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UTFÄRDARE/HANDLÄGGARE  
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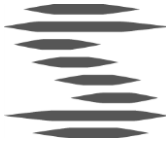
# Installation Guide for a participant's ECP/EDX Node in the Svenska kraftnät ECP Network





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# 1 Document History

| Version | Date       | Changes   |
|---------|------------|---|
| 4.7_1   | 2022-01-17 | Complete rewrite of earlier version (1.06).<br>Instructions for Linux installation added. |
| 4.8.2_1 |            | Updated for ECP 4.8.2 and EDX 1.9.2.  |

## 2 Introduction

### 2.1 Background

The European association for the cooperation of TSOs for electricity (ENTSO-E) have developed the ENTSO-E Communication and Connectivity Service Platform (ECCo SP), a communication platform for information exchange between system operators and other electricity market players over public links. The platform consists of two main functional blocks: Energy Communication Platform (ECP) and ENTSO-E Data eXchange (EDX).

ECP Endpoint and EDX Toolbox are two components of this solution that a market player have to install to be able to participate in message exchange between other participants connected to an ECP/EDX network.

### 2.2 Purpose

This document will serve as an abbreviated complement to the more complete (and in some areas more complex) Installation Guides provided with the ECCo SP software. It will support parties in the process of a basic installation of an ECP/EDX node and setting up a basic connection of that node to the ECP/EDX network of the Swedish TSO *Svenska kraftnät*.

### 2.3 Target group and required knowledge

The target group for this document is a person that will accomplish installation and basic configuration of the participant's ECP Endpoint and EDX Toolbox software in the participant IT environment. Thus necessary knowledge about this environment and about normal system administration activities within that type of environment is required.

### 2.4 Scopes and limitations

This document describes installation of the ECP Endpoint and EDX Toolbox software, also described in the Installation Guides provided with the software, but with following scopes and limitations:



- > Software versions used are ECP Endpoint 4.8.2 and EDX Toolbox 1.9.2. This also means that references made in this document to the ECCo SP documents means the documents covering these versions of the software components.
- > ECP Endpoint and EDX Toolbox is installed on same host
- > No external database is used (only the default internal Derby database)
- > No high availability solution is used
- > Only first-time installation is covered (not upgrade of an existing installation)

## 3 ECP/EDX Network overview

### 3.1 The big picture

The goal of ECP is to provide secure and reliable messaging between participants in the energy sector, from one Business Applications (BA) to another. The big picture is shown below:

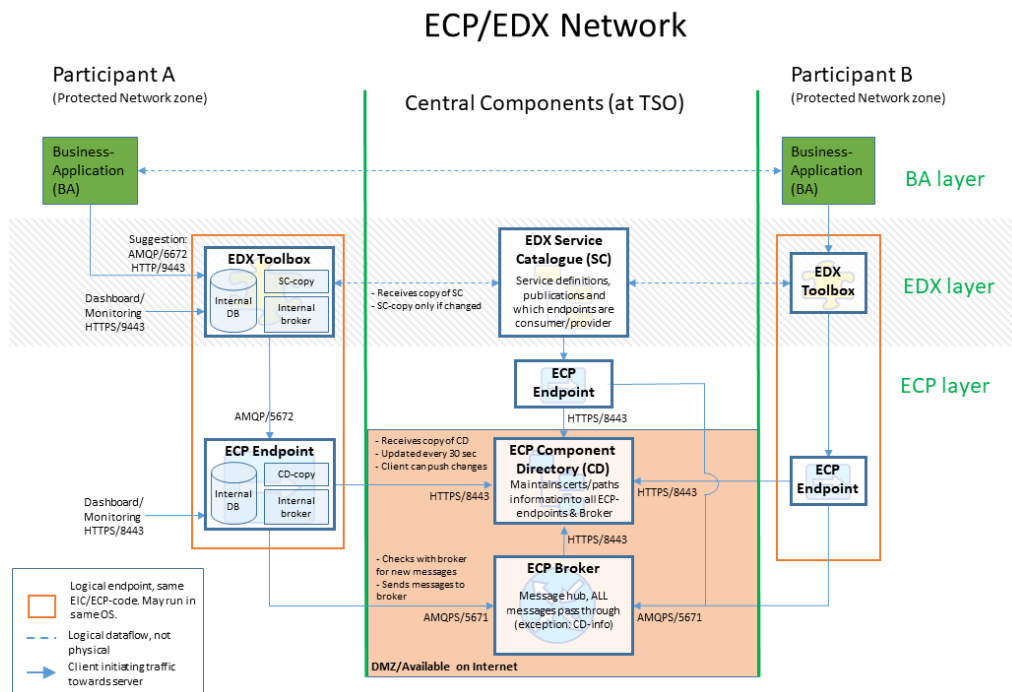


Figure: ECP/EDX Network overview

The drawing aims at answering the following questions:

- > What components exist in the ECP and which must a participant in the network install?
- > Which ports must be opened in which direction and in which firewall?



- > What is the general purpose of the various components in ECP?
- > How does the messages flow in the system and how is the logical flow?

During the installation of the ECP Endpoint you will register your Endpoint in the ECP Component Directory of *Svenska kraftnät*. This registration is a two-phase action where a registration key, provided by *Svenska kraftnät*, is used in a request sent from the participant Endpoint to the Component Directory (at *Svenska kraftnät*). This request then have to be approved by *Svenska kraftnät* and after approval you may send messages from one ECP Endpoint to another in the network.

By adding the EDX Toolbox "on top" of the ECP Endpoint, you will gain the service-concept which among many thing will allow you to address a service provider without knowing a specific address (example of destination: "SERVICE-FASIT").

The EDX Toolbox have to be installed after installation of the ECP Endpoint. When the EDX Toolbox is installed and registered by *Svenska kraftnät* in their EDX Service Catalogue you will be able to test EDX-to-EDX traffic.

When EDX-to-EDX traffic works you may test BA-to-BA traffic.

For deeper insights in components and concepts used, please see the documentation packaged with the software components, in particular the following documents:

- > ECP Functional Specification
- > ECP High Level Concept
- > ECP System Design
- > EDX Technical Design
- > EDX User Guide

## 3.2 Terminology

In the table below acronyms/terms used in this installation guide are described. Please use it as a reference. Defined words are in bold font.

| <b>Short</b> | <b>Expanded</b>                   | <b>Definition</b>  |
|--------------|-----------------------------------|--|
| AMQP         | Advanced Message Queuing Protocol | A protocol/standard developed in 2014 by OASIS for reliable (persisted) message communication.   |
| BA           | Business Application              | A "normal" application outside <b>ECP</b> , communicating through ECP with other <b>BAs</b> . The <b>BA</b> must connect with an <b>EDX Toolbox</b> to send/receive messages from the network. |



| Short        | Expanded  | Definition   |
|--------------|---|--|
| Broker       | Central Broker  | The central broker in an <b>ECP</b> -network is directly reachable for all <b>ECP Endpoints</b> and all messages in the network are sent to and retrieved from this broker. It supports <b>AMQP(S)</b> . In addition to the central broker, each <b>ECP Endpoint</b> and <b>EDX Toolbox</b> also have an "internal broker" (same type of broker) for message handling. |
| CD           | Component Directory                                     | An <b>ECP</b> component, maintaining information about all <b>ECP Endpoints</b> , <b>Broker</b> and <b>SC</b> . This is like the phone book of an <b>ECP</b> -network.   |
| ECCo SP      | ENTSO-E Communication and Connectivity Service Platform | A communication platform for information exchange between system operators and other electricity market players over public links. The platform consists of two main functional blocks: Energy Communication Platform ( <b>ECP</b> ) and ENTSO-E Data eXchange ( <b>EDX</b> ).   |
| EIC-code     | Energy Identification Codes                             | These codes are provided by <i>Svenska kraftnät</i> and identifies your particular endpoint (shared by <b>ECP Endpoint</b> and <b>EDX Toolbox</b> ) and is stored in the <b>CD</b> .   |
| ECP          | Energy Communication Platform                           | A platform developed for <b>ENTSO-E</b> , by Unicorn, according to <b>MADES 1.1/2.x</b> specification – intended to provide secure and reliable messaging between the actors ( <b>TSOs</b> and others) in the energy sector. The platform consists of <b>ECP Endpoint</b> , <b>ECP Broker</b> and <b>ECP Component Directory (CD)</b> .                                |
| ECP Endpoint | ECP Endpoint  | A specific component/server in the <b>ECP</b> -network, responsible for sending/receiving messages to/from the central <b>Broker</b> .   |
| EDX          | ENTSO-E Data eXchange                                   | A lightweight service bus, providing higher level data exchange services on top of an <b>ECP</b> network. EDX consists of two types of modules: <b>EDX Toolbox</b> and <b>EDX Service Catalogue (SC)</b> .   |
| EDX Toolbox  | EDX Toolbox   | A "front" to the <b>ECP Endpoint</b> , logically a part of the same endpoint. EDX offers a richer set of interfaces for a <b>BA</b> to connect to. EDX has a Service concept which allows for more advanced routing of messages and addressing of endpoints.   |
| Endpoint     | Endpoint  | An endpoint is the "logical endpoint" – a combination of both the <b>ECP Endpoint</b> and the <b>EDX Toolbox</b> .   |
| ENTSO-E      | European Network of TSOs                                | The European association for the cooperation of <b>TSOs</b> for electricity  |
| HA           | High Availability                                       | A term used for a database-setup, with multiple databases in a cluster. This is not part of the regular setup of <b>ECP</b> endpoints, but it is possible to use e.g. MySQL or MSSQL for such a setup.   |
| MADES        | Market Data Exchange Standard                           | A specification developed by <b>ENTSO-E</b> describing a communication system between actors in the energy sector.   |
| SC           | Service Catalogue                                       | An <b>EDX</b> component which keeps information about which endpoints consume/provides certain services. Without registration here, an <b>EDX Toolbox</b> cannot access services.  |
| TSO          | Transmission System Operator                            | Responsible for the distribution of energy (electricity or natural gas), in an area/country.   |

