
P3 - Portable Data/Voice Extension System

Installation and Operation Manual



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		1
Index		Side
1	Preface	5
1.1	Overview	5
1.2	General Information on P3 System Documentation	5
1.3	Safety	5
1.4	Acronyms and Definitions	7
2	The P3 Concept	9
2.1	Introduction	9
2.2	Feature Overview	12
2.3	Application	14
3	Equipment Description	16
3.1	Frontpanel Layout	16
3.2	Control and Monitoring Elements	18
3.2.1	Keypad Block	18
3.2.2	System Status Display	21
3.2.3	LED Signaling	22
3.2.4	Acoustical Alarm	23
3.3	Interfaces	23
3.3.1	LAN Interface	23
3.3.2	Line Interface	25
3.3.3	POTS Interface	26
3.3.4	Handset Interface	27
3.3.5	RS232 Interface	28
3.3.6	DC Power Supply Interface	29
3.4	Miscellaneous	30
3.4.1	Battery	30
3.4.2	External AC/DC Adaptor	30
3.4.3	POTS Handset	31

4	Installation Instructions	33
4.1	Unpack and Inspect	33
4.2	General Installation Guidelines	34
4.3	ADSL Connection Setup	35
4.4	Spanning Tree Function Setup	35
4.5	Ethernet Bridge Setup	36
4.6	Point-to-Point Field Telephone Function Setup	37
4.7	VoIP based Network Telephone Function Setup	38
4.8	Mixed P3/P1 Applications	39
4.9	Default Settings	40

5	Configuration	42
5.1	Management access via LCD menu	42
5.1.1	Submenu ADSL PORTS	46
5.1.2	Submenu ETHERNET PORT	47
5.1.3	Submenu NETWORK SETTINGS	48
5.1.4	Submenu Voice over IP	49
5.1.5	Submenu MISCELLANEOUS	50
5.2	Management access via the RS232 interface	51
5.3	Remote Management access via Telnet	54
5.4	Description of management commands	55
5.4.1	HELP - Overview about all management commands	56
5.4.2	VERSION - Display of current version (administrative data)	56
5.4.3	SHOW Display of Status and Configuration information	56
5.4.4	SET -Configuration settings	58
5.4.5	STATS - Display of statistics	59
5.4.6	CLEAR - Clears statistic counters	60
5.4.7	PING – Network connectivity testing	61
5.4.8	REBOOT – Software Restart	61
5.5	Software Download	61

6	Warranty Details	64
6.1	Provisions of warranty	64
6.2	Limited Warranty	65
6.3	Repair Turnaround Time	65
6.4	Product Return	65
6.5	Billing	66
6.6	Recycling information	66

Annex	Product Specifications	67
Annex A	Hardware Features	67
Annex B	Software Features	69
Annex C	Mechanical Characteristics	69
Annex D	Environmental Conditions	70

1 Preface

1.1 Overview

We are pleased with your choice of our product P3 – Portable RADSL Communications System.

The purpose of this handbook is to provide an overview of the P3 system and to describe the installation, operation and maintenance procedures. Carefully reading these following instructions, will enable you to quickly familiarise with diverse features and advantages of this advanced broadband communications system.

1.2 General Information on P3 System Documentation

The documentation concept for the P3 system covers a number of individual documents (see Individual documents and ID numbers)

Document	Abbreviation	Id no.
Data Sheet English	DBe	951931
System Description English	SYSe	951933
User Manual English	IOMe	951935

Table 1 Individual documents and ID numbers

1.3 Safety

The P3 system has been developed with the latest technology and high degree of operational safety including compliance with the latest ISO 9001 standards.

The system is safe in normal operation. There are however, limited sources of danger that mustnot be neglected: inside the device exist dangerous currents and due care must be excercised. DCI recommends only experienced personnel to access P3's internal components.

The following rules must be observed to keep the technically unavoidable residual risk to a minimum

- installation, commissioning, configuration and de-installation solely by skilled personal using the relevant documentation; the user must have read and understood installation, operation and safety instructions,
- P3 system must be connected to earth ground by using the terminal screw attached to the front panel before connecting any external cabling,
- no smoking, no open flames, no sparks during battery charging process in close neighborhood to the unit
- in case of using the supplied AC/DC adapter it must be ensured that AC power plug fits securely into the AC outlet and that the voltage and frequency ratings indicated in this manual will correspond to the AC power source,
- in case of using any alternative external power supply (e.g. generator car battery, solar panel) it must be ensured that the produced voltage corresponds to the specified P3 DC input voltage range (see 3.3.6 / page 29),
- transport, storage and operation of the system solely under the specified environmental conditions (see Annex D / page 70),
- direct contact with water has to be avoided.
never place the device or any auxiliary part (e.g. AC/DC adapter) in a location where the danger exists that water would be able to penetrate into the device,
- the external AC/DC adaptor must not be applied under conditions of high relative humidity above 95% or condensation
- if a device with ground connection (e.g. PC desktop with protection earth) shall be connected to the RS232 interface the phone selector switch must be in position "VoIP" (this safety rule does not apply to devices without earth connection),
- operation of the system only in perfect working order:
in case of following situations the device has to be disconnected from the power supply and sent to repair:
- the power cable or connector are worn or damaged,

- water or other liquids penetrated the device,
- the case is damaged
- the device shows striking deviations from normal operation

CE Marking:

The P3 RADSL Communication System conforms to the following European directives:

Safety: CENELEC EN 60950

EMC: CENELEC EN 55024
CENELEC EN 55022

The CE mark is affixed to the system to indicate conformity with these directives.

1.4 Acronyms and Definitions

100Base-TX	100 Mbps Twisted Pair Ethernet
10Base-T	10 Mbps Twisted Pair Ethernet
ADSL	Asymmetric Digital Subscriber Line
DMT	Discrete Multitone
H.323	VoIP protocol suite defined by International Telecommunications Union
HDLC	High Level Data Link Control Protocol
LAN	Local Area Network
LCD	Liquid Crystal Display
LED	Light Emission Diode
MAC	Medium Access Control Protocol
MDI	Medium Dependent Interface
MDI-X	MDI with internal crossover
P3	Portable RADSL Communications System
PBX	Private Branch Exchange
POTS	Plain Old Telephone Service
RADSL	Rate-Adaptive ADSL

RJ45	8 pin connector/socket type
RS232	Serial Interface
RTP	Real Time Transport Protocol
Sub-D	Physical connector type
TELNET	TCP/IP oriented terminal program
TFTP	Trivial File Transfer Protocol
TxHIGH	ADSL transceiver unit transmitting at high data rate
TxLOW	ADSL transceiver unit transmitting at low speed
UTP	Unshielded Twisted Pair
VoIP	Voice over IP

2 The P3 Concept

2.1 Introduction

In the world of modern and diversified data applications, rapidly established communications links of high bandwidth are in increasing demand. This is particularly prominent in areas where no clear line of sight exist for radio signals to propagate or laying of fibre-optic cable is difficult. P3 were designed in close collaboration with Australian Army Signallers (RASC) specifically to overcome problems of establishing comms infrastructure in difficult terrain. In short, P3 is a soldier friendly device designed for fast and effective data and voice links set up over copper cables (or DON10) - without loss of functionality, compared to fibre-optic networks.

The P3 (**P** for **P**ortable; **3** independent RADSL transmission channels) is a stand alone communication system for data and voice links extensions: capable of 8Mbps throughput over 8Kms of copper cables.

The asymmetric transmission channels can be configured for high and low (or Master and Slave) data transmission independently. This is shown in the Figure 1 below.

Let's assume a simple point to point links must be established: consisting of 2 x P3s indicated by P3-a and P3-b and interconnected by one twisted copper pair. In configuration A, the asymmetric transmission capability is set for high bit rate transmission from P3-a to P3-b and low bit rate transmission from P3-b to P3-a. This is indicated by "highstream" and "lowstream" accordingly. In configuration B the opposite directions for "highstream" and "lowstream" are adjusted. The RADSL transceiver transmitting in highstream direction is denoted as TxHIGH whereas the

transceiver transmitting in lowstream direction is denoted as TxLOW. Each physical RADSL interface of a P3 system can be configured according to the real needs in a network configuration.

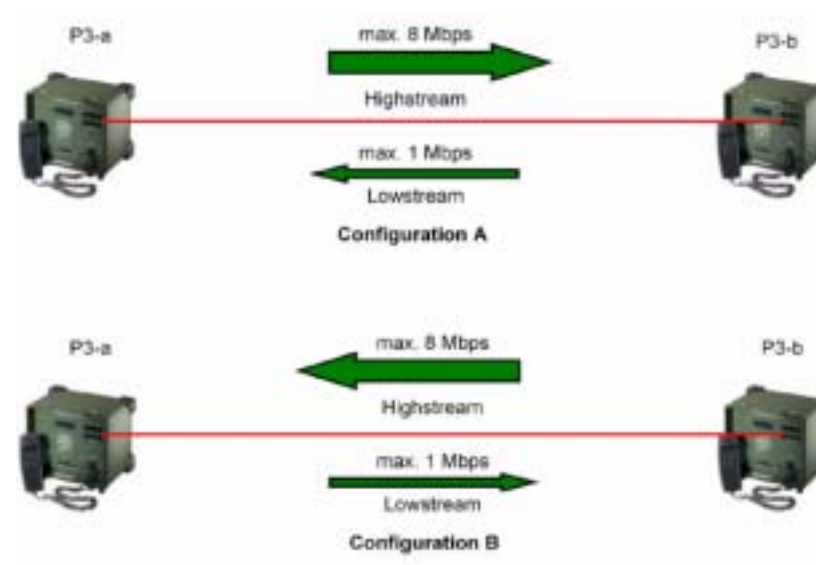


Figure 1 Definition of highstream and lowstream bitrates

In the highstream direction data rates up to max. 8 Mbps are achieved; for lowstream direction maximum data rates up to 1 Mbps can be achieved.

The multiport 100/10Base-T auto-negotiating Ethernet interface for symmetrical UTP cabling allows for universal interconnection of Ethernet LAN or PCs equipped with Ethernet adapter. The P3 features integrated transparent bridge functionality which is interfaced to the three RADSL lines.

Each P3 unit contains an integrated telephone handset for voice communications over the same copper cable as used for data, independently of the LAN traffic and even to LAN failures. This can be used to connect P3 to e.g. a PBX as well as for direct field telephone communication between adjacent P3s. Additional Voice over IP based network telephone function allows for secure voice communication in a meshed network to any other P3 location or even PCs connected to the network.

P3 is easily configured via the integrated tactile membran keypad and LCD display, thus no external computers are required. Furthermore a remote management is provided from any PC without the need of installing any dedicated management software.

The units's functionality can be greatly extended by connecting auxiliary units (video cameras, encryption modules etc.) to the Ethernet interface.

P3 can operate on the internal battery capable of up to 8 hours of operations under full load conditions (*significantly longer with only one or two RADSL channels in use*). Apart from the internal power supply P3 offers a number of external powering options, like AC/DC mains adapter, car batteries, generators or solar panels.

The following Figure 2 shows the P3 system layout with the main controls.

