



TranSync AIS 140

Quick Developer Guide

TranSync AIS 140
Version V1.2

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1. GPS data packet format

The communication is transferred asynchronously in bytes. The length of each packet transmits between the Device and the server as follow.

Format			Length(Byte)
GPS data packet (48+ optional parameters)	Start Bytes		2
	Packet Length		1
	LAC		2
	Device ID		8
	Information Serial Number		2
	Protocol Number		1
	Information Content	Date Time	6
		Latitude	4
		Longitude	4
		Speed	1
		Course	2
		MNC	1
		Cell ID	2
		Status bit	4
	Additional Info	GSM Signal Strength	1
		Voltage Level	1
		Number of satellites used for fix	1
		HDOP	1
		ADC Value	2
	Optional parameters	Odometer TAG ID	1
		Odometer Length	1
		Odometer Value	5
		RFID TAG ID	1
		RFID Length	1
		RFID Value	N
		ADC-2 Value index	1
		ADC-2 Value length	2
		ADC-2 Value	N
Stop Byte			2

Start Byte

2bytes, 0x2A2A

Packet length

The total no of bytes from “**Packet Length**” to “**Additional Info**” and the default is 44 bytes.

LAC

Location Area Code (LAC) included in LAI consists of two bytes and is encoded in hexadecimal. The available range is 0x0001-0xFFFFE, and the code group 0x0000 and 0xFFFF cannot be used. (See GSM specification 03.03, 04.08 and 11.11).

NOTE: In case of High Resolution data bit set to 1 in status block, LAC will represent event id corresponding to Sensor alert packet generated event id.

Device ID

The Device ID applies IMEI number of 15 bits.

Example: if the IMEI is 123456789012345, the Device ID is 0x01 0x23 0x45 0x67 0x89 0x01 0x23 0x45.

Information Serial Number

The serial number of the first GPRS data (including GPS data packet, heartbeat packet, Command packet) sent after booting is “1”, and the serial number of data sent later at each time will be automatically added “1”.

Protocol Number

The protocol number is 0x10.

Date& time:

Note: Time Stamp will be UTC, Add 5.30 hours to get current time.

Format	Length(Byte)	Example
Year	1	0x0A
Month	1	0x03
Day	1	0x17
Hour	1	0x0F
Minute	1	0x32
Second	1	0x17

Latitude

Four bytes represents latitude value of location data.

Example: 01E15928 (Hexadecimal) 0x01 0xE1 0x59 0x28.

Step: 1 : Latitude : RAW HEX DATA from device 4 Bytes : **01 E1 59 28** - Raw Hex

Step: 2: Latitude : Convert 4 Bytes to decimal : 31545640 - Decimal

Step: 3: Latitude : Divide Decimal Value by long FACTOR = 1800000

Step: 4: After Dividing Result will be : 17.5253 (Latitude).

Longitude

Four bytes represents longitude value of location data. The range of the value is 0-324000000, indicating a range of 0°-180°.

The conversion method herein is same to the method mentioned in Latitude.

Speed

One byte represents running Speed of GPS. The value ranges from 0x00 to 0xFF indicating

A range from 0 to 225km/h. Speed is the average speed of the data interval:

$$\text{SPEED} = \text{Distance travelled since last Location update} / \text{Time elapsed since last location update (Ping Interval)}.$$

Example: 0x00 represents 0 km/h.
 0x10 represents 16km/h.
 0xFF represents 255 km/h.

Course

Two bytes are represents, defining the running direction of GPS. The value ranges from 0° to 360°measured clockwise from north of 0°.

MNC

Mobile Network Code (MNC)

Example: MNC is 0x00

Cell ID

Cell Tower ID (Cell ID) , which value ranges from 0x000000 to 0xFFFFF.

Status

4 bytes data representing various status information of the GPS device. Assuming 4 bytes as 32 bits, the lowest bit is 0 while the highest is 31. In the process of data transmission, the higher one will be transmitted first.

This block of data represents information about different types of alerts and other valuable information. Please check the table below more details.

