
Chapter D14: ISDN PRI Access Interface

D14.1 Functional Description

D14.1.1 Overview

The ETSI ISDN Primary Rate Interface supports 30B+D network access (30 64Kb/s B-channels for voice/data and a 64Kb/s D-channel for signalling) over 2Mb/s E1 carriers at the T reference point, primarily for point-to-point communication between digital PBXs and local exchanges. The characteristics of this interface are summarised in figure 92.

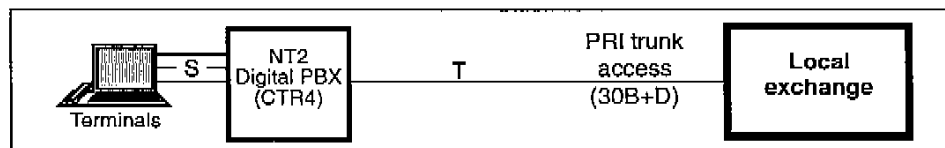


Figure 92: ETSI ISDN PRI access

Some non-ETSI ISDN PRI variants support 23B+D network access over 1.5Mb/s T1 carriers rather than 30B+D access over E1s. In functional terms, e.g. message flows and procedures for call establishment, these operate in essentially the same way as ETSI PRI. To avoid duplication, the description in this chapter therefore refers simply to PRI except where it is explaining the differences between variants.

PRI can support network access for any PRI-enabled device, not just for digital PBXs. For example, ISN04 (TDM) can use ETSI PRI to communicate with an IN external IP, and can also support connections to intelligent muxes that support dynamic timeslot allocation.

PRI is an asymmetrical interface, i.e. the protocol and procedures defined for the local exchange end of the interface are not identical to those defined for the PBX end of the interface. Typically, a switch supports PRI in *network* or *master* mode;

the PBX supports it in *user* or *slave* mode. A switch with CTR4 type approval can, however, also use PRI user mode to support indirect access to an AO network for subscribers connected to the PSTN (from the PSTN perspective, the AO switch is a PRI user).

Note: To prevent confusion, the ETSI PRI specifications listed in section D14.1.2 always use the terms *sending* and *receiving* from the viewpoint of the PBX. Overlap sending, for example, means overlap signalling from the PBX to the switch; overlap receiving means overlap signalling from the switch to the PBX.

D14.1.2 Specifications

D14.1.2.1 ETSI Specifications

ETSI ISDN PRI is defined in the following specifications:

- ETS 300 403, which defines the layer 3 protocol for basic call control. It is a delta document to ITU-T Recommendation Q.931 (White Book).
Note: Support for ETS 300 403 implies support for its predecessor ETS 300 102, which is based on the Blue Book version of Q.931.
- ETS 300 402, which defines the layer 2 data link protocol. It is a delta document to ITU-T Recommendations Q.920 and Q.921 (White Book).
Note: Support for ETS 300 402 implies support for its predecessor ETS 300 125, which is based on the Blue Book versions of Q.920/Q.921.
- ETS 300 011, which defines the physical layer (layer 1).

The ISN04 (TDM) implementation of ETSI PRI is defined in the following Nortel Interface Specification (NIS):

NIS A215-1

Specification of the Primary Rate Interface at the T Reference Point

D14.1.2.2 National Variants of ETSI PRI

Although ETSI ISDN PRI can be used unmodified in a national network, some national regulators have defined their own national variants. Such a variant is typically characterised by differences in protocol (messages, information elements or IE values) or procedures.

Section D14.2.3 **Capabilities** on page 306 provides information about how these national variants differ from ETSI ISDN PRI in terms of messages, information elements and IE values defined, and also summarises the compliance of the ISN04 (TDM) implementation with the various specifications.

The following national ETSI PRI variants have been defined for countries in which ISN04 (TDM) is to be deployed:

- Belgian PRI (NET3), which is specified in Belgacom Technical specifications for the User-Network interface (a subset of ETS 300 102, with national-specific signalling for AOC)
See AU2524 for details

- Italian PRI (X11), which is specified in
ITVSN
(a subset of ETS 300 102, with national-specific signalling for AOC)
See AU2524 for details
- Netherlands PRI, which is specified in
User-Network Aspects Euro-ISDN PTT Telecom
(a subset of ETS 300 102, with national-specific signalling for AOC)
See AJ5084 for details
- Spanish PRI, which is specified in
Spain PRI Specification: ISDN User-Network Interface Layer 3
(a subset of ETS 300 102)
See AU3208 for details
- Swiss PRI (SWISS3), which is specified in
SwissNet User-Network Interface
Specification for Layer 2 and 3 of the D-Channel Protocol
(PTT 840.73.2 Edition 2 1995, as updated by Jan 97 Corrigendum)
(a subset of ETS 300 102, with national-specific signalling for AOC)
See AU2826 for details

D14.1.2.3 Other National PRI Variants

French PRI Variants

French PRI (Numeris) is specified in

CSE P-22-30A, NV Approval for ISDN Equipment
(a subset of ETS 300 403 with some national-specific extensions)

There are two versions of Numeris, VN4 and VN6, both of which are supported by ISN04 (TDM); VN4 is more widely deployed at present, but VN6 is intended to replace it. See AJ4994 and AX0679 for details of VN4 support.

Numeris+ VN6 PRI is an evolution of the VN4 interface that supports not only some MoU supplementary services, but also a number of French-specific non-MoU supplementary services. These rely on the use of the National Facility IE, and are therefore not ETSI-compliant. See A59022564 for details of the ISN04 (TDM) implementation of Numeris+ VN6 PRI, including interworkings with other interfaces and support for services.

Australian PRI (TS14)

TS14 is the Australian primary rate interface, defined in the following specifications:

- Austel Technical Standard 014.2, TS014 1990
- Austel Technical Standard 014, *General Requirements for Customer Equipment Connected to PRI*, Volumes 1 and 2 (TS014 1994)

The 1994 TS14 specification is based on the Red Book versions of the ITU-T DSS1 Recommendations Q.931, Q.921 and Q.920, with some modifications and

additional Australian-generated material. It is now evolving to correspond more closely to the latest ITU-T Recommendations.

In addition to being used as the PRI protocol between a PBX and the ISDN network, TS14 also enables the connection of PBXs and mobile communication systems (MobileSat) to the PSTN.

TS14 can outpulse a maximum of 28 digits. The maximum number of digits permitted in the Calling Line Identifier field is 20. The maximum number of billable digits is 18.

Japan PRI (INS1500)

Japan PRI (INS1500) is a 23B+D interface supported over 1.5Mb/s T1 carriers. A given D-channel can support signalling not only for B-channels on the same carrier but also for B-channels on other carriers.

Both network mode and user mode are supported.

The Japan PRI protocol supports only en-bloc sending and receiving of called party digits. It does not support overlap sending or receiving.