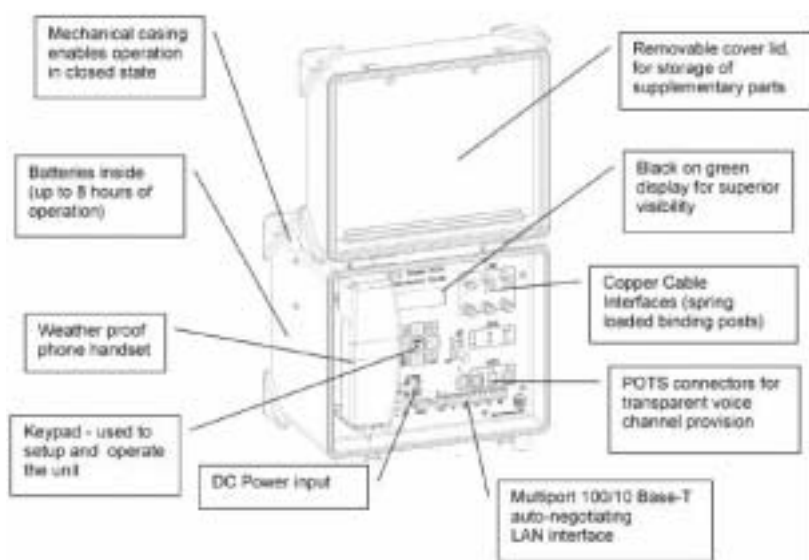


Figure 2 P3 Mechanical Layout

P3 is fully compliant with the P1 (single RADSL channel LAN extension) system, ensuring flexible and cost effective configurations. Please refer to 4.8 / page 39 for detailed information how to operate P1 and P3 in common system applications.

2.2 Feature Overview

Hardware Features

- 3 independent rate-adaptive RADSL DMT transceivers
- each transceiver can be configured for TxHIGH or TxLOW mode independently
- 6-port auto-negotiating 10 Base-T/100 Base-TX Ethernet interface
- POTS splitter provides a simultaneous voiceband channel
- keypad with tactile membrane control buttons
- antiglare black-on-green LCD display
- field telephone function – for independent point-to-point voice communications over the same copper line as used for data
- voice-over IP (VoIP) based network telephone function
- power supply by internal battery or external AC/DC adapter or alternative DC power source inputs
- up to 8 hours battery backup,
- LED indication of battery/mains feeding, battery charging, ADSL and Ethernet link and data transmission status
- sophisticated power management function feeding only those units which are in operational mode
- interconnection panel with spring loaded binding posts
- shock absorbent ruggedised casing, in-built carry handle
- operation with closed lid possible

Software Features

- Ethernet transparent Multiport Bridge
- Self-learning bridging algorithm (dynamic update of bridge lookup table)
- Spanning Tree Algorithm
- HDLC Encapsulation of MAC frames

- Configuration & supervision software supporting menu driven commands
- VoIP software stack (H.323 & RTP)
- TELNET based remote management access
- Software download via TFTP
- Extended diagnostics and testing functions via RS232 interface

2.3 Application

P3 offers many possibilities in the way the system can operate. From a simple point to point transparent LAN link to a complex web of "P3"s, including a data repeater, effectively extending the reach of "P3" from 5 to 10Kms to 15Kms, etc., see Figure 3 below.

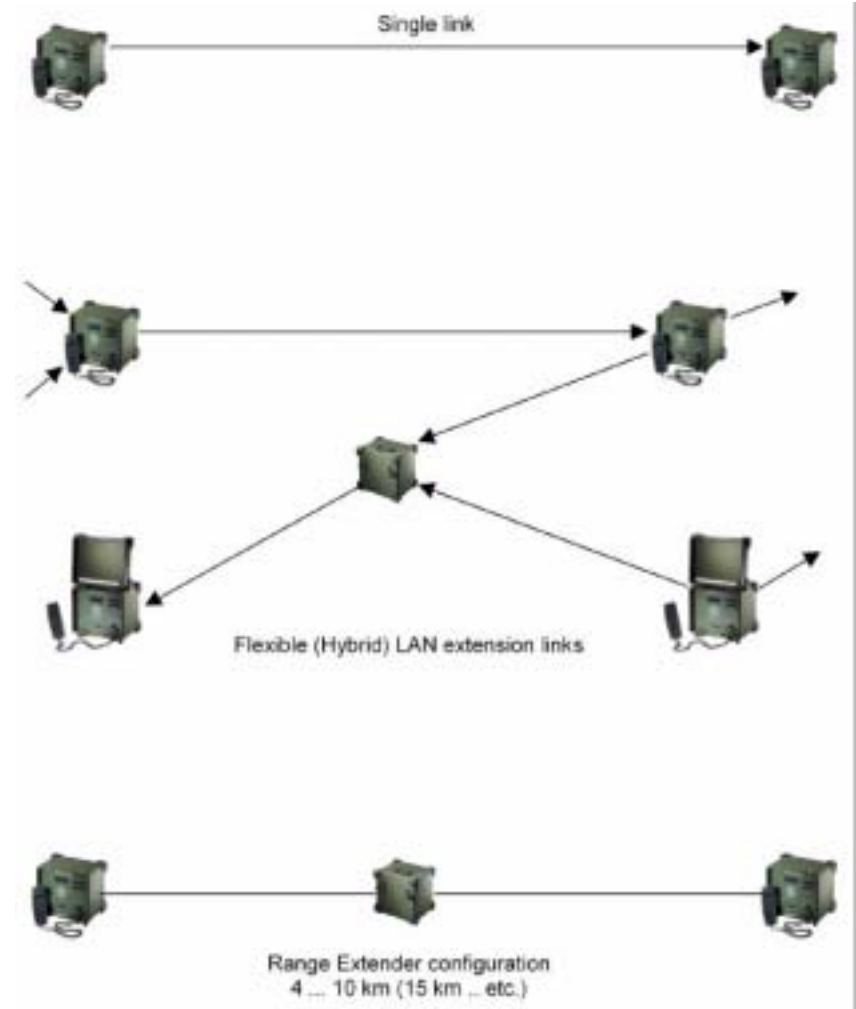


Figure 3

P3 Field Deployment Configurations

The main application of the system are:

- field deployed LAN networks, especially where no other data infrastructure exist or possible,
- general LAN network extensions and back-ups,
- telemetry applications where a rapid deployment of data networks is essential, including defence, fire brigades, police, mining, tele-medicine, remote instrumentation control and monitoring.
- range extender (P3 Repeater configuration) for up to 5 km with every hop.

3 Equipment Description

3.1 Frontpanel Layout

This section summarizes all interfaces, control and supervising elements of P3. Detailed information about it will be provided in the subsequent sections.

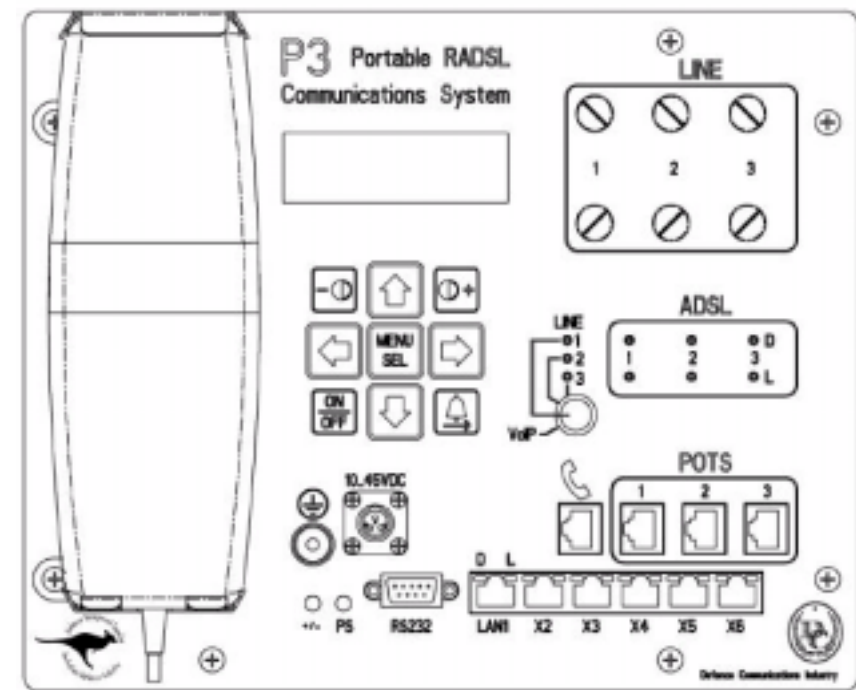


Figure 4 P3 Frontpanel Layout

LCD Display:

Provides P3 status and responses to the keypad management functions.

Keypad:

9 tactile membran keys supporting following functions:

- on/off switch,
- contrast control of LCD display,
- LCD menu navigation keys,
- ringing button for point-to-point telephone function.

Line Interface:

Spring loaded binding posts for easy connection of up to three copper lines.

ADSL LED block:

Indicates link and data transmission status of ADSL transceivers.

POTS Interface:

Enables transparent usage of the line for voiceband applications.

Handset Interface:

Connecting the integrated handset or ordinary POTS set for VoIP based network telephone or point-to-point field telephone function.

Handset:

Ruggedized POTS handset with integrated dialing block.

Telephone mode selector switch:

Selection of desired telephone function – VoIP based network telephone or point-to-point field telephone function, respectively.

Ethernet Interface:

6 LAN ports available operating at 10Base-T or 100Base-Tx Ethernet mode. Attached LEDs indicate link and data transmission status.

RS232 Interface:

Useful for extended maintenance and diagnostics functions (e.g. software download)

Power Supply interface:

For all DC input sources in voltage range between 10V and 45 V. Attached LEDs indicate power status and voltage polarity mismatch.

Ground Terminal:

Connects P3 to earth ground.

3.2 Control and Monitoring Elements

3.2.1 Keypad Block

The tactile membrane control buttons are arranged in a '3x3' push button structure (see Figure 5).

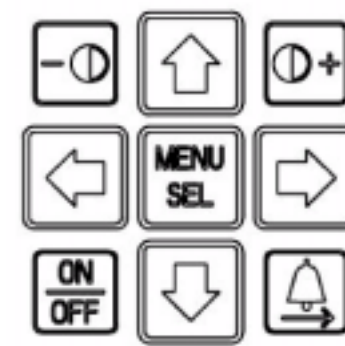


Figure 5 P3 Keypad Arrangement

From a functional point of view according to Figure 6 the four grey shaded buttons are used for hardware related functions, while the white background buttons are used for LCD menu control.

LOWER CONTRAST	UP INCREMENT VALUE	HIGHER CONTRAST
LEFT DECREMENT VALUE / ESCAPE	MENU / SEL VALIDATION / MAIN MENU	RIGHT EXECUTE / INCREMENT VALUE
POWER ON / OFF	DOWN DECREMENT VALUE	Ringing Button

Figure 6 Functional Description of P3 Keys

The two corner buttons on the top control LCD contrast. It is worthful to adjust them to optimize LCD visibility under different ambient light conditions.

On the bottom left corner the power on/off switch is located.

