# Protocol for CP-100G

Version 2.03

2009. 07. 17

## Revision History

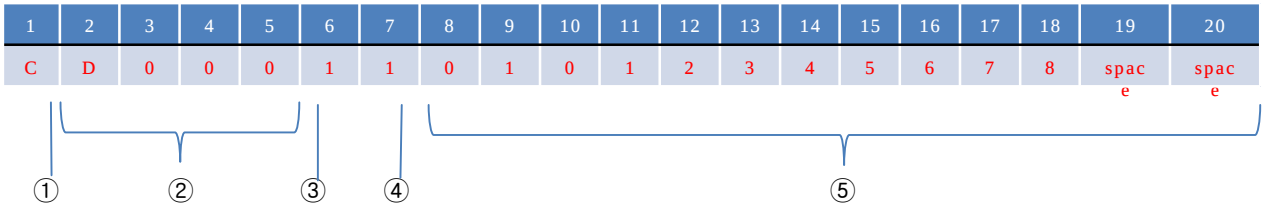
| Data | Description | Author | Note |
|---|---|---|---|
| 03.14.09 | Add setup for Ex GPRS | Sun duk | |
| 04.01.09 | Add Cell-ID Part in Page 6 and Page 11 | Sun duk | |
| 04.14.09 | Change chapter structure and add new protocol | Joon-Wook Choi | |
| 05.06.09 | Change protocol | Joon-Wook Choi | |
| 05.15.09 | Change protocol(GPS+GSM Cell Information) | Joon-Wook Choi | |
| 07.17.09 | Change protocol(Add '\r' and '\n' at the end of GPRS Send Data) | Joon-Wook Choi | |

# I. How to setup the device for Operator Mode (B2C)

## 1. Set up procedure by SMS command

### Step 1. Change to SMS mode using SMS command

‘CD00011010123456 78 ’

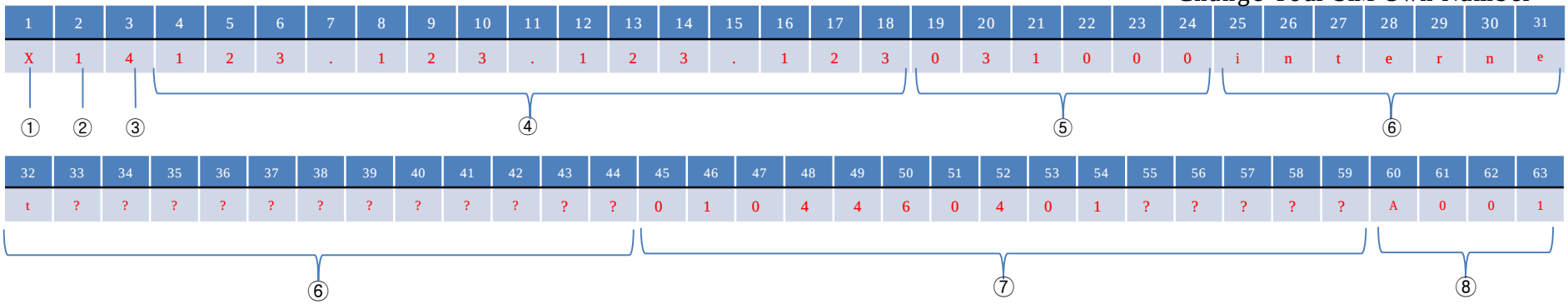



① : ‘C’ CODE
② : ‘D000’Terminal ID
③ : ‘1’ Response need
④ : ‘1’ : SMS Mode
⑤ : Control Phone Number

### Step 2. Set IP, Port, APN

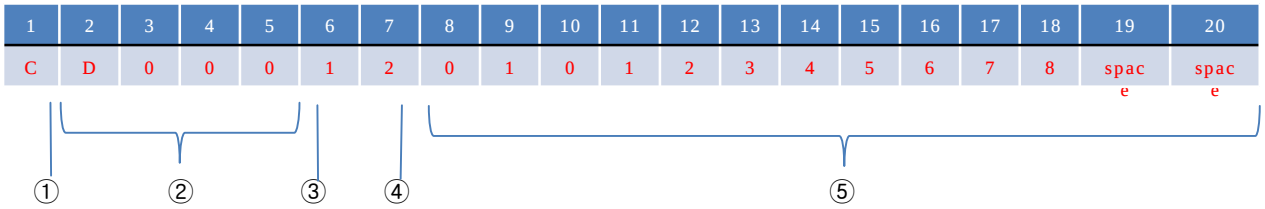
‘X14123.123.123.123031000internet????????????0104460401?????A001’

