

# **Preliminary Manual**



Followit Positioning Services

Version 1.1  
Preliminary release

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# Followit Positioning Services

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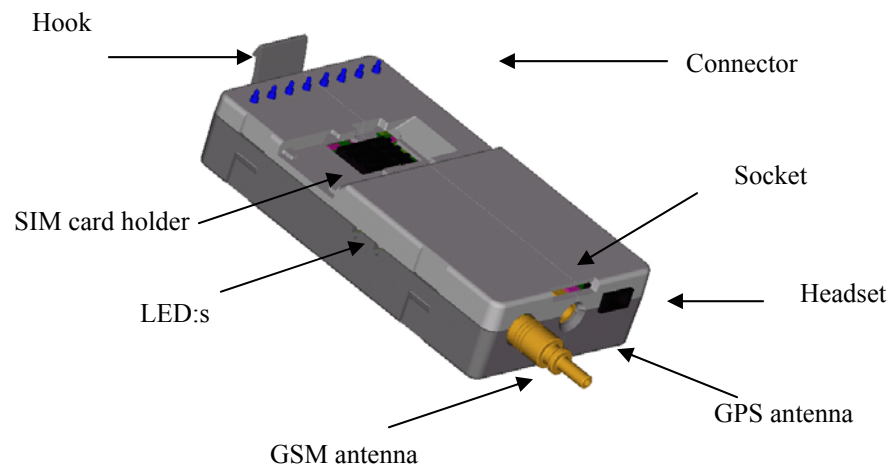
## Followit Positioning Services

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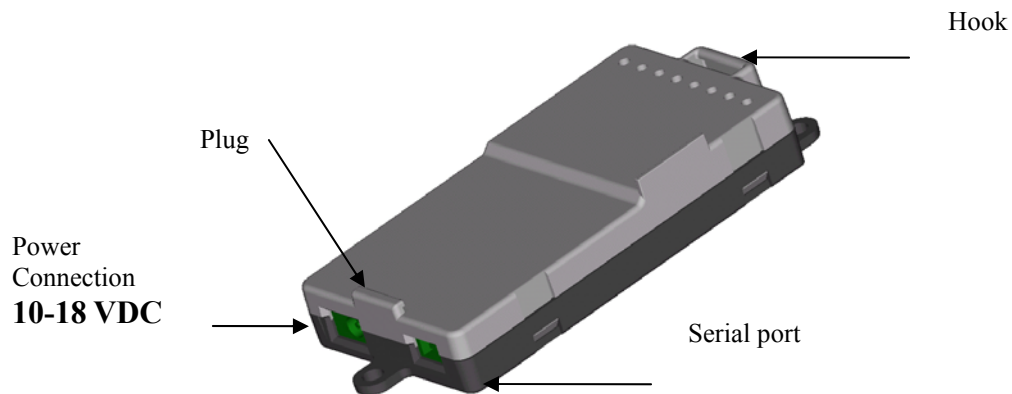
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## 1 General

### 1.1 MRS- Main



### 1.2 MRS-Power



Start connecting the plug with the socket, and push in the hook (towards the connector) into the loop. The hook should never be pushed away from the connector; it can easily be broken. **The enclosed cable must be connected to trough an external fuse (1A) to a power source.**

### **2        Conditions of guarantee**

Followit AB offers 12 months guarantee for possible manufacturing defects, starting from the time of delivery. This includes all products of the complete range. In case of malfunctioning contact Followit reseller and/or return the defected product for replacement.

A copy of the original invoice and a short description of the defect must be presented with the returned product.

The conditions of guarantee not include:

- Defects that have no bearing for the functionality or usage of the product.
- Defects that are caused by the customer through installation errors, adjustments or use, including changes or other interference.

### **3            Security instruction**

The transponder includes a radio transmitter:

#### **3.1            Safety**

##### **3.1.1            Hospital environment**

Do not use the equipment in hospitals or near medical equipment such as pacemakers or hearing aid.

##### **3.1.2            Transport**

The equipment may not be turned on when on board on an airline.

##### **3.1.3            Chemicals**

Do not use the equipment in vicinity of petrol stations, fuel depot, and chemical factories or in areas near explosives.

##### **3.1.4            Radio**

The equipment can disturb other electronic equipment such as TV, radio or computers.

##### **3.1.5            Children**

The SIM-card is removable and therefore there is a risk that small children can swallow them. SIM-card must be handled with care and may not be bent, scratched or be exposed to static electricity.

#### **3.2            Notes**

##### **3.2.1            Applications**

Use only Followits original accessories to avoid eventual damage on the equipment.

##### **3.2.2            Maintenance**

The transponder may not be exposed to knocks and blows nor kept in extreme heat. Cleaning is done with an antistatic polishing cloth.

##### **3.2.3            Loss**

If the transponder and/or SIM-card are lost, then you must immediately contact reseller to prevent misuse.

