
ISDN MESSAGE SET (NT_S208 -2)

Reference Manual

IDACOM

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**ISDN MESSAGE SET
(NT_S208-2)**

Reference Manual

November 1990
R01

SUPPORTED MESSAGE SETS

A number of ISDN D-Channel Layer 3 Message Sets are available to support all application monitor and simulation tests. CCITT is the international message set and is provided as the default to all ISDN users.

Contact your IDACOM/HP sales representative to either purchase additional sets and/or update existing message sets.

The following table contains a complete list of all currently available message sets and the corresponding release dates and numbers.

Message Set	Description	Release Date	Release #
International			
CCITT_1988	CCITT Q.931/I.451 Network Layer, Blue Book (1988)	November 1990	R01
North America			
ATT_5E6	AT&T 5D5-900-321, 5E6 Generic Program (03/89)	November 1990	R01
ATT_41449	AT&T Primary Rate Interface Spec, TR41449 (07/89)	November 1990	R01
NT_S208-4	Northern Telecom NIS S208-4 (1988), Functional	November 1990	R01
NT_S208-2	Northern Telecom NIS S208-2 (1986), Stimulus	November 1990	R01
NT_A211-1	Northern Telecom NIS A211-1, Issue AB01 (03/87)	November 1990	R01
Europe			
VN2_133e	CNET Tech Spec ST/LAA/RSM/ 133, Ed 3 (07/88) English	November 1990	R01
VN2_133f	CNET Tech Spec ST/LAA/RSM/ 133, Ed 3 (07/88) French	November 1990	R01
1TR6_MGK	FTZ 1TR6 ISDN-D-Kanal-Protokoll (Ausgabe 1.90) - MGK	November 1990	R01
1TR6_NSA	FTZ 1TR6 ISDN-D-Kanal-Protokoll (Ausgabe 1.90) - NStAnI	November 1990	R01
Asia			
NTT_INS-89	NTT INS Net 64/1500 Service Interface (1989)	November 1990	R01

PREFACE

This manual is intended to provide a list of message identifiers, information element identifiers, and information element structures for the NT_S208-2 Message Set. Refer to the ISDN Programmer's Manual for a list of identifiers and structures for the CCITT (default) message set.

This manual is not intended to provide basic user instruction, but rather provides examples which apply standard techniques for writing layer 3 test scripts using the Interactive Test Language (ITL). Refer to the Programmer's Reference Manual for general programming information, and the ISDN Programmer's Manual for more information and examples regarding ISDN test scripts. Refer to the machine specific User Manual for a quick reference to the basic operation of the protocol tester and for instructions to load and operate the software.

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INTRODUCTION

This message set is implemented in accordance with: Northern Telecom NIS S208-2, Issue AA03, ISDN Basic Rate Access User-Network Interface Specification, September 1986.

The message set name (NT_S208-2) is used with the LOAD_MESSAGE_SET command or the *Load Message Set* function key under the **MessageSet** topic. This name is also displayed on various menus, and is used to identify the message set variation when layer 3 complete report format is selected. The corresponding entry on the Message Set Selection Menu identifies the message set name, description, and release number:

NT_S208-2	Northern Telecom NIS S208-2 (1986), Stimulus	R01
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This message set contains unique identifiers which can be used in ISDN test scripts to reference received and transmitted messages. These identifiers are listed in three sections:

- Message Type Identifiers
- Information Element Identifiers
- Information Element Structures (including parameter field selectors and associated field values constants)

The following subsections provide some examples illustrating the use of each of these types of identifiers. Refer to the ISDN Programmer's Manual for more information and detailed examples.

