TECHNICAL CODE

SPECIFICATION FOR ANALOGUE CALLING LINE IDENTIFICATION PRESENTATION (A-CLIP) FACILITY FOR CONNECTION TO THE TELECOMMUNICATIONS NETWORK (SECOND REVISION)

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MCMC MTSFB T002:2026

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Section 96 of the Act also provides for the Commission to determine a technical code in accordance with Section 55 of the Act if the technical code is not developed under an applicable provision of the Act and it is unlikely to be developed by the Technical Standards Forum within a reasonable time.

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Committee representation

This technical code was developed by Communications Terminal Working Group of the Malaysian Technical Standards Forum Bhd (MTSFB), which consists of representatives from the following organisations:

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Foreword

This technical code for the Specification for Analogue Calling Line Identification Presentation (A-CLIP) Facility for Connection to the Telecommunications Network ('this Technical Code') was developed pursuant to Section 185 of the Communications and Multimedia Act 1998 (Laws of Malaysia Act 588) by the Communications Terminal Working Group of the Malaysian Technical Standards Forum Bhd (MTSFB).

This Technical Code was developed for the purpose of communications equipment's compliance with the Communications and Multimedia (Technical Standards) Regulations 2000.

Major modifications in this revision are as follows.

a) Revision of the title and scope to expand the application from connection to the Public Switched Telephone Network (PSTN) to connection to a telecommunications network'

b) Removal of general requirements and alignment with MCMC MTSFB TC T022, *Communications Equipment – Baseline Requirements*, for the applicable baseline requirements

c) Reorganisation of the clauses to provide a clearer sequence of requirements.

d) Improvement of the overall document structure to enhance clarity, consistency and ease of reference.

The Specification for Analogue Calling Line Identification Presentation (A-CLIP) Facility for Connection to the Telecommunications Network shall comply with all requirements within this Technical Code and MCMC MTSFB TC T022, *Communications Equipment - Baseline Requirements.*

This Technical Code shall replace the SKMM MTSFB TC T002:2013, *Specification for Analogue Calling Line Identification Presentation (A-CLIP) Facility for Connection to Public Switched Telephone Network (PSTN).* The latter shall be deemed to be invalid to the extent of any conflict with this Technical Code.

This Technical Code shall be read together with MCMC MSFB TC T001:2026, *Specification for Analogue Terminal Equipment Connected to the Telecommunications Network*.

This Technical Code shall continue to be valid and effective from the date of its registration until it is replaced or revoked.

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MCMC MTSFB T002:2026

SPECIFICATION FOR ANALOGUE CALLING LINE IDENTIFICATION PRESENTATION (A-CLIP) FACILITY FOR CONNECTION TO THE TELECOMMUNICATIONS NETWORK

1. Scope

This Technical Code specifies the minimum requirements for Analogue Calling Line Identification Presentation (A-CLIP) functionality supported by analogue terminal equipment ("the Equipment") connected to a telecommunications network. It covers voice-band data transmission in both the on-hook and off-hook states, including the applicable timing and signal-level requirements at the connection point between the telecommunications network and the Equipment.

2. Normative references

The following normative references are indispensable for the application of this Technical Code. For dated references, only the edition cited applies. For undated references, the latest edition of the normative references (including any amendments) applies.

MCMC MTSFB TC T022, *Communications Equipment - Baseline Requirements*

ITU-T Rec. T.50, *Terminal equipment and protocols for telematic services*

GR-30-CORE, *LSSGR Voiceband Data Transmission Interface*

3. Abbreviations

For the purposes of this Technical Code, the following abbreviations apply.

ACK	Acknowledge Signal
A-CLIP	Analogue Calling Line Identification Presentation
CAS	Customer Premises Equipment Alerting Signal
CLI	Call Line Identification
CSS	Channel Seizure Signal
DATA	Data Transmission
DN	Directory Number
ETSI	European Telecommunications Standards Institute
FSK	Frequency Shift Keying
MDMF	Multiple Data Message Format
MS	Mark Signal
OSI	Open Switching Interval
SAS	Subscriber Alerting Signal
SDMF	Single Data Message Format
SI	Silent Interval
T	Transition time

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4. Terms and definitions

In this Technical Code, the following terms and definitions apply unless the context requires otherwise:

4.1 Caller Display on Call Waiting

A service where caller number will be delivered by off-hook data transmission using multiple data message format and involves handshaking between the Equipment and the network.