Change Your IP
Change Your SIM APN
Change Your SIM Own Number



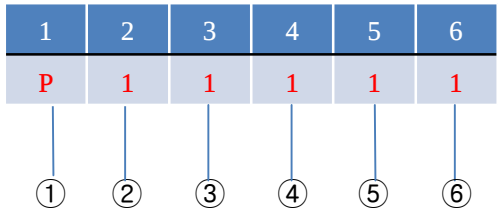

① : ‘X’ CODE
② : ‘1’ Response need
③ : ‘4’ Change TCP/IP Address, Port, APN …
④ : ‘123.123.123.123’ Server IP
⑤ : ‘031000’ Sever Port
⑥ : ‘internet????????????’ Access Point Name
⑦ : ‘0104460401?????’ Own Number
⑧ : ‘A001’ Center Code

## Step 3. Change to GPRS mode using SMS command 'CD000120101234567 8 '




① : 'C' CODE
② : 'D000'Terminal ID
③ : '1' Response need
④ : '2' : GPRS Mode change
⑤ : Control Phone Number

## Step 4. Setting to receive Reports 'P11111'

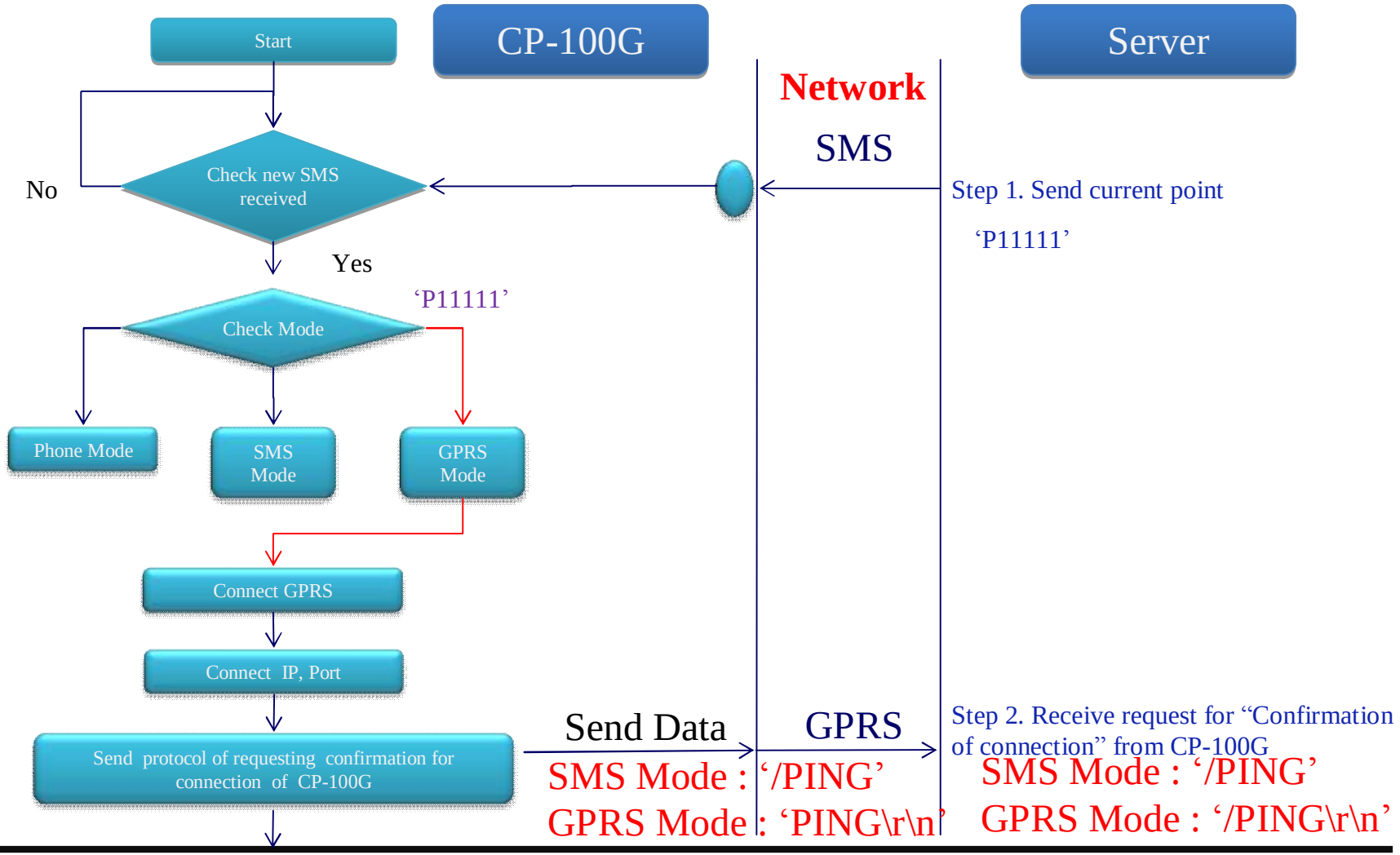



① : 'P' CODE
② : '1' Response need
③ : '1' Emergency Report
④ : '1' Report for Safe Zone Out
⑤ : '1' Low Battery Report
⑥ : '1' Report for Current Location