The ISN04 (TDM) implementation of INS1500 has been enhanced to ensure that neither receipt of non-supported IEs or nor requests for non-supported services causes calls to be taken down or affects CLIP/CLIR functionality (see A59013405).

The ISN04 (TDM) implementation of Japan PRI is defined in the following NIS:

NIS A220-1: Japan Primary Rate Interface

ANSI PRI

ANSI PRI is a 23B+D interface supported over 1.5Mb/s T1 carriers.

The ISN04 (TDM) implementation of ANSI PRI is based on ANSI specification T1.607 (1990). Both network mode and user mode are supported. The ANSI PRI protocol supports only en-bloc sending and receiving of called party digits. It does not support overlap sending or receiving.

The ISN04 (TDM) implementation of ANSI PRI is defined in the following NIS:

NIS A211-1: PRI Network Interface Specification

See A59034016 for details of ISN04 (TDM) support for ANSI PRI.

Hong Kong PRI (CR13)

Hong Kong PRI (CR13) is a 23B+D interface supported over 1.5Mb/s T1 carriers. The protocol is based on HKTA 2015. Both network mode and user mode are supported. Hong Kong PRI supports overlap sending (inpulsing), but not overlap receiving (outpulsing). Maximum size of called party number is 19 digits (as specified in HKTA 2015).

See A59034004 for details of ISN04 (TDM) support for ANSI PRI.

D14.1.3 ISDN Service Categories

ISDN service categories and priorities are defined in the CEPT MoU (Memorandum of Understanding). This lists the telecommunication services that are to be implemented by member PTTs within a certain timeframe. Services are denoted as Priority 1, 2 or 3, depending on the urgency with which they must be introduced. Priority 1 services are to be introduced first and priority 3 last.

The ETSI ISDN telecommunication services (i.e. those listed in the MoU) are divided into three categories: bearer services, teleservices and supplementary services. These categories are distinguishable by the service attributes that may be applied to them.

Service attributes, as defined in CCITT Blue Book Recommendation I.210, may be high or low layer. Low layer attributes are those used to describe the type of information being carried (prior to conversion to 64 Kb/s data). High layer attributes describe the functional characteristics of a service.

The attributes applicable to each service category are as follows:

- Bearer services
Low layer attributes only
- Teleservices
Both low and high layer attributes
- Supplementary Services
High layer attributes only

Figure 93 illustrates these service categories in relation to the end-to-end handling of an ISDN call.

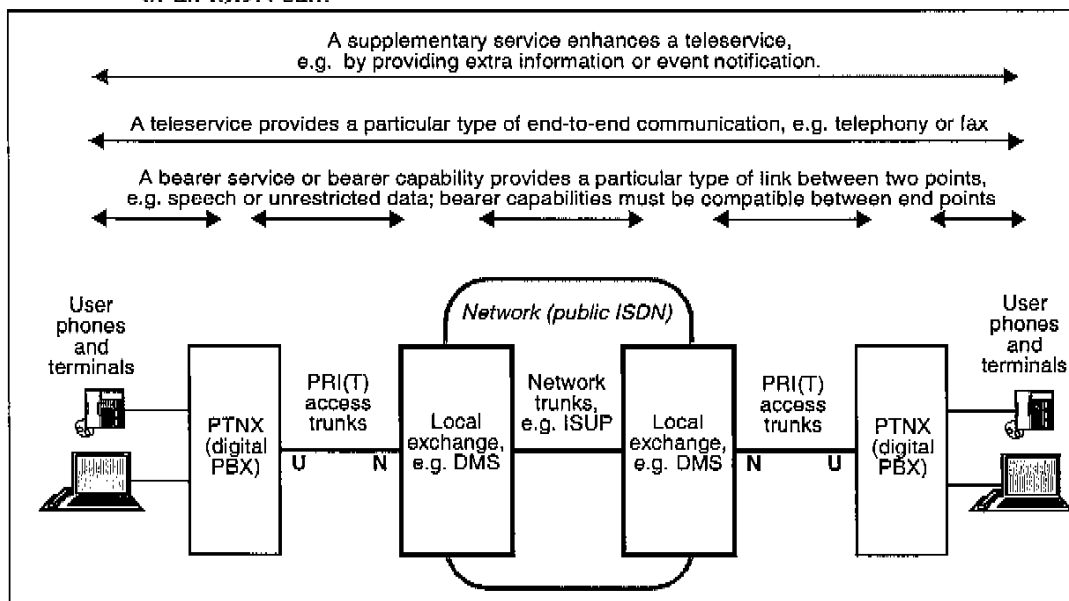


Figure 93: Bearer services, teleservices and supplementary services

Table 16 illustrates the distinctions between these types of service by listing the Priority 1 services defined in the CEPT MoU (MoU1 services).

Table 16: CEPT MoU Priority 1 ISDN Telecommunication Services

Service Type	Service Name
<i>Bearer Services</i>	64 Kb/s for 3.1 KHz audio Provides a 64 Kb/s 8 KHz structured channel for the transfer of 3.1 KHz audio information, including speech, voice band data via modems, and facsimile group 1-3 data (analogue fax).
	64 Kb/s for Speech Essentially the same as 3.1 KHz audio, but permits the attachment of equipment such as echo cancellers, so not suitable for data (bit integrity not guaranteed).
	64 Kb/s Unrestricted Provides a 64 Kb/s 8 KHz structured channel for unrestricted information transfer between reference points.
<i>Teleservices</i>	3.1 KHz telephony
	Telefax Group 4
	Teletex
<i>Supplementary Services</i>	Calling Line Identification Presentation (CLIP)
	Calling Line Identification Restriction (CLIR)
	Direct Dialling In (DDI)
	Multiple Subscriber Number (MSN)
	Terminal Portability (TP)

The ISN04 (TDM) implementation of ETSI PRI is fully compliant with the Priority 1 schedule of the CEPT MoU on ISDN rollout for Europe, "Memorandum of Understanding on the implementation of an European ISDN Service by 1992" with regard to MoU Priority 1 bearer services and teleservices, and is compliant with regard to call control procedures except as noted in section D14.2.3.4.

See section D14.2.3.3 on page 309 for details of ISN04 (TDM) support for these basic MoU1 services and for the more extensive range of services defined as MoU2.

D14.2 ISN04 (TDM) Implementation

ISN04 (TDM) can support PRI either in network mode or in user mode.

D14.2.1 Hardware Support

One Interface per E1 Carrier

ISN04 (TDM) can support PRI over 2Mb/s carriers terminated on PCM30 interface cards housed in an ISDN-ready Digital Trunk Controller Overseas (DTCO_i or DTCO_{2i}). With this implementation, each carrier supports one complete 30B+D interface. Two options are available for support of PRI network mode:

- Carriers terminated on 6X27BB cards housed in a DTCO_i. Each card terminates four carrier links.
- Carriers terminated on interface packets housed in a DTCO_{2i}. Each dual PCM30 interface packet terminates two carrier links, and up to four packets can be housed on an AMC (Access Multiplexer Capability) card for insertion in a DTCO_{2i} slot.