### 4 **Product classification**

1. Flexible GPS and GSM positioning/control module.
2. User defined control functionality.
3. User communication through GSM (Data and/or SMS).
4. Measure 76 x 39 x 30 mm (transponder).
5. Electric power: from 10 V up to 18 VDC.
6. Ambient temp: -20°C to 55°C
7. Equipped with 12 channels parallel GPS receiver based on Modular ASiSTM (Application Specific Integrated System) architecture in 0.35uCMOS technology.
8. Equipped with dual band GSM module with ETSI GSM phase 2+ Standard Class 4 (2W @ 900 MHz), Class 1 (1W @ 1800/1900 MHz)
9. GPS antenna – active.
10. GSM antenna
11. Power supply

### **5        Assembly instructions**

#### **5.1        Transponder**

The power supply must be fastened with screws on to a level surface. Do not tighten the screws to hard.

The transponder can then be attached to the power supply. The transponder must be mounted in a dry environment without chemical substances or other stuff that can affect plastics or electronics. The transponder should not be installed where there are extreme temperature variations or where extreme vibrations are common. Do not assemble the transponder in a dusty environment.

#### **5.2        GPS antenna**

The antenna should be mounted level with free sight of the sky for optimal performance. Avoid placing the antenna near voluminous objects. The signals manage to penetrate for example, plastic and glass, but not any kind of metal or metallized glass.

#### **5.3        GSM antenna**

Mount the antenna as freely and high up as possible. Preferably, place the GPS antenna and GSM antenna as far away from each other as possible.

#### **5.4        SIM card conditions**

- 1- The PIN code must be disabled.
- 2- The SIM card must have SMS text mode (ASCII) enabled for both incoming and outgoing SMS messages.
- 3- GSM data must be enabled if DATA route is used.
- 4- All DATA calls must be in asynchronous transparent mode. All other calls except voice calls are ignored.

### 5.5 General functions

Position data are always buffered in memory. When the memory is full, the oldest positions will be written over according to the FIFO-principle (First In First Out).

Activation of the alarm button will always exit the current mode of operation and send an alarm message.

#### 5.5.1 Common result data

##### 5.5.1.1 Position result

All messages from the MRS include the following data:

- Unit ID:  
"ID:xxxxxx"
- Selected mode:  
" \nMODE:-----"
- Alarm type: 6 character alarm type, if not in alarm mode "0":  
" \nALARM:xxxxxx" or " \n ALARM:0"
- History flag: Current "C", Latest valid "LV", if the navigation was unsuccessful the latest valid position from buffer is sent instead:  
" \nHISTORY FLG:C" or " \n HISTORY FLG:LV"
- Point nr: "1" - "<max checkpoints>" Number of checkpoint which this result is originated from. Only valid in Checkpoint mode.  
" \nPOINTNO:--"
- Latitude:  
" \nLAT:xxxx.xxxx"
- Longitude:  
" \nLON:xxxx.xxxx"
- Speed:  
" \nSPEED:xxx.x"
- Course:  
" \nDIR:xxx.xx"
- UTC time:  
" \nUTIME:xx:xx:xx.x"
- Date:  
" \nDATE:xxxx.xx.xx"

### 5.5.1.2 Replies

- Unit ID:  
"ID:xxxxxx"
- Selected mode:  
" \nMODE:-----"
- Reply string (if "\nERRxx" see error table)  
" \nREPLY: <reply string>"
- \n

### 5.6 Mode 0: Terminate/Init

#### 5.6.1 Description

Aborts current mode of operation and sets the common MRS parameters. MRS will now be ready to receive mode selection message.

This message must be sent to the module after first power up at factory.

The init message is stored in flash for each new init.

This message can be sent to the module at any time. If the module is in an operation mode, the module will be set into init phase and will be expecting a new operation mode initiation.

This means that this message works both as an initiation message and as a termination message.

This message is ALWAYS replied.

#### 5.6.2 Control parameters

- Unit ID: only 6 characters. The ID is related to the IMEI-nr of the GSM-module.
- Mode: Selected mode "INIT" ("init" or "0")
- Answer route selector: "SMS" ("sms"), "DATA" ("data"), or "TCPIP" ("tcpip")
- 1<sup>st</sup> Phone no: only digits with the exception of "+" only in the beginning, maximum no of digits 20 including the "+".
- 2<sup>nd</sup> Phone no: only digits with the exception of "+" only in the beginning, maximum no of digits 20 including the "+".
- SMS service centre number: only digits with the exception of "+" only in the beginning, maximum no of digits 20 including the "+".
- SMS check interval: "000030" to "999999" (hhmmss). ("0" or "000000" Never check)
- Send Reply: "REP"("rep"), "NOREP"("norep")
- Coordinate system: "-1" up to "218"
- Position answer format: "D"("d"), the latitude and longitude in the answer would be in degrees and decimal of degrees. "DM"("dm") the latitude and longitude in the answer would be in degrees and minutes and decimal of minutes.
- Buffer Size: User defined buffer size. "0001" to "1000"
- Full buffer condition: "ON"("on"), "OFF"("off"). If this condition is set, the buffer will be transferred to the user when the maximum buffer size (1000 positions) is reached. If the Full Buffer Condition is not set the buffer will be rewritten upon reaching maximum size without any transmission to the user.
- GPS condition: Wait "W" ("w"), GPS always on or Sleep "S" ("s"), GPS on only while navigating.  
While "W" ("w") condition set, a small buffer is updated in a round buffer in RAM containing the last 5 positions with a 10sec interval.
- Server IP-nr: "xxx.xxx.xxx.x" (will be ignored if data route is SMS or DATA. DO NOT leave empty. If not used insert "000.000.000.0")
- Server port-nr: "0" to "999999" (will be ignored if data route is SMS or DATA. DO NOT leave empty. If not used insert 0)
- Username: only 4 characters, 0-9, Aa-Zz. NOTE: no " ," allowed (Username will be ignored if data route is SMS or DATA. DO NOT leave empty. If not used insert 0)

