AT-DCDC-M4850ND-IP65

The Amptron® BluEdge AT-DCDC-M4850ND-IP65 is a bi-directional DC-DC charger that works across any combination of 12V, 24V, 36V, and 48V battery systems. Whether you're charging a 48V lithium auxiliary from a 12V starter battery, running solar MPPT into a 36V bank, or managing a complex dual-battery marine setup — this single unit handles it all.

PHYSICAL SPECIFICATIONS

Parameter	Specification
Model	AT-DCDC-M4850ND-IP65
Series	Amptron® BluEdge
Dimensions (Body)	280mm L x 175mm W x 76mm H
Dimensions (incl. Mounting Feet)	305mm L x 175mm W x 76mm H
Weight	3kg
Enclosure	Industrial-grade aluminium with sealed junction box
IP Protection Rating	IP65 (fully dust-tight; protected against water jets from any direction)
Cooling Method	Passive convection; vertical heat dissipation — mount horizontally for optimal airflow
Minimum Ventilation Clearance	150mm above and below unit
Mounting Orientation	Horizontal (fin side up)
Mounting Hardware	Self-tapping screws or auxiliary fixing hardware (not included)
System Wiring	Negative grounded

SUPPORTED BATTERY SYSTEMS

Parameter	Battery 1 (Main / Auxiliary)	Battery 2 (Start / Alternator)
Role	Main or auxiliary service battery	Starter battery or alternator source
Auto-Detected System Voltages	12V / 24V / 36V / 48V	Auto
Battery Voltage Operating Range	8V to 64V	8V to 64V
Supported Battery Types	GEL, SEL/AGM, Flooded (FLD), Lithium (LI), Advanced User (USE)	GEL
Max Charge Current	50A	50A
Lithium Charge Configuration	Customisable via external display or Bluetooth app	N/A

BATTERY-TO-BATTERY DC-DC CHARGING

Parameter	Specification
Charging Topology	Bi-Directional Buck-Boost
Max Charge Current	50A (both directions)
B2 → B1 Charge Activation	B2 > 13.2V×n (adjustable) AND B1 > 5V (adjustable)
B2 → B1 Charge Deactivation	B2 < 12.7V×n (adjustable) OR B1 < 5V
B1 → B2 Charge Activation	B1 > 12.7V×n (adjustable) AND B2 < 12V×n (adjustable)
B1 → B2 Charge Deactivation	B2 > 12.8V×n (adjustable) OR B1 < 12V×n OR B2 < 5V
Forced Charge Mode	Manual override; charge either bank from the other on demand — used to recover a flat starter battery
IGN Signal Input	Yes — when connected, automatically offsets start/stop thresholds by 0.5V to enable earlier charge activation during engine operation
Smart Alternator Compatibility	Yes — IGN input detects alternator running signal and adjusts charge thresholds accordingly

MPPT SOLAR CHARGING

Parameter	Specification
Solar Charging Mode	Buck MPPT + CC + CV
Max Solar Input Voltage (Voc)	140V
Max Solar Input Power	750W (12V system) / 1,500W (24V) / 2,250W (36V) / 3,000W (48V)
MPPT Tracking Efficiency	>99%
Solar Priority (Default)	Battery 1 (Main/Auxiliary) charged first; Battery 2 charged after Battery 1 reaches full charge
Solar Priority (Configurable)	Yes — charge priority between B1 and B2 adjustable via external display
Minimum PV Voc vs Battery Voltage	PV Voc must be at least 3V higher than the battery voltage (Buck mode requirement)

ELECTRICAL & SYSTEM CHARACTERISTICS

Parameter	Specification
Charging Efficiency	>98%
No-Load Loss	25mA
Charging Derating	Automatic step derating when internal temperature reaches 70°C; auto-recovery once temperature normalises
Operating Temperature	-25°C to +45°C
Storage Temperature	-35°C to +65°C
Operating Altitude	<3,000m
Electrical Connectors	M6 bare wire terminals
Recommended Wire Gauge	12mm² / 6AWG (for 50A)
Recommended Wire Gauge (30A)	8mm² / 8AWG
DC Isolation Requirement	Mandatory — DC isolation device must be installed on both B1 and B2 battery connections as close to battery terminals as practicable

COMMUNICATION & MONITORING

Parameter	Specification
Communication Ports	RS485 + CAN Bus (J1939)
CAN Bus Protocol	J1939 — natively compatible with Amptron BluEdge battery BMS
CAN Bus Priority	Highest — when CAN bus is detected, BMS controls max charge voltage, max charge current, and charge enable/disable directly; overrides all local settings
RS485 Protocol	RS485 Modbus; baudrate 9600; RJ12 connector
Bluetooth	Via optional AT-MON-DCDC-M4850ND external display (built-in Bluetooth) or optional separate Bluetooth dongle
App Compatibility	iOS and Android (BLE Insight app)
Data Logging	Up to 300 days of system charge history
External Temperature Sensor	Yes — BAT1 external temperature sensor port included

PROTECTION FEATURES

Protection	Description
PV Over-Voltage	Solar input voltage exceeds safe operating threshold — automatic shutdown and recovery
PV Reverse Polarity	Solar panel connected with reversed polarity — automatic protection, no component damage
Battery Over-Voltage	Battery terminal voltage exceeds safe charging limit — charging suspended automatically
Battery Over-Charge	Prevents overcharging beyond configured charge voltage — automatic cutback
Battery Reverse Polarity	Battery connected with reversed polarity — automatic protection
Controller Over-Temperature	Internal temperature monitoring with step derating at 70°C and auto-recovery
High Ambient Temperature	System protection activates under sustained high ambient temperature conditions