

Measured Central Management System: CityEV

Test date: 30 May 2018

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

Facilitator: Kevin Spencer

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Testing: CityEV measured Central Management System (mCMS)

Description: The Cityline series of electric vehicle chargepoint provide urban on-street residential electric vehicle charging infrastructure. CityEV is taking the route of using an unmetered supply and implementing a measured Central Management System. ELEXON witnessed CityEV's mCMS on 30 May 2018.

1. 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 | <ul style="list-style-type: none"> • System Component Software revisions at time of testing • Chargepoint firmware 2.90 • Central system communications gateway 1.14 • mCMS event log file generator service 1.03 • Central system database: 2.11 • Web portal: 1.24 | Pass |
| Test 1.2 | CMS operating platform and version | Non-functional | See above. | Pass |
| Test 1.3 | The technical details of the measurement device to be used | Non-functional | See above. | Pass |
| Test Group 2 | <u>Synchronisation to UTC</u> | 4.6.3.3(i) | Time Synchronisation is done the central server clock (Microsoft Windows Time Service) and maintained to within +/- 2 seconds of 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 | See screenshot "Chargepoint database entry". | Pass |
| Test 3.1.1 | Road Reference | Functional | See above. | Pass |
| Test 3.1.2 | Town, Parish, District | Functional | See above. | Pass |
| Test 3.1.3 | Road Name | Functional | See above. | Pass |
| Test 3.1.4 | Location | Functional | See above. | Pass |
| Test 3.1.5 | Unit Type | Functional | See above. | Pass |
| Test 3.1.6 | Unit Identity | Functional | See above. | Pass |
| Test 3.1.7 | CMS Unit Reference | Functional | See above. | Pass |
| Test 3.1.8 | Charge Code | Functional | ELEXON to provide national mCMS generic charge code. | 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 provide a control charge code. | Pass |
| Test 3.1.13 | Ordinance Survey Grid ref 'East' or Latitude | Functional | See screenshot "Chargepoint database entry". | Pass |
| Test 3.1.14 | Ordinance Survey Grid ref 'North' or Longitude | Functional | See screenshot "Chargepoint database entry". | Pass |

| Test Ref | Requirement / Details | Requirement Reference | Comment | Complies |
|----------------------|---|-----------------------|---|----------|
| Test 3.1.15 | Exit Point | Functional | If appropriate | N/A |
| 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 | | 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 | This test only applies to Apparatus where more than one item is connected to a single CMS unit reference. | N/A |
| Test 3.3.5 | Switch Regime | Functional | Agreed default switch regime | Pass |
| Test 3.3.6 | Charge Code | Functional | | Pass |
| Test 3.4 | Audit Trail | Functional | | Pass |
| Test Group 4 | <u>Equipment control information</u> | | This test group refers to the control device | |
| Test 4.1 | Add, delete, modify manually or electronically | Functional | | N/A |
| Test 4.1.1 | CMS Unit Reference | Functional | | N/A |
| Test 4.1.2 | Sum of CMS Controller devices | Functional | | N/A |
| Test 4.1.3 | Switch Regime | Functional | Agreed default switch regime | N/A |
| Test 4.1.4 | Charge Code | Functional | | N/A |

| Test Ref | Requirement / Details | Requirement Reference | Comment | Complies |
|-----------------|------------------------------|------------------------------|----------------|-----------------|
| Test 4.2 | Audit Trail | Functional | | N/A |

3. 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 | Based on the dimming levels, the system recorded 3.09 kWh of unit usage. The power analyser recorded 3.08 kWh of unit usage. The difference between the two values give an error margin of 0.32%. The calculations are shown in the attached excel workbook. | Pass |
| Test 5.2 | Scenario 2 | 4.5.2.3 | See above. | Pass |
| Test 5.3 | Scenario 3 | 4.5.2.3 | The absence of the unit usage can be seen in the event log. | Pass |
| Test 5.4 | Scenario 4 | 4.5.2.3 | Not part of the witness test – demonstrated in the test evidence provided by the applicant. | Pass |
| Test 5.5 | Scenario 5 | 4.5.2.3 | Not part of the witness test – demonstrated in the test evidence provided by the applicant. | Pass |
| Test 5.6 | Scenario 6 | 4.5.2.3 | Communication failure The objective was to disconnect the unit to the mCMS. The device was not able to communicate any data to the server but was still recording the consumption, using its internal memory. When the driver went back online, it re-connected to the mCMS and updated any information collected while offline. | Pass |
| Test Group 6 | <u>Record operational switching times and power levels</u> | | Events and power levels should be available via a user interface to the CMS | |

| Test Ref | Requirement / Details | Requirement Reference | Comment | Complies |
|---------------------|---|--------------------------|--|----------|
| Test 6.1 | Record operational switching times for Scenarios 1 to 6 | 4.6.3.3(b) 4.6.3.3(c) | | Pass |
| Test 6.2 | Audit Trail | 4.6.3.3(h) | | Pass |
| Test Group 7 | <u>Generate Operational Event Log</u> | | Generate events for each scenario | |
| Test 7.1 | Scenario 1 | 4.5.2.3 | The event log (Hmeterid20180530001) can be found in the relevant folder for test group 5. The calculations to prove the times and power levels are accurate the same as for test group 5 because there isn't a meter with a display to give us a separate set of readings to test against. | Pass |
| Test 7.2 | Scenario 2 | 4.5.2.3 | See above and event log Hmeterid20180530005. | Pass |
| Test 7.3 | Scenario 3 | 4.5.2.3 | See above and event Hmeterid20180530006. | Pass |
| Test 7.4 | Scenario 4 | 4.5.2.3 | | Pass |
| Test 7.5 | Scenario 5 | 4.5.2.3 | | Pass |
| Test 7.6 | Scenario 6 | 4.5.2.3 | The communication failure can be seen in the last two events logs (Hmeterid20180530005 and Hmeterid20180530006). | 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 |

4. 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) | | Pass |
| Test 10.11 | Trailer | 4.6.6.3(c) | | Pass |