ELEXON

GENERIC LED CHARGE CODES AND VARIABLE POWER SWITCH REGIMES: GUIDANCE FOR CUSTOMERS

Guidance Note

Public

Contents

Why has this guidance been provided?

In June 2016 Elexon implemented changes to the Unmetered Supplies (UMS) processes for LED lighting equipment. This document details the changes that have been implemented and provides guidance to UMS customers on how to correctly declare the new Charge Codes and Switch Regimes on their UMS inventory submissions to Unmetered Supplies Operators (UMSOs). Further detail can be found in the UMS Operational Information Document (OID).

What changes have been implemented?

Elexon has published generic LED Charge Codes on the UMS Operational Charge Codes Spreadsheet. These Charge Codes have the following structure:

The Structure of Generic LED Lighting Charge Codes

These Generic Charge Codes are for LED Lighting, i.e. Street Lights, Illuminated Sign Lights, 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 1500) of the equipment in watts at full power, i.e. '0250' represents a lamp with a full 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.

How do I know if the manufacturer has applied to use the Generic LED Charge Codes for my LED Lighting product?

LED Lighting manufacturers can apply to use a range of Generic LED Charge Codes that match the minimum to maximum range of Circuit Watts that can be delivered to the LEDs by the driver.

Manufacturers have to provide Elexon with 'test data' from an accredited test house that proves the LED lighting equipment can be configured to drive the LEDs over the range of Watts defined by the Generic LED Charge Codes that they have applied to use. Once approved, the manufacturer's designation/ driver description and range of Generic LED Charge Codes will be published on the Manufacturer Equipment LED Range Spreadsheet:

Example Entries on the Manufacturer Spreadsheet

Manufacturer	Manufacturer's Designation	Generic LED Codes – Lower Limit	Generic LED Codes – Upper Limit
Philips Lighting	25W or 40W Xitanium Driver[1]	4200080000100	4200400000100
Holophane Europe Limited	DSX2 100 LED	4201460000100	4202320000100
Urbis Schréder	8 LED LF	4200100000100	4200190000100

What is the difference between Dimming and 'Reduced Operation'?

Reduced Operation refers to LED equipment where the usual operation of the equipment at full power is less than the maximum power of the LED driver capability. For example, a manufacturer's product line may consist of multiple versions of the same number of LEDs and LED driver combination in the lantern, but pre-set to a variety of reduced operation levels, such as 100 Watts, 80 Watts and 60 Watts for normal dusk to dawn operation at a constant level. The Charge Code to use in your inventory must reflect the circuit watts of the equipment at full power (or reduced operation level).

Dimming refers to the reduction of light output and power input of LED equipment to less than either the full power or reduced operation level during part of the dusk to dawn operation. The reduction in power consumption from part night dimming is calculated by linking the Charge Code with alpha-numeric Variable Power Switch Regimes that are published in the Variable Power Switch Regime Spreadsheet. For example, a luminaire may switch on at 100 Watts and during the night be 'dimmed' to 50% of full power (i.e. 50 Watts).

Dimming is not a consideration in the Generic LED Charge Code Ranges. Dimming of Generic LED Charge Codes is accommodated by linking the Charge Code with one of the Variable Power Switch Regimes.

[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.

How do I apply for a Variable Power Switch Regime?

You, your UMSO, the Meter Administrator (MA) or the equipment manufacturer can apply for a Variable Power Switch Regime from Elexon. The application can be made for a single change in power level or up to 8 different power levels, including the on/off events, in a 24 hour period. These Switch Regimes can only be used with Charge Codes that have '100' as their last 3 digits.

The manufacturer or lighting engineer can set the apparatus to any percentage level between 10% and 85% of full power (noting the limit of 8 events). However, when applying for the Variable Power Switch Regimes the applicant should round the power levels to the nearest 5% boundary (percentages ending in a 0 or a 5).

More specifically, if the dimming % ends in a 1, 2, 8 or 9 then round to nearest % ending 0. If the dimming % ends 3, 4, 6 or 7 round to nearest dimming % ending in a 5.

E.g. Assuming dimming % are always whole numbers and the apparatus is physically set to dim to 52% of full power at 02:00 hrs and to 68% of full power at 04:00 hrs. The application for a Switch Regime would be for 50% of full power at 02:00 hrs and 70% full power at 04:00 hrs.

The applicant needs to declare if the Switch Times are in Co-ordinated Universal Time (UTC) (equivalent of Greenwich Mean Time (GMT)) or if the times are 'Clock Time' (GMT in winter and British Summer Time (BST) in Summer). All timed events need to be on the hour or half hour, so ending xx:00 or xx:30.

Where a dimming device can be configured remotely or locally, prior to making any changes to the dimming pattern, you must ensure that a suitable Variable Power Switch Regime (VPSR), which matches the new dimming pattern, is defined in the Variable Power Switch Regime Spreadsheet on the BSC Website. If a suitable VPSR is not already approved, an application for a new VPSR must be completed as described earlier, which needs to be approved and published before changing the operation of the device.

