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1. Status Report

This report ('Status Report') is sent to the server periodically as defined by user to configure 'status report' if conditions for issuing the report are met. The following two (2) tables show how one reporting can be made in 2 different types such as in 'normal' (string) and in 'zip'.

1.1 Zip (HEX, fixed length)

Example (raw data):


81 00 30 03 60 00 00 01 39 FF FF 74 01 00 0E 01 10 0B 11 08 25 27 00 00 00 4F 01 C2 00 00 00 0E 14 02 3B E3 9B 07 90 27 93
18 3B 19 8F 0A 01 01 01 01 EC 000F9FFF

HDR (1 Byte)	PKT_LEN (2 Bytes)	DEV_ID (5 Bytes)	REPORT_MAP (3 Bytes)	MODEL (1 Byte)	SW_VER (3 Bytes)
MSG_TYPE (1 Byte)	DATE (3 Bytes)	TIME (3 Bytes)	CELL_ID (4 Bytes)	MCC (2 Bytes)	MNC (2 Bytes)
LAC (2 Bytes)	RX_LVL (1 Byte)	LAT (4 Bytes)	LON (4 Bytes)	SPD (2 Bytes)	CRS (2 Bytes)
SATT (1 Byte)	FIX (1 Byte)	IN_STATE (1 Byte)	OUT_STATE (1 Byte)	MODE (1 Byte)	STT_RPT_TYPE (1 Byte)
MSG_NUM (2 Bytes)	reserved (1byte)	ASSIGN_MAP (4 Bytes)	S_ASSIGN1 (2 Bytes)	S_ASSIGN2 (2 Bytes)	S_ASSIGN3 (2 Bytes)
S_ASSIGN4 (2 Bytes)	S_ASSIGN5 (2 Bytes)	S_ASSIGN6 (2 Bytes)	S_ASSIGN7 (2 Bytes)	S_ASSIGN8 (2 Bytes)	S_ASSIGN9 (2 Bytes)
S_ASSIGN10 (2 Bytes)	S_ASSIGN11 (2 Bytes)	S_ASSIGN12 (2 Bytes)	S_ASSIGN13 (2 Bytes)	S_ASSIGN14 (2 Bytes)	S_ASSIGN15 (2 Bytes)
M_ASSIGN1 (4 Bytes)	M_ASSIGN2 (4 Bytes)	M_ASSIGN3 (4 Bytes)	M_ASSIGN4 (4 Bytes)	M_ASSIGN5 (4 Bytes)	M_ASSIGN6 (4 Bytes)
M_ASSIGN7 (4 Bytes)	M_ASSIGN8 (4 Bytes)	L_ASSIGN1 (8 Bytes)	L_ASSIGN2 (8 Bytes)	L_ASSIGN3 (8 Bytes)	L_ASSIGN4 (8 Bytes)
L_ASSIGN5 (8 Bytes)	L_ASSIGN6 (8 Bytes)	L_ASSIGN7 (8 Bytes)	L_ASSIG8 (8 Bytes)		

Field	Data	Conversion	Description
HDR	81		Header of Status Report. <ul style="list-style-type: none"> 81: No ACK response required 91: Required ACK response
PKT_LEN	00 32		Length of zip data excluding HDR and PKT_LEN
DEV_ID	03 60 00 00 01	HEX	Device ID , BCD Format Value: 0360000001 If the Device ID is 0360000001, this field will be filled with 0x03, 0x60, 0x00, 0x00 and 0x01.
REPORT_MAP (Map Bit 0)	39 FF FF	HEX -> BIN	Map of the headers that are included in the report Bit 0: REPORT_MAP Bit 1: MODEL Bit 2: SW_VER Bit 21: MSG_NUM

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			Bit 22: reserved Bit 23: Assign Map
MODEL (Map Bit 1)	MODEL (Map Bit 1)	74	HEX -> DEC
SW_VER (Map Bit 2)	01 00 0E	HEX -> DEC	Software Version. Value: 1.0.14
MSG_TYPE (Map Bit 3)	01	HEX -> DEC	Data to check whether this report is on-line or stored. Real Time (1) Or Stored (0) Message
DATE (Map Bit 4)	10 0B 11	HEX -> DEC	Date (Year + Month + Day) when this report is created. Value: 2016/11/17 Ex) 16 : 0x10, 11 : 0x0B, 17 : 0x11
TIME (Map Bit 5)	08 25 27	HEX -> DEC	Time (Hour + Minute + Second) when this report is created. Value: 08:37:39 Ex) 08: 0x08, 37: 0x25, 39: 0x27
CELL_ID (Map Bit 6)	00 00 00 4F	HEX	Unique Id of Serving Cell. Value: 0000004F First 2 bytes are always 0 when the device connected to 2G network.
MCC (Map Bit 7)	01 C2	HEX -> DEC	Mobile Country Code Value: 450
MNC (Map Bit 8)	00 00	HEX -> DEC	Mobile Network Code Value: 0
LAC (Map Bit 9)	00 0E	HEX	Location Area Code Value: 0014
RX_LVL (Map Bit 10)	14	HEX -> DEC	Signal Strength (See table in Normal report below) Value: 20 Please refer RX_LVL row of below table, in the 1.2 Normal.
LAT (Map Bit 11)	02 3B E3 9B	HEX -> DEC	Latitude position Value: +37.479323 Bit 31: <ul style="list-style-type: none"> • 1 = negative • 0 = positive To convert take HEX(02B3E39B) and convert to Decimal value of 37,479,323 then divide by 1,000,000
LON (Map Bit 12)	07 90 27 93	HEX -> DEC	Longitude position Value: +126.887827 Bit 31: <ul style="list-style-type: none"> • 1 = negative • 0 = positive To convert take HEX(07902793) and convert to Decimal value of 126,887,827 then divide by 1,000,000
SPD (Map Bit 13)	18 3B	HEX -> DEC	Speed Value: 062.03 HEX(18 3B) = Decimal 6,203 Take the decimal value and divide by 100 to get 62.03km/h

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CRS (Map Bit 14)	19 8F	HEX -> DEC	Course (Heading) on the ground in degree Value: 65.43 HEX(19 8F) = Decimal 6,543 Take the decimal value and divide by 100 to get 65.43 degrees
SATT (Map Bit 15)	0A	HEX -> DEC	Number of GPS Satellites
FIX (Map Bit 16)	01	HEX -> DEC	GPS Fix Status '1' or '0' <ul style="list-style-type: none"> 1 => GPS is fixed 0 => GPS is not fixed. The position of this report is last position that the device can receive.
IN_STATE (Map Bit 17)	FF	HEX -> BIN	Not support (reports with FF if enabled)
OUT_STATE (Map Bit 18)	FF	HEX -> BIN	Not support (reports with FF if enabled)
MODE (Map Bit 19)	01	HEX -> DEC	Mode the Device is in: <ul style="list-style-type: none"> 0 = Parking 1 = Driving 8 = Driving and Charging
STT_RPT_TYPE (Map Bit 20)	01	HEX -> DEC	Type of Report <ul style="list-style-type: none"> 0 = Response by CMD request 1 = Time 3 = Angle/Heading (Only ST4950) 4 = Heart Beat
MSG_NUM (Map Bit 21)	01 EC	HEX -> DEC	Value: 0492 Message number. After 9999, message number returns to 0.
reserved (Map Bit 22)			Reserved field (reports with FF if enabled)
ASSIGN_MAP (Map Bit 23)	000F9FFF	HEX -> BIN	Map of the custom assignable headers that can be included at the end of the standard report format. See Tables for Small, Medium, and Large Assign option below for more information Bit 0: S_ASSIGN1 (2 Bytes) Bit 1: S_ASSIGN2 (2 Bytes) Bit 14: S_ASSIGN15 (2 Bytes) Bit 15: M_ASSIGN1 (4 Bytes) Bit 22: M_ASSIGN8 (4 Bytes) Bit 23: L_ASSIGN1 (8 Bytes) ... Bit 30: L_ASSIGN8 (8 Bytes) Bit 31: reserved
S_ASSIGN1 (Assign_Map Bit 0)			Custom Small Assignable Header (2 Bytes in length)
S_ASSIGN2 (Assign_Map Bit 1)			
S_ASSIGN3 (Assign_Map Bit 2)			



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S_ASSIGN4 (Assign_Map Bit 3)			
S_ASSIGN5 (Assign_Map Bit 4)			
S_ASSIGN6 (Assign_Map Bit 5)			
S_ASSIGN7 (Assign_Map Bit 6)			
S_ASSIGN8 (Assign_Map Bit 7)			
S_ASSIGN9 (Assign_Map Bit 8)			
S_ASSIGN10 (Assign_Map Bit 9)			
S_ASSIGN11 (Assign_Map Bit 10)			
S_ASSIGN12 (Assign_Map Bit 11)			
S_ASSIGN13 (Assign_Map Bit 12)			
S_ASSIGN14 (Assign_Map Bit 13)			
S_ASSIGN15 (Assign_Map Bit 14)			Custom Small Assignable Header (2 Bytes in length)
M_ASSIGN1 (Assign_Map Bit 15)			Custom Medium Assignable Header (4 Bytes in length)
M_ASSIGN2 (Assign_Map Bit 16)			
M_ASSIGN3 (Assign_Map Bit 17)			
M_ASSIGN4 (Assign_Map Bit 18)			
M_ASSIGN5 (Assign_Map Bit 19)			
M_ASSIGN6 (Assign_Map Bit 20)			
M_ASSIGN7 (Assign_Map Bit 21)			
M_ASSIGN8 (Assign_Map Bit 22)			Custom Medium Assignable Header (4 Bytes in length)
L_ASSIGN1 (Assign_Map Bit 23)			Custom Large Assignable Header (8 Bytes in length)
L_ASSIGN2 (Assign_Map Bit 24)			
L_ASSIGN3 (Assign_Map Bit 25)			
L_ASSIGN4 (Assign_Map Bit 26)			
L_ASSIGN5 (Assign_Map Bit 27)			
L_ASSIGN6 (Assign_Map Bit 28)			
L_ASSIGN7 (Assign_Map Bit 29)			
L_ASSIGN8 (Assign_Map Bit 30)			Custom Large Assignable Header (8 Bytes in length)

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<Examples> (When a MAP header is included it will be underlined)

CASE 1: Minimal Data Status Report Example

81 00 21 03 60 00 00 01 39 F8 39 01 10 0B 11 08 25 27 02 3B E3 9B 07 90 27 93 18 3B 19 8F 0A 01 01 02 01 EC

CASE 2: Minimal Data Status Report Example & Status Report Map Removed

81 00 1E 03 60 00 00 01 01 10 0B 11 08 25 27 02 3B E3 9B 07 90 27 93 18 3B 19 8F 0A 01 01 02 01 EC

CASE 3: Standard Status Report Example with added assign options below

- S_ASSIGN1 = BAT_VOLT, S_ASSIGN2 = IN_TEMP, S_ASSIGN2 = IN_HUM, M_ASSIGN2 = DED_BLE1_ID, L_ASSIGN1 = TEMP_ID1

81 00 42 03 60 00 00 01 BF FF FF 24 01 00 0E 01 10 0B 11 08 25 27 00 00 00 4F 01 C2 00 00 00 0E 14 02 3B E3 9B 07 90 27 93 18 3B 19 8F 0A 01 05 08 01 02 01 EC 00 80 80 0D 00 28 01 21 10 FE 00 80 17 57 FF FF FF FF FF FF FF FF

