



LUPINE[®]
LIGHTING SYSTEMS

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Micro Charger



Micro Charger Basic



Wiesel



Charger One



- **Important!** This charger is to be used to charge rechargeable Li-Ion batteries or NiMH batteries only.
- Do NOT use non-rechargeable batteries. – Risk of explosion!
- Do NOT open the charger or power supply. Only the manufacturer is authorized to do this.

Note:

Charger One is compatible with all Lupine Li-Ion and NiMH batteries.

The Charger One default settings are optimal for the batteries that are provided with each Lupine lamp. The user can change these settings, but the battery and charger will work perfectly well without any such change. Therefore, you should only change the Charger One default settings once you have familiarized yourself with the system's function and usage modalities.

Note: All of the pictures in this manual show a Li-Ion battery being charged. However, the instructions are identical for an NiMH battery, except that in such a case the instructions would say NiMH in lieu of Li-Ion. In the instructions in this manual, "ABCDE" stands for the relevant battery type (i.e. Li-Ion or NiMH).

Components:

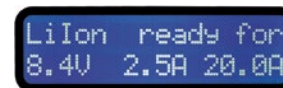
Contents of package:

- Charger One
- Power supply
- 12V charging cable

Although Charger One was developed specially for use with high capacity Li-Ion batteries, the charger is also compatible with all Lupine NiMH batteries. The included power supply provides the necessary supply voltage (12 V/2 A) with Charger One plugged into a 100-240 V outlet. Thanks to the power supply's integrated universal input, Charger One can be used worldwide via travel adapter.

Plugging in Charger One:

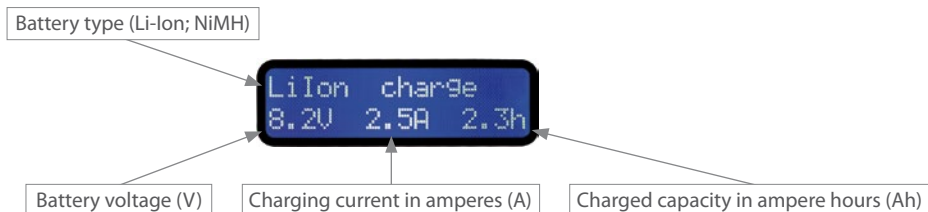
Insert the power supply plug into an outlet and plug the power supply jack into the relevant Charger One socket.



Switch to the other battery types by pressing the Select button quickly (a beep will sound each time you press the button). The device will store the last setting you select even if you unplug it, which means that this setting will be available the next time you use the device.

Charging:

The charger is now ready for use. Plug the battery into the charger. The charging process will start automatically and the following message will appear on the first line of the display: "ABCDE charge" (where ABCDE stands for the type of battery selected).



Note: The actual capacity of a rechargeable battery can only be determined when the battery is actually used. The value displayed is calculated on the basis of the aggregate charging current during the charging period, and thus factors in all power loss that occurs during the charging process as a matter of course. Hence the value shown during the charging process is always higher than the nominal capacity of a new battery and does not necessarily provide an accurate indication of actual battery life. During the charging process, Charger One monitors the voltage and charging status of the connected battery, and manages charging voltage and current in accordance with this data and the selected charging program. During the initial phase of charging a completely discharged battery with low battery voltage (normally far below 8.2 V), the charging current will jump quickly to 2.5 A and will remain at that level for a relatively lengthy period. By the time the battery voltage rises above 8 V in the latter stages of the charging process (or when a low battery is being charged), the charging current will have gone below 1 A, and the battery will be almost fully charged.

Although the final stage of the charging process is relatively lengthy compared to the remaining chargeable capacity, this process makes for a battery that is fully charged and whose total capacity is fully usable. If the battery is disconnected from the charger prior to this final stage, the battery's life will be a good 10 percent shorter than would otherwise be the case.

Once the battery is charged to the brim, "ABCDE full" or "ABCDE pulse" will appear on the display. Conservation charging ("Pulse") is only activated for NiMH and NiCd batteries and it is unnecessary for Li-Ion batteries.



The battery is now fully charged. You can either disconnect it from the charger and begin using it immediately, or simply leave it connected to the charger until the next use. If an NiMH battery is left connected to the charger for weeks at a time, it needs to be "woken up" for its capacity to be fully available.

