Generic LED Charge Codes: Guidance to Manufacturers on the Application Process

Why has this guidance been provided?

A majority of the Charge Code applications that ELEXON receive are for Light Emitting Diode (LED) Lighting. Since the introduction of Generic LED Ranges back in July 2016, there have been numerous queries received by ELEXON regarding how the new Generic LED Charge Codes work and what ELEXON requires from a manufacturer to process a Charge Code request.

This document details and defines the structure of Generic LED Charge Code Ranges and explains the documents ELEXON require from a manufacturer for a Generic LED Charge Code Range to be issued. This document also provides an overview of the key steps involved in each application cycle and why Charge Codes can take weeks to be approved. Further detail can be found in the UMS Operational Information Document (OID).

What are Generic LED Charge Code Ranges?

Generic LED Charge Code Ranges are a requirement for LED lighting equipment looking to be connected to the Distribution Network via an Unmetered Supply. Charge Codes are used by customers to look up the circuit watts associated with unmetered equipment to calculate consumption.

The difference between Generic LED Charge Code Ranges and standard Charge Codes (traffic and miscellaneous equipment and legacy LED charge codes) is the use of a 'lower and upper limit'. Due to the dimming capabilities of LED Lighting equipment, there are now two defined charge codes values that identify the equipment's maximum and minimum power levels.

Prior to the Generic LED Charge Code Ranges, there used to be a unique Charge Code created for each dimming level of a piece of lighting equipment. With the new Generic LED Charge Code Ranges, all wattages between the minimum and maximum power levels are available within the same Charge Code Range, and no longer need numerous Charge Codes for dimming levels.

Generic LED Charge Codes are published on the Manufacturer Equipment LED Range Spreadsheet.

The Structure of Generic LED Lighting Charge Codes

Generic LED Charge Codes Ranges are for LED Lighting, i.e. Street Lights, Illuminated Signs, aesthetic lighting or other purposes, but not for traffic signals.

Digits	Description
1 and 2	Always 42
3, 4, 5 and 6	The Circuit Watts (0001 to 0500) of the equipment in watts, i.e. '0250' represents a lamp with a power rating of 250 watts. For lamps with driver enabled Constant Light Output (CLO) this will be the mid-life value. See note below for Central Management System (CMS) controlled CLO.
7, 8, 9 and 10	Always 0000
11, 12 and 13	Always 100

Definition of digits 1 and 2:

The value of 42 defines the product as LED lighting.

Definition of digits 3, 4, 5 and 6

These represent the Circuit Watts of the equipment in Watts (W) at full power, i.e. '0250' represents a lamp with a full power rating of 250 watts. For lamps with driver enabled CLO this will be the mid-life value.

Definition of digits 7, 8, 9 and 10

For other lighting these digits can be used to define the manufacturer or type of driver or ballast, for these generic codes it will always be 0000.

Definition of digits 11, 12 and 13

The value of 100 defines that these Charge Codes are the full power rating for the lamp.

Lower and Upper Limits

Every Generic LED Lighting Charge Code Range comes with a 'lower limit' and 'upper limit'. The two limits specify the minimum and maximum wattages the equipment is capable of running at. For example, if a piece of lighting equipment can dim, with power levels decreasing from 100 watts (at full power) down to 20 watts, then their Generic LED Lighting Charge Code will look like this:

Lower Limit	Upper Limit
42 0020 0000 100	42 0100 0000 100

If a piece of lighting equipment does not have dimming capabilities, then the lower limit and upper limit will be the same value, and ultimately have the same code structure.

How do manufacturers apply for the Generic LED Charge Codes?

In order to apply for Generic LED Charge Codes Ranges, you must provide the following documents:

1. A completed application form

2. Test Data obtained from an **ISO 17025** accredited test house along with a clear description of the equipment (including the Product Name and Product Code, and version number if applicable, used by the manufacturer), its typical operation and installation. Specific details on testing requirements can be found on the next page.

3. A certificate of the ISO 17025 accredited test house. Test houses that have ISO 17065 can apply to ELEXON to provide a service to third parties that are not ISO 17025 accredited. The accredited test house must ensure the third party can meet the appropriate testing standards and must review and issue test reports on behalf of the third party;

4. A brochure or product specification of the equipment and pictures.

What are the testing requirements for LED lighting equipment?

The purpose of the testing procedure is to provide an accurate indication of the load at the Distribution Network terminals of the particular equipment under normal conditions; i.e. to establish what consumption would be recorded by a standard meter fitted at the supply terminals.

When conducting testing, the circuit watts and Volt Ampere (VA) should be measured at five different voltage levels from 210V, increasing in 10V increments up to 250V (at 50Hz). A sample size of five is required unless, on review of the test data, it is determined that more samples are needed. For example:

Manufacturer's name and equipment model name: .....

Voltage		Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
210	Watts					
	VA					
220	Watts					
	VA					
230	Watts					
	VA					
240	Watts					
	VA					
250	Watts					
	VA					

For non-dimming LED lighting equipment, the five samples at 210-250V will be tested at the equipment's full power level.

For LED lighting equipment with dimming capabilities, the above testing procedure must be conducted at **five** different power levels (including full power). The five points of test data must show include the equipment at full power, at its lowest dimmed level and then at three other separate points in between. For example, if a piece of lighting equipment runs at 100W when at full power, and can dim down to 20W, we require test data at those two points, then **also** three points in between those values, such as at 80%, 60% and 40% dimming.

The five different power level measurements are required to ensure consistency in the equipment's dimming capabilities. This allows us to extrapolate intermediate power levels. We still expect the test data to include both Watts (W) and Volt-Amps (VA). However, we shall not consider or reject applications based on the derived power factors since we are assuming a unity power factor.

