



## **Technical Specification**

for

## **Analogue Calling Line Identity Presentation Facility**

for connection to

## **Public Switched Telephone Network (PSTN)**

### **IDA TS ACLIP**

Issue 1 Rev 1, May 2011

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<b>NOTICE</b>
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<b>This Specification is subject to review and revision.</b>
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## 1 SCOPE

The following identifies the technical requirements for terminal equipment connected to the Public Switched Telephone Network (PSTN) to receive Analogue Calling Line Identity Presentation (A-CLIP) information while it is in on-hook condition (unlooped condition) and during the first long silent interval between the first and second ringing signal received (see Annex A, Figure A-1).

The technical requirements assume that the terminal equipment is ready to receive the information when the PSTN transmits it. There will not be any acknowledgement between the terminal equipment and the PSTN.

The technical requirements are based on the on-hook data transmission associated with Power Ringing in the Bellcore Generic Requirements GR-30-CORE Issue 1, December 1994. In addition, the terminal equipment must conform with the ITU-T Recommendation T.50 (International Alphabet No. 5) for the conveyance and display of Calling Line Identification (CLI) and name of the calling party.

## 2 PSTN-TO-TERMINAL EQUIPMENT INFORMATION SIGNALLING

### 2.1 INTERFACE

TABLE 1  
Data signalling interface parameters

Link type	simplex, two wire
Transmission scheme	analogue, phase coherent frequency shift keying (FSK)
Logical 1 (mark)	1200 ± 12 Hz
Logical 0 (space)	2200 ± 22 Hz
Transmission rate	1200 bit/s
Application of data	serial, binary, asynchronous
Bit error rate	≤ 1 out of 100,000 bits
Phase continuity	maintained from beginning of service to end of message
Receiver sensitivity	-26 dBm ± 2 dBm
Bit duration	833 ± 50 μs (start and stop bits have the same duration as a standard bit)
Electrical characteristics	allowable d.c. resistance and a.c. impedance for on-hook condition (unlooped) are given in specification PSTN 1

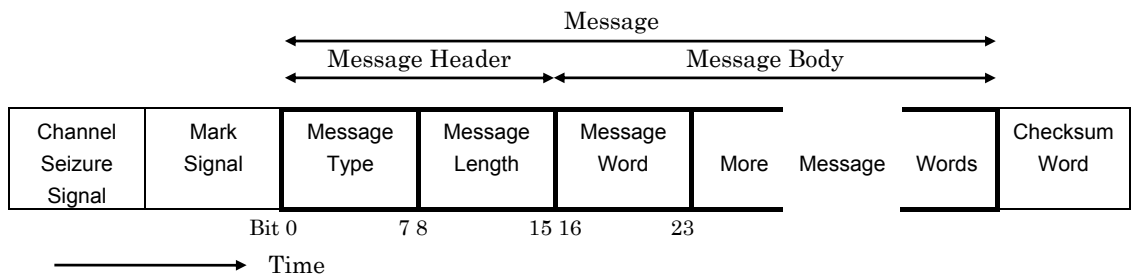
**2.2 PROTOCOL**

**2.2.1 Data message format**

The information that the PSTN is transmitting to the terminal equipment is in a series of 8-bit words each bounded by a start bit (space) and a stop bit (mark). The information is segmented according to one of the two formats: the Single Data Message Format (SDMF) or the Multiple Data Message Format (MDMF). They are as shown in Figure 1 and Figure 2.

**2.2.1.1 Single Data Message Format (SDMF)**

The SDMF defines a message consisting of a message header and message body. The message header is a two-word field consisting of a message type and message length. Both message type and message length are 8-bit words. The message type contains an assigned value for identifying the service. The message length indicates the number of message words that follow (excluding the checksum word). The message body contains the information that the PSTN is transmitting to the terminal equipment. The message words are alphanumeric characters using 8 bit codes.