Charger One display messages at a glance:

Charger ready for use:	ABCDE ready for charge
During the charging process:	ABCDE charge
When the battery is fully charged:	ABCDE full
During a conservation charging pulse:	ABCDE pulse
Battery disconnected from charger during or after charging:	ABCDE disconnected
Faulty electrical connection:	ABCDE error
(Disconnect the power supply and wait four seconds before plugging it back in)	

Restoring default settings:

If you accidentally access the Charger One programming function or if you make an error while programming the device, proceed as follows to restore the device's default settings: **Unplug Charger One and disconnect it from the battery. Plug in the power supply while holding down the Select button.** Release the select button. The default settings have now been reactivated and the software version will be displayed. You may then have to select the correct program for your battery by pressing the button quickly one or more times, as needed.

12 V charging cable (not compatible with the Wiesel)

The 12 V charging cable enables you to charge Charger One in your car, mobile home or the like. Please note that when you start the engine, "Error" may appear on the device display. In such a case, reconnect the charger to the 12 V power supply.



Note: Charger One features numerous individual programming options. However, the default settings do **not need to be changed** in any way.

Main menu:

To select a program in the main menu, quickly press the Select button repeatedly until you reach the desired program. The following programs are available:

Li-Ion charging mode

The charging and deactivation characteristics of this mode are specially designed for our Li-Ion batteries. Charger One ends the charging process automatically when the battery is fully charged. Display: Li-Ion full. The battery can be left connected to the charger. Disconnecting the battery from the charger shortly before use will not impair the battery's performance in any way.

Li 50 % charging mode

This mode helps keep the battery in an optimally charged state. Half charged Li-Ion batteries should be kept in a cool place. Li 50% charging mode discharges and recharges any Li-Ion battery to 50 percent of its capacity, a function that helps prevent battery aging. The battery is first discharged, then completely charged, and then discharged to 50% of its capacity. When this process is completed (indicated by "Storage" on the display), you can either disconnect the battery or leave it connected. However, the battery must be recharged prior to the next use. **This mode is suitable for use in cases where the battery will be stored for four to six weeks.**

NiMH charging mode

The charging and deactivation characteristics of this mode are specially designed for our NiMH batteries. After the battery has been charged, the charger automatically switches to pulse conservation charging. Display: Pulse - full. The battery can and should be left connected to the charger. **Owing to their high self-discharging rates, NiMH batteries should not be removed from the charger until shortly before use.**

Form mode (NiMH, NiCd)



NEVER use this mode with Li-Ion batteries. This mode is intended for use SOLELY with NiCd and NiMH batteries.

Inasmuch as Form mode has no shutoff function, the charging process in this mode must be monitored. Use this mode to reactivate older batteries or batteries that have been stored for a lengthy period and whose level is unknown.

Slow overcharging of the entire battery pack ensures that even the weakest cells are fully charged, whereas the battery's strongest cells convert the extra electricity to heat. In other words, the battery should feel warm after being charged using this mode. The heat generated by low charging current for up to approximately 20 to 30 hours will not damage the battery in any way.

However, in order to avoid damaging the battery, this mode needs to be programmed carefully, as follows:

Select the maximum charging current manually, in accordance with the battery's characteristics as follows:

NightMare 7.8/8.2 Ah:	0.9 A
Passbio XC 5.2 Ah:	0.5 A
X-Beam 3.2 Ah:	0.3 A

If you're unsure which values to select in such a case, then select the lowest ones (also see "Reducing charging current" below). It is also important to limit maximum charged capacity, likewise via manual selection.

Note: This charging method should be used in exceptional cases only – notably, for example, for batteries that have been stored for several months or that are extremely discharged. With such batteries, standard charging mode is likely to shut down prematurely since full recognition of the battery level is determined by the majority of cells, but not by the weaker ones.

Important: When charging bottle batteries, it is essential to leave the cover open to allow for better heat dissipation.

Discharge mode

This "Disc" mode discharges your battery and then shows you the amount of capacity discharged, thus enabling you to check your battery's capacity. However, you also need to bear in mind that Charger One is not a measuring device and that the capacity shown on the display is only a relative value.

Note: Charger One discharge current is limited to 0.1-0.5 A, which in turn determines discharge time.

Helpful hint: Discharge mode can also be used without the power supply connected, which makes the discharge and capacity determination process very convenient. However, please note that the charger gets quite warm during the discharge process.

Charging mode submenus:

The submenus of the various charging modes enable you to define the basic settings for each such mode. To access the submenus, hold down the Select button for more than three seconds.

If you do not press the Select button again, one of the three options will be displayed for five seconds and its value will be saved when the program switches to the next option. Once all three options have been displayed, Charger One automatically goes back to the main menu and is ready for charging.

The options at a glance:

Charge

select: press key ... charge

Press the button quickly to switch from the default **charge** to **1-+ charge**; to **select 3-+ charge**, press the button again.

