**Communication Protocol between MDVR and Central Server**

Version: V2.6

# Edit log:

|  |  |  |
| --- | --- | --- |
| Ver. | Description | Date |
| V1.6 | 2.3.3 Add recording retrieval, upload plan retrievval  2.7 Change: the unit of altigude  2.8.3 Add: Swipe card info  2.9.1 Add: upload server address, support adding new link and feedback retrieval result.  2.9.2 Support message link and media link feed back result  2.15 Add: Automatic upload management.  3.3 Add: Swipe card info. | Oct.11, 2017 |
| V1.7 | 2.8.3 Card: add fields | Oct. 18,2017 |
| V1.8 | 2.2 Adjust media type  2.3.3 Adjust media type  2.4.1 Add data frame list  2.10.1 Add data frame list  2.15 big changes  3.6 Add data frame definition | Nov.08,2017 |
| V1.9 | 2.3.3 Delete info related with chapter 2.15  2.3.4 Correct link type  2.8.1 Add additional info  2.8.3 Adjust rules of status data in load data in reporting  2.10.1 Add more control info  2.12.6 Change function status to available  2.15 Delete the chapter | Nov.17,2017 |
| V2.0 | 3.1 Change error code 10,add error code 255 | Nov.24,2017 |
| V2.1 | 2.7.3 Change direction of data transmission | Dec.05,2017 |
| V2.2 | 2.13.1 Add settings for server address;Support to create new link to set parameters;change [null] to [ ] in rules to get parameters | Jan.27,2018 |
| V2.3 | Change chapter 4 to make sure parameters in doc are same with that on device | Feb.08,2018 |
| V2.4 | Change chapter 4 to make sure parameters in doc are same with that on device | Mar.12,2018 |
| V2.5 | 4.24 Add settings for upload interval of status data | Apr.11,2018 |
| V2.6 | 2.8.3 Add “3-Write block fail”  4.24 Correct description for gpsinterval | Apr.20,2018 |

# Transmission Rule

## Transmission Foundation

Because of penetrability and stability of mobile network, the data interaction is based on the TCP/IP protocol. MDVR takes the initiative to connect to the server and then build the communication and business interaction with the server.

There are two types of network link: Signal link and media link.

Notes:

1. If there is no special instruction, the data bit starts from 0.
2. The protocol adopts host byte sequence (small endian), when the business data is interacting, the related byte encoding sequence to send.
3. If there is no special instruction, the protocol loading data adopts JSON encoding rule, and all of them are using character string mode to represent.
4. The session numbering mentioned in this document usually are regenerated every time when the MDVR gets access to the sever, it is not recommended to use it repetitively to ensure the uniqueness.

## Signal Link

MDVR takes the initiative to connect to the sever and build the interaction link with sever through the locally configured sever address and port. If the network gets get disconnected, the MDVR will try to reconnect to the sever in every specific interval.

This signal link is used for basic signal control business, all the signal requests,(except for the media link which contains interacting with the business data) needs to interact through this link. For more details, please refers to the protocol description.

## Media Link

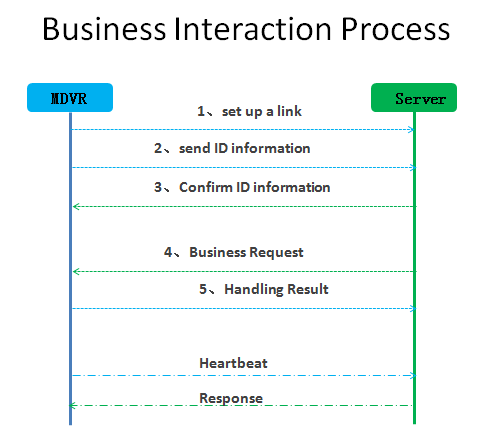
When MDVR receives the request from the signal link to rebuild the link, according to the received sever address and port, the MDVR will voluntarily try to connect to the sever.

If the network gets disconnected, the MDVR will not automatically try to connect. If reconnection is needed, then the sever will send the request according to the new business regulation.

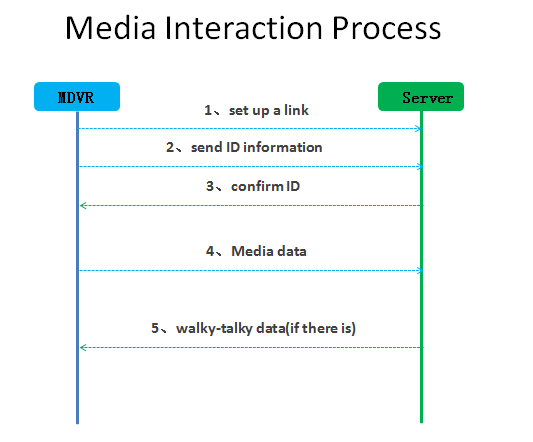
This link is used for media data transmission, such as audio video data sending to the sever, or the walky-talky data sending to the MDVR side. For more details, please refer to the protocoldescription.

## Interaction Process

Service interaction process:



Media interaction process:



Notes:

1. MDVR takes the initiative to send the heartbeat, and sever will respond to that, it is considered to be offline when the sever still has not received the heartbeat for 30s by default.
2. If there is other message to send, then heartbeat will not be sent. Sending heartbeat will not be calculated until there is no more data to send.

## Message Structure

### Message Components

Message header+ loading data

|  |  |  |
| --- | --- | --- |
| **Items** | **Length** | **Specification** |
| Message header | 8 bytes | Information header |
| Loading data | N bytes | the practical loading data |

### Message header

|  |  |  |
| --- | --- | --- |
| **Data items** | **Length** | **Specification** |
| ID | 1 byte | it is a fixed ‘H’ |
| Version | 1 byte | 1 the current version is 1 |
| Type | 2 bytes | Message type definition, to distinguish the message data. |
| Loading length | 4 bytes | The actual loading length, it doesn’t include the length of the current message header.  The actual entire data package length= loading length+ message header length(8 bytes) |

### Loading Data

Actual loading data, for details, please refer to the specific definition of each message.

### Rules of Defining Message Type

Bidirectional message uses the range from 0x0000 to 0x0FFF.

The message that MDVR sends to the sever uses the range from 0x1000 to 0x3FFF.

The message that sever sends to the MDVR uses the range from 0x4000~0x6FFF.

All the other field are reserved for future use.

# Protocol Contents

## Heartbeat

### MDVR Request

|  |  |
| --- | --- |
| **Contents** | **Description** |
| message numbering | 0x0001 |
| transmission direction | MDVR → sever |
| interaction link | signal link, media link. |
| loading data | None |

### Sever Response

|  |  |
| --- | --- |
| **Contents** | **Description** |
| Message numbering | 0x0001 |
| Transmission direction | sever →MDVR |
| Interaction link | signal link, media link. |
| Loading data | None |

## Media Data

The loading data in media data is using binary coding format.

|  |  |  |  |
| --- | --- | --- | --- |
| **Contents** | **Description** | | |
| message numbering | 0x0011 | | |
| Transmission direction | MDVR 🡪 Server, MDVR🡨 Server | | |
| Interaction link | Media link | | |
| Loading data | Contents | Length | Description |
| Media type | 2bytes | Refer to [Data Frame Code](#_Data_Frame_Code) |
| Channel | 2 bytes | The channel of encoder(valid in realtime video and playbackreplay,start from 1) |
| Time stamp | 8 bytes | The millisecond from 1970-1-1 0:0:0,the same as the time display on OSD. |
| Media data | N bytes | The corresponding ending data |
|  |  |  |
|  |  |  |

## Device Registration

### Signal Link Registration Request

|  |  |  |  |
| --- | --- | --- | --- |
| **Contents** | **Description** | | |
| message numbering | 0x1001 | | |
| Transmission direction | MDVR → sever | | |
| Interaction link | Signal link | | |
| Loading data | adopt JSON encoding rule | | |
| Items that must be filled in | | |
| Contents | Field name | Description |
| Device numbering | dn | Device ID, for example “10011” |
| Unique ID | guid | The one and only ID, for example ”01128F134D8E00FA”, (Temporarily reserved) |
| Session numbering | ss | The session numbering generated by the device, for example “12FB-01DE-0001-0203” |
| Access network | at | 1—Ethernet 2--WIFI 3--2G , for more information, please refer to [Network Type Code](#_Network_Type_Code). |
| mobile phone number | mb |  |
| Device type | dt | 2 bytes length, the higher byte is for the channel number, such as “16384”=0x4000, of which, the 4 means the 4 channels MDVR, the other byte is reserved. “0x40000” can also be used to do the transmission. |
| Device time | dtu | 2017-01-01 00:10:11 |
| Optional type | | |
| Connect to the AP | ap | The hotspot when MDVR connects to the sever in WiFi mode. |
| Version | Ver | Current version of device |

Loading data sample：

{

"dn": "10012",

"guid": "01128F134D8E00FA",

“ss”:” 12FB-01DE-0001-0203” ,

"at": "5",

"mb": "13912346688",

“dtu”:”1483200611”,

"dt": "0x4000",

"ap": "howen-wifi-ap",

"ver": "V1.3.21"

}

### Signal Link Registration Response

|  |  |  |  |
| --- | --- | --- | --- |
| **Content** | **Description** | | |
| message numbering | 0x4001 | | |
| Transmission direction | sever →MDVR | | |
| Interaction link | Signal link | | |
| Loading data | adopt JSON encoding rule | | |
| Items that must be filled in | | |
| Content | Field name | Description |
| Session numbering | ss | The session numbering generated by the device, for example, “12FB-01DE-0001-0203”. |
| Error code | err | Please refer to error code table. |
|  |  |  |
|  |  |  |

Loading data sample：

{

“ss”:”12FB-01DE-0001-0203”,

"err": "0"

}

### Media Link Registration Request

|  |  |  |  |
| --- | --- | --- | --- |
| **Contents** | **Description** | | |
| message numbering | 0x1002 | | |
| Transmission direction | MDVR →sever | | |
| Interaction link | Media link | | |
| Loading data | Adopt JASON encoding rule | | |
| Items must be filled in | | |
| Content | Field name | Description |
| Session numbering | ss | Device replys to request from server: session number is generated by server;  Device sends request to server:session number is generated by device;  Example for session number: ”12FB-01DE-0001-0203” |
| Device numbering | dn | Device ID, for example “10011” |
| Access network | at | 1-Ethernet 2-WIFI 3-2G, for more information, please refer to [Network Type Code](#_Network_Type_Code). |
| Media type | mt | 1-live view 2-playback 3-audio 4-file transmission  5-serial data transparent transmission 6-Result of recording search |
| Channels | ch | Correspond with specific channel, starting from 1, 0 means no need for the channel. |
| Optional items(mt=4 – Valid in file transmission | | |
| File offset address | of | The offset address relative to the file, it is used for breakpoint transmission. |
| File type | ft | Reference [File Type Code](#_File_Type_Code) |

Loading data sample：

{

"dn": "10012",

“ss”:”12FB-01DE-0001-0203”,

"at": "5",

"mt": "1",

“ch”:”2”

}

### Media Link Registration Response

|  |  |  |  |
| --- | --- | --- | --- |
| **Contents** | **Description** | | |
| message numbering | 0x4002 | | |
| Transmission direction | MDVR 🡨🡨 Server | | |
| Interaction link | Media link | | |
| Loading data | Adopt JASON encoding rule | | |
| Items that must be filled in | | |
| Contents | Field name | Description |
| Session numbering | ss | Device replys to request from server: session number is generated by server;  Device sends request to server:session number is generated by device;  Example for session number: ”12FB-01DE-0001-0203” |
| Error code | err | please refer to [Error Code](#_Error_Code) |
| Optional items(In register request command, mt=4 is only valid in file transmission) | | |
| File offset | of | The offset address relative to the file, it is used for breakpoint transmission. |

Loading data sample：

{

“ss”:”12FB-01DE-0001-0203”,

"err": "0"

}

## Live Preview

### Preview Request

|  |  |  |  |
| --- | --- | --- | --- |
| **Contents** | **Description** | | |
| message numbering | 0x4010 | | |
| Transmission direction | MDVR 🡨 Server | | |
| Interaction link | Signal link | | |
| Loading data | Adopt JASON encoding rule | | |
| Items that must be filled in | | |
| Contents | Contents | Contents |
| Session numbering | ss | The session number generated by the sever, for example, “12FB-01DE-0001-0203”. |
| Channel | ch | Correspond to the specific channel, starting from 1, 0 means no need for the channel. |
| Stream type | si | 0-substream 1-main stream |
| Report to the sever | srv | The sever address or domain name of sever receiving the report. For example, ”www.how.com:31500”[www.how.com](http://www.how.com) is the domain name and 31500 is the port number. |
| Optional items | | |
| Protocol type | pt | 0-private protocol (by defualt) |
| Switch | on | 0-close, 1-open. When pt is 0, sever can close the link to stop preview. When pt= others, then this value needs to be used to close the link. |
|  | Data frame list | fl | List of data frame in transmission. Refer to [Data Frame Code](#_Data_Frame_Code).  e.g. “1;2;3” means needing to transmit data of type1,2,3 |

