SOPHO 2000 IPS

Hybrid communication servers

Internet Protocol Server

Key features

- More than 400 telephony features
- Supports legacy circuit switching for digital and analogue telephony
- Supports full native peer-to-peer IP switching for VoIP
- Crystal clear voice quality for wired and wireless terminals
- Fully-featured node-to-node networking (up to 255 nodes) with high level of integration
- Intranodal (LAN) and internodal (WAN) peer-to-peer IP connectivity
- Supports full range of Dterm telephone sets
- Supports wireless IP DECT and VoWLAN*
- Certified SIP trunk interface (RFC 3261)
- Wealth of telephony applications to improve your efficiency
- Compact module
- Integration with SOPHO iS3000 series

** check your local contact for availability in your country*

The SOPHO 2000 IPS (Internet Protocol Server) is the ideal communication solution for small and medium-sized offices, and (remote) branch offices. It caters for both TDM and IP telephony and can support up to 956 extensions.

Technology that helps you work smarter, not harder

The SOPHO 2000 IPS allows your small or medium-sized (branch) offices to take full advantage of all the benefits of peer-to-peer IP telephony, while still enjoying the hundreds of PBX features available with the SOPHO communications platforms. Although the system fully supports native IP telephony, this is completely optional. The SOPHO 2000 IPS offers the utmost flexibility by providing the choice of time division multiplex (TDM) switching, pure peer-to-peer IP connectivity or a combination of the two, all in a single unit.

NEC PHILIPS

NEC PHILIPS UNIFIED SOLUTIONS

While the SOPHO 2000 IPS can function within and support a hybrid network, comprising traditional/analogue switching, IP/TDM/IP switching and pure peer-to-peer IP switching, users can continue to utilise their existing equipment while they phase in IP telephony and lay the foundations for future networks.

Different sizes for different needs

The SOPHO 2000 IPS is designed to fit into any environment. With the availability of smaller sized Distributed Modules (local or remote) any requirement can be met.

General architecture

From the very beginning, the SOPHO 2000 IPS has been designed with simplicity in mind. It consists of various independent modules, each pre-engineered to ensure that Quality of Service (QoS) standards are maintained across the entire solution.

The system provides pure voice-over-IP (VoIP) peer-to-peer connections across local (LAN) and wide area (WAN) corporate networks, and also supports time division switching (TDM). This makes the SOPHO 2000 IPS a fully hybrid system. Depending on the number of traditional circuit switched end-users, the system is available in two configurations:

- SOPHO 2000 IPS: supports up to 512 TDM stations and is therefore intended more for traditional users.

- SOPHO IPS DM (Distributed Modules): supports a maximum of 120 TDM stations and is oriented more towards IT-focused users.

Independent of the configuration chosen, both systems can support up to 956 IP stations (depending on the number of TDM stations used).

SOPHO 2000 IPS

The SOPHO 2000 IPS is made up of so-called Port Interface Modules (PIMs). These PIMs house the control cards and plug-in cards that interface with end-user equipment. A single system can comprise a maximum of eight PIMs.

Each PIM provides 12 universal card slots and a maximum of 64 LT ports (see figure 1).

The first PIM (PIM0) contains the Main Processor and includes the non-blocking TDM switching matrix, which consists of non-blocking 1024 x 1024 time slots.

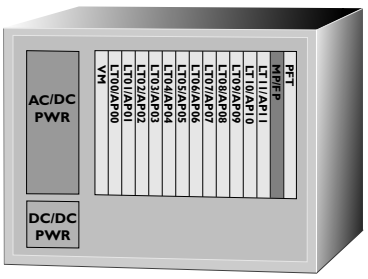

Figure 1
SOPHO 2000 IPS PIM-shelf Layout

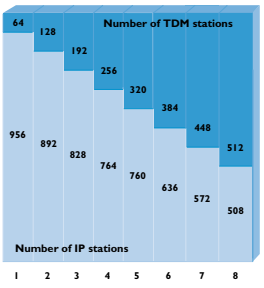

Figure 2
Number of PIMs

Capacity

The maximum system capacity is 1020 ports. With a single PIM, the system can support 64 TDM extensions and up to 956 IP extensions. Each additional PIM allocates 64 ports to TDM extensions and correspondingly reduces the number of ports available for IP extensions. An eight PIM system therefore provides 512 TDM ports and reduces the capacity for IP ports to 508 (see figure 2).

