



**BLACK BOX Catalogue Ltd**  
The Source for Connectivity

ISU9930 – Base Unit 2 Line Support  
ISU9931 – Fail Safe Relay Option  
ISU9932 – Software Upgrade  
ISU9932-SNMP – SNMP Option  
ISU9932-3PRI – 3<sup>rd</sup> Line Software Upgrade  
ISU9932-4PRI – 4<sup>th</sup> Line Software Upgrade

## **IntelliShare BRI/PRI Reference Guide**

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## Operators.

### Overview

There are three basic ways to operate the IntelliShare BRI/PRI:

- Locally via the control port (DB9 to RJ45 adapter necessary).  
This gives access to the IntelliShare BRI/PRI HI (ANSI Human Interface).
- Remotely via TCP/IP through LAN interface.
- Remotely via TCP/IP through ISDN interface.

Each of the last two access types has it's own unique IP address.

Telnet gives access to the IntelliShare BRI/PRI HI.

SNMP provides access to the Simple Network Management interface.

Any access to the IntelliShare BRI/PRI requires validation of the operator. This validation consists of:

- Identification of the operator by means of a login sequence.
- Verification of the operator's access rights when reading, writing, executing or performing special actions.

Multiple operators can be logged in simultaneously, according to the following rules:

- Only one operator at a time can use the local serial port.
- Only one operator at a time can be associated with a given IP address. The association between the operator and the IP address is made dynamically through the login sequence. When logged in, the operator is allowed to use SNMP and Telnet (if enabled); no separate login for these facilities is needed. The same rule holds for the logout sequence.
- Access to the IntelliShare BRI/PRI HI is restricted to a single operator, either local or remote.

Remark that only one Telnet session can be used at a time.

### Login sequence.

The login sequence consists of identification of the operator by a shorthand operator name, and validation through a password check. Login is possible through either HI or SNMP using their respective facilities to pass commands.

The following rules apply concerning the login sequence:

- Access to the HI is granted only if no other operator is currently logged in.
- A local operator is logged out automatically after an inactivity of up to 4 minutes.
- A Telnet session is disconnected automatically after an inactivity of 4.25 minutes, thus allowing a local operator to access the HI. However, the operator remains validated for TCP/IP and is still able to interact via SNMP
- When connecting using Telnet, the login sequence is executed automatically if the operator is still validated for TCP/IP.
- A login will effectuate a logout of the preceding operator in order to assure that no more than one operator is associated with an IP or local port.

The following rules apply for the definition of operators:

- The IntelliShare BRI/PRI comes with a default Administrator which is defined as:

```
Name:      ADM
Password:  ADM
Rights:    x7777
```

- The ADM password can be modified by using the SET PSW command. It is important not to forget this password, because the only way to recover access in that case is to force a configuration erase (local maintenance!).



- Definition of new operators (names and rights) requires the highest write level. When defining a new operator, the IntelliShare BRI/PRI will automatically assign a password, which is equal to the name. This password can be modified using the SET PSW command. It is not possible to reverse calculate a password: If this password is forgotten, then changing the name of the operator will re-create the entry.
- User names and passwords are always treated as uppercase strings, even if they are entered in lowercase. This means that a username entered as 'adm' will always be interpreted as 'ADM'.

## Operator's Access rights

Access rights are classified into:

- R: Read rights (access to configuration and status items).  
A numeric value 0-7. Value comparison occurs when verifying the rights.
- W: Write rights (access to configuration item).  
A numeric value 0-7. Value comparison occurs when verifying the rights.
- X: Execute rights (access to commands).  
A numeric value 0-7. Value comparison occurs when verifying the rights.
- P: Protocol rights (access to special protocols).  
A bitmap value. Bit comparison occurs when verifying the rights.  
Currently not used.

Note that numeric values larger than 7 can be specified. These values are provided for maintenance and should not be granted elsewhere. The representation of the access rights is as follows: xPXWR

The following actions are taken when the operator has insufficient rights:

- insufficient Read rights:
  - strings are shown as "\*\*\*\*"
  - numbers are shown as "-1"
- insufficient Write rights:
  - Edition of the item is disabled in the HI
  - SNMP Set action is ignored
- insufficient Execute rights:
  - The error message "Denied" is returned and the command is ignored
- insufficient access rights:
  - The error message "Access denied" is returned, or the access is ignored.

## Required access levels.

Description tables throughout this guide contain a column that indicates the required access levels for configuration items, status items, command execution and protocol use.

The required access levels are represented by the numbers p, x, w, r, which are compared to the operator access rights PXWR :

- If  $R \geq r$  then the operator has read access to the corresponding field.
- If  $W \geq w$  then the operator has write access to the corresponding field.
- If  $X \geq x$  then the operator has the right to execute the corresponding command.
- If  $P \geq p$  then the operator has the right to use the corresponding protocol.



## Configuration databases and procedures.

### Overview

The IntelliShare BRI/PRI makes use of three copies of the configuration:

- **SAVED Database:** Non-volatile copy of the configuration.
- **EDT Database:** Copy of the configuration, used during edition.
- **RUN Database.** Copy of the configuration and status items used by the IntelliShare BRI/PRI for actual operation.

The EDT database can be modified using the screen oriented human interface (WIN CFG command).

The RUN database can be inspected using the WIN STS and WIN HISTORY command.

It is important to realise that editing the configuration will not have any influence on the running configuration until explicitly confirmed with an activation command (CFG RUN). All manipulations with databases are grouped in the CFG command class (See section “Commands”).

### Reconfiguration procedure (Activation)

Before enabling the use of a physical element (slot, line, port), a number of checks are performed first.

The results of these checks is shown in the *Sts* (Status) field of the Status Database for the respective element, using the following configuration status codes:

- **INIT:** Initial setting
- **HW:** A hardware problem was detected for the particular device or the device is not present
- **KEY:** A software key is required to activate the device
- **IDLE:** The device is not configured for use
- **ACT:** The device is configured and functions properly
- **RES:** A reset is required to activate the device
- **CFG:** A configuration error was detected for the device

### Effects of reconfiguration.

Sometimes it is not possible to ensure that configuration changes can be resolved without risk for the consistency of the system. In this case, the configuration changes are not handled, and the *Sts* field indicates RES. A restart (RESET SYS) may then be used.

Note however that a warm restart of the hardware may lead to problems with attached equipment (especially ISDN network when reconfiguration is done while calls are in an active state). A safe method for performing a warm reset consists of physically disconnecting the ISDN interface. This is also the reason of being of the FailSafe activation timer while booting the system. Its default value is set to 20 seconds. This is the time needed for a network to return to a known idle state.

The warm restart is discussed in the Command Section (RESET SYS).



## The ANSI Human Interface

### Overview

The ANSI human interface can be accessed locally via the serial port, or remotely via a Telnet session, as described in the ‘Operators’ section.

This interface provides 3 main facilities:

- A Screen (window) oriented interface for configuration, status and history.
- A Line oriented interface for commands (including status and logging).
- File transfer with X-modem.

### Screen interface

This interface is activated using a line command

- WIN Top level menu.
- WIN CFG EDT Databases (configuration screens)
- WIN STS RUN Databases (status screens)
- WIN HISTORY RUN Database (history screens)

The screen interface allows to edit the configuration, and to inspect the status of the system. It does not allow the execution of commands.

The following keystrokes are interpreted:

Key (c- = control-)	Action
Single ESC	Confirm the current entry - if any - and return to the higher menu level. Note: on some PC keyboards, ESC cannot be sent when Caps-Lock is on. In that case, use c-X.
ANSI F1 c-K	In WIN STS only: switch between status and running configuration view.
ANSI F2 c-W	Switch between Browse and Record view
c-B	Page-Up (“Back”)
c-D, ANSI cursor down	Cursor Down
c-F	Page-Down (“Forward”)
c-H	Back-space: Cursor back or go to previous field. Does not erase.
c-I	Tab (goes to next field)
c-L, ANSI cursor left	Cursor Left
c-M (Enter)	Enter
c-N	Immediate refresh when in status screen
c-Q	Abort edition of current record (all modifications to record are ignored)
c-R, ANSI cursor right	Cursor Right
c-T	Back Tab
c-U, ANSI cursor up	Cursor Up
c-V	View link to other database. This allows to copy field contents between related fields: Pressing c-V again in the viewed database will copy the field contents to the edited field. Any other key will abort the view without copy.
c-X	Confirm the current entry.
c-Z	Abort edition of current record (all modifications to record are ignored)



## Line interface

This is the default interface when logging into the system.

The line interface allows to issue commands and to inspect the status of the system. It does not allow editing the configuration.

The line interface features a command history of 500 characters.

The following keystrokes are interpreted:

Key (c- = control-)	Action
c-B	Top of history
c-D, ANSI cursor down	Next in history
c-F	End of history
c-H	Back-space: Does not erase.
c-I	Tab is ignored
c-L, ANSI cursor left	Cursor Left
c-M (Enter)	Enter, confirm command
c-N	Linefeed is ignored
ANSI home	Start of Line
ANSI end	End of line.

## X-modem interface

The standard X-modem protocol is implemented, and the following extensions are supported:

- CRC instead of Checksum.
- Abort with double cancel (c-X c-X).
- Transmission is fully driven by receiver.

The X-modem file transfer is activated using the commands “CFG XMSEND <file>” or “CFG XMRECV <file>”, where <file> stands for *CFG.TXT* or *CFG.BIN*, for transferring *text*, respectively *binary* configuration files. If <file> is omitted, the default *CFG.BIN* will be assumed.

Transmission is done using either Checksum or CRC, as required by the receiver.

Reception is done using either Checksum or CRC. First CRC is requested 6 times (1 minute), then CHK is requested for another 3 times (30 sec).

Upon completion, the number of transferred blocks and retries is shown, and the final result. The possible result codes generated on an Xmodem error are:

- NoData: no data was received from the remote side
- BadData: the remote side is consistently sending protocol-foreign data
- BadSeq: an unrecoverable sequence error occurred
- RemoteAbort: the transfer was aborted by a double c-X.
- LocalAbort: the application on the IntelliShare BRI/PRI aborted the X-Modem (due to reading an end of file)

Other error messages are generated due to parsing errors of the text configuration file (only for the upload of text configurations). These error messages are listed in the paragraph on text configuration (see par. ).