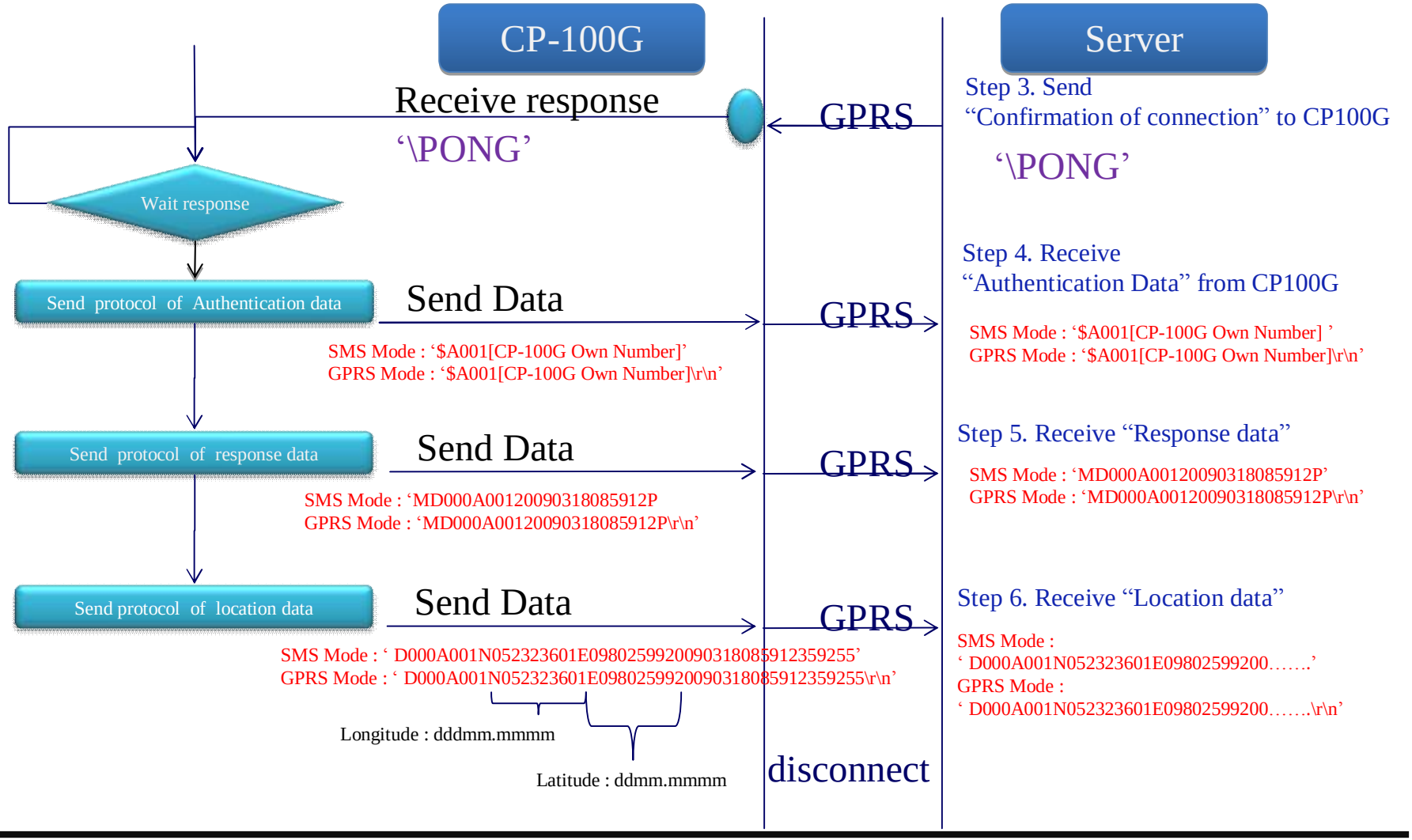
**If there is no error message up to Step 4, CP-100G is ready to work by GPRS**

# 2. Flow of the GPRS operation

## A. Flow Chart of Report



# B. Flow Chart of Event Report



## II. Protocol format of Server to control CP-100G

The Protocol Formats for below service modes are provided ……..

