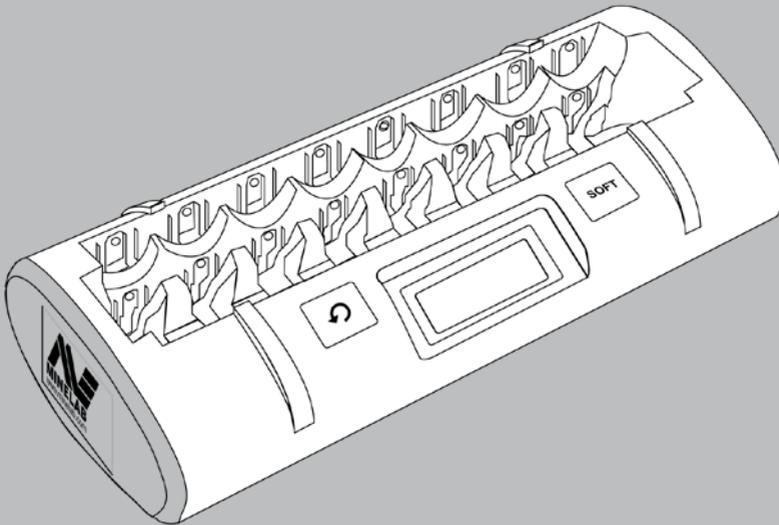


IMC

Battery Charger

Instruction Manual



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2 Introduction to the Intelligent Multi Charger

The Intelligent Multi Charger (IMC) is a robust, intelligent, fast charging device designed to charge 'C', 'D', 'AAA' and 'AA' cell rechargeable batteries. The user initiated conditioning (discharge before charge) facility allows the cycling of batteries if required.

The IMC has been designed for global portability, and can operate from a wide range of power sources. Automatic detection of input power allows the IMC to run from 100 V to 240 V AC mains and generator supplies without the need for user intervention.

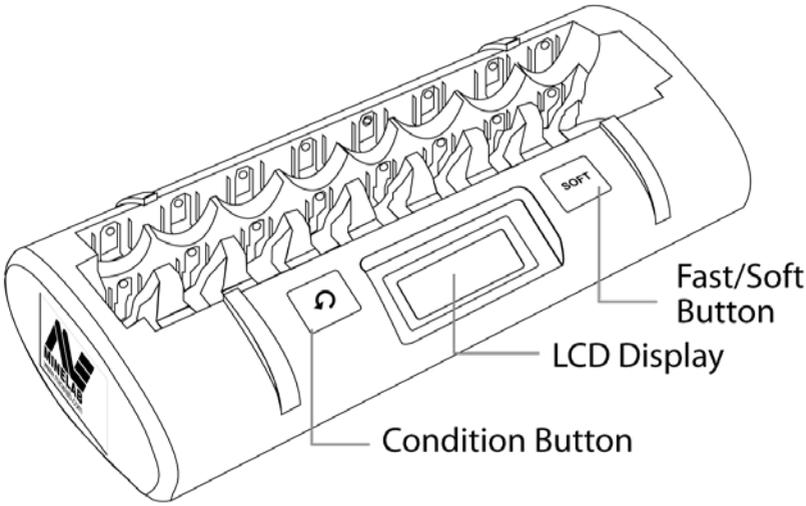


Figure 1 - Intelligent Multi Charger (IMC)



IMPORTANT

Always remove charger from carry bag before use.

The Minelab Intelligent Multi Charger comprises the following parts:

<i>Description</i>	<i>Qty</i>	<i>Minelab Part No</i>
1. Intelligent Multi Charger with Power Supply Module	1	0302-0087
2. Intelligent Multi Charger Carry Bag	1	3001-0067
3. Intelligent Multi Charger Instruction Manual	1	4901-0111
4. Mains Power Cable	1	
US Mains Cable, or		67-90202
AUS Mains Cable, or		67-90200
EURO Mains Cable, or		67-90203
UK Mains Cable		67-90201
Optional:		
Battery NiCd 'D' Cell 4.5Ah		0303-0010
Battery NiMH 'C' Cell		0303-0035



Figure 2 - Parts for the IMC

4 | Battery Charging Modes

Note: In all modes, the backlight on the LCD will remain on until the charger is disconnected from the mains supply.

This section explains various charging modes and when to use them.

Rapid Charging Mode (Default)

Rapid Charging Mode is the default setting and offers the shortest recharging time (approximately one to three hours for 'C' cell and one to five hours for 'D' cell).

Soft Charging Mode

Soft Charging Mode maximizes battery life and performance. It is suitable for most batteries and is recommended if recharging time is not critical.

