SA-CMU-SR-V1

Control Management Unit / SNMP AGENT

USER MANUAL

Version	1.1
Revision	15 January 2003
Document name	UM_SA-CMU-SR-V1_v1-1.doc

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VERSION CONTROL

Version	Date	Major changes to previous version
1.0	14.11.2002	Initial version.
1.1	15.01.2003	Change power consumption

1 GENERAL INFORMATION

This manual is a general specification of the SNMP AGENT FOR HDSL MODEM named CMU (common management unit).

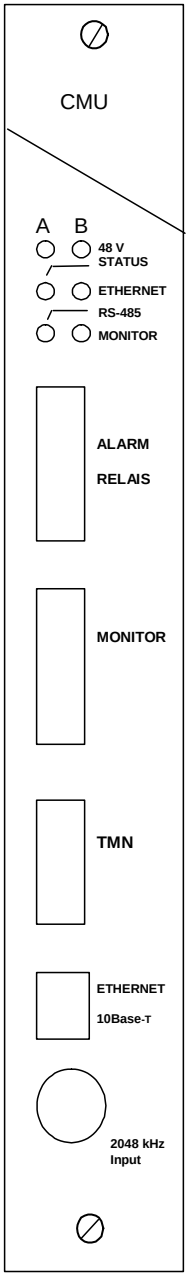
1.1 Features

This CMU has the following features:

- SNMP Agent
- Management until 96 LTU in one or two sub-rack
- Ethernet interface 10Base-T 10 Mb
- Local control via RS-485
- Configuration using a RS-232 connector with the same philosophy that the LTU menu
- Supervision of the two -48V_{DC} input powers supplies (-48V_A and -48V_B from the PSB)
- Distribution and supervision of the external clock
- Collection of the alarms of all the LTUs in a sub-rack and activation of the appropriate alarm relay
- Interfacing the RS-232 monitor to the LTUs
- Interfacing the RS-485 bus to the LTUs, thus providing TMN facilities
- Generation of the local +5V_{DC} auxiliary power supply

The CMU together with 12 LTUs forms a fully equipped 19” sub-rack. The CMU is connected to the LTUs over the backplane and powered by dual -48 V_{DC} inputs via the PSB.

2 CMU FRONT PANEL DESCRIPTION



Power Leds. Green LEDs for the power supply A & B status
Status Led Green LED for normal operation.
Red for boot.
Blinking for hardware error
Ethernet Led Green Data reception
Red Link Integrity Fail
Rs-485 Led Green Data reception
Red Data transmission
Monitor Led Green Data reception
Red Data Transmission

D-Sub 15 female, alarm relays connector

D-Sub 9 female, RS-232 interface for local monitor access

D-Sub 9 male, RS-485 interface for TMN access

RJ-45 Ethernet 10Base-T connector

BNC 75Ω, external 2048kHz clock input

3 SYSTEM OVERVIEW

3.1 Monitor (RS-232) Interface

The CMU has an RS-232 monitor interface connector on the front panel to enable the user / operator to address the CMU or each individual LTU, monitor relevant events, display information about the LTU and HDSL links and have full system configuration and fault localization capabilities. The RS-232 monitor signals are converted to TTL levels and distributed to all the LTUs via a "point-multipoint" bus over the backplane.
The terminal for the monitor should be VT100 compatible and be configured as follows:

- 9600 baud, asynchronous
- 8 bits, no parity, one stop bit
- XON/XOFF enabled
- No new line on carriage return (i.e. no line feed on carriage return)

At any one time, the CMU or only one of the LTUs can be "logically" connected to this monitor interface. The appropriate CMU or LTU is addressed according to its physical location in the sub-rack with %nn command.
Please note that if the auxiliary +5V_{DC} power supply on the CMU fails, the monitor function will cease to operate, but the functionality of the LTUs is still fully guaranteed.
The CMU monitor is similar to the LTU monitor. The main menu is:

```
                    CMU-ACU
                Monitor Version V1.1
                 Copyright (C) 2001

               +--------------------+
               |    MAIN MENU       |
               +--------------------+

          1. Performance management (PM)
          2. Fault and maintenance management (FMM)
          3. Configuration management (CM)
          4. Security management (SM)
          5. Exit

     CMU_01> Select [1..5]: 2
```

The performance menu and security menu is not actual implement. With the fault and maintenance menu you can see the next command:

```
-------------------------------------------------------------
FIRM                  Display version and date of firmware
RESET                 Equipment restart
INST                  Display installed HDSL
ALARM                 Display alarm status

M(AIN)                Return to main menu
-------------------------------------------------------------
CMU_01_FMM>
```