ETSI-compliant PRI user mode with hardware-controlled notification of loss of frame alignment is supported over carriers terminated on the 6X27BD enhanced PCM30 interface card in a DTCO_{i+}. The 6X27BB card provides full functional support for PRI user mode, but with slightly slower software-controlled notification of loss of frame alignment. The capabilities supported by AMC cards are equivalent to those of the 6X27BB card, not the 6X27BD card.

For both network and user mode, PRI signalling is terminated on a BX01AB Enhanced ISDN Preprocessor (EISP) card housed in the same DTCO_i or DTCO_{2i} as the carrier termination.

See section B1.4.1 on page 59 for more information about DTC configurations.

Multiple Interfaces per STM-1 Carrier

ISN04 (TDM) can also support the following types of ISDN PRI over STM-1 carriers terminated on an SPM (see A59026237 for details):

- Base/generic ETSI PRI and national ETSI PRI variants
- Numeris VN4 and VN6 PRI for France

A multiplexer provides the mapping between external E1 carriers and an STM-1 carrier terminated on an SPM at the switch. The 30B+D PRI structure on each external E1 carrier is preserved on the STM-1 carrier, which can support up to 63 E1s in this way. The capabilities available to a PRI PBX served by an E1 multiplexed on to an STM-1 are the same as those available to a PBX served by an E1 directly terminated on a DTCO_i or DTCO_{2i}.

PRI signalling is terminated on a DLC (Data Link Controller) card in the SPM. Only network mode signalling is supported, not user mode.

See section B1.4.2 on page 69 for more information about the SPM.

T1 Carrier Support

For the Japan, ANSI and Hong Kong variants of PRI, the interface structure consists of 23 64Kb/s B-channels and a 64Kb/s D-channel. It is supported over 1.54 Mb/s μ -law DS-1 carriers (T1s), not 2Mb/s A-law PCM30 carriers (E1s). These carriers are terminated at the switch on 6X50 DS-1 interface cards housed in DTCi peripherals equipped with an EISP.

In the case of Japan PRI, a given D-channel can support signalling not only for B-channels on the same carrier but also for B-channels on other carriers.

D14.2.2 Software Support

PRI trunk groups can be defined in table TRKGRP with a trunk type of either PRA or IBN. Trunk type PRA should be used for any PRI trunks that may be involved in interaction with IN.

A PRI trunk group has no subgroups as such, but table TRKSGRP is used to define the signalling characteristics of the D-channel that conveys the ISDN signalling for the B-channels in the group (signalling type **ISDN**, external protocol **87Q931**). The D-channel is associated with the CLLI for the trunk group via table TRKGRP. The B-channels are datafilled as trunk group members in table TRKMEM.

In conceptual terms, there is a logical terminal (LT) at either end of an ISDN interface. Each logical terminal has an identifier and belongs to a logical terminal group. For ISN04 (TDM), these attributes are datafilled in tables LTGRP, LTDEF and LTMAP.

Table LTDEF also provides the following information for each ISDN interface:

- LT class (PRI).
- Number of B-channels (30 for ETSI PRI).
- The version of PRI to be used over the interface, which is identified by means of a unique Protocol Version Control (PVC) value generated from the values of the **VARIANT** and **ISSUE** fields in the table LTDEF entry.

A **variant** is a separate call processing agent. ISN04 (TDM) currently supports the following variants of PRI:

- Base ETSI PRI
- Australian PRI (TS14)
- Japanese PRI (INS1500)
- ANSI PRI
- Hong Kong PRI (CR13)
- French PRI (Numeris)
- QSIG (described in Chapter D15: QSIG VPN Interface)

An **issue** is a refinement of a variant that implements minor variations in protocol and/or procedures. ISN04 (TDM) currently supports five national-specific issues of the base ETSI PRI variant: Belgian PRI (NET3), Netherlands PRI, Spanish PRI,

Italian PRI (X11) and Swiss PRI (SWISS3). The QSIG variant has two issues: ISO1996 and ETSI1993. There are also two issues each of the French PRI variant (VN4 and VN6) and the Japanese INS1500 PRI variant. The other supported PRI variants have only one issue each.

Note: This PRI usage of the term *variant* reflects the names of the fields in table LTDEF, but differs from how the term is used for other interfaces such as CCS7. Spanish ISUP, for example, is defined as a variant of the ETSI ISUP agent, while Spanish PRI is defined as an issue of the ETSI PRI variant of PRI.

See AE0888 and AE1089 for details of the ISN04 (TDM) implementation of Protocol Version Control for PRI.

LTDEF datafill options can be summarised as follows:

Protocol version	VARIANT field	ISSUE field
Base ETSI PRI	ETSIPRI	1990
Belgian PRI	ETSIPRI	NET3
Netherlands PRI	ETSIPRI	HOLLAND1
Spanish PRI	ETSIPRI	SPAIN1
Italian PRI	ETSIPRI	X11
Swiss PRI	ETSIPRI	SWISS3
Australian PRI (TS14)	AUSTPRI	TS141990
Japanese PRI (INS1500 Version 1)	INSPRI	V1
Japanese PRI (INS1500 Version 5)	INSPRI	V2
ANSI PRI	ANSI	V1
Hong Kong PRI (CR13)	HKPRI	V1
French PRI (Numeris / VN4)	EVN4PRI	EVN4V1
French PRI (Numeris+ / VN6)	EVN4PRI	FR_VN6
QSIG (ISO / 1996)	QSIGPRI	ISO1996
QSIG (ETSI / 1993)	QSIGPRI	ETSI1993

D14.2.3 Capabilities

D14.2.3.1 Messages Supported

For ease of comparison between PRI variants, the framework used below to summarise message support (even for non-ETSI variants) is the one defined in ETS 300 403. Note that this does not include service-specific messages such as USER INFORMATION. For information about messages used to provide support for supplementary services, see Chapter E7: ISDN Supplementary Services.

Note: Messages not included in ETS 300 403 are listed below provided that they are supported by at least one non-ETSI PRI variant. The message names are in italics like this.

