LANCOM™ Office series

Preface

Thank you for placing your trust in this *LANCOM* product.

With the *LANCOM Office*, you have chosen a powerful router that lets you easily and conveniently provide individual computers or an entire local network with high-speed Internet access.

Model varieties

This user manual applies to the following models of the *LANCOM Office* series which are different in hard and software equipment:

- *LANCOM 800 Office*
- *LANCOM DSL/I-10 Office*
- *LANCOM DSL/I-1611 Office*

Model restrictions

The sections of the documentation that refer only to a range of models are marked either in the corresponding text itself or with appropriate comments placed beside the text.

User manual and *LANCOM* reference manual

The documentation of the device consists of two parts: the user manual and the *LANCOM* reference manual.

You are now reading the user manual. It contains all of the information that you need to set up your *LANCOM Office* router quickly. It also contains the most important technical specifications for the device.

The *LANCOM* reference manual can be found on the CD as an Acrobat (PDF) document. It is designed as a supplement to the user manual and goes into detail on topics that apply to a variety of *LANCOM* devices. These include:

- Configuration and management (*LANtools*, *WEBconfig*, remote configuration)
- Advanced security settings
- Server services (DHCP, DNS, charge management)
- Routing and WAN functions

This documentation was created by…

…several members of our staff from a variety of departments in order to ensure you the best possible support when using your *LANCOM* product.

In case you encounter any errors, or just want to issue critics or enhancements, please do not hesitate to send an email directly to:

info@lancom.de

Our online services (www.lancom.de) are available to you around the clock should you have any queries regarding the topics discussed in this manual or require any further support. Current drivers, firmware, tools and manuals can be downloaded at any time. The knowledge database (KnowledgeBase) offers an additional large pool of information.

In addition, LANCOM Systems Support is available. For telephone numbers and contact addresses of the LANCOM Systems Support, please see the enclosed leaflet or the LANCOM Systems website.

Information symbols	
	Very important instructions. Failure to observe this may result in damage.
	Important instruction that should be observed.
	Additional information that may be helpful but which is not required.

Special formatting in body text	
Bold	Menu commands, command buttons, or input fields
Code	Inputs and outputs in command-line mode
<Value>	Placeholder for a specific value
Italic	Notes and product names

Contents

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1 Introduction

The rapid development of the computer engineering led in the last years to a shoot up of electronically transferred data volume. More and more users want to send and receive more and more data. A demand, that clearly exceeds the capabilities of past transmission technologies (analog modems or ISDN devices) .

New technologies compensate these restrictions and offer genuine broadband communication with clearly higher data transmission rates. The most important criterion for the spreading of these new access technologies is the availability in as much as possible offices or private dwellings. One of the new technologies is the transmission by means of DSL, using simple copper wires for the "last mile". A broadband connection to the Internet can be realized also over the domestic cable TV connection.

A *LANCOM DSL/I-10 Office* or *LANCOM DSL/I-1611 Office* does function with nearly each high-speed Internet access based on DSL or cable TV. The Internet access is always made via an external modem that is connected to the router.

The most powerful representative in the series, the *LANCOM DSL/I-1611 Office*, additionally offers the possibility to be used as a VPN gateway.

The smallest member of the *LANCOM Office* series is the *LANCOM 800 Office*. This device hasn't got a DSL interface, but possesses all features which are available for the ISDN interface and which are described in this manual.

This chapter...

... introduces you briefly to the functions and application fields of routers. You get an overview of the abilities of your *LANCOM Office*. You find a detailed description of the functions, the software and its operation, as well as an introduction to the technical basics in the following chapters.

1.1 What does a router do?

Routers connect Local Networks (LANs) and individual PCs to form a Wide Area Network (WAN). In this WAN each computer can access (depending on its rights) the other computers and services of the complete WAN. The router thereby searches a way on which the data between the computers can be exchanged.

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This is available e.g. with *LANCOM DSL/I-1611 Office* and *LANCOM DSL/I-10 Office* in form of a DSL connection, which is realized via conventional copper telephone lines. Furthermore, an ISDN connection with an adequate ISDN router is available then, as well as *LANCAPI* functions and dial-back up for the Internet connection.

With these features a *LANCOM Office* is ideally suited in particular for the use with high-speed Internet connections. All workstations in the local network of a company can access and use the services and contents of the World Wide Web if the LAN is connected to the network of an Internet service provider

Ethernet (LAN)

LANCOM Office   DSL or cable modem

Internet Service Provider
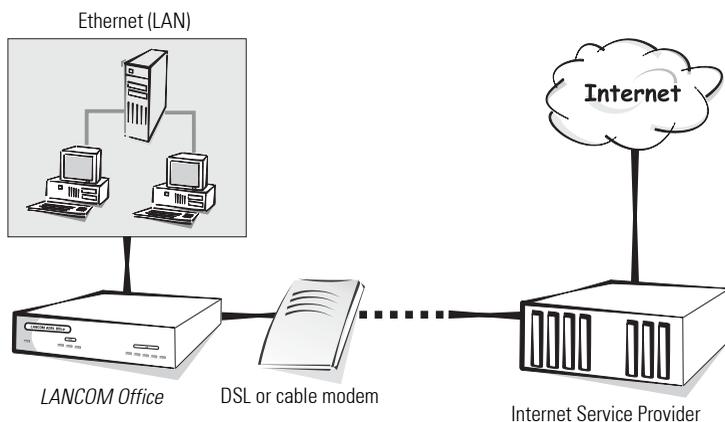
The router is integrated into the LAN like a conventional PC. All data, which flows through the wiring of the network, reaches also the router. The router decides independently then whether particular data must be transferred into another network or not.

1.2 Typical applications

1.2.1 Internet in the LAN

In many enterprises grows the demand for an access to the Internet from all workstations of the LAN. Online searches, e-mail and file transfer are only some applications, which facilitate the PC-based work for the users.

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The router links all the workstation computers on your local area network to the global Internet. Security functions such as IP Masquerading and Firewall filters protect your LAN against unauthorized access from outside.

1.2.2   LAN to LAN coupling

If the business runs correctly, soon it becomes time for a subsidiary or a branch office in the global markets. Also the branch has its own network and would like to be always up to date.

The LAN to LAN coupling links individual LANs to form one large network, even if this means crossing continents. Using connections via switched lines, an intelligent line management in interaction with sophisticated filter mechanisms ensures small connecting costs.

Faster, more economically and more flexibly is the network coupling via Internet. Here the broadband access to the Internet comes into play (via DSL or the cable TV network). LAN to LAN couplings via the Internet take place as Virtual Private Networks (VPN).

LANCOM DSL/I-1611 Office can be upgraded with the *LANCOM VPN Option* and supports the set-up of VPNs then.

1.2.3   Homeworking with Remote Access

The work of many office workers in modern organizations is less and less dependent on any definite location - the most important factor is unimpaired access to shared and freely available information.

Remote Access (RAS) is the magic word here. Employees working from home or field staff can dial into the company network via ISDN. When working with remote access, *LANCOM Office* protects the company network: the callback function only grants access to known and registered users. And for a more comfortable settlement of accounts, the connecting costs are centrally registered in the company.

All devices of the *LANCOM Office* series support remote access services via ISDN. Optionally, the *LANCOM DSL/I-1611 Office* supports VPN-based RAS as well.

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1.2.4 Office communications

Faxing directly from within applications, voice mail with different announce-ments according to the time of day, banking without having to leave the office: These functions can be enabled by using *LANCAPI*.

The *LANCAPI* is a special type of CAPI-2.0 interface that permits appropriate applications to access the router.

All *LANCOM Office* enable office communication functions via their ISDN interface.

1.3 What can your *LANCOM Office* do?

The following section provides a brief overview of the most important fea-tures of your device.

1.3.1 All devices of the *LANCOM Office* series

Simple Installation

- Power supply to *LANCOM Office*
- Establishing connection to the LAN
- Establishing connection to DSL or cable modem (not *LANCOM 800 Office*)
- Connecting ISDN cable
- Switch on
- Installation of *LANCOM* software and basic configuration with the com-fortable wizards
- Go!

LAN connection

You link a LANCOM router with its 10/100Base-T connector to an (Fast) Eth-ernet. The connector checks automatically the operation speed of the local area network.

WAN connection

LANCOM DSL/I-10 Office and *LANCOM DSL/I-1611 Office* are connected to the Ethernet interface of a DSL or cable modem.

For *LANCOM 800 Office*, the ISDN interface is available as WAN connector.

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LANCOM DSL/I-1611 Office and *LANCOM DSL/I-10 Office* have got an additional ISDN connector, which is linked to the S_0 port(s) of an ISDN point-to-multipoint connection (point-to-multipoint configuration) or a point-to-point connection (point-to-point configuration). The router automatically detects your port type and D-channel protocol in use.

IP-Routing: connection establishing and administration

The router checks all IP packets in the network whether they have to be sent to another network or computer. If a transfer is necessary, the router establishes the connection itself and closes the connection once the transfer is completed.

Security features

A *LANCOM Office* has powerful security functions to prevent unauthorized access to your company network from outside. IP masquerading hides all workstations of a LAN behind a single public IP address. The actual identities (IP addresses) remain concealed. Firewall filters allow specific IP addresses, protocols and ports to be blocked. MAC address filters enable control of access for specific workstations to the IP routing functions of the device.

