



ICP V8

Inosat Communication Protocol

(Revision 1.14)

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DOCUMENT ORIGIN

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CHANGE TRACK

VERSION	DATE	CHANGES
1.1	26-11-2014	Examples and Flowchart diagram included. New Get commands for Accelerometer, DriverKey, Analog 1 and 2 configurations.
1.2	12-12-2014	SET UNIT CONFIG (0x24) command: <ul style="list-style-type: none"> "Maximum speed" format changed; "Immobilization speed" format changed; SET GPRS CONFIG" (0x26) command: <ul style="list-style-type: none"> Byte offset changed; UNIT CONFIG (0x21) command: <ul style="list-style-type: none"> Byte offset changed; GPRS CONFIG" (0x22) command: <ul style="list-style-type: none"> Byte offset changed; UNIT LOCATION (0x24) command: <ul style="list-style-type: none"> Added GPS Antenna Status.
1.3	24-12-2014	New commands for Xpert and Impact configurations. Navigator synchronization and get the firmware version. <ul style="list-style-type: none"> ERASE XPERT EEPROM (0x2E); SET VEHICLE AND DRIVING CONFIG (0x2F); GET VEHICLE AND DRIVING CONFIG (0x30); SET IMPACT CONFIG (0x36); GET IMPACT CONFIG (0x37); SET_OUTPUT2 (0x38); NAVIGATOR SYNC REQUEST (0x39); GET FIRMWARE AND HARDWARE(0x40); GENERIC DATA (0x23); XPERT EEPROM ERASE (0x25); VEHICLE AND DRIVING CONFIG (0x26); IMPACT CONFIG (0x2D); OUTPUT2 (0x2E); FIRMWARE AND HARDWARE (0x2F). Added the field description of Xpert Generic Data.
1.4	08-04-2015	Document page number corrected
1.5	07-07-2015	Added the Tachograph ID in Vehicle and Driving configurations.
1.6	14-07-2015	Correction of the SMS algorithm (coding/decoding commands).
1.7	23-09-2015	Update Ignition type configuration field value.
1.8	29-09-2015	Correction of Ignition type configuration field value.

1.9	22-10-2015	<p>Added field description of EBS messages; Added the following messages:</p> <ul style="list-style-type: none"> • SET COM PORT CONFIG (0x48); • GET COM PORT CONFIG (0x49); • SET CARRIER DIGITAL PORTS CONFIG (0x4A); • GET CARRIER DIGITAL PORTS CONFIG (0x4B); • COM PORT CONFIGS (0x35) • CARRIER DIGITAL PORTS CONFIG (0x36)
1.10	12-01-2016	<p>Added the following messages:</p> <ul style="list-style-type: none"> • SERVER TO GARMIN NAV MSG (0x4C); • GARMIN NAV TO SERVER MSG (0x37)
1.11	11-02-2016	<p>Changed the following messages:</p> <ul style="list-style-type: none"> • SERVER TO GARMIN NAV MSG (0x4E); • GARMIN NAV TO SERVER MSG (0x3A)
1.12	15-07-2016	<p>Added the following messages:</p> <ul style="list-style-type: none"> • SET 24HRESET CONFIG (0x3A) • GET 24HRESET CONFIG (0x3B) • SET DISTANCE TRAVELLED CONFIG (0x3F) • SET HEADING CONFIG (0x41) • GET HEADING CONFIG (0x42) • GET DISTANCE TRAVELLED CONFIG (0x4F) • HEADING CONFIG (0x30) • UNIT LOCATION MESSAGE INCRT DISTANCE (0x38) • UNIT LOCATION MESSAGE TOTAL DISTANCE (0x39) • 24H RESET CONFIG (0x3B) • DISTANCE TRAVELLED CONFIG (0x41)
1.13	27-10-2016	<p>Added the following messages:</p> <ul style="list-style-type: none"> • SET FLEXIBLE COM PORT CONFIG (0x58); • GET FLEXIBLE COM PORT CONFIG (0x59); • FLEXIBLE COM PORT CONFIG (0x44); • XPRT GENERIC DATA V2 (0x42)
1.14	09-02-2017	<p>Added the following commands:</p> <ul style="list-style-type: none"> • SET GENERIC DATA VERSION CONFIG (0x5C); • GET GENERIC DATA VERSION CONFIG (0x5D);

1 Protocol overview

Inosat’s location unit communicates with a remote server using a proprietary open protocol (Version: 0x0A).

1.1 GPRS Protocol command structure

The location packet sent from the server to the location unit looks as follows:



- Every command starts with 2 synchronization bytes: [0x0F] [0x0F].
- A 1-byte Protocol Version Field follows, defining the format of the used protocol.
- The Unit Command.
- A 16-bit little endian CRC-CCITT (XModem) checksum.
- Every packet ends with 1 byte: [0x04].
- The Protocol Version, Unit Command and Checksum fields are encoded with a byte stuffing algorithm described below.

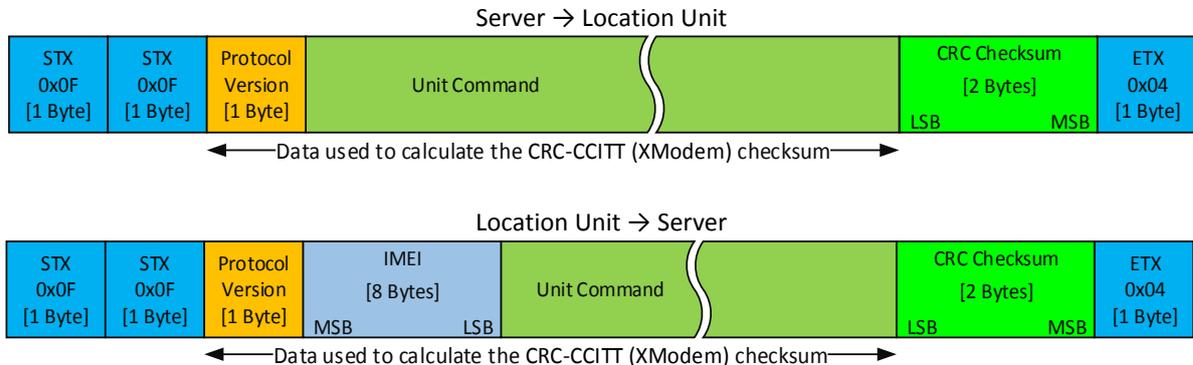
A basic unit location packet sent from the location unit to the server looks as follows:



- Every command starts with 2 synchronization bytes: [0x0F] [0x0F].
- A 1-byte Protocol Version Field follows, defining the format of the used protocol.
- The location unit IMEI unique identification number, BCD coded into 8 bytes.
- The Unit Command.
- A 16-bit little endian CRC-CCITT (XModem) checksum.
- Every packet ends with 1 byte: [0x04].
- The Protocol Version, Unit Command and Checksum fields are encoded with a byte stuffing algorithm described below.

1.1.1 Checksum

The CRC-CCITT (XModem) checksum is calculated based on all packet data bytes excluding the synchronization, end and checksum fields. The calculated checksum is placed at the end of the Unit Command.



The checksum calculation can be implemented as follows:

```
static const unsigned short crc16tab[256]= {
    0x0000,0x1021,0x2042,0x3063,0x4084,0x50a5,0x60c6,0x70e7,
    0x8108,0x9129,0xa14a,0xb16b,0xc18c,0xd1ad,0xe1ce,0xf1ef,
    0x1231,0x0210,0x3273,0x2252,0x52b5,0x4294,0x72f7,0x62d6,
    0x9339,0x8318,0xb37b,0xa35a,0xd3bd,0xc39c,0xf3ff,0xe3de,
    0x2462,0x3443,0x0420,0x1401,0x64e6,0x74c7,0x44a4,0x5485,
    0xa56a,0xb54b,0x8528,0x9509,0xe5ee,0xf5cf,0xc5ac,0xd58d,
    0x3653,0x2672,0x1611,0x0630,0x76d7,0x66f6,0x5695,0x46b4,
    0xb75b,0xa77a,0x9719,0x8738,0xf7df,0xe7fe,0xd79d,0xc7bc,
    0x48c4,0x58e5,0x6886,0x78a7,0x0840,0x1861,0x2802,0x3823,
    0xc9cc,0xd9ed,0xe98e,0xf9af,0x8948,0x9969,0xa90a,0xb92b,
    0x5af5,0x4ad4,0x7ab7,0x6a96,0x1a71,0x0a50,0x3a33,0x2a12,
    0xdbfd,0xcbdc,0xfbbf,0xeb9e,0x9b79,0x8b58,0xbb3b,0xab1a,
    0x6ca6,0x7c87,0x4ce4,0x5cc5,0x2c22,0x3c03,0x0c60,0x1c41,
    0xedae,0xfdf,0xcdec,0xddcd,0xad2a,0xbd0b,0x8d68,0x9d49,
    0x7e97,0x6eb6,0x5ed5,0x4ef4,0x3e13,0x2e32,0x1e51,0x0e70,
    0xff9f,0xefbe,0xdfdd,0xcffc,0xbf1b,0xaf3a,0x9f59,0x8f78,
    0x9188,0x81a9,0xb1ca,0xa1eb,0xd10c,0xc12d,0xf14e,0xe16f,
    0x1080,0x00a1,0x30c2,0x20e3,0x5004,0x4025,0x7046,0x6067,
    0x83b9,0x9398,0xa3fb,0xb3da,0xc33d,0xd31c,0xe37f,0xf35e,
    0x02b1,0x1290,0x22f3,0x32d2,0x4235,0x5214,0x6277,0x7256,
    0xb5ea,0xa5cb,0x95a8,0x8589,0xf56e,0xe54f,0xd52c,0xc50d,
    0x34e2,0x24c3,0x14a0,0x0481,0x7466,0x6447,0x5424,0x4405,
    0xa7db,0xb7fa,0x8799,0x97b8,0xe75f,0xf77e,0xc71d,0xd73c,
    0x26d3,0x36f2,0x0691,0x16b0,0x6657,0x7676,0x4615,0x5634,
    0xd94c,0xc96d,0xf90e,0xe92f,0x99c8,0x89e9,0xb98a,0xa9ab,
    0x5844,0x4865,0x7806,0x6827,0x18c0,0x08e1,0x3882,0x28a3,
    0xcb7d,0xdb5c,0xeb3f,0xfb1e,0x8bf9,0x9bd8,0xabbb,0xbb9a,
    0x4a75,0x5a54,0x6a37,0x7a16,0x0af1,0x1ad0,0x2ab3,0x3a92,
    0xfd2e,0xed0f,0xdd6c,0xcd4d,0xbdaa,0xad8b,0x9de8,0x8dc9,
    0x7c26,0x6c07,0x5c64,0x4c45,0x3ca2,0x2c83,0x1ce0,0x0cc1,
    0xef1f,0xff3e,0xcf5d,0xdf7c,0xaf9b,0xbfba,0x8fd9,0x9ff8,
    0x6e17,0x7e36,0x4e55,0x5e74,0x2e93,0x3eb2,0x0ed1,0x1ef0
};

unsigned short crc16_ccitt(const void *buf, int len)
{
    int counter;
    unsigned short crc = 0;
    for(counter = 0; counter < len; counter++)
        crc = (crc<<8) ^ crc16tab[((crc>>8) ^ *(char *)buf++)&0xFF];
    return crc;
}
```

1.1.2 Byte stuffing and framing

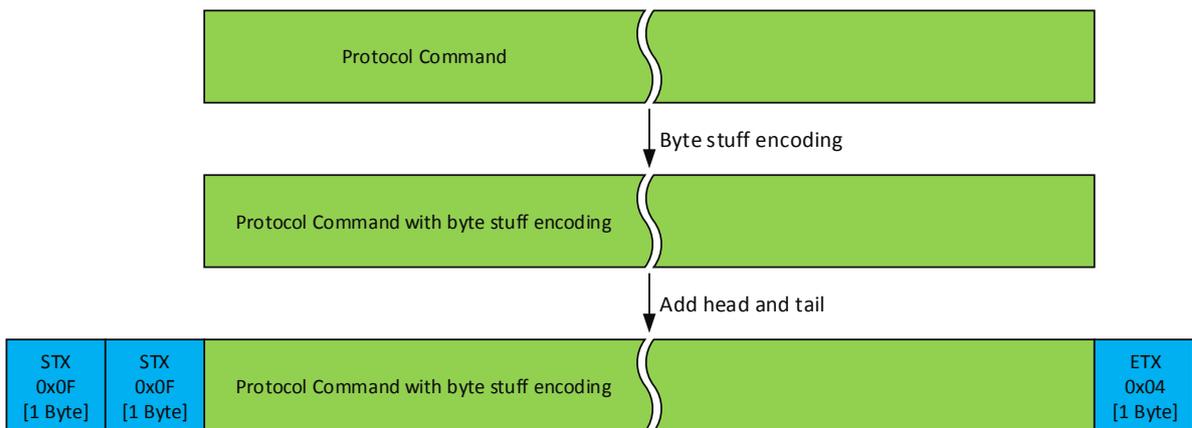
For a more reliable packet transmission, all protocol commands are packed into frames containing special synchronization and end data bytes.

To ensure an efficient, reliable, and unambiguous encoding within the GPRS packet framing regardless of the protocol command contents, a byte stuffing algorithm is used.

1.1.2.1 Byte stuffing and frame encoding

Byte stuff encoding consists of adding a DLE (0x05) byte before every protocol command byte containing STX (0x0F), ETX (0x04), or DLE (0x05).

After the byte stuff algorithm is applied to the protocol command, an enclosing command frame can be built by adding two STX (0x0F) bytes before and an ETX (0x04) after the byte stuffed protocol command.



The byte stuffing algorithm can be implemented as follows:

- BufferIn [n] contains data bytes without byte stuffing.
- BufferOut will hold the data with byte stuff applied and the synchronization and end chars.
- BufferOutLength will hold the output buffer length.

