ST4410
Retail
Operation Manual for SB

Suntech International Ltd.

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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'.

Zip (HEX, fixed length)

Example (raw data):

81 00 30 20 11 23 45 69 39 FF FF C9 01 01 01 01 17 04 04 02 13 37 00 6C 9D 0F 01 C2 00 05 21 25 3C 02 3B E3 6E 07 90 27 89 18 3B 19 8F 0A 01 00 01 02 23

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_ASSIGN8 (8 Bytes)	reserved				

Field	Data	Conversion	Description
HDR	81		Header of Status Report. • 81: No ACK response required • 91: Required ACK response
PKT_LEN	00 30		Length of zip data excluding HDR and PKT_LEN
DEV_ID	20 11 23 45 69	HEX	Value: 2011234569 Device ID, BCD Format If the Device ID is 2011234569, this field will be filled with 0x20, 0x11, 0x23, 0x45 and 0x69.
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 Bit 22: RF_STATUS Bit 23: ASSIGN_MAP
MODEL (Map Bit 1)	C9	HEX -> DEC	Value: 201 Device Model (According to table model).

			Model Identification Table **Model** / **ID** ST4410 / BE ST4410G / C9
SW_VER (Map Bit 2)	01 01 01	HEX -> DEC	Value: 1.1.1 Software Version.
MSG_TYPE (Map Bit 3)	01	HEX -> DEC	Real Time (1) Or Stored (0) Message
DATE (Map Bit 4)	17 04 04	HEX -> DEC	Value: 20230404 GPS Date (Year + Month + Day) Ex) 23: 0x17 04: 0x04 04: 0x04 **This field is not supported on the ST4410 model.**
TIME (Map Bit 5)	02 13 37	HEX -> DEC	Value: 02:19:55 Time (Hour + Minute + Second). Ex) 02: 0x02 19: 0x13 55: 0x37 **This field is not supported on the ST4410 model.**
CELL_ID (Map Bit 6)	00 6C 9D 0F	HEX	Value: 006C9D0F Unique Id of Serving Cell. First 2 bytes are always 0 when the device connected to 2G network.
MCC (Map Bit 7)	01 C2	HEX -> DEC	Value: 450 Mobile Country Code
MNC (Map Bit 8)	00 05	HEX -> DEC	Value: 5 Mobile Network Code
LAC (Map Bit 9)	21 25	HEX	Value: 2125 Location Area Code
RX_LVL (Map Bit 10)	3C	HEX -> DEC	Value: 60 Signal Strength (See table in Normal report above)
LAT (Map Bit 11)	02 3B E3 6E	HEX -> DEC	Value: +37.479278 Bit 31: • 1 = negative • 0 = positive To convert take HEX (023BE36E) and convert to Decimal value of 37,479,278 then divide by 1,000,000 **This field is not supported on the ST4410 model.**
LON	07 90 27 89	HEX -> DEC	Value: +126.887817

(Map Bit 12)			Bit 31: • 1 = negative • 0 = positive To convert take HEX (07902789) and convert to Decimal value of 126,887,817 then divide by 1,000,000 **This field is not supported on the ST4410 model.**
SPD (Map Bit 13)	18 3B	HEX -> DEC	Value: 062.03 HEX (18 3B) = Decimal 6,203 Take the decimal value and divide by 100 to get 62.03km/h **This field is not supported on the ST4410 model.**
CRS (Map Bit 14)	19 8F	HEX -> DEC	Value: 65.43 HEX (19 8F) = Decimal 6,543 Take the decimal value and divide by 100 to get 65.43 degrees **This field is not supported on the ST4410 model.**
SATT (Map Bit 15)	0A	HEX -> DEC	Number of GPS Satellites **This field is not supported on the ST4410 model.**
FIX (Map Bit 16)	01	HEX -> DEC	Fix Status '1' or '0' • 1 => GPS is fixed • 0 => GPS is not fixed **This field is not supported on the ST4410 model.**
IN_STATE (Map Bit 17)	-	-	**This field is not supported.**
OUT_STATE (Map Bit 18)	-	-	**This field is not supported.**
MODE (Map Bit 19)	00	HEX -> DEC	Mode the Device is in: • 0 = Normal • 6 = Emergency
STT_RPT_TYPE (Map Bit 20)	01	HEX -> DEC	Type of Report When the Mode value is not 6 (Emergency) : • 0 = Response by CMD request • 1 = Time When the Mode value is 6 (Emergency) : • 0 = Response by CMD request • 2 = Emergency by GPRS Command • 3 = Emergency by RF Command • 4 = Emergency by Jammer Detection • 6 = Carton Package is opened • 10 = Emergency by Presence
MSG_NUM (Map Bit 21)	02 23	HEX -> DEC	Value: 0547 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)		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) • 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) • See options in table 5 below
M_ASSIGN1 (Assign_Map Bit 15)			Custom Medium Assignable Header (4 Bytes in length) • See options in table 6 below
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) • 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) • See options in table 7 below
reserved			reserved

<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 = BCK_VOLT, S_ASSIGN2 = PWR_VOLT, L_ASSIGN1 = DID

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 00 03 00 24 04 AA 50 00 00 19 3E 0C CD 01

CASE 4: Standard Status Report Example with added assign options below
- S_ASSIGN1 = BCK_VOLT, S_ASSIGN2 = PWR_VOLT, L_ASSIGN1 = DID
- 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 24 04 AA 50 00 00 19 3E 0C CD 01

Normal (ASCII, variable length)

Example Raw Zip Data:

81 00 30 20 11 23 45 69 39 FF FF C9 01 01 01 01 17 04 04 02 13 37 00 6C 9D 0F 01 C2 00 05 21 25 3C 02 3B E3 6E 07 90 27 89 18 3B 19 8F 0A 01 00 01 02 23

Example Normal Data (ASCII):

STT;2011234569;39FFFF;201;1.1.1;1;20230404;02:19:55;006C9D0F;450;5;2125;60;+37.479278;+126.887817;62.03;65.43;10;1;0;1;0547

HDR	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	reserved					

Field	Data	Max Length	Description
HDR	STT	3-4 char	Header of Status Report. • STT: No ACK response required • ASTT: Required ACK response
DEV_ID	2011234569	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)	36	2 char	Device Model (According to table model).
SW_VER (Map Bit 2)	1.0.14	String	Number of the released Software Version.
MSG_TYPE (Map Bit 3)	1	1 char	Report is real time (1); Report is storage (0).
DATE (Map Bit 4)	20230404	8 char	GPS date yyyymmdd or (Year + Month + Day) **This field is not supported on the ST4410 model.**
TIME (Map Bit 5)	02:19:55	8 char	GPS time hh:mm:ss or (Hour : Minute : Second) **This field is not supported on the ST4410 model.**
CELL_ID (Map Bit 6)	006C9D0F	8 char	Unique ID of Serving Cell. 8 digit hex First 4 digits are always 0 when the device connected to 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)	60	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). **This field is not supported on the ST4410 model.**
LON (Map Bit 12)	+126.887827	String	Longitude (+/-xxx.xxxxxx). **This field is not supported on the ST4410 model.**
SPD (Map Bit 13)	62.03	String	Speed in km/h. (1 km/h = 0.621371 mph) **This field is not supported on the ST4410 model.**
CRS (Map Bit 14)	65.43	String	Course on the ground in degree. **This field is not supported on the ST4410 model.**
SATT (Map Bit 15)	10	String	Number of GPS satellites. **This field is not supported on the ST4410 model.**
FIX (Map Bit 16)	1	1 char	Fix Status '1' or '0' • 1 => GPS is fixed • 0 => GPS is not fixed **This field is not supported on the ST4410 model.**
IN_STATE (Map Bit 17)	-	-	**This field is not supported.**
OUT_STATE (Map Bit 18)	-	-	**This field is not supported.**
MODE (Map Bit 19)	0	1 char	Mode the Device is in: • 0 = Normal • 6 = Emergency
STT_RPT_TYPE (Map Bit 20)	1	1 char	Type of Report: When the Mode value is not 6 (Emergency) :

			• 0 = Response by CMD request • 1 = Time When the Mode value is 6 (Emergency) : • 0 = Response by CMD request • 2 = Emergency by GPRS Command • 3 = Emergency by RF Command • 4 = Emergency by Jammer Detection • 6 = Carton Package is opened • 10 = Emergency by Presence
MSG_NUM (Map Bit 21)	0547	4 char	Message number. After "9999" is reported, message number returns to "0000"
RESERVED (Map Bit 22)	-	-	Reserved field (reports with FF if enabled)
ASSIGN_MAP (Map Bit 23)		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) • 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) • See options in table 5 below
M_ASSIGN1 (Assign_Map Bit 15)			Custom Medium Assignable Header (4 Bytes in length) • See options in table 6 below
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) • 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) • See options in table 7 below
reserved			reserved

<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 = BCK_VOLT, S_ASSIGN2 = PWR_VOLT, L_ASSIGN1 = DID

STT;0360000001;BFFFFF;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;800003;3.6;11.94;500000193E0CCD01

CASE 4: Standard Report Example with added assign options below

- S_ASSIGN1 = BCK_VOLT, S_ASSIGN2 = PWR_VOLT, L_ASSIGN1 = DID
- ASSIGN_MAP removed from report

STT;0360000001;3FFFFF;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;3.6;11.94;500000193E0CCD01

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.