Login barring prevents any "brute force attacks" and denies access to the router after a configurable number of login attempts using an incorrect password. This measure effectively protects the configuration of the router against repeated attacks.

DHCP

Your *LANCOM Office* features the following DHCP modes:

- DHCP server to assign the IP addresses
- DHCP relay agent to forward DHCP inquiries

Your device works already with the presetting in an ingenious automatic DHCP mode, so that the setting-up of a *LANCOM Office* becomes easy both in an existing and in a new network, regardless of its DHCP settings.

DNS server

The built-in DNS server of the router creates links between IP addresses and names of computers or networks. In case of inquiries for known computer names, the correct route can be assigned directly then .

Thereby, the DNS server can make use of the names and IP information provided both from the DHCP server and from the NetBIOS module.

The DNS server can be used also as an effective filter for users in the own LAN. For individual computers or entire networks the access to certain domains can be blocked.

Virtual Private Network (VPN)

Your *LANCOM DSL/I-1611 Office* can be upgraded with the VPN option to a full-featured VPN gateway (according to the IPSec standard). This enables to establish secure network couplings to other VPN gateways via the Internet (or other IP networks). The IPSec standard and most recent encoding techniques ensure a high safety level of the VPN connections.

LANmonitor

With LANmonitor you have under Windows operating systems all router's status information always on the screen. For each device of the local area network the most important information is provided, e.g.:

• Connecting state for each transfer channel
• Name of the connected remote station
• Which module from the device is connected? (Router, *LANCAPI*)
• Connecting time and data transmission rates
• Excerpts from the statistics of the device (e.g. information from the PPP negotiation).

Beyond that, the software supports logging and storage of output for later purposes on the PC.

Status displays

LED status information on the front panel of your device provide a quick check of all LAN and WAN connections and facilitate the diagnosis of potential system troubles.

Configuration

Setting up and configuring the device to your specific requirements is made quick and easy by the included configuration tool *LANconfig* for Windows operating systems.

For Linux exists a beta version of xLANconfig which you can find on the LANCOM CD or download in the current version from the download area of the LANCOM website.

Users of other operating systems than Windows may employ the HTML-based configuration with *WEBconfig*, a SNMP management system, Telnet or any terminal program.

The access to the device is possible from the LAN, from WAN, by remote configuration via ISDN dial-in, or directly through the integrated serial configuration interface.

The integrated setup wizards of *LANconfig* and *WEBconfig* help you to set up the devices in a few steps.

Firmware update

In order to preserve always an up to date software version, all devices have got an internal Flash ROM memory.Thus a new firmware can be downloaded very comfortably, and it is not necessary to open your device.

The current firmware version is always available via the *LANCOM* hompage. It can be uploaded to the device through the LAN or WAN interface, via ISDN or through the serial configuration interface.

LANCOM FirmSafe

There is no risk involved in uploading a new firmware: The *LANCOM* FirmSafe function enables two firmware files being preserved on one device. If the new firmware version does not function as desired after the upload, you can simply revert to the previous version.

If you encounter an error during the upload (e.g. caused by a transmission error), the device reverts automatically to the working previous version.

Connect charge protection

The connect charges for the Internet use are calculated time-dependent, according to your Provider. For not being surprised by a high invoice at the end of the month, you can specify in advance how many online minutes for the Internet connection should be permitted over a *LANCOM Office* in a certain period (e.g. 600 minutes in 6 days).

Statistics

The extensive statistics provide control of your *LANCOM Office* at any time . For example, you find information about all transmitted data packets in order to optimize the configuration of your device.

1.3.2 Additional functions of the ISDN interface

All *LANCOM Office* provide an ISDN connector, which offers some additional functions.

Multiprotocol router

Via the ISDN interface other protocols than IP can be routed also . For example, the IPX protocol enables the coupling of Novell networks.

LANCOM router offer a special feature for the interconnection of Microsoft peer-to-peer networks. With the integrated routing of NetBIOS/IP packets, the linking of Windows networks becomes a simple task. The remote stations with which NetBIOS information have to be exchanged are registered in a special list in order to avoid that each NetBIOS packet triggers a connection.

Acting as a NetBIOS proxy then, the router answers all inquiries regarding known computers locally, and avoids in this way an unnecessary establishment of connections.

Compatibility by PPP

The router supports communication with products of other vendors. Especially PPP is a very widespread protocol for the interchange of network data via point-to-point connections.

Remote configuration using PPP

A special configuration highlight of LANCOM is the PPP-based remote management for routers, which cannot and should not be set up locally. A new device has just to be supplied with voltage and to be connected with its WAN interface. Then you can dial-in to the router simply over a PPP connection and configure it comfortably from your specific remote location. This access is protected by a password after the initial configuration and remains locked for unauthorized callers.

Security features for the ISDN interface

To secure the integrated ISDN interface, the *LANCOM Office* uses password protection and caller identification (CLI), as well as the callback function to restrict connection establishment to previously specified ISDN subscriber numbers. Furthermore, additional PPP authentication mechanisms enhance the security concept.

Optional *LANCOM Dynamic VPN*

With the *LANCOM VPN Option* a *LANCOM DSL/I-1611 Office* is enabled to set up VPN tunnels even between two peers with both dynamic IP addresses. This is enabled by the patent-pending *LANCOM Dynamic VPN* technology.

LANCOM LANCAPI and *LANCOM CAPI* Faxmodem

The main advantages of using *LANCAPI* are economic ones: *LANCAPI* is a special implementation of the CAPI 2.0 interface that permits different communication programs to access a router via the network.

By *LANCAPI*, all workstations that are part of a LAN get an unrestricted access to office communication functions such as fax and eurofile transfer. All functions are available via the network, without additional hardware at the workstations. This eliminates the costs of equipping all individual workstations with ISDN adapters or modems. Solely the software for office communication has to be installed at each workstation (if not already provided by the operating system).

A fax device is simulated at the workstation so that faxes can be sent. With *LANCAPI*, the PC forwards the fax via the network to the router, which establishes the connection to the recipient then.

Automatic time control

The device needs always the exact time in order to provide meaningful statistics and to choice the right connection via the least-cost-router . The device itself can read the time via the ISDN network or via public NTP time servers. The internal time of the router is compared either with each connection establishment or with each switch-on of the device with the external time service. A manual setting of the time is also possible, of course.

Channel bundling and compression

The device supports on the ISDN line both static and dynamic channel bundling via MLPPP and BACP. Stac data compression (hi/fn) can be used to achieve an additional increase of the data transfer rate up to 400%.

Least-cost-routing

Also with a considerable large number of providers for telecommunication services, you always select the most inexpensive ISDN lines with the least-cost-router. Thereby you define once the provider with the most favorable rates for your needs and by each connection, the router selects automat-

ically the provider with the most favorable rates (no matter, if via the router or via *LANCAPI*).

Leased line option

The network coupling via ISDN leased lines is possible with the optional leased line option.

2 Introducing the *LANCOM Office*

This section introduces the device. We will give you an overview of all status displays and connectivities.

2.1 The front of the unit

The front panel of the unit features as display elements a series of Light Emitting Diodes (LEDs).

Only *LANCOM DSL/I-10 Office* and *LANCOM DSL/I-1611 Office*
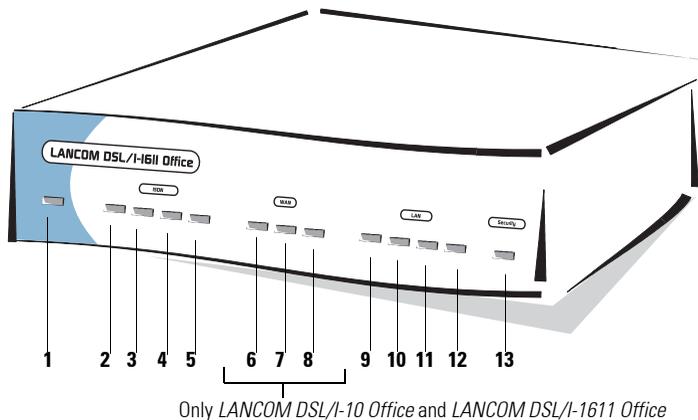
Meanings of the LEDs

1 **Power/Msg** – This LED flashes once when powering-up your device. After the self-test either an error is indicated by a flashing, or the device starts and the LED lights constantly..

off		Device off
red	flashing once	Self-test when powering up
red	blinking	Constant flashing indicates time or charge limit exceeded. Other flashing types indicate boot errors
red		Device is ready for use

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2 **ISDN S$_0$ Status** – Indicates the status of the ISDN-S$_0$ connection:

off		not connected or no S$_0$ voltage (many ISDN connections disable the S$_0$ voltage after a certain, inactive time)
green	blinking	initializing (establishing contact with the connection point)
green		ready for use (S$_0$ bus activated, TEI existing and D channel protocol checked)
green	Power off	LED on, but Power-LED off: device in boot monitoring

3 **3 ISDN Chan1** – Status of the first logical ISDN B channel (in router as well as in CAPI operation):

off		no connection established
red	blinking	incoming call
green	blinking	outgoing call
red		physical line enabled, protocol negotiation ongoing
green		protocol negotiation (X.75, PPP etc) finished, physical and logical connection operational
green/red	short red flashes	indication of received data packets

4 **ISDN Chan2** – Status of the second logical ISDN B channel (meaning see ISDN Chan1)

5 **ISDN-1+2** – Indicates, whether the actual ISDN connection is a static or a dynamic channel bundling.

off	no bundled connection active
green	static or dynamic channel bundling connection active

Not available on LANCOM 800 Office

6 **WAN-Rx/Tx** – This yellow LED indicates the data transfer via the WAN connection (via DSL or cable modem).

