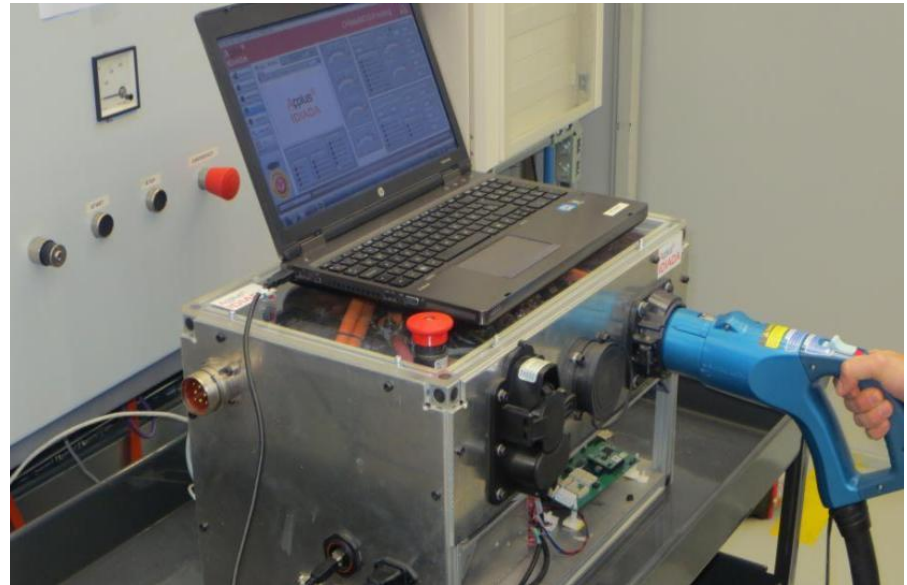


**Applus<sup>+</sup>**  
**IDIADA**

*YOUR DEVELOPMENT PARTNER*



**CHAdeMO certification tests at IDIADA HQ in Europe**

Klaus Kersting, Product Manager EV/HEV

20.05.2014

01\_ IDIADA short introduction

02\_ Charger test activities

03\_ EV Charging simulator

04\_ CHAdeMO certification

05\_ Conclusions

Total: 1.733 people

## Main Centers for Engineering, Testing and Homologation

### Brazil

148

- São Paulo
- Curitiba
- Sete Lagoas
- Tatuí

### China

197

- Shanghai
- Beijing
- Chongqing
- Changchun
- Guangzhou
- Liuzhou
- Shenzhen

### Czech Republic

153

- Hradec Králové
- Liberec
- Mlada Boleslav

### Germany

80

- Ingolstadt
- Munich
- Wolfsburg

### India

119

- Pune
- New Delhi
- Chennai
- Bangalore

### Spain

938

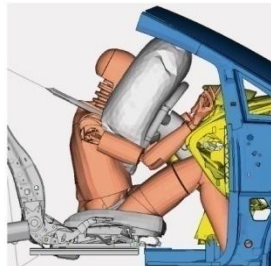
- **Barcelona** - Headquarters & Main Technical Centre
- Madrid
- Granada
- Mojácar
- Vigo

## Other offices

98

- |            |            |                   |            |          |             |
|------------|------------|-------------------|------------|----------|-------------|
| • Bangkok  | • Hinckley | • Kuala Lumpur    | • Paris    | • Puebla | • Togliatti |
| • Brussels | • Istanbul | • Lu Kang         | • Poznan   | • Riyadh | • Tokyo     |
| • Detroit  | • Jakarta  | • Nizhny Novgorod | • Pretoria | • Seoul  | • Turin     |