Zip (HEX, fixed length)

Example (raw data):

82 00 2F 20 11 23 45 69 39 FF FF C9 01 01 01 01 17 04 04 04 09 1A 00 6C 9D 0F 01 C2 00 05 21 25 39 02 3B E3 5E 07 90 27 7F 18 3B 19 8F 0A 01 92 FF 05 00 AB 6D 07 00

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_MOD (2 Bytes)	ALERT_DATA	RESERVED (1byte)	ASSIGN_MAP (4 Bytes)	S_ASSIGN1
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)	reserved				

Field	Data	Conversion	Description
HDR	82		Header of Alert Report. • 82: No ACK response required • 92: Required ACK response
PKT_LEN	00 2F		Length of zip data excluding HDR and PKT_LEN
DEV_ID	20 11 23 45 69	HEX	Value: 2011234569 Device ID
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: ALERT_DATA Bit 22: RF_STATUS Bit 23: ASSIGN_MAP
MODEL (Map Bit 1)	C9	HEX -> DEC	Value: 201 Device Model (According to table model).
SW_VER	01 01 01	HEX -> DEC	Value: 1.1.1

(Map Bit 2)			Software Version.
MSG_TYPE (Map Bit 3)	01	HEX -> DEC	Real Time (1) Or Stored (0) Message
DATE (Map Bit 4)	17 04 04	HEX -> DEC	Value: 20230404 GPS Date (Year + Month + Day). **This field is not supported on the ST4410 model.**
TIME (Map Bit 5)	04 09 1A	HEX -> DEC	Value: 04:09:26 Time (Hour + Minute + Second). **This field is not supported on the ST4410 model.**
CELL_ID (Map Bit 6)	00 6C 9D 0F	HEX	Value: 006C9D0F Unique Id of Serving Cell. First 2 bytes are always 0 when the device connected to 2G network.
MCC (Map Bit 7)	01 C2	HEX -> DEC	Value: 450 Mobile Country Code
MNC (Map Bit 8)	00 05	HEX -> DEC	Value: 5 Mobile Network Code
LAC (Map Bit 9)	21 25	HEX	Value: 2125 Location Area Code
RX_LVL (Map Bit 10)	39	HEX -> DEC	Value: 57 Signal Strength (See table in Normal report above)
LAT (Map Bit 11)	02 3B E3 5E	HEX -> DEC	Value: +37.479323 Bit 31: • 1 = negative • 0 = positive To convert take HEX (023BE39B) and convert to Decimal value of 37,479,323 then divide by 1,000,000 **This field is not supported on the ST4410 model.**
LON (Map Bit 12)	07 90 27 7F	HEX -> DEC	Value: +126.887827 Bit 31: • 1 = negative • 0 = positive To convert take HEX (07902793) and convert to Decimal value of 126,887,827 then divide by 1,000,000 **This field is not supported on the ST4410 model.**
SPD (Map Bit 13)	18 3B	HEX -> DEC	Value: 062.03 HEX (18 3B) = Decimal 6,203 Take the decimal value and divide by 100 to get 62.03km/h **This field is not supported on the ST4410 model.**
CRS (Map Bit 14)	19 8F	HEX -> DEC	Value: 65.43 HEX (19 8F) = Decimal 6,543 Take the decimal value and divide by 100 to get 65.43 degrees

			This field is not supported on the ST4410 model.
SATT (Map Bit 15)	0A	HEX -> DEC	Number of GPS Satellites **This field is not supported on the ST4410 model.**
FIX (Map Bit 16)	01	HEX -> DEC	Fix Status '1' or '0' • 1 => GPS is fixed • 0 => GPS is not fixed **This field is not supported on the ST4410 model.**
IN_STATE (Map Bit 17)	-	-	**This field is not supported.**
OUT_STATE (Map Bit 18)	-	-	**This field is not supported.**
ALERT_ID (Map Bit 19)	92	HEX -> DEC	Value: 75 Alert ID Number: • See Alert ID Table
ALERT_MOD (Map Bit 20)	FF 05	HEX -> DEC	Contains Modifier for certain Alert IDs • First Byte: Contains Number 1-8 of Temp sensor that triggered Alert ID 75, 76, or 77, Input that that triggers Alert ID of Input High or Input Low, etc. • 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 AB 6D 07 00	HEX -> DEC	Contains Data for certain Alert IDs Note) For details on data of other IDs, refer to Chapter 2.3 below.
RESERVED (Map Bit 22)	-	-	Reserved field (reports with FF if enabled)
ASSIGN_MAP (Map Bit 23)		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) • 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) See options in table 5 below
M_ASSIGN1 (Assign_Map Bit 15)			Custom Medium Assignable Header (4 Bytes in length) • See options in table 6 below
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) • 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) • See options in table 7 below
reserved			reserved

<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
- S_ASSIGN3 = ADC_1, S_ASSIGN8 = TEMP_1, L_ASSIGN3 = TEMPID_1

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 02 00 00 84 02 F8 01 14 15 00 00 00 45 0F B8 42

CASE 4: Standard Alert ID Report Example with added assign options below
- S_ASSIGN3 = ADC_1, S_ASSIGN8 = TEMP_1, L_ASSIGN3 = TEMPID_1
- 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 02 F8 01 14 15 00 00 00 45 0F B8 42

Normal (ASCII, variable length)

Example Zip Data:

82 00 2F 20 11 23 45 69 39 FF FF C9 01 01 01 01 17 04 04 04 09 1A 00 6C 9D 0F 01 C2 00 05 21 25 39 02 3B E3 5E 07 90 27 7F 18 3B 19 8F 0A 01 92 FF 05 00 AB 6D 07 00

Example Normal Data (ASCII):

ALT;2011234569;39FFFF;201;1.1.1;1;20230404;04:09:26;006C9D0F;450;5;2125;57;+37.479262;+126.887807;62.03;65.43;10;1;146;;011234567;-255

HDR	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_MOD	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_ASSIGN8	reserved					

Field	Data	Max Length	Description
HDR	ALT	3-4 char	Header of Alert Report. • ALT: No ACK response required • AALT: Required ACK response
DEV_ID	2011234569	10 char	Device ID.
REPORT_MAP	7FFFFF	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: ALERT_DATA Bit 22: RF_STATUS Bit 23: ASSIGN_MAP
MODEL (Map Bit 1)	C9	2 char	Device Model (According to table model).
SW_VER (Map Bit 2)	1.1.1	String	Number of the released Software Version.
MSG_TYPE (Map Bit 3)	1	1 char	Report is real time (1); Report is storage (0).
DATE (Map Bit 4)	20230404	8 char	GPS date yyyymmdd or (Year + Month + Day) **This field is not supported on the ST4410 model.**
TIME (Map Bit 5)	04:09:26	8 char	GPS time hh:mm:ss or (Hour : Minute: Second) **This field is not supported on the ST4410 model.**
CELL_ID (Map Bit 6)	006C9D0F	8 char	Unique ID of Serving Cell. 8-digit hex First 4 digits are always 0 when the device connected to 2G network.
MCC (Map Bit 7)	450	String	Mobile Country Code. 0 ~ 65535
MNC (Map Bit 8)	5	String	Mobile Network Code. 0 ~ 65535
LAC (Map Bit 9)	2125	4 char	Location Area Code. 4 digits hex
RX_LVL (Map Bit 10)	57	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)	+37.479262	String	Latitude (+/-xx.xxxxxx). **This field is not supported on the ST4410 model.**
LON	+126.887807	String	Longitude (+/-xxx.xxxxxx).

(Map Bit 12)			**This field is not supported on the ST4410 model.**
SPD (Map Bit 13)	62.03	String	Speed in km/h. (1 km/h = 0.621371 mph) **This field is not supported on the ST4410 model.**
CRS (Map Bit 14)	65.43	String	Course on the ground in degree. **This field is not supported on the ST4410 model.**
SATT (Map Bit 15)	10	String	Number of GPS satellites. **This field is not supported on the ST4410 model.**
FIX (Map Bit 16)	1	1 char	Fix Status '1' or '0' • 1 => GPS is fixed • 0 => GPS is not fixed **This field is not supported on the ST4410 model.**
IN_STATE (Map Bit 17)	-	-	**This field is not supported.**
OUT_STATE (Map Bit 18)	-	-	**This field is not supported.**
ALERT_ID (Map Bit 19)	146	1 char	Alert ID Number: • See Alert ID Table
ALERT_MOD (Map Bit 20)	If there is a MOD value, the value is displayed as a string; otherwise, nothing is displayed.	String	Contains Modifier for certain Alert IDs • Number 1-8 of Temp sensor that triggered Alert ID 75, 76, or 77 • Input that triggers Alert ID of Input High or Input Low Note) For details on data of other IDs, refer to Chapter 2.3 below.
ALERT_DATA (Map Bit 21)	901234566;-255	String	Contains Data for certain Alert IDs. Note) For details on data of other IDs, refer to Chapter 2.3 below.
RESERVED (Map Bit 22)	-	-	Reserved field (reports with FF enabled)
ASSIGN_MAP (Map Bit 23)		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) • 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) See options in table 5 below
M_ASSIGN1 (Assign_Map Bit 15)			Custom Medium Assignable Header (4 Bytes in length) • See options in table 6 below
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) • 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) • See options in table 7 below
reserved			reserved

<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

- MINI_ASSIGN_3 = ADC_1, MINI_ASSIGN_8 = TEMP_1, ASSIGN_3 = TEMPID_1

ALT;0360000001;BFFFFF;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;400084;7.60;+27.6;15000000450FB842

CASE 4: Standard Report Example with added assign options below

- MINI_ASSIGN_3 = ADC_1, MINI_ASSIGN_8 = TEMP_1, ASSIGN_3 = TEMPID_1
- ASSIGN_MAP removed from report

ALT;0360000001;3FFFFF;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;7.60;+27.6;15000000450FB842

Alert ID Table for ST4410

Name	Description	Alert ID (default)	Alert Mod	Alert Data
Carton Box Opened	Alert is sent when Carton Box is Opened	145	FF 00	-
Presence Device Absent	Alert is sent when Presence Device is Absent	146	FF 05	ZIP) Device ID(4Byte) + RSSI(1byte) Ex) ZIP : 35B7 BF8700 NORMAL: 901234567,-255
Absent Device Recovered	Alert is sent when Absent Device is Recovered	147	FF 05	ZIP) Device ID(4Byte) + RSSI(1byte) Ex) ZIP : 35B7 BF8700 NORMAL: 901234567,-255
Low Back-up Battery	Alert is sent when the Back-Up Battery is low.	43	FF 00	-
Jamming Detected	Alert is sent when Jamming has been detected.	50	FF 00	-
Power Key Pressed	Alert is sent when the device turn on/off by power key.	55	1 = Turn On 2 = Turn Off ZIP(1BYTE)) + 00 Ex) 01 00 Blank – Turn Off by itself from low-battery	-
Sim Card Removed	Alert is sent when a sim-card is removed.	72	FF 00	-
Lose Network Connection	Alert is sent when whenever the network connection is lost	141	FF 00	

Note) In case of the Normal, ”ALERT_DATA” & “ALERT_MODE” field is filled with blank for unsupported ALERTs.

Neighbor Cell Report

This report is sent when a status or alert report is sent. The following two (2) tables show how one reporting can be made in 2 different types such as in 'normal' (string) and in 'zip'.