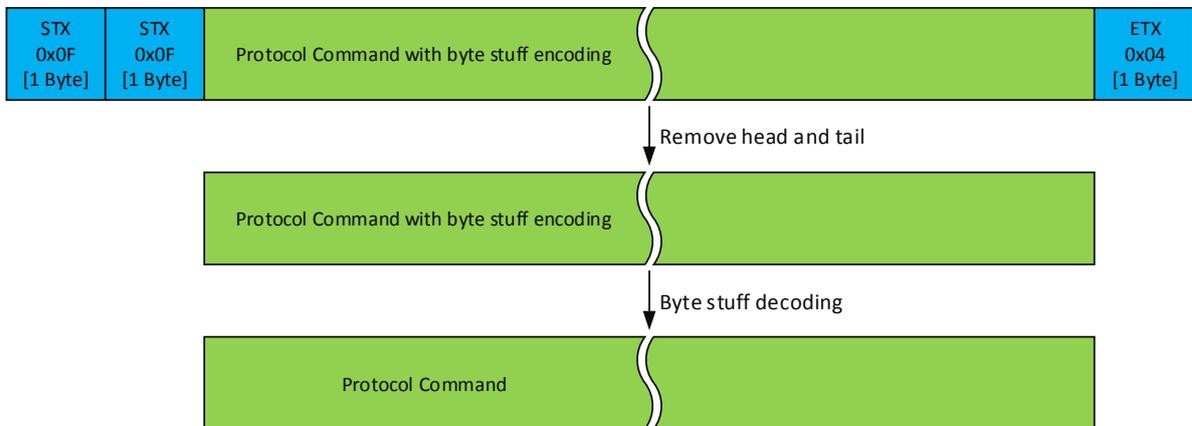
```
#define STX 0x0F           // Start of Transmission
#define ETX 0x04         // End of Transmission
#define DLE 0x05         // Data link escape

BufferOutLength = 0;
BufferOut [BufferOutLength++] = STX;    // Synchronization bytes
BufferOut [BufferOutLength++] = STX;

for (i = 0; i < n; i++)
{
    if ((BufferIn [i] == STX) || (BufferIn [i] == ETX) || (BufferIn [i] == DLE))
    {
        BufferOut [BufferOutLength++] = DLE;
    }
    BufferOut [BufferOutLength++] = BufferIn [i];
}
BufferOut [BufferOutLength++] = ETX;    // End byte
```

1.1.2.2 Frame decoding and byte stuffing removal

Encoded commands received by the server can be decoded by removing the synchronization (STX) and end (ETX) bytes, and removing the byte stuff from the encoded command.



The byte stuffing removal algorithm can be implemented as follows:

- BufferIn [N] contains incoming encoded commands.
- BufferOut will hold the decoded protocol command.
- BufferOutLength will hold the decoded protocol command length.

```

#define STX 0x0F           // Start of Transmission
#define ETX 0x04           // End of Transmission
#define DLE 0x05           // Data link escape

bEscape = FALSE;
bStart  = FALSE;
length  = 0;

for (i=0; i<n; i++) {
    if ((BufferIn[i] != STX) && (BufferIn[i] != ETX) && (BufferIn[i] != DLE)) {
        BufferOut[length++] = BufferIn[i];
        bEscape = FALSE;
        bStart = FALSE;
        continue;
    }

    if (bEscape) {
        BufferOut[length++] = BufferIn[i];
        bEscape = FALSE;
        bStart = FALSE;
        continue;
    }

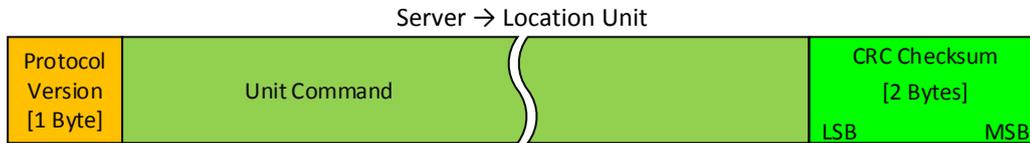
    if (BufferIn[i] == STX) {
        if (bStart) length = 0;
        bStart = !bStart;
    } else if (BufferIn[i] == DLE) {
        bEscape = TRUE;
        bStart = FALSE;
    } else {
        BufferOutLength = length;
        bEscape = FALSE;
        bStart = FALSE;
        length = 0;
        break;
    }
}

```

1.2 SMS Protocol command structure

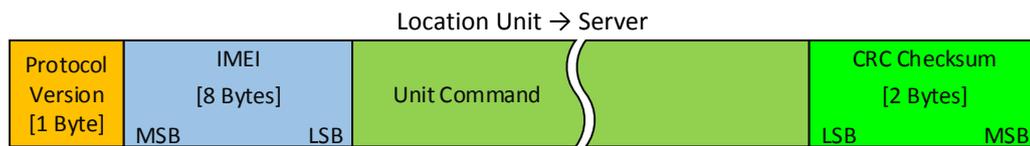
SMS services allow 160 seven-bit character messages (GSM 03.38) to be exchanged between the location unit and server. Due to the limited character set and to ensure the efficient usage of each message, all protocol commands are encoded to ensure full usage of the six-bit character set.

A basic unit location SMS sent from the server to the location unit looks as follows:



- A 1-byte Protocol Version Field follows, defining the format of the used protocol.
- The Unit Command.
- A 16-bit little endian CRC-CCITT (XModem) checksum.
- The Protocol Version, Unit Command and Checksum fields are encoded to comply with GSM 03.38 standard character set using an algorithm described below.

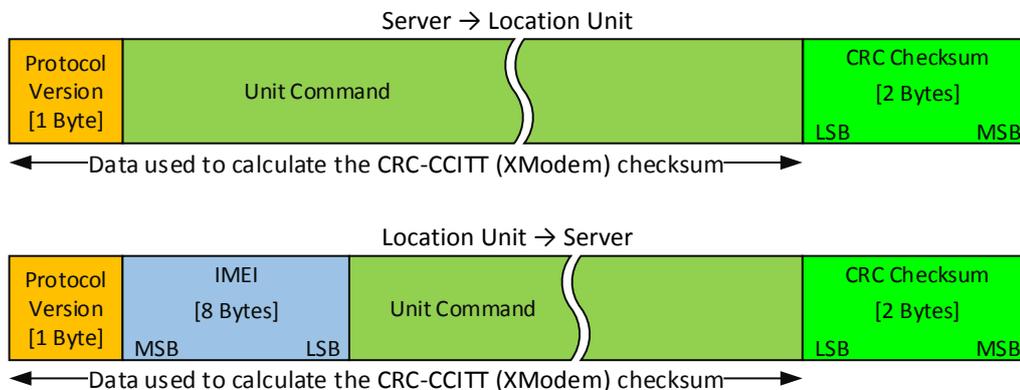
A basic unit location packet sent from the location unit to the server looks as follows:



- A 1-byte Protocol Version Field follows, defining the format of the used protocol.
- The location unit IMEI unique identification number, BCD coded into 8 bytes.
- The Unit Command.
- A 16-bit little endian CRC-CCITT (XModem) checksum.
- The Protocol Version, Unit Command and Checksum fields are encoded to comply with GSM 03.38 standard character set using an algorithm described below.

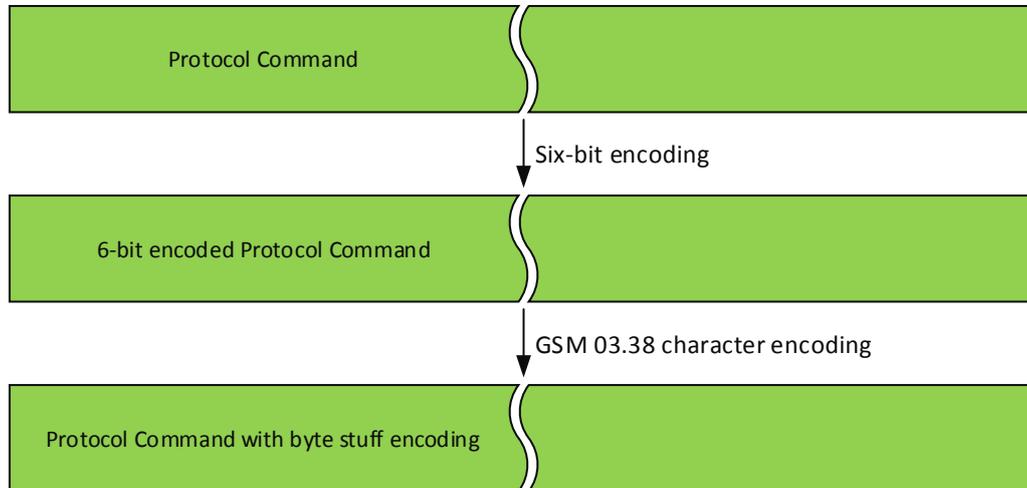
1.2.1 Checksum

The CRC-16 checksum is calculated based on all command data bytes excluding the checksum field. The calculated checksum is placed at the end of the Unit Command.



1.2.2 Commands sent by the server

Before sending a SMS to the location unit, the server must encode the command according to GSM 03.38 standard character set. The protocol command is firstly divided into 6-bit coded data bytes and then encoded to GSM 03.38 standard character set.



The algorithm works as follows:

- BufferIn contains incoming protocol command.
- BufferInLength contains protocol command length.
- BufferOut will hold the GSM 03.38 encoded protocol command.
- BufferOutLength will hold the GSM 03.38 encoded protocol command length.

```
LengthTemp = 0;
```

```
// 6-bit command encoding
for (i = 0; i < BufferInLength; i++) {
    BufferTemp [LengthTemp++] = (BufferIn [i] / 16);
    BufferTemp [LengthTemp++] = (BufferIn [i] & 0x0F);
}

```

```
k = 0;
for (i = 0; i < LengthTemp; i++) {
    b = BufferTemp [i++] * 16;
    if (i >= LengthTemp) c = 0;
    else c = BufferTemp [i];

    c = (((c & 0x0f) + b) / 4) + '0';
    if (c > 0x3f) c++;
    if (c > 0x5a) c += 0x06;
    *(BufferOut + k++) = c;
}

```

```
if (i >= LengthTemp) break;
b = BufferTemp [i++] * 16;
if (i >= LengthTemp) c = 0;
else c = BufferTemp [i];

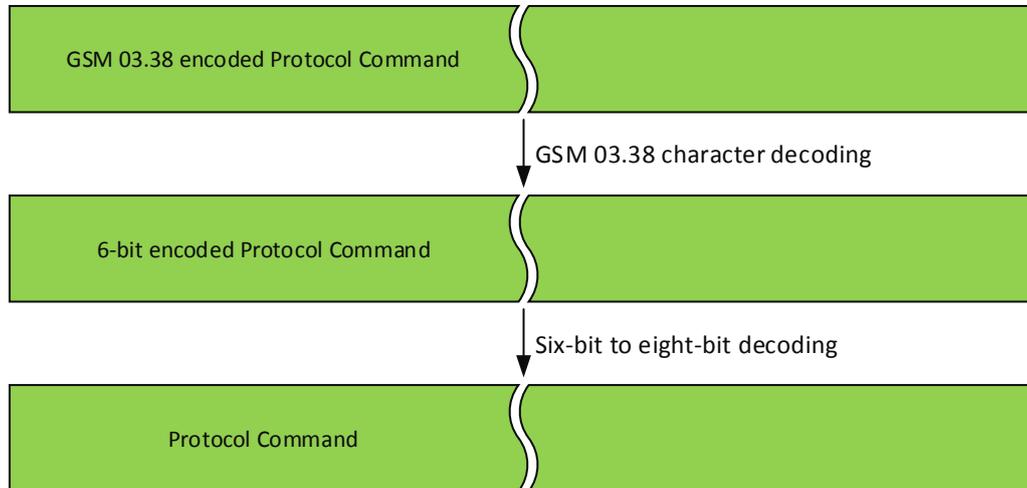
// GSM 03.38 encoding
c = (((c & 0x0f) + b) & 0x3f) + '0';
if (c > 0x3f) c++;
if (c > 0x5a) c += 0x06;
*(BufferOut + k++) = c;
}

```

```
BufferOutLength = k;
```

1.2.3 Commands received by the server

Once the server receives an encoded SMS from the location unit, it must decode it into protocol commands. The encoded SMS is firstly translated from GSM 03.38 standard character set to 6-bit coded data bytes and then decoded to 8-bit data bytes.



The algorithm works as follows:

- BufferIn contains incoming encoded commands.
- BufferInLength contains encoded command length.
- BufferOut will hold the decoded protocol command.
- BufferOutLength will hold the decoded protocol command length.

```

// GSM 03.38 decoding
for (i = 0; i < BufferInLength; i++) {
    c = *(BufferIn + i);
    if (c > 0x5a) c -= 0x06;
    if (c > 0x3f) c--;
    BufferTemp1 [i] = c - '0';
}

j = 0;
// 6-bit to 8-bit command decoding
for (i = 0; i < BufferInLength; i++) {
    BufferTemp2 [j++] = BufferTemp1 [i] / 4;
    if (++i >= BufferInLength) break;
    BufferTemp2 [j++] = ((BufferTemp1 [i - 1] * 4) | (BufferTemp1 [i] / 16)) & 0x0f;
    BufferTemp2 [j++] = BufferTemp1 [i] & 0x0f;
}

for (i = 0; i < j; i += 2) {
    *BufferOut++ = (BufferTemp2 [i] << 4) + (BufferTemp2 [i + 1]);
}

BufferOutLength = j / 2;
  
```

2 Unit Command Types

Types are groups of commands related to each other. The following table shows the short names, description and Type definitions.

