



GlobalTop Tech Inc.
宇誠科技股份有限公司

Document	Global Top LOCUS Library User Manual				
Author	Hector Su	Date	2013/05/20	Ver.	1.3



Global Top LOCUS Library User Manual

V 1.3

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Version History

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Date	Rev.	Author	Description
2011/09/27	1.0	Hector Su	First Release
2011/10/20	1.1	Hector Su	Second Release
2012/06/02	1.2	Hector Su	Third Release
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1. LOCUS Introduction

LOCUS is the name of MTK innate logger solution.

1.1 LOCUS Benefit

1. Auto logging data to MTK chip internal flash, no need to wakeup HOST side.
2. Smart overlapping mechanism to keep latest logger data (4 KB base).
3. Flexible configuration to support most logging type, mode and contents.
4. Logger capability in MTK chip internal flash:
 1. With 2 sector flash (128KB), user can log > 32 hours.
 2. With AlwaysLocate™, user can log up to 48 hours (2 days) under standard scenario.

1.2 LOCUS Operation

Step 1. Save configuration to firmware setting by pre-setting.

- Logging type
 1. Overlap
 2. Full&Stop
- Logging mode
 - Normal mode (logging per positioning, ex: 1 sec)
 - Interval mode (logging per pre-setting interval, ex: 10sec)
 - AlwaysLocate™ mode (logging with AlwaysLocate™)
- Logging contents

Step 2. Send PMTK command to do real-time application (if needed).

- PMTK183: Query logger status and configuration.
- PMTK184: Erase internal flash.
- PMTK185: Start/Stop logger operation.

Step 3. Use HOST sample code to dump and parse logger data in MTK chip.

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2. LOCUS PMTK Command List

2.1 PMTK_LOCUS_QUERY_STATUS

Packet Type: 183 PMTK_LOCUS_QUERY_STATUS

Packet Meaning:

Query Logging status

DataField:

None

Return:

\$PMTKLOG,Serial#, Type, Mode, Content, Interval, Distance, Speed, Status, Number, Percent*Checksum

Serial#: Logging serial number : 0~65535

Type: Logging type – 0: Overlap, 1: FullStop

Mode: Logging mode – 0x08 interval logger

Content: Logging contents of configuration

Interval: Logging interval setting (valid when Interval mode selected)

Distance: Logging distance setting (valid when Distance mode selected)

Speed: Logging speed setting (valid when Speed mode selected)

Status: Logging status – 0: Logging, 1: Stop logging

Number: Logging number of data record

Percent: Logging life used percentage (0%~100%)

Example:

Input: \$PMTK183*38<CR><LF>

Return: \$PMTKLOG,456,0,b,31,2,0,0,0,3769,46*2A<CR><LF>

Details: It's configurable in Core Builder's LOCUS page ()

Mode: Logging mode – 0x08 interval logger

// 1<<0: AlwaysLocate™ mode (logging with AlwaysLocate™)

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// 1<<1: Fix only mode (logging when 3D-fix only)
// 1<<2: Normal mode (logging per positioning, ex: 1sec)
// 1<<3: Interval mode (logging per pre-setting interval, ex: 15sec)
// 1<<4: Distance mode (logging by distance, ex: 50 meters)
// 1<<5: Speed mode (logging by speed, ex:10 m/s)
Contents: Logging contents of configuration (by Bit-Map)
#define LOCUS_CONTENT_UTC (1<<0) // 4-byte
#define LOCUS_CONTENT_VALID (1<<1) // 1-byte
#define LOCUS_CONTENT_LAT (1<<2) // 4-byte
#define LOCUS_CONTENT_LON (1<<3) // 4-byte
#define LOCUS_CONTENT_HGT (1<<4) // 2-byte
#define LOCUS_CONTENT_SPD (1<<5) // 2-byte
#define LOCUS_CONTENT_TRK (1<<6) // 2-byte
#define LOCUS_CONTENT_HDOP (1<<10) // 2-byte
#define LOCUS_CONTENT_NSAT (1<<12) // 1-byte

2.2 PMTK_LOCUS_ERASE_FLASH

Packet Type: 184 PMTK_LOCUS_ERASE_FLASH

Packet Meaning:

Erase Logging flash

Data Field:

PMTK184,Type

Type: Erase type – 1: erase all logger internal flash data

Example:

Input: \$PMTK184,1*22<CR><LF>

Return: \$PMTK001,184,3*3D<CR><LF>

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2.3 PMTK_LOCUS_STOP_LOGGER

Packet Type: 185 PMTK_LOCUS_STOP_LOGGER

Packet Meaning:

Stop/Start Logging flash

Data Field:

PMTK185,Type

Type: Logging type – 1: Stop logging

0: Start logging

Example:

Input: \$PMTK185,1*23<CR><LF>

Return: \$PMTK001,185,3*3C<CR><LF>

2.4 PMTK_LOCUS_LOG_NOW

Packet Type: 186 PMTK_LOG_NOW

Packet Meaning:

Snapshot write log

Data Field:

PMTK186,Type

Type: 1 means snapshot log data

Example:

Input: \$PMTK186,1*20<CR><LF>

Return: \$PMTK001,186,3*3F<CR><LF>

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2.5 PMTK_Q_LOCUS_DATA

Packet Type: 622 PMTK_Q_LOCUS_DATA

Packet Meaning:

Dump LOCUS internal flash data

Data Field:

PMTK622,Type

Type: 0 means dump full flash data

1 means dump partial in used flash data

Example:

Input: \$PMTK622,0*28<CR><LF> (It's same as \$PMTK622*34<CR><LF> only)

Return: \$PMTK001,622,3*36<CR><LF>

2.6 PMTK_LOCUS_CONFIG

Packet Type: 187 PMTK_LOCUS_CONFIG

Packet Meaning:

Configure LOCUS setting by command

Data Field:

PMTK187,mode,setting

Type: 1 means interval mode

Setting: New setting instead of the original configuration (e.g. change to 5 seconds interval as the example below)

Example:

Input: \$PMTK,187,1,5*38<CR><LF>

Return: \$PMTK001,187,3*3E<CR><LF>

Note:

1. It only allow user to set interval temporary, and the setting will get back to default when power on (without coin-battery)

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3. LOCUS Parser

Dump LOCUS data in a binary file, and parse the data.