In point-to-point field telephone function the ringing button on the bottom right corner can be pressed in order to call the opposite P3 at the line where the phone selector switch is directed to.

The remaining white background buttons in the figure above provide software control of P3.

By pushing the menu key (centre key) the program changes into the control mode. The main menu is displayed. The respective active menu item will be displayed highlighted by a blinking cursor.

During active control mode the keypad is interpreted as follows:

- “UP” or “DOWN”: the complete menu is scrolled accordingly in a circular way
- “RIGHT”; executes current menu selection which may result for lower-level menu selection or execution of selected command.
- “LEFT” return to previous upper-level menu selection or return from main menu to status display mode.
- “MENU” return to main menu

During parameters setting mode the buttons are programmed for selection of parameter and for setting the corresponding parameter values. In this case the keys indicated by “UP”, “DOWN”, “LEFT” and “RIGHT” have to be used for selecting the parameters in the direction as listed on the display (*i.e. in the case of parameters being listed vertically “UP” and “DOWN” have to be used and, in the case of parameters being listed horizontally “LEFT” and “RIGHT” have to be used*). Singular parameters have to be regarded as listed vertically.

Selected values are entered by pushing the “SEL” key (centre keypad button). Moving to next menu without pushing “SEL” will ignore the selected settings.

The parameter setting mode can be abandoned by scrolling through the displayed parameter list until no further parameter is available in the respective direction.

Parameter arrangement		
Key	Vertical order	Horizontal order
RIGHT	Increment parameter value	Previous parameter
LEFT	Decrement parameter value	Next parameter
UP	Previous parameter	Increment parameter value
DOWN	Next parameter	Decrement parameter value
SEL	Selection (Parameter valid)	Selection (Parameter valid)

Table 2 Key functions in parameter setting mode

During selection of parameter values, typing the „Increment/Decrement-parameter- value“ key will change the parameter values step by step (single step mode). Pushing down the key for longer periods the granularity of parameter values will increase within a first time period linear and after a certain time exponentially. Changing the direction will result in decreasing of value granularity. Inactivation for some time will reset the step width to the lowest one.

In this case values within large intervals can be adjusted very economically. Please take care by typing the correct keys fast enough in order to adjust the required granularity steps for quick parameter settings before a time interval will be interpreted as a pause for switching back to single step mode.

Most parameters do not need this procedure due to small parameter value ranges.

Activation of dedicated operational states by following keypad combinations:

- “RIGHT+LEFT” modifies the control mode in a way that previous menu sequences are recommended to the user for subsequent operations. This may simplify the navigation within the menu structure if specific system parts have to be configured or supervised. The function is deactivated by typing these key combination again.

- “RIGHT+SEL” switch on display light permanently (only if manual display light control is selected)
- “LEFT+SEL” switch off display light permanently (only if manual display light control is selected)

3.2.2 System Status Display

After switching the P3 ‘on’, the system status is displayed on the LCD display. Dynamic refresh/update of this information is performed periodically.

The following general system status information can be obtained from the display in the default mode (i.e. neither control mode nor parameter settings mode is active):

The top row shows status information about LAN interfaces and power supply:

ETHER 10 HDuplex: LAN interfaces operating at 10 Mbps in half-duplex mode

ETHER 100 HDuplex: LAN interfaces operating at 100 Mbps in half-duplex mode



Battery operation (normal battery status, capacity >30%)



Battery low (capacity >10%)



Battery critical low (capacity <10%)

Note: The periodic display cycle of all battery icons symbolizes the battery charging process (including charge retainment) which takes place as soon as an external power adaptor is connected with P3.

The lower three rows characterize the status of ADSL Transceivers 1..3:

Transceiver operates in TxHIGH-Mode:

TX:xxxx RX:yyy: ADSL link displaying data rates [kbps] established

NOLINK (TxHigh): No ADSL link available

INIT (TxHigh): During ADSL link activation

Transceiver operates in TxLOW-Mode:

RX:xxxx TX:yyy: ADSL link displaying data rates [kbps] established

NOLINK (TxLow): No ADSL link available

INIT (TxLow): During ADSL link activation

Transceiver disabled:

DISABLED: ADSL transceiver switched off

Optionally a fifth row can be displayed when pressing the DOWN key. It displays the adjusted IP address of P3 (required for TELNET management and VoIP based network telephone). It disappears when pressing the UP key.

3.2.3 LED Signaling

Table 3 shows the P3's LED signaling scheme.

Designation	Color	Status	Description
PS	Green/ orange/ red	Steady green	External power source connected; Battery fully charged (charge retainment)
		Steady orange	External power source connected; Battery is charging
		Steady red	Battery operation; (Battery capacity > 30%)
		Slow blinking red	Battery low; (Battery capacity >10%)
		Fast blinking red	Battery critical low; (Battery capacity ≤10%)
		Off	P3 switched off and no external power source connected

Table 3

Local LED signaling

Designation	Color	Status	Description
+/-	Red	On	Invalid polarity of external DC source
		Off	External DC source polarity ok
L (LAN)	Green	On	LAN link established
		Blinking	Port temporarily partitioned because of excessive collisions
		Off	No LAN link
D (LAN)	Yellow	Blinking	During reception of Ethernet Frames
L (ADSL)	Green	Steady	ADSL link established
		Blinking	ADSL link activation
		Off	No ADSL link
D (ADSL)	Yellow	Blinking	Data transfer via ADSL line
Line 1..3	Red	Steady	Incoming or outgoing ringing signal (point-to-point telephone function)

Table 3 Local LED signaling

3.2.4 Acoustical Alarm

If battery voltage becomes low or critical low an acoustical notification is possible. This function can be enabled by the LCD menu or command line interface. In default state this alarm is disabled.

3.3 Interfaces

3.3.1 LAN Interface

The P3 unit contains six Ethernet LAN ports located at the lower right part of the front panel (see Figure 7).

The left one is a MDI type RJ45 port or a connection be made in a MDIX type port of a Hub or Switch with supplied 1:1 cable.

The remaining five interfaces are MDIX type RJ45 ports destined to a PC-Host MDI connection with supplied 1:1 cable.

A general rule for the correct use of a normal 1:1 cable or a crossover cable is the following: To connect a MDI interface to a MDIX interface, use a normal 1:1 cable. To connect a MDI interface to another MDI interface or a MDIX interface to another MDIX interface, use a crossover cable.

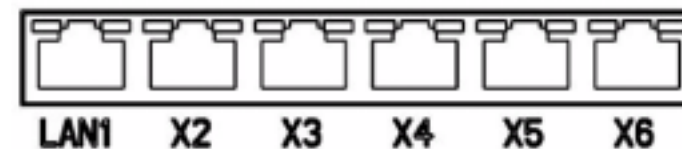


Figure 7 Ethernet LAN ports

Pin assignment of the RJ-45 Ethernet sockets is shown in Table 4 and Figure 8 respectively:

Pin	MDI	MDIX
1	TX+ (transmit data +)	RX+ (receive data +)
2	TX- (transmit data -)	RX- (receive data -)
3	RX+ (receive data +)	TX+ (transmit data +)
4 .. 5	Not used	Not used
6	RX- (receive data -)	TX- (transmit data -)
7 .. 8	Not used	Not used

Table 4 Pin assignment of the RJ45 socket

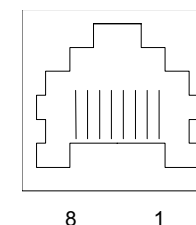


Figure 8 Front view of the RJ-45 socket

All interfaces are capable of supporting 10Base-T or 100Base-TX Ethernet half duplex transmission. The actual speed is determined by auto-negotiation between P3 and the corresponding opposite node. If the opposite node also supports 100Base-TX this high speed will be adjusted. On the other hand when the opposite node is only capable of 10Base-T operation this low rate will be adjusted.

If all connected Ethernet links are able to support 100Base-TX 100 Mbps transmission speed is adjusted for the integrated repeater; otherwise all links are forced to run at 10 Mbps for compatibility reasons.

The P3 allows the use of either shielded or nonshielded cables of category 3,4 or 5.

For 100 Base-TX category 5 is strongly recommended to ensure high quality of transmission. The maximum cable length shall not exceed 100 m.

3.3.2 Line Interface

P3 provides three independent line interfaces – each of them for simultaneous ADSL and voiceband transmission.

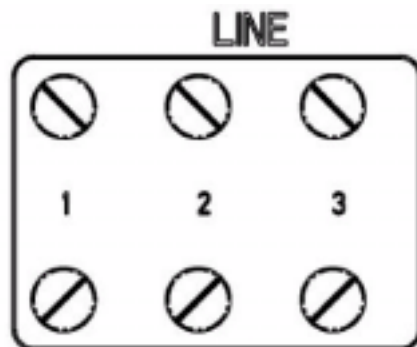


Figure 9 Line port binding posts

The spring loaded binding posts are especially suited dedicated for direct connection of steel reinforced copper wires - simply by pressing the connector buttons and inserting the wires into the prepared holes. No precautions are necessary for correct line polarity.

The line length influences the transmission data rate. The rate adaptive ADSL operation mode will automatically adjust the highest possible data rate dependent on the actual line length and diameter.

Always use twisted pair cable types because non-twisted cable types may reduce the ADSL transmission performance significantly.

3.3.3 POTS Interface

Three independent RJ45 POTS interfaces serve for transparent provision of the voiceband channel.

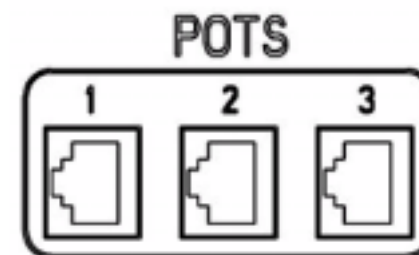


Figure 10 POTS ports

For example at one P3 an ordinary POTS set or the integrated handset can be attached to the RJ45 socket whereas at the other location a PBX may be connected.

The telephone mode selections switch shouldn't be in position of corresponding line in order not to influence the connection by the integrated handset.

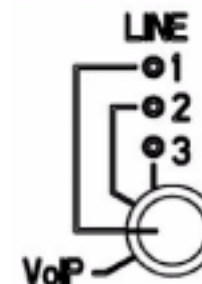


Figure 11 Telephone mode selector switch

Pin assignment of the RJ45 socket for POTS interface is shown in Table 5 and Figure 8 respectively:

Pin	Description
1..3	Not used
4,5	POTS wires
6..8	Not used

Table 5 Pin assignment of the POTS interface

Recommended cable type: UTP-3 or higher category (e.g. UTP-5, STP). The cable length shall not exceed 100 m.

3.3.4 Handset Interface

The handset interface connects the integrated POTS handset with P3. The standard two wire telephone interface enables also usage of alternative POTS sets if necessary.



Figure 12 Handset interface

The socket's pin assignment, recommended cable type and maximum cable length is identical with information provided in previous section.