Loading data sample：

{

“ss”:”12FB-01DE-0001-0203”,

"si": "1",

"srv": "192.168.3.210:5678",

“ch”:”2”

}

### Preview Response

|  |  |  |  |
| --- | --- | --- | --- |
| **Contents** | **Description** | | |
| message numbering | 0x1010 | | |
| Transmission direction | MDVR → Sever | | |
| Interaction link | Signal link | | |
| Loading data | Adopt JASON encoding rule | | |
| Items that must be filled in | | |
| Contents | Contents | Contents |
| session numbering | ss | Session numbering generated by the device, for example, “12FB-01DE-0001-0203” |
| Channel | ch | Correspond to the specific channel, starting from 1, 0 means no need for the channel. |
| stream type | si | 0—usbstream 1—mainstream |
| error code | err | Please refer to error code table |

Loading sample：

{

“ss”:”12FB-01DE-0001-0203”,

"si": "1",

“ch”:”2”,

“err”:”0”

}

### Forced Coding I Frame (Not completed yet)

|  |  |
| --- | --- |
| **Contents** | **Description** |
| message numbering | 0x4011 |
| Transmission direction | sever →MDVR |
| Interaction link | Media link |
| Loading data | None |

## Snapshot

### Snapshot Request

|  |  |  |  |
| --- | --- | --- | --- |
| Content | Description | | |
| Message numbering | 0x4020 | | |
| Transmission Direction | MDVR ←←Server | | |
| Interaction Link | Signal Link | | |
| Loading Data | Adopt JSON Encoding Rule | | |
| Items that must be filled in | | |
| Content | filed Name | Description |
| Session Numbering | ss | The session number generated by the sever, for example” 12FB-01DE-0001-0203” |
| Channel list | cl | Channel list, start from 1, using “;” to split multi channel, for example “ 1;2; 3” means Channel 1, Channel 2, and Channel 3 |

Loading DataSample：

{

“ss”:”12FB-01DE-0001-0203”,

“cl”:”1;3”

}

### Snapshot Respond

|  |  |  |  |
| --- | --- | --- | --- |
| Content | Description | | |
| Message numbering | 0x1020 | | |
| Transmission Direction | MDVR →→Server | | |
| Interaction Link | Signal Link | | |
| Loading Data | Adopt JSON Encoding Rule | | |
| Items that must be filled in | | |
| Content | filed Name | Description |
| Session Numbering | ss | The session number generated by the sever, for example”12FB-01DE-0001-0203” |
| Error Code | err | Please refer to Error Code list |
| Result List | rl | Array, refer to the result List |
|  |  |  |
|  |  |  |

|  |  |  |
| --- | --- | --- |
| Result List rl (content is included in the rl) | | |
| content | filed Name | Description |
| Channel | ch | 1, Start from 1 |
| File Path | fn |  |

Loading Data Sample ：

{

“ss”:”12FB-01DE-0001-0203”,

“err”:”0”,

“rl”:[

{

“ch”:”1”,

“fn”:”/mnt/snap\_1.jpg”

},

{

“ch”:”2”,

“fn”:”/mnt/snap\_2.jpg”

}

]

}

Remark:

1, after the capture is completed, Will determine whether the automatic upload to the server , according to the device configured ftp server address and configuration rules.

## Audio Operation

### Audio Request

|  |  |  |  |
| --- | --- | --- | --- |
| Content | Description | | |
| Message numbering | 0x4030 | | |
| Transmission Direction | MDVR ←←Server | | |
| Interaction Link | Signal Link | | |
| Loading Data | JSON/ Adopt JSON Encoding Rule | | |
| Items that must be filled in | | |
| Content | Filed Name | Description |
| Session Numbering | ss | The session number generated by the sever, for example”12FB-01DE-0001-0203” |
| Channel | ch | Correspond to the specific channel, starting from 1  1, intercom: temporarily the ch1 camera audio will be reported to the server, the other channels audios can not be used as a intercom, only as listening use. Will adjust later based on hardware device (channel is invalid)  2, listening is for all channels  3, broadcast has nothing to do with the channel |
| Working Mode | wm | 0—listening, 1—intercom, 2—Broadcast, 3—PTT (not implemented yet) |
| Registered Server | srv | Registered Server IP address or Domain Name, for example” [www.how.com:31500](http://www.how.com:31500)”, the [www.how.com](http://www.how.com) is domain name, 31500 is port |
| optional items | | |
| Protocol Type | pt | 0—private protocol (default) |
| Switch | on | 0-OFF, 1-ON, Server can shut the link and stop the real time viewing when pt is 0, if pt is xx value, then the real time viewing will be shut when pt=xx |

Loading data Sample ：

{

“ss”:” 12FB-01DE-0001-0203” ,

"ch": "1",

"wm": "0",

"srv": "192.168.3.210:5678"

}

### Request Respond

|  |  |  |  |
| --- | --- | --- | --- |
| Content | Description | | |
| Message numbering | 0x1030 | | |
| Transmission Direction | MDVR →→Server | | |
| Interaction Link | Signal Link | | |
| Loading Data | JSON/Adopt JSON Encoding Rule | | |
| Items that must be filled in | | |
| Content | filed Name | Description |
| Session Numbering | ss | The session number generated by the sever, for example”12FB-01DE-0001-0203” |
| channel | ch | Correspond to the specific channel, starting from 1 |
| working mode | wm | 0—listening, 1—intercom, 2—Broadcast, 3—PTT (not completed yet) |
| Error Code | err | Please refer to Error Code list |

Loading data Sample：

{

“ss”:”12FB-01DE-0001-0203”,

"si": "1",

"us": "192.168.3.210:5678",

“ch”:”2”,

“err”:”0”

}

### Audio Data

Refer to the media data

The data needs to be encoded by the G726 and then be sent to the device, otherwise the device can not be play.

The server needs to perform G726 decoding after receiving the data, otherwise can not play.

## GPS Location Status

### Subscription Request

|  |  |  |  |
| --- | --- | --- | --- |
| Content | Description | | |
| Message numbering | 0x4040 | | |
| Transmission Direction | MDVR←←Server | | |
| Interaction Link | Signal Link | | |
| Loading Data | JSON/Adopt JSON Encoding Rule | | |
| Content | filed Name | Description |
| Session Numbering | ss | The session number generated by the sever, for example”12FB-01DE-0001-0203” |
| Subscription | ct | the subscribed content is corresponded to the bit  reference [2.7.5 status context bits description](#_Status_context_bits) |

Loading Data Sample：

{

“ss”:”12FB-01DE-0001-0203”,

“ct”:”0x0F”

}

Means subscribe the below content

bit0--/ location info

bit1—Gsensor

bit2--/ basic status

bit3--/ communication module working status

### Subscription Respond

|  |  |  |  |
| --- | --- | --- | --- |
| content | Description | | |
| Message numbering | 0x1040 | | |
| Transmission Direction | MDVR →→Server | | |
| Interaction Link | Signal Link | | |
| Loading Data | JSON/Adopt JSON Encoding Rule | | |
| Content | filed Name | Description |
| Session Numbering | ss | The session number generated by the sever, for example”12FB-01DE-0001-0203” |
| Error Code | err | please refer the Error Code list |

Loading Data Sample：

{

“ss”:”12FB-01DE-0001-0203”,

“err”:”0”

}

### Service Data

|  |  |  |  |
| --- | --- | --- | --- |
| content | Description | | |
| Message numbering | 0x1041 | | |
| Transmission Direction | MDVR 🡪🡪Server | | |
| Interaction Link | Signal Link | | |
| Loading Data | Binary coded format | | |
| content | length | description |
| Session Numbering length | 1 byte | including End Character, If the session number is empty, the session number field needs to add an end character, length is 1 |
| Session Numbering | N byte | 1~N byte |
| Status Data | N byte | Refer to [Status Data](#_状态数据_1) |

### Status Data

|  |  |  |
| --- | --- | --- |
| header info | | |
| content | length | Description |
| Device Time | 6 byte | Device time, each byte correspond to year, month, date, min, second, and year = current year -2000 |
| content | 2 byte | The contents of the following data, according to the bit corresponding to the specific content, if the bit is 0, that means no such data.  the following status definition refer to this rule, if the bit is 0, means no data  reference [2.7.5 status context bits description](#_Status_context_bits) |
|  |  |  |

|  |  |  |
| --- | --- | --- |
| location info | | |
| content | length | description |
| info | 1 byte | bit0—Direction Indicator，0—0°~180°，1--180°~360°  bit1--Longitude mark, 0—East Longitude, 1—West Longitude  bit2--Altitude direction, 0—above sea level, 1—lower then sea level  bit3~bit7—reserved |
| location type | 1 byte | 0—location invalid1--GPS2--BD 3--Glonass  4--AGPS 5--base station location6--WIFI |
| time | 6 byte | Positioning module acquisition time, each bit correspond to YEAR, MONTH, DATE, HOUR, MIN, SECOND, and year=current year-2000 |
| direction | 1byte | 0~180, unit is degree |
| satellite QTY | 1byte |  |
| Speed | 2byte | km/hour\*100 |
| Altitude | 2 byte | Meter\*100 |
| positioning accuracy | 2 byte | meter |
| Degree of longitude | 1byte | 0~ 180 |
| Minute of longitude | 4byte | minute\*10000 |
| Degree of latitude | 1byte | -90 ~ +90 |
| Latitude Division | 4byte | minute\*10000 |

|  |  |  |
| --- | --- | --- |
| GSensor | | |
| content | length | description |
| Identifier bit | 1 byte | bit0-xyz acceleration (0: data not exist, 1: data exist)  bit 1-tilt (0: data not exist, 1: data exist)  bit2-impact(0: data not exist, 1: data exist)  bit3~bit7—reverse |
| X | 2byte | g\*100，-4000~+4000 |
| Y | 2byte | g\*100，-4000~+4000 |
| Z | 2byte | g\*100，-4000~+4000 |
| Tilt | 2byte | g\*100，-4000~+4000 |
| Impact | 2byte | g\*100，-4000~+4000 |

|  |  |  |
| --- | --- | --- |
| basic status | | |
| content | length | description |
| Identifier bit 1 | 1 byte | bit0-ACC (0-invalid, 1-valid)bit1-break (0-invalid, 1=valid)  bit2-turn left (0-invalid, 1-valid)  bit3-turn right(0-invaid, 1-valid)  bit4-forward (0-invalid, 1-valid)  bit5-backword (0-invalid, 1-valid)  bit6-left front door(0-Close, 1-Open)  bit7-right front door (0-close, 1-Open) |
| Identifier bit2 | 1byte | bit0-left mid door (0-close, 1-Open)  bit1-right mid door(0-close, 1-open)  bit2-left back door(0-close, 1-open)  bit3-right back door(0-close, 1-open) |
| reverse | 2byte |  |

|  |  |  |
| --- | --- | --- |
| module working status | | |
| content | length | description |
| Identifier bit | 2byte | bit0-mobile network(0: data not exist, 1: data exist)  bit1-location module (0:data not exist, 1:data exist)  bit2-WIFI module (0:data not exist, 1:data exist)  bit3-Gsensor(0:data not exist, 1:data exist)  bit4-recording status (0:data not exist, 1:data exist) |
| mobile network | 1 byte | 0--unknown 1--normal 2--abnormal 3—not exist |
| GPS location module | 1byte | 0--unknown 1--normal 2--abnormal 3—not exist |
| WIFI module | 1byte | 0--unknown 1--normal 2--abnormal 3—not exist |
| GSensor | 1byte | 0--unknown 1--normal 2--abnormal 3—not exist |
| Recording status | 2byte | each byte correspond to a channel number, 0-not recording, 1-recording |

|  |  |  |
| --- | --- | --- |
| Fuel consumption status (not implemented yet) | | |
| Identifier bit | 1 byte | bit0-fuel consumption (0: data not exist, 1: data exist)  bit1-balance fuel (0: data not exist, 1: data exist) |
| Fuel consumption | 2 byte | Fuel consumption \*10 |
| balance fuel | 2 byte |  |

|  |  |  |
| --- | --- | --- |
| mobile network status | | |
| content | length | description |
| Identifier bit 1 | 1byte |  |
| signal intensity | 1 byte | 0: invalid, 1~10 (strongest) |
| network type | 1 byte | please refer to the network type list |
| reserved | 2 byte |  |