SOPHO IPS DM

Designed to complement the IPS family, The SOPHO IPS DM (Distributed Modules) supports the same features and functionality as the SOPHO 2000 IPS, but is tailored to meet different space requirements. The IPS DM offers superior port density, with each chassis occupying only two rack units, without compromising the IP extension capacity.

Although the housing is different, it can accommodate the same cards and devices as the SOPHO 2000 IPS.

The IPS DM is made up of special 19-inch modules. A single IPS DM system consists of a maximum of three modules, each providing five universal card slots and a maximum of 40 LT ports (see figure 3).

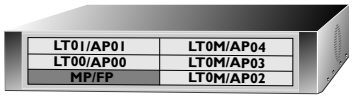

Figure 3
SOPHO IPS DM PIM shelf Layout

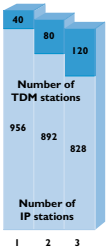

Figure 4
Number of DM-PIMs

The maximum number of ports provided by the system depends on the number of PIMs used. The number of IP extensions is similar to the 2000 IPS (maximum 956 extensions with one PIM). Each additional PIM reduces the number of IP extensions by 64, but allocates only 40 additional TDM ports (see figure 4).

System boards

Different types of card provide specific functions within the system. Three types of card are available:

Common Control Cards

- Main Processor (MP): responsible for the overall system operation, storage of user data and licenses. It also provides an (optional) Ethernet interface
- Firmware Processor (FP): controls all Line/Trunk circuit cards, the IP PAD card and all system resources. A separate FP card is required for each two additional PIMs. The first is built into the Main Processor and controls the first two PIMs

Line/Trunk (LT) Cards

- Line/Trunk cards support legacy stations, analogue trunks, voicemail ports, DTMF register/senders, etc.
- Each port connects to the MDF via the LTC (Line Trunk Connection) 25-pair cable.
- Each pair cross-connects at the MDF to either a trunk or a physical device.

Application Processor (AP) cards

These cards are intended to support special applications, such as digital trunks (PRI, BRI), Station Message Detail Recording, Data/Protocol Handler, IPT and 32 Party Conference. Depending on the application, they communicate only with the CPU, requiring only two pairs (talk and transmit). Extra pairs are required for data signalling to be cross connected at the MDF.

The Main Processor (MP)

The SOPHO 2000 IPS has a powerful, single-board Main Processor (MP) that is the heart of pure IP and TDM-based connections. The MP employs a high-speed CPU, which is equivalent to a Pentium. The MP card size is minimized by means of advanced LSI technology. The On-board Ethernet Interface card is mounted on the MP and does not require a PIM slot. This interface card is linked to the LAN, for call control processing of IP terminals, and interfaces with several types of application. It also provides connectivity to an Open Application Interface (OAI) server. The OAI provides robust and flexible Computer Telephony Integration (CTI). One card is required per system.

The MP has the following characteristics:

- CPU: AMD Flan SC520 Pentium equivalent
- Memory: (FROM = 8Mb, SDRAM = 32Mb)
- PZ-M606 LAN: 10/100BaseT Ethernet interface
- Two Phase Locked Oscillators (PLO) for network clock synchronisation
- Built-in modem: 33.6 kbps
- Time Division Switch (1024x1024)
- Open Application Interface (OAI)
- Other characteristics:
  - 3/4 Pty CFT = 16
  - DTG
  - PB Senders = 32
  - RS232C = 2 Ports at 38.4 kbps
  - DK (Digital Key interface card)

- System clock
- Hold tone
- Selectable internal melody or External source (1 jack/input)
- 4PBR (4x Push Button Receiver)
- Two digital announcement trunks
- BS00 (Bus) and FP (Firmware Processor) function
- PZ-M537 memory expansion
- DRS function, AP01 & CC01, FP0

The on-board Device Registration Server (DRS) provides log-in/log-out management of IP terminals, including registration and authentication. The built-in DRS can also interface with the DHCP server to provide easy administration of IP addresses.