In the configuration menu the command is:

```
-------------------------------------------------------------
C(ONFIG)              Display configuration
DEFAULT               Load default configuration
LOAD                  Load configuration from no volatile
STORE                 Store the actual configuration and restart

IPLOC dirIP           Set local IP address
IPNMS [1,2] dirIP     Set IP NMS 1,2 address
COMM  com             Set comunity
NETW  [1,2] red       Set network table 1,2
GATW  [1,2] red gatw  Set gateways 1,2

POLLTIM [100..900]    Polling Temporization polling (ms)
LOCTIM  [100..3000]   T. local answer (ms)
REMTIM  [100..5000]   T. remote answer (ms)
WIRES   [2,4,4x]      Number of wires: 2, 4 o 4 crossed
MAXRACK  [0..1]       Bigger rack address
MAXBOARD [1..48]      Lower rack address

LANG                  Change language('English')
M(AIN)                Return to main menu
-------------------------------------------------------------
CMU_01_CM>
```

3.2 Jumper configuration

The CMU have the next configuration jumper:

Jumper	Description			
BOOT	ON It is possible to use the boot menu			
J2	OFF The RX Bus monitor is disconnect of back-panel			
J3	OFF The TX Bus monitor is disconnect of back-panel			
J7	OFF Disconnect the status signal of 2,048 Mbis clock from back-panel			
J8	OFF Disconnect 2,048 Mbis clock from back-panel			
J1	ON Disable the 48V B alarm			
J10	ON Termination impedance of RS-485 TX bus			
J11	ON Termination impedance of RS-485 TX bus			
J4-J6-J5	J4	J6	J5	RACK ADDRESS
	OFF	OFF	OFF	0
	OFF	OFF	ON	1
	OFF	ON	OFF	2
	OFF	ON	ON	3
	ON	OFF	OFF	4
	ON	OFF	ON	5
	ON	ON	OFF	6
	ON	ON	ON	7

3.3 CMU Power Concept

The CMU is supplied with (dual) -48V_{DC} (referenced to 0 V_{DC} of the exchange battery) by the PSB via the sub-rack backplane. The CMU converts this -48V_{DC} to it's +5V_{DC} onboard supply, and this +5V_{DC} is used simultaneously for the auxiliary supply for the "pull-up" voltage of the "open-collector" alarm outputs of the LTUs. If one of the dual 48V_{DC} turns off, the CMU activates the non-urgent alarm.
The ground reference of the secondary voltage is tied to FPE (Functional Protective Earth). This is done over the backplane as well as over the sub-rack with its front-panels.

3.4 External Clock

The CMU supervises and distributes the external 2048 kHz clock input. It has a 75Ω BNC input, which is transformer, coupled.
The clock input is converted to TTL level and driven to the LTUs over the backplane. This is to enable the LTUs' E1 interfaces to be synchronized to a central master clock, if needed.
The minimum 0.75 V_{pk} clock input (ITU-T G.703, Sec. 10) can be further attenuated up to -6 dB without disruption to the external clock distribution over the backplane, and before a Loss of External Clock (LOXCK) alarm is asserted over the backplane to the LTUs.

3.5 TMN (RS-485) Interface

The CMU provides a Telecommunications Management Network (TMN) interface. The RS-485 signals are wired to the backplane and distributed to all the LTUs in the same sub-rack.
The CMU can directly address the individual LTUs with the appropriate protocol.

If there is more than one sub-rack in a shelf, the linking of the RS-485 buses between sub-racks must be realized over a bus connection from the front panel of the various CMU s.
The RS-485 interface is operable in either half-duplex (default) or full-duplex modes. Due to the physical bus-loading limits, up to a maximum of 31 LTUs may be connected to the RS-485 bus at any one time.

3.6 Alarm Relays

The urgent and non-urgent alarm relays for a sub-rack are located on the CMU. The "potential-free" alarm relays' outputs are as follows:

- Urgent Alarm Normally Open
- Urgent Alarm Normally Closed
- Non-Urgent Alarm Normally Open
- Non-Urgent Alarm Normally Closed
-

Each LTU in the sub-rack has two "open-collector" alarm outputs, namely an urgent and a non-urgent alarm output. These alarm outputs are "wired-OR" on the backplane to the CMU. Hence, the CMU will activate the urgent alarm relay if one or more LTUs assert the urgent alarm. It will activate the non-urgent alarm relay if one or more LTUs assert the non-urgent alarm or if one of the supplies fails. Please refer to the LTU Operating Manual for the criteria for each alarm condition.