2.1 Sent by the server

Name	Type	Description
RESET	0x20	Reboots the location unit. Can also erase all recorded route locations.
GET LOCATION	0x21	Requests the most recent location.
GET ROUTE	0x22	Extracts all recorded locations.
ROUTE EXTRACTION ACK	0x23	Acknowledges the successful reception of the route.
SET UNIT CONFIG	0x24	Configures the general settings of the location unit.
GET UNIT CONFIG	0x25	Gets the current general unit configuration.
SET GPRS CONFIG	0x26	Configures the location unit GPRS settings.
GET GPRS CONFIG	0x27	Gets the location unit current GPRS settings.
SET OUTPUT1	0x28	Sets the state of digital output 1.
SET ACCEL CONFIG	0x29	Configures the unit's accelerometer.
SET DRIVERKEY RING CONFIG	0x2A	Configures the Driverkey ring.
SET I'M ALIVE CONFIG	0x2B	Configures the "I'm alive" feature.
SET ANALOG1 CONFIG	0x2C	Configures the Analog 1 input.
SET ANALOG2 CONFIG	0x2D	Configures the Analog 2 input.
ERASE XPERT EEPROM	0x2E	Deletes data from Inoxpert's EEPROM memory.
SET VEHICLE AND DRIVING CONFIG	0x2F	Configures Inoxpert's vehicle and driving settings.
GET VEHICLE AND DRIVING CONFIG	0x30	Gets the vehicle and driving configuration.
GET ACCEL CONFIG	0x31	Gets the accelerometer configuration.
GET DRIVERKEY RING CONFIG	0x32	Gets the Driver key ring configuration.
GET IM ALIVE CONFIG	0x33	Gets the "I'm alive" configuration.
GET ANALOG1 CONFIG	0x34	Gets the Analog 1 input configuration.
GET ANALOG2 CONFIG	0x35	Gets the Analog 2 input configuration.
SET IMPACT CONFIG	0x36	Configures the impact sensor.
GET IMPACT CONFIG	0x37	Gets the impact configuration.
SET OUTPUT2	0x38	Sets the state of digital output 2.
NAVIGATOR SYNC REQUEST	0x39	Navigator synchronization request.
SET 24HRESET CONFIG	0x3A	Configures the 24 hours reset.
GET 24HRESET CONFIG	0x3B	Gets the 24 hours reset configuration.
SET DISTANCE TRAVELLED CONFIG	0x3F	Configures the "distance travelled" feature.
GET FIRMWARE AND HARDWARE	0x40	Gets the firmware and hardware version.
SET HEADING CONFIG	0x41	Configures the "heading" feature.
GET HEADING CONFIG	0x42	Gets the "heading" configuration.
SET CARRIER DIGITAL PORTS CONFIG	0x4A	Configures the CARRIER digital ports.
GET CARRIER DIGITAL PORTS CONFIG	0x4B	Gets the CARRIER digital ports configuration.
SERVER TO GARMIN NAV MSG	0x4E	Send message to GARMIN NAV.
GET DISTANCE TRAVELLED CONFIG	0x4F	Gets the "distance travelled" configuration.
SET FLEXIBLE COM PORTS CONFIG	0x58	Sets the flexible communication ports functions.
GET FLEXIBLE COM PORTS CONFIG	0x59	Gets the flexible communication ports functions.
SET GENERIC DATA VERSION CONFIG	0x5C	Sets the generic data version configuration.
GET GENERIC DATA VERSION CONFIG	0x5D	Gets the generic data version configuration

2.2 Received by the server

Name	Type	Description
ROUTE EXTRATION END	0x20	Signals the end of a route extraction.
UNIT CONFIG	0x21	Returns the location unit general configuration.
GPRS CONFIG	0x22	Returns the location unit GPRS configuration.
XPRT GENERIC DATA	0x23	Sends Xpert generic data to the server.
UNIT LOCATION	0x24	Returns the unit location.
XPRT EEPROM ERASE	0x25	Returns the EEPROM erase result sent by Xpert.
VEHICLE AND DRIVING CONFIG	0x26	Returns the vehicle and driving configuration.
ACCEL CONFIG	0x27	Returns the accelerometer configuration.
DRIVERKEY RING CONFIG	0x28	Returns the Driver Key configuration.
IM ALIVE CONFIG	0x29	Returns the “I’m alive” configuration.
ANALOG1 CONFIG	0x2A	Returns the Analog 1 configuration.
ANALOG2 CONFIG	0x2B	Returns the Analog 2 configuration.
OUTPUT 1 STATE	0x2C	Returns the state of digital output 1.
IMPACT CONFIG	0x2D	Returns the impact configuration.
OUTPUT 2 STATE	0x2E	Returns the state of digital output 2.
FIRMWARE AND HARDWARE	0x2F	Returns the firmware and hardware version.
HEADING CONFIG	0x30	Returns the “heading” configuration.
CARRIER DIGITAL PORTS CONFIG	0x36	Returns the COM port configuration.
UNIT LOCATION MESSAGE INCR DISTANCE	0x38	Returns the unit location with the incremental distance.
UNIT LOCATION MESSAGE TOTAL DISTANCE	0x39	Returns the unit location with the total distance travelled.
GARMIN NAV TO SERVER MSG	0x3A	Send message to Server.
24H RESET CONFIG	0x3B	Returns the 24 hours reset configuration.
DISTANCE TRAVELLED CONFIG	0x41	Returns the “distance travelled” configuration.
XPRT GENERIC DATA V2	0x42	Sends Xpert generic data version 2 to the server.
FLEXIBLE COM PORTS CONFIG	0x44	Returns the FLEXIBLE COM port configuration.
GENERIC DATA VERSION CONFIG	0x5B	Returns the generic data version configuration.

Remark: All remaining command types are reserved for future use.

3 Unit Command Description

3.1 Server to Location unit

RESET (0x20)

Command		RESET			
Description		Reboots the location unit.			
Type		Server → Location Unit			
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x20	TYPE	-	Command type
1	1 Byte	-	ROUTE ERASE	-	Execute a route erase: 0 Don't erase route 1 Erase route

GET LOCATION (0x21)

Command		GET LOCATION			
Description		Requests the most recent unit location.			
Type		Server → Location Unit			
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x21	TYPE	-	Command type

GET ROUTE (0x22)

Command		GET ROUTE			
Description		Extracts all recorded locations.			
Type		Server → Location Unit			
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x22	TYPE	-	Command type

ROUTE EXTRACTION ACK (0x23)

Command	ROUTE EXTRACTION ACK				
Description	Acknowledges the successful reception of the route.				
Type	Server → Location Unit				
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x23	TYPE	-	Command type
1	1 Byte	-	GPRS DATA AVAILABLE	-	The server has data to be sent to the location unit, by GPRS: 0 There's no data available 1 There's data available
2	1 Byte	-	ERROR	-	Route extraction result: 0 Successful route extraction 1 Route extraction error occurred

SET UNIT CONFIG (0x24)

Command	SET UNIT CONFIG				
Description	Configures the general settings of the location unit.				
Type	Server → Location Unit				
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x24	TYPE	-	Command type
1	1 Byte	-	VEHICLE TYPE	-	Sets the vehicle type where the unit is installed. The following vehicle types can be selected: 0 Light vehicle 1 Heavy vehicle 2 Machine Note: Only one option must be selected to determine the contents value.
2	1 Byte	-	IMMOBILIZATION TYPE	-	Immobilization type used by the location unit: 0 Normal 1 Ignition block by driver key absence 2 Immobilization if the GPS is valid and current speed is less immobilization speed 3 Immobilization if the GPS is valid and current speed is less immobilization speed or ignition is OFF. 4 Forced immobilization. Any speed and GPS status. Note: Only one option must be selected to determine the contents value.
3	1 Byte	-	IGNITION TYPE	-	Ignition type used by the location unit: 0 Standard (IGN true if 12V or 24V are present in unit Ignition wire input) 1 reserved – do not use 2 Xpert RPM (IGN is true if RPM > 0) 3 Virtual Ignition (Combination between external power supply and movement) 4 Movement sensor (IGN true if movement is detected)

					<p>Note1: Only one option must be selected to determine the contents value.</p> <p>Note2: For option 2, Xpert Vehicle type must be correctly configured. See msg 0x2F type.</p> <p>Note 3: For option 3, external power supply must be present.</p>
4	1 Byte	-	UDP TO TCP TIMEOUT	Min	<p>Timeout (1 to 255 minutes) to switch from UDP to TCP when no route is sent through UDP protocol.</p> <p>If set to zero, no protocol switch will occur.</p>
5	1 Byte	-	TCP TO UDP TIMEOUT	Min	<p>Timeout (1 to 255 minutes) to switch from TCP back to UDP.</p> <p>If set to zero, no timeout based protocol switch will occur. In this situation, the protocol switch will occur during the following GPRS reconnection.</p>
6	2 Bytes	-	LOW POWER TIMEOUT	Min	Timeout (0 to 65535 minutes) before the location unit enters a power saving mode.
8	2 Bytes	-	MAXIMUM SPEED	Km/h	Maximum speed (0 to 999 Km/h).
10	1 Byte	-	IMMOBILIZATION SPEED	Km/h	Immobilization speed (0 to 99 Km/h).
11	2 Bytes	-	ROUTE RECORDING NATIONAL TIMER	Sec	Periodicity (0 to 65535 seconds) of route location recording while the unit is registered in a national network.
13	2 Bytes	-	ROUTE RECORDING ROAMING TIMER	Sec	Periodicity (0 to 65535 seconds) of route location recording while the unit is registered in a roaming network.
15	2 Bytes	-	ROUTE RECORDING OVERSPEED TIMER	Sec	Periodicity (0 to 65535 seconds) of route location recording, while the vehicle is over the maximum speed.
17	2 Bytes	-	GPRS SENDING NATIONAL TIMER	Sec	Periodicity (0 to 65535 seconds) of route location sending while the unit is registered in a national network.
19	2 Bytes	-	GPRS SENDING ROAMING TIMER	Sec	Periodicity (0 to 65535 seconds) of route location sending while the unit is registered in a roaming network.
21	2 Bytes	-	GPS RESET TIMEOUT	Sec	GPS module reset timeout (0 to 65535 seconds) when there's no GPS signal while the ignition is on.
23	1 Byte	-	GENERAL CONFIGURATION FLAGS	-	<p>General configuration setting flags as bellow:</p> <ol style="list-style-type: none"> 1 ROUTE COMPRESSION - Route location recording when the ignition is on. 2 RECORD POWER SOURCE CHANGE EVENTS - Unit records a location when the power is switched off. 4 RECORD ENCLOSURE OPENING EVENTS - Unit records a location when the enclosure is opened. 8 RECORD HEADING CHANGE EVENTS - Unit records a location when the heading changes. 16 RECORD TEMPERATURE CHANGE EVENTS - Unit records a location when a temperature change event occurs. 32 SPEED LIMIT BUZZER ALARM – Play a buzzer sound when the speed limit is exceeded. 64 HARSH BUZZER ALARM – Play a buzzer sound when any harsh alarm is triggered. <p>Note: All required settings shall be added to determine the final value.</p>
24	2 Bytes	-	DIGITAL PORT RECORDING TRIGGER	-	<p>Digital ports location recording trigger :</p> <p>DIGITAL PORT 1:</p> <ol style="list-style-type: none"> 0 Doesn't record locations by port change 1 Records a location when port changes from 0 to 1 2 Records a location when port changes from 1 to 0 3 Records a location in any port change. <p>DIGITAL PORT 2:</p> <ol style="list-style-type: none"> 0 Doesn't record locations by port change 4 Records a location when port changes from 0 to 1 8 Records a location when port changes from 1 to 0 12 Records a location in any port change. <p>DIGITAL PORT 3:</p>

					0 Doesn't record locations by port change 16 Records a location when port changes from 0 to 1 32 Records a location when port changes from 1 to 0 48 Records a location in any port change. DIGITAL PORT 4: 0 Doesn't record locations by port change 64 Records a location when port changes from 0 to 1 128 Records a location when port changes from 1 to 0 192 Records a location in any port change. DIGITAL PORT 5: 0 Doesn't record locations by port change 256 Records a location when port changes from 0 to 1 512 Records a location when port changes from 1 to 0 768 Records a location in any port change. Note: All required settings shall be added to determine the final value.
26	1 Byte	-	GPRS RECONNECT TIMEOUT	Min	Timeout (0 to 255 minutes) required to establish a new GPRS connection after the previous connection has been lost.
27	1 Byte	-	GPRS REOPEN SOCKET TIMEOUT	Min	Timeout (0 to 255 minutes) required to open a socket again.
28	1 Byte	-	GPRS RECLOSE SOCKET TIMEOUT	Sec	Timeout (0 to 255 seconds) required to close a socket.

GET UNIT CONFIG (0x25)

Command	GET UNIT CONFIG				
Description	Gets the current general unit configuration.				
Type	Server → Location Unit				
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x25	TYPE	-	Command type

SET GPRS CONFIG (0x26)

Command	SET GPRS CONFIG				
Description	Configures the location unit GPRS settings.				
Type	Server → Location Unit				
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x26	TYPE	-	Command type
1	1 Byte	-	GPRS CONFIGURATION	-	Sets the type of GPRS communications allowed: 1 GPRS NATIONAL - Allows GPRS registration when the GSM is registered in a national network. 2 GPRS ROAMING - Allows GPRS registration when the GSM is registered in a roaming network. 4 UDP ENABLE - Allows the route to be sent by UDP protocol. 8 SOCKET ALWAYS OPEN - When set to '0', allows to have the socket always open Note: All required settings shall be added to determine the final value.

2	31 Bytes	-	GPRS SERVER ADDRESS	-	Null terminated string containing the server address required during a GPRS connection.
*	2 Bytes	-	GPRS SERVER PORT	-	TCP/IP port (1 to 65535) used with GPRS sockets.
*	31 Bytes	-	GPRS ACCESS POINT	-	Null terminated string containing the GPRS APN access point used for GPRS connections.
*	31 Bytes	-	GPRS USERNAME	-	Null terminated string containing the username required during GPRS connection.
*	24 Bytes	-	GPRS PASSWORD	-	Null terminated string containing the password required during GPRS connection.