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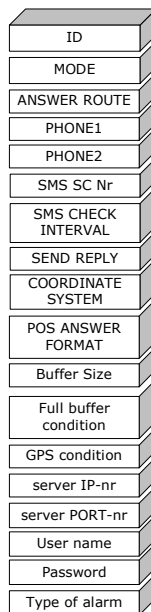
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- Password: only 4 characters, 0-9, Aa-Zz. NOTE: no “,” allowed (Password will be ignored if data route is SMS or DATA. DO NOT leave empty. If not used insert 0)
- Type of alarm: only 4 characters, 0-9, Aa-Zz. NOTE: no “,” allowed (will be ignored if no alarm. If not used insert 0 )

### 5.6.3 Messages

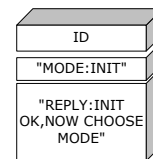
#### Message to MRS-module. Seperators <comma>

MODE 0  
INIT  
TERMINATE



#### Reply to user. Seperators <Line feed>

INIT  
REPLY



## Followit Positioning Services

### 5.6.4 Examples

<CR><LF>+FPD: 89<CR><LF> ← Prefix only if command sent by data, 89 is the following data length

212127,INIT,DATA,+46801234561,0,+46805000000,010000,rep,1,d,5,off,w,000.000.000.0,0,0,0,0

meaning

Init, MRS will send replies and results via data to given number, waiting between results

<CR><LF>+FPD: 84<CR><LF> ← Prefix only if command sent by data, 84 is the following data length

212127,INIT,SMS,+46801234561,0,+46705008600,001000,norep,218,d,7,off,s,000.000.000.0,0,0,0,0,PFTA

meaning

Init, MRS will send results via SMS to given number, sleeping between results

### 5.6.5 Phone number combinations

| Answer route<br>SMS | Sender nr<br>(saved in flash after 1th<br>SMS) | 1 <sup>st</sup> Phone<br>nr | 2 <sup>nd</sup> Phone nr | Reply ON     | Results                                                                         |
|---------------------|------------------------------------------------|-----------------------------|--------------------------|--------------|---------------------------------------------------------------------------------|
|                     | x                                              | 0                           | 0                        | To sender nr | To sender nr                                                                    |
|                     | x                                              | 0                           | x                        | To sender nr | To tel 2                                                                        |
|                     | x                                              | x                           | 0                        | To sender nr | To tel 1                                                                        |
|                     | x                                              | x                           | x                        | To sender nr | To tel 1 & tel 2<br>Except buffer<br>read outs that<br>are only sent to<br>tel1 |

| Answer route<br>DATA | Sender nr<br>(saved in flash after 1th<br>SMS ignored when route<br>DATA) | 1 <sup>st</sup> Phone<br>nr               | 2 <sup>nd</sup> Phone nr                  | Reply ON                             | Results                                                                  |
|----------------------|---------------------------------------------------------------------------|-------------------------------------------|-------------------------------------------|--------------------------------------|--------------------------------------------------------------------------|
|                      | x                                                                         | 0                                         | 0                                         | Only during<br>ongoing<br>order call | Only during<br>ongoing order<br>call                                     |
|                      | x                                                                         | 0                                         | x<br><b>MUST BE A<br/>GSM DATA<br/>NR</b> | Only during<br>ongoing<br>order call | Tel2 will be<br>called. Call<br>must be<br>terminated by<br>called party |
|                      | x                                                                         | x<br><b>MUST BE<br/>A GSM<br/>DATA NR</b> | 0                                         | Only during<br>ongoing<br>order call | Tel1 will be<br>called. Call<br>must be<br>terminated by<br>called party |
|                      | x                                                                         | x<br><b>MUST BE<br/>A GSM<br/>DATA NR</b> | x                                         | Only during<br>ongoing<br>order call | Tel1 will be<br>called. Call<br>must be<br>terminated by<br>called party |

### 5.7 Mode 1: Interval

#### 5.7.1 Description

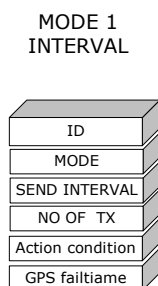
MRS transmits data at specified intervals, a specified number of times or indefinite.  
Low current consumption with long transmit intervals.