3.7 Auxiliary +5V_{DC} Generation

The CMU also generates a local +5V_{DC} auxiliary supply for its onboard active components and alarm relays. Additionally, it is used for the "pull-up" voltage for the "open-collector" alarm outputs of the LTUs.
This auxiliary supply generation section is transformer coupled to the backplane and the onboard active components.
This auxiliary supply will cease if both the -48 V_{DC} supplies fail or if the onboard DC-DC converter fails.

4 MANAGEMENT SYSTEM

4.1 General description

The Management System arises in the face of the necessity of remote control of HDSL modem as well as of obtaining statistical of operation of these.
The main functions of the Management System are:

- Remote Configuration of the modem.
- Control of their state and parameters.
- Reception of alarms of the modem.
- Management of the remote modem.
- Get statistical, Etc.

4.2 Description of the SNMP Protocol of the Management System

The Management System is based on the protocol of communications SNMP. This protocol will use primitive of the type petition and answer among the Management Center and the elements to control. It is implemented on the layer TCP/UDP that is mounted on the Protocol Internet (IP).
The protocol SNMP offers a system of security and protection for accesses to management variable defining for it the community concept. For each community and variable is defined the access right to this variable from SNMP's Center. In case this access rights are violated, messages are sent (traps) of error to the Center of Administration configured in the Element Agent.

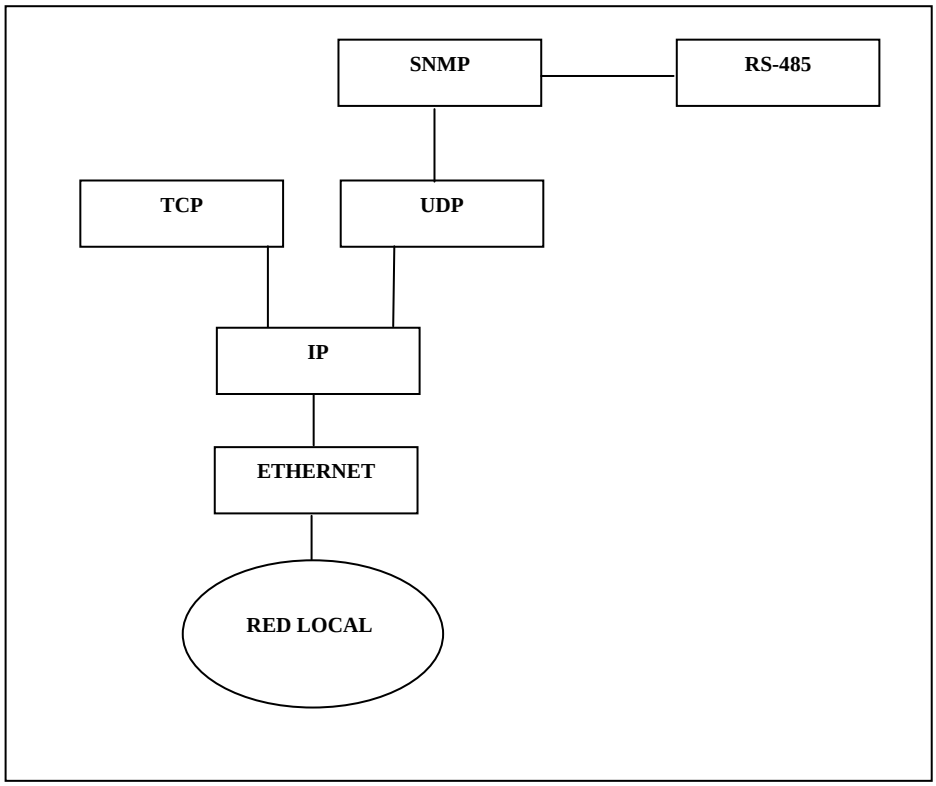


Figure 2.SNMP Protocol architecture.

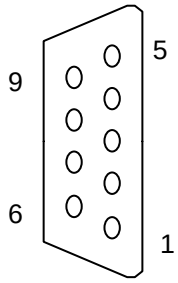
4.3 Local Interconnection.

