

## **MANUAL** DSO assessment

# RESEARCHING AND D TESTING SMART AND SUST IN BL E CHARGING

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These specifications have been developed

in collaboration with the grid

operators in the Netherlands.





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## CHAPTER 1 THE DSO ASSESSMENT

#### 1.1 SAFELY CONNECTION OBJECTS IN PUBLIC SPACES

It is important that electrical equipment in (semi) public spaces is safe. Because of this, grid operators impose certain conditions on objects connected to the public electricity grid. These conditions apply to objects with a low-voltage grid connection, such as parking meters, public lighting and charging stations. The grid operators inspect the unmanned objects for these requirements. We call this a DSO assessment.

Before unmanned objects in the public domain are given a grid connection, they are inspected. This provides assurance that objects in the public domain meet safety standards and function optimally. From 1 July 2023, the joint grid operators will apply national requirements for objects in the public domain. The national requirements and associated certification are mandatory for obtaining a grid connection.

ElaadNL is a foundation that carries out these inspections, free of charge, on behalf of the grid operators. Stichting ElaadNL is responsible for this, given their experience with inspections for charging stations and suitable location. The approved objects will appear on a public list, so that it is clear to everyone which objects/suppliers meet the grid operators' requirements. Should your organisation produce an object that requires a grid connection and this object is not on this list, the grid operators will not connect it. The list of approved objects and the set-up requirements per type of grid connection can be found on our website: **DSO assessment**.

#### 1.2 CONNECTIONREQUIREMENTS FOR THE DSO ASSESSMENT

Three documents have been drawn up for low-voltage connections up to 3x80A in unmanned objects. These documents with specifications and requirements can be downloaded from the ElaadNL website (but also from Netbeheer Nederland and the individual grid operators). The documents form the basis on which the grid operator inspection team approves objects for admission to the electricity grid. This is coordinated and facilitated by ElaadNL in cooperation with experts from the regional grid operators. The requirements are designed to ensure a safe and reliable connection to the public electricity grid.

#### **1.3 STANDARDISATION OF GRID CONNECTIONS**

The development of these specifications is an important step towards further standardisation for grid connections. The advantage for object manufacturers and contractors is that the grid operators part of a **reference type** only needs to be approved once, and can then be used throughout the Netherlands in all service areas of the various grid operators.

A reference type is the basic variant of an object that serves as a starting point for inspections. For unmanned objects, the reference type is determined as the smallest variant (e.g. in terms of dimensions or diameter). This variant goes through the entire inspection process. Should there be in the same line of the object, objects that are larger, it falls under the same reference type and does not need to be inspected. However, the same requirements apply to all objects, each reference type will have to comply with them and will always have to be reported in order to have the different reference types identified for the grid operators.



If another type of the same object differs from the reference type (e.g. due to changes in housing, foundation, which affects sealing, or connections), it is considered a new reference type and must go through its own inspection process. This procedure is designed to determine which variants should be treated as separate types, ensuring safety and compliance with requirements without unnecessary inspections for all variants.



Figure 1: Step diagram of the DSO assessment process. See Chapter 3 for further explanation.



## CHAPTER 2 THE COMPACT CONNECTION MODULE

The compact connection module (CAM) is the physical grid operator connection for unmanned objects in public spaces, such as speed cameras, charging stations, outdoor cabinets and public lighting. From 6 March 2023, all grid operators in the Netherlands will use this new compact connection module as the standard connection technology. This module is more compact, safer and faster to connect.

#### 2.1 BENEFITS OF THE COMPACT CONNECTION MODULE

- **Uniformity**: A single connection module for all grid operators in the Netherlands ensures uniformity and standardisation. The dimensions are the same everywhere and easy to connect;
- **Safety**: The new compact connection module is more secure than its predecessors, ensuring extra reliability;
- **Convenience**: Plug-and-play makes installation quick and easy.