Not available on LANCOM 800 Office

7 **WAN-Link** – This green LED indicates that the Ethernet connection between *LANCOM Office* and the DSL resp. cable modem is operational.

Not available on LANCOM 800 Office

8 **WAN-Chan** – This LED indicates the status of the WAN connection (via DSL or cable modem) to the provider. The connection to the provider normally requires a login with username and password. With time-depen-

dent connecting rates arise charges during this time. The meanings of the LED in detail:

off	no active connection
red	establishing connection (login)
green	Connection established (login successful)

9 **LAN-Rx/Tx** – Data packet from the device to the LAN or from the LAN sent to the device

10 **LAN-Coll** – Sending collision

11 **LAN-Link** – The connection to the LAN is established and ready for use

12 **LAN-Fast** – The LAN speed is 100 Mbps

*Not available on
LANCOM 800
Office*

13 **Security-VPN/Msg** –
LANCOM DSL/I-1611 Office: In VPN gateway operation, the LED provides the VPN status information:

off	no active VPN connection
green	VPN connection(s) active
red	establishing a VPN tunnel

LANCOM DSL/I-10 Office: This LED indicates the activities of the Stateful Inspection Firewall. It will flash red on certain firewall events (e.g. rejecting/dropping of packets)

2.2 The back of the unit

The connectors and switches of the device are located on the rear panel.

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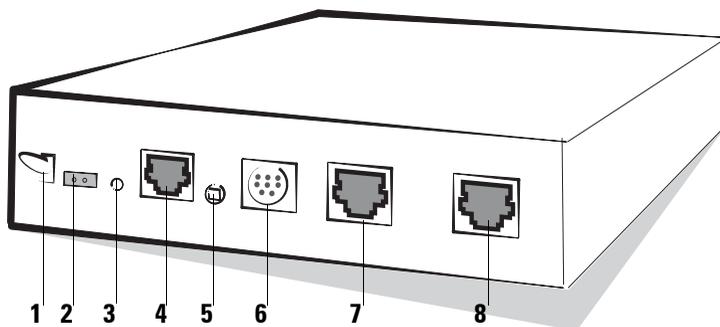
1 On/off switch

2 Connection for the power adapter

Only use the included power supply unit! Using an unsuitable power supply may cause damage or injury.

3 Reset switch – For setting the device into the delivery state, push the set reset bottom and press it for approximately 5 seconds. As soon as the reset switch is released, the front panel LEDs of the device will light up and the device will be reset to the factory-default state.

4 10/100Base-Tx for the connection to the LAN. Supported are 10 Mbps or 100 Mbps connections. *LANCOM Office* identifies automatically the used network speed (autosensing).

5 Node/Hub switch – for a direct connection of a single PC, the Rx and Tx wires of the LAN connector **4** can be crossed within the device ('hub' setting).
When you connect to an external hub or switch, it should be set to the 'Node' position (presetting).

6 V.24 serial configuration port

7 ISDN S_0 port

8 10Base-T-port for DSL or cable modem (not *LANCOM 800 Office*)

3 Installation

This chapter will assist you to quickly install hardware and software. First, check the package contents and system requirements. If all prerequisites are fulfilled, the device can be installed and configured quickly and easily.

3.1 Package contents

Please check the package contents for completeness before starting the installation. The package should contain the following components:

- *LANCOM Office*
- Power adapter
- LAN connector cable (green plugs)
- WAN connector cable for DSL or cable modem (only *LANCOM DSL/I-10 Office* and *LANCOM DSL/I-1611 Office*, dark blue plugs)
- ISDN connector cable (light blue plugs)
- Connector cable for the serial configuration port
- *LANCOM* CD with *LANtools* and further software
- Printed documentation

Please contact the address stated on the delivery note of the unit if anything is missing.

3.2 System preconditions

Computers that connect to a *LANCOM Office* must meet the following minimum requirements:

- Any operating system that supports TCP/IP, e.g. Windows Millennium Edition (Me), Windows 2000, Windows XP, Windows 98, Windows 95, Windows NT, Linux, Apple Mac OS, OS/2, BeOS.
- An Ethernet card must be installed.
- The TCP/IP protocol must be installed.
- A web browser should be installed.

The LANtools and the functions of the LANCAPI also require a Windows operation system.

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3.3 Hardware installation

a Connect your *LANCOM Office* to the LAN. Plug the supplied network cable (green plugs) into the 10/100Base-Tx connection of the device 4 and into a free connector socket of your local network (resp. a free socket of a hub or switch in your LAN). It is also possible to connect an individual PC. In this case, you turn the node/hub switch 5 on 'hub'.
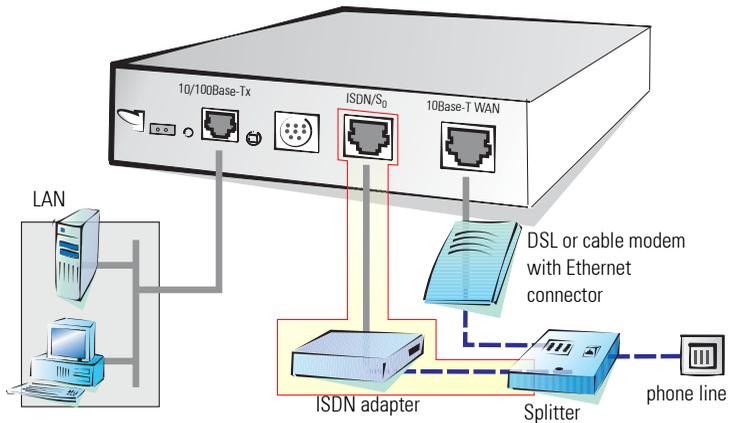
DSL/cable modem connection only for
LANCOM DSL/I-1611 Office and
LANCOM DSL/I-10 Office

b Connect your *LANCOM Office* to ISDN. Plug one end of the supplied ISDN connector cable (light blue plugs) in the ISDN S_0 port 7 of the device and the other end into an ISDN S_0 point-to-point or point-to-multipoint connection (point-to-point or point-to-multipoint configuration).

c Connect your *LANCOM DSL/I-10 Office* or *LANCOM DSL/I-1611 Office* to the DSL or cable TV network. Plug the supplied WAN connector cable (deep blue plugs) into the 10Base-T-WAN connection 8 of the device, and plug the other end into your DSL or cable modem's Ethernet port.

Please notice that your DSL or cable modem must have an Ethernet connection (10Base-T). An operation of the LANCOM Office with a modem that has only an USB or ATM interface is not possible.

d Connect the unit to an AC power supply using the included power adapter, and switch the device on. After a short self-test the ‚Power/Msg'

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LED will be permanently lit. The LED 'LAN-Link' indicates a correct connection to the LAN.

If the 'LAN Link' LED does not light, please actuate the Node/Hub switch 5 on the back of the unit. If the LED still does not light, there might be a problem with the network or cable installation.

3.4 Software installation

This section covers the installation of the included *LANCOM* software for Windows. If you use your *LANCOM Office* exclusively with computers running operating systems other than Windows, you may skip this section. A software installation is not necessary in this case.

A Windows operating system is required for a few functions of your router. Among these functions is the monitoring with LANmonitor. The LANCAPI functions of the LANCOM Office require also a Windows operating system for the ISDN interface at your working place PCs.

3.4.1 Starting *LANCOM* setup

Place the *LANCOM* CD in your CD drive. The setup program will start automatically.

If the setup program does not start automatically, run AUTORUN.EXE in the root folder of the CD.

In Setup select **Install LANCOM software**. The following selection menus will appear on the screen:

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LANCOM Software Setup

Software Components
Specify which software components you want to be installed during setup.

Place a checkmark beside each software component you want to install, or remove the checkmark to exclude it from installation.

☑ LANconfig
☑ LANmonitor
☑ LANCAPI
☑ LANCAPI Dial-Up Networking Support
☑ CAPI Faxmodem
☑ LANCOM Online Documentation

Enables you to configure your LANCOM device in ease from your computer.

< Back   Next >   Cancel

3.4.2   **Which software should you install?**

Select the required software for the operation of your *LANCOM Office*:

- **LANconfig** is the configuration program for all *LANCOM*. *WEBconfig* can be used alternatively (or in addition) via a web browser.
- **LANmonitor** lets you monitor all *LANCOM* in the LAN.
- **LANCAPI** can be installed on as many Windows PCs in the LAN as required, permitting them to run any ISDN software. A PC with LANCAPI behaves as if it had its own ISDN card. In actual fact, the ISDN connection is realized centrally using the *LANCOM* with its ISDN interface.
- **LANCAPI Dial-up Networking Support** lets you use the CAPI software interface on your Windows PC as a network adapter, for example for dial-up remote access to an *LANCOM*.
- The **LANCOM CAPI Faxmodem** installs a fax modem driver on your Windows PC, permitting you to send faxes via the *LANCAPI*.

