Installation routine test summary-Application guide

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| Version | Creation date | Description | Author |
| 1.x | 22-05-2025 | Draft | *Eress Cross Acceptance Working Group\** |

This is a sample installation routine test report that was produced as an annex to the Guidelines.

*This document shall contains all relevant informations for the IM, to carry out the registration for the billing of this vehicle in European countries.*

*This information is used to clearly identify the energy calculation (ECF/DHS/Meter). This information shall make it possible to establish the manufacturer and the calibration validity. without any further documentation.*

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| --- | --- | --- |
| **Consumption**  **Point ID:** | National Vehicle Register code (NVR, 2 Letters) |  |
|  | Vehicle Keeper Marking  (VKM, 1-5 Letters) |  |
|  | European Vehicle Number (12 digits) |  |
|  | EMS ID (1 digit) |  |
| **EMS equipment** | Manufacturer of EMS or ECF |  |
|  | Serial number (S/N) of EMS or ECF |  |
|  | Calibration date: |  |

*Please note the format for the EVN (50463:2012 or 2017) when filling in.*

*Due to the possibility, there is an ECM-Maintenance, including replacement, recalibration and documentation existing, it is ensured that the recalibration periods are monitored. There is no need to enter the technical data multiple times. but because there are regulatory requirements in some countries, a serial number of the ECF/DHS/meter is required.*

*This form can be used for new installation/ maintenance, replacement and recalibration of EMS: This form shall be used to document the installation per vehicle, based on the installation type test.*

**Complete installation / First time installation**

**Replacement/repair / (re)calibration of device or sensor of the same type**

*It is possible, to use this form for a new installation or the replacement of a component (e.g. Sensor, Meter)=> In this case, there may not be completed all fields.*

**EMS included in ECM-Maintenance Plan (Calibration of Sensors and ECF/DHS/Meter)** (Remark: If not applicable, be sure to complete **Annex A** at the end of document.

**If all tests are successful, the EMS is ready to be used and delivers approved billing data.**

|  |  |
| --- | --- |
| Routine test completed successfully | YES  NO |
| Binding procedure successfully completed (50463:2017 only) | YES  NO |
| Date and time of inspection |  |
| Inspection site name |  |
| Signature |  |
| Additional comments |  |

*A contact should be noted who can provide information in the event of missing information or unexpected measurement data.*

Installation routine test procedure

*This document describes the routine test protocol for the DHS system, based on EN 50463.*

*Correct billing data should be reliably transmitted once commissioning has taken place.*

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| --- | --- | --- | --- |
| **Step** | **Action** | **Expected result** | **OK/NOK** |
| 1.1. | Switch the train in mode SHUTDOWN | Train is in mode  SHUTDOWN |  |

General safety requirements

*Check that any measures regarding the general safety requirements identified during the installation design review are correctly implemented.*

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| --- | --- | --- | --- |
| **Step** | **Action** | **Expected result** | **OK/NOK** |
| 2.1. | Check if installation of energy meter and energy sensor is in accordance with installation design. | Installation in accordance with installation design. |  |

Visual inspection

*Check that the EMS equipment type and traction unit are in accordance with the type reported in the Conformity Assessment File. Carry out a visual inspection in accordance with EN 50155:2017, 13.4.1. Check if EMS equipment type has been installed in accordance with the installation design and installation procedures.*

**Attention: follow workshop procedures/work-instructions for inspection on and near high-voltage installations.**

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| --- | --- | --- | --- |
| **Step** | **Action** | **Expected result** | **OK/NOK** |
| 3.1. | Check if the right type of energy meter is placed | Type in accordance with installation design. |  |
| 3.2. | Check if the energy meter is correctly placed | Installation in accordance with installation design. |  |
| 3.3. | Check if the right type of sensors is placed | Type in accordance with installation design. |  |
| 3.4. | Check that the sensors are correctly installed, | Installation in accordance with installation design. |  |
| 3.5. | Check the cabling of the meter | Installation in accordance with installation design. |  |
| 3.6. | Check the cabling of the sensors, especially the polarity of the sensors power supply (if applicable) | Installation in accordance with installation design. |  |

Power-up

*Energize the power supply to the EMS and check that the EMS reaches operational status in accordance with EN 50463-1:2017, 4.2.3.2. (The EMS shall achieve operational status and be ready to measure energy within 60 s after application of power to the EMS.)*