1.1 Using Message Identifiers

Message identifiers uniquely identify a message type in both received and transmitted messages, and are expressed in the following form:

M#xxxx (eg. M#SETUP)

In addition, the following default identifiers (specific received messages only) are also included with each message set:

- M#ANY (any valid message)
- M#INVALID (an invalid message)
- M#UNDEF (an unknown/undefined message type)

Example 1:

After receiving a Setup message, perform an action (eg. send a Setup Acknowledge response, increment a counter, etc.).

```
M#SETUP ?L3_MSG
ACTION{
    ( code specifying action taken if Setup message received )
}ACTION
```

Example 2:

Send an Alert message in an I frame complete with desired information elements.

```
M#ALERT MESSAGE>
    I#DISPLAY
    I#SIGNAL
<SEND
```

Message identifiers can also be used for filter/trigger management from within a script.

Example 3:

Set the display/report filter to only pass Setup and Connect messages.

```
R_FILTER          ( Select the display filter )
F3=NONE           ( Block all message types )
M#SETUP F+MSG     ( Pass Setup messages )
M#CONN F+MSG      ( Pass Connect messages )
```



1.2 Using IE Identifiers

IE identifiers uniquely identify an information element in both received and transmitted messages, and are expressed in the following form:

I#xxx (eg. I#CAUSE)

Example 1:

Determine if the Cause IE appears in the last received message at least once.

```
I#CAUSE 1 ?L3_IE
IF
    ( code specifying action taken if the first Cause IE is found )
ELSE
    ( code specifying action taken if the first Cause IE is not found;
      ie: none present )
ENDIF
```

Example 2:

Prepare a Cause IE for later inclusion and transmission within a message.

```
I#CAUSE ELEMENT>
  ALL_EXCLUDED
  OCTET_3 INCLUDED
  OCTET_4 INCLUDED
  OCTET_5 INCLUDED
<ELEMENT
```

Also in this group are octet identifiers which uniquely identify an octet number that can be used for any IE that contains that octet number. Octet identifiers are used in both received and transmitted messages and are expressed in the following form:

OCTET_xx (eg. OCTET_3.1)

Example 1:

Determine if Octet 3A is present in the Cause IE of the latest message received.

```
I#CAUSE OCTET_3A ?L3_OCTET
IF
  ( code specifying action taken if the octet is present;
    ie: process the specified Recommendation )
ENDIF
```



1.3 Using IE Structures

Information element structures consist of the information element parameter field selectors and the associated field value identifiers.

The parameter field selectors are expressed in the following form:

->xxx_yyyy (eg. ->BC_CODING_STANDARD)

where: xxx = the information element associated with that parameter field
 (eg: Bearer Capability)
 yyy = the parameter field (either a string or a bit field)

The field value identifiers are expressed in the following form:

#xxxxx (eg. #INTERNATIONAL = 0b00000001)

All parameter field selectors are used with the *DEC and *COD structure indicators. *DEC provides the base address of the decoder parameter structure. When used with a field selector, decoded parameter values can be accessed. *COD complements *DEC and provides the base address of the coder parameter structure for the current connection. The contents of specific parameter fields can then be changed prior to transmission.

Example 1:

Depending on the contents of the received Bearer Capability Coding Standard parameter field (Octet 3, 2 bits), perform one of two different actions.

```
*DEC ->BC_CODING_STANDARD @      ( Obtain the received value )
#CCITT =                          ( Compare with identifier )
IF
    T." Coding Standard is CCITT" TCR
ELSE
    T." Coding Standard is not CCITT" TCR
ENDIF
```

 **NOTE**

The preceding example uses a bit field and @ (fetch); ! (store) and T. (print value) can also be used. If the parameter is a string (a sequence of one or more characters), !STRING or T.TYPE can be used.

