



## Notebook Computer Battery Packs

# GP Batteries

### WORLDWIDE HEADQUARTERS HONG KONG

**GPI INTERNATIONAL LIMITED**  
8/F, Gold Peak Building, 30 Kwai Wing Road,  
Kwai Chung, N.T., Hong Kong  
Tel: (852) 2484 3333 Fax: (852) 2480 5912  
E-mail address: gpil@goldpeak.com  
Website: <http://www.gpbatteries.com.hk>

### SALES & MARKETING BRANCH OFFICES

**ASEAN**  
GP BATTERY MARKETING (SINGAPORE) PTE. LIMITED  
37 Pioneer Road, Singapore 639579  
Tel: (65) 6559 9760 Fax: (65) 6559 9761

**MALAYSIA**  
GP BATTERY MARKETING (MALAYSIA) SDN. BHD.  
Lot 8, Jalan Pemberita U1/49,  
Temasya Industrial Park,  
40150 Shah Alam, Selangor Darul Ehsan, Malaysia  
Tel: (60) 3 5569 3499 Fax: (60) 3 5569 3498

**THAILAND**  
GP BATTERY MARKETING (THAILAND) CO., LTD.  
102 Soi Sukhumvit 26, Sukhumvit Road,  
Klongton, Klongtoey,  
Bangkok 10110 Thailand  
Tel: (66) 2 661 3688 Fax: (66) 2 661 3602

**TAIWAN**  
GOLD PEAK INDUSTRIES (TAIWAN) LIMITED - TAIPEI OFFICE  
8/F, No. 205 Sec. 1, Fu Xing South Road,  
Taipei 10666, Taiwan, R.O.C.  
Tel: (886) 2 2772 9998 Fax: (886) 2 2731 4868/2741 0192

**CHINA**  
HUIZHOU CHAO BA BATTERY TECHNOLOGY CO., LTD  
2/F, South of Hongye Industrial Building,  
Tianluo Mountain, 14th Industrial District,  
Huizhou City, Guangdong, China  
(Postal Code: 516003)  
Tel: (86) 752 282 8428 Fax: (86) 752 280 2872

**HONG KONG**  
GP BATTERY MARKETING (H.K.) LIMITED  
Gold Peak Building, 8/F, 30 Kwai Wing Road,  
Kwai Chung, N.T., Hong Kong  
Tel: (852) 2420 0281 Fax: (852) 2494 9349

**KOREA**  
GP BATTERY MARKETING (KOREA) LIMITED  
Kunsul Hoekwan Building, 9/F, 71-2 Non Hyun-Dong,  
Kang Nam-Gu, Seoul, South Korea  
Tel: (82) 2 549 7188/9, 2 516 3936/7  
Fax: (82) 2 514 0623, 2 516 0621

**U.S.A.**  
GOLD PEAK INDUSTRIES (NORTH AMERICA) INC.  
11235 West Bernardo Court, San Diego,  
CA 92127-1638, U.S.A.  
Tel: (1) 858 674 6099 Fax: (1) 858 674 6496/674 5883

**CANADA**  
GP BATTERY MARKETING INC.  
Unit 7, 7780 Woodbine Avenue, Markham,  
Ontario, Canada L3R 2N7  
Tel: (1) 905 474 9507 Fax: (1) 905 474 9452

**LATIN AMERICA**  
GP BATTERY MARKETING (LATIN AMERICA) INC.  
8370 NW, 66th Street, Miami, Florida 33166, U.S.A.  
Tel: (1) 305 471 7717 Fax: (1) 305 471 7718

**EUROPE**  
GP BATTERIES EUROPE B.V.  
Kortijzer 4, 5721 VE Asten,  
The Netherlands  
Tel: (31) 493 681030 Fax: (31) 493 681039

**GERMANY**  
GP BATTERY MARKETING (GERMANY) GMBH  
Niederlorticker Str. 62, 40667 Meerbusch, Germany  
Tel: (49) 2132 1377-0 Fax: (49) 2132 1377-13

**POLAND**  
GP BATTERY (POLAND) SP. Z.O.O.  
ul. Slowicza 19, PL-02170 Warsaw, Poland  
Tel: (48) 22 868 0490 Fax: (48) 22 846 7535

**U.K.**  
GP BATTERIES (U.K.) LIMITED  
Summerfield Avenue,  
Chelston Business Park, Wellington,  
Somerset, TA21 9JF, United Kingdom  
Tel: (44) 1 823 660 044 Fax: (44) 1 823 665 595

**ITALY**  
GP BATTERY MARKETING ITALY S.R.L.  
Via Alessandro Volta 3,  
20094 Assago (MI), Italy  
Tel: (39) 02 488 2512 Fax: (39) 02 488 2865

**SCANDINAVIA**  
GPBM NORDIC AB  
Grimboasen 5, SE-417 49, Goteborg, Sweden  
Tel: (46) 31 558 600 Fax: (46) 31 556 813

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# GP Batteries

## Notebook Computer Battery Packs



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GP Smart rechargeable batteries incorporate an innovative integrated circuit that monitors the power system, generating data on power usage, battery status and battery charging.