Zip (HEX, fixedlength)

Example (raw data):

AB 00 6A 20 11 23 45 69 C9 01 01 01 17 04 04 02 13 37 00 6C 9D 0F 01 C2 00 05 21 25 3C 00 6C 9D 0F 01 C2 00 0C 21 25 00 38 00 00 6C 9D 0F 01 C2 00 1E 21 25 00 38 00 03 16 1A 20 01 C2 00 06 20 EB 00 33 00 00 36 9D 08 01 C2 00 08 00 06 00 2D 00 00 36 9D 08 01 C2 00 1E 00 06 00 2D 00 00 00 00 00 00 00 00 00 00 00 00 00 00 02 23

HDR (1 Byte)	PKT_LEN (2 Bytes)	DEV_ID (5 Bytes)	MODEL (1 Byte)	SW_VER (3 Bytes)	DATE (3 Bytes)	TIME (3 Bytes)
CELL_ID (4 Bytes)	MCC (2 Bytes)	MNC (2 Bytes)	LAC (2 Bytes)	RX_LVL (1 Byte)	NBR_CELL (78 Bytes)	NBR_MSG_NUM (1 Bytes)

Field	Data	Conversion	Description
HDR	AB		Header of Status Report. • AB: No ACK response required • BB: Required ACK response
PKT_LEN	00 6A		Length of zip data excluding HDR and PKT_LEN
DEV_ID	20 11 23 45 69	HEX	Value: 2011234569 Device ID, BCD Format If the Device ID is 2011234569, this field will be filled with 0x20, 0x11, 0x23, 0x45 and 0x69.
MODEL	C9	HEX -> DEC	Value: 201 Device Model (According to table model). Model Identification Table **Model** / **ID** ST4410 / BE ST4410G / C9
SW_VER	01 01 01	HEX -> DEC	Value: 1.1.1 Software Version.
DATE	17 04 04	HEX -> DEC	Value: 20230404 GPS Date (Year + Month + Day) Ex) 23: 0x17 04: 0x04 04: 0x04 **This field is not supported on the ST4410 model.**
TIME	02 13 37	HEX -> DEC	Value: 02:19:55 Time (Hour + Minute + Second).

			Ex) 02: 0x02 19: 0x13 55: 0x37 **This field is not supported on the ST4410 model.**
CELL_ID	00 6C 9D 0F	HEX	Value: 006C9D0F Unique Id of Serving Cell. First 2 bytes are always 0 when the device connected to 2G network.
MCC	01 C2	HEX -> DEC	Value: 450 Mobile Country Code
MNC	00 05	HEX -> DEC	Value: 5 Mobile Network Code
LAC	21 25	HEX	Value: 2125 Location Area Code
RX_LVL	3C	HEX -> DEC	Value: 60 Signal Strength (See table in Normal report above)
NBR_CELL	00 6C 9D 0F 01 C2 00 0C 21 25 00 38 00 00 6C 9D 0F 01 C2 00 1E 21 25 00 38 00 03 16 1A 20 01 C2 00 06 20 EB 00 33 00 00 36 9D 08 01 C2 00 08 00 06 00 2D 00 00 36 9D 08 01 C2 00 1E 00 06 00 2D 00 00 00 00 00 00 00 00 00 00 00 00 00	ID, LAC - HEX MCC, MNC, RX_LVL,TM_ADV - HEX -> DEC	Information of a total of 6 neighboring cells. Format : ID MCC MNC LAC RX_LVL TM_ADV (NBR Cell 1) ID MCC MNC LAC RX_LVL TM_ADV (NBR Cell 2) ID MCC MNC LAC RX_LVL TM_ADV (NBR Cell 3) ID MCC MNC LAC RX_LVL TM_ADV (NBR Cell 4) ID MCC MNC LAC RX_LVL TM_ADV (NBR Cell 5) ID MCC MNC LAC RX_LVL TM_ADV (NBR Cell 6)
NBR_MSG_NUM	02 23	HEX -> DEC	Value: 0547 Message number of NBR Report. When STT is transmitted, the Message Number of STT is displayed. When ALT is transmitted, the ALT ID is displayed.

Normal (ASCII, variable length)

Example Raw Zip Data:

AB 00 6A 20 11 23 45 69 C9 01 01 01 17 04 04 02 13 37 00 6C 9D 0F 01 C2 00 05 21 25 3C 00 6C 9D 0F 01 C2 00 0C 21 25 00 38 00 00 6C 9D 0F 01 C2 00 1E 21 25 00 38 00 03 16 1A 20 01 C2 00 06 20 EB 00 33 00 00 36 9D 08 01 C2 00 08 00 06 00 2D 00 00 36 9D 08 01 C2 00 1E 00 06 00 2D 00 00 00 00 00 00 00 00 00 00 00 00 00 00 02 23

Example Normal Data (ASCII):

NBR;2011234569;201;1.1.1;20230404;02:19:55;006C9D0F;450;5;2125;60;006C9D0F;450;12;2125;56;0;006C9D0F;450;30;2125;56;0;03161A20;450;6;20EB;51;0;00369D08;450;8;0006;45;0;00369D08;40;30;0006;45;0;00000000;0;0;0000;0;0;0547

HDR	DEV_ID	MODEL	SW_VER	DATE	TIME	CELL_ID
MCC	MNC	LAC	RX_LVL	NBR_CELL	NBR_MSG_NUM	

Field	Data	Max Length	Description
HDR	NBR	3-4 char	Header of Status Report. • NBR: No ACK response required • ANBR: Required ACK response
DEV_ID	2011234569	10 char	Device ID.
MODEL	201	2 char	Device Model (According to table model).
SW_VER	1.1.1	String	Number of the released Software Version.
DATE	20230404	8 char	GPS date yyyymmdd or (Year + Month + Day) **This field is not supported on the ST4410 model.**
TIME	08:37:39	8 char	GPS time hh:mm:ss or (Hour : Minute : Second) **This field is not supported on the ST4410 model.**
CELL_ID	006C9D0F	8 char	Unique ID of Serving Cell. 8 digit hex First 4 digits are always 0 when the device connected to 2G network.
MCC	450	String	Mobile Country Code. 0 ~ 65535
MNC	5	String	Mobile Network Code. 0 ~ 65535
LAC	2125	4 char	Location Area Code. 4 digits hex
RX_LVL	60	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
NBR_CELL	006C9D0F;450;12;2125;56;0; 006C9D0F;450;30;2125;56;0; 03161A20;450;6;20EB;51;0; 00369D08;450;8;0006;45;0; 00369D08;40;30;0006;45;0; 0;0;0;0;0;0	1 char	Information of a total of 6 neighboring cells. Format : ID;MCC;MNC;LAC;RX_LVL;TM_ADV; (NBR Cell 1) ID;MCC;MNC;LAC;RX_LVL;TM_ADV; (NBR Cell 2) ID;MCC;MNC;LAC;RX_LVL;TM_ADV; (NBR Cell 3) ID;MCC;MNC;LAC;RX_LVL;TM_ADV; (NBR Cell 4) ID;MCC;MNC;LAC;RX_LVL;TM_ADV; (NBR Cell 5) ID;MCC;MNC;LAC;RX_LVL;TM_ADV (NBR Cell 6)

NBR_MSG_NUM	0547	4 char	Message number of NBR Report. When STT is transmitted, the Message Number of STT is displayed. When ALT is transmitted, the ALT ID is displayed.

10: Network Parameters / Report Config / SMS / Report Mapping

Network Parameters Tab

Network parameters control how the device connects to the Cellular Network, Report Server, and Maintenance Server.

1000: Authentication

Select the correct GPRS/HSPA Authentication for the network you are connecting the device to.

Range: 00 ~ 03
Units: N/A
Default: 02

- 00 = PAP
- 01 = CHAP
- 02 = Automatic
- 03 = None

1001: APN

Input the Access Point Name for the carrier/network you are connecting the device to
APN must have no more than 100 digits.
Just available characters for APN are A-Z, a-z, 0-9

Units: N/A
Default: NULL

1002: User ID

This is the ID for GPRS/HSPA Access if your network requires an ID and password to access the network.
User ID must have no more than 32 digits.
Just available characters for User ID are A-Z, a-z, 0-9

Units: N/A
Default: NULL

1003: User Password

This is the password for GPRS/HSPA Access if your network requires an ID and password to access the network.
User Password must have no more than 32 digits.
Just available characters for User Password are A-Z, a-z, 0-9

Units: N/A
Default: NULL

1004: PIN Number

Pin number to release PIN lock if it is enabled on the SIM
Pin number must have no more than 8 digits.
Just available characters for pin number are 0-9

Units: N/A
Default: empty

1005: Server IP

IP address of the Server/Platform the device will send it's reports to.
This can be a number in IP format or a domain name.
DNS must have at least 5 digits and no more than 64 digits.
Available characters for domain name are A-Z, a-z, 0-9 or hyphen ('-'), period ('.').

Units: N/A
Default: NULL

1006: Server Port

Port of the Server/Platform that the device will send it's reports to

Range: 0 ~ 65535
Units: N/A
Default: 0

1007: Server Type

Select the type of server the device will be connected to

Range: 00 or 01
Units: N/A
Default: 00

- 00 = TCP
- 01 = UDP

1008: Backup Server IP

IP address of the Backup Server/Platform the device will send it's reports to if it cannot connect to the Server IP.
This can be a number in IP format or a domain name.
DNS must have at least 5 digits and no more than 64 digits.
Available characters for domain name are A-Z, a-z, 0-9 or hyphen ('-'), period ('.').

Units: N/A
Default: NULL

1009: Backup Server Port

Port of the Server/Platform that the device will send it's reports to if it cannot connect to the Server IP

Range: 0 ~ 65535
Units: N/A
Default: 0

1010: Backup Server Type

Select the type of the backup server the device will be connected to

Range: 00 or 01
Units: N/A
Default: 00

- 00 = TCP
- 01 = UDP

1011: UDP ACK

When using a UDP server type, this parameter will select whether or not to acknowledge or 'ACK' the messages that are sent from the device to the server.

Setting this parameter to 0 will disabled the acknowledge message, otherwise the Bitmap below shows the options to select which reports to require an acknowledgement for.

Units: N/A
Default: 0

Bitmap:

- Bit 0 = Status Report (ASTT)
- Bit 1 = Alert ID Report (AALT)
- Bit 2 = Travel Report (ATRV)
- Bit 3 = External Serial Report (AUEX)
- Bit 4 = OBDII Travel Report (AOTR)
- Bit 5 = OBDII Report (AOBD)
- Bit 6 = RFA Report (ARFA)
- Bit 7 = PID Report (APID)
- Bit 8 = OVD Report (AOVD)
- Bit 9 = CAM Report (ACAM)
- Bit 10 = BLE Report (ABLE)
- Bit 11 = TWS Report (ATWS)
- Bit 12 = TIC Report (ATIC)
- Bit 13 = TIS Report (ATIS)
- Bit 14 = TRQ Report (ATRQ)
- Bit 15 = TPR Report (ATPR)
- Bit 16 = Sensor Report (ASNB)
- Bit 17 = Sensor Report (ASNE)
- Bit 18 = BSA Report (ABSA)
- Bit 29 = EMD Report (AEMD)
- Bit 30 = CID Report (ACID)
- Bit 31 = JID Report (AJID)

Note. UDP ACK parameter should be entered by decimal

1012: Device Port

When using a UDP server type, this parameter sets the port for receiving commands from the server via UDP. If '0' or empty, the device would use port 9000.