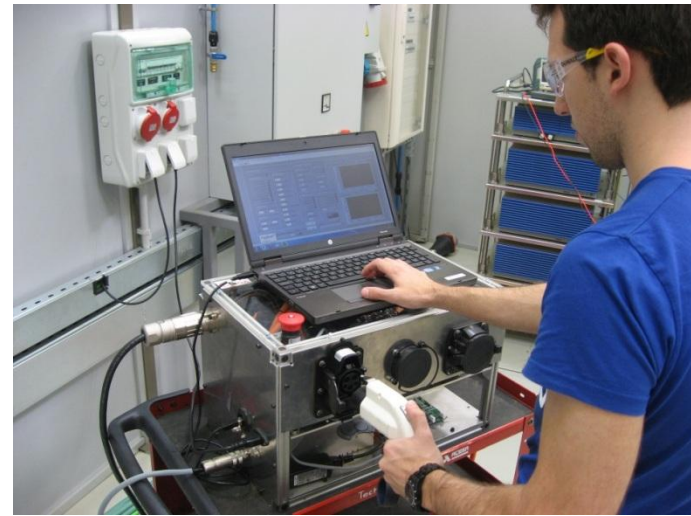
- ⊕ Engineering
- ⊕ Homologation
- ⊕ Proving ground and laboratory testing
- ⊕ Testing facility design



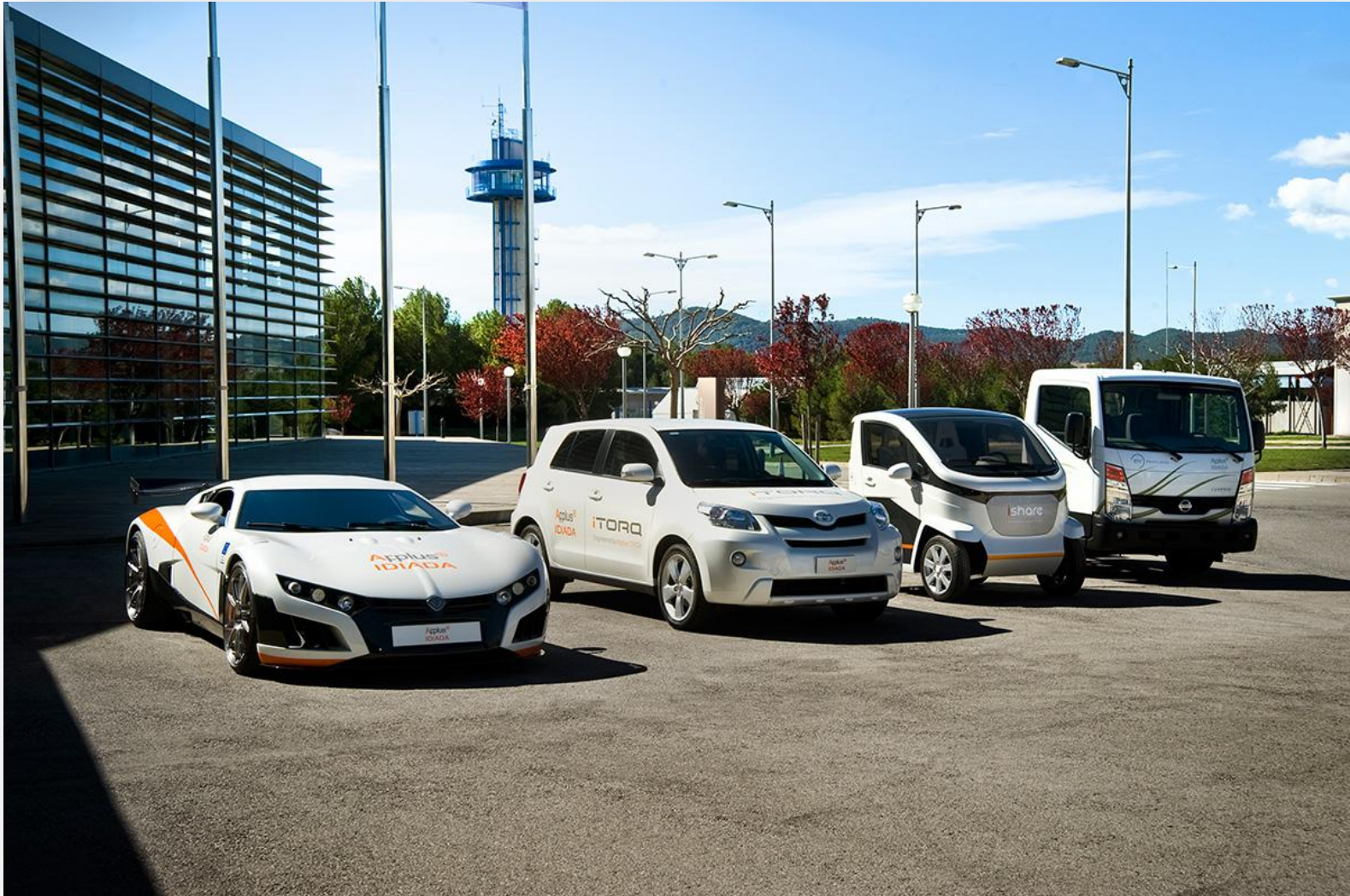
The most comprehensive independent proving ground



