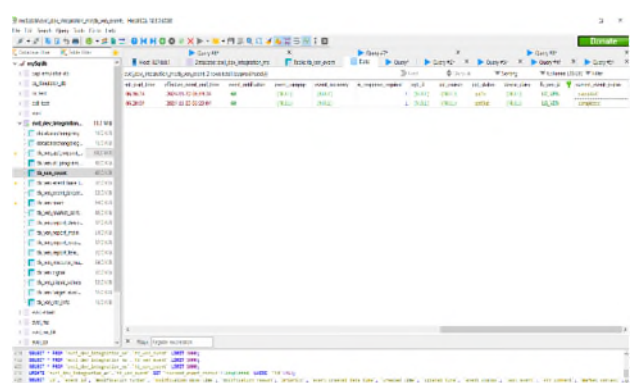


Test report no.: <i>Prüfbericht-Nr.:</i>	KR24SAZL 001	Order no.: <i>Auftrags-Nr.:</i>	156166868 10	Page 1 of 11 <i>Seite 1 von 11</i>
Client reference no.: <i>Kunden-Referenz-Nr.:</i>	2024374	Order date: <i>Auftragsdatum:</i>	2024-11-18	
Client: <i>Auftraggeber:</i>	LG Electronics BS R&D Lab, W4, 10, Magokjungang 10-ro, Gangseo-gu, Seoul, Republic of Korea			
Test item: <i>Prüfgegenstand:</i>	Open ADR			
Identification / Type no.: <i>Bezeichnung / Typ-Nr.:</i>	e-Centric Manager VEN			
Order content: <i>Auftrags-Inhalt:</i>	IT Equipment			
Test specification: <i>Prüfgrundlage:</i>	OpenADR 2.0b Test Specification v1.1.7			
Date of sample receipt: <i>Wareneingangsdatum:</i>	2024-11-18			
Test sample no.: <i>Prüfmuster-Nr.:</i>	A003869711-001			
Testing period: <i>Prüfzeitraum:</i>	2024-11-18 ~ 2024-11-20			
Place of testing: <i>Ort der Prüfung:</i>	TUV Rheinland Korea Ltd. Seoul			
Testing laboratory: <i>Prüflaboratorium:</i>	TUV Rheinland Korea Ltd.			
Test result*: <i>Prüfergebnis*:</i>	Pass			
tested by: <i>geprüft von:</i>		authorized by: <i>genehmigt von:</i>		
Date: 2024-11-27 <i>Datum:</i>	YoungJu Yoon	Issue date: 2024-11-27 <i>Ausstellungsdatum:</i>	Gwang-Hyeon Ryu	
Position / Stellung	Expert/Sachverständige(r)	Position / Stellung	Expert/Sachverständige(r)	
Other: <i>Sonstiges:</i>	The e-Centric VEN is a solution compliant with the OpenADR 2.0b standard, allowing seamless integration with demand response (DR) programs.			
Condition of the test item at delivery: <i>Zustand des Prüfgegenstandes bei Anlieferung:</i>	Test item complete and undamaged <i>Prüfmuster vollständig und unbeschädigt</i>			
* Legend: P(ass) = passed a.m. test specification(s) F(ail) = failed a.m. test specification(s) N/A = not applicable N/T = not tested				
* Legende: P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet				
This test report only relates to the above mentioned test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark. <i>Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.</i>				

