TELES.MANUALS

TELES.NMS

Software version 14.0

TELES
Communication Systems

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1 ABOUT THIS MANUAL

Congratulations on the purchase of your new TELES.NMS! This manual is set up to guide you through the step-by-step use of your TELES.NMS.

Make sure you familiarize yourself thoroughly with the safety and security precautions detailed in Chapter 2 ⇨ before you begin using your TELES.NMS. TELES is not liable for any damage or injury resulting from a failure to follow these safety and security instructions!

1.1 ORGANIZATION

This manual is organized into the following chapters.

Chapter 1, "About this Manual" introduces the TELES.NMS Manual and how it is set up.

Chapter 2, "Safety and Security Precautions" contains information about security issues relevant to connection with the IP network.

Chapter 3, "Overview" briefly describes the TELES.NMS and its implementation.

Chapter 4, "NMS Database Copy" describes the application used to copy, convert, import and export TELES.NMS MySQL and SQL databases.

Chapter 5, "Server Applications" describes the server applications that regulate access to the common data shared by the local host.

Chapter 6, "The NMS Desktop" describes the frontend application that serves as the main NMS workspace.

Chapter 7, "Supplementary Modules" contains a description of additional applications included in TELES.NMS.

Chapter 8, "System Data Directories" describes the TELES.NMS directories and their contents.

Chapter 9, "NMS Testing, Polling and Support Procedures" describes how to perform and evaluate tests using TELES.NMS.

Chapter 10, "Appendix" contains additional information that may be useful to you.

1.2 CONVENTIONS

This document uses the following typographic conventions:

- **Bold** – items from the GUI menu.
- Halfbold – items from the GUI and the menu.
- Code – file names, variables and constants in configuration files or commands in body text.
- "conventions" on page 5 ⇨ – cross-references can be accessed in the PDF files by a single mouse click.

Configuration data or extracts are written in single-column tables with a gray background.

1.3 SAFETY SYMBOLS

The following symbols are used to indicate important information and to describe levels of possible danger.

	**Note** Useful information with no safety implications.
	**Attention** Information that must be adhered to as it is necessary to ensure that the system functions correctly and to avoid material damage.
	**Warning** Danger. Could cause personal injury or damage to the system.
	**Dangerous voltage** Could cause injury by high voltage and/or damage the system.
	**Electrostatic discharge** Components at risk of discharge must be grounded before being touched.

2 SAFETY AND SECURITY PRECAUTIONS

Please be sure and take time to read this section to ensure your personal safety and proper operation of your TELES Access Gateway.

To avoid personal injury or damage to the system, please follow all safety instructions before you begin working on your TELES Access Gateway.

TELES Access Gateways are CE certified and fulfill all relevant security requirements. The manufacturer assumes no liability for consequential damages or for damages resulting from unauthorized changes.

This chapter applies for all TELES Access Gateways. Information that applies only for individual TELES Access Gateways specifies the system for which it applies.

2.1 SAFETY MEASURES

Danger of electric shock - the power supplies run on 230 V. Unplug the TELES Infrastructure System from its power source before working on the power supply or extension socket.

Make sure to install the system near the power source and that the power source is easily accessible.

Bear in mind that telephone and WAN lines are also energized and can cause electric shocks.

Wire your system using only the cables included in the package contents. Use only proper ISDN and Ethernet cables.

Do not insert foreign objects into openings in the device. Conductible objects can cause short circuits that result in fire, electric shock or damage to the device.

Do not open the TELES Access Gateway except to install an additional TELES component. Changes in the device are not permitted.

Be sure to respect country-specific regulations, standards or guidelines for accident prevention.

2.2 TIPS FOR EMC PROTECTION

Use shielded cables.
Do not remove any housing components. They provide EMC protection.

2.3 SYSTEM SECURITY

This section describes all points crucial to the TELES Access Gateway's system security.

The system's location must support normal operation of TELES Access Gateways according to EN ETS 300 386. Be sure to select the location with the following conditions in mind:

Location: Make sure you install the system in a clean, dry, dust-free location. If possible, the site should be air-conditioned. The site must be free of strong electrical or magnetic fields, which cause disrupted signals and, in extreme cases, system failure.

Temperature: The site must maintain a temperature between 0 and 45°C. Be sure to guard against temperature fluctuations. Resulting condensation can cause short circuiting. The humidity level may not exceed 80%.
To avoid overheating the system, make sure the site provides adequate ventilation.

Power: The site must contain a central emergency switch for the entire power source. The site's fuses must be calculated to provide adequate system security. The electrical facilities must comply with applicable regulations.
The operating voltage and frequency may not exceed or fall below what is stated on the label.
Antenna: iGATE contains no provision or protective device against power surges or lightning strikes.
The installation of the antenna must fulfill all necessary safety requirements. Employ the services of a professional antenna installer.

