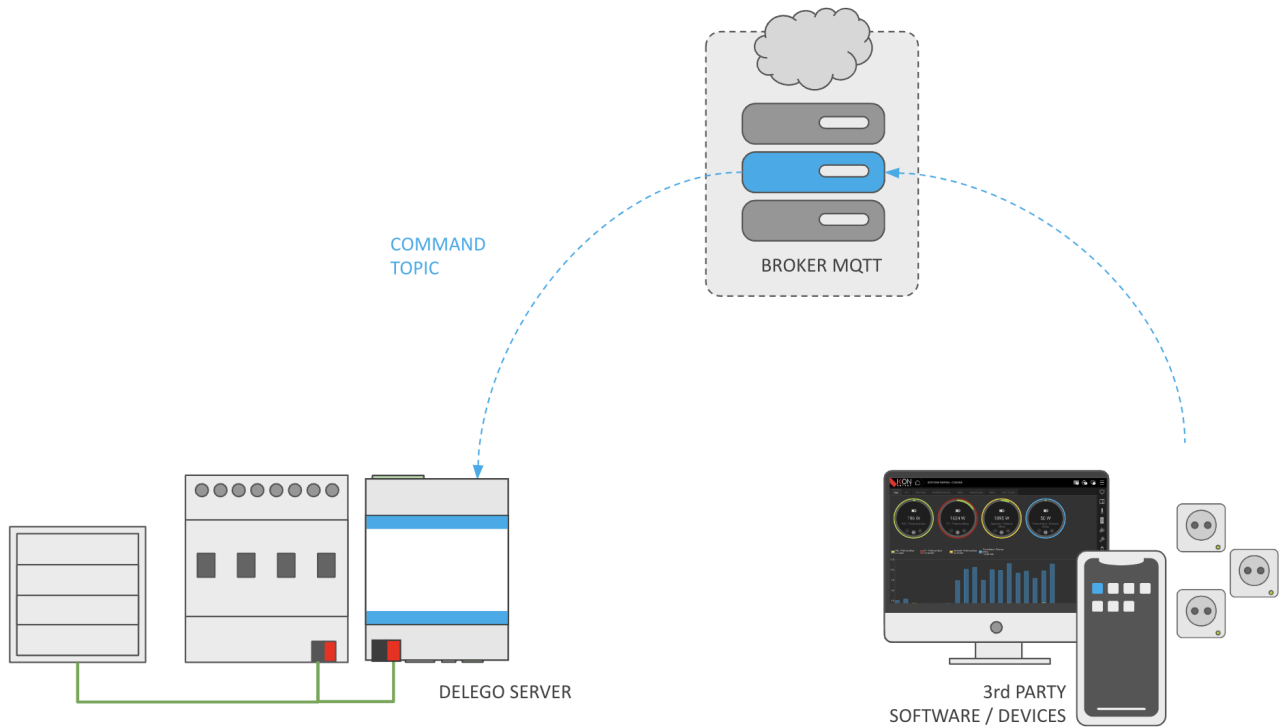
- when a value is received via MQTT, it is passed to the object as a command
- vice versa, when the object changes state, its value is sent to the broker via MQTT

To each of the objects associated with the connection, it is possible to assign two topics, i.e. the communication channels on which DELÉGO exchanges information with the broker; for further information on MQTT topics, please refer to the specifications of this protocol, and to the documentation widely available on the internet.

The *topic in report* is used by DELÉGO to send the state of objects every time it changes:



Conversely, when DELÉGO receives a value on the *command topic*, runs it as a command on objects.



In both cases, DELÉGO expects NUMERIC VALUES to be exchanged on the topics, using the dot as decimal separator (if they are not integer values); There is no provision for the exchange of different formats e.g. JSON.

For each object it is necessary to indicate at least one *command topic* or a *topic in report*. It is obviously possible to specify both.



It is strongly discouraged to use the same topic for both the command and the report, because loops could be generated.