1	The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system. Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request. <i>Alle eingesetzten Prüfmittel waren zum angegebenen Prüfzeitraum gemäß eines festgelegten Kalibrierungsprogramms unseres Prüfhauses kalibriert. Sie entsprechen den in den Prüfprogrammen hinterlegten Anforderungen. Die Rückverfolgbarkeit der eingesetzten Prüfmittel ist durch die Einhaltung der Regelungen unseres Managementsystems gegeben.</i> <i>Detaillierte Informationen bezüglich Prüfkonditionen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden.</i>
2	As contractually agreed, this document has been signed digitally only. TÜV Rheinland has not verified and unable to verify which legal or other pertaining requirements are applicable for this document. Such verification is within the responsibility of the user of this document. Upon request by its client, TÜV Rheinland can confirm the validity of the digital signature by a separate document. Such request shall be addressed to our Sales department. An environmental fee for such additional service will be charged. For information on verifying the authenticity of our documents, please visit the following website: go.tuv.com/digital-signature <i>Wie vertraglich vereinbart, wurde dieses Dokument nur digital unterzeichnet. Der TÜV Rheinland hat nicht überprüft, welche rechtlichen oder sonstigen diesbezüglichen Anforderungen für dieses Dokument gelten. Diese Überprüfung liegt in der Verantwortung des Benutzers dieses Dokuments. Auf Verlangen des Kunden kann der TÜV Rheinland die Gültigkeit der digitalen Signatur durch ein gesondertes Dokument bestätigen. Diese Anfrage ist an unseren Vertrieb zu richten. Eine Umweltgebühr für einen solchen zusätzlichen Service wird erhoben. Informationen zur Verifizierung der Authentizität unserer Dokumente erhalten Sie auf folgender Webseite: go.tuv.com/digital-signature</i>
3	Test clauses with remark of * are subcontracted to qualified subcontractors and described under the respective test clause in the report. Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report. <i>Prüfklausel mit der Note * wurden an qualifizierte Unterauftragnehmer vergeben und sind unter der jeweiligen Prüfklausel des Berichts beschrieben. Abweichungen von Prüfspezifikation(en) oder Kundenanforderungen sind in der jeweiligen Prüfklausel im Bericht aufgeführt.</i>
4	The decision rule for statements of conformity, based on numerical measurement results, in this test report is based on the "Zero Guard Band Rule" and "Simple Acceptance" in accordance with ILAC G8:2019 and IEC Guide 115:2021, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account and hence also not declared in the test report. For additional information to the resulting risk based of this decision rule please refer to ILAC G8:2019. <i>Die Entscheidungsregel für Konformitätserklärungen basierend auf numerischen Messergebnissen in diesem Prüfbericht basiert auf der "Null-Grenzwert-Regel" und der "Einfachen Akzeptanz" gemäß ILAC G8:2019 und IEC Guide 115:2021, es sei denn, in der auf Seite 1 dieses Berichts genannten angewandten Norm ist etwas anderes festgelegt oder vom Kunden gewünscht. Dies bedeutet, dass die Messunsicherheit nicht berücksichtigt wird und daher auch nicht im Prüfbericht angegeben wird. Zu weiteren Informationen bezüglich des Risikos durch diese Entscheidungsregel siehe ILAC G8:2019.</i>

Revisions		
Report No.	Issue date	Change / Remarks
KR24SAZL 001	2024-11-27	initial test report

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1. Testing Laboratory

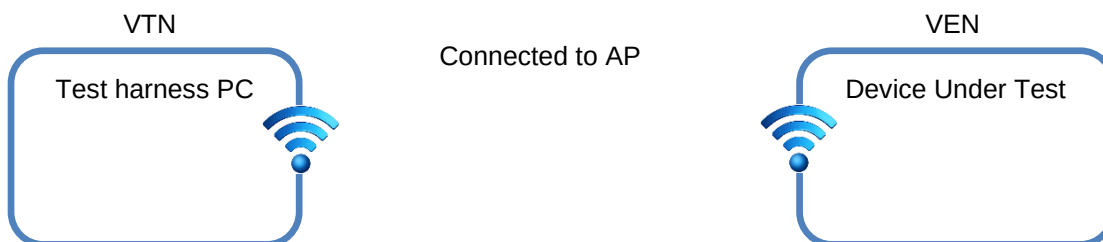
1.1 ATL information

NAME:	TÜV RHEINLAND KOREA LTD.
Address	2F, N-Tower, Semicolon Mullaee, 25, Mullaee-ro 28-gil, Yeongdeungpo-gu, Seoul, 07298, Rep. of Korea
City:	Seoul
Postal code:	07298
Country:	South Korea
Telephone:	+82 2 860 9860
Fax:	+82 2 860 9861
URL:	https://www.tuv.com/korea/ko/
E-mail:	Info@kor.tuv.com