|  |  |  |
| --- | --- | --- |
| WIFI WIFI network | | |
| content | length | description |
| Identifier bit1 | 1byte | bit0-signal intensity (0:data invalid, 1: data valid)  bit1-network address(0:data invalid, 1: data valid)  bit2-Gateway (0: data invalid, 1: data valid)  bit3-subnet mask (0: data invalid, 1: data valid)  bit4-SSID(0: data invalid, 1: data valid) |
| signal intensity | 1byte | 0: invalid, 1~10 (strongest) |
| network address | 4byte | 192.168.0.1,  byte[0]=0xC0,byte[1]=0xA8,byte[2]=x000,byte[3]=0x01 |
| gateway | 4 byte | Same as above |
| Subnet mask | 4 byte | Same as above |
| SSIDSSID length | 1 byte | length includes terminator |
| SSID | Nbyte | 1~256 byte |

|  |  |  |
| --- | --- | --- |
| hard disk status | | |
| content | length | Description |
| Identifier bit | 1byte | each bit correspond to one group of hard disk status (0: data invalid, 1: data valid) |
| one group of hard disk data information | | |
| ID | 1byte | 1~8 |
| hard disk status | 1byte | 0—unknown, 1—recording, 2—idle, 3—abnormal, 4—full |
| hard disk size | 4byte | Mega Bytes |
| hard disk balance capacity | 4byte | Mega Bytes |

|  |  |  |
| --- | --- | --- |
| alarm status | | |
| content | length | Description |
| Identifier bit | 4 byte | bit0—video loss (0: data invalid, 1: data valid)  bit1—motion detection (0: data invalid, 1: data valid)  bit2—video blind (0: data invalid, 1: data valid)  bit3—alarm input trigger(0: data invalid, 1: data valid)  bit4—over speed alarm (0: no trigger, 1: trigger)  bit5—low speed alarm (0: no trigger, 1: trigger)  bit6—emergency alarm (0: no trigger, 1: trigger)  bit7—over time stop (0: no trigger, 1: trigger)  bit8—vibration alarm (0: no trigger, 1: trigger)  bit9—out of GEO fencing alarm (0: no trigger, 1: trigger)  bit10—enter GEO fencing alarm (0: no trigger, 1: trigger)  bit11—exist line alarm (0: no trigger, 1: trigger)  bit12-enter line alarm (0: no trigger, 1: trigger)  bit13—fuel level alarm (0: no trigger, 1: trigger) |
| video loss | 2 byte |  |
| motion detection | 2 byte |  |
| video blind | 2 byte |  |
| alarm input trigger | 2 byte |  |
|  |  |  |
|  |  |  |

|  |  |  |
| --- | --- | --- |
| temperature and humidity status (not implemented yet) | | |
| content | length | Description |
| Identifier bit | 2 byte | bit0—in vehicle temperature (0: data invalid, 1: data valid)  bit1—outside of vehicle temperature (0: data invalid, 1: data valid)  bit2—motor temperature(0: data invalid, 1: data valid)  bit3—device temperature (0: data invalid, 1: data valid)  bit4—in vehicle humidity (0: data invalid, 1: data valid)  bit5—outside of vehicle humidity |
| in vehicletemperature | 2 byte | temperature \*100 times |
| outside of vehicletemperature | 2 byte | temperature \*100 times |
| motor temperature | 2 byte | temperature \*100 times |
| device temperature | 2 byte | temperature \*100 times |
| in vehicle humidity | 1 byte | percentage |
| outside of vehicle humidity | 1 byte | percentage |

|  |  |  |
| --- | --- | --- |
| Statistics data | | |
| content | length | Description |
| flag | 2 byte | Bit0--mileage ,0--data not exist, 1--data exist,include total mileage and current day mileage |
| Total Mileage | 4byte | meter |
| Current day mileage | 4byte | meter |
|  |  |  |

### Status context bits description

|  |  |  |
| --- | --- | --- |
| Description | | |
| content | length | Description |
| content | 2 byte | The contents of the following data, according to the bit corresponding to the specific content, if the bit is 0, that means no such data.  the following status definition refer to this rule, if the bit is 0, means no data  bit0-location info ( 0: no, 1: exist)  bit1- Gsensor( 0: no, 1: exist)  bit 2-basic status (0: no, 1: exist)  bit3-communication module working status (0: no, 1: exist)  bit4-fuel consumption status ( 0: no, 1: exist)  bit5-network status (0: no, 1: exist)  bit6-WIFI network status (0: no, 1: exist)  bit7-hard disk status(0: no, 1: exist)  bit8-alarm status(0: no, 1: exist)  bit9-temperature and humidity status (0:no, 1: exist)  bit10—statistics data(0:no, 1: exist) |
|  |  |  |

## Alarm Event

### Subscription Request

|  |  |  |  |
| --- | --- | --- | --- |
| content | Description | | |
| Message numbering | 0x4050 | | |
| Transmission direction | MDVR 🡨🡨 Server | | |
| Interaction link | signal link | | |
| loading data | adopt JSON encoding rule | | |
| content | filed Name | Description |
| Session numbering | ss | The session numbering generated by the device, for example”12FB-01DE-0001-0203” |
| request | ct | Refer to [Status context bits description](#_Status_context_bits) |
| Optional items | | |
| Additional info | ei | Determines if the status info contains session number.  It is used to be compatible with older version:  0 – not contain[default], 1 – contain , Other – reserved |

Loading data sample：

{

“ss”:”12FB-01DE-0001-0203”,

“ct”:”0x01”

}

，means if alarm trigger, device will report to server for the below data

bit0—location information

alarm load

### Subscription Respond

|  |  |  |  |
| --- | --- | --- | --- |
| content | Description | | |
| Message numbering | 0x1050 | | |
| Transmission direction | MDVR →→Server | | |
| Interaction Link | signal link | | |
| loading data | JSONadopt JSON encoding rule | | |
| content | filedName | Description |
| Session Numbering | ss | The session number generated by the sever, for example”12FB-01DE-0001-0203” |
| Error Code | err | please refer to the Error Code list |

Loading data sample：

{

“ss”:”12FB-01DE-0001-0203”,

“err”:”0”

}

### Service Data

Alarm service data format as below:

Message header + JSON load (alarm detail) +status data

|  |  |  |  |
| --- | --- | --- | --- |
| content | Description | | |
| Message numbering | 0x1051 | | |
| Transmission direction | MDVR 🡨🡨 Server | | |
| Interaction link | signal link | | |
| loading data | Binary coded format | | |
| content | filed Name | Description |
| Session numbering length | 1 byte | Including terminator, if session numbering is empty, the session number field needs to add terminator, length is 1 |
| Session numbering | N byte | 1~255 byte |
| content length | 4 byte | Length of Alarm content description string, including terminator |
| adopt JSON encoding rule (alarm content description) | | |
| content | filedName | Description |
| Items that must be filled in | | |
| Device Time | dtu | For example: 2017-01-01 12:11:31 |
| start time | st | for example: 2017-01-01 11:05:31, trigger time may not be the report time, need to separate them |
| End Time | et | empty means trigger , not empty means end time |
| Event Type | ec | refer to the [Event Type Code](#_Event_Type_Code) |
| Picture address | pa | save path of related pictures |
| recording address | ra | save path of related recording files |
| alarm description | det | The definition for different event type is different, refer to the below description, the content in description is included in det  For example, if video loss, it will be ”det”:{“ch”:”1”}; |
| location status data (If the subscribed data is 0, it will not load the data) | | |
| Binary coded format | | |
| refer to [Status Data](#_Status_Data) | | |

|  |  |  |
| --- | --- | --- |
| video loss, motion detection, video blind, input trigger, emergency alarm | | |
| content | filedname | description |
| channel | ch | trigger channal, starting from 1 |

|  |  |  |
| --- | --- | --- |
| low speed alarm, over speed alarm, low temperature alarm, high temperature alarm | | |
| content | filedname | description |
| trigger threshold | vt | conditional value, if >90 is over speed, then the trigger threshold is 90 |
| time threshold | tt | if > 90 over 5 second is over speed, then the time threshold is 5 second |
| maximum value | max | Maximum value generated during the alarm |
| minimum value | min | Minimum value during the alarm |
| avarage | avg | Average value during the alarm |
| current value | cur | Current value when reporting |

|  |  |  |
| --- | --- | --- |
| Overtime parking | | |
| content | filedname | Description |
| trigger value | vt |  |
| parking time | st | second |

|  |  |  |
| --- | --- | --- |
| vibration alarm / Acceleration Alarm | | |
| content | field name | Description |
| trigger threshold | vt | conditional value, if >90 is over speed, then the trigger threshold is 90 |
| time threshold | tt | if > 90 over 5 second is over speed, then the time threshold is 5 second |
| maximum value | max | Maximum value generated during the alarm |
| minimum value | min | Minimum value in a period |
| current value | avg | Average value in a period |
| current value | cur | Current value when reporting |
| direction | dt | 1—X direction, 2—Y direction, 3—Z direction, 4—impact, 5—tilt |

|  |  |  |
| --- | --- | --- |
| Electronic fencing, Electornic route | | |
| content | field name | description |
| numbering | num | fencing or route numbering |
| status | st | 0—enter, 1—leave |

|  |  |  |
| --- | --- | --- |
| abnormal open/ close door | | |
| content | field name | description |
| numbering | num | 1—left front door 2—right front door 3—left mid door  4—right mid door 5—left rear door 6—right rear door |
| status | st | 0--close 1—open |

|  |  |  |
| --- | --- | --- |
| storage abnormal | | |
| content | filedname | description |
| numbering | num | For example: sd1, sd2,hdd1,hdd2 |
| status | st | 0--loss 1--broken 2— cannot overwrite 3—Write block fail |

|  |  |  |
| --- | --- | --- |
| fatigue driving | | |
| content | field name | description |
| fatigue level | de |  |
|  |  |  |

|  |  |  |
| --- | --- | --- |
| fuel level abnormal alarm | | |
| content | field name | description |
| trigger threshold | vt |  |
| oil tank capacity | to |  |
| balance fuel capacity | fr |  |
|  |  |  |

|  |  |  |
| --- | --- | --- |
| Swipe Card | | |
| Content | Field name | Description |
| Swipe card info | cn | Card number, etc. |
| Onboard/offboard | up | 1—Onboard (checkin), 2—Offboard (check out), else—invalid |
| History | ht | 1—Historial data 2—Realtim data, Else—invalid |

Some data in the alarm load data is not yet implemented.

## File Query

### Query Request

|  |  |  |  |
| --- | --- | --- | --- |
| content | Description | | |
| Message numbering | 0x4060 | | |
| Transmission direction | MDVR ←←Server | | |
| Interaction link | Signal link | | |
| loading data | JSON adopt JSON encoding rule | | |
| Items that must be filled in | | |
| content | field name | Description |
| Session numbering | ss | The session numbering generated by the device, for example”12FB-01DE-0001-0203” |
| start time | st | start time, for example: ”2017-01-01 12:30:30” |
| end time | et | end time, for example ”2017-01-02 10:30:30” |
| channel list | chl | corresponding to the exact channel, starting from 1, and split by ”;”, for exmaple ”1;2;5” means channel 1, channel 2, and channel 5 |
| file type | ft | refer to the file type code |
|  |  |  |
| optional items | | |
| storage list | ml | Correspond to the storage location, split by ”;”, all type including sd1,sd2,hd1,hd2, for example ”sd1;hd1”means searching recording file from sd1 and hd1  If this item not exist, then search all the storage as default.  (not yet implemented) |
| Upload server | srv | The sever address or domain name of auto upload server. For example： [www.how.com:31500](http://www.how.com:31500)。 [www.how.com](http://www.how.com) is the domain name and 31500 is the port number  If there is now this field, then follow message link. Otherwise after adding this field, will add new link, like the media data. |

Loading data sample ：

{

“ss”:”12FB-01DE-0001-0203”,

"chl": "1;3",

"st": "2017-01-01 00:00:00",

"et": "2017-01-02 12:30:00",

"ft": "1"

}

### File Result

|  |  |  |  |
| --- | --- | --- | --- |
| content | descritpion | | |
| Message numbering | 0x1060 | | |
| Transmission Direction | MDVR →→Server | | |
| Interaction Link | signal link/Media link | | |
| loading data | adopt JSON encoding rule | | |
| Items that must be filled in | | |
|  | field name | Description |
| Session numbering | ss | The session number generated by the sever, for example” 12FB-01DE-0001-0203” |
| Error Code | err | please refer to the error code list, No.8 and No. 9 error type |
| Optional items ( if error code is No. 8, there is data coming, else no data coming ) | | |
| file information |  | file data, refer to the below file result list |
|  |  |  |

|  |  |  |
| --- | --- | --- |
| file information fi (content included in fi filed ) | | |
| Optional items | | |
| Content | field name | Description |
| start time | st | start time, for example ”2017-01-01 12:30:30” |
| End time | et | end time, for example ”2017-01-01 13:30:30” |
| Channel list | chl | corresponding to the exact channel, starting from 1, and split by ”;”, for exmaple ”1;2;5” means channel 1, channel 2, and channel 5 |
| file type | ft | refer to file type code |
| file path | fn | For example ”/mnt/sd1/xxxx.264” |
| file size | fs | byte |
| file duration length | fd | second |