## 4 Installation preparations

### 4.1 Prerequisites

Before starting installation and configuration of software, ensure following prerequisites are fulfilled:

- > **necessary agreements** with *Svenska kraftnät* are in place,
- > **system specifications** (for hardware and OS) **are meeting requirements** specified in ECCo SP software Installation Guides,





- > **network setup** is configured to enable the host system to connect to port 8443 (for HTTPS traffic) on the *Svenska kraftnät* ECP Component Directory and to port 5671 (for AMQPS traffic) on the *Svenska kraftnät* ECP Broker (network addresses for these components are provided by *Svenska kraftnät*),
- > **installation packages** are downloaded from locations appointed by *Svenska kraftnät*,
- > **EIC V-type code for the ECP Endpoint** to be installed is delivered by *Svenska kraftnät*,
- > **EIC V-type code and connection URL for the *Svenska kraftnät* managed ECP Component Directory** (to connect the installed ECP Endpoint to) is delivered by *Svenska kraftnät*,
- > **registration key** for registration, and the **password** for the registration key, of the ECP Endpoint in ECP Component Directory is delivered by *Svenska kraftnät*,
- > **EIC V-type code for the *Svenska kraftnät* managed EDX Service Catalogue** is delivered by *Svenska kraftnät*,
- > **installation time agreed** with ECP Management on *Svenska kraftnät* for eventual support during installation and for approval of request for connection to the *Svenska kraftnät* ECP Component Directory and EDX Service Catalogue,

## 4.2 Hardware requirements

The software have to be installed on hardware that meet the hardware requirements listed in chapter 4.1.1 of *Installation Guide for ECP* and chapter 4.1.1 of *Installation Guide for EDX*.

# 5 ECP Endpoint Installation

The ECP Endpoint must be installed before the EDX Toolbox.

The following network ports are used in this installation, and have to be opened on the local firewall on the host where the software is installed:

- > TCP/8443 – for management of the ECP Endpoint via the HTTP GUI

Proceed to applicable chapter below (5.1 or 5.2) depending on which OS to install on.

## 5.1 Installation on Windows

### 5.1.1 Local system firewall opening

Ensure the port(s) specified in the beginning of chapter 5 are enabled using the description in chapter 5.2.3 of *Installation Guide for ECP*.



### 5.1.2 Software installation

Follow descriptions in chapter 7.2.1 to 7.2.3 of *Installation Guide for ECP*.

**NOTE!** Do not start the service until initial configuration according to chapter 5.3 in this guide is performed.

Next perform the initial configuration described in chapter 5.3 below.