#### 5.7.2 Control parameters

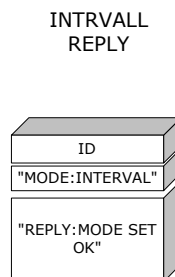
- Unit ID: only 6 characters. The ID is related to the IMEI-nr of the GSM-module.
- Mode: Selected mode "INTERVAL" ("interval" or "1")
- Transmit interval: "000001" to "999999" (hhmmss)  
(format hhmmss allows intervals from 1s to 99Hours 99minutes 99 seconds) Note:  
Shortest interval while SMS answer route is 30sec regardless of input.
- Number of transmissions: "000" to "999", "000"= infinite number of transmissions.  
Transmission will only be executed if the next condition is set to "TX" ("tx").
- Action condition: "STORE"("store") buffer positions, "TX"("tx") transmit positions.
- GPS data fail time: "01" – "99" (minutes). If no valid navigation is established after this time and the action condition is set to "STORE"("store"), the entire buffer will be sent to user. (Note: only limited amount of 5 last positions will be sent to user if answer route is set to "SMS"("sms") due to cost and efficiency issues. Entire buffer=buffer size defined in init.)

#### 5.7.3 Messages

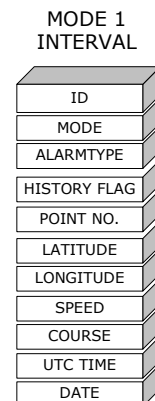
**Message to MRS-module.**  
**Seperators <comma>**



**Reply to originator.**  
**Seperators <Line Feed>**



**Result to user after each interval completed**  
**Seperators <Line Feed>**



### 5.7.4 Examples

<CR><LF>+FPD: 22<CR><LF> ← Prefix only if command sent by data, 22 is the following data length

212127,1,000030,5,tx,1

meaning

MRS will send 5 results with 30s interval

<CR><LF>+FPD: 32<CR><LF> ← Prefix only if command sent by data 32 is the following data length

212127,INTERVAL,000030,0,STORE,5

meaning

MRS will store results with 30s interval and send the result buffer if navigation is lost for more than 5 minutes.

## 5.8 Mode 2: Limit

### 5.8.1 Description

User defines a rectangular area by sending 2 coordinates to the module.

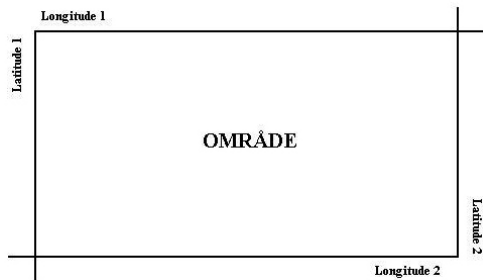
MRS transmits data when selected position and/or speed conditions are reached.

### 5.8.2 Control parameters

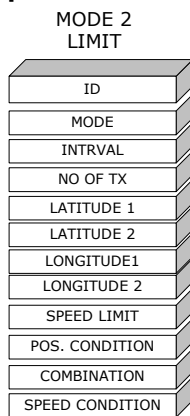
- Unit ID: only 6 characters. The ID is related to the IMEI-nr of the GSM-module.
- Mode: Selected mode "LIMIT" ("limit" or "2")
- Interval: "000001" – "999999" (hhmmss) Note: Shortest interval while SMS answer route is 30sec regardless of input.
- Number of transmissions: "000" to "999", "000"= infinite number of transmissions.
- Latitude 1: Degrees north, -Degrees south
- Latitude 2: Degrees north, -Degrees south (Note: Latitude 1 must be less than Latitude 2)
- Longitude 1: Degrees east, -Degrees west
- Longitude 2: Degrees east, -Degrees west (Note: Longitude 1 must be less than Longitude 2)
- Position condition: "INSIDE" (inside), "OUTSIDE" (outside)
- Speed limit: "0000"-"9999" (km/h)
- Speed condition: "ABOVE" ("above"), "BELOW" ("below")
- Combination: "AND" ("and"), "OR" ("or"), "POS" ("pos"), "SPEED" ("speed")

## 5.8.3 Messages

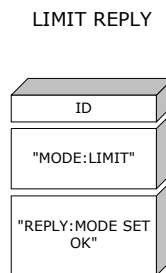
**NOTE: Smaller value of latitude first, smaller value of longitude first.**



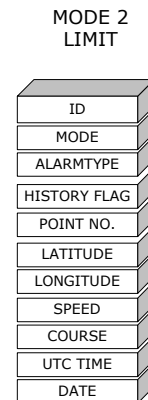
### Message to MRS-module. Seperators <Comma>



### Reply to originator. Seperators <Line Feed>



### Result to user. Seperators <Line Feed>



## 5.8.4 Examples

<CR><LF>+FPD: 76<CR><LF> ← Prefix only if command sent by data, 76 is the following data length

212127,LIMIT,000100,0,64.76800,64.76900,21.01900,21.02000,INSIDE,3,BELOW,AND  
meaning

MRS will check position every minute and send results if inside given coordinates and speed is below 3 m/s

<CR><LF>+FPD: 77<CR><LF> ← Prefix only if command sent by data, 77 is the following data length

212127,LIMIT,000010,5,64.76800,64.76900,21.01900,21.02000,OUTSIDE,0,ABOVE,POS  
meaning

MRS will check position every 10s and send 5 results if outside given coordinates

### 5.9 Mode 3: Alarm

#### 5.9.1 Description

MRS transmits data when the alarm button is pushed and is held down at least **2** sec.

This event could occur at any time. The result will be sent to the user **5** times with a interval of **10** seconds. Then the module will terminate the previous mode of operation and will wait for a new operation mode message.