* Dynamic Offset

GET GPRS CONFIG (0x27)

Command		GET GPRS CONFIG			
Description		Gets the location unit current GPRS settings.			
Type		Server → Location Unit			
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x27	TYPE	-	Command type

SET OUTPUT 1 (0x28)

Command		SET OUTPUT 1			
Description		Sets the state of digital output 1.			
Type		Server → Location Unit			
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x28	TYPE	-	Command type
1	1 Byte	-	SET OUTPUT 1	-	Sets the state of the digital output 1: 1 - Digital output port 1 on 0 - Digital output port 1 off

SET ACCEL CONFIG (0x29)

Command		SET ACCEL CONFIG			
Description		Configures the unit's accelerometer.			
Type		Server → Location Unit			
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x29	TYPE	-	Command type
1	1 Byte	-	ACCELEROMETER FRONT FACE	-	Setting used to adjust the location unit hardware position related to the front of the vehicle.
2	1 Byte	-	HARSH ALARMS	-	Enable or disable harsh alarms: 1 HARSH BRAKING ALARM – Enables the alarm trigger in the event of a harsh braking. 2 HARSH ACCELERATION ALARM - Enables the alarm trigger in the event of a harsh acceleration.

					4 HARSH TURN ALARM - Enables the alarm trigger in the event of a harsh cornering. Note: Add all required settings to determine the final value. All excluded alarms will be disabled.
3	2 Bytes	-	HARSH BREAK THRESHOLD LEVEL	0.01 m/s ²	Configures the harsh breaking threshold level.
5	2 Bytes	-	HARSH ACCELERATION THRESHOLD LEVEL	0.01 m/s ²	Configures the harsh acceleration threshold level.
7	2 Bytes	-	HARSH TURN THRESHOLD LEVEL	0.01 m/s ²	Configures the harsh turn threshold level.

SET DRIVERKEY RING CONFIG (0x2A)

Command	SET DRIVERKEY RING CONFIG				
Description	Configures the Driverkey ring.				
Type	Server → Location Unit				
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x2A	TYPE	-	Command type
1	1 Byte	-	TIME ON	Sec	Number of seconds (0 to 255) the buzzer is on, while it's ringing.
2	1 Byte	-	TIME OFF	Sec	Number of seconds (0 to 255) the buzzer is off, while it's ringing.

SET I'M ALIVE CONFIG (0x2B)

Command	SET I'M ALIVE CONFIG				
Description	Configures the "I'm alive" feature.				
Type	Server → Location Unit				
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x2B	TYPE	-	Command type
1	1 Byte	-	I'M ALIVE PERIODICITY	Hours	Configures the "I'm alive" reporting periodicity (0 to 255). If the value is zero, the reporting will be disabled.

SET ANALOG1 CONFIG (0x2C)

Command	SET ANALOG1 CONFIG				
Description	Configures the first analog input.				
Type	Server → Location Unit				
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x2C	TYPE	-	Command type
1	1 Byte	-	ANALOG PORT 1 CONFIGURATION	-	Configures the analog port 1: Decimal 1 to select Temperature sensor 1 Decimal 4 to select Fuel sensor

SET ANALOG2 CONFIG (0x2D)

Command		SET ANALOG2 CONFIG			
Description		Configures the second analog input.			
Type		Server → Location Unit			
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x2D	TYPE	-	Command type
1	1 Byte	-	ANALOG PORT 2 CONFIGURATION	-	Configures the analog port 2: Decimal 1 to select Temperature sensor 2 Decimal 4 to select Fuel sensor

ERASE XPERT EEPROM (0x2E)

Command		ERASE XPERT EEPROM			
Description		Deletes data from Inoxpert's EEPROM memory.			
Type		Server → Location Unit			
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x2E	TYPE	-	Command type

Note: This command erases Xpert and EBS data stored in memory;

SET VEHICLE AND DRIVING CONFIG (0x2F)

Command		SET VEHICLE AND DRIVING CONFIG			
Description		Configures Inoxpert's vehicle and driving settings.			
Type		Server → Location Unit			
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x2F	TYPE	-	Command type
1	2 Bytes	-	CONFIGURED VEHICLE	-	ThermoKing / Tachograph configuration: 0 to 16383 VEHICLE ID 16384 TERMOKING 32768 TACHOGRAPH Note: All required options shall be added. Thermoking and Tachograph are set to absent by default. Please contact INOSAT to get the most updated list of Vehicle IDs.
3	2 Bytes	-	HIGH RPM	RPM	Sets the high RPM threshold for normal driving.
5	2 Bytes	-	LOW RPM	RPM	Sets the low RPM threshold for normal driving.
7	2 Bytes	-	HIGH RPM ECHO MODE	RPM	Sets the high RPM threshold for echo mode driving.
9	2 Bytes	-	LOW RPM ECHO MODE	RPM	Sets the low RPM threshold for echo mode driving.
11	2 Bytes	-	HARSH BRAKE	0.01 m/s ²	Sets the harsh brake threshold level.
13	2 Bytes	-	HARSH ACCELERATION	0.01 m/s ²	Sets the harsh acceleration threshold level.

15	2 Bytes	-	HIGH ENGINE TEMPERATURE	°C	Sets the engine's high temperature threshold level.
17	1 Byte	-	TACHOGRAPH ID	-	Sets the Tachograph: 0 <u>NO TACHO SELECTED</u> 1 <u>VDO/CONTINENTAL 1381</u> 2 <u>STONERIDGE</u> 3 <u>ACTIA</u> 4 <u>INTELIC</u> <i>Note: Only one option must be selected to determine the value.</i>

GET VEHICLE AND DRIVING CONFIG (0x30)

Command	GET VEHICLE AND DRIVING CONFIG				
Description	Gets the vehicle and driving configuration.				
Type	Server → Location Unit				
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x30	TYPE	-	Command type

GET ACCEL CONFIG (0x31)

Command	GET ACCEL CONFIG				
Description	Requests the accelerometer configuration.				
Type	Server → Location Unit				
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x31	TYPE	-	Command type

GET DRIVERKEY RING CONFIG (0x32)

Command	GET DRIVERKEY RING CONFIG				
Description	Requests the Driver Key Ring configuration.				
Type	Server → Location Unit				
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x32	TYPE	-	Command type

GET IM ALIVE CONFIG (0x33)

Command	GET IM ALIVE CONFIG				
Description	Requests the “I’m alive” configuration.				
Type	Server → Location Unit				
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x33	TYPE	-	Command type

GET ANALOG1 CONFIG (0x34)

Command	GET ANALOG1 CONFIG				
Description	Requests the Analog 1 configuration.				
Type	Server → Location Unit				
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x34	TYPE	-	Command type

GET ANALOG2 CONFIG (0x35)

Command	GET ANALOG2 CONFIG				
Description	Requests the Analog 2 configuration.				
Type	Server → Location Unit				
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x35	TYPE	-	Command type

SET IMPACT CONFIG (0x36)

Command	SET IMPACT CONFIG				
Description	Configures the impact sensor.				
Type	Server → Location Unit				
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x36	TYPE	-	Command type
1	2 Bytes	-	THRESHOLD LEVEL	0.001 g’s	Sets the threshold level of the impact sensor. Min.: 2500 (2.5 g) / Max.: 8000 (8.0 g) / Default.: 2500 (2.5 g)
3	2 Bytes	-	MINIMUM ACCELERATION	0.001 g’s	Sets the minimum acceleration of the bump. Min.: 13 (0.013 g) / Max.: 20 (0.020 g) / Default.: 18 (0.018 g)
5	2 Bytes	-	MINIMUM SPEED	Km/h	Sets the minimum speed of the bump. Min.: 1 (1km/h) / Max.: 999 (999km/h) / Default.: 50 (50km/h)

7	1 Byte	-	IMPACT ALARMS	-	<p>Enable or disable impact alarms:</p> <ol style="list-style-type: none"> 1 POSITIVE IMPACT ALARM – Enables the alarm trigger in the event of a positive impact. 2 NEGATIVE IMPACT ALARM – Enables the alarm trigger in the event of a negative impact. 4 BUMP ALARM - Enables the alarm trigger in the event of a bump. <p>Note: Add all required settings to determine the final value. All excluded alarms will be disabled.</p>
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GET IMPACT CONFIG (0x37)

Command		GET IMPACT CONFIG			
Description		Gets the impact configuration.			
Type		Server → Location Unit			
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x37	TYPE	-	Command type

SET OUTPUT 2 (0x38)

Command		SET OUTPUT 2			
Description		Sets the state of digital output 2.			
Type		Server → Location Unit			
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x38	TYPE	-	Command type
1	1 Byte	-	SET OUTPUT 2	-	Sets the state of the digital output 2: 1 - Digital output port 2 on 0 - Digital output port 2 off

NAVIGATOR SYNC REQUEST (0x39)

Command		NAVIGATOR SYNC REQUEST			
Description		Navigator synchronization request.			
Type		Server → Location Unit			
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x39	TYPE	-	Command type
1	2 Bytes	-	SYNC_VALUE	-	Synchronization Value: 0 – General Navigator synchronization

SET 24H RESET CONFIG (0x3A)

Command		SET 24H RESET CONFIG			
Description		Configures the 24 hours reset.			
Type		Server → Location Unit			
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x3A	TYPE	-	Command type
1	1 Byte	-	DAY OF WEEK	-	Configures the day of the week that the unit make the reset: 1 SUNDAY 2 MONDAY 4 TUESDAY 8 WEDNESDAY 16 THURSDAY 32 FRIDAY 64 SATURDAY Note: Add all required days to determine the final value. All excluded days will be disabled.
2	1 Byte	-	HOURS	-	Hour of the reset.
3	1 Byte	-	MINUTES	-	Minutes of the reset.

GET 24H RESET CONFIG (0x3B)

Command		GET 24H RESET CONFIG			
Description		Gets the 24 hours reset configuration.			
Type		Server → Location Unit			
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x3B	TYPE	-	Command type

SET DISTANCE TRAVELLED CONFIG (0x3F)

Command		SET DISTANCE TRAVELLED CONFIG			
Description		Configures the “distance travelled” feature.			
Type		Server → Location Unit			
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x3F	TYPE	-	Command type
1	1 Byte	-	OPTIONS	-	Setting options this feature: 1 Feature enable 2 Ignition enable Note: Add all required to determine the final value. All excluded days will be disabled.
2	1 Byte	0x00	RESERVED	-	Set as the default value.
3	1 Byte	0x00	RESERVED	-	Set as the default value.
4	1 Byte	0x00	RESERVED	-	Set as the default value.
5	4 Bytes	0x00000000	RESERVED	-	Set as the default value.

GET FIRMWARE AND HARDWARE (0x40)

Command	GET FIRMWARE AND HARDWARE				
Description	Gets the firmware and hardware version.				
Type	Server → Location Unit				
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x40	TYPE	-	Command type

SET HEADING CONFIG (0x41)

Command	SET HEADING CONFIG				
Description	Configures the “heading” feature.				
Type	Server → Location Unit				
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x41	TYPE	-	Command type
1	1 Byte	-	HEADING	o	Minimum heading variation to record a new position. Default: 30°
2	1 Byte	-	SPEED	Km/h	Minimum speed to record a new position route. Default: 20km/h

GET HEADING CONFIG (0x42)

Command	GET HEADING CONFIG				
Description	Gets the “heading” configuration.				
Type	Server → Location Unit				
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x42	TYPE	-	Command type

SET COM PORTS CONFIG (0x48)

Command	SET COM PORTS CONFIG				
Description	Configures the communication ports configuration.				
Type	Server → Location Unit				
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x48	TYPE	-	Command type
1	1 Byte	-	CANBUS 1	-	Set CANBUS 1 PORT function: 0x00 - Default (XPRT)
2	1 Byte	-	CANBUS 1 SUB	-	Set CANBUS 1 PORT sub-function: If CANBUS 1 Function = 0x00: No Sub-function defined

3	1 Byte	-	CANBUS 2	-	Set CANBUS 2 PORT function: 0x00 - Default (Tachograph Remote Download) 0x01 - EBS system
4	1 Byte	-	CANBUS 2 SUB	-	Set CANBUS 2 PORT sub-function: If CANBUS 2 Function = 0x00 : No Sub-function defined If CANBUS 2 Function = 0x01: CANBUS 2 SUB = 0x00 - WABCO EBS System CANBUS 2 SUB = 0x01 - HALDEX EBS System CANBUS 2 SUB = 0x02 - KNORR EBS System
5	1 Byte	-	RS485		Set RS485 PORT function: 0x00 - Default
6	1 Byte	-	RS485 SUB		Set RS485 PORT sub-function: If RS485 Function = 0x00: No Sub-function defined
7	1 Byte	-	UART A		Set UART A PORT function: 0x00 - Default 0x01 - Navigator 0x02 - Bluetooth 0x03 - Thermograph 0x04 - GARMIN Navigator
8	1 Byte	-	UART A SUB		Set UART A PORT sub-function: If UARTA Function = 0x00: No Sub-function defined If UARTA Function = 0x01: No Sub-function defined If UARTA Function = 0x02: No Sub-function defined If UARTA Function = 0x03: Thermograph function UART A SUB = 0x00 - THERMOKING/TRANSCAN Thermographs UART A SUB = 0x01 - CARRIER/DATACOLD 500 Thermographs UART A SUB = 0x02 - THERMOKING TOUCHPRINT Thermographs If UARTA Function = 0x04: No Sub-function defined
9	1 Byte	-	UART B		Set UART B PORT function: 0x00 - Default (RFID) 0x01 - Refrigerator machine
10	1 Byte	-	UART B SUB		If UARTB Function = 0x00: No Sub-function defined If UARTB Function = 0x01: Refrigerator machine function UART B SUB = 0x00 - THERMOKING IBOX UART B SUB = 0x01 - CARRIER GATEWAY
11	1 Byte	-	RESER. 1		Reserved for future development - Set as 0x00
12	1 Byte	-	RESER. 1 SUB		Reserved for future development - Set as 0x00
13	1 Byte	-	RESER. 2		Reserved for future development - Set as 0x00
14	1 Byte	-	RESER. 2 SUB		Reserved for future development - Set as 0x00

GET COM PORTS CONFIG (0x49)

Command	GET COM PORTS CONFIG				
Description	Gets the communication ports configuration.				
Type	Server → Location Unit				
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x49	TYPE	-	Command type

SET CARRIER DIGITAL PORTS CONFIG (0x4A)