CASE 4: Standard Status Report Example with added assign options below

- S_ASSIGN1 = BAT_VOLT, S_ASSIGN2 = IN_TEMP, S_ASSIGN2 = IN_HUM, M_ASSIGN2 = DED_BLE1_ID, L_ASSIGN1 = TEMP_ID1
- ASSIGN_MAP removed from report

81 00 3E 03 60 00 00 01 3F FF FF 24 01 00 0E 01 10 0B 11 08 25 27 00 00 00 4F 01 C2 00 00 00 0E 14 02 3B E3 9B 07 90 27 93 18 3B 19 8F 0A 01 05 08 01 02 01 EC 00 28 01 21 10 FE 00 80 17 57 FF FF FF FF FF FF FF FF



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1.2 Normal (ASCII, variable length)

Example Raw Zip Data:

81 00 32 03 60 00 00 01 39 FF FF 74 01 00 0E 01 10 0B 11 08 25 27 00 00 00 4F 01 C2 00 00 00 0E 14 02 3B E3 9B 07 90 27 93
18 3B 19 8F 0A 01 01 01 01 EC 000F9FFF

Example Normal Data (ASCII):

STT;0360000001;39FFFF;116;1.0.14;1;20161117;08:37:39;0000004F;450;0;0014;20;+37.479323;+126.887827;62.03;65.43;10
;1;1;1;0492 000F9FFF

HDR	PKT_LEN	DEV_ID	REPORT_MAP	MODEL	SW_VER
MSG_TYPE	DATE	TIME	CELL_ID	MCC	MNC
LAC	RX_LVL	LAT	LON	SPD	CRS
SATT	FIX	IN_STATE	OUT_STATE	MODE	STT_RPT_TYPE
MSG_NUM	reserved	ASSIGN_MAP	S_ASSIGN1	S_ASSIGN2	S_ASSIGN3
S_ASSIGN4	S_ASSIGN5	S_ASSIGN6	S_ASSIGN7	S_ASSIGN8	S_ASSIGN9
S_ASSIGN10	S_ASSIGN11	S_ASSIGN12	S_ASSIGN13	S_ASSIGN14	S_ASSIGN15
M_ASSIGN1	M_ASSIGN2	M_ASSIGN3	M_ASSIGN4	M_ASSIGN5	M_ASSIGN6
M_ASSIGN7	M_ASSIGN8	L_ASSIGN1)	L_ASSIGN2	L_ASSIGN3	L_ASSIGN4
L_ASSIGN5	L_ASSIGN6	L_ASSIGN7	L_ASSIGN8		

Field	Data	Max Length	Description
HDR	STT	3-4 char	Header of Status Report. <ul style="list-style-type: none"> STT: No ACK response required ASTT: Required ACK response
DEV_ID	0360000001	10 char	Device ID.
REPORT_MAP (Map Bit 0)	39FFFF	6 char	Map of the headers that are included in the report Bit 0: REPORT_MAP Bit 1: MODEL Bit 2: SW_VER Bit 21: MSG_NUM Bit 22: reserved Bit 23: Assign Map
MODEL (Map Bit 1)	116	3 char	Device Model (According to model table). Please refer MODEL row of above table, in the 1.1 ZIP.
SW_VER (Map Bit 2)	1.0.14	String	Software Version.
MSG_TYPE (Map Bit 3)	1	1 char	Data to check whether this report is on-line or stored. Report is real time (1); Report is storage (0).
DATE (Map Bit 4)	20161117	8 char	GPS date yyyyymmdd or (Year + Month + Day)
TIME (Map Bit 5)	08:37:39	8 char	GPS time hh:mm:ss or (Hour : Minute : Second)
CELL_ID (Map Bit 6)	0000004F	8 char	Unique ID of Serving Cell. 8 digit hex First 4 digits are always 0 when the device connected to 2G


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			network.
MCC (Map Bit 7)	450	String	Mobile Country Code. 0 ~ 65535
MNC (Map Bit 8)	0	String	Mobile Network Code. 0 ~ 65535
LAC (Map Bit 9)	0014	4 char	Location Area Code. 4 digits hex
RX_LVL (Map Bit 10)	20	String	Signal Strength. 0 ~ 63 in 2G. 0: less than -110 dBm 1: -110 to -019 dBm 62: -49 to -48 dBm 63: greater than -48 dBm 0 ~ 65 in 3G/4G. 0: less than -105 dBm 1: -104 to -103 dBm 64: -41 to -40 dBm 65: greater than -40 dBm
LAT (Map Bit 11)	+37.479323	String	Latitude (+/-xx.xxxxxx).
LON (Map Bit 12)	+126.887827	String	Longitude (+/-xxx.xxxxxx).
SPD (Map Bit 13)	62.03	String	Speed in km/h. (1 km/h = 0.621371 mph)
CRS (Map Bit 14)	65.43	String	Course (Heading) on the ground in degree.
SATT (Map Bit 15)	10	String	Number of GPS satellites.
FIX (Map Bit 16)	1	1 char	Fix Status: '1' or '0' <ul style="list-style-type: none"> 1 => GPS is fixed 0 => GPS is not fixed. The position of this report is last position that the device can receive.
IN_STATE (Map Bit 17)	00000000	String	Not support.
OUT_STATE (Map Bit 18)	00000000	String	Not support.
MODE (Map Bit 19)	1	1 char	Mode the Device is in: <ul style="list-style-type: none"> 0 = Parking 1 = Driving 8 = Driving and Charging
STT_RPT_TYPE (Map Bit 20)	1	1 char	Type of Report: <ul style="list-style-type: none"> 0 = Response by CMD request 1 = Time 3 = Angle/Heading (Only ST4950) 4 = Heart Beat
MSG_NUM (Map Bit 21)	0492	4 char	Message number. After "9999" is reported, message number returns to "0000"
reserved (Map Bit 22)			Reserved field (reports blank if enabled)



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ASSIGN_MAP (Map Bit 23)	000F9FFF	HEX -> BIN	<p>Map of the custom assignable headers that can be included at the end of the standard report format.</p> <p>See Tables for Small, Medium, and Large Assign option below for more information</p> <p> Bit 0: S_ASSIGN1 (2 Bytes) Bit 1: S_ASSIGN2 (2 Bytes) Bit 14: S_ASSIGN15 (2 Bytes) Bit 15: M_ASSIGN1 (4 Bytes) Bit 22: M_ASSIGN8 (4 Bytes) Bit 23: L_ASSIGN1 (8 Bytes) ... Bit 30: L_ASSIGN8 (8 Bytes) Bit 31: reserved </p>
S_ASSIGN1 (Assign_Map Bit 0)			Custom Small Assignable Header (2 Bytes in length) See options in table 5 below
S_ASSIGN2 (Assign_Map Bit 1)			
S_ASSIGN3 (Assign_Map Bit 2)			
S_ASSIGN4 (Assign_Map Bit 3)			
S_ASSIGN5 (Assign_Map Bit 4)			
S_ASSIGN6 (Assign_Map Bit 5)			
S_ASSIGN7 (Assign_Map Bit 6)			
S_ASSIGN8 (Assign_Map Bit 7)			
S_ASSIGN9 (Assign_Map Bit 8)			
S_ASSIGN10 (Assign_Map Bit 9)			
S_ASSIGN11 (Assign_Map Bit 10)			
S_ASSIGN12 (Assign_Map Bit 11)			
S_ASSIGN13 (Assign_Map Bit 12)			
S_ASSIGN14 (Assign_Map Bit 13)			
S_ASSIGN15 (Assign_Map Bit 14)			Custom Small Assignable Header (2 Bytes in length)
M_ASSIGN1 (Assign_Map Bit 15)			Custom Medium Assignable Header (4 Bytes in length)
M_ASSIGN2 (Assign_Map Bit 16)			
M_ASSIGN3 (Assign_Map Bit 17)			
M_ASSIGN4 (Assign_Map Bit 18)			

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M_ASSIGN5 (Assign_Map Bit 19)			
M_ASSIGN6 (Assign_Map Bit 20)			
M_ASSIGN7 (Assign_Map Bit 21)			
M_ASSIGN8 (Assign_Map Bit 22)			Custom Medium Assignable Header (4 Bytes in length) See options in table 6 below
L_ASSIGN1 (Assign_Map Bit 23)			Custom Large Assignable Header (8 Bytes in length) See options in table 7 below
L_ASSIGN2 (Assign_Map Bit 24)			
L_ASSIGN3 (Assign_Map Bit 25)			
L_ASSIGN4 (Assign_Map Bit 26)			
L_ASSIGN5 (Assign_Map Bit 27)			
L_ASSIGN6 (Assign_Map Bit 28)			
L_ASSIGN7 (Assign_Map Bit 29)			
L_ASSIGN8 (Assign_Map Bit 30)			Custom Large Assignable Header (8 Bytes in length)

<Examples> (When a MAP header is included it will be underlined)

CASE 1: Minimal Data Report Example
 STT;0360000001;39F839;1;20161117;08:37:39;+37.479323;+126.887827;62.03;65.43;10;1;1;2;0492

CASE 2: Minimal Data Report Example & Status Report Map Removed
 STT;0360000001;1;20161117;08:37:39;+37.479323;+126.887827;62.03;65.43;10;1;1;2;0492

CASE 3: Standard Report Example with added assign options below


- S_ASSIGN1 = **BAT_VOLT**, S_ASSIGN2 = **IN_TEMP**, S_ASSIGN2 = **IN_HUM**, M_ASSIGN2 = **DED_BLE1_ID**,
 L_ASSIGN1 = **TEMP_ID1**

STT;0360000001;BFFFFFF;36;010;1;20161117;08:37:39;0000004F;450;0;0014;20;+37.479323;+126.887827;62.03;65.43;10;1;00000101;00001000;1;2;0492;0080800D;4.1;+29.0;43.40;801757;FFFFFFFFFFFFFFFF

CASE 4: Standard Report Example with added assign options below

- S_ASSIGN1 = **BAT_VOLT**, S_ASSIGN2 = **IN_TEMP**, S_ASSIGN2 = **IN_HUM**, M_ASSIGN2 = **DED_BLE1_ID**,
 L_ASSIGN1 = **TEMP_ID1**
- ASSIGN_MAP removed from report

STT;0360000001;3FFFFFF;36;010;1;20161117;08:37:39;0000004F;450;0;0014;20;+37.479323;+126.887827;62.03;65.43;10;1;00000101;00001000;1;2;0492;4.1;+29.0;43.40;801757;FFFFFFFFFFFFFFFF

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2. Alert Report

Device sends 'Alert' to the server as defined by user in the course of setting the relevant parameters. Most of cases that requiring an alert to be issued means that the vehicle or asset or its driver is in danger or is almost in danger that should be notified by device to the server and/or the cellular phone (If communication via SMS has been configured) for warning.

