PT-CTXC

IFMAR©
2006-2007 ISTC WORLD CHAMPION

platinum CELL MASTER

HIGH RESOLUTION 16BIT AD INSIDE - SUPER LINEAR CURRENT CHARGER

OPERATION MANUAL

Please read the complete instructions before use.

Muchmore

1.CELL MASTER

The CELL MASTER Version 1.0(referred to as CM)is a state of the art microprocessor based charger/discharger system for rechargeable batteries for R/C use. With CTX technology developed by our team of R&D, factory team drivers and world champion Surikarn Chaidajsuriya, Muchmore introduces the next generation of charger for serious R/C drivers.
The CM is linear type and can fully charge 1 to 8 cells at a digitally presettable amperage up to a maximum 10.0amps using peak detection, temperature limit, capacity limit methods. The CM can automatically repeak by CTX charge mode.
The CM can charge Litheum battery up to 3 cells.

- Black back lit LCD with 16x2 characters
- IC controlled ball bearing fans
- Gold plated clips
- High resolution16bit AD for accurate volt reading
- 6 charging memories
- Auto restart system
- Autostart timer
- Blue state Indicator
- Customizable charging name
- Zero-delta peak cutoff
- Ouput control pins for Battery warmer or Cooling fan stand

SPECIFICATIONS

Dimensions	124 x114 x 47mm
Weight	482g
No. of cells	1~8
Max charge current	0.1~10.0A(adjustable)
Discharge current	0.1~10.0A(adjustable)
Cut-off Voltage	0.1~9.9V(adjustable)
Input Voltage	10.0~16.0V
Charging Capability	10~9990mAh(adjustable)
Charging Modes	Peak & CTX charge, Trickle, Flex, Li-Ion
Trickle Charge Rate(after charge)	0.1A
Voltage Threshold/Delta Peak	Zero, 3~99mV
Flex Charge	0~9Level(adjustable)
Thermometer sensor	15~70degrees Celcious
Keys	4
Cooling	Ball bearing temp controlled dual fans

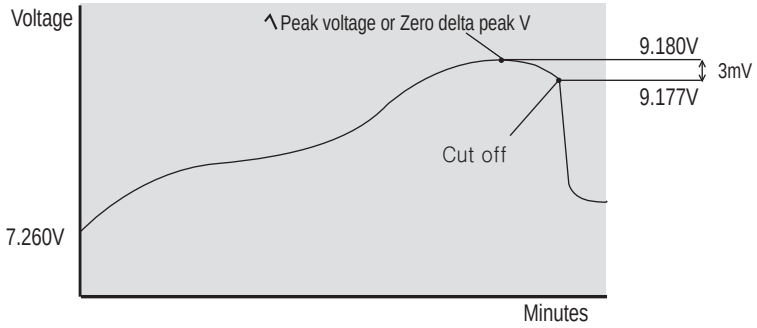
⚠WARNING

To reduce the risk of injury, use only rechargeable Ni-CD or Ni-MH or Litheum/Lithium-Ion, Litheum/Lithium Polimer batteries with the CM. Do not leave the CM unattended. The remote possibility of a failure could cause an extreme overcharge. This could cause the battery to rupture.
Always make sure all the batteries in the pack are in the same state of discharge before charging a pack. Otherwise, any cells that are partially charged before charging will get extremely hot and may be damaged or vent battery acids. To prevent this, make sure the thermo sensor from the CM is always attached to the battery's surface. Check your battery pack occasionally for overheating, If cell are too hot to touch there is something wrong and the pack must be disconnected from the charger.
Muchmore Racing(or their associated distributors) shall not be liable for any property damage or personal injury which may result from the failure to these instruction or other improper use of this product.
Avoid any contact of your CM with water or other liquids. Never operate on carpets, cloths, pit towel or other materials.
Never cover the cooling fans or holes on the CM. Disconnect the CM from power supply when not in use. Only charge serially switched battery packs containing 1~8cells. Never charge parallel switched cells. Never connect the CM directly to a 110/230 VAC power source. For best performance, we recommend the Power Master(24A power supply #MM-CTXP3)
New charger may produce a slight odour in the first few hours of service due to matereials curing inside the device.

2.What's Delta peak?

- Let's be clear about this. "Delta peak" is short hand for "The peak charge is detected by measuring the Delta Voltage". "Delta" is a mathematical term which means "The change in". So what is delta peak charging ? As a Ni-Cd battery is charged its voltage increases. This increase in voltage is technically called a positive delta V (or voltage). Positive because the voltage is rising. It is a basic characteristic of these cells that when they are fully charged the voltage levels off and even goes down very slightly. These conditions are known as Zero delta V and negative delta V. The CM charger looks for this change and terminates the charge when it sees it. The CM has a 16bit AD which allows the charge to terminate in a milli volt. E.g. for Ni-Cds it is fine to watch for negative delta V but the vlotage dip is not so pronounced in NiMH cells so it is better to charge them using Zero delta V i.e. don't wait for the voltage to drop but cut off when the voltage levels off.(See page 6 "ZERO DELTA PEAK")