Networking

Private networking

The SOPHO 2000 IPS delivers numerous networking features. This allows multi-site customers to transform their entire network of (worldwide) locations into a single, unified, global communications network. This transparent networking increases the efficiencies of multi-site organizations and greatly reduces overall network costs. This is the most powerful feature of the SOPHO 2000 IPS and one that sets it above competing systems of comparable size. The concept is based on the Common Channel Inter-office Signalling (CCIS) protocol. This protocol derives its functionality from CCITT SS#7 recommendations. The CCIS signalling link, common to all voice and data channels, exchanges information related to addressing (dialled digits, calling/called number), supervisory functions (call set up & termination) and network accounting & management (centralized billing and fault reporting).

The key capabilities and benefits of CCIS are:

- 95% feature transparency
- Centralized services; network administration from a single, central location
- Facilities optimization
- Equipment interchangeability
- LAN/WAN connectivity

CCIS can run on practically all types of interface without compromising on key capabilities. It is compatible with:

- CCIS over E&M Tie lines
- CCIS over Digital Trunk (E1) Interface
- CCIS over ISDN (event driven)
- CCIS over IP

Multi-vendor networking

The Philps SOPHO 2000 IPS supports the following open interfaces:

- Q.SIG
- H.323
- SIP

Voice over IP

The SOPHO 2000 IPS/DM is capable of providing full (native) Voice over IP without losing any useful traditional telephony features.

The SOPHO 2000 IPS has been designed to produce significant cost savings through peer-to-peer IP telephony.

By utilizing the IP infrastructure, the need for cards is reduced, while the required plant footprint is also minimized. With traditional circuit-switching technology, a port is required for each station and each tie line connection.

With IP connectivity, multiple calls are channelled through a single 10/100 Ethernet port, while voice calls travel directly between users' telephones.

IP-PAD gateway

The key to enabling IP switching is the Packet Assemble/Disassemble (PAD) gateway card. This card supports the system's IP telephony capabilities, by converting the speech path of the IP network to the legacy (TDM-based) interfaces in the system, or vice versa.

Crystal-clear voice quality over IP, another SOPHO 2000 IPS advantage, is achieved through:

- Standard QoS mechanisms (IP Precedence/Diffserv/802.1p/q)
- Minimum delay, thanks to peer-to-peer VoIP
- Best-in-class voice compression CODECs (G.711, G.729a, G723.1)

Payload	Bandwidth
G.711/40ms (64k)	72 kbps
G.711/10ms (64k)	96 kbps
G.723.1/30ms (5.3K)	16 kbps
G.723.1/30ms (6.3k)	17 kbps
G.729a/10ms (8k)	40 kbps
G.729a/40ms (8k)	16 kbps

What is Quality of Service?

Quality of Service means having a good voice connection via the IP network. The SOPHO 2000 IPS is capable of optimal performance within the following QoS parameters:

- Bandwidth: the rate at which traffic is carried by the network
- Latency: the delay that an application can tolerate in delivering a packet of data
- Jitter: the variation in delay
- Loss: the percentage of lost data
- Differentiated Services (Diffserv) on the following combinations:
  - Peer-to-peer CCIS
  - H.323 trunking
  - SIP trunking
  - Dterm IP to Dterm IP
  - Dterm IP to IP-PAD
  - Dterm IP/IP-PAD to peer-to-peer CCIS

Bandwidth control allows VoIP traffic to be assigned an available bandwidth threshold, both within a location and between locations, and to restrict outgoing/incoming calls when VoIP traffic exceeds this threshold. When VoIP traffic over CCIS threshold is exceeded, calls can be routed to legacy trunks (TDM Network). The system can also store fault information and provide external alarm indication.

Functionality

The SOPHO 2000 IPS offers more than 400 telephony features. Some of the most striking include:

- Voice guidance (instead of tones)
- Uniform call distribution
- Name dialling/display with integrated phone book
- Password dialling
- Internal intercom paging
- Music on hold
- Fax arrival indicator (on device)
- Calling party information, regardless of location on the network.