Have a close look at the fields from the following table for more information on when and what alerts are triggered.

2.1 Zip (HEX, fixed length)

Example (raw data):


82 00 33 03 60 00 00 01 39 FF FF 74 01 00 0E 01 10 0B 11 08 25 27 00 00 00 4F 01 C2 00 00 00 0E 14 02 3B E3 9B 07 90 27 93
18 3B 19 8F 0A 01 4B 01 02 00 DF 00018000

HDR (1 Byte)	PKT_LEN (2 Bytes)	DEV_ID (5 Bytes)	REPORT_MAP (3 Bytes)	MODEL (1 Byte)	SW_VER (3 Bytes)
MSG_TYPE (1 Byte)	DATE (3 Bytes)	TIME (3 Bytes)	CELL_ID (4 Bytes)	MCC (2 Bytes)	MNC (2 Bytes)
LAC (2 Bytes)	RX_LVL (1 Byte)	LAT (4 Bytes)	LON (4 Bytes)	SPD (2 Bytes)	CRS (2 Bytes)
SATT (1 Byte)	FIX (1 Byte)	IN_STATE (1 Byte)	OUT_STATE (1 Byte)	ALERT_ID (1 Byte)	ALERT_MODE (2 Bytes)
ALERT_DATA	reserved (1byte)	ASSIGN_MAP (4 Bytes)	S_ASSIGN1 (2 Bytes)	S_ASSIGN2 (2 Bytes)	S_ASSIGN3 (2 Bytes)
S_ASSIGN4 (2 Bytes)	S_ASSIGN5 (2 Bytes)	S_ASSIGN6 (2 Bytes)	S_ASSIGN7 (2 Bytes)	S_ASSIGN8 (2 Bytes)	S_ASSIGN9 (2 Bytes)
S_ASSIGN10 (2 Bytes)	S_ASSIGN11 (2 Bytes)	S_ASSIGN12 (2 Bytes)	S_ASSIGN13 (2 Bytes)	S_ASSIGN14 (2 Bytes)	S_ASSIGN15 (2 Bytes)
M_ASSIGN1 (4 Bytes)	M_ASSIGN2 (4 Bytes)	M_ASSIGN3 (4 Bytes)	M_ASSIGN4 (4 Bytes)	M_ASSIGN5 (4 Bytes)	M_ASSIGN6 (4 Bytes)
M_ASSIGN7 (4 Bytes)	M_ASSIGN8 (4 Bytes)	L_ASSIGN1 (8 Bytes)	L_ASSIGN2 (8 Bytes)	L_ASSIGN3 (8 Bytes)	L_ASSIGN4 (8 Bytes)
L_ASSIGN5 (8 Bytes)	L_ASSIGN6 (8 Bytes)	L_ASSIGN7 (8 Bytes)	L_ASSIGN8 (8 Bytes)		

Field	Data	Conversion	Description
HDR	82		Header of Alert Report. <ul style="list-style-type: none"> 82: No ACK response required 92: Required ACK response
PKT_LEN	00 33		Length of zip data excluding HDR and PKT_LEN
DEV_ID	03 60 00 00 01	HEX	Device ID , BCD Format Value: 0360000001 If the Device ID is 0360000001, this field will be filled with 0x03, 0x60, 0x00, 0x00 and 0x01.
REPORT_MAP (Map Bit 0)	39 FF FF	HEX -> BIN	Map of the headers that are included in the report Bit 0: REPORT_MAP Bit 1: MODEL Bit 2: SW_VER Bit 21: MSG_NUM

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			Bit 22: reserved Bit 23: Assign Map														
MODEL (Map Bit 1)	74	HEX -> DEC	Model No. Value: 116 (ST4910) Device Model (According to table model). Model Identification Table <table border="1" data-bbox="790 593 1173 855"> <thead> <tr> <th>Model</th> <th>ID</th> </tr> </thead> <tbody> <tr> <td>ST4910</td> <td>101 (116)</td> </tr> <tr> <td>ST4910B</td> <td>102</td> </tr> <tr> <td>ST4950</td> <td>103 (117)</td> </tr> <tr> <td>ST4950B</td> <td>104</td> </tr> <tr> <td>ST4950DS</td> <td>118</td> </tr> <tr> <td>ST4950BDS</td> <td>119</td> </tr> </tbody> </table>	Model	ID	ST4910	101 (116)	ST4910B	102	ST4950	103 (117)	ST4950B	104	ST4950DS	118	ST4950BDS	119
Model	ID																
ST4910	101 (116)																
ST4910B	102																
ST4950	103 (117)																
ST4950B	104																
ST4950DS	118																
ST4950BDS	119																
SW_VER (Map Bit 2)	01 00 0E	HEX -> DEC	Software Version. Value: 1.0.14														
MSG_TYPE (Map Bit 3)	01	HEX -> DEC	Data to check whether this report is on-line or stored. Real Time (1) Or Stored (0) Message														
DATE (Map Bit 4)	10 0B 11	HEX -> DEC	Date (Year + Month + Day) when this report is created. Value: 2016/11/17 Ex) 16 : 0x10, 11 : 0x0B, 17 : 0x11														
TIME (Map Bit 5)	08 25 27	HEX -> DEC	Time (Hour + Minute + Second) when this report is created. Value: 08:37:39 Ex) 08: 0x08, 37: 0x25, 39: 0x27														
CELL_ID (Map Bit 6)	00 00 00 4F	HEX	Unique Id of Serving Cell. Value: 0000004F First 2 bytes are always 0 when the device connected to 2G network.														
MCC (Map Bit 7)	01 C2	HEX -> DEC	Mobile Country Code Value: 450														
MNC (Map Bit 8)	00 00	HEX -> DEC	Mobile Network Code Value: 0														
LAC (Map Bit 9)	00 0E	HEX	Location Area Code Value: 0014														
RX_LVL (Map Bit 10)	14	HEX -> DEC	Signal Strength (See table in Normal report below) Value: 20 Please refer RX_LVL row of below table, in the 2.2 Normal.														
LAT (Map Bit 11)	02 3B E3 9B	HEX -> DEC	Latitude position Value: +37.479323 Bit 31: <ul style="list-style-type: none"> • 1 = negative • 0 = positive To convert take HEX(02B3E39B) and convert to Decimal value of														


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			37,479,323 then divide by 1,000,000
LON (Map Bit 12)	07 90 27 93	HEX -> DEC	Longitude position Value: +126.887827 Bit 31: <ul style="list-style-type: none"> • 1 = negative • 0 = positive To convert take HEX(07902793) and convert to Decimal value of 126,887,827 then divide by 1,000,000
SPD (Map Bit 13)	18 3B	HEX -> DEC	Speed Value: 062.03 Unit: km/h HEX(18 3B) = Decimal 6,203 Take the decimal value and divide by 100 to get 62.03km/h
CRS (Map Bit 14)	19 8F	HEX -> DEC	Course (Heading) on the ground in degree Unit: °C Value: 65.43 HEX(19 8F) = Decimal 6,543 Take the decimal value and divide by 100 to get 65.43 degrees
SATT (Map Bit 15)	0A	HEX -> DEC	Number of GPS Satellites
FIX (Map Bit 16)	01	HEX -> DEC	GPS Fix Status '1' or '0' <ul style="list-style-type: none"> • 1 => GPS is fixed • 0 => GPS is not fixed. The position of this report is last position that the device can receive.
IN_STATE (Map Bit 17)	FF	HEX -> BIN	Not support (reports with FF if enabled)
OUT_STATE (Map Bit 18)	FF	HEX -> BIN	Not support (reports with FF if enabled)
ALERT_ID (Map Bit 19)	4B	HEX -> DEC	Alert ID Number Value: 75 (high triggered of 1W temperature) <ul style="list-style-type: none"> • See Alert ID Table
ALERT_MOD (Map Bit 20)	01 02	HEX -> DEC	Contains Modifier for certain Alert IDs <ul style="list-style-type: none"> • First Byte: 1. 1W temperature probe's number. • Second Byte: Length of the ALT_DATA Note) For details on data of other IDs, refer to Chapter 2.3 below.
ALERT_DATA (Map Bit 21)	00 DF	HEX -> DEC	Contains Data for certain Alert IDs, Temperature Data and etc. Note) For details on data of other IDs, refer to Chapter 2.3 below. Unit: °C Ex) HEX (DF) → DEC (224) and then divide by 10. The value is 22.4°C.
reserved (Map Bit 22)			Reserved field (reports with FF if enabled)



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ASSIGN_MAP (Map Bit 23)	00018000	HEX -> BIN	<p>Map of the custom assignable headers that can be included at the end of the standard report format.</p> <p>See Tables for Small, Medium, and Large Assign option below for more information</p> <p>Bit 0: S_ASSIGN1 (2 Bytes) Bit 1: S_ASSIGN2 (2 Bytes) Bit 14: S_ASSIGN15 (2 Bytes) Bit 15: M_ASSIGN1 (4 Bytes) Bit 22: M_ASSIGN8 (4 Bytes) Bit 23: L_ASSIGN1 (8 Bytes) ... Bit 30: L_ASSIGN8 (8 Bytes) Bit 31: reserved</p>
S_ASSIGN1 (Assign_Map Bit 0)			Custom Small Assignable Header (2 Bytes in length)
S_ASSIGN2 (Assign_Map Bit 1)			
S_ASSIGN3 (Assign_Map Bit 2)			
S_ASSIGN4 (Assign_Map Bit 3)			
S_ASSIGN5 (Assign_Map Bit 4)			
S_ASSIGN6 (Assign_Map Bit 5)			
S_ASSIGN7 (Assign_Map Bit 6)			
S_ASSIGN8 (Assign_Map Bit 7)			
S_ASSIGN9 (Assign_Map Bit 8)			
S_ASSIGN10 (Assign_Map Bit 9)			
S_ASSIGN11 (Assign_Map Bit 10)			
S_ASSIGN12 (Assign_Map Bit 11)			
S_ASSIGN13 (Assign_Map Bit 12)			
S_ASSIGN14 (Assign_Map Bit 13)			
S_ASSIGN15 (Assign_Map Bit 14)			Custom Small Assignable Header (2 Bytes in length)
M_ASSIGN1 (Assign_Map Bit 15)			Custom Medium Assignable Header (4 Bytes in length)
M_ASSIGN2 (Assign_Map Bit 16)			
M_ASSIGN3 (Assign_Map Bit 17)			
M_ASSIGN4 (Assign_Map Bit 18)			