#### 5.9.2 Control parameters

- None

#### 5.9.3 Messages

**Message to MRS-module.**  
**Seperators <Comma>**

**Pushing the alarm button  
and holding during 2 sec**

**No reply**

**Result to user.**  
**Seperators <Line Feed>**

MODE 3  
ALARM

|              |
|--------------|
| ID           |
| MODE         |
| ALARMTYPE    |
| HISTORY FLAG |
| POINT NO.    |
| LATITUDE     |
| LONGITUDE    |
| SPEED        |
| COURSE       |
| UTC TIME     |
| DATE         |

### 5.10 Mode 4: Buffer Request

#### 5.10.1 Description

Send the contents of the buffer to the user on this request.

The amount of results is, the number of positions stored in the internal memory (**maximum of 5 in RAM and 1000 + 999 last positions in FLASH**). The maximum of amount will vary depending on the time of usage.

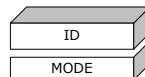
#### 5.10.2 Control parameters

- Unit ID: only 6 characters. The ID is related to the IMEI-nr of the GSM-module.
- Mode: Selected mode "BUFFERREQ" ("bufferreq" or "4")

#### 5.10.3 Messages

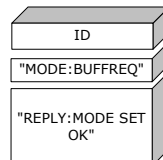
**Message to MRS-module.**  
**Seperators <Comma>**

MODE 4  
BUFFER  
REQUEST



**Reply to originator.**  
**Seperators <Line Feed>**

BUFFER  
REQUEST  
REPLY



**Result to user.**  
**Seperators <Line Feed>**

MODE 4  
BUFFER  
REQUEST



#### 5.10.4 Examples

<CR><LF>+FPD: 16<CR><LF> ← Prefix only if command sent by data, 16 is the following data length

212127,BUFFERREQ

meaning

MRS will send the result buffer (buffer size determined by INIT)

### 5.11 Mode 6: Checkpoints

#### 5.11.1 Description

A number (max 15) of checkpoints consisting of areas and timeslots are defined. Then mode is started. MRS navigates and checks fix data and time against checkpoints. When sub mode and checkpoint conditions are met, fix data is transmitted. Mode completes after the last timeslot has expired.

When mode completes or aborts all checkpoints are cleared. Navigation results (position and time) are acquired with an approximate interval of 10 s.

#### 5.11.2 Checkpoint parameters

- Unit ID: only 6 characters. The ID is related to the IMEI-nr of the GSM-module.
- Mode: Selected mode "CHECKPOINT" ("checkpoint" or "6")
- Sub mode: "POINT" ("point"), "WITHIN" ("within"), "EXPIRED" ("expired") or "CLEAR" ("clear")
- Latitude: Degrees north, -Degrees south
- Longitude: Degrees east, -Degrees west
- Radius: Allowed distance from checkpoint in meters
- Timeslot start time: YYYY.MM.DD.HH.MM
- Timeslot stop time: YYYY.MM.DD.HH.MM

#### 5.11.3 Sub modes

The following sub modes are available:

POINT

Checkpoint with coordinates and timeslot is stored in MRS.

WITHIN

Checkpoint mode is started and fix is sent once for each checkpoint if MRS is inside the defined area,  
within the defined timeslot. Fix is sent as soon conditions are met.

EXPIRED

Checkpoint mode is started and fix is sent once for each checkpoint if MRS has not been inside the defined area, within the defined timeslot. Fix is sent when timeslot has expired.

CLEAR

All previous checkpoints will be cleared.

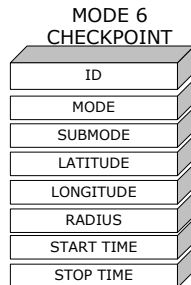
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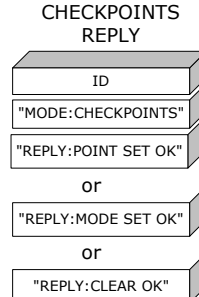
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### 5.11.4 Messages

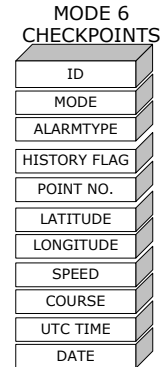
#### Message to MRS-module. Seperators <Comma>



#### Reply to originator. Seperators <Line Feed>



#### Result to user. Seperators <Line Feed>



### 5.11.5 Examples

<CR><LF>+FPD: 79<CR><LF> ← Prefix only if command sent by data, 79 is the following data length

212127,CHECKPOINT,POINT,64.76900,21.02000,100,2002.06.25.12.30,2002.06.25.13.30

meaning

MRS will save a checkpoint with the given coordinates, size and timeslot

<CR><LF>+FPD: 34<CR><LF> ← Prefix only if command sent by data, 34 is the following data length

212127,CHECKPOINT,WITHIN,0,0,0,0,0

meaning

MRS will send results once for every checkpoint if within given area and timeslot

(If checkpoint not visited within timeslot, no result will be sent)

<CR><LF>+FPD: 35<CR><LF> ← Prefix only if command sent by data, 35 is the following data length

212127,CHECKPOINT,EXPIRED,0,0,0,0,0

meaning

MRS will send results when timeslot expires, once for every checkpoint that has not been visited within its timeslot.