2.4 SERVICING THE SYSTEM

Regular servicing ensures that your TELES Access Gateway runs trouble-free. Servicing also includes looking after the room in which the system is set up. Ensure that the air-conditioning and its filter system are regularly checked and that the premises are cleaned on a regular basis.

2.4.1 REPLACING COMPONENTS

If your TELES Access Gateway contains any of the following components, replace them according to the following table:

Table 2.1 Component Life Span

Component	Life span
Filter pads	6 months
CPU fan (TELES Access Gateways without iLCR Base Board only)	5 years
Power adapter incl. 3.3 V Adapter	5 years
Fan	5 years
Hard disk (IDE) (TELES Access Gateways without iLCR Base Board only)	3 years

2.4.2 PROTECTING THE OPERATING SYSTEM

Changing configuration data may lead to malfunctions and/or misrouting, as well as possible consequential damage. Make changes at your own risk. TELES is not liable for any possible damage resulting from or in relation to such changes. Please thoroughly check any changes you or a third party have made to your configuration!

Make sure your hard disk or flash disk contains enough storage space. Downloading the log files and deleting them from the system on a regular basis will ensure your system's reliability.

Be careful when deleting files that you do not delete any files necessary for system operation.

Do not perform queries on the database. This can result in damages to the database. Do not use any MySQL tools, such as MySQL-Front to make changes in or perform tests on the database.

vGATE Control Unit:

vGATE Control Unit:
Do not use Ctrl/Alt/Del (Task Manager) to shut down vGateDesktop or vGATECtrl. Do not perform queries on the database. This can result in damages to the database. Do not use any MySQL tools, such as MySQL-Front to make changes in or perform tests on the database.

2.5 CDR FILES

Call Detail Records are intended for analysis of the system's activity only. They are not designed to be used for billing purposes, as it may occur that the times they record are not exact.

Inaccuracies in the generation of CDRs may occur for active connections if traffic is flowing on the system while modifications in configuration or routing files are activated.

2.6 NETWORK SECURITY

Every day hackers develop new ways to break into systems through the Internet. While TELES takes great care to ensure the security of its systems, any system with access through the Internet is only as secure as its user makes it. Therefore, to avoid unwanted security breaches and resulting system malfunctions, you must take the following steps to secure your TELES Access Gateway if you connect it to the Internet:

- Use an application gateway or a packet firewall.
- To limit access to the system to secure remote devices, delete the default route and add individual secure network segments.
- Access to the system via Telnet, FTP, HTTP, GATE Manager or remote vGateDesktop must be password protected. Do not use obvious passwords (anything from `sesame` to your mother-in-laws maiden name). Remember: the password that is easiest to remember is also likely to be easiest to crack.

The firewall must support the following features:

- Protection against IP spoofing
- Automatic recognition of security breaches
- Logging of all attempts to access the system

The firewall must be able to check the following information and only allow trusted users to access the TELES Access Gateway:

- IP source address
- IP destination address
- Protocol (whether the packet is TCP, UDP, or ICMP)
- TCP or UDP source port
- TCP or UDP destination port
- ICMP message type

For operation and remote administration of your TELES Access Gateway, open only the following ports only when the indicated services are used:

Table 2.2 Default Ports Used for Specific Services

Service	Protocol	Port
For all systems except vGATE		
FTP	TCP	21 (default, can be set)
Telnet (for TELES debug access only)	TCP	23
SMTP	TCP	25
DNS forward	UDP	53
HTTP	TCP	80 (default, can be set)
SNTP	UDP	123
SNMP	UDP	161
H.225 registration, admission, status	UDP	1719 (default, can be set)
H.225 signaling	TCP	1720 (default, can be set)
Radius	UDP	1812 (default, can be set)
Radius accounting	UDP	1813 (default, can be set)
GATE Manager	TCP	4445 (default, can be set)
SIP signaling	UDP / TCP	5060 (default, can be set)
RTP	UDP	29000-29120 (default, can be set)

Table 2.2 Default Ports Used for Specific Services *(continued)*

Service	Protocol	Port
vGATE Control Unit	TCP	57343
vGATE tunneling	TCP	4446
For vGATE Control Unit and iMNP		
FTP	TCP	21
Telnet	TCP	23
MySQL database	TCP	3306
iGATE or TELES.VoIPBOX GSM/CDMA 4FX to vGATE	TCP	57342
vGATE tunneling to iGATE or TELES.VoIPBOX GSM/CDMA 4FX	TCP	4446
iGATE or TELES.VoIPBOX GSM/CDMA 4FX to iMNP	TCP	9003
Remote vGateDesktop	TCP	57344
Remote vGateDesktop (read only)	TCP	57345
iMNP	TCP	9003
For TELES.vGATE Sim Unit		
vGATE Control Unit plus iGATE or TELES.VoIPBOX GSM/CDMA 4FX	TCP	51500
For TELES.NMS		
FTP	TCP	21
Telnet	TCP	23
MySQL database	TCP	3306
TELES.NMS protocol	TCP	5000
TELES.NMS update	TCP	5001
TELES.NMS task	TCP	5002
TELES.NMS task	TCP	5003