Example 2:

Set the appropriate values of the two parameter fields of Octet 4 of the Bearer Capability IE prior to transmission.

```
#CIRCUIT_MODE *COD ->BC_TRANSFER_MODE !
#384KBIT/S    *COD ->BC_TRANSFER_RATE !
```

2

MESSAGE IDENTIFIERS

2.1 Q.931 Protocol Discriminator (value = 0X08)

M#INFO
M#SETUP

Information
Setup

3**IE IDENTIFIERS**

3.1 Codeset 0

I#BEARER_CAP	Bearer Capability
I#CAUSE	Cause
I#CHANNEL_ID	Channel Identification
I#CONN_ADDR	Connect Address
I#DEST_ADDR	Destination Address
I#DISPLAY	Display
I#KEYPAD	Keypad
I#LOW_LAY_COMP	Low Layer Compatibility
I#ORIG_ADDR	Origination Address
I#PROGRESS_IND	Progress Indicator
I#REDIRING_ADDR	Redirecting Address
I#SHIFT	Shift
I#SIGNAL	Signal
I#TERM_CAPAB	Terminal Capabilities

3.2 Codeset 6

I#B-CHAN_CONTR	B-channel Control
I#INIT	Initialize
I#NTL_FEAT_ACT	Feature Activation
I#NTL_FEAT_IND	Feature Indication
I#SHIFT	Shift
I#TERM_PROF	Terminal Profile

4**IE STRUCTURES****4.1 B-channel Control IE (I#B-CHAN_CONTR)**

Possible octet inclusions/exclusions:

OCTET_3

->BCC_PARAM	B-Channel Parameter, Octet 3
#0	<i>release B1</i>
#1	<i>release B2</i>
#2	<i>connect B1</i>
#3	<i>connect B2</i>

4.2 Bearer Capability IE (I#BEARER_CAP)

Possible octet inclusions/exclusions:

OCTET_3, OCTET_4

->BC_CODING_STANDARD	Coding standard, Octet 3
#CCITT	<i>CCITT</i>
#NETWORK_SPECIFIC	<i>network specific</i>
->BC_TRANSFER_CAP	Info. trans. cap., Octet 3
#SPEECH	<i>speech</i>
#UNRESTRICTED	<i>unrestricted digital information</i>
#RESTRICTED	<i>restricted digital information</i>
#3.1KHZ_AUDIO	<i>3.1 kHz audio</i>
->BC_TRANSFER_MODE	Transfer mode, Octet 4
#CIRCUIT_MODE	<i>circuit mode</i>
#PACKET_MODE	<i>packet mode</i>
->BC_TRANSFER_RATE	Info. transfer rate, Octet 4
#PACKET	<i>channel size (packet mode)</i>
#64KBIT/S	<i>64 kbit/s circuit-mode</i>

4.3 Cause IE (I#CAUSE)

Possible octet inclusions/exclusions:

OCTET_3, OCTET_4, OCTET_4A, OCTET_5

->C_CODING_STANDARD	Coding standard, Octet 3
#CCITT	<i>CCITT</i>
#NETWORK_SPECIFIC	<i>network specific</i>
->C_LOCATION	Location, Octet 3
#USER	<i>user</i>
#LOCAL_PRIVATE	<i>private network serving local user</i>
#LOCAL_PUBLIC	<i>public network serving local user</i>
#TRANSIT	<i>transit network</i>
#REMOTE_PUBLIC	<i>remote local network</i>
#REMOTE_PRIVATE	<i>remote private network</i>
->C_CAUSE_VALUE	Cause value, Octet 4
#UNASSIGNED_NUMBER	<i>Unassigned number</i>
#NORMAL_CLEARING	<i>Normal call clearing</i>
#USER_BUSY	<i>User busy</i>
#CALL_REJECTED	<i>Call rejected</i>
#INVALID_NUMBER_FORMAT	<i>Invalid number format</i>
#NORMAL_UNSPECIFIED	<i>Normal, unspecified</i>
#NO_CHANNEL_AVAIL	<i>No circuit/channel available</i>
#SWITCH_CONGESTION	<i>Switching equipment congestion</i>
#RESOURCE_UNAVAIL_UNSPEC	<i>Resources unavailable unspecified</i>
#SERVICE_UNAVAIL_UNSPEC	<i>Service not available</i>
#INVALID_CALL_REF	<i>Invalid call reference value</i>
#INCOMPATIBLE_DEST	<i>Incompatible destination</i>
#CALL_NOT_SUBSCRIBED	<i>Direct call not subscribed</i>
#MESSAGE_TYPE_UNIMPL	<i>Message type non-existent</i>
#IE_UNIMPL	<i>Information element not implemented</i>
#INVALID_IE_CONTENTS	<i>Invalid IE contents</i>
#PROTOCOL_ERROR_UNSPEC	<i>Protocol error, unspecified</i>
#CAUSE_UNKNOWN	<i>Cause unknown</i>
->C_DIAG_LENGTH	Diagnostic Length, Octet 4a
(numeric value)	<i>range 0 through 255</i>
->C_DIAGNOSTIC	Diagnostic(s), Octet 5 *
(hex characters)	<i>max. length 18 octets</i>