Test laboratories for many different functionalities



IDIADA has developed EV prototype vehicle demonstrators



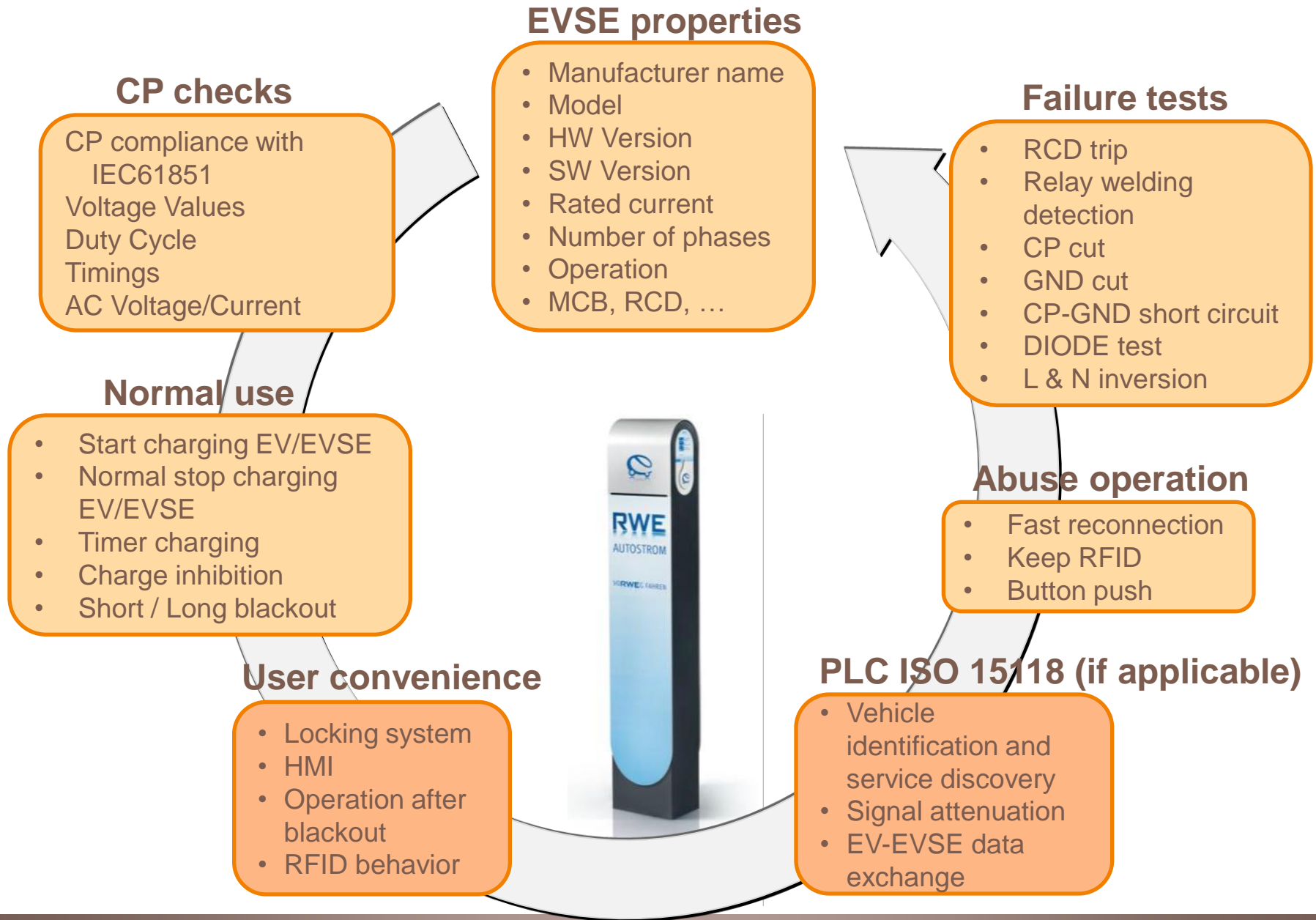
## Specialized charger test workshop



## 160kW battery simulator







## AC Charging

## DC Charging

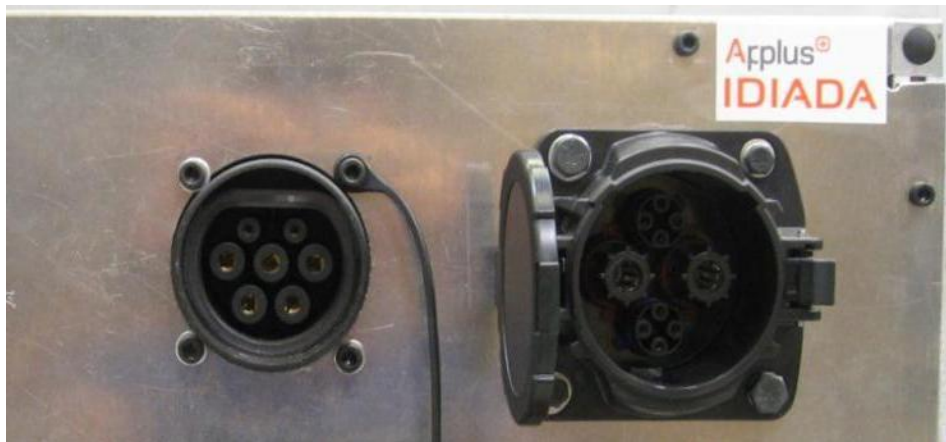