Message category	Message name	ETS 300 403 section	Supported in												
			Base	Belg.	Neth.	Spain	Italian	Swiss	French VN6	French VN4	Australia	Japan	ANSI	HK	
Call establishment messages	ALERTING	3.1.1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
	CALL PROCEEDING	3.1.2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
	CONNECT	3.1.3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
	CONNECT ACK	3.1.4	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
	PROGRESS	3.1.8	Y	Y	Y	Y	Y	Y	Y	Y	N ^[1]	Y	Y ^[2]	Y	Y
	SETUP	3.1.14	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	SETUP ACK	3.1.15	Y	Y	Y	Y ^[3]	Y	Y	Y	Y	Y	Y	N	N	Y
	<i>SUCCESSFUL CALL</i>	N/A	N	N	N	N	N	N	N	Y ^[4]	N	N	N	N	
Call information phase messages	RESUME	3.1.11	N	N	N	N	N	N	N	N	N	N	N	N	
	RESUME ACK	3.1.12	N	N	N	N	N	N	N	N	N	N	N	N	
	RESUME REJECT	3.1.13	N	N	N	N	N	N	N	N	N	N	N	N	
	SUSPEND	3.1.18	N	N	N	N	N	N	N	N	N	N	N	N	
	SUSPEND ACK	3.1.19	N	N	N	N	N	N	N	N	N	N	N	N	
	SUSPEND REJECT	3.1.20	N	N	N	N	N	N	N	N	N	N	N	N	
Call clearing messages	DISCONNECT	3.1.5	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
	RELEASE	3.1.9	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
	RELEASE COMPLETE	3.1.10	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Miscellaneous messages	INFORMATION	3.1.8	Y	Y	Y	Y ^[3]	Y	Y	Y	Y	Y	Y	N	Y	
	NOTIFY	3.1.9	Y	Y	Y	Y	Y	Y	Y	N ^[5]	Y	Y ^[6]	Y	Y	
	SEGMENT	3.5.1	N ^[7]	N ^[7]	N ^[7]	N ^[7]	N ^[7]	N ^[7]	N ^[7]	N ^[8]	N ^[7]	N ^[7]	N	N	
	STATUS	3.1.16	Y	Y	Y	Y	Y	Y	Y	Partial ^[9]	Y	Y	Y	Y	
	STATUS ENQUIRY	3.1.17	Y	Y	Y	Y	Y	Y	Y	N ^[5]	Y	Y	Y	Y	
	<i>FACILITY</i>	N/A	Y ^[10]	Y ^[10]	Y ^[10]	Y ^[10]	Y ^[10]	Y ^[10]	Y ^[10]	Y ^[10]	Y ^[11]	Y ^[10]	Y ^[10]	N	N
	<i>FACILITY ACK</i>	N/A	N	N	N	N	N	N	N	N ^[5]	N	N	N	N	N
	<i>FACILITY REJECT</i>	N/A	N	N	N	N	N	N	N	Y	N	N	N	N	N
	<i>REGISTER</i>	N/A	N	N	N	N	N	N	N	N	Y ^[12]	N	N	N	N
<i>REGISTER ACCEPT</i>	N/A	N	N	N	N	N	N	N	N ^[5]	N	N	N	N	N	
<i>REGISTER REJECT</i>	N/A	N	N	N	N	N	N	N	N	Y	N	N	N	N	

Part D: Interfaces
Chapter D14: ISDN PRI Access Interface

PROPRIETARY

ISN04 (TDM) Product Description
Issue ISN04TDM.3 (approved)

Message category	Message name	ETS 300 403 section	Supported in												
			Base	Belg.	Neth.	Spain	Italian	Swiss	French VN6	French VN4	Australia	Japan	ANSI	HK	
Global call reference messages	RESTART	3.4.1	Y	Y	Y	Y	Y	Y	Y	Y	N ^[8]	Y	Y	Y	Y
	RESTART ACK	3.4.2	Y ^[13]	Y ^[13]	Y ^[13]	Y ^[13]	Y ^[13]	Y ^[13]	Y ^[13]	Y ^[13]	N ^[8]	Y	Y	Y	Y
	STATUS	3.4.3	Y	Y	Y	Y	Y	Y	Y	Y	N ^[8]	Y	Y	Y	Y
	SEGMENT	3.5.1	N ^[7]	N ^[7]	N ^[7]	N ^[7]	N ^[7]	N ^[7]	N ^[7]	N ^[7]	N ^[8]	N ^[7]	N ^[7]	N	N

- [1] Numeris VN4 uses the SUCCESSFUL CALL ATTEMPT message instead.
 [2] Supported only in the network-to-user direction.
 [3] Spanish PRI supports only overlap sending (PBX to switch), not overlap receiving (switch to PBX). Trunk group datafill must be used to disable overlap outputting from ISN04 (TDM). See AU3208 for details.
 [4] Numeris/VN4 treats this message as a PROGRESS message.
 [5] Message defined in CSE P-22-30A as "Not recognised by the public network".
 [6] Supported only in the user-to-network direction.
 [7] Message segmentation is not required, as no supported message is long enough to need it.
 [8] Message not defined in CSE P-22-30A.
 [9] When a STATUS message is received in the null state, ISN04 (TDM) sends a RELEASE COMPLETE message with a cause value of 81 (Invalid Call Reference).
 [10] Used to provide generic supplementary service support, e.g. for AOC-D.
 [11] ISN04 (TDM) will reply with a FACILITY REJECT message.
 [12] ISN04 (TDM) will reply with a REGISTRATION REJECT message.
 [13] ISN04 (TDM) sends a RESTART ACK indicating which channels have been returned to idle if a multi-channel RESTART is received but not all channels can be returned to idle, as specified in ETS 300 403 §5.5.2. See AU2826.

D14.2.3.2 Information Elements Supported

For ease of comparison between PRI variants, the framework used below to summarise IE support (even for non-ETSI variants) is the one defined in ETS 300 403. Note that this does not include service-specific IEs. For information about IEs used to provide support for supplementary services, see Chapter E7: ISDN Supplementary Services.

Note: IEs not included in ETS 300 403 are listed below provided that they are supported by at least one non-ETSI PRI variant. The names are in italics *like this*.

IE name	ETS 300 403 section	Max. length (octets)	Supported in												
			Base	Belg.	Neth.	Spain	Italian	Swiss	French VN6	French VN4	Australia	Japan	ANSI	HK	
Bearer Capability	4.5.5	12	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y ^[1]	Y	Y
Call Identity	4.5.6	10	N	N	N	N	N	N	N	N	N	N	N	N	N
Call State	4.5.7	3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y ^[3]	Y	Y
Called Party Number	4.5.8	23	Y	Y	Y	Y	Y	Y	Y	Y ^[4] ^[5]	Y ^[4] ^[5]	Y	Y	Y	Y
Called Party Subaddress	4.5.9	23	Y	Y	Y	Y	Y	Y	Y	Y	Y ^[6]	Y	Y	N	Y
Calling Party Number	4.5.10	24	Y	Y	Y	Y	Y	Y	Y	Y ^[7] ^[8]	Y ^[7] ^[8]	Y	Y	Y	Y
Calling Party Subaddress	4.5.11	23	Y	Y	Y	Y	Y	Y	Y	Y	Y ^[6]	Y	Y	N	Y
Cause ^[9]	4.5.12	32	Y	Y	Y	Y	Y	Y	Y	Y	Y ^[10]	Y	Y ^[11]	Y	Y