1.2 Test Equipment

GTEM	Instrument	Manufacturer	Model Number	Version/Errata
G1824528	PC	Dell	XPS 15	Window10
9019280	Test tool	QualityLogic	OpenADR2.0bCertTest	1.1.7

1.3 Test Setup



2. General Product Information

2.1 Client information

NAME:	LG Electronics
Address:	BS R&D Lab, W4, 10, Magokjungang 10-ro, Gangseo-gu, Seoul, Republic of Korea
Telephone:	+82 10 2389 9792
Contact person:	Sibong Roh
e-mail:	sibong.roh@lge.com

2.2 DUT information

PRODUCT NAME:	e-Centric Manager VEN
HW version:	N/A
SW version:	1.0.0
Product type:	VEN
OpenADR profile:	2.0b
Test Mode:	Pull
Transport:	HTTP
Security:	Standard

3. Information about Test Results

3.1 General

Documentation of tested devices and results:

The complete set of measurement results is stored at the TÜV Rheinland Korea Ltd. test laboratory and is available on demand.

Interpretation of test results:

The results of the inspection are described on the following pages. "Pass" in the summary list of this test report means the performed tests according to the test specification were verified and that the tested device is conformant to the specifications.

4. Test Results

4.1 VEN Pull Tests

4.1.1 EiRegisterParty Service

No.	Test Cass	Date	Result	Log
1	N1_0010_TH_VTN_1	Nov / 18 / 2024	PASS	View Log TraceLog_111824_153529_245.txt
2	N1_0015_TH_VTN_1	Nov / 18 / 2024	PASS	View Log TraceLog_111824_153720_731.txt
3	N1_0020_TH_VTN_1	Nov / 18 / 2024	PASS	View Log TraceLog_111824_152432_743.txt
4	N1_0025_TH_VTN_1	Nov / 18 / 2024	PASS	View Log TraceLog_111824_152548_581.txt
5	N1_0030_TH_VTN_1	Nov / 18 / 2024	PASS	View Log TraceLog_111824_153437_141.txt
6	N1_0040_TH_VTN_1	Nov / 18 / 2024	PASS	View Log TraceLog_111824_153157_649.txt
7	N1_0050_TH_VTN_1	Nov / 18 / 2024	PASS	View Log TraceLog_111824_153815_303.txt
8	N1_0060_TH_VTN_1	Nov / 18 / 2024	PASS	View Log TraceLog_111824_152725_943.txt
9	N1_0065_TH_VTN_1	Nov / 18 / 2024	PASS	View Log TraceLog_111824_152831_496.txt
10	N1_0070_TH_VTN_1	Nov / 18 / 2024	PASS	View Log TraceLog_111824_154420_969.txt
11	N1_0080_TH_VTN_1	Nov / 18 / 2024	NA	View Log TraceLog_111824_154532_122.txt

4.2.2 EiOpt Service

No.	Test Cass	Date	Result	Log
1	P1_2010_TH_VTN_1	Nov / 18 / 2024	PASS	View Log TraceLog_111824_154716_677.txt
2	P1_2015_TH_VTN_1	Nov / 18 / 2024	PASS	View Log TraceLog_111824_171219_174.txt
3	P1_2020_TH_VTN_1	Nov / 18 / 2024	PASS	View Log TraceLog_111824_155245_981.txt
4	P1_2030_TH_VTN_1	Nov / 18 / 2024	PASS	View Log TraceLog_111824_155355_358.txt
5	P1_2040_TH_VTN_1	Nov / 18 / 2024	PASS	View Log TraceLog_111824_155520_274.txt
6	P1_2050_TH_VTN_1	Nov / 18 / 2024	NA	View Log TraceLog_111824_155824_732.txt

