

Measured Central Management System: Swarco

Test date: 11 March 2019

Location: Power Data Associates office. Wrest Park, Silsoe, Bedfordshire MK45 4HR

Facilitator: Kevin Spencer

Witness: Adam Jessop

Testing: Swarco measured Central Management System (mCMS)

Description: Swarco are manufacturers of EVSE (ELEctric Vehicle Supply Equipment). One product in Swarco's range is the Opticharge. Opticharge is a product designed to be retrofitted onto existing street lighting columns. Because the power supply to street lighting columns is unmetered they are seeking to qualify this product using measured Central Management System (mCMS). ELEXON witnessed Swarco's mCMS on 11 March 2019.

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System Requirements

| Test Ref | Requirement / Details | Requirement Reference | Comment | Complies |
|---------------------|--|-----------------------|--|----------|
| Test Group 1 | <u>Configuration Control</u> | | | |
| Test 1.1 | CMS software version | Non-functional | 1.0.0 | Pass |
| Test 1.2 | CMS operating platform and version | Non-functional | Linux Ubuntu 16.04 | Pass |
| Test 1.3 | The technical details of the measurement device to be used | Non-functional | Emlite EML M18 Single phased MID Meter | Pass |
| Test Group 2 | <u>Synchronisation to UTC</u> | 4.6.3.3(i) | Selected on system – Customer will see local time, but the event log will show UTC | Pass |

2 Data Input and Storage Requirements

| Test Ref | Requirement / Details | Requirement Reference | Comment | Complies |
|----------------------|---|-----------------------|---|----------|
| Test Group 3a | <u>Detailed Inventory information</u> | | | |
| Test 3.1 | Add, delete, modify manually or electronically: | Functional | | Pass |
| Test 3.1.1 | Road Reference | Functional | | Pass |
| Test 3.1.2 | Town, Parish, District | Functional | | Pass |
| Test 3.1.3 | Road Name | Functional | | Pass |
| Test 3.1.4 | Location | Functional | | Pass |
| Test 3.1.5 | Unit Type | Functional | | Pass |
| Test 3.1.6 | Unit Identity | Functional | | Pass |
| Test 3.1.7 | CMS Unit Reference | Functional | CPID (Charge Point identifier) LPI000000003 | Pass |
| Test 3.1.8 | Charge Code | Functional | 89010000000100 | Pass |
| Test 3.1.9 | Number of Items | Functional | Always one. | Pass |
| Test 3.1.10 | Switch Regime | Functional | Agreed default switch regime | Pass |
| Test 3.1.11 | Number of Controls | Functional | Always one. | Pass |
| Test 3.1.12 | Control Charge Code | Functional | ELEXON to create control charge code | Pass |
| Test 3.1.13 | Ordinance Survey Grid ref 'East' or Latitude | Functional | | Pass |

| Test Ref | Requirement / Details | Requirement Reference | Comment | Complies |
|----------------------|---|-----------------------|---|----------|
| Test 3.1.14 | Ordinance Survey Grid ref 'North' or Longitude | Functional | | Pass |
| Test 3.1.15 | Exit Point | Functional | | Pass |
| Test 3.2 | Audit Trail | Functional | | Pass |
| Test Group 3b | <u>Inventory control information</u> | | | |
| Test 3.3 | Add, delete, modify manually or electronically: | Functional | | Pass |
| Test 3.3.1 | Sub-Meter ID | Functional | Applicant was unable to demonstrate Sub-Meter ID process on the day, but provided evidence post-meeting that satisfies the requirements | Pass |
| Test 3.3.2 | Effective From Date | Functional | | Pass |
| Test 3.3.3 | CMS Unit Reference | Functional | | Pass |
| Test 3.3.4 | Number of Items | Functional | | Pass |
| Test 3.3.5 | Switch Regime | Functional | | Pass |
| Test 3.3.6 | Charge Code | Functional | | Pass |
| Test 3.4 | Audit Trail | Functional | | Pass |
| Test Group 4 | <u>Equipment control information</u> | | | |
| Test 4.1 | Add, delete, modify manually or electronically | Functional | | Pass |
| Test 4.1.1 | CMS Unit Reference | Functional | | Pass |

| Test Ref | Requirement / Details | Requirement Reference | Comment | Complies |
|------------|-------------------------------|-----------------------|---------|----------|
| Test 4.1.2 | Sum of CMS Controller devices | Functional | | Pass |
| Test 4.1.3 | Switch Regime | Functional | | Pass |
| Test 4.1.4 | Charge Code | Functional | | Pass |
| Test 4.2 | Audit Trail | Functional | | Pass |