Once the device has been re-configured you must immediately provide a new inventory to the UMSO declaring the appropriate VPSR as defined in the Variable Power Switch Regime Spreadsheet on the BSC Website: Variable Power Switch Regime Spreadsheet.

Where a dimming device can be configured remotely or locally the manufacturer (or its representative) will provide an undertaking to Elexon that customers will not be provided with the ability to change the operation of the device. Furthermore, any changes undertaken by any party on behalf of the customer will be reported to both Elexon and the UMSO. Where changes are made, the customer must provide a new inventory (in accordance with the Connection Agreement provisions) declaring the new Switch Regime for the revised Variable Power Switch Regime as defined in the Variable Power Switch Regime Spreadsheet on the BSC Website: Variable Power Switch Regime Spreadsheet.

Applications for a Variable Power Switch Regime(s) should be made to UMS.Operations@elexon.co.uk. The Elexon team will liaise with the applicant to ensure the appropriate Switch Regimes are provided and published.

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 your Meter Administrator.*

The Variable Power Switch Regimes Spreadsheet details the timing and percentage of full power (not lumen) associated with dimming events. The Switch Regimes can accommodate up to 8 events (including On and Off events). The published full power percentages must be in 5% ranges (i.e. ending in a 5 or 0). The spreadsheet contains filters to enable you to identify if the required Switch Regime already exists. For example, a Switch Regime that dims to 70% energy from 22:00 to 06:00 hrs (GMT) would look like this:

Switch Regime	PECU lux level	GMT or Clock	On Event	% Power	Switch Event 2	% Power	Switch Event 3	% Power	…	Switch Event 8	% Power	Off Event
D18	35/18	GMT	PECUS	100	22:00	70	06:00	100	…			PECUS

How do you realise the benefits of dimming in your electricity bills?

There are two distinct methods for calculating the reduced energy consumptions from dimming, depending on whether your unmetered energy is purchased via half hourly MPANs or non-half hourly MPANs.

Half Hourly traded MPANs

Where you are purchasing energy in the Half-Hourly (HH) market, your Meter Administrator (MA) will apply the percentages to the full power Watts in the Equivalent Meter (the MA software) kWh consumption calculation for each half hour.

For example, 200 x 100 Watt LEDs will use 10 kWh (20kW load divided by 2) in a half hour. If the Switch Regime shows that at midnight the power is reduced to 50%, substituting 50 Watts for 100 Watts will give a consumption of 5 kWh for the half hour from 00:00 to 00:30. The reduced Watts will continue to be used by the Equivalent Meter for subsequent half hours until the Switch Regime shows a change in power.

If you have a Central Management System (CMS) in place the MA receives a daily Event Log from the CMS which contains the timings and power percentages to be used in the energy calculations. A Variable Power Switch Regime is not required.

Non Half Hourly traded MPANs

The UMS Operational Switch Regime Spreadsheet contains the annual burn hours that will be applied to the apparatus Circuit Watts for the Generic LED Charge Codes for UMS customers that are trading in the Non-Half Hourly (NHH) market. The Variable Power Switch Regimes are all alpha-numeric:

UMS Operational Switch Regime spreadsheet extract

Regime	Period	Eastern	East Midlands	London		North Scotland
A01	Variable Power Switch Regime - 70/35 (GMT)	2982	2981	2984	…	2967
A02	Variable Power Switch Regime - 70/35 (GMT)	1791	1790	1792	…	1782
A03	Variable Power Switch Regime - 70/35 (GMT)	2141	2140	2142	…	2131

The four digit numbers in the columns above (e.g. labelled Eastern, East Midlands, etc.) are adjusted annual dusk to dawn burn hours. The burn hours have been adjusted according to the dimming profile for the Switch Regime that is defined by the Variable Power Switch Regime Spreadsheet.

To calculate the adjusted hours for a Switch Regime, the power percentages are applied to the full circuit watts to obtain a reduced annual kWh for the dusk to dawn period. For ease of calculation rather than try to replicate these

[2] Cells are left blank if the events are not required for the Switch Regime

calculations using power percentages when calculating an annual consumption from a customer's inventory, the annual hours are reduced to provide the same result.

To illustrate the impact of such a regime, consider an LED light with 100 Circuit Watts dimmed to 70% from 22:00 to 06:00, which in the Eastern region has a published Burn Hours of 3296 hours from dusk to dawn using a 35/18 PECU. Applying the dimmed percentages produces a kWh figure for dusk to dawn which is 81 kWh annually less than the annual kWh figure at 100% throughout the night.

How do you submit the information in your inventory to the LDSO?

The LED Generic Charge Codes and Variable Power Switch Regimes are entered into the inventory in exactly the same manner and format as other Charge Codes and Switch Regimes.

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** or call **0370 010 6950**.