4.2.3 EiReport Service

No.	Test Cass	Date	Result	Log
1	R1_3010_TH_VTN_1	Nov / 18 / 2024	PASS	View Log TraceLog_111824_163025_044.txt
2	R1_3020_TH_VTN_1	Nov / 18 / 2024	PASS	View Log TraceLog_111824_163059_152.txt
3	R1_3025_TH_VTN_1	Nov / 18 / 2024	PASS	View Log TraceLog_111824_163438_443.txt
4	R1_3027_TH_VTN_1	Nov / 18 / 2024	PASS	View Log TraceLog_111824_163913_290.txt
5	R1_3030_TH_VTN_1	Nov / 18 / 2024	PASS	View Log TraceLog_111824_164420_338.txt
6	R1_3040_TH_VTN_1	Nov / 18 / 2024	PASS	View Log TraceLog_111824_164933_903.txt
7	R1_3045_TH_VTN_1	Nov / 18 / 2024	PASS	View Log TraceLog_111824_165454_420.txt
8	R1_3150_TH_VTN_1	Nov / 18 / 2024	PASS	View Log TraceLog_111824_165800_226.txt

9	R1_3160_TH_VTN_1	Nov / 18 / 2024	PASS	View Log TraceLog_111824_165935_312.txt
10	R1_3170_TH_VTN_1	Nov / 18 / 2024	PASS	View Log TraceLog_111824_170627_514.txt
11	R1_3180_TH_VTN_1	Nov / 18 / 2024	PASS	View Log TraceLog_111824_170944_178.txt
12	R1_3190_TH_VTN_1	Nov / 18 / 2024	PASS	View Log TraceLog_111824_171045_765.txt

4.2.4 EiEvent Service

No.	Test Cass	Date	Result	Log
1	E1_1010_TH_VTN_1	Nov / 18 / 2024	PASS	View Log TraceLog_111824_160039_937.txt
2	E1_1020_TH_VTN_1	Nov / 18 / 2024	PASS	View Log TraceLog_111824_160121_505.txt
3	E1_1025_TH_VTN_1	Nov / 18 / 2024	PASS	View Log TraceLog_111824_160214_600.txt
4	E1_1027_TH_VTN_1	Nov / 18 / 2024	PASS	View Log TraceLog_111824_160256_858.txt
5	E1_1030_TH_VTN_1	Nov / 18 / 2024	PASS	View Log TraceLog_111824_160349_637.txt
6	E1_1040_TH_VTN_1	Nov / 18 / 2024	PASS	View Log TraceLog_111824_160447_337.txt
7	E1_1050_TH_VTN_1	Nov / 18 / 2024	PASS	View Log TraceLog_111824_160857_774.txt
8	E1_1055_TH_VTN_1	Nov / 18 / 2024	PASS	View Log TraceLog_111824_161023_347.txt
9	E1_1060_TH_VTN_1	Nov / 18 / 2024	PASS	View Log TraceLog_111824_161329_866.txt
10	E1_1065_TH_VTN_1	Nov / 18 / 2024	NA	View Log TraceLog_111824_161444_488.txt
11	E1_1070_TH_VTN_1	Nov / 18 / 2024	PASS	View Log TraceLog_111824_161526_532.txt
12	E1_1080_TH_VTN_1	Nov / 20 / 2024	PASS	View Log TraceLog_112024_132722_974.txt
13	E1_1090_TH_VTN_1	Nov / 18 / 2024	PASS	View Log TraceLog_111824_162817_015.txt

4.2.5 EiEvent Ported A Profile

No.	Test Cass	Date	Result	Log
1	A_E1_0020_TH_VTN_1	Nov / 20 / 2024	PASS	View Log TraceLog_112024_132825_586.txt
2	A_E1_0040_TH_VTN_1	Nov / 20 / 2024	PASS	View Log TraceLog_112024_132956_265.txt
3	A_E1_0060_TH_VTN_1	Nov / 20 / 2024	PASS	View Log TraceLog_112024_133117_922.txt
4	A_E1_0070_TH_VTN_1	Nov / 20 / 2024	PASS	View Log TraceLog_112024_133204_539.txt
5	A_E1_0082_TH_VTN_1	Nov / 20 / 2024	PASS	View Log TraceLog_112024_133303_608.txt
6	A_E1_0086_TH_VTN_1	Nov / 20 / 2024	PASS	View Log TraceLog_112024_133357_599.txt
7	A_E1_0090_TH_VTN_1	Nov / 20 / 2024	PASS	View Log TraceLog_112024_133453_828.txt
8	A_E1_0092_TH_VTN_1	Nov / 20 / 2024	PASS	View Log TraceLog_112024_133550_949.txt
9	A_E1_0094_TH_VTN_1	Nov / 20 / 2024	PASS	View Log TraceLog_112024_133701_595.txt
10	A_E1_0096_TH_VTN_1	Nov / 20 / 2024	PASS	View Log TraceLog_112024_133740_396.txt
11	A_E1_0098_TH_VTN_1	Nov / 20 / 2024	PASS	View Log TraceLog_112024_133841_613.txt
12	A_E1_0100_TH_VTN_1	Nov / 20 / 2024	PASS	View Log TraceLog_112024_133941_957.txt
13	A_E1_0102_TH_VTN_1	Nov / 20 / 2024	PASS	View Log TraceLog_112024_134031_532.txt
14	A_E1_0104_TH_VTN_1	Nov / 20 / 2024	PASS	View Log TraceLog_112024_134131_175.txt
15	A_E1_0110_TH_VTN_1	Nov / 20 / 2024	PASS	View Log TraceLog_112024_134233_589.txt