Byte	Bit	Code Meaning
BYTE_3	Bit 7	0: Live data; 1: Saved data
	Bit 6	0 (Reserved)
	Bit 5	1: GPS not Responding Alert
	Bit 4	0 (Reserved)
	Bit 3	Represents Tracker Type as decimal value(Ex: 111=7 i.e AIS140 Tracker)
	Bit 2	
	Bit 1	
	Bit 0	
BYTE_2	Bit 7	1: Over Speed Alert
	Bit 6	1: SOS Alert
	Bit 5	0 (Reserved)
	Bit 4	1: Immobilization Alert
	Bit 3	0 (Reserved)
	Bit 2	0 (Reserved)
	Bit 1	0 (Reserved)

BYTE_1	Bit 0	Input -4
	Bit 7	0 (Reserved)
	Bit 6	
	Bit 5	
	Bit 4	0 (Reserved)
	Bit 3	0 (Reserved)
	Bit 2	0 (Reserved)
	Bit 1	0 (Reserved)
	Bit 0	0 (Reserved)
BYTE_0	Bit 7	0 : Output 2 OFF; 1 : output 2 ON
	Bit 6	0 : Output 1 OFF; 1 : output 1 ON
	Bit 5	0 : AC(Input -3)OFF ; 1 : AC ON
	Bit 4	0 : Power ON; 1 : Power OFF
	Bit 3	0 : Ignition OFF ; 1 : Ignition ON
	Bit 2	0 : West Longitude ; 1: East Longitude
	Bit 1	0 : South Latitude ; 1: North Longitude
	Bit 0	0 : GPS is not Fixed ; 1: GPS Fixed

*Optional

BYTE_3 LSB nibble represents tracker model with their corresponding integer values.

Tracker Type	Integer Value
P2 basic Tracker	1
Asset Tracker	2
Bike Tracker	3
P2 serial device	4
OBD device	5
L1 Multifunctional	6
AIS 140	7

Additional Info

- GSM Signal Strength:

GSM maximum signal strength is 31 then the value is 0x1F.

- Voltage level:

Internal Battery Voltage level Max value is 42, then the value is 0x2A, i.e. 4.2v.

- Quantity of positioning satellites

If there are 12 satellites, then the value is 0x0C.

- Horizontal dilution of precision (HDOP):

If HDOP value reported has a maximum value of 50, then the value is 0x32.

- ADC value:

If ADC value reported has a value of 5000, then the value is 0x1388

Note: Max ADC value up to 5V =5000mv

Optional parameters

Additional information is represented in TLV (Tag Length Value) format.

- **TAG:** Type of info
- **Length:** Length of value (bytes)
- **Value:** Value of info

Refer optional parameters TAG ID to decode type & value.

Odometer Data

- Index: 0x01
- Length: 0x05 (1 byte hex representing odometer data length in fixed bytes)
- Data: 0000001234 (Hex bytes, value in meters)

RFID Data

- Index: 0x02

- Length: 0x05 (1 byte hex representing RFID data length in variable bytes)
- Data: 0x0000000000 (hex variable bytes)

ADC -2: Data

- Index: 0x05
- Length: 0x02 (2 byte hex representing ADC data length in fixed bytes)
- Data: 0x1234 (Hex bytes, value in Milli Volts)

Note: Max ADC -2 value up to 5V =5000mv

Stop Byte

Fixed value: 0x23 0x23

Protocol Data Example

2A2A3400000865733024047755030010110419043B20020BAB2C07D48B500B00DD003
0000000000F1728080A00000105000002642802050000000000050200002323

Description	No Of Bytes	Description	Data from example
Start Byte	2	Start Bytes	0x2A2A
Packet Length	1	Default is 43 bytes	0x34
LAC	2	The available range is 0x0001-0Xffe	0x0000
Device ID	8	15 digits of IMEI	865733024047755
Information Serial Number	2		0300
Protocol Number	1	The protocol number is 0x10.	0x10
Date Time	6		0x110419043B20
Latitude	4		0x020BAB2C
Longitude	4		0x07D48B50
Speed	1	Average speed is km/hour	0x0B
Course	2		0x00DD
MNC	1		0x00
Cell ID	2		0x3000
Status Byte	4		0x0000000F
GSM Signal Strength	1	Signal strength 1 - 31(Full Signal)	0x17
Voltage Level	1		0x28