System features include:

- Alternative routing from IP trunks to other PSTN trunks when the data network or intranet is unavailable. This is a major advantage over IP solutions using a server platform that cannot easily (if at all) provide alternate routing to PSTN in an all-trunks-busy condition.
- ACD
- Attendant console
- Authorisation codes
- Account codes
- Classes of service
- Forced account codes
- Automatic wake-up/reminder
- Malicious call trace
- Night service
- No-attendant service
- QSIG networking
- Recorded message service
- Least-cost routing with auto-update
- Traffic measurement
- Trunk-to-trunk connections

Operator features include:

- Call-waiting queue length
- Call-waiting pick-up
- Call fall-back reason

Built-in hotel functionality

With the SOPHO 2000 IPS all the features required by the hotelier are included within the system software, allowing hotel staff to control the telephone activity without the need of additional applications.

- Automatic wake up + No answer
- Do not disturb
- Check in/Check out
- Direct data entry
- Guest name display
- Maid/Room status
- Message waiting

- Room cut-off
- Single digit dialling
- PMS interface

Reliability

The SOPHO 2000 IPS is designed and manufactured to provide the highest level of system reliability. Useful features include: remote maintenance, distributed call processing, error-correcting memory, battery back up, and automatic system alarm indicators, all ensuring unsurpassed reliability.

As an option, a second Main Processor (MP) can be installed in a (special) first PIM. The second MP remains in a state of 'cold' stand by, unless there is a MP failure, in which case the stand-by MP becomes active and takes over. Data copy from active MP to stand-by MP can be scheduled up to four times a day, at times specified by the customer or recommended by the installer.

- SOPHO 2000 IPS's five-9s (carrier-class) reliability is well established, and is measured against accepted industry standards. Features include:
  - Embedded software dedicated to its purpose
  - Designed for maximum up-time
  - Industry hardware for maximum reliability
  - Back-up processor for instant recovery in case of main processor crash
  - Battery back-up for safe operation in case of mains failure
  - Stand-by remote system for automatic call control take-over in case of network failure

Security

Dterm IP security (password encoding at time of login)

When Dterm IP is registered in the SOPHO 2000 IPS, the login code (DNR) and password entered from the terminal can be encrypted. The login code uses a proprietary algorithm, but the password can be either a proprietary algorithm or the MD5 algorithm. MD5 is an algorithm defined in RFC 1321 from the IETF. The Encryption Algorithm can be assigned on a system-wide basis by system programming. Encryption is available in both Login Method (with password protected) and Automatic Login Method (MAC Address Authentication).

Platform security

The SOPHO 2000 IPS can be programmed to enable password-controlled access to program changes. Up to eight password levels are available. This feature, when activated, prevents unwanted changes by unauthorized personnel. In addition, the 2000 IPS has a proprietary operating system, making it invulnerable to viruses or hacking.

Management

The SOPHO 2000 IPS provides web-enabled network management for managing traffic costs and more. Please refer to the appropriate datasheet. The Management@Net portal supports the 2000 IPS, providing customers with a single point of access to all management applications, independent of the platform. Management@Net features include:

- Web-portal for flexible access
- Multi-authorisation levels
- User-friendly modules that enable you to:
  - control and report traffic costs
  - program and change system parameters and user options
  - manage name-number relations
  - manage and maintain the DECT database
- Accounting package based on MTS TABS web solution
- OpenWorX Manager (the OpenWorX database is used in combination with the SuperVisor 60E). The OpenWorX database functions as the Central Directory

Terminals and wireless

IP DECT

IP DECT offers the mobility to move around the building while enjoying uninterrupted access to telephony, along with other features, such as voicemail and text messages. IP DECT is the marriage between DECT and VoIP, where the RFPs communicate with the system via the LAN infrastructure. Calls made by using this mobile solution are cheaper than those made through the normal telephone infrastructure. A PBX only needs to be IP-enabled, which means simply installing a circuit board, to support all available IP-based solutions. This protects existing PBX investments and customers who already have a DECT solution can keep using their existing DECT handsets that communicate to the IP DECT access points integrated on the data network.