Design the smart feature into your portable computer to differentiate your product from the competition by offering advanced power management features that increase run time and enhance reliability and ease of use.

## Major Features of Li-ion Batteries

- High Energy Density**  
 Greater than 300 Wh/L and 150 Wh/kg; about 25% better than NiMH and 50% better than NiCd.
- High Voltage**  
 Voltage per cell is 3.7 volt, 3 times that of NiMH batteries. It allows a simpler battery configuration and better space utilization for low cell voltages.
- Superior Cycle Life Performance**  
 Can exceed 300 cycles at 1C and achieve over 500 cycles at 0.2C.
- Superior Low Temperature Performance**  
 All models can work at temperatures as low as -20°C.
- Superior High Temperature Storage Performance**  
 Loss of capacity is only 3% after storage at 60°C for 1 week at 0.2C discharge rate, or 4% at 1C discharge rate. This is essential for notebook computers as they run at high temperature.
- Fast Charge Rate**  
 Can be fully charged in less than 2.5 hours due to the low internal resistance.
- High Drain Rate**  
 Pulse loads can be up to 2C rate.
- Flat Discharge Characteristics**  
 Graphite type negative electrode has steady discharge voltage essential for electronic equipment.
- Reliable Safety Design**  
 Designed and built with internal safety features to resist physical abuse and to prevent overcharge and over current.
- Environmentally Friendlier**  
 Contain no toxic heavy metals such as mercury, cadmium or lead.
- Low Self Discharge Rate**
- Low Internal Resistance**
- No Memory Effect**

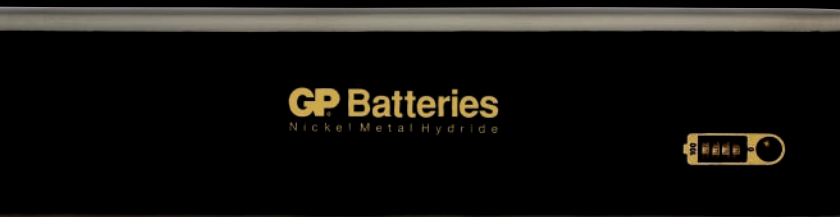


On-pack fuel gauge displays accurate indication of capacity remaining while the chip inside provides battery-related information to the computer.



## Lithium Ion 18650

The heart of GP Smart Li-ion Battery Pack is the highest capacity GP Li-ion 18650 battery, the Milestone Cell of 2200mAh launched by GP Batteries. Its ultra-high performance makes it the most logical power force for advanced portable devices.



# Notebook Computer Battery Packs

## GP SmartFeatures

- Ultra-low power consumption**  
 Draws less than 1 mA when active and 3µA when asleep, resulting in shelf life of up to 9 months.
- Capacity learning algorithms**  
 Measures and communicates full charge capacity over battery life.
- High-precision circuitry**  
 Better than 8000 to 1 dynamic range. Doesn't miss high current pulses or low sleep currents.
- Smart battery data**  
 Support both SMBus 1.0 and 1.1a. OEMs can enable innovative GUIs to differentiate their products.

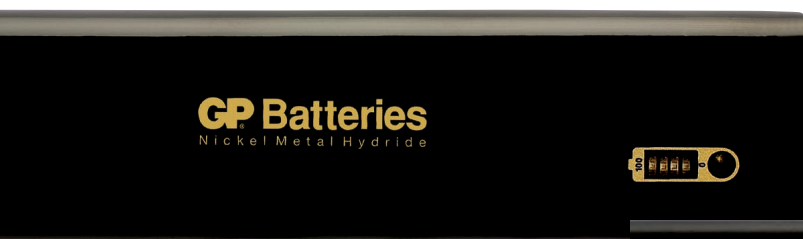
## GP Smart Communications Protocol

GP Smart rechargeable batteries are built on open standard that will protect your investment in product design and power-related software. These standards can easily be adopted to new and emerging battery technologies, allowing you to deliver your state-of-the-art products to market faster.