- e.g. 3mV set

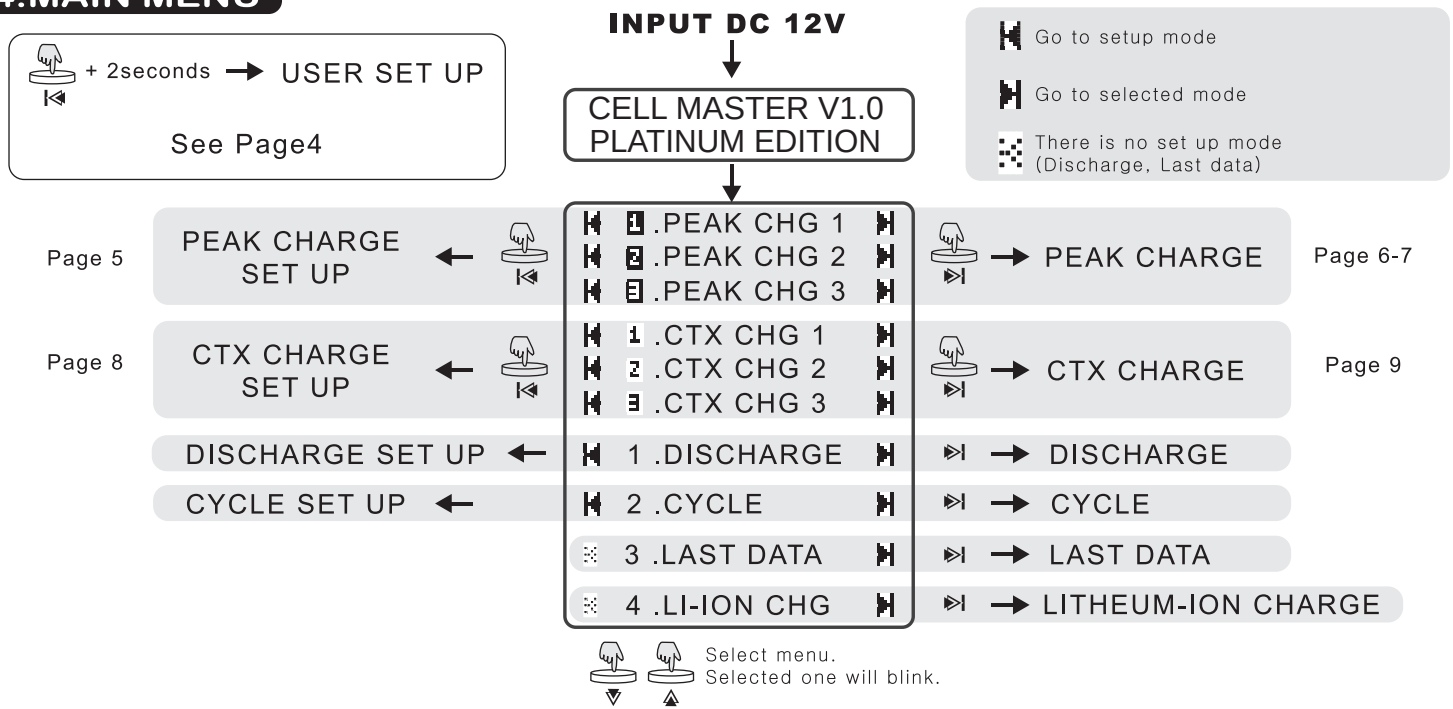


3.State indicator

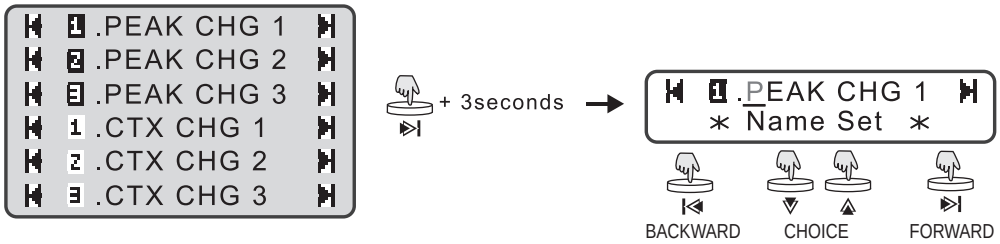
A state indicator blue LED is equiped on the CM which allows you could aware of the CM's state.

On : Charging, discharging
Blinking once a second(LED turned on very short time) : Charge/discharge/cycle finished
Blinking once a second(LED turned on longer time) : Delaying
Blinking twice a second : Error occured

4.MAIN MENU



- Customizable charge name(PEAK, CTX CHG)



5.USER SET UP

MAIN MENU

⏮ +2seconds

LONG LOCK OUT
Batteries that have been fully discharged can cause fulse peak for several minutes.
Long lockout charge will cure this problem.
Set Long lock out time at this mode.
(more information->Page 6)

-LONG LOCK OUT-
TIME : 10:00

⏭ Cursor moves. ▼ ▲ Value set up

⏮

OUTPUT CONTROL
On the right side of the CM, it has output pins for Muchmore's cooling fan stand or Battery warmer. Both can be controlled by temperature(Output thermometer comes with the CM)

-OUTPUT CONTROL-
Pin using: FAN

⏭ Enter

e.g.
On in rest:42C
Fan stand will act over 42deg.C during rest time.
Warmer cut:35C
Battery warmer stops warming over 35deg.C

⏮

TIME VIEW
You can choose Time view as two ways.
Minutes+Seconds or Only seconds.