No. of Satellites	1		0x08
HDOP	1		0x0A
ADC value	2		0x0000
Odometer Index	1	Odometer data index	01
Odometer Length	1	Odometer data length	05
Odometer Reading	5	Odometer Data	0000026428
RFID Index	1	RFID data index – Fixed	02
RFID Length	1	RFID tag length – Variable	05
RFID Tag	5	Tag ID (n bytes)	0x00000000000
ADC -2	1	ADC-2 data index – Fixed	05
ADC-2 Length	1	ADC-2 length – Variable	02
ADC -2 value	2	ADC -2 (2 bytes)	0x0000
Stop Byte	2	Stop Bytes – Fixed	0x2323

2. Configuration Settings.

Location Update Frequency

Ex: VLTSETTT#0000;PASS#0000;UFRQ#60;

NOTE: Value in Seconds example: 60=1min

Description			No Of Bytes	Remarks	Example from above string
Header	Settings header	VLTSETTT	8	Fixed	VLTSETTT
	Value Separator	#	1	Fixed	#
	Password			Default value -	"0000"
		XXXX	4	"0000"	"0000"
	Token Separator	;	1	Fixed	;
Password Setting	PASS	PASS	4	PASS	PASS
	Value Separator	#	1	Fixed	#
	Value	0000	4	Fixed	0000
	Token Separator	;	1	Fixed	;
User frequency	User frequency Header	UFRQ	4	Fixed	UFRQ
	Value Separator	#	1	Fixed	#
	User frequency	60		Frequency in seconds (Default 30Sec)	60
	Token Separator	;	1	Fixed	;

IP & Port Change Message

VLTSETTT#0000;PASS#0000;IP#172.18.180.218;PORT#1390;

Description			No Of Bytes	Remarks	Example from above string
Header	Settings Header	VLTSETTT	8	Fixed	VLTSETTT
	Value Separator	#	1	Fixed	#
	Password			Default value	
		XXXX	4	"0000"	"0000"
	Token Separator	;	1	Fixed	;
Password setting	Header	PASS	4	Fixed	PASS
	Value Separator	#	1	Fixed	#
	Value	0000	4	Default value	0000

	Token Separator	;	1	Fixed	;
Server IP address of	server / URL Header	IP	2	Fixed	IP
	Value Separator	#	1	Fixed	#
	IP address of server/ URL	XXXXX	Max 25 bytes		Transync.in
	Token Separator	;	1	Fixed	;
Server Port setting	Header	PORT	4		PORT
	Value Separator	;	1		;
	Server Port setting value	XXXXX	5		1390
	Token Separator	;	1	Fixed	;

Ignition OFF Frequency Setting Message

VLTSETTT#0000;PASS#0000;IUFRQ#60;

NOTE: Whenever ignition is OFF data packet frequency 60 seconds.

Description			No Of Bytes	Remarks	Example from above string
Header	Settings header	VLTSETTT	8	Fixed	VLTSETTT
	Value Separator	#	1	Fixed	#
	Password			Default value	
		XXXX	4	"0000"	"0000"
	Token Separator	;	1	Fixed	;
	Header	PASS	4	Fixed	PASS
	Value Separator	#	1	Fixed	#
	Value	0000	4	Default value	0000

	Token Separator	;	1	Fixed	;
Ignition OFF Frequency	IUFRQ Header	IUFRQ	4	Fixed	IUFRQ
	Value Separator	#	1	Fixed	#
	IUFRQ	XX			60
	Token Separator	;	1	Fixed	;

Output Control Message (immobilization)

Immobilization Control 1

- VLT;0000;GPO1#ON;
- VLT;0000;GPO1#OFF;

Response: VLT;0000;GP1 OFF;DEVICEIMEINUMBER#

Note : Immobilization Alert will send only for Output Control 1

Output Control 2

- VLT;0000;GPO2#ON;
- VLT;0000;GPO2#OFF;