## The World Wide Web based Human Interface

The WWW human interface can be accessed through a TCP/IP connection between a Web browser and the ID-MUX. This TCP/IP link can be locally established (through the LAN Ethernet port), or remotely (through a PPP dial-up session).

The IntelliShare BRI/PRI web server is HTTP 1.1 compliant, but is compatible with HTTP 1.0 clients. The HTTP server listens on TCP port 80 for incoming HTTP connections.

The number of simultaneous HTTP connections is limited to 6. As most browsers use one connection for the download of the HTML page, and one for graphics, this implies that at most 3 concurrent connections are supported.

The WWW interface provides the following facilities:

- HTTP 1.0 authentication. The user entered should be one of the users defined in the operator database.
- A configuration, status and history view through a set of HTML tables (equivalent to the human ANSI human interface).
- A simulated view of the frontpanel of the IntelliShare BRI/PRI, containing a picture of the status of the LEDs.
- An HTML page for uploading and downloading a *text* configuration. The configuration syntax of the file is described in chapter . Binary uploads or downloads are not supported.
- A button for launching a direct Telnet session to the IntelliShare BRI/PRI.

The WWW server is compatible with Internet Explorer 4 and higher versions, and Netscape Communicator 4.7.

## Text Configuration Syntax

### Database configuration syntax

The syntax used for the configuration of the Edit database in text format is based on the LISP language, and is constituted of nested lists of values, enclosed within brackets.

It follows the following scheme:

```
(Database,
  (<dbase1>, ( ( [<fieldtag1>, ...]),
               ( [<field1>, ...]),
               ( [<field2>, ...]),
               ...
             ),
  , ( ( [<fieldtag2>, ...]),
       ( [<field1>, ...]),
       ( [<field2>, ...]),
       ...
     ),
  ...
),
(<dbase2>, ( ( [<fieldtag1>, ...]),
             ( [<field1>, ...]),
             ( [<field2>, ...]),
             ...
           ),
  , ( ( [<fieldtag2>, ...]),
       ( [<field1>, ...]),
       ( [<field2>, ...]),
       ...
     ),
  ...
),
...
)
```

The following is a concrete example:

```
(Database,
(Sys,
  ( (N, Type, Name, Log, Trp, IP, SubMask, Gateway, PrimMgr, SecdMgr, RdComm,
    WrComm, TrpComm, pppIP, pppCDN, pppCLI, TLogOff, TFailSf, ClkSlve, AlmTime, AlmTOut, AlmCDN ,
    AlmCLI , AlmLine),
    (1, IMX, IMX, 20, 50, 194.007.215.230, 255.255.255.000, 000.000.000.000,
    000.000.000.000, 000.000.000.000, public, netman, trap, 192.168.003.001, *99, *, 0, 0, AUTO,
    00:00:00, 0, , , -----)
  )
),
(Slot,
  ( (N, Type, Name),
    (1, IMX, S1)
  )
),
(Line,
  ( (N, Type, Name, Act, Sgn, Tei, NT, Idle, Crc4, StrInc, EndInc, StrOutg,
    EndOutg, CLISrch, CLISrch, AlmFrom, Options),
    (1, BR, L1, On, Isdn, 64, NT, x49, NoCRC4, 0, 0, 0, 0, , , -----,
    -----),
    (2, BR, L2, On, Isdn, 64, NT, x49, NoCRC4, 0, 0, 0, 0, , , -----,
    -----),
    (3, BR, L3, On, Isdn, 64, NT, x49, NoCRC4, 0, 0, 0, 0, , , -----,
    -----),
    (4, BR, L4, On, Isdn, 64, NT, x49, NoCRC4, 0, 0, 0, 0, , , -----,
    -----)
  ),
  ( (N, Sgn, Tei, Idle, Crc4, AlmFrom, Options),
    (5, None, 0, x49, NoCRC4, -2-----, -----),
    (6, None, 64, x49, NoCRC4, -----, -----),
    (7, None, 64, x49, NoCRC4, -----, -----),
    (8, None, 64, x49, NoCRC4, -----, -----)
  )
)
```

```

(9, None, 0 , x49, NoCRC4, -----8--, -----),
(10, None, 0 , x49, NoCRC4, -----, -----)
)
),
(FixN64,
( (N, Act , Name, NrTS, LineIn, TSIn, LineOut, TSOOut, PControl),
(1, Off, F1, 0, NONE, 1, NONE, 1, ---),
(2, Off, F2, 0, NONE, 1, NONE, 1, ---),
(3, Off, F3, 0, NONE, 1, NONE, 1, ---),
(4, Off, F4, 0, NONE, 1, NONE, 1, ---)
)
),
(Route,
( (N, Act , LineIn, Search, Replace, LineOut, Calltyp, FailMin),
(1, Off, -----, , , -----, -----, 0),
(2, Off, -----, , , -----, -----, 0),
(3, Off, -----, , , -----, -----, 0),
(4, Off, -----, , , -----, -----, 0),
(5, Off, -----, , , -----, -----, 0),
(6, Off, -----, , , -----, -----, 0),
(7, Off, -----, , , -----, -----, 0),
(8, Off, -----, , , -----, -----, 0),
(9, Off, -----, , , -----, -----, 0),
(10, Off, -----, , , -----, -----, 0)
)
),
(Oper,
( (N, Name, Rights, Info),
(1, ADM, x7777, ),
(2, SUP, x0333, ),
(3, SYS, x0222, ),
(4, USR, x0111, ),
(5, , x0000, ),
(6, , x0000, ),
(7, , x0000, ),
(8, , x0000, )
)
)
)
)

```

The format of text configuration file follows the following syntax rules:

- The configuration should start with the 'Database' tag, and end with a bracket. The database tag denotes that what follows between brackets are configuration items for the Edit Database of the IntelliShare BRI/PRI.
- Each field in the 'database' section is a configuration of a particular database of the IntelliShare BRI/PRI.
- A particular database configuration has the following syntax:
  1. Starts with the database name, a comma, and an opening bracket.
  2. Within brackets, the various field names of the database to be configured, separated by commas. The field names are the same as those used in the Human Interface of the IntelliShare BRI/PRI.
  3. Within brackets, the values of one or more records, corresponding to the fields referred to by the previous list of field names, separated by commas. The format for the values reflects the format as used in the Human Interface of the IntelliShare BRI/PRI.
  4. If necessary, one can continue the configuration of a particular database by repeating steps 2 and 3. As such, configurations of different field arrays can be done in an easy way (as an example, see the line configuration in previous example).
  5. Close the configuration of the particular database with a closing bracket.
- Everything following a semicolon (;) character on the same line is considered as comment.

When writing a configuration, one should pay attention to the following syntax items:

- An opening bracket always has to be followed by a closing bracket.
- Items enclosed within brackets have to be separated by commas.
- Whitespace characters (space, tab or newline) are ignored, except if they are enclosed by double quotes ("). Whitespace characters only serve to enhance readability and have no syntactical meaning.

- Configuration values that contain whitespace characters, such as strings, *must* be enclosed by double quotes (“”).
- Each record to be configured must start with the index of the record (the ‘*N*’ field).
- Database and Field tags are case-insensitive.

On an upload of a text configuration to the IntelliShare BRI/PRI, the syntax of the configuration will be verified by the IntelliShare BRI/PRI for errors. The following errors can be generated:

Error	Warning/Error	Explanation
Unexpected opening bracket	Error	An unexpected opening bracket was encountered
Expected opening bracket	Error	An opening bracket was expected
Expected closing bracket or comma	Error	A closing bracket or comma was expected on the specified line
Unrecognized field <tag>	Warning	A field name was encountered that is not equal to the field names pertaining to the database that is being parsed
Index field missing	Error	The index field must be the first field in the description of the record to be configured.
Field too long	Error	The length of the field supplied exceeds 80 characters
Bad Index <index>	Error	The record index used is out of range for the database that is being configured
Bad field contents <field value> or insufficient rights	Warning	The value of the field is invalid or not recognized, or you have insufficient rights. This can be because of: <ul style="list-style-type: none"> <li>▫ The syntax doesn't correspond to the type of field being configured</li> <li>▫ The value is out of range for the particular field</li> <li>▫ For a field that represents an enumerated list, the value doesn't match one of the items in the enumerated list</li> <li>▫ The operator with which you logged in has insufficient rights to write to this field</li> </ul>
Values cnt doesn't match fields cnt	Error	The number of values in the record doesn't match the number of field types listed
Invalid Tag	Error	The Tag supplied was not 'Database' or 'Command'
Unrecognized dbase name <db name>	Error	The database name supplied is not one of <i>System, Slot, Line, FixN64, Route, Operator</i> .

An occurrence of an error will cause the IntelliShare BRI/PRI to abort the upload in progress. In this case, the IntelliShare BRI/PRI will return a description of the error encountered, together with the line number on which the error was detected.

A non-critical error (warning) causes the IntelliShare BRI/PRI to ignore the configuration item that caused the warning, and the parsing of the configuration will continue. At the end of the upload, the IntelliShare BRI/PRI will return a description of the *last* warning encountered, together with the line number.

## Command syntax

The possibility exists to add commands to the configuration file. In this way, you can execute commands, together with the configuration of the device.