IE name	ETS 300 403 section	Max. length (octets)	Supported in											
			Base	Belg.	Neth.	Spain	Italian	Swiss	French VN6	French VN4	Aust-ralia	Japan	ANSI	HK
Channel Identification ^[12]	4.5.13	34	Y	Y	Y	Y	Y ^[13]	Y	Y ^[13]	Y ^[13]	Y	Y ^[14] Y ^[15]	Y	Y
Date/time	4.5.15	8	N	N	N	N	N	N	N	N	N	N	N	N
Display	4.5.16	82	N	N	N	N	N	N	N	N	N	Y	N	Y
Facility	N/A		Y ^[16]	Y ^[16]	Y ^[16]	Y ^[16]	Y ^[16]	Y ^[16]	Y ^[16]	Y ^[17]	N	Y ^[16]	Y ^[16]	N
Feature Activation	N/A		N	N	N	N	N	N	N	N	N	N	N	Y
Feature Indication	N/A		N	N	N	N	N	N	N	N	N	N	N	Y
High Layer Compatibility	4.5.17	5	Y	Y	Y	Y	Y	Y	Y ^[10]	Y ^[10]	Y	Y	Y	Y
Information Request	N/A		N	N	N	N	N	N	N	N	N	N	N	Y
Keypad Facility	4.5.18	34	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N
Low Layer Compatibility	4.5.19	18	Y	Y	Y	Y	Y	Y	Y ^[8]	Y ^[8]	Y	Y	Y	Y
Network Specific Facilities	4.5.21		N	N	N	N	N	N	Y ^[18] Y ^[19]	Y ^[18] Y ^[19]	N	N	N	N
Notification Indicator	4.5.22	3	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
Progress Indicator	4.5.23	4	Y ^[20]	Y ^[20]	Y ^[20]	Y ^[20]	Y ^[20]	Y ^[20]	Y ^[20]	Y ^[20]	Y	Y	Y	Y
Restart Indicator	4.5.25	3	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
Segmented Message	4.5.26		N ^[21]	N ^[21]	N ^[21]	N ^[21]	N ^[21]	N ^[21]	N ^[21]	N ^[21]	N ^[22]	N ^[21]	N ^[21]	N
Sending Complete	4.5.27	1	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y
Transit Network Selection	4.5.29		N	N	N	N	N	N	N	N	N	N	N	N
User-to-User Information	N/A	128 ^[23]	Y ^[24]	Y ^[24]	Y ^[24]	Y ^[24]	Y ^[24]	Y ^[24]	Y ^[24]	Y ^[24]	Y ^[24]	Y ^[24]	Y ^[24]	N

[1] Japan PRI supports a User Information Layer 1 Protocol Identifier of Recommendation G.711 μ -Law whereas ETSI PRI supports Recommendation G.711 A-Law. Japan PRI also supports User Information Layer 2 Protocol and User Information Layer 3 Protocol information elements where ETSI PRI does not.

[2] Supported only in incoming STATUS message.

[3] Call State values Overlap Sending and Overlap Receiving are not supported.

[4] Maximum length 21 octets.

[5] French PRI supports the provision of two calling party number IEs, i.e. either the user-provided number or the network-provided default number, or both.

[6] Maximum length 8 octets.

[7] Maximum length 13 octets.

[8] The maximum length for the calling party number IE is 22 and the maximum length for the low layer compatibility IE is 18 in CSE P-22-30A. The ISN04 (TDM) implementation follows Appendix C.4.6 of ITAAB Advisory Note:054 rev.1.

[9] From EUR009, customers can use datafill to define a customised set of cause-to-treatment mappings (choice of tone/announcement) for treatments provided over PRI. Cause value now provided in PROGRESS messages transmitted on call failure. See AU2791.

[10] Maximum length 4 octets.

[11] Japan PRI supports the Diagnostics field while ETSI PRI does not.

[12] ISN04 (TDM) sends a RESTART ACK indicating which channels have been returned to idle if a multi-channel RESTART is received but not all channels can be returned to idle, as specified in ETS 300 403 §5.5.2. See AU2826.

[13] Maximum length 5 octets.

[14] Japan PRI supports use of the Interface Identifier IE for explicit interface identification. It also supports slot map channel identification while ETSI PRI does not.

[15] Supported in both directions in ALERTING and CONNECT messages for symmetrical call control.

[16] Used to provide generic supplementary service support, e.g. for AOC-D.

Part D: Interfaces **PROPRIETARY** **ISN04 (TDM) Product Description**
Chapter D14: ISDN PRI Access Interface **Issue ISN04TDM.3 (approved)**

- [17]National Facility IE only (see Note 18).
- [18]This IE is referred to as National Facility in CSE P-22-30A. It is used to support France-specific implementations of ISDN supplementary services (not ETSI-compliant). Support for per-call AOC-D, per-call CLIR and per-call MCID is described in A59022564. Support for CFU and CD is described in A59027629.
- [19]Maximum length 24 octets.
- [20]Two PIs in a message supported (see AU2831).
- [21]Message segmentation is not required, as no supported message is long enough to need it.
- [22]IE not defined in CSE P-22-30A.
- [23]This is the maximum size of the user data; the maximum size of the IE is 131 octets.
- [24]Used to support the UUS supplementary service (UUS1 only, both implicit and explicit).

D14.2.3.3 Services Supported

The ETSI-defined ISDN services that have been implemented and are available over the ISN04 (TDM) ETSI PRI interface are shown in Table 17. Service support over French PRI (Numeris VN4/VN6) is as for ETSI PRI except where noted otherwise. For descriptions of the supplementary services listed, see Chapter E7: ISDN Supplementary Services.

Note: The only supplementary services supported by T1-based 23B+D variants of PRI (Japan INS1500, ANSI, Hong Kong CR13) are equivalents of the MoU1 services CLIP, CLIR and DDI, but these are actually supported as part of basic call.