4.2 Multiple Data Message Format (MDMF)

Message format that supports the transmission of one or more parameters within a single message, with each parameter identified by a parameter type and parameter length

4.3 Single Data Message Format (SDMF)

Message format that supports the transmission of a single set of data within a message, without the use of parameter type and parameter length fields.

5. Baseline requirements

The Equipment shall be designed to meet the baseline requirements as outlined in MCMC MTSFB TC T022.

6. Technical requirements

6.1 Received data signal parameters

The Equipment shall be capable of interoperating correctly with the telecommunications network for voice-band data transmission and shall comply with the received data signal parameters specified in Table 1.

Table 1. Frequency Shift Keying (FSK) data signal parameters

Item	Parameter		
Link type	simplex, two wire		
Transmission scheme	analogue, phase coherent FSK		
Logical 1 (mark) / Logical 0 (space)	(1200 ± 12) Hz/ (2200 ± 22) Hz	or	1300 Hz + 1.5%/ 2100 Hz + 1.5%
Transmission rate	1200 bit/s ± 12 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	-40 dBm ± 2 dBm		
Signal to Noise Ratio	15 dB		
Bit duration	833 ± 80 µs (start and stop bits have the same duration as a standard bit)		

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6.2 Data message format

The data message shall be transmitted as a series of 8-bit data words, with each data word bounded by a start bit (space) and a stop bit (mark). The data message shall use either the Single Data Message Format (SDMF) or Multiple Data Message Format (MDMF), as shown in Figure 1 and Figure 2, respectively.

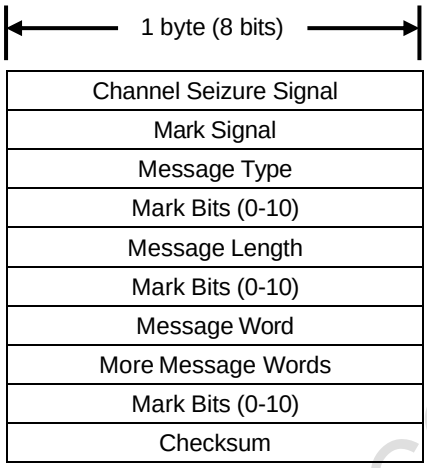

Figure 1. Single Data Message Frame format

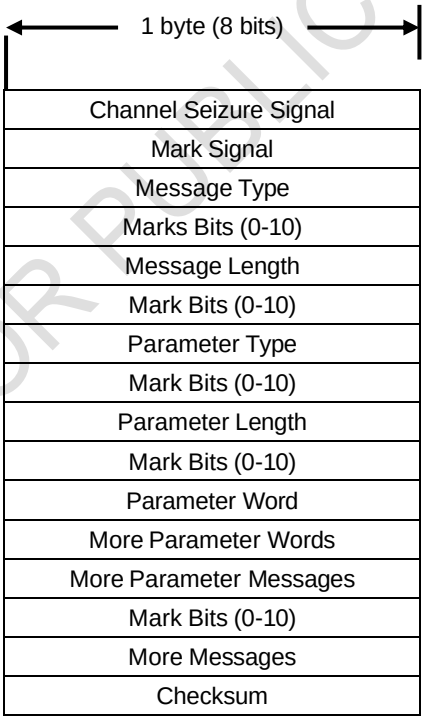

Figure 2: Multiple Data Message Frame format

The data received shall be in the order of the least significant bit of each data byte first.

Message words not recognised by the Equipment shall be ignored (i.e. the corresponding message shall not be displayed). Recognition shall be based on the value used in the message type.

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If the Equipment recognises the message type of multiple messages but does not recognise one or more of the parameter type words within the multiple messages, the Equipment shall process the message as follows:

a) all recognised parameter types shall continue to be processed (i.e. the corresponding message is displayed); and

b) all unrecognised parameter type words shall be ignored (i.e. the corresponding message is not displayed).

On receiving each message (single or multiple) the Equipment shall be able to switch “ON”, provide the message to be displayed, and then switch “OFF”. Single messages and/or multiple messages shall be received in a sequence, and therefore the Equipment shall be caused to switch “ON” and “OFF” several times.

6.3 Message and parameter types

The message type identifies the service or capability associated with the message. The message type value for SDMF and MDMF shall be within the range of 0 to 255.