Command		SET COM PORTS CONFIG			
Description		Configures the CARRIER digital ports.			
Type		Server → Location Unit			
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x4A	TYPE	-	Command type
1	1 Byte	-	PORT RECORDING TRIGGER		<p>CARRIER DIGITAL PORT 1:</p> <p>0 Doesn't record locations by port change 1 Records a location when port changes from 0 to 1 2 Records a location when port changes from 1 to 0 3 Records a location in any port change.</p> <p>CARRIER DIGITAL PORT 2:</p> <p>0 Doesn't record locations by port change 4 Records a location when port changes from 0 to 1 8 Records a location when port changes from 1 to 0 12 Records a location in any port change.</p> <p>CARRIER DIGITAL PORT 3:</p> <p>0 Doesn't record locations by port change 16 Records a location when port changes from 0 to 1 32 Records a location when port changes from 1 to 0 48 Records a location in any port change.</p> <p>CARRIER DIGITAL PORT 4:</p> <p>0 Doesn't record locations by port change 64 Records a location when port changes from 0 to 1 128 Records a location when port changes from 1 to 0 192 Records a location in any port change.</p>

GET CARRIER DIGITAL PORTS CONFIG (0x4B)

Command		GET CARRIER DIGITAL PORTS CONFIG			
Description		Gets the CARRIER digital ports configuration.			
Type		Server → Location Unit			
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x4B	TYPE	-	Command type

SERVER TO GARMIN NAV MSG (0x4E)

Command		SERVER TO GARMIN NAV			
Description		Send message to GARMIN NAV			
Type		Server → Location Unit			
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x4E	TYPE	-	Command type
1	1 Byte	0x10	Data Link Escape		ASCII DLE character (16 decimal)
2	1 Byte	-	Packet ID		Identifies the type of packet
3	1 Byte	-	Payload size		Number of bytes of payload data
4+n	n bytes	-	App payload		Application Payload [n= 0 to 255 bytes]
4+n + 1	1 Byte	-	Checksum		2's complement of the sum of all bytes from byte 1 to byte n-4 (end of the payload)
4+n + 2	1 Byte	0x10	Data Link Escape		ASCII DLE character (16 decimal)
4+n + 3	1 Byte	0x03	End Of Text		ASCII ETX character (3 decimal)

GET DISTANCE TRAVELLED CONFIG (0x4F)

Command		GET DISTANCE TRAVELLED CONFIG			
Description		Gets the “distance travelled” configuration.			
Type		Server → Location Unit			
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x4F	TYPE	-	Command type

SET FLEXIBLE COM PORTS CONFIG (0x58)

Command		SET FLEXIBLE COM PORTS CONFIG			
Description		Configures the communication ports configuration.			
Type		Server → Location Unit			
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x58	TYPE	-	Command type
1	1 Byte	-	CANBUS 1	-	Set CANBUS 1 PORT function: 0x00 - Default (XPERT)
2	1 Byte	-	CANBUS 1 SUB	-	Set CANBUS 1 PORT sub-function: If CANBUS 1 Function = 0x00: No Sub-function defined
3	1 Byte	-	CANBUS 2	-	Set CANBUS 2 PORT function: 0x00 - Default (Tachograph Remote Download) 0x01 - EBS system
4	1 Byte	-	CANBUS 2 SUB	-	Set CANBUS 2 PORT sub-function: If CANBUS 2 Function = 0x00 : No Sub-function defined If CANBUS 2 Function = 0x01: No Sub-function defined
5	1 Byte	-	RS485		Set RS485 PORT function: 0x00 - Default

6	1 Byte	-	RS485 SUB	Set RS485 PORT sub-function: If RS485 Function = 0x00: No Sub-function defined
7	1 Byte	-	UART A	Carries the UART A function: 0 - Default (NAV/Bluetooth) ; 1 - Thermograph; 2 - Fridge Machine 3 - GARMIN Navigator
8	1 Byte	-	UART A SUB	UART A PORT sub-function: If UARTA Function = 0x00: No Sub-function defined If UARTA Function = 0x01: No Sub-function defined If UARTA Function = 0x02: Fridge Machine function UARTA SUB = 0x00 - THERMOKING IBOX UARTA SUB = 0x01 - CARRIER GATEWAY If UARTA Function = 0x03: No Sub-function defined
9	1 Byte	-	UART B	Carries the UART A function: 0 - Default (Driver Key) ; 1 - Thermograph; 2 - Fridge Machine 3 - GARMIN Navigator
10	1 Byte	-	UART B SUB	UART B PORT sub-function: If UARTB Function = 0x00: No Sub-function defined If UARTB Function = 0x01: No Sub-function defined If UARTB Function = 0x02: Fridge Machine function UARTB SUB = 0x00 - THERMOKING IBOX UARTB SUB = 0x01 - CARRIER GATEWAY If UARTB Function = 0x03: No Sub-function defined
11	1 Byte	-	RESER. 1	Reserved for future development - Set as 0x00
12	1 Byte	-	RESER. 1 SUB	Reserved for future development - Set as 0x00
13	1 Byte	-	RESER. 2	Reserved for future development - Set as 0x00
14	1 Byte	-	RESER. 2 SUB	Reserved for future development - Set as 0x00

GET FLEXIBLE COM PORTS CONFIG (0x59)

Command	GET FLEXIBLE COM PORTS CONFIG				
Description	Gets the communication ports configuration.				
Type	Server → Location Unit				
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x4D	TYPE	-	Command type

SET GENERIC DATA VERSION CONFIG (0x5C)

Command	SET GENERIC DATA VERSION CONFIG				
Description	Configures generic data message version.				
Type	Server → Location Unit				
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x5C	TYPE	-	Command type
1	1 Byte	-	GENERIC DATA VERSION	-	Set the generic data version: 0x00 - Generic data version 1 (DEFAULT) 0x01 - Generic data version 2

GET GENERIC DATA VERSION CONFIG (0x5D)

Command	GET GENERIC DATA VERSION CONFIG				
Description	Gets the generic data message version configuration.				
Type	Server → Location Unit				
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x5D	TYPE	-	Command type

3.2 Location unit to Server

ROUTE EXTRACTION END (0x20)

Command	ROUTE EXTRACTION END				
Description	Signals the end of a route extraction.				
Type	Location Unit → Server				
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x20	TYPE	-	Command type
1	2 Bytes	-	TOTAL ROUTE LOCATIONS	-	Number of route locations.

UNIT CONFIG (0x21)

Command	UNIT CONFIG				
Description	Returns the location unit general configuration.				
Type	Location Unit → Server				
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x21	TYPE	-	Command type
1	1 Byte	-	VEHICLE TYPE	-	<p>Sets the vehicle type where the unit is installed. The following vehicle types can be selected:</p> <ul style="list-style-type: none"> 0 Light vehicle 1 Heavy vehicle 2 Machine <p>Note: Only one option must be selected to determine the value.</p>
2	1 Byte	-	IMMOBILIZATION TYPE	-	<p>Immobilization type used by the location unit:</p> <ul style="list-style-type: none"> 0 Normal 1 Ignition block by driver key absence 2 Immobilization if the GPS is valid and current speed is less immobilization speed 3 Immobilization if the GPS is valid and current speed is less immobilization speed or ignition is OFF. 4 Forced immobilization. Any speed and GPS status. <p>Note: Only one option must be selected to determine the contents value.</p>
3	1 Byte	-	IGNITION TYPE	-	<p>Ignition type used by the location unit:</p> <ul style="list-style-type: none"> 0 Standard (IGN true if 12V or 24V are present in unit Ignition wire input) 1 <i>reserved – do not use</i> 2 Xpert RPM (IGN is true if RPM > 0) 3 Virtual Ignition (Combination between external power supply and movement) 4 Movement sensor (IGN true if movement is detected) <p>Note1: Only one option must be selected to determine the contents value. Note2: For option 2, Xpert Vehicle type must be correctly configured. See msg 0x2F type. Note 3: For option 3, external power supply must be present.</p>

4	1 Byte	-	UDP TO TCP TIMEOUT	Min	Timeout (1 to 255 minutes) to switch from UDP to TCP when no route is sent through UDP protocol. If set to zero, no protocol switch will occur.
5	1 Byte	-	TCP TO UDP TIMEOUT	Min	Timeout (1 to 255 minutes) to switch from TCP back to UDP. If set to zero, no timeout based protocol switch will occur. In this situation, the protocol switch will occur during the following GPRS reconnection.
6	2 Bytes	-	LOW POWER TIMEOUT	Min	Timeout (0 to 65535 minutes) before the location unit enters a power saving mode.
8	2 Bytes	-	MAXIMUM SPEED	Km/h	Maximum speed (0 to 9999 Km/h).
10	1 Byte	-	IMMOBILIZATION SPEED	Km/h	Immobilization speed (0 to 99 Km/h).
11	2 Bytes	-	ROUTE RECORDING NATIONAL TIMER	Sec	Periodicity (0 to 65535 seconds) of route location recording while the unit is registered in a national network.
13	2 Bytes	-	ROUTE RECORDING ROAMING TIMER	Sec	Periodicity (0 to 65535 seconds) of route location recording while the unit is registered in a roaming network.
15	2 Bytes	-	ROUTE RECORDING OVERSPEED TIMER	Sec	Periodicity (0 to 65535 seconds) of route location recording, while the vehicle is over the maximum speed.
17	2 Bytes	-	GPRS SENDING NATIONAL TIMER	Sec	Periodicity (0 to 65535 seconds) of route location sending while the unit is registered in a national network.
19	2 Bytes	-	GPRS SENDING ROAMING TIMER	Sec	Periodicity (0 to 65535 seconds) of route location sending while the unit is registered in a roaming network.
21	2 Bytes	-	GPS RESET TIMEOUT	Sec	GPS module reset timeout (0 to 65535 seconds) when there's no GPS signal while the ignition is on.
23	1 Byte	-	GENERAL CONFIGURATION FLAGS	-	General configuration setting flags as bellow: <ol style="list-style-type: none"> 1 ROUTE COMPRESSION - Route location recording when the ignition is on. 2 RECORD POWER SOURCE CHANGE EVENTS - Unit records a location when the power is switched off. 4 RECORD ENCLOSURE OPENING EVENTS - Unit records a location when the enclosure is opened. 8 RECORD HEADING CHANGE EVENTS - Unit records a location when the heading changes. 16 RECORD TEMPERATURE CHANGE EVENTS - Unit records a location when a temperature change event occurs. 32 SPEED LIMIT BUZZER ALARM – Play a buzzer sound when the speed limit is exceeded. <p>Note: All required settings shall be added to determine the final value.</p>
24	2 Byte	-	DIGITAL PORT RECORDING TRIGGER	-	Digital ports location recording trigger : DIGITAL PORT 1: <ol style="list-style-type: none"> 0 Doesn't record locations by port change 1 Records a location when port changes from 0 to 1 2 Records a location when port changes from 1 to 0 3 Records a location in any port change. DIGITAL PORT 2: <ol style="list-style-type: none"> 0 Doesn't record locations by port change 4 Records a location when port changes from 0 to 1 8 Records a location when port changes from 1 to 0 12 Records a location in any port change. DIGITAL PORT 3 (need expansion board): <ol style="list-style-type: none"> 0 Doesn't record locations by port change 16 Records a location when port changes from 0 to 1 32 Records a location when port changes from 1 to 0 48 Records a location in any port change. DIGITAL PORT 4 (need expansion board): <ol style="list-style-type: none"> 0 Doesn't record locations by port change

					64 Records a location when port changes from 0 to 1 128 Records a location when port changes from 1 to 0 192 Records a location in any port change. DIGITAL PORT 5 (need expansion board): 0 Doesn't record locations by port change 256 Records a location when port changes from 0 to 1 512 Records a location when port changes from 1 to 0 768 Records a location in any port change. Note: All required settings shall be added to determine the final value.
26	1 Byte	-	GPRS RECONNECT TIMEOUT	Min	Timeout (0 to 255 minutes) required to establish a new GPRS connection after the previous connection has been lost.
27	1 Byte	-	GPRS REOPEN SOCKET TIMEOUT	Min	Timeout (0 to 255 minutes) required to open a socket again.
28	1 Byte	-	GPRS RECLOSE SOCKET TIMEOUT	Sec	Timeout (0 to 255 seconds) required to close a socket.

GPRS CONFIG (0x22)

Command		GPRS CONFIG			
Description		Returns the location unit GPRS configuration.			
Type		Location Unit → Server			
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x22	TYPE	-	Command type
1	8 Bytes	-	IMEI	-	BCD coded unit's GSM IMEI number.
9	1 Byte	-	GPRS CONFIGURATION	-	Type of GPRS communications allowed: 1 GPRS NATIONAL - Allows GPRS registration when the GSM is registered in a national network. 2 GPRS ROAMING - Allows GPRS registration when the GSM is registered in a roaming network. 4 UDP ENABLE - Allows the route to be sent by UDP protocol. Note: All required settings shall be added to determine the final value.
10	31 Bytes	-	GPRS SERVER ADDRESS	-	Null terminated string containing the server address required during a GPRS connection.
*	2 Bytes	-	GPRS TCP PORT	-	TCP/IP port (1 to 65535) used with GPRS sockets.
*	31 Bytes	-	GPRS ACCESS POINT	-	Null terminated string containing the GPRS APN access point used for GPRS connections.
*	31 Bytes	-	GPRS USERNAME	-	Null terminated string containing the username required during GPRS connection.
*	24 Bytes	-	GPRS PASSWORD	-	Null terminated string containing the password required during GPRS connection.