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M_ASSIGN5 (Assign_Map Bit 19)			
M_ASSIGN6 (Assign_Map Bit 20)			
M_ASSIGN7 (Assign_Map Bit 21)			
M_ASSIGN8 (Assign_Map Bit 22)			Custom Medium Assignable Header (4 Bytes in length)
L_ASSIGN1 (Assign_Map Bit 23)			Custom Large Assignable Header (8 Bytes in length)
L_ASSIGN2 (Assign_Map Bit 24)			
L_ASSIGN3 (Assign_Map Bit 25)			
L_ASSIGN4 (Assign_Map Bit 26)			
L_ASSIGN5 (Assign_Map Bit 27)			
L_ASSIGN6 (Assign_Map Bit 28)			
L_ASSIGN7 (Assign_Map Bit 29)			
L_ASSIGN8 (Assign_Map Bit 30)			Custom Large Assignable Header (8 Bytes in length)

<Examples> (When a MAP header is included it will be underlined)

CASE 1: Minimal Data Alert ID Report Example
 82 00 1E 03 60 00 00 01 39 98 39 01 10 0B 11 08 25 27 02 3B E3 9B 07 90 27 93 0A 01 4B 03 02 00 DF

CASE 2: Minimal Data Alert ID Report Example & Status Report Map Removed
 82 00 1B 03 60 00 00 01 01 10 0B 11 08 25 27 02 3B E3 9B 07 90 27 93 0A 01 4B 03 02 00 DF

CASE 3: Standard Alert ID Report Example with added assign options below

- M_ASSIGN = **DRIVING_TIME**, M_ASSIGN = **PARKING_TIME**

82 00 43 03 60 00 00 01 BF FF FF 24 01 00 0E 01 10 0B 11 08 25 27 00 00 00 4F 01 C2 00 00 00 0E 14 02 3B E3 9B 07 90 27 93 18 3B 19 8F 0A 01 05 08 4B 03 02 00 DF 00 01 80 00 **00 00 00 05** **00 00 05 C4**

CASE 4: Standard Alert ID Report Example with added assign options below

- M_ASSIGN = **DRIVING_TIME**, M_ASSIGN = **PARKING_TIME**
- ASSIGN_MAP removed from report

82 00 3F 03 60 00 00 01 BF FF FF 24 01 00 0E 01 10 0B 11 08 25 27 00 00 00 4F 01 C2 00 00 00 0E 14 02 3B E3 9B 07 90 27 93 18 3B 19 8F 0A 01 05 08 4B 03 02 00 DF **00 00 00 05** **00 00 05 C4**

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2.2 Normal (ASCII, variable length)

Example Zip Data:


82 00 33 03 60 00 00 01 00 3F FF FF 24 01 00 0E 01 10 0B 11 08 25 27 00 00 00 4F 01 C2 00 00 00 0E 14 02 3B E3 9B 07 90 27
93 18 3B 19 8F 0A 01 01 02 00 DF

Example Normal Data (ASCII):


ALT;0360000001;003FFFFF;36;1.0.14;1;20161117;08:37:39;0000004F;450;0;0014;20;+37.479323;+126.887827;62.03;65.43;1
0;1;75;1;+22.3 00018000

HDR	PKT_LEN	DEV_ID	REPORT_MAP	MODEL	SW_VER
MSG_TYPE	DATE	TIME	CELL_ID	MCC	MNC
LAC	RX_LVL	LAT	LON	SPD	CRS
SATT	FIX	IN_STATE	OUT_STATE	ALERT_ID	ALERT_MODE
ALERT_DATA	reserved	ASSIGN_MAP	S_ASSIGN1	S_ASSIGN2	S_ASSIGN3
S_ASSIGN4	S_ASSIGN5	S_ASSIGN6	S_ASSIGN7	S_ASSIGN8	S_ASSIGN9
S_ASSIGN10	S_ASSIGN11	S_ASSIGN12	S_ASSIGN13	S_ASSIGN14	S_ASSIGN15
M_ASSIGN1	M_ASSIGN2	M_ASSIGN3	M_ASSIGN4	M_ASSIGN5	M_ASSIGN6
M_ASSIGN7	M_ASSIGN8	L_ASSIGN1)	L_ASSIGN2	L_ASSIGN3	L_ASSIGN4
L_ASSIGN5	L_ASSIGN6	L_ASSIGN7	L_ASSIG8		

Field	Data	Max Length	Description
HDR	ALT	3-4 char	Header of Alert Report. <ul style="list-style-type: none"> ALT: No ACK response required AALT: Required ACK response
DEV_ID	0360000001	10 char	Device ID.
REPORT_MAP (Map Bit 0)	39FFFF	6 char	Map of the headers that are included in the report Bit 0: REPORT_MAP Bit 1: MODEL Bit 2: SW_VER Bit 21: MSG_NUM Bit 22: reserved Bit 23: Assign Map
MODEL (Map Bit 1)	116	3 char	Device Model (According to model table). Please refer MODEL row of above table, in the 2.1 ZIP.
SW_VER (Map Bit 2)	1.0.14	String	Software Version.
MSG_TYPE (Map Bit 3)	1	1 char	Data to check whether this report is on-line or stored. Report is real time (1); Report is storage (0).
DATE (Map Bit 4)	20161117	8 char	GPS date yyyyymmdd or (Year + Month + Day)
TIME (Map Bit 5)	08:37:39	8 char	GPS time hh:mm:ss or (Hour : Minute : Second)
CELL_ID (Map Bit 6)	0000004F	8 char	Unique ID of Serving Cell. 8 digit hex First 4 digits are always 0 when the device connected to

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			2G network.
MCC (Map Bit 7)	450	String	Mobile Country Code. 0 ~ 65535
MNC (Map Bit 8)	0	String	Mobile Network Code. 0 ~ 65535
LAC (Map Bit 9)	0014	4 char	Location Area Code. 4 digits hex
RX_LVL (Map Bit 10)	20	String	Signal Strength. 0 ~ 63 in 2G. 0: less than -110 dBm 1: -110 to -019 dBm 62: -49 to -48 dBm 63: greater than -48 dBm 0 ~ 65 in 3G/4G. 0: less than -105 dBm 1: -104 to -103 dBm 64: -41 to -40 dBm 65: greater than -40 dBm
LAT (Map Bit 11)	+37.479323	String	Latitude (+/-xx.xxxxxx).
LON (Map Bit 12)	+126.887827	String	Longitude (+/-xxx.xxxxxx).
SPD (Map Bit 13)	62.03	String	Speed in km/h. (1 km/h = 0.621371 mph)
CRS (Map Bit 14)	65.43	String	Course (Heading) on the ground in degree.
SATT (Map Bit 15)	10	String	Number of GPS satellites.
FIX (Map Bit 16)	1	1 char	Fix Status: '1' or '0' <ul style="list-style-type: none"> 1 => GPS is fixed 0 => GPS is not fixed. The position of this report is last position that the device can receive.
IN_STATE (Map Bit 17)		String	Not support.
OUT_STATE (Map Bit 18)		String	Not support.
ALERT_ID (Map Bit 19)	75	1 char	Alert ID Number: <ul style="list-style-type: none"> See Alert ID Table
ALERT_MOD (Map Bit 20)	1	String	Contains Modifier for certain Alert IDs <ul style="list-style-type: none"> 1W temperature probe's number.
ALERT_DATA (Map Bit 21)	+22.3	String	Contains Data for certain Alert IDs, Temperature Data and etc. Note) For details on data of other IDs, refer to Chapter 2.3 below. Unit: °C
reserved (Map Bit 22)			Reserved field (reports blank if enabled)
ASSIGN_MAP (Map Bit 23)	00018000	8 char	Map of the custom assignable headers that can be included at the end of the standard report format.

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			<p>See Tables for Small, Medium, and Large Assign option below for more information</p> <p>Bit 0: S_ASSIGN1 (2 Bytes) Bit 1: S_ASSIGN2 (2 Bytes) Bit 14: S_ASSIGN15 (2 Bytes) Bit 15: M_ASSIGN1 (4 Bytes) Bit 22: M_ASSIGN8 (4 Bytes) Bit 23: L_ASSIGN1 (8 Bytes) ... Bit 30: L_ASSIGN8 (8 Bytes) Bit 31: reserved</p>
--	--	--	--

<Examples> (When a MAP header is included it will be underlined)

CASE 1: Minimal Data Report Example
 ALT;0360000001;399839;1;20161117;08:37:39;+37.479323;+126.887827;10;1;1;2;0492

CASE 2: Minimal Data Report Example & Status Report Map Removed
 ALT;0360000001;1;20161117;08:37:39;+37.479323;+126.887827;10;1;1;2;0492

CASE 3: Standard Report Example with added assign options below


- M_ASSIGN = DRIVING_TIME, M_ASSIGN = PARKING_TIME

ALT;0360000001;BFFFFFF;26;010;1;20161117;08:37:39;0000004F;450;0;0014;20;+37.479323;+126.887827;62.03;65.43;10;1;00000101;00001000;1;2;0492;00018000;6;1480

CASE 4: Standard Report Example with added assign options below


- M_ASSIGN = DRIVING_TIME, M_ASSIGN = PARKING_TIME
- ASSIGN_MAP removed from report

ALT;0360000001;3FFFFFF;26;010;1;20161117;08:37:39;0000004F;450;0;0014;20;+37.479323;+126.887827;62.03;65.43;10;1;00000101;00001000;1;2;0492;6;1480

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2.3 Alert ID Table

Name	Description	Alert ID (default)	Alert Mod	Alert Data
Power Up	An alert is sent when the device is turned on by HALL sensor.	99	0 = Hall 1 = USB 2 = Charge On 3 = Battery filled up (Parameter 1939) 4 = Unknown (when the device is rebooted by unexpected cause)	-
Shutdown	An alert is sent when the device is turned off by Hall sensor or Battery threshold.	55	0 = By key 1 = Reserved 2 = Battery Low 3 = Command	-
Battery Low	Alert is sent when vehicle battery voltage drops below the 'Low Battery Threshold' in Power.	14	FF 00	-
Mode Changed.	Alert is sent when the vehicle is entering Driving or Park Mode.	18	0 = Parking 1 = Driving	-
Exit Geo-Fence	Alert is sent when the vehicle exits a defined Geo-Fence	5	Geo-Fence ID (1-10) ZIP (1BYTE) + 00 Ex) 0A 00	
Enter Geo-Fence	Alert is sent when the vehicle enters a defined Geo-Fence	6		
Detect Light	Alert is sent when the bright light is detected	20	FF 00	
Charging is detected (ST4950 only)	An alert is sent when the battery of device charge started.	44	FF 00	
Stop charging (ST4950 only)	An alert is sent when the battery of device stop charging.	45	0 = Charger unplugged 1 = Full Charged (or Charge protected)	
SIM card removed		72	FF 00	
Temp. High	Alert is sent when one of the 1-Wire temperature sensor readings goes above the high temperature threshold	75	ZIP: 1 st : no. of 1-W Temp Probe 2 nd : Size of Alert Data Ex) 01 02 Normal: no. of 1-W Temp Probe Ex) 1	Temperature Reading ZIP(2BYTE)
Temp. Low	Alert is sent when one of the 1-Wire temperature sensor readings goes below the low temperature threshold	76	ZIP: 1 st : no. of 1-W Temp Probe 2 nd : Size of Alert Data Ex) 01 02 Normal: no. of 1-W Temp Probe	Temperature Reading ZIP(2BYTE)