We denominate Local Interconnection (VIL) to the bus that interconnect to each other to all the modem local that belong to the Management Unit of with the SNMP Agent.
The function of this bus is the one of allowing the Agent the supervision of the modem of him clerks.
The VIL bus is implemented using a shared bus (an element Master and multiple Slaves) using for it the electric norm RS485.
Master's function in the bus RS485 (VIL) is made by the SNMP Agent.
The Slaves elements of the VIL are the HDSL modem.
Following this topologic of shared bus (Master - Slaves) the function of sending messages for the VIL are made by the SNMP Agent .The modem only transmit the answer messages for expressed petition of the SNMP Agent. This way, the Agent goes sending messages to all the modem, so much local as remote, continually and in a recurrent way.
Each element located in the VIL will have a identifying (ID) that will be its node address in the bus. The SNMP Agent will use this to address to the different modem connected to the VIL bus. The modem will only respond to messages that correspond to its own ID or to the ID of its modem remote associate

5 CONNECTORS

5.1 Monitor Connector

Type: Sub-D9, female

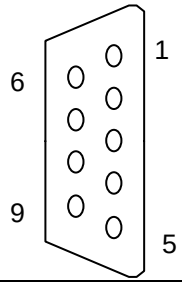


Pin	Signal	Description
1	FPE	Functional Protective Earth
2	TxD	RS-232 Serial Data Output Signal
3	RxD	RS-232 Serial Data Input Signal
5	GND	RS-232 Signal Ground

Note: All other pins are not connected on the CMU.

5.2 TMN Connector

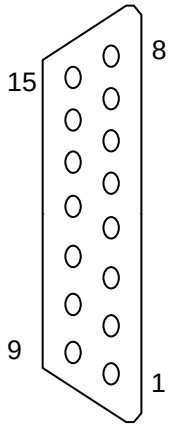
Type: Sub-D9, male



Pin	Signal	Description
1	FPE	Functional Protective Earth
5	GND	RS-485 Signal Ground
6	TX_485+	RS_485 Serial Data Output (pos)
7	TX_485-	RS_485 Serial Data Output (neg)
8	RX_485+	RS_485 Serial Data Input (pos)
9	RX_485-	RS_485 Serial Data Input (neg)

Note: All other pins are not connected on the CMU.

5.3 Alarm Relay Connector



Type: Sub-D15, female

Pin	Signal	Description
1	FPE	Functional Protective Earth
6	A_NU_NO	Non-Urgent Alarm, normally open
7	A_U_NO	Urgent Alarm, normally open
8	FPE	Functional Protective Earth
13	A_NU_NC	Non-Urgent Alarm, normally closed
14	A_U_NC	Urgent Alarm, normally closed
15	A_COM	Common Alarm Contact

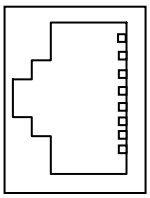
Note: All other pins are not connected on the CMU.

5.4 External Clock Input Connector

Type: BNC 75Ω

Note: The input is transformer coupled.

5.5 Ethernet connector



Pin	Signal	Description
1	TD	Transmission
2	TDN	Transmission
3	RD	Reception
6	RDN	Reception

TECHNICAL SPECIFICATION

5.6 Interfaces

5.6.1 Ethernet Interface

Signal Level:	IEEE Std 802.3
Data Rate:	10 Mbit/s
Protocol:	IEEE Std 802.3,IP/UDP, SNMP, TFTP
Connector Type:	RJ-45

5.6.2 Monitor Interface

Signal Level:	RS-232
Data Rate:	9600 Baud, Asynchronous
Protocol:	8 Bit, No Parity, 1 Stop Bit No Linefeed with Carriage Return XON/XOFF enabled
Connector Type:	Sub-D9 female

5.6.3 TMN Interface

Signal Level:	RS-485
Data Rate:	9600 Baud, Asynchronous
Protocol:	Proprietary
Connector Type:	Sub-D9 male

5.7 External Clock Input

Norm referred:	ITU-T Rec. G.703, Sec. 10
Maximum peak voltage:	1.5 V_{pk} @ 75 Ω
Minimum peak voltage:	0.75 V_{pk} @ 75 Ω (with up to 6 dB attenuation)

5.8 Power Supply

Local Powering:	-40V_{DC} .. 72V_{DC} (redundant via PSB)
Power Consumption:	max. 1.5W (all alarms off), max 1.7W (all alarms on)

5.9 Environmental

5.9.1 Climatic Conditions

Storage:	ETS 300 019-1-1 Class 1.2	(-25°C … +55°C)

Transportation:	ETS 300 019-1-2 Class 2.3	(-40°C … +70°C)
Operation:	ETS 300 019-1-3 Class 3.2	(-5°C … +45°C)

5.9.2 Safety

According to EN 60950

5.9.3 EMC

According to EN 55022 , Class B

5.10 Physical Dimensions

19“ Plug-in unit: height: 259 mm (6 HE), width: 30 mm
PCB dimensions: height: 234 mm, length: 220 mm