Conditioning Mode

Conditioning Mode is a special mode which rejuvenates and cycles batteries. It applies a special initial charge, discharge and recharge cycle which restores battery performance (requires up to 30 hours for 'C/D' cell batteries).

The conditioning cycle can be used to recondition degraded batteries and exercise infrequently used batteries. It is recommended for use once every ten normal charges for NiMH batteries to ensure performance.

Set-Up Procedures for Charging Batteries

AC Mains and Generator

Using automatic supply voltage detection, the IMC can operate from most AC Mains supplies around the world. AC power will also be accepted from most portable generator sets.

A generator capable of supplying a nominal 100 V or 240 V is suitable as a source of power for the IMC. It is important that only self-regulating generators are used. A generator that has to have its speed manually adjusted as different loads are connected and disconnected is unsuitable for use with the IMC.

To charge batteries:

1. Remove the charger and power supply module from the carry bag.
2. Connect one end of the supplied AC power lead to the AC socket located on the end of the power supply module (refer Figure 3).
3. Connect the other end of the power lead to the AC power outlet or mains or a generator.

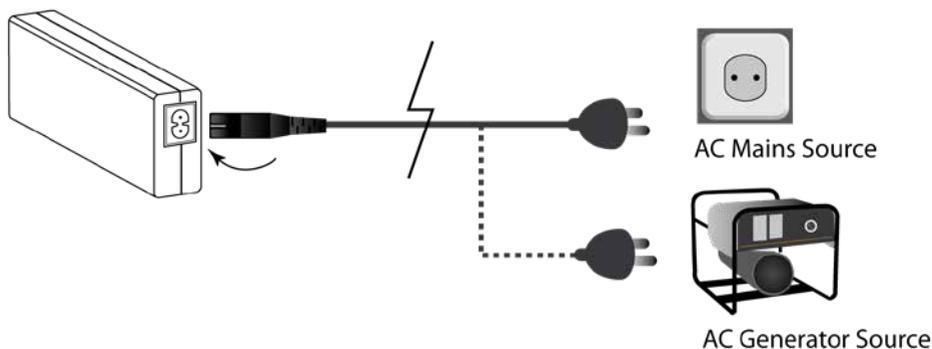


Figure 3 - AC Power Supply Module

On application of power, each symbol (shown on the LCD display) from right to left will be displayed for approximately 0.5 second. Once this test is complete and there are no batteries in the charger, the display will go blank. The IMC is now ready for use.

6 Battery Charging Procedure - Rapid

Note: As rechargeable batteries can only be fast charged between 0°C and +45°C, direct exposure to sunlight, snow or ice could prevent the IMC from entering fast charge mode. Ensure the IMC is protected from rain, snow or any other liquid.

Note: Rechargeable batteries gradually become warmer whilst being charged. Therefore, if warm batteries are inserted into the IMC, the charger may establish, after only a short time, that the batteries have received a full charge. To avoid premature charge termination, allow the batteries to cool to the same temperature as the IMC before inserting into the battery slots.

Rapid Charging Mode (Default)

1. Insert batteries. For best performance insert batteries from left to right. Note that each battery slot will only support ONE battery at a time. Do not attempt to insert more than one battery in any given slot.

If a battery cannot be detected, make sure that the battery is inserted all the way and try changing the slot. If it still cannot be recognized, the battery may not be accepting a charge and may need to be replaced.

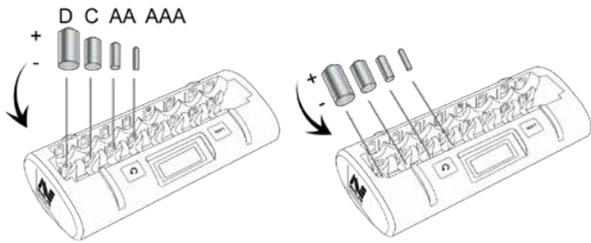


Figure 4 - Insert Batteries from Left to Right

2. When the battery is correctly inserted, charging will commence for that slot. The IMC is equipped with a four-level battery gauge which displays the charging progress for each slot.

CHARGE  Flashing	CHARGE  Flashing	CHARGE  Flashing	DONE Solid
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Figure 5 - Status of Battery Charger Rapid Charging Mode (Default)

Battery Charging Procedure - Soft

Note: *Soft Charging is activated for all battery slots simultaneously and cannot be activated for each individual battery.*

Soft Charging Mode

1. Remove all batteries from the IMC.
2. Insert one battery into the leftmost slot.
3. Within five seconds, press and hold the 'SOFT' button until the 'Soft Charging' symbol is displayed on the LCD.

