



ISDN CUSTOMER PREMISES EQUIPMENT TO BE CONNECTED TO THE PUBLIC TELECOMMUNICATIONS NETWORKS IN HONG KONG

What is ISDN?

ISDN stands for *Integrated Services Digital Network*. ISDN is a telecommunications network which has a digital end-to-end connectivity to support a wide range of services such as voice, fax, data, video etc. using a limited set of connection types and interface arrangements. In Hong Kong, ISDN service is provided by the Fixed Telecommunications Network Services (FTNS) operators. Users can connect their terminal equipment to the ISDNs by means of two standard types of user-network interface:

(a) *Basic Rate Access (BRA)*

BRA basically provides digital line connection of desktop terminal equipment to the ISDN. The BRA interface consists of two bearer channels (B-channels) and one data channel (D-channel). Each B-channel transmits user information with a capacity of 64 kilo bits per second (kbit/s), while the D-channel carries call set-up and signalling information at 16 kbit/s. The BRA interface is also referred to as a 2B+D connection which provides a total traffic carrying capacity of 144 kbit/s.

(b) *Primary Rate Access (PRA)*

PRA provides a high speed digital trunk connection of medium/large terminal equipment to the ISDN. There are two options of PRA according to the different transmission standards employed:

- (i) **23B+D** connection which consists of twenty-three B-channels each at 64 kbit/s plus one D-channel at 64 kbit/s, with the total traffic carrying capacity thus at 1544 kbit/s

or

- (ii) **30B+D** connection which consists of thirty B-channels each at 64 kbit/s plus one D-channel at 64 kbit/s, with the total capacity thus at 2048 kbit/s

What technical standards for ISDN are adopted in Hong Kong?

2. There are three major industry standards for ISDN which are developed by:
 - International Telecommunication Union - Telecommunication Standardization Sector (ITU-T);
 - European Telecommunications Standards Institute (ETSI); and
 - American National Standards Institute (ANSI).
3. Having considered the range of choice of terminal equipment by the consumers and the network investments for implementing ISDN, the Telecommunications Authority (TA) has decided to adopt a multi-standard approach in Hong Kong. FTNS operators may choose their own ISDN user-network interface based on the ITU-T, ETSI or ANSI standards.

What ISDN services will be provided in Hong Kong?

4. In order to allow interworking of terminal equipment connected to the different ISDN platforms of network operators, the TA has decided that transparent communications for the following basic ISDN services must be ensured across different ISDNs in Hong Kong:
 - (i) Basic voice and data communications by using the B channels;
 - (ii) Calling Line Identification Presentation;
 - (iii) Calling Line Identification Restriction;
 - (iv) Multiple Subscriber Number;
 - (v) Sub-addressing; and
 - (vi) Group 4 fax transmission.
5. FTNS operators offering ISDN services should, as a minimum, include the services in (i), (ii) and (iii) above in their portfolio. The TA will review the list of basic ISDN services and in consultation with the operators, add/delete other ISDN services to/from the list from time to time. FTNS operators may provide ISDN services in addition to the basic ISDN services listed above at their own discretion.

6. Information regarding the ISDN characteristics and services provided by the FTNS operators can be obtained from the network operators. The contacts of the network operators can be found from OFTA's website at <http://www.ofta.gov.hk/en/tips/servicetype/local/operator.html>.

How to obtain ISDN connection?

7. Figure 1 illustrates the typical configuration for connection of ISDN terminal equipment to the FTNS operator's network at reference point S/T:

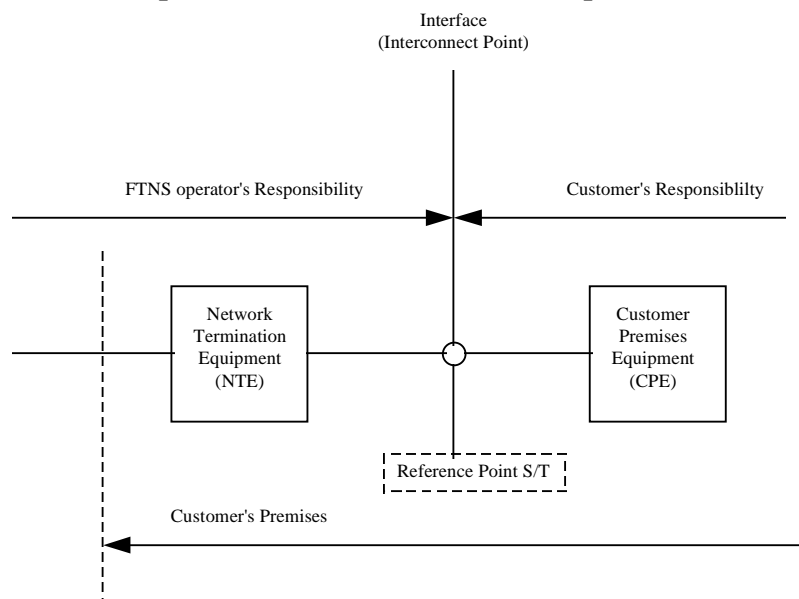


Figure 1 Interconnection of CPE to FTNS operator's ISDN

8. A user can procure its own ISDN terminal equipment which can be physically connected to a FTNS operator's network by standard ISO 8877 8-pole plug (for BRA interface) or by other method (for PRA interface) as specified by the network operator concerned.

What are the major types of ISDN terminal equipment?

9. ISDN terminal equipment is the customer premises equipment (CPE) employed by a user to gain access to ISDN services provided by network operators. A variety of ISDN CPE is currently available on the market to support a wide range of voice and non-voice applications. ISDN CPE can be classified as single-line and multi-line types of equipment.

10. Single-line ISDN CPE is a piece of equipment that supports the connection of only one exchange line using BRA interface to the network. Examples are:

- ISDN digital telephone

- Group 4 fax machine
- Videophones
- ISDN data modem
- Terminal Adaptor

11. Multi-line ISDN CPE is a piece of equipment that supports the connection of more than one exchange line using BRA interface and/or using PRA interface for connection to the network. Examples are:

- Inverse Multiplexer
- Videoconferencing sets
- Integrated Services Private Branch Exchange (ISPBX)

What are the technical requirements for ISDN CPE?

12. ISDN CPE intended to be connected to the FTNS operator's network using standard ISDN user-network interface shall comply with the technical specification issued by the TA. At present, the following five specifications are available:

- | | |
|-----------|--|
| HKTA 2014 | Network Connection Specification for Connection of Customer Premises Equipment (CPE) to the Public Telecommunication Network (PTN) in Hong Kong using ISDN Basic Rate Access (BRA) based on ITU-T Recommendations |
| HKTA 2015 | Network Connection Specification for Connection of Customer Premises Equipment (CPE) to the Public Telecommunication Network (PTN) in Hong Kong using ISDN Primary Rate Access (PRA) at 1544 kbit/s based on ITU-T Recommendations |
| HKTA 2021 | Network Connection Specification for Connection of Customer Premises Equipment (CPE) to the Public Telecommunication Network (PTN) in Hong Kong by ISDN Basic Rate Access (BRA) Interface Using Metallic Loops on the Network Side of the Network Termination (NT) - Layer One Specification |
| HKTA 2026 | Network Connection Specification for Connection of Customer Premises Equipment (CPE) to the Public Telecommunication Network (PTN) in Hong Kong using ISDN Basic Rate Access (BRA) based on ANSI Standards |

HKTA 2027 Network Connection Specification for Connection of Customer Premises Equipment (CPE) to the Public Telecommunication Network (PTN) in Hong Kong using ISDN Primary Rate Access (PRA) at 1544 kbit/s based on ANSI Standards

13. Technical specifications for other ISDN user-network interface will be issued as necessary. Supplementary specifications can also be issued by the operators themselves if required to specify their ISDN service offerings.

Are there any certification requirements for ISDN CPE to be used in Hong Kong?

14. For both single-line and multi-line ISDN CPE, certification is on a voluntary basis. However, manufacturers, suppliers and dealers should ensure that their equipment comply with the relevant technical specifications. The network operators may reject connection of any ISDN CPE if they find that the CPE causes harm to the network. If manufacturers, suppliers and dealers want to be sure that their equipment will be accepted for connection to the FTNS operators' networks, they should apply to a Certification Body (CB) for certification of their CPE beforehand.