Loading Data Sample ：

{

“ss”:”12FB-01DE-0001-0203”,

“err”:”8”,

“fi”:{

"chl": "1;2;3",

"st": "2017-01-01 00:00:00",

"et": "2017-01-02 01:30:00",

"ft": "1",

"fn ": "/mnt/sd1/20170111.jpg",

"fs": "102400"

}

}

## Recording Playback

### Playback Request

|  |  |  |  |
| --- | --- | --- | --- |
| Content | Description | | |
| Message numbering | 0x4070 | | |
| Transmission Direction | MDVR ←←Server | | |
| Interaction Link | signal link | | |
| loading data | adopt JSON encoding rule | | |
| Items that must be filled in | | |
| Content | field name | Description |
| Session numbering | ss | The session number generated by the sever, for example” 12FB-01DE-0001-0203” |
| Channel list | chl | corresponding to the exact channel, starting from 1, and split by ”;”, for exmaple ”1;2;5” means channel 1, channel 2, and channel 5 |
| registered server | srv | Registered Server IP address or Domain Name, for example” [www.how.com:31500](http://www.how.com:31500)”, the [www.how.com](http://www.how.com) is domain name, 31500 is port |
| start time | st | start time, for example ”2017-01-01 12:30:30” |
| End time | et | end time, for example ”2017-01-02 10:30:30” |
| Optional items | | |
| Data frame list | fl | List of data frame in transmission. Refer to [Data Frame Code](#_Data_Frame_Code).  e.g. “1;2;3” means needing to transmit data of type1,2,3 |
| Accurate time stamp | tt | The accurate time stamp will be skipped to.  It is used in Download process to avoid duplicated data transmission. |
| File name | fn | Corresponding file name of recording file.It is usually used in alarm recording playback, and start time/end time is invalid in this mode. |
|  |  |  |

Loading Data Sample ：

{

“ss”:” 12FB-01DE-0001-0203” ,

"chl": "1;3",

"st": "2017-01-01 00:00:00",

"et": "2017-01-02 12:30:00",

" ft ": "1",

"srv": "192.168.3.210:5678"

}

### Request Respond/

|  |  |  |  |
| --- | --- | --- | --- |
| Content | Description | | |
| Message numbering | 0x1070 | | |
| Transmission Direction | MDVR →→Server | | |
| Interaction Link | signal link | | |
| loading data | adopt JSON encoding rule | | |
| Items that must be filled in | | |
| Content | field name | Description |
| Session numbering | ss | The session number generated by the sever, for example” 12FB-01DE-0001-0203” |
| Error Code | err |  |
|  |  |  |

Loading Data Sample ：

{

“ss”:”12FB-01DE-0001-0203”,

“err”:”0”

}

### Media Data

refer to [Media Data](#_Media_Data)

After all the data has been sent, a packet with a media length of 0 is sent, as a mark that replay is completed.

### Time control (locate the time)

|  |  |  |  |
| --- | --- | --- | --- |
| Content | Description | | |
| Message numbering | 0x4071 | | |
| Transmission Direction | MDVR ←←Server | | |
| Interaction Link | Media link | | |
| loading data | adopt JSON encoding rule | | |
| Items that must be filled in | | |
| Content | field name | Description |
| control type | act | (Reserverd) |
| Optional items | | |
| offset time | of | exact time, for example ”2017-01-01 12:35:58”, skip valid |
|  |  |  |

Loading Data Sample ：

{

“act”:”0”,

“of”:” 2017-01-01 12:35:58”,

}

## Series port transparent transmission

### Transparent transmission Request

|  |  |  |  |
| --- | --- | --- | --- |
| Content | Description | | |
| Message numbering | 0x4080 | | |
| Transmission Direction | MDVR ←←Server | | |
| Interaction Link | signal link | | |
| loading data | adopt JSON encoding rule | | |
| Items that must be filled in | | |
| Content | field name | Description |
| Session numbering | ss | The session number generated by the sever, for example”12FB-01DE-0001-0203” |
| Port numbering | si | starting from 1 |
| stop bit | sb | 0 -- 1; 1--1.5 ; 2--2 |
| check bit | cb | 0—no 1—odd 2--Even numbers 3—sign 4--space |
| data bit | db | value from 4~8 |
| baudrate | br |  |
| registered server | srv | Registered Server IP address or Domain Name, for example” [www.how.com:31500](http://www.how.com:31500)”, the [www.how.com](http://www.how.com) is domain name, 31500 is port |

Loading Data Sample ：

{

“ss”:” 12FB-01DE-0001-0203” ,

"si": "3",

"sb": "2",

"cb: "0",

"db: "8",

"br: "8000",

"srv": "192.168.3.210:5678"

}

### Request Respond

|  |  |  |  |
| --- | --- | --- | --- |
| Content | Description | | |
| Message numbering | 0x1080 | | |
| Transmission Direction | MDVR →→Server | | |
| Interaction Link | signal link | | |
| loading data | adopt JSON encoding rule | | |
| Items that must be filled in | | |
| Content | field name | Description |
| Session numbering | ss | The session number generated by the sever, for example” 12FB-01DE-0001-0203” |
| Error Code | err |  |

Loading Data Sample ：

{

“ss”:”12FB-01DE-0001-0203”,

“err”:”0”

}

### Media Data

refer to [Media data](#_Media_Data)

## File Transmission

### Request to transmit the file to Device

|  |  |  |  |
| --- | --- | --- | --- |
| Content | Description | | |
| Message numbering | 0x4090 | | |
| Transmission Direction | MDVR ←←Server | | |
| Interaction Link | signal link | | |
| loading data | adopt JSON encoding rule | | |
| Items that must be filled in | | |
| Content | field name | Description |
| Session numbering | ss | The session number generated by the sever, for example” 12FB-01DE-0001-0203” |
| Action | act | 0—download from device 1—download from server |
| Registered Server | srv | Registered Server IP address or Domain Name, for example” [www.how.com:31500](http://www.how.com:31500)”, the [www.how.com](http://www.how.com) is domain name, 31500 is port |
| File type | ft | Reference [3.4 File Type Code](#_File_Type_Code) |
| file name | fn | device save file name, if empty, device can define the name |
| File size | fs | Numbers of bytes |
| File offset | fo | The offset bytes from file begin |

Loading Data Sample ：

{

“ss”:” 12FB-01DE-0001-0203” ,

"act": "0",

“ft”: ”1”,

"fs": "10240",

"fn": "aa.mp4",

"srv": "192.168.3.210:5678",

"of": "0"

}

### Request Respond

|  |  |  |  |
| --- | --- | --- | --- |
| Content | Description | | |
| Message numbering | 0x1090 | | |
| Transmission Direction | MDVR →→Server | | |
| Interaction Link | signal link | | |
| loading data | adopt JSON encoding rule | | |
| Items that must be filled in | | |
| Content | field name | Description |
| Session numbering | ss | The session number generated by the sever, for example” 12FB-01DE-0001-0203” |
| Error Code | err |  |
| offset address | of | the relative offset for file, for resume from break point uploading |

Loading Data Sample ：

{

“ss”:”12FB-01DE-0001-0203”,

“err”:”0”,

“of”:”0”

}

### Media Data

refer to the [media data](#_Media_Data)

After all the data has been sent, a packet with a media length of 0 is sent, as a mark that file transfer is completed.

### ftp file tranmission (not implemented yet)

|  |  |  |  |
| --- | --- | --- | --- |
| Content | Description | | |
| Message numbering | 0x4091 | | |
| Transmission Direction | MDVR ←←Server | | |
| Interaction Link | signal link | | |
| loading data | adopt JSON encoding rule | | |
| Items that must be filled in | | |
| Content | field name | Description |
| Session numbering | ss | The session number generated by the sever, for example” 12FB-01DE-0001-0203” |
| ftp server | ftp | rule: <ftp://user> name:password@server: port |
| action type | act | Reference [3.4 File Type Code](#_File_Type_Code) |
| Optional items | | |
| version | ver | version to be upgraded |
| file name | fn | file name which need to be processed |

Loading Data Sample ：

{

“ss”:”12FB-01DE-0001-0203”,

“ftp”:”<ftp://aa:123@192.168.0.5:32001>”,

“act”:”1”,

“ver”:”1.02.3”

}

### ftp transmission over report (not implemented yet)

|  |  |  |  |
| --- | --- | --- | --- |
| Content | Description | | |
| Message numbering | 0x1091 | | |
| Transmission Direction | MDVR →→Server | | |
| Interaction Link | signal link | | |
| loading data | adopt JSON encoding rule | | |
| Items that must be filled in | | |
| Content | field name | Description |
| Session numbering | ss | The session number generated by the sever, for example” 12FB-01DE-0001-0203” |
| ftp server | ftp | rule: <ftp://user> name:password@server: port |
| action type | act | 1—upgrading 2—download from ftp 3--upload file to ftp |
| Error Code | err |  |
| Optional items | | |
| version | ver | vertion need to be upgraded |
| file name | fn | file need to be processed |

Loading Data Sample:

{

“ss”:”12FB-01DE-0001-0203”,

“ftp”:”<ftp://aa:123@192.168.0.5:32001>”,

“act”:”1”,

“ver”:”1.02.3”,

“err”:”0”

}

### Device file generation notification

|  |  |  |  |
| --- | --- | --- | --- |
| Content | Description | | |
| Meessage number | 0x1092 | | |
| Transmission Direction | MDVR 🡪🡪 Server | | |
| Interaction Link | Signal link | | |
| loading data | adopt JSON encoding rule | | |
| Items that must be filled in | | |
| Content | Field name | Description |
| Session numbering | ss | The session number generated by the device, such as "12FB-01DE-0001-0203", uses the session number corresponding to the registered link |
| File type | ft | Refer to [File Type Code](#_File_Type_Code) |
| File name | fn | File name to be processed |

Loading Data Sample:

{

“ft”:”1”,

“fn”:” /mnt/snap\_1.jpg”

}

## Parameter Configuration

### Configration Request

|  |  |  |  |
| --- | --- | --- | --- |
| Content | Description | | |
| Message numbering | 0x40A0 | | |
| Transmission Direction | MDVR ←←Server | | |
| Interaction Link | signal link | | |
| Loading data | adopt JSON encoding rule | | |
| Items that must be filled in | | |
| Content | field name | Description |
| Session numbering | ss | The session number generated by the sever, for example” 12FB-01DE-0001-0203” |
| Optional items | | |
| Content | sc | the definition is different for each parameter configuraton, field name is different as well.  the descriped content is included in the field name, if the data is empty behind field name, that means operation for gain parameter, refer to parameter description  for example:  set the clock parameter, it will be ”clock”:{“a”:”1”,”b”:”6”} gain the clock parameter, it will be ”clock”:”” |
|  | Server | srv | IP address or domain name of server[e.g. [www.how.com:31500](http://www.how.com:31500), [www.how.com](http://www.how.com) is address and 31500 is port]. It will use signal link if there is no server settings, otherwise it will create a new link like media data transfer. |

Loading Data Sample ：

1、Set clock and time at the same time

{

"ss" : "12FB-01DE-0001-0203"

"sc" :

{

"clock" :

{

"timezone" : "3"

},

"time" :

{

"interval" : "7",

"ntp" : "www.ntp.com"

}

},

}

2、obtain clock, time and record at the same time

{

"ss" : "12FB-01DE-0001-0203"

"sc" :

{

"clock" :

{

"timezone" : "3"

},

"time" :

{

"interval" : "7",

"ntp" : "www.ntp.com"

}

},

}

### Request Respond

|  |  |  |  |
| --- | --- | --- | --- |
| Content | Description | | |
| Message numbering | 0x10A0 | | |
| Transmission Direction | MDVR →→Server | | |
| Interaction Link | signal link | | |
| loading data | adopt JSON encoding rule | | |
| Items that must be filled in | | |
| Content | field name | Description |
| Session numbering | ss | The session number generated by the sever, for example” 12FB-01DE-0001-0203” |
| Error Code | err | refer to the Error code list |
| Optional items | | |
| parameter content | pc | refer to the same content in the configuration request |

Loading Data Sample ：

{

“ss”:” 12FB-01DE-0001-0203” ,

“err”:”0”,

"sc" :

{

“time”:{

"mode": "5"

}

}

}

## Device Control

The below protocol will not have relative MDVR respond except special remark.

