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**NETWORK CONNECTION SPECIFICATION
FOR CONNECTION OF
CUSTOMER PREMISES EQUIPMENT (CPE)
TO THE PUBLIC TELECOMMUNICATIONS NETWORK
(PTN) IN HONG KONG OVER DIGITAL TRUNK
AT 1544KBIT/S USING DTMF SIGNALLING
WITH CALL LINE IDENTIFICATION FROM THE PTN**



**TELECOMMUNICATIONS AUTHORITY
HONG KONG**

FOREWORD

1. This specification is issued pursuant to Section 32D of the Telecommunications Ordinance (Cap. 106). This specification sets out the technical requirements for multi-line customer premises equipment (CPE) to be connected to the Public Telecommunications Networks (PTN) in Hong Kong over digital trunk at 1544 kbit/s using DTMF signalling which supports calling line identification (CLI) from the PTN.
2. Digital trunks at 1544 kbit/s may be provided by any one of the Fixed Telecommunications Network Services (FTNS) operators in Hong Kong. CPE should comply with this specification for connection to the digital trunk at 1544 kbit/s using DTMF signalling with CLI provided by the FTNS operators. The general technical characteristics of the FTNS networks are given in HKTA 2201. Supplementary information on network characteristics and services of the FTNS networks may be obtained direct from the operators. Contact information of the FTNS operators can be found in the information note OFTA I 412.
3. At present, the Office of the Telecommunications Authority (OFTA) operates a **Hong Kong Telecommunications Equipment Evaluation and Certification** (“HKTEC”) scheme. Details of the scheme can be found in the information note OFTA I 421. Under the scheme, suppliers or manufacturers may apply for certification of their customer premises equipment against this specification. The application procedures for certification of customer premises equipment can be found in the information note OFTA I 412. A label prescribed by the Telecommunications Authority (TA) may be affixed to the certified equipment. Details of the labelling arrangement can be found in the Standardisation Guide HKTA 3211.
4. The TA may amend any part of this specification as and when he deems necessary.
5. In case of doubt about the interpretation of this specification, the methods of carrying out the test and the validity of statements made by the manufacturers of the equipment, the decision of the TA shall be final.
6. The TA accepts no responsibility for the satisfactory performance of the CPE connected to the public telecommunications networks. The CPE is not normally evaluated against performance, reliability or quality-of-service parameters.
7. The HKTA specifications and information notes issued by the TA can be downloaded from OFTA’s website at <http://www.ofta.gov.hk>. Enquiries about this specification may be directed to -

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AMENDMENT TABLE

Item	Issue No.	Paragraph	Descriptions
1.	Issue 2	Foreword Para. 3-4	Update contact information for FTNS operators. Add information for HKTEC Scheme and classify the CPE under CCS Cat. I
2.	Issue 3	Foreword	Certification and labelling arrangements are updated.
3.	Issue 4	Foreword	Update information on certification and labelling as a result of the accreditation of Certification Bodies (CBs).
4.	Issue 4	Content	A content table is added before the main text.
5.	Issue 4	Para. 4	A new paragraph 4 listing out the standards under reference in this specification is added.

CONTENT

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2. BASIC TECHNICAL REQUIREMENTS
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1. SCOPE

This Network Connection Specification covers the basic technical requirements for connection of multi-line customer premises equipment (CPE) with digital interface to the Public Telecommunications Networks (PTN) in Hong Kong over digital trunks using DTMF signalling at the transmission rate of 1544 kbit/s and defines additional signalling requirements to be complied with by the CPE in order to support calling line identification (CLI) from the PTN. CPE that supports the receiving of CLI from the PTN over 1544 kbit/s digital trunks using DTMF signalling is required to comply with this specification.

2. BASIC TECHNICAL REQUIREMENTS

The customer premises equipment that is designed to support calling line identification from the PTN by this specification shall comply with the basic technical requirements as defined in -

HKTA 2017 Network Connection Specification for Connection of Customer Premises Equipment (CPE) to the Public Telecommunications Network (PTN) in Hong Kong over Digital Trunk at 1544 kbit/s using DTMF Signalling

3. ADDITIONAL SIGNALLING REQUIREMENTS TO SUPPORT CALLING LINE IDENTIFICATION FROM THE PTN

3.1 REGISTER SIGNALLING FROM PUBLIC EXCHANGE TO CPE FOR DDI CALLS WITH CALLING LINE IDENTIFICATION FROM THE PTN

3.1.1 DTMF signalling is employed as the register signalling (dialling) method for calls initiated from the PTN to CPE [direct-dial-in (DDI)] and the CPE shall comply with the signalling requirements as defined in paragraph 5.4 of HKTA 2017. For delivery of calling line identity (CLI) to the CPE, a digit sequence embedding both the CLI and the DDI information as described in paragraph 3.1.2 below will be sent by the PTN and shall be interpreted by the CPE. The DTMF signal frequencies shall be in accordance with ITU-T Recommendation Q.23.