- TIME VIEW -
MIN:SEC - 00:00

▼ ▲ →

- TIME VIEW -
SEC - 00000

⏮

KEY TONES
Choose key tone as you like.(3 tones)

-KEY TONES-
MELODY : 1

▼ ▲ Select

⏮

MELODY SELECT
Give own melody to Start(1~3), End(1~3), Error sounds(1~3).

- MELODY SELECT -
Start : 1

▼ ▲ Select ⏭ Enter

⏮

ERROR SOUND
Set the number of error and ending sound.
Once, 5times, 10times, 30times, Forever

- ERROR SOUND -
5 times

▼ ▲ Select

⏮

LITHEUM ION/POLIMER FUNCTION
Turn on or off the Li-Ion charge function at main menu.

- LI-ION Fun. -
Function ON

⏮

LOGO SET
Type your own name or favorite words for opening display.

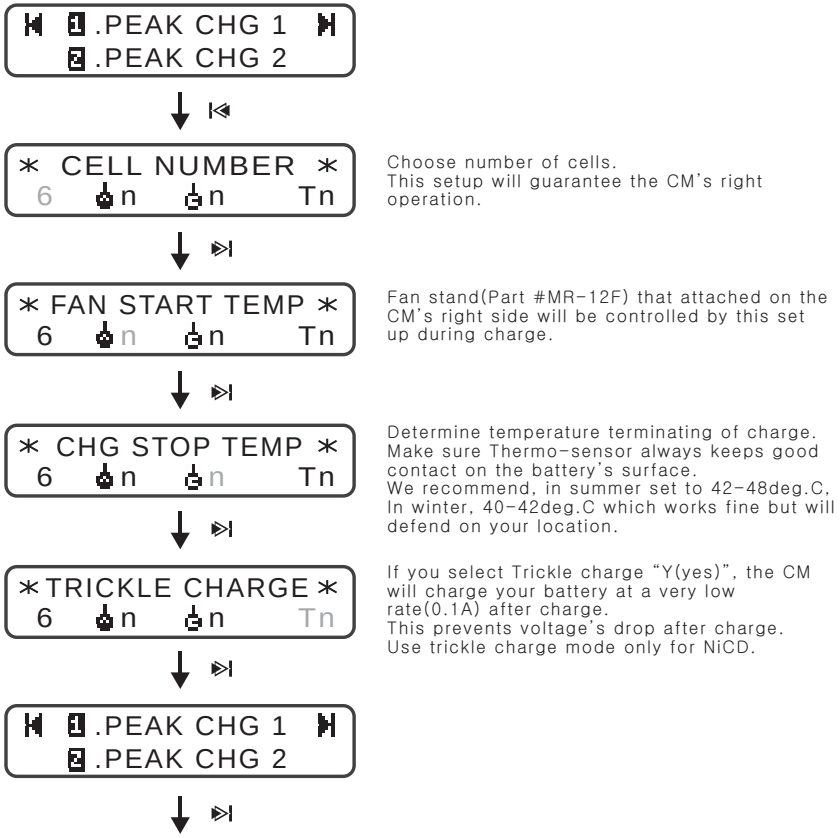
- LOGO SET -
PLATINUM EDITION

⏮

- FACTORY RESET -
RESET

All saved data will be cleared if u click ⏭ button twice.
If the CM shows some broken letters, use this function to cure the matter.

6.PEAK CHARGE-set up



Page 6 PEAK CHG 1

Choose number of cells.
This setup will guarantee the CM's right operation.

Fan stand(Part #MR-12F) that attached on the CM's right side will be controlled by this set up during charge.

Determine temperature terminating of charge.
Make sure Thermo-sensor always keeps good contact on the battery's surface.
We recommend, in summer set to 42-48deg.C,
In winter, 40-42deg.C which works fine but will defend on your location.

If you select Trickle charge "Y(yes)", the CM will charge your battery at a very low rate(0.1A) after charge.
This prevents voltage's drop after charge.
Use trickle charge mode only for NiCD.

KEY OPERATION

- Backward
- Set values
- Forward
  +1second back to Main menu

OPTIONAL PART

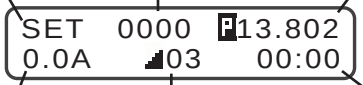
MM-WTB Warming tray blue
MM-WTK Warming tray black
MM-WTP Warming tray purple

MR-12FB 12V Cooling fan stand blue
MR-12FK 12V Cooling fan stand black
MR-12FP 12V Cooling fan stand purple

7.PEAK CHARGE - 1

SET:set up display
DLY:Delaying
CHG:charging
ERR:Error
CHK CLIP Check alligator clips
OVER VOT Over voltage error occured. The voltage of charging battery is higher than the voltage of power supply. Decrease charging amp or increase voltage of power supply.
OVERHEAT The CM is very hot.
Do not block the air flow around slots or the fan inlet in the back of the case. This could cause excessive heat build up and may short out the output circuit FETs which would void warranty. Blow out dirt in the fan and heatsink area occasionally. Otherwise there may be excessive heat build up that could cause the unit to fail.