### PTZ Control

|  |  |  |  |
| --- | --- | --- | --- |
| Content | Description | | |
| Message numbering | 0x4100 | | |
| Transmission Direction | MDVR ←←Server | | |
| Interaction Link | signal link | | |
| loading data | adopt JSON encoding rule | | |
| Items that must be filled in | | |
| Content | field name | Description |
| Session numbering | ss | The session number generated by the sever, for example” 12FB-01DE-0001-0203” |
| action | act | refer to [the PTZ action code](#_PTZ_Movement_Code) |
| channel | ch | Related channel, from 1 |
| Optional items | | |
| X direction speed | xs | X direction moving speed, 1~10 |
| Y direction speed | ys | Y direction moving speed, 1~10 |
| preset | pre | 0~255 |
|  |  |  |

Loading Data Sample ：

{

“ss”:”12FB-01DE-0001-0203”,

“act”:”3”,

"xs": "3",

"ys": "10",

"pre”: "15"

}

### Restart

|  |  |  |  |
| --- | --- | --- | --- |
| Content | Description | | |
| Message numbering | 0x4102 | | |
| ransmission Direction | MDVR ←←Server | | |
| Interaction Link | signal link | | |
| loading data | adopt JSON encoding rule | | |
| Items that must be filled in | | |
| Content | field name | Description |
| Session numbering | ss | The session number generated by the sever, for example” 12FB-01DE-0001-0203” |

Loading Data Sample ：

{

“ss”:”12FB-01DE-0001-0203”

}

### Upgrade

refer to ftp file transmission

### Factory Default Setting

|  |  |  |  |
| --- | --- | --- | --- |
| Content | Description | | |
| Message numbering | 0x4103 | | |
| Transmission Direction | MDVR ←←Server | | |
| Interaction Link | signal link | | |
| loading data | adopt JSON encoding rule | | |
| Items that must be filled in | | |
| Content | field name | Description |
| Session numbering | ss | The session number generated by the sever, for example” 12FB-01DE-0001-0203” |

Loading Data Sample ：

{

“ss”:”12FB-01DE-0001-0203”

}

### Synchronization time (not implemented yet)

|  |  |  |  |
| --- | --- | --- | --- |
| Content | Description | | |
| Message numbering | 0x4104 | | |
| Transmission Direction | MDVR ←←Server | | |
| Interaction Link | signal link | | |
| loading data | adopt JSON encoding rule | | |
| Items that must be filled in | | |
| Content | field name | Description |
| Session numbering | ss | The session number generated by the sever, for example” 12FB-01DE-0001-0203” |
| Time | tm | The specific time: if empty, then MDVR access to the positioning time to synchronize; if such as "2017-01-01 11:30:58", then set to this point in time |

Loading Data Sample ：

{

“ss”:”12FB-01DE-0001-0203”,

“tm”:”2017-01-01 11:30:58”

}

### Recording Control (not implemented yet)

|  |  |  |  |
| --- | --- | --- | --- |
| Content | Description | | |
| Message numbering | 0x4105 | | |
| Transmission Direction | MDVR ←←Server | | |
| Interaction Link | signal link | | |
| loading data | adopt JSON encoding rule | | |
| Items that must be filled in | | |
| Content | field name | Description |
| Session numbering | ss | The session number generated by the sever, for example” 12FB-01DE-0001-0203” |
| Open List | ol | conrrespond to the exact channel, starting from channel 1, and split by ”;”, for example ”1;2;5” means channel 1, channel 2, channel 5 |
| Close List | cl | same as above |

Loading Data Sample ：

{

“ss”:”12FB-01DE-0001-0203”,

“ol”:”1;3;4”,

“cl”:”2”

}

Means channel 1, 3, 4 start recording, channel 2 stop recording, other channels will be remain the existing status

### Clear Alarm (not implemented yet)

|  |  |  |  |
| --- | --- | --- | --- |
| Content | Description | | |
| Message numbering | 0x4106 | | |
| Transmission Direction | MDVR ←←Server | | |
| Interaction Link | signal link | | |
| loading data | adopt JSON encoding rule | | |
| Items that must be filled in | | |
| Content | field name | Description |
| Session numbering | ss | The session number generated by the sever, for example” 12FB-01DE-0001-0203” |

Loading Data Sample ：

{

“ss”:”12FB-01DE-0001-0203”

}

### Vehicle Control

|  |  |  |  |
| --- | --- | --- | --- |
| Content | Description | | |
| Message numbering | 0x4107 | | |
| Transmission Direction | MDVR ←←Server | | |
| Interaction Link | signal link | | |
| loading data | adopt JSON encoding rule | | |
| Items that must be filled in | | |
| Content | field name | Description |
| Session numbering | ss | The session number generated by the sever, for example” 12FB-01DE-0001-0203” |
| Action type | act | 1—cut the fuel 2—resume the fuel  3—cut the electronic 4—resume electronic  5—open the door6—close the door |
| Optional items | | |
| door ID | do | 1—left front door 2—right front door 3—left mid door  4—right mid door 5—left rear door 6—right rear door |
|  |  |  |

Loading Data Sample ：

{

“act”:”5”,

“do”:”2”  
}

### Format Disk

|  |  |  |  |
| --- | --- | --- | --- |
| Content | Description | | |
| Message numbering | 0x4108 | | |
| Transmission Direction | MDVR ←← Server | | |
| Interaction Link | signal link | | |
| loading data | adopt JSON encoding rule | | |
| Items that must be filled in | | |
| Content | field name | Description |
| Session numbering | ss | The session number generated by the sever, for example”12FB-01DE-0001-0203” |
| Disk ID | num | For example “sd1,sd2,hdd1,hdd2” |

Loading Data Sample：

{

“ss”:” 12FB-01DE-0001-0203”

“num”:”sd1”

}

### Respond

|  |  |  |  |
| --- | --- | --- | --- |
| Content | Description | | |
| Message numbering | 0x1100 | | |
| Transmission Direction | MDVR →→Server | | |
| Interaction Link | signal link(All of the requests in 2.14 return the response and are distinguished by the session number) | | |
| loading data | adopt JSON encoding rule | | |
| Items that must be filled in | | |
| Content | field name | Description |
|  | ss | The session number generated by the sever, for example” 12FB-01DE-0001-0203” |
| Error Code | err | refer to the Error code list |

Loading Data Sample ：

{

“ss”:”12FB-01DE-0001-0203”,

“err”:”0”

}

# Code List

## Error Code

|  |  |
| --- | --- |
| Value | Description |
| 0 | Success |
| 1 | Duplicated ID |
| 2 | invalid parameter |
| 3 | invalid command |
| 4 | device busy |
| 5 | connection lost |
| 6 | related file not exist |
| 7 | disk not exist |
| 8 | follow up data |
| 9 | file search finish |
| 10 | Device is not authorized |
| 255 | Unknown error |

## Network Type Code

|  |  |
| --- | --- |
| Value | Description |
| 0 | unknown |
| 1 | wired |
| 2 | WIFI |
| 3 | 2G |
| 4 | 3G |
| 5 | 4G |
| 6 | 5G |
| 7 | WIFI+3/4/5G, connect with mobile network proxy via WIFI to access Internet |
| 8 | CABLE+3/4/5G, connect with mobile network proxy via CABLE to access Internet |

## Event Type Code

|  |  |
| --- | --- |
| Value | Description |
| 0 | unknown |
| 1 | video lost |
| 2 | motion detection |
| 3 | video blind |
| 4 | input trigger |
| 5 | emergency alarm |
| 6 | low speed alarm |
| 7 | over speed alarm |
| 8 | low temperature alarm |
| 9 | high temperature alarm |
| 10 | humidity alarm |
| 11 | parking over time |
| 12 | acceleration alarm |
| 13 | GEO fencing |
| 14 | electronic route |
| 15 | abnormal openclose the door |
| 16 | storage abnormal |
| 17 | fatigue driving |
| 18 | fuel consumption abnormal |
| 19 | illegal ACC |
| 20 | GPS module abnormal |
| 21 | front panel open |
| 22 | Swipe card |

## File Type Code

|  |  |
| --- | --- |
| Value | Description |
| 0 | unknown |
| 1 | general recording |
| 2 | alarm recording |
| 3 | general snapshot file |
| 4 | alarm snapshot file |
| 5 | upgrade file |
| 6 | log file |
| 7 | Configuration file |

## PTZ Movement Code

|  |  |
| --- | --- |
| value | Description |
| 0 | unknown |
| 1 | up |
| 2 | down |
| 3 | left |
| 4 | right |
| 5 | left up |
| 6 | left down |
| 7 | right up |
| 8 | right down |
| 9 | call preset |
| 10 | set preset |
| 11 | clear preset |
| 12 | Iris + |
| 13 | Iris - |
| 14 | zoom - |
| 15 | zoom + |
| 16 | focus - |
| 17 | focus+ |
| 18 | auto pan |
| 19 | wiper ON |
| 20 | Wiper OFF |
| 21 | Patrol ON |
| 22 | Patrol OFF |
| 23 | light ON |
| 24 | Light OFF |

## Data Frame Code

|  |  |
| --- | --- |
| Value | Description |
| 0 | Invalid |
| 1 | I frame of video (H264) |
| 2 | P frame of video(H264) |
| 3 | Audio frame(G726 contains a special head of 2bytes) |
| 4 | Serial data frame |
| 5 | File data frame (If the length of media data and other info are 0, it means file transmission isfinished or file playback is finished.) |
| 6 | Status data frame(Only valid in playback) |
| 7 | Alarm data frame(Only valid in playback) |
|  |  |

# Parameter Description

Please note that parameters are case sensitive.

## Clock

|  |  |  |  |
| --- | --- | --- | --- |
| field name | CLOCK | | |
| loading data description | | | |
| Content | | field name | Description |
| version | | --version | "1.0.1.1" |
| Calibration mode | | switch | 0--Manual 1—GPS adjust 2—NTP |
| time zone | | timezone | Each time zone has 4 Calibration point :00,:15,:30,:45, correspond number starting from 0~103, for example “GMT+8 0”is correspond to “20”, and convert to time zone, Keep a decimal \*10 |
| NTP server | | ntpserver | 0~64 byte |
| NTP server port | | ntpport |  |
| date display mode | | DateType | 0—YY/MM/DD 1—DD/MM/YY 2—MM/DD/YY |
| buzzer | | buzzerSwitch | 0--OFF 1--ON |
| operation time out | | OprTimeOut | 30~3600 second |

Demo ：

{

"CLOCK": {

"--version": "1.0.1.1",

"switch": "1",

"timezone": "200",

"ntpserver": "www.ntp.com",

"ntpport": "123",

"DateType": "0",

"buzzerSwitch": "1",

"OprTimeOut": "60"

}

}

## Mobile Network

|  |  |  |  |
| --- | --- | --- | --- |
| field name | DIALUP | | |
| loading data description | | | |
| Content | | field name | Description |
| version | | --version | "1.0.1.1" |
| function switch | | switch | 0--OFF 1--ON |
| type | | type | 0--WCDMA 1--EVDO 2--TD-SCDMA, 3--TDD-LTE 4--FDD-1(), 5--FDD-2() |
| apn | | apn | 0~64 byte |
| Server Code | | servercode | 0~64 byte |
| User Name | | user | 0~64 byte |
| password | | passwd | 0~64 byte |
| Service number | | SmsService | 0~64 byte |

Demo ：

{

"DIALUP": {

"--version": "1.0.1.0",

"switch": "1",

"type": "0",

"apn": "3gnet",

"servercode": "\*99#",

"user": "card",

"passwd": "card",

"smsservice": "13800138000"

}

}

## Disk Abnomal

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| field name | DiskAbnormal | | | | |
| loading data description | | | | | |
| Content | | field name | Description | | |
| version | | --version | "1.0.1.1" | | |
| disk root node | | disk | ID from 0~3, for example disk 0 is disk0,there are 4 disks in total | | |
|  | |  | Content | field name | Description |
| enable | enable |  |
|  | interval | reserved |
|  | delay | reserved |
|  | holdTime | reserved |
| linkage | linkage | reserved |
|  |  |  |

Demo ：

{

"DiskAbnormal": {

"--version": "1.0.1.1",

"disk0": {

"enable": "0",

"interval": "600",

"delay": "15",

"holdTime": "60",

"linkage": "0"

},

"disk1": {

"enable": "0",

"interval": "600",

"delay": "15",

"holdTime": "60",

"linkage": "0"

