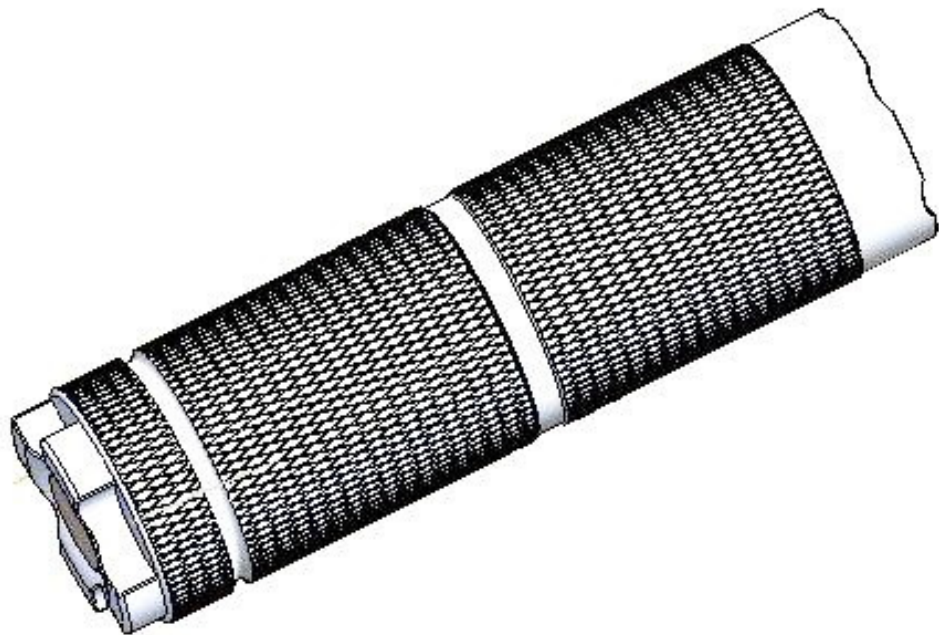


LF3XT 操作手冊

Operation Manual



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Introduction :

LF3XT is a multi-function flashlight build-in MCU through single push-button switch to control all operations . There are two user interface : Compact User Interface (CUI , default) and Full-function User Interface (FUI) . In CUI user can handle it easily via four command only . FUI provide more functional and powerful command that user can define or program his personal need .

Definition :

- **Click** (shorten : ***C***) : Press the push-button switch quickly and release , the timing must less than 0.3 second . That is similar to operate a mouse of computer .
- **Press & Hold** (shorten : ***PH***) : Press the push-button switch and hold more than 0.5 second .
- **Multi-click or plus *PH* command** : The interval of every click or press & hold must be less than 0.3 second . Ex: command ***3xC*** will be click , release switch for less than 0.3 second , click , release switch for less than 0.3 second , click and release switch for more than 0.3 second as an end of command .

Operation of Compact User Interface :

There is a user mode only . The minimum and maximum mode are operated as a temporary mode that means the brightness of them won't be memorized even you ramp the brightness . For example :

50 %	→	0.2%	→	15%	→	50%	→	0.2%
Turn ON		Min. mode		ramp		user mode		Min. mode
Any press		2xC		PH		2xC		2xC

Power OFF Operation :

- Tactical signal function is OFF : Any press will power on the light .
- Tactical signal function is ON : Only **1xC** command power on the light , except **1xC** command LF3XT will turn on when push button switch be pressed and turn off when switch be released .

Power ON Operation :

There are four commands for basic operation and three for advanced function .

1. **1xC** : Shutdown the light .

2. **2xC** : Minimum brightness (fixed 0.2% brightness when access Min. mode) or toggle Min./User mode .

3. **1xC + PH** : Maximum brightness (fixed 100% brightness when access Max. mode) or toggle Max./User mode .

User → Min. → User → Max. → User → Min. → Max. → Min.

2xC 2xC 1xC+PH 1xC+PH 2xC 1xC+PH 2xC

4. **PH** : Increase/Decrease brightness . The default is increase for Min. mode and decrease for Max. mode . LF3XT will memorize it after using **PH** command to change the brightness of user mode automatically .

5. **4xC** : Toggle tactical signal function ON/OFF and indicate double flash when the status be changed .