3.3.5 RS232 Interface

The RS232 serial interface serves for P3 service and diagnostic management access from a notebook or PC. If a device with protector connection (e.g. PC desktop with protector ground) shall be connected to the RS232 interface the phone selector switch must be in position "VoIP" (this safety rule does not apply to devices without earth connection),

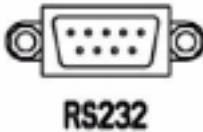


Figure 13 RS232 interface

Pin assignment of the Sub-D jack for connecting a configuration terminal is shown in Pin assignment of the Sub-D jack for connecting a configuration terminal is shown in and Figure 14 respectively.

Pin	Description
1,4,6..9	Not used
2	Transmit data
3	Receive data
5	Ground

Table 6 Pin assignment of the RS232 interface

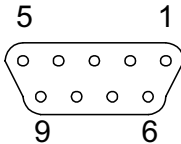


Figure 14 Front view of the RS232 socket

The cable cord shall be shorter than 3 m.

3.3.6 DC Power Supply Interface

The DC power supply interface supports a universal DC input voltage range between 10 V and 45 V which can be provided by the supplied AC/DC adaptor or alternative source like

- car batteries
- generators
- solar panels
- etc.



Figure 15 DC Power Supply Interface

Pin	Description
A	Plus
B	Minus
C	Unconnected

Table 7 Pin assignment of the DC Power Supply Interface

3.4 Miscellaneous

3.4.1 Battery

The integrated 12V lead acid battery is maintenance free. The nominal lifetime specified by the manufacturer [Sonnenschein] is 10 years. Please contact DCI should the battery ever become not chargeable or require replacement.

The battery supplies the unit up to 8 hours at 20°C/68°F ambient temperature and up to 4 hours at very low temperature of -25°C/-13°F. If the battery voltage becomes too low to guarantee P3's reliable operation the unit is shutdown automatically.

The battery is recharged as soon as an external power source is connected to P3. The maximum recharging time of an empty battery amounts about 5 hours in switched off condition or 12 hours if the unit is operational.

Please do not charge the battery at ambient temperature above 40°C/104°F because this may reduce the batteries lifetime.

In case the P3 is not used for a longer time periode it has to be stored in a free from frost environment to prevent battery damage.

P3 with equipped lead acid battery is not subject of the transport regulations on dangerous good.

3.4.2 External AC/DC Adaptor

The external AC/DC adaptor converts input voltage between 90..260 VAC and 47..63 Hz input frequency into output voltage of +24 VDC. The maximum output power amounts 60 W, which enables P3 internal battery charging and operation simultaneously.

The DC output contains the following protections:

- Overvoltage Protection
- Short circuit protection
- Overload protection

In all cases the output will shut-down and latch-off till restarting.

When using the adapter relative humidity of 95 % shall not exceed. Condensation conditions must be avoided.

3.4.3 POTS Handset

The integrated POTS handset can be used for both VoIP based network telephone function or point-to-point field telephone function respectively.

The on-hook/off-hook key is located at the bottom side of the unit. It must be pressed to enable receiving calls. Therefore please make sure, that the handset is always inserted into the attachment angles when no call is active.

For VoIP based network telephone function the dialing keys „0“..“9“ are used to enter the destination number. Integrated calling number memories and a re-dialing function facilitate the entry of phone numbers.

Re-dialing function:

Press key:



The last dialed phone number will be taken automatically for setup of the next call

Storage of dialing numbers:

1. Off-hook the handset and wait for dialing tone

2. Press key:



3. Press key:



4. Type in the desired memory index (0..9)
5. Type in the phone number to be stored on this memory index

6. Press key:



Dial with stored number:

1. Off-hook the handset and wait for dialing tone

2. Press key:



3. Type in the memory index

Dialing memory deletion:

1. Off-hook the handset and wait for dialing tone

2. Press key:



3. Press “1” key:

4. Dial „1590“

5. Press key:



6. Dial “251”

7. Press key:



All memory indices will be deleted now.

4 Installation Instructions

4.1 Unpack and Inspect

Upon receiving P3 unpack the unit and inspect it for signs of damage. If it has been damaged in transit, report the extent of the damage to the transportation company and to DCI immediately. Order replacement equipment if necessary.

The following standard items are shipped with each P3; please check your package for all the expected items.

Component	Number	Description
P3 Base Unit	1	Aluminium case with closable lid
POTS Handset	1	Handset for telephone functions
AC/DC Adapter	1	External adapter converting mains voltage into 24 V DC voltage
Mains Cable for AC/DC Adapter	1	With power plug according to national specifications
LAN Cable	1	1:1 connecting cable for inter-connecting P3 and a Ethernet Hub, Switch or Host with RJ-45 connector at both sides (black colour)
Management Cable	1	1:1 connecting cable for inter-connecting P3 and a PC with 9 pin Sub-D male and female connector
Operations Manual	1	This document

Table 8 P3 scope of delivery

If shipment is incomplete or incorrect, contact **dci** as described in in 6.4 / page 65

4.2 General Installation Guidelines

The P3's location of use must be in accordance with the safety rules (see 1.3 / page 5). This especially implies:

- direct contact with water has to be avoided.
never place the device or any auxiliary part (e.g. AC/DC adapter) in a location where the danger exists that water would be able to penetrate into the device,

Further advice:

- at high ambient temperature (> 40°C/104°F) never expose the system to direct solar radiation immediately before or during it's operation,
- excessive exposure to dust must be avoided when device lid is open,

You can operate the unit with both opened or closed lid, respectively. Before closing the lid make sure that all external cabling is located in the rubber cable insertion slot at the bottom side of the unit.

Before switching on or connecting any external power source to P3 the unit must be connected to ground. Use for this purpose the yellow-green coloured terminal screw on the front panel after you have opened the lid.

For **switching on** the unit **press the On/Off button** on the lower left corner of the keypad for a short moment. For **switching off** the unit the On/Off button must be **pressed for at least 3 sec** in order to avoid unintentionally shutdown. After switching off the unit please wait for at least 10 sec before switching on it again.

4.3 ADSL Connection Setup

1. Installed twisted pair copper line connection between spring loaded binding posts of different P3 units

Note: Never shortcut the ports of P3 because the resulting loops will disturb the bridging of Ethernet frames through the unit!

2. Configure the ADSL Transceivers. TxHigh must be selected at the line end where high data rate shall be transmitted, whereas TxLow must be adjusted at the opposite side. For configuration of ADSL Transceiver's operating mode refer to sections 5.1.1 / page 46 and 5.4.4 / page 58.
3. Check whether the corresponding ADSL link LED begins to flash and shows steady green indication after some seconds. The ADSL link is now active and ready for Ethernet packet transfer. You can see the automatically adjusted data rate at the LCD display

It is recommended to disable ADSL transceivers not used for network connection in order to save power consumption. This is especially important during internal battery operation. For switching off transceivers see same sections as mentioned above.

4.4 Spanning Tree Function Setup

For protection purposes it is possible to use several different connections between two P3 or to setup arbitrary ring or meshed network topologies (see Figure 16). The spanning tree algorithm ensures that only one of several possible links between two units will be used for data transmission in order to prevent endless Ethernet frame transmission loops. When network topology changes e.g. because of link failure the algorithm automatically determines new paths for all reachable nodes. However this procedure takes some time of about 30 s while application data transmission is interrupted. Therefore it is recommended to enable spanning tree algorithm only where required.

You can check whether spanning tree is enabled or disabled by the menu NETWORK SETTINGS - SPANNING TREE. Enable spanning tree function is further reviewed in 5.1.3 / page 48 and 5.4.4 / page 58.

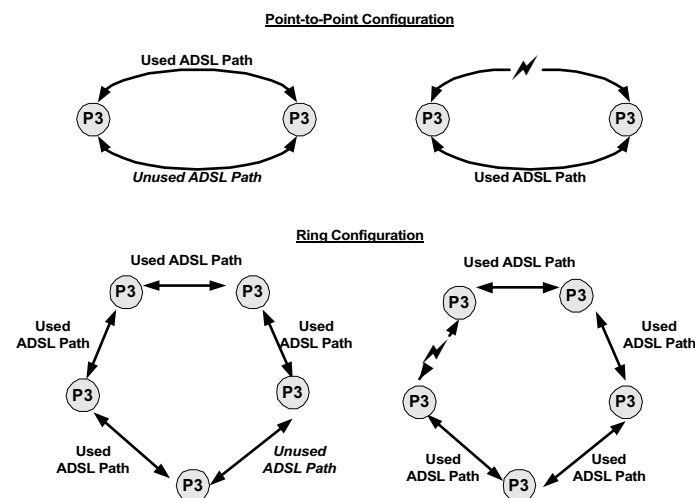


Figure 16 System Configurations requiring Spanning Tree Function

4.5 Ethernet Bridge Setup

1. Connect network units (PCs, workstations, hubs, switches, routers etc.) with P3's LAN interfaces (refer to 3.3.1 / page 23 for cabling and 10Mbps or 100Mbps mode related information).
2. Check whether the green link LED signals Ethernet link availability for the corresponding LAN port
3. The bridging of Ethernet Frames via P3 does not require any configuration. All hosts in the network will be reachable as well as they would belong to a common Ethernet segment

4.6 Point-to-Point Field Telephone Function Setup

Note: For safety reasons no device with ground connection may be attached to RS232 interface when point-to-point telephone function is used.

1. Connect the handset (or an ordinary phone set) to the handset interface which is located directly below the telephone mode selector switch
2. Off-hook the handset.
3. Switch the telephone mode selector switch to the line (1..3) where you want to direct the call.
4. Check whether there is a twisted pair connected to the corresponding line binding post.
5. Call the user at opposite P3 by pressing the button marked with a bell symbol at the bottom right corner of the LED keypad. The corresponding line LED above the phone selector switch indicates that you are calling desired direction.
6. On the opposite side the incoming call is always indicated by the corresponding line LED above the telephone mode selector switch and a acoustic alarm is generated independently of the actual telephone selector switch position. Additionally the handset rings if the telephone mode selector switch is already in the line position of incoming call.
7. The user at the opposite side has simply to off hook the handset and to switch the telephone mode selector switch to the indicated position in order to enable voice communications.
8. On-Hook both handsets after the call has finished

4.7 VoIP based Network Telephone Function Setup

Note: Code-protection of the VoIP feature has been superceded. All P3 units come with VoIP enabled as a standard.

1. Setup the IP address and subnetmask of P3. This address is required to reach your unit from other stations. If P3 and other stations supporting VoIP based network telephone which belong to the same IP sub-network the network address part of IP addresses (which is indicated by the subnetmask) must be equal. Otherwise additionally a default router entry is necessary. How to perform these network settings is explained in section 5.1.3 / page 48.
2. Setup the base address and address mask. The base address is used in short dialing mode to calculate the destination IP address of the node to be called. The part of the base address which is used for this calculation is marked by the address mask. These and all following configuration settings are described in section 5.1.4 / page 49.
3. Setup the voice coder type. Voice coder types G.711 serve for best quality phone calls at 64 kbps data rate. A-law and μ -law identify different PCM encoding schemes. The G.723 codecs save bandwidth by applying voice compression. All VoIP stations in the network must use the same coder type.
4. Select silence suppression if desired. It will save transmission bandwidth during voice pause.
5. Reboot P3 in order to assure that new settings are used by the system
6. Switch the telephone selector switch into position „VoIP“ at local and all P3 which shall be reachable by VoIP based field telephone function.
7. Off-Hook the handset
8. Wait for dialing tone.

