

# **Mictrack Communication Protocol**

**(for MT821/MT825)**

**V2.0**

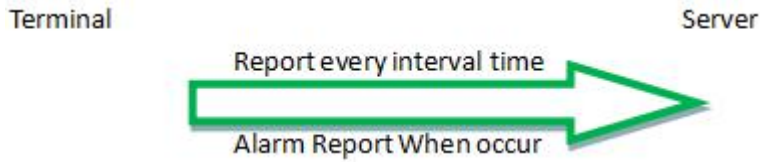
**Contents**

1. Communication rules.....	1
1.1 Report--Auto Report/Alarm Report.....	1
1.2 Command-Setting/Query Parameter.....	1
2. Terminal to Server Message Format.....	1
2.1 Report Message Format.....	1
2.2 Report GPS Data.....	2
2.2.1 Satellite No.....	2
2.2.2 Separator.....	2
2.2.3 Time Stamp.....	2
2.2.4 Latitude Longitude.....	3
2.2.5 Speed.....	3
2.2.6 Heading.....	3
2.2.7 Event ID.....	3
2.2.8 Voltage.....	3
2.2.9 Sequence number.....	3
2.3 Report Cell Data.....	3
2.3.1 UTC Time.....	4
2.3.2 MNC.....	4
2.3.3 CELL ID.....	4
2.3.4 LAC.....	4
2.3.5 MCC.....	4
2.3.6 PCID.....	4
2.3.7 Sequence number.....	4
2.4 WIFI Data.....	4
2.4.1 MAC.....	5
2.4.2 RSSI.....	5
2.5 WIFI+CELL Data.....	5
2.6 Heart beat data.....	6
2.7 Configuration information Data.....	6
2.7.1 Version.....	7
2.7.2 G-sensor status.....	7
2.7.3 Interval.....	7
2.7.4 RTC Time.....	7
2.7.5 RTC Interval.....	7
2.7.6 Key function.....	7
2.7.7 Timezone.....	7
2.7.8 Timezone status.....	7
2.8 Command Response format.....	7
2.8.1 Command Code.....	7
2.8.2 Separator.....	7
2.8.3 Result.....	8

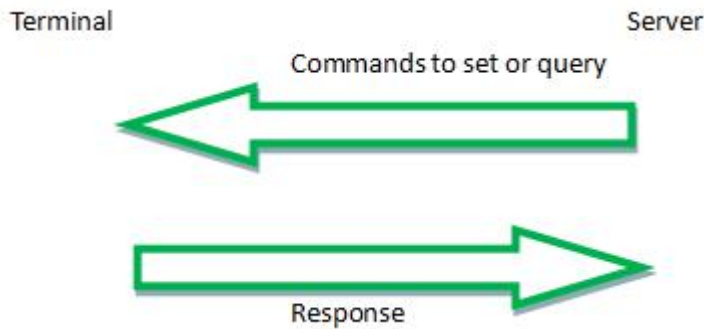
2.8.4 End Sign.....	8
3. Server/SMS to Terminal Message Format.....	8
3.1 Command Code.....	8
3.1.1 Data.....	8
3.1.2 APN.....	8
3.1.3 Working Mode.....	9
3.2 Network mode.....	11
3.2.1 Setup to Cat M1 network only.....	11
3.2.2 Setup to NB-IoT network only.....	11
3.2.3 Setup to GSM only.....	11
3.2.4 Protocol.....	11
3.2.5 Light (MT821 only).....	11
3.2.6 Rconf.....	12
3.2.7 Reboot.....	12
3.2.8 Reset.....	13
3.2.9 OTA.....	13

# 1. Communication rules

## 1.1 Report--Auto Report/Alarm Report



## 1.2 Command-Setting/Query Parameter



# 2. Terminal to Server Message Format

## 2.1 Report Message Format

Content	Length(Byte)
Head	2
Separator	1
Mode	1
Separator	1
IMEI	15
Separator	1
Data Type	2
Separator	1
Report Data	90

- <Head> Fixed characters, which is “MT”
- <Separator>Fixed character, which is “;”
- <Mode >the device working mode
- <IMEI>Device IMEI number (15 digital)
- <Data Type> check the follow table

Data type	Description
R0	GPS Data
R1 (MT825 only)	WIFI data
R12 (MT825 only)	WIFI+GSM cell
R13 (MT825 only)	WIFI +LTE cell
R2	GSM cell data
R3	LTE cell data
RH	Heart beat data
RC	Configuration inflammation data

## 2.2 Report GPS Data

Item	Max Length(B)
Satellite no.	2
Separator	1
Time Stamp	12
Separator	1
Latitude	9
Separator	1
Longitude	10
Separator	1
Speed	8
Separator	1
Heading	3
Separator	1
Event ID	1
Separator	1
Battery Voltage	4
Separator	1
Sequence number	3

Example:

MT;6;866425031361423;R0;10+190109091803+22.63827+114.02922+2.14+69+2+3744+113

### 2.2.1 Satellite No

The number of available satellites.