1. Setting Message for Mode Change
2. Message for PONG
3. Setting Message for GPRS(APN) and Server (IP, Port)
4. Setting Message for Activation of Event Report based on GPS only or GPS+GSM CELL information
5. Setting Message for Time Interval for Periodic Location Report based on GPS only or GPS+GSM CELL information
6. Setting Message for Safe Zone service

# 1. Setting Message for Mode Change

You can change current operation mode to another mode such as SMS or GPRS.

| **Title** | | **Protocol Definition** | | | | **System** | | | |
|---|---|---|---|---|---|---|---|---|---|
| Setting Command | | | | | | Author | | Data | |
| Server -> Unit | | ID | C | NAME | Mode Setting | Header | | TYPE | |
| Ref. Item | | | | | | Length | | Field Step. | |
| No | Item | Type | Len | Pos | Example | Contents | | | |
| 1 | Code | char | 1 | | “C” | | | | |
| 2 | MS ID | char | 4 | | “D000” | - “D000”~”D999” | | | |
| 3 | Acknowledge set | char | 1 | | “1”, “0” | - “1” : Need response , “0” : No t response | | | |
| 4 | Control Mode | char | 1 | | “0” | -“0”: Phone SMS MODE “1”: SMS MODE “2”: GPRS MODE | | | |
| 5 | Control Phone number | char | 13 | | “01012345678 ” | Control Phone number<br>If length < 13 then feel ‘ ’( 0x20) to tail | | | |

## 2. Message for the PONG

Response to confirm connection to CP100G

| Title | | Protocol Definition | | | | System | | | |
|---|---|---|---|---|---|---|---|---|---|
| Setting Command | | | | | | Author | | Data | |
| Server -> Unit | | ID | \ | NAME | Conformation of connection | Header | | TYPE | |
| Ref. Item | | | | | | Length | | Field Step. | |
| No | Item | Type | Len | Pos | Example | Contents | | | |
| 1 | Code | char | 1 | | “ \ ” | | | | |
| 2 | Message | char | 4 | | “PONG” | Default “PONG” | | | |

## 3. Setting Message for GPRS(APN) and Server (IP, Port)

Request CP-100G to set APN for GPRS connection and Server IP with Port number for TCP connection

| Title | Protocol Definition | | | | System | | | |
|---|---|---|---|---|---|---|---|---|
| Setting Command | | | | | Author | | Data | |
| Unit -> server | ID | X | NAME | Modify IP, Port , APN Setting | Header | | TYPE | |
| Ref. Item | | | | | Length | | Field Step. | |

| No | Item | Type | Len | Pos | Example | Contents |
|---|---|---|---|---|---|---|
| 1 | Code | char | 1 | | “X” | |
| 2 | Acknowledge set | char | 1 | | “1”, “0” | 1 : Need response , 0 : Not response |
| 3 | Bearer type | char | 1 | | “1”, “2”, “3”, “4” | - “1” Change TCP/IP Address (IP and Port number)<br>- “2” Change SMSC CID number<br>- “3” Change Center Code<br>- “4” Change TCP/IP, SMSC CID, Center Code |
| 4 | Sever IP | char | 15 | | “123.123.123.123”, “123.023.152.078” | |
| 5 | Sever Port | char | 6 | | “123456”, “009876” | |
| 6 | APN | char | 20 | | Access Point Name | “mft??????????????????”, “internet????????????” |
| 7 | OWN Number | Char | 15 | | “0104460401?????” | Own Number<br>If length < 15 then feel ‘?’( 0x1F) to tail<br>Use 13 bytes only, 2 bytes are reserved |
| 8 | Center Code | char | 4 | | “A001” | Default “A001” |

## 4. Setting Message to Activate Event Report and Request Current Location based on GPS

Request CP-100G to activate each event report based on GPS only

| Title | Protocol Definition | | | | System | | | |
|---|---|---|---|---|---|---|---|---|
| Setting Command | | | | | Author | | Data | |
| Sever -> Unit | ID | P | NAME | Modify Report setting and request current location based on GPS | Header | | TYPE | |
| Ref. Item | | | | | Length | | Field Step. | |

| No | Item | Type | Len | Pos | Example | Contents |
|---|---|---|---|---|---|---|
| 1 | Code | char | 1 | | “P” | |
| 2 | Ack setting | char | 1 | | “1”, “0” | - “1” : Need response, “0” : Not response |
| 3 | My Zone | char | 1 | | “1”, “0” | - “1” : Report “0” : No report |
| 4 | Safe Zone | char | 1 | | “1”, “0” | - “1” : Report “0” : No report |
| 5 | Low Battery | char | 1 | | “1”, “0” | - “1” : Report “0” : No report |
| 6 | Current Location | char | 1 | | “1”, “0” | - “1” : Report “0” : No report |

