



DURO BATTERY CHARGERS



The **Duro Series** are feature-rich and versatile battery chargers designed to service a wide range of portable electronic devices.

Using the most effective charging methods and built-in safety features, the **Duro A-Series** is ideal for wireless communications and industrial applications. The **Duro B-Series** features SMBus capability, fulfilling an important need in the mobile computing, medical and defense markets.

With hot and cold temperature charge protection, redundant full-charge detection and the ability to reactivate over-discharged lithium-ion batteries, Duro Battery chargers provide a quick and reliable charge even under harsh conditions. Advanced functionality, exceptional quality and low price make Duro chargers the number one choice.

Trust your batteries to Cadex, we have been experts in battery-care technology for over 25 years

Benefits of the Duro battery chargers

- Effective charging methods assure safe charging even under adverse conditions.
- Precise full-charge detection keeps battery cool and extends service life.
- SMBus charging with conditioning and calibration functions keep batteries in optimal operating condition (*B-5 only*).
- Quality design and manufacturing provide superior product performance, reliability and longevity.

Features of the Duro battery chargers



Cold charging – Below 0°C (32°F), Duro chargers apply a trickle charge to warm up the nickel-based battery, then switch to fast-charge on reaching operating temperature. A charge time-out-timer prevents a prolonged charge at low temperature. For safety reasons, lithium-ion does not charge below 5°C (41°F).



Hot charging – Above 50°C (123°F), Duro chargers allow nickel-based batteries to cool down to 45°C (113°F) before charging. If the temperature remains high, a timer terminates the charge with a fail indication. This protects the battery and charger for optimum safety.

Signal indicators

Three light signals indicate charging, ready and fail status. Fail denotes a battery that is shorted, unable to follow the predicted voltage pattern or other anomalies. A fail condition terminates service to protect the battery and charger and alerts the user with a flashing red LED.

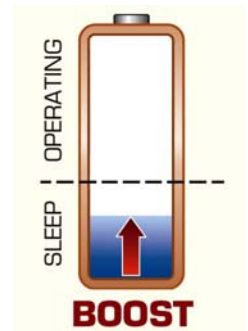
Calibration & Conditioning

Bay 1 and Bay 2 on the Duro B5 version allow calibration of smart batteries by applying a full discharge and recharge. The Duro B5 recognizes when the SMBus battery requires calibration and prompts the user to perform the service with a flashing red LED.

For best results, SMBus batteries should be calibrated once every three months or after every 40 cycles. For nickel-based batteries, the conditioning discharge also helps in reversing memory and improving performance. Batteries in constant use should be serviced once every 1-3 months.

Reactivating lithium-ion batteries

When discharged too low, some lithium-ion batteries appear dead and cannot be recharged. The Duro charger recognizes this condition and reactivates the pack's safety circuit with charge pulses. Upon reaching operations voltage, the charger switches to a regular charge.



Charging SMBus Batteries

The Duro Series B charger services SMBus batteries by communicating with the battery's internal digital circuits. When fully charged, the charger resets the fuel gauge to indicate "FULL".

Tri-chemistry selection



Only for batteries with identification code

The Duro adapters automatically detect the battery type and select the correct charge algorithm. Nickel and lithium-based batteries can be charged in the same adapter.

Active charge operation



The Duro allows monitoring voice traffic while on charge. If the battery gets low, the charger automatically applies a topping charge.

Not for transmitting in charger

Duro Battery Chargers are available in two models

Duro A-Series – 1 and 5 bay configurations



Duro A1 Single-bay Charger

This compact single-bay charger services lithium and nickel based batteries. The external 18-watt (or higher) AC power supply provides a minimum of 15 watts of charge power per bay. Charge time is 2-3 hours, depending on battery size.

- NiCd, NiMH, Li-ion
- 1.5 Amp charge current (up to 15 W per bay)
- Charge/Ready/Fail LED's



Duro A5 Multi-bay Charger System

Comes with a 90-watt external AC power supply to provide 15 watts of charge power per bay. Charge time is 2-3 hours, depending on battery size.

- NiCd, NiMH, Li-ion
- 1.5 Amp charge current (up to 15 W per bay)
- Charge/Ready/Fail LED's

Duro B-Series – 1 and 5 bay configurations



Duro B1 Single-bay Charger

Charges SMBus and non-SMBus batteries. A 30-watt external (or higher) AC power supply provides a minimum of 25 watts of charge power per bay for a charge time of 2-3 hours on most batteries.