CAPACITY(mAh) can be limited.
Set 5~10% higher than battery's capacity.
Ex: GP3300 => 3600



P :Power supply voltage
:Voltage at output connectors.
:Temperature at output thermo sensor

Charging current(Ampere)
For battery's safety and life time, always charge under 4A for Sub-C type,
2A for AA, AAA type batteries.

Auto start Timer:
This convenient feature lets you preselect when you want to start the CM for a charge session: adjustable from 0 to 18hours.

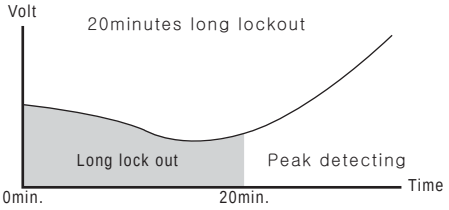
KEY OPERATION

- Backward
- Capacity, Peak sesitivity, Auto start timer value setting
- Forward, Charge start
  +1second:Charge start
  +2seconds:Long lockout charge start

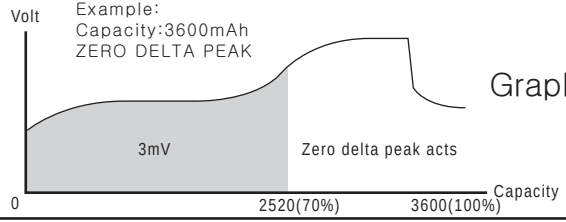
Delta peak value setting(Threshold setting)
03 means 3mV(0.003V). The delta peak value entered is the drop in millivolts that the CM looks for to determine that battery pack has peaked. This is adjustable from 03~99mV/pack. To adjust,push the ▼▲ buttons. If you set up high delta peak value, the CM will charge longer time. We recommend to start charge with 03mV for all batteries at the beginning. Under certain conditions, a battery pack or cell can exhibit a false peak. Under these circumstances, it peaks before it is charged, and the result is that battery pack or cell does not receive a full charge. False peaks can be caused by several things. Batteries that have been fully discharged can false peak for several minutes. Use long lockout to alleviate this problem. Another cause is using alligator clips on solid leads. This can produce a poor connection that can't handle the charge current. It is best to clip onto braided wire or multi-stranded wire where more area is contacted by alligator clips.

LONG LOCKOUT CHARGE(can be used PEAK, CTX CHG, CYCLE)
Set long lockout charge time(1~30min) at USER SETUP(page4)
Press and hold ▶| key for 2seconds. If long lock out charge acts, mark will be shown instead of delta peak value.

ZERO DELTA PEAK(Set delta peak value at 00(0mV))
The CM has Zero delta peak charging cut off system which can cut off charge at the peak voltage if the peak voltage stays for 7seconds(If this condition is not satisfied, the CM will cut off by 3mV). For preventing from false zero delta peak before it is charged, zero delta peak will act after 70% charge of set capacity. (See graph2)



Graph 1

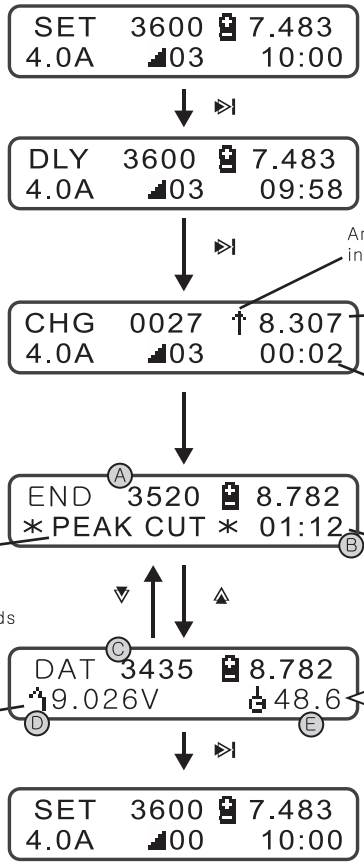


Graph 2

8.PEAK CHARGE - 2

e.g. of Peak charge

Capacity:3600, Charge amp:4
Delta peak cut:3mV,
Delay time:10min.



Now delaying 10min.
⏭ key skips delay(Start charge)

Arrow indicates voltage's increment or decrement.

The CM provides 0.001V(1mV) display. So you can check the accuracy of peak detection.

Time and temperature are displayed in turns.
Time:7seconds, Temp:3seconds

● Changing set up during a peak charge

Long lockout on/off: ⏮ +3seconds can be applied during cycle
Changing current: ▼ ▲
Capacity, delta peak, cut off temperature: ⏮ → ▼ ▲

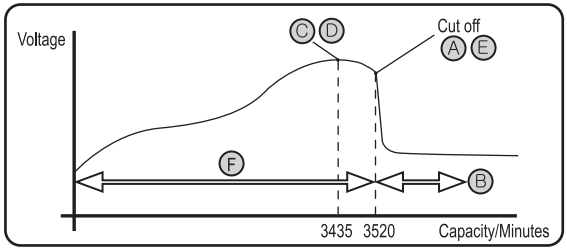
The CM shows what kind of charging cutoff program applied.
CAPC CUT Capacity cut-off
ZERO-CUT Zero delta peak cut-off
PEAK CUT Delta peak cut-off
TEMP CUT Temperature cut-off
NEGAVOLT will be shown if voltage drops continuously more than 60 seconds without peak voltage.

Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ

Elapsed time after terminating of charge

PEAK VOLTAGE

Temperature when charge terminated and charged time are shown in turns.



● You can check data at 3. LAST DATA -> a. CHG DATA which were automatically saved.

KEY OPERATION

⏮ backward

▼ ▲ Set value
Data check after charge

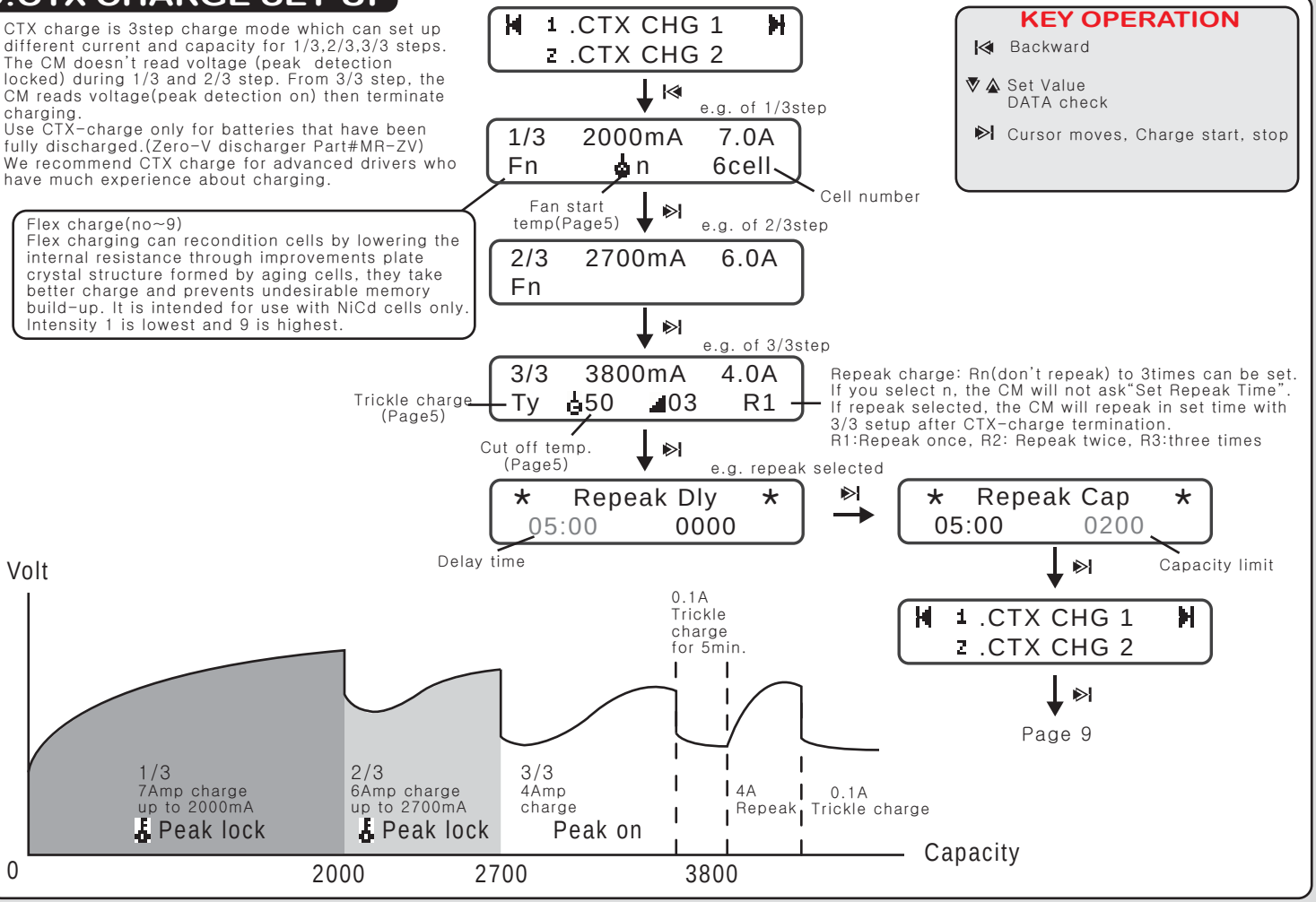
⏭ Cursor move, charge start or stop

9.CTX CHARGE SET-UP

CTX charge is 3step charge mode which can set up different current and capacity for 1/3,2/3,3/3 steps. The CM doesn't read voltage (peak detection locked) during 1/3 and 2/3 step. From 3/3 step, the CM reads voltage(peak detection on) then terminate charging.
Use CTX-charge only for batteries that have been fully discharged.(Zero-V discharger Part#MR-ZV)
We recommend CTX charge for advanced drivers who have much experience about charging.