These two modes are particularly useful for "training" NiMH batteries in that the battery is automatically charged and discharged three times.

Note: If you select this option, each time you plug the battery into the charger, the following message will be displayed: "ABCDE 1-+ charge or 3-+ charge".

Five seconds later the following message will appear, regardless of whether you press the button:

Limit charging current

select: press key ... | max: 2.5 A

In this option, each short press of the button reduces the charging current (starting from the 2.5 A default value) by 0.4 A, whereby the cycle starts over again the next time the button is pressed after you reach 2.1 A. **This mode is useful for fully charging very old batteries.**

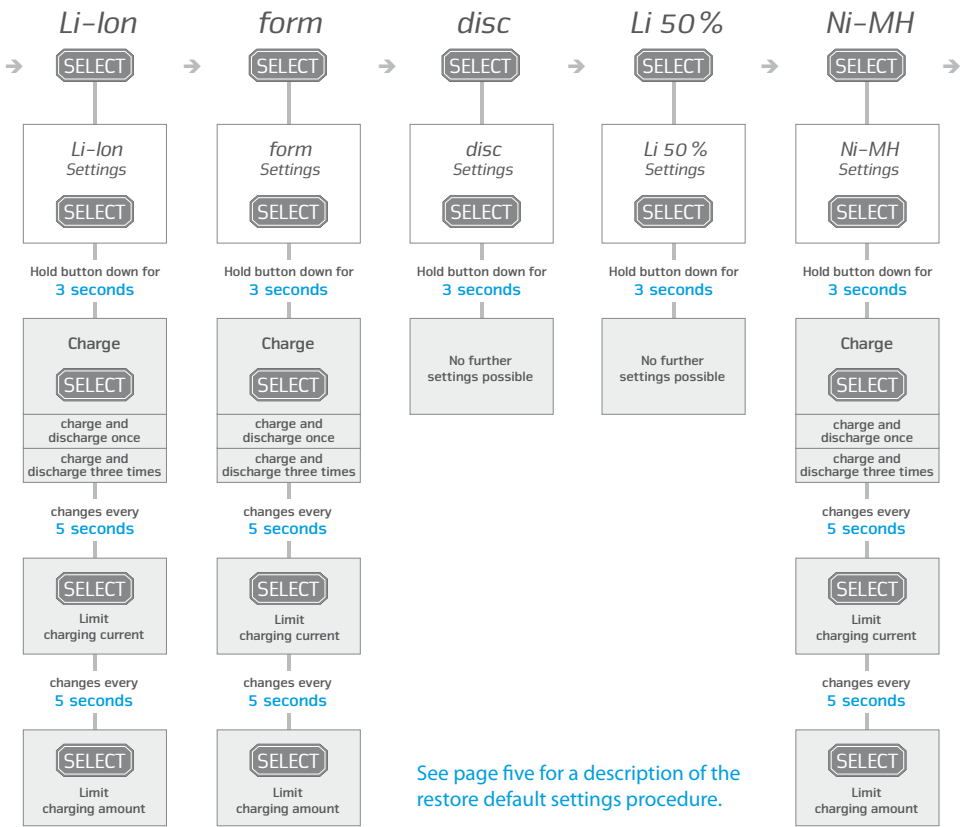
Five seconds later the following message will appear, regardless of whether you press the button:

Limit charged capacity

select: press key ... Max Ah: 20 Ah

To increase the maximum charged capacity in 0.5 Ah increments, press the button repeatedly (up to the 20 Ah default setting). Limiting charged capacity helps to improve the reliability of batteries whose quality is unknown (this does not apply to Lupine batteries). Here too the program advances at five second intervals, regardless of whether the button is pressed. The device now reverts automatically to the main menu and can be used for charging.

Helpful hint: If you do not wish to change any setting, simply refrain from pressing the button while the program progress through the various menu items. This is also the easiest way to restore submenu default settings.



See page five for a description of the restore default settings procedure.

Components:

Micro Charger Li-Ion and power supply

Plugging in the device:

Plug the included power supply into an outlet and connect the power supply to the Micro Charger. Plug the battery into the charger when the orange LED begins flashing.



Charging:

Charging begins automatically, and the orange and blue LEDs come on. The brightness of the blue LED varies according to the strength of the charging current, i.e. the higher the current the brighter the LED.

