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TT-6000 INMARSAT-C LES
API-Header Description

TT-99-108806   Version 1.0.1.

Thrane & Thrane

TT-6000 Inmarsat-C Land Earth Station

API-Header Description

Software Definition Document

Document number:	TT 99-108806
Revision:	1.0.1
File name:	API-Header
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1. INTRODUCTION

The headers described in this document are the LES generated message headers assigned in front of each message – can be empty. Additionally the document describes format of PDN's, NDN's and Message Status responses.

1.1. SCOPE AND PURPOSE

It is the purpose of this document to describe the possible header layouts as they can be assigned for the individual terrestrial and mobile users.

The purpose of the document is to help fleet-managers and fleet-management programmers in gaining the optimal use of the Inmarsat-C system.

1.2. DOCUMENT OVERVIEW

The rest of the document consists of the following chapters:

Textual Headers

> In this chapter the specific headers, which are assigned to messages are described. These are the textual headers mainly used in the To-Mobile direction and for normal textual message forwarding.

API Headers

> In this chapter the specific API-headers, which can be assigned to messages are described. These are the API-headers mainly used in the interface to computerised equipment for easy internal routing and decoding.

1.3. ABBREVIATIONS

TUS	Terrestrial User Station
RU	Registered User
RUL	Registered User List
NRU	Non Registered User
SEM	State Event Machine
DNID	Data Network Id (polling)
ENID	EGC Network Id

2. TEXTUAL HEADERS

The delivery notification and message status/journalling formats can be configured freely for the customer to a certain extent. Using fixed text combined with a number of variables to choose in between can create the format. The variables are inserted independently in the format definition in the configuration. The way of using a variable is done by inserting a '/' immediately followed by the name of the variable, in the resulting text the variable is substituted by the value of the variable. In the following subsections the variables are described and the possible values are specified and explained.

2.1. MESSAGE HEADERS

The 'Message Headers' are headers added to the messages in the forwarding process.

The fields of the 'Message Header' are as follows:

Field Name	Description
Description Text:	A short descriptive text, identifying the header. This text is used when selecting the text in for a DNID, Mailbox or Barring Entry.
Message Header:	The message header to be added in front of Ship-Shore messages. The message header comprises <text> and <token> mixed as per wish. They are used in the message header as follows: <text> will be shown to the user exactly as entered. <token> will cause information to be entered at that position. Below is listed the valid tokens, and what they causes to be insert: /STIM Message store time /TIM Forwarding time /REF Message reference number /ORG Originator answer-back /ATT Attention text /OCE Origination Ocean Region

An example could be:

Thrane & Thrane LES /ORG /STIM /REF

This will cause a header similar to:

Thrane & Thrane LES 482380001=ABCDX 01-may-1994 20:22:00 100234

2.2. POSITIVE DELIVERY NOTIFICATION.

The positive delivery notification can be configured using the following variables:

Variable List	Variable Description
/REF	This variable refer to the Message Reference Number, which is always a 6-digit number. If the number is less than 100.000 the number is prefixed with "0"'s, eg. 001928.
/ADDR	This variable refer to the destination address of the message, which can either be a specific MES number and/or indicate that it is a group/area poll or EGC message. In case of a group/area poll this field will simply be replaced by the text 'poll' and for group/area EGC it will be replaced by the text 'egc'. For individual polls and EGC's the field is respectively replaced by the text '<9-digit Inmarsat Mobile Number> poll' and '<9-digit Inmarsat Mobile Number>egc', eg. '492380055 egc'. For simple message the field is replaced by the text '<9-digit Inmarsat Mobile Number>', eg '492380055'.
/DTIM	This variable refer to the delivery time of the message. The format of the time field is 'DD-MMM-YY HH:MM' of the DD part is less than 10 it is prefixed by a space eg. ' 9-NOV-94 12:55', hereby the time field is always 15-digits.
/ATTNO	This field simple hold the number of delivery attempts made. There is no fixed number of digits for this field.
/STIM	This variable refer to the store time of the message. The format of the time field is 'DD-MMM-YY HH:MM' of the DD part is less than 10 it is prefixed by a space eg. ' 9-NOV-94 12:55', hereby the time field is always 15-digits.
/EGCNO	Gives the delivery number for an EGC message. For all other message types this field is always empty. The string consist of 'in attempt no. <attempt #>'.
/NOW	This variable refer to the delivery time of the PDN. The format of the time field is 'DD-MMM-YY HH:MM' of the DD part is less than 10 it is prefixed by a space eg. ' 9-NOV-94 12:55', hereby the time field is always 15-digits.
/OCE	Gives the ocean region the message was attempted delivered to.
/AAB	Gives the answerback received from the message destination.