Range: 0 ~ 65535
Units: N/A

Default: 0

1013: Connection Type

This parameter can be used to determine the connection type with the server
Range: 00 or 01
Units: N/A
Default: 00

- 00 = Keep connected
  - Device always keeps connection and can receive a command via GPRS.
- 01 = Close Connection
  - Device maintains connection while the device is sending the data to the server. Within 3 minutes after sending all the data that the device has been keeping, the device disconnects connection as there is no data to be sent any more inside the device. In this case, the device cannot receive a command via GPRS.

1060: Keep Alive Interval

Interval to send the Keep Alive report

The Device will send the keep alive report in Driving mode & Parking mode & Sleep mode. It will also wake the device from sleep in Park Mode.

The mobile network automatically disconnects when there is no data communication for a long time in order to manage limited network IP resources.
For example, if there is no data communication between the server and the device for 1 hour (it's depending on the network service provider), the mobile network cut the connection.
To prevent this, if you set Keep Alive Interval to 58 minutes, it sends a short message "KEEP_ALIVE" to the server before 60 minutes.
As a result, the mobile network leaves the connection between server and device.

Range: 0 ~ 432000
Units: Minutes
Default: 0

1070: TCP Keep Alive

Range: 00 or 01
Units: N/A
Default: 0(USA, EU, STB), 1(STG)

- 00 = Disable
- 01 = Enable

Enable or disable TCP keep-alive probe. This function prevents tcp connection from being teared down on some network operator when there's no data transfer.
(Supported by LATAM or Brazil only)

1071: TCP Keep Alive Idle Time

Range: 60 to 7200
Units: Seconds
Default: 150

Interval time for TCP keep-alive probe when TCP keep-alive function enabled.
(Supported by LATAM or Brazil only)

1061: Jamming Detection

Range: 0~3
Default: 0

- 0 = Disabled
- 1 = Enable and device is changed to Emergency when jammer is detected.
- 2 = Enable and device sends Alert report when jammer is detected.
- 3 = Enable and device is changed to Emergency when jammer is detected, and then the Emergency shall be kept even though the jamming condition is no longer observed.

Device will send an alert after recovering the GSM network.
It takes about 2 minutes.

1062: Check distance for jamming[meter]

Range: 0 ~ 60000
Units: Meter
Default: 500

This is complementary to the detection function of device described above on the GPRS/HSPA jamming by utilizing a distance value as a parameter when jamming is done.
Once jamming on the GPRS/HSPA network starts being detected, the device will also check the distance between the current location of the vehicle and the First geographical Point ('Fp') where the jamming started being detected.
If the distance is greater than JAM_CHK_DIST for a while, triggered by JAM_DET mode.
If '0', skip this procedure.
(Supported by LATAM or Brazil only)

1063: Check no GPS duration for jamming[sec.]

Range: 0 ~ 43200
Units: Seconds
Default: 300

It is complementary to the function of GPRS/HSPA jamming detection in an area 'without GPS connectivity' ('No GPS').
After detecting jamming first in such a bad GPS connecting area, the device begins to count the 2 time-length factors (*A and B*) to make a sum (*A + B = C*) if the vehicle moves in the area:

- *A: time length that needs to complete the jamming detection*
- *B: time length that the vehicle driver needs to complete driving in the area.*

If *C* (the sum) is longer than the length of the jamming detection ('JAM_CHK_TM') the device judges that jamming was done in the area. Please refer to the table for more details.
If the device has not moved in the area, ignore jamming detection until the jamming detection function is released.

If '0', skip this procedure.
(Supported by LATAM or Brazil only)

1016: Scanning Band Mode

Select the type of the Scanning Band mode
Some technologies may not be available depending on the device´s model, please consult the user´s manual and technical specification.

4G Model:
Range: 00 ~ 03
Units: N/A
Default: 00, 03(for BRAZIL)

- 00 = Global (Roaming): LTE Cat M1(or Cat 1) and GSM all bands
- 01 = Country (Mexico): LTE Cat M1(or Cat 1) Band 4, NB Band 5 and GSM all bands.
- 02 = Country (Europe): LTE Cat M1(or Cat 1), NB Band 3, 8, 20 and GSM all bands.
- 03 = Country (Brazil): LTE Cat M1(or Cat 1), NB Band 1,3,5,28 and GSM all bands.

3G Model:
Range: 00 ~ 01
Units: N/A
Default: 00

- 00 = Global (Roaming): All available bands
- 01 = Telcel Mexico: 850 and 1900MHz

1054: Scan Mode

Configure RAT to be searched
Some technologies may not be available depending on the device´s model, please consult the user´s manual and technical specification.

Range: 00 ~ 05
Units: N/A
Default: 00(for USA), 01(for LATAM or BRAZIL)

- 00: LTE Cat M1(or Cat 1) only
- 01: LTE Cat M1(or Cat 1) & GSM
- 02: LTE Cat NB only
- 03: LTE Cat M1(or Cat 1) & Cat NB(available in LATAM or BRAZIL devices only)
- 04: LTE Cat M1(or Cat 1) & Cat NB & GSM(available in LATAM or BRAZIL devices only)
- 05: GSM only(available in USA or BRAZIL devices only)
- 06: LTE Cat NB & GSM(available in USA only)

Report Config/Setting Tab

This section will cover the parameters that can be found in the "Report Settings" tab of SyncTrak. This section will go over the functionality of the parameters that control how the device sends its different reports.

1055: Zip/Normal

Selects whether or not to use the 'Normal' or 'Zip' reporting format

- 00 = Zip is Disabled, so 'Normal' reporting format will be used
- 01 = Zip is enabled, so 'Zip' reporting format will be used

Range: 00 ~ 01
Units: N/A
Default: 00

1058: Command Response Direction

Sets how the device will send a response message when it receives a command from SMS or Server/Platform.

For example, if you set 2 and server send a command to device through GPRS communication, the device will try to send a response through SMS (SMS_NO)

if you set 3 and server or sms send a command to device through GPRS communication, the device will try to send a response through SMS(SMS_NO) and server (SMS_NO)

When it is set as the boss and sends a response to the server, it passes the command reception channel information in the last field (Supported by LATAM or Brazil only)
ex) type both, send to server

- Received command from server: ";0"
- Received command from sms: ";1;[SMS_NO]"
  (SMS sender's phone number is also sent)

Range: 00 ~ 03
Units: N/A
Default: 00

How to set direction of Command response

- 00: No Use
- 01: Server
- 02: SMS
- 03. Both

1072: AES128

Selects whether or not to use the AES128.

Range: 00 ~ 02
Units: N/A
Default: 00

00 = Disable
01 = Reserved
02 = User Enc. Key

1073: AES128 Key

This Parameter will be setting User AES128 Key
User AES128 Key should be 32 characters and possible range of each character are:
'0'~'9', 'a'~'f', 'A'~'F'.

SMS Tab

Parameters under the SMS tab control SMS reporting and what numbers can SMS the device to change the existing parameter values.

1025: SMS Number

Phone Number that will receive SMS reports sent by the device.
Range: 0 to 20 numeric digits.

Note. Change IP to 0.0.0.0, Port to 0 for both main and backup server and enter valid SMS number, then device sends reports to SMS.

1030: SMS Lock

Lock of Receiving Commands by SMS
If enabled, only the phone numbers listed in parameters 1031 through 1034 (MT1-MT4) will be able to send SMS commands to the device. All other commands received by phone numbers that are not defined in these parameters will be ignored by the device.

Range: 00 or 01
Units: N/A
Default: 00

- 00 = Disable
- 01 = Enable

1031: SMS MT1

When SMS Lock is set, the device will accept SMS commands from the phone number listed in this parameter.
Range: 0 to 20 numeric digits.

1032: SMS MT2

When SMS Lock is set, the device will accept SMS commands from the phone number listed in this parameter.
Range: 0 to 20 numeric digits.

1033: SMS MT3

When SMS Lock is set, the device will accept SMS commands from the phone number listed in this parameter.
Range: 0 to 20 numeric digits.

1034: SMS MT4

When SMS Lock is set, the device will accept SMS commands from the phone number listed in this parameter.
Range: 0 to 20 numeric digits.

1035: MT Call Lock

If enabled, only a call which have been received from CALL_MT1 ~ MT5 numbers can be accepted.

Range: 00 or 01
Units: N/A
Default: 00

Lock of Incoming Call

- 00 = Disable
- 01 = Enable

Report Mapping Tab

1080: Status Report Map

Binary map of the standard headers that will be included in the Status Reports.
The size of the Report map is 4 bytes (32 bits).

- Bit 0: Report Map
- Bit 1: Model
- Bit 2: Software Version
- Bit 3: Message Type
- Bit 4: Date
- Bit 5: Time
- Bit 6: Cell ID
- Bit 7: MCC
- Bit 8: MNC
- Bit 9: LAC – Local Area Code
- Bit10: RX_LVL
- Bit11: Latitude
- Bit12: Longitude
- Bit13: Speed
- Bit14: Course/Heading
- Bit15: Satellite Count
- Bit16: GPS Fix Status
- Bit17: Input States
- Bit18: Output States
- Bit19: Mode
- Bit20: Status Report Type
- Bit21: Message Number
- Bit22: reserved
- Bit23: Assign Map

1082: Alert ID Report Map

Binary map of the standard headers that will be included in the Alert ID reports.
The size of the Report map is 4 bytes (32 bits).

- Bit 0: Report Map
- Bit 1: Model

- Bit 2: Software Version
- Bit 3: Message Type
- Bit 4: Date
- Bit 5: Time
- Bit 6: Cell ID
- Bit 7: MCC
- Bit 8: MNC
- Bit 9: LAC – Local Area Code
- Bit10: RX_LVL
- Bit11: Latitude
- Bit12: Longitude
- Bit13: Speed
- Bit14: Course/Heading
- Bit15: Satellite Count
- Bit16: GPS Fix Status
- Bit17: Input States
- Bit18: Output States
- Bit19: Alert ID
- Bit20: Alert Modifier
- Bit21: Alert ID Data
- Bit22: reserved
- Bit23: Assign Map

1097: PRM Report Enable

Selects whether or not to use the PRM Report.