(If checkpoint visited within timeslot, no result will be sent)

<CR><LF>+FPD: 33<CR><LF> ← Prefix only if command sent by data, 33 is the following data length

212127,CHECKPOINT,CLEAR,0,0,0,0,0

meaning

MRS will clear all checkpoints

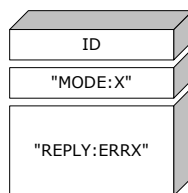
### 5.11.6 List of errors

| ERROR String sent to originator | Error description    |
|---------------------------------|----------------------|
| ERR1                            | Sent order not valid |

### 5.11.7 Messages

The error message contains the mode during which the error occurred.

**ERROR REPORT.  
Seperators <Line Feed>**



## 6            Co-ordinate system

| Number | Name  | Description                                                                   |
|--------|-------|-------------------------------------------------------------------------------|
| -1     | WGS84 | Universal                                                                     |
| 000    | ADI-M | Mean Solution (Ethiopian and Sudan)                                           |
| 001    | ADI-E | Burkina Faso                                                                  |
| 002    | ADI-F | Cameroon                                                                      |
| 003    | ADI-A | Ethiopia                                                                      |
| 004    | ADI-C | Mali                                                                          |
| 005    | ADI-D | Senegal                                                                       |
| 006    | ADI-B | Sudan                                                                         |
| 007    | AFG   | Somalia                                                                       |
| 007    | ARF-M | Mean solution (Botswana, Lesotho, Malawi, Swaziland, Zaire, Zambia, Zimbabwe) |
| 008    | ARF-A | Botswana                                                                      |
| 009    | ARF-H | Burundi                                                                       |
| 010    | ARF-B | Lesotho                                                                       |
| 011    | ARF-C | Malawi                                                                        |
| 012    | ARF-D | Swaziland                                                                     |
| 013    | ARF-E | Zaire                                                                         |
| 014    | ARF-F | Zambia                                                                        |
| 015    | ARF-G | Zimbabwe                                                                      |
| 016    | ARS-M | Mean Solution (Kenya and Tanzania)                                            |
| 017    | ARS-A | Kenya                                                                         |
| 018    | ARS-B | Tanzania                                                                      |
| 019    | PHA   | Djibouti                                                                      |
| 020    | BID   | Guinea-Bissau                                                                 |
| 021    | CAP   | South Africa                                                                  |
| 022    | CGE   | Tunisia                                                                       |
| 023    | DAL   | Guinea                                                                        |
| 024    | EUR-F | Egypt                                                                         |
| 025    | EUR-T | Tunisia                                                                       |
| 026    | LEH   | Ghana                                                                         |
| 027    | LIB   | Liberia                                                                       |
| 028    | MAS   | Eritrea                                                                       |
| 029    | MER   | Morocco                                                                       |
| 030    | MIN-A | Cameroon                                                                      |
| 031    | MIN-B | Nigeria                                                                       |
| 032    | MPO   | Gabon                                                                         |
| 033    | NSD   | Algeria                                                                       |
| 034    | OEG   | Old Egypt                                                                     |
| 035    | PTB   | Mean Solution (Burkina Faso and Niger)                                        |
| 036    | PTN   | Congo                                                                         |

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## Followit Positioning Services

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|     |        |                                                         |
|-----|--------|---------------------------------------------------------|
| 037 | SCK    | Namibia                                                 |
| 038 | SRL    | Sierra Leone                                            |
| 039 | VOR    | Algeria                                                 |
| 040 | AIN-A  | Bahrain Island                                          |
| 041 | AIN-B  | Saudi Arabia                                            |
| 042 | BAT    | Sumatra (Indonesia)                                     |
| 043 | EUR-H  | Iran                                                    |
| 044 | HKD    | Hong Kong                                               |
| 045 | HTN    | Taiwan                                                  |
| 046 | IND-B  | Bangladesh                                              |
| 047 | IND-I  | India and Nepal                                         |
| 048 | INF-A  | Thailand                                                |
| 049 | ING-A  | Vietnam (near 16deg N)                                  |
| 050 | ING-B  | Con Son Island (Vietnam)                                |
| 051 | INH-A1 | Thailand (1997)                                         |
| 052 | IDN    | Indonesia                                               |
| 053 | KAN    | Sri Lanka                                               |
| 054 | KEA    | West Malaysia and Singapore                             |
| 055 | KGS    | Korean Geodetic System                                  |
| 056 | NAH-A  | Masirah Island (Oman)                                   |
| 057 | NAH-B  | United Arab Emirates                                    |
| 058 | NAH-C  | Saudi Arabia                                            |
| 059 | FAH    | Oman                                                    |
| 060 | QAT    | Qatar                                                   |
| 061 | SOA    | Singapore                                               |
| 062 | TIL    | Brunei and East Malaysia (Sarawak and Sabah)            |
| 063 | TOY-M  | Mean Solution (Japan, Okinawa and South Korea)          |
| 064 | TOY-A  | Japan                                                   |
| 065 | TOY-C  | Okinawa                                                 |
| 066 | TOY-B  | South Korea                                             |
| 067 | AUA    | Australia and Tasmania (Australian geodetic 1966)       |
| 068 | AUG    | Australia and Tasmania (Australian geodetic 1984)       |
| 069 | EST    | Estonia                                                 |
| 070 | EUR-M  | Mean Solution (Europe 1950)                             |
| 071 | EUR-A  | Western Europe (1950)                                   |
| 072 | EUR-E  | Cyprus                                                  |
| 073 | EUR-G  | England, Channel Islands, Scotland and Shetland Islands |
| 074 | EUR-K  | England, Ireland, Scotland and Shetland Islands         |
| 075 | EUR-B  | Greece                                                  |