In case default definition is used for the positive delivery notification, it has the following format :

<CR><LF>/REF /ADDR /DTIM delivered<CR><LF>

2.3. NEGATIVE DELIVERY NOTIFICATION.

The negative or non-delivery notification can be configured using the following variables:

Variable List	Variable Description
/REF	This variable refer to the Message Reference Number, which is always a 6-digit number. If the number is less than 100.000 the number is prefixed with "0"'s, eg. 001928.
/ADDR	This variable refer to the destination address of the message, which can either be a specific MES number and/or indicate that it is a group/area poll or EGC message. In case of a group/area poll this field will simply be replaced by the text 'poll' and for group/area EGC it will be replaced by the text 'egc'. For individual polls and EGC's the field is respectively replaced by the text '<9-digit Inmarsat Mobile Number> poll' and '<9-digit Inmarsat Mobile Number>egc', eg. '492380055 egc'. For simple message the field is replaced by the text '<9-digit Inmarsat Mobile Number>', eg '492380055'.
/CC	This variable refer to the reason for non delivery of the message. The description of the possible values for this field is given in a following subsection.
/STIM	This variable refer to the store time of the message. The format of the time field is 'DD-MMM-YY HH:MM' of the DD part is less than 10 it is prefixed by a space eg. ' 9-NOV-94 12:55', hereby the time field is always 15-digits.
/ATTNO	This field simple hold the number of delivery attempts made. There is no fixed number of digits for this field.
/LATT	This variable refer to the time for the latest delivery attempt of the message. The format of the time field is 'DD-MMM-YY HH:MM' of the DD part is less than 10 it is prefixed by a space eg. ' 9-NOV-94 12:55', hereby the time field is always 15-digits.
/EGCNO	Gives the delivery number for an EGC message. For all other message types this field is always empty. The string consist of 'in attempt no. <attempt #>'.
/NOW	This variable refer to the delivery time of the PDN. The format of the time field is 'DD-MMM-YY HH:MM' of the DD part is less than 10 it is prefixed by a space eg. ' 9-NOV-94 12:55', hereby the time field is always 15-digits.
/OCE	Gives the ocean region the message was attempted delivered to.
/AAB	Gives the answerback received from the message destination.

In case default definition is used for the negative delivery notification, it has the following format :

<CR><LF>/REF /ADDR /STIM not delivered due to /CC<CR><LF>

2.4.   MESSAGE STATUS.

The message status can be configured using the following variables, message journalling is using the same format as message status for each status specification :