- 00 = Disable
- 01 = Enable

Range: 00 or 01
Units: N/A
Default: 01(STG), 00(USA), 00(EU)

11: Assign Headers – Status Report

The Status Assign Headers consist of 3 different data options that can be added to the end of the Status Reports:

- Small Assign:
  - 2 Byte Data Field
  - Each option is assigned an ID value from 00 to FF
- Medium Assign
  - 4 Byte Data Field
  - Each option is assigned an ID value from 00 to FF
- Large Assign
  - 8 Byte Data Field
  - Each option is assigned an ID value from 00 to FF

1100 – 1114: Small Assign options 1 – 15

2-byte parameter to designate the ID from the Small Assign Table

- 1100 = S_ASSIGN1
- …
- 1114 = S_ASSIGN15

1140 – 1147: Medium Assign options 1 – 8

4-byte parameter to designate the ID from the Small Assign Table

- 1140 = M_ASSIGN1
- …
- 1147 = M_ASSIGN8

1160 – 1167: Large Assign options 1 – 8

8-byte parameter to designate the ID from the Large Assign Table

- 1160 = L_ASSIGN1
- …
- 1167 = L_ASSIGN8

12: Assign Headers – Alert Report

The Alert Assign Headers consist of 3 different data options that can be added to the end of the Alert Reports:

- Small Assign:
  - 2 Byte Data Field
  - Each option is assigned an ID value from 00 to FF
- Medium Assign
  - 4 Byte Data Field
  - Each option is assigned an ID value from 00 to FF
- Large Assign
  - 8 Byte Data Field
  - Each option is assigned an ID value from 00 to FF

1200 – 1214: Small Assign options 1-15 (ALT Report)

2-byte parameter to designate the ID from the Small Assign Table

- 1200 = S_ASSIGN1
- …
- 1214 = S_ASSIGN15

1240 – 1247: Medium Assign options 1- 8 (ALT Report)

4-byte parameter to designate the ID from the Small Assign Table

- 1240 = M_ASSIGN1
- …
- 1247 = M_ASSIGN8

1260 – 1267: Large Assign options 1 – 8 (ALT Report)

8-byte parameter to designate the ID from the Large Assign Table

- 1260 = L_ASSIGN1
- …
- 1267 = L_ASSIGN8

13: Alert Config 1

2-byte Parameters that designate whether or not the Alert Report is enabled, and the value of the Alert ID that will be sent when the Alert Report is generated.

1328: Back-Up Battery Low (43)

This Alert ID is sent by the device right before it shuts down due to low back-up battery voltage.
Parameter Structure:

- 1st Byte is the enable feature
  - 00 = Disabled
  - 01 = Enabled
- 2nd Byte is the ID that will be generated for the report
  - Option of Hex: 00 to FF (Decimal: 0-255)

1339: Sim Card Removed (72)

Parameter Structure:

- 1st Byte is the enable feature
  - 00 = Disabled
  - 01 = Enabled
- 2nd Byte is the ID that will be generated for the report
  - Option of Hex: 00 to FF (Decimal: 0-255)

1340: Jamming Detected (50)

Parameter Structure:

- 1st Byte is the enable feature
  - 00 = Disabled

- 01 = Enabled
- 2nd Byte is the ID that will be generated for the report
  - Option of Hex: 00 to FF (Decimal: 0-255)

1374: Carton Box Opened (145)

Parameter Structure:
- 1st Byte is the enable feature
  - 00 = Disabled
  - 01 = Enabled
- 2nd Byte is the ID that will be generated for the report
  - Option of Hex: 00 to FF (Decimal: 0-255)

1375: Presence Device Absent (146)

Parameter Structure:
- 1st Byte is the enable feature
  - 00 = Disabled
  - 01 = Enabled
- 2nd Byte is the ID that will be generated for the report
  - Option of Hex: 00 to FF (Decimal: 0-255)

1376: Absent Device Recovered (147)

Parameter Structure:
- 1st Byte is the enable feature
  - 00 = Disabled
  - 01 = Enabled
- 2nd Byte is the ID that will be generated for the report
  - Option of Hex: 00 to FF (Decimal: 0-255)

14: Alert Config 2

2-byte Parameters that designate whether or not the Alert Report is enabled, and the value of the Alert ID that will be sent when the Alert Report is generated.

1438: Power Key Pressed or Turn Off by itself from low-battery (55)

This alarm ID is sent when the power is on/off by power key. (Only supported by STx330 series)
This alarm ID is sent when the Turn Off by itself from low-battery. (Only supported by 4290 series, 4410 series)

Parameter Structure:
- 1st Byte is the enable feature
  - 00 = Disabled
  - 01 = Enabled
- 2nd Byte is the ID that will be generated for the report

- Option of Hex: 00 to FF (Decimal: 0-255)

1471: Lose Network Connection (141)

This alert ID is sent whenever the network connection is lost.
(Only supported by STG or SB and 4G Model)

Parameter Structure:

- 1st Byte is the enable feature
  - 00 = Disabled
  - 01 = Enabled
- 2nd Byte is the ID that will be generated for the report
  - Option of Hex: 00 to FF (Decimal: 0-255)

16: Mode Configuration and Profile Settings

Mode Config Tab

The Mode Configuration parameters control the different modes that will be utilized on the device. These modes are built in to cover the standard functions, and can be configured and customized by the following parameters.

1605: Normal Profile/Enable

This parameter is used to select the Profile that will be assigned to Normal Mode.

- 00 = Disabled
- 0X = Reporting Profile that is assigned to Normal Mode

Range: 00 ~ 06
Units: N/A
Default: 01(Profile 1)

1628: Emergency Profile/Enable

This parameter is used to select the Profile that will be assigned to Emergency Mode.

- 0 = Disabled
- X = Reporting Profile that is assigned to Emergency Mode

Range: 00 ~ 06
Units: N/A
Default: 06(Profile 6)

Profile Setting Tab

This section will cover the Reporting Profile Settings that can be assigned to each Mode

1670: Profile 1 Time

Range: 0 ~ 2880 (48 hours maximum)
Units: Minutes
Default: 60

Time Interval for which the device will send Status Reports in Profile 1.

- 0 = Disabled
- X = Timer value that the device will “OR” condition with the Distance and Heading/Angle Change values in Profile 1

1673: Profile 2 Time

Range: 0 ~ 2880 (48 hours maximum)
Units: Minutes
Default: 3

Time Interval for which the device will send Status Reports in Profile 2.

- 0 = Disabled
- X = Timer value that the device will “OR” condition with the Distance and Heading/Angle Change values in Profile 2

1676: Profile 3 Time

Range: 0 ~ 2880 (48 hours maximum)
Units: Minutes
Default: 15

Time Interval for which the device will send Status Reports in Profile 3.

- 0 = Disabled
- X = Timer value that the device will “OR” condition with the Distance and Heading/Angle Change values in Profile 3

1679: Profile 4 Time

Range: 0 ~ 2880 (48 hours maximum)
Units: Minutes
Default: 60

Time Interval for which the device will send Status Reports in Profile 4.

- 0 = Disabled
- X = Timer value that the device will “OR” condition with the Distance and Heading/Angle Change values in Profile 4

1682: Profile 5 Time

Range: 0 ~ 2880 (48 hours maximum)
Units: Minutes
Default: 1

Time Interval for which the device will send Status Reports in Profile 5.

- 0 = Disabled
- X = Timer value that the device will “OR” condition with the Distance and Heading/Angle Change values in Profile 5

1685: Profile 6 Time

Range: 0 ~ 2880 (48 hours maximum)
Units: Minutes
Default: 15

Time Interval for which the device will send Status Reports in Profile 6.

- 0 = Disabled
- X = Timer value that the device will "OR" condition with the Distance and Heading/Angle Change values in Profile 6

19: Power

This section will cover the parameters that can be found in the "Power" tab of SyncTrak.

1936: Use Low Battery Shutdown

Enables protective shut down of the device if the back-up battery falls below a specified voltage

- 00 = Doesn't power off the device
- 01 = Power off the device when vehicle battery is disconnected and Backup battery voltage is low

Range: 00 – 01
Units: N/A
Default: 01

1937: Low Battery Shutdown Threshold

Range: 3.40 – 3.80
Units: Volts DC
Default: 3.40

Threshold of backup battery voltage for power off.

For ST4290 Series model
Range: 3.00 – 3.30
Default: 3.00

1938: Low Battery Alert Threshold

Range: 3.50 – 3.90
Units: Volts DC
Default: 3.50

Threshold of backup battery voltage for the Alert. It should be set greater than 1937: Low Battery Shutdown Threshold.

For ST4290 Series model
Range: 3.10 – 3.50
Default: 3.40

25: RF1 Parameters

This section will cover the parameters about RF features.
RF1 parameters are available only for RF device.

2501: RF Channel

This parameter controls the channel for RF.

Range: 1 ~ 20
Default: 1

2502: Status of Battery

This parameter controls if RF message includes field for voltage and status of battery.

Range: 0(Disable) or 1(Enable)

Customer Code Tab

2505: Customer Code

This parameter controls the customer code

Range: 6 to 10 numeric digits.

Default code is selected if it is empty. When it is empty, default code will be selected.
Customer Code cannot be read by SyncTrak or remotely.

Presence Parameters Tab

2561: Type of Presence Function

These parameters control the type of Presence function.

Range: 0 ~ 2
Default: 0

- 0: Disable
- 1: Slave
- 2: Master

2562: Action of Presence Function

These parameters control the action of Presence function.

Range: 0 or 2
Default: 0

- 0: No action
- 1: Emergency and Alert
- 2: Report Alert only

2563: Timeout of Presence Function

This parameter sets the timeout period used by a device to consider it missing.

Range: 0 ~ 5760
Units: Minutes
Default: 25

2569: Presence MSG TX Interval

Time interval between transmissions of presence message (only when Type of Presence Function (2561) is 2).

Range: 0 ~ 2880 (48 hours maximum)
Units: Minutes
Default: 10

Presence Device List Tab

2571 to 2580: Serial No. of Presence device

These parameters control the serial no. of Presence function.

The serial number is 9 digits in total, and the number is 9 digits from the second number of ESN.

Ex) If the ESN is 2011234569, the serial number is 011234569.

27: Device Configuration

2704: Carton Box Open Emergency

This parameter which will decide to change or not to change into Emergency Mode when the carton package is opened.

Range: 0 ~ 2
Default: 0

- 0: Disable
- 1: Enable and device is changed to Emergency when carton box is opened
- 2: Enable and device sends Alert report when carton box is opened

2705: Power Off by Key

This parameter which will decide to turn off the switch or not to turn off the switch when location of the power switch is moved to OFF.