6. **5xC** : Indicate the voltage of battery . First shows the integer number , two second blank , and decimal number finally .

double quick flash → 0

one time flash → 1

two times flash → 2

..... nine times flash → 9

7. **5xC + PH** : Toggle CUI/FUI and indicate double flash when the operation interface be changed .

How to turn on rechargeable battery over-discharge protection in CUI :

In CUI there is no command to turn on or turn off over-discharge protection , but it still work in CUI . The following steps show how to program it :

1. Turn on LF3XT .
2. **5xC + PH** change to FUI and indicate double flash .
3. **4xC + PH** access function operation mode . It shows one flash , two seconds blank and repeat – function mode 1 .
4. **1xC** go to next function mode and indicate flash 2 times 2 seconds blank & repeat – function mode 2 (rechargeable battery over-discharge protection function) .
5. **3xC + PH** go into over-discharge protection function setting .
After an one second LED ON indication will show the status of setting .
 - flash 1 time 2 seconds blank & repeat : No protection .
 - flash 2 times 2 seconds blank & repeat : 16340 Li-Ion , RCR123 protection . 3.0V -- warning & 2.8V -- shutdown .
 - flash 3 times 2 seconds blank & repeat : LiFePO4 battery protection . 2.7V – warning & 2.5V – shutdown .

- flash 4 times 2 seconds blank & repeat : 2AA NiMH battery protection . 2.0V – warning & 1.8V – shutdown . Note : This is for using 2AA tube an accessory of LF3XT in the future .
6. ***1xC*** go to the next protection .
 7. ***3xC + PH*** save and exit protection setting .
 8. ***3xC*** exit , back to the main operation mode of FUI .
 9. ***5xC + PH*** back to CUI and done .

Operation of Full-function User Interface :

Power OFF Operation :

- Tactical signal function is OFF : Any press will power on the light .
- Tactical signal function is ON : Only ***1xC*** command power on the light , except ***1xC*** command LF3XT will turn on when push button switch be pressed and turn off when switch be released .

Power ON Operation (Main Operation Mode) :

There are five operation modes maximum , user can define it by using function mode 3 to set the operation mode number . Default setting is five operation modes : Mode 1 , Mode 2 Mode 5 . If

the operation number set to three then the modes are Mode 1 , Mode 2 and Mode 3 .

Every operation mode can be defined to one of the four output style – Brightness output , Strobe , Beacon flash and SOS .

- Strobe : 8 kinds of frequency output and a random strobe
- Beacon flash : Both of Single flash and Double flash with 8 kinds of frequency output .

1. ***1xC*** : Shutdown . Before turn off the power will save previous operation mode to memory if last mode memorized setting is ON (default) . Next power on will into this mode directly .
2. ***2xC*** : Next operation mode . Mode 1 -> Mode 2 -> Mode 3 ... Mode 5 -> Mode 1 in serial . If the mode number is 3 then : Mode 1 -> Mode 2 -> Mode 3 -> Mode 1 in serial .
3. ***4xC*** : Toggle tactical signal function ON/OFF and indicate double flash when the status be changed .
4. ***5xC*** : Battery voltage report . First shows the integer number , one second blank , and decimal number finally . Double flash quickly means 0 .
5. ***PH*** : In any operation mode ***PH*** command shows 100%

brightness output and back to previous operation mode when push-button switch released .

6. ***1xC + PH*** : In any operation mode ***1xC + PH*** command shows 100% brightness random strobe and back to previous operation mode when push-button switch released .
7. ***3xC + PH*** : Setting mode entry . Set current operation mode only . Ex : Now is Mode 2 , ***3xC + PH*** will go into Mode 2 setting mode .
8. ***4xC + PH*** : Function setting mode entry . There are four function modes can be set – Over-discharge protection , Mode number , Reset and Last mode memorized setting .
9. ***5xC + PH*** : Toggle CUI/FUI and indicate double flash when the operation interface be changed .

Function Setting Mode :

1. **Indicated Signal** : Every time into function setting mode will be always in first mode .
 - Reserved for the future : flash 1 time , 2 seconds blank and repeat .
 - Rechargeable battery over-discharge protection : flash 2

times , 2 seconds blank and repeat .

- Mode number setting : flash 3 times , 2 seconds blank and repeat .
- Reset function : flash 4 times , 2 seconds blank and repeat .
- Memory function : flash 5 times , 2 seconds blank and repeat .