Variable List	Variable Description
/REF	This variable refer to the Message Reference Number, which is always a 6-digit number. If the number is less than 100.000 the number is prefixed with "0"'s, eg. 001928.
/ADDR	This variable refer to the destination address of the message, which can either be a specific MES number and/or indicate that it is a group/area poll or EGC message. In case of a group/area poll this field will simply be replaced by the text 'group/area poll' and for group/area EGC it will be replaced by the text 'group/area egc'. For individual polls and EGC's the field is respectively replaced by the text '<9-digit Inmarsat Mobile Number> poll' and '<9-digit Inmarsat Mobile Number>egc', eg. '492380055 egc'. For simple message the field is replaced by the text '<9-digit Inmarsat Mobile Number> msg', eg '492380055 msg'. The length of the field is always 15-digits.
/STIM	This variable refer to the store time of the message. The format of the time field is 'DD-MMM-YY HH:MM' of the DD part is less than 10 it is prefixed by a space eg. ' 9-NOV-94 12:55', hereby the time field is always 15-digits.
/STAT	This variable refer to the status of the message. The description of the possible values for this field is given in the following table.
/CC	This variable refer to the reason for non delivery of the message. The description of the possible values for this field is given in a following subsection.
/ATTNO	This field simple hold the number of delivery attempts made. There is no fixed number of digits for this field, it can be an empty field, depending on the status of the message (/STAT) - for specification of this refer to the /STAT desciption table. In case where the field is not empty it is format as '<# of attempts> attempts', where <# of attempts> is at least 2 digits wide and in case of less that 10 it is prefixed with a space, thereby make the field length 11 digits as long as # of attempts is less than 100.
/LATT	This variable refer to the time for the latest delivery attempt of the message. The format of the time field is 'DD-MMM-YY HH:MM' of the DD part is less than 10 it is prefixed by a space eg. ' 9-NOV-94 12:55', hereby the time field is 15-digits except if no delivery attempts has yet been made then the field is empty.
/EGCNO	Gives the delivery number for an EGC message. For all other message types this field is always empty. The string consist of 'in attempt no. <attempt #>'.
/OCE	Gives the ocean region the message was attempted delivered to.
/AAB	Gives the answerback received from the message destination.

In case default definition is used for the message status, it has the following format :

/REF /ADDR /STIM /STAT /CC<CR><LF>

The following table gives a description of the possible values of the /STAT variable.

Variable Value List	Value Description
pending	This field value indicates that the user has requested deferred delivery of the message and the first delivery attempt time has not yet been reached. The field length is 11 characters. The /ATTNO field is empty. The /LATT field is empty. The /CC field is empty.
in progess	This field value indicates that the message is not yet delivered. The field length is 11 characters. The /ATTNO field is always filled in except if the message has been successfully rerouted to another LES for delivery to MES in not covered ocean region.This situation can only occur if the LES supports the Thrane & Thrane special rerouting protocol. The /LATT field can be empty, if first delivery attempts has not yet finished. The /CC field is empty in the following cases : • in case first delivery attempts has not yet finished. • in case of an EGC with repetitions, where the last broadcast was successful. • in case the message has been rerouted to another LES for delivery to MES in not covered ocean region.
deleted by user	This field value indicates that the message has been deleted by the user. The field length is 15 characters. The /ATTNO field is always empty. The /LATT field can be empty, if no delivery attempts has been made before the deletion. The /CC field is always empty.
deleted by operator	This field value indicates that the message has been deleted by the LES operator. The field length is 19 characters. The /ATTNO field is always empty. The /LATT field can be empty, if no delivery attempts has been made before the deletion. The /CC field is always empty.
aborted	This field value indicates that the message delivery has failed, and no more delivery attempts will be made. The field length is 11 characters. The /ATTNO field and the /LATT field can be empty, if no delivery attempts has been made before the abortion. The /CC field is never empty.
delivered	This field value indicates that the message has been delivered successfully. The field length is 11 characters. The /ATTNO field is never empty. The /LATT field is never empty.

	The /CC field is always empty.

2.5. REASON CODES IN NDN'S AND MESSAGE STATUS.

The following table gives a description of the possible values of the /CC variable. This variable is used in as well the definition of non-delivery notifications as message status.