16	A_E1_0130_TH_VTN_1	Nov / 20 / 2024	PASS	View Log TraceLog_112024_134325_023.txt
17	A_E1_0180_TH_VTN_1	Nov / 20 / 2024	PASS	View Log TraceLog_112024_134419_421.txt
18	A_E1_0190_TH_VTN_1	Nov / 20 / 2024	PASS	View Log TraceLog_112024_134514_478.txt
19	A_E1_0200_TH_VTN_1	Nov / 20 / 2024	PASS	View Log TraceLog_112024_134859_225.txt
20	A_E1_0210_TH_VTN_1	Nov / 20 / 2024	PASS	View Log TraceLog_112024_135126_923.txt
21	A_E1_0220_TH_VTN_1	Nov / 20 / 2024	PASS	View Log TraceLog_112024_135747_992.txt
22	A_E1_0230_TH_VTN_1	Nov / 20 / 2024	PASS	View Log TraceLog_112024_140633_792.txt
23	A_E1_0240_TH_VTN_1	Nov / 20 / 2024	PASS	View Log TraceLog_112024_141335_681.txt
24	A_E1_0250_TH_VTN_1	Nov / 20 / 2024	PASS	View Log TraceLog_112024_141640_107.txt
25	A_E1_0260_TH_VTN_1	Nov / 20 / 2024	PASS	View Log TraceLog_112024_142410_739.txt
26	A_E1_0262_TH_VTN_1	Nov / 20 / 2024	PASS	View Log TraceLog_112024_143045_530.txt
27	A_E1_0267_TH_VTN_1	Nov / 20 / 2024	PASS	View Log TraceLog_112024_144217_050.txt
28	A_E1_0268_TH_VTN_1	Nov / 20 / 2024	PASS	View Log TraceLog_112024_145109_603.txt
29	A_E1_0270_TH_VTN_1	Nov / 20 / 2024	PASS	View Log TraceLog_112024_145920_630.txt
30	A_E1_0280_TH_VTN_1	Nov / 20 / 2024	PASS	View Log TraceLog_112024_150602_921.txt
31	A_E1_0285_TH_VTN_1	Nov / 20 / 2024	PASS	View Log TraceLog_112024_150811_699.txt
32	A_E1_0300_TH_VTN_1	Nov / 20 / 2024	PASS	View Log TraceLog_112024_150912_912.txt
33	A_E1_0310_TH_VTN_1	Nov / 20 / 2024	PASS	View Log TraceLog_112024_151027_993.txt
34	A_E1_0340_TH_VTN_1	Nov / 20 / 2024	PASS	View Log TraceLog_112024_151207_564.txt
35	A_E1_0345_TH_VTN_1	Nov / 20 / 2024	PASS	View Log TraceLog_112024_151303_224.txt
36	A_E1_0360_TH_VTN_1	Nov / 20 / 2024	PASS	View Log TraceLog_112024_151359_054.txt
37	A_E1_0370_TH_VTN_1	Nov / 20 / 2024	PASS	View Log TraceLog_112024_151527_227.txt
38	A_E1_0390_TH_VTN_1	Nov / 20 / 2024	PASS	View Log TraceLog_112024_151635_511.txt
39	A_E1_0392_TH_VTN_1	Nov / 20 / 2024	PASS	View Log TraceLog_112024_151751_790.txt