The syntax is the following:

```
(Command, "command1", "command2", ...)
```

The following is a concrete example:

```
(Command, "cfg run", "reset sys")
```

Following rules apply for commands:

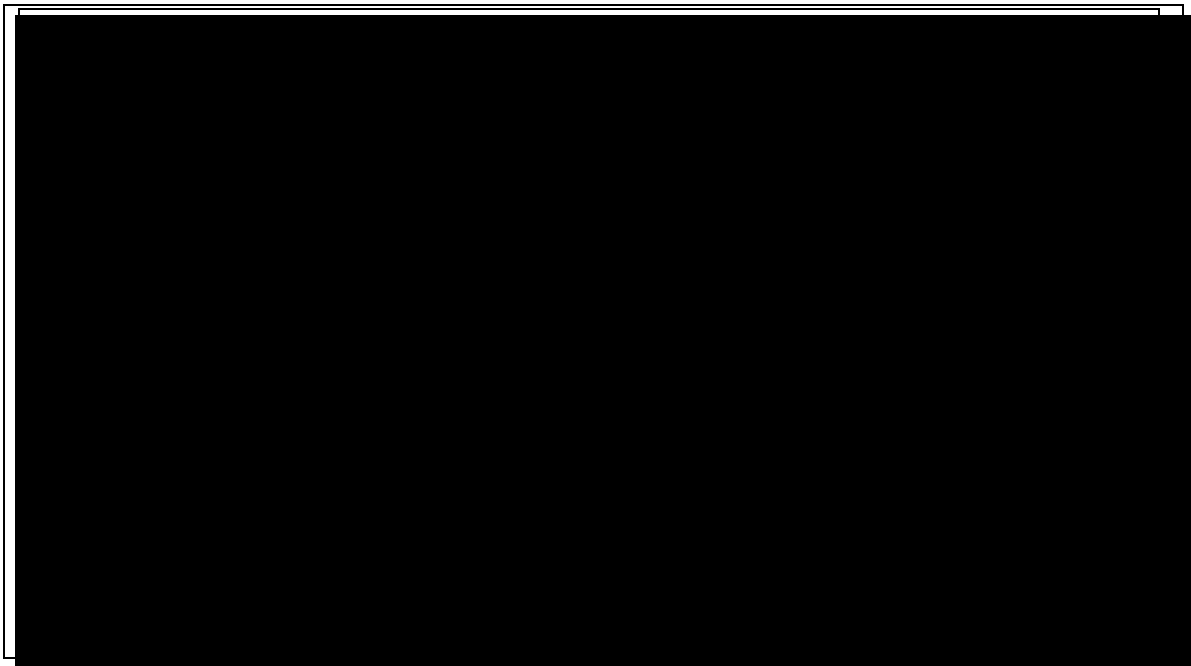
- Commands are executed in the same order as they appear in the configuration file.
- Commands are only executed when the complete configuration is read, and is regardless of the relative position of the command section with respect to the database section.
- If an error is encountered during the parsing of the database section, then no commands will be executed.

## Configuration screens

- The running configuration can be accessed in the HI using the command  
WIN STS (+) press F1 to show current configuration.
- The edit copy of the configuration can be accessed in the HI by using the command  
WIN CFG

Note that the screens show the record number (index) on the top-right of the window, unless only 1 record number exists. Note that capital letters and/or numbers should be used for names.

## System Configuration



Nr	Item	r,w	Description
2	Type	1,8	System type (IMX).
3	Name	1,3	MIB-II System Name
4	Log	1,3	Log threshold level: 0-99. All events with level equal or greater than this threshold will be logged.
5	Trp	1,3	Trap threshold level: 0-99. All events with level equal or greater than this threshold will generate traps.
6	IP	1,3	IP address assigned to the IntelliShare BRI/PRI for remote control via LAN interface.
7	SubMask	1,3	IP submask for the IntelliShare BRI/PRI
8	Gateway	1,3	IP address of the default gateway for the IntelliShare BRI/PRI
9	PrimMgr	1,3	IP address of the primary SNMP manager (receives Traps). If not specified, then every IP is allowed to connect. SNMP access and traps will only be possible if a valid login was done for this IP.
10	SecdMgr	1,3	IP address of secondary SNMP manager (does not receive traps). If not specified, then every IP is allowed to connect. SNMP access will only be possible if a valid login was done for this IP
11	RdComm	1,3	The SNMP Community String which allows Read-Only. A valid login with read rights is additionally required
12	WrComm	1,3	The SNMP Community String which allows Read/Write. A valid login with write rights is additionally required



13	TrpComm	1,3	The Community String sent along with SNMP Traps
14	pppIP	1,3	IP address assigned to the IntelliShare BRI/PRI for remote control via ISDN. Remark that if the host at the other end is not configured with an own PPP address, the IntelliShare BRI/PRI will assign it an IP address with a host address one higher than the address defined here.
15	pppCDN	1,3	Special assigned ISDN phone number for remote control via ISDN. The number specified can contain wildcards (* and ?) which will be matched against the called phone number of the remote control call. If this field is left blank, remote control via ISDN will be disabled.
16	pppCLI	1,3	Calling Line Identifier for remote control via ISDN. This ISDN number will be checked against the ISDN phone number of the calling entity of the remote control call. The number can contain wildcards (* and ?).
17	TlogOff	1,3	Telnet and Local control port will be logged off after TlogOff seconds (0=disable auto logoff). Note that SNMP is not logged off: The logout command must be issued to logoff SNMP
18	TfailSF	1,3	Delay taken into account before the failsafe relays are activated when the power down condition is fulfilled.
19	ClkSlve	1,3	Preferred ISDN Line on which clock slaving will be attempted, or AUTO if there is no preference. In this case, first PRI lines, then BRI lines will be tried to slave on. If there's no slaving possible on the defined line, the IntelliShare BRI/PRI will revert back to auto slaving.
20	AlmTime	1,3	Time of Day on which an alarm remote control outcall will be attempted to the ISDN number as specified in field 22. A value of 00:00:00 disables this feature.
21	AlmTOut	1,3	Time an alarm remote control outcall can be idle before the call is disconnected. A value of 0 specifies no timeout.
22	AlmCDN	1,3	ISDN phone number to be called when an alarm remote control call is initiated.
23	AlmCLI	1,3	Calling Line Identification to be used for the alarm remote control call.
24	AlmLine	1,3	Bitmask of lines that can be used for the alarm remote control call.
25	AOCEnbl	1,3	System wide flag enabling or disabling the generation of Advice of Charge information.
26	AOCTyp	1,3	Type of AOC information to be generated: Advice of charge during the call (AOC-D) or Advice of charge at the end of the call (AOC-E). AOC-D generates an Advice of Charge pulse contained in an Facility Information Element at each expiry of a time interval, as defined by the charging profile (see par. ). AOC-E only generates a total charge at the end of the call.
27	AOCCTyp	1,3	AOC Charging type to be generated: 'Currency', in which the charging amount is expressed in currencies, or 'Unit', in which the charging amount is expressed in units (i.e. units of fixed amount of money).
27	AOCCurr	1,3	Character field (max. 4 characters) specifying the currency in which the charging will be applied. Only applicable if 'Currency' is selected in the AOCCTyp field.
28	AOCMult	1,3	Multiplier applied to the charging amount. Ranges are from 0.001 to 1000. Only applicable if 'Currency' is selected in the AOCCTyp field.
29	HttpRef	1,3	Refresh rate of the web server pages in seconds. If zero, no refreshing of web pages will be applied.

The field 'Name' is used to define the MIB-II System group. Note that this field cannot be directly modified in the MIB-II group, but only indirectly via the field defined here. As a consequence, only a validated operator is able to change the MIB-II System group contents.

Note also that the MIB-II System description is read-only and contains the manufacturer, product and serial number identification.

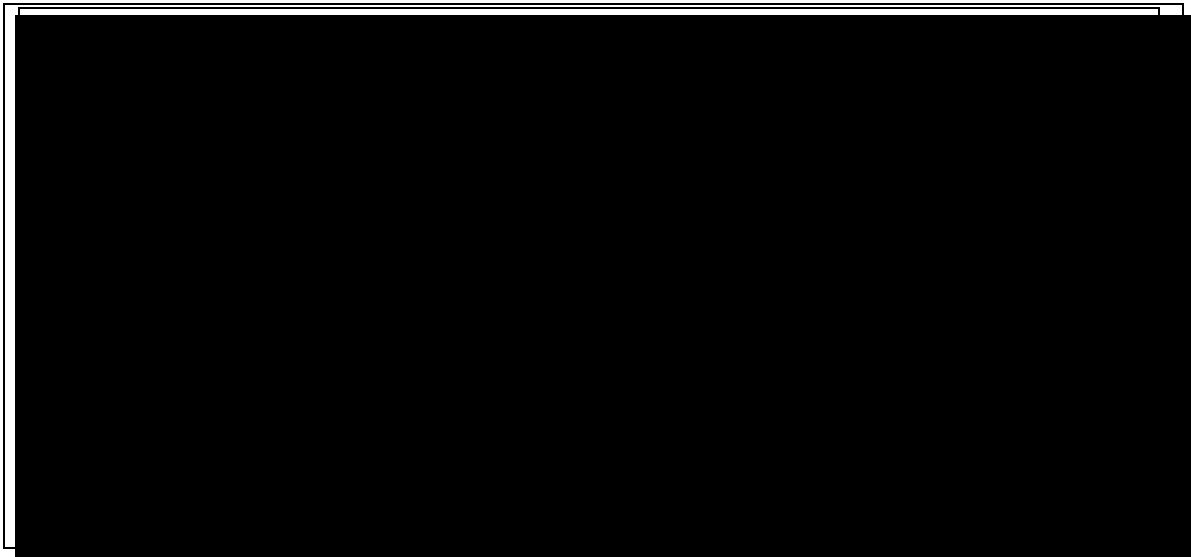
## Slot Configuration

-SlotCfg-----	
-	
N	1
Type	IMX



Name S1

Nr	Item	r,w	Description
1	N	0,8	Index. This corresponds to the record number, and is used to identify the slot (as S1,S2,...) in loggings and in commands.
2	Type	1,3	Type of card (IMX in Slot 1 & VXI in slot 2 if any)
3	Name	1,2	Name (for info only)