## 5.2 Installation on Linux

### 5.2.1 Local system firewall opening

Ensure the port(s) specified in the beginning of chapter 5 are enabled using the firewall commands described in chapter 5.2.2 of *Installation Guide for ECP*.

### 5.2.2 Software installation

- 1 Ensure the software prerequisites listed in chapter 7.4.2 of *Installation Guide for ECP* are fulfilled.
- 2 Install the software using instruction in chapter 7.4.3.1 of *Installation Guide for ECP*.

**NOTE!** Do not start the service until initial configuration according to chapter 5.3 in this guide is performed.

Next perform the initial configuration described in next chapter.

## 5.3 Initial configuration

For the installed component to be able to start correctly some initial configurations have to be performed before first start. Add properties (with described values) that are not present in the default installed file, and update properties already present in default installed file.

The properties files to be modified are found in the `<installation_path>` directory on Windows and in the `/etc/ecp-endpoint/` directory on Linux.

### 5.3.1 Configure ecp.properties

| Properties   | Description   |
|--|---|
| <code>ecp.endpoint.amqpApiEnabled=true</code><br><code>ecp.endpoint.sendHandler[0].beanName=amqpApiSendHandler</code><br><code>ecp.endpoint.sendHandler[0].typeName=*</code><br><code>ecp.networks=DefaultNetwork</code> | These properties are required for the EDX Toolbox to be able to communicate via the ECP Endpoint.   |
| <code>internalBroker.host=127.0.0.1</code><br><code>internalBroker.useAuthentication=false</code>  | Defines how the ECP Endpoint exposes itself to the EDX Toolbox when both tools are installed on same host.  |
| <code>ecp.messagebox.retentionPeriod=86400000</code>   | Changing the default value (14 days) to 1 day to limit disk space needed for an endpoint with high traffic. (If more historic data is needed the default value can be used) |



### 5.3.2 Configure `ecp-users.properties`

This file contains credential for the users with access to the admin GUI for the ECP Endpoint. Two different users are predefined in the default installed files. To increase security of the system the default passwords for these users have to be changed. See chapter 5.1 of *Administration Guide for ECP* for further information about authentication configuration.

As of ECP version 4.8.1 the **Linux** installation package includes a Bash script that can be used to replace default delivered passwords with encrypted ones, including the administrator password in `ecp-users.properties`. The ECP team at *Svenska kraftnät* however have no experience of this script. For more information about the script see chapter 7.4.8 of *Installation Guide for ECP*.

## 5.4 Start ECP Endpoint

### 5.4.1 Start on Windows

Follow instructions in chapter 7.2.4 and 7.2.5 of *Installation Guide for ECP* to start the ECP Endpoint and for verification of the start.

### 5.4.2 Start on Linux

Follow instructions in chapter 7.4.4 and 7.4.5 of *Installation Guide for ECP* to start the ECP Endpoint and for verification of the start.

Full upstart of the service can take about 30 seconds (depending on system performance). Look in the file `/var/log/ecp-endpoint/catalina.out` for a message saying like “Server startup in [26289] milliseconds” as an indicator of successful startup.

## 5.5 Registration of the ECP Endpoint

The ECP Endpoint now have to be registered in the ECP Component Directory managed by *Svenska kraftnät*. Follow the steps described in chapter 8.2 of *Installation Guide for ECP* up to, but not including, chapter 8.2.1.

- 1 In step 1 (*Import Certificates*) of the registration process use the registration key (at “Certificate File”) and registration key password (at “Certificate File password”) provided by *Svenska kraftnät*.
- 2 In step 2 (*Connect to Component Directory*) enter the Component Directory URL and Component Directory EIC V-type code provided by *Svenska kraftnät*. The paragraph about NAT can be disregarded from.
- 3 In registration process step 3 (*Send Registration Request*) enter the EIC V-type code provided by *Svenska kraftnät* for your ECP Endpoint in the “Endpoint Code” field.



- 4 For “Contact Email” a monitored<sup>1</sup> email address must be used when registered to the production network. *Svenska kraftnät* will not approve the registration request if a personal email address is used, because *Svenska kraftnät* will use this email address to send information about upgrades and issues. In the test network, a personal email address is allowed.
- 5 Phone number will be used only as secondary option if email contact fails.
- 6 Click on the “Submit request” button.