Table 17: ISN04 (TDM) Implementation of ETSI-Defined Services

Service Type	Service Name
<i>Bearer Services</i> ^[1]	Circuit mode speech bearer service
	Circuit mode 64 Kb/s unrestricted bearer service
	Circuit mode 3.1kHz audio bearer service ^[2]
	Circuit mode rate adapted 56 Kb/s data ^[3]
<i>Teleservices</i>	3.1 KHz telephony
	Telefax Group 4
	Teletex Videotex
<i>MoU1 supplementary services</i>	Calling Line Identification Presentation (CLIP) ^[4]
	Calling Line Identification Restriction (CLIR) ^{[5][6]}
<i>MoU2 supplementary services</i>	Direct Dialling In (DDI)
	Advice Of Charge During Call (AOC-D) ^{[6][7][8]}
	Advice Of Charge at End of Call (AOC-E) ^{[7][8]}
	Closed User Group (CUG) ^[10]
	Call Waiting (CW) ^{[11][12]}
	Call Hold (CH) ^{[13][12]}
	Connected Line Identification Presentation (COLP) ^[10]
	Connected Line Identification Restriction (COLR) ^[10]
	Call Completion to Busy Subscriber (CCBS) ^{[14][10]}
	Call Completion on No Reply (CCNR) ^{[15][10]}
	Call Forward Unconditional (CFU) ^{[16][17]}
	Call Forward on Busy (CFB) ^{[16][10]}
	Call Forward on No Reply (CFNR) ^[16]
	Call Deflection (CD) ^{[17][18]}
	Partial Herouting (PRR) ^{[16][19]}
	Explicit Call Transfer (ECT) ^[16]
	Malicious Call Identification (MCI) ^{[6][20]}
	Subaddressing (SUB)
	User-to-User Signalling (UUS) ^[21]
	Message Waiting Indication (MWI) ^{[22][10]}

Note: No MoU2 services are supported over T1-based 23B+D variants of PRI (Japan INS1500, ANSI, Hong Kong CR13)

- [1] The ISN04 (TDM) implementation of Numeris VN6 also provides limited support for the bearer capability Unrestricted Digital Information with Tones and Announcements (formerly 7KHz audio). ISN04 (TDM) will not generate this value, but will accept it if received, and treat it as unrestricted data without tones or announcements. See 59022564.
- [2] This bearer capability can support facsimile group 2/3 calls.
- [3] Data calls with a data rate (i.e. bearer capability) less than 56 Kb/s are accepted only if an ISDN LLC (Low Layer Compatibility) parameter is included in the call, in which case the call is allowed to proceed with bearer capability set to 64 Kb/s. If there is no LLC, ISN04 (TDM) rejects the call. Packet mode is not supported.
- [4] Referred to as Call Identification for Numeris VN4.
- [5] Referred to as Call Non-Identification for Numeris VN4.
- [6] Per-call service implementation supported by Numeris VN6 via National Facility IE, as described in 59022564.
- [7] For an overview of the AOC system and its interaction with PRI software metering, see A59026347.
- [8] Referred to as Indication of Charges for Numeris VN4.
- [9] Referred to as Total Cost for Numeris VN4.
- [10] Service not defined in the CSE P-22-30A Numeris specification either for VN4 or VN6, and therefore not available for French PRI.
- [11] Only the calling user may be PRI.
- [12] Not supported by French PRI (Numeris VN4 or VN6).
- [13] Only the remote user may be PRI.
- [14] See AR2196 for details.
- [15] Functionality delivered by 59016186. Tested and supported only for PRI(T)-to-PRI(T) calls.
- [16] Service functionality provided primarily by PBX, not switch. ISN04 (TDM) supports the resulting call reconfiguration via PRI, and provides redirecting information to ISDN forwarded-to parties as described in A59027615, but does not provide redirection notification back to caller.
- [17] France-specific version of service, using National Facility IE, supported over French PRI as described in A59027629.
- [18] Not supported over ETSI PRI.
- [19] Not a service in its own right, but a capability associated with the Call Forward service.
- [20] Not supported by Numeris VN4.
- [21] UUS Service 1 (implicit) only.
- [22] See A59013065 for details. PRI can be used both as receiving user interface (for voice mail subscribers) and as controlling user interface for voice mail system.

ISN04 (TDM) also supports a number of non-ETSI services over PRI, i.e. services supported over ISDN interfaces but not defined by ETSI. These are of two types:

- Generic non-ETSI services that can be deployed in any national network:
 - Random and circular hunting for PRI trunk groups (see AJ4929)
Even distribution of calls to a given set of trunk groups (a super-group) between their B-channels. Particularly useful for switches connected to Internet Service Providers (ISP), with many outgoing-only trunk groups assigned to the same dialled number and long call hold times.
 - Using a PRI trunk group as a backup/alternative route for a set of BRI hunt groups (see AR2189).
- National non-ETSI services that are specific to a particular national network. Two of these have been defined for use in Germany (see AR2189 for details):
 - Network Advice Of Charge (NAOC)
 - Priority Class Of Service (PCOS)
 - Emergency Calls

D14.2.3.4 Basic Circuit Switched Call Control Procedures

The ISN04 (TDM) implementation of ETSI PRI supports the following circuit-switched call control procedures:

- Call establishment at the originating interface, including
 - En-bloc sending
 - Overlap sending (i.e. overlap signalling in the PBX-to-switch direction), including translation / routing based on first NPI / TON received in a SETUP or INFORMATION message (see A59023654)
Note: Not supported by Japanese PRI (INS1500).
 - B-channel negotiation

Note: Transit network selection is not supported.
- Bearer capability billing for call originations via an AMA type 071 module appended to the base AMA record (see AF6487 for details).
- Network tones support for the originating interface (see AU2501 for details)
For an originating PBX or key system that cannot provide tones, ISN04 (TDM) can provide the following backward tones:
 - A backward dial tone on the selected B-channel when it receives a SETUP message with no dialled digits. The tone is removed when the first INFORMATION message with dialled digits is received.
 - Ring tone back to the caller when ringing is being applied to the destination terminal.
 - Failure tones indicating why call establishment has not been successful.
- Call establishment at the destination interface, including
 - En-bloc receiving
 - Overlap receiving (overlap signalling in the switch-to-PBX direction)
Note: Not supported by Japanese PRI (INS1500), French Numeris VN4 PRI or Spanish PRI.
 - B-channel negotiation
Note: Random and circular hunting for PRI trunk groups (see AJ4929) makes it possible to ensure that calls to a given set of trunk groups (a super-group) are evenly distributed between their B-channels.

D14.2.3.5 Enhanced Capabilities

- Per-extension billing (TRKGRP option BILLDN, order code PBXT0025)
If a CgPN (Calling Party Number) is provided in the SETUP message for a call, this number is screened to verify that it is within the range of numbers allocated to the PBX, and the screened number is used in billing the call if screening is successful. If screening fails, the default DN for the PBX is used instead. This default functionality can be modified in two ways:
 - If the BILL_FROM_CP_N option is specified in table LTDATA, calls are billed to the CgPN as received in the incoming SETUP message, not to the screened/edited CgPN (see AU3273). Also supported for Japan INS1500 as described in A59022582.