Variable Value List	Value Description
mess deleted by user	Indicates that the message has been deleted by the user.
mess deleted by operator	Indicates that the message has been deleted by the LES operator.
ocean region not served	Used only in case of poll and EGC. It indicates that a request was made to sent to a not covered ocean region.
ses unknown	Indicates that the called mobile is unknown to the LES.
ses barred	Indicates that access to the called mobile is barred.
ses logged out	Indicates that access to the called mobile is logged out.
ses not in ocean region	Indicates that access to the called mobile is logged into a not covered ocean region.
ses not commisioned	Indicates that access to the called mobile is not yet commisioned for commercial traffic.
no conn possible	Indicates that the message delivery has failed because MES does not answer to announcements. This is typically because the MES is not reachable (eg. switched off) without having been logged out.
mess timed out	Indicates that the message has timed out without any forwarding attempts being made. This is typically because queue of messages to the same MES exist and this message is not the first message in the queue and at the same time the MES is not reachable without having been logged out.
dest timeout	Indicates that some error has occured in the inmarsat c protocol causing a timeout situation.
std c error	Indicates that the MES or NCS did not operate correctly according to the Inmarsat C protocols.
ces not in service	Indicates that the LES is out of service, this is typically due to restoration mode operation.
tdm congested	Indicates that the LES is congested for LES to MES traffic.
tdm not available	Indicates that the LES currently has no TDM channels.
dest busy	Indicates that the MES is continuously busy in the MES to LES direction.
internal error	Indicates that an unusaul internal error has occurred within the LES during message delivery.

3. API HEADERS

As a special option to programming interface to the LES from terrestrial subscribers, the LES offers a fixed type header referred to as the API header. This header is only usable to applications utilising transfer of 8 bit transparent data messages. The header content is always forwarded to the destination as 8 bit data.

The API header offers access for the computers, which is actually accessing the LES, to message and system related data in a structured, fixed format way. The facility is intended for Fleet Management system mainly.

Five variants of the API header exists:

(i)   API header attached to data reports forwarded from a DNID file.

(ii)   API header attached to messages forwarded from a DNID file

(iii)   API header attached to messages, both when forward normally or from mailboxes

(iv)   API header attached to PDN's, both when forward normally or from mailboxes

(v)   API header attached to NDN's, both when forward normally or from mailboxes

When the LES operator for a dedicated destination, DNID file or mailbox selects the API header option, the API header excludes any other type of header.

3.1. API-HEADERS GENERAL DESCRIPTION

The layout of the five different headers is shown on the following figures.

```
+--------------------+
|        01          |  1 byte : Indication of header start (EOH)
+--------------------+
+      'T&T'         |  3 bytes: ASCII values for string "T&T"
+                    |           i.e. byte values 54H,26H,54H
+--------------------+
|        01          |  1 byte : Type of API header (01 for DNID header)
+--------------------+
|        22          |  1 byte : The length of this header in bytes
+--------------------+
+   Mess. Ref. No.   |  4 bytes: Message reference number, LSB first.
+                    |
+                    |
+--------------------+
|    Presentation    |  1 byte : Receive alphabet from satellite side message
+--------------------+           reception, see note 1
|      LES ID        |  1 byte : LES ID, can be used for identification of
+--------------------+           ocean region for multi ocean LES's
+    Data Length     |  2 bytes: Number of data bytes following the header
+--------------------+           LSB first.
+    Stored time     |  4 bytes: Giving the time of message store. The bytes
+                    |           given will be the number of seconds since
+                    |           January 1. 1970 0:0:0, LSB first
+--------------------+
+       DNID         |  2 bytes: DNID file. LSB first
+--------------------+
|   Member number    |  1 byte : Member number sent by the MES when storing
+--------------------+           the data report
|        02          |  1 byte : Indication of header end (STX)
+--------------------+

LEGEND: LSB Least significant byte
```