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			Ex) 1	
Temp. Return	Alert is sent when one of the 1-Wire temperature sensor readings returns to a temperature reading that is between the low temperature threshold and high temperature threshold	77	ZIP: 1 st : no. of 1-W Temp Probe 2 nd : Size of Alert Data Ex) 01 02 Normal: no. of 1-W Temp Probe Ex) 1	Temperature Reading ZIP(2BYTE)
In Temp. High	Alert is sent when the temperature inside the device goes above the high temperature threshold	110	ZIP: 1 st : no. of Temp Probe 2 nd : Size of Alert Data Ex) ZIP : FF 02	Temperature ZIP(2BYTE)
In Temp. Low	Alert is sent when the temperature inside the device goes below the low temperature threshold	111	ZIP: 1 st : no. of Temp Probe 2 nd : Size of Alert Data Ex) ZIP : FF 02	Temperature ZIP(2BYTE)
In Temp. Return	Alert is sent when the temperature inside the device returns to normal area after high or low threshold alert.	112	ZIP: 1 st : no. of Temp Probe 2 nd : Size of Alert Data Ex) ZIP : FF 02	Temperature ZIP(2BYTE)
In Hum. High	Alert is sent when the humidity inside the device goes above the high temperature threshold	113	ZIP: 1 st : no. of Temp Probe 2 nd : Size of Alert Data Ex) ZIP : FF 02	Humidity ZIP(2BYTE)
In Hum. Low	Alert is sent when the humidity inside the device goes below the low temperature threshold	114	ZIP: 1 st : no. of Temp Probe 2 nd : Size of Alert Data Ex) ZIP : FF 02	Humidity ZIP(2BYTE)
In Hum. Return	Alert is sent when the humidity inside the device returns to normal area after high or low threshold alert.	115	ZIP: 1 st : no. of Temp Probe 2 nd : Size of Alert Data Ex) ZIP : FF 02	Humidity ZIP(2BYTE)
D_BLE IN Alert	Alert is sent when dedicated ELA BEL1 appears and can be started scanning.	119	ZIP: 1 st : none 2 nd : Size of Alert Data Ex) ZIP : FF 06	Ex) ELA BLE: 1 st : BLE ID size 2 nd ~ 4 th : ID 5 th ~6 th : Temperature
D_BLE OUT Alert	Alert is sent when dedicated ELA BEL1 is disappeared.	120	ZIP: 1 st : none 2 nd : Size of Alert Data Ex) ZIP : FF 06	Ex) ELA BLE: 1 st : BLE ID size 2 nd ~ 4 th : ID 5 th ~6 th : Temperature
D_BLE Temp. High	Alert is sent when dedicated ELA BEL's temperature goes above the high threshold.	121	ZIP: 1 st : none 2 nd : Size of Alert Data Ex) ZIP : FF 06	Ex) ELA BLE: 1 st : BLE ID size 2 nd ~ 4 th : ID 5 th ~6 th : Temperature
D_BLE Temp. Low	Alert is sent when dedicated ELA BEL's temperature goes below the low threshold.	122	ZIP: 1 st : none 2 nd : Size of Alert Data Ex) ZIP : FF 06	Ex) ELA BLE: 1 st : BLE ID size 2 nd ~ 4 th : ID 5 th ~6 th : Temperature
D_BLE Temp. Return	Alert is sent when ELA BEL's	123	ZIP:	Ex) ELA BLE:

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	temperature returns to normal area after high or low threshold alert.		1 st : none 2 nd : Size of Alert Data Ex) ZIP : FF 06	1 st : BLE ID size 2 nd ~ 4 th : ID 5 th ~6 th : Temperature
D_BLE Hum. High	Alert is sent when dedicated ELA BEL's humidity goes above the high threshold.	124	ZIP: 1 st : none 2 nd : Size of Alert Data Ex) ZIP : FF 06	Ex) ELA BLE: 1 st : BLE ID size 2 nd ~ 4 th : ID 5 th ~6 th : Humidity
D_BLE Hum. Low	Alert is sent when dedicated ELA BEL's humidity goes below the low threshold.	125	ZIP: 1 st : none 2 nd : Size of Alert Data Ex) ZIP : FF 06	Ex) ELA BLE: 1 st : BLE ID size 2 nd ~ 4 th : ID 5 th ~6 th : Humidity
D_BLE Hum. Return	Alert is sent when ELA BEL's humidity returns to normal area after high or low threshold alert.	126	ZIP: 1 st : none 2 nd : Size of Alert Data Ex) ZIP : FF 06	Ex) ELA BLE: 1 st : BLE ID size 2 nd ~ 4 th : ID 5 th ~6 th : Humidity

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7. Acknowledgment Message

The acknowledgment message can be configured on the device to be required for the specified reports.

7.1 Zip (HEX, fixed length)

Example Zip (raw data): - USA

90 00 07 03 60 00 00 01 91 2C

HDR (1 Byte)	PKT_LEN (2 Bytes)	DEV_ID (5 Bytes)	ACK_RPT (1 Byte)	CHK_SUM (1 Byte)
------------------------	-----------------------------	----------------------------	----------------------------	----------------------------


Field	Data	Conversion	Description
HDR	90		Header of Acknowledge Message.
PKT_LEN	00 07		Length of zip data excluding HDR and PKT_LEN
DEV_ID	03 60 00 00 01	HEX	Value: 100850000 Device ID
ACK_RPT	91		Report in which the platform is Acknowledging <ul style="list-style-type: none"> 91 = ASTT (requires ack) 92 = AALT (requires ack) B6 = ASNB (requires ack) B7 = ASNE (requires ack)
CHK_SUM	2C	HEX -> DEC	The device will add the bytes of the original message that come after the device ID, and the CHK_SUM value in the Acknowledge report will be the first byte: Example Report to Platform: 81 00 0B 03 60 00 00 01 00 00 07 1A 00 0A 01 <ul style="list-style-type: none"> In this example these bytes would be added: 00 00 07 1A 00 0A 01 The total value when added would be: HEX(00 2C) → CHK_SUM would be 2C

Example Zip (raw data): - LATAM

90 00 06 03 60 00 00 01 2C

HDR (1 Byte)	PKT_LEN (2 Bytes)	DEV_ID (5 Bytes)	CHK_SUM (1 Byte)
------------------------	-----------------------------	----------------------------	----------------------------

Field	Data	Conversion	Description
HDR	90		Header of Acknowledge Message.
PKT_LEN	00 06		Length of zip data excluding HDR and PKT_LEN
DEV_ID	03 60 00 00 01	HEX	Device ID
CHK_SUM	2C	HEX -> DEC	CHK_SUM is the checksum of the total report packet. Example Report to Platform: 91 00 0B 03 60 00 00 01 00 00 07 1A 00 0A 01 The total value when added would be: HEX(01 2C) → CHK_SUM would be 2C

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7.2 Normal (ASCII, variable length)

Example Normal Data (ASCII): - USA

ACK;0360000001;ASTT;0F

HDR	DEV_ID	ACK_RPT	CHK_SUM
-----	--------	---------	---------

Field	Data	Max Length	Description
HDR	ACK	8 char	Header of Acknowledge Message.
DEV_ID	0360000001	10 char	Device ID.
ACK_RPT	ASTT	4 char	Report in which the platform is Acknowledging <ul style="list-style-type: none"> • ASTT = Status (requires ack) • AALT = Alert (requires ack) • ASNB = Basic sensor (requires ack) • ASNE = Extended sensor (requires ack)
CHK_SUM	0F	HEX -> DEC	<p>The device will add the bytes of the original message that come after the Device ID, and the CHK_SUM value will be used for Acknowledge messages to verify the server has received all of the information correctly. The server must send the ACK message correctly to the device before any more reports will be sent by the device. Checksum data is allowed in upper case only.</p> <p>Example Report to Platform: Normal: ASTT;5000000001;000007;26;010;1 '\r'(0xD) Raw: 41 53 54 54 3B 31 30 30 38 35 30 30 30 30 30 3B 30 30 30 30 30 37 3B 32 36 3B 30 31 30 3B 31 0D</p> <ul style="list-style-type: none"> • To calculate the CHK_SUM value add each byte value together following the Device ID. In this example these bytes would be added: 30 30 30 30 30 37 3B 32 36 3B 30 31 30 3B 31 0D The total value when added would be: HEX(03 0F) → CHK_SUM would be 0F

Example Normal Data (ASCII): - LATAM

ACK;0360000001;AB


HDR	DEV_ID	CHK_SUM
-----	--------	---------

Field	Data	Max Length	Description
HDR	ACK	8 char	Header of Acknowledge Message.
DEV_ID	0360000001	10 char	Device ID.
CHK_SUM	AB	HEX -> DEC	<p>The device will add the bytes of the original message that come after the Device ID, and the CHK_SUM value will be used for Acknowledge messages to verify the server has received all of the information correctly. The server must send the ACK message correctly to the device before any more reports will be sent by the device. CHK_SUM is the checksum of the total report packet.</p>

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			<p>Example Report to Platform:</p> <p>Normal: ASTT;0360000001;000007;26;010;1 '\r'(0xD)</p> <p>Raw: 41 53 54 54 3B 30 33 36 30 30 30 30 30 30 31 3B 30 30 30 30 37 3B 32 36 3B 30 31 30 3B 31 0D</p> <p>The total value when added would be: HEX(06 AB) → CHK_SUM would be AB</p>
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9. Maintenance Report


The Suntech device will send this report every time it powers up for the first time, and then on a defined interval to check in with the Suntech maintenance server SCUTI.

Example Normal Data (ASCII):

MNT;0360000001;STG.58.1.0.14;20161117;08:37:39;001;NoData;NA;C

HDR	DEV_ID	DEVICE_FW_VER	DATE	TIME	PROF_VER	PHONE#
ANT	BAT					

Field	Data	Max Length	Description
HDR	MNT	3 char	Header of Maintenance Report.
DEV_ID	0360000001	10 char	Device ID.
DEVICE_FW_VER	STG.58.1.0.14	String	Number of the released Software Version.
DATE	20161117	8 char	GPS date <ul style="list-style-type: none"> yyymmdd or (Year + Month + Day)
TIME	08:37:39	8 char	GPS time <ul style="list-style-type: none"> hh:mm:ss or (Hour : Minute : Second)
PROF_VER	001	3 char	This is the last downloaded profile version by OTA or SyncTrak. Factory default value is 001.
PHONE#	NoData	String	Current Phone Number
ANT	C	String	GPS Antenna Check <ul style="list-style-type: none"> C = Connected(Internal antenna) NC = Disconnected SH = Short NA = Not available
BAT	C	String	Battery Check <ul style="list-style-type: none"> C = Connected NC = Disconnected ER = Error

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14. Parameter Report


“Parameter Report” is sent by device for informing with device IP address to server. This report is sent when UDP session is established and device IP is changed by PDP.