If you have direct contact with ECP Management on *Svenska kraftnät* you now can inform them that you have sent the registration request. Otherwise send an email to [ecp@svk.se](mailto:ecp@svk.se) to notify about the registration request.

When the registration request is approved by *Svenska kraftnät* your ECP Endpoint becomes operational. This is indicated on the “Dashboard” page by the “Certificates” tile being green.



## 5.6 Configure Message Path

After completion of registration it is possible to send messages to other ECP nodes in the network. To describe how message are supposed to be routed to your endpoint you however must define a Message Path.

- 1 Open a web browser and navigate to the URL of your ECP Endpoint GUI (e.g. [https://<address-to-endpoint>:8443/ECP\\_MODULE/](https://<address-to-endpoint>:8443/ECP_MODULE/)) and log in using credentials for a user defined with role “admin” in configuration file `ecp-users.properties` (see chapter 5.3.2 above).
- 2 Add a Message Path according to instructions in *Installation Guide for ECP* chapter 8.4.1.
  - In the Broker drop-down list (to the right of the “Indirect” button) select a *Svenska kraftnät* Broker, with EIC V-type code starting with “46V”.
  - Set “Valid from” to at least 24 hour before current hour to ensure the Message Path will become valid immediately.

## 5.7 Installation verification

When a Message Path is properly configured you will be able to test sending and receiving messages. Agree with *Svenska kraftnät* on the EIC V-type code for an ECP Endpoint that will be used as the counterpart.

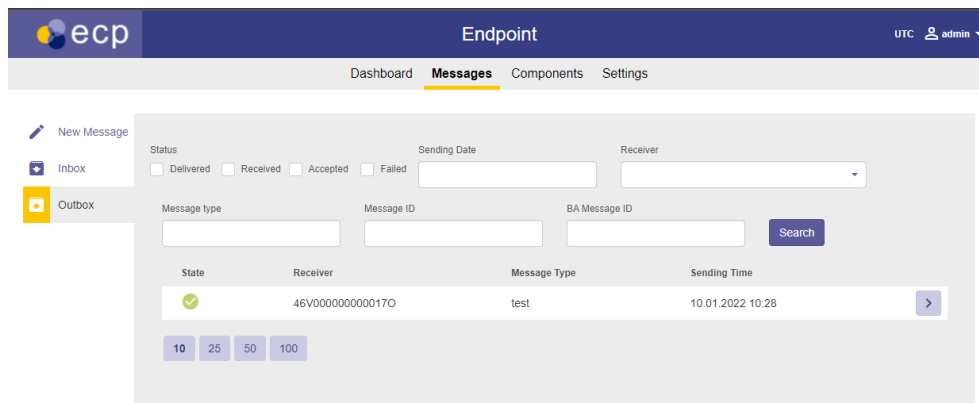
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<sup>1</sup> Monitored means that emails sent to the address will be handled at least daily.



### 5.7.1 Verify message sending

- 1 Open a web browser and navigate to the URL of your ECP Endpoint GUI (e.g. [https://<address-to-endpoint>:8443/ECP\\_MODULE/](https://<address-to-endpoint>:8443/ECP_MODULE/))
- 2 Go to “Messages” > “New Message”
- 3 Enter the agreed EIC V-type code in “Receiver’s endpoint code”, set “Message Type” to “text” and add a small text file (without any sensitive content) in the file upload field.
- 4 Click the “Send” button.
- 5 When the message is successfully received by the receiver the status of the message will be “Received”, indicated by a green check-mark (see below screenshot) in the “State” column.



## 6 EDX Toolbox Installation

When the ECP Endpoint is installed and basic functionality is verified the installation of the EDX Toolbox software can start.

The following ports are the one used in this installation, and have to be opened on the local firewall on the host where the software is installed:

- > TCP/6672 – for AMQP access to the internal broker of the EDX Toolbox
- > TCP/9443 – for management of the EDX Toolbox via the HTTP GUI

Proceed to applicable chapter below (6.1 or 6.2) depending on which OS to install on.

### 6.1 Installation on Windows

#### 6.1.1 Local system firewall opening

Ensure the port(s) specified in the beginning of chapter 6 are enabled using the description in chapter 5.2.3 of *Installation Guide for EDX*.



### 6.1.2 Software installation

Follow descriptions in chapter 6.2.3 or 6.2.4 of *Installation Guide for EDX*.