}

}

}

## Live Viewing

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| field name | DISPLAY | | | | |
| loading data description | | | | | |
| Content | | field name | Description | | |
| version | | --version | "1.0.1.1" | | |
| resolution | | DisplayType | 0--720x576 1--1024x768 2--1280x720  3--1920x1080 4-- Maximization | | |
| channel root node | | chn | chn0 is channel 1, chn1 is channel 2, and so on . There are 16 channels in total | | |
|  | |  | Content | field name | Description |
| chroma | Brior | 0~255 |
| brightness | Coght | 0~255 |
| contrast | Colntrast | 0~255 |
| saturation | Saturation | 0~255 |
| display position | DisPos | 0—left up 1—left down, 2—right up 3—right down |
| live view | Preview | 0--OFF 1--ON |
| channel name | ChnName | 0~12byte |

Demo ：

{

"DISPLAY ": {

"--version": "1.0.1.1",

"DisplayType": "1",

"chn0": {

"Brior": "64",

"Coght": "64",

"Colntrast": "304",

"Saturation": "32",

"DisPos": "1",

"Preview": "1",

"ChnName": "1"

},

"chn1": {

"Brior": "64",

"Coght": "64",

"Colntrast": "304",

"Saturation": "32",

"DisPos": "1",

"Preview": "1",

"ChnName": "CH2"

}

}

}

## G-SENSOR

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| field name | GSENSOR | | | | |
| loading data description | | | | | |
| Content | | field name | Description | | |
| version | | --version | "1.0.1.1" | | |
| switch | | switch | 0：OFF 1：ON | | |
| unit | | unit | reserved | | |
|  | | brakedirect | reserved | | |
|  | | correctx | X direction correct | | |
|  | | correcty | Y direction Correct | | |
|  | | correctz | Z direction Correct | | |
| direction root node | |  | The below name is corresponded to each direction  xalarm—x direction  yalarm—y direction  zalarm—z direction  hitalarm—impact  tiltalarm—tilt | | |
|  | |  | Content | field name | Description |
| enable | enable | 0--OFF 1--ON |
|  | limit | threshold |
|  | delay | alarm delay duration, unit: second |
| record | record | 0--OFF 1--ON |
|  | holdtime | reserved |
| linkage | linkage | bit0—Alarm output1  bit1—Alarm output 2  bit2—buzzer  bit3—snapshot  bit4—request for intercom  bit5—center server  bit6—GUI prompt |
|  |  |  |

Demo ：

{

"GSENSOR": {

"--version": "1.0.1.0",

"switch": "0",

"unit": "0",

"brakedirect": "0",

"correctx": "0",

"correcty": "0",

"correctz": "0",

"xalarm": {

"enable": "0",

"limit": "80",

"delay": "0",

"record": "0",

"holdtime": "5",

"linkage": "0"

},

"yalarm": {

"enable": "0",

"limit": "80",

"delay": "0",

"record": "0",

"holdtime": "5",

"linkage": "0"

}

}

}

## Alarm input and output

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| field name | IOSET | | | | |
| loading data description | | | | | |
| Content | | field name | Description | | |
| version | | --version | "1.0.1.1" | | |
| input root node | | input |  | | |
|  | |  | Content | field name | Description |
| channel root node | chn | chn0 is channel 1, chn1 is channel 2, and so on |
|  |  | please refer to the below input parameter for the exact configuration |
| output root node | | output |  | | |
|  | |  | Content | field name | Description |
| channel root node | chn | chn0 is channel 1, chn1 is channel 2, and so on |
|  |  | please refer to the below output parameter for the exact configuration |

|  |  |  |
| --- | --- | --- |
| Alarm Input Parameter | | |
| Content | field name | Description |
| Name | name |  |
| Enable | enable | 0--OFF 1--ON |
|  | limit | 0--low, 1--high |
|  | delay | Alarm delay duration, unit: second |
| record | record | 0--OFF 1--ON |
|  | holdtime | Duration of state protection, unit: second |
| linkage | linkage | bit0—alarm output 1  bit1—alarm output 2  bit2—buzzer  bit3—snapshot  bit4—request for intercom  bit5—central server  bit6—GUI prompt |
| live view channel | PreviewChn | channel 1 ~n is corresponding to the number starting from 0 |

|  |  |  |
| --- | --- | --- |
| alarm output parameter | | |
| Content | field name | Description |
| Name | name |  |
| enable | enable | 0--OFF 1--ON |
|  | limit | 0--low, 1--high |
|  | delay | reserved |
| record | record | 0--OFF 1--ON |
|  | holdtime | reserved |
| linkage | linkage | bit0—alarm output 1  bit1- alarm output 2  bit2—buzzer  bit3—snapshot  bit4—request for intercom  bit5—Central Server  bit6—GUI Prompt |
| live view channel | PreviewChn | channel 1 ~n is corresponding to the number starting from 0 |

Demo：

{

"IOSET": {

"--version": "1.0.1.0",

"input": {

"chn0": {

"name": "in1",

"enable": "0",

"limit": "1",

"delay": "0",

"record": "1",

"holdtime": "5",

"linkage": "1",

"PreviewChn": "1"

}

"chn1": {

"name": "in2",

"enable": "0",

"limit": "1",

"delay": "0",

"record": "1",

"holdtime": "5",

"linkage": "1",

"PreviewChn": "1"

}

},

"output": {

"chn0": {

"name": "out1",

"enable": "0",

"limit": "0",

"delay": "0",

"record": "0",

"holdtime": "0",

"linkage": "0",

"PreviewChn": "0"

}

"chn1": {

"name": "out2",

"enable": "0",

"limit": "0",

"delay": "0",

"record": "0",

"holdtime": "0",

"linkage": "0",

"PreviewChn": "0"

}

}

}

}

## Basic Configuraiton

|  |  |  |  |
| --- | --- | --- | --- |
| field name | JTBASE | | |
| loading data description | | | |
| Content | | field name | Description |
| version | | --version | "1.0.1.1" |
| Province Code | | province | 0~8 byte |
| City Code | | city | 0~8 byte |
| Manufacturer | | manufacturer | 0~32 byte |
| Device ID | | DevId | 0~32 byte |
| Phonenum | | phonenum | 0~16 byte |
| terminal model | | model | 0~32 byte |
| terminal ID | | TerminalId | 0~32 byte |
|  | | color |  |
| vehicle License | | license | 0~16 byte |
| center Server 1-protocol type | | protocol1 | 0:shutdown, 1:T standard, 2:T ministerial standard, 3:T extension, 4:R standard |
| Center server 2 protocol type | | protocol2 | 0:shutdown, 1:R standard, 2:R extension, 3:F ministerial standard, 4: ministerial standard , 5:R ministerial standard video |
| gpsGPS interval | | gpsInterval | Second |
| Gps position mode | | gpsPosMode |  |

Demo ：

{

"JTBASE": {

"--version": "1.0.1.2",

"province": "9",

"city": "8",

"manufacturer": "99999999999",

"DevId": "88888888888",

"phonenum": "013900000002",

"model": "99999999999",

"TerminalId": "88888888888",

"color": "0",

"license": "AAAAAA",

"protocol1": "1",

"protocol2": "0",

"gpsInterval": "0"

"gpsPosMode": "0"

}

}

## Wired Network

|  |  |  |  |
| --- | --- | --- | --- |
| field name | LOCAL | | |
| loading data description | | | |
| Content | | field name | Description |
| IP address | | ip | 0~20 byte |
| subnet mask | | mask | 0~20 byte |
| gateway | | gw | 0~20 byte |
| domain name | | dns | 0~20 byte |
| MAC address | | mac | 0~20 byte |
|  | | LinkType | reserved, reserved for LAN port Peripheral |
|  | |  |  |
|  | |  |  |

Demo ：

{

"LOCAL": {

"--version": "1.0.1.0",

"ip": "192.168.001.010",

"mask": "255.255.255.000",

"gw": "192.168.001.001",

"dns": "113.068.119.068",

"mac": "113.68.119.68",

"LinkType": "0"

}

}

## Motion Detection

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| field name | MOTIONDETECT | | | | |
| loading data description | | | | | |
| Content | | field name | Description | | |
| version | | --version | "1.0.1.1" | | |
| channel root node | | chn | chn0 is channel 1, chn1 is channel 2, and so on . maximum 16 channel | | |
|  | |  | Content | field name | Description |
| channel root node | chn | chn0 is channel 1, chn1 is channel 2, and so on, maximum 16 channel |
| sensitivity | Sensitivity |  |
| alarm parameter root node | alarm | alarm linkage trigger relative parameter, refer to the alarm parameter |
| region parameter root node | Rect | motion detection region parameter, refer to the region parameter |
|  |  |  |

|  |  |  |
| --- | --- | --- |
| Alarm Parameter | | |
| Content | field name | Description |
| enable | enable | 0--OFF 1--ON |
|  | limit | reserved |
|  | delay | reserved |
| record | record | 0--OFF 1--ON |
|  | holdtime | reserved |
| linkage | linkage | bit0—alarm output 1  bit1—alarm output 2  bit2—buzzer  bit3—snapshot  bit4—request intercom  bit5—center server  bit6—GUI prompt |
| live view channel | PreviewChn | channel 1 ~n is corresponding to the number starting from 0 |
|  |  |  |
|  |  |  |

|  |  |  |
| --- | --- | --- |
| region parameter | | |
| Content | field name | Description |
| Start X coordinate | sx | region start X coordinate |
| start Y coordinate | sy | region start Y coordinate |
| width | width | region Width |
| height | height | region Height |
|  |  |  |
|  |  |  |

Demo：

{

"MOTIONDETECT": {

"--version": "1.0.1.0",

"chn0": {

"Sensitivity": "20",

"alarm": {

"enable": "0",

"limit": "1",

"delay": "15",

"record": "1",

"holdtime": "5",

"linkage": "1",

"PreviewChn": "1"

},

"rect": {

"sx": "1",

"sy": "1",

"width": "1",

"height": "1"

}

}

}

}

## OSD

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| field name | OSD | | | | |
| loading data description | | | | | |
| Content | | field name | Description | | |
| version | | --version | "1.0.1.1" | | |
| region Node | | region | Region0 is Region 0, Region 1 is Region 2, and so on. There are 9 regions at max. | | |
|  | |  | Content | field name | Description |
| Start X coordinate | sx | Region Start X coordinate |
| Start Y coordinate | sy | Region Start Y coordinate |
| width | width | Region width |
| Height | height | Region Height |
| display type | type | 0--no 1--date 2-- Pulse velocity3—GPS location information 4--text |
| text information | text | 0~64 byte |

Demo ：

{

"OSD": {

"--version": "1.0.1.3",

"region0": {

"sx": "50",

"sy": "900",

"width": "304",

"height": "32",

"type": "1",

"text": "CH1"

}

"region1": {

"sx": "50",

"sy": "400",

"width": "304",

"height": "32",

"type": "1",

"text": "CH2"

}

}

}

## Power Management

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| field name | POWER | | | | |
| loading data description | | | | | |
| Content | | field name | Description | | |
| version | | --version | "1.0.1.1" | | |
| Switch | | switch | 0--OFF 1--ACC 2—schedule | | |
| delay power off | | delay | Second | | |
| screen off time | | ScreenOffTime | Second | | |
| power startup | | PowerOnTime | relative to the exact time ( second) in a day | | |
| power off time | | PowerOffTime | relative to the exact time ( second) in a day | | |
| ACC power off recording channel | | AccPowerOffRecEnable | Channels keep recording when acc is off.Set by bit.  0--OFF 1—ON. E.g. 15 means 0x0f, so channel 1 – 4 will keep recording | | |
| ACC power off recording time | | AccOffRecTime | Second | | |
| Enable reboot schedule | | TimeRebootEn | 0—off, 1--on | | |
| Scheduled time to reboot | | RebootTime | The second in a day | | |
| week root node | | week | week0 is Sunday, week1 is Monday, and so on | | |
|  | |  | Content | field name | Description |
| time slot 1 | time0 | xx:xx-xx:xx format, xx means hour and minutes |
| time slot 2 | time1 | Same as above |
| time slot 3 | time2 | Same as above |
| time slot 4 | time3 | Same as above |

Demo：

{

"POWER": {

"--version": "1.0.1.0",

"switch": "1",

"delay": "1",

"AccOffRecTime": "1",

"ScreenOffTime": "3",

"PowerOnTime": "0",

"PowerOffTime": "86399",

"AccPowerOffRecEnable": "15",

" TimeRebootEn": "0",

" RebootTime": "0",

"week0": {

"time0": "00:00-23:59",

"time1": "00:00-00:00",

"time2": "00:00-00:00",

"time3": "00:00-00:00"