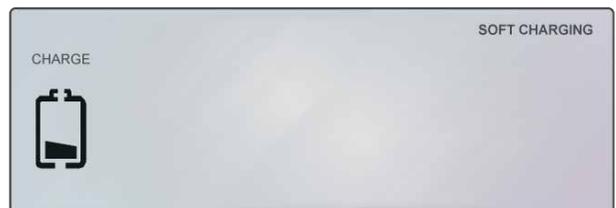
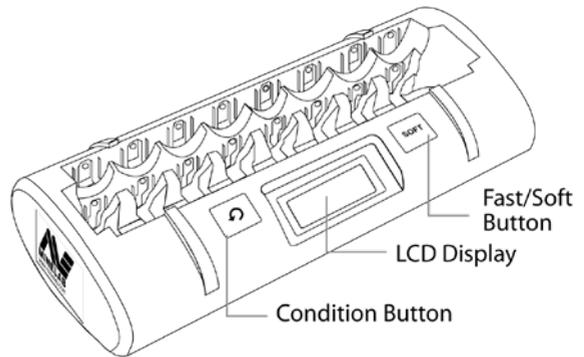


Figure 6 - Soft Charging Procedure

4. Insert the remaining batteries.
5. Soft Charging Mode will remain activated as long as there are batteries in the charger (even if charging is completed). The charger will reset to Rapid Charge Mode (Soft Charging symbol disappears) when all batteries are removed.

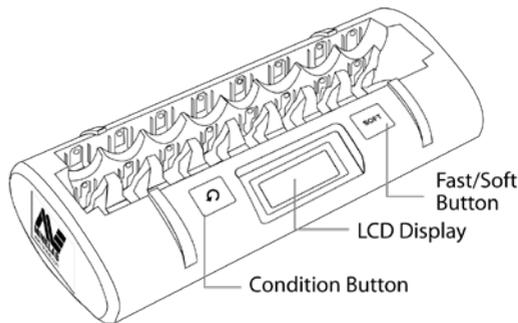
8 Battery Conditioning Procedure

Note: Conditioning is activated for all battery slots simultaneously and cannot be activated for each individual battery.

Minelab supplied batteries do not require discharge before recharging. However, if cycling of a set of batteries is required, the IMC can be used to automatically conduct a discharge-before-charge cycle once initiated by the user. Conditioning a set of batteries in an IMC will take up to 30 hours.

Ensure that the set-up procedure has been completed.

1. Remove the charger from the carry bag.
2. Remove all batteries from the charger.
3. Insert ONE battery into the leftmost slot.
4. Within five seconds, press and hold the 'CONDITION' button until the 'Condition' symbol is displayed on the LCD screen.



Tip: If 'Conditioning' and 'Soft Charging' are desired simultaneously, insert the first battery and press the 'Soft Charging' button first, followed immediately by the 'Conditioning' button.

THIS CAN TAKE UP TO 60 HOURS FOR HIGH CAPACITY BATTERIES.



Figure 7 - Conditioning Mode Procedure

5. Insert the remaining batteries.
6. The condition cycle will apply an initial charge, then discharge and recharge the batteries.
7. The status of the conditioning procedure is shown on the LCD (refer Figure 8).

CHARGE CHARGE CHARGE 		CHARGE CHARGE CHARGE 	DONE
Initial Charging	Discharging	Recharging OR Standby for Charging	Done

Figure 8 - Charging and Discharging symbols

Additional Notes:

It is normal for all symbols to disappear from one or more slots toward the end of discharge. This indicates that discharging is nearly completed and recharging will commence soon.

During discharging, batteries that finish before others will show 'CHARGE' symbols. However, actual charging will not commence until all batteries have finished discharging.

Conditioning mode will remain activated as long as there are batteries in the charger (even if charging is completed). The charger will reset to 'Rapid Charge' mode (the Conditioning symbol disappears) when all batteries are removed.



IMPORTANT

Always remove charger from carry bag before use.

Features and Specifications

Features

- Eight independent charging slots. Charges 1-8 AA, AAA, C or D NiMH/NiCd batteries
- Selectable 'Rapid Charge' and 'Soft Charge' modes
- Ultra fast recharging time
- Selectable conditioning/rejuvenation cycle
- Worldwide power supply

Electrical

Rapid Charge Current	2.0 A (AA, C, D) 0.7 A (AAA)
Microprocessor	Eighth generation MH-NM7008 Powerex Precision Microprocessor
Charge Time*	<ul style="list-style-type: none"> • AA/AAA: 1 hour (Rapid), 2 hours (Soft) • C: 1 to 3 hours (Rapid) 2 to 6 hours (Soft) • D: 1 to 5 hour (Rapid), 5 to 10 hours (Soft) <p><i>*Charge time will vary depending upon the brand, capacity and condition of batteries being charged.</i></p>
Input Voltage	AC 100-240 V 50-60 Hz

Environmental

Temperature	<ul style="list-style-type: none"> • Operation: 0 to +45°C • Storage: -20 to + 65°C
Humidity	<ul style="list-style-type: none"> • Operation: 0 to 95% (non-condensing) • Storage: 0 to 95% (non-condensing)
Vibration	Will withstand vibration consistent with normal road transport conditions without damage.