- If DEFLT_DN=Y is specified in table XLAFEAT, calls are billed to the default DN for the PBX even if a CgPN is provided in the SETUP message (see A59027853).
- Clearing of calls that fail screening
By default, if the CgPN provided in a SETUP message fails screening, call setup continues with the default DN for the PBX as the CLI. Feature A59028144 makes it possible to take down the call instead.
- Successful screening of calls with CgPN TON=Unknown
By default, incoming calls with CgPN TON=Unknown fail screening at the switch unless the CgPN has a national access code prefix, causing the default PBX CLI to be used instead. Option SCRNLTIID_IC_TON can be specified in table LTDATA to ensure that such calls will be treated as national calls and that the user-provided CLI will be used. This is necessary when handling calls from some PBX types in the Netherlands. See A59036446.
- Indicating multiple channels in RESTART ACK (see AU2826)
ISN04 (TDM) sends RESTART ACK indicating which channels have been returned to idle if a multi-channel RESTART is received but not all channels can be idled. This is as specified in ETS 300 403 §5.5.2. Global restart procedures further enhanced by feature A59022616.
- Cause value enhancements (see AU2791)
 - Cause values passed transparently over PRI<->PRI interworkings.
 - Default set of cause value mappings for agents that interwork with PRI.
 - Default set of cause-to-treatment mappings for PRI, plus flexibility in how cause values are mapped to treatments provided over PRI.
 - Cause value IE in PROGRESS messages transmitted on call failure.
- Two Progress Indicators (see AU2831)
ISN04 (TDM) supports two Progress Indicator (PI) IEs in a message, and maps these over PRI/ISUP and ISUP/PRI interworkings as described in Q.699.
- Overlap outpulsing/inpulsing control via TRKSGRP datafill (see AU2834)
The OVLOPOFF option switches off outpulsing, causing ISN04 (TDM) to store up incoming digits and send them to the called party in en-bloc mode. The OVLPOFF option switches off overlap inpulsing, causing ISN04 (TDM) to respond with a RELEASE COMPLETE instead of a SETUP ACK if it receives a SETUP message that does not provide enough digits to route a call. The RLC indicates incomplete address (cause #28).
- Limits on incoming and outgoing calls
Table LTDATA can be used to specify the maximum number of incoming calls and the maximum number of outgoing calls that can be simultaneously supported over a given PRI interface. If a call attempt would cause the specified maximum to be exceeded, the call will be dropped. To ensure that capacity is not left unused, the values of MAX_IN_CALLS and MAX_OUT_CALLS should add up to 30. See 59022390.
- Software metering can be used to keep track of the call charge units accumulated for calls made via a PRI trunk (see A59017967).

D14.3 Limitations

- The ISN04 (TDM) implementation of PRI does not support the following call control procedures:
 - Signalling procedures for bearer capability selection
 - Signalling procedures for high layer compatibility selection
 - Circuit-mode multirate (N x 64Kb/s base rate) procedures
 - Transit network selection
 - Network specific facility selection
 - Message segmentation procedures
- The maximum message length supported by ISN04 (TDM) is 256 bytes, not 260 bytes as defined in Q.921 section 5.9.3. A fix for this is available as a patch, pending a permanent solution.
- A maximum of 29 digits can be outpulsed for a called party number. This exceeds the 20-digit limit specified in ETS 300 403.
- Because ISN04 (TDM) supports ETSI PRI as a trunk access agent, it has no mechanism either to route calls to a specific timeslot or to associate a particular subscriber with a specific timeslot.
- Direct interworking to the proprietary attendant console interface is not supported.

D14.4 PRI Signalling Interworkings

See section D1.8 on page 175 for explanations of the abbreviations used.

Interworking between ETSI PRI and	Interworking support for PRI variants / issues												Further information
	Base	Belgian	Netherlands	Spanish	Italian	Swiss	French V06 (f)	French V04	Australia	Japan	ANSI	HK	
Standard IBN lines	Y [2]	Y	Y	Y	Y	Y	Y	Y	Y	N [3]	t	t	
Business set lines	Y	Y	Y	Y	Y	Y	Y	Y	Y	N [3]	N	N	
CAS mux lines	Y	t	Y	Y	t	t	t	t	Y	N [3]	N	N	Interworking initially supported only for LC and EC lines. AU3208 added support for interworking with DC5 lines
V5.2 lines	Y	t	Y	Y	t	t	Y	Y	Y(PSTN) N(BRI)	N [3]	N	N	
Cornerstone lines	Y	t	t	t	t	t	t	t	t	t	N	N	
CentrexIP lines	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	
Attendant console	N	N	N	N	N	N	N	N	N	N [3]	N	N	
SMDI	Y	Y	t	t	Y	Y	Y	Y	N	N [3]	N	N	Interworking fully supported, including MWI and message retrieval (see A59013065)

ISN04 (TDM) Product Description
Issue ISN04TDM.3 (approved)

PROPRIETARY

Part D: Interfaces
Chapter D14: ISDN PRI Access Interface

Interworking between ETSI PRI and	Interworking support for PRI variants / issues												Further Information
	Base	Belgian	Netherlands	Spanish	Italian	Swiss	French Vn6 [1]	French Vn4	Australia	Japan	ANSI	HK	
ACD	Y	Y	Y	Y	Y	Y	Y	Y	Y	N [3]	N	N	I/W to NACD needs IBN7 looparound
SCAI (ICM / CompuCALL)	Y [4]	Y	t	t	Y	Y	Y	Y	Y	N [3]	N	N	
TOPS (GOSS7)	Y	t	t	t	t	t	t	t	Y	Y	N	N	
ISDN BRI	Y [5]	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	I/W includes support for: • Customised cause mapping [6] • Two Progress Indicators [7] • PRI notification of BRI suspend/resume [8]
ISDN PRI	Y [9]	Y [10]	Y	Y	Y [11]	Y [12]	Y	Y [13]	Y	Y	t	Y	
QSIG	Y	t	Y	Y	t	t	Y	Y [14]	Y [15]	N	Y	N	Customised cause mapping supported. [6]
CAS PBX Type 1	N [16]	N	N	N	N	N	N	N	N	X	X	X	EC, LC
CAS PBX Type 2	Y [17]	t	N	N	t	t	t	t	N	X	X	X	AC15A, DC5A
DPNSS	Y [18]	X	X	X	X	X	X	X	X	X	X	X	
DASS2	Y [18]	X	X	X	X	X	X	X	X	X	X	X	Supplementary services not supported, except for subaddressing for DASS2->PRI data calls
ETSI ISUP [19] [20]	Y [21]	Y [22]	Y	Y	Y [23]	Y [24]	Y	Y [14]	Y [2] N [V1]	Y [2] N [V1]	Y	Y	Overlap inpulsing and outpulsing [25] fully supported in both directions. Customised cause mapping supported. [6] Interworking with ETSI ISUP V2 can support two CLIs (PN and NN), as required for France [26]
IBN7 (ANSI ISUP+)	Y [27]	Y	Y	Y	Y	Y	Y	Y [14]	Y	Y	Y	Y	
USA FGD ISUP	t	X	X	X	X	X	X	X	X	X	Y	X	
Australian ACIF I-ISUP	Y	X	X	X	X	X	X	X	Y [28]	X	X	X	
Japan ISUP variants	N	X	X	X	X	X	X	X	X	Y	X	X	
Malaysia ISUP	Y	X	X	X	X	X	X	X	X	X	X	X	
UK ISUP	Y [29]	X	X	X	X	X	X	X	X	X	X	X	
SPIROU (French ISUP)	Y	X	X	X	X	X	Y	Y	X	X	X	X	
ITU TUP [30]	Y [31]	X	X	X	X	X	X	X	X	X	Y [32]	Y [32]	