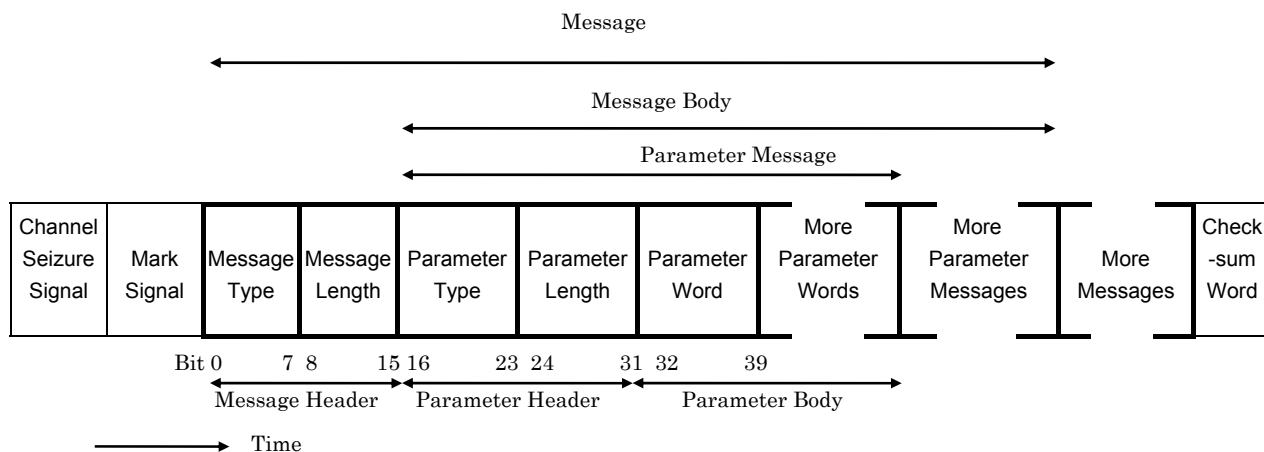


Note: The SDMF consists of a message type, a message length and one or more message words. Each word is an 8-bit byte.

Figure 1 : Single Data Message Format

**2.2.1.2 Multiple Data Message Format (MDMF)**

The MDMF consists of a message header and a message body. The message header consists of a message type and a message length. The message type contains an assigned value for identifying the service. The message length indicates the number of words that follow (excluding the checksum word). Both message type and message length are 8-bit words. The message body contains one or more smaller messages called parameter messages. Like messages, each parameter message has a header and body. The parameter header consists of the parameter type and the parameter length. Both parameter type and parameter length are 8-bit words. The parameter type contains an assigned value for identifying the subsequent parameter word(s). The parameter length indicates the number of parameter words in the parameter body. The MDMF allows parameter messages to include several features to be received within the same frame.



Note: The MDMF consists of a message type, a message length, and one or more parameter messages. Each parameter message consists of a parameter type, a parameter length, and one or more parameter words. The message type, message length, parameter type, parameter length, and each parameter word are each an 8-bit byte.

Figure 2 : Multiple Data Message Format

- 2.2.2** The data shall be received in the order of the least significant bit of each data byte first.
- 2.2.3** Data messages not recognised by the terminal equipment shall be ignored (i.e. the corresponding data shall not be displayed). Recognition shall be based on the value used in the message type word.
- 2.2.4** If the terminal equipment recognises the message type word of the multiple data message but does not recognise one or more of the parameter type words within the multiple data message, the terminal equipment should process the message as follows:
- all recognised parameter type words should continue to be processed (i.e. the corresponding data is displayed);
  - and all unrecognised parameter type words should be ignored (i.e. the corresponding data is not displayed).
- 2.2.5** On receiving each data message (single or multiple) the terminal equipment shall be able to switch "on", provide the data to be displayed, and then switch "off". Single data messages and/or multiple data messages may be received in a sequence, and therefore the terminal equipment may be caused to switch "on" and "off" several times.

## 2.3 CONTENTS OF DATA MESSAGE

- 2.3.1** The message type word indicates the service and/or capability associated with the data message. Values for the message type words of the single and multiple data messages range between the binary equivalent of 0 to 255. The service supported is Calling Number Delivery Service. The content of the message type word in binary is given in Table 2.

TABLE 2  
**Message type word for Calling Number Delivery Service**

Bit number	Value	Meaning	Type of data message
76543210	00000100	Calling Number Delivery Information	Single Data Message

- 2.3.2** In addition to this service, the message type word given in Table 3 is expected to be used in new services and in enhancements to existing service.

TABLE 3  
**Message type words for additional services**

Bit number	Value	Meaning	Type of data message
76543210	10000000	Call Setup	Multiple Data Message

- 2.3.3** Values for the parameter type words within the multiple data messages range between the binary equivalent of 0 to 255. The contents of the parameter type words used in the Call Setup multiple data message by the PSTN are defined in Table 4.

