REGENERATIVE BATTERY PACK TEST SYSTEM MODEL 17050

The Chroma 17050 system is a versatile platform that can be equipped with DC sources of different power ratings to cover a wide range of applications. Designed for both global and regional markets, it accommodates diverse power configurations to deliver tailored charge/discharge test solutions, along with customized system integration and worldwide service support.

Energy Recycling

The system features regenerative technology that recovers the large amount of power normally dissipated as heat during battery cycling. This not only reduces energy consumption but also ensures stable test performance without introducing harmonic interference to other equipment. The recovered energy can be fed back to the grid for reuse, easing the load on power infrastructure, reducing thermal management challenges, and aligning with green energy policies.

Independent Channel Architecture

The system supports testing of multiple battery modules or packs simultaneously, with each channel providing independent test characteristics. Channels can also be paralleled to meet higher current requirements, offering flexibility between high channel-count testing and high-current applications.

Versatile Programming

The Chroma 17050 system, together with Chroma's Battery Pro X software, offers flexible programming with an intuitive interface for editing and executing test steps. The software supports graphical creation of test programs, predefined test modules, real-time data monitoring, and seamless integration with external equipment. These features make test configuration more accurate and more efficient, meeting the needs of demanding applications.

Battery Reliability Testing

The system features dedicated functions for evaluating the self-discharge rate of batteries during long-term storage, providing an in-depth analysis of durability and performance. The resulting data provides critical support for subsequent applications.

High-Speed Response Capability

With Chroma's Battery Pro X software integrated with third-party hardware, abnormal conditions can be detected in real time, triggering charge/discharge protection to stop the test. Combined with a BMS designated by Chroma and a data logger, the system achieves sampling latency of less than 10ms. This capability supports battery performance prediction, degradation analysis, and protection parameter verification, while ensuring accurate test status monitoring, data recording, fault diagnosis, and safety protection.

Customized Integration with Chambers and Chillers

The system can be software-integrated with third-party chambers and chillers to achieve precise control of both temperature and humidity. This reduces fragmented operation across multiple devices, simplifies overall workflow, and effectively shortens setup and operating time.

With these features, the Chroma 17050 system delivers a high-efficiency, fast-response, all-in-one solution for battery testing. Channels can be used independently or paralleled to support different testing needs. The system also simplifies durability testing, enables temperature and humidity control, and provides flexible programming functions. Together, these capabilities make operation easier while fully meeting the requirements of diverse test environments.

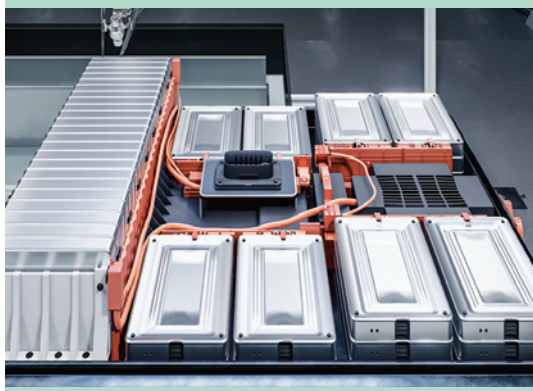
MODEL 17050

Key Features

- Customized integration functionality:
  - Current/voltage ranges:
    - 180A/360A/540A@100V models
    - 40A/80A/120A@600V models
    - 55A@1200V models
    - 180A@2000V models
  - Power ranges:
    - Supports parallel operation up to 20 units:
      6kW/12kW/18kW @100V models
    - Supports parallel operation up to 40 units:
      6kW/12kW/18kW @600V models
      12kW/18kW @1200V models
      36kW/45kW @2000V models
- Battery discharge energy recovery and reuse (Efficiency >90%, PF >0.95, I_THD <5%)
- Smooth current switching: seamless transition between charge/discharge with no interruption or surges
- Test data analysis: reports and graphical presentation of results
- Independent or parallel channel operation
- Data protection: supports restoration of test data after power interruption
- Optional accessories enable fast response capability with latency <10ms
- Customized integration functionality:
  - BMS data acquisition and judgment
  - Integration with chambers and chillers
  - Multi-channel voltage/temperature acquisition

Applications

- Backup battery modules
- Electric vehicle battery modules
- Electric scooter traction batteries
- E-bike batteries
- Power tool batteries
- Energy storage system batteries