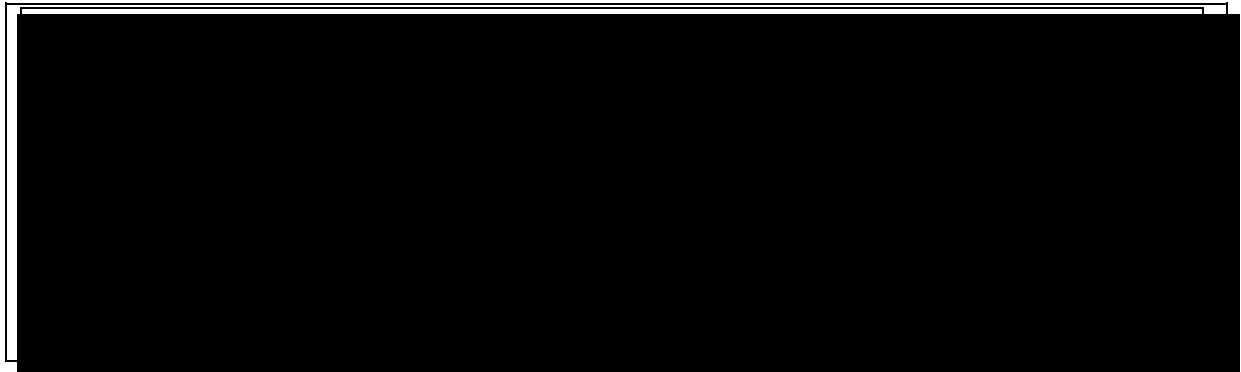


### Line Configuration

Nr	Item	r,w	Description
1	N	0,8	Index. This corresponds to the record number, and is used to identify the line (as L1,L2,...) in loggings and in commands
2	Type	1,8	Type of line interface (PR=Primary Rate;BR=Basic Rate)
3	Name	1,2	Name given to the line interface.
4	Act	1,2	Line Enabling (Off, On).
5	Sgn	1,3	Signalling protocol PR : None=Ts16 for data; ISDN=Ts16 for LapD BR : None or ISDN.
6	Tei	1,3	Terminal Equipment Identifier. PR: Should be 0 (fixed); BR: can be 0 (Fixed) or 64 (automatic) In case TEI is 0, physical and data-link activation of the line will continuously be attempted, for BRI as well as PRI lines. As a consequence, a line with configured TEI == 0 and with no physical activation is considered 'dead' and won't be selected during the route selection process.
7	NT	1,3	Specifies if the line interface is connected to a network (Net) or to a DTE equipment (Usr) Note: - connection Line-DTE: crossed cables - connection Line-ISDN or Line-DCE: straight cables
8	Idle	1,2	IDLE code sent in a none-active timeslot. To specify as hex, precede the value with 'x'. For PR lines: Advised code for ISDN connection is x49 For BR lines: Advised code for ISDN connection is x49
9	Crc4	1,2	Specifies if 2MB frame CRC procedure should be enabled. On: CRC is enabled. Off: CRC is disabled. Auto: automatic detection of the usage of the CRC procedure by the remote

			<p>device.</p> <p>Use of CRC is advised unless not supported by the ISDN network</p> <p>This field has no meaning for BRI lines, as the CRC procedure is not supported on those lines.</p>
10	StrInc	1,3	<p>First B Channel to be used for incoming calls, if a B Channel is requested by the remote end. StrInc can range from 0 to 31 (0 defining the first B-channel). Remark that it doesn't make sense to select B-channel 0 as the starting channel, as it is the framing channel on PR and the D-channel on BR.</p>
11	EndInc	1,3	<p>Last B Channel to be used for incoming calls, if a B Channel is requested by the remote end. If StrInc and EndInc both are set to zero, then the default assignment of channels is taken, i.e. assignment of channels in ascending order. EndInc can range from 0 to 31 (0 defining the first B-channel)</p>
12	StrOutg	1,3	<p>First B Channel to be used for outgoing calls, if a B Channel can be assigned by the IntelliShare BRI/PRI (i.e. if the line is an NT line, or the line is set in exclusive mode, i.e. the first bit in the Line Options field is set). StrOutg can range from 0 to 31 (0 defining the first B-channel). Remark that it doesn't make sense to select B-channel 0 as the starting channel, as it is the framing channel on PR and the D-channel on BR.</p>
13	EndOutg	1,3	<p>Last B Channel to be used for outgoing calls, if a B Channel can be assigned by the IntelliShare BRI/PRI (i.e. if the line is an NT line, or the line is set in exclusive mode, i.e. the first bit in the Line Options field is set)</p> <p>If StrOutg and EndOutg both are set to zero, then the default assignment of channels is taken, i.e. assignment of channels in descending order. EndOutg can range from 0 to 31 (0 defining the first B-channel)</p>
14	CLISrch	1,3	<p>The Calling Line Identification of the incoming call will be matched against this number. In case there is a match, the CLI of the incoming call will be replaced with the pattern as specified in the CLIREpl field (field 15). If there is no match, the CLI of the incoming call will not be changed.</p> <p>The syntax of the search pattern is equal to the syntax of the Route Search field, and is described fully in par. .</p>
15	CLIREpl	1,3	<p>Pattern used in the substitution of the CLI number, if there was a match of the CLI number with the pattern as specified in the CLISrch field. In case there is no match, the CLIREpl field will be ignored, and no substitution will take place.</p> <p>The syntax of the replace pattern is equal to the syntax of the Route Search field, and is described fully in par. .</p>
16	AlmFrom	1,2	<p>Specifies lines which may force a datalink error on this line.</p> <p>- The datalink on this line will be forced down when one of the indicated lines detects a persistent deactivation condition. When the line gets activated again, then the alarm is cleared. This ia a special feature which is not needed in most cases.</p>
17	Options	1,2	<p>Options Bitmask. Following bits are defined:</p> <p>Bit 1: If set, the IntelliShare BRI/PRI will force the other end to accept the proposed B-Channel in the ISDN Setup message.</p> <p>Bit 2: By default, the IntelliShare BRI/PRI will send a 'Call Proceeding' message in response of a 'Setup message', if both the source and destination of the call are configured as TE (i.e., the lines selected on the IntelliShare BRI/PRI for the route are configured as NT). If bit 2 is set, then the IntelliShare BRI/PRI will NOT send a 'Call proceeding' message in this case.</p>

**Fixn64 Configuration**



Nr	Item	r,w	Description
1	N	0,8	Index. This corresponds to the record number, and is used to identify the Port (as P1,P2,..) in logings.
2	Act	1,3	Activates the fixed channel.
3	Name	1,2	Name given to the Port. This name is used in the port definition. Syntax: [GROUP:]NAME[.priority] IntelliShare BRI/PRI: Group and Priority are not used.
4	NrTS	1,3	Number of consecutive 64kbit/s timeslots that are to be crossconnected from LineIn to LineOut.
5	LineIn	1,3	The incoming line
6	TSIn	1,3	The position of the first timeslot on the incoming line at which the port starts. Remark: timeslot 16 is excluded from a port if ISDN is enabled on the line.
7	LineOut	1,3	The outgoing line. This can be an ISDN line (L1 – L10), or a port on the VXI module (P1 – P4).
8	TSOut	1,3	The position of the first timeslot on the outgoing line at which the port starts. Remark: timeslot 16 is excluded from a port if ISDN is enabled on the line.
9	PContrl	1,3	Bitmask, defining the signals to be asserted on the port of the VXI module, if used. The following signals are defined: <ul style="list-style-type: none"> <li>▪ X : - External/internal clock. When set enabling DTE timing - when not set DCE timing is used</li> <li>▪ S : - asserts DSR and CTS. When set, DSR &amp; CTS will be always ON - if not set DSR &amp; CTS will be ON when DTR is activated</li> <li>▪ C : - asserts DCD/I (for X21). When set, DCD (I) will be always ON - When not set, DCD/I will be ON if G704 is activated (PH-AI) &amp; not digital loop is performed or Local loop is performed.</li> </ul>

## Route Configuration

Nr	Item	r,w	Description
1	N	0,8	Index. This corresponds to the record number, and is used to identify the route (as R1,R2,...) in loggings.
2	Type	1,3	De/Activation of the current route.
3	LineIn	1,3	The set of incoming lines which are to be taken in account for this route. Multiple input lines are selectable.
4	Search	1,3	The incoming CDN <sup>1</sup> is matched with the value of 'Search'. If equal, the CDN is replaced with 'Replace' else the next route in the table is checked. Some special features are : * : this symbol is a group wildcard. If placed in front, the last numbers of the CDN make the difference. If placed last, the first numbers of the CDN make the difference. Example : Search = 02* & Replace = 5552* The incoming CDN=023128 becomes CDN=55523128. ? : this symbol is a single wildcard. The '?' can be a value between 0 and 9. Example : Search = 023?2 & Replace = 02302 The incoming CDN=02372 becomes CDN=02302.
5	Replace	1,3	The total/partial replacement for the Search value. See Search above.
6	LineOut	1,3	The outgoing line(s) where the call has to be forwarded. If the route is considered as valid. If multiple lines are selected (hunting groups), the calls are forwarded in a round robin manner. This means the first call is forwarded to the first available line, the second call to the second available line, .... If the last line in the route is reached and a new call is coming in, the call is forwarded back to the first line, the next call to the second line,..... . If the line is configured for a TEI value of 0, or the line is a PRI line, the hunting group algorithm will skip the line if it is unavailable (i.e. if its level 1 is down). If all lines are occupied, the next route in the table is taken.
7	Calltyp	1,3	Bitmask defining the call types to be verified during route selection. The bitmask is based on the CIP (Connection Identification Profile) mask as defined in the CAPI standard. It defines the following bits: Bit 1: Speech call Bit 2: Unrestricted digital information call Bit 3: Restricted digital information call Bit 4: 3.1 kHz audio call Bit 5: 7 kHz audio call Bit 6: video call Bit 7: packet mode call Bit 8: call with 56 kBit/s rate adaptation Bit 9: unrestricted digital information with tones/announcements call Only calls with a bearer capability corresponding to the bit fields set will be selected for the route. If no bits are set in this field, the Calltyp field will be ignored.

<sup>1</sup> CDN : Called Dial Number

8	FailMin	1,3	If specified (non-0), the route may be temporarily disabled during the specified number of minutes depending on the cause of the latest call failure. The following causes will disable the route: class 2: 34,38,41,42,43,44,47 class 3: ,49,50,57,58,63 class 4: 65,66,69,70,79 class 5: 81,82,83,84,85,86,88,91,95
9	ChgProf	1,3	ASCII string defining the charging profile label applied to this route. This label should correspond to a charging profile label in the charging profile database (see par.). If there is no matching label in the charging profile database, then a free of charge call will be assumed. If the label is empty, or the originator of the call is on a 'User' (TE) line, then no charging will be applied.