}

}

}

## PTZ

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| field name | PTZ | | | | |
| loading data description | | | | | |
| Content | | field name | Description | | |
| version | | --version | "1.0.1.1" | | |
| channel root | | chn | chn0 is channel 1，chn1 is channel 2, and so on. There are 16channels in max. | | |
|  | |  | Content | field name | Description |
| protocol | Protocol | 0--Pelco-D1--Pelco-P |
| number Address | Number | 1~63 |
| preset | Perset | 1~27 |
|  |  |  |

Demo：

{

"PTZ": {

"--version": "1.0.1.0",

"chn0": {

"Protocol ": "1",

"Number": "1",

"Perset": "1"

}

"chn1": {

"Protocol ": "1",

"Number": "2",

"Perset": "1"

}

}

}

## Record

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| field name | RECORD | | | | |
| loading data description | | | | | |
| Content | | field name | Description | | |
| version | | --version | "1.0.1.1" | | |
| Sysnorm | | SysNorm | 0--PAL 1--NTSC | | |
| recording mode | | RecMode | 0--start 1—schedule 2--alarm | | |
| over writing | | AutoCover | 0--OFF 1--Enable | | |
| Audio output gain | | AOVolume |  | | |
| audio compression type | | AudioType |  | | |
| pack time | | PackTime | Unit: second，15\*60s~10\*60\*60s | | |
| camera tpe | | CameraType | 0—8\*1080P [Means 8 channels 1080P]  1—4\*1080P  2—8\*720P  3—8\*1080N  4—4\*1080P+4\*D1[Mixed mode,4 ch 1080P and 4ch D1]  5—4\*720P+4\*D1  6-- 2\*1080P+6\*720P  7-- 2\*1080P+4\*720P  8-- 2\*1080P+6\*D1  9-- 2\*1080P  10-- 2\*720P  11-- 4\*1080N  12-- 4\*720P  13-- 2\*720P+2\*D1  14-- 4\*D1  15-- 1\*1080P+1\*D1  16-- 4\*D1+4\*720P  17-- 4\*D1+2\*1080N  18-- 2\*1080P+2\*720P  19-- 2\*1080P+2\*D1  20-- 6\*720P+2\*D1  21-- 2\*720P+6\*D1  22-- 8\*960H  23-- 4\*960H  24-- 6\*1080P+2\*960H  25-- 4\*D1+2\*1080P | | |
| time root node | | RecTimers | Summary of time node | | |
|  | |  | Content | field name | Description |
| time root node | time | Time0 for Sunday, time1 for Monday, and so on.There are 7 root nodes for time .  Refer to the following time period for details |
|  |  |  |
| Main stream root node | | MainChn | Summary of main stream node | | |
|  | |  | Content | field name | Description |
| channel root node | chn | chn0 is channel 1, chn1 is channel 2, and so on.There are 16channels. for more detail, please refer to the below main stream description |
|  |  |  |
|  |  |  |
|  |  |  |
| substream root node | | SubChn | Summary of sub stream node | | |
|  | |  | Content | field name | Description |
| channel root node | chn | chn0 is channel 1, chn1 is channel 2, and so on.There are 16channels. for more detail, please refer to the below sub stream description |
|  |  |  |
| IPC root node | | IPCChn | summary of IPC root node | | |
|  | |  | Content | field name | Description |
| channel root node | chn | chn0 is channel 1, chn1 is channel 2, and so on.There are 8channels. for more detail, please refer to the below IPC description |
|  |  |  |

|  |  |  |
| --- | --- | --- |
| Time parameter | | |
| Content | field name | Description |
| start time1 | start1 | relative to the exact time ( second) in a day |
| End time1 | end1 | relative to the exact time ( second) in a day |
| start time2 | start2 | relative to the exact time ( second) in a day |
| End time2 | end2 | relative to the exact time ( second) in a day |

|  |  |  |
| --- | --- | --- |
| main stream parameter | | |
| Content | field name | Description |
| record | isRec | 0--OFF 1--ON |
| frame rate | FrameRate | 1~25(PAL) 1~30(NTSC) |
| resolution | Resolution | 0--HD1080 1--HD720 2—VGA,  3--D1 4--HD1 5--CIF 6--WD1 |
| quality | Quality | 0(best) ~7 |
| with audio | HaveAudio | 0--OFF 1-ON |
| bit rate | Bitrate |  |
|  | PicLevel |  |
|  | Gop |  |
| mirror | Mirror | 0--OFF 1—left / right mirror 2—up / down mirror |
|  |  |  |

|  |  |  |
| --- | --- | --- |
| sub stream parameter | | |
| Content | field name | Description |
| record | isRec | 0--OFF 1--ON |
| frame rate | FrameRate | 1~25(PAL) 1~30(NTSC) |
| resolution | Resolution | 0--HD1080 1--HD720 2—VGA, 3--D1 4--HD1 5--CIF 6--WD1 |
| quality | Quality | 0 (best ) ~7 |
| with audio | HaveAudio | 0--OFF 1--ON |
| bit rate | Bitrate |  |
|  | PicLevel |  |
|  | Gop |  |
| mirror | Mirror | 0--OFF 1—left / right mirror 2—up/ down mirror |

|  |  |  |
| --- | --- | --- |
| IPC parameter | | |
| Content | field name | Description |
| switch | isOpen | 0--OFF 1--ON |
| device type | DevType | 0--IPC 1--DVR |
| protocol | Protocol | 0--ONVIF 1-user define |
| remote channel No. | ChlNo |  |
| remote port | CameraPort |  |
| remote address | CameraIP | 0~20 byte |
| user name | UserName | 0~20 byte |
| password | UserPwd | 0~20 byte |
| IPC address | ipcAddr | 0~256 byte |
| rtsp address 1 | rtspUrl\_0 | 0~256 byte |
| rtsp address 2 | rtspUrl\_1 | 0~256 byte |

Demo：

{

"RECORD": {

"--version": "1.0.1.1",

"SysNorm": "0",

"RecMode": "0",

"AutoCover": "1",

"AOVolume": "1",

"AudioType": "1",

"PackTime": "1",

"CameraType": "12",

"RecTimers": {

"time0": {

"start1": "0",

"end1": "12000",

"start2": "0",

"end2": "0"

}

"time0": {

"start1": "12000",

"end1": "86399",

"start2": "0",

"end2": "0"

}

},

"MainChn": {

"chn0": {

"isRec": "1",

"FrameRate": "25",

"Resolution": "1",

"Quality": "4",

"HaveAudio": "1",

"Bitrate": "4096",

"PicLevel": "1",

"Gop": "25",

"Mirror": "0"

}

"chn0": {

"isRec": "1",

"FrameRate": "25",

"Resolution": "1",

"Quality": "4",

"HaveAudio": "1",

"Bitrate": "4096",

"PicLevel": "1",

"Gop": "25",

"Mirror": "0"

}

},

"SubChn": {

"chn0": {

"isRec": "1",

"FrameRate": "6",

"Resolution": "5",

"Quality": "4",

"HaveAudio": "0",

"Bitrate": "1",

"PicLevel": "1",

"Gop": "1"

}

},

"IPCChn": {

"chn0": {

"isOpen": "1",

"DevType": "1",

"Protocol": "1",

"ChlNo": "1",

"CameraPort": "1",

"CameraIP": "1",

"UserName": "1",

"UserPwd": "1",

"ipcAddr": "1",

"rtspUrl\_0": "1",

"rtspUrl\_1": "1"

}

}

}

}

## Serial port

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| field name | RSBASE | | | | |
| loading data description | | | | | |
| Content | | field name | Description | | |
| version | | --version | "1.0.1.1" | | |
| series node | | rs | rs0 is channel 1, rs1 is channel 2, and so on.There are 8channels. | | |
|  | |  | Content | field name | Description |
| baudrate | baudrate | baudrate, for example: 115200 |
| data bit | databit | data bit, 5, 6, 7, 8 |
| stop bit | stopbit | stop bit, 1 or 2 |
| parity bit | parity | parity. N—no parity, O—Odd parity, E—event numbers parity, S—SpaceParity M  --MarkParity |
| function | func | 0x00--series port close  0x0--transparent transmission  0x02—PTZ  0x03--external GPS  0x04--user define 1  0x05-user define 2  0x06 --car OBD interface  0x07--Ultrasonic fuel sensor 0  ID: TUWS02-2 manuafacturer:XMXD  0x08-- Ultrasonic fuel sensor 1  ID: TUWS02-2 manuafacturer: XMXD  0x09—card swapping machine, manufacturer:DK  0xa—people counting  0xb—Fatigue driving sensor  0xc—TTS. For Chinese voice;Encode with GB2312;Manufacture:HDKJ  0xd—Capacitive fuel sensor.ID:CR-606 Manufacture:HNCR  0xe—DAVITEQ Capacitive Fuel Sensor  0xf—Third party transparent transmission  0x10--LLS30160CapacitiveFuel Sensor  0x11—Transparent transmission with ministerial standard protocol  0x100--STD GPS send  0x200—Serial port test |

Demo：

{

"RSBASE": {

"--version": "1.0.1.1",

"rs0": {

"baudrate": "38400",

"databit": "8",

"stopbit": "1",

"parity": "0",

"func": "0"

}

"rs1": {

"baudrate": "11500",

"databit": "8",

"stopbit": "1",

"parity": "0",

"func": "9"

}

}

}

## Cental Server

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| field name | SERVER | | | | |
| loading data description | | | | | |
| Content | | field name | Description | | |
| version | | --version | "1.0.1.1" | | |
| Server node | | server | server0 is server 1，server1 is server 2, and so on, maximum 4 servers | | |
|  | |  | Content | field name | Description |
| switch | enable | 0--OFF 1--ON |
| connection type | conntype | reserved |
| IP address for main server | mainip | IP address for main server, 0~64 byte |
| main port 5V | mainport | main server port |
| main udp port | mainudpport | reserved |
| backup address | bakip | backup server address, 0~64 byte |
| backup port | bakport | backup server port |
| backup udp port | bakudpport | reserved |
|  |  |  |

Demo：

{

"SERVER": {

"--version": "1.0.1.0",

"server0": {

"enable": "1",

"conntype": "0",

"mainip": "192.168.001.37",

"mainport": "6608",

"mainudpport": "8000",

"bakip": "113.108.120.47",

"bakport": "6608",

"bakudpport": "9000"

}

"server1": {

"enable": "0",

"conntype": "0",

"mainip": "192.168.001.121",

"mainport": "6608",

"mainudpport": "8000",

"bakip": "113.108.120.47",

"bakport": "6608",

"bakudpport": "9000"

}

}

}

## Speed parameter

|  |  |  |  |
| --- | --- | --- | --- |
| field name | SPEED | | |
| loading data description | | | |
| Content | | field name | Description |
| version | | --version | "1.0.1.1" |
| source | | source | 0--GPS 1--car 2—mixed |
| unit | | unit | speed unit: 0-Km/s, 1-MPH |
| Velocity coefficient | | pulse | Coefficient between pulse and velocity |
| position mode | | posmode | 0x01--GPS0x02—beidou 0x03—dual mode |
| stop alarm | | stopalarm | stop alarm sub node, for more detail, please refer to the alarm parameter |
| low speed warning | | lowprealarm | sub node, for more detail, please refer to the alarm parameter |
| low speed alarm | | lowalarm | sub node, for more detail, please refer to the alarm parameter |
| high speed warining | | highprealarm | sub node, for more detail, please refer to the alarm parameter |
| high speed alarm | | highalarm | sub node, for more detail, please refer to the alarm parameter |
| harsh break | | harshbraking | sub node, for more detail, please refer to the alarm parameter |
| hardsh breacker | | harshacc | sub node, for more detail, please refer to the alarm parameter |

|  |  |  |
| --- | --- | --- |
| Alarm Parameter | | |
| Content | field name | Description |
| enable | enable | 0--OFF 1--ON |
|  | limit | the threshold |
|  | delay | alarm delay duration, unit: second |
| record | record | 0--OFF 1--ON |
|  | holdtime | Duration of state protection, unit: second |
| linkage | linkage | bit0—alarm output 1  bit1—alarm output 2  bit2—buzzer  bit3—snapshot  bit4—request intercom  bit5—center server  bit6—GUI marks |
|  |  |  |

Demo：

{

"SPEED": {

"--version": "1.0.1.1",

"source": "0",

"unit": "0",

"pulse": "0",

"posmode": "0",

"stopalarm": {

"enable": "0",

"limit": "0",

"delay": "0",

"record": "0",

"holdtime": "0",

"linkage": "0"

},

"lowprealarm": {

"enable": "0",

"limit": "0",

"delay": "0",

"record": "0",

"holdtime": "0",

"linkage": "2"

},

"lowalarm": {

"enable": "0",

"limit": "10",

"delay": "0",

"record": "0",

"holdtime": "0",

"linkage": "0"