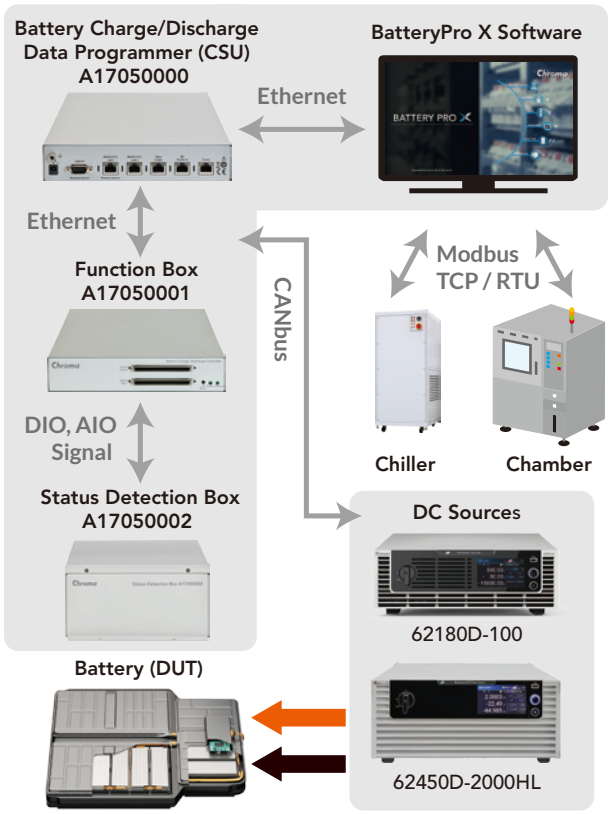


Chroma

SYSTEM FEATURES

Suitable for Space-Constrained Applications

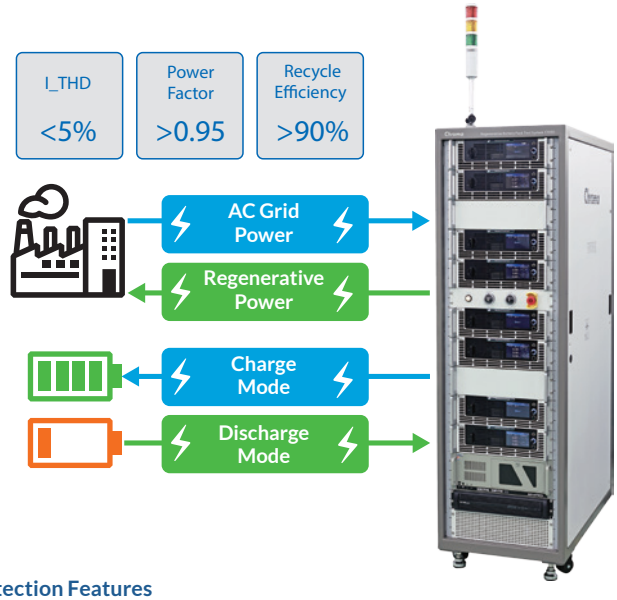
The 17050 model can be configured to communicate with stand-alone units and DC sources designated by Chroma. With Chroma's Battery Pro X software, each channel can perform independent testing to meet a wide range of battery pack requirements. The system also supports integration with chambers and chillers, and unlike fixed rack-based setups, offers greater flexibility for use in space-limited test environments. A reference diagram is shown below.



Discharge Energy Recovery

- Energy can be recycled back to the grid or internal loads, with recovery efficiency >90%
- Low heat output reduces air-conditioning demand and lowers operating costs
- At rated power, the power factor (PF) exceeds 0.95

The system delivers high power testing capability even in space- limited environments. A single cabinet achieves a maximum power density of 106kW/m³ while weighing only 1600lbs, minimizing footprint and saving valuable floor space.



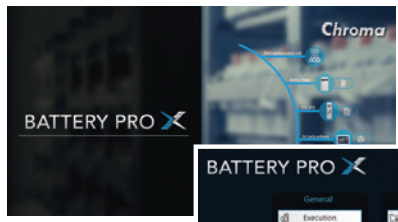
Protection Features

- Overcharge voltage, overdischarge voltage, overcurrent, overtemperature, overcapacity, and short-circuit resistance protection
- Reverse connection protection and line-loss protection (ΔV)
- Delta protection: −ΔV/+ΔV (voltage), +ΔI/−ΔI (current) protections

The system also features a pre-charge circuit that prevents inrush current from damaging power components.

BATTERY CHARGE/DISCHARGE SOFTWARE BATTERY PRO X

The 17050 test system pairs with Chroma's Battery Pro X software, which is designed to meet the diverse requirements of rechargeable battery testing with robust safety and stability. When abnormal conditions are detected, the system's charge/discharge protection automatically halts the test to ensure data integrity. In addition, the software provides flexible programming, fast response capability with data acquisition latency of less than 10ms, and comprehensive data protection. These functions prevent data loss caused by unexpected power interruptions while supporting secure storage and rapid recovery, delivering a highly synchronized and reliable testing solution.