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## Followit Positioning Services

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|     |       |                                                                            |
|-----|-------|----------------------------------------------------------------------------|
| 076 | EUR-I | Italy (Sardinia)                                                           |
| 077 | EUR-J | Italy (Sicily)                                                             |
| 078 | EUR-L | Malta                                                                      |
| 079 | EUR-C | Finland and Norway                                                         |
| 080 | EUR-D | Portugal and Spain                                                         |
| 081 | EUS   | Mean Solution (European 1979)                                              |
| 082 | HJO   | Iceland                                                                    |
| 083 | IRL   | Ireland                                                                    |
| 084 | OGB-M | Mean Solution (England, Isle of Man, Scotland, Shetland Islands and Wales) |
| 085 | OGB-A | England                                                                    |
| 086 | OGB-B | England, Isle of Man and Wales                                             |
| 087 | OGB-C | Scotland and Shetland Islands                                              |
| 088 | OGB-D | Wales                                                                      |
| 089 | MOD   | Sardinia                                                                   |
| 090 | SPK-A | Hungary                                                                    |
| 091 | SPK-B | Poland                                                                     |
| 092 | SPK-C | Czechoslovakia                                                             |
| 093 | SPK-D | Latvia                                                                     |
| 094 | SPK-E | Kazakhstan                                                                 |
| 095 | SPK-F | Albania                                                                    |
| 096 | SPK-G | Romania                                                                    |
| 097 | CCD   | Czechoslovakia                                                             |
| 098 | CAC   | Mean Solution (Florida and Bahamas)                                        |
| 099 | NAS-C | Mean Solution (CONUS)                                                      |
| 100 | NAS-B | Western USA                                                                |
| 101 | NAS-A | Eastern USA                                                                |
| 102 | NAS-D | Alaska (excluding Aleutian Islands)                                        |
| 103 | NAS-V | Aleutian Islands (East of 180deg W)                                        |
| 104 | NAS-W | Aleutian Islands (West of 180deg W)                                        |
| 105 | NAS-Q | Bahamas (exluding San Salvador Island)                                     |
| 106 | NAS-R | San Salvador Island                                                        |
| 107 | NAS-E | Canada Mean Solution (including Newfoundland)                              |
| 108 | NAS-F | Alberta and British Columbia                                               |
| 109 | NAS-G | Eastern Canada                                                             |
| 110 | NAS-H | Manitoba and Ontario                                                       |
| 111 | NAS-I | NW Territories and Saskatchewan                                            |
| 112 | NAS-J | Yukon                                                                      |
| 113 | NAS-O | Canal Zone                                                                 |
| 114 | NAS-P | Caribbean                                                                  |
| 115 | NAS-N | Central America                                                            |
| 116 | NAS-T | Cuba                                                                       |
| 117 | NAS-U | Greenland (Hayes Peninsula)                                                |
| 118 | NAS-L | Mexico                                                                     |

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## Followit Positioning Services

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|     |       |                                                                               |
|-----|-------|-------------------------------------------------------------------------------|
| 119 | NAR-A | Alaska (excluding Aleutian Islands)                                           |
| 120 | NAR-E | Aleutian Islands                                                              |
| 121 | NAR-B | Canada                                                                        |
| 122 | NAR-C | CONUS                                                                         |
| 123 | NAR-H | Hawaii                                                                        |
| 124 | NAR-D | Mexico and Central America                                                    |
| 125 | BOO   | Colombia                                                                      |
| 126 | CAI   | Argentina                                                                     |
| 127 | CHU   | Paraguay                                                                      |
| 128 | COA   | Brazil                                                                        |
| 129 | PRP-M | Mean Solution (Bolivia, Chile, Colombia, Ecuador, Guyana, Peru and Venezuela) |
| 130 | PRP-A | Bolivia                                                                       |
| 131 | PRP-B | Northern Chile (near 19deg S)                                                 |
| 132 | PRP-C | Southern Chile (near 43deg S)                                                 |
| 133 | PRP-D | Colombia                                                                      |
| 134 | PRP-E | Ecuador                                                                       |
| 135 | PRP-F | Guyana                                                                        |
| 136 | PRP-G | Peru                                                                          |
| 137 | PRP-H | Venezuela                                                                     |
| 138 | HIT   | Southern Chile (near 53deg S)                                                 |
| 139 | SAN-M | Mean Solution                                                                 |
| 140 | SAN-A | Argentina                                                                     |
| 141 | SAN-B | Bolivia                                                                       |
| 142 | SAN-C | Brazil                                                                        |
| 143 | SAN-D | Chile                                                                         |
| 144 | SAN-E | Colombia                                                                      |
| 145 | SAN-F | Ecuador (excluding Galapagos Islands)                                         |
| 146 | SAN-J | Baltra, Galapagos Islands                                                     |
| 147 | SAN-G | Guyana                                                                        |
| 148 | SAN-H | Paraguay                                                                      |
| 149 | SAN-I | Peru                                                                          |
| 150 | SAN-K | Trinidad and Tobago                                                           |
| 151 | SAN-L | Venezuela                                                                     |
| 152 | ZAN   | Suriname                                                                      |
| 153 | AIA   | Antigua, Leeward Islands                                                      |
| 154 | ASC   | Ascension Island                                                              |
| 155 | SHB   | St. Helena Island                                                             |
| 156 | BER   | Bermuda Islands                                                               |
| 157 | DID   | Deception Island, Antarctica                                                  |
| 158 | FOT   | Nevis, St. Kitts, Leeward Islands                                             |
| 159 | GRA   | Faial, Graciosa, Pico, Sao Jorge and Terceira Islands (Azores)                |