#### 2.2 ORDER INFORMATION

Suppliers are obliged to install the mounting plate in the object before the grid connection is realised. Suppliers and producers of objects can order the prefabricated mounting plate from Connectens with article number: CTI00403. To do so, please visit Connectens' website or send an e-mail to **orders@connectens.nl**. A c-rail with the correct dimensions can also be ordered on the website.

#### Public lighting (OVL)

Integrating a connection to the switched grid is achieved by the CAM 1x6A. The CAM-OVL is placed in the object's already existing c-rail.

#### Unmanned object (un)metered

A distinction is made between unmanned object unmetered lx10A (no smart meter) and unmanned objects metered (with smart meter) up to 1x10A. The CAM is placed in the already existing c-rail of the object.

#### unmanned object metered 3x25A t/m 3x80A

The CAM for unmanned objects, cover objects from 3x25A to 3x80A. The CAM wide is placed on the already existing mounting plates.









## CHAPTER 3 THE PROCESS

This chapter describes the complete process leading to the approval, certification and connection of unmanned objects and charging infrastructure. The process is carefully designed to ensure that all objects meet the set requirements and standards, with the aim of a safe, sustainable and standardised application in public spaces.

#### **3.1 ONLINE INTRODUCTION**

An online introduction is the ideal way to get to know each other in an approachable and efficient way. During the introduction, the focus is on exchanging information, discussing mutual expectations and laying a foundation for further cooperation. We look forward to learning more about each other during the online introduction and making a good start in the process together.

#### 3.2 DELIVERY OF DOCUMENTS

Full and clear documentation is required to understand the object's compliance. Product drawings, test reports, general conditions and photos including a sketch of the object form the basis for establishing conformity and identification.

A product drawing is considered the basic documentation of an object (does not apply to a charging station). In the initial phase, the **product drawing** is used to assess whether an object meets the set-up requirements. In addition, parties can recognise approved objects via the website. For these reasons, we ask every supplier to supply a product drawing that clearly shows all set-up requirements. This can be either in the form of visual or textual representations. Upon approval, the product drawing will be published on the ElaadNL website. Please therefore ensure that no important personal and/or company details are shown on the product drawing. Examples of approved product drawings can be seen on the website (<u>ASSESSMENT</u> <u>UNNMANED OBJECTS - ELAADNL</u>), these can be helpful as examples.

Unmanned objects placed in public spaces must comply with various standards. These standards guarantee protection, safety and standardisation. To ensure this conformity, the necessary tests must be carried out by **accredited testing bodies**. This independent testing ensures that the objects meet the required standards and are suitable for safe and sustainable use in public spaces. The responsibility of having the tests carried out lies with the supplier of the object. The inspection team assesses the full external test report. Providing only a certificate or declaration of conformity (with the exception of NEN-EN:40-2) is not sufficient in this respect.

**The general terms and conditions** of the DSO assessment play a crucial role in ensuring legal clarity for both the grid operator and the supplier. The conditions include agreements on grid access, maintenance obligations and solving malfunctions.

Laying down these aspects clearly avoids misunderstandings and conflicts. In case of breakdowns, damage or other problems, it is essential to know who is responsible and how such issues should be handled. General terms and conditions specify the liabilities of both



parties and provide guidelines for dispute resolution. This ensures a fair and predictable approach to conflict resolution, which can avoid lengthy legal proceedings.

#### 3.3 (DIGITAL) PRE-ASSESSMENT

The first step in preparing for the DSO assessment at ElaadNL is a Delivery of documents. This inspection includes a 3D model evaluation to ensure that unmanned objects fully meet the requirements for grid operator inspections. The starting point of this process is the submission of a detailed product drawing by the supplier of the unmanned object or charging object.

After receiving the drawing, ElaadNL schedules a digital session. During this session, we discuss in detail the set-up requirements for the requested grid connection and provide targeted feedback. Together, we look at how any necessary adjustments can be made to meet these requirements. After the session, we send feedback with all points discussed during the pre-inspection. Finally, we schedule an official DSO assessment with the supplier that takes place at ElaadNL's premises.