Select the appropriate software options and confirm with **Next**. The software is automatically installed.

3.5   **In the next chapter …**

… we will perform the basic configuration of your device. Only with a few mouse clicks you will configure your *LANCOM Office* such as all PCs in the LAN have got an Internet access with highest speed.

4 Basic configuration

In this chapter we will explain the basic configuration of your *LANCOM Office*:

- Assignment of a free IP address
- Activation of the integrated DHCP server (if desired)
- Protection of the configuration access by password
- Configuration of the ISDN interface
- Setting up an Internet access

4.1 Starting the setup wizard

Any unconfigured *LANCOM Office* can be accessed in two comfortable ways:

- *LANconfig* will automatically find any unconfigured *LANCOM* and will start the setup wizard for its basic configuration automatically.
- With *WEBconfig*: Enter IP address of the unconfigured *LANCOM Office* at any PC of the connected network in the address field of a web browser. In certain network environments you can access your *LANCOM Office* also with the input of any name in the address field. See 'What is the IP address of the LANCOM Office?' on page 28.

You should never have more than one unconfigured LANCOM in a network segment at any given time, since all unconfigured LANCOM devices use the same IP address (with final digits '254'), which would result in an address conflict then. To avoid such problems, always configure multiple LANCOM devices one after the other, immediately assigning unique IP addresses.

4.1.1 Basic configuration with LANconfig

a Start up *LANconfig* by clicking **Start / Programs / LANCOM / *LANconfig***.

LANconfig automatically detects the new *LANCOM Office* in the TCP/IP network. Then the setup wizard starts that will help you making the basic settings of the device or will even do all the work for you (provided a suitable network environment exists).
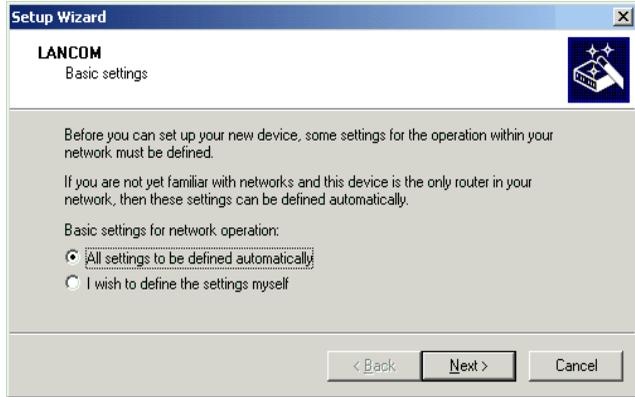
*If the setup wizard does not start automatically, start a manual search for new devices in the network (**Device / Find**).*

*This input window appears only, when no DHCP server is active in your network and your PC has also got no manually assigned IP address. Otherwise the wizard goes on as described under **b** for the input 'I wish to define the settings myself'.*

Make your selection after the following considerations:

Select 'All settings to be defined automatically' …

… if you are **not** familiar with networks and IP addresses and you have not been used any IP addresses in your network so far. Then the router as DHCP server will automatically specify and assign the IP addresses for all devices in the LAN.

Select 'I wish to define the settings myself' …

… if you are familiar with networks and IP addresses, and one of the following conditions is applicable:

• You have not yet used IP addresses in your network but would like to do so now. You would like to specify the IP address for your router, selecting it from the address range reserved for private use, e.g. '10.0.0.1' with the netmask '255.255.255.0'. At the same time you will set the address range that the DHCP server uses for the other devices in the network (provided that the DHCP server is switched on).

• You have previously used IP addresses for the computers in your LAN.

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b If you would like to configure the TCP/IP settings manually, assign an available address from a suitable address range to the *LANCOM Office*. Confirm your choice with **Next**.

c Specify whether or not the router should act as a DHCP server. Make your selection and confirm with **Next**.

d In the following window, specify the password for configuration access. In addition, you may specify whether the device may only be configured from the local network, or whether remote configuration via the WAN and/or via ISDN is also permissible. Confirm your choice with **Next**.

Please note that enabling this will also permit remote configuration via the Internet. You should always make sure that the configuration access is protected with a password.

e Now configure the ISDN interface. Confirm your choice with **Next**.

f If you would like to configure the ISDN settings for your *LANCOM Office*, enter the subscriber number (as MSN, i.e. without area code) on which the router will accept calls. In addition, you can enter a trunk code for dialing into ISDN. Finally, you should specify whether or not the tariff information is to be transmitted at your ISDN connection. Confirm your choice with **Next**.

g Complete the configuration with **Finish**.

4.1.2 4.1.2 Basic configuration with *WEBconfig*

As you know, it is possible to configure with *WEBconfig* your *LANCOM Office* with any web browser. So you are not dependent on the operating system Windows as with *LANconfig*.

The only precondition: You must know how to address the unconfigured router in the LAN. An unconfigured *LANCOM* always reacts to a certain IP address, and in some network configurations even to a name.

Does my *LANCOM Office* react to a name?

If you do not yet have a DHCP or DNS server on your LAN, the router reacts to any name (like 'LANCOM' or 'Router') that you specify in the URL address field of a web browser.

If you don't know whether IP addresses have been used in your network up until now, display the IP address of your own PC (see the following section).

If the 'IP Address' field contains the value '0.0.0.0', this indicates that an IP address has not yet been assigned to the network card.

What is the IP address of the *LANCOM Office*?

The IP address of an unconfigured *LANCOM* results from the IP address of your PC by replacing the last number of its IP address (behind the third dot) with 254.

For example, if your PC is assigned the IP address 10.0.0.17, then you will find an unconfigured *LANCOM* under the address 10.0.0.**254**. The IP address of your PC can be displayed (depending on the operating system) with the following command line commands (entry under Windows at the command prompt):

Operating system	Command in the command line
Windows 95, Windows 98, Windows Me	`winipcfg`
Windows NT 4.0, Windows 2000, Windows XP	`ipconfig`
Linux, UNIX	`ifconfig`

Starting the wizards in *WEBconfig*

a Start your web browser (e.g. Internet Explorer, Netscape Navigator) and call the *LANCOM Office* there:

`http://<IP address of the LANCOM>` (or with any desired name)

The following main menu will be displayed:

EN

LC1621.Internet LANCOM
Systems

(LANCOM 1621 ADSL/ISDN 2.70.0023 / 02.08.2002)

Setup Wizards
Wizards enable you to handle frequent configuration jobs easily and quickly:

- Basic Settings
- Security Settings
- Setup Internet Access   Setup wizards for the most
- Selection of Internet Provider   common tasks
- Setup a RAS Account
- Connect Two Local Area Networks

Device Configuration and Status
These menu options enable you to access the device's entire configuration:

- Expert Configuration
- Save Configuration
- Load Configuration

Firmware Handling
- Perform a Firmware Upload

The setup wizards are tailored precisely to the functionality of the specific LANCOM. As a result, your device may not offer all the wizards shown here.

b Select **Basic settings**. In the following window you may specify wether the configuration of the IP parameters may be automatically or manually.

This input option appears only, when no DHCP server is active in your network and your PC has also got no assigned IP address. Otherwise the wizard goes on as described from step **d**.

c Make your selection after the following considerations:

Activate 'IP parameters to be defined automatically' …

… if you are not familiar with networks and IP addresses and you have not been used any IP addresses in your network so far. Then the router as DHCP server will automatically specify and assign the IP addresses for all devices in the LAN.

**Deactivate 'IP parameters to be defined automatically' …**

… if you are familiar with networks and IP addresses, and one of the following conditions is applicable:

- You have not yet used IP addresses in your network but would like to do so now. You would like to specify the IP address for your router, selecting it from the address range reserved for private use, e.g.'10.0.0.1' with the netmask '255.255.255.0'. At the same time you will set the address range that the DHCP server uses for the other devices in the network (provided that the DHCP server is switched on).

- You have previously used IP addresses for the computers in your LAN. Assign an available address from a suitable address range to your new device. Specify whether or not the device should act as a DHCP server in the LAN.

d If you would like to configure the IP settings manually, assign an available address from a suitable address range to the *LANCOM Office*. Also set whether or not it is to operate as a DHCP server. Confirm your entry with **Apply**.

e In the following window 'Security settings' window, specify a password for configuration access. You may specify whether the device may only be configured from the local network or whether remote configuration via the WAN (via DSL or cable modem, with *LANCOM 800 Office* only via ISDN) is also permissible. Confirm your choice with **Apply**.

Please note that enabling this will also permit remote configuration via the Internet. You should always make sure that the configuration access is suitably protected, e.g. with a password.

For a *LANCOM DSL/I-1611 Office* or a *LANCOM DSL/I-10 Office* you have just been installing the DSL interface, so that you have now the possibility to configure the ISDN interface. Confirm your choice with **Apply**.

f If you have chosen the configuration of the ISDN port, you will finally be asked, if the tariff information is also to be transmitted at your ISDN port. Make your selection and confirm with **Apply**.

g When *WEBconfig* reports the acceptance of the entries, the basic configuration has been completed.