**NOTE!** Since the EDX Toolbox is installed on same host as the ECP Endpoint the option “*Change default ports (ECP is installed on this server)*” (in step 2 of the installation wizard) **must** be checked. For more extensive information see chapter 6.3 of *Installation Guide for EDX*.

**NOTE!** Do **not start** the service until initial configuration according to chapter 6.3 in this guide is performed.

Next perform the initial configuration described in chapter 6.3 below.

## 6.2 Installation on Linux

### 6.2.1 Local system firewall opening

Ensure the ports specified in the beginning of chapter 6 are enabled using the firewall commands described in chapter 5.2.2 of *Installation Guide for EDX*.

### 6.2.2 Software installation

- 1 Ensure the software prerequisites listed in chapter 5.1 of *Installation Guide for EDX* are fulfilled.
- 2 Install the software using instruction in chapter 6.4.3 of *Installation Guide for EDX*.

**NOTE!** Do **not start** the service until initial configuration according to chapter 6.3 of this guide is performed.

Next perform the initial configuration described below.

## 6.3 Initial configuration

For the installed component to be able to start correctly some initial configurations have to be performed before first start. Add properties (with described values) that are not present in the default installed file, and update properties already present in default installed file.

### 6.3.1 Configure edx.properties

This properties file is found in the `<installation_path>` directory on Windows and in the `/etc/edx-toolbox/` directory on Linux. Most of the default values set can be used, but following parameters must be configured:

| Properties                    | Description  |
|-------------------------------|--|
| <code>edx.toolbox.code</code> | Set the value of this property to the EIC V-type code assigned for your ECP Endpoint in step 3 of chapter 5.5 “Registration of the ECP Endpoint” of this installation guide. |



| Properties   | Description   |
|--|---|
| <code>edx.serviceCatalogue.code</code>   | Set value of this property to the EIC V-type code for the EDX Service Catalogue provided by <i>Svenska kraftnät</i> . |
| <code>internalBroker.amqp.port=6672</code>   | Change default value to avoid collision with ECP Endpoint internal broker amqp port.                                  |
| <code>internalBroker.amqp.host=0.0.0.0</code>                                      | Change default value to enable access to EDX Toolbox internal broker from BA:s outside the ECP/EDX host.              |
| <code>ecp.broker.url=amqp://\${ecpBroker.amqp.host}:\${ecpBroker.amqp.port}</code> | Change default value (amqps://...) to connect to internal broker of ECP Toolbox using unencrypted protocol.           |

### 6.3.2 Configure `edx-users.properties`

This file contains credential for the users with access to the admin GUI for the EDX Toolbox. Two different users are predefined in the default installed files. To increase security of the system the default passwords for these users have to be changed. See chapter 8 of *User Guide for EDX* for further information about authentication configuration.

As of EDX version 1.9.1 the **Linux** installation package includes a Bash script that can be used to replace default delivered passwords with encrypted ones, including the administrator password in `edx-users.properties`. The ECP team at *Svenska kraftnät* however have no experience of this script. For more information about the script see chapter 6.4.9 of *Installation Guide for EDX*.

### 6.3.3 Change Tomcat port numbers

The default Tomcat port numbers have to be updated to avoid collision with Tomcat port numbers used by ECP Endpoint.

For installation on **Windows** follow instructions in chapter 6.3.3 of *Installation Guide for EDX* for necessary adjustments. **Note!** This step is not needed if the option “Change default ports (ECP is installed on this server)” was checked during installation (see chapter 6.1.2 above).

For installation on **Linux** follow instructions in chapter 6.6.1 of *Installation Guide for EDX* for necessary adjustments.

## 6.4 Start EDX Toolbox

### 6.4.1 Start on Windows

Follow instructions in chapter 6.2.5 and 6.2.6 of *Installation Guide for EDX* to start the ECP Endpoint and for verification of the start.



## 6.4.2 Start on Linux

Follow instructions in chapter 6.4.5 and 6.4.6 of *Installation Guide for EDX* to start the EDX Toolbox and for verification of the start.

Full upstart of the service can take about 30 seconds (depending on system performance). Look in the `edx.log` file for the message described in chapter 6.4.6 of *Installation Guide for EDX* to find out when the startup is finished.