9. Dial the desired number . Two numbering formats are supported:

Long Dialing Format: Enter the full IP address including preceding „0“ (in 12 digits format).

Example: Called Node: 192.168.1.2
 12 digits format: 192.168.001.002
 Dialed Number: 192168001002

Short Dialing Format: Enter 9 as indication for this format followed by the remaining address part which is not covered by the base address.

Example: Called Node: 192.168.1.2
 Base Address: **192.168.1.0**
 Address Mask: **255.255.255.0**
 Dialed Number: 9002

10. You will hear the ringing or occupied tone now dependent on the network connection has been established successfully and the opposite station is able to accept the call.

11. On the opposite station the telephone rings to signal incoming call

12. As soon as the opposite handset is off-hooked the voice communication will be possible.

4.8 Mixed P3/P1 Applications

P1 modems provide LAN interconnection at speeds of up to 8 Mbps and integrate bridging and routing functionality.

General information about it's installation and configuration contains the corresponding P1 user manual.

This section addresses all specific information which is useful for operating P3 and P1 together in common system applications.

Operating Mode

Always configure P1 for "bridge" operating mode (default setting). You can check this e.g. with a terminal connected to P1 serial interface and issuing the command "show mode". If disabled you can enable bridge mode with the command "set mode". Don't forget to call write command to save this modification permanent. It doesn't matter whether management IP port is enabled or disabled.

P3/P1 connection

Steel reinforced copper wires can be directly connected to both P1 and P3 at the integrated spring loaded binding posts. If you want to connect a P3 ADSL port with P1-H it must be configured for TxLOW operating mode. Vice versa if you want to connect a P3 ADSL port with P1-L it must be configured for TxHIGH. See 5.1.1 or 5.4.4 to get informed how to perform these settings.

Transparent Voice Channel

If you want to use the voiceband channel transparently for other applications it is directly accessible at the corresponding POTS interface of P3 (The telephone mode selector switch should not be directed to this line). At P1 side you need a external splitter to be inserted between P1 and the copper twisted pair transmission line. Splitter units can be ordered as a option (see P1 manual).

P1 Management

The P1 management command "remote" which is used to perform management actions on the opposite P1 from the local RS232 terminal is not applicable when connecting P1 with P3.

4.9 Default Settings

P3 provides default configurations as shown in Table 9:

Parameter	Default Value
ADSL operating mode Line #1 Line #2 Line #3	TxHigh TxLow Disabled
ADSL target signal-to-noise ratio (SNR) Highstream direction Lowstream iirection	3 dB 3 dB
ADSL interleaver delay Highstream direction Lowstream direction	0 ms 0 ms
Spanning Tree mode	disabled

Table 9 Default configuration

Parameter	Default Value
IP address	192.168.1.1
Subnet mask	255.255.255.0
Default gateway	0.0.0.0
VoIP mode	enabled
Base Address	192.168.1.0
Address Mask	255.255.255.0
Coder Type	G.723 (6,3 kbps)
Silence Suppresion	disabled
Voice volume	32
Tone volume	24
Shutdown-time for LCD display background light	5 min
Acoustical alarm locking state	Disabled
Telnet password	pw-p3

Table 9 Default configuration

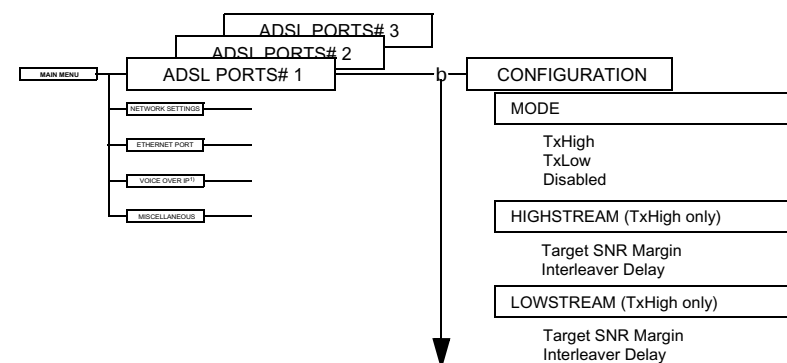
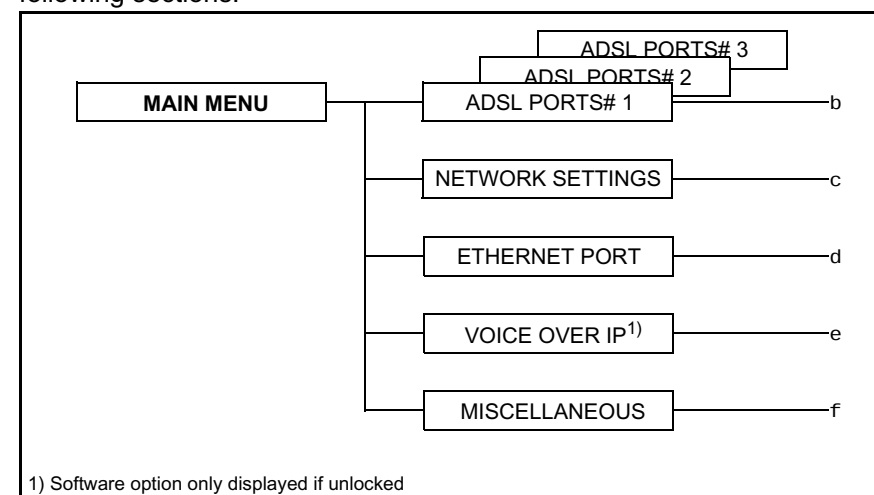
Information about parameter settings are described in section 5 / page 42.

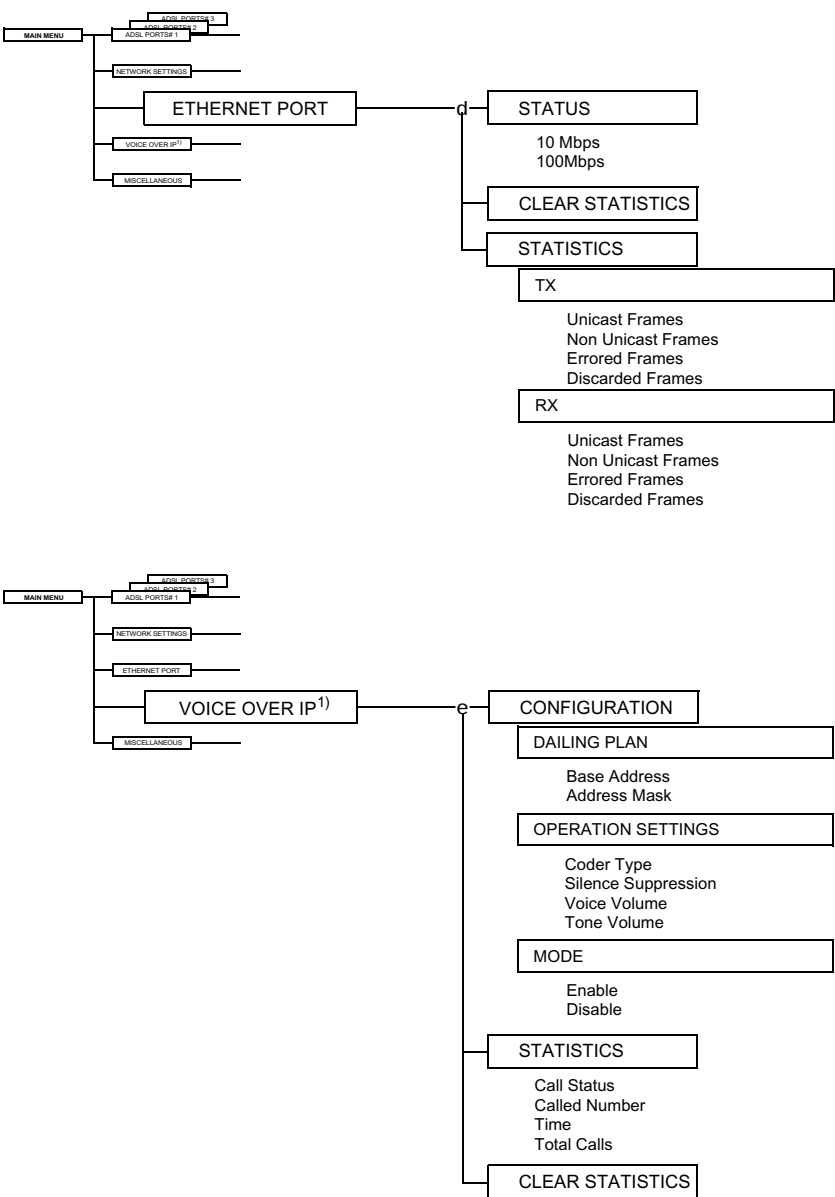
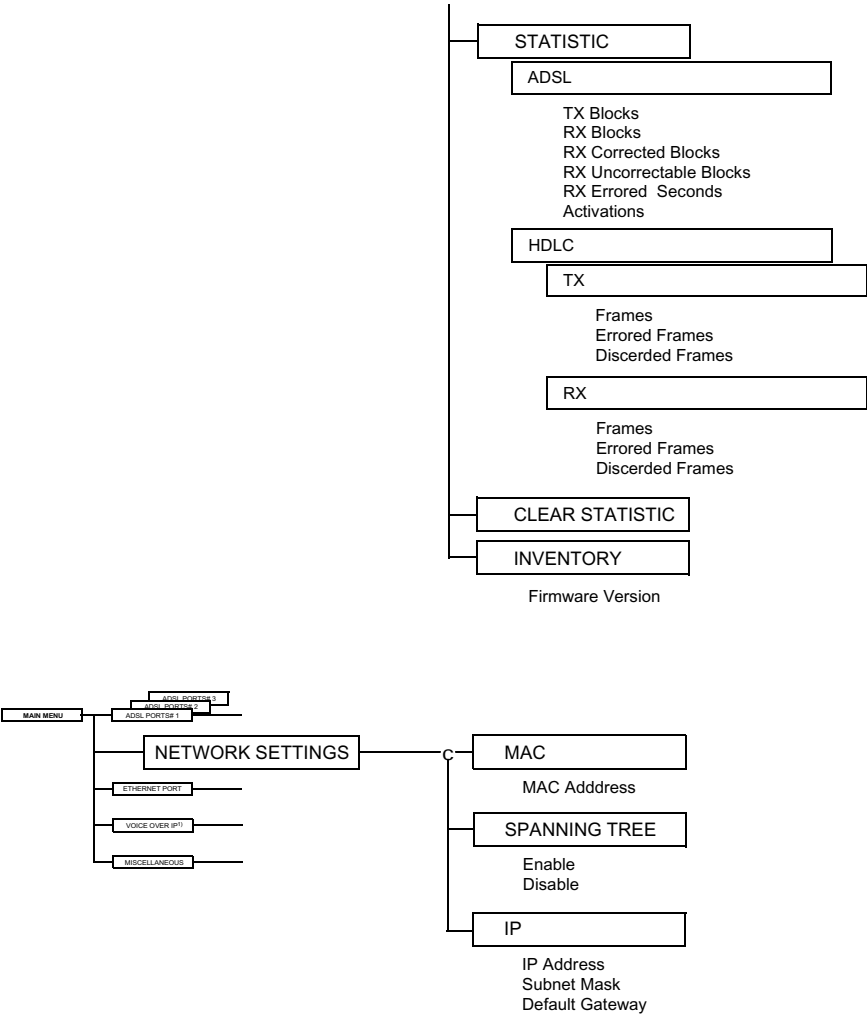
5 Configuration