**AOC Profile Configuration**



Nr	Item	r,w	Description
1	N	0,8	Index. This corresponds to the record number, and is used to identify the charging profile entry in status screens.
2	Act	1,3	Activates the charging profile.
3	Label	1,3	ASCII string defining the label of the charging profile. This label is linked to the 'ChgProf' label field in the route configuration. Multiple charging profiles with the same label can be configured in the charging profile database. The database will be searched for a certain label in consecutive order from top to bottom, i.e. the most specific charging profiles should come first in the database. If no charging profile is found with a certain label, a 'free of charge' charging profile will be implied.
4	Days	1,3	Bitmask defining the first letter of the days of the week. Starts with a Sunday. The last bit (H) represents holidays, and enable the charging profile for a holiday. The definition of holidays is done in the holidays database (see par. ). Setting these bits enable the charging profile for the corresponding days of the week.
5	StrTime	1,3	Starting hour at which the charging profile is enabled.
6	EndTime	1,3	End hour at which the charging profile is disabled. Charging will be applied when this hour is reached. It is possible to define a time zone with the StrTime and EndTime fields that crosses a midnight boundary,i.e. a time zone with StrTime 18 and EndTime 8 defines a time zone from 6 pm to 8 am next morning. Remark however that the charging profile will only be valid in the days that are configured in the Days field, i.e. if the time zone crosses the midnight boundary into a day not defined in the Days field, then the charging profile will not be applicable.
7	c0	1,3	Initial charge amount. This is the amount charged immediately after the call is connected through (i.e. when the Connect message is sent). Ranges from 0 – 9999. Remark that this field should be used in combination with the system flags

			AOCCTyp and AOCMult, i.e. the resulting amount charged depends on the 'Charging type' (Currency or Units), and in the case of 'Currency', on the multiplier chosen.
8	t0	1,3	Initial time interval in seconds for which the initial charging amount applies. When this interval expires, incremental charges will apply. Ranges from 0 – 3600 sec.
9	DeltaC	1,3	Charging increment applied at each expiry of a DeltaT time interval (see field 10). Ranges from 0 – 9999 Remark that this field should be used in combination with the system flags AOCCTyp and AOCMult, i.e. the resulting amount charged depends on the 'Charging type' (Currency or Units), and in the case of 'Currency', on the multiplier chosen.
10	DeltaT	1,3	Time interval in seconds after which a charging increment DeltaC will be applied. Ranges from 0 – 3600 sec.

### AOC Holiday Configuration

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Nr	Item	r,w	Description
1	N	0,8	Index. This corresponds to the record number of the holiday
2	Act	1,3	Activates the holiday.
3	Date	1,3	month and day (in this order!) of the holiday.

### Operator Configuration

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Nr	Item	r,w	Description
1	N	0,8	Index. This corresponds to the record number, and is used to identify the operator (as O1,O2,..) in logings and in commands
3	Name	3,7	Short-Name for the operator
4	Rights	3,7	Hex-map specifying the operators access rights: <ul style="list-style-type: none"> <li>▪ mask x000F : read rights (0-7)</li> <li>▪ mask x00F0 : write rights (0-7)</li> <li>▪ mask x0F00 : execute rights (0-7)</li> </ul> The following levels are advised (see Ref. Manual for rights-lists): <ul style="list-style-type: none"> <li>▪ USR: x0111 (loc,tcp R=1 W=1 X=1)</li> <li>▪ SYS: x0222 (loc,tcp R=2 W=2 X=2)</li> <li>▪ SUP: x0333 (loc,tcp R=3 W=3 X=3)</li> </ul>

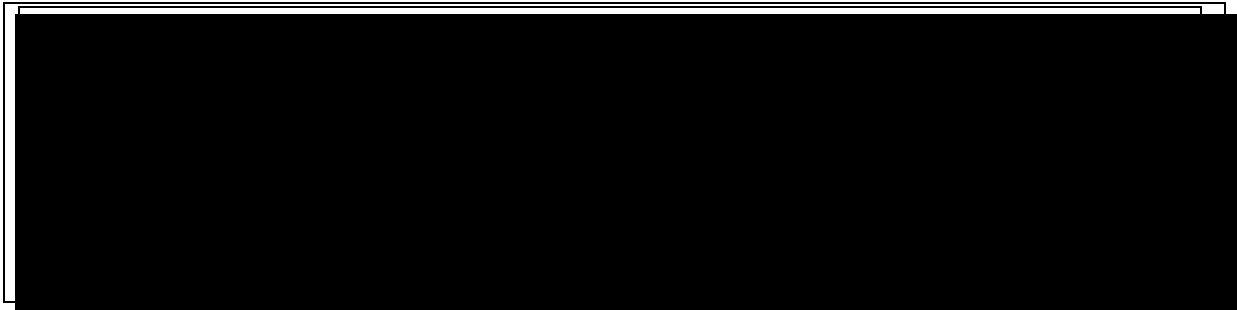
			▪ ADM: x7777 (all rights)
5	Info	3,3	User Info field



## Status Screens

The status screens can be accessed using the command WIN STS.

### System Status



Nr	Item	r,w	Description
1	N	1,8	Index
2	Date	1,8	Current date
3	Time	1,8	Current time
4	Clksrc	1,8	Specifies which interface is used as a provider for clock synchronisation for all lines. 0=free run.
5	Trc	1,8	Current trace level
6	HwErr	1,8	0 = No errors Contact support if this value differs from 0

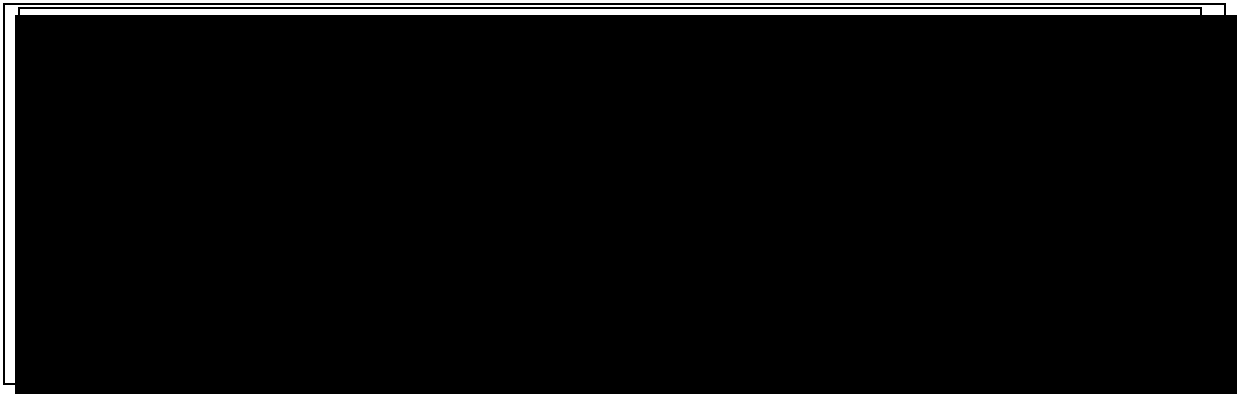
### Slot Status



Nr	Item	r,w	Description
1	N	1,8	Index. This corresponds to the record number, and is used to identify the entry (as S1,S2,..) in loggings and in commands
2	Sts	1,8	Gives the status of the entry INIT : entry is not checked HW : hardware error related with this entry KEY : entry is not activated by the key option IDLE : entry passed checks and is ready but not active ACT : entry passed checks and is active RES : entry has been changed and a reset system is required to activate the changes CFG : entry has been changed but configuration error occurs
3	SW	1,8	SW Version for card in this slot.
4	HW	1,8	HW Version for card in this slot

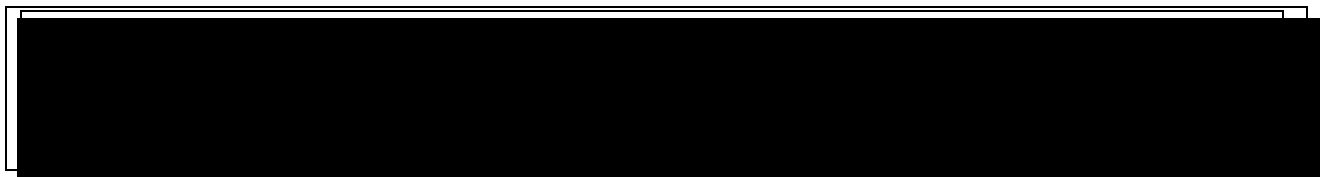
5	LED	1,8	LED status. As on front panel. R=Red,G=Green,Y=yellow
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## Line Status



Nr	Item	r,w	Description
1	N	1,8	Index. This corresponds to the record number, and is used to identify the entry (as L1,L2,...) in loggings and in commands
2	Sts	1,8	Gives the status of the entry INIT : entry is not checked HW : hardware error related with this entry KEY : entry is not activated by the key option IDLE : entry passed checks and is ready but not active ACT : entry passed checks and is active RES : entry has been changed and a reset system is required to activate the changes CFG : entry has been changed but configuration error occurs
3	L1State	1,8	State of the line according to the I430/I431 protocols
4	PH	1,8	Up : physical layer is up Dn : physical layer is down
5	L2State	1,8	State of the 2MB link. According to the Q921 protocol
6	DL	1,8	Up : datalink is up DN : datalink is down
7	Bconn	1,8	Bitmap indicating connected Timeslots. For ISDN, this corresponds to connected B channels
8	AlmFrom	1,8	Specifies lines which may force a datalink error on this line. The datalink on this line will be forced down when one of the indicated lines detects a persistent deactivation condition during a time T_DI (advised value 1-5 seconds). When the condition during a time T_AI (advised 1-5 seconds), then the alarm is cleared. This is a special feature which is not needed for most cases.
9	Trc	1,8	Current trace level
10	TEI	1,8	The current TEI value assigned to this line. The field will show 127 if no TEI is assigned

## FixN64 Status



Nr	Item	r,w	Description
1	N	1,8	Index. This corresponds to the record number, and is used to identify the entry (as P1,P2,..) in loggings and in commands.
2	Sts	1,8	Gives the status of the entry INIT : entry is not checked HW : hardware error related with this entry KEY : entry is not activated by the key option IDLE : entry passed checks and is ready but not active ACT : entry passed checks and is active RES : entry has been changed and a reset system is required to activate the changes CFG : entry has been changed but configuration error occurs
3	PortSts	1,8	Gives the status of the DTE and DCE signals on the VXI module port X: DTE timing is ON S: DSR and CTS are ON C: DCD (I) is ON T: DTR is ON M: Test mode indication (TMI) i.e. when in Local or Digital loop L: Local loop is set. D: Digital loop is set.