* Dynamic Offset

XPert GENERIC DATA (0x23)

Command	XPert GENERIC DATA				
Description	Sends Xpert generic data to the server.				
Type	Location Unit → Server				
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x23	TYPE	-	Command type
1	3 Bytes	-	TIME	-	BCD coded Location time (HHMMSS).
4	3 Bytes	-	DATE	-	BCD coded Location date (DDMMYY).
7	2 Bytes	-	ALTITUDE	-	Location altitude.
9	n Bytes	-	XPert GENERIC DATA	-	Note: For more information, see Generic data message protocol V1 – integration guide

UNIT LOCATION (0x24)

Command	UNIT LOCATION				
Description	Returns the unit location.				
Type	Location Unit → Server				
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x24	TYPE	-	Command type
1	1 Byte	-	REASON	-	Reason to send the location: 1 ANSWER_TO_LOCATION_REQUEST 2 ANSWER_TO_TURN_OFF_ON_IMOBILIZATION 3 ANSWER_TO_TURN_OFF_ON_ACTUATOR1 4 ANSWER_TO_TURN_OFF_ON_ACTUATOR2 5 NATIONAL_ROUTE_PERIODICITY 6 SPEEDING_ROUTE_PERIODICITY 7 – 9 <i>Reserved</i> 10 DIGITAL_INPUT_PORT_CHANGE 11 UNIT_IMOBILIZATION_STATE_CHANGED 12 UNIT_IGNITION_CHANGED 13 – 17 <i>Reserved</i> 18 UNIT_ACTUATOR1_STATE_CHANGED 19 UNIT_DRIVERKEY_CHANGED 20 ROAMING_ROUTE_PERIODICITY 21 POWER_SUPPLY_SOURCE_CHANGED 22 – 23 <i>Reserved</i> 24 OPTICAL_SENSOR_STATE_CHANGED 25 HEADING_ROUTE_PERIODICITY 26 TEMPERATURE_STATE_CHANGED 27 HARSH_ACCELERATION_LOCATION 28 HARSH_BRAKING_LOCATION 29 HARSH_CORNERING_LOCATION 30 IAM_ALIVE_LOCATION 31 SPEEDLIMIT_LOCATION 32 – 52 <i>Reserved</i> 53 IMPACT_LEVEL1_LOCATION 54 IMPACT_LEVEL2_LOCATION 55 – 57 <i>Reserved</i> 58 UNIT_ACTUATOR2_STATE_CHANGED
2	3 Bytes	-	TIME	-	BCD coded Location time (HHMMSS).
5	3 Bytes	-	DATE	-	BCD coded Location date (DDMMYY).
8	4 Bytes	-	LATITUDE	-	BCD coded Location latitude. Latitude coordinate xxmmddd. xx=degrees; mm=minutes; dddd=decimal part of minutes.

12	5 Bytes	-	LONGITUDE	-	BCD coded Location longitude. Longitude coordinate yyymmddd. yyy=degrees; mm=minutes; dddd=decimal part of minutes.
17	2 Bytes	-	HEADING	-	Location heading in degrees.
19	2 Bytes	-	SPEED	-	Location speed value in the following format: xxx.x (Divide by 10 to get km/h)
21	1 Byte	-	GPS SATELLITES	-	Number of GPS satellites available.
22	1 Byte	-	LOCATION STATUS	-	<p>Location status:</p> <p>1 Latitude direction 2 Longitude direction 4 GSM Network status 8 GPS Status 16 GPS Antenna Status 32 Internal battery</p> <p>NORTH is latitude direction = 1 SOUTH is latitude direction = 0 EAST is longitude direction = 0 WEST is longitude direction = 1</p> <p>GPS Status = 1, means the GPS is not fix, and the coordinates are old or outdated GPS Status = 0, means the GPS is fix, and the coordinates are updated</p> <p>GSM Network Status = 1, means the GSM is not register GSM Network Status = 0, means the GSM is register</p> <p>GPS antenna status = 1, GPS antenna plugged GPS antenna status = 0, GPS antenna unplugged</p> <p>Internal battery = 1, unit is powered by the internal battery. (External power supply disconnected) Internal battery = 0, external power supply connected.</p> <p>Note: Sent value is determined by adding the numbers corresponding to the flags above.</p>
23	1 Byte	-	TEMPERATURE 1	-	Temperature sensor 1 value.
24	1 Byte	-	TEMPERATURE 2	-	Temperature sensor 2 value.
25	2 Bytes	-	PERIPHERAL STATE	-	<p>Peripheral state:</p> <p>1 Ignition 2 Digital Port 1 4 Digital Port 2 8 Digital Port 3 (need expansion board) 16 Digital Port 4 (need expansion board) 32 Digital Port 5 (need expansion board) 64 CARRIER Digital Port 1 (If present) 128 CARRIER Digital Port 2 (If present) 256 CARRIER Digital Port 3 (If present) 512 CARRIER Digital Port 4 (If present) 1024 Reserved (Future use) 2048 Reserved (Future use) 4096 Output1 8192 Output2 (need expansion board) 16384 Reserved (Future use) 32768 Reserved (Future use)</p> <p>Note: Sent value is determined by adding the numbers corresponding to the flags above.</p>
27	6 Bytes	-	DRIVER ID	-	Driver ID card number.
33	1 Byte	-	MAIN VOLTAGE	-	External power voltage.
34	1 Byte	-	INTERNAL BATTERY VOLTAGE	-	Internal battery voltage (x10).
35	1 Byte	-	GSM SIGNAL LEVEL	-	GSM network signal level.
36	2 Bytes	-	FUEL TANK LEVEL	-	Fuel tank level.

XPRT EEPROM ERASE (0x25)

Command	XPRT EEPROM ERASE				
Description	Returns the EEPROM erase result sent by Inoxpert.				
Type	Location Unit → Server				
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x25	TYPE	-	Command type
1	1 Byte	-	RESULT	-	Operation result: 0x00 Operation failed 0x01 Operation successfully completed

VEHICLE AND DRIVING CONFIG (0x26)

Command	VEHICLE AND DRIVING CONFIG				
Description	Returns of the vehicle and driving configuration sent to Inoxpert.				
Type	Location Unit → Server				
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x26	TYPE	-	Command type
1	2 Bytes	-	CONFIGURED VEHICLE	-	ThermoKing / Tachograph configuration: 0 to 16383 <u>VEHICLE ID</u> 16384 <u>TERMOKING</u> 32768 <u>TACHOGRAPH</u> Note: Numbers related to all required options shall be added. Thermoking and Tachograph are set to absent by default. Please contact INOSAT to get the most updated list of Vehicle IDs.
3	2 Bytes	-	HIGH RPM	RPM	High RPM threshold for normal driving.
5	2 Bytes	-	LOW RPM	RPM	Low RPM threshold for normal driving.
7	2 Bytes	-	HIGH RPM ECHO MODE	RPM	High RPM threshold for echo mode driving.
9	2 Bytes	-	LOW RPM ECHO MODE	RPM	Low RPM threshold for echo mode driving.
11	2 Bytes	-	HARSH BRAKE	0.01 m/s ²	Harsh brake threshold level.
13	2 Bytes	-	HARSH ACCELERATION	0.01 m/s ²	Harsh acceleration threshold level.
15	2 Bytes	-	HIGH ENGINE TEMPERATURE	°C	Engine's high temperature threshold level.
17	1 Byte	-	TACHOGRAPH ID	-	Sets the Tachograph ID: 0 <u>NO TACHO SELECTED</u> 1 <u>VDO/CONTINENTAL 1381</u> 2 <u>STONERIDGE</u> 3 <u>ACTIA</u> 4 <u>INTELIC</u>

ACCEL CONFIG (0x27)

Command		ACCEL CONFIG			
Description		Unit accelerometer configuration.			
Type		Location Unit → Server			
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x27	TYPE	-	Command type
1	1 Byte	-	ACCELEROMETER FRONT FACE	-	Setting used to adjust the location unit hardware position related to the front of the vehicle.
2	1 Byte	-	HARSH ALARMS	-	Enable or disable harsh alarms: <ol style="list-style-type: none"> 1 HARSH BRAKING ALARM – Enables the alarm trigger in the event of a harsh braking. 2 HARSH ACCELERATION ALARM - Enables the alarm trigger in the event of a harsh acceleration. 4 HARSH TURN ALARM - Enables the alarm trigger in the event of a harsh cornering. <p>Note: Add all required settings to determine the final value. All excluded alarms will be disabled.</p>
3	2 Bytes	-	HARSH BREAK THRESHOLD LEVEL	0.01 m/s ²	Configures the harsh breaking threshold level.
5	2 Bytes	-	HARSH ACCELERATION THRESHOLD LEVEL	0.01 m/s ²	Configures the harsh acceleration threshold level.
7	2 Bytes	-	HARSH TURN THRESHOLD LEVEL	0.01 m/s ²	Configures the harsh turn threshold level.

DRIVERKEY RING CONFIG (0x28)

Command		DRIVERKEY RING CONFIG			
Description		Driver key ring Configuration.			
Type		Location Unit → Server			
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x28	TYPE	-	Command type
1	1 Byte	-	TIME ON	Sec	Number of seconds (0 to 255) the buzzer is on, while it's ringing.
2	1 Byte	-	TIME OFF	Sec	Number of seconds (0 to 255) the buzzer is off, while it's ringing.

I'M ALIVE CONFIG (0x29)

Command	I'M ALIVE CONFIG				
Description	"I'm alive" feature configuration.				
Type	Location Unit → Server				
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x29	TYPE	-	Command type
1	1 Byte	-	I'M ALIVE PERIODICITY	Hours	Configures the "I'm alive" reporting periodicity (0 to 255). If the value is zero, the reporting will be disabled.

ANALOG1 CONFIG (0x2A)

Command	ANALOG1 CONFIG				
Description	Analog 1 input configuration.				
Type	Location Unit → Server				
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x2A	TYPE	-	Command type
1	1 Byte	-	ANALOG PORT 1 CONFIGURATION	-	Configures the analog port 1: Decimal 1 to select Temperature sensor 1 Decimal 4 to select Fuel sensor

ANALOG2 CONFIG (0x2B)

Command	ANALOG2 CONFIG				
Description	Analog 2 input configuration.				
Type	Location Unit → Server				
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x2B	TYPE	-	Command type
1	1 Byte	-	ANALOG PORT 1 CONFIGURATION	-	Configures the analog port 1: Decimal 1 to select Temperature sensor 1 Decimal 4 to select Fuel sensor

OUTPUT 1 STATE (0x2C)

Command		OUTPUT 1 STATE			
Description		State of digital output 1.			
Type		Location Unit → Server			
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x2C	TYPE	-	Command type
1	1 Byte	-	OUTPUT 1 STATE	-	State of the digital output 1: 0 – Digital output port 1 off 1 – Digital output port 1 on 2 – Waiting for low speed (current speed > immobilization speed) 3 – Waiting for low speed or ignition off

IMPACT CONFIG (0x2D)

Command		IMPACT CONFIG			
Description		Returns the impact configuration.			
Type		Location Unit → Server			
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x2D	TYPE	-	Command type
1	2 Bytes	-	THRESHOLD LEVEL	0.001 g's	Sets the threshold level of the impact sensor. Min.: 2500 (2.5 g) / Max.: 8000 (8.0 g) / Default.: 2500 (2.5 g)
3	2 Bytes	-	MINIMUM ACCELERATION	0.001 g's	Sets the minimum acceleration of the bump. Min.: 13 (0.013 g) / Max.: 20 (0.020 g) / Default.: 18 (0.018 g)
5	2 Bytes	-	MINIMUM SPEED	Km/h	Sets the minimum speed of the bump. Min.: 1 (1 km/h) / Max.: 999 (999 km/h) / Default.: 50 (50 km/h)
7	1 Byte	-	IMPACT ALARMS	-	Enable or disable impact alarms: 1 POSITIVE IMPACT ALARM – Enables the alarm trigger in the event of a positive impact. 2 NEGATIVE IMPACT ALARM – Enables the alarm trigger in the event of a negative impact. 4 BUMP ALARM - Enables the alarm trigger in the event of a bump. Note: Add all required settings to determine the final value. All excluded alarms will be disabled.

OUTPUT 2 STATE (0x2E)

Command	OUTPUT 2 STATE				
Description	State of digital output 2.				
Type	Location Unit → Server				
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x2E	TYPE	-	Command type
1	1 Byte	-	OUTPUT 2 STATE	-	State of the digital output 2: 0 – Digital output port 2 off 1 – Digital output port 2 on

FIRMWARE AND HARDWARE VERSION (0x2F)

Command	FIRMWARE AND HARDWARE VERSION				
Description	Returns the firmware and hardware version.				
Type	Location Unit → Server				
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x2F	TYPE	-	Command type
1	2 Bytes	-	FIRMWARE	-	Firmware Version.
3	1 Byte	-	BETA_VERSION	-	Firmware Beta Subversion (0xFF, if final firmware).
4	1 Byte	-	HARDWARE	-	Hardware Version.
5	1 Byte	-	BOOTLOADER	-	Bootloader Version.