5   Setting up Internet access

All computers in the LAN can take advantage of the central Internet access of the *LANCOM Office*. The connection to the Internet provider can be established via any WAN connection, i.e. not only via DSL (if present), but also via ISDN. Internet access via ISDN can be used as a backup connection for DSL, for example.
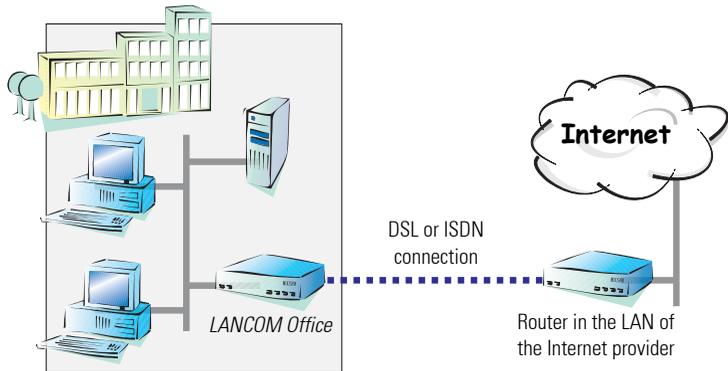
Does the setup wizard know your Internet provider?

A convenient wizard is available to help you set up Internet access. The wizard knows the access information of major Internet providers and will offer you a list of providers to choose from. If you find your Internet service provider on this list, you normally will not have to enter any further transfer parameters to configure your Internet access. Only the authentication data that are supplied by your provider are required.

Additional information for unknown Internet providers

If the setup wizard does not know your Internet provider, it will prompt you for all of the required information step by step. Your provider will supply this information.

Additional connection options

You may also enable or disable further options in the wizard, depending on whether or not they are supported by your Internet provider:

- **Time-based billing or flat rate - select the accounting model used by your Internet provider.**

- When using time-based billing, you can set the *LANCOM Office* to automatically close existing connections if no data has been transferred within a specified time (the so-called idle time).

  In addition, you can activate a line monitor that identifies inactive remote stations faster and therefore can close the connection before the idle time has elapsed.

- Active line monitoring can also be used with flat rate billing to continuously check the function of the remote station.

  You also have the option of keeping flat rate connections alive if required. Dropped connections are then automatically reestablished.

- **Dynamic channel bundling (ISDN only)**
  - If required, the second ISDN B channel will automatically be bundled to the connection. This doubles the available bandwidth; but it may also double your connect charges as well. What's more, your ISDN connection will be busy in this case, with all other incoming and outgoing calls being rejected.

- **Data compression (ISDN only)**
  - This permits an additional increase in data throughput.

5.1 Instructions for *LANconfig*

a Highlight the *LANCOM Office* in the selection window. From the menu bar, select **Tools / Setup Wizard**.

b Launch the 'Set up Internet access' wizard. Follow the wizard's instructions and enter the required information.
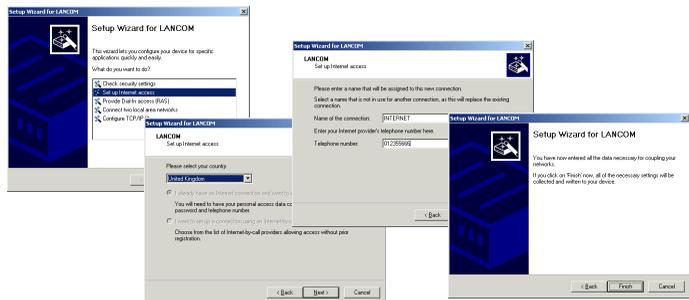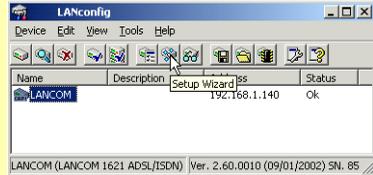

c From the menu, select **Setup Internet access wizard** and click **Next**.

d d In the following window select your country and your Internet provider if possible, and enter your access information.

e e Depending on their availability, the wizard will display additional options for your Internet connection.

f f The wizard will inform you as soon as the entered information is complete. Complete the configuration with **Finish**.

LANconfig:

Quick access to the setup wizards

Under *LANconfig*, the fastest way to launch the setup wizards is via the button on the toolbar.

5.2 Instructions for *WEBconfig*

a In the main menu, select **Setup Internet access**.

b In the following window select your country and your Internet provider if possible, and enter your access information.

EN

   c Depending on their availability, the wizard will display additional options for your Internet connection.

   d The wizard will inform you as soon as the entered information is complete. Complete the configuration with **Next**.

6 Linking two networks

With the network interconnection (also known as LAN to LAN coupling) of the *LANCOM Office*, two local networks are linked via ISDN. A setup wizard handles the configuration of the connection in the usual convenient manner.

Always configure both sides

Both routers involved in the network interconnection must be configured. Care must be taken to ensure that the configuration information provided matches.

The following instructions will assume that LANCOM routers are being used on both sides. A network interconnection may also be realized with routers from other manufacturers. A mixed setup usually requires more extensive configuration measures for both devices, however. Please refer to the LAN-COM reference manual for more information in this regard.

Security aspects

You must, of course, protect your LAN against unauthorized access. A *LANCOM Office* therefore offers a whole range of security mechanisms that can provide an outstanding level of protection:

- Password-protected connections – simple and effective security.
- Verification of the ISDN subscriber number – for additional security.
- Callback function – for the highest security. Instruct the router to call incoming callers back under their own numbers.

The callback function cannot be configured using the wizard. It can only be set up in the expert configuration. For details, please see the LANCOM reference manual.

High-speed network links via DSL—VPN is the answer

To couple LANs using a fast DSL connection, you need the *LANCOM VPN Option*. This software option enables your *LANCOM DSL/I-1611 Office* router as a fully-fledged VPN gateway. Two *LANCOM* routers with *LANCOM VPN Option* can be deployed to link LANs via the Internet.

The setup and configuration of VPN connections are covered in the *LANCOM VPN Option*

6.1 What information is necessary?

The wizard will prompt you for the necessary information on a step-by-step basis. If possible, however, you should have it available before launching the wizard.

To explain the significance of the information requested by the wizard, we will be using a typical deployment as an example: setting up a link between a branch office and its headquarters. The routers involved are named 'HEAD_OFFICE' and 'BRANCH'.

Please refer to the following tables for the entries to be made for each of the routers. Arrows mark the dependencies between the entries.

6.1.1 General information

Name of local device and of remote station

Settings of the router in the ...	Head Office		Branch
Name of the local device	*'HEAD OFFICE'*	→	*'BRANCH'*
Name of the remote station	*'BRANCH'*	→	*'HEAD OFFICE'*

If you haven't already named your *LANCOM*, the wizard will ask you for a new, **unique device name**. With this entry, you will rename your *LANCOM*. Be sure to give the two devices different names.

The **name of the remote station** is necessary for its identification.

Connection information

Settings of the router in the ...	Head Office		Branch
Remote ISDN subscriber	*(0789) 654321*	←→	*(0123) 123456*
Remote ISDN caller ID	*(0789) 654321*	←→	*(0123) 123456*
Password for ISDN connection	*'Secret'*	←→	*'Secret'*

Enter the subscriber number of the remote station in the **ISDN subscriber number** field. The complete subscriber number including all necessary area and country codes is required.

The stated **ISDN caller ID** is used to identify and authenticate callers. When a *LANCOM* receives a call, it compares the ISDN caller ID entered for the

remote station with the actual caller ID transferred via the D channel. An ISDN caller ID generally consists of an area code and an MSN.

The **password for the ISDN connection** is an alternative to the use of the ISDN caller ID. It is always used to authenticate callers that do not send an ISDN caller ID. The exact same password must be entered on both sides. It is used for calls in both directions.

Data compression and Channel bundling

Settings of the router in the ...	Head Office		Branch
Data compression	*on/off*	◄──►	*on/off*
Channel bundling	*on/off*	◄──►	*on/off*

Data compression increases the transfer speed of the connection at no additional cost. This is completely unlike the bundling of two ISDN channels with MLPPP (**M**ulti**L**ink **PPP**): The transfer rate will be doubled but there will also be additional telephone costs for two connections.
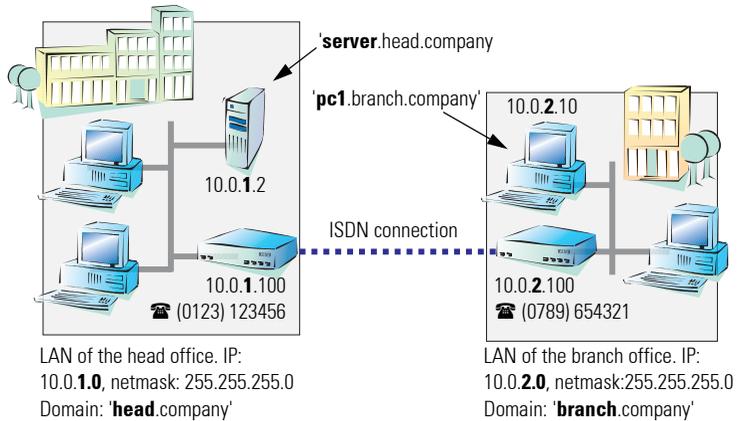
Selection of network protocols

Select the desired network protocols:

- TCP/IP - for example for Internet, intranet, Windows, Unix. NetBIOS can also be selected for Windows peer-to-peer networks.
- IPX - for Novell networks

6.1.2 Settings for the TCP/IP router

In TCP/IP networks, addressing has a special significance. Please note that two interconnected networks are logically separate from one another. Each must therefore have its own network number (in our example, '10.0.1.x' and '10.0.2.x'). These network numbers may not be identical.