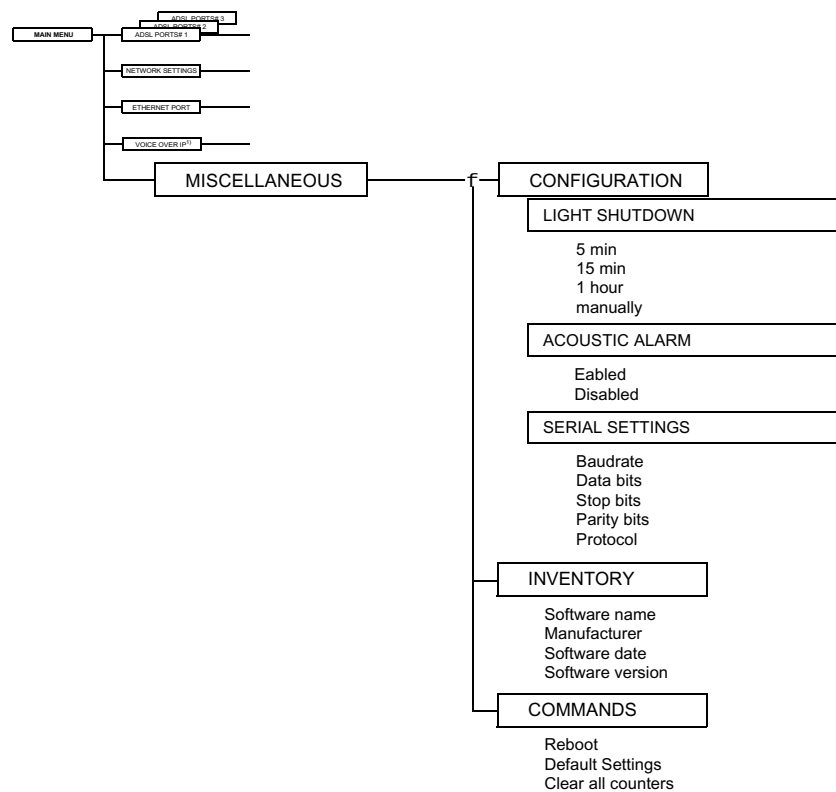
5.1 Management access via LCD menu

The integrated LCD display and keypad enables immediate configuration and monitoring of P3 without the need for any additional tool like PC etc. The menu structure is displayed in following picture.

The operation of the keypad to navigate through the menu items and to select or modify parameters is explained in section 3.2.1 / page 18. The main menu is divided into five categories which are described in the following sections.







5.1.1 Submenu ADSL PORTS

The submenu ADSL contains all management elements for configuration and retrieving of statistical and inventory data of ADSL transceivers.

Submenu	Purpose	Parameters	Parameter values
CONFIGURATION - MODE	Setup mode of ADSL transceiver	Mode	TxHigh, TxLow, Disabled
CONFIGURATION - HIGHSTREAM	Setup highstream transmission parameters	Target SNR Margin ¹⁾ Interleaver Delay ²⁾	0..15 dB 0..16ms
CONFIGURATION - LOWSTREAM	Setup lowstream transmission parameters	Target SNR Margin ¹⁾ Interleaver Delay ²⁾	0..15 dB 0..16ms
STATISTICS - ADSL	Shows ADSL statistical data	TxBLOCKS RxBLOCKS RxCorrect Blocks RxUncorrectable Blocks RxErrored Seconds ³⁾ Activations	
STATISTICS – HDLC - TX	Shows HDLC Transmitter statistics	Frame Number Error Number Discarded Frames due to buffer overflow	
STATISTICS – HDLC - RX	Shows HDLC Receiver statistics	Frame Number Error Number Discarded Frames due to buffer overflow	
CLEAR STATISTICS	Clears statistic counters		
INVENTORY	Shows ADSL firmware version	Firmware version	

Table 10 Submenu ADSL description

1) Target SNR Margin specifies a target signal-to-noise ratio which must be met during line

initialization. A high target SNR will make the system more resistant against noise disturbance on the cost of a slightly reduced data rate.

- 2) Interleaver enables burst error correction for up to 500 μ s duration. However this causes an additional delay which is specified with this parameter. The optimal configuration can be achieved by selecting a maximum possible interleave channel delay in relation to a tolerable delay of the application or higher layer protocols respectively.
- 3) Second interval where at least one of the following events occurred:
 - CRC checksum error
 - Loss of signal (LOS) defect
 - Severely errored frame (SEF) defect

5.1.2 Submenu ETHERNET PORT

The submenu ETHERNET contains all management elements for supervision of the six Ethernet ports.

Submenu	Purpose	Parameters	Parameter values
STATUS	Shows interface speed	Mode	10 Mbps, 100 Mbps
STATISTICS - TX	Shows Ethernet Transmitter statistics	Unicast Frames Non-Unicast Frames Error Number Discarded Frames due to buffer overflow	
STATISTICS - RX	Shows Ethernet Receiver statistics	Unicast Frames Non-Unicast Frames Error Number Discarded Frames due to buffer overflow	
CLEAR STATISTICS	Clears Ethernet statistic counters		

Table 11 Submenu ETHERNET description

5.1.3 Submenu NETWORK SETTINGS

The submenu NETWORK SETTINGS contains all network related management elements.

Submenu	Purpose	Parameters	Parameter values
MAC ADDRESS	Display of MAC Address	MAC Address ¹⁾	
Spanning Tree	Enable/Disable Spanning Tree algorithm	Mode	Enabled Disabled
IP SETTINGS	Setup of IP parameters	IP Address ²⁾ Subnet Mask ³⁾ Default Gateway ⁴⁾	

Table 12 Submenu NETWORK SETTINGS description

- 1) The MAC address is assigned as layer 2 address to the local IP port which is used for TCP/IP applications like TELNET and VoIP. It is set uniquely by *pmns* and can not be modified.
- 2) The IP address denotes the local IP node which is used for TCP/IP applications. It must be configured by the user in order to match to and be unique within the local subnetwork (i.e. same subnet number but different node number).
- 3) The subnetmask identifies the subnet part of the IP address (bits which are „1“). Vice versa all „0“ bits identify the node number within the subnetwork.
- 4) As default gateway the IP address of a router within the local subnetwork may be entered as an option. All IP packets with destination addresses outside the local subnet will be directed to this router.

5.1.4 Submenu Voice over IP

The submenu Voice over IP contains all management elements for configuration and retrieving of status and statistical data of VoIP based network telephone function.

Submenu	Purpose	Parameters	Parameter values
CONFIGURATION – DIALING PLAN	Setup short dialing mode parameters	Base Address ¹⁾ Address Mask ²⁾	
CONFIGURATION MODE	Disable/Enable VoIP mode	Mode	Enabled Disabled
CONFIGURATION – OPERATION SETTINGS	Setup VoIP operational parameters	Coder Type ³⁾ Silence Suppression ⁴⁾ Voice Volume Tone Volume	G.723.1 (6,3 kbps) G.723.1 (5,3 kbps) G.711 (A-law) G.711 (μ-law) Enabled Disabled 0..63 0..31
STATISTIC	Shows information about current VoIP call	Call status Called Number Call Duration Total Calls	
CLEAR STATISTICS	Clears VoIP statistics counters		

Table 13 Submenu Voice over IP description

- 1) Base address is used in short dialing mode to calculate the destination IP address of the node to be called (see 4.7 / page 38).
- 2) Address mask identifies the part of base address to be used to calculate the destination IP address
- 3) Voice coder types G.711 serve for best quality phone calls at 64 kbps data rate. A-law and μ-law identify different PCM encoding schemes. The G.723 codecs save bandwidth by applying voice compression. All VoIP stations in the network must use the same coder type.
- 4) Silence suppression capability saves transmission bandwidth during voice pause.

5.1.5 Submenu MISCELLANEOUS

The submenu MISCELLANEOUS contains all remaining equipment management functions.

Submenu	Purpose	Parameters	Parameter values
CONFIGURATION - LIGHT SHUT-DOWN	Delay until LCD light switches off	Shutdown delay	5 min, 15 min, 1 hour, manual control ¹⁾
CONFIGURATION – ACOUSTIC ALARM	Enable or disable acoustic alarm	Alarm	Enable Disable
CONFIGURATION – SERIAL SETTINGS	Shows RS232 parameters	Baud rate Data bits Stop bits Parity bits Protocol	
INVENTORY	P3 general information	Software name Manufacturer Software version Software date	
COMMANDS - REBOOT	Software restart		
COMMANDS DEFAULT SETTINGS	configuration of default settings ²⁾		
COMMANDS CLEAR ALL COUNTERS	Clears all statistical counters		

Table 14 Submenu MISCELLANEOUS description

- 1) The manual light control is explained in section 3.2.1 / page 18
- 2) P3 default settings are listed in section 4.3 / page 35

5.2 Management access via the RS232 interface

The management access via RS232 interface supports sophisticated service and diagnostics functions like software download. It is not required for typical application of P3 which can be fully controlled and supervised via the display and keypad based integrated user interface.

Note: If a device with ground connection (e.g. PC desktop with protection earth) shall be connected to the RS232 interface the telephone mode selector switch must be in position "VoIP" (this safety rule does not apply to devices without earth connection),

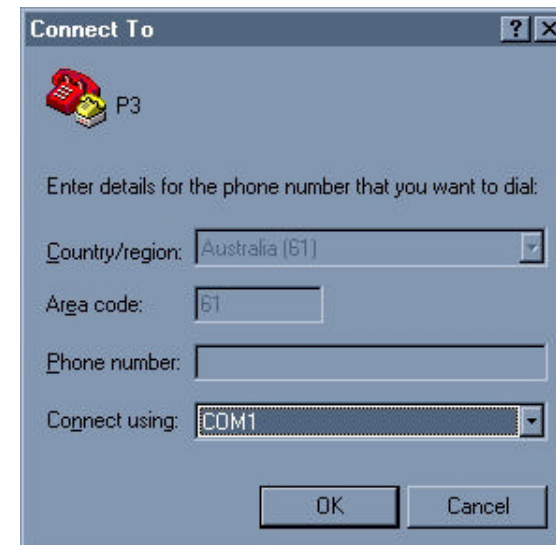
In the sequel management access via the serial interface of a Windows based PC is described. Alternatively other terminal types can be utilized as well. Please consult the documentation of the appropriate device in this case.