SDMF shall support calling number delivery service. The message type value for calling number delivery service shall be as specified in Table 2.

Table 2. Message type for calling number delivery service

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

The message type value for additional services using MDMF shall be as specified in Table 3.

Table 3. Message type for additional services

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

The parameter type value for MDMF shall be within the range of 0 to 255. The parameter type values used for the Call Setup message shall be as specified in Table 4.

Table 4. Parameter type words for Call Setup message type

Bit Number	Value	Meaning
76543210	00000001	Date and Time
	00000010	Calling Line Identification
	00000100	Reason for absence of DN
	00000111	Name

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6.4 On-hook data reception

6.4.1 Data transmission associated with ringing

In the on-hook state, data transmission may occur with or without an associated ringing signal. For example, a visual message waiting indication may use on-hook data transmission without an associated ringing signal. Data transmission associated with a telecommunications network ringing signal shall comply with Figure 3 and Table 5.

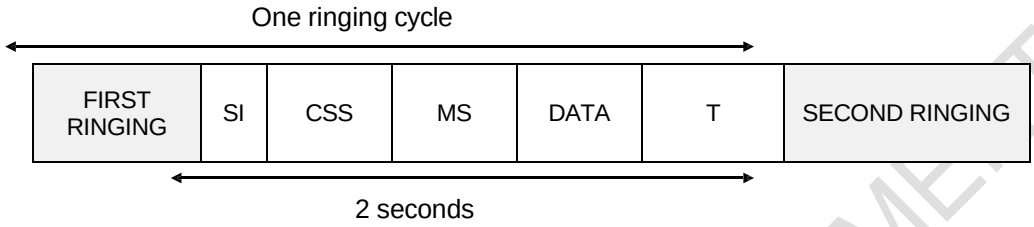

Figure 3. Timing diagram for on-hook data transmission associated with ringing signal

Table 5. Timing parameters for on-hook data transmission associated with ringing signal

Parameter	Value	Descriptions
Ringing Current	0.4 s ON, 0.2 s OFF, 0.4 s ON, 2.0 s OFF	One ringing cycle
SI	(0.25 -0.5) s	Silent interval before transmission of data message from telecommunications network to the Equipment
CSS	0.2 s	Channel Seizure Signal
MS	0.15 s	Mark Signal
DATA	≥ 200 ms	Data transmission shall stop at least 200 ms before the arrival of the second ringing cycle.
T	≥ 200 ms	Transition time between data transmission and the second ringing where T shall not be less than 200 ms.

6.4.2 Channel Seizure Signal (CSS) and Mark Signal (MS)

For on-hook data reception, each message (single or multiple) shall be preceded by a CSS and a MS (logic 1). The purpose of the CSS and the MS is to alert and condition the Equipment for the reception of a message frame. The CSS shall consist 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 MS shall consist of 180-mark bits.

6.4.3 Analogue Calling Line Identification Presentation (A-CLIP) message format

Message formats used by telecommunications network to convey A-CLIP service information to the Equipment shall be as in Table 6.

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Table 6. Message format for A-CLIP service

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

6.4.4 Display requirements

The Equipment shall be capable of storing at least 12 characters. The information shall be displayed on a narrower display if scrolling is provided such that all 12 characters can be displayed. The Equipment shall be able to display either lower or upper case letters.

When Calling Line MDMF Identification (CLI) is Not Available, the Equipment shall be able to interpret reason for Absence of Caller Name. The reason may be displayed as received in the first byte of the parameter (the single ASCII characters "P" or "O"). Messages translated to "Private" or "Unavailable" and "Withheld" or "Out Of Area" are also acceptable.

The parameter byte for network message system status indicates when messages are waiting in a message system. A value of zero means no messages waiting; a value of 1 means one or more messages waiting. (Optional).

6.5 Off-hook data reception for call waiting

The Equipment that supports Call Waiting function shall comply as follows:

For off-hook data transmission, a stable call shall be interrupted, and a clear, voice-free channel established in Open Switching Interval (OSI) time interval. The telecommunications network initiates the process within W duration by muting transmission to and from the far end, and transmitting the alerting sequence Subscriber Alerting Signal (SAS) to alert the Equipment to new waiting calls. After a short period of X1, the telecommunications network transmits the Customer Premises Equipment Alerting Signal (CAS) to alert the Equipment to prepare for data reception.