EN

'**server**.head.company

'**pc1**.branch.company'

10.0.**2**.10

10.0.**1**.2

ISDN connection

10.0.**1**.100
☎ (0123) 123456

10.0.**2**.100
☎ (0789) 654321

LAN of the head office. IP:
10.0.**1.0**, netmask: 255.255.255.0
Domain: '**head**.company'

LAN of the branch office. IP:
10.0.**2.0**, netmask:255.255.255.0
Domain: '**branch**.company'

Unlike when accessing the Internet, all of the IP addresses in the involved networks are visible on the remote side when coupling networks, not just those of the router. The computer with the IP address 10.0.2.10 in the branch office LAN sees the server 10.0.1.2 in the headquarters and can access it (assuming it has the appropriate rights), and vice versa.

DNS access to the remote LAN

Thanks to DNS, it is not only possible to access remote computers in a TCP/IP network via their IP address, but also by using freely defined names.

For example, the computer with the name 'pc1.branch.company' (IP 10.0.2.10) will not only be able to access the server of the head office via its IP address, but also via its name, 'server.head.company'. The only precondition: the domain of the remote network in the wizard must be specified.

The domain can only be specified in the LANconfig wizard. In WEBconfig, enter the appropriate information later in the expert configuration. For more information, see the LANCOM reference manual.
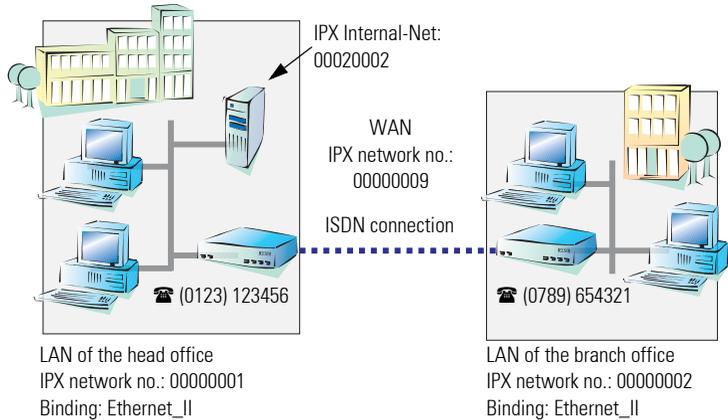
6.1.3 Settings for the IPX router

Coupling two typical IPX networks to form a WAN requires three IPX network numbers:

- for the LAN of the head office
- for the LAN of the branch office
- for the higher-level WAN

The IPX network numbers in the head and branch offices are specified to the respective remote sides.

IPX Internal-Net:
00020002

WAN
IPX network no.:
00000009

ISDN connection

☎ (0123) 123456   ☎ (0789) 654321

LAN of the head office   LAN of the branch office
IPX network no.: 00000001   IPX network no.: 00000002
Binding: Ethernet_II   Binding: Ethernet_II

The three required network numbers are designated as "External Network Numbers" by the IPX conventions. Like IP network addresses, the apply to an entire LAN segment. On the other hand, internal IPX numbers are used to address specific Novell servers in the LAN. All three specified network numbers must be distinct from one another and from all used internal IPX network numbers.

In addition, it may be necessary to enter the frame type ("binding").

Specifying the IPX network number and binding used is not necessary if the remote network also contains a Novell server. It is only necessary to enter the network number for the WAN manually in this case.

6.1.4 Settings for NetBIOS routing

NetBIOS routing can be set up quickly: All that is required in addition to the information for the TCP/IP protocol used is the name of a Windows workgroup from in the router's own LAN.

Remote Windows workgroups do not appear in the Windows Network Neighborhood, but can only be contacted directly (e.g. via Find Computers).
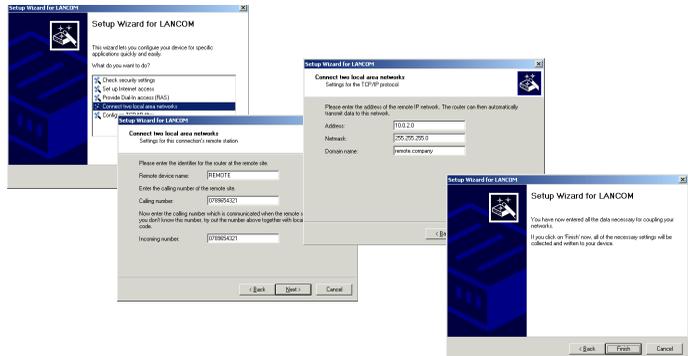
6.2 Instructions for *LANconfig*

Perform the configuration on both routers, one at a time.

a Launch the 'Connect two local area networks' wizard. Follow the wizard's instructions and enter the required information.

b The wizard will return a message to indicate that it has all the information it needs. Close the wizard with **Finish**.

c After finishing the configuration of both routers, you can test the network connection. Try to contact a computer in the remote LAN (e.g. with ping). The *LANCOM Office* should automatically set up a connection to the remote station and contact the required computer.

6.3 Instructions for *WEBconfig*

Perform the configuration on both routers, one at a time.

a a From the main menu, launch the 'Connect two local area networks' wizard. Follow the wizard's instructions and enter the required information.

EN

b The wizard will return a message to indicate that it has all the information it needs. Close the wizard with **Terminate**.

c After finishing the configuration of both routers, you can test the network connection. Try to contact a computer in the remote LAN (e.g. with ping). The *LANCOM Office* should automatically set up a connection to the remote station and contact the required computer.

Ping - quick testing for TCP/IP connections

To test a TCP/IP connection, simply send a `ping` from your computer to a computer in the remote network. For more information on the 'ping' command, please see the documentation of your operating system.

IPX and NetBIOS connections can be tested by searching for a remote Novell server or a computer in the remote Windows workgroup from your computer.

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7   Providing dial-up access

Your *LANCOM Office* supports dial-up connections to permit individual computers full access to your network. This service is also known as RAS (**R**emote **A**ccess **S**ervice).

The physical connection is realized via ISDN. An ISDN adapter or ISDN modem is therefore the only hardware requirement for the PC. PPP is used as the data transfer protocol. This ensures that all common devices and operating systems are supported.

A setup wizard handles the configuration of the dial-up connection in the usual convenient manner.

Security aspects

You must, of course, protect your LAN against unauthorized access. A *LANCOM Office* therefore offers a whole range of security mechanisms that can provide an outstanding level of protection:

- Password-protected connections - simple and effective security.
- Verification of the ISDN subscriber number - for increased security.
- Callback function - the highest security levels can be achieved by setting the router to call participants back at a number specified earlier.

The callback function cannot be configured using the wizard. It can only be set up in the expert configuration. For details, please see the LANCOM reference manual.

7.1   Which information is required?

The wizard will set up dial-up access for only one user. Please run the wizard again for each additional user.

User name and password

Users authenticate themselves with this information when dialing in.
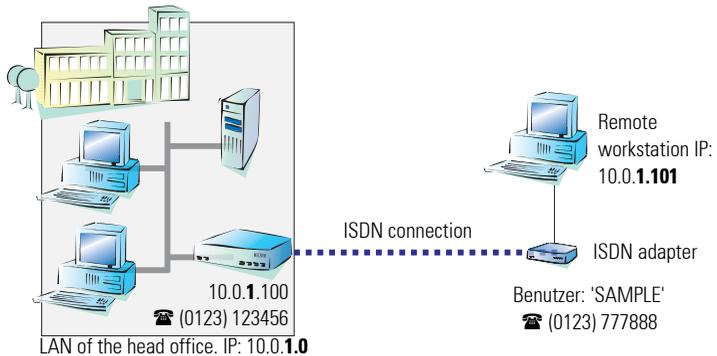
Incoming number

The *LANCOM Office* uses the optional ISDN caller ID as an additional user authentication. This security function should not be used when users dial in from differing locations.

Selection of network protocols

Select the desired network protocols:

- TCP/IP - for example for Internet, intranet, Windows, Unix. NetBIOS can also be selected for Windows peer-to-peer networks.
- IPX - for Novell networks

Important for TCP/IP: One IP address

Remote workstation IP: 10.0.**1.101**

ISDN connection

ISDN adapter

10.0.**1**.100
☎ (0123) 123456

Benutzer: 'SAMPLE'
☎ (0123) 777888

LAN of the head office. IP: 10.0.**1.0**

Each active RAS user must be assigned an IP address when using the TCP/IP protocol. This IP address can be permanently assigned when setting up a user. However, it is simpler to let the *LANCOM Office* automatically assign free IP addresses to users when they dial in. In this case you only need to specify the IP address range that the *LANCOM Office* should use for RAS users..

The ISDN calling line identity (CLI)

The ISDN caller ID—also known as CLI (**C**alling **L**ine **I**dentity)—this is the telephone number of the caller which is transmitted to the participant receiving the call. As a rule, it consists of the country and area codes and an MSN.