The SOPHO 2000 IPS provides a unique set of features with DECT terminals. A choice of business phones is available, enabling individual user needs to be met.

Mobile Integration

Many employees today not only need the freedom to move around and work from different locations within the office, but also outside the office, at customers' premises, or on the road. While IP DECT provides mobility within the office, the integration of mobile or GSM telephony within the PBX provides access to a range of features from virtually any location.

By means of the SOPHO Mobility Access (SMA*) feature of the PBX, mobile phone users can link their mobile phones to the PBX, giving them access to the whole range of PBX-based features. Users can supply their contacts with a single phone number. If they are going to be away from their desks and only available via their mobile phones, they can adjust their settings so that a call to a desk phone is automatically transferred to a mobile phone.

It also provides access to any extension on the corporate network. If a company has branches around the world that are all connected to the same network, the mobile user can dial up the PBX and route the call to an extension on the other side of the globe, for just the cost of a local mobile-to-fixed call.

VoWLAN

VoWLAN* offers the ultimate in convergence, in a voice and data network, or with end-user devices such as Wi-Fi handsets, PDAs or laptops. Because this solution is integrated with its voice communication platform, voice always gets the highest priority. Users can roam the network and calls are seamlessly handed over between WLAN access points. Ease of deployment is ensured by a powerful management solution and it is also highly secure. Provisions at all network layers mean intruders can be detected, located and blocked, irrespective of where they operate from.

In addition to the main voice application, a wide range of other WLAN applications is offered by Business ConneCT.

** Check your local contact for availability in your country*

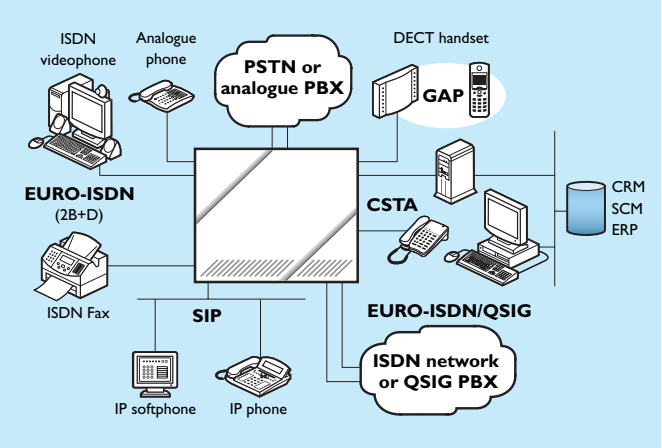

Figure 5

Open standards

The SOPHO 2000 IPS offers customers a variety of solutions aimed at multi-vendor interoperability. SOPHO products are compatible with any QoS infrastructure, from NEC Philips, 3Com or Cisco.

The SOPHO 2000 IPS features an open communications platform for easy addition of third-party applications (see figure 5).

- The Q-SIG protocol provides support to third-party PBXs, including the SOPHO iS3000. This allows the 2000 IPS to provide standard connectivity when interfacing with a Q-SIG network. A 30 B-channel 2Mbps (E1) digital interface and a QSIG D-channel handler are required for each physical interface.
- TDM connectivity
- H.323
  Channel card and compression cards are available for connectivity (trunking or devices) based on standard H.323. A separate (external) H.323 gatekeeper is also required. Any standard gatekeeper should comply.
- Session Initiation Protocol (SIP) compatible

Certified SIP trunk interface

The SOPHO 2000 IPS is fully SIP-compliant (RFC 3261), providing a certified SIP trunk interface that is open to ISP's and Carriers. Offering a wider choice of communication platforms, applications and possibilities than ever before.