4.2.6 General Tests

No.	Test Cass	Date	Result	Log
1	G1_4005_TH_VTN_1	Nov / 20 / 2024	PASS	View Log TraceLog_112024_131258_256.txt
2	G1_4010_TH_VTN_1	Nov / 20 / 2024	PASS	View Log TraceLog_112024_131450_285.txt
3	G1_4011_TH_VTN_1	Nov / 20 / 2024	PASS	View Log TraceLog_112024_131704_217.txt
4	G1_4012_TH_VTN_1	Nov / 20 / 2024	PASS	View Log TraceLog_112024_131750_562.txt
5	G1_4015_TH_VTN_1	Nov / 20 / 2024	PASS	View Log TraceLog_112024_131846_141.txt
6	G1_4030_TH_VTN_1	Nov / 20 / 2024	PASS	View Log TraceLog_112024_131945_845.txt
7	G1_4007_TH_VTN_1	Nov / 20 / 2024	PASS	View Log TraceLog_112024_132252_602.txt

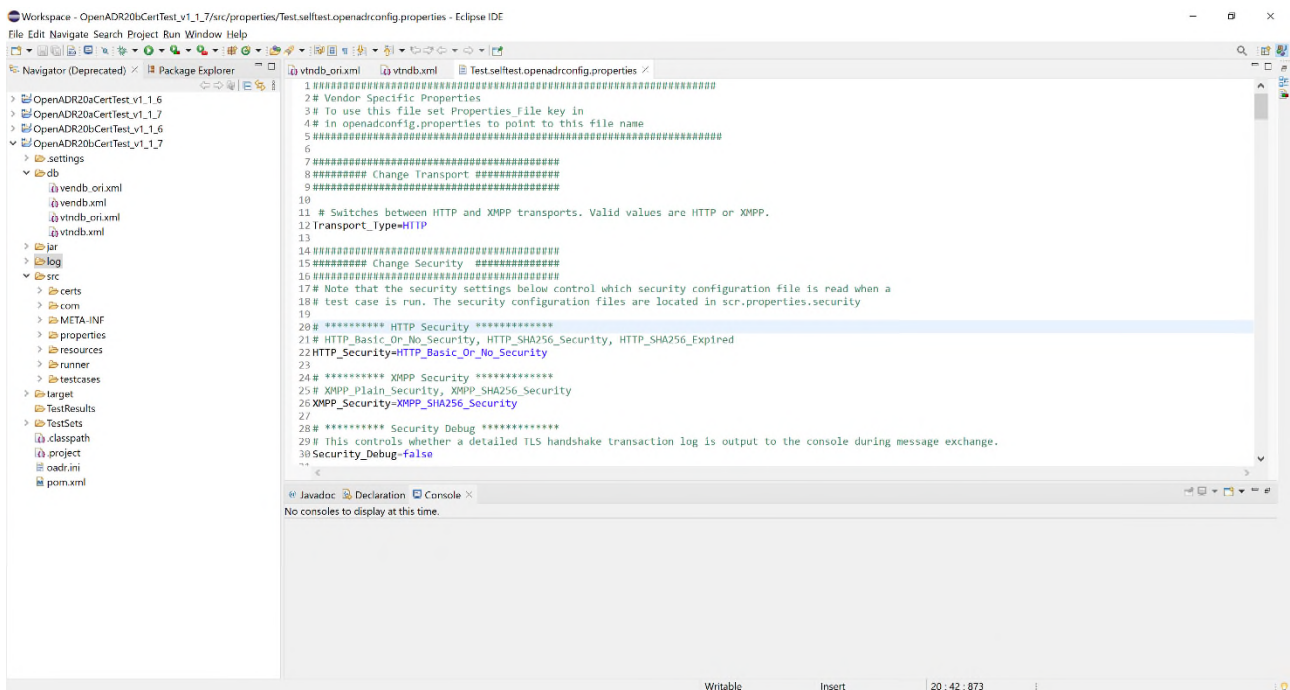
Appendix A: Remarks and References

Log files for the executed test cases are provided in the electronic format.