**Route Status**



Nr	Item	r,w	Description
1	N	1,8	Index. This corresponds to the record number, and is used to identify the entry (as R1,R2,..) in loggings and in commands.
2	Sts	1,8	Gives the status of the entry INIT : entry is not checked HW : hardware error related with this entry KEY : entry is not activated by the key option IDLE : entry passed checks and is ready but not active ACT : entry passed checks and is active RES : entry has been changed and a reset system is required to activate the changes CFG : entry has been changed but configuration error occurs
3	State	1,8	OK : route is possible WAIT : route has failed and fail timer was started for this route. The indication remains until the next time that the route is tried.
4	Date	1,8	Date of last use of this route.

5	Time	1,8	Time of last use of this route. If in Wait state, then attempts to use this route will fail until Time+WaitMin
6	Cause	1,8	Latest ISDN cause received on this route
7	CGN	1,8	Full calling number on this route
8	CDN	1,8	Full called number on this route.
9	Lineout	1,8	Indicates the line that was selected.
10	AOCNdx	1,8	Charging profile index last selected for the route



**AOC Profile Status**



Nr	Item	r,w	Description
1	N	1,8	Index. This corresponds to the record number, and is used to identify the entry (as R1,R2,..) in loggings and in commands.
2	Sts	1,8	Gives the status of the entry INIT : entry is not checked HW : hardware error related with this entry KEY : entry is not activated by the key option IDLE : entry passed checks and is ready but not active ACT : entry passed checks and is active RES : entry has been changed and a reset system is required to activate the changes CFG : entry has been changed but configuration error occurs
3	Route	1,8	Last route for which this charging profile applied

**Operator Status**



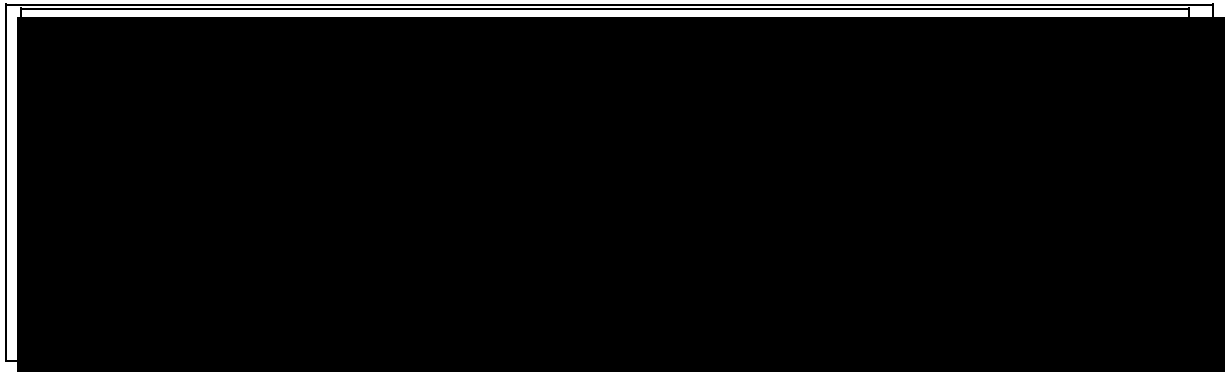
Nr	Item	r,w	Description
1	N	1,8	Index. This corresponds to the record number, and is used to identify the entry (as O1,O2,..) in loggings and in commands.
2	Sts	1,8	Gives the status of the entry INIT : entry is not checked HW : hardware error related with this entry KEY : entry is not activated by the key option IDLE : entry passed checks and is ready but not active ACT : entry passed checks and is active RES : entry has been changed and a reset system is required to activate the changes CFG : entry has been changed but configuration error occurs
3	Intf	1,8	LOCAL : connected via control port. LAN : connected via lan interface. PPP : connected via remote control.
4	Time	1,8	Time of latest login/logout
5	Date	1,8	Date of latest login/logout
6	IP	1,8	Current or Last used IP address

7	BadPsw	1,8	Incremented at each unsuccessful login. Reset when changing password
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## History Screens

The history screens can be accessed using the command WIN HISTORY.

### Line History.



Nr	Item	r,w	Description
1	N	1,8	Index. This corresponds to the line number for which history are printed
2	AmaxIn	1,8	Maximum number (high watermark) of channels occupied by incoming calls on this line since reset of the IntelliShare BRI/PRI
3	AmaxOut	1,8	Maximum number (high watermark) of channels occupied by outgoing calls on this line since reset of the IntelliShare BRI/PRI
4	AminFre	1,8	Minimum number (low watermark) of free channels on this line since reset of the IntelliShare BRI/PRI
5	ChanIn	1,8	Current number of channels used for incoming calls
6	ChanOut	1,8	Current number of channels used for outgoing calls
7	ChanFre	1,8	Current free number of channels
8	APHDown	1,8	Total time in seconds level 1 went down on this line since reset of the IntelliShare BRI/PRI
9	ACRCErr	1,8	Number of CRC errors occurred since reset of the IntelliShare BRI/PRI
10	AfrmErr	1,8	Number of framing errors occurred since reset of the IntelliShare BRI/PRI
11	AConTim	1,8	Total connection time for all calls on this line since reset of the IntelliShare BRI/PRI. The connection time is counted from the moment the B-channels are connected through
12	Achrges	1,8	Total charges applied to all calls on this line since reset of the IntelliShare BRI/PRI

### 1.1.Route History.



Nr	Item	r,w	Description
1	N	1,8	Index. This corresponds to the route record index for which history are printed.
2	ACllAtt	1,8	Number of call attempts made on this route since reset of the IntelliShare BRI/PRI
3	AScCall	1,8	Number of successful calls made on this route since reset of the IntelliShare BRI/PRI. Each call resulting in a successful 'connect through' of B-channels is considered as a successful call.
4	AFICall	1,8	Number of failed calls made on this route since reset of the IntelliShare BRI/PRI. A call is considered failed if for some reason the connection was dropped before both ends B-channels were connected through.
5	AConTim	1,8	Total connection time for all calls made on this route since reset of the IntelliShare BRI/PRI. The connection time is counted from the moment the B-channels are connected through.
6	ADblCnt	1,8	Number of times this route has been disabled since reset of the IntelliShare BRI/PRI
7	AChrges	1,8	Total charges applied to all calls for which this route is selected since reset of the IntelliShare BRI/PRI



## Commands

### Features

- Commands can be abbreviated. The first match will be used.
- When a command is incomplete, then an error message is displayed according to the following logic:
  - the recognised and accepted part is shown
  - the offending remainder of the input is replaced by a question mark
  - the question mark is followed by the expected input pattern (or alternatives list).
- When a command can be executed, then either the result of the command is returned or a message indicating that the command has been processed.

### Syntax conventions

<x> indicates a variable argument  
 [ ] denotes optional arguments  
 { | } denotes alternatives  
 CAP capitals denote keywords

### Command organisation and required access.

Command	x	Action
LOGIN <name> [<psw>]	0	Login sequence. If <psw> is not specified, then it is requested by the HI. In that case, the password is not echoed to the screen, and is not saved in the command history. When doing a login via SNMP, <psw> must be specified.
LOGOUT	0	Logout the current operator. When the command is issued via the serial port, the local operator is logged out. When the command is issued via TCP/IP (Telnet or SNMP), then the remote operator associated with the IP address is logged out (effectively disabling SNMP and Telnet until new login).
WIN [ { CFG   STS   HISTORY } ]	1	Telnet or Local only (Error for SNMP and other). Provide access to the screen interface
SHOW {..}	1	Telnet or Local only (Error for SNMP and other).
SHOW TIME	1	Show the current time and date (hh:mm:ss,yyyy/mm/dd)
SHOW CFG <from> [<to> [X]]	1	Show a sequence of CFG records (from the RUN database) in browse format. <ul style="list-style-type: none"> <li>▪ &lt;from&gt;,&lt;to&gt;=&lt;class&gt;&lt;index&gt; where &lt;class&gt; is G(general system), S(slot), L(line), F(FixN64), R(Route), A(AOC_Profile), H(AOC_Holiday) or O(operator).</li> <li>▪ If X is specified, extended information will be shown. In this case, all fields are shown for the specified records. In the other case, the fields shown are the same as can be found in the screen browser.</li> </ul>
SHOW STS <from> [<to> [<dt>[X]]]	1	Show a sequence of STS records (from the RUN database) in browse format. See SHOW CFG. <ul style="list-style-type: none"> <li>▪ &lt;dt&gt; specifies an optional time interval in seconds for repeated showing</li> </ul>
SHOW HISTORY <from> [<to> [<dt>[X]]]	1	Show a sequence of HISTORY records (from the RUN database) in browse format. See SHOW CFG. <ul style="list-style-type: none"> <li>▪ &lt;dt&gt; specifies an optional time interval in seconds for repeated showing</li> </ul>
SHOW ID	1	Show identification of the components of the IntelliShare BRI/PRI firmware and hardware : <ul style="list-style-type: none"> <li>▪ Global FW code and revision</li> <li>▪ Pcode : HW product code and revision</li> <li>▪ Model : or product name</li> </ul>

		<ul style="list-style-type: none"> <li>▪ SerNr : serial number</li> <li>▪ MacAdr : Mac address</li> </ul>
SHOW ID X	1	<p>Show identification extended : in addition to SHOW ID the following identification is displayed :</p> <ul style="list-style-type: none"> <li>▪ Options:P&lt;p&gt;,H&lt;h&gt;,S&lt;s&gt;,K&lt;kkkkkkkkkk&gt; activated options where &lt;p&gt; is product option, &lt;h&gt; HW option, &lt;s&gt; SW option, &lt;k...&gt; keycode.</li> <li>▪ FW release date</li> <li>▪ L2+L3 FW component code and revision</li> <li>▪ L1 FW component code and revision</li> <li>▪ XW component code, revision and release date</li> </ul>
SHOW LOG <number>	1	<p>&lt;number&gt;=0: start the log output at the oldest entry                  &lt;number&gt; =non-0: show the next &lt;number&gt; log entries.</p>
SHOW KEYS	0	Show installed hardware keys and software keys in plain text format.