To connect to your integrated broker it is necessary to configure a connection in any case, however using a simplified procedure, better described below.

2.2 New connection

To create a new connection, expand the entry

FIELD TECHNOLOGIES > MQTT > MQTT CLIENT

in the configuration side menu, and press the [+] button in the toolbar; once the new connection has been created, access its tab to set the parameters. A tab like the following figure is shown:

The screenshot shows the 'delégo' web interface. On the left is a dark sidebar menu with options like Setup, Field technologies (KNX, Modbus, Matter, MQTT), MQTT Client (MQTT connection 1), MQTT Broker, MBUS, Line 1, User Interface, Basic functions, Integrations, Energy Management, Trends, Notifications, Automations, Guest room management, Settings, and Change password. The main area is titled 'Generic settings' and contains a form for 'MQTT connection 1'. The form has sections for 'General information' (Name, Broker source, MQTT broker address, IP port, Unique Client ID, SSL encryption, Authentication, Username, Password, Echo timeout), 'Appearance' (Execution state), and 'Permissions' (Enable communication, Execute at startup). At the bottom are 'CLOSE', 'START', and 'STOP' buttons. A status bar at the very bottom shows 'MQTT connection 1' and some icons.

Enter the following information:

NAME	Identify the connection within the project
TIP ON BROKER	Specify “use external broker” to connect to a service on the Internet or another device on the LAN. Conversely, select "use integrated broker" to connect to DELÉGO's internal broker (see next section for details)
MQTT BROKER ADDRESS	MQTT broker internet domain, without port and routes
IP PORT	Communication port. Typically the following ports are used: • 1883: Unencrypted MQTT communication • 8883: MQTT communication encrypted with SSL
UNIQUE CLIENT ID	Enter a wording (we recommend without spaces or special characters) that uniquely identifies the DELÉGO client for the broker. Depending on the MQTT service you use, there may be restrictions on this wording, or it may be provided by the service.
SSL ENCRYPTION	Select whether the communication is protected by SSL
AUTHENTICATION	Select whether the service includes authentication
USERNAME PASSWORD	Service access credentials
TIMEOUT ECHO	Time interval in seconds for the anti-echo functionality. The default is set to 10 seconds. Normally it is not necessary to intervene on this parameter.

Once all the data has been entered, press START to begin communication with the broker; if the data and credentials are correct, after a few seconds the CONNECTION STATUS must become CONNECTED. At this point, you are ready to attach objects to the connection.

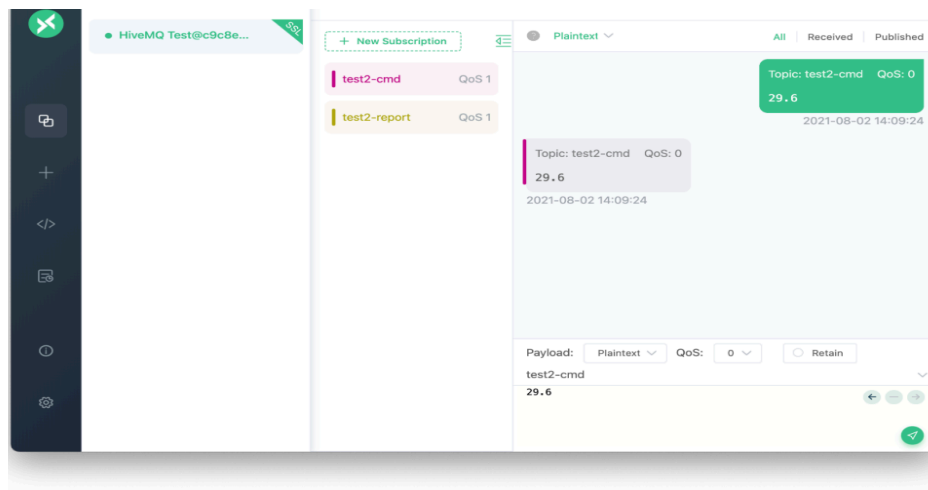
2.3 Object association

Drag the supervision objects you want to connect to the service into the ASSOCIATED OBJECTS section; for each of them it is necessary to indicate at least one of the following parameters:

COMMAND TOPIC	Name or path of the topic on which to receive commands
TOPIC IN REPORT	Name or path of the topic on which to send status changes

It is possible to directly control the object via the selector in the STATUS column, in order to check in real time whether the MQTT communication is taking place correctly.