- NiCd, NiMH, Li-ion
- SMBus and non-SMBus charging
- 3 Amp charge current (25 W per bay)
- Charge/Ready/Fail LED's



Duro B5 Multi-bay Charger & Conditioning System

Similar to B1 with 5 bays for simultaneous service of 5 batteries; includes battery calibration & conditioning function on bays 1 and 2. A 150-watt external AC power supply provides 25 watts of charge power per bay.

- NiCd, NiMH, Li-ion
- Charge/Ready/Fail LED's
- SMBus & non-SMBus charging
- 3 Amp charge current (25 W per bay)
- 1 Amp discharge current
- Calibration and conditioning
- Prompts need to calibrate

Product Specifications

	Duro A1	Duro A5	Duro B1	Duro B5	
System	1-bay quick-charger for regular batteries	5-bay quick-charger for simultaneous charge of 5 batteries	1-bay quick-charger for regular and SMBus batteries	5-bay quick-charger for simultaneous charge of 5 regular and SMBus batteries	
Battery interface	The chargers are factory configured for the battery type. Customer specified.				
Battery chemistries	Nickel-cadmium (NiCd), nickel-metal-hydride (NiMH) and lithium-ion (Li-ion). Automatic chemistry selection with identification code on pack.				
Full-charge termination	<p>Nickel-based: Constant current; charge termination: dT/dt (rate-of-temperature increase); 1°C/min. rise, NDV 8-10mV/cell; plateau timer; trickle charge of 0.05C when ready.</p> <p>Lithium-based: Constant voltage, current limit; charge termination on current drop to 0.05C. Voltage cut-off settings programmable from 3.4-4.6V; factory set for A-Series, SMBus readable for B-Series.</p>				
Temperature management	<p>Nickel-based: Trickle charge if below 0°C, normal charge when battery warms up;</p> <p>Lithium-based: No charge if below 5°C, resumes charge when battery warms up.</p> <p>No charge for all chemistries above 50°C; resumes charge for nickel batteries when cooled down to 45°C.</p>				
Battery Ah/V	500mAh – 10 Ah				
Low voltage version	3.60 - 7.20V	3.60 - 7.20V	3.60 - 7.20V	3.60 - 7.20V	
High voltage version	8.40 - 14.40V	8.40 - 14.40V	9.60 - 14.40V	9.60 - 14.40V	
Charge time	Nickel-based chemistries: 90 minutes typical; longer on larger batteries Lithium-based chemistries: 3h typical; longer on larger batteries				
Discharge power	Not available	Not available	Not available	1A max each for bays 1 & 2	
Light signals	<p>Charging: Flashing green</p> <p>Ready: Solid green</p> <p>Fail: Solid red</p>			Same, red/green discharging; flashing red prompts need to calibrate	
Electrical	Min. 18 watts external 1.5A, 15W per bay AC power adapter (90-264 VAC, 47-63 Hz)	90 watts external 1.5A, 15W per bay AC power adapter (90-264 VAC, 47-63 Hz)	Min. 30 watts external 3A, 25W per bay AC power adapter (90-264 VAC, 47-63 Hz)	150 watts external 3A, 25W per bay AC power adapter (90-264 VAC, 47-63 Hz)	
Vehicle mount	Contact Cadex sales				
Approvals	CSA 60950, UL60950, EN 60950 for safety and FCC Part 15 Class A, EN55022 Class A for EMI, and EN61000-3-2, EN61000-3-3 and EN61000-4-2, -3, -4, -5, -6, -11 for EMC. RoHS and WEE compliant.				
Environmental	Operating temperature: 0°C to +40°C (32°F to +104°F) Storage temperature: -30°C to +70°C (-22 to +158°F)				
Physical	Length Width Height Weight	232.4 mm (9.15") 127 mm (5") 57 mm (2.24") 0.4 kg (0.88 lb)	520.7 mm (20.5") 232.2 mm (9.14") 57 mm (2.24") 3.25 kg (7.16 lb)	232.4 mm (9.15") 127 mm (5") 57 mm (2.24") 0.4 kg (0.88 lb)	520.7 mm (20.5") 232.2 mm (9.14") 57 mm (2.24") 3.25 kg (7.16 lb)
Warranty	Cadex warrants the charger against defective materials and workmanship for a period of one (1) year from the original purchase date.				

Customer Satisfaction

When purchasing a Cadex product, you are assured of advanced design, superior quality and competitive pricing. Cadex combines engineering strength with 25 years of manufacturing excellence.

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