Range: 0 ~ 1
Default: 0

- 0: Disable
- 1: Enable

2706: Keep on when Jammer is detected

This parameter that determines whether the device remains on when a jammer is detected.

Range: 0 ~ 1
Default: 0

- 0: Disable
- 1: Enable

2707: Delay for Entering Sleep

This parameter determines the delay to go to sleep after sending the last message to the server.

Range: 5 ~ 60
Units: Seconds
Default: 5

2708: Neighbor Cell Enabled

This parameter determines whether to activate the Neighbor Cell function or not.

Range: 0 ~ 1
Default: 1

- 0: Disable
- 1: Enable

28: RF2 Parameters

This section will cover the parameters about RF features.
RF2 parameters are available only for RF device.

2800: RX Interval in Normal

This parameter sets the time interval between two consecutive RF Rx wake-ups in normal mode to check if a command has been received via RF.

Range: 0 ~ 60
Units: Seconds
Default: 10

2801: RX Duration in Normal

This parameter sets the time interval needed to keep the RF chip active to check if a command has been received via RF.

Let us take an example: If “RX Interval in Normal” (2800) is 12, and if “RX Duration in Normal” (2504) is 200, the device will keep the RF chip enabled for 200 mili seconds at a time interval of 12 seconds to check if a command comes into.

Range: 0 ~ 60000
Units: Milli Seconds
Default: 300

2802: Emergency TX Number

This parameter sets the number of times to transmit RF data in emergency mode.

Range: 0 ~ 15
Default: 1

2803: TX Interval in Emergency

This parameter sets the time interval required to transmit data over RF in emergency mode.

Range: 1 ~ 60
Units: Seconds
Default: 2

2804: RX Duration in Emergency

This parameter sets the amount of time needed to keep the RF RX active to check for RF commands in emergency mode.

Range: 0 ~ 60000
Units: Milli Seconds
Default: 300

2805: Band Width

This parameter sets the bandwidth value that should be used to configure the RF receiver.

Range: 6 ~ 25
Units: KHz

Default: 6

2806: GNSS Fix Timeout

Range: 1 – 300
Units: Seconds

Timeout for GPS fix.

If GPS is not fixed for this timeout, device transmit “Status Report” without fixed position.

Default : 180 (3 min).

This parameter is not supported on the ST4410 model.

2807: GNSS Report Type

Determine if Report strings include GPS related fields.

Type	Normal	Emergency	Alert
0	X	X	X
1	X	X	O
2	X	O	X
3	X	O	O
4	O	X	X
5	O	X	O
6	O	O	X
7	O	O	O

Default: 7

X –Means GPS information Disabled
O –Means GPS information Enabled

This parameter is not supported on the ST4410 model.

99: MCU Update Parameters

This section covers the parameters for the MCU Update function.

9900: MCU Update

This parameter selects the MCU OTA Binary file path.

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 (Hex)	Zip Ex	Normal Ex	Description
DEV_TEMP	52	01 14	+27.6	Temperature Sensor 1 in the chain. • 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
TTFF	60	00 0E	14	Time To First Fix (seconds) **This field is not supported on the ST4410 model.**
ALTITUDE	13	00 EA	234	Altitude (meter) • Convert zip to Altitude by converting HEX (00 EA) to DEC (234) • Convert zip to Altitude by converting HEX (FF 16) to DEC (-234) → FFFF – 00EA (234) + 1 = FF16 2's complement **This field is not supported on the ST4410 model.**
RF_STATUS	62	00 01	001	This field brings the information about whether collaborative network is enabled or not, and which RF channel is set. First digit means collaborative network is Disabled or not. Value : 0 • 0 = Collaborative network is disabled • 1 = Collaborative network is enabled for emergency and ERB mode. • 2 = Collaborative network is enabled for emergency mode only. • 3 = Collaborative network is enabled for Emergency mode temporally. The other two digits means rf channel set. Value : 1 You can see that the current RF channel is set to 1.
BCK_VOLT	1	00 24	3.6	Current Backup Battery Voltage • Convert zip to VDC by converting HEX (24) to DEC (36) then divide by 10
NET_STATUS	20	00 01	1	Network Status • 1 => Connected with Server • 2 => Disconnected with Server • 3 => Disconnected GPRS Bearer • 4 => No Network

				• 5 => Sim Blocked • 6 => Network Error (Limited Service) • 7 => No Sim • 8 => Jammer detected • 255 => Initial State
TA	81	00 0F	15	Timing Advance(0 ~ 63) 255: Invalid or not measured

Parameter Configuration

Before a device starts being operated, its parameters should be set first. This *chapter* shows the string to be sent to device.

There are 3 options of sending string.

Option 1: by using PC.
Option 2: by using GPRS/HSPA network.
Option 3: by messaging via SMS.

In practice, configuration can be made more efficiently with 'SyncTrak', i.e. a setting tool provided by Suntech.

Once a device receives a command from the server, it gets back to the server with a relevant response. Device also changes some parameters (if it is required to do so) or takes an action as instructed below as per the command sent by the server.

Programming Parameter Format

Here are some examples for programming parameters of the device
PRG and REQ Command can use maximum 20 items at one time.

Structure

Program Command

- Parameter of XXYY are equal to:
  - XX = Group Param ID
  - YY = Param ID
- Program structure
  - PRG; [DEVICE ID];[Group Param ID];[Param ID]#[Param Value]
  - PRG;[DEVICE ID];[Group Param ID];[Param ID]#[Param Value];[Param ID]#[Param Value]

Response Options:

- RPR;[DEVICE ID];[Parameter]
  - Will list the XXYY Parameter in the response for each parameter that was successfully received and programmed.
- ERROR
  - Error with no successful programming completed
- ERR;[Parameter]
  - Error with the listed parameter, but other parameters programmed successfully
- USP;[Parameter]
  - A parameter was given in the command that is not listed in the supported parameter of the device (or FW version of the device).

Examples

This section will cover some examples of program commands and device reposes

Example 1: Basic Command

Program command for parameter numbers 1000: Authentication and 1001: APN

- Command sent to device:
  - PRG;[DEVICE ID];10;00#1;01#testapn.test

- Response sent back from device:
  - RPR;[DEVICE ID];1000;1001

Example 2: ERR incorrect data given
Program command for parameter numbers 1000: Authentication and 1001: APN

- Command sent to device:
  - PRG;[DEVICE ID];10;00#99;01#testapn.test
    - Parameter number 1000 does not support value 99, so the device encounters an error when trying to program this value
- Response sent back from device:
  - RPR;[DEVICE ID];1001
    ERR;1000

Note: In this case the “OK” response means that the device successfully programmed parameter ID 1001, but the ERR in the response designates that the parameter ID 1000 was not able to be written to the device.

Example 3: Errors

- Command sent to device:
  - PRG;[DEVICE ID];1;00#1;01#testapn.test
- Response sent back from device:
  - ERROR

- Command sent to device
  - PRG;[DEVICE ID];10;00#1;01testapn.test
- Response sent back from device:
  - RPR;[DEVICE ID];1000;
  - ERROR

Requesting Parameter Value Format

Structure

Program Command

- Parameter of XXYY are equal to:
  - XX = Group Param ID
  - YY = Param ID
- Request structure
  - REQ;[DEVICE ID];[Group Param ID];[Param ID];
  - REQ;[DEVICE ID];[Group Param ID];[Param ID],[Param ID]

Response Options:

- Response with Parameter values:
  - RRE;[DEVICE ID];[Group Param ID];[Param ID]#[Param Value]
  - RRE;[DEVICE ID];[Group Param ID];[Param ID]#[Param Value];[Param ID]#[Param Value]
- ERROR
  - Error with no successful request completed

Examples

This section will cover some examples of request parameter commands and device reposes

Example 1: Basic Command

- Command sent to device:

  - REQ;[DEVICE ID];10;00,01
- Response sent back from device:
  - RRE;[DEVICE ID];10;00#1;01#testapn.test

Example 2: USP parameter

- Command sent to device:
  - REQ;[DEVICE ID];10;00,01,15
- Response sent back from device:
  - RRE;[DEVICE ID];10;00#1;01#testapn.test
    USP;1015

Example 3: Errors

- Command sent to device:
  - REQ;[DEVICE ID];1;00,01
- Response sent back from device:
  - ERROR

- Command sent to device:
  - REQ;[DEVICE ID];10;00,1
- Response sent back from device:
  - RRE:[DEVICE ID];10;00#1
    ERROR

Command Structure:

- CMD;[DEVICE_ID];[Param ID];[Param Value]
- "**AT^**" must be added when sending commands from PC by USB.
  <Example>
  AT^CMD; 4309999001;01;01

01: Network Commands

0101: Check-In to Maintenance Server

Following command will prompt the device to report to the maintenance server to check for updates.

<Example>
Command: CMD;4309999001;01;01
Response: RES; 4309999001;01;01

0102: Requesting IMSI

The server sends the device this command requesting IMSI (International Mobile Subscriber Identity) if the server wants to receive IMSI from the device.
If the device receives the command from the server, it sends the IMSI to the server.

Response Options:

- When the device has no SIM or is under power-on process, the IMSI number cannot be read.
  - RES;4309999001;01;02;NotReady

<Example>
Command: CMD;4309999001;01;02
Response: RES;4309999001;01;02;724031111553779

0103: Requesting ICCID

How to request ICCID (Integrated Circuit Card Identifier), which is a sequence number that is displayed on SIM.
If device receives this command, it sends the server ICCID.

Response Options:

- When the device has no SIM or is under power-on process, the ICCID number cannot be read.
  - RES;4309999001;01;03;NotReady

<Example>
Command: CMD;4309999001;01;03
Response: RES;4309999001;01;03;89550230000084256668

0104: Check if connected to 2G, 3G, or 4G

Following table shows Radio Access Technology which the device is currently connected.
Response options:

- 0: GSM
- 1: GSM COMPACT
- 2: UTRAN

- 3: GSM with EDGE availability
- 4: UTRAN with HSDPA availability
- 5: UTRAN with HSUPA availability
- 6: UTRAN with HSDPA and HSUPA availability
- 7: Reserved
- 8: LTE Cat M1
- 9: LTE Cat NB1
- 255: Invalid or No Network

<Example>
Command: CMD;4309999001;01;04
Response: RES;4309999001;01;04;3

0105: Request its Own Phone Number

Requesting own phone number.