CFG {...}	2	Access to manipulation of databases.
CFG RUN	2	Copy EDT database to SAVED database. Copy EDT database to RUN database. (Re)Activate the RUN database
CFG SAVE	2	Copy EDT database to SAVED database. No further actions are done
CFG LOAD	2	Copy SAVED database to EDT database. No further actions are done
CFG ACTIVATE	2	(Re)Activate the RUN database
CFG DEFAULT	2	Erase the EDT database, and fill with factory defaults. No further actions are done
CFG XMSEND { CFG.TXT   CFG.BIN   ROUTE.TXT   AOC.TXT   STS.TXT   HISTORY.TXT }	2	<p>Sends various info to a PC using X-modem:</p> <ul style="list-style-type: none"> <li>▫ CFG.TXT: the EDT database will be sent in text format (see also chapter on page 10).</li> <li>▫ CFG.BIN: the EDT database will be sent in binary format.</li> <li>▫ ROUTE.TXT: the route configuration will be sent in text format.</li> <li>▫ AOC.TXT: the configuration for Advice of Charge will be sent in text format.</li> <li>▫ STS.TXT: the status information will be sent in text format</li> <li>▫ HISTORY.TXT: the history information will be sent in text format.</li> </ul>
CFG XMRECV { CFG.TXT   CFG.BIN }	2	Receive the EDT Database from a PC using X-modem. If CFG.TXT is supplied, then the EDT database will be sent in text format (see also chapter on page 10). If CFG.BIN is supplied, then the EDT database will be sent in binary format. Note that a CFG RUN is needed to activate the received database.

SET {...}	2	Operational settings.
SET PSW	1	This command can only be executed Locally or via Telnet. The old password is requested and verified, then the new password is requested and verified.
SET TIME hh:mm:ss [,yyy/mm/dd]	2	Set the current time and optionally the current date
SET TRACE <for> <level>	2	Set an extended tracing level for either a specific Line(<L<n>) or Slot(S<n>). If <n> is omitted, then the setting is made for all.
SET LOOP {OFF   LL   DL} P<n>	2	<p>Enables a local or digital loop on a port of the VXI module.</p> <ul style="list-style-type: none"> <li>▫ OFF: Disables the local or digital loop on the specified port</li> <li>▫ LL: Creates a local loop on the specified port</li> <li>▫ DL: Creates a digital loop on the specified port</li> <li>▫ P&lt;n&gt;: the port on which the loop needs to be enabled or disabled</li> </ul>

RESET {...}	2	Reset commands
RESET SYS	2	Execute a warm system restart.
RESET HISTORY	2	Reset the history database to initial values
RESET LOG	2	Reset the database of loggings.
REM {...}	1	A remark line. The REM command is not interpreted by the command shell. Its only purpose is to add comments in the tracing info.
MAINT	3	Start maintenance operations. See user manual.
MAINT UPGRADE	3	Starts a remote software upgrade. See user manual for details

## Tracing, Logs and Traps.

### Overview

The occurrence of specific events may be signalled as follows:

- Trace messages on the local or telnet interface.  
The trace message appears when the operator is not entering data (cursor at beginning of line). While the operator is performing commands (e.g.: edition, file transfer,..), traces are temporarily stored, to be shown when the operator finishes the respective command. Up to 100 events can be remembered in this way.
- Logged in a non-volatile buffer within the IntelliShare BRI/PRI. Up to 400 events can be stored. The stored events are not cleared by a power down.
- Sent to an SNMP station as traps. Every logged event can be sent in this way.

Each event has an associated level. This level is compared with the configured trace, log and trap levels to determine whether the event should be traced, logged and/or trapped. This is done according to the following logic:

- If the event level is higher than the SYS.LOG level, then the event is logged.
- If the event level is higher than the SYS.TRP level, then a trap is generated for this event.  
However, only logged events can generate traps.
- If the event level is higher than the trace level (SET TRACE command), then the event is traced. Tracing is enabled only while the operator is logged in.

The advised level for logging and trapping is respectively 20 and 50.

The events which trigger the above actions are classified in 3 classes.

- Slot related events:
  - Datapath settings
  - Time adjustments between slots
- Line related events:
  - ISDN Physical, Datalink, and Call Control events
  - Incoming calls before attribution to a port.
- Other events:
  - LAN related events
  - Internally detected error conditions (bugs or recoverable unexpected conditions).

### Trap and message format

The traps and messages share a number of common properties in order to simplify treatment by management software.

Message format.



Some examples of typical messages are shown below.



The message format consists of:

- Event time (referred to the real time of the IntelliShare BRI/PRI), in the format HH:MM:nnnn where nnnn is the time in 1/100 seconds
- Space
- Class identifier followed by relevant record number:  
Ln = Line defined in record number n  
Sn = Slot defined in record number n (n=1 for IntelliShare BRI/PRI)  
<underscore><subclass> = other events.
- Space
- Sub classification (see list below)
- rest of message.

The use of this message format allows to perform pattern matching on the contents of the message.

## Traps.

To further simplify treatment by SNMP based managers, the trap message contains the following elements:

- The Trap time stamp refers to the number of 1/100 seconds since power-up as required.
- The message is sent as a string 'varbind'.
- The record number is also sent separately as an integer 'varbind'.

For each class, a separate Trap type is defined.

## Overview of Line Messages.

### Physical layer events (PH)

- L<n> PH DI = signals loss of physical activation
- L<n> PH AR = signals higher layer activation request
- L<n> PH AI = signals achievement of physical activation

### Q921 Datalink events (DL)

The DL tracing is comparable to the tracing obtained by a Q921 analyser. In addition, the internal working of the Q921 layer can be verified. This tracing is generally useful for specialists only.

- L<n> DL R <lapd-type> <bytes> = reception of Q921 packet
- L<n> DL T <lapd-type> <bytes> = transmission of Q921 packet

Tracing of Q921 message exchanges in the D channel.

<lapd-type> = {INFO | RR | RNR | REJ | SABME | DM | UINFO | DISC | UA | FRMR | XID}  
<bytes> = shows the first few bytes of the packet.

- L<n> DL ST<nr> <primitive> <code> = Q921 primitive

Refer to the Q921 specification for a list of the primitives.

In the case of MDL primitives, the respective type is shown as an integer value in code.

### Q931 Call Control events (CC)

The CC tracing is comparable to the tracing obtained by a Q931 analyser. In addition, the internal working of the Q931 layer can be verified. This tracing is generally useful for specialists only and may help to identify protocol problems with non-ETSI networks.

- L<n> CC R CR=<crv> ST<state> <messagetype> (<cause>)
- L<n> CC T CR=<crv> ST<state> <messagetype> (<cause>)

Reception and Transmission of Q931 packets.

<crv> = Call reference value.  
 <state> = State of the Q931 entity before receiving/sending the message  
 <messagetype> = message type as specified in ETSI Q931.  
 <cause> = cause value if sent in message. Else unspecified.

- L<n> CC CR=<crv> ST<state> Err-Abort (err <err\_nr>)
- L<n> CC CR=<crv> ST<state> Err-Disc (err <err\_nr>)
- L<n> CC CR=<crv> ST<state> Err-release (err <err\_nr>)

Recovery of network interaction problems according to Q931. These traces show abnormal events during interaction with the ISDN network, which have been identified are remedied (either by aborting the call, by sending a disconnect, or by sending a release).

Refer to the Q931 norm for interpretation of these errors.

Class	Error	Description
Abort	3	Datalink release indication
	4	Reception of release complete after outgoing call
	5	Datalink release in state 2
	6	Datalink release indication
	7	Call not in state 0 as expected by network
	8	T309 expired
	9	T303 expired
	10	Release received in state 19
	12	T308 expired
	13	Status error in state 19
Disc	1	DL establish indication during overlap
	2	T304 expired
	3	T310 expired
	5	T313 expired
	7	T301 expired
Release	4	State error
	6	N322 error

### ISDN Protocol Errors (ERR)

- L<n> ERR<nr> at <unit>.<line>

This message is internally generated when a condition is detected which is unexpected or which cannot be handled according to the ETSI norms.

Signal these errors to DATAx, if possible accompanied by a detailed line trace.

### Incoming call (INC)

- L<n> INC from <cgcn> to <cdn>

This message is generated on an incoming call, before it is accepted or refused.

<cgcn> specifies the calling number, and <cdn> specifies the called number, as extracted from the setup message.



Note that some networks may omit <cgnd> and/or <cdnd> in the setup message. In this case, the value 0 is shown. If the number is longer than 9 digits, then only the last 9 digits are shown.

## Outgoing call (OUT)

- L<n> CID <c> OUT to <cdnd>

This message is generated when an incoming call is being forwarded by the IntelliShare BRI/PRI to its final destination. The CID<sup>2</sup> <c> represents the index in the connection table the call has been assigned to the connection.

<cdnd> specifies the called number. If the number is longer than 9 digits, then only the last 9 digits are shown.

## Connected Call (Connected)

- L<n> CID <c> Connected

This message is generated when a connect indication is received on line <n> to indicate that the calling/called party is connected. The CID <c> represents the index in the connection table the call has been assigned to the connection.

## Disconnected Call (Disconnected)

- L<n> CID <c> Disconnected

This message is generated when a disconnect indication is received on line <n> to indicate that the calling/called party is being disconnected. The CID <c> represents the index in the connection table the call has been assigned to the connection.

## Overview of Slot Messages

### *TIME related events (TIME)*

- S<n> TIME D yyyy/mm/dd hh:mm:ss

This message is generated every hour on slot n. It gives you some reference about the time in the log. D is the first letter of the day of the week.

- S<n> TIME Adjust Log time (old <d>)

This message is generated when there is a difference between the system clock and real time clock.

### Datapath related events (PATH)

- S<n> PATH NRM L<l1>T<t1>=L<l2>T<t2>

This message is generated when a path is laid between line <l1> timeslot <t1> and line <l2> timeslot <t2> on slot.

### Slot related errors (ERR)

- S<n> ERR<nr> at <unit>.<line>

This message is internally generated when a condition is detected which is unexpected or which cannot be handled and which is related to slot related procedures.

Signal these errors to Black Box, if possible accompanied by a detailed trace.

---

<sup>2</sup> CID: Connection identifier

## Overview of General and Internal Messages

### System related messages (SYS)

- `_SYS` Boot up.  
Generated at power up.

### LAN related messages (LAN)

- `_LAN ERR <description>`
  - `_LAN <description>`
- The messages are self explaining.

### Errors in operating system, and general support code (ERR)

- `_ERR_<nr>_<description>` (<additional info>)  
This message is internally generated when a condition is detected which is unexpected or which cannot be handled and which is related to general or operating system procedures.  
Signal these errors to DATAx, if possible accompanied by a detailed trace.
- `_CFG ERR<nr> <description> <entry>`  
This message is generated when an error in a new configuration is detected. The entry field returns the index of the record in the configuration.



