



OBC AND DC-DC CONVERTER POWER HIL TESTBED MODEL 8620

Chroma ATE introduces the 8620 OBC and DC-DC Converter Power HIL Testbed, equipped with comprehensive testing capabilities for EV charging and powertrain components. The system's flexible hardware configuration allows it to meet DUT-specific testing requirements. Options include programmable DC power supplies, programmable DC electronic loads, digital power meters, and oscilloscopes. This versatile testbed supports various system architectures and provides advantages such as scalability and platform sharing.

The Chroma 8620 is specifically designed for the R&D of on-board chargers (OBC) and DC-DC converters. It features user-friendly software with graphical user interfaces for monitoring and control, manual and automated testing, and automated test report generation. This suite of capabilities meets the needs of high-volume, repeatable testing, enhancing both test coverage and efficiency.

The Chroma 8620 supports loading of Simulink-based vehicle models. This allows customers to leverage their existing models without the hassle of time-consuming redevelopment. Additionally, the system supports CAN HS/FD and LIN communication interfaces for loading of DBC and LDF files.

Besides simulating the DUT's normal operating conditions in real environments and verifying its functionality, the Chroma 8620 can also simulate abnormal operating conditions, including communication anomalies and signal faults (open circuit, short to ground, short to battery, pin-to-pin short). By identifying potential hazards that may occur during charging or driving, this pre-vehicle testing approach not only prevents accidents and reduces risks but also significantly lowers the costs associated with whole-vehicle testing.

MODEL 8620

KEY FEATURES

- Supports customized hardware configuration, platform sharing, and expansion
- Flexible software platform
 - Intuitive user interfaces for monitoring and operation
 - Manual testing capabilities
 - Automated test program editing
 - Automated test report generation
 - Supports LabVIEW, C/C++, Python, .NET languages
 - Supports data recording
- Supports CAN, CAN FD, LIN, and RS-485 communication
- Integrated real-time system and fault injection unit for comprehensive ISO 26262 functional safety test
- Supports importing Simulink-based vehicle models to verify dynamic performance with NEDC, WLTP, etc. driving patterns
- Supports advanced automated test software through ASAM XIL and ASAM XIL-MA
- Independent PLC monitoring system to ensure testbed safety

APPLICATIONS

- OBC calibration & verification
- DC-DC converter calibration & verification
- OBC & DC-DC converter 2-in-1 calibration & verification
- Reliability and durability testing
- Vehicle driving cycle conditions simulation
- System integration testing



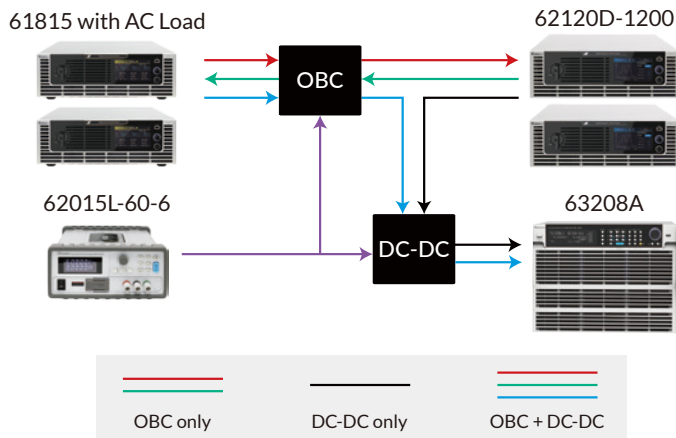
VEHICLE DEVELOPMENT PROCESS AND TEST REQUIREMENTS

The Chroma 8620 OBC and DC-DC Converter Power HIL Testbed supports Hardware-in-the-Loop testing compliant with the ISO 26262 V-model for functional safety in automotive development. It covers failure modes, functional hazard analysis, and potential risk mitigation for on-board chargers (OBC) and DC-DC converters in the design stage of the V-model. Various vehicle operating conditions can be simulated on the platform, enabling users to identify and correct issues early in development before whole-vehicle trials, helpful in obtaining Automotive Safety Integrity Level (ASIL) certification.