Physical

Size	47 cm (W) x 20 cm (D) x 11.5 cm (H) (in carry bag)
Weight	1.75 kg (charger and bag, without batteries)

Frequently Asked Questions

<i>Q: The IMC does not recognize my battery.</i>	First, make sure the battery is properly seated. Insert the battery so that the negative terminal touches the charging contacts first, then tilt it forward until it clicks. Also try removing the battery and inserting it into another slot. If the battery still cannot be recognized, it might no longer accept a charge and should be replaced.
<i>Q: In 'Condition' mode, the batteries appear to charge for a very long period of time.</i>	<p>During discharging (the second phase of 'Conditioning'), batteries that finish before others will show 'CHARGE' symbols. However, actual charging will not commence until all batteries have finished discharging. In this case the CHARGE symbols shown indicate 'STANDBY' for charging.</p> <p>This feature is designed to allow a rest period between battery discharging and charging, which improves battery performance.</p>
<i>Q: The IMC makes a faint clicking sound.</i>	This is pulse charging at work, and is normal.
<i>Q: What is the difference between a solid 'DONE' and a flashing 'DONE'.</i>	A flashing 'DONE' indicates that charging for that slot was terminated by high voltage. It is common for certain batteries to terminate this way and does not harm the health of the battery.
<i>Q: During discharging, the right side of the IMC becomes warm. Is this normal?</i>	This is normal. The energy drained from the batteries is dissipated as heat. The circuit is located at the right side of the IMC.
<i>Q: Why can't I charge lower capacity batteries?</i>	<p>The batteries, not the charger, determine whether they can be rapid charged.</p> <p>For normal charging mode (Rapid): 'AAA' capacity greater than 700 mAh, all others greater than 2000 mAh.</p> <p>For soft charging mode: 'AAA' capacity greater than 350 mAh, all others greater than 1000 mAh.</p>

Rechargeable Battery Management Guidelines

Battery Management

Ideally, rechargeable batteries should be used frequently to get maximum life from them. If charged and used correctly (regularly fully discharged to 'Battery Low'), a life of two to five years can be realistically expected.

All references to NiCd batteries in the following text also apply to NiMH batteries.

Batteries must be kept in the same sets of four during charge and use. This is the single most important factor for efficient rechargeable battery management. (This can be easily accomplished by numbering the batteries by set.) If batteries with unequal levels of charge are mixed, the following problem can be expected:



During use, after the battery with the least charge is fully discharged, power is drawn from the remaining batteries until the detector low battery alarm is triggered. During this period, power passing through the discharged battery may force it into reverse polarity, and some damage to the battery will occur.

Every time a battery is overcharged or discharged to the point of reverse polarity, some damage will occur. Therefore, if batteries are continuously mismanaged, their working life will be significantly shortened. Storage and use in very hot (over 40 degrees C), or very cold (less than 5 degrees C) temperatures will also shorten battery working life.

All supplied batteries should be fully discharged at least once a month. This can be achieved by using them in the detector until the 'Battery Low' alarm is triggered, or by using the discharge function on the IMC.

Additional Notes

Self discharge: Rechargeable batteries slowly lose their charge during storage. The rate of self discharge depends on the following:

- Environmental temperature conditions
- Condition of the battery (new or well managed batteries will self discharge more slowly)
- Charge state of the batteries (fully charged batteries will discharge more quickly)

Batteries should be recharged before use if they have been stored for more than 4 or 5 days and a full charge is required.

Storage: Ideally, batteries should be stored at temperatures between 5 and 30 degrees C, with relative humidity between 5 and 60%. When stored under these conditions, shelf life can be measured in years. Shelf life is not affected by the charge state of the batteries when put into storage.

Rechargeable Battery Management Procedures for Countermine Users

Note: *New batteries should be put through two charge discharge cycles before use.*

Suggested Battery Management Procedures

On receipt of new batteries:

1. Divide batteries into sets of four.
2. Number each battery in the set with the same unique number (for example each number can start at 001).
3. Make up battery carry boxes (with compartments and lids) to hold enough sets of four batteries (refer Figure 9).