## 5. Setting Message to Activate Event Report and Request Current Location based on GPS+GSM Cell Information

Request CP-100G to activate each event report based on both of GPS and GSM Cell Information

* Note : If “current location field” is set to ‘1’ then CP-100G will immediately report current location 1 time based on both of GPS and GSM CELL Information.

| **Title** | | **Protocol Definition** | | | | **System** | | | |
|---|---|---|---|---|---|---|---|---|---|
| Setting Command | | | | | | Author | | Data | |
| Sever -> Unit | | ID | I | NAME | Modify Report setting and request current location based on GPS+GSM | Header | | TYPE | |
| Ref. Item | | | | | | Length | | Field Step. | |
| No | Item | Type | Len | Pos | Example | Contents | | | |
| 1 | Code | char | 1 | | “I” | | | | |
| 2 | Ack setting | char | 1 | | “1”, “0” | - “1” : Need response, “0” : Not response | | | |
| 3 | My Zone | char | 1 | | “1”, “0” | - “1” : Report “0” : No report | | | |
| 4 | Safe Zone | char | 1 | | “1”, “0” | - “1” : Report “0” : No report | | | |
| 5 | Low Battery | char | 1 | | “1”, “0” | - “1” : Report “0” : No report | | | |
| 6 | Current location | char | 1 | | “1”, “0” | - “1” : Report “0” : No report | | | |

## 6. Setting Message for Time Interval of Periodic Location Report based on GPS

Request CP-100G to set time interval for periodic location report based on GPS only

| Title | Protocol Definition | | | | System | | | |
|---|---|---|---|---|---|---|---|---|
| Setting Command | | | | | Author | | Data | |
| Server -> Unit | ID | R | NAME | Modify Report Period base on GPS | Header | | TYPE | |
| Ref. Item | | | | | Length | | Field Step. | |

| No | Item | Type | Len | Pos | Example | Contents |
|---|---|---|---|---|---|---|
| 1 | Code | char | 1 | | "R" | |
| 2 | Ack setting | char | 1 | | "1", "0" | - "1" : Need response , "0" : Not response |
| 3 | Report setting | char | 1 | | "1", "0" | - "1" : Report "0" : No report |
| 4 | Report Period | char | 6 | | Default "000600" 10 minutes | - Time Interval of periodic location report |

## 7. Setting Message for Time Interval of Periodic Location Report based on GPS+GSM Cell Information

Request CP-100G to set time interval of the periodic location report based on both of GPS and GSM Cell information

* Notes :

- If you want to change mode to based on GPS only, send “Modify Report Period based on GPS” message(see Page 12)

| **Title** | **Protocol Definition** | | | | **System** | | | |
|---|---|---|---|---|---|---|---|---|
| Setting Command | | | | | Author | | Data | |
| Server -> Unit | ID | G | NAME | Modify Report Period base on GPS+GSM | Header | | TYPE | |
| Ref. Item | | | | | Length | | Field Step. | |

| No | Item | Type | Len | Pos | Example | Contents |
|---|---|---|---|---|---|---|
| 1 | Code | char | 1 | | “G” | |
| 2 | Ack setting | char | 1 | | “1”, “0” | - “1” : need response , “0” : Not response |
| 3 | Report setting | char | 1 | | “1”, “0” | - “1” : Report “0” : No report |
| 4 | Report Period | char | 6 | | Default “000600” 10 minute | - Time Interval of periodic location report |

## 8. Setting Message for Safe Zone Service

Request CP-100G to activate safe zone service with location

| Title | Protocol Definition | | | | System | | | |
|---|---|---|---|---|---|---|---|---|
| Setting Command | | | | | Author | | Data | |
| Server -> Unit | ID | S | NAME | Safe zone Information | Header | | TYPE | |
| Ref. Item | | | | | Length | | Field Step. | |

| No | Item | Type | Len | Pos | Example | Contents |
|---|---|---|---|---|---|---|
| 1 | Code | char | 1 | | “S” | |
| 2 | Ack setting | char | 1 | | “1”, “0” | - “1” : Need response , “0” : No t response |
| 3 | Report setting | char | 1 | | “1”, “0” | - “1” : Report “0” : No report |
| 4 | Area | char | 4 | | “0010” | - “0010” ~ “9999” (1 = 10 m, Start 0010 = 100 m) |
| 5 | Safe Zone Long | char | 8 | | 12701.1234 -> “E127011234”<br>-12701.1234 -> “W127011234” | Longitude of MS (WGS-84) dddmm.mmmm |
| 6 | Safe Zone Lat | char | 7 | | 3701.1234 -> “N37011234”<br>-3701.1234 -> “S37011234” | Latitude of MS(WGS-84) ddmm.mmmm |

## III. Protocol format of CP-100G to Report to server

The Protocol Formats for below service modes are provided ……..