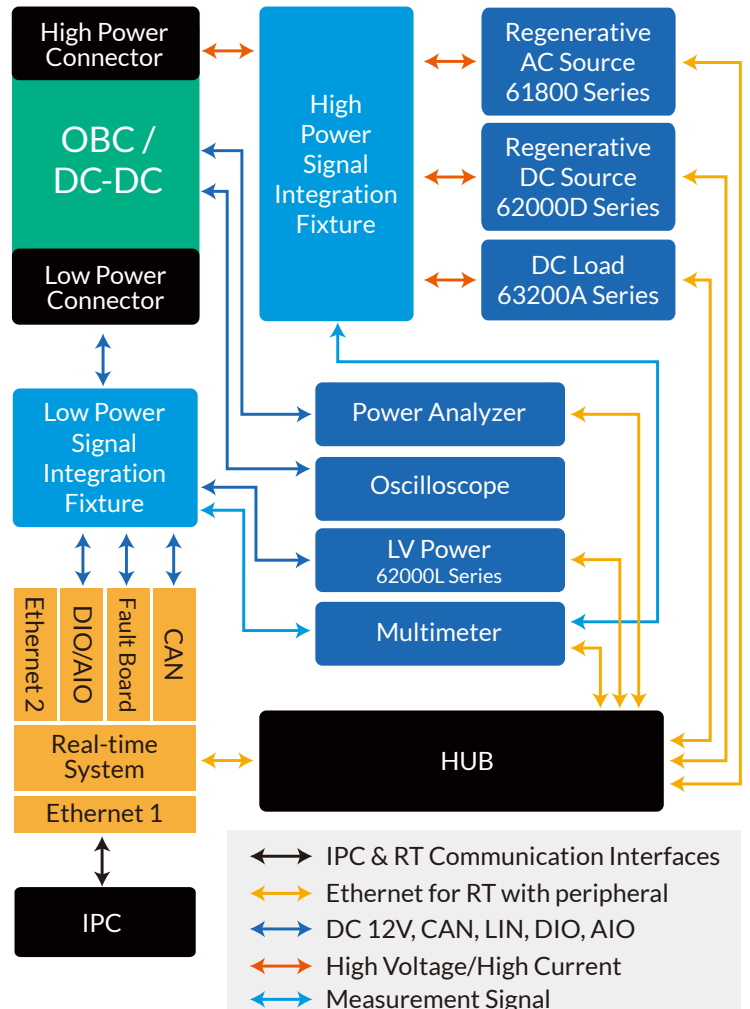
The testbed's versatile architecture supports expansion or replacement of peripheral equipment to meet the testing needs of different DUT specifications. Existing configurations can be easily modified for new projects, eliminating the need to start from scratch. The Chroma 8620 enables users to perform highly repeatable automated tests, reducing errors caused by operator fatigue during long manual testing sessions. These capabilities combined significantly reduce the number of whole-vehicle tests required, cut development costs, shorten testing schedules, and improve testing efficiency.



The Chroma 8620 employs a flexible software architecture that enables loading of CAN HS/FD and LIN communication files. It combines real-time systems, power equipment, measurement instruments, and mathematical vehicle models for dynamic real-time testing of OBCs and DC-DC converters. Users can flexibly edit the user interfaces and automated test sequences during manual or automated testing. Automated testing supports higher-level testing software using the ASAM XIL interface. Upon completing automated test procedures, the platform generates test reports automatically for convenient review of test variations and results. Test data can also be recorded and stored in TDMS, CSV, or Text format for further analysis.



The 8620 platform supports testing of three DUT architectures: OBC, DC-DC, or OBC + DC-DC. Both the user interface and automated test sequences can be repeatedly edited or duplicated for adaptation to new DUTs or projects. The automated test sequences support programming in familiar languages such as LabVIEW, C/C++, Python, and .NET, promoting reusability across R&D teams, avoiding duplicate engineering work, and improving overall development efficiency.



OPTIMIZED TEST ITEMS & USER INTERFACES

The Chroma 8620 offers a highly customizable software platform for creating automated test sequences. Beyond (editable) standard regulatory tests for OBCs and DC-DC converters, the testbed can also be custom-programmed for DUT functional testing, including power cycling, normal and abnormal communication behaviors, and signal fault injection. The system can simulate various control sequences, timing variations, and fault behaviors, enhancing overall test coverage. This enables execution of tests that cannot be performed on complete vehicles, preventing costly and dangerous field failures, and allowing early completion of hazard analysis and risk assessment.

The software platform's customizable user interfaces are based on integrated power equipment, measurement devices, and vehicle models. Through the UI, users can conduct test operations and monitor data in real-time, including parameter changes, chart displays, and signal status, offering both user convenience and testing efficiency.

On-Board Charger (OBC)

Regulation Testing

1. AC input voltage/frequency range test
2. Three-phase AC voltage phase deviation test
3. Start input surge current test
4. DC output voltage/current/power limiting test
5. DC output voltage/current error test
6. DC output voltage ripple factor test
7. Start output overshoot test
8. Output load dump test
9. Power factor test
10. Charging efficiency test
11. AC/DC input over and under voltage protection test
12. Phase loss protection test
13. Over temperature protection test
14. Other*

DUT Functional Testing

1. CAN basic communication function test
2. Input linear regulation test
3. Output load regulation test
4. Input frequency limit test
5. Power-on frequency limit test
6. Static power test
7. Input voltage limit test
8. Power-on input voltage limit test
9. Communication abnormality test
10. Signal fault injection testing
11. Charging process abnormality test
12. Other*

DC-DC Converter

Regulation Testing

1. Efficiency test
2. Rated power test
3. Voltage control error test
4. Current control error test
5. Overshoot and recovery time testing
6. Quiescent current test
7. Output voltage ripple coefficient test
8. Input/output over/under voltage protection test
9. Output short circuit protection test
10. Over temperature protection test
11. Other*

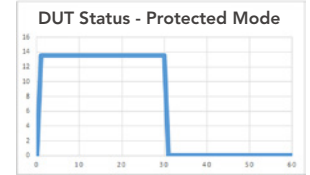
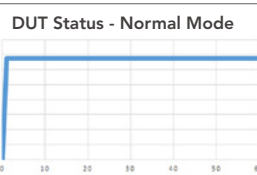
DUT Functional Testing