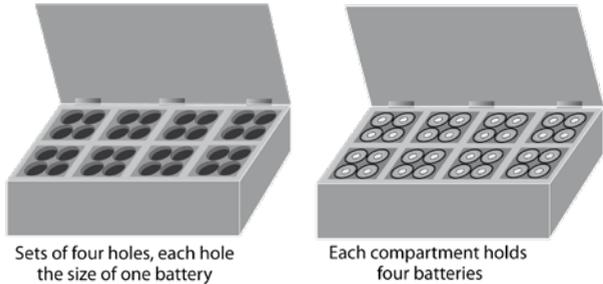


Figure 9 - Examples of Battery Carry Boxes

Battery Management Routine

Start of day:

- Team leaders or logistics staff hand each deminer one set of batteries at the start of the day.
- Team leaders or logistics staff check that all batteries in the set have the same number.

End of day:

- Deminers return the set of batteries to team leaders or logistic staff.
- Team leaders or logistics staff check that all batteries in the set have the same number and insert into storage box.

Note: *One full discharge/charge cycle takes up to 30 hours.*

Discharge/Charge Cycle

Each set of batteries should be given one discharge/charge cycle at least once a month as follows:

1. Operator takes one set of four batteries from a compartment in the box and checks that all batteries in the set have the same number.
2. Insert ONE battery in the leftmost slot of the IMC.
3. Within five seconds, press and hold the 'CONDITION' button until the 'CONDITION' symbol is displayed on the LCD screen.
4. Insert the remaining batteries.
5. When the word 'DONE' appears on the LCD screen, remove the charged batteries and place them into the box.

Data Recording

All battery sets should be listed to ensure that each set is given at least one discharge/cycle per month.

Action to be taken when one set of batteries is defective:

1. Determine which battery is faulty (multi-meter can be used – one battery will probably have a different voltage to the other three; this will be the defective battery).
2. Replace faulty battery with battery from spares.
3. Number new battery with same number as the other three.
4. Put this set of batteries through two discharge/charge cycles before use.

Warranty

For service or repairs the Charger must be returned, with cables, to the nearest Minelab Office or a Minelab authorised repair centre. This Warranty does not cover damage to the Charger or injury to persons due to accident, deliberate misuse, alteration, modification, or unauthorised use of this product.

Product Information

This product is distributed by:
Minelab Electronics Pty Ltd,
2 Second Avenue,
Mawson Lakes SA 5095,
Australia.

Minelab is an ISO9001 endorsed company, and hence all areas of product quality are carefully controlled and monitored. In order to ensure the product works reliably throughout its operational life, the user must adhere to the following cautions to prevent damage to the product, or injury to themselves or others.



Caution

- Risk of electric shock if opened.
- This appliance is not intended for use by young children or infirm persons unless they have been adequately supervised by a responsible person to ensure that they can use the appliance safely.
- Do not expose to liquid, vapour or rain.
- Do not charge battery cells other than NiMH or NiCd. 'AA', 'C' and 'D' batteries must be able to accept a 2.0A (Rapid Mode)/1.0A (Soft Mode) charge current. 'AAA' batteries must be able to accept a 0.7 (Rapid)/0.35A (Soft) charge current.
- To charge 'AA/C/D' batteries rated under 2000 mAh, always use the 'Soft Charging' mode.
- Do not expose the unit to rain or moisture due to the risk of fire.
- Do not operate the charger if it appears damaged in any way.
- Always place the battery cells with positive tip facing the top. Incorrect polarity may cause fire or explosion. Observe polarity diagrams located on the charger.
- Do not allow the unit to be exposed to direct sunlight. Operate in well ventilated areas.
- Do not allow the battery terminals to become shorted.
- Do not operate charger inside the carry case.



Working for a Cleaner, Greener Future

For Consumers within the European Union: Do not dispose of this equipment in general household waste.

The crossed wheeled bin symbol on this equipment indicates this unit should not be disposed of in general household waste, but recycled in compliance with local government regulations and environmental requirements.

Please dispose of this equipment via a recycling service or centre, or by returning the unit to the respective Minelab outlet as appropriate for your unit. This will enable the equipment to be disposed of in an environmentally safe manner.

Disposal of unwanted electronic equipment in land filled waste may contribute to adverse long term environmental effect due to the leaching of contaminating and toxic substances contained within some electronic equipment.

THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES

Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Disclaimer:

Certain descriptions and illustrations contained in this manual may differ from the exact model purchased. In addition, Minelab reserves the right to respond to ongoing technical progress by introducing changes in design, appearance, equipment and technical features at any time.

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