Table 2.2 Default Ports Used for Specific Services *(continued)*

Service	Protocol	Port
TELES.NMS Listen	TCP	4444
For vGATE Call Manager		
Radius authentication	UDP	1812
Radius accounting	UDP	1813

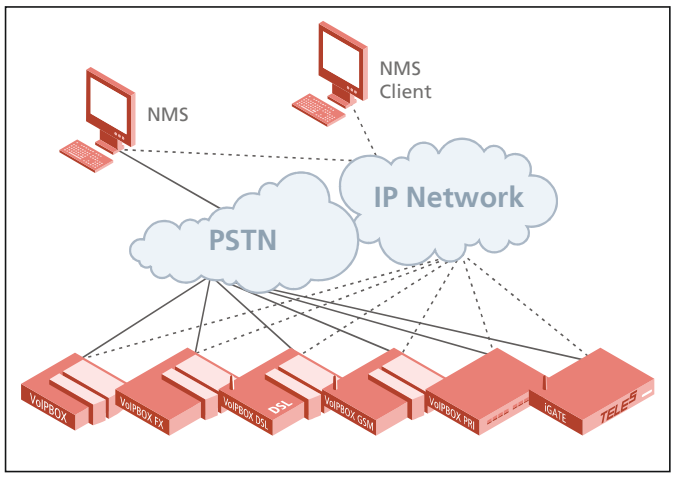
Connection from a vGATE Control Unit to a iGATE or iGATE requires ICMP access. The TCP filters listed above are activated in the default configuration of the vGATE Control Unit or the TELES.NMS server.

3 OVERVIEW

The TELES Network Management System offers automated remote administration, testing and maintenance services for TELES infrastructure systems.

TELES.NMS can automatically monitor up to 100.000 individual systems (or network elements). The basic TELES.NMS configuration runs on a single computer running Windows 2000.

TELES.NMS manages the central database with the information on each network element. It runs the Windows 2000 Professional operating system, MySQL Server software and all applications included with TELES.NMS.



You can also install a TELES.NMS client on a remote PC. The installation is described in Chapter 10.4 ⇨ of this manual.

3.1 WHAT'S NEW IN VERSION 14.0

- SIP callback possible
- Now retrieves and displays VoIP statistics
- Self-provisioning of all TELES Access Gateway devices now possible with NMSJobs

3.2 FEATURES

- Supports self-provisioning of all TELES Access Gateways
- Supports second generationTELES Access Gateways, such as iGATE GSM, iGATE CDMA, iGATE UMTS, VoIPBOX BRI.
- TELES.NMS Listen available over IP with second generation systems.
- A MySQL Server provides access to the common database via the ODBC interface.
- TELES.NMS offers three methods for confirming the operational status of tested systems:
  - Periodic automatic testing (NMS dials the systems)
  - Regular status notifications from each system (polling)
  - Support calls from systems in case of errors
- The testing interval for each system can be individually set.
- If a tested system returns error messages, TELES.NMS can place an automatic emergency message to a pre-selected e-mail address (operator alarm).
- The network element's log file is automatically picked up for easier error diagnosis.
- Individual tested systems may be marked as especially crucial (VIP) and assigned to groups for a better overview.
- The **NMS Desktop** application displays tested systems in various views, allowing you to concentrate on particular systems while maintaining an overview even with a large network. The **Group View**, **Error View**, **VIP View**, **Update View** and **Full View** windows can show network elements as icons or as a detailed list.
- The **NMS Jobs** module is used to define and manage recurring maintenance tasks. Defined jobs can be used to automatically trace ISDN activities, restart systems, transfer files and routing tables and update software using one of four different recurrence patterns. Actions can be carried out once (non-recurring job), cyclically, daily and monthly.
- The EventViewer2 keeps a record of NMS communication activities using an automated logging feature. The application tracks the errors selected in the EventManager that take place during communication

between NMS and network elements, such as systems that cannot be reached, or for which the password is incorrect. (The error history for individual tested systems is viewed separately from the NMS Desktop)

- The Update Management features allow automatic system installation, setup and configuration.
- Complete call data log automatically transferred to NMS from TELES.iLCR 1BRI Boxes, TELES.iLCR 2BRI Boxes, and iLCR 6BRI Boxes or picked up by NMS from VoIPBOX BRIes, iGATEs and VoIPGATEs.
- Possibility to use the same routing files for different system types
- Definition of iLCR port error categories
- Group based time zone support
- Group based testing possible
- NMSEventManager allows selection of events to save, send alarm messages and display in the EventViewer2
- NMS User Manager allows selection of user rights for security
- CDRs can be saved in the database or in a file
- For all second generation systems and for first generation systems with an integrated iLCR IP Board, all TELES.NMS functions can be performed over IP. 4 B channels can be used for testing over IP or 2 B channels per ISDN board can be used for testing over IP and ISDN.