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Process Requirements

| Test Ref | Requirement / Details | Requirement Reference | Comment | Complies |
|---------------------|--|-----------------------|--|----------|
| Test Group 5 | <u>CMS Event Driven Measurement</u> | | Where events are driven by the connection of Apparatus to an exit point | |
| Test 5.1 | Scenario 1 | 4.5.2.3 | <p>The data from scenarios 1 and 2 were combined to provide a longer period for comparison</p> <p>Based on the dimming levels; the system recorded 2.44 kWh of unit usage. The power analyser recorded 2.53 kWh of unit usage. The difference between the two values gives an error margin of 3.56%. The calculations are shown in the attached excel workbook.</p> <p>The power analyser will produce a higher result due it measuring the consumption of the EV charging unit itself. A charge code will be created to cover this consumption at 7W</p> | Pass |
| Test 5.2 | Scenario 2 | 4.5.2.3 | See above | Pass |
| Test 5.3 | Scenario 3 | 4.5.2.3 | Event Log shows no events until scenario 1 test | Pass |
| Test 5.4 | Scenario 4 | 4.5.2.3 | Event created for device being connected and disconnected. Provides half-hourly updates of 0 consumption. If nothing is connected, no events are created | Pass |
| Test 5.5 | Scenario 5 | 4.5.2.3 | Not tested | N/A |

| Test Ref | Requirement / Details | Requirement Reference | Comment | Complies |
|---------------------|---|--------------------------|--|----------|
| Test 5.6 | Scenario 6 | 4.5.2.3 | <p>Failure was simulated by disconnecting the SIM card from the device. Disconnection was made 7 minutes into a charge. The charge was ended approximately 20 minutes later, but the SIM remained disconnected until the next day.</p> <p>The details of the charge is not provided in the version 1 of the event log due to the SIM card being disconnected. Version 2 of the event log shows the missing events accounted for.</p> <p>With all test scenarios combined, the system recorded a total of 3.02kWh and the power analyser recorded a total 3.14kWh of unit usage. The difference between the two totals is 3.97%, which although outside of the permitted tolerance, is due to the power analyser including the consumption of the EV charging unit itself.</p> | |
| Test Group 6 | <u>Record operational switching times and power levels</u> | | | |
| Test 6.1 | Record operational switching times for Scenarios 1 to 6 | 4.6.3.3(b) 4.6.3.3(c) | | |
| Test 6.2 | Audit Trail | 4.6.3.3(h) | | |
| Test Group 7 | <u>Generate Operational Event Log</u> | | | |

| Test Ref | Requirement / Details | Requirement Reference | Comment | Complies |
|---------------------|--|--------------------------|---|----------|
| Test 7.1 | Scenario 1 | 4.5.2.3 | The relevant Event Log file 'aptev1220190311002' can be found in the 'ELEXON Witness Test' folder | Pass |
| Test 7.2 | Scenario 2 | 4.5.2.3 | The relevant Event Log file 'aptev1220190311002' can be found in the 'ELEXON Witness Test' folder | Pass |
| Test 7.3 | Scenario 3 | 4.5.2.3 | The relevant Event Log file 'aptev1220190311002' can be found in the 'ELEXON Witness Test' folder | Pass |
| Test 7.4 | Scenario 4 | 4.5.2.3 | The relevant Event Log file 'aptev1220190311002' can be found in the 'ELEXON Witness Test' folder | Pass |
| Test 7.5 | Scenario 5 | 4.5.2.3 | Not tested | N/A |
| Test 7.6 | Scenario 6 | 4.5.2.3 | The relevant Event Log file 'aptev1220190311002' can be found in the 'ELEXON Witness Test' folder | Pass |
| Test 7.7 | Available daily and on request | 4.6.6.3(b) 4.6.6.3(c) | Evidence the MA can get the file daily and on request | Pass |
| Test 7.8 | Audit Trail | 4.6.6.3(h) | | Pass |
| Test Group 8 | <u>Volume and Performance</u> | | | |
| Test 8.1 | Compliance with operational timescales | Functional | | Pass |

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Data Output Requirements

| Test Ref | Requirement / Details | Requirement Reference | Comment | Complies |
|---------------------|-------------------------------------|-----------------------|---|----------|
| Test Group 9 | <u>Operational Event Log</u> | | Testing that the event log is in the correct format | |
| Test 10.1 | File Format | 4.6.6.3(c) | | Pass |
| Test 10.2 | Filename | 4.6.6.3(c) | | Pass |
| Test 10.3 | Header identifier | 4.6.6.3(c) | | Pass |
| Test 10.4 | Sub-Meter ID | 4.6.6.3(c) | | Pass |
| Test 10.5 | Date | 4.6.6.3(c) | | Pass |
| Test 10.6 | Version | 4.6.6.3(c) | | Pass |
| Test 10.7 | CMS Unit reference | 4.6.6.3(c) | | Pass |
| Test 10.8 | Time | 4.6.6.3(c) | | Pass |
| Test 10.10 | Percentage of base power | 4.6.6.3(c) | | Pass |
| Test 10.10 | Information Flag | 4.6.6.3(c) | Each entry on event log ends with '0' as information flag | Pass |
| Test 10.11 | Trailer | 4.6.6.3(c) | | Pass |