1. Message for PING

2. Message for Authentication

3. Report Message for Location Information based on GPS only or GPS+ GSM CELL Information

4. Report Message for Event Information based on GPS only or GPS+ GSM CELL Information.

5. Message for Acknowledgement to confirm the received command

# 1. Message for PING

Request confirmation of connection to server

| Title | Protocol Definition | | | | System | | | |
|---|---|---|---|---|---|---|---|---|
| Connect Command | | | | | Author | | Data | |
| Unit -> server | ID | / | NAME | Conformation of connection | Header | | TYPE | |
| Ref. Item | | | | | Length | | Field Step. | |

| No | Item | Type | Len | Pos | Example | Contents |
|---|---|---|---|---|---|---|
| 1 | Code | char | 1 | | “/” | |
| 2 | message | char | 4 | | “PING” | Default “PING” |
| 3 | End of data | char | 2 | | ‘\r’’\n’ | \r = 0x0d(carrige return), \n = 0x0a(linefeed), GPRS Mode only |

## 2. Message for Authentication

Send authentication  data to server

| **Title** | | **Protocol Definition** | | | | **System** | | | |
|---|---|---|---|---|---|---|---|---|---|
| Setting Command | | | | | | Author | | Data | |
| Unit -> server | | ID | $ | NAME | Authentication Data to server | Header | | TYPE | |
| Ref. Item | | | | | | Length | | Field Step. | |
| No | Item | Type | Len | Pos | Example | Contents | | | |
| 1 | Code | char | 1 | | “$” | | | | |
| 2 | Center Code | char | 4 | | “A001” | Default “A001” | | | |
| 3 | Own Number | char | 13 | | “0104460401” | Own Number | | | |
| 4 | End of data | char | 2 | | ‘\r’’\n’ | \r  = 0x0d(carrige return), \n = 0x0a(linefeed), GPRS Mode only | | | |

## 3. Report Message for Location Information based on GPS

Send location information to server based on GPS only

| Title | Protocol Definition | | | | System | | | |
|---|---|---|---|---|---|---|---|---|
| Setting Command | | | | | Author | | Data | |
| Unit -> server | ID | SPACE | NAME | Location information to sever | Header | | TYPE | |
| Ref. Item | | | | | Length | | Field Step. | |

| No | Item | Type | Len | Pos | Example | Contents |
|---|---|---|---|---|---|---|
| 1 | Code | char | 1 | | “SPACE” | |
| 2 | Unit ID | char | 4 | | “D000” | Between D000~D999 |
| 3 | Center Code | char | 4 | | “A001” | Default “A001” |
| 4 | Longitude | char | 10 | | 12701.1234 -> “E127011234”<br>-12701.1234 -> “W127011234” | Longitude of MS (WGS-84) dddmm.mmmm |
| 5 | Latitude | char | 9 | | 3701.1234 -> “N37011234”<br>-3701.1234 -> “S37011234” | Latitude of MS(WGS-84) ddmm.mmmm |
| 6 | Date | char | 8 | | “YYYYMMDD” | Date from GPS information |
| 7 | Time | char | 6 | | “HHMMSS” | Time from GPS information |
| 8 | Direction | char | 3 | | “000” ~ “359” | Direction from GPS information |
| 9 | Speed | char | 3 | | “000” ~ “255” | Speed“km/h” from GPS information |
| 10 | End of data | char | 2 | | ‘\r’’\n’ | \r = 0x0d(carrige return), \n = 0x0a(linefeed), GPRS Mode only |