Example Normal Data (ASCII):

PRM;6000000001;30;1.0.14;IP:10.158.133.173

HDR	DEV_ID	MODEL	SW_VER	IP_INFO
-----	--------	-------	--------	---------

Field	Data	Max Length	Description
HDR	PRM	3 char	Header of PRM Report.
DEV_ID	6000000001	10 char	Device ID.
MODEL	30	2 char	Device Model (According to table model).
SW_VER	1.0.14	String	Number of the released Software Version.
IP_INFO	IP:10.158.133.173	String	IP:xxx.xxx.xxx.xxx

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15. Small Assign Headers

These headers can be assigned to the standard report structure headers S_ASSIGNX. The Mini Assign Header is limited to 2 Bytes of data for the zip format, and all headers that require more bytes to represent can be found in the Assign Header section. Even if the EMPTY field is checked, it is not displayed in ZIP mode.

Mini Header	ID	Zip Ex	Normal Ex	Description
BAT_VOLT	18			
PWR_VOLT	02			Not support
TEMP_1	03	01 14	+27.6	Temperature Sensor 1 in the chain (1-Wire). <ul style="list-style-type: none"> Zip: If Binary bit 15 is set, then the value is negative. For -27.6 the Zip value would be (81 14) Convert zip to Celsius by converting HEX(01 14) to DEC(276) then divide by 10
IN_TEMP	19			Temperature sensor inside the device
IN_HUM	1A			Humidity sensor inside the device
IN_BARO	1B			Atmospheric pressure sensor inside the device
WIFI1_SIG	1C			Signal of scanned WIFI 1
WIFI2_SIG	1D			Signal of scanned WIFI 2
WIFI3_SIG	1E			Signal of scanned WIFI 3
DED_BLE1_TEMP	1F			Temperature of dedicated BLE device 1
DED_BLE2_TEMP	20			Temperature of dedicated BLE device 2
...				
DED_BLE16_TEMP	2E			Temperature of dedicated BLE device 16
DED_BLE1_HUM	3F			Humidity of the dedicated BLE device 1
DED_BLE2_HUM	41			Humidity of the dedicated BLE device 2
...				
DED_BLE15_HUM	4E			Humidity of the dedicated BLE device 16

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16. Medium Assign Headers

These headers can be assigned to the standard report structure headers M_ASSIGNX. The Assign Header is 4 Bytes of data for the zip format. Even if the EMPTY field is checked, it is not displayed in ZIP mode.

Header	ID	Zip Ex	Normal Ex	Description
DRIVING_TIME	19			Driving cumulative time(Unit: min.)
PARKING_TIME	1A			Parking cumulative time(Unit: min.)
DED_BLE1_ID	1B			ID of dedicated BLE device 1
DED_BLE2_ID	1C			ID of dedicated BLE device 2
...				
DED_BLE16_ID	2A			ID of dedicated BLE device 16

17. Large Assign Headers

These headers can be assigned to the standard report structure headers L_ASSIGNX. The Assign Header is 8 Bytes of data for the zip format. Even if the EMPTY field is checked, it is not displayed in ZIP mode.

Header	ID	Zip Ex	Normal Ex	Description
TEMP_ID1*	02	15 00 00 00 45 0F B8 42	15000000450FB842	Temperature Sensor ID number 1 (1-wire) (*Please refer to the explanation below)
WIFI1_MAC_ADDR	17			Mac address of scanned WIFI 1
WIFI2_MAC_ADDR	18			Mac address of scanned WIFI 2
WIFI3_MAC_ADDR	19			Mac address of scanned WIFI 3

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19. Sensor Report

* Sensor report is only for B Series (ST4910B/ ST4950B/ST4950BDS).

This report is sent to the server periodically as defined by user to configure 'Sensor Saving Interval' and 'Sensor Saving Count to Report'. The following two (4) tables show how to make one sensor reporting in 2 different types such as in 'ZIP' and in 'Normal' (string).

One reporting consists of two reports. For ZIP, 19.1 and 19.2. For normal, 19.3 and 19.4.

First report contains information of time, position, internal sensors and 1W temperature sensor.

And, 2nd report contains temperature and humidity. If 2nd report cannot send all values, the report extends 3rd, 4th and etc.

1st ZIP – 2nd ZIP – 3rd ZIP

Also, if first report cannot send all values, reports should be divided to 1st group, 2nd group and etc.

1st Group : 1st ZIP – 2nd ZIP – 3rd ZIP

2nd Group : 1st ZIP – 2nd ZIP

19.1 1st Zip (HEX)

Example Zip (raw data):

A6 00 48 60 00 00 00 01 03 FF FF 24 01 00 0E 02 01 03 10 0B 11 08 24 27 08 25 08 2F 08 39 02 3B E3 9B 07 90 27 93
00 00 00 64 00 60 00 00 FE 0C FE 00 01 04 01 05 01 06 01 C4 01 C3 01 C2 03 F5 03 F5 03 F5 01 01 04 01 04 01 04

HDR	PKT_LEN	DEV_ID	REPORT_MAP	MODEL	SW_VER
TOTAL_NO	CURR_NO	SCAN_CNT	START_DATE	START_TIME	SCAN_TIME
START_LAT	START_LON	LAT_GAP	LON_GAP	IN_TEMP	IN_HUM
IN_BARO	1W_TEMP_CNT	1W_TEMP	reserved	reserved	reserved

Field	Data	Conversion	Description
HDR	A6		Header of Basic Sensor Report (1 st) <ul style="list-style-type: none"> A6: No ACK response required B6: Required ACK response
PKT_LEN	00 49		Length of zip data excluding HDR and PKT_LEN
DEV_ID	60 00 00 00 01	HEX	Value: 6000000001 Device ID
REPORT_MAP (Map Bit 0)	03 FF FF	HEX -> BIN	Map of the headers that are included in the report Bit 0: REPORT_MAP Bit 1: MODEL Bit 2: SW_VER Bit 16: 1W_TEMP_CNT Bit 17: 1W_TEMP Bit 18: reserved ... Bit23: reserved Please refer "2601: Basic Sensor Report Map".
MODEL (Map Bit 1)	68	HEX	Value: 104 Device Model (According to table model).
SW_VER (Map Bit 2)	01 00 0E	HEX	Value: 1.0.14 Software Version.
TOTAL_NO	02	HEX	Value: 2

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(Map Bit 3)			Total report number to report sensor packet
CURR_NO (Map Bit 4)	01	HEX	Value: 1 Current report number to report sensor packet
SCAN_CNT (Map Bit 5)	03	Hex	Value: 3 Number of the scanning.
START_DATE (Map Bit 6)	10 0B 11	HEX -> DEC	Value: 20161117 GPS Date (Year + Month + Day).
START_TIME (Map Bit 7)	08 24 27	HEX -> DEC	Value: 08:37:39 Time (Hour + Minute + Second).
SCAN_TIME (n) (Map Bit 8)	08 25 08 2F 08 39	HEX -> DEC	Value: 08:37, 08:47, 08:57 Time (House + Minute)
START_LAT (Map Bit 9)	02 3B E3 9B	HEX -> DEC	Value: +37.479323 (position of the 1st packet) Bit 31: <ul style="list-style-type: none"> 1 = negative 0 = positive To convert take HEX(02B3E39B) and convert to Decimal value of 37,479,323 then divide by 1,000,000
START_LON (Map Bit 10)	07 90 27 93	HEX -> DEC	Value: +126.887827 (position of the 1st packet) Bit 31: <ul style="list-style-type: none"> 1 = negative 0 = positive To convert take HEX(07902793) and convert to Decimal value of 126,887,827 then divide by 1,000,000
LAT_GAP (n) (Ma Bit 11)	00 00 00 64 00 60	HEX -> DEC	Gap from previous packet's latitude. This 2 byte is 2's completion (-32768~32767). Value: 00 00 : no use 00 64 : latitude of 2 nd scanning. 2 nd - 1 st 00 60 : latitude of 3 rd scanning. 3 rd - 2 nd Latitude at 2 nd scanning : 1) Hex 023BE39B covers to decimal 37,479,323. 2) Hex 0064 converts to decimal 100. 3) Add gap in previous latitude and then divided by 1,000,000. ((37,479,323 +100)/1,000,000) 4) So, real latitude is +37.479423.
LON_GAP (n) (Map Bit 12)	00 00 FE 0C FE 00	HEX -> DEC	Gap from previous packet's longitude. This 2 byte is 2's completion (-32768~32767). Value: 00 00 : invalid FE 0C : longitude of 2 nd scanning. 2 nd - 1 st FE 00 : longitude of 3 rd scanning. 3 rd - 2 nd Longitude at 2 nd scanning : 1) Hex 07902793 covers to decimal 126,887,827. 2) Hex FE0C converts to decimal, -500.

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			<p>3) Add gap in previous longitude and then device by 1,000,000. ((126,887,827-500)/1,000,000)</p> <p>4) So, real longitude is +126.887327.</p>
IN_TEMP (n) (Map Bit 13)	01 04 01 05 01 06	HEX -> DEC	Internal temperature Value : +27.6°C, +27.7°C, +27.8°C Report Range: -40.0°C ~ 125.0°C If Binary bit 15 is set, then the value is negative. For -27.6 the Zip value would be (81 14). Convert zip to Celsius by converting HEX(01 14) to DEC(276) then divide by 10
IN_HUM (n) (Map Bit 14)	01 C4 01 C3 01 C2	HEX -> DEC	Internal humidity Value: 45.2%, 45.1%, 45.0% Report Range: 0% ~ 100% Convert zip to humidity by converting HEX(11 AC) to DEC(4524) then divide by 10
IN_BARO(n) (Map Bit 15)	03 F5 03 F5 03 F5	HEX -> DEC	Internal barometric pressure of the packet (Atmospheric pressure sensor inside the device) Value: 1013 hPa, 1013 hPa, 1013 hPa Report Range: 300 hPa ~ 1250 hPa Convert zip to Barometric Pressure by converting HEX(00 03 F5) to DEC(1013) then divide by 10
1W_TEMP_CNT (Map Bit 16)	01	HEX	Number of 1-Wire probe ST4910 and ST4950 series are fixed '1'.
1W_TEMP(n) (Map Bit 17)	01 04 01 04 01 04	HEX -> DEC	Value : +27.6°C Temperature of 1-Wire probe Zip: If Binary bit 15 is set, then the value is negative. For -27.6 the Zip value would be (81 14) Convert zip to Celsius by converting HEX(01 14) to DEC(276) then divide by 10 If the value is "FF FF", it means invalid value and it can be reported when the data cannot read at that scan time.
Reserved (Map Bit 18 ~ 23)			Reserved field (reports with FF if enabled)

