

DCP0046 Attachment – Detailed Solution

This attachment sets out the solution proposed by DCP0046 for Half Hourly (HH) and Non Half Hourly (NHH) multi-level static dimming apparatus.

1. Applying for Charge Codes

Manufacturers will need to request Charge Codes for each type of apparatus they intend to supply. Dimming equipment may be used in a standalone configuration or in conjunction with other elements in the luminaire, i.e. a ballast and/or Photo Electric Control Unit (PECU) array. This results in four potential options when applying for Charge Codes:

Charge Code Options	Dimmer	Ballast	PECU
1	✓		
2	✓	✓	
3	✓	✓	✓
4	✓		✓

The Charge Code test requirements will be dependent on whether the dimming control is integral to the ballast, and these are set out in the tables below.

1.a Charge Code Test Requirements for dimming devices integral to the ballast

In this case the applicant will apply for a new Charge Code that represents the combination of dimmer and ballast:

Charge Code Options	Dimmer	Ballast	PECU
1	✓		
2	✓	✓	
3	✓	✓	✓
4	✓		✓
i. The testing requirements will be for 5 samples with data provided at a range of dimming levels (to be defined) by the accredited Test House. ii. Evidence must be provided that the product switching times are accurate given the timing methodology (e.g. mid-dark); and			

- iii. The relationship between the control signal and percentage energy dimming will need to be provided by the manufacturer.

1.b Charge Code Test Requirements for dimming devices that are not integral to the ballast

In this case the applicant will apply for a 'Controller Charge Code' that will be used in conjunction with existing Charge Codes for Electronic ballasts:

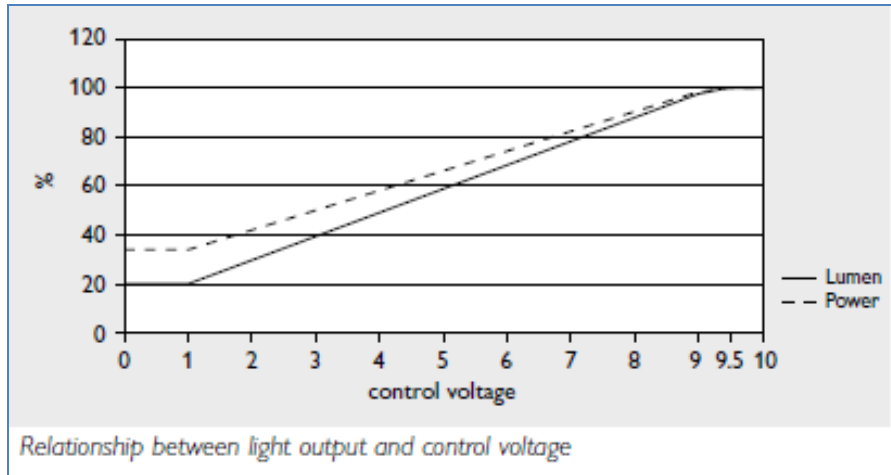
Charge Code Options	Dimmer	Ballast	PECU
1	✓		
2	✓	✓	
3	✓	✓	✓
4	✓		✓
<ul style="list-style-type: none"> i. The testing requirements will be for 5 samples with data provided at a range of dimming levels (to be defined) by the accredited Test House; and ii. Evidence that the product switching times are accurate given the timing methodology (e.g. mid-dark). <p><i>Where the Dimmer is used in conjunction with a PECU, but not integral to the PECU, the Charge Code Circuit will include a PECU 'Uplift' such that only one control needs to be declared by the customer in its inventory submission.</i></p>			

2. Applying for Switch Regimes

Each valid dimmer or dimmer/ballast combination will need to be assigned a Switch Regime that is able to reflect the changes in load caused by the dimming apparatus.

