

Charge Codes for Vehicle Activated Signs

A Request for Changes to the OID to clarify the measurement requirements and data to be presented

Document Control

vA	28 th Feb 2021	MP (ARTSM)	
vB	5 th April 2022	MP (ARTSM)	Revised after first review
vC	28 th June 2022	MP (ARTSM)	Revised for submission to UMSUG
vD	6 th Dec 2022	MP (ARTSM)	Revised following UMSUG & ARTSM input
vE	7 th Dec 2022	MP (ARTSM)	Error corrected following Elexon feedback
vF	8 th Dec 2022	MP(ARTSM)	Modified after discussion of switch regime

Context

Getting charge codes for vehicles activated signs is problematic for manufacturers for a number of reasons which are described and addressed below. Furthermore, not having a charge code is a serious obstacle to selling products.

Number of Similar Samples for Testing

Due to the very site-specific nature of these products they rarely have five identical samples of product, so cannot meet the Elexon requirements for testing product uniformity.

The lower power use and low numbers of products mean that in the over-all scale of things, this is not a big problem for Elexon, so we need to pursue it through their processes to get agreements

BUT

The DfT's Traffic Signs Regulations and General Directions, (the legal act defining what can be put by the roadside) categorises signs into size groups (300mm, 450mm, 600mm etc according to the speed of traffic on the road and the requirements for visibility).

As a result manufacturers may produce signs with different messages on them but they will fall into one of the size categories.

Additional Facilities

Signs may also have flashing conspicuity indicators and a message such as "SLOW" also proportionate the size category of the sign.

SO

Elexon have previously accepted that Manufacturers can compile a set of five signs that span one or two adjacent size categories of which at least 2 should be of the larger variant, with and without the flashers and text as a group and submit this group to an agreed test house to receive five distinct but closely grouped measurements.

Specifically, any group of signs so submitted should include two signs with text and conspicuity flashers, one with either conspicuity or text but not both, and two with only the legend.

Sign 1 Larger size, conspicuity and text

Sign 2 Larger size, legend only

- Sign 3 Smaller size, conspicuity and text
- Sign 4 Smaller size, conspicuity OR text but not both
- Sign 5 Smaller size, legend only

However despite this precedent the recent dialogue with UMSUG and Elexon has suggested that mixing two sizes is not well received. Given the already stated difficulty in having sufficient stock of signs due to the highly bespoke nature of the product, the compromise is to reduce the number of signs to three, but all of one size. This change has been included in the revised proposal below.

Dimming and Duty Cycle

The second variable to be accommodated is dimming. VAS can be dimmed, often across a range of dimming steps.

The third area of difficulty arises from the level of activation, (the duty cycle,) of signs by passing traffic as this is not a constant, with some sites being busier, some less so.

Again, previously Elexon has accepted the following process as a fair accommodation of these two factors.

The equipment is measured in its highest brightness and its lowest brightness. The effective power use is then derived as 30% of the bright power + 70% of the dim power.

This figure is taken as accommodating the quiescent power, the effects of dimming and importantly it also accommodates the average duty cycle of the sign face being activated by passing traffic.

Agreement

The manufacturing community represented by ARTSM (The Association for Road Traffic Safety and Management) on who's behalf this document is being submitted, have collaborated in presenting this potential solution to the problems identified above approach based on one applicant's previous engagement with Elexon.

Proposal for UMSUG Committee

We request that the OID is amended to read as follows:-

That manufacturers requesting measurements in support of charge codes for vehicle activated signs may submit a set of three VAS to an agreed third-party test house, but these do not have to be identical signs provided they are all from one sign class (basic dimension) as identified in TSRGD. Of these signs one should support a legend and conspicuity flashers one should support a legend, both conspicuity flashers and text and one support a legend only.

- Sign 1 Legend, conspicuity flashers and text
- Sign 2 Legend only
- Sign 3 Legend and conspicuity flashers only

Each sign shall be measured in its maximum bright state, Pb and its lowest dim state, Pd and its quiescent state Pq, i.e. powered but with no display presented. Measurements shall be at the normal range of supply voltages identified in the OID.

At each voltage setting the effective power, P_e , for each sign shall be calculated as when bright, $(P_b * 9.84\%) + (P_q * 90.16\%)$ and when dimmed $(P_d * 1.72\%) + (P_q * 98.26\%)$ These weightings are based on data provided by Elexon in the course of developing this proposal.

The average of the effective powers for the set of three units shall be used to implement a charge code.

Each manufacturer shall be allocated a charge code for all their signs of the size and model tested.

By way of example the product description in the register would look something like

“Manufacturer X Model Y Size 300mm VAS”

Choice of Switch Regime

VAS do not employ external photocells as they have to alter the light output of the sign face to maintain sign visibility under a range of ambient light conditions. In reality they spend the majority of their time running in either maximum bright or fully dimmed modes, stepping through the intermediate levels only briefly during dawn, dusk and periods of very overcast weather.

While the choice of switch regime is not a part of the testing process when it comes to adding VAS to user inventories only specific combinations of charge code and switch regime are permitted for traffic signalling equipment as defined in OID section 7.6.

This proposal suggests that all VAS use Switch regime 821 or the manufacturer lux levels if provided as the best representation of the complex dimming situation.

Information Providing Context and Numbers of Deployed Signs

For the benefit of the UMSUG committee and to set this issue on context, we have also approached local authorities and obtained an indication of the numbers and sizes of vehicle activated signs on their networks.

Typical Power Use

The current charge code list includes a generic description with a circuit power figure of 10W. This is the same or higher than all manufacturer specific listings.

Effective Power Use by Local Authority

Data from two shire and one urban authority are offered in the tables below. Note that recording is not always as comprehensive as might be optimal.

So using the generic circuit wattage value these authorities represent 730W, 3510W and 300W of average continuous power use respectively for each authority.

Supporting Data

Local Highway Authority data on VAS deployment in their equipment inventories.

Shire 1			
Nominal Size (mm)	No.	Flashers	No.
300	6	No	13
450	50	Yes	54
600	8	n/a	6
750	1		
Other	8		
Total	73		73

Shire 2			
Nominal Size (mm)	No.	Flashers	No.
300	n/a	No	n/a
450	n/a	Yes	n/a
600	n/a	n/a	n/a
750	n/a		
Other	n/a		
Total	351		351

Urban			
Nominal Size (mm)	No.	Flashers	No.
300	n/a	No	n/a
450	n/a	Yes	n/a
600	6	n/a	n/a
750	n/a		
Other	24		
Total	30		30