1. Connect your P3 unit to the serial PC interface by means of the supplied cable cord.
2. Start the program "Hyper Terminal". You will find this program within the start menu, follow the path "Program-Accessories-Hyper Terminal"

3. Assign a name to it, e.g. P3!



4. Adjust the correct designation of the serial interface port in case your PC has more than one COM port!



5. For serial data transfer following parameter settings have to be done:

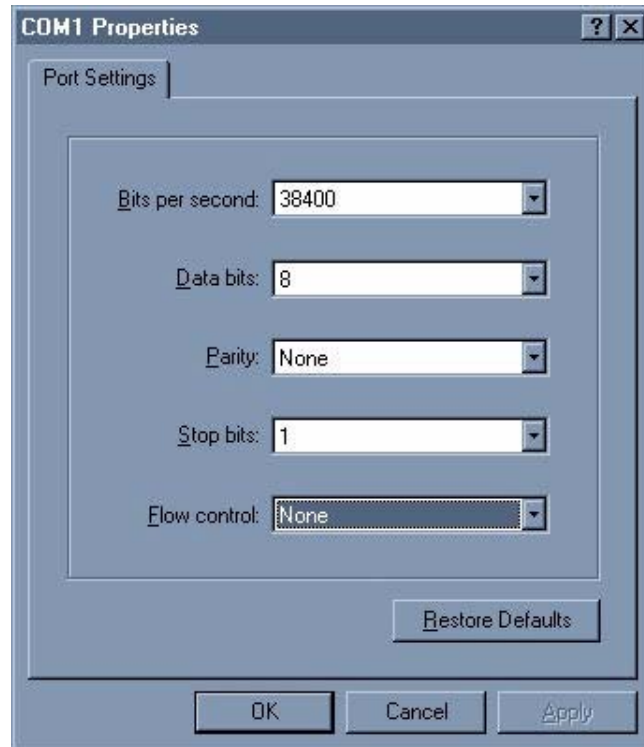
Bits per second: Data rate equal to 38400 bps.

Data bits: Always utilise value 8 here!

Parity: Check whether "no parity" is set!

Stop bits: Choose 1 stop bit!

Flow Control: The option "None" has to be selected.



6. If you press now the enter key, the command prompt „P3>“ appears at the screen.

Now you are permitted to perform management transactions as described in section 5.4 / page 55.

5.3 Remote Management access via Telnet

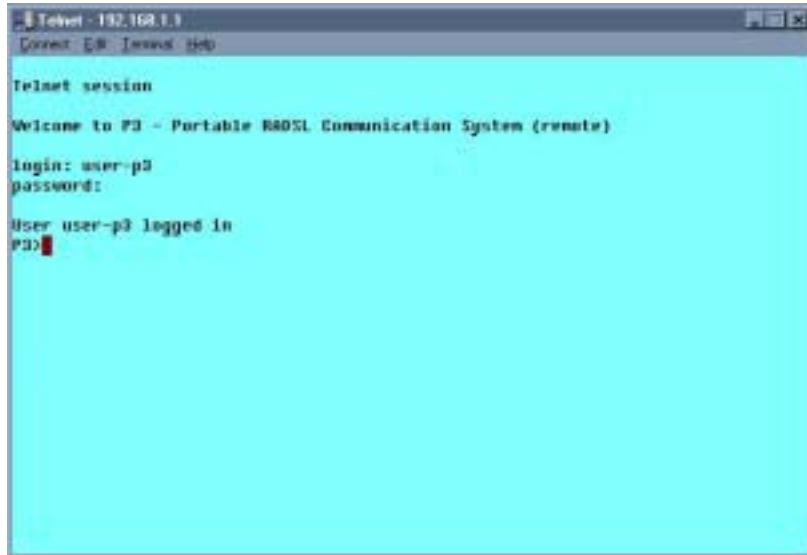
Beside the local management access via the RS232 interface management access to P3 can be performed alternatively via an Ethernet LAN. The following steps are required:

1. Setup the IP address and subnetmask of P3. If P3 and the PC where the management actions shall take place belong to the same IP sub-network the network address part of IP addresses (which is indicated by the subnetmask) must be equal. Otherwise additionally a default router entry is necessary. How to perform these network settings is explained in section 5.1.3 / page 48. After settings have been made a P3 restart is necessary.
2. To access P3 from a local host connect P3 with the LAN via Ethernet interface. It's also possible to access P3 from hosts connected at remote P3 via ADSL links.
3. Select the program "Telnet" at your PC or at your workstation!
4. Go to menu "connect" and open the window "remote system"
5. Enter the current IP address of P3 for establishing the connectivity. If PC and P3 do not belong to the same IP subnetwork additionally the default gateway settings have to be made in the PC.



6. After establishing the connection between P3 and PC you are requested to enter user name „user-p3“ and password (default: „pw-p3“). See section 5.4 / page 55 for changing the password or reset it to default value respectively.

7. After display of the „P3>“ command prompt at the screen, you may perform configuration management of the P3 unit.



5.4 Description of management commands

Table 15 contains all available management commands for accessing P3' via the RS232 or the TELNET interface.

Command	Description
help,?	overview about commands
version	display of current version
show	status indication
set	configuration
stats	statistics

Table 15 Overview about management commands

Command	Description
clear	clears statistic counters
ping	network connectivity testing
reboot	software restart

Table 15 Overview about management commands

Only lower-case letters may be used for command input!

5.4.1 HELP - Overview about all management commands

The help command lists all available management commands. Alternatively this could be done by entering the key question mark ("?").

5.4.2 VERSION - Display of current version (administrative data)

The version command displays administrative data:

- Application
- Manufacturer
- Software version
- Software release date
- Software version of ADSL firmware

5.4.3 SHOW Display of Status and Configuration information

The show command displays current status, configurations and interface conditions. For selecting particular status and configuration information additional qualifiers have to be selected, which parameters are listed in the sequel. This parameter list will also be displayed in case the show command is executed without additional qualifiers.

ether Shows actual speed at the Ethernet interface (10 Mbps or 100 Mbps)

net P3 network settings (IP and MAC layer)

	- MAC layer address - Spanning tree algorithm (enabled or disabled) - IP address - IP subnet mask - IP default gateway
dsl <1..3>	ADSL configuration and status information: - actual status of the ADSL link (active, init, no link) - actual data rate in kbps (highstream and lowstream direction) - actual SNR signal noise margin (TxHigh: lowstream / TxLow: highstream) - actual line attenuation (TxHigh: lowstream / TxLow: highstream) Following parameters are only available at TxHigh (for highstream and low-stream direction) - selected target SNR signal noise margin in dB - delay caused by the interleaved channel in ms
voip	Voice over IP configuration and status information: - VoIP (enabled, disabled or locked) - Base address - Address mask - Voice coder - Silence suppression enabled or disabled
serial	Configuration data about serial interface: - baud rate in kbps - number of data bits - number of stop bits - number of parity bits - flow control protocol
power	Actual P3 power supply status - external supply or internal battery - charging status of internal battery
alarm	Enabling status of acoustic alarm
prod	Specific manufacturing data - serial number - MAC address - Hardware version

- Ident number
- Production date

5.4.4 SET -Configuration settings

The set command is used for configuration of the P3. For selecting the particular functions additional qualifiers have to be selected, which possible parameter values are listed in the sequel. This parameter list will also be displayed in case the set command is executed without additional qualifiers.

net	P3 network configuration (IP layer) - enable/disable spanning tree algorithm - IP address - IP subnet mask - IP default gateway
dsl <1..3>	ADSL configuration settings - enable/disable ADSL transceiver - transceiver mode (TxHigh or TxLow) only possible at TxHigh: Separate for highstream- and lowstream directions: - Target SNR signal noise margin in dB - Delay caused by interleaved channel in msec
voip	Voice over IP configuration settings: - enable/disable VoIP function - base address - address mask - coder type - enable/disable silence suppression
Note:	If the VoIP function is locked you are requested to enter the unlock code to use this feature.
alarm	Enable/disable acoustic alarm
password	Password setup for TELNET access
defaultpw	Reset password for TELNET access to default value

defaults Reset all configuration parameters (except TELNET password) to default values.

5.4.5 STATS - Display of statistics

The stats command displays the actual counter value of different data for valuation of data transmission capabilities and system performance. For selecting the particular statistic information additional qualifiers have to be selected, which possible parameter values are listed below. This parameter list will also be displayed in case the stat command is executed without additional qualifiers.

ether Statistic data about the Ethernet interface:

Receiver:

- number of received unicast Ethernet frames
- number of received non-unicast Ethernet frames (i.e. broadcast or multicast)
- number of receive errors
- number of discarded frames due to buffer overflows

Transmitter:

- number of sent unicast Ethernet frames
- number of sent non-unicast Ethernet frames
- number of transmit errors
- number of discarded frames due to buffer overflows

dsl <1..3> ADSL statistical information:

- number of sent blocks
- number of received blocks
- number of corrected received blocks
- number of uncorrectable received blocks
- number of errored seconds
- number of ADSL initializations

hdlc <1..3> HDLC statistical information:

HDLC receiver:

- number of received HDLC frames
- number of receive errors
- number of discarded frames due to buffer overflows

HDLC transmitter:

- number of sent HDLC frames
- number of transmit errors
- number of discarded frames due to buffer overflows

voip

Voice over IP statistical information:

- current call state
- dialed number
- total calls
- list of previous calls:
 - called number
 - incoming/outgoing call
 - call establishment
 - remote site address for outgoing calls

5.4.6 CLEAR - Clears statistic counters

The clear command clears statistic counters. For selecting the particular statistic counters additional qualifiers have to be selected, which possible parameter values are listed below. This parameter list will also be displayed in case the clear command is executed without additional qualifiers.

ether Clears Ethernet statistic counters

dsl Clears ADSL statistic counters of all lines

dsl [<1..3>] Clears ADSL statistic counters of specified line

hdlc Clears HDLC statistic counters of all lines

hdlc [<1..3>] Clears HDLC statistic counters of specified line

voip Clears Voice over IP statistic counters

all Clears all P3 statistic counters

5.4.7 PING – Network connectivity testing

The ping command checks connectivity to the host in the network to the IP address that is specified in the command. The timeout of waiting for a reply (in seconds) and the number of repetitions are optional parameters.

Syntax: ping host [timeout]
 ping -s [count] host [timeout]

5.4.8 REBOOT – Software Restart

The reboot command performs a software restart of the P3.

5.5 P3 Software Download / Upgrade

The software download function provides P3 functionality update, as well as, any new features introduction.

The manufacturer will provide advice about new software releases and may conduct the installation during annual training refreshers.

To carry out this function the following steps have to be done:

5.5.1 Getting the TFTP server software and the P3 software image

The following files are required:

- **PUMPKIN.EXE** (contains installation software for TFTP server)
- **P3 software image** (file name is dependent on version)

5.5.2 Installing the TFTP server

Please run the program **PUMPKIN.EXE**

This will install the TFTP server on your computer. You may select the destination directory during installation procedure.

5.5.3 Software Download from TFTP server to 'P3' units

Please start the TFTP server via the start menu:

"Programs - Accessories - Klever Co - Pumpkin"

After the program window appears on the screen, please select the menu **"Options"** and enter the directory where the P3 software image is located.

Please select the option **"Give all files"** within the group **"Read behaviour"**.