TABLE 4  
**Parameter type words for Call Setup message type**

Bit number	Value	Meaning
76543210	00000001	Date & Time
	00000010	Calling Line Identification
	00000100	Reason for Absence of DN
	00000111	Name

- 2.3.4** Each Single or Multiple Data Message is preceded by the Channel Seizure Signal and the Mark (logic 1) Signal. The purpose of the Channel Seizure Signal and the Mark Signal is to alert and condition the terminal equipment for the reception of a message frame. The Channel Seizure Signal consists of a block of 300 continuous bits of alternating "0"s and "1"s. The first bit to be received is "0" and the last bit is "1". The Mark Signal consists of 180 mark bits.

- 2.3.5** The data message formats used by Singapore PSTN to convey A-CLIP Service information to the terminal equipment are described in Annex B.

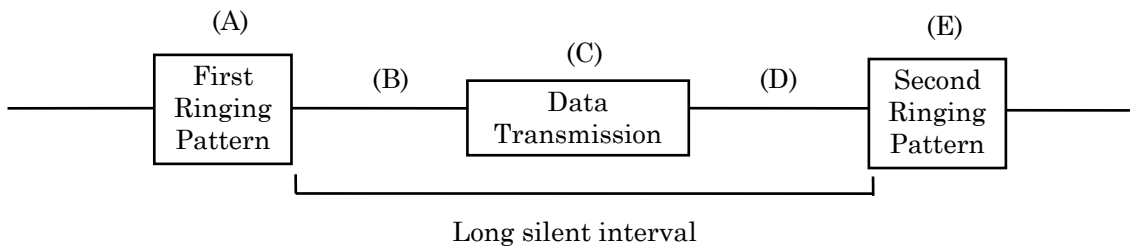
## **2.4 ERROR DETECTION**

The last word of the Single or Multiple Data Message is a checksum word. The checksum word contains the two's complement of the modulo 256 sum of each bit in all the other words in the message. At the terminal equipment the checksum shall be recomputed and compared with the checksum word received in the message. The received message is considered to be error free if both values are identical. However, this approach is not able to detect all transmission errors. Specifically, it cannot detect offsetting bit errors occurring in the same message.

If the terminal equipment detects an error, none of the received data should be displayed. The terminal shall not send a message to indicate that an error has been detected as the PSTN would not retransmit the data. Error correction is not supported by this protocol.

### **3            TERMINAL EQUIPMENT-TO-PSTN INFORMATION SIGNALLING**

Terminal equipment shall not initiate the transmission of data to the PSTN.



Parameter	Value	Description
A	0.2 - 3.0 s	Power ringing includes ringing of any distinctive pattern or a first burst
B	0.5 - 1.5 s	Time between the end of first ringing pattern and the start of data transmission
C	variable	Time available for sending data, including Channel Seizure and Mark
D	$\geq 200$ ms	PSTN must stop data transmission at least 200 ms before the application of the second ringing pattern
E	0.8* - 3.0 s	Power ringing includes ringing of any distinctive pattern

\* To reflect local condition of  $1.0 \pm 10\%$  seconds of second ringing pattern

Figure A1 : Data transmission associated with Singapore PSTN power ringing

TABLE B-1  
Data Message Format for A-Clip Service

Calling Line Identification (CLI) (SDMF)	Calling Line Identification (CLI) and Name (MDMF)	Calling Line Identification (CLI) Not Available (MDMF)
Date	Date	Date
Time	Time	Time
CLI	CLI	Reason for absence of Directory Number (DN):  "P" or "O"
	Name (caller's name if provided)	Name :  For "P" - "PRIVATE" / "PAYPHONE" fixed characters may be sent  For "O" - "OVERSEAS" / "OPERATOR" / "REMINDER" / "OUT" may be sent

## Annex C: Addendum/Corrigendum

<b>Changes to IDA TS ACLIP Issue 1, Jul 05</b>			
<b>Page</b>	<b>TS Ref.</b>	<b>Items Changed</b>	<b>Effective Date</b>
—	—	Change of IDA's address at cover page to Mapletree Business City.	1 May 11

<b>Changes to IDA TS PSTN 1 A-CLIP Issue 1 Rev 1</b>			
<b>Page</b>	<b>TS Ref.</b>	<b>Items Changed</b>	<b>Effective Date</b>
—	—	<p>Title of Specification has been renamed as "Technical Specification for Analogue Calling Line Identity Presentation Facility for connection to Public Switched Telephone Network (PSTN)" (IDA TS ACLIP Issue 1).</p> <p>Changes are mainly editorial in nature, in which the essential technical requirements for compliance remain unchanged.</p>	21 Jul 05