Fig. 1   API header, DNID file data report retrieval

```
+--------------------+
¦        01          ¦   1 byte : Indication of header start (EOH)
+--------------------¦
+       'T&T'        ¦   3 bytes: ASCII values for string "T&T"
+                    ¦            i.e. byte values 54H,26H,54H
+--------------------¦
¦        02          ¦   1 byte : Type of API header (02 for DNID MSG. header)
+--------------------¦
¦        25          ¦   1 byte : The length of this header in bytes
+--------------------¦
+  Mess. Ref. No.    ¦   4 bytes: Message reference number, LSB first.
+                    ¦
+                    ¦
+--------------------¦
¦   Presentation     ¦   1 byte : Receive alphabet from satellite side message
+--------------------¦            reception, see note 1)
¦     LES ID         ¦   1 byte : LES ID, can be used for identification of
+--------------------¦            ocean region for multi ocean LES's
+  Data Length       ¦   2 bytes: Number of data bytes following the header
+--------------------¦            LSB first.
+    Stored time      ¦  4 bytes: Giving the time of message store. The bytes
+                    ¦            given will be the number of seconds since
+                    ¦            January 1. 1970 0:0:0, LSB first
+--------------------¦
+       DNID         ¦   2 bytes: DNID file. LSB first
+--------------------¦
+    MES Mobile      ¦   4 bytes: Originating Inmarsat Mobile number
+      number        ¦            LSB first.
+                    ¦
+--------------------¦
¦        02          ¦   1 byte : Indication of header end (STX)
+--------------------+

LEGEND: LSB Least significant byte
```

Fig. 2   API header, DNID file message retrieval

```
+--------------------+
¦        01          ¦   1 byte : Indication of header start (EOH)
+--------------------¦
+       'T&T'        ¦   3 bytes: ASCII values for string "T&T"
+                    ¦            i.e. byte values 54H,26H,54H
+--------------------¦
¦        03          ¦   1 byte : Type of API header (03 for message header)
+--------------------¦
¦        23          ¦   1 byte : The length of this header in bytes
+--------------------¦
+  Mess. Ref. No.    ¦   4 bytes: Message reference number, LSB first.
+                    ¦
+                    ¦
+--------------------¦
¦   Presentation     ¦   1 byte : Receive alphabet from satellite side message
+--------------------¦            reception, see note 1)
¦     LES ID         ¦   1 byte : LES ID, can be used for identification of
+--------------------¦            ocean region for multi ocean LES's
+  Data Length       ¦   2 bytes: Number of data bytes following the header
+--------------------¦            LSB first.
+    Stored time     ¦   4 bytes: Giving the time of message store. The bytes
+                    ¦            given will be the number of seconds since
+                    ¦            January 1. 1970 0:0:0, LSB first
+--------------------¦
+    MES Mobile      ¦   4 bytes: Originating Inmarsat Mobile number
+      number        ¦            LSB first.
+                    ¦
+--------------------¦
¦        02          ¦   1 byte : Indication of header end (STX)
+--------------------+

LEGEND: LSB Least significant byte
```

Fig. 3   API header, message forwarding and mailbox message retrieval

```
+--------------------+
¦        01          ¦   1 byte : Indication of header start (EOH)
+--------------------+
+       'T&T'        ¦   3 bytes: ASCII values for string "T&T"
+                    ¦            i.e. byte values 54H,26H,54H
+--------------------+
¦        04          ¦   1 byte : Type of API header (04 for PDN header)
+--------------------+
¦        20          ¦   1 byte : The length of this header in bytes
+--------------------+
+  Mess. Ref. No.    ¦   4 bytes: Message reference number, LSB first.
+                    ¦
+                    ¦
+--------------------+
¦  Delivery attempts ¦   1 byte : Number of message delivery attempts
+--------------------+
+     Stored time    ¦   4 bytes: Giving the time of message store. The bytes
+                    ¦            given will be the number of seconds since
+                    ¦            January 1. 1970 0:0:0, LSB first
+--------------------+
+     MES Mobile     ¦   4 bytes: Originating Inmarsat Mobile number
+       number       ¦            LSB first.
+                    ¦
+--------------------+
¦        02          ¦   1 byte : Indication of header end (STX)
+--------------------+

  LEGEND: LSB Least significant byte
```