KEY OPERATION

- Backward
- Set Value / DATA check
- Cursor moves, Charge start, stop



10.CTX CHARGE

CTX-chage does not allow chaging set up during charging.

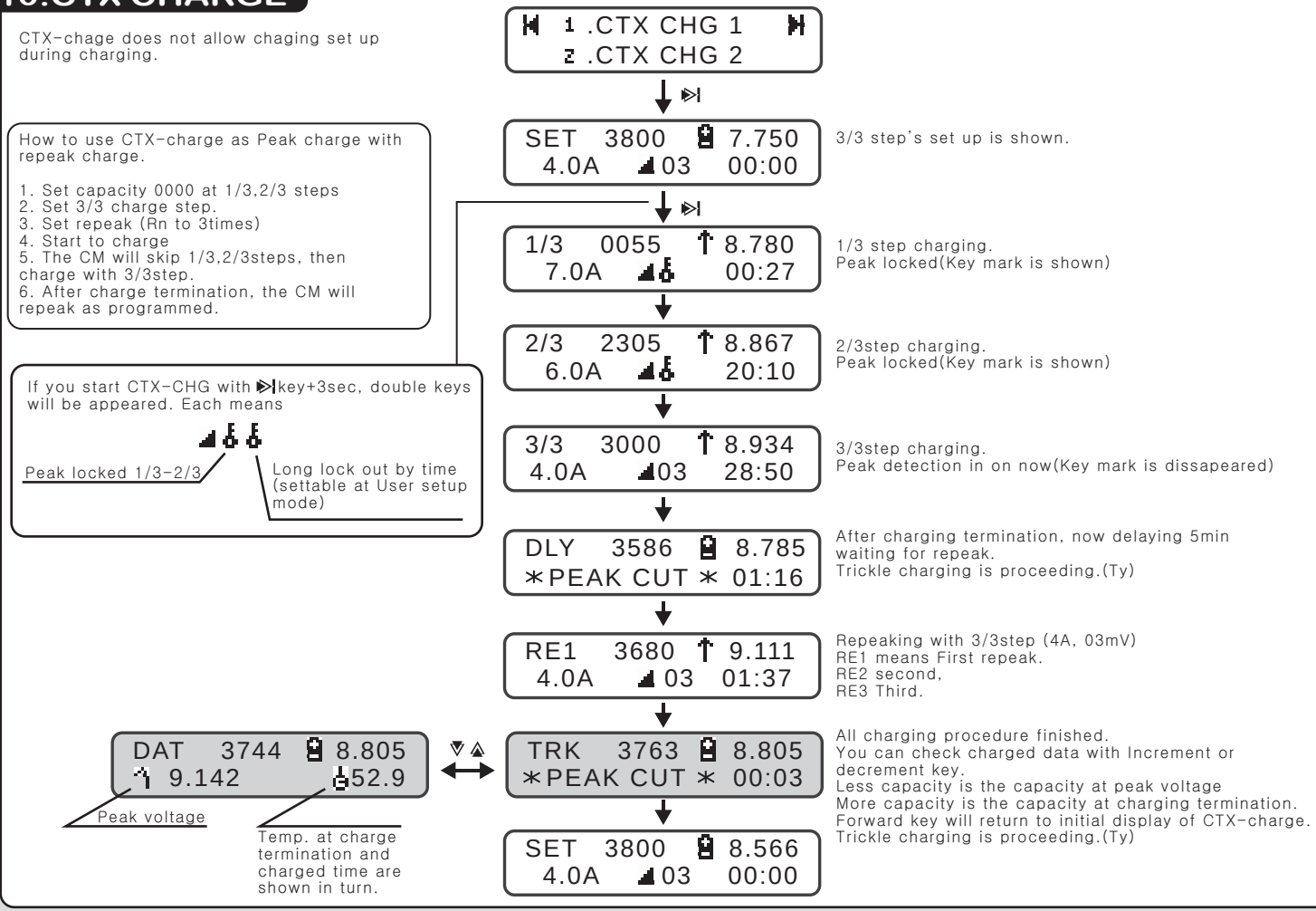
How to use CTX-charge as Peak charge with repeak charge.

1. Set capacity 0000 at 1/3,2/3 steps
2. Set 3/3 charge step.
3. Set repeak (Rn to 3times)
4. Start to charge
5. The CM will skip 1/3,2/3steps, then charge with 3/3step.
6. After charge termination, the CM will repeak as programmed.