4.4 Channel Identification IE (I#CHANNEL_ID)

Possible octet inclusions/exclusions:

OCTET_3

->CID_INT_PRESENT	Interface ident., Octet 3
#IMPLICIT	<i>implicitly identified</i>
#EXPLICIT	<i>explicitly identified</i>

->CID_INT_TYPE	Interface type, Octet 3
#BASIC_INTERFACE	<i>basic interface</i>
#OTHER_INTERFACE	<i>other interface</i>
->CID_PREF/EXCL	Preferred/Exclusive, Octet 3
#PREFERRED	<i>indicated channel preferred</i>
#EXCLUSIVE	<i>only indicated channel acceptable</i>
->CID_DCHANNEL	D-channel indicator, Octet 3
#NOT_D_CHANNEL	<i>not D-channel</i>
#D_CHANNEL	<i>D-channel identified</i>
->CID_INFO_CHAN_SEL	Info. chan. sel., Octet 3
#NO_CHANNEL	<i>no channel</i>
#B1_CHANNEL	<i>B1 channel</i>
#B2_CHANNEL	<i>B2 channel</i>
#ANY_CHANNEL	<i>any channel</i>

4.5 Connect Address IE (I#CONN_ADDR)

Possible octet inclusions/exclusions:

OCTET_3, OCTET_4

->CA_ADDR_TYPE	Type of Address, Octet 3
(numeric value)	<i>range 0 through 7</i>
->CA_NUMBER/ADDR	Number/Address Plan, Octet 3
(numeric value)	<i>range 0 through 15</i>
->CA_ADDR_DIGIT	Address Digit, Octet 4 *
(IA5 characters)	<i>max. length 16 octets</i>

4.6 Destination Address IE (I#DEST_ADDR)

Possible octet inclusions/exclusions:

OCTET_3, OCTET_4

->DA_ADDR_TYPE	Type of Address, Octet 3
(numeric value)	<i>range 0 through 7</i>
->DA_NUMBER/ADDR	Number/Address Plan, Octet 3
(numeric value)	<i>range 0 through 15</i>
->DA_ADDR_DIGIT	Address Digit, Octet 4 *
(IA5 characters)	<i>max. length 16 octets</i>

4.7 Display IE (I#DISPLAY)

Possible octet inclusions/exclusions:

OCTET_3

->DNTL_DISPLAY Display, Octet 3 *
 (IA5 characters) *max. length 40 octets*

4.8 Initialize IE (I#INIT)

Possible octet inclusions/exclusions:

OCTET_3

->IN_PARAM Initialize Param, Octet 3
 #INIT_TERMINAL *initialize terminal*

4.9 Keypad IE (I#KEYPAD)

Possible octet inclusions/exclusions:

OCTET_3

->KNTS_KEYPAD Keypad information, Octet 3 *
 (IA5 characters) *max. length 30 octets*

4.10 Low Layer Compatibility IE (I#LOW_LAY_COMP)

Possible octet inclusions/exclusions:

OCTET_3, OCTET_3A, OCTET_3B

->LL_CODING_STANDARD Coding standard, Octet 3
 #CCITT *CCITT*
 #NETWORK_SPECIFIC *network specific*
->LL_MODEM/DATA Modem/Data Terminal, Octet 3
 #MODEM *modem*
 #DATA_TERMINAL *data terminal unit*
 #NO_MODEM/DTU *modem/TDU not indicated*
->LL_MODEM/DTU Modem/DTU Protocol, Octet 3a
 (numeric value) *range 0 through 127*
->LL_ASYNC/SYNCH Asyn/Synch, Octet 3b
 #ASYNCHRONOUS *asynchronous*
 #SYNCHRONOUS *synchronous*

->LL_ACCESS_DATA_RATE	Access Data Rate, Octet 3b
#0.6KBIT/S	<i>0.6 kbit/s Rec V.6 and X.1</i>
#1.2KBIT/S	<i>1.2 kbit/s Rec V.6</i>
#2.4KBIT/S	<i>2.4 kbit/s Rec V.6 and X.1</i>
#3.6KBIT/S	<i>3.6 kbit/s Rec V.6</i>
#4.8KBIT/S	<i>4.8 kbit/s Rec V.6 and X.1</i>
#7.2KBIT/S	<i>7.2 kbit/s Rec V.6</i>
#8KBIT/S	<i>8 kbit/s Rec I.460</i>
#9.6KBIT/S	<i>9.6 kbit/s Rec V.6 and X.1</i>
#14.4KBIT/S	<i>14.4 kbit/s Rec V.6</i>
#16KBIT/S	<i>16 kbit/s Rec I.460</i>
#19.2KBIT/S	<i>19.2 kbit/s Rec V.6</i>
#32KBIT/S	<i>32 kbit/s Rec I.460</i>
#48KBIT/S	<i>48 kbit/s Rec V.6 and X.1</i>
#56KBIT/S	<i>56 kbit/s Rec V.6</i>
#75_BIT/S	<i>75 bit/s Rec. V.6 and X.1</i>
#150BIT/S	<i>150 bit/s Rec. V.6 and X.1</i>
#300BIT/S	<i>300 bit/s Rec. V.6 and X.1</i>

4.11 Feature Activation IE (I#NTL_FEAT_ACT)

Possible octet inclusions/exclusions:

OCTET_3

->FA_VALUE (numeric value)	Feature value, Octet 3 <i>range 0 through 127</i>
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4.12 Feature Indication IE (I#NTL_FEAT_IND)

Possible octet inclusions/exclusions:

OCTET_3, OCTET_4

->FI_VALUE (numeric value)	Feature value, Octet 3 <i>range 0 through 127</i>
->FI_STATE_PARAM	State Parameter, Octet 4
#IDLE	<i>idle</i>
#DIALING/ACTIVE	<i>dialing or active</i>
#INCOMING_CALL	<i>incoming call offered</i>
#HELD	<i>held</i>
#ASSO_CALL_ACTIVE	<i>associated call active</i>
#INACTIVE	<i>inactive</i>
#ACTIVE	<i>active</i>
#REQUESTED_CALL	<i>requested call offered</i>
#PARAMETER_ENTRY	<i>parameter entry</i>

4.13 Origination Address IE (I#ORIG_ADDR)

Possible octet inclusions/exclusions:

OCTET_3, OCTET_4

->OA_ADDR_TYPE (numeric value)	Type of Address, Octet 3 <i>range 0 through 7</i>
->OA_NUMBER/ADDR (numeric value)	Number/Address Plan, Octet 3 <i>range 0 through 15</i>
->OA_ADDR_DIGIT (IA5 characters)	Address Digit, Octet 4 * <i>max. length 16 octets</i>

4.14 Progress Indicator IE (I#PROGRESS_IND)

Possible octet inclusions/exclusions:

OCTET_3, OCTET_4

->PI_CODING_STANDARD #CCITT #NETWORK_SPECIFIC	Coding standard, Octet 3 <i>CCITT</i> <i>network specific</i>
->PI_LOCATION #USER #LOCAL_PRIVATE #LOCAL_PUBLIC #TRANSIT #REMOTE_PUBLIC #REMOTE_PRIVATE	Location, Octet 3 <i>user</i> <i>private network serving local user</i> <i>public network serving local user</i> <i>transit network</i> <i>public network serving remote user</i> <i>private network serving remote user</i>
->PI_DESCRIPTION #NOT_END_TO_END #DEST_NON_ISDN #ORIG_NON_ISDN #RETURNED_TO_ISDN #TREATMENT_APPLIED #CALL_PROCEEDING #ALERTING_DEST #DEST_CONNECTED #DIALING #DISCONNECT	Progress ind., Octet 4 <i>call is not end-to-end ISDN</i> <i>destination address is non-ISDN</i> <i>origination address is non-ISDN</i> <i>call has returned to the ISDN</i> <i>treatment applied to call</i> <i>call proceeding</i> <i>call alerting at destination</i> <i>call connect at destination</i> <i>dialing</i> <i>disconnect</i>

4.15 Redirecting Address IE (I#REDIRING_ADDR)

Possible octet inclusions/exclusions:

OCTET_3, OCTET_4

->RA_ADDR_TYPE (numeric value)	Type of Address, Octet 3 <i>range 0 through 7</i>
->RA_NUMBER/ADDR (numeric value)	Number/Address Plan, Octet 3 <i>range 0 through 15</i>
->RA_ADDR_DIGIT (IA5 characters)	Address Digit, Octet 4 * <i>max. length 16 octets</i>

4.16 Shift IE (I#SHIFT)

->SH_TYPE #LOCKING #NON_LOCKING	Shift type <i>locking</i> <i>non-locking</i>
->SH_CODESET #CODESET0 #CODESET6	Codeset ident. <i>I.451 (Q.931) IE</i> <i>local network specific IE</i>

4.17 Signal IE (I#SIGNAL)

Possible octet inclusions/exclusions:

OCTET_3

->SI_VALUE #DIAL_ON #RING_BACK_ON #CONGESTION_ON #BUSY_ON #CONFIRM_ON #CALL_WAITING_ON #OFF_HOOK_ON #BUSY_VERIFY #SPECIAL_TONE #BARGE_IN #EXPENSIVE_ROUTE #TONES_OFF #ALERTING_ON_0 #ALERTING_ON_1 #ALERTING_ON_2 #ALERTING_ON_3 #ALERTING_ON_4 #ALERTING_ON_5	Signal value, Octet 3 <i>dial tone on</i> <i>ring back tone on</i> <i>network congestion tone on</i> <i>busy tone on</i> <i>confirm tone on</i> <i>call waiting tone on</i> <i>off-hook warning tone on</i> <i>busy verify tone</i> <i>special dial tone</i> <i>barge in warning</i> <i>expensive route</i> <i>tones off</i> <i>alerting on - pattern 0</i> <i>alerting on - pattern 1</i> <i>alerting on - pattern 2</i> <i>alerting on - pattern 3</i> <i>alerting on - pattern 4</i> <i>alerting on - pattern 5</i>
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

#ALERTING_ON_6	<i>alerting on - pattern 6</i>
#ALERTING_ON_7	<i>alerting on - pattern 7</i>
#ALERTING_OFF	<i>alerting off</i>

4.18 Terminal Capabilities IE (I#TERM_CAPAB)

Possible octet inclusions/exclusions:

OCTET_3

->TC_CODING_STANDARD	Coding Standard, Octet 3
#NETWORK_SPECIFIC	<i>network specific</i>
->TC_DISCRIPTION	Terminal Descrip, Octet 3
#STIMULUS_MODE	<i>stimulus mode terminal</i>

4.19 Terminal Profile IE (I#TERM_PROF)

Possible octet inclusions/exclusions:

OCTET_3

->TP_TERM_PROFILE (numeric value)	Terminal Profile id, Octet 3 <i>range 0 through 255</i>
----------------------------------------	------------------------------------------------------------