Innova Robotics Instruments
Active Load DL-series
ATR-DL-PRJ-060
January 2026
DS-PRJ060 Rel.2.0

The DL-1.1 Active Load (2026) is an evolution of the DL-1.0 microprocessor-controlled device, designed for use in laboratories, industrial applications, and workshops. Developed by ATEC Robotics in collaboration with Innova Robotics, it enables high-precision measurement and characterization of current, voltage, and power. A dissipative operating principle is employed to ensure high stability and accurate voltage and current measurements. The system is optimized for testing fully assembled battery packs, with a maximum dissipation capability of **up to 1 kW**.

The DL-1.1 supports continuous power dissipation of up to **1 kW** and is cooled by controlled forced airflow. The **DL-10.0** model is equipped with a liquid cooling system. Models **DL-2.0** and **DL-10.0** are manufactured on request, as the DL-1.1 meets the practical requirements of nearly all sustainable-mobility battery manufacturers and is therefore the most widely requested model.

DL-US models refer to custom-built units manufactured according to specific customer requirements and typically produced in defined batch quantities.

The **DL-0.5** is a newly introduced model designed for small workshops and laboratories. It features a compact and less intrusive form factor and is optimized for battery testing applications requiring a total dissipation power of up to **500 W**.

The **Graphical User Interface (GUI)** allows users to configure test procedures for virtually any type of battery. The main software automatically sets the cut-off voltage to prevent over-discharge, adapting all parameters to the specific cell chemistry (Pb, NiCd, Lithium-ion, $LiFePO_4$, LiPo, etc.). All operations are managed by an embedded processor, which communicates with an external PC via a USB interface.

The GUI, compatible with Windows operating systems (32/64-bit), maintains a continuous connection with the Innova Robotics data center, enabling real-time device status monitoring and predictive maintenance. The main PC software automatically generates test certificates, as shown in the accompanying figures. In addition, a dedicated Android application allows users to remotely monitor test progress.

Starting from **2026**, changes to the available model lineup are planned, as summarized in the corresponding table.

Models main information from 2026

Model	Continuous Power Dissipation (kW)	Peak Power Dissipation (kW)	Cooling System	Production sstatus
DL-1.0	0.8	1.0	Controlled Airflow	Discontinued
DL-0.5	0.5	0.5	Controller Airflow	Availability: mid-2026
DL-1.1	1.0	1.0	Controlled Airflow	In production
DL-2.0	2.0	2.0	Controlled Airflow	Manufactured on request
DL-10.0	10.0	10.0	Water Cooling	Manufactured on request
DL-US	See note	See note	See note	Custom-built on reques

Note: The **DL-US** model is manufactured according to user-defined performance specifications, with a minimum order quantity of **10 units**. Pricing is defined upon receipt of the final specifications, which are discussed and developed jointly with the **Innova and ATEC Robotics** engineering teams.

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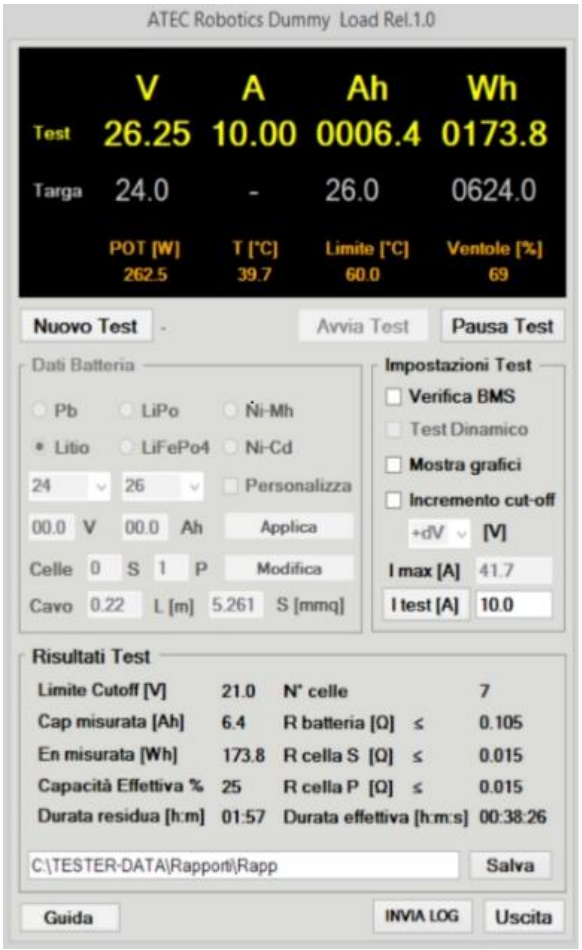
Graphical User Interface (GUI)

- Allows configuration of test procedures for virtually any cell type.
- Automatically sets the cut-off voltage to prevent over-discharge, with parameters adapted to the specific cell chemistry (Pb, NiCd, Lithium-ion, $LiFePO_4$, LiPo, etc.).
- Managed by an embedded processor that communicates with an external PC via a USB interface.