- Multiple Sourcing**  
 Employing the smart function allows multiple sourcing of batteries irrespective of the subtle differences in battery characteristics.
- Multiple Chemistry**  
 Different types of battery chemistry can be used interchangeably.
- Standardized Power Management Software**  
 Support of the technology by the O/S through ACPI, simplifies power management software development. GP's open system specifications are widely adopted by a number of leading software and component suppliers including the System Management Bus (SMBus) and Smart Battery Data (SBD).
  - \*SMBus is a serial bus that provides the pathway for the battery to communicate with other components in the computer.
  - \*SBD is a specification that defines the information accessible across the SMBus from 34 data points in the battery integrated circuit.
 GP also employs *an advanced interconnect* which is a self securing battery interconnection system that provides viable direction mating and voltage/form factor polarization for safe, consumer-friendly operation.

## Specifications

Model	Chemistry	Size	Voltage (V)	Capacity (mAh)	Dimension L x W x H (mm)	Weight (g)
<b>With Smart Chips</b>						
DR202B	Li-ion	9 x 18650	11.1	5400/6300	149.5 x 89.3 x 20.0	460
DR15SBA	NiMH	9 x 4/5 AF	10.8	2100	145.0 x 52.8 x 19.3	305
DR35SBA	NiMH	9 x 7/5 AF	10.8	3700	215.0 x 52.8 x 19.3	505
B905S	NiMH	10 x 7/5 AF	12.0	3700	150 x 89.3 x 20.0	585
B905B	NiMH	10 x 7/5 AF	12.0	3700	150 x 89.3 x 20.0	585
<b>Without Smart Chips</b>						
DR17	NiMH	6 x 4/5 AF	7.2	2100	145.0 x 35.8 x 18.3	220
DR30	NiMH	6 x 7/5 AF	7.2	3700	113.0 x 71.0 x 18.3	350
DR31	NiMH	9 x 7/5 AF	10.8	3700	209.0 x 52.5 x 18.5	305
DR35	NiMH	9 x 7/5 AF	10.8	3700	215.0 x 52.5 x 18.5	500
B905	NiMH	10 x 7/5 AF	12.0	3700	150 x 89.3 x 20.0	585



# Notebook Computer Battery Packs

## GP SmartPower Control Panel

## GP Standard-Sized Batteries Built in a SmartWay

GP standard-sized rechargeable batteries will save you heavy investment in battery related engineering, inventory and after sales service.

- **Lower up-front design and product life cycle costs**  
GP standard-sized batteries and design-in assistance eliminate customized power sources, interconnects and chargers, reducing engineering costs and shortening time to market.
- **Design flexibility**  
Available in sizes to match your energy requirements, from handheld computers to high performance notebooks.
- **Reduced inventory exposure**  
Standard sizes minimise inventory requirements and avoid product obsolescence.

## Retailers' Preference

Retailers will also benefit from GP's standard-sized batteries with

- Fewer SKUs
- Reduced consumer confusion
- Easy & unassisted sales

## Work Effectively with GP SmartBatteries

- Run time will be prolonged and capacity can be fully utilized
- Greater value in a compact size - Cost competitive and equal in size to batteries without smarts
- Accurate fuel gauge indicator on screen/on battery
- Predictable run time forecast - indicates remaining capacity and run time within an estimated 1%
- Replacement convenience through GP worldwide distribution

## Guarantee

GP computer packs have been tested by the industry and UL listed to guarantee the performance as specified. Every GP computer pack is fully guaranteed against defects in material and workmanship.

## Safety Precautions

Please follow the safety precautions carefully as improper handling of rechargeable batteries may result in injury or damage from electrolyte leakage, heating ignition or explosion. To ensure safety, consult with GP regarding the charge and discharge specifications, equipment structure, warning labels and other important details when designing equipment to use GP rechargeable batteries.

- Do not dismantle or modify the battery.
- Do not charge the Li-ion battery above 4.20V per cell.
- Do not reverse charge the battery.
- Do not heat or incinerate the battery.
- Do not pierce, crush or cause mechanical damage to the battery.
- Do not charge a battery at high temperature condition, such as at or near a fire.
- Do not short circuit the battery.
- Do not discharge a battery to below 2.8V per cell for Li-ion models.
- Do not allow the battery to get wet or be immersed in water.
- Do not strike or throw the battery.
- For long period of storage, temperature should be below 45°C for Li-ion and 35°C for NiMH.
- After long period of storage, battery may be required some cycling to recover capacity.