In order to apply for a Switch Regime, an applicant will need to provide the following:

- i. The switching times for which the application is being made;
- ii. The percentage energy and associated LUX levels mapped to the switching times.
- iii. A statement of the dimmer type and ballasts and appropriate Charge Codes that will be used with the Switch Regime;
- iv. Evidence that the dimming device will accurately dim the proposed ballast, e.g. the relationship between the input control signal from the dimming device and the percentage energy input to the proposed ballast e.g. Philips Dynadimmer and Philips Electronic ballast:



- v. Confirmation that the dimmer's Switch Regime will be fixed and labelled by the manufacturer and cannot be modified by the customer, or an undertaking that a re-application for another Switch Regime be made on customer re-configuration of the dimmer.

3. Allocation of Switch Regimes

Following successful application a Switch Regime will be allocated to a valid combination of dimming control/ ballast combination by ELEXON. This could be an existing Switch Regime, if the burn hours match another regime; otherwise ELEXON will construct a new Switch Regime and assign a unique code. Note that Switch Regime IDs currently consist of 3-digit codes and there is limited space for more. This solution would require the ID field to either be expanded to include more digits or be converted into an alphanumeric code.

New Switch Regimes will be derived by ELEXON using an 'Estimated Annual Consumption (EAC) Adjustment Factor'. The 'EAC Adjustment Factor' will be the percentage (%) average annual energy reduction that is achieved given the switching events and the percentage of energy dimming. This will then be applied to the appropriate existing 'Burn Hours' published in the Operational Information Spreadsheet for Switch Regimes. This new data will be published for use by the Unmetered Supplies Operator (UMSO) in calculation of EACS. Any new Switch Regimes will be mapped to a number of burn hours for each Grid Supply Point (GSP) Group, and will be entered into the Switch Regime table in the Operational Information Document supporting spreadsheet published on the ELEXON website.

In addition, the Switch Regime will be mapped to a further table showing the detailed switching times and dimming levels for the valid dimmer/ballast combinations.

Dimming Regime table:

Switch Regime ID	On Event: Level 1	Time: Level 2	Time: Level 3	Time: Level 4	Time: Level 5	Off Event	Valid Dimmer/Ballast Combinations
5D1		00:00	02:00	04:00	6:00		Philips Dynadimmer

Switch Regime ID	On Event: Level 1	Time: Level 2	Time: Level 3	Time: Level 4	Time: Level 5	Off Event	Valid Dimmer/Ballast Combinations				
	100%	75%	50%	75%	100%	0%	(Control Charge Code 9xxxxxxxxx) with Philips Cosmopolis Extreme Electronic ballasts (Charge Codes <table border="1" data-bbox="1098 667 1417 947"> <tr> <td>50 0090 0002 100</td> </tr> <tr> <td>50 0090 3000 100</td> </tr> <tr> <td>50 0140 0003 100</td> </tr> <tr> <td>50 0140 3000 100</td> </tr> </table>	50 0090 0002 100	50 0090 3000 100	50 0140 0003 100	50 0140 3000 100
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4. Construction of Customer Inventory

The customer will be required to provide the following details in its Inventory Submission:

- i. The Charge Code for the electronic ballast or integral dimmer/ballast combination;
- ii. The charge code of the dimmer or dimmer/PECU Combination; and
- iii. The Switch Regime Code.

5. Validation of Inventory

The UMISO will validate the customer's inventory against both the Switch Regimes and the more detailed Dimming Regime table so as to confirm that the customer has used an appropriate combination of dimmer, ballast and Switch Regime.

6. Calculation of NHH EACs

For NHH Unmetered Supplies, the UMISO will use the information in the inventory and the relevant Switch Regime to determine an EAC using the current methodology. This will then be sent to the NHH Data Collector for use in Settlement.

7. Calculation of HH Values

For HH Unmetered Supplies, the Meter Administrator will use the information in the Summary Inventory, and the Switch Regime to calculate HH values. The Equivalent Meter software will therefore have to accommodate the additional Switch Regime information in order to construct a HH profile that accurately reflects the behaviour of the multi-level dimmer. These values will then be passed by the Meter Administrator to the HH Data Collector for use in Settlement.