Software & Connectivity

- GUI compatible with Windows operating systems (32/64-bit).
- Continuous connection with the **Innova** and **ATEC Robotics Data Center** for real-time device monitoring and predictive maintenance.
- Automatic generation of test certificates on the PC.
- Dedicated Android application for remote test monitoring.



Operation Modes

The loads support the typical operation modes: Constant Current (CC, static or dynamic), Constant Power (CP), and Constant Voltage (CV). Mode selection is managed through the Graphical User Interface (GUI). Additional protective settings are available to safeguard the test equipment. For example, a constant current test can be limited by a maximum power value, while constant voltage, constant power, or constant resistance modes can be limited by a maximum current value. These limits are automatically determined by the software and proposed to the user for approval.

Static and Dynamic Operations

In static operation, a single value is set via the GUI. In dynamic operation, the user can define a sequence of values to create step profiles on any of the four physical quantities: voltage (U), current (I), power (P), or resistance (R).

Battery Test Mode

In battery test mode, the load can discharge a battery with constant or variable current until the battery voltage reaches a threshold defined by the cell chemistry (Pb, NiCd, Lithium, LiFePO4, LiPo, etc.). Once the threshold is reached, the test stops automatically. A certificate with graphs is then generated, and the discharge time along with the dissipated charge (Ah) is measured, displayed, and printed.

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Water cooling for model DL 10.0

The water cooling replaces the standard fan cooling non sufficiente per la dissipazione locale di 10kW. It has some advantages namely no hot air exhaust on the device, significantly lower noise, 100% permanent power.

Power Derating

All units in the series are equipped with thermal derating to limit power and prevent overheating when operating near maximum power levels. Every model integrates this feature. In the base model, cooled by controlled airflow, lower ambient temperatures and improved cooling conditions allow for higher dissipation capability.

Recharge Function

The recharge function is available in the model ATR-DL-PRJ-060-R (R = Recharge). This feature automatically verifies the efficiency of the charge/discharge cycle, with the result included in the test report generated by this model. Ask for availability (depending of the number of ordered devices).

Remote Status Check

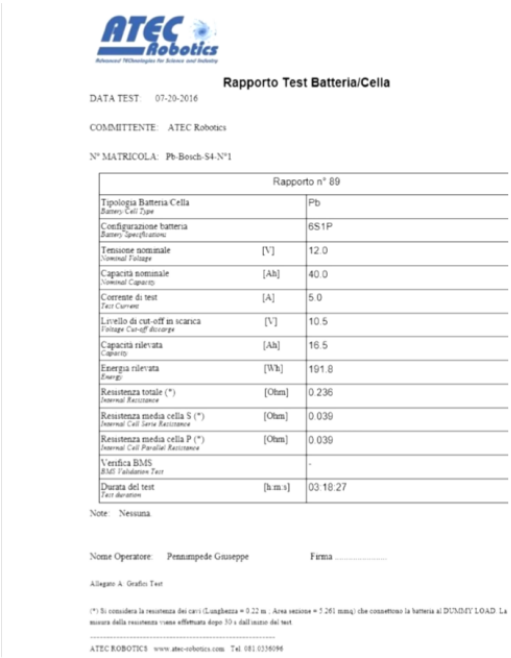
An Android application is available to remotely monitor the status of ongoing tests (main informations).

Precise measurements

The system is equipped with a remote voltage sensing input, featuring a dedicated voltage measurement line electrically separated from the current path, enabling ultra-precise input voltage measurements independent of load current. This ensures accurate readings even in the presence of voltage drops along the power cables. For rapid measurements, or when the remote sensing inputs cannot be used, the system implements a computational compensation method that accurately corrects cable-induced voltage losses based on the specified length and cross-section of the connection cables between the dummy load and the battery.

