AccuPower ®

® Lithium-Ion Battery
4S1P NCR18650B

Nominal / Charge voltage: 14.4V / 16.8V
Energy Capacity: 48.24 Wh / 3.35 Ah
max. charge current: 3A
max. discharge current: 3A / Peak 4A

Lithium-Ion Rechargeable Battery with Protection Circuit Module. Battery must be Charged in appropriate charger only. Charge: 0 to45°C, Discharge: -20 to +50°C.

CAUTION: Check battery polarity and install correctly. Do not dispose of in fire, put in backwards or short circuit, otherwise battery may explode or leak causing personal injury.
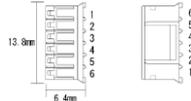** Designed and Developed in AUSTRIA**

Li-Ion

Connector JST PHR-6
+SPH-002T-P0.5L
(housing + crimp)
1 BAT_SDA
2 BAT_SCL
3 BAT_GND
4 BAT_GND
5 BAT_14V8
6 BAT_14V8

13.8mm
6.4mm

Lithium-Battery Pack with protection electronics
(PCM single cells monitoring), protects the battery against
overcharge, deep discharge and short circuit,
Implemented cell balancing,
and Gas Gauge with SM Bus Interface

Applications
Automotive
Industrial
Medical
Sport
and others

Safety tested
UN 38.3 Passed
Certified
Transportation Requirements
AccuPower

Transportation Safety
Test passed for:
☑ Cargo Aircraft only
☐ Sea
☑ Road

Pack Specifications	
Nominal Voltage	14.4 V
Capacity (Nominal)	3350 mAh ±6%.
Energy	48.24 Wh
Weight	195 grams ±5g.
Size (L x W x H) mm	74 x 19,5 x 70.5 ±1

Operating Specifications	
Operating Voltage	12 V to 16.8 V
Charge Voltage	(**Max**. 16.80 V)
Discharge End Volt.	12.0V
Operating Temperature: Discharge Charge	-20°C to 50°C 0°C to 45°C
Max. Discharge Current	3A (continuous) 4A (Peak)
Max. Charge Current	2A / Pack 3A @ (0°C-45°C)

Storage Specifications	
Storage Temperature Relative humidity (45-75%) SoC: State-of-Charge ≥ 70%	6 months: -20~25°C(1*) 3 months: -20~45°C(1*) 1 month: -20~60°C(1*)

Note (1): If the cell is kept as ex-factory status (≤ 30% of charge), the capacity recovery rate is more than 80%.

Standard charging method
0.5C CC （constant current） charge to Max. 16.80V, then CV (constant voltage Max. 16.80V) charge till charge current decline to ≤ 0.02C

Transportation
The transport of this battery should be noted that this is a lithium-Ion battery (dangerous goods class 9 / UN3480 / packing group II, ADR / RID, IATA DGR, IMDG). During transport, do not subject the Batteries or the box(es) to violent shaking, bumps, rain and direct sunlight.

Due to the new IATA Dangerous Goods Regulations since April 2016, the state of charge condition for air transport must not exceed 30% of the nominal capacity!

Care and safety recommendations:
Never open, short circuit or put in fire. Do not install backwards. Avoid short circuit with metal objects.

Bas. 02/18

⚠ ATTENTION! Recharge batteries immediately after receipt: ⚠

Please pay attention to following recommendations:

1. Please fully charge before using it with the suitable charger!!!
2. Always avoid Deep discharge of the battery
3. Charge the battery before longer Storage.
4. Use only the battery charger specified for this battery type.
5. Do not leave battery in charger over 24 hours.
6. Keep it in a cool and dry place.
7. Avoid exposure to high temperatures.
8. Do not disassemble or modify the battery, may cause the battery to generate heat, explode or ignite.
9. Dispose properly used batteries. Dispose it according to the applicable recycling regulations. Contact your city recycling coordinator. Thank you.
10. If the battery will be stored before use - then charge the battery with the suitable charger up to 70% for long-term storage, the battery must be recharged again to 70% after a maximum of four months.

Overcharge/Overdischarge/Overcurrent Safety Circuits:

The controller IC measures the voltage for each cell (or for each parallel battery block) and shuts off a control switch to either prevent overcharging (if the voltage exceeds the specified voltage range) or to prevent over discharging (if the voltage falls below the specified voltage range). Moreover, the voltage of the control switch is measured on both ends and in order to prevent overcurrent, control switches are shut off if the voltage exceeds specifications.

• The Functions of the Safety Circuits (typical functions)
The voltages listed below are typical values and are not guaranteed. The charge voltage varies according to model number.

1. The Overcharge Safety Function
The charge stops when the voltage per cell rises above 4.25 ± 0.05 V.
The charge restarts when the voltage per cell falls below 4.00 ± 0.05 V.

2. The Overdischarge Safety Function
The discharge stops when the voltage per cell falls below 3.00 ± 0.05 V.
The discharge restarts when the voltage per cell rises above 3.1 ± 0.05V.

3. The Overcurrent Safety Function
The discharge is stopped when the output terminals are shorted. The discharge restarts when the short is removed.

> ## Attention: Please fully charge the batteries before using!!!

Information and contents in this datasheet are for reference purpose only. They do not constitute any warranty or representation and are subject to change without notice.

SM Bus Data

Following information's can be accessed via the SM Bus.
Folgende Informationen können über den SM Bus abgerufen werden

Device Address / *Adresse für µC ist*: default 0x16 + R/W Bit

Connector JST PHR-6
+SPH-002T-P0.5L
(housing + crimp)
1 BAT_SDA
2 BAT_SCL
3 BAT_GND
4 BAT_GND
5 BAT_14V8
6 BAT_14V8

Funktion / Function	Register	Type*	Min Value	Max Value	Einheit / Unit
State of charge / *Aktueller Ladezustand*	0x0D	U1	0	100	%
Remaining capacity / *Verbleibende Kapazität*	0x0F	U2	0	65535	1 mAh
Full charge capacity / *Vollständige Kapazität*	0x10	U2	0	65535	1 mAh
Battery voltage / *Aktuelle Akkuspannung*	0x09	U2	0	65535	1 mV
Average current / *Durchschnittlicher Strom*	0x0B	I2	-32767	32768	1 mA
Actual current / *Aktueller Strom*	0x0A	I2	-32767	32768	1 mA
Battery temperature / *Akkupack Temperatur*	0x08	U2	0	65535	0.1°K
Average time to „Empty" at actual current / *Voraussichtliche Zeit bis „Akku leer" bei momentanem Strom*	0x12	U2	0	65535	minutes
Average time to „Full" at actual current / *Voraussichtliche Zeit bis „Akku voll" bei momentanem Strom*	0x13	U2	0	65535	minutes
Cycle count / *Zyklenanzahl*	0x17	U2	0	65535	-
State of health / *Akkuzustand*	0x4F	U1	0	100	%

The Data is provided in little endian byte orientation /
Die Daten besitzen Little Endian Byte Orientation

*Type: **U .... unsigned integer**   **1 .... one byte long**
         I......... signed integer   **2 .... two bytes long**

SM Bus operating voltage: 3,3 V
SM Bus operating frequency: 100 kHz

D R A F T