Response Options:

- When the device has no SIM or is under power-on process, the own phone number cannot be read.
  - RES; 4309999001;01;05;NotReady
- If the own number field in SIM is empty, the device reports with "NoData".
  - RES; 4309999001;01;05;NoData

<Example>
Command: CMD;4309999001;01;05
Response: RES;4309999001;01;05;82220275656

0202: Set Google Map Address

In a case that you use a smart phone operating a function of "Where Are You", you can use the server of the Google as set below *in italic bold letters, "Google map address".* The users of the Google map should check what the right map address of the Google is and that the right address should be set. The Google map address needs to be checked. If the Google map address is not right, this function ("Where Are You") can't be used.

Set location link address format (Google map address).
This command is either followed by "=" or inserted inside the address.
<Example>
Command: CMD;4309999001;02;02;***http://maps.google.com/maps***?q=
Response: RES;4309999001;02;02

<Note>
The max of input string is 96 characters.

0203: Get Google Map Address

In case this command is made, the pre-set existing Google Map address will be known.
Definition: Get Google Map Address.

<Example>
Command: CMD;4309999001;02;03
Response: RES;4309999001;02;03;http://maps.google.com/maps?q=

03: Command for General Use

After device is configured, user may need to check/query values of the parameters if he/she wants to change those values. This chapter shows user how to change the parameters values that have been set already.

0301: Requesting Status Report

Once this command is made, some interactions will be made between the server and the device as described in the *'Meaning' section* of the table below.

Requesting Status of the device

If device receives this 'Request' command from the server, it sends the Status string to the server promptly.

<Example>
Command: CMD;4309999001;03;01
Response: [Defined Status Report Structure]

C.F. To request status string via external RS232, you must send the "SttReq" command.

0302: Re-setting (Restoring to factory defaults and rebooting)

Once this command is made, some interactions will be made between the server and the device as described in the *'Meaning' section* of the table below.

Re-setting the current parameters values

This command is used to initialize all the parameters with the values set in the factory of the devices and to reboot the device.

c.f. Parameters are not initialized in Brazil firmware. It has same effect with Reboot command.

<Example>
Command: CMD;4309999001;03;02
Response: RES;4309999001;03;02

0303: Reboot

This command is made by the server to the device which needs to be rebooted.

<Example>
Command: CMD;4309999001;03;03
Response: RES;4309999001;03;03;Reboot

0304: Request Device Version

Requesting information about version of the device
For OBD Models TYPE 2 transmits the STN1110 version

If the device receives this command, it reports to the server about:

CMD; 4309999001;03;04;<Type>

<Type>

- 1: Main firmware
- 2: MCU firmware
- 4: Modem firmware

<Example>
Command: CMD;4309999001;03;04;01
Response: RES;4309999001;03;04; 01;STG.56.1.0.2

Command: CMD;4309999001;03;04;02
Response: RES;4309999001;03;04;02;M007
Response: RES;4309999001;03;04;02;NotSupport

Command: CMD;4309999001;03;04;04
Response: RES;4309999001;03;04;04;BG96MAR02A07M1G_01.014.01.014
Response: RES;4309999001;03;04;04;NotReady

0305: Preset

This command sends the saved settings of the parameter
However, when transmitting by SMS, it is transmitted by dividing it by 800 bytes
(Only supported by LATAM or Brazil)

- Support Parameter List
  1) Network Parameter
  2) Report Config/Setting
  3) Profile Setting
  4) SMS
  5) Accelerometer
  6) Power
  7) Ignition
  8) Input
  9) Output
  10) Mode Config
  11) 1-Wire Setting
  12) Serial RS232

<Example>
Command: CMD;4309999001;03;05
Response:
RES;4309999001;03;05;10;00#02;01#;02#;03#;04#0000;05#211.118.107.218;06#6605;07#00;08#;09#0;10#00;11#0;12#0;13#00;60#0;20#suntechscuti.com;21#9000;22#24;23#00:00;70#00;71#60;61#00;62#500;63#300;65#60;66#60;67#60;68#60,10;55#00;58#00;59#00;64#00,10;25#1234567891234567897 8;30#00;31#45645665465468798798;32#56465487879879879878;33#898987987987987897 98;34#12313213213213216546,19;00#00;01#0.06;02#600;03#0.70;04#1.50;10#00;11#10.0;12#10.0;13#20.0;14#40.0,19;30#00;31#01;32#01;33#17.00;34#8.00;35#18.00;36#01;37#3.40;38#3.50,17;00#03;01#0;02#0;05#5;06#10;07#70;08#5;09#500;10#70;15#0.00;16#0.00,17;20#00;21#20;22#18;23#0;24#00;25#1;26#02;27#20,17;60#00;61#01;75#9999;76#1100;77#1111;62#00;63#01;80#9999;81#1111;82#1111;64#00;65#01,16;70#600;71#0;72#0;73#600;74#0;75#0;76#3600;77#0;78#0;79#10;80#1000;81#90;82#30;83#1000;84#60;85#3600;86#1000;87#30,16;00#04;01#0;05#01;06#0;10#02;11#0;12#30;13#30;14#30;15#0;16#0;17#0;20#05;21#100;22#10;23#10;24#5;25#10;36#00,19;50#00;51#05;56#30,19;70#00;80#100;81#-50;82#100;83#-50;84#100;85#-50;86#100;87#-50;88#100;89#-50;90#100;91#-50;92#100;93#100;95#-50

0306: PresetP

This command sends the saved settings of the specified parameter

(Only supported by LATAM or Brazil)

* Value: 0~tab total count

- List of unsupported parameters
  1) 1W Add Driver ID
  2) 1W Remove Driver ID
  3) 1W Get Driver ID
  4) Circular Geofence
  5) Command String
  6) Polygon Geofence

<Example>
Command: CMD;4309999001;03;06;[value]
Response: RES;4309999001;03;06;[Setting Data]
Response: RES;4309999001;03;06;Not Support

Command: CMD;4309999001;03;06;0
Response:
RES;4309999001;03;06;10;00#02;01#;02#;03#;04#0000;05#211.118.107.218;06#6605;07#00;08#;09#0;10#00;11#0;12#0;13#00;60#0;20#suntechscuti.com;21#9000;22#24;23#00:00;70#00;71#60;61#00;62#500;63#300;65#60;66#60;67#60;68#60

Command: CMD;4309999001;03;06;1
Response: RES; 4536435435;03;06;10;55#00;58#00;59#00;64#00
Command: CMD;4309999001;03;06;12
Response: RES;4536435435;03;06;Not Support

05: COMMAND FOR VARIOUS USAGES

0502: Erase all the saved reports → Erase All

This command is used if you want to erase all the saved reports and disable the outputs. This command is needed to initialize the device which is to be delivered to a new customer.

<Example>
Command: CMD;4309999001;05;02
Response: RES;4309999001;05;02

0504: Initialize Message Number

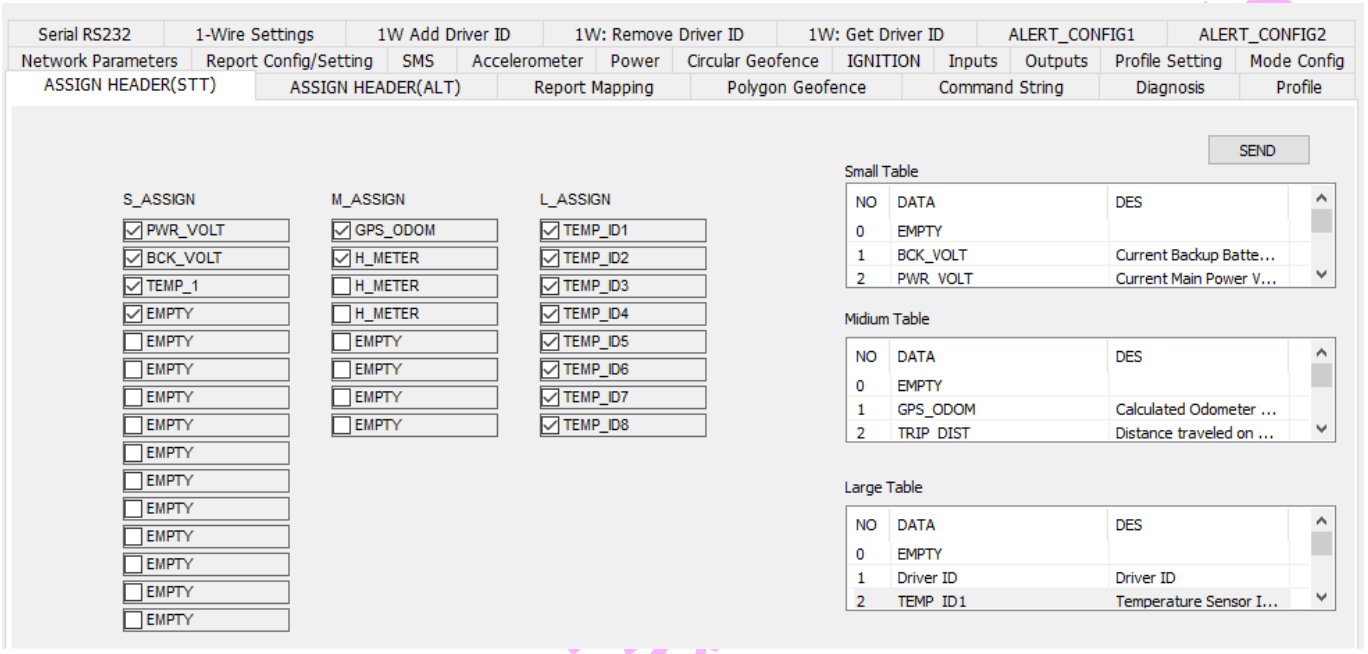
This command is used if you want to initialize sequence number of the message.