### 2.2.2 Separator

Fixed character, which is “+”

### 2.2.3 Time Stamp

UTC Time of last GPS location, the format is “YYMMDDhhmmss”

For example, "190109091803" means 09:18:03 on Jan, 09,2019

### 2.2.4 Latitude Longitude

The device latitude and longitude, the format: (-)dd.ddddd,(-)ddd.ddddd

### 2.2.5 Speed

Current speed , unit is km/h. For example, "2.14" means 2.14km/h

### 2.2.6 Heading

Track angle in degrees. From 0 to 359

### 2.2.7 Event ID

Event ID	Description
0	Device power on
2	GPS report
3	WIFI report
4	Cell report
5	SOS report (for MT825) Light sensor report ( for MT821)
8	Low battery
11	Heart beat
12	Power off
13	Charging
14	Charging full
15	Power on under power saving mode
16	Power off under power saving mode

### 2.2.8 Voltage

Backup battery voltage. 3744 means 3.740V

### 2.2.9 Sequence number

Plus 1 when report one message from 0 to 255(255->0)

## 2.3 Report Cell Data

Item	Max Length(B)
UTC Time	12
Separator	1
MNC	2
Separator	1
Cell ID	9
Separator	1
LAC	5
Separator	1

MCC	3
Separator	1
PCID	3
Separator	1
Event ID	1
Separator	1
Battery Voltage	4
Separator	1
Sequence number	3

Note: Only LTE cell has PCID .

**GSM Cell data:**

MT;1;866425031379169;R2;181129081017+0,21681,20616,460+4+3976+0

**LTE Cell data:**

MT;1;866425031379169;R3;190528030445+0,167910723,14924,460,176+4+3587+11

### 2.3.1 UTC Time

Refer to 2.2.3

### 2.3.2 MNC

Mobile network code

### 2.3.3 CELL ID

The parameter is the 16-bit (GSM) or 28-bit (LTE) cell ID. Range: 0-0xFFFFFFFF

### 2.3.4 LAC

Location area code.

### 2.3.5 MCC

Mobile country code

### 2.3.6 PCID

Physical Cell ID.

### 2.3.7 Sequence number

Plus 1 when report one message from 0 to 255(255->0)

## 2.4 WIFI Data

Item	Max Length(B)
UTC Time	12
Separator	1
MAC	17
Separator	1
RSSI	3
Separator	1

MAC	17
Separator	1
RSSI	3
Separator	1
Event ID	1
Separator	1
Battery Voltage	4
Separator	1
Sequence number	3

MT;6;866425031377981;R1;190108024848+6a:db:54:5a:79:6d,-91,00:9a:cd:a2:e6:21,-94+3+3831+0

#### 2.4.1 MAC

MAC address of AP.

#### 2.4.2 RSSI

Received Signal Strength Indication.

### 2.5 WIFI+CELL Data

Item	Max Length(B)
UTC Time	12
Separator	1
MAC	17
Separator	1
RSSI	3
Separator	1
MAC	17
Separator	1
RSSI	3
Separator	1
MNC	2
Separator	1
Cell ID	9
Separator	1
LAC	5
Separator	1
MCC	3
Separator	1
PCID	3
Separator	1
Event ID	1
Separator	1
Battery Voltage	4



Separator	1
Sequence number	3

Note: Only LTE cell has PCID .