19.2 2nd ~ nth Zip (HEX)

Example Zip (raw data):

A7 00 3E 60 00 00 00 01 00 0F FF 24 01 00 0E 02 02 03 03 80 07 89 02 4F 39 03 08 88 01 04 01 04 01 04 00 E6 00 E6
 00 E6 00 E7 00 E7 00 E7 01 C4 01 C4 01 C4 01 C2 01 C2 01 C0 01 C2 01 C2 01 C0

HDR	PKT_LEN	DEV_ID	REPORT_MAP	MODEL	SW_VER
TOTAL_NO	CURR_NO	SCAN_CNT	D_ELA_CNT	D_ELA_ID	D_ELA_SEN

Field	Data	Conversion	Description
HDR	A7		Header of Extended Sensor Report (from 2 nd ~ n th) <ul style="list-style-type: none"> A7: No ACK response required B7: Required ACK response
PKT_LEN	00 3E		Length of zip data excluding HDR and PKT_LEN
DEV_ID	60 00 00 00 01 01	HEX	Value: 6000000001 Device ID
REPORT_MAP (Map Bit 0)	00 0F FF	HEX -> BIN	Map of the headers that are included in the report Bit 0: REPORT_MAP Bit 1: MODEL Bit 2: SW_VER Bit 6: D_ELA_CNT Bit 7: D_ELA_ID Bit 8: D_ELA_SEN Bit 9 ~ Bit 23: reserved Please refer "2602: Extended Sensor Report Map".
MODEL (Map Bit 1)	68	HEX	Value: 104 Device Model (According to table model).
SW_VER (Map Bit 2)	01 00 0E	HEX	Value: 1.0.14 Software Version.
TOTAL_NO (Map Bit 3)	02	HEX	Value: 2 Total report number to report sensor packet
CURR_NO (Map Bit 4)	02	HEX	Value: 1 Current report number to report sensor packet
SCAN_CNT (Map Bit 5)	03	Hex	Value: 3 Number of the scanning.
D_ELA_CNT (Map Bit 6)	03	Hex	Number of ELA sensor of the dedicated BLEs in this report. If other brand sensor has 3 hex digit ID, temperature and humidity sensor, it may be assigned to same REPORT_MAP bit.
D_ELA_ID (n) (Map Bit 7)	80 07 89 02 4F 39 03 08 88	HEX	Dedicated BLE ID list which current report includes. Value: 1 st ID = 800789, 2 nd = 024F39, 3 rd = 030888
D_ELA_SEN (2)(n)(n) (Map Bit 8)	01 04 01 04 01 04 00 E6 00 E6 00 E6	HEX -> DEC	Temperature of the dedicated BLE device of this report. Value : 1 st ELA (800789): +27.6°C, +27.6°C, +27.6°C 2 nd ELA (024F39): +23.0°C, +23.0°C, +23.0°C 3 rd ELA (030888): +23.1°C, +23.1°C, +23.1°C Convert zip to Celsius by converting HEX(01 14) to DEC(276) then

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	00 E7 00 E7 00 E7		divide by 10. If Binary bit 15 is set, then the value is negative. For -27.6°C, the ZIP value would be (81 14). If the value is “FF FF”, it means invalid value and it can be reported when the data cannot read at that scan time.
	01 C4 01 C4 01 C4		Humidity of the dedicated BLE device of this report. Value: 45.2% 1 st ELA (800789): 45.2%, 45.2%, 45.2% 2 nd ELA (024F39): +45.0%, 45.0%, 49.8%
	01 C2 01 C2 01 C0		Convert zip to humidity by converting HEX(11 AC) to DEC(4524) then divide by 10 . If the value is “FF FF”, it means invalid value and it can be reported when the data cannot read at that scan time.
	01 C2 01 C2 01 C0		If the value is “FF FF”, it means invalid value and it can be reported when the data cannot read at that scan time.
Reserved (Map Bit 9 ~ 23)			Reserved field (reports with FF if enabled)

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19.3 1st Normal

Example Zip (raw data):

```
A6 00 49 60 00 00 00 01 03 FF FF 24 01 00 0E 02 01 03 10 0B 11 08 24 27 08 25 08 2F 08 39 02 3B E3 9B 07 90 27 93
00 00 00 64 00 60 00 00 81 F4 80 E0 01 04 01 05 01 06 01 C4 01 C3 01 C2 03 F5 03 F5 03 F5 01 01 04 01 04 01 04
```

Example Normal Data (ASCII):

```
SNB; 6000000001; 03FFFF; 30; 1.0.14; 2; 1; 3; 20161117; 08:37:39; 08:37:08:47,08:57; +37.479323; +126.887827;
+000,+100,+096;+000,-500,-224;+27.6,+27.7,+27.8;45.2,45.1,45.0;1013,1013,1013;1;+27.6,+27.6,+27.6
```

HDR	DEV_ID	REPORT_MAP	MODEL	SW_VER	TOTAL_NO
CURR_NO	SCAN_CNT	START_DATE	START_TIME	SCAN_TIME	START_LAT
START_LON	LAT_GAP	LON_GAP	IN_TEMP	IN_HUM	IN_BARO
1W_TEMP_CNT	1W_TEMP	reserved		reserved	reserved

Field	Data	Conversion	Description
HDR	SNB	3 char	Header of Basic Sensor Report (1 st)
DEV_ID	6000000001	10 char	Device ID
REPORT_MAP (Map Bit 0)	03FFFF	6 char	Map of the headers that are included in the report Bit 0: REPORT_MAP Bit 1: MODEL Bit 2: SW_VER Bit 16: 1W_TEMP_CNT Bit 17: 1W_TEMP Bit 18: reserved ... Bit23: reserved Please refer "2601: Basic Sensor Report Map".
MODEL (Map Bit 1)	104	3 char	Device Model (According to table model).
SW_VER (Map Bit 2)	1.0.14	String	Number of the released Software Version.
TOTAL_NO (Map Bit 3)	2	String	Value: 2 Total report number to report sensor packet
CURR_NO (Map Bit 4)	1	String	Value: 1 Current report number to report sensor packet
SCAN_CNT (Map Bit 5)	3	String	Value: 3 Number of the scanning.
START_DATE (Map Bit 6)	20161117	8 char	Date yyyyymmdd when the first temperature is measured.
START_TIME (Map Bit 7)	08:37:39	8 char	Time hh:mm:ss when the first temperature is measured.
SCAN_TIME (n) (Map Bit 8)	08:37,08:47, 08:57	String	Time (House + Minute)
START_LAT (Map Bit 9)	+37.479323	String	Latitude of 1 st scan

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START_LON (Map Bit 10)	+126.887827	String	Longitude of 1 st scan
LAT_GAP (n) (Map Bit 11)	+000,+100, +096	String	Gap from previous packet's latitude. The value should be divided by 1,000,000. Value: +000 : no use +100 : latitude of 2 nd scanning. 2 nd - 1 st +096 : latitude of 3 rd scanning. 3 rd - 2 nd Latitude at 2 nd scanning : $(37,479,323 +100)/1,000,000 = +37.479423$
LON_GAP (n) (Map Bit 12)	+000,-500,- 224	String	Gap from previous packet's longitude. The value should be divided by 1,000,000. Value: +000 : no use -500 : longitude of 2 nd scanning. 2 nd - 1 st -224 : longitude of 3 rd scanning. 3 rd - 2 nd Longitude at 2 nd scanning : $(126,887,827-500)/1,000,000 = 126.887.327$
IN_TEMP (n) (Map Bit 13)	+27.6,+27.7, +27.8	String	Internal temperature Report Range: -40.0°C ~ 125.0°C
IN_HUM (n) (Map Bit 14)	45.2,45.1, 45.0	String	Internal humidity Value: 45.2%, 45.1%, 45.0% Range: 0% ~ 100%
IN_BARO(n) (Map Bit 15)	1013,1013, 1013	HEX -> DEC	Internal barometric pressure of the packet (Atmospheric pressure sensor inside the device) Report Range: 300 hPa ~ 1250 hPa
1W_TEMP_CNT (Map Bit 16)	1	1 char	Number of 1-Wire probe ST4910 and ST4950 series are fixed '1'.
1W_TEMP(n) (Map Bit 17)	+27.6,+27.6, +27.6	HEX -> DEC	Value : +27.6°C Temperature of 1-Wire probe Zip: If Binary bit 15 is set, then the value is negative. For -27.6 the Zip value would be (81 14) Convert zip to Celsius by converting HEX(01 14) to DEC(276) then divide by 10 If the string is "NA", it means invalid value and it can be reported when the data cannot read at that scan time.
Reserved (Map Bit 18 ~ 23)			Reserved field (reports with FF if enabled)

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19.4 2nd ~ nth Normal

Example Zip (raw data):

A7 00 3E 60 00 00 00 01 00 0F FF 24 01 00 0E 02 02 03 03 80 07 89 02 4F 39 03 08 88 01 04 01 04 01 04 00 E6 00 E6 00 E6 00 E7 00 E7 00 E7

Example Normal Data (ASCII):

SNE; 6000000001;000FFF;30;1.0.14;2;2;3;3; 800789,024F39,030888; +27.6,+27.6,+27.6,+23.0,+23.0, ,+23.0,+23.1,+23.1,+23.1,45.2, 45.2,45.2,45.0,45.0,45.0,45.0,45.0,45.0,45.0

HDR	PKT_LEN	DEV_ID	REPORT_MAP	MODEL	SW_VER
TOTAL_NO	CURR_NO	SCAN_CNT	D_ELA_CNT	D_ELA_ID	D_ELA_SEN

Field	Data	Conversion	Description
HDR	SNE	3 char	Header of Extended Sensor Report (from 2 nd ~ n th)
DEV_ID	6000000001	10 char	Value: 6000000001 Device ID
REPORT_MAP (Map Bit 0)	000FFF	8 char	Map of the headers that are included in the report Bit 0: REPORT_MAP Bit 1: MODEL Bit 2: SW_VER Bit 6: D_ELA_CNT Bit 7: D_ELA_ID Bit 8: D_ELA_SEN Bit 9 ~ Bit 23: reserved Please refer "2602: Extended Sensor Report Map".
MODEL (Map Bit 1)	104	3 char	Value: 104 Device Model (According to table model).
SW_VER (Map Bit 2)	1.0.14	String	Value: 1.0.14 Software Version.
TOTAL_NO (Map Bit 3)	2	String	Value: 2 Total report number to report sensor packet
CURR_NO (Map Bit 4)	2	String	Value: 1 Current report number to report sensor packet
SCAN_CNT (Map Bit 5)	3	String	Value: 3 Number of the scanning.
D_ELA_CNT (Map Bit 6)	3	1 char	Number of temperature sensor of the dedicated BLEs in this report. If other brand sensor has 6 hex value ID, temperature and humidity sensor, it may be assigned to same REPORT_MAP bit.
D_ELA_ID (n) (Map Bit 7)	800789, 024F39, 030888	String	Dedicated BLE ID list which current report includes. Value: 1 st ID = 800789, 2 nd = 024F39, 3 rd = 030888
D_ELA_SEN (2)(n)(n) (Map Bit 8)	+27.6, +27.6,	String	Temperature of the dedicated BLE device of this report. Value :

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	+27.6, +23.0, +23.0, +23.0, +23.1, +23.1, +23.1		1 st ELA (800789): +27.6°C, +27.6°C, +27.6°C 2 nd ELA (024F39): +23.0°C, +23.0°C, +23.0°C 3 rd ELA (030888): +23.1°C, +23.1°C, +23.1°C If the string is "NA", it means invalid value and it can be reported when the data cannot read at that scan time.
	45.2, 45.2, 45.2, 45.0, 45.0, 45.0, 45.0, 45.0, 45.0		Humidity of the dedicated BLE device of this report. Value: 45.2% 1 st ELA (800789): 45.2%, 45.2%, 45.2% 2 nd ELA (024F39): +45.0%, 45.0%, 49.8% If the string is "NA", it means invalid value and it can be reported when the data cannot read at that scan time.
Reserved (Map Bit 9 ~ 23)			Reserved field (reports with empty if enabled)

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19.5 Example

Case 1)

Zip report when sensors were scanned 80 times for all internal sensors, a 1W temperature sensor and 5 BLE devices. 5 BLE devices were set to report both temperature and humidity:

The sensor report consists of one group that has 3 reports.