HEADING CONFIG (0x30)

Command	HEADING CONFIG				
Description	Returns the “heading” configuration.				
Type	Location Unit → Server				
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x30	TYPE	-	Command type
1	1 Byte	-	HEADING	°	Minimum heading variation
2	1 Byte	-	SPEED	Km/h	Minimum speed

CARRIER DIGITAL PORTS CONFIG (0x36)

Command		COM PORTS CONFIG			
Description		CARRIER digital ports configuration			
Type		Location Unit → Server			
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x36	TYPE	-	Command type
1	1 Byte	-	PORT RECORDING TRIGGER	-	<p>CARRIER DIGITAL PORT 1:</p> <p>0 Doesn't record locations by port change 1 Records a location when port changes from 0 to 1 2 Records a location when port changes from 1 to 0 3 Records a location in any port change.</p> <p>CARRIER DIGITAL PORT 2:</p> <p>0 Doesn't record locations by port change 4 Records a location when port changes from 0 to 1 8 Records a location when port changes from 1 to 0 12 Records a location in any port change.</p> <p>CARRIER DIGITAL PORT 3:</p> <p>0 Doesn't record locations by port change 16 Records a location when port changes from 0 to 1 32 Records a location when port changes from 1 to 0 48 Records a location in any port change.</p> <p>CARRIER DIGITAL PORT 4:</p> <p>0 Doesn't record locations by port change 64 Records a location when port changes from 0 to 1 128 Records a location when port changes from 1 to 0 192 Records a location in any port change.</p>

UNIT LOCATION MESSAGE INCR DISTANCE (0x38)

Command		UNIT LOCATION MESSAGE INCR DISTANCE			
Description		Returns the unit location with the incremental distance.			
Type		Location Unit → Server			
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x38	TYPE	-	Command type
1	1 Byte	-	REASON	-	<p>Reason to send the location:</p> <p>1 ANSWER_TO_LOCATION_REQUEST 2 ANSWER_TO_TURN_OFF_ON_IMOBILIZATION 3 ANSWER_TO_TURN_OFF_ON_ACTUATOR1 4 ANSWER_TO_TURN_OFF_ON_ACTUATOR2 5 NATIONAL_ROUTE_PERIODICITY 6 SPEEDING_ROUTE_PERIODICITY 7 – 9 <i>Reserved</i> 10 DIGITAL_INPUT_PORT_CHANGE 11 UNIT_IMOBILIZATION_STATE_CHANGED 12 UNIT_IGNITION_CHANGED 13 – 17 <i>Reserved</i> 18 UNIT_ACTUATOR1_STATE_CHANGED 19 UNIT_DRIVERKEY_CHANGED 20 ROAMING_ROUTE_PERIODICITY 21 POWER_SUPPLY_SOURCE_CHANGED 22 – 23 <i>Reserved</i> 24 OPTICAL_SENSOR_STATE_CHANGED 25 HEADING_ROUTE_PERIODICITY</p>

					26 TEMPERATURE_STATE_CHANGED 27 HARSH_ACCELERATION_LOCATION 28 HARSH_BRAKING_LOCATION 29 HARSH_CORNERING_LOCATION 30 IAM_ALIVE_LOCATION 31 SPEEDLIMIT_LOCATION 32 – 52 <i>Reserved</i> 53 IMPACT_LEVEL1_LOCATION 54 IMPACT_LEVEL2_LOCATION 55 – 57 <i>Reserved</i> 58 UNIT_ACTUATOR2_STATE_CHANGED
2	3 Bytes	-	TIME	-	BCD coded Location time (HHMMSS).
5	3 Bytes	-	DATE	-	BCD coded Location date (DDMMYY).
8	4 Bytes	-	LATITUDE	-	BCD coded Location latitude. Latitude coordinate xxmmdddd. xx=degrees; mm=minutes; dddd=decimal part of minutes.
12	5 Bytes	-	LONGITUDE	-	BCD coded Location longitude. Longitude coordinate yyymdddd. yyy=degrees; mm=minutes; dddd=decimal part of minutes.
17	2 Bytes	-	HEADING	-	Location heading in degrees.
19	2 Bytes	-	SPEED	-	Location speed value in the following format: xxx.x (Divide by 10 to get km/h)
21	1 Byte	-	GPS SATELLITES	-	Number of GPS satellites available.
22	1 Byte	-	LOCATION STATUS	-	Location status: 1 Latitude direction 2 Longitude direction 4 GSM Network status 8 GPS Status 16 GPS Antenna Status 32 Internal battery NORTH is latitude direction = 1 SOUTH is latitude direction = 0 EAST is longitude direction = 0 WEST is longitude direction = 1 GPS Status = 1, means the GPS is not fix, and the coordinates are old or outdated GPS Status = 0, means the GPS is fix, and the coordinates are updated GSM Network Status = 1, means the GSM is not register GSM Network Status = 0, means the GSM is register GPS antenna status = 1, GPS antenna plugged GPS antenna status = 0, GPS antenna unplugged Internal battery = 1, unit is powered by the internal battery. (External power supply disconnected) Internal battery = 0, external power supply connected. Note: Sent value is determined by adding the numbers corresponding to the flags above.
23	1 Byte	-	TEMPERATURE 1	-	Temperature sensor 1 value.
24	1 Byte	-	TEMPERATURE 2	-	Temperature sensor 2 value.
25	2 Bytes	-	PERIPHERAL STATE	-	Peripheral state: 1 Ignition 2 Digital Port 1 4 Digital Port 2 8 Digital Port 3 (need expansion board) 16 Digital Port 4 (need expansion board) 32 Digital Port 5 (need expansion board) 64 CARRIER Digital Port 1 (If present) 128 CARRIER Digital Port 2 (If present) 256 CARRIER Digital Port 3 (If present) 512 CARRIER Digital Port 4 (If present) 1024 <i>Reserved (Future use)</i> 2048 <i>Reserved (Future use)</i> 4096 Output1 8192 Output2 (need expansion board) 16384 <i>Reserved (Future use)</i> 32768 <i>Reserved (Future use)</i>

					Note: Sent value is determined by adding the numbers corresponding to the flags above.
27	6 Bytes	-	DRIVER ID	-	Driver ID card number.
33	1 Byte	-	MAIN VOLTAGE	-	External power voltage.
34	1 Byte	-	INTERNAL BATTERY VOLTAGE	-	Internal battery voltage (x10).
35	1 Byte	-	GSM SIGNAL LEVEL	-	GSM network signal level.
36	2 Bytes	-	FUEL TANK LEVEL	-	Fuel tank level.
38	1 Byte	-	TAXIMETER STATE	-	Taximeter State
39	1 Byte	-	ROTATION TIME	Sec	Rotation Time value in seconds
40	4 Bytes	-	INCREMENTAL DISTANCE	m	BCD coded incremental distance. Value in meters
44	2 Bytes	-	ALTITUDE	m	Altitude value in meters

UNIT LOCATION MESSAGE TOTAL DISTANCE (0x39)

Command		UNIT LOCATION MESSAGE TOTAL DISTANCE			
Description		Returns the unit location with the total distance travelled.			
Type		Location Unit → Server			
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x39	TYPE	-	Command type
1	1 Byte	-	REASON	-	Reason to send the location: 1 ANSWER_TO_LOCATION_REQUEST 2 ANSWER_TO_TURN_OFF_ON_IMOBILIZATION 3 ANSWER_TO_TURN_OFF_ON_ACTUATOR1 4 ANSWER_TO_TURN_OFF_ON_ACTUATOR2 5 NATIONAL_ROUTE_PERIODICITY 6 SPEEDING_ROUTE_PERIODICITY 7 – 9 <i>Reserved</i> 10 DIGITAL_INPUT_PORT_CHANGE 11 UNIT_IMOBILIZATION_STATE_CHANGED 12 UNIT_IGNITION_CHANGED 13 – 17 <i>Reserved</i> 18 UNIT_ACTUATOR1_STATE_CHANGED 19 UNIT_DRIVERKEY_CHANGED 20 ROAMING_ROUTE_PERIODICITY 21 POWER_SUPPLY_SOURCE_CHANGED 22 – 23 <i>Reserved</i> 24 OPTICAL_SENSOR_STATE_CHANGED 25 HEADING_ROUTE_PERIODICITY 26 TEMPERATURE_STATE_CHANGED 27 HARSH_ACCELERATION_LOCATION 28 HARSH_BRAKING_LOCATION 29 HARSH_CORNERING_LOCATION 30 IAM_ALIVE_LOCATION 31 SPEEDLIMIT_LOCATION 32 – 52 <i>Reserved</i> 53 IMPACT_LEVEL1_LOCATION 54 IMPACT_LEVEL2_LOCATION 55 – 57 <i>Reserved</i> 58 UNIT_ACTUATOR2_STATE_CHANGED
2	3 Bytes	-	TIME	-	BCD coded Location time (HHMMSS).
5	3 Bytes	-	DATE	-	BCD coded Location date (DDMMYY).

8	4 Bytes	-	LATITUDE	-	BCD coded Location latitude. Latitude coordinate xxmmdddd. xx=degrees; mm=minutes; dddd=decimal part of minutes.
12	5 Bytes	-	LONGITUDE	-	BCD coded Location longitude. Longitude coordinate yyymdddd. yyy=degrees; mm=minutes; dddd=decimal part of minutes.
17	2 Bytes	-	HEADING	-	Location heading in degrees.
19	2 Bytes	-	SPEED	-	Location speed value in the following format: xxx.x (Divide by 10 to get km/h)
21	1 Byte	-	GPS SATELLITES	-	Number of GPS satellites available.
22	1 Byte	-	LOCATION STATUS	-	<p>Location status:</p> <ul style="list-style-type: none"> 1 Latitude direction 2 Longitude direction 4 GSM Network status 8 GPS Status 16 GPS Antenna Status 32 Internal battery <p>NORTH is latitude direction = 1 SOUTH is latitude direction = 0 EAST is longitude direction = 0 WEST is longitude direction = 1</p> <p>GPS Status = 1, means the GPS is not fix, and the coordinates are old or outdated GPS Status = 0, means the GPS is fix, and the coordinates are updated</p> <p>GSM Network Status = 1, means the GSM is not register GSM Network Status = 0, means the GSM is register</p> <p>GPS antenna status = 1, GPS antenna plugged GPS antenna status = 0, GPS antenna unplugged</p> <p>Internal battery = 1, unit is powered by the internal battery. (External power supply disconnected) Internal battery = 0, external power supply connected.</p> <p>Note: Sent value is determined by adding the numbers corresponding to the flags above.</p>
23	1 Byte	-	TEMPERATURE 1	-	Temperature sensor 1 value.
24	1 Byte	-	TEMPERATURE 2	-	Temperature sensor 2 value.
25	2 Bytes	-	PERIPHERAL STATE	-	<p>Peripheral state:</p> <ul style="list-style-type: none"> 1 Ignition 2 Digital Port 1 4 Digital Port 2 8 Digital Port 3 (need expansion board) 16 Digital Port 4 (need expansion board) 32 Digital Port 5 (need expansion board) 64 CARRIER Digital Port 1 (If present) 128 CARRIER Digital Port 2 (If present) 256 CARRIER Digital Port 3 (If present) 512 CARRIER Digital Port 4 (If present) 1024 Reserved (Future use) 2048 Reserved (Future use) 4096 Output1 8192 Output2 (need expansion board) 16384 Reserved (Future use) 32768 Reserved (Future use) <p>Note: Sent value is determined by adding the numbers corresponding to the flags above.</p>
27	6 Bytes	-	DRIVER ID	-	Driver ID card number.
33	1 Byte	-	MAIN VOLTAGE	-	External power voltage.
34	1 Byte	-	INTERNAL BATTERY VOLTAGE	-	Internal battery voltage (x10).
35	1 Byte	-	GSM SIGNAL LEVEL	-	GSM network signal level.
36	2 Bytes	-	FUEL TANK LEVEL	-	Fuel tank level.

38	1 Byte	-	TAXIMETER STATE	-	Taximeter State
39	1 Byte	-	ROTATION TIME	Sec	Rotation Time value in seconds
40	6 Bytes	-	TOTAL DISTANCE	m	BCD coded total distance. Value in kilometers
44	2 Bytes	-	ALTITUDE	m	Altitude value in meters

GARMIN NAV TO SERVER MSG (0x3A)

Command	GARMIN NAV TO SERVER				
Description	Send message to Server				
Type	Location Unit → Server				
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x3A	TYPE	-	Command type
1	1 Byte	0x10	Data Link Escape		ASCII DLE character (16 decimal)
2	1 Byte	-	Packet ID		Identifies the type of packet
3	1 Byte	-	Payload size		Number of bytes of payload data
4+n	n bytes	-	App payload		Application Payload [n= 0 to 255 bytes]
4+n + 1	1 Byte	-	Checksum		2's complement of the sum of all bytes from byte 1 to byte n-4 (end of the payload)
4+n + 2	1 Byte	0x10	Data Link Escape		ASCII DLE character (16 decimal)
4+n + 3	1 Byte	0x03	End Of Text		ASCII ETX character (3 decimal)

24HRESET CONFIG (0x3B)

Command	24HRESET CONFIG				
Description	Returns the 24 hours reset configuration.				
Type	Location Unit → Server				
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x3B	TYPE	-	Command type
1	1 Byte	-	DAY OF WEEK	-	Day of the week that the unit make the reset: 1 SUNDAY 2 MONDAY 4 TUESDAY 8 WEDNESDAY 16 THURSDAY 32 FRIDAY 64 SATURDAY
2	1 Byte	-	HOURS	-	Hour of the reset.
3	1 Byte	-	MINUTES	-	Minutes of the reset.

DISTANCE TRAVELLED CONFIG (0x41)

Command	<i>DISTANCE TRAVELLED CONFIG</i>				
Description	Returns the “distance travelled” configuration.				
Type	Location Unit → Server				
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x41	TYPE	-	Command type
1	1 Byte	-	OPTIONS	-	Options this feature: 1 Feature enable 2 Ignition enable
2	1 Byte	0x00	RESERVED	-	<i>Reserved</i>
3	1 Byte	0x00	RESERVED	-	<i>Reserved</i>
4	1 Byte	0x00	RESERVED	-	<i>Reserved</i>
5	4 Bytes	0x00000000	RESERVED	-	<i>Reserved</i>

XPERT GENERIC DATA V2 (0x42)

Command	<i>XPERT GENERIC DATA V2</i>				
Description	Sends Xpert generic data V2 to the server.				
Type	Location Unit → Server				
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x42	TYPE	-	Command type
1	3 Bytes	-	TIME	-	BCD coded Location time (HHMMSS).
4	3 Bytes	-	DATE	-	BCD coded Location date (DDMMYY).
7	2 Bytes	-	ALTITUDE	-	Location altitude.
9	n Bytes	-	XPERT GENERIC DATA V2	-	Note: For more information, see Generic data message protocol V2 – integration guide

FLEXIBLE COM PORT CONFIG (0x44)

Command	<i>FLEXIBLE COM PORTS CONFIG</i>				
Description	Returns the COM port configuration				
Type	Location Unit → Server				
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x44	TYPE	-	Command type
1	1 Byte	-	CANBUS 1	-	CANBUS 1 PORT function: 0x00 - Default (XPERT)
2	1 Byte	-	CANBUS 1 SUB	-	CANBUS 1 PORT sub-function: If CANBUS 1 Function = 0x00: No Sub-function defined
3	1 Byte	-	CANBUS 2	-	CANBUS 2 PORT function: 0x00 - Default (Tachograph Remote Download) 0x01 - EBS system