#### WIFI+GSM cell data:

MT;6;866425031377981;R12;190108024848+6a:db:54:5a:79:6d,-91,00:9a:cd:a2:e6:  
21,-94+0,21681,20616,460+3+3831+0

#### WIFI+LTE cell data

MT;6;866425031377981;R13;190108024848+6a:db:54:5a:79:6d,-91,00:9a:cd:a  
2:e6:21,-94+0,167910723,14924,460,176+3+3831+0

## 2.6 Heart beat data

Item	Max Length(B)
Satellite no.	2
Separator	1
UTC Time	12
Separator	1
Fix value	1
Separator	1
Fix value	1
Separator	1
Fix value	1
Separator	1
Fix value	1
Separator	1
Event ID	1
Separator	1
Battery Voltage	4
Separator	1
Sequence number	3

MT;4;866425031379169;RH;5+190116112648+0+0+0+0+11+3954+1

## 2.7 Configuration information Data

Item	Max Length(B)
Version	35
Separator	1
G-Sensor status	1
Separator	1
Interval	5
Separator	1
RTC Time	2
Separator	1

RTC Interval	5
Separator	1
Key function	1
Separator	1
Timezone	1
Separator	1
Timezone status	1
Separator	1

MT;6;862785045414383;RC;MT825\_MICTRACK\_B1.07V3.3\_20200910+0+120+0+720+0+32+1

### 2.7.1 Version

Firmware version

### 2.7.2 G-sensor status

0: means G-Sensor is disable

1: means G-Sensor is enable

### 2.7.3 Interval

Interval time on Mode 6.

### 2.7.4 RTC Time

Wake up time on Mode 0.

### 2.7.5 RTC Interval

Interval time on Mode 1 or Mode 5.

### 2.7.6 Key function

This value is reserved and can ignore.

### 2.7.7 Timezone

Current Time zone of the device location.

### 2.7.8 Timezone status

0: means Timezone is invalid

1: means Timezone is valid

## 2.8 Command Response format

Content	Max Length (Byte)
Command Code	13
Separator	1
Result	7
End Sign	1

### 2.8.1 Command Code

Refer to 3.1 for detail.

### 2.8.2 Separator

Fixed character, which is “=”

**2.8.3 Result**

Setting result, "Success" or "Fail"

**2.8.4 End Sign**

Fixed character, which is "!"

**3. Server/SMS to Terminal Message Format**

Content	Max Length (Byte)
Command Code	13
Separator	1
Parameter1	64
Separator	1
Parameter2	20
Separator	1
Parameter3	80
Separator	1
Parameter4	10
End Sign	1

**3.1 Command Code****3.1.1 Data**

Content	Description
Command Code	data
Separator	,
Parameter1	IP:Port
End Sign	#

This command is used to set the server IP and port.

For example: data,113.98.254.179:7700#

After setup the device will directly connect to 113.98.254.179:7700 , and then report to this server.

Response:

- data=Success!
- data=Fail!

**3.1.2 APN**

Content	Description
Command Code	apn

Separator	,
Parameter1	APN
Separator	,
Parameter 2	Username
Separator	,
Parameter 3	Password
End Sign	#

- If the APN include APN username and password please send the command:  
apn,internet,internet,internet#
- If the sim card only have APN and APN username and password are blank,  
please send the command: apn,m2m,,#

Response:

- apn=Success!
- apn=Fail!

### 3.1.3 Working Mode

Content	Description
Command Code	mode
Separator	,
Parameter1	Report mode (0-7)
Separator	,
Parameter2	Time/interval
End Sign	#

#### Report mode description

Parameter1	Parameter2	Description
0	Time (0-23 hour)	One report per day
1	interval:(3-1440); unit:min	GPS & TCP sleep
4	0	TCP always ON
5	Interval 3-1440); unit:min	GPS sleep
6	Interval (10-86400); unit:sec	GPS & TCP always ON
7	Interval (10-86400); unit:sec	Power Saving mode

- **One day one report mode**

The device will wake up and send data to server, then go to sleep again..

Example:

mode,0,8#

Device will work in “one day one report” mode and will report at 8 am every day.

- **Deep sleep interval mode**

Device will wake up and send data to server by interval time, then go to sleep.

Example:

mode,1,60#

The device will report to server every 60mins.

- **TCP Always on mode**

Device will keep connecting with server all the time and server can send the command to tracker at any time.

Example: Mode,4,0#

- **GPS sleep mode**

Device will report to server by interval time, after that the GPS will disable. When interval time is arrived, the GPS will enable and report data to server again.

Example:

Mode,5,10#

The device will report data every 10mins.

- **GPS always on mode**

GPS power on all the time, and report by interval.

Example:

Mode,6,10#

The device will report data every 10sec.

Response:

- mode=Success!
- mode=Fail!

