PECU Array Information Note

Why do I need a PECU Array?

There are two main reasons to use an Array:

- Without an Array an algorithm is used to determine the switching on/off times for the lighting. This does not accurately reflect actual local environmental conditions and photocell performance. On average, customers using an Array benefit from a reduction of around 1% in their annual calculated consumption.
- In many areas of the country the Unmetered Supplies Operator (UMSO) requires that an Array is used to give the best assessment of the electricity consumed considering the local light and weather conditions.

Can an Array be shared?

It is possible to share an Array, depending on several considerations. The key factors are typically the proximity of the two lighting authorities to each other as well as the types of photocells they use. These would need to be largely common to both authorities. Permission from the UMSO is also required, again we will be happy to liaise with them regarding this.

Configuration

A Photo-Electric Cell Unit (PECU) Array is a box approximately 1.0m (l) x 0.64m (w) x 0.32m (h) and populated with 30 photocells which are representative of the photocells used within the Lighting Authority. Within the box are terminal blocks, a data logger and a cellular modem. Where miniature photocells are prevalent these can be fitted instead of a NEMA socket (see “Procurement” below).

The approximate weight is 30kg, excluding photocells. The Array is only waterproof when the lid is closed and locked and all NEMA cells or miniature cells have been fitted in accordance with the instructions and guidance contained in the manufacturers’ User Manual. The interior of the Array shall not be exposed to moisture i.e. rain or snow etc.

Customers are strongly advised to fully read the manufacturers’ User Manual and Data Sheet, making themselves conversant with the Array and relevant equipment before attempting installation or maintenance work.

Location & Installation Considerations

The following should be considered when determining the location of the Array:

- Typical location is the flat roof of a local authority building within the Lighting Authority area, near the centre of the street light load.
- Elevation should be consistent with normal photocell locations; a two storey building is ideal.
- It should be accessible for safe and convenient replacement of photocells
- It should not be subject to excessive shadows from trees, buildings, lift shafts, air conditioning units etc.
- Artificial lighting (e.g. floodlights) should not be positioned such as that they interfere with the Array in any way.

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- The Array should be sufficiently elevated to ensure that Array is not flooded if the roof 'puddles'.
- The Array should be aligned so that the North legend on the lid points in a northerly direction.
- The Array should be fitted at a permanent, maximum 10°, incline. The north facing side, typically the key side, must be the raised end.
- The Array requires a single phase 230V AC electricity supply. Typical energy consumption is 2A and ~5A with the system heaters operating.
- A good signal strength will be required for the cellular modem.

As Meter Administrator, Power Data Associates (PDA) are required to formally agree the proposed location with your local distribution company (UMSO). If you provide the address, a photo of the proposed location and if possible, the proposed location indicated by a link to a satellite image (Google maps, Bing maps, etc.), we will happily liaise with them.

Photocell population

The Array is populated with 30 photocells which is a representation of the whole of your inventory. Cell population is based upon the cells operating lux level i.e. 35/18, 20/20 or 10/10 type and the associated load per each type of cell, ***Power Data Associates will advise of the correct population mix for an Array.*** The photocell population is reviewed regularly, at least twice a year, to ensure it remains reflective of your inventory.

The photocells should be representative of the lux levels and age of the photocell population out on street. Ideally, they should also represent the physical construction, e.g. NEMA, one-part miniature and two-part miniature, etc.

PDA require photographs of the installed Array, at least, one close up showing the cell population and one from a distance showing the Array and its surroundings. Also required is a listing of the photocells installed in each channel, for which we provide a template form for completion.

The Array must have all 30 channels populated with a cell to be weatherproof.

Operation & Maintenance

PDA will interrogate the Array and download the events recorded by the data logger daily. The events are then validated to check for faulty photocells and other anomalies.

If any photocells are deemed to have failed, or to be operating inconsistently with others of the same type, they are excluded from the energy calculation. PDA will identify and report faulty photocells to the Lighting Authority or their nominated contractor for replacement.

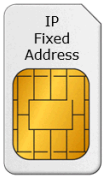
Replacement of failed photocells can be easily performed by the customer. The procedure is identical to replacing a photocell on a lighting column. PDA is available to provide guidance.

Communications

Interaction between PDA and the Array prior to 2022 has relied on dial-up communications either through PSTN analogue telephone landline or via a 2G cellular network. These methods were superseded in 2022 for new Array's with Internet Protocol (IP) communication. This has become necessary due to the government planned phase out of PSTN, 2G and 3G.

The IP Array will need a SIM card which can be provided by Tailor Made Systems or the customer.

If the customer wants to source their own SIM card for their Array, the following requirements must be noted.



- Data SIM with a small monthly data allowance, recommend 1Gb.
- Fixed IP address.

Further details can be obtained from Tailor Made Systems.

It is recommended to test the SIM card is working correctly in the Array prior to it being installed up on a roof. Ideally the Array should be powered with photocells installed so that it can be dialled for a few days while it is located in your office/workshop. It is easier to resolve any problems (such as communication or photocell failures) whilst in your premises before the Array is installed on a rooftop.

How can I check my Array is working?

Some simple Array checks:

- Check the power to the Array and modem is on by confirming that the green LED indicator on top of the Array is flashing. If not, it may be worth turning the power off for 30 seconds and then back on
- Request PDA to conduct a test dial to assess the communications connection.
- A common issue identified by dialling a cellular or PSTN Array is that the modem (or the whole Array) is not receiving power. The message you will hear in this instance is the standard 'the mobile you are calling is switched off', or 'mobile is unavailable'. On older arrays that utilise a fixed phone line, the call will instead ring continuously unanswered.
- Other problems such as an engaged tone, number not recognised, continuous ringing, etc. may be resolved by a 30-second shutdown and repower, but otherwise it is worth checking the cellular contract is still operational, and that the cellular signal is still active at the Array location.
- For older Array's with PSTN phone lines, it is worth noting that if the building changes to a digital phone system, this is likely to prevent the Array from communicating. In parallel with support requests to Tailor Made Systems it is worth speaking to your IT department to confirm there have been no recent changes to the phone system.
- Is there evidence of water damage? If the seal around a photocell socket fails, this could allow water to leak into the cabinet. If drainage holes have been blocked or water has accumulated within the Array then it may have caused damage to the electronics.

Further advice is available from Power Data Associates and/or Tailor Made Systems.

Power Data Associates also produce a number of reports relating to the Array and the burning hours for each cell type and/or per channel. There is a tab within the customer's Monthly Report summarising the Array and cell types burning hours.

Procurement

Tailor Made Systems Ltd (formerly EGS Technologies) is the established provider of Arrays. Their current model can be specified as all (30) NEMA sockets, all miniature sockets, or a combination of both.

Tailor Made Systems can be contacted on 01926 479072 or via email admin@malms.aero. PDA does not currently support any other design of Array as no others have been approved as part of our Equivalent Meter.

This document has been prepared in good faith and free of charge. Whilst reasonable steps have been taken to ensure the information is correct, if you would like further information, advice or clarity, please contact us via email UMS@PowerDataAssociates.com or by phone 01525 601201.

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