2. **1xC** : Next function mode .

3. **2xC** : Previous function mode .

4. **3xC** : Exit & back to Main operation mode without saving .

5. **3xC + PH** : Current function mode entry .

Rechargeable battery over-discharge protection mode :

MCU measures voltage of battery every 32 mS (mini-second) , there are two levels : low battery warning level and shutdown level . Low battery warning level : flash 3 times every minute . Shutdown level : flash 16 times and turn off the power .

- flash 1 time 2 seconds blank & repeat : No protection .
- flash 2 times 2 seconds blank & repeat : 16340 Li-Ion , RCR123 protection . 3.0V -- warning & 2.8V -- shutdown .
- flash 3 times 2 seconds blank & repeat : LiFePO4 battery

protection . 2.7V – warning & 2.5V – shutdown .

- flash 4 times 2 seconds blank & repeat : 2AA NiMH battery protection . 2.0V – warning & 1.8V – shutdown . Note : This is for using 2AA tube an accessory of LF3XT in the future .

Note : Judgement for rechargeable battery : full charge the battery and install it into LF3XT . Turn on and using **5xC** command to read the voltage of battery . 16340 Li-Ion / RCR123 : 4.2V ; LiFePO4 : 3.6V ; 2AA NiMH : 2.8V .

1. **1xC** : go to the next protection setting..
2. **3xC** : Exit & back to Main operation mode without saving .
3. **3xC + PH** : Save setting & exit and back to Function setting mode .

Operation mode number setting :

1. Indicated signal :

- Mode No. = 1 : flash 1 time , 1 second blank and repeat .
- Mode No. = 2 : flash 2 times , 1 second blank and repeat .
- Mode No. = 3 : flash 3 times , 1 second blank and repeat .
- Mode No. = 4 : flash 4 times , 1 second blank and repeat .
- Mode No. = 5 : flash 5 times , 1 second blank and repeat .

2. **1xC** : Mode No. increase , 5 is the maximum .
3. **2xC** : Mode No. decrease , 1 is the minimum .
4. **3xC** : Exit & back to Main operation mode without saving .
5. **3xC + PH** : Save setting & exit and back to Function setting mode .

Reset function :

After you input command **3xC + PH** to access reset function , LF3XT will finish the follow works :

- Restore the factory default setting to memory .
- Exit and back to Main operation mode 1 .

Memory function setting mode :

1. **1xC** : Toggle On/Off memory function , On : 2 Hz flash signal ,
Off : 1 Hz flash signal .
2. **3xC** : Exit & back to Main operation mode without saving .
3. **3xC + PH** : Save setting & exit and back to Function setting mode .

Setting Mode :

1. ***1xC*** : Logarithm increase brightness by the factor 1.5 , or next frequency when toggle to frequency setting (command ***4xC***) .
2. ***2xC*** : Logarithm decrease brightness by the factor 1.5 , or previous frequency when toggle to frequency setting (command ***4xC***) .
3. ***3xC*** : Exit & back to Main operation mode without saving .
4. ***4xC*** : Toggle brightness / frequency setting , only Strobe and Beacon flash are available .
5. ***5xC*** : Setting brightness report , first shows the ten number , 1 second blank and shows the unit number . (exception : 100% -- flash 1 time , 1 second blank , flash 2 times quickly , 1 second blank and flash 2 times quickly)
6. ***PH*** : Next output style , there are four different styles can be chosen . Brightness -> Strobe -> Beacon -> SOS -> Brightness in serial .
7. ***1xC + PH*** : Increase brightness linear and slowly , this command is for fine adjustment of brightness .
8. ***2xC + PH*** : Decrease brightness linear and slowly , this command is for fine adjustment of brightness .

9. **3xC + PH** : Save setting & exit and back to Main operation mode .

Factory Default Setting :

Compact User Interface : (default)

- User mode : 50% brightness
- Tactical signal function : OFF
- Over-discharge protection : OFF

Full-function User Interface :

Memory function : ON

Tactical signal function : OFF

Rechargeable battery over-discharge protection : OFF

Operation mode number : 5

Mode 1 : 50% brightness output .

Mode 2 : 15% brightness output .

Mode 3 : 2% brightness output .

Mode 4 : 50% brightness double flash Beacon .

Mode 5 : 15% brightness SOS .