},

}

}

## Storage management

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| field name | STORE | | | | |
| loading data description | | | | | |
| Content | | field name | Description | | |
| alarm pre-record | | prerecord | Unit: second | | |
| alarm post-record | | delayrecord | Unit: second | | |
| Record file protect | | protectEnable | 0—OFF, 1--Enabled | | |
|  | | protectday | reserved | | |
| alarm recording push switch | | sendEnable | 0—OFF 1--CMSV6 2--FTP | | |
|  | |  |  | | |
| disk info root node | | diskinfo |  | | |
|  | |  | Content | field name | Description |
|  | |  | disk list | disk | disk0 is disk 0，disk1 is disk 2, and so on.There are 6 disks.  0—no 1—main recording  2--mirror 3--bakcup |
|  | |  |  |  |  |
|  | | stdpartsize |  | | |
|  | |  | Content | field name | Description |
| disk list | disk | disk0 is disk 0，disk1 is disk 2, and so on.There are 6 disks.  0--non 1—main stream recording  2--mirror 3—backup  For more detail info, pleas refer to the below disk parameter |
|  | | priblksize |  | | |
|  | |  | Content | field name | Description |
| disk list | disk | disk0 is disk 0，disk1 is disk 2, and so on.There are 6 disks.  0--non 1—main stream recording  2--mirror 3—backup  For more detail info, pleas refer to the below disk parameter |

Demo：

{

"STORE": {

"--version": "1.0.1.3",

"prerecord": "10",

"delayrecord": "120",

"protectEnable": "0",

"protectday": "0",

"diskinfo": {

"disk0": "1",

"disk1": "0",

"disk2": "0"

"disk3": "0"

"disk4": "0"

"disk5": "0"

},

"sendEnable": "1",

"stdPartSize": {

"disk0": "0",

"disk1": "0",

"disk2": "0"

"disk3": "0"

"disk4": "0"

"disk5": "0"

},

"priblksize": {

"disk0": "0",

"disk1": "0",

"disk2": "0"

"disk3": "0"

"disk4": "0"

"disk5": "0"

}

}

}

## Temperature

|  |  |  |  |
| --- | --- | --- | --- |
| field name | TEMP | | |
| loading data description | | | |
| Content | | field name | Description |
| unit | | unit |  |
| temperature root node | |  | the below name corresponding to each control type  lalarm—low temperature  halarm—high temperature  for more detail information, please refer to the alarm parameter |

|  |  |  |
| --- | --- | --- |
| alarm parameter | | |
| Content | field name | Description |
| enable | enable | 0--OFF 1--ON |
|  | limit | the threshold |
|  | delay | alarm delay duration, unit: recond |
| record | record | 0--OFF 1--ON |
|  | holdtime | Duration of state protection, unit: second |
| linkage | linkage | bit0—alarm output 1  bit1—alarm output 2  bit2—buzzer  bit3—snapshot  bit4—request intercom  bit5—center server  bit6—GUI prompt |

Demo：

{

"TEMP": {

"--version": "1.0.1.0",

"unit": "0",

"lalarm": {

"enable": "0",

"limit": "11",

"delay": "0",

"record": "0",

"holdtime": "0",

"linkage": "0"

},

"halarm": {

"enable": "0",

"limit": "15",

"delay": "0",

"record": "0",

"holdtime": "0",

"linkage": "17"

}

}

}

## Remote Upgrade

|  |  |  |  |
| --- | --- | --- | --- |
| field name | UPGRADE | | |
| loading data description | | | |
| Content | | field name | Description |
| IP address of Server | | ip | FTP server address, 0~64 byte |
| Port of Server | | port | FTP server port |
| user name | | user | FTP server user name, 0~32 byte |
| password | | passwd | FTP Server password, 0~32 byte |

Demo：

{

"UPGRADE": {

"--version": "1.0.1.0",

"ip": "192.168.001.100",

"port": "21",

"user": "test",

"passwd": "123456"

}

## Video lost

|  |  |  |  |
| --- | --- | --- | --- |
| field name | VideoLostAlm | | |
| loading data description | | | |
| Content | | field name | Description |
| version | | --version | "1.0.1.1" |
| channel root node | | chn | chn0 is channel 1, chn1 is channel 2, and so on, There are 16 channels. for more detail, please refer to the configuration parameter |

|  |  |  |
| --- | --- | --- |
| Configration parameter | | |
| Content | field name | Description |
| enable | enable | 0--OFF 1--ON |
|  | interval | reserved |
|  | delay | reserved |
|  | holdTime | reserved |
|  | linkage | bit0—alarm output 1  bit1—alarm output 2  bit2—buzzer  bit3—snapshot  bit4—request intercom  bit5—center server  bit6—GUI prompt |

Demo：

{

"VideoLostAlm": {

"--version": "1.0.1.1",

"chn0": {

"enable": "0",

"interval": "600",

"delay": "15",

"holdTime": "60",

"linkage": "0"

},

"chn1": {

"enable": "0",

"interval": "600",

"delay": "15",

"holdTime": "60",

"linkage": "0"

},

"chn2": {

"enable": "0",

"interval": "600",

"delay": "15",

"holdTime": "60",

"linkage": "0"

},

"chn3": {

"enable": "0",

"interval": "600",

"delay": "15",

"holdTime": "60",

"linkage": "0"

}

}

## Video Output

|  |  |  |  |
| --- | --- | --- | --- |
| field name | VIDEOOUT | | |
| loading data description | | | |
| Content | | field name | Description |
| version | | --version | "1.0.1.1" |
| screen mode | | mode | 0—single screen 1-2 screens  2—4 screens 3—6 screens  4—9screens |
|  | | chn | Set by bit |
|  | | ShowNum | reserved |
|  | | LoopTime | reserved |

Demo：

{

"VIDEOOUT": {

"--version": "1.0.1.0",

"mode": "2",

"chn": "15",

"ShowNum": "4",

"LoopTime": "0"

}

}

## Voltage

|  |  |  |  |
| --- | --- | --- | --- |
| field name | VOLTAGE | | |
| loading data description | | | |
| Content | | field name | Description |
| version | | --version | "1.0.1.1" |
| unit | | powerdelay | delay power off when power valtage is abnormal , unit is second |
| valtage root | |  | The below name is corresponding to each type of control type  lalarm—low voltage  halarm—high voltage  for more detail, please refer to the configuration parameter |

|  |  |  |
| --- | --- | --- |
|  | | |
| Content | field name | Description |
| enable | enable | 0--OFF 1--ON |
|  | limit | The threshold |
|  | delay | alarm delay duration, unit: second |
| record | record | 0--OFF 1--ON |
|  | holdtime | Duration of state protection, unit: second |
| linkage | linkage | bit0—alarm output 1  bit1-- alarm output 2  bit2—buzzer  bit3—snapshot  bit4—request intercom  bit5—center server  bit6--GUI prompt |

Demo：

"VOLTAGE ": {

"--version": "1.0.1.0",

"powerdelay": "0",

"lalarm": {

"enable": "0",

"limit": "110",

"delay": "0",

"record": "1",

"holdtime": "0",

"linkage": "0"

},

"halarm": {

"enable": "0",

"limit": "150",

"delay": "0",

"record": "1",

"holdtime": "0",

"linkage": "0"

}

}

}

## WIFI

|  |  |  |  |
| --- | --- | --- | --- |
| field name | WIFI | | |
| loading data description | | | |
| Content | | field name | Description |
| version | | --version | "1.0.1.1" |
| module open | | isOpen | 0--OFF 1--ON |
| password open | | EncSw | 0--OFF 1--ON |
| authorized mode | | AuthMode | 0—open type 1—share mode  2--WPA 3--WPA-PS |
| encryption | | Encrypt | 0--No 1—WEP  2--TKIP 3--AES |
| Purpose | | Purpose | 0--Station, 1--AP |
| Dhcp | | Dhcp | 1-DHCP, 0—static IP |
| SSID | | SSID | 0~32 byte |
| password | | Pwd | 0~16 byte |
| IP address | | IpAddr | 0~20 byte |
| Subnet masker | | SubNet | 0~20 byte |
| gateway | | GateWay | 0~20 byte |

Demo：

{

"WIFI": {

"--version": "1.0.1.0",

"isOpen": "0",

"EncSw": "1",

"AuthMode": "3",

"Encrypt": "2",

"Purpose": "0",

"Dhcp": "1",

"SSID": "howen",

"Pwd": "123123",

"IpAddr": "192.168.002.202",

"SubNet": "255.255.255.000",

"GateWay": "192.168.002.002"

}

}

## TTX

|  |  |  |  |
| --- | --- | --- | --- |
| Field name | TTX | | |
| loading data description | | | |
| Content | | Field name | Description |
| Version | | --version | "1.0.1.1" |
| Heartbeat | | heartbeat | Heartbeat interval |
| Center Server1 | | gpsinterval1 | Data upload interval, Unit:second |
| Center Server2 | | gpsinterval2 | Data upload interval, Unit:second |

Demo：

{

"TTX": {

"--version": "1.0.1.0",

" heartbeat ": "60",

" gpsinterval1": "15",

" gpsinterval2": "20"

}

}

# Message Matrix

## Public Section

|  |  |  |
| --- | --- | --- |
| function | value | Description |
| heartbeat request | 0x0001 | [refer to the description](#_MDVR_Request) |
| Media data | 0x0011 | [refer to the description](#_Media_Data) |

## MDVR→→Server

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| function | value | description |
| signal link registeration | 0x1001 | [refer to the description](#_Signal_Link_Registration) |
| Media link registeration | 0x1002 | [refer to the description](#_Media_Link_Registration) |
| live viewing respond | 0x1010 | [refer to the description](#_Preview_Response) |
| snapshot screen | 0x1020 | [refer to the description](#_Snapshot_Respond) |
| audio request | 0x1030 | [refer to the description](#_Request_Respond) |
| subscriptiointion respond for location status , | 0x1040 | [refer to the description](#_Subscription_Respond) |
| status data | 0x1041 | [refer to the description](#_Service_Data) |
| subcripe and respond for alarm | 0x1050 | [refer to the description](#_订阅应答_1) |
| alarm data | 0x1051 | [refer to the description](#_业务数据) |
| file search result | 0x1060 | [refer to the description](#_File_Result) |
| Playback request and repond | 0x1070 | [refer to the description](#_Request_Respond/) |
| transparent transmission request and repond | 0x1080 | [refer to the description](#_请求应答_1) |
| file transmission respond | 0x1090 | [refer to the description](#_请求应答_2) |
| report for ftp file transmission | 0x1091 | [refer to the description](#_ftp_transmission_over) |
| parameter configuration | 0x40A0 | [refer to the description](#_请求应答_3) |

## MDVR←←Server

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| function | value | Description |
| signal link respond | 0x4001 | [refer to the description](#_Signal_Link_Registration_1) |
| media link respond | 0x4002 | [refer to the description](#_Media_Link_Registration_1) |
| live view request | 0x4010 | [refer to the description](#_Preview_Request) |
| Forced encoding I frame | 0x4011 | [refer to the description](#_Forced_Coding_I) |
| snapshot request | 0x4020 | [refer to the description](#_Snapshot_Request) |
| audio request | 0x4030 | [refer to the description](#_Audio_Request) |
| subscriptiointion request for position status | 0x4040 | [refer to the description](#_Subscription_Request) |
| alarm subscriptioin and request | 0x4050 | [refer to the description](#_订阅请求_1) |
| file search request | 0x4060 | [refer to the description](#_Query_Request) |
| playback request | 0x4070 | [refer to the description](#_Playback_Request) |
| playback control | 0x4071 | [refer to the description](#_Play_Control) |
| tranparament transmission request | 0x4080 | [refer to the description](#_Transparent_transmission_Request) |
| file transmission request | 0x4090 | [refer to the description](#_Request_to_transmit) |
| ftp file trabmission request | 0x4091 | [refer to the description](#_ftp文件传输) |
| paramenter configuiration request | 0x40A0 | [refer to the description](#_Configration_Request) |
| PTZ control | 0x4100 | [refer to the description](#_PTZ_Control) |
| output manage | 0x4101 | [refer to the description](#_Output_Control) |
| restart | 0x4102 | [refer to the description](#_Restart) |
| upgrade |  | [refer to the description](#_Upgrade) |
| factory defual setting | 0x4103 | [refer to the description](#_Factory_Default_Setting) |
| synchronization time | 0x4104 | [refer to the description](#_Synchronization_time) |
| record manager | 0x4105 | [refer to the description](#_Recording_Control) |
| clear alarm | 0x4106 | [refer to the description](#_Clear_Alarm) |
| vehicle manager | 0x4107 | [refer to the description](#_Vehicle_Control) |