Part D: Interfaces
Chapter D14: ISDN PRI Access Interface

PROPRIETARY

ISN04 (TDM) Product Description
Issue ISN04TDM.3 (approved)

Interworking between ETSI PRI and	Interworking support for PRI variants / Issues											Further information	
	Base	Belgian	Netherlands	Spanish	Italian	Swiss	French VN6 [1]	French VN4	Australia	Japan	ANSI		HK
IUP / BTUP	Y [33] [34] [35]	X	X	X	X	X	X	X	X	X	X	X	En-bloc signalling supported in both directions. PRI overlap signalling supported only for PRI to BTUP interworking (overlap sending). CLI supported on I/W.
SSUTR2 / FTUP	Y	X	X	X	X	X	Y	Y [14]	X	X	X	X	
INAP [20] [36]	Y [37]	Y	Y	Y	Y	t	Y	Y [14]	Y	X	Y	Y	IN queries can be triggered by calls on incoming PRI trunks; calls can also be interworked to PRI trunk (a) for user interaction via external IP, and (b) on completion of query.
R1 CAS	Y [38]	t	N	N	t	t	t	t	N	N [3]	t	X	
Global R2 CAS	Y [39]	X	N	N	X	X	X	X	X	X	Y	Y	
Flexible CAS	N	N	N	N	N	N	N	N	X	N	t	X	Flexible CAS currently used only for Italian R2 CAS
USA R1 CAS	t	X	X	X	X	X	X	X	X	X	Y	X	

[1] For details of Numeris VN6 support for interworkings, including parameter mappings, see A59022564.

[2] See AE0976, AC0280 for details.

[3] Looparound trunks currently used to support interworking.

[4] As for associated IBN line interface (typically ACD).

[5] See AE1599, AE1615 for details.

[6] See AU2791 for details.

[7] See AF7551 for details.

[8] See AU3354 for details.

[9] See AE0814 and related documentation for details.

[10] Belgian PRI interworks with Belgian PRI as well as base ETSI PRI.

[11] Italian PRI interworks with Italian PRI as well as base ETSI PRI.

[12] Swiss PRI interworks with Swiss PRI as well as base ETSI PRI.

[13] French PRI (Numeris/VN4) interworks with French PRI as well as base ETSI PRI.

[14] See AX0679 for details.

[15] See A59027928 for details.

[16] See NC0504 for details.

[17] See AE1090 for details.

[18] See AF6412 for details.

[19] Information applies to both ETSI ISUP V1 and V2 except as noted. For information about ETSI ISUP national variant interworkings, see Chapter D19 on page 352.

[20] Interworking enhanced to support SCP control of early answer message on CTR, datafillable inter-digit timeout for P&C, and use of Signal Processing Application Peripheral (SPAP) instead of STR card for oMidCall (EDP-8) supervision. See 59012227 for details.

[21] See AR1795 for details.

[22] Belgian PRI interworks with Belgian ISUP V2 as well as base ETSI ISUP V1 and V2.

[23] Italian PRI interworks with Italian ISUP V1 as well as base ETSI ISUP V1 and V2.

[24] Swiss PRI interworks with Swiss ISUP (which is deemed to be equivalent to ETSI ISUP V2) as well as base ETSI ISUP V1 and V2.

[25] Overlap outputting not supported by French PRI (Numeris/VN4).

[26] See A59027509 for details.

[27] See AC0339 for details.

[28] Presentation Indicator mapped transparently on interworking from TS14 to I-ISUP (see A59016613).

[29] See AJ4323 for details.

[30] For information about TUP national variant interworkings, see Chapter D27 on page 434.

[31] Except PTUP.

[32]RB-TUP only.

[33]See AE0961 (en-bloc), AE1231 (overlap), AJ4201 (CLI) for details.

[34]BTUP-to-PRI interworking enhanced to support two CLIs for delivery over PRI. SIM message exchange obtains PN. Additional ACI message exchange obtains NN. See A59036636.

[35]Interworking enhanced to support mapping between BTUP SIC (Service Indicator Code) and PRI BC (see A59034260).

[36]PRI trunks that may be involved in interaction with IN should be datafilled in table TRKGRP with a trunk type of PRA.

[37]See SIM specification "INAP Generic Interworking Specification" for details.

[38]See AE1090 for details.

[39]See AR2176 for details.

D14.5 Commercial Software Packaging

Note: ISN04 (TDM) supports PRI in both network mode and user mode. The order code for a given PRI national variant gives access to network mode support. If user mode support is also required, PBXT0004 must be ordered as well as the national variant order code. User mode support is not currently available for Australian PRI (TS14) or Japanese PRI (INS1500). It is not required for Numeris VN4 or VN6.

SW Order Code	Description
PBXT0001	PRI Base
PBXT0002	ETSI PRI (T)
PBXT0004	PRI User Mode
PBXT0013	Belgian PRI
PBXT0014	Italian PRI
PBXT0015	French PRI (Numeris)
PBXT0019	Swiss PRI
PBXT0020	Spanish PRI
PBXT0021	Netherlands PRI
PBXT0025	Extension Billing
PBXT0028	PRI - VN Enhancements
PBXT0032	PRI Enhancements - Incoming, Outgoing, 2way Circuits
AUS00004	Australia PRI (TS14)
JPN00005	Japan PRI (INS 1500)

D14.6 Overview of Feature Set Support

PRI supports all of the CEPT MoU Priority 1 supplementary services with the exception of Multiple Subscriber Number (not relevant) and Terminal Portability. It also supports a number of Priority 2 supplementary services.

See section D14.2.3.3 for a list of supported services, and Chapter E7: ISDN Supplementary Services for details.

French PRI (Numeris VN4 and VN6) does not support all of the services supported by base ETSI PRI. Services not supported over French PRI are identified via footnotes in section D14.2.3.3 and Chapter E7.

The only supplementary services supported by T1-based 23B+D variants of PRI (Japan INS1500, ANSI, Hong Kong CR13) are equivalents of the MoU1 services CLIP, CLIR and DDI, but these are actually supported as part of basic call.