If you start CTX-CHG with ⏭key+3sec, double keys will be appeared. Each means

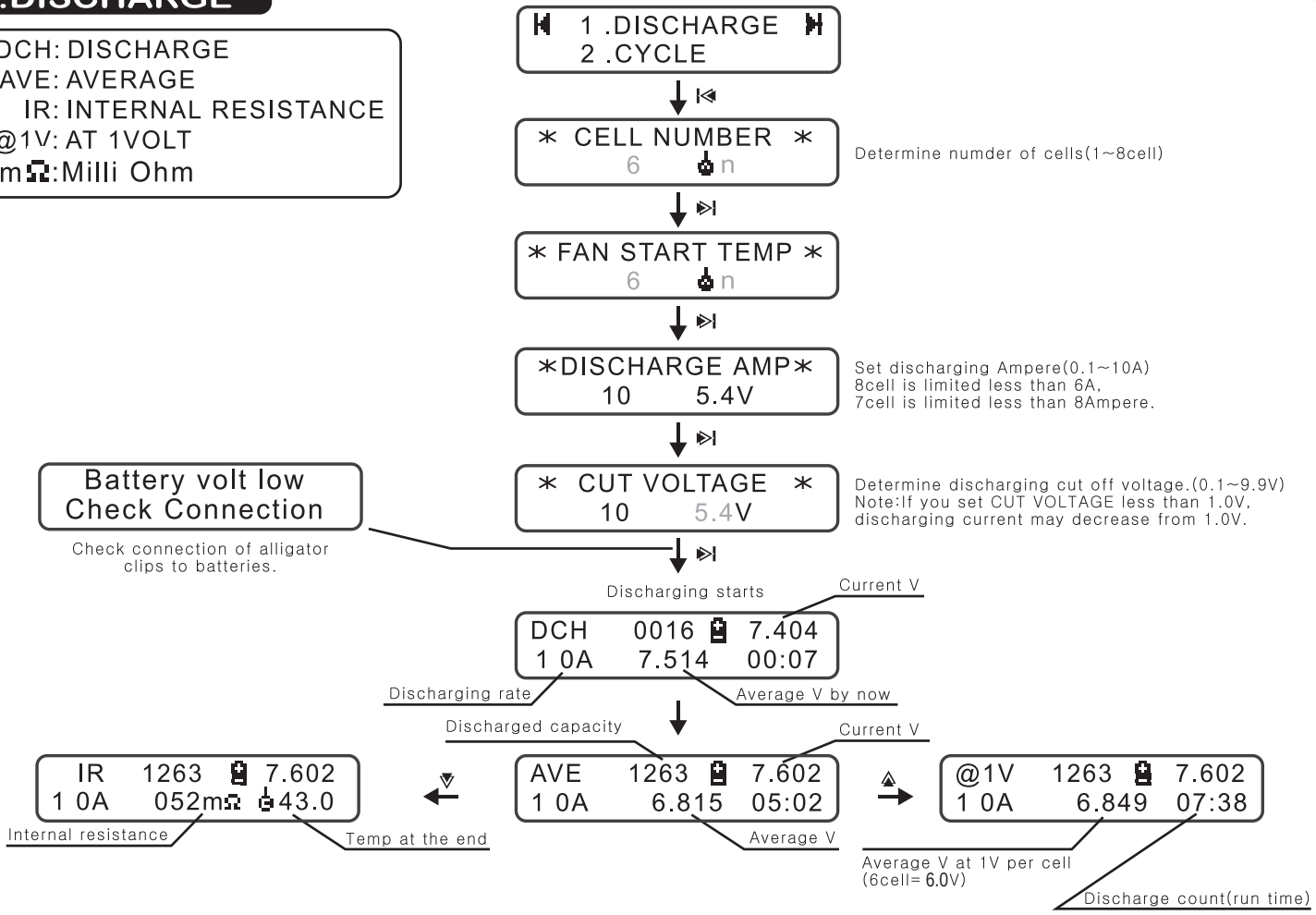
Peak locked 1/3-2/3

Long lock out by time (settable at User setup mode)



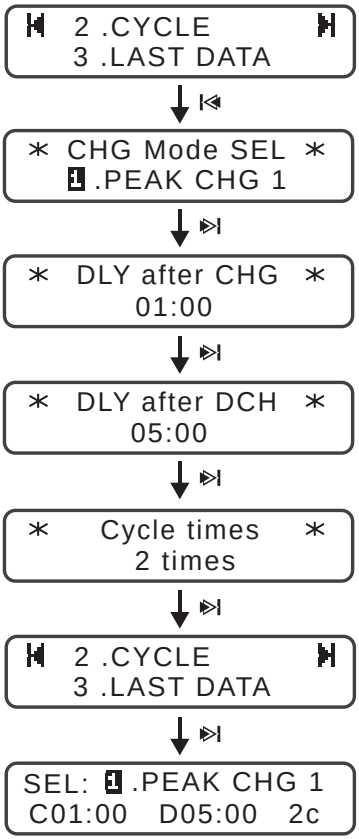
11.DISCHARGE

DCH: DISCHARGE
AVE: AVERAGE
IR: INTERNAL RESISTANCE
@1V: AT 1VOLT
mΩ: Milli Ohm



12.CYCLE

SET UP



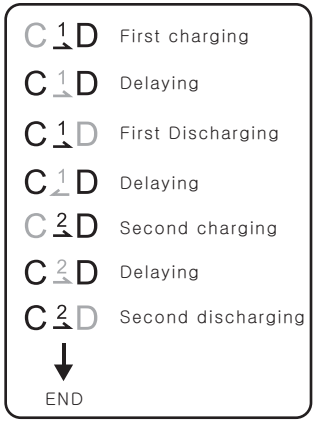
Choose one charge mode from 3 of PEAK CHG, 3 of CTX CHG.