Response: VLT;0000;GP2 OFF;DEVICEIMEINUMBER#

ODO Meter Reset

- VLT;0000;ODOMTRST;0;

Note: i.e : 0= Integer value in decimal

Response: VLT;0000;ODOMTRST;0;0#

3. Status Command

SMS

VLT;0000;STATUS;

Response:

Tag	Value	Description
VLT	Header	Fixed
TM	07	Tracker Model
FV	G01	Firmware Version
Signal	18%	GSM signal strength
IMEI No	865733024020950	Device ID – to be used in the platform to uniquely identifying the device
PORT	5005	Server Port
IP	185.45.192.166	
GPS	FIX,b	GPS Status
UFRQ	10	10 to 86,400Sec
IUFRQ	30	10 to 86,400Sec

4. Delete History Command

Note: This Command is to be executed when saved logs are not required.

SMS CMD :

VLT;0000;DELHISTORY;

Response: History file deleted

5. Restart Command

SMS CMD :

VLT;0000;RST;

Response: Device is Restarting

6. SMS GPS Position Command

SMS CMD :

VLT;0000;GETLOC;

Example Response Data

Response will be Google maps device position link.

i.e : <https://www.google.co.in/maps/place/17.407512,78.449203;>

7. DATA COMMAND

Note: All commands will work through both SMS and TCP

Data Command Request.

2A2A3D000008657330240477550300402EVLSETTT;PASS#0000;IP#182.18.160.218;PORT#1390;
2323

Request Hex String for IP and Port Change:

VLTSETTT;PASS#0000;IP#182.18.160.218;PORT#1390;

Convert above Ascii to Hex String.

56 4C 54 53 45 54 54 54 3B 50 41 53 53 23 30 30 30 30 3B 49 50 23 31 38 32 2E 31 38 2E 31 36 30 2E 32 31 38 3B
50 4F 52 54 23 31 33 39 30 3B

Example:

2A 2A **3E** 00 00 08 65 73 30 24 04 77 55 03 00 40 **2F** 56 4C 54 53 45 54 54 54 3B 50 41 53 53 23 30 30 30 30 3B
49 50 23 31 38 32 2E 31 38 2E 31 36 30 2E 32 31 38 3B 50 4F 52 54 23 31 33 39 30 3B 23 23

Note: Start byte 2A2A and end byte 2323 are not considered for calculation of string length.

Example:

- i) 3E- Full Packet Length.
- ii) 2F - IP and port change Length Command Length (Convert String to Hex as shown above)

Description	No Of Bytes	Description	Data from example
Start Byte	2	Start Bytes - Fixed	0x2A2A
Packet Length	1	Packet Length – 15 bytes	0x3E
Reserved	2	Reserved Always 0x0000	0x0000
Device ID	8	15 digits of IMEI	0865733024047755
Request Identifier – Unique request ID	2	Range 0x0000 – 0xFFFF	0300
Protocol Number	1	The protocol number is 0x40.	0x40
Command Length	1	Command Length	0x2F
Command Echo		Command	Request command
End Byte	2	End Bytes-Fixed	0x2323

Data Command Response.

2A2A1000000865733024047755030047012DVLTTSETT;PASS#0000;IP#182.18.160.218;PORT#1390; 2323

Description	No Of Bytes	Description	Data from example
Start Byte	2	Start Bytes - Fixed	0x2A2A
Packet Length	1	Packet Length - 16 bytes	0x10
Reserved	2	Reserved Always 0x0000	0x0000
Device ID	8	15 digits of IMEI	0865733024047755
Request Identifier	2	Range 0x0000 – 0xFFFF	0300
Protocol Number	1	The protocol number is 0x47.	0x47
Request Status	1	1 – Success. 0 - Fail	0x01
Command Length	1	Command Length	0x2D
Echo		Command	Same SMS echo in Hex Format
End Byte	2	End Bytes-Fixed	0x2323

Note: Every payload will be in hex bytes except response for configuration setting messages which will be in ASCII.