The CLI is well-suited for authentication purposes for two reasons: it is very difficult to manipulate, and the number is transferred free of charge via the ISDN control channel (D channel).
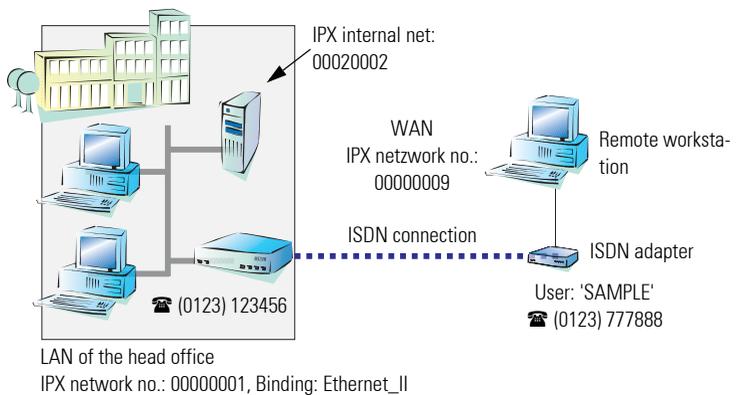

During both manual and automatic IP address assignment, please ensure that only free addresses from the address range of your local network are used. In our example, the IP address '10.0.1.101' will be assigned to the PC when connecting.

EN

This IP address makes the computer a fully-fledged member of the LAN: with the appropriate rights, it can access all of the other devices in the LAN. The same applies in the other direction as well: computers in the LAN will also be able to access the remote machine.

Settings for IPX

Two IPX network numbers must be provided for remote access to an IPX network:

- the IPX network number of the head office
- an additional IPX network number for the higher-level WAN

IPX internal net: 00020002

WAN
IPX netzwork no.: 00000009

Remote worksta-tion

ISDN connection

ISDN adapter

☎ (0123) 123456

User: 'SAMPLE'
☎ (0123) 777888

LAN of the head office
IPX network no.: 00000001, Binding: Ethernet_II

The required network numbers are designated as "External Network Numbers". Like IP network addresses, they apply to an entire LAN segment. On the other hand, internal IPX numbers are used to address specific Novell servers in the LAN. All three specified network numbers must be distinct from one another and from all used internal IPX network numbers.

In addition, it may be necessary to enter the frame type ("binding").

Specifying the IPX network number and binding used is not necessary if the remote network also contains a Novell server. A network number for the WAN must also be entered manually in this case, however.

Settings for NetBIOS routing

All that is required to use NetBIOS is the name of a Windows workgroup from the router's own LAN.

*The connection is not established automatically. The RAS user must manually establish a connection to the LANCOM Office via Dial-Up Networking first. When connected, they can search for and access computers in the remote network (via **Find / Computers**, not through the Network Neighborhood).*

7.2 Settings for the dial-in computer

A number of settings must be configured on the dial-in computer. These are briefly listed here, based on a Windows computer:

- Dial-Up Networking (or another PPP client) must be correctly configured
- Network protocol (TCP/IP, IPX) installed and bound to the dial-up adapter
- New connection in Dial-Up Networking with the call number of the router
- Terminal adapter or ISDN card set to PPPHDLC
- PPP selected as the Dial-Up server type, 'Enable software compression' and 'Require data encryption' unchecked
- Select desired network protocols (TCP/IP, IPX)
- Additional TCP/IP settings:
    - Assignment of IP address and name server address enabled
    - 'IP header compression' disabled

These settings will permit a PC to dial into a remote LAN via ISDN and access its resources in the usual manner.

7.3 Instructions for *LANconfig*

a Launch the 'Provide Dial-In access (RAS)' wizard. Follow the wizard's instructions and enter the required information.
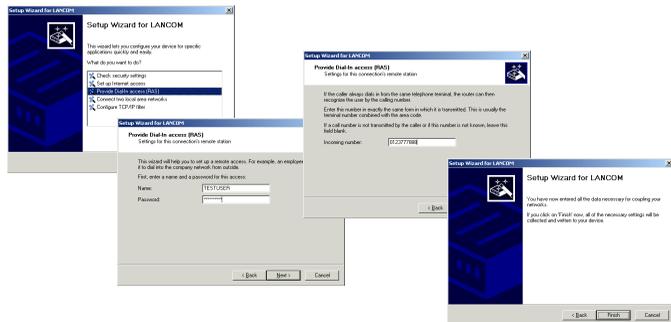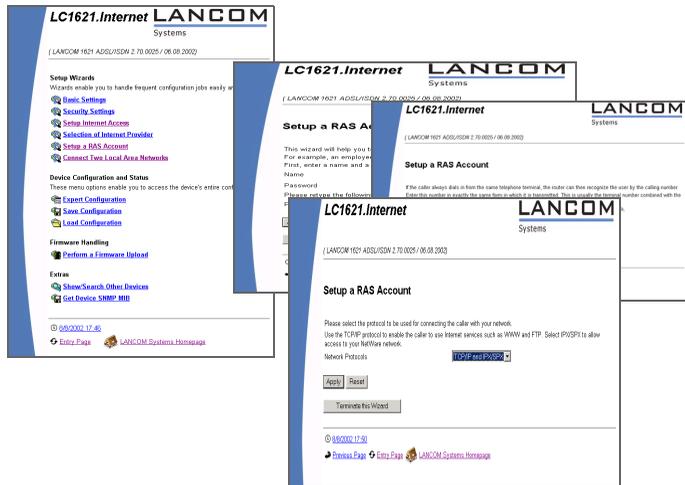
EN

b The wizard will return a message to indicate that it has all the information it needs. Close the wizard with **Finish**.

c Configure Dial-Up Networking access on the dial-in PC as described. Next, test the connection (see box 'Ping - quick testing for TCP/IP connections' on page 41).

7.4 Instructions for *WEBconfig*

a From the main menu, launch the 'Connect two local area networks' wizard. Follow the wizard's instructions and enter the required information.

b Configure Dial-Up Networking access on the dial-in PC as described. Next, test the connection (see box 'Ping - quick testing for TCP/IP connections' on page 41).

8 Office communications with the *LAN-CAPI*

LANCAPI from LANCOM Systems is a special version of the popular CAPI interface. CAPI (Common ISDN Application Programming Interface) establishes the connection between ISDN adapters and communications programs. For their part, these programs provide the computers with office communications functions such as a fax machine or answering machine.

In this chapter, we would like to introduce *LANCAPI* and its uses for office communications applications.

8.1 What are the advantages of *LANCAPI*?

The main advantages of using *LANCAPI* are economic. *LANCAPI* provides all Windows workstations integrated in the LAN with unlimited access to office communications functions such as fax machines, answering machines, online banking and eurofile transfer. All functions are supplied via the network without the necessity of additional hardware at each individual workstation. This eliminates the costs of equipping the workstations with ISDN adapters or modems. All you need to do is to install the office communications software on the individual workstations.

For example, faxes are sent by simulating a fax machine at the workstation. With LANCAPI, the PC forwards the fax via the network to the router which establishes the connection to the recipient.

All applications that you run via LANCAPI use direct ISDN connections which do not make use of the device's router functions. As a result, the firewall and charge monitoring functions do not work!

The client-server principle

The *LANCAPI* is made up of two components, a server (in the *LANCOM Office*) and a client (on the PCs). The *LANCAPI* client should only be installed on the computers of the local network that intend to use the functions of the *LAN-CAPI*.

8.2 Configuring the *LANCAPI* server

Two basic issues are important when configuring the *LANCAPI* server:

EN

- What call numbers from the telephone network should *LANCAPI* respond to?
- Which of the computers in the local network should be able to access the telephone network via *LANCAPI*?

The configuration of the router is performed using the *LANconfig* or *WEBconfig* configuration tables. The following two sections contain step-by-step instructions for each of these configuration programs.

8.2.1 Instructions for *LANconfig*

a Doubleclick the device name in the list to open the configuration of the router and enter your password when prompted to do so.

Double-click the list entry
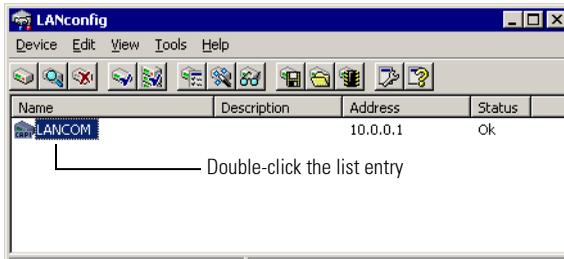
b Select the **LANCAPI** configuration section.
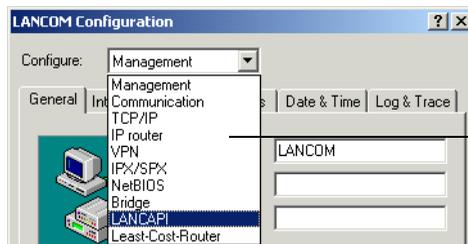
Select the configuration for *LANCAPI*

EN

c Select the ISDN interface.
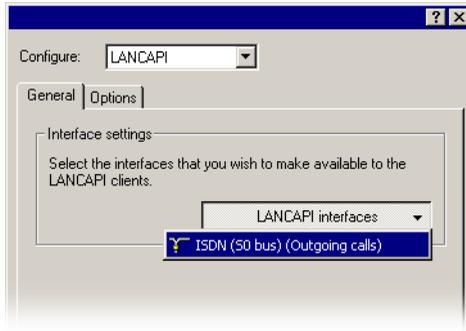
d Activate the *LANCAPI* server for the outgoing and incoming calls, or allow only outgoing calls.
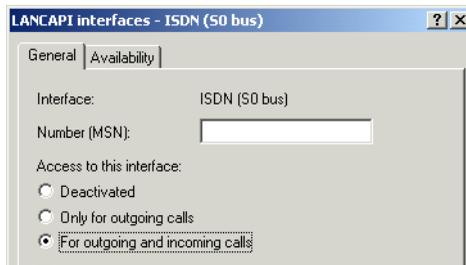
If you would like the *LANCAPI* server to accept incoming calls, enter all of the MSNs on which the *LANCAPI* should answer calls in the 'Number (MSN/EAZ)' field. Use semicolons to separate multiple numbers. If you do not enter a subscriber number here, the *LANCAPI* will answer all incoming calls on the local ISDN connection.