Generic LED Charge Code Ranges will only be created based on the test data provided. If a piece of lighting equipment can dim lower than what is declared in the test data, the application may be rejected, or a customer may refuse to connect the equipment to an Unmetered Supply due to a lack of proof of consumption below the lower limit.

Example Entries

Manufacturer	Manufacturer's Designation	Generic LED Codes – Lower Limit	Generic LED Codes – Upper Limit
Philips Lighting	40W Xitanium Driver[1]	42 0008 0000 100	42 0040 0000 100
Holophane Europe Limited	DSX2 100 LED	42 0146 0000 100	42 0232 0000 100
Urbis Schréder	8 LED LF	42 0010 0000 100	42 0019 0000 100

Once published, you must inform customers of the appropriate Charge Codes for the equipment they have purchased. **Ideally, we would expect Manufacturers to label the Apparatus with the appropriate Charge Code that matches the configuration.**

What about Constant Light Output (CLO)?

Applications for CLO Generic LED Charge Codes should include evidence of the beginning, mid, and end-of-life in any test data. This data shall be provided for all equipment that has driver enabled CLO functionality. For this purpose mid-life is halfway through the design life of the product.

E.g. If the end-of-life current is 20% higher than the beginning-of-life current, then the driver output current should be adjusted to simulate 'end of life' conditions and the appropriate measurements taken.

This may be achieved by using a resistor or other methodology. A clear statement of methodology shall be supplied with the application.

The mid-point of the beginning of 'life' and ''end of life' data will then be used by BSCCo.

The mid-life circuit watts value will be used by BSCCo to define the Charge Code.

When informing customers of the Generic LED Charge Code, manufacturers must declare the 42 Series Generic LED Charge Code that has the Circuit Watt value (digits 3 to 6) that matches the approved 'mid-life' value. For example, if the mid-life value for an LED street light is 52 Watts then the manufacturer should declare the Generic LED Charge Code to the customer as 42 0052 0000 100.

Note: *that CLO & dimming controlled by a Central Management System (CMS) does not need a Variable Power Switch Regime as the dimming is reported in the CMS event log.*

How is dimming of LED Lighting accommodated using the Generic LED Charge Codes?

Dimming of Generic LED Charge Codes and other dimmable lighting equipment Charge Codes (ending with 100) is accommodated by linking the Charge Code with alpha- numeric Variable Power Switch Regimes that are published on the Variable Power Switch Regime Spreadsheet.

Note: *that dimming controlled by a Central Management System (CMS) does not need a Variable Power Switch Regime as the dimming is reported in the CMS event log provided to the Meter Administrator.*

[1] We use these examples for the purposes of this guidance only; they may not be a true reflection of the limits for these types of Apparatus.

What is the approval process for Charge Codes?

Unmetered Supplies Charge Codes and Switch Regimes are released as part of the monthly Market Domain Database (MDD) publishes. MDD contains Electricity Market information and is essential to the operation of the Supplier Volume Allocation (SVA) trading arrangements. Because Charge Codes and Switch Regimes are used by Unmetered Supply Operators (UMSOs) to calculate the consumption of unmetered equipment, it is essential that Charge Code applications are fully scrutinized and assessed by a variety of industry bodies before they can become valid for use in Settlements.

A full Charge Code application can take approximately two months from the date of the application cycle deadline, to the date in which the Charge Code becomes valid for use in Settlements through an MDD publish. In between those dates, there are various approval bodies that review Charge Code applications, and manufacturers may be contacted during these reviews and asked to provide further information on their lighting equipment, or explain any inconsistencies in provided test data.

- In the five working days between the application deadline and UMSUG (Unmetered Supply User Group) review, ELEXON create 'proposed' charge codes based on the test data provided by the manufacturer and calculate an average circuit watt using an average of the samples provided.

- The Unmetered Supply User Group (UMSUG) is a committee consisting of various industry members related to Unmetered Supplies, including members from ELEXON, Meter Administrators, Unmetered Supply Operators and technical experts in areas such as lighting and traffic equipment. During the UMSUG review, UMSUG members assess the proposed Charge Codes created by ELEXON and may propose amendments or rejections, or have queries to pass on to the manufacturers.

- After the UMSUG review is the Market Participants Impact Assessment (MPIA). This is where the Charge Codes begin to tie into the MDD release cycle. As Charge Codes are processed as part of MDD, all applications are assigned a 'Change Request' number for that particular MDD cycle, and must be assessed by all Market Participants like every other Change Request for that cycle. Market Participants are Parties that are signed up to the BSC. Because there are various non-UMS related Change Requests being assessed, the impact assessment lasts for 14 working days.

- The next stage is the Supplier Volume Allocation Group (SVG) Meeting. This is where all Change Requests for an MDD cycle (including the UMS Change Request) are officially approved for use in Settlements by a committee consisting of various industry members.

- In the 11 working days after the SVG Meeting, all approved Change Requests are 'published' into the live MDD database and industry flows are sent out to all Parties that include the new changes to the database. To allow time to rectify any potential errors with the flows or data, there is an 11 day period before all approved Change Requests 'go live'. During this time, the live Charge Code spreadsheets on the ELEXON website are updated with approved Charge Codes, but are not valid for use in Settlements until the agreed go live date for all Change Requests of that MDD cycle. During this period, manufacturers may request to see if their Charge Code application was approved and find out in advance what their Charge Code is.

Visit the ELEXON website to found out more about Market Domain Data and to view the calendar for upcoming UMS application cycles.

Where can I get more information?

More information can be found in the Operational Information Document, or you can contact ELEXON at the following e-mail address: UMS.Operations@elexon.co.uk

Or contact the **BSC Service Desk** at bscservicedesk@cgi.com or call **0870 010 6950**.