15. More details about CPE certification can be found in the following information note issued by the TA:

[OFTA I 412](#)

["How to apply for Certification of Customer Premises Equipment to be connected to the Public Telecommunications Networks in Hong Kong"](#)

Is there any labelling requirement for ISDN CPE?

16. For ISDN CPE which has been certified, a label prescribed by the TA may be affixed on a voluntary basis to the equipment to identify its conformity. Although labelling is voluntary, manufacturers, suppliers and dealers are encouraged to use labels prescribed by the TA for consumer guidance. More details about the labelling arrangement can be found in the following document issued by the TA:

[HKTA 3211](#)

["Standardisation Guide for Labelling of Telecommunications Equipment"](#)

How to select a suitable ISDN CPE?

17. In view of the different standards of ISDN user-network interface and different range of ISDN services that may be supported by the network operators in Hong

Kong, consumers are suggested to choose a suitable ISDN CPE to suit their own needs. Some hints are given below:

- (a) type of ISDN applications required;
- (b) type of user-network interface supported by the ISDN CPE for connection to the FTNS operators' networks;
- (c) whether the CPE has the desirable features and capability and can make use of all the basic and supplementary ISDN services offered by the FTNS operator chosen by the user;
- (d) whether to select a *multi-standard ISDN CPE* which is capable of working with different standards of ISDN platforms (ITU-T, ANSI, ETSI etc.) by means of simple modifications like firmware changes or software upgrade. This will minimize possible cost of switching between different ISDN platforms in future;
- (e) whether to use an ISDN CPE with certification against the relevant HKTA specification to confirm its compatibility with the FTNS operators' networks; and
- (f) other user-dependent criteria, such as cost, maintenance, reliability, performance, etc.

How can I obtain HKTA specifications and other relevant information notes?

18. HKTA specifications and other relevant information notes issued by the TA may be obtained through one of the following methods:

- (a) OFTA's Internet Home Page. The Home Page address is <http://www.ofta.gov.hk>;
- (b) Hard copies are available upon written request to the following:

Senior Telecommunications Engineer,
Standards Section,
Office of the Telecommunications Authority,
29/F Wu Chung House,
213 Queen's Road East, Wanchai,
Hong Kong.

How can I obtain additional information?

19. Additional information may be obtained from:

Senior Telecommunications Engineer
Standards Section
Office of the Telecommunications Authority
29/F, Wu Chung House,
213 Queen's Road East, Wanchai,
Hong Kong.

Tel : +852 2961 6388

Fax : +852 2838 5004

Email : standards@ofta.gov.hk

Office of the Telecommunications Authority
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Glossary

User-Network Interface

It is the interface between the terminal equipment and a network termination at which a defined set of procedures is applied to enable the user to employ the services and/or facilities of the network.

Calling Line Identification Presentation

This service enables the receiver of a call to identify the calling party's ISDN number, possibly with sub-address information.

Calling Line Identification Restriction

This service enables the originator of a call to restrict presentation of the calling party's ISDN number and sub-address to the called party.

Multiple Subscriber Number

This service provides the possibility for assigning multiple ISDN numbers to a single interface.

Sub-addressing

This service allows the called user to expand his addressing capacity beyond the one given by the ISDN number, so that a call can be routed directly to a specific piece of equipment among multiple devices connected to the same interface. Both the calling party and the receiver must subscribe to this service if either are to take advantage of the service.

Group 4 fax machine

Group 4 fax machines are designed to work on the ISDN. Unlike conventional Group 3 fax machines which convert the scanned image into analogue signals for transmission over the telephone network, Group 4 fax machines send digitally scanned image directly over the ISDN and can achieve faster and higher quality of transmission.

Terminal Adaptor

An equipment which provides protocol conversion functions to enable a non-ISDN equipment to be connected to ISDN and can be available as standalone modules, centralized units on a rack or as PC cards.

Inverse Multiplexer

A device which allows very high speed of information transfer to be achieved by transmission through a number of lower-speed ISDN connections. The inverse multiplexer effectively pulls together the ISDN connections at one end and then re-synchronizes the information at the other end. Owing to proprietary standards, usually the inverse multiplexer on each end of the digital path has to be the same to ensure successful communication.

Integrated Services Private Branch Exchange (ISPBX)

A Private Automatic Branch Exchange (PABX) that has ISDN capabilities including connection to ISDN by standard user-network interfaces.