Vehicle



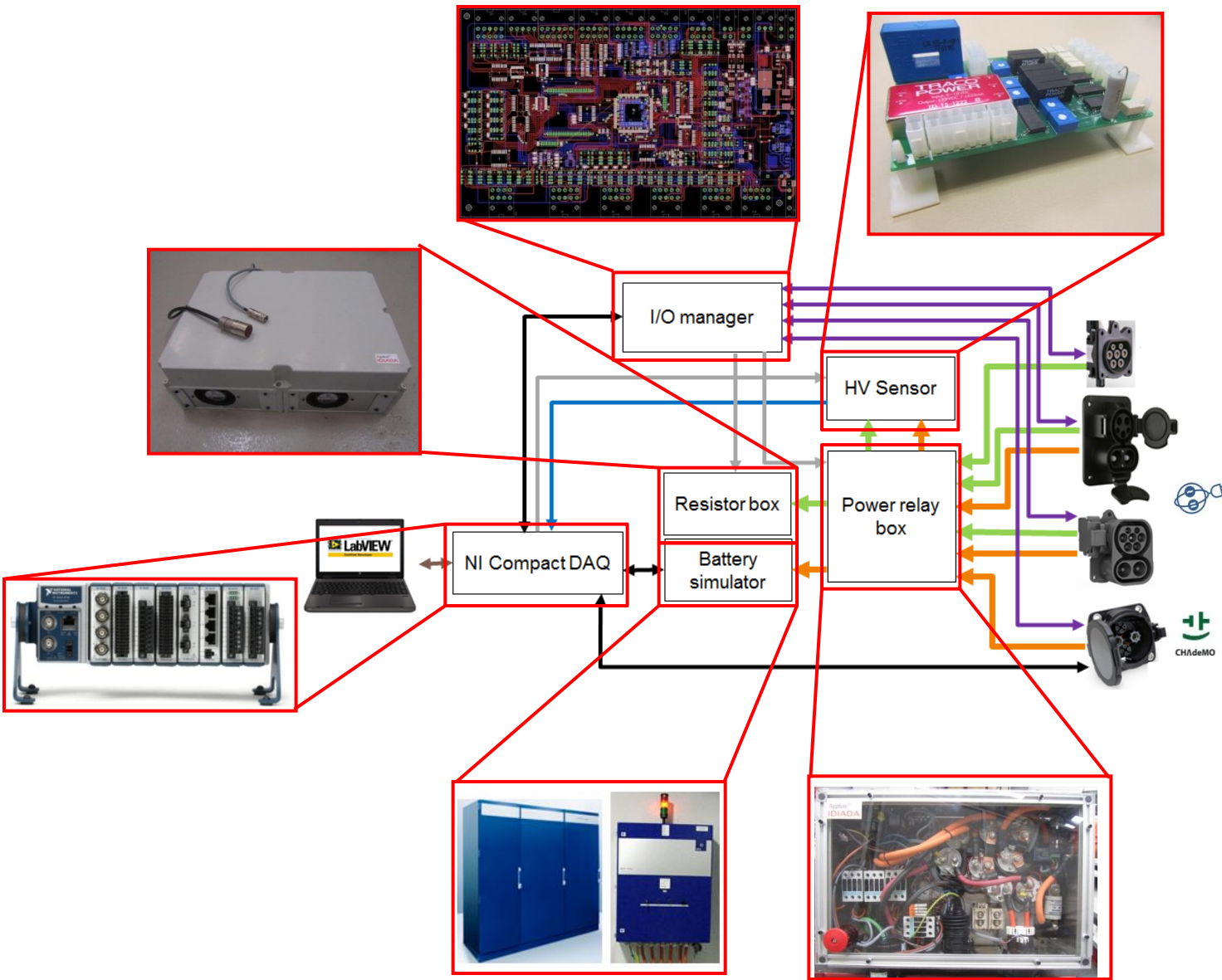
IDIADA performs charger test on a regular basis for different vehicle manufacturers in order to assure safety and compatibility.

More than 120 AC and DC charger tests have been performed so far.

EV Simulator



Tests include simulator and also vehicle tests for both AC and DC charging.

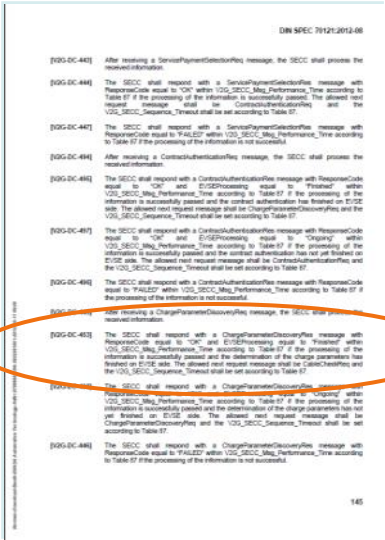


CAN buses
DC power
AC power
Analog & PLC communication
Analog signals
Digital signals
USB

- Prepared for:
- AC mode 3
  - CHAdeMO
  - CCS

Certified by  
CHAdeMO!!!