# 4. Report Message for Location Information based on GPS+GSM Cell Information

Send location information to server based on both of GPS and GSM Cell Information

| Title | Protocol Definition | | | | System | | | |
|---|---|---|---|---|---|---|---|---|
| Setting Command | | | | | Author | | Data | |
| Unit -> server | ID | A | NAME | Location information to sever based on GPS+GSM | Header | | TYPE | |
| Ref. Item | | | | | Length | | Field Step. | |

| No | Item | Type | Len | Pos | Example | Contents |
|---|---|---|---|---|---|---|
| 1 | Code | char | 1 | | “A” | |
| 2 | Unit ID | char | 4 | | “D000” | Between D000~D999 |
| 3 | Center Code | char | 4 | | “A001” | Default “A001” |
| 4 | Longitude | char | 10 | | 12701.1234 -> “E127011234”<br>-12701.1234 -> “W127011234” | Longitude of MS (WGS-84) dddmm.mmmm |
| 5 | Latitude | char | 9 | | 3701.1234 -> “N37011234”<br>-3701.1234 -> “S37011234” | Latitude of MS(WGS-84) ddmm.mmmm |
| 6 | Date | char | 8 | | “YYYYMMDD” | Date from GPS information |
| 7 | Time | char | 6 | | “HHMMSS” | Time from GPS information |
| 8 | Direction | char | 3 | | “000” ~ “359” | Direction from GPS information |
| 9 | Speed | char | 3 | | “000” ~ “255” | Speed“km/h” from GPS information |
| 4 | MCC+MNC | Char | 5~6 | | “20408” | MobileCountryCode + MobileNetworkCode (AT+COPS? → +COPS: ,2,"20408" OK) |
| 5 | LAC | Char | 4 | | “0021” | LocalAreaCode (AT+CREG? → +CREG: 2,1,"0021","6E0B" OK) |
| 6 | Cell-ID | Char | 4 | | “6E0B” | Cell-ID |
| 7 | Signal | Char | 2 | | “30” | GSM signal strength (AT+CSQ → +CSQ: 30,99 OK) |
| 8 | End of data | char | 2 | | ‘\r’’\n’ | \r = 0x0d(carrige return), \n = 0x0a(linefeed), GPRS Mode only |

# 5. Report Message for Event Information based on GSP

Send event information including event type and status to server based on GPS only

| **Title** | **Protocol Definition** | | | | **System** | | | |
|---|---|---|---|---|---|---|---|---|
| Setting Command | | | | | Author | | Data | |
| Unit -> server | ID | ! | NAME | Event information to server | Header | | TYPE | |
| Ref. Item | | | | | Length | | Field Step. | |

| No | Item | Type | Len | Pos | Example | Contents |
|---|---|---|---|---|---|---|
| 1 | Code | char | 1 | | “!” | |
| 2 | Unit ID | char | 4 | | “D000” | “D000”~”D999” |
| 3 | Center Code | char | 4 | | “A001” | Default “A001” |
| 4 | Longitude | char | 10 | | 12701.1234 -> “E127011234”<br>-12701.1234 -> “W127011234” | Longitude of MS (WGS-84) dddmm.mmmm |
| 5 | Latitude | char | 9 | | 3701.1234 -> “N37011234”<br>-3701.1234 -> “S37011234” | Latitude of MS(WGS-84) ddmm.mmmm |
| 6 | Date | char | 8 | | “YYYYMMDD” | Date from GPS information |
| 7 | Time | char | 6 | | “HHMMSS” | Time from GPS information |
| 8 | Direction | char | 3 | | “000” ~ “359” | Direction from GPS information |
| 9 | Speed | char | 3 | | “000” ~ “255” | Speed“km/h” from GPS information |
| 10 | GPS status | char | 1 | | “1” “0” | GPS fix status ( “1” – fixed, “0” – unfixed) |
| 11 | Event Code | char | 2 | | “02” “04” | page 24> Reference index 1 |
| 12 | Event Value | char | 1~3 | | “000” “50” | page 24> Reference index 1 |
| 13 | End of data | char | 2 | | ‘\r’’\n’ | \r = 0x0d(carrige return), \n = 0x0a(linefeed), GPRS Mode only |

# 6. Report Message for Event Information based on GPS+GSM Cell Information

Send event information including event type and status to server based on both of GPS and GSM Cell information

| Title | Protocol Definition | | | | System | | | |
|---|---|---|---|---|---|---|---|---|
| Setting Command | | | | | Author | | Data | |
| Unit -> server | ID | ? | NAME | Event information to server based on GPS+GSM | Header | | TYPE | |
| Ref. Item | | | | | Length | | Field Step. | |