The following screen shows an example of test MQTT client software, with which it is possible to register with the same broker and read/write on the same topics, and thus verify correct DELÉGO communication:



Before carrying out a test with DELÉGO, we recommend checking the correct configuration and functionality of the broker. For this purpose, it is possible to use other known equipment, or two instances of a test MQTT client software, writing and receiving each other on command and report topics.

If the expected operation is verified, you can proceed to configure DELÉGO and carry out the necessary checks in the real environment.

2.4 Internal connection

To connect to the internal broker of DELÉGO select “use integrated broker” in the client connection configuration seen previously; in this case it is not necessary to enter all the fields normally expected, and it is possible to choose the user from a drop-down menu (instead of typing it manually). For security reasons it is still necessary to specify the password.

2.5 M2M connection

It is possible to use the MQTT protocol to create bidirectional machine-to-machine communication between multiple DELEGOs, as long as they are all connected to the same network.

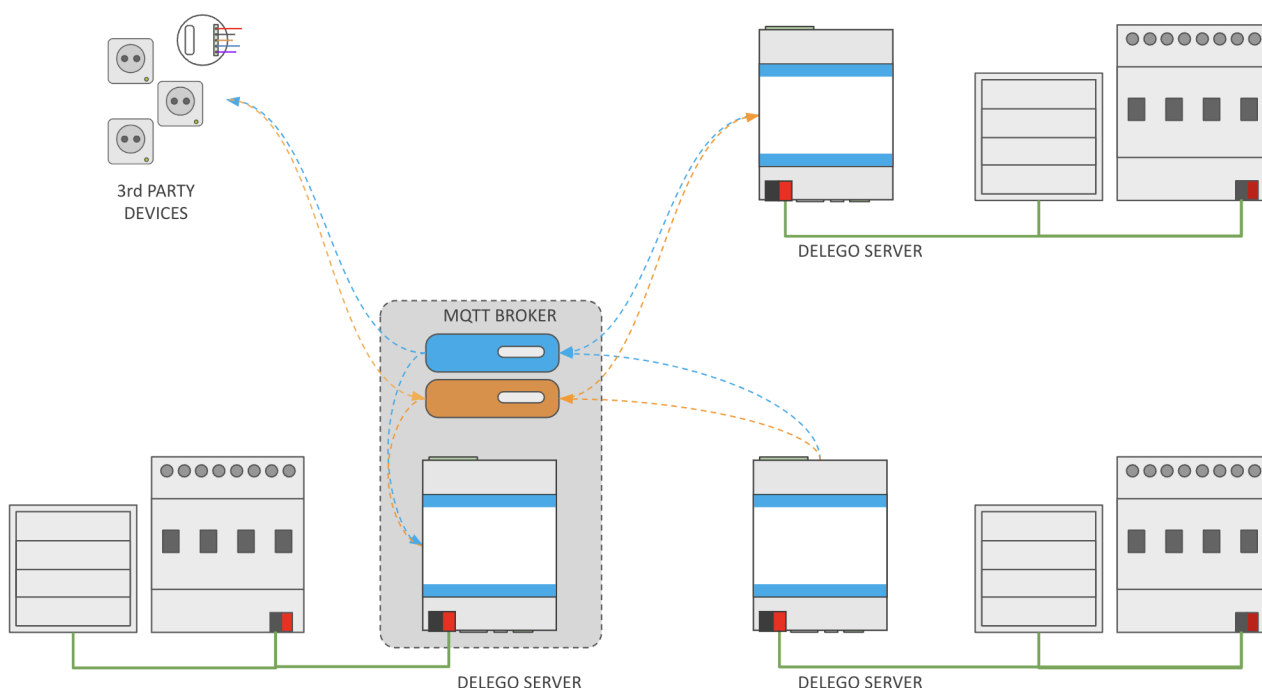
First of all, it must be established which one DELEGO must act as a "master" and enable the integrated MQTT broker on this.