Stand-alone applications		
Application	**Modules**	**Functionality**
MyOffice@Net	Employee	call features
		directory browser
		voicemail
		presence management
SuperVisor (SV60E)		PC-based operator console
Contact@Net		family of web-enabled applications for multimedia contact centres
MyMail@Net		family of web-enabled applications to access voicemail messages
Messenger@Net		family of web-enabled applications for alarm messaging features
Management@Net	Accounting Management	reporting and billing
	Performance Management	traffic analysis
	Fault Management	alarming and monitoring
	Configuration Management – MA4000	manage and maintain the PBX database
	– IP DECT Manager	manage and maintain the DECT database
	– MATWorX	maintain the PBX database (for Service Engineers)
Softphone (Dterm SP30)		IP multimedia softphone
Speech		speech enabled directory dialler

Integrated applications		
Application	**Modules**	**Functionality**
Business ConneCT	Employee	call features
		directory browser
		voicemail
		presence management
	Operator	call handling
		monitoring
		directory browser
	Agent (and Supervisor)	inbound/outbound multi media communication
		skill based routing, email routing, auto-attendant
		group and supervisor information, statistics and reporting

Applications

The platform can be delivered complete with all types of application required to perform specific tasks. The table provides an overview of the available applications.

Servicability

Fault prevention

- Qualitative diagnostics (pre-timed or on demand)
- Remote dial-up inquiry or polling
- Continuous quantitative diagnostics fault detection
- On-site fault-isolation diagnostics reporting and printout

Fault isolation

- System status testing
- Service record print
- Diagnostics routine print

System capability

Empowerment

- Minimal preparation costs.
- Reduced implementation costs
- Manageable operational costs
- Reduced power consumption
- Minimal heat dissipation
- Reduced voltage requirements
- Universal single pair cabling
- Reduced desk/floor costs
- System traffic management and reporting
- Traffic measurement reports
- Variable system timers
- System inventory management and reporting
- Match communications power and costs to telephone users
- 16 service feature classes
- 16 restriction classes
- Attendant control facilities
- Station access control
- Day/night service classes
- Forced or optional account codes

Fault correction

- On-line card replacement
- Universal card slots
- On-line programming
- 8 levels of password protection
- Faulty station isolation
- On-site or remote fault detection

Versatility

- Modular Chassis (MC) design
- PCM digital sampling
- Stored-program control
- AMD processor
- Time-division switching
- IP switching
- Modular switching matrix
- Full traffic capability (non-blocking)
- Flexible numbering plan
- Universal station and line card slots
- Tone-to-pulse conversion
- Tone-to-tone conversion
- Flexible ringing
- Flexible line appearance

Adaptability

- 8-port extension and line cards
- Universal card slots
- Universal single-pair cabling
- Special application processors
- Feature software enhancements
- System performance enhancements
- On-site or remote system reconfigurations
- Software packaging flexibility
- On-site or remote database management
- PC-based Windows-driven GUI Maintenance Administration Terminal (MAT)

Available terminals

- Dterm IP
- Dterm Digital
- Dterm Analogue
- Add-on key module (DSS/BLF)
- SN753 Desk Console
- Dterm SP30

Scalability

Hardware expansion

- 8-slot station and low-cost hardware expansion
- Upgradeable system configurations
- Upgradeable application processors
- Universal line and station card slots

Software expansion

- Downloadable CPU software and firmware
- Feature enhancements
- System performance enhancements
- System configuration upgrades (Peripheral Enhancements)
- Interface with peripheral systems
- Drive-integrated CTI and OAI applications

Capacity boundaries

Boundaries	
Max. nr. of TDM ports*	512/120
Max. nr. of IP ports	956
Max. nr. of trunks	256
Max. nr. of networked nodes	255
Max. nr. of operators	8
Max. nr. of PC-based operators	12
Buffer for max. SMDR records	27 000

** 980 possible in case of R-PIM network*

Expert Services

The SOPHO 2000 IPS is fully supported by our Expert Services. This extensive portfolio of services provides the insight and support needed to get the most out of equipment and applications. The services offered comprise advice, design, customisation, integration, training, maintenance, continuous optimisation and Business Partner services.