Logo Customization

Customization of the logo displayed on the test certificate is available upon request. The request must be specified at the time of order to allow evaluation of the associated modification costs.



ATEC Robotics

Rapporto Test Batteria/Cella

DATA TEST: 07-20-2016

COMMITTENTE: ATEC Robotics

N° MATRICOLA: Pb-Bosch-S4-N°1

Rapporto n° 89		
Tipologia Batteria Cella *Battery Cell Type*		Pb
Configurazione batteria *Battery Specifications*		6S1P
Tensione nominale *Nominal Voltage*	[V]	12.0
Capacità nominale *Nominal Capacity*	[Ah]	40.0
Corrente di test *Test Current*	[A]	5.0
Livello di cut-off in scarica *Voltage Cut-off discarge*	[V]	10.5
Capacità rilevata *Capacity*	[Ah]	16.5
Energia rilevata *Energy*	[Wh]	191.8
Resistenza totale (*) *Internal Resistance*	[Ohm]	0.236
Resistenza media cella S (*) *Internal Cell Serie Resistance*	[Ohm]	0.039
Resistenza media cella P (*) *Internal Cell Parallel Resistance*	[Ohm]	0.039
Verifica BMS *BMS Validation Test*		-
Durata del test *Test duration*	[h:m:s]	03:18:27

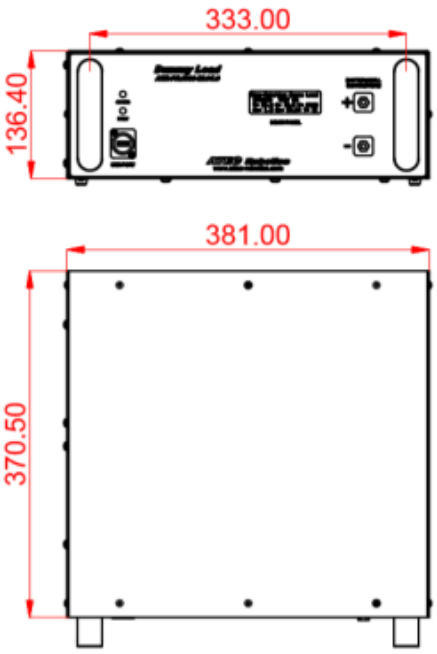
Note: Nessuna

Nome Operatore: Pennimpede Giuseppe Firma .....

Allegato A: Grafici Test

(*) Si considera la resistenza dei cavi (Lunghezza = 0.22 m , Area sezione = 5.261 mm2) che connettono la batteria al DUMMY LOAD. La misura della resistenza viene effettuata dopo 30 s dall'inizio del test

ATEC ROBOTICS www.atec-robotics.com Tel. 081 0356096



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ITEM	Value	DL 1.0	DL 1.1	DL 2.0	DL10.0
PWR input Voltage	90 →264 V ca @ 50/60Hz				
PWR consumption		50W	50W	80W	200W
Mimic panel	4x20 character				
GUI interface	Windows OS 32/64 W10/11				
Batt test - Cutoff	Adjustable all parameters				
Readout	Capacity of discharge				
Typology of battery	Pb, Li, LiPo LiFePo4, LiMn2O4, Ni-Mh, NiCd				
Cooling		F.V.	F.V.	F.V.	L.C.
Alarms	Overvoltage Overcurrent, Overtemperature PWR status				
Terminals	Screws terminal	M6	M6	M6	M10
Dissipation continuous W		800	1000	2000	10000
Dissipation peak W		800	1000	2000	10000
Input Voltage V max*		36	84	84	100
Test Current A max*		40	40	40	100
Mimic Panel resolution	10 mA/10mV				
GUI resolution	10mA/1mV				
Accuracy	<= 0.2%				
Simulated resistance	0 ….1000 ohm				
GUI Interfacing	USB2.0				
Remote control	Android app				
Protections	Thermal protection Overcurrent protection				
Maximum operating altitude	2000 m a.s.l.				
Dimensions (WxHxD)	W H D	385 144 402	385 144 402	385 144 402	500 350 402
Weight kg (about)		15	16	18	25

F.V – Forced Ventilation L.C. - Liquid Cooling

Note (*): The specified voltage and current ratings are not intended to be applied simultaneously. All operating points must remain within the device Safe Operating Area (SOA) and below the maximum allowable power dissipation.