- **Power saving mode**

When device detect to vibrate it will wake up or it will power off.

Example:

Mode,7,10#

The device will report data every 10sec when vibrate.

Response:

- mode=Success!
- mode=Fail!

**Note:**

When the device keep the connection with server, if you send the command “where?” to server, the device will send the real time location to server.

## 3.2 Network mode

### 3.2.1 Setup to Cat M1 network only

SMS Command format : netlock,2,3,0#

Reply: netlock=Success!

Note: In this mode device will only work under Cat M1 network.

### 3.2.2 Setup to NB-IoT network only

SMS Command format :netlock,3,3,1#

Reply: netlock=Success!

Note: Device will only work under NB-IoT network.

### 3.2.3 Setup to GSM only

SMS Command format : netlock,1,1,2#

Reply: netlock=Success!

Note: Device will only work under GSM network.

### 3.2.4 Protocol

Content	Description
Command Code	protocol
Separator	,
Parameter1	0/1
Separator	,
Parameter2	0/1
End Sign	#

This Command is to set TCP or UDP.

- Parameter 1: 0 means UDP, 1 means TCP.
- Parameter 2: 0 not need ACK. 1 mean need to response ACK.  
If use TCP please ignore this parameter and configure it to 0/1.
- For example: protocol,1,0/1#  
It means TCP protocol. The parameter2 is 0 or 1.
- For example: protocol,0,0# / protocol,0,1#  
It means UDP protocol. If the parameter2 is 0 it don't need to response ACK.  
If the parameter2 is 1 it need to response ACK

Response:

- Protocol =success!
- ----Protocol =Fail!

### 3.2.5 Light (MT821 only)

Content	Description
---------	-------------

Command Code	light
Separator	,
Parameter	0/1
End Sign	#

This command is use to disable/enable light sensor alert.

Parameter: 0 means disable light sensor alert and 1 enable light sensor alert.

For example: light,1#

It means enable the light sensor feature.

For example: light,0#

It means disable the light sensor feature.

Note: If you disable/enable the light sensor then you need to reboot the device then it will work.

Response:

---light =success!

---light =Fail!

### 3.2.6 Rconf

Content	Description
Command Code	rconf
Separator	,
Type	1
End Sign	#

This is a command to query current device config info.

For example,

rconf,1#

Response:

867035047590649

rconf=m2m,,113.98.254.179,7700,6,30,MT825\_MICTRACK\_B1.08V3.8\_20200814,NB-IoT

Note: According the above message and we can get the info as follow:

ID: 867035047590649

APN: m2m

IP/Port: 113.98.254.179:7700

Working Mode: Mode,6,60#

Firmware version: MT825\_MICTRACK\_B1.08V3.8\_20200814

Network Mode: NB-IoT

### 3.2.7 Reboot

Content	Description
Command Code	reboot
Separator	,

Type	0
End Sign	#

This is a command to let the unit software reset.

For example,

reboot,0#

The device will restart after send this command.

Response:

- reboot=Success!
- reboot=Fail!

### 3.2.8 Reset

Content	Description
Command Code	factoryreset
Separator	,
Type	1
End Sign	#

This is a command is reset the unit to default settings.

For example,

factoryreset,1#

The device will resume to factory settings after send this command.

Response:

- Factoryreset=Success!
- Factoryreset=Fail!

### 3.2.9 OTA

Content	Description
Command Code	otastart
Separator	,
Parameter1	IP:Port
Separator	,
Account name	
Separator	,
password	
Separator	,
Firmware name	



Separator	,
Parameter2	1
End Sign	#

This command is to Remote update the firmware, you can update via SMS or server.

For example:

```
otastart,173.230.147.117:21,ota,ota,MT825.bin,1#
```

Response:

- otastart =Success! OTADONE
- ota=Fail! OTAFAILED

After OTA progress, it will response "OTADONE" if OTA successfully or response "OTAFAILED" when OTA fail. If it has failed, you can try again.

(End of the document)

mictrack

**Shenzhen Mictrack Electronics Co.,Ltd.**

**Add:** B305-306, Kangsheng Electronic Industrial Park, Zhonghua Rd, Longhua District, Shenzhen, China 518131

**Tel:** +86-755-21014699

**Web:** [www.mictrack.com](http://www.mictrack.com)

**Email:** [info@mictrack.com](mailto:info@mictrack.com)