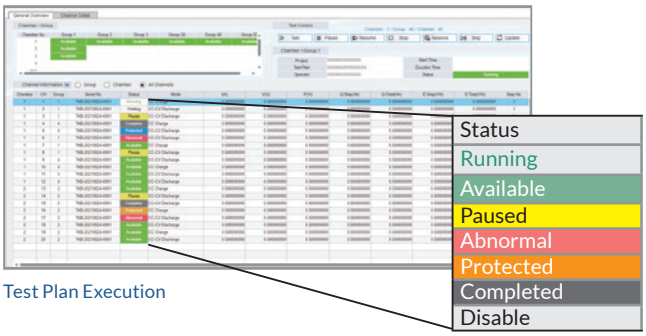
Main Screen

Menu Screen

- **Configuration**
  - Hardware Config.
  - Channel Binding
  - I/O Mapping
- **Test Plan**
  - UUT Setup
    - Protection setting
    - BMS Mapping table
    - CAN/RS-485 setting
  - Main Recipe
  - Sub-Recipe
- **Execution**
  - Chamber/Group
  - Test Control
  - Channel Info.
  - Event Monitor
- **Report**
  - Auto Report
  - Data Spectrum
- **Management**
  - Project Management
  - User Control
  - Log / Storage Setting
  - Others

Designed for Battery Applications

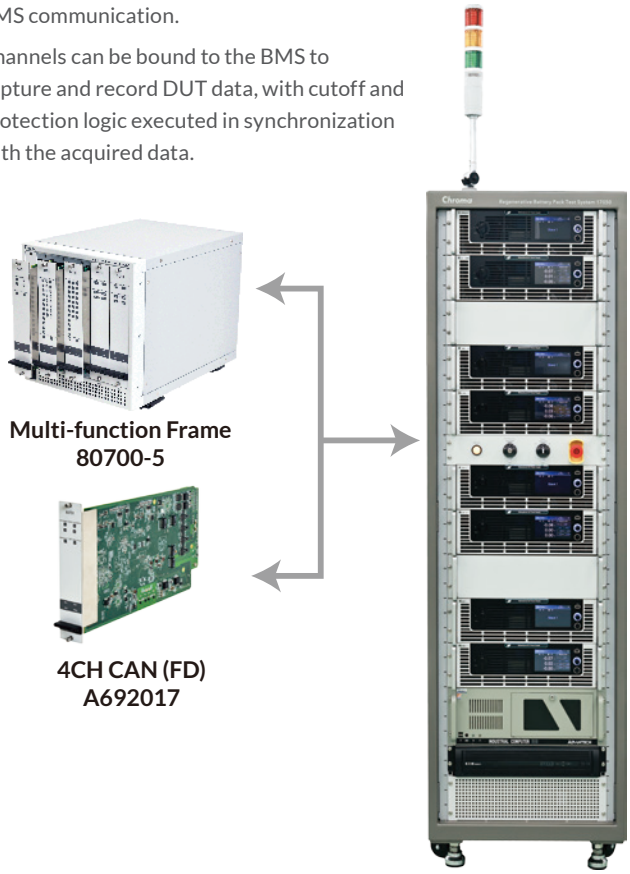
- Comprehensive control of battery charge/discharge cycles and test functions, from basic measurements to advanced data analysis, all performed with industry-leading precision and efficiency.
- The Test Plan Execution screen clearly visualizes channel status, improving workflow and reducing training time to deliver a streamlined testing experience.
- The Channel Detail screen allows users to monitor testing progress and data in real time.
- The Recipe Editor features an intuitive interface enabling users to quickly create and modify test recipes.



Test Plan Execution

BMS Communication Functions

- Uses the Chroma 80700-5 standard chassis integrated with the A692017/4CH CAN (FD) bus communication card module to perform BMS communication.
- Channels can be bound to the BMS to capture and record DUT data, with cutoff and protection logic executed in synchronization with the acquired data.