<Example>
Command: CMD;4309999001;05;04
Response: RES;4309999001;05;04;0

0507: Request Complete STT Assign Map

This command is sent when you request about the current configuration for the Short, Medium and Long Assign. This device sends only enabled assign header

Command: CMD;4309999001;05;07
Response: RES;4300999021;05;07;STT ASSIGNMAP;S_ASSIGN,M_ASSIGN,L_ASSIGN



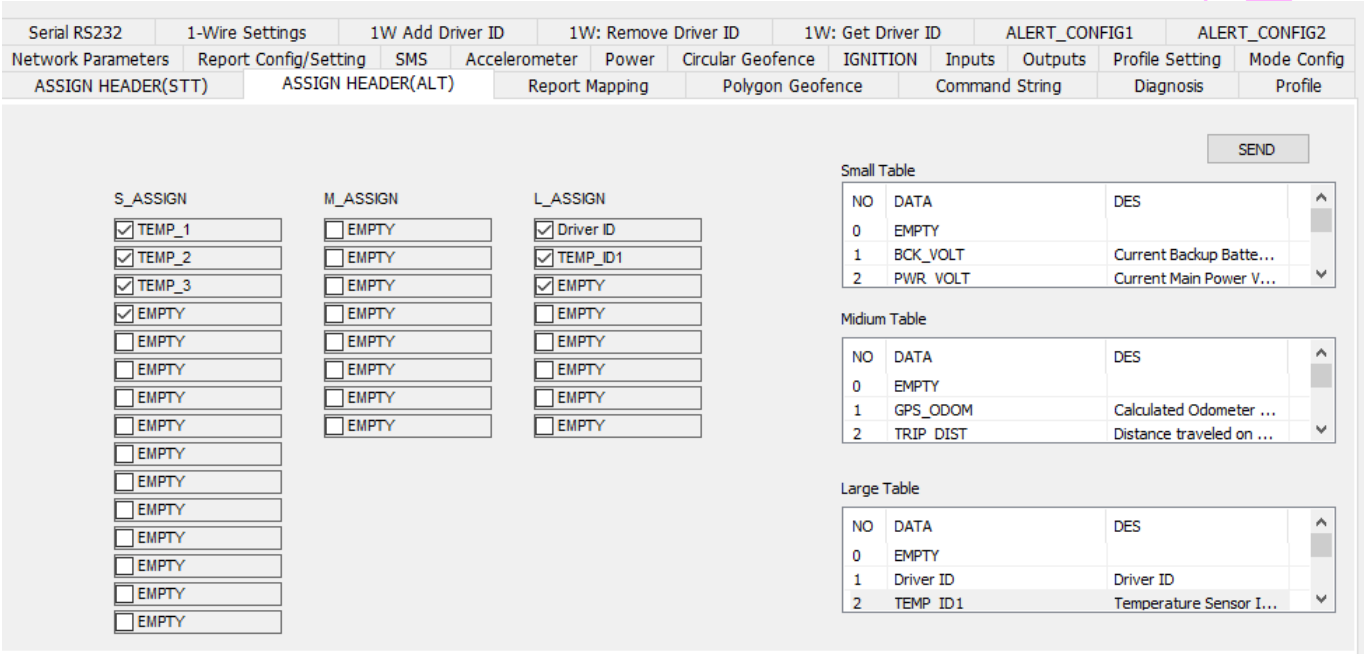
<Example>
Command: CMD;4309999001;05;07
Response: RES;4309999001;05;07;7F81800F;02,01,03,00;01,06;02,03,04,05,06,07,08,09

*STT ASSIGN MAP : 7F881800F
*S_ASSIGN : 02,01,03,00
*M_ASSIGN : 01,06
*L_ASSIGN: 02,03,04,05,06,07,08,09

0508: Request Complete ALT Assign Map

This command is sent when you request about the current configuration for the Short, Medium and Long Assign. This device sends only enabled assign header

Command: CMD;4309999001;05;08
Response: RES;4300999021;05;08;ALT ASSIGNMAP;S_ASSIGN,M_ASSIGN,L_ASSIGN



<Example>
Command: CMD;4309999001;05;08
Response: RES;4309999001;05;08;0380000F;03,04,05,00;;01,02,00

*ALT ASSIGN MAP : 0380000F
*S_ASSIGN: 03,04,05,00
*M_ASSIGN:
*L_ASSIGN: 01,02,00

07: USER Commands

0700: Encoding Type

This Command will be setting Encoding Type
Device ID can be encrypted when command is sent by SMS
(Only supported by LATAM or Brazil)

Value	Encoding Type
0	Disable Device ID is not encrypted
1	Auto Encoding Key. Device ID is encrypted by auto-generated Encoding Key.
2	User Encoding Key. Device ID is encrypted by user-defined Encoding Key.

<Example>
Command: CMD;4309999001;07;00;1
Response: RES;4309999001;07;00;1
Command: CMD; 4309999001;07;00;q
Response: RES; 4309999001;07;00;<value>

0701: User Encoding Key

This Command will be setting User Encoding Key
Device ID can be encrypted when command is sent by SMS
(Only supported by LATAM or Brazil)

<Example>
Command: CMD;4309999001;07;01;1D3F35zT2AcBqCud
Response: RES;4309999001;07;01;1D3F35zT2AcBqCud

User Encoding Key should be 16 characters and possible range of each character are:
'0'~'9', 'a'~'z', or 'A'~'Z'

0773: StartEmg

Starts Emergency Mode.

<Example>
Command: CMD;4309999001;07;73
Response: RES;4309999001;07;73

0774: StopEmg

Stops Emergency Mode.

<Example>
Command: CMD;4309999001;07;74
Response: RES;4309999001;07;74

0775: CoNetEmg1

Start Collaborative Network for EMG MODE.

<Example>
Command: CMD;4309999001;07;75
Response: RES;4309999001;07;75

0776: CoNetEmg0

Stop Collaborative Network for EMG MODE.

<Example>
Command: CMD;4309999001;07;76
Response: RES;4309999001;07;76

0782: ReqCoNet

<Example>
Command: CMD;0541234567;07;82
Response: RES;0541234567;07;82;<ConetEnabled>

<ConetEnabled>
“Enabled” : Conet is Enabled
“Disabled” : Conet is Disabled

0789: SetREPCHARGE

This command is to set the report to server while charging the battery.

<Example>
Command: CMD;4309999001;07;89;<Enabled>
Response: RES;4309999001;07;89;<Enabled>

<Enabled>

0 : Device does not report to server while its battery is recharged.
1 : Device report to server while its battery is recharged.
The device report to server periodically, according to its report interval configuration.

Default : 0

0790: ReqREPCHARGE

This command is to request the report charge option.

<Example>
Command: CMD;4309999001;07;90
Response: RES;4309999001;07;90;<Enabled>

<Enabled>

0 : Device does not report to server while its battery is recharged.
1 : Device report to server while its battery is recharged.
The device report to server periodically, according to its report interval configuration.

FEATURES

1.1 Presence Check Function

Presence Check Function is a configurable function. This configuration can be done by SyncTrak, GPRS and SMS.
Presence Message Request and Presence Message packet are always transmitted according to RF_CH.
In case the RF Device identifies the absence of another RF Device, it takes one of the configurable presence absence error actions:

- Either enter into emergency mode AND send a GSM/GPRS alert to Server (indicating the missing ID)
- Or simply send a GSM/GPRS alert to Server (including the missing ID)

It is possible to activate the presence function as 'master' in all operation modes (Normal and Emergency mode)
It is possible to activate the presence function as 'slave' in Normal mode only/

A. When the Device is set as SLAVE:
a. With no Stored Device(s): keeps its RF receiver (Rx) enabled all the time (except when transmitting)
b. With Stored Device(s): keeps its RF receiver (Rx) enabled all the time (except when transmitting).
When it is the addressee of a PMR, it then transmits a PM packet back whenever requested; when it is not the addressee of a PMR, it disregards it.
If it does not receive either a PMR or a PM from each one of the stored devices in its memory within a pre-defined (configured) presence timeout, it takes the configured presence absence error action. If the presence timeout is set as '0' (zero), no presence absence error action is taken, even existing stored devices in its memory.

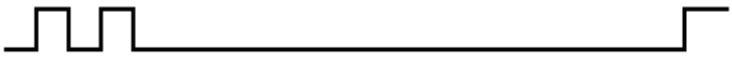
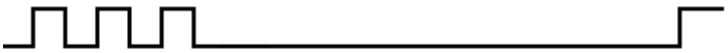
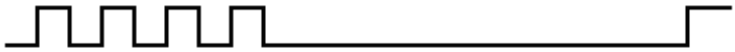
B. When the Device is set as MASTER:
a. With no Stored Device(s): transmits PM packets at a pre-defined (configured) time interval;
b. With Stored Device(s): transmits PM packets to the 1st stored device in its memory, and then enables its RF Rx for 600ms to listen the PM back from such stored device. If it does not receive the PM back from such stored device, it repeats the above procedure for the second time after 1 minute, and if it does not receive the PM back from such stored device again, it repeats the above procedure for the third time after 1 minute.
If it does not receive the PM back from such stored device after the third attempt, it takes the configured presence absence error action.
The above procedure is taken for each of the stored devices in its memory, one by one.

1.2 Three-Color LED for Back-up Battery

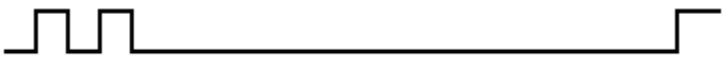
Depending upon voltage level of its back-up battery, the ST410 has 3 color of LEDs to indicate status of its back-up battery level as shown in the following table:
This LED is blinking or lighting only when charger is connected.
It is not turned on when setting cable is connected.

Behavior of LED	Status of Backup Battery
Red LED blinking	Under 20% of the full capacity
Orange LED blinking	20% to 90%
Green LED blinking	Upper 90%
Green LED lighting	Fully charged
Green and Red LED blinking by turns	Battery error

1.3 Blue LED for GPRS

GPRS	Blink Count	Meaning
Normal	1	
Server Com. Error	2	 <Probable Causes> 1. Server or network parameter is wrong. 2. Server is closed. 3. Temporary network barrier
GPRS Com. Error	3	 <Probable Causes> 1. Network parameter is wrong. 2. SIM is blocked about GPRS using. 3. Temporary network barrier 4. Weak GPRS signal 5. GPRS antenna connection is not firm.
No Network	4	 <Probable Causes> 1. GPRS antenna is disconnected. 2. GPRS antenna or socket of GPRS antenna is broken. 3. Device is broken.
SIM PIN Locked	5	 <Probable Causes> 1. SIM PIN is enabled.
Cannot Attach NW	6	 <Probable Causes> 1. Weak GPRS signal. 2. GPRS antenna connection is not firm.
No SIM	7	 <Probable Causes> 1. There is no SIM or SIM is not inserted properly. 2. SIM or SIM socket is broken.

1.4 Red LED for GPS

GPS	Blink Count	Remarks
Normal	1	
No Fix	2	 **<Possible Cause>** 1. If power on, GPS chipset is trying to find position during some minutes.

		2. GPS antenna lays on weak or no GPS signal position 3. GPS antenna connection is not firm.
GPS Chipset Error GPS Antenna Error	4	 **<Possible Cause>** 1. GPS antenna is disconnected. 2. GPS antenna or socket of GPS antenna is broken. 3. Unit is broken.

REVISIONS

Rev. No.	Date	Modifications were made on:	Writer
Rev. 1.01	2023-08-21	First version	G. Borborema
Rev. 1.02	2023-12-22	NBR Cell Report description included Small Assign Headers description included 2708 parameter included	G. Borborema