## 6.5 Registration of the EDX Toolbox

The installed EDX Toolbox have to be registered in the EDX Service Catalogue managed by *Svenska kraftnät*. There is a button on the EDX Toolbox GUI “Settings” page named “Register Toolbox to SC”, but this function is for some unknown reason unfortunately not working as expected.

The registration instead have to be performed manually by *Svenska kraftnät*, and should have been performed in advance since all details needed are generated by *Svenska kraftnät*. Thus the installed EDX Toolbox should be able to communicate with other EDX Toolboxes in the ECP/EDX network as soon as it is started up according to instructions in previous chapter.

## 6.6 Installation verification

Two different tests can be performed to verify that the EDX Toolbox is successfully connected to the ECP/EDX network.

### 6.6.1 Send test message to EDX Toolbox without relation to Service

The first test sends a test message to an EDX Toolbox, identified by its *Toolbox Code*, which is the same as the EIC V-type code for the ECP Endpoint the receiving EDX Toolbox is connected to. This message is not related to any Service of the EDX Toolbox.

This test verifies that your installed EDX Toolbox is able to communicate with the other EDX Toolbox.

To perform this test:

- 1 Open a web browser and navigate to the URL to your EDX Toolbox GUI (e.g. <https://<host-address>:9443/>).
- 2 After a successful login you should end up on the “Messages” page. If not; click on “Messages” in the top navigation bar of the GUI.
- 3 Click on “New Message” and enter following data in the form:
  - “Receiver”: use the same EIC V-type code you used in the test in chapter 5.7.
  - “Message Type”: enter “TEST”





- Add a small text file (without any sensitive content) in the file upload field.
- 4 Click on the “Send” button
  - 5 Wait a few seconds and refresh the page in the browser. When status of the message sent is changed to “Received” (see screenshot below) the test is successful.

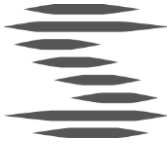
The screenshot shows the EDX Toolbox Messages Monitoring interface. The top navigation bar includes 'Publications', 'Messages', 'Services', and 'Settings'. The 'Messages' section is active, showing a 'Messages Monitoring' view. On the left, there are options for 'New Message', 'Incoming Pull Messages', and 'Messages'. The main area contains a form with fields for 'EDX Message ID', 'BA Message ID', 'Status', 'Message Type', 'Direction', 'Sender', 'Receiver', and 'Service'. A 'Date Range' field and a 'Search' button are also present. Below the form is a table with columns for 'Status', 'Message Type', 'Direction', 'Sender', 'Receiver', and 'Time'. The first row in the table shows 'Received' in the Status column, 'TEST' in Message Type, 'Send' in Direction, and two long alphanumeric strings in Sender and Receiver. The 'Received' text is highlighted with a red box. At the bottom, there are pagination controls for 10, 25, 50, and 100 items.

### 6.6.2 Send test message to specific EDX Toolbox service

This test verifies that the EDX Toolbox can send messages to a specific service, consumed on another EDX Toolbox, which also verifies that the communication with the EDX Service Catalogue works correctly.

To perform this test:

- 1 Open a web browser and navigate to the URL to your EDX Toolbox GUI (e.g. <https://<host-address>:9443/>).
- 2 After a successful login you should end up on the “Messages” page. If not; click on “Messages” in the top navigation bar of the GUI.
- 3 Click on “New Message” and enter following data in the form:
  - “Receiver”: enter “SERVICE-SVKTEST”.
  - “Message Type”: enter “TEST”
  - Add a small text file (without any sensitive content) in the file upload field.
- 4 Click on the “Send” button
- 5 Wait a few seconds and refresh the page in the browser. When status of the message sent is changed to “Received” (as in screenshot above) the test is successful.



## 7 Next step

When the installation, and the verification of the installation, is complete the result is an ECP/EDX node with basic functionality for basic communication with the *Svenska kraftnät* ECP/EDX network.

For this system to be practically useful a lot of further configuration is needed, e.g. adding configuration directives for Integration Channels and Routing in the `edx.yml` file to enable your Business Application to correctly communicate with Business Applications on the other side of the network. For a production environment also some monitoring will be needed.

These aspects are though not covered by this document since they are specific to each Business Application integrated or to internal requirements and procedures of the actors IT environment. The responsibility for further configuration is also on the actor and not on *Svenska kraftnät*.