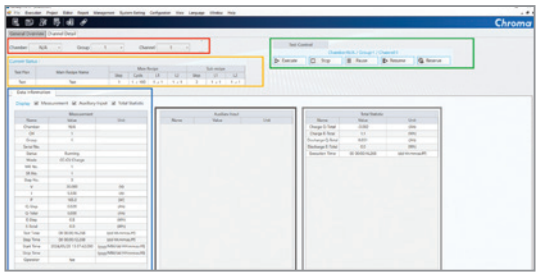


Multi-function Frame 80700-5

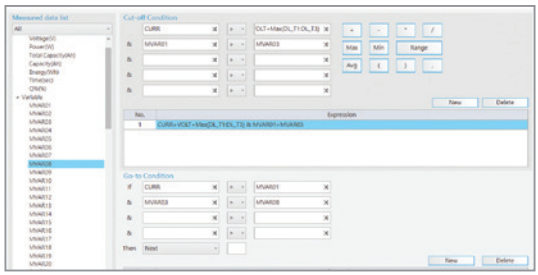
4CH CAN (FD) A692017

Test Step Setup

- Three-layer recipe structure: Test Plan, Main Recipe, Sub Recipe
- Each Test Plan can include up to 10 Main Recipes
- Each Main Recipe can include up to 50 Sub-Recipes or 500 charge/discharge conditions
- Each Sub-Recipe can include up to 200 charge/discharge conditions
- Dual-level looping (Cycle & Loop): each layer supports up to 999,999 cycles
- Supports dynamic charge/discharge waveform editing with current switching speed of 10ms
- Test steps include: CV, CC, CP, CC-CV, waveform current, and DCIR
- Cutoff/jump conditions can be defined by time, current, capacity, cutoff voltage, cutoff current, or variable settings. Logical expressions and If-Then-Else rules are also supported, enabling flexible parameter configuration aligned with testing and verification logic.



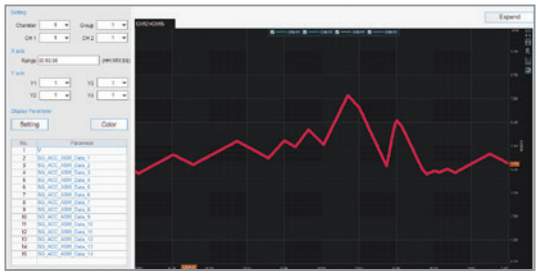
Channel Detail



Cutoff/jump Condition Setup

Report Analysis and Statistical Reporting

- Generate detailed reports and step-by-step reports
- Customizable report formats with export to PDF, CSV, and XLS
- Graphical reporting functions included
- Report analysis tools allow users to create customized reports by defining X- and Y-axis parameters, such as lifecycle reports, Q Ah) – V reports, and V/I(A)/T (°C) vs. time reports
- Real-time viewing of test reports for each channel



Real-Time Chart

SPECIFICATIONS

Model									
Power per channel		18kW						36kW	45kW
Max. Power (Parallelable)		360kW (20 units)		720kW (40 units)				1440kW (40 units)	1800kW (40 units)
Voltage Range		0-100V		0-600V		0-1200V		35V-650V/105V-2000V	
Max. Voltage per channel		200V (2 units series)		1200V (2 units series)		1200V		2000V	
Max. Current per channel		540A		120A		40A		180A/60A	
Channels		1CH to 4CH							
Setting/Measurement per channel									
Voltage Accuracy ± (% of full scale)		0.05% + 0.05%						0.02% + 0.02%	
Voltage Accuracy & Voltage Resolution (2 Scales as full scale)	1	0-100V/200V	10mV	0-600V/1200V	10mV	0-600V/1200V	100mV	105V-2000V	100mV
	2	0-20V/40V	10mV	0-120V/240V	10mV	0-120V/240V	100mV	35V-650V	100mV
Current Accuracy ± (% of full scale)		0.1% + 0.1%						0.04% + 0.04%	
Current Accuracy & Current Resolution (2 Scales as full scale)	1	540A	10mA	120A	10mA	40A	10mA	180A	10mA
	2	108A	10mA	24A	10mA	8A	10mA	60A	10mA
Current Slew Rate/ms		30A		60A		20A		90A/30A	
Others									
Protection		OVP, UVP, OCP, OPP, FAN							
Operating Temperature		32°F to 104°F (0°C to 40°C)							
Storage Temperature		-40°F to 185°F (-40°C to 85°C)							
Operating Humidity		5% to 85% RH, non-condensing							
Safety & EMC		CE *2							
Cabinet Weight		±1600 lbs *3							
Cabinet Dimension (W x D x H)		24 in x 43 in x 81 in *3							

*All specifications are subject to change without notice.

Note *2: Please refer to the user manual for details.

Note *3: These specifications are for reference only and may vary depending on power configuration.

ORDERING INFORMATION

Regenerative Battery Pack Test System Model 17050			
Power Range	Voltage (V)	Current (A)	Channels
144kW/360kW *1	100/200	540	1-4
720kW *1	600/1200	120/40	1-4
1,440kW *1	2,000	60	1-4
1,800kW *1	2,000	60	1-4

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