# Test requirements workflow for QC tests

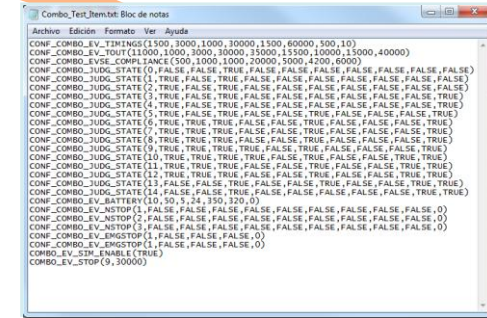


Test no.	Condition	Item to validate	Test Ref. values	Result	Judgement	Regulation	Testing method	Remarks
FI2-4	ServiceParametersOnOffYes	SECC message data	DISE must send at least the mandatory messages. Check integrity with the Req.	002018 / 01676211	OK	EC simulation	EV simulator	2 tests, 20min
FI2-7	ConnectAuthentificationYes	SECC message data	DISE must send at least the mandatory messages. Check integrity with the Req.	002018 / 01676211	OK	EC simulation	EV simulator	2 tests
FI2-8	ChargeParametersDiscoveryYes	SECC message data	DISE must send at least the mandatory messages. Check integrity with the Req.	002018 / 01676211	OK	EC simulation	EV simulator	3 tests

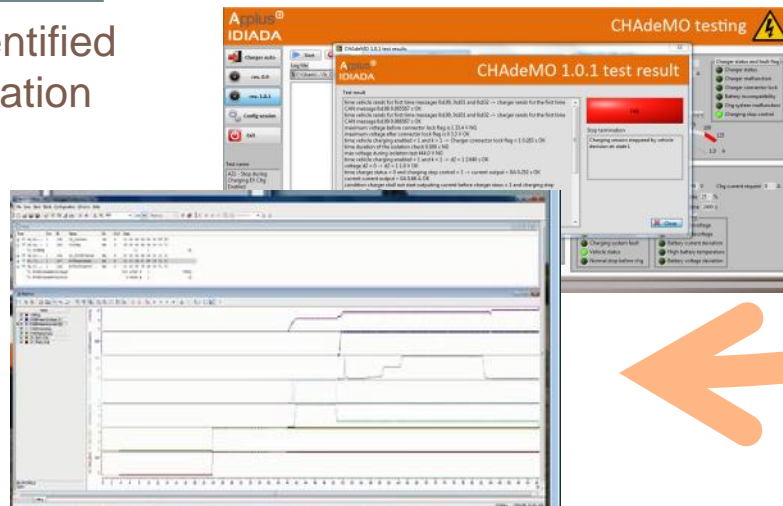
Test no.	Condition	Item to validate	Test Ref. values	Result	Judgement	Regulation	Testing method	Remarks
FI2-9	PowerDataYesYes	SECC message data	DISE must send at least the mandatory messages. Check integrity with the Req.	002018 / 01676211	OK	EC simulation	EV simulator	2 tests
FI2-11	StateDataYes	SECC message data	DISE must send at least the mandatory messages. Check integrity with the Req.	002018 / 01676211	OK	EC simulation	EV simulator	3 tests
FI2-12	PHDataYesYes	SECC message data	DISE must send at least the mandatory messages. Check integrity with the Req.	002018 / 01676211	OK	EC simulation	EV simulator	3 tests

new test item is identified



new simulator test is programmed in a fast user-friendly language

requirement is identified from the specification



Logging data and automatic analysis is generated



requirement is tested with the EV Simulator

Feb 24 – 28, 2014:

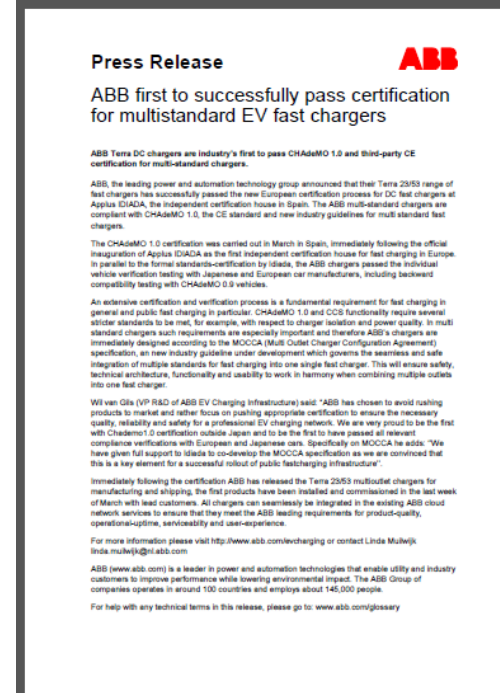
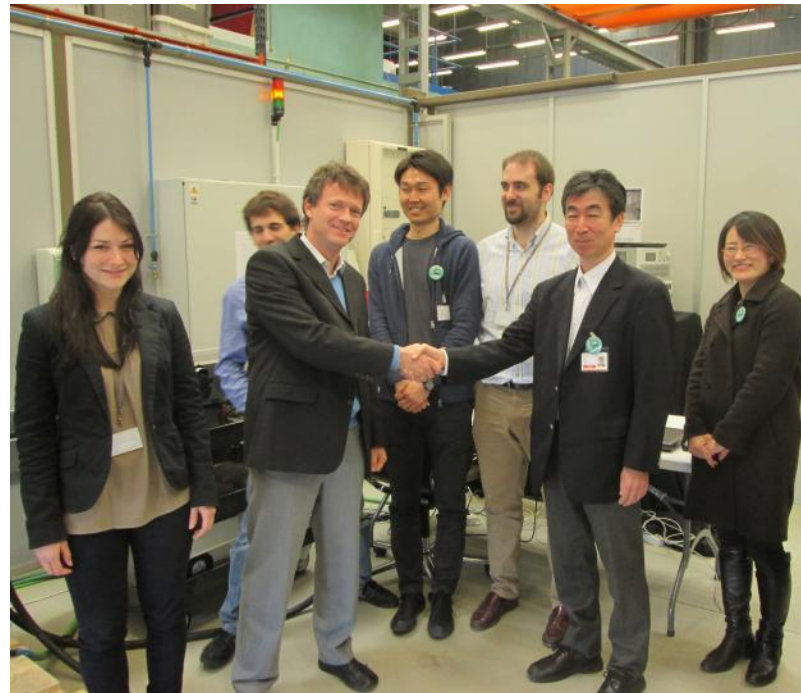
experts from CHAdEMO association visited IDIADA to audit IDIADA engineers and certify test machine

Mar 03 – 07, 2014:

first CHAdEMO 1.0 charger successfully passed the protocol tests

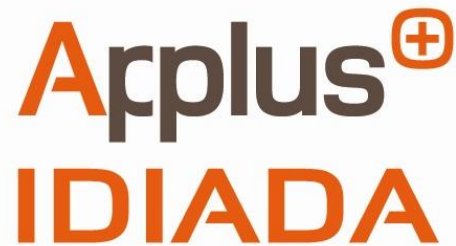
Apr 08, 2014:

first CHAdEMO 1.0 charger certified by IDIADA





IDIADA's charger test team is ready to help you!



**YOUR DEVELOPMENT PARTNER**

For further information:

### **Applus IDIADA**

Main Technical Centre

L'Albornar – PO Box 20

E-43710 Santa Oliva (Tarragona) Spain

T +34 977 166 000

F +34 977 166 007

e-mail: [idiada@idiada.com](mailto:idiada@idiada.com)

**[www.idiada.com](http://www.idiada.com)**

#### **Applus IDIADA Belgium**

T +32 2 719 02 45 (Brussels)

e-mail: [idiada\\_belgium@idiada.com](mailto:idiada_belgium@idiada.com)

#### **Applus IDIADA Brazil**

T +55 41 3373 0411 (Curitiba)

T +55 11 4330 9880 (São Paulo)

T +55 15 3205 2952 (Tatuí)

e-mail: [idiada\\_brasil@idiada.com](mailto:idiada_brasil@idiada.com)

#### **Applus IDIADA China**

T +86 10 8446 3317 (Beijing)

T +86 431 8190 9680 (Changchun)

T+ 86 23 6756 8060 (Chongqing)

T +86 20 2282 9202 (Guangzhou)

T +86 (21) 6210 0894 (Shanghai)