3.1 LOCUS Dump Sample Code

Sample code for LOCUS dumping when Host issue PMTK622, and the PMTKLOX is used to dump flash data content.

PMTKLOX packet type after Host issue PMTK622.

Type 1: LOCUS start (n is the number of PMTKLOX packets will be sent)

→PMTKLOX,0,n

Type 2: LOCUS data (data will be sent by 8-byte HEX string, at most 24 events)

→PMTKLOX,1,0,xxxxxxxx, xxxxxxxx, xxxxxxxx,...

→...

→PMTKLOX,1,n-1, xxxxxxxx, xxxxxxxx, xxxxxxxx,...

Type 3: LOCSU end

→PMTKLOX,2

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3.1.1 PMTKLOX packet format

PMTKLOX,0,n (LOCUS start)

PMTKLOX,1,0,xxxxxxxx, xxxxxxxx, xxxxxxxx,... (LOCUS data, xxxxxxxx is 8-byte HEX string, at most 24 xxxxxxxx)

PMTKLOX,1,1,xxxxxxxx, xxxxxxxx, xxxxxxxx,... (LOCUS data, xxxxxxxx is 8-byte HEX string, at most 24 xxxxxxxx)

PMTKLOX,1,2,xxxxxxxx, xxxxxxxx, xxxxxxxx,... (LOCUS data, xxxxxxxx is 8-byte HEX string, at most 24 xxxxxxxx)

PMTKLOX,1,3,xxxxxxxx, xxxxxxxx, xxxxxxxx,... (LOCUS data, xxxxxxxx is 8-byte HEX string, at most 24 xxxxxxxx)

...

PMTKLOX,1,n-1,xxxxxxxx, xxxxxxxx, xxxxxxxx,... (LOCUS data, xxxxxxxx is 8-byte HEX string, at most 24 xxxxxxxx)

PMTKLOX,2 (LOCUS end)

3.1.2 LOCUS Dump Sample Code

Please refer to the LOCUS attachment for sample code.

Locus_Dump_Sample_Code.cpp

Locus_Dump_Sample_Code.h

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3.2 LOCUS Parse Sample Code

Sample code for LOCUS parsing

3.2.1 LOCUS Parser

```
//-----  
// Locus_Parser_Start  
// Function : Parse Locus' data with binary format  
// Parameter:  
//   InputDataFileName : The file name of  
//                       Locus' binary data  
// Return   : 0 :success  
//           1 : The type of files is wrong  
//           2 : Fail to Create/Open output file  
//           3 : File name is NULL  
//           4 : Fail to read locus.bin  
//-----  
int Locus_Parser_Start(char* InputDataFileName);
```

3.2.2 LOCUS Parse Sample Code

Please refer to the LOCUS attachment for sample code

Locus_Parser.cpp

Locus_Parser.h

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4. LOCUS Contents description

4.1 Details for logging content

Table	Naming	Size (bytes)	UTC (4)	Fix Type (1)	Lat (4)	Lon (4)	Height (2)	Speed (2)	Heading (2)	HDOP (2)	SatNo (1)	Checksum (1)
A	Basic	16	○	○	○	○	○					○
B	Racing	20	○	○	○	○	○	○	○			○
C	Search	19	○	○	○	○	○			○	○	○
D	Saving	13	○		○	○						○
E	All	23	○	○	○	○	○	○	○	○	○	○

4.2 LOCUS operation in Normal and Power saving mode

Below is the Logging mode behavior during Position normal mode

Positioning LOCUS config	Normal mode	Power saving mode (Periodic/AlwaysLocate)
AL mode	No logging	Logging once before go to sleep
Normal mode	Logging per fix	Logging per fix
Customization	Logging when over the customization criterion	Logging when over the customization criterion
AL + Normal	Logging per fix	Logging once before go to sleep
AL + Customization	Logging when over the customization criterion	Logging once before go to sleep
Normal + Customization	Logging per fix	Logging per fix
AL + Normal + Customization	Logging when over the interval	Logging once before go to sleep

Note:

1. The baud rate 115200 bps is recommended, because of using it for dumping data from internal memory of chip successfully.
2. It does not provide command to change setting of LOCUS function. It is only set by GlobalTop.

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3. The "Fix Only" is compatible with all other options.
4. The "AL" is used to save flash data and only Log once before going to sleep when AL running.
5. The "Interval", "Distance", "Speed" are called "Customization mode" in the table, and all of them are &&(AND) condition with each other configuration.

4.3 LOCUS ACK description

Here is the LOCUS special ACK description for HOST reference.

1	\$PMTKLOG,FULL_STOP*3E	Notify Host LOCUS become full and stop
2	\$PMTKLOG,WRITE_ERR*2D	Notify Host LOCUS write error
3	\$PMTKLOG,ERASE_ERR*30	Notify Host LOCUS erase error

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