Next you need to configure the MQTT client connections as follows:

- On the same DELEGO, configure an "integrated broker" connection by selecting one of the previously set up users
- On the other DELEGOs, create a generic connection, specifying the IP address of the master and manually typing the user to use

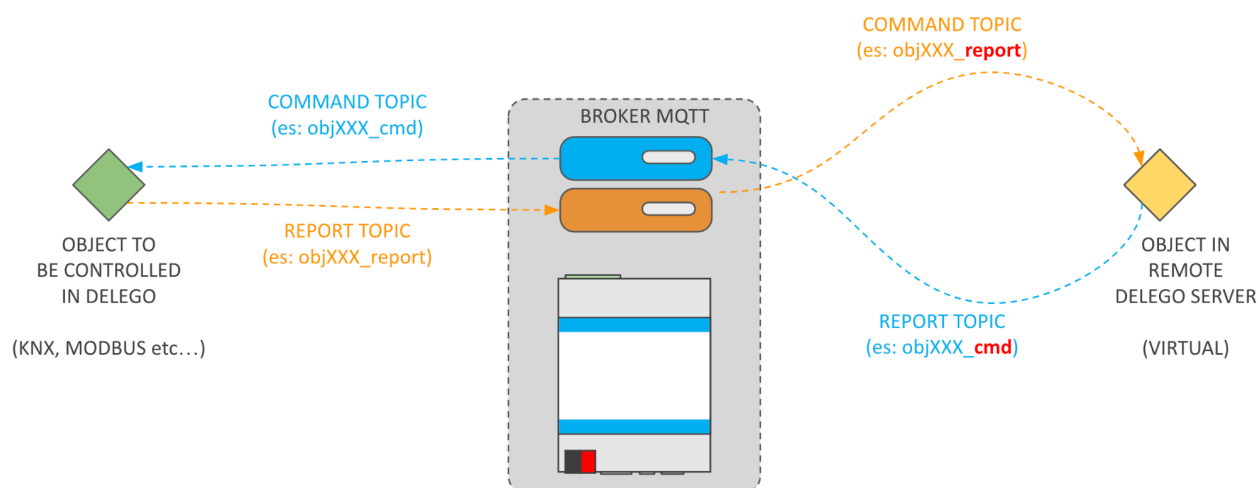


For each of the DELEGOs, including the master, a dedicated user must be provided, and a *client ID* unique



To drive an object from another server from a DELEGO, at that point, it is necessary to proceed as follows:

- In the DELEGO that must be controlled, drag the technological object (e.g. KNX) into the connection tab, arbitrarily deciding a topic for the command and one for the status
- In the other DELEGOs, create a virtual object with the same graphic rendering and drag it into the corresponding connection MQTT client, using:
 - Come *command topic* the one that is marked for the report on the other server
 - Come *topic in report* the one that is instead used for the command



In other words, the topics must be "crossed" between the object to be controlled and the object "synchronized" on the other DELEGO.

3 Revision history

The following table contains the most relevant changes in the software releases, concerning the topics of this application manual:

Release	Changes	Date
2.8.0	Minor changes	15/04/2026
2.7.0	Minor changes	01/09/2025
2.6.0	First revision of the document	02/04/2025



Before the software release 2.6 the application manuals of DELÉGO SERVER were organized differently. An exact correspondence with older versions of the manuals and the changelog could not be found for this reason.