T +86 (772) 3166 619 (Liuzhou)

e-mail: [idiada\\_china@idiada.com](mailto:idiada_china@idiada.com)

#### **Applus IDIADA Czech Republic**

T +420 493 654 811 (Hradec Králové)

T +420 482 424 243 (Liberec)

T +420 326 736 860 (Mladá Boleslav)

e-mail: [info@idiada.cz](mailto:info@idiada.cz)

#### **Applus IDIADA France**

T +33 (0) 141 146 085 (Sèvres CEDEX)

e-mail: [idiada\\_france@idiada.com](mailto:idiada_france@idiada.com)

#### **Applus IDIADA Germany**

T +49 (0) 173 610 2083 (Ilsfeld)

T +49 (0) 841 885 38-0 (Ingolstadt)

T +49 (0) 893 090 560 (Munich)

T +49 (0) 537 155 555 (Wolfsburg)

e-mail: [idiada\\_germany@idiada.com](mailto:idiada_germany@idiada.com)

#### **Applus IDIADA India**

T +91 986 009 8659 (Bangalore)

T +91 994 0679 933 (Chennai)

T +91 124 4028 888 (New Delhi)

T +91 203 0556 900 (Pune)

e-mail: [idiada\\_india@idiada.com](mailto:idiada_india@idiada.com)

#### **Applus IDIADA Italy**

T +39 011 3997 764 (Turin)

e-mail: [idiada\\_italia@idiada.com](mailto:idiada_italia@idiada.com)

#### **Applus IDIADA Japan**

T +81 (0) 42 512 8982 (Tokyo)

e-mail: [idiada\\_japan@idiada.com](mailto:idiada_japan@idiada.com)

#### **Applus IDIADA South Korea**

T +82 31 478 1821 (Seoul)

e-mail: [idiada@idiada.co.kr](mailto:idiada@idiada.co.kr)

#### **Applus IDIADA Madrid**

T +34 915 095 795 (Madrid)

e-mail: [idiada\\_madrid@idiada.com](mailto:idiada_madrid@idiada.com)

#### **Applus IDIADA Malaysia**

T +603 9207 7018 (Kuala Lumpur)

e-mail: [idiada\\_malaysia@idiada.com](mailto:idiada_malaysia@idiada.com)

#### **Applus IDIADA Poland**

T +48 61 6226 905 (Poznan)

e-mail: [idiada\\_polska@idiada.com](mailto:idiada_polska@idiada.com)

#### **Applus IDIADA Russia**

T +7 (831) 297 94 32 (Nizhny Novgorod)

e-mail: [idiada\\_russia@idiada.com](mailto:idiada_russia@idiada.com)

#### **Applus IDIADA Saudi Arabia**

T +966 53 4147 301 (Riyadh)

e-mail: [idiada\\_GCC@idiada.com](mailto:idiada_GCC@idiada.com)

#### **Applus IDIADA Taiwan**

T +886 47 810 702 (Lu-Kang)

e-mail: [idiada\\_taiwan@idiada.com](mailto:idiada_taiwan@idiada.com)

#### **Applus IDIADA Thailand**

T +66 86 7917 071 (Bangkok)

e-mail: [idiada\\_thailand@idiada.com](mailto:idiada_thailand@idiada.com)

#### **Applus IDIADA Turkey**

T +90 216 250 6050 (Istanbul)

e-mail: [idiada\\_turkey@idiada.com](mailto:idiada_turkey@idiada.com)

#### **Applus IDIADA UK**

T +44 (0) 7 979 691 631 (Hinckley)

e-mail: [idiada\\_uk@idiada.com](mailto:idiada_uk@idiada.com)

#### **Applus IDIADA USA**

T +1 248 656 3469 (Detroit)

e-mail: [idiada\\_USA@idiada.com](mailto:idiada_USA@idiada.com)

#### **CTAG IDIADA**

T +34 986 900 300 (Pontevedra)

e-mail: [ctag\\_idiada@idiada.com](mailto:ctag_idiada@idiada.com)