1st report includes information of scanned times, positions, internal sensors and 1W sensors.

HDR	PKT_LEN	DEV_ID	REPORT_MAP	MODEL	SW_VER
A6					
TOTAL_NO	CURR_NO	SCAN_CNT			
03	01	80			
START_DATE	START_TIME	TIME			
3 bytes	3 bytes	160 bytes			
START_LAT	START_LON	LAT_GAP	LON_GAP		
		160 bytes	160 bytes		
IN_TEMP(n)	IN_HUM(n)	IN_BARO(n)	1W_TEMP(n)		
160 bytes	160 bytes	160 bytes	160 byte		

2nd report Includes information of temperature in 5 BLE devices and humidity in 1 BLE sensors,.

HDR	PKT_LEN	DEV_ID	REPORT_MAP	MODEL	SW_VER
A7					
TOTAL_NO	CURR_NO	SCAN_CNT			
03	02	80			
TMP_ELA_CNT	TMP_ELA_LE_ID	ELA_TEMP			
05	15 bytes	900 bytes			
HUM_ELA_CNT	HUM_ELA_ID	ELA_HUM			
01	3 bytes	180 bytes			

3rd report Includes information of temperature in 2 BLE sensors,.

HDR	PKT_LEN	DEV_ID	REPORT_MAP	MODEL	SW_VER
A7					
TOTAL_NO	CURR_NO	SCAN_CNT			
03	03	80			
HUM_ELA_CNT	HUM_ELA_ID	ELA_HUM			
04	12 bytes	720 bytes			

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Case 2)

Zip report when sensors were scanned 100 times for all internal sensors, a 1W temperature sensor and 3 ELA puck devices. 2 BLE were set to report both temperature and humidity and 1 BLE was set to report only temperature:

The sensor report consists of two groups that each has 2 reports.

1st report of 1st group includes 80 scanned values of scanned times, positions, internal sensors and 1W sensors.

HDR A6	PKT_LEN	DEV_ID	REPORT_MAP	MODEL	SW_VER
TOTAL_NO 02	CURR_NO 01	SCAN_CNT 80			
START_DATE 3 bytes	START_TIME 3 bytes	TIME 160 bytes			
START_LAT	START_LON	LAT_GAP 160 bytes	LON_GAP 160 bytes		
IN_TEMP(n) 160 bytes	IN_HUM(n) 160 bytes	IN_BARO(n) 160 bytes	1W_TEMP(n) 160 byte		

2nd report of 1st group Includes 80 scanned values of 3 BLE devices.

HDR A7	PKT_LEN	DEV_ID	REPORT_MAP	MODEL	SW_VER
TOTAL_NO 02	CURR_NO 02	SCAN_CNT 80			
TMP_ELA_CNT 03	TMP_ELA_LE_ID 9 bytes	ELA_TEMP 540 bytes			
HUM_ELA_CNT 01	HUM_ELA_ID 3 bytes	ELA_HUM 180 bytes			

1st report of 2nd group includes 20 scanned values of scanned times, positions, internal sensors and 1W sensors.

HDR A6	PKT_LEN	DEV_ID	REPORT_MAP	MODEL	SW_VER
TOTAL_NO 02	CURR_NO 01	SCAN_CNT 14			
START_DATE 3 bytes	START_TIME 3 bytes	TIME 40 bytes			
START_LAT	START_LON	LAT_GAP 40 bytes	LON_GAP 40 bytes		
IN_TEMP(n) 40 bytes	IN_HUM(n) 40 bytes	IN_BARO(n) 40 bytes	1W_TEMP(n) 40 byte		

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2nd report of 2nd group Includes 20 scanned values of 3 BLE devices.

HDR	PKT_LEN	DEV_ID	REPORT_MAP	MODEL	SW_VER
A7					
TOTAL_NO	CURR_NO	SCAN_CNT			
02	02	14			
TMP_ELA_CNT	TMP_ELA_LE_ID	ELA_TEMP			
03	9 bytes	120 bytes			
HUM_ELA_CNT	HUM_ELA_ID	ELA_HUM			
01	3 bytes	40 bytes			

Case 3)

1. Another new group will be sent when gap of the latitude or longitude exceeds 2 bytes.
2. When some sensors are inserted or removed by setting parameters in Sensor Report, stored data will be sent and then start new sensor's value.

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REVISIONS

Rev. No.	Date	Modifications were made on:	Writer
Rev. 1.00	2020-03-18	Draft	BC.Jeon
Rev. 2.00	2020-03-24	Added Maintenance Report	BC.Jeon
Rev. 3.00	2020-04-03	Added Alert Mod of 'SHUTDOWN'	BC.Jeon
Rev. 4.00	2020-04-29	Added Alert of 'Charge On/ Off'	BC.Jeon
Rev. 5.00	2020-05-04	Added Alert Mod of 'Power Up'	BC.Jeon
Rev. 6.00	2020-06-26	Added the temperature report Added Alert of 'Enter/Exit Geo-Fence' Added Alert of 'Light brighten'	BC.Jeon
Rev. 7.00	2020-07-02	Modify the character of 'temperature report' Added Alert Mod of 'Power Up' Remove N/A field in GPS_ANT field of MNT report when the device has internal GPS antenna.	BC.Jeon
Rev. 8.00	2020-07-10	Changed Alert Mod of 'SHUTDOWN'	BC.Jeon
Rev. 9.00	2020-07-16	Changed the temperature report for '1-wire'	BC.Jeon
Rev. 10.00	2020-07-24	Changed Alert Mod of 'Power Up' Added the field for Wi-Fi at STT report.	BC.Jeon
Rev. 11.00	2020-07-31	LAC(Zip Format), HEX Changed Alert Mod of 'Power Up' Changed the temperature report.	BC.Jeon
Rev. 12.00	2020-08-14	Changed the TEMP ID of TPR report. Added the field for battery voltage at ALT report.	BC.Jeon
Rev. 13.00	2020-08-20	Added the zip of TPR report.	BC.Jeon
Rev. 14.00	2020-08-31	Changed the max number of 1-wire. Changed the description of Wi-Fi field for zip mode. Added the description of temperature zip data for TPR report.	BC.Jeon
Rev. 15.00	2020-09-03	Changed the HDR zip data of TPR report.	BC.Jeon
Rev. 16.00	2020-09-11	Changed the description of MODE field for Zip and Normal in Status Report (Driving and Charging mode: 2 -> 8)	YH Choe
Rev. 17.00	2020-09-21	Changed '89' to 'FB' in the HDR example raw data in Zip Format of TPR report	YH Choe
Rev. 18.00	2020-10-23	Added the field for Driving Time and Parking Time at STT and ALT report	YH Choe
Rev. 19.00	2020-10-30	Added the field for humidity in Ascii Format of Temperature report	YH Choe
Rev. 20.00	2020-11-02	Added the field for humidity in Zip(HEX) Format of Temperature report	YH Choe
Rev. 21.00	2020-11-13	Modified the field for 'REPORT_MAP' in Zip(HEX) and Ascii Format of STT report and ALT report (3FFFFF -> 003FFFFF) Changed description of HUMIDITY of Zip(Hex) Format in TPR Changed description of TEMP and HUMIDITY of Ascii Format in TPR Added alert id of "Shocked" and "Crash detected" in Alert ID Table	YH Choe
Rev. 22.00	2020-12-02	Added description of note about "Shocked" and "Crash detected" in Alert ID Table	YH Choe
Rev. 23.00	2020-12-07	Updated the explain that Shock and Collision feature is only applied ST4910 of Beam Live	YH Choe
Rev. 24.00	2020-12-18	Added Angle/Heading item in STT_RPT_TYPE of STT report(hex , ascii)	YH Choe
Rev. 25.00	2021-01-13	Changed name to 'Collision Project' about the feature of shock and collision	YH Choe

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Rev. 26.00	2021-02-15	Standardized B model report (add small, medium, large assign and sensor report). Changed REPORT_MAP to 3 bytes.	SA Kim
Rev. 26.01	2021-02-18	Changed Alert ID, sensor report map structure and position gap values in ZIP. Modified assign IDs in 15, 16 and 17.	SA Kim
Rev 26.02	2021-03-15	Removed examples for using assignment map Modified SNB Normal Example	SA Kim
Rev 27.00	2021-03-21	Add STT_RPT_TYPE 'Heart Beat' Change Small Assign of 'BAT_VOLT', 01 -> 18	KSH
Rev 27.01	2021-04-01	Change Detect Light 11 -> 20	KSH
Rev 27.02	2021-04-09	Added the item of DRIVING_TIME and PARKING_TIME in Medium Assign Headers	YH Choe
Rev 27.03	2021-04-19	Changed the Description of UDP ACK for ASCII	KSH
Rev 27.04	2021-05-06	Unified of UDP ACK for USA and LATAM	KSH
Rev 27.05	2021-05-20	Added Angle/Heading item in STT_RPT_TYPE of STT report(hex , ascii)	YH Choe
Rev 27.06	2021-05-31	Added examples of assign header in STT and ALT Report.	YH Choe
Rev 27.07	2021-06-03	Modified alert mode of power up alert.	SA Kim
Rev 27.08	2021-06-08	Corrected a typo where Bit 11 is missing after Fiedl Map Bit 10 and the remaining fields are assigned sequentially starting from Bti 12 in '19.3 1st Normal' of '19.Sensor Report' chapter.	YH Choe

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