

Turntide Battery Control Unit (BCU)

The Turntide Battery Control Unit (BCU) is cell agnostic and flexible over multiple system voltages and parallel/serial battery pack arrangements.

The BCU interfaces with IsoSPI networked battery-based Cell Monitoring Unit (CMU) which connect to, control and monitor the voltage, current and temperature of a set of battery cells. The BCU provides the management for the CMU connected battery cells, the battery system & safe system integration.



BCU Enclosure with full HW connector options fitted with 250V_{DC} application voltage (500V_{DC} option also available)

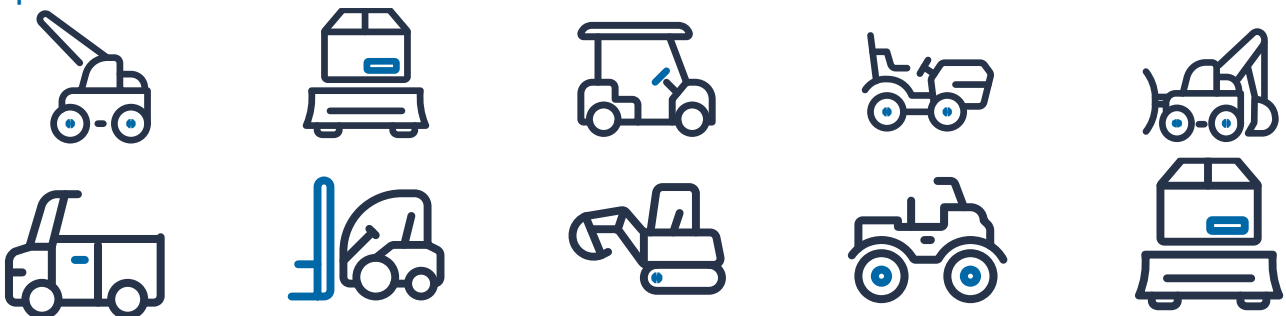
System integration can include multiple DC Bus contactor control, Pre-charge management, Charge management, CAN based or I/O based application interfacing.

Lithium battery cells are chemical devices, who's life are affected by temperature. The BCU provides thermal management to keep battery packs in an optimum condition.

Features

- 250k/500k/IM baud CAN communication for system data & control (compliant with J1939)
- Management of battery voltage, temperature, cell balancing and load current limits
- Safe management of DC Bus contractor isolation devices
- State of Charge (SoC) and State of Health (SoH) battery tracking and reporting
- DC Bus and Pre-charge contactor management
- Battery Charger management
- Serial and/or Parallel battery pack connectivity
- Battery system Bus voltages (38– 500V)
- RoHS, WEEE, R-100
- EMC and ESD compliant
- Various build options; 3 off HV Bus monitoring input channels
- 0-120V_{DC}, 0-250V_{DC} and 0-500V_{DC}.

Applications



TURNTIDE TECHNOLOGIES

Turntide Technologies designs and manufactures breakthrough electric motors, power electronics and energy storage solutions that optimize performance, reliability, and efficiency in all things that move.

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Details are correct at time of publishing

TTS-MAN-010
V2.0 – 23/09/2024

Specification

Key Features			
Battery Controller Function	Central BCU networking to multiple packs providing an integrated battery solution with a high level of system power and control management.		
Max’ Connectable Packs	18	Cell & System Balancing	Managed passive
Battery HV Bus Range	Multiple direct 38V _{DC} to 500V _{DC} battery HV Bus voltage monitoring for enhanced power delivery management.	Fault Management	Battery component fault management for volt, temperature and current
Charge Control	Current control based on cell voltage/temperature*	Battery Data Logging	Battery status, faults and operational logs for battery analysis
Power Supply Voltage	36V (12V and 24V typical)	Working Isolation Voltage (V _{DC})	500
* Dynamically de-rated by BMS message over CAN depending on cell condition.			
Environmental			
Operation Temperature (°C)	-15 to +60	Altitude (metres)	2000
Storage Temperature (°C)	-45 to +60	IP Rating	IP67
Humidity (%RH)	5 to 95		
IO			
Connectors	<ul style="list-style-type: none">P1, 35way AMPSEAL Header: 776231-1(BMS Interface,Comms,PWR,L.S.Drives)P2, 23way AMPSEAL Header: 776228-1 (HVIL and I/O Expansion)P3, 14way AMPSEAL Header: 776262-1 (HV Monitor for 38V to 250V applications)P4, 12way Souriau Header: UTS71412P (HV Monitor for 250V to 500V applications)		
Application CAN 1 interface	<ul style="list-style-type: none">SAE J1939 compatible at 250k/500k/IM baud.	DC Bus Voltage Monitoring	<ul style="list-style-type: none">3 x HV DC Bus analogue I/O (0-500 V_{DC} range)<ul style="list-style-type: none">○ 0-120 V_{DC}○ 0-250 V_{DC}○ 0-500 V_{DC}
Main DC Bus Contactor IO	<ul style="list-style-type: none">For positive & negative Power Bus and Pre-Charger	Pack IsoSPI Interface	<ul style="list-style-type: none">Connects up to 18 packs & acquires temperature, voltage, current and fault status.
Full Master HVIL loop circuit	<ul style="list-style-type: none">Pulse current, circuit integrity testing.Dedicated master drive & return monitor line.	Battery Expansion IO	<ul style="list-style-type: none">6 digital outputs & 6 digital inputs for simple application control and monitoring.
Mass, Dimensions and Drawings			
Weight (g)	1330 (Max depending on variant)	Length (mm)	274
Width (mm)	173	Height (mm)	66
Mounting	M5 with optional mounting attachments		
Safety and Compliance			
Design Certification	<ul style="list-style-type: none">EN60068-2-27:2009EN60068-2-6:2008	<ul style="list-style-type: none">EN60068-2-1/2/14/30:2007	<ul style="list-style-type: none">EN60068-2-64:2008+A1:2019
EMC	<ul style="list-style-type: none">EN61000-6-2:2005EN61000-6-3:2007 + A1:2011.	Safety Class	<ul style="list-style-type: none">IEC 62619Battery Directive 2023/1542
Other	<ul style="list-style-type: none">RoHSWEEEREACH		

For more information on this product or Turntide's range of inverters, motors, batteries, pumps and fans, please visit our web-site or contact our team of experts at electrificationsales@turntide.com.

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