| No | Item | Type | Len | Pos | Example | Contents |
|---|---|---|---|---|---|---|
| 1 | Code | char | 1 | | "?" | |
| 2 | Unit ID | char | 4 | | "D000" | "D000"~"D999" |
| 3 | Center Code | char | 4 | | "A001" | Default "A001" |
| 4 | Longitude | char | 10 | | 12701.1234 -> "E127011234"<br>-12701.1234 -> "W127011234" | Longitude of MS (WGS-84) dddmm.mmmm |
| 5 | Latitude | char | 9 | | 3701.1234 -> "N37011234"<br>-3701.1234 -> "S37011234" | Latitude of MS(WGS-84) ddmm.mmmm |
| 6 | Date | char | 8 | | "YYYYMMDD" | Date from GPS information |
| 7 | Time | char | 6 | | "HHMMSS" | Time from GPS information |
| 8 | Direction | char | 3 | | "000" ~ "359" | Direction from GPS information |
| 9 | Speed | char | 3 | | "000" ~ "255" | Speed"km/h" from GPS information |
| 4 | MCC+MNC | Char | 5~6 | | "20408" | MobileCountryCode + MobileNetworkCode (AT+COPS? → +COPS: ,2,"20408" OK) |
| 5 | LAC | Char | 4 | | "0021" | LocalAreaCode (AT+CREG? → +CREG: 2,1,"0021","6E0B" OK) |
| 6 | Cell-ID | Char | 4 | | "6E0B" | Cell-ID |
| 7 | Signal | Char | 2 | | "30" | GSM signal strength (AT+CSQ → +CSQ: 30,99 OK) |
| 8 | GPS status | char | 1 | | "1" "0" | GPS fix status ( "1" – fixed, "0" – unfixed) |
| 9 | Event Code | char | 2 | | "02" "04" | page 24> Reference index 1 |
| 10 | Event Value | char | 1~3 | | "000" "50" | page 24> Reference index 1 |
| 11 | End of data | char | 2 | | '\r''\n' | \r = 0x0d(carrige return), \n = 0x0a(linefeed), GPRS Mode only |

# 7. Report Message for Acknowledgement to confirm received command

Send ACK. message to confirm received command

| Title | Protocol Definition | | | | System | | | |
|---|---|---|---|---|---|---|---|---|
| Setting Command | | | | | Author | | Data | |
| Unit -> server | ID | M | NAME | ACK of received command to server | Header | | TYPE | |
| Ref. Item | | | | | Length | | Field Step. | |

| No | Item | Type | Len | Pos | Example | Contents |
|---|---|---|---|---|---|---|
| 1 | Code | char | 1 | | “M” | |
| 2 | Unit ID | char | 4 | | “D000” | “D000”~”D999” |
| 3 | Center Code | char | 4 | | “A001” | Default “A001” |
| 4 | Date | char | 8 | | “YYYYMMDD” | Date from GPS information |
| 5 | Time | char | 6 | | “HHMMSS” | Time from GPS information |
| 6 | Command Code | char | 1 | | “C”, “X”, “P”, “I” , “S”… | Received Command from server |
| 7 | End of data | char | 2 | | ‘\r’’\n’ | \r = 0x0d(carrige return), \n = 0x0a(linefeed), GPRS Mode only |

## 8. Report Error Message for alerting own number is empty or wrong

Send error message to server for wrong or empty own number

| Title | Protocol Definition | | | | System | | | |
|---|---|---|---|---|---|---|---|---|
| Setting Command | | | | | Author | | Data | |
| Unit -> server | ID | % | NAME | Own number Error send to server | Header | | TYPE | |
| Ref. Item | | | | | Length | | Field Step. | |

| No | Item | Type | Len | Pos | Example | Contents |
|---|---|---|---|---|---|---|
| 1 | Code | char | 1 | | “%” | |
| 2 | Unit ID | char | 4 | | “D000” | “D000”~”D999” |
| 3 | Center Code | char | 4 | | “A001” | Default “A001” |
| 4 | Error type | char | 14 | | “SET OWN NUMBER” | Request server to setup valid own number |
| 5 | End of data | char | 2 | | ‘\r’’\n’ | \r = 0x0d(carrige return), \n = 0x0a(linefeed), GPRS Mode only |

# [Reference Index 1]

| Title | Protocol Definition | | | | System | | | |
|---|---|---|---|---|---|---|---|---|
| Index 1 | | | | | Author | | Data | |
| Unit -> Server | ID | | NAME | Index | Header | | TYPE | |
| Ref. Item | | | | | Length | | Field Step. | |

| No | Item | Type | Len | Event Code | Event Value | Contents |
|---|---|---|---|---|---|---|
| 1 | Low Battery | char | | “02” | -000 | |
| 2 | Emergency button | char | | “04” | -000 | SOS |
| 3 | Safe Zone | char | | “06” | - 0~999(1=10m) | Safe Zone Out, Event Value is Safe Zone Area(page 14 => Safe zone Information) |
| 4 | My Zone | char | | “26” | -50(500 m) | My Zone Out, Event Value is fixed to be 50(500m) by default |
| 5 | My Zone Start /Finish | char | | “27”/”37” | -000 | Starting/Finishing My Zone |