4	1 Byte	-	CANBUS 2 SUB	-	CANBUS 2 PORT sub-function: If CANBUS 2 Function = 0x00 : No Sub-function defined If CANBUS 2 Function = 0x01: No Sub-function defined
5	1 Byte	-	RS485		RS485 PORT function: 0x00 - Default
6	1 Byte	-	RS485 SUB		RS485 PORT sub-function: If RS485 Function = 0x00: No Sub-function defined
7	1 Byte	-	UART A		Carries the UART A function: 0 - Default (NAV/Bluetooth) ; 1 - Thermograph; 2 - Fridge Machine 3 - GARMIN Navigator
8	1 Byte	-	UART A SUB		UART A PORT sub-function: If UARTA Function = 0x00: No Sub-function defined If UARTA Function = 0x01: No Sub-function defined If UARTA Function = 0x02: Fridge Machine function UARTA SUB = 0x00 - THERMOKING IBOX UARTA SUB = 0x01 - CARRIER GATEWAY If UARTA Function = 0x03: No Sub-function defined
9	1 Byte	-	UART B		Carries the UART A function: 0 - Default (Driver Key) ; 1 - Thermograph; 2 - Fridge Machine 3 - GARMIN Navigator
10	1 Byte	-	UART B SUB		UART b PORT sub-function: If UARB Function = 0x00: No Sub-function defined If UARB Function = 0x01: No Sub-function defined If UARB Function = 0x02: Fridge Machine function UARB SUB = 0x00 - THERMOKING IBOX UARB SUB = 0x01 - CARRIER GATEWAY If UARB Function = 0x03: No Sub-function defined
11	1 Byte	-	RESER. 1		Reserved for future development - Read as 0x00
12	1 Byte	-	RESER. 1 SUB		Reserved for future development - Read as 0x00
13	1 Byte	-	RESER. 2		Reserved for future development - Read as 0x00
14	1 Byte	-	RESER. 2 SUB		Reserved for future development - Read as 0x00

GENERIC DATA VERSION CONFIG (0x5B)

Command	GENERIC DATA VERSION CONFIG				
Description	Returns the generic data version configuration				
Type	Location Unit → Server				
Comment					
Command Contents:					
Byte Offset	Number Format	Value	Name	Unit	Description
0	1 Byte	0x5B	TYPE	-	Command type
1	1 Byte	-	GENERIC DATA VERSION	-	Set the generic data version: 0x00 - Generic data version 1 (DEFAULT) 0x01 - Generic data version 2

4 Examples

4.1 SET GPRS CONFIG by TCP socket

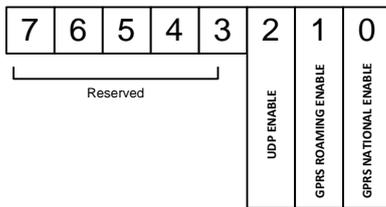
GPRS Configuration command full packet representation. beginner, terminator, byte stuffing and checksum are included:

0F 0F 0A 26 03 31 39 35 2E 32 34 35 2E 31 36 30 2E 32 33 34 00 C9 C3 69 6E 74 65 72 6E 65 74 6D 32 6D 2E 61 69 72 2E 63 6F 6D 00 75 73 65 72 00 70 61 73 73 00 10 89 04

Decode each field:

- 0F 0F → STX STX (Beginner)
- 0A → Protocol Version 10
- 26 → Command Type (0x26)
- 03 → GPRS Configuration options (GPRS National = Enable; GPRS Roaming Enable; UDP Disable)

GPRS Configuration setting flags bit order



- 31 39 35 2E 32 34 35 2E 31 36 30 2E 32 33 34 00 → URL HOST IP ("195.245.160.234")
- C9 C3 → TCP IP Port number = 50121, LSB = C9, MSB = C3
- 69 6E 74 65 72 6E 65 74 6D 32 6D 2E 61 69 72 2E 63 6F 6D 00 → APN ("internetm2m.air.com") Standard ASCII Code
- 75 73 65 72 00 → USERNAME ("user") Standard ASCII Code
- 70 61 73 73 00 → PASSWORD ("pass") Standard ASCII Code
- 10 89 → Checksum = 60497, LSB = 0x51, MSB = 0xEC
- 04 → ETX (Terminator)

4.2 SET UNIT CONFIG by TCP socket

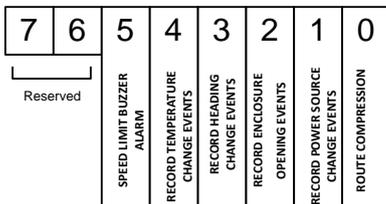
SET UNIT CONFIG command full packet representation. Beginner, terminator, byte stuffing and checksum are included:

0F 0F 0A 24 00 00 00 14 28 78 00 78 00 05 05 3C 00 3C 00 05 05 00 3C 00 3C 00 1A 00 39 FF 03 01 01 05 0F 90 B5 04

Decode each field:

- 0F 0F → STX STX (Beginner)
- 0A → Protocol Version 10
- 24 → Command Type (0x24)
- 00 → Vehicle type = 0
- 00 → Immobilization type = 0
- 00 → Unit Ignition type = 0
- 14 → GPRS UDP to TCP timeout = 20 minutes
- 28 → GPRS TCP to UDP timeout = 40 minutes
- 78 00 → Unit Low Consumption timeout = 120 minutes (LSB = 0x78, MSB = 0x00)
- 78 00 → Unit Maximum Speed = 120 km/h (LSB = 0x78, MSB = 0x00)
- 05 05 → Unit Immobilized Speed = 5 km/h (The first byte is a DLE from byte stuffing)
- 3C 00 → Route Recording National Timer = 60 sec (LSB = 0x3C, MSB = 0x00)
- 3C 00 → Route Recording Roaming Timer = 60 sec (LSB = 0x3C, MSB = 0x00)
- 05 05 00 → Route Recording Speeding Timer = 5 sec (The first byte is a DLE from byte stuffing)
- 3C 00 → Route GPRS Sending National Timer = 60 sec (LSB = 0x3C, MSB = 0x00)
- 3C 00 → Route GPRS Sending Roaming Timer = 60 sec (LSB = 0x3C, MSB = 0x00)
- 1A 00 → GPS Reset Timeout = 26 sec (LSB = 0x1A, MSB = 0x00)
- 39 → Configuration Bits = 0011 1001 (Binary representation)
 ROUTE COMPRESSION = true; RECORD POWER SOURCE CHANGE EVENTS = false; RECORD ENCLOSURE OPENING EVENTS = false;
 RECORD HEADING CHANGE EVENTS = true; RECORD TEMPERATURE CHANGE EVENTS = true; SPEED LIMIT BUZZER ALARM = true.

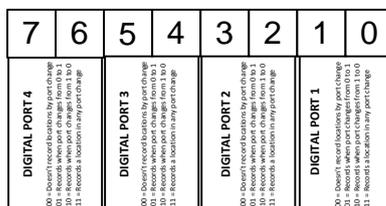
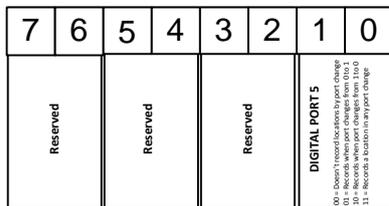
General configuration setting flags bit order



FF 03 → Digital Port Store Variation = 0000 0011 1111 1111 (Binary representation), Port 1,2,3,4 and 5 are configured to record a location in any port change. (0xff = LSB, 0x03 = MSB).

Digital ports location recording trigger (MSB)

Digital ports location recording trigger (LSB)



- 01 → GPRS Reconnect Timeout = 1 minute
- 01 → GPRS Reopen Socket Timeout = 1 minute
- 05 0F → GPRS Reclose Socket Timeout = 15 sec (The first byte is a DLE from byte stuffing)
- 90 B5 → Checksum = 46480, LSB = 0x90, MSB = 0xB5
- 04 → ETX (Terminator)

4.3 UNIT LOCATION command by TCP socket

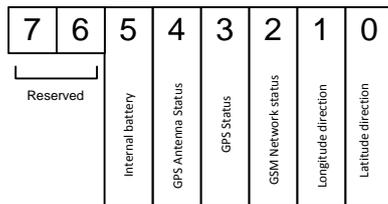
Unit Location information decoded. Beginner, terminator, byte stuffing and checksum are included:

0F 0F 0A 08 63 07 10 12 69 39 55 24 0C 15 35 53 25 11 14 38 44 50 32 00 09 16 12 13 27 01 00 00 00 03 AF AF
 00 00 00 00 00 00 00 0C 00 1D FD FD 85 29 04

Decode each field:

- 0F 0F → STX STX (Beginner)
- 0A → Protocol version: 10
- 08 63 07 10 12 69 39 55 → IMEI number: 863071012693955 (8 bytes representing a 16 BCD value)
- 24 → Command type: 0x24
- 0C → Reason code: UNIT_IGNITION_CHANGED (12)
- 15 35 53 → Time in BCD value: 15:35:53 (hh:mm:ss)
- 25 11 14 → Date in BCD value: 25/11/14 (dd:mm.yy)
- 38 44 50 32 → Latitude coordinate xxmmddd (xx = 38, mm = 44, dddd = 5032).
 xx=degrees; mm=minutes; dddd=decimal part of minutes.
- 00 09 16 12 13 → Longitude coordinate yyymmddd (yyy = 009, mm = 16, dddd = 1213).
 yyy=degrees; mm=minutes; dddd=decimal part of minutes.
- 27 01 → Heading: 295 degrees (LSB = 0x27, MSB = 0x01)
- 00 00 → Speed over ground (km/h) (LSB = 0x00, MSB = 0x00)
- 00 → Number of GPS satellites available: 0
- 03 → Location status: Latitude direction = true (Meaning NORTH); Longitude direction = true (Meaning WEST);

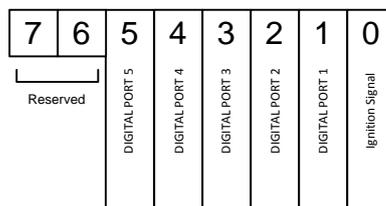
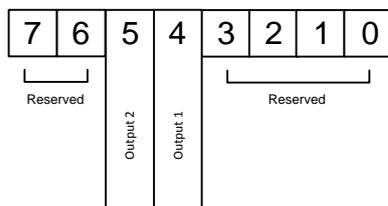
Location status bit order



- AF → Temperature sensors (175 = invalid or no sensor present)
- AF → Temperature sensors (175 = invalid or no sensor present)
- 00 00 → Peripheral state: 0000 0000 0000 0000 (Binary representation)

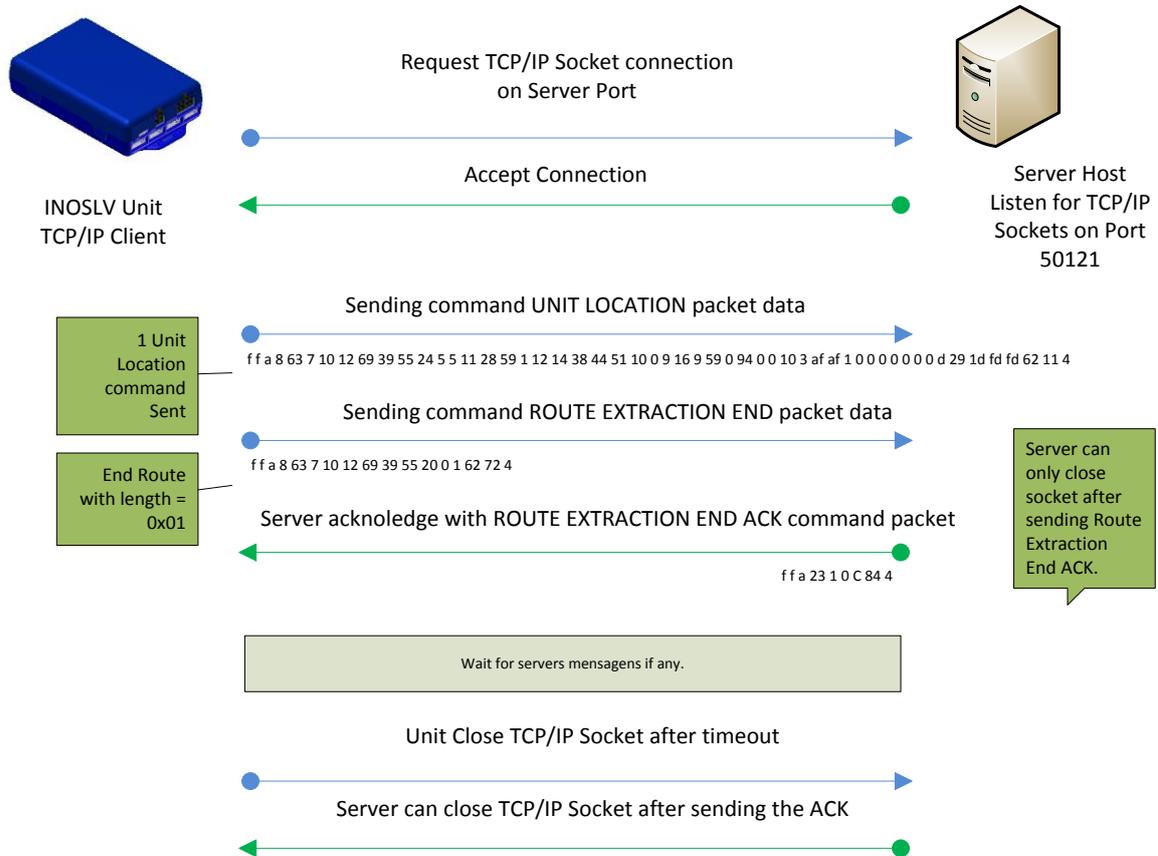
Peripheral state (MSB)

Peripheral state (LSB)



- 00 00 00 00 00 00 → Driver Key (6 bytes)
- 0C → External power voltage: 12 volts
- 00 → Internal battery voltage: 0 volts
- 1D → GSM level: 29
- FD FD → FuelTankLevel: 65021 (LSB = 0xFD, MSB = 0xFD)
- 85 29 → Checksum 10629, LSB = 0x85, MSB = 0x29
- 04 → ETX (Terminator)

4.4 Sending 1 Location and closing TCP/IP socket



4.6 Sending Unit Location message by TCP socket