Fig. 4   API header, PDN messages

```
+--------------------+
¦        01          ¦   1 byte : Indication of header start (EOH)
+--------------------+
+       'T&T'        ¦   3 bytes: ASCII values for string "T&T"
+                    ¦            i.e. byte values 54H,26H,54H
+--------------------+
¦        05          ¦   1 byte : Type of API header (05 for NDN header)
+--------------------+
¦        21          ¦   1 byte : The length of this header in bytes
+--------------------+
+  Mess. Ref. No.    ¦   4 bytes: Message reference number, LSB first.
+                    ¦
+                    ¦
+--------------------+
¦   Failure reason   ¦   1 byte : Reason for message abortion, see note 2)
+--------------------+
¦  Delivery attempts ¦   1 byte : Number of message delivery attempts
+--------------------+
+     Stored time    ¦   4 bytes: Giving the time of message store. The bytes
+                    ¦            given will be the number of seconds since
+                    ¦            January 1. 1970 0:0:0, LSB first
+--------------------+
+     MES Mobile     ¦   4 bytes: Originating Inmarsat Mobile number
+       number       ¦            LSB first.
+                    ¦
+--------------------+
¦        02          ¦   1 byte : Indication of header end (STX)
+--------------------+

  LEGEND: LSB Least significant byte
```

Fig. 5   API header, NDN messages

Note 1)   Presentation field is coded as follows:
        1: Message received using 7 bit, the message content is printable
        2: Message received using transparent data, message content might be binary
           data

Note 2)   Delivery failure reasons are:
        00: Unknown error
        01: MES unknown
        02: MES logged out
        03: MES not in covered ocean region
        04: MES barred at LES
        05: MES not answering to call announcement
        06: MES not commissioned

        16: Message timed out at LES, e.g. due to MES busy

        18: Message deleted by LES operator
        19: Message deleted by terrestrial subscriber
        20: Message addressed to not covered ocean region,
           e.g. EGC or POLL message

3.2. API-HEADERS PROGRAMMERS DESCRIPTION

The API-headers are headers used for computer interface to the LES.

