

# **Retranslator Protocol Description**

The Retranslator protocol is used to retransmit data in binary format using TCP. Using the protocol, you can transfer location information, values of various sensors, and JPEG images.

# Table of Contents

- Data Type Table ..... 3
- Packet Structure ..... 3
  - Packet Structure Table ..... 3
  - Posinfo Block..... 4
  - Image Block ..... 6
- Example of Packet Parsing..... 8

## Data Type Table

Size (Bytes)	Type	Byte Order	Description
N	Binary	Big-endian	Binary data.
N	String		The value must be converted according to ASCII encoding. Its limit is determined by the zero byte 0x00.
2	Short		An unassigned integer.
4	Integer		A signed integer.
8	Long		A signed integer.
8	Double	Little-endian	A signed fractional number.
1	Byte	-	An unassigned integer.

## Packet Structure

Packet Size	UID	Time	Bitmask	Posinfo Block	Pwr_ext Block	Avl_inputs Block	Block ...
-------------	-----	------	---------	---------------	---------------	------------------	-----------

## Packet Structure Table

Field Type	Field Value	Field Description
Integer	Packet size	The size of the whole packet, excluding the current field. Little-endian byte order. The only exception from the Data Type Table.
String	Unique identifier of the controller	Corresponds to the unique identifier of the hardware unit.
Integer	Time	Timestamp in seconds since January 1, 1970 (UTC±00:00).

Integer	Message mask	bit	Bitmask Description Table	
			0x00000001	Information about location.
			0x00000002	Information about digital inputs.
			0x00000004	Information about digital outputs.
			0x00000010	Alarm bit.
			0x00000020	Driver ID information.
			0xFFFFFC8	Bits are reserved.
-	Data structure	block	A substructure that contains data blocks. Description is below.	

### Data Block Structure

Field Type	Field Value	Field Description	
Short	Block type	Constant: 0x0BBB	
Integer	Block size	The size of the data block, excluding the <i>Block type</i> field and the current field.	
Byte	Stealth attribute	Stealth Attribute Values	
		1	The parameter is hidden. It is not registered in the message.
		0	The parameter is shown. It is registered in the message.

		<p>Note:</p> <ul style="list-style-type: none"><li>To register the <i>Posinfo</i>, <i>Avl_inputs</i>, <i>Avl_outputs</i>, <i>Avl_driver</i> blocks, the stealth attribute should have the value 1.</li><li>To display other blocks when registering the message, the stealth attribute should have the value 1.</li></ul>																				
Byte	Block data type	<table><tr><th colspan="2">Block Data Types</th></tr><tr><td>0x01</td><td>String</td></tr><tr><td>0x02</td><td>Binary (Only for the Posinfo block)</td></tr><tr><td>0x03</td><td>Integer</td></tr><tr><td>0x04</td><td>Double</td></tr><tr><td>0x05</td><td>Long</td></tr><tr><td>0x06</td><td>JPEG image (Only for the Image block)</td></tr></table>	Block Data Types		0x01	String	0x02	Binary (Only for the Posinfo block)	0x03	Integer	0x04	Double	0x05	Long	0x06	JPEG image (Only for the Image block)						
Block Data Types																						
0x01	String																					
0x02	Binary (Only for the Posinfo block)																					
0x03	Integer																					
0x04	Double																					
0x05	Long																					
0x06	JPEG image (Only for the Image block)																					
String	Block name	<table><tr><th colspan="2">Non-variable Block Names</th></tr><tr><td>posinfo</td><td>Information about location</td></tr><tr><td>image</td><td>JPEG image</td></tr><tr><td>avl_inputs</td><td>Values of digital inputs</td></tr><tr><td>avl_outputs</td><td>Values of digital outputs</td></tr><tr><td>avl_driver</td><td>Driver ID</td></tr></table> <hr/> <table><tr><th colspan="2">Recommended Block Names</th></tr><tr><td>adc1, adcN</td><td>Analog sensor values</td></tr><tr><td>gsm</td><td>GSM signal level</td></tr><tr><td>ign</td><td>Ignition. Recommended value: 1/0</td></tr></table>	Non-variable Block Names		posinfo	Information about location	image	JPEG image	avl_inputs	Values of digital inputs	avl_outputs	Values of digital outputs	avl_driver	Driver ID	Recommended Block Names		adc1, adcN	Analog sensor values	gsm	GSM signal level	ign	Ignition. Recommended value: 1/0
Non-variable Block Names																						
posinfo	Information about location																					
image	JPEG image																					
avl_inputs	Values of digital inputs																					
avl_outputs	Values of digital outputs																					
avl_driver	Driver ID																					
Recommended Block Names																						
adc1, adcN	Analog sensor values																					
gsm	GSM signal level																					
ign	Ignition. Recommended value: 1/0																					

		can1, canN	Values of the CAN bus sensor
		pwr_ext	External power supply voltage
		pwr_int	Internal power supply voltage
		The name of the block corresponds to the name of the parameter that will be registered in the message, except for the <i>Posinfo</i> and <i>Image</i> blocks. The block may have another name, but its maximum size is 38 bytes.	
-	-	Block value in accordance with the transmitted value.	

### Posinfo Block

Field Type	Field Value	Field Description
Double	Longitude	Longitude.
Double	Latitude	Latitude.
Double	Altitude	Absolute altitude above sea level. Measured in meters.
Short	Speed	Measured in km/h.
Short	Course	Degrees 0 – 359.
Byte	Number of satellites	If the number of satellites is less than four, the track should be displayed with a dashed line, which indicates insufficient location accuracy.

### Image Block

Field Type	Field Value	Field Description
Long	Title	Constant: 0x0000000000000000.
Integer	Image Size	Only the binary part of the block is included in the size.
Binary	Image	JPEG data.

## **Confirmation of Data Processing**

To each valid incoming packet, the system should send 0x11 as a response. If data is retransmitted from the system to a third-party platform, the response is not required.

## Example of Packet Parsing

Source packet:

74000000333533393736303133343435343835004B0BFB70000000030BBB000000270102706F73696E666F00A027AFDF5D9848403AC7253383DD4B400000000000805A40003601460B0BBB0000001200047077725F657874002B8716D9CE973B400BBB00000011010361766C5F696E707574730000000001
--

74000000 is the packet size (116);

33353339373630313334343534383500 is the controller identifier;  
(353976013445485);

5D515DBB is the UTC time (1565613499 = 2019/08/12 15:38:19);

00000003 is the bitmask (3);

0BBB is the block type (3003);

00000027 is the block size (39);

01 is the stealth attribute (1);

02 is the data type of the block (2);

706F73696E666F00 is the name of the block (posinfo);

A027AFDF5D984840 is the longitude (49.1903648);

3AC7253383DD4B40 is the latitude (55.7305664);

0000000000805A40 is the altitude (106.0);

0036 is the speed (54);

0146 is the course (326);

0B is the number of satellites (11);

0BBB is the block type (3003);

00000012 is the block size (18);

00 is the stealth attribute (0);

04 is the type of block data (4);

7077725F65787400 is the name of the block (pwr\_ext);

2B8716D9CE973B40 is the value (27.593);



0BBB is the block type (3003);

00000011 is the block size (17);

01 is the stealth attribute (1);

03 is the type of block data (3);

61766C5F696E7075747300 is the name of the block (avl\_inputs);

00000001 is the value (1).