8.2.2 Instructions for *WEBconfig*

a In the main menu, select **Expert Configuration**.

b In the following menus, select **Setup / LANCAPI Module / Interface-list.**

c In the **Interface-list**, select the only entry, **S0-1**.

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d Activate the *LANCAPI* server for the outgoing and incoming calls ('On'), or allow only outgoing calls ('Out').

If you would like the *LANCAPI* server to accept incoming calls, enter all of the MSNs on which the *LANCAPI* should answer calls in the 'Subscriber Numbers (MSN/EAZ)' field. Use semicolons to separate multiple numbers. If you do not enter a subscriber number here, the *LANCAPI* will answer all incoming calls on the local ISDN connection. Confirm your entries with **Apply**.

8.3   Installing the *LANCAPI* client

You must have administrator rights to install the LANCAPI client on a system running Windows XP or Windows 2000.

a Place the *LANCOM* CD in the CD-ROM drive of the client PC. If the setup program does not automatically start when you insert the CD, simply click 'autorun.exe' in the main directory of the *LANCOM* CD in the Windows Explorer.

b Select the **Install LANCOM software** entry.

c Highlight the *LANCAPI* option. Click **Next** and follow the instructions for the installation routine. Finally, restart the computer if required.

The *LANCAPI* client will start automatically from now on. Its status is displayed by the new icon in the Windows system tray (next to the clock).

=active	= error	= inactive

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8.4 Configuration of the *LANCAPI* client

The configuration of the *LANCAPI* client is used to determine which *LANCAPI* servers will be used and how these will be checked. All parameters can remain at their default settings if you are using only one *LANCOM* in your LAN as a *LANCAPI* server.

a Start the *LANCAPI* client in the 'LANCOM' program group. Information regarding the drivers and the available service can be found on the 'General' tab.

b In the *LANCAPI* client, change to the **Network** tab. First, select whether the PC should find its own *LANCAPI* server, or specify the use of a particular server.

- For the former, determine the interval at which the client should search for a server. It will continue searching until it has found the number of servers specified in the next field. Once the required number of servers has been found, it will stop searching.

- In the event that the client should not automatically search for servers, list the IP addresses of the servers to be used by the client. This can be useful if you are operating several *LANCOM* in your LAN as *LANCAPI* servers and you would like to specify a server for a group of PCs, for example.

- It is also possible to set the interval at which the client checks whether the found or listed servers are still active.

Quick access to the *LANCAPI* client

There are two ways to launch the *LANCAPI* client directly from the Windows taskbar: Double-clicking the icon will open the status window, from which you can reach the configuration via **Properties**.

A right-click will take you to the client even faster. Select **Properties** from the context menu.

8.5 How to use the *LANCAPI*

Two options are available for the use of the *LANCAPI*:

- You may use software which interacts directly with a CAPI (in this case, the *LANCAPI*) port, such as RVS-COM. This type of software searches for the CAPI during its installation and uses it automatically.

- Other programs such as LapLink can establish a variety of connection types, for example, using Windows Dial-Up Networking. You may select the installed communications device that you would like to use when creating a new dial-up connection. For the *LANCAPI*, select the entry 'ISDN WAN Line 1'.

8.6 The *CAPI Faxmodem*

The *CAPI Faxmodem* provides a Windows fax driver (Fax Class 1) as an interface between the *LANCAPI* and applications, permitting the use of standard fax programs with an *LANCOM Office*.

Installation

The *CAPI Faxmodem* can be installed from the CD setup. Always install the *CAPI Faxmodem* together with the current version of *LANCAPI*. After restarting, the *CAPI Faxmodem* will be available to your system. Under Windows 98, it can be found under **Start / Settings / Control Panel / Modems**.

Faxing with the *CAPI Faxmodem*

Most major fax programs recognize the *CAPI Faxmodem* automatically during installation and identify it as a 'Class 1' fax modem. Fax transmissions can thus be realized at speeds of up to 14,400 bps. If your fax program offers you a choice (such as WinFax and Talkworks Pro), select the option 'CLASS 1 (Software Flow Control)' when setting up the modem.

Windows XP and Windows 2000 provide full fax functionality in conjunction with the *CAPI Faxmodem*. An additional fax program is not required.

The CAPI Faxmodem requires LANCAPI for the transmission of fax messages.

9 Troubleshooting

In this chapter, you will find suggestions and assistance for a few common difficulties.

9.1 No DSL connection is established

After startup, the router automatically attempts to connect to the DSL provider. During this process, the WAN link LED will blink green. If successful, the LED will switch over to steady green. If, however, the connection can't be established, the WAN link LED will light up red. The reason for this is usually one of the following :

Problems with cabling for DSL?

Only the cable provided with your device should be used to connect to DSL. This cable must be connected to the Ethernet port of your DSL modem.

Selected interface is activated?

WAN Interface (DSL and/or ISDN) is activated in the Default settings. Please check this under:

Configuration tool	Run command
LANconfig	Management / Interfaces / Interface settings / Interface
WEBconfig	Expert Configuration / Setup / Interfaces / Interface

9.2 DSL data transfer is slow

The data transfer rate of an Internet or DSL connection is dependent upon numerous factors, most of which are outside of one's own sphere of influence. Important factors aside from the bandwidth of one's own Internet connection are the Internet connection and current load of the desired target. Numerous other factors involving the Internet itself can also influence the transfer rate.

Increasing the TCP/IP window size under Windows

If the actual transfer rate of a DSL connection is significantly below the fastest rate listed by the provider, there are only a few possible causes (apart

from the above-mentioned external factors) which may involve one's own equipment.

One common problem occurs when large amounts of data are sent and received simultaneously with a Windows PC using an asynchronous connection. This can cause a severe decrease in download speed. The cause of this problem is what is known as the TCP/IP receive window size of the Windows operating system that is set to a value too small for asynchronous connections.

Instructions on how to increase the Windows size can be found in the KnowledgeBase of the support section of the LANCOM website (www.lancom.de).

9.3   Unwanted connections under Windows XP

Windows XP computers on a LAN attempt to compare their clocks with a timeserver on the Internet at startup. This is why when a Windows XP in the LAN is started, a connection to the Internet is established by the *LANCOM*.

To resolve this issue, you can turn off the automatic time synchronization under **Right mouseclick on the time of day / Properties / Internet time**.

10 Technical data

10.1 Hardware specifications

	LANCOM Office
10Base-T WAN connection (not LANCOM 800 Office)	Ethernet IEEE 802.3, 10Base-T (RJ-45) with PPP over Ethernet (PPPoE), PPTP or Plain Ethernet communication protocols
ISDN interface	ISDN S_0 bus, point to point and point to multipoint configuration, I.430, (autosensing), optional leased line support; D-channel 1TR6, DSS1 (Euro ISDN); B-channel PPP (asynchronous/synchronous), X.75, HDLC, MLPPP for channel bundling, CAPI 2.0 via LANCAPI, Stac data compression, V.110/GSM
LAN interface	Ethernet IEEE 802.3, 10/100Base-TX (RJ45, Node/Hub switch), Autosensing, full duplex
LEDs and switches	LEDs for Power, WAN and LAN status, security/VPN power switch, reset button and Node/Hub switch
Power supply	12 V AC with external adapter 230 V, 12 VA
Environment	Temperature: 5–40°C, humidity: 0–80%, non-condensing
Housing	stable metal housing, connectors on the rear side 230 x 38 x 228 mm (W x H x D)

10.2 10.2 Contact assignment

10.2.1 Ethernet interfaces 10/100Base-T (LAN) and 10Base-T (WAN)

8-pin RJ45 sockets as per ISO 8877, EN 60603-7

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Connector	Pin	Line
	1	T+
	2	T-
	3	R+
1 2 3 4 5 6 7 8	4	–
	5	–
	6	R-
	7	–
	8	–

10.2.2 ISDN S_0 interface

8-pin RJ45 socket as per ISO 8877, EN 60603-7

Connector	Pin	Line	IAE
	1	–	–
	2	–	–
	3	T+	2a
1 2 3 4 5 6 7 8	4	R+	1a
	5	R-	1b
	6	T-	2b
	7	–	–
	8	–	–

10.2.3   10.2.3 Configuration interface (outband)

8-pin mini-DIN socket

Connector	Pin	Line
	1	CTS
	2	RTS
	3	RxD
	4	RI
	5	TxD
	6	DSR
	7	DCD
	8	DTR
	U	GND

11 Annex

11.1 CE declaration of conformity

The CE declarations of conformity for the *LANCOM Office* are available for download on the *LANCOM* Systems web site (www.lancom.de).

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