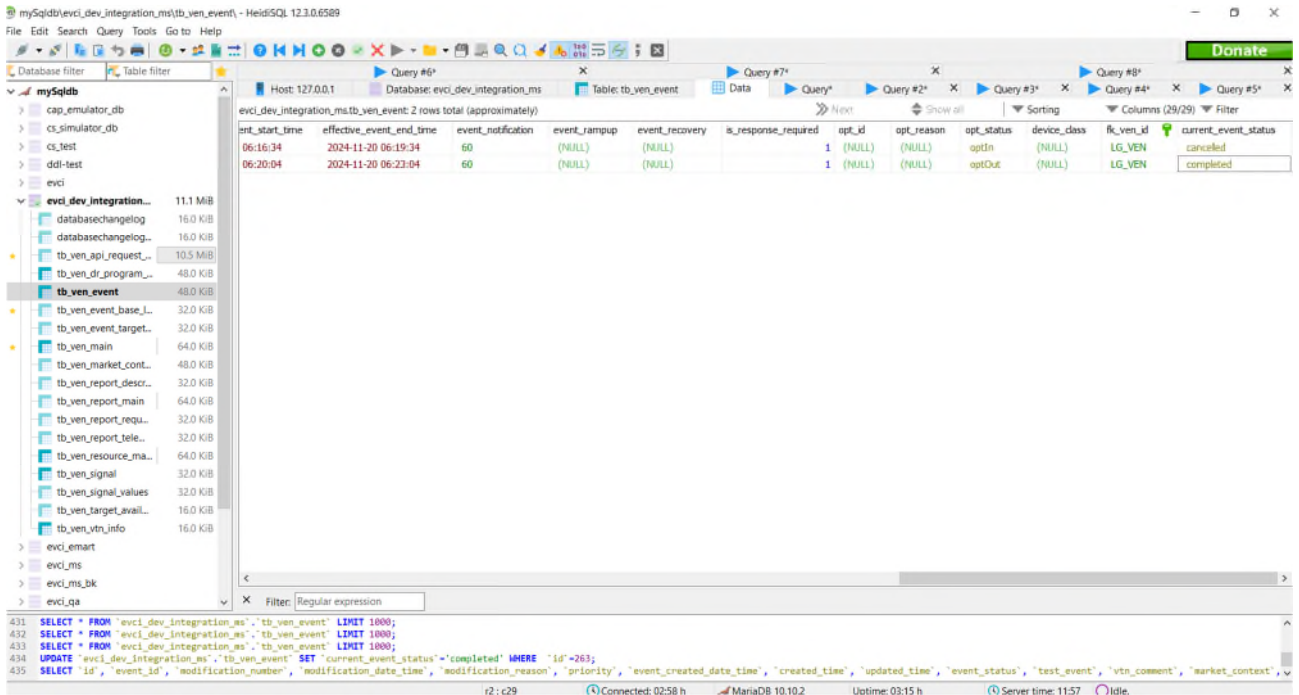
List of all executed tests with links to the log files is located in the “logfile.html” which could be opened in any web-browser.