3.1.2 For DDI calls with delivery of CLI to the CPE, a digit sequence of the following formats shall be sent from the PTN to the CPE -

Case 1 : DDI Digits are sent

Digit Sequence = * XX .. X * YY .. Y *
 (1st digit) (CLI) (DDI digits) (last digit)

Note 1: * is the DTMF asterisk which is sent as the first digit, the last digit and in between as a delimiter to separate the CLI and DDI information

Note 2: XX .. X are the digits representing the CLI information

Note 3: YY .. Y are the digits representing the DDI information

Case 2 : DDI Digits are not sent

Digit Sequence = * XX .. X * *
 (1st digit) (CLI) (last digit)

Note 4: * is the DTMF asterisk which is sent as the first digit and the last two digits

Note 5: XX .. X are the digits representing the CLI information

Note 6: No DDI digits are sent

- 3.1.3 The length of the CLI information shall be the nominal digit length of a directory number in Hong Kong (i.e. eight digits at present).
- 3.1.4 For calls classified as “Out of area” and “Private”, special digit pattern of all “0” (zero) and all “1” (one) will be sent respectively as the CLI. The nominal digit length of the all “0” or all “1” patterns is the same as the nominal digit length of the CLI (i.e. eight digits at present). For these cases, the CPE shall be able to display meaningful messages to customer terminals.
- 3.1.5 For Immediate Start method, the public exchange will start to send the digit sequence of DTMF signals described in paragraph 3.1.2 when a minimum of 600 ms has elapsed after the seizure of the digital trunk by the public exchange.
- 3.1.6 For Delay Dial method, please refer to paragraph 3.2.2 for the timing requirements.

3.2 LINE SIGNALLING FOR DDI CALLS WITH CALLING LINE IDENTIFICATION FROM THE PTN

- 3.2.1 The PCM line signalling protocol for DDI calls as defined in paragraph 5.2 of HKTA 2017 shall apply, with the exception of paragraph 3.2.2 below.
- 3.2.2 For the Delay Dial Method, the signalling timing as defined in Figure 1 and Table 1 shall apply.

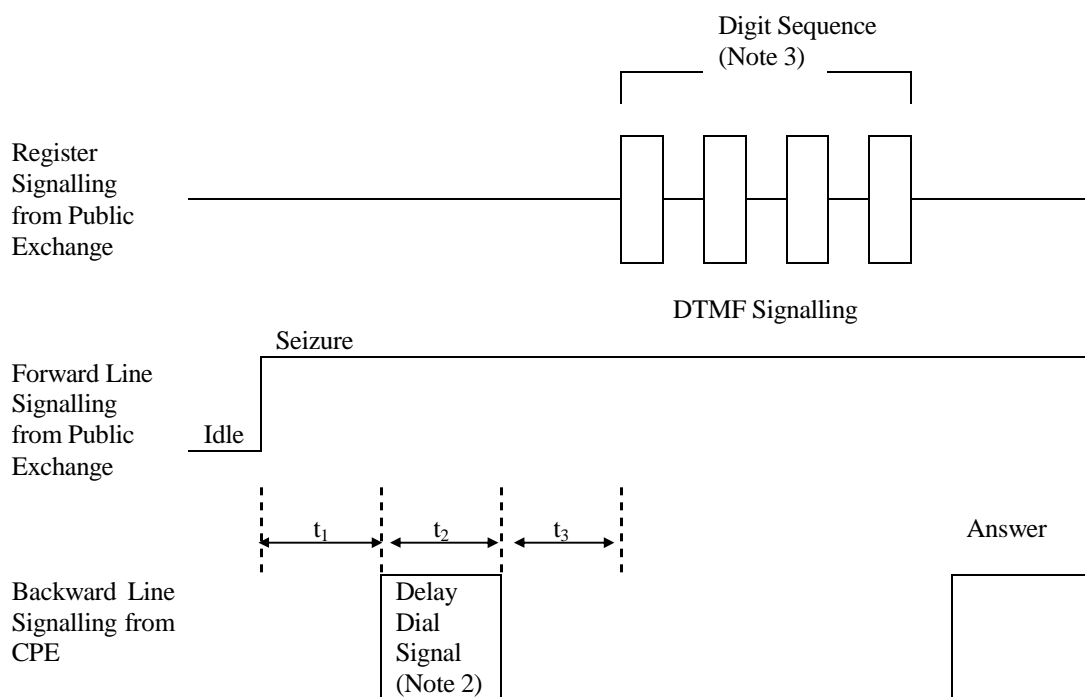


Figure 1. Timing Diagram of Delay Dial Method by DTMF Signalling for DDI call with CLI delivered to the CPE

Timing	Description	Limit
t_1	Duration between the beginning of seizure and the beginning of delay dial signal	4 s maximum (Note 1)
t_2	Duration of the delay dial signal	140 ms minimum 4 s maximum
t_3	Duration between the end of delay dial signal and the first digit in the digit sequence	80 ms - 300 ms

Table 1 Delay Dial Method Timing Requirement of DTMF Signalling for DDI Calls

Note 1 : There is no minimum limit for t_1 and the CPE can return the delay dial signal as soon as the seizure signal from the public exchange is detected.

Note 2 : The delay dial signal is a momentary reversal of the polarity of the A and B bits transmitted from the CPE.

Note 3 : The digit sequence to be sent for DDI calls from the PTN to the CPE with calling number delivery shall be in the format as defined in paragraph 3.1.2.

4. REFERENCE

- 4.1 HKTA 2017 - “Network Connection Specification for Connection of Customer Premises Equipment (CPE) to the Public Telecommunications Network (PTN) in Hong Kong over Digital Trunk at 1544 kbit/s using DTMF Signalling” issued by the Telecommunications Authority
- 4.2 ITU-T Recommendation Q. 23 - Technical Features of Push-Button Telephone Sets

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