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## Followit Positioning Services

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|     |       |                                             |
|-----|-------|---------------------------------------------|
| 160 | ISG   | South Georgia Island                        |
| 161 | LCF   | Cayman Brac Island                          |
| 162 | ASM   | Montserrat, Leeward Islands                 |
| 163 | NAP   | Trinidad and Tobago                         |
| 164 | FLO   | Corvo and Flores Islands (Azores)           |
| 165 | PLN   | Canary Islands                              |
| 166 | POS   | Porto Santo and Madeira Islands             |
| 167 | PUR   | Puerto Rico and Virgin Islands              |
| 168 | QUO   | South Greenland                             |
| 169 | SAO   | Sao Miguel, Santa Maria Islands (Azores)    |
| 170 | SAP   | East Falkland Island                        |
| 171 | SGM   | Salvage Islands                             |
| 172 | TDC   | Tristan da Cunha                            |
| 173 | ANO   | Cocos Islands                               |
| 174 | GAA   | Republic of Maldives                        |
| 175 | IST   | Diego Garcia                                |
| 176 | KEG   | Kerguelen Island                            |
| 177 | MIK   | Mahe Island                                 |
| 178 | REU   | Mascarene Islands                           |
| 179 | AMA   | American Samoa Islands                      |
| 180 | ATF   | Iwo Jima                                    |
| 181 | TRN   | Tern Island                                 |
| 182 | ASQ   | Marcus Island                               |
| 183 | IBE   | Efate and Erromango Islands                 |
| 184 | CAO   | Phoenix Islands                             |
| 185 | CHI   | Chatham Island (New Zealand)                |
| 186 | GIZ   | Gizo Island (New Georgia Islands)           |
| 187 | EAS   | Easter Island                               |
| 188 | GEO   | New Zealand                                 |
| 189 | GUA   | Guam                                        |
| 190 | DOB   | Guadalcanal Island                          |
| 191 | JOH   | Johnston Island                             |
| 192 | KUS   | Caroline Islands, Fed. States of Micronesia |
| 193 | LUZ-A | Philippines (excluding Mindanao Island)     |
| 194 | LUZ-B | Mindanao Island                             |
| 195 | MID   | Midway Islands                              |
| 196 | OHA-M | Mean Solution (old Hawaiian)                |
| 197 | OHA-A | Hawaii                                      |
| 198 | OHA-B | Kauai                                       |
| 199 | OHA-C | Maui                                        |
| 200 | OHA-D | Oahu                                        |

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## Followit Positioning Services

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|     |       |                                                    |
|-----|-------|----------------------------------------------------|
| 201 | PIT   | Pitcairn Island                                    |
| 202 | SAE   | Espirito Santo Island                              |
| 203 | MVS   | Viti Levu Island (Fiji Islands)                    |
| 204 | ENW   | Marshall Islands                                   |
| 205 | WAK   | Wake Atoll                                         |
| 206 | BUR   | Bankga and Belitung Islands (Indonesia)            |
| 207 | CAZ   | Camp McMurdo Area, Antarctica                      |
| 208 | EUR-S | Iraq, Israel, Jordan, Lebanon, S. Arabia and Syria |
| 209 | GSE   | Kalimantan (Indonesia)                             |
| 210 | HEN   | Afghanistan                                        |
| 211 | HER   | former Yugoslavia                                  |
| 212 | IND-P | Pakistan                                           |
| 213 | PUK   | Russia                                             |
| 214 | TAN   | Madagascar                                         |
| 215 | VOI   | Tunisia/Algeria                                    |
| 216 | VOI-2 | Tunisia/Algeria                                    |
| 217 | YAC   | Uruguay                                            |
| 218 | RT90  | Sweden                                             |

### 7

### **Terminology**

|        |                                                 |
|--------|-------------------------------------------------|
| MRS    | Mobile Retrieval System                         |
| GSM    | Global System for Mobile Communication          |
| GPS    | Global Positioning System                       |
| SMS    | Short Message Service                           |
| DATA   | GSM data call (as opposed to VOICE call)        |
| TCP/IP | Transmission Control Protocol/Internet Protocol |