Determine delay time after charging termintion.

Determine delay time after discharging termintion.(The CM will ask this if you cycle once)

Determine number of repetition(1~3times).

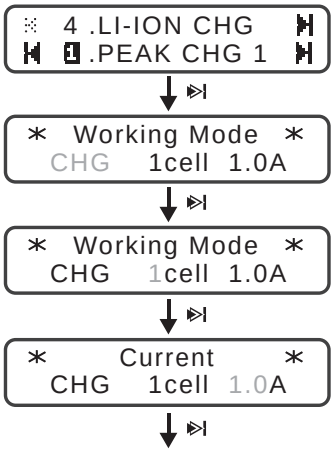
SEL:selected charging mode
C-DLY after CHG, D-DLY after discharge
c-Number of cycle
⏭ key will start cycling. (⏭ +3seconds will make long lockout charge.)
During charge, you can make or release peak lock(long lockout charge) by push and hold ⏮ key 2seconds.



CH1	CHARGE 1 DATA
DC1	DISCHARGE 1 DATA
CH2	CHARGE 2 DATA
DC2	DISCHARGE 2 DATA

13.LI-ION CHG

Charge only Litheum Polimer or Ion batteries.
If Li-battery is already more than 60% charged, CM may not charge but will show "CHK CELL". For this case, discharge your battery for a while then try again.



Choose CHG or DCH.

Determine number of cells.
This is very important for safety.
If set up is wrong, it has remote possiblity of explosion.

Set up CHG/DCH current Amp.

14.SYMBOLS & Message

- Delta peak detection value(or Threshold value, mV)
- Current temperature on output thermometer from the CM
- Fan starting temperature during charging.
- Charging termination temperature
- Peak locked(If this key mark is shown, charging will not be terminated by peak detection-Temp cut or Capacity cut is applied)
- Doubled locked(Peak locked by 1/3~2/3 step during CTX-CHG and Long lockout are acting simultaneously.
- Input voltage from the power supply
- Voltage of connected batteries.
- Peak voltage(Higher number of peak voltage means the battery has higher internal resitance-old batteries)
- Voltage of battery pack is increasing.
- Voltage of battery pack is Decreasing.

SUP Power fails. If power return within 3min. CM will charge your battery automatically.

15.Charge set up example

	PEAK CHG								CTX-CHG															
Type of battery pack	Cell No.			TRK	Capacity (mAh)	CHG Ampere		Long lockout	1/3 mAh	CHG Amp	Flex		Cell No.	2/3 mAh	CHG Amp	Flex	3/3 mAh	CHG Amp	TRK			RPK	RPK time	RPK mAh limit
8cell(for Tx) Ni-MH 1800mAh	8	n	42	No	1900	0.8	24	10min.																
6cell GP3700 (Fully discharged)	6	42	48	No	4100	5.0	8	15min.	2650	7.0	No	42	6	2680	0.2	No	4100	4.0	No	48	03	1	5:00	250
6cell GP3300 (Fully discharged)	6	42	48	No	3800	4.5	8	15min.	2400	7.0	No	42	6	2420	0.2	No	3800	4.5	No	48	03	1	5:00	250
6cell Intellect 4200	6	42	48	No	5000	5.5	6	15min.																
Tamiya RC2400SP 6cell	6	45	48	No	2650	5.0	18	15min.																
Tamiya RC3000MH	6	42	45	No	3200	4.5	18	15min.																
Sanyo RC3000HV 6cell	6	42	45	No	3300	4.5	18	15min.																
Sanyo RC3300 6cell	6	42	48	No	3800	4.5	8	15min.																
Sanyo RC3600 6cell	6	40	46	No	3900	4.5	3	15min.																

● See latest charge set up on www.much-more.co.kr

16.PRODUCT WARRANTY

- MUCHMORE RACING warrants their Cell Master to be free from defects in material and workmanship for a period of 120 days from the date of purchase. This warranty applies only to the original purchaser. MUCHMORE RACING (or their associated distributors) will repair or replace without charge, or refund the purchase price of any product which fails during the warranty period by reason of defect in material or workmanship found upon examination by MUCHMORE RACING to have been the cause of failure. This warranty does not cover any failures attributable to abuse, mishandling, failure to follow operating instruction, alteration or accident. To make a claim under this warranty, the purchaser must return the product to MUCHMORE RACING (or the relevant Countries associated distributors) at the address shown below, properly packed and with shipping charges prepaid. All claims must be made within thirty (30) days from the product failure and, in any event, within thirty (30) days of the expiration of the 120 day warranty. All claims must be accompanied by a sales slip or other written proof of date of purchase. The maximum repair costs for any failure caused by the purchaser are 50% of retail price (original purchase price). Since we cannot supervise the proper use of our products, we can not accept any liability for direct or indirect damage of any type arising from their use or occurring to the property of the user and/or third parties. Therefore, any use of this product shall take place at the user's own risk. The warranty claim may not exceed the value of this product in any case. By putting this product into operation you accept the above conditions and assume full responsibility for use of this product.

17. CONTACT

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