#### 3.4 THE DSO ASSESSMENT

The invitation for the DSO assessment will be sent by e-mail to the supplier and will contain general instructions. The inspection will take place at ElaadNL (Westervoortsedijk 73, Arnhem), where experts from the regional grid operators and ElaadNL staff will be present to coordinate the process. It is important that the object including the grid operator section, foundation and fittings, is brought to the assessment. An inspection period will be organised every quarter.

#### 3.5 ASSESSMENT AND MODIFICATION FORM

During the physical grid inspection, an **assessment form** is used. All connection specifictions are listed in a form during the assessment. The assessment form is used to write down feedback and keep structure during the inspection. Should there be any feedback on the object during the inspection, this is noted. In addition to the textual assessment, photos are added so that it is clearly documented in what condition the unmanned object was inspected.

After completion of the inspection, the assessment form is sent to the supplier. This allows the supplier to analyse any discrepancies or areas for improvement and make adjustments where necessary. Finally, the changes implemented by the supplier are delivered to the object via the change form sent with the initial feedback. The explanation of the change form is described below.

The **modification form** is designed to facilitate structured communication regarding changes to the object following the DSO assessment. It serves as a central document for recording, reviewing and documenting all changes. This process supports a transparent and thorough review, ensuring that any proposed change is in line with the specified requirements. The supplier has the responsibility to describe the changes related to the object, including evidence, in the modification form. The modification form also contains the assessment of the **product drawing**. This includes a brief description per item of what changes should be applied to the product drawing. This includes both visual and textual changes..

#### 3.6 SUBMISSION OF THE MODIFICATION FORM

The modification form is a document that must be submitted to the inspection team as soon as the changes have been made by the supplier. The form should clearly state, both textually and with digital evidence, which modifications have been made to the object. A guide on how to use



the modification form is included with the modification form. It is the supplier's responsibility to state why the requirement(s) are now met. In addition, the supplier should also provide the updated product drawing with all applied changes.

#### 3.7 ASSESSMENT INSPECTION TEAM

After receiving the modification form with supporting evidence, the inspection team assesses the modifications. All changes are carefully discussed and the team assesses whether the rejected aspects meet the requirements after the adjustments. If this shows that the object still does not meet the requirement(s), this will be communicated to the supplier. The inspection team proceeds with certification as soon as the object meets all connection requirements and specifications.

#### 3.8 OFFICIAL CERTIFICATION

After successful completion of the DSO assessment, the supplier will receive the certificate confirming that the property meets the current connection specifications. The certificate is essential for applying for a connection via **MijnAansluiting.nl**. This is the national portal for registering and realising new connections. Without this certificate, the connection cannot be approved, which delays the commissioning of the object. With this certificate, ElaadNL guarantees a standardised and transparent approval process, which contributes to an efficient roll-out of unmanned objects and charging stations in the Netherlands. The responsibility lies with the supplier to provide the relevant data for the certificate. This includes:

- Supplier name and place of business: Full name and address details of the supplier.
- Product type: Specific product series or name of the object.
- Minimum dimensions: Dimensions consistent with the approved type.

#### 3.9 ISSUING THE CERTIFICATE

After successful completion of the DSO assessment process, the supplier receives a certificate confirming that the object meets all the requirements set by the grid operator. This certificate serves as proof of use and application in public spaces.

The certificate is issued after all required documentation has been approved and the test results have been positively assessed. It is important that the certificate is kept carefully and made available in case of any inspections or enquiries. By doing so, we jointly contribute to a safe, reliable and standardised infrastructure.

A valid certificate is required to apply for a grid connection via **MijnAansluiting.nl**. This certificate demonstrates that the object meets the set requirements and standards and is suitable for safe and sustainable connection to the grid. When submitting the application on MijnAansluiting.nl, the certificate can easily be added as part of the required documentation.

#### 3.10 WEBSITE PUBLICATION

For reliable and standardised connections to the grid, we work with an overview of approved objects per connection category. This overview can be found on our website and provides a central source of information for all parties involved. The reason for this overview is simple: it allows teams from the grid operators to check, whether the object they are going to build meets the requirements and has been approved. This prevents surprises during execution, increases efficiency and minimises errors that could lead to unsafe situations, breakdowns or non-compliant connections.