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| --- | --- | --- | --- |
| **Step** | **Action** | **Expected result** | **OK/NOK** |
| 4.1. | Power up the vehicle |  |  |
| 4.2. | Start measuring time when the vehicle is powered up | Train is in mode READY or  OPERATE |  |
| 4.3. | Check: DHS Status |  |  |
| 4.4. | Stop measuring time when DHS is operational | Measured time < 60 s |  |

Power-down

*Energize the IUA with all external equipment. Initiate an intentional power down of the power supply used by the EMS and check the EMS has successfully powered down in accordance with EN 504631:2017, 4.2.3.3. (In the event of intentional loss of power to the EMS, no CEBD and other data shall be lost. Unintentional loss of power shall not affect data stored in the EMS. NOTE The EMS could include a procedure for transmitting all unsent CEBD to DCS)*

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| --- | --- | --- | --- |
| **Step** | **Action** | **Expected result** | **OK/NOK** |
| 5.1. | Power off the DHS | DHS is powered off |  |
| 5.2. | Wait at least 1 minute |  |  |
| 5.3. | Power on the DHS | DHS is operational again |  |
| 5.4. | Download the log file / Check DCS | Log file is downloaded |  |
| 5.4. | Check in the logfile / DCS that the DHS has powered down and powered up again with no failure messages | DHS logfile should indicate that no measured data has been lost |  |

Traction supply system change

*Apply the input signals to the EMS, check that traction supply system change is detected in accordance with EN 50463-1:2017, 4.2.5.1.   
NOTE If the same device is used for different traction supply systems, it is sufficient to perform one traction supply system change.*

|  |  |  |  |
| --- | --- | --- | --- |
| **Step** | **Action** | Measurements are taken without interruption | **OK/NOK** |
| 6.1. | Perform one traction supply system change. | Measurements are taken without interruption |  |

Protection from non-authorized access

*Check that the measures for protection from non-authorized access identified during the installation design review are implemented and functioning.*

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| --- | --- | --- | --- |
| **Step** | **Action** | **Expected result** | **OK/NOK** |
| 7.1. | Check if installation of energy meter and energy sensor is in accordance with installation design. And check if measures for protection from nonauthorized access (e.g., seal) are functional. | Installation in accordance with installation design. All measures for protection from non-authorized access are functional. |  |

Indicator

*Check if the required indicators are functioning correctly.   
The indicators shall be checked in the internal diagnostic system of the DHS energy-meter.*

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| --- | --- | --- | --- |
| **Step** | **Action** | **Expected result** | **OK/NOK** |
| 8.1. | Vehicle in mode READY or OPERATE | Vehicle in mode READY or OPERATE |  |
| 8.2. | Check: DHS Status / indicators | Indicators should be … |  |

EMS data flow test

*Provide signals to each of the EMS inputs and check that all devices are functioning and CEBD is stored in the DHS. Check that CEBD in the DHS is available through the local service port. Initiate data export from the DHS to a DCS and check that transfer is successful. Check that the DHS is accessible from the DCS. NOTE The DCS can be the actual or a simulated one.*

|  |  |  |  |
| --- | --- | --- | --- |
| **Step** | **Action** | **Expected result** | **OK/NOK** |
| 9.1. | Trainset should be in mode READY or OPERATE | Train is in mode READY or OPERATE |  |
| 9.2. | Trainset should be in READY or OPERATE for at least one period when sending data (e.g., 30 min if sending data each 30 minutes) |  |  |
| 9.3. | Check in the DHS log file, that the last CEBD file has been sent successfully to the DCS OR check on the DCS for the measurements | Log file indicates a successful transfer OR data available on the server |  |
| 9.4. | Check data, that the reading corresponds to the expected values. | Results indicates correctly stored energy measurement values. |  |

*Please complete Annex A if the information is not included in ECM-Documentation*

Annex A

Additional information if EMS is **not included in ECM maintenance plan**:

|  |  |  |
| --- | --- | --- |
| **Sensor AC current** | Manufacturer and Type |  |
|  | Serial number (S/N) |  |
|  | Calibration date: |  |
| **Sensor AC voltage** | Manufacturer and Type |  |
|  | Serial number (S/N) |  |
|  | Calibration date: |  |
| **Sensor DC current** | Manufacturer and Type |  |
|  | Serial number (S/N) |  |
|  | Calibration date: |  |
| **Sensor DC voltage** | Manufacturer and Type |  |
|  | Serial number (S/N) |  |
|  | Calibration date: |  |

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