API-headers are defined for simple messages, DNID-messages, data reports, PDN's and NDN's.

```
/****************************************************************/
/* API Misc. definitions
/****************************************************************/
#define     API_SOH                          1
#define     API_EOH                          2

#define     API_LEAD_TEXT                    "T&T"


/****************************************************************/
/* API Header type definitions
/****************************************************************/
#define     API_DNID_HEADER_TYPE             1
#define     API_DNID_MSG_HEADER_TYPE         2
#define     API_MSG_HEADER_TYPE              3
#define     API_PDN_HEADER_TYPE              4
#define     API_NDN_HEADER_TYPE              5



/****************************************************************/
/* API Alphabet type definitions
/****************************************************************/
#define     API_IA5                          1
#define     API_TRANS_DATA                   2


/****************************************************************/
/* API Reason code definitions
/****************************************************************/
#define     API_UNKNOWN_ERROR                0x00

#define     API_MES_UNKNOWN                  0x01
#define     API_MES_LOGGED_OUT               0x02
#define     API_MES_NOT_IN_OR                0x03
#define     API_MES_BARRED                   0x04
#define     API_MES_NOT_ANSWERING            0x05
#define     API_MES_NOT_COMMISSIONED         0x06
#define     API_MSG_TIMED_OUT                0x10
#define     API_MSG_DELETED_BY_OPERATOR      0x12
#define     API_MSG_DELETED_BY_USER          0x13
#define     API_MSG_OR_NOT_COVERED           0x14
```

```
/***************************************************************/
/* API Header definitions
/***************************************************************/

        struct  api_dnid_type
        {
        unsigned char      soh;              /* Always holding the SOH (0x01)              */
        unsigned char      lead_text[3];     /* Always holding the text 'T&T'              */
        unsigned char      header_type;      /* DNID, DNID_MSG, MSG, PDN, NDN              */
        unsigned char      header_length;    /* Length of header incl. SOH, EOH            */
        unsigned long      ref_no;           /* Reference Number 1 - 999999           */
        unsigned char      alphabet;         /* ITA2, IA5 or transparent data              */
        unsigned char      les_id;           /* LES Id (including ocean region)            */
        unsigned short     data_length;      /* Number of bytes in message                 */
        unsigned long      stored_time;      /* Seconds since UTC 700101 00:00             */
        unsigned short     dnid;             /* The DNID in question                       */
        unsigned char      member;/* Member Number in DNID group                 */
        unsigned char      eoh;              /* Always EOH (= STX) (0x02)             */
        };

        struct  api_dnid_msg_type
        {
        unsigned char      soh;              /* Always holding the SOH (0x01)              */
        unsigned char      lead_text[3];     /* Always holding the text 'T&T'              */
        unsigned char      header_type;      /* DNID, DNID_MSG, MSG, PDN, NDN              */
        unsigned char      header_length;    /* Length of header incl. SOH, EOH            */
        unsigned long      ref_no;           /* Reference Number 1 - 999999           */
        unsigned char      alphabet;         /* ITA2, IA5 or transparent data              */
        unsigned char      les_id;           /* LES Id (including ocean region)            */
        unsigned short     data_length;      /* Number of bytes in message                 */
        unsigned long      stored_time;      /* Seconds since UTC 700101 00:00             */
        unsigned short     dnid;             /* The DNID in question                       */
        unsigned long      mes;              /* Org. Inmarsat Mobile Number           */
        unsigned char      eoh;              /* Always EOH (= STX) (0x02)             */
        };
        struct  api_msg_type
        {
        unsigned char      soh;              /* Always holding the SOH (0x01)              */
        unsigned char      lead_text[3];     /* Always holding the text 'T&T'              */
        unsigned char      header_type;      /* DNID, DNID_MSG, MSG, PDN, NDN              */
        unsigned char      header_length;    /* Length of header incl. SOH, EOH            */
        unsigned long      ref_no;           /* Reference Number 1 - 999999           */
        unsigned char      alphabet;         /* ITA2, IA5 or transparent data              */
        unsigned char      les_id;           /* LES Id (including ocean region)            */
        unsigned short     data_length;      /* Number of bytes in message                 */
        unsigned long      stored_time;      /* Seconds since UTC 700101 00:00             */
        unsigned long      mes;              /* Org. Inmarsat Mobile Number           */
        unsigned char      eoh;              /* Always EOH (= STX) (0x02)             */
        };
```

```
struct  api_pdn_type
{
unsigned char    soh;              /* Always holding the SOH (0x01)              */
unsigned char    lead_text[3];     /* Always holding the text 'T&T'              */
unsigned char    header_type;      /* DNID, DNID_MSG, MSG, PDN, NDN              */
unsigned char    header_length;    /* Length of header incl. SOH, EOH            */
unsigned long    ref_no;           /* Reference Number 1 - 999999         */
unsigned char    deliv_att;        /* Number of delivery att. used               */
unsigned long    stored_time;      /* Seconds since UTC 700101 00:00             */
unsigned long    mes;              /* Dest. Inmarsat Mobile Number        */
unsigned char    eoh;              /* Always EOH (= STX) (0x02)           */
};


struct  api_ndn_type
{
unsigned char    soh;              /* Always holding the SOH (0x01)              */
unsigned char    lead_text[3];     /* Always holding the text 'T&T'              */
unsigned char    header_type;      /* DNID, DNID_MSG, MSG, PDN, NDN              */
unsigned char    header_length;    /* Length of header incl. SOH, EOH            */
unsigned long    ref_no;           /* Reference Number 1 - 999999         */
unsigned char    reason;           /* Reason code for non delivery               */
unsigned char    deliv_att;        /* Number of delivery att. used               */
unsigned long    stored_time;      /* Seconds since UTC 700101 00:00             */
unsigned long    mes;              /* Dest. Inmarsat Mobile Number        */
unsigned char    eoh;              /* Always EOH (= STX) (0x02)           */
};
```