1. CAN basic communication function test
2. Input linear regulation test
3. Output load regulation test
4. Input linearity/output load regulation combined test
5. Online output voltage adjustment test
6. Input voltage limit test
7. Power-on input voltage limit test
8. Output voltage rise/fall time test
9. Signal fault injection testing
10. Other*

Input Correct Control Flow, Data, Time



Input Abnormal Control Flow, Data, Time, Fault



* Ask for a complete list



POWER HIL DEDICATED SYSTEM ARCHITECTURE

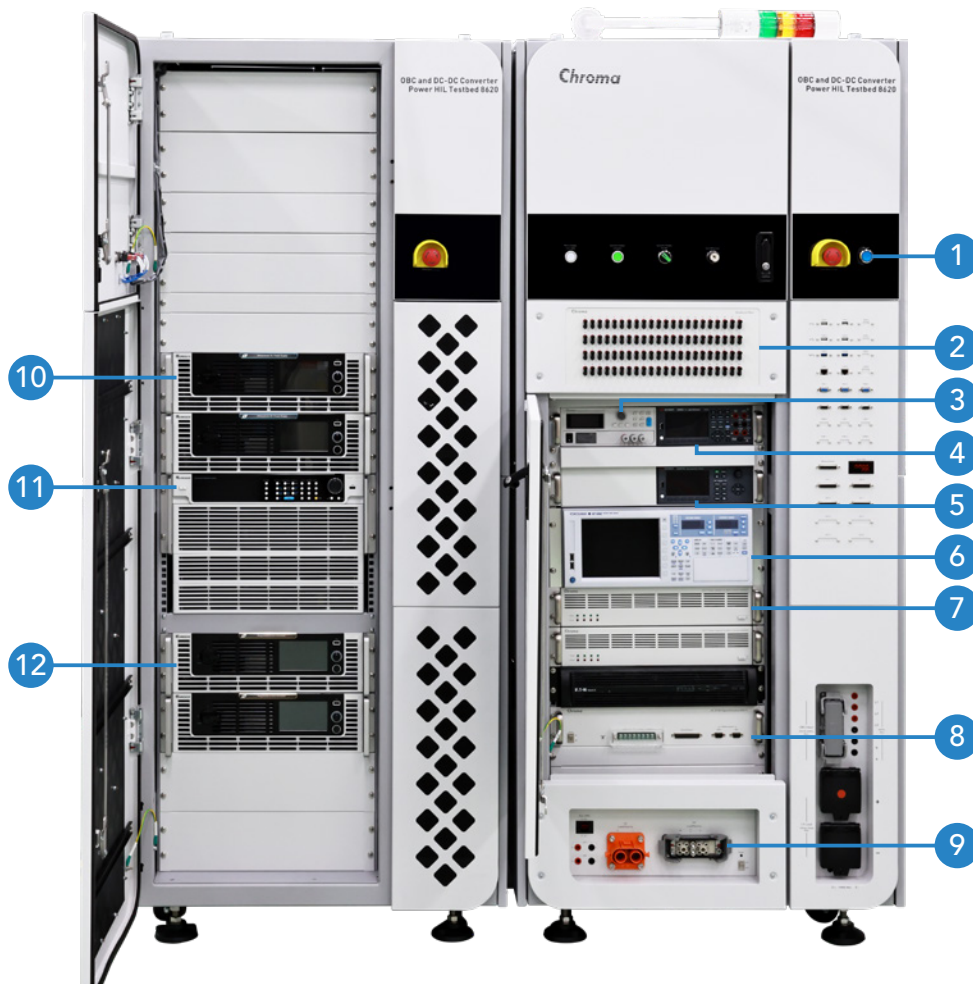
The Chroma 8620 supports customized hardware configurations, offering dedicated Power HIL main cabinets and auxiliary cabinets that integrate power equipment for optimal use of test space.

An independent PLC monitoring system provides real-time monitoring of system software and power equipment operation status, promptly activating protection and warning mechanisms to prevent damage to equipment and DUTs.



Extension Rack

Main Rack



1. Status display panel
2. Breakout Box
3. DC power supply
62000L series
4. Digital multimeter
Keysight 34465A
5. Data acquisition system
Keysight DAQ970A
6. Power analyzer
YOKOGAWA WT1806E
7. DCCT power adapter
A662025
8. EVSE signal simulator
9. Input/output control box
10. DC power supply
62000D series
11. DC electronic load
63200A series
12. Regenerative grid simulator
61800 series

ORDERING INFORMATION

8620: OBC and DC-DC Converter Power HIL Testbed
 Regenerative Grid Simulator: 61800 Series
 DC Power Supply: 62000H, 62000D, 62000P, 62000L Series
 DC Electronic Load: 63200A Series
 Multi-function test platform / AC EVSE signal simulator: 80700 / 80703

*1: The number of racks depends on the order specifications.

*2: All specifications are subject to change without notice.

Get more information by downloading Chroma ATE APP



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Search Keyword

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