When the battery is fully charged, and the charger switches to Full, the green LED comes on. The battery can be left plugged into the charger for an indefinite period. Although this will not damage the battery, it is not advantageous for Li-Ion batteries since they do not require conservation charging. When kept in a cool place, the annual self-discharging rate for such batteries is 15%. An extremely discharged battery is indicated by a flashing LED. However, in most such cases the Micro Charger will be able to carry out the charging process normally, although it may take some time.

⚠ **Important!** This charger is to be used to charge rechargeable Li-Ion batteries only and is not to be used for NiMH batteries.

➔ **Do NOT use non-rechargeable batteries. – Risk of explosion!**

➔ **Do NOT open the charger or power supply. Only the manufacturer is authorized to do this.**

LED display:

Orange/blue LED on: battery being charged
(The stronger the charging current, the brighter the blue LED)

Orange LED flashes: standby mode

Green LED on: battery fully charged

Charged-capacity display:

When a fully charged battery is disconnected from the charger, the battery's charged capacity is shown as follows via the charger's green and orange LEDs, after the green LED flashes briefly:

Green LED: each flash = 1 Ah

Orange LED: each flash = 1/10 of an Ah

For example, after the battery is disconnected, the green LED flashes three times and then the orange LED blinks eight times. This means that the charged capacity is 3.8 Ah. The extent to which this information serves as a reliable guide to the battery's life for future use depends on how low the battery was prior to being charged. In any case, this information makes it much easier to predict the battery's life and thus reduces the risk of early failure.

Accessories:

12 V charging cable (not compatible with the Wiesel)

This cable can be used to charge a battery in a car, motor home or the like.



Components:

Micro Charger Li-Ion Basic and power supply

Plugging in the device:

Plug the included power supply into an outlet and connect the power supply to the **Micro Charger Basic**. Plug the battery into the charger when the **orange and green LEDs** begins flashing.



Charging:

Charging begins automatically, and the orange LED come on.

When the battery is **fully** charged, and the charger switches to Full, the **green LED** comes on.

The battery can be left plugged into the charger for an indefinite period. Although this will not damage the battery, it is not advantageous for Li-Ion batteries since they do not require conservation charging. When kept in a cool place, the annual self-discharging rate for such batteries is 15%. An extremely discharged battery is indicated by a flashing LED. However, in most such cases the Micro Charger will be able to carry out the charging process normally, although it may take some time.

LED display:

Orange LED on: battery being charged

Green LED on: battery fully charged



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- **Do NOT use non-rechargeable batteries. – Risk of explosion!**
- **Do NOT open the charger or power supply. Only the manufacturer is authorized to do this.**

Accessories:

12V charging cable (not compatible with the Wiesel). This cable can be used to charge a battery in a car, motor home or the like.

Components:

Wiesel charger and three plug adapters (for continental Europe, the UK and the US).



Plugging in the device:

Plug the included power supply into an outlet and connect the power supply to the Wiesel.

Charging:

Charging begins automatically, and the green LED come on.

When the battery is fully charged, and the charger switches to Full, the green LED goes off. The battery can be left plugged into the charger for an indefinite period. Although this will not damage the battery, it is not advantageous for Li-Ion batteries since they do not require conservation charging. When kept in a cool place, the annual self-discharging rate for such batteries is 15%.

Note: The green LED only comes on during the charging process and will not come on if a fully charged battery is plugged into the device.

LED display:

Green LED on: battery being charged

Green LED off: battery is fully charged



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Power supply: (Charger One, Micro Charger, Micro Charger Basic)

Input voltage: 100 – 240 V~, 50 – 60 Hz
Output voltage: 12 V =, 2 A

Charger One:

Input voltage: 12 – 14 V =, >= 2 A from power supply or 12V charging cable
Charging current: up to 2.5 A
Discharge current: 0.1 – 0.5 A
Compatible batteries: Li-Ion 7.2 V, Ni-MH 2 – 6 cells
Display: illuminated two-line 16 character display
Terminals: polarity-protected input and output terminals

Micro Charger:

Input voltage: 12 – 14 V =, >= 2 A from power supply or or 12V charging cable
Charging current: up to 2 A
Compatible batteries: Li-Ion 7.2 V
Display: charging control via three LEDs
Terminals: polarity-protected input and output terminals

Micro Charger Basic:

Input voltage: 12 – 14 V =, >= 2 A from power supply or or 12V charging cable
Charging current: up to 1.7 A
Compatible batteries: Li-Ion 7.2 V
Display: charging control via two LEDs
Terminals: polarity-protected input and output terminals

Wiesel:

Input voltage: 100 – 240 V~, 50 – 60 Hz
Charging current: up to 1.2 A
Compatible batteries: Li-Ion 7.2 V
Display: charging control via one LED
Plug adapters





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