Upon detection of the CAS, the Equipment shall mute the subscriber's handset to prevent near-end interference, attach a data receiver to the line, and respond to the telecommunications network with an Acknowledge Signal (ACK) indicating its readiness.

The telecommunications network shall wait for the ACK within t1 period. If ACK is detected, the telecommunications network shall begin to transmit data after Q transition time and re-establish the voice path by un-muting the far-end shortly after the end of data transmission. At about the same time, the Equipment shall un-mute the handset, and the stable call is completely re-established.

In the event that the telecommunications network does not detect ACK signal within t1 period, the data shall not be transmitted and is called an unsuccessful attempt. The complete stages of the process of the successful and unsuccessful attempt shall comply with Figure 4 and Figure 5. The detailed timing requirements describing this handshake shall be described in Table 7.

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Table 7. Off-Hook parameter values

Parameter and assignment	Value	Descriptions
OSI	(0-300) ms	OSI during which the DC voltage between the tip and ring conductors is removed, temporarily suspending line supervision and transmission.
W	(0-60) ms	Time during which the telecommunications network mutes the far-end transmission before transmitting the alerting sequence, in the absence of an OSI.
	100 ± 10 ms (90 - 110)	Time during which the telecommunications network continues to mute the far-end transmission following an OSI.
X	(250 ms-1 sec)	Time allowed for the SAS, including distinctive alerting patterns.
X1	(0-50) ms	Transition time allowed between the generation of different alerting signals.
Y	(80-85) ms	Duration of the Customer Premises Equipment Alerting Signal (CAS).
t1	160±5 ms (155-165 ms)	Acknowledgement timeout period during which the telecommunications network waits for an ACK. The network shall time out after 165 ms if no ACK is detected. Upon detection of an ACK, timing of interval t1 shall stop and timing of interval Q shall start.
Q	(50-500) ms Strong objective: 50-100	Transition time between detection of an ACK and the start of FSK data transmission.
Z	Feature-specific	Time required to transmit the feature-specific data.
S	(0-320) ms Strong objective: 0-120	Time taken by the telecommunications network to restore voice transmission following the end of data transmission or, where applicable, the end of an OSI.

The CAS and ACK shall meet the characteristics specified in Table 8.

Table 8. Handshaking signal characteristics

Signal	CAS	ACK
Frequency	(2130 ± 11) Hz (2750 ± 14) Hz	941 Hz ± 1.5 □ 1633Hz + 1 □
Level	Between -32 dBm and -14 dBm pertone	Between -12.0 dBm and -8.0 dBm (lower tone) Between -10.0 dBm and -6.0 dBm (upper tone) Level between lower tone and upper tone shall be 1 dB to 4 dB higher than the lower tone

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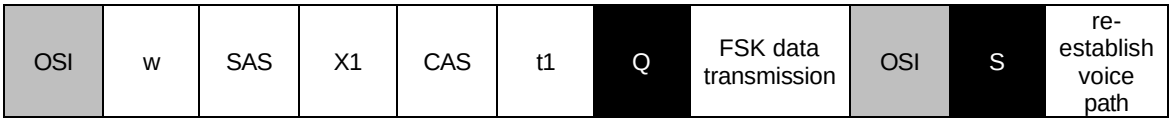

Figure 4. Successful attempt

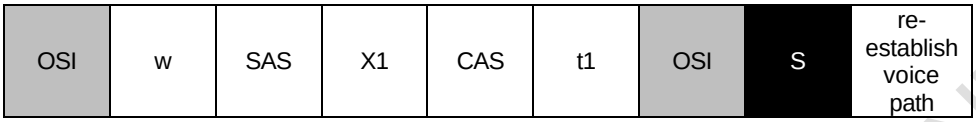

Figure 5. Unsuccessful attempt

6.6 Error detection

The last word of an SDMF or MDMF message shall be a checksum word. The checksum shall be calculated as the two's complement of the modulo-256 sum of all preceding words in the message.

Upon receipt of a message, the Equipment shall recompute the checksum and compare the calculated value with the checksum word received. The message shall be considered error-free when the calculated and received checksum values are identical.

If the Equipment detects an error, the information contained in the affected message shall not be displayed. The Equipment shall not transmit an error indication to the telecommunications network. Error correction and retransmission are not supported by this protocol.

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Acknowledgements

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