Technical data

To meet specific customer environmental needs, the SOPHO 2000 IPS provides the following installation options:

- Floor-standing installation
- Wall-mounted installation
- 19-inch rack-mounted installation

The SOPHO IPS DM is only available in the 19-inch rack-mounted configuration

Cabinet specification

SOPHO 2000 IPS

- Single PIM dimensions: 43 x 22.3 x 35.6 cm (wxdxh)
- When built into a 19-inch rack, a single PIM occupies 8 rack units
- Weight: approximately 18.5 kg/single PIM, including PWR and 15 cards (weight varies depending on the system configuration)

SOPHO IPS DM

- Single Modular Chassis (MC) dimensions: 43 x 36.5 x 8.8 cm (wxdxh)
- Weight: approx. 7 kg/MC (all slots occupied)
- Up to three Modular Chassis (MC) can be stacked
- Built into a 19-inch rack, a single MC requires two rack units (2RU)
- Fan cooling

Power supply

The SOPHO 2000 IPS can be powered directly from the mains.

An optional battery or Uninterrupted Power Supply (UPS) can be installed to ensure continued operation in the event of a power failure.

- Mains: 240 V; AC: 40-60Hz

Performance

Busy hour call attempts >5 000

Transmission

Pulse Code Mode (PCM) in accordance with A-law CCITT G.711

Switching

Non-blocking Time Division Multiplex (TDM) switching matrix in 64kbit/s time-slots

Power consumption

SOPHO 2000 IPS

Number of MCs	Maximum AC Power (W)
1	360
2	720
3	1080
4	1440
5	1800
6	2160
7	2520
8	2880

SOPHO IPS DM

Number of MCs	Maximum AC Power (W)
1	110
2	220
3	330

System availablity

State-of-the-art technology is used throughout the SOPHO 2000 IPS family, thus reducing potential system failures to an absolute minimum.

- Mean time between (fatal) failures > 9.5 years

Interface compliance

The SOPHO IPS DM is fully compliant with European Directives 73/23/EEC (Safety), 83/336/EEC (EMC), 1999/5/EC (R&TTE) and the Council Recommendation 1999/519/EC (EMF)

- Public telecommunications interfaces in compliance with:
  - digital interfaces
    - ISDN Basic Rate: TBR3
    - ISDN Primary Rate: TBR4
    - DECT: EN 301 406 (TBR6), TBR10, TBR22
- Analogue interface compliance:
  - TBR21 – for the SS interface
  - TBR15 – for 2-wire E&M interface
  - TBR17 – for the 4-wire E&M interface
- SIP interface compliance
  - RFC 3261

Environmental conditions

Operating condition	Temperature	Relative humidity
Operations	0°C to 40°C	15% to 90%
Storage and Transit	-18°C to 50°C	8% to 90%
Above 30°C: not to exceed 72 consecutive hours or 15 days in a year.		

The equipment is in compliance with the requirements of EU directive 2002/95/EC (RoHS) and 2002/96/EC (WEEE).

Interfaces

- Open Application Interface(OAI)
- Ethernet Interface
- Maintenance Interface
  - direct connections (RS-232C)
  - modem connection
  - LAN connection
- PMS interface (V.24 or IP)

The following is an overview of the wide variety of interface types supported by the SOPHO 2000 IPS.

Trunk interfaces:

- E&M tie lines; both 2 and 4-wire, type I and V
- Analogue interface; 8 loop start trunks per analogue trunk card
- ISDN interface; PRI and BRI
- QSIG
- SIP interface
- H.323 interface

IP specifications

Item	Specifications
Voice encoding	G.729a
	G.723.1 (5.3 kbps/6.3 kbps)
	G.711
IP PAD	8/32 channels per card, automatically seized per call
DTMF- signal	H.245
Inter-office/Intra-office signalling	H.245
	PROTIMS over IP
	CCIS over IP
	SIP
	H.323
Jitter Control	Dynamic Jitter Buffer
Quality-of- Service (QoS)	ToS, IP precedence, DiffServ
LAN interface	10BASE-T/100BASE-TX
Echo Canceller (IP-PAD)	G.168
Fax over IP (pass through)	G.711
	G.726

The products and services described herein are not necessarily available in all countries. Due to continuous improvements this specification is subject to change without notice. Issued 10/06. Printed in the Netherlands. 3522 001 07821.

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