The supplier should provide the following information for publication on the website:

- Supplier name
- Object description
- Current sketch
- Current product drawing



## CHAPTER 4 ACCESSIBILITY SMART KWH METER

## Grid operators install a smart kWh meter for measuring energy consumption. Accessibility of this smart kWh meter is a requirement.

#### 4.1 UNMANNED OBJECTS

To minimise radio attenuation of the object and thus optimise the accessibility of smart meters, it is necessary to install **radio slits** in the objects' casing. These radio slits should have specific dimensions and be placed in a certain way to meet requirements and be efficient. The starting point is that radio slits are made on both sides of the (outer) casing at the level of the kWh meter. These radio slits should be at least 32 cm long (vertically) and 1 cm wide (horizontally), and placed opposite of each other. These cut-outs should then be sealed with suitable material that allows communication signal to pass through and also ensures that IP and IK values are maintained.

In situations where multiple objects are placed next to each other, or multiple compartments with damping partitions, radio slits should be used in the access door of the network operator compartment, instead of facing each other. The radio slits should be positioned at the level of the kWh meter. Three options are described below:

- 1. Four, five, or more, radio slits with at least 32 cm in length (vertical) and at least 1 cm wide (horizontal). The total width from left to right radio slit should be at least 10 cm.
- 2. If option one is not possible, the two parties shall coordinate on the radio slit options.
- 3. Demonstrate maximum radio attenuation by means of the test protocol. This protocol can be found on our website. The test protocol must be carried out by an external accredited body.

These options for radio slits at the front of the access door can be applied instead of radio slits at the sides of the object, provided this is coordinated with the network operators. Alignment on this can be found via: info@netbeheerderskeuringen.nl.

#### 4.2 CHARGING STATIONS

For charging stations, the maximum radio attenuation must be demonstrated using the test protocol. This protocol can be found on our **website**. The test protocol must be carried out by an external accredited body.



### CHAPTER 5 ACCESS MANAGEMENT

Grid operators play a crucial role in ensuring a reliable and safe energy supply. In case of disruptions or emergencies, it is essential that they have immediate access to connections to quickly identify and solve problems. This prevents long-term outages, minimises risks for users and ensures continuity of supply.

Access management at unmanned objects requires a solution that is both efficient and secure. To ensure this, we use a double-cylinder lever system. This system is specially designed to share access without compromising the security of the object. One cylinder position must be kept free. When the grid connection is realised, the grid operator then places its own cylinder in the detached cylinder position. The other belongs to the Charge Point Operator. This gives both parties access when needed, without depending on each other's availability. Each party retains control over its own access rights, which enhances security and guarantees operational independence.



### APPENDIX SOURCES AND REFERENCES

- Netbeheer Nederland: Samen aan de slag met het energiesysteem | Netbeheer Nederland
- Mijnaansluiting: MijnAansluiting.nl nuts aansluitingen aanvragen
- DSO ASSESSMENT: DSO ASSESSMENT ELAADNL
- Charging Station Inspections: CHARGING STATION INSPECTIONS ELAADNL
- Inspections of Unmanned Objects: Inspections of Unmanned Objects ElaadNL
- CAM Liander: Onbemande aansluitingen Compacte Aansluitmodule | Liander
- CAM Enexis: Compacte Aansluitmodules | Enexis Netbeheer
- CAM Stedin: Laadpalen en straatverlichting drie keer sneller aansluiten met nieuwe, Compacte Aansluitmodule | Stedin
- Unmanned objects public lighting: Inspections of Unmanned Objects ElaadNL
- Unmanned objects public space (unmetered): Inspections of Unmanned Objects •
  ElaadNL
- Unmanned objects public space (metered): Inspections of Unmanned Objects ElaadNL
- Charging Station Inspections 3x25A 3x80A: CHARGING STATION INSPECTIONS ELAADNL

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