Next a connection between pc and P3 via an RS232 interface is to be established
Start the terminal program as described in the P3 User Guide (section 5.2 / Page 51)

5.5.4 Start / Programs / Accessories / Communications / Hyperterminal

and Configure the serial port (COM1 or COM2 or other) to the following parameters:

- from the Hyperterminal window select **File/Properties/**
- from the newly opened window **"New Connection Properties"** select **"Connection Using"** the appropriate serial port (COM1 or COM2, etc.)
- Select **"Configure"** option and select the following communications parameters:
 - Bit Rate : 38400 bps
 - Data Bits : 8
 - Parity : none
 - Stop Bits : none
 - Flow Control : none

Communication to the P3 via the serial cable should now be possible.

Any key pressed and the computer keyboard should produce a response from P3

5.5.5 Type the command **"reboot"**.

Please press a key (computer keyboard) within 2 seconds of the initial message:

"To run boot monitor, press any key within 2 seconds ..."

the **"reboot"** command provides access to the 'boot management' menu.

5.5.6 At this stage please select item **"Software-Update (Flash) via TFTP"**

You will be asked for some values relating to the necessary Ethernet connection between P3 and your computer.

5.5.7 PC to P3 (LAN) connection

*Please ensure that the connection from the PC 10BaseT port is to one of the P3 LAN ports **from 2 to 6** (i.e. not Port-1). This connection should be made using the supplied Ethernet cable (straight of 1:1 LAN cable).*

*PCs with autonegotiation 100/10 Mbps Ethernet adapters must be configured to 10Base-T halfduplex mode within **System Control / Network Settings / Network Adapter** window.*

5.5.8 Provide the following connection parameters:

- IP address for the P3 unit
- Subnet mask for the P3 unit
- Default gateway (optional, only required if TFTP server and P3 unit belongs to different subnetworks)
- IP address of your computer containing the TFTP server
- P3 software image file name

An example of all of the boot monitor and P3 settings is depicted in Figure 17

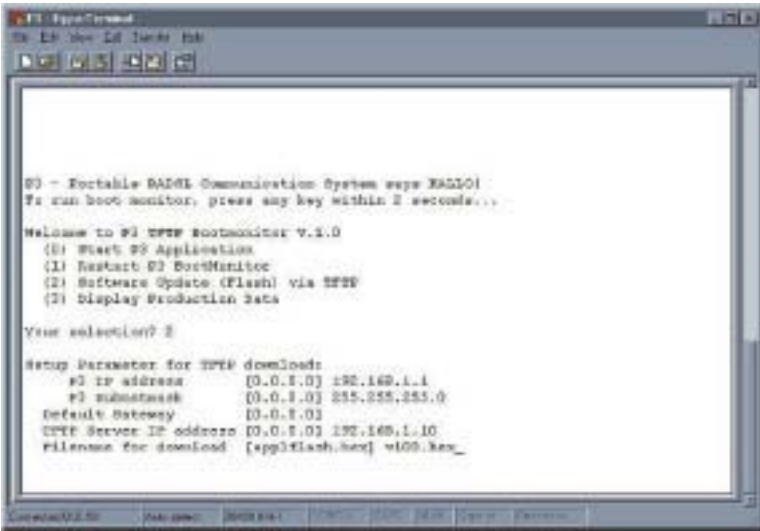


Figure 17 : Software download - boot manager menu (example)

5.5.9 Software Download Completion

When the download is complete, the P3 unit will perform an automatic restart with the new software version. You may now quit the TFTP server or continue software download for additional P3 units. The TFTP server supports also downloading for several P3 units in parallel.

Note: If a download could not be completed successfully e.g. because of power fail or Ethernet link disconnection, you will need to repeat the software download process by calling the *boot manager* again after restart.

6 Warranty Details

6.1 Provisions of warranty

The **dci** grants a claim of guarantee for this product in accordance with contract conditions. **dci** warrants that, for a period of 24 month from the date of shipment, the hardware portion of its products will be free of material defects and faulty workmanship, under normal use. **dci** obligations under this warranty, is limited to replacing or repairing, at **dci** premises any such hardware product which is returned during the 12 months warranty period in accordance with **dci** instructions and which is confirmed by dci to comply with the foregoing warranty conditions. This warranty does not cover the following and the customer will be required to pay repair charges, even for defects occurring within the guarantee period referred to above.

- Any defect that occurs due to mishandling (such as an operation performed that is not mentioned in the Instruction, etc.)
- Any defect that occurs due to repair, modification etc. performed by anyone other than **dci**.
- Removing the front panel by unauthorized users will void any future warranty claims
- Any defect or damage that occurs due to transport, a fall, shock, etc. after purchase of the product.
- Any defect or damage that occurs due to fire, earthquake, flood damage, thunderbolt, other natural disasters, environmental pollution and irregular voltage sources.
- Any defect that occurs due to careless or improper storage (such as keeping the product under conditions of high temperature and humidity), improper maintenance, etc.
- Any defect that occurs due to sand, mud etc. entering the inside of the product casing.

dci's sole liability under warranty shall be limited to repairing or replacing the product.
Any liability for secondary damage, which are caused by a defect of this product are excluded.

6.2 Limited Warranty

If a returned product, after examination by **dc**i was found to have a fault or defect or damage of any sort caused by improper use of the product or it would be obvious that the product being exposed to extreme operating conditions, **dc**i will undertake repairs or replacement at cost. The transportation charges for shipment of returned products to **dc**i will be prepaid by the Buyer.

dci may use reconditioned parts for such repair or replacement. This warranty **does not** apply to any product which has been repaired, worked upon, or altered by persons not authorised by **dc**i or has been determined to be subjected to misuse, accident, fire or other accident, or operation beyond its designed range.

6.3 Repair Turnaround Time

Products sent in for repair will be repaired and returned promptly. The standard turnaround time on all repairs shall be 30 days of receipt of the returned unit at dci on current products and within 30 days.

6.4 Product Return

The returned P3 must be packed at least in equivalent quality packaging material. Otherwise, if equipment arrives damaged due to sub-standard packaging the owners for such a damage would lie with the customer. Return the defective unit(s), freight prepaid, to the **dc**i Customer Repair Facility at the following address:

Defence Communications Industry
4 Nirvana Crescnt
Bulleen VIC 3105
Australia

Please mark the correspondence regarding the order and include the following with the returned unit:

- All known facts as to the nature of the failure

- Company name, address and name of person to contact in case of questions about the unit(s)
- Shipping address for the return of the unit(s) upon completion of repairs

6.5 Billing

In the event of equipment returned for repair, replacement - irrespectively of the warranty status and which is found to be damaged due to customer negligence or which has had parts removed - will be repaired on a time and material basis. **dc**i will contact the customer for disposition on any equipment that is in this condition or determined to be beyond repair. In the event that the returned equipment is not covered by warranty, **dc**i will contact the customer with estimated repair or replacement charges and obtain customer disposition of the product if a purchase order has not been provided.

6.6 Recycling information

The product contains a lead acid battery. At the product 'end of life' customer should return battery (or the complete unit) to dci. Alternatively, qualified recycling metal merchant could be approached.

Annex Product Specifications

Annex A Hardware Features

ADSL interface:

- Three ADSL interfaces which can operate in TxHigh or TxLow mode independently from each other
- DMT ADSL according to ITU-T G.992.1 & ANSI T1.413 Issue 2 (Full rate over analogue telephone lines)
- Up to 8 Mbps in highstream direction and 1Mbps in lowstream direction (in 32 kbps increments)
- Maximum reach up to 5 km with AWG26 cabling (longer with thicker gauge copper)
- Connector type: WD-1A/TT (spring loaded binding posts)
- Copper Cable Types:
 - Symmetrical twisted pair (shielded or unshielded)
 - Military or Industrial Grade (steel reinforced copper cable)

Ethernet interface:

- 6 parallel interfaces
- Interface Type: 10Base-T (IEEE802.3) / 100Base-TX (IEEE802.3u), half duplex
- Data Rate Auto-Negotiation Function
- RJ45 connector
- Interface Wiring: 1 * MDI, 5* MDI-X
- Distance max. 100 m
- Cable Type: UTP5 (100Base-TX) or UTP3/UTP5 (10Base-T)

POTS interface:

- Three interfaces corresponding to ADSL interfaces for simultaneous transmission of voiceband services via twisted pair copper line
- Transparent Tip/Ring interface
- Connector: RJ45

- Reference impedance: 600 Ohms

Handset interface:

- For VoiP based network telephony or point-to-point field telephone applications
- Reference impedance: 600 Ohms
- Multi-frequency Dialing Mode Support
- Ringing Frequency: 25 Hz

Ruggedised Telephone Handset:

- Multi-frequency Dialing Mode Support
- Memory for 10 phone numbers
- Dialing repetition function

RS232 serial interface:

- Sub D, 9 pin connector
- Data Rate: 38,4 kbps
- Distance max. 3 m

Power Supply:

- DC power input 10 V ... 45 V
- Power consumption for operation below 15 W
- External AC/DC adaptor with universal input voltage range 90..260 V and 47..63 Hz input frequency
- Internal backup batteries for up to 8 hours sustained operation

Visual and Audio indicators (Alarms):

- Front panel LEDs indicate unit power/battery charging status, DC polarity mismatch, network connection and activity for Ethernet and ADSL interfaces
- Optional acoustic alarm notifies critical system states (e.g. battery critical low)

Annex B Software Features

ADSL:

- Automatic Bitrate Adjustment (RADSL)

Ethernet Bridging:

- IEEE802.1d transparent, learning bridge
- Dynamic learning of MAC addresses
- Bridging table size: 4096 stations
- Automatic aging of bridging table entries
- Spanning Tree Algorithm (IEEE802.1d)
- HDLC Encapsulation of MAC-Frames with minimum overhead

Management:

- Manage all functions through an integrated LCD display/keypad interface
- Local management console for extended service and diagnostics via RS232 interface
- Remote management support vial Telnet console from an arbitrary point in the network
- Trivial File Transfer Protocol (TFTP) support for software updates

Voice over IP software:

- Compliant with ITU-T H.323 Protocol Stack family
- Speech Compression according to ITU-T G.723.1 (6.3/5.3 kbps) and G.711 (64 kbps A-law/ μ -law)

Annex C Mechanical Characteristics

- Mil. Spec. shock absorbent ruggedised casing
- air-pressure valve for air transport
- In-built carry handle
- Dimensions: 326 mm x 300 mm x 226 mm (L x W x H)

- Weight approx. 11kg/24lb
- Storage space for supplementary parts

Annex D Environmental Conditions

- Safety: CENELEC EN 60 950
- EMC:
 - Immunity CENELEC EN 55024
 - Emission CENELEC EN 55 022
- Climatic Conditions
 - Operation -25°C/-13°F ... 55°C/131°F (ETSI ETS 300 019-1-3: Class 3.3)
 - Storage -25°C/-13°F ... 55°C/131°F (ETSI ETS 300 019-1-1: Class 1.2)
 - Transport -40°C/-40°F ... 70°C/158°F (ETSI ETS 300 019-1-2: Class 2.3)
- Mechanical Protection Class (IEC529)
 - Closed Lid IP52
 - Opened Lid IP41

(Information on compliance with further standards on request)