Appendix B: Photos

- Test harness GUI



- Device Under Test GUI

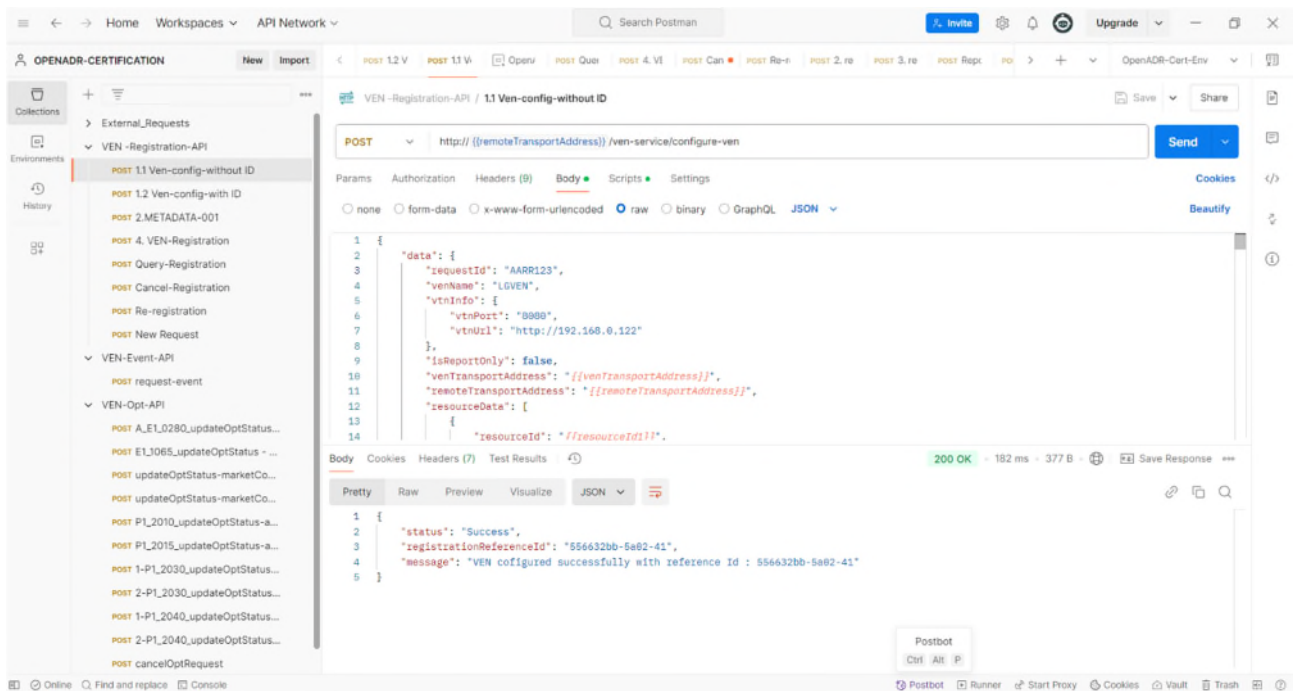


mySqlDb\evci_dev_integration_ms(tb_ven_event) - HeidiSQL 12.3.0.6589

Host: 127.0.0.1 Database: evci_dev_integration_ms Table: tb_ven_event

int_start_time	effective_event_end_time	event_notification	event_rampup	event_recovery	is_response_required	opt_id	opt_reason	opt_status	device_class	fk_ven_id	current_event_status
06:16:34	2024-11-20 06:19:34	60	(NULL)	(NULL)		1	(NULL)	optIn	(NULL)	LG_VEN	canceled
06:20:04	2024-11-20 06:23:04	60	(NULL)	(NULL)		1	(NULL)	optOut	(NULL)	LG_VEN	completed

SQL Query #6*
SELECT * FROM 'evci_dev_integration_ms'.tb_ven_event' LIMIT 1000;
SELECT * FROM 'evci_dev_integration_ms'.tb_ven_event' LIMIT 1000;
SELECT * FROM 'evci_dev_integration_ms'.tb_ven_event' LIMIT 1000;
UPDATE 'evci_dev_integration_ms'.tb_ven_event SET 'current_event_status'='completed' WHERE 'id'=263;
SELECT 'id', 'event_id', 'modification_number', 'modification_date_time', 'priority', 'event_created_date_time', 'created_time', 'updated_time', 'event_status', 'test_event', 'vtn_comment', 'market_context',



VEN-Registration-API / 1.1 Ven-config-without ID

POST http://{{remoteTransportAddress}}/ven-service/configure-ven

Body (raw):

```
{
  "data": {
    "requestId": "AARR123",
    "venName": "LG_VEN",
    "vtnInfo": {
      "vtnPort": "0000",
      "vtnUrl": "http://192.168.0.122"
    }
  },
  "isReportOnly": false,
  "venTransportAddress": "{{venTransportAddress}}",
  "remoteTransportAddress": "{{remoteTransportAddress}}",
  "resourceData": {
    "resourceId": "{{resourceId!}}"
  }
}
```

Response (200 OK):

```
{
  "status": "Success",
  "registrationReferenceId": "556632bb-5a02-41",
  "message": "VEN configured successfully with reference id : 556632bb-5a02-41"
}
```

End of test report