**List of messages and their levels.**

Class	Level	Message format	
General	99	ERR<nr> at <module>.<line>	
General	1	CHK<nr> at <module>.<line>	
General	10	S<n> PATH L<n>T<ts>=L<n>T<ts>	
General	10	S<n> PATH L<n>T<ts>=P<port>	
General	10	S<n> PATH L<n>T<ts> idle	
Line	30	L<n> PH DI	
Line	30	L<n> PH AI	
Line	30	L<n> PH AR	
Line	10	L<n> PH_BCHAN <n> st<status>	
	50		--- Advised level for traps
General	40	R<n> Connect <cdn>	
General	40	R<n> Disconnect <cdn>	
General	40	Charged amount <amount>	
	20		--- Advised level for logs
Line	20	L<n> CC R CR=<crv> ST<state> <messagetype> (<cause>)	
Line	20	L<n> CC T CR=<crv> ST<state> <messagetype> (<cause>)	
Line	8	L<n> DL R <lapd-type> <bytes>	
Line	8	L<n> DL T <lapd-type> <bytes>	
Line	6	L<n> DL ST <nr> <primitive>	
Line	22	L<n> MDL Error <code>	
Line	22	L<n> MDL TEI = <nr>	
Line	22	L<n> MDL TEI Removed	
General	8	Tracer Error (index <nr>)	

**ISDN call clear causes**

Following ISDN cause values are defined in ITU-T Q931:

Normal class	Class 0		
		1	Unallocated (unassigned) number
		2	No route to specified transit network
		3	No route to destination
		6	Channel unacceptable
		7	Call awarded and being delivered in an established channel
	<b>Class 1</b>	16	Normal call clearing
		17	User busy
		18	No user responding
		19	No answer from user (user alerted)
		21	Call rejected
		22	Number changed
		26	Non-selected user clearing
		27	Destination out of order
		28	Invalid number format (address incomplete)
		29	Facility rejected
		30	Response to STATUS ENQUIRY
		31	Normal, unspecified
<b>Resource unavailable class</b>	<b>Class 2</b>	34	No circuit/channel available
		38	Network out of order
		41	Temporary failure
		42	Switching equipment congestion
		43	Access information discarded
		44	REQUESTED CIRCUIT/CHANNEL NOT AVAILABLE
		47	Resource unavailable, unspecified
<b>Service or option not</b>	<b>Class 3</b>	49	Quality of Service not available



<b>available class</b>		50 57 58 63	Requested facility not subscribed Bearer capability not authorised Bearer capability not presently available Service or option not available, unspecified
<b>Service or option not implemented class</b>	<b>Class 4</b>	65 66 69 70 79	Bearer capability not implemented Channel type not implemented Requested facility not implemented Only restricted digital information bearer capability is available Service or option not implemented, unspecified
<b>Invalid message (e.g. parameter out of range) class</b>	<b>Class 5</b>	81 82 83 84 85 86 88 91 95	Invalid call reference value Identified channel does not exist A suspended call exists, but this call identity does not Call identity in use No call suspended Call having the requested call identity has been cleared Incompatible destination Invalid transit network selection Invalid message, unspecified
<b>Protocol error (e.g. unknown message) class</b>	<b>Class 6</b>	96 97 98 99 100 101 102 111	Mandatory information element is missing Message type non-existent or not implemented Message not compatible with call state or message type non-existent or not implemented Information element non-existent or not implemented Invalid information element contents Message not compatible with call state Recovery on time expiry Protocol error, unspecified
<b>Interworking class</b>	<b>Class 7</b>	127	Interworking, unspecified



## Technical specifications

### Table top housing

#### Interfaces:

- BR ISDN S2 interfaces:  
Connector: RJ-45 female  
Conform to CTR3, I430, Q921 & Q931
- PR ISDN S2 interfaces:  
Connector: RJ-45 female  
Conform to CTR4, I431, Q921 & Q931
- Control port interface:  
Connector: RJ-45 female (with convertor DB9 to RJ45)  
Electrical: V28  
Functional: V24 (CT 102, 103, 104; no XON/XOFF or RTS/CTS flow control on DTE)  
Speeds: asynchronous from 9600 to 115200 bit/s
- Ethernet interface:  
Connector: RJ-45 female  
Recommendations fulfilled: 10Base-T, IEEE 802.3 & 802.2

#### Front panel:

- LED indications: HB, ALM, LAN, BR1 to BR8, PR1, PR2

#### Human Interface:

- Local: ANSI compatible terminal on control port
- Remote through ethernet port: SNMP and Telnet based on TCP/IP stack
- Remote through B-channel: SNMP and Telnet based on the PPP protocol

#### Operating environment:

- Recommendations fulfilled:
  - Safety: EN 60950
  - EMC/EMI: EN 50081-1 & EN 50082-1
- Operating temperature: 5°C to 40°C
- Max. humidity: 15% to 80% non condensing

#### Power supply:

- AC power supply: Input voltage: 100-240 VAC  $\pm$  10%, 50-60 Hz
- DC power supply: Input voltage: 36-72 VDC
- Power consumption: < 15 Watt

#### Mechanical data:

- W x H x D: 268 x 39 x 243 mm
- Weight: < 2 kg



**Connector definitions**BRI port: RJ-45 (120  $\Omega$  bal.)

Pin nr	Circuit name	Input/Output
1		
2		
3	RX ring	I
4	TX ring	O
5	TX tip	O
6	RX tip	I
7		
8		

PRI port: RJ-45 (120  $\Omega$  bal.)

Pin nr	Circuit name	Input/Output
1	RX ring	I
2	RX tip	I
3		
4	TX ring	O
5	TX tip	O
6		
7		
8		

Control port: RJ-45 (V24/V28)

Pin nr	Circuit name	Input/Output
1	RXD	O
2		
3	TXD	I
4	RTS	I
5		
6	CTS	O
7		
8		
9	SGND	O

Ethernet port: RJ-45 (10Base-T)

Pin nr	Circuit name	Input/Output
1	TX p	O
2	TX n	O
3	RX p	I
4		
5		
6	RX n	I
7		
8		



Power inlet: XLR (+5V DC)

Pin nr	Circuit name	Input/Output
1	+5V	I
2	SGND	I
3		

## Cable definitions

DX\_C2DMM-R45-R45 (BRI + PRI straight)

Connector 1			Connector 2		
Pin number	Circuit name		Pin number	Circuit name	
	BRI	PRI		BRI	PRI
1		TX1	1		TX1
2		TX2	2		TX2
3	RX1		3	RX1	
4	TX1	RX1	4	TX1	RX1
5	TX2	RX2	5	TX2	RX2
6	RX2		6	RX2	
7			7		
8			8		

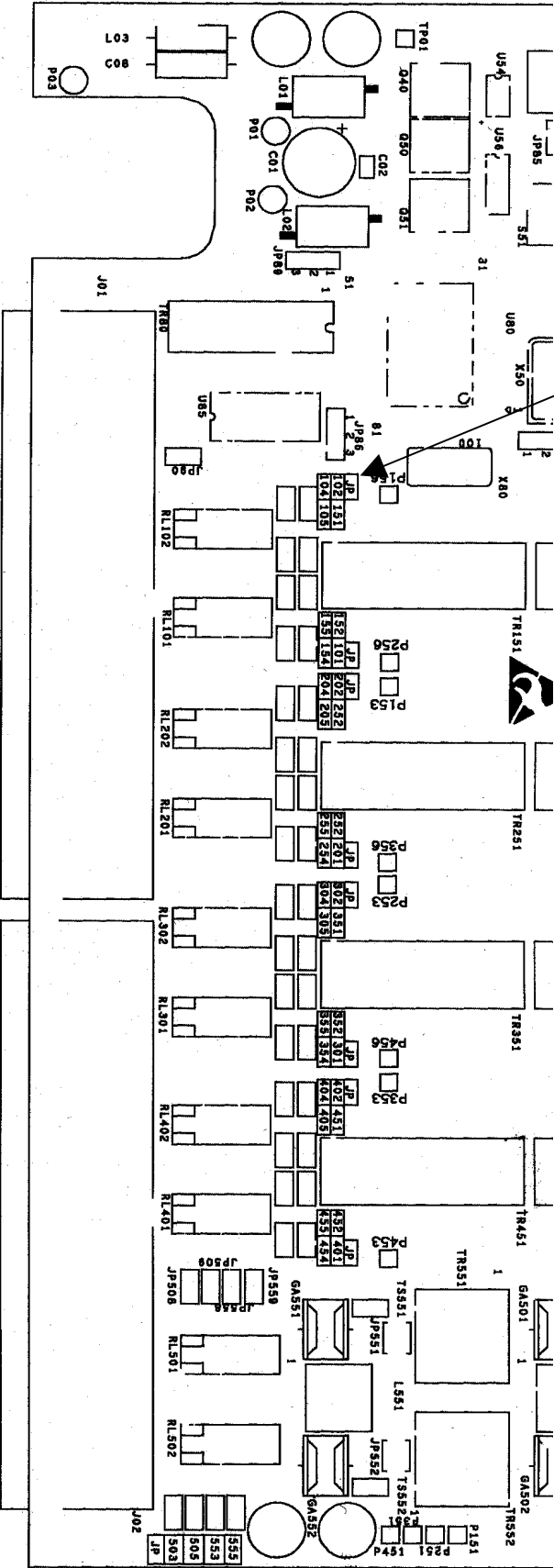
DX\_C2XMM-R45-BRI (BRI crossed)

Connector 1		Connector 2	
Pin nr	Circuit name	Pin nr	Circuit name
1		1	
2		2	
3	RX1	3	TX1
4	TX1	4	RX1
5	TX2	5	RX2
6	RX2	6	TX2
7		7	
8		8	

DX\_C2XMM-R45-R45 (PRI crossed)

Connector 1		Connector 2	
Pin nr	Circuit name	Pin nr	Circuit name
1	TX1	1	RX1
2	TX2	2	RX2
3	-	3	-
4	RX1	4	TX1
5	RX2	5	TX2
6	-	6	-
7	-	7	-
8	-	8	-

Floorplan – location of jumpers



JP = jumper