3.3 SYSTEM REQUIREMENTS

3.3.1 PC FOR TELES.NMS

Table 3.3 TELES.NMS PC Configuration

Component	NMS Server
Operating system	Windows 2000 Professional, Service Pack 4
Processor	Intel Pentium IV 2.40 GHz
Memory	512 MB PC133 RAM
Hard drive	60 GB (boot) ExelStor J360
Graphics card	8 ATI RAGE XL PCI
Ethernet adapter	Intel (R) Pro/100
Network protocols	TCP/IP
ISDN Adapter	HST Saphir III (BRI) HST Saphir IV (PRI)
ISDN Driver	HST Dual CAPI
ISDN Line	Point-to-Multipoint Point-to-Point
Database Components	▪ MySQL ODBC 3.51 ▪ MySQL Server 4.0.22

3.3.2 TESTED SYSTEMS (NETWORK ELEMENTS)

On each of the network elements, the dial-in number for NMS testing must be active (`MapIn` to remote administration). Remote administration must be configured. (For information on other specific configuration prerequisites for each system type, see Chapter 4.3 ⇨). Table 3.4 ⇨ lists each supported system type and the version number capable of cooperation with TELES.NMS.

Table 3.4 NMS-Capable TELES Infrastructure Systems

System Type	Version
All second generation systems	as of 11.6d
iGATE	as of 5.10
iGATE-C	as of 6.10
TELES.iLCR 1BRI Box	as of 1.0
TELES.iLCR 2BRI Box	as of 2.15
iLCR 6BRI Box	as of 1.0
iLCR PRI Box	as of 3.03
iLCR System	as of 3.01g
VoIPGATE	as of 6.00

3.4 TERMS & CONCEPTS

This section explains some of the terminology and concepts that are central to understanding the TELES.NMS software.

3.4.1 NMS TESTING, POLLING AND SUPPORT CALLS

NMS Testing

During *NMS testing*, TELES.NMS places calls to network elements to verify their operational status. The **NMS Desktop** application calls the dial-in number for NMS testing specified in each system's configuration file. The system only accepts ISDN calls to this number when errors have occurred. In this case, the event log file is picked up. Otherwise, the system sends an alerting signal to tell TELES.NMS that it is still operational, and NMS then disconnects the call. This type of testing may be initiated from the NMS Desktop by clicking the **Start Testing** button on the toolbar. All systems for which the **Test cyclically** option has been marked in the system editor are dialed sequentially during cyclic testing.

Individual network elements may be tested by hand using the **Start single test** command from the context menu available in certain NMS Desktop views.

NMS testing can also be performed automatically on a certain group of systems using the NMS Jobs application. The **Test system** command can be activated from the **Commands** tab of the NMS Job Editor.

NMS testing is also available using IP. TELES.NMS sets up an IP connection to the system.

Polling

TELES infrastructure systems dial in to the **NMS Listen** application at a specified interval to signal their operational status. This so-called *polling* call shows TELES.NMS that the system is still up and running, and offers the opportunity for further actions such as routing table updates, etc. If updated routing tables are available and the update table flag has been set for the selected system(s) in the **NMS Update View**, the new tables will be transferred to the system at this time.

You can poll second generation systems over IP connection using the command `RemoteCallback=`*<ip address of the* TELES.NMS *server> <time> <daymap>.*

For PC-based systems such as iLCRs, iGATEs and VoIPGATE systems, both the TELES.NMS number and interval at which the calls should be placed are entered into the configuration file using the `RemoteCallback=`*number time day* command. Box-based systems use two separate commands to make these settings. The `NMSPollNumber` defines the number to be dialed, and the frequency with which such calls are placed is defined using either the `NMSPollInterval` or `CallbackFrequency` entry.

Support Calls

Network elements can be configured to contact TELES.NMS when errors occur. These *support calls* also connect the system to the **NMS Listen** application, but a different number is dialed (not the same number used for regular polling calls). PC-based systems define this support number using the `AlarmCallBack` command, whereas box-based units use `EmergencyNumber`.

Most TELES infrastructure systems dial the support number after power failure or other malfunction. iLCR Boxes use this number to pick up a table each time they are connected to the power supply. During this connection the system transfers the event log to TELES.NMS and receives a new routing table if necessary. When answering calls at this number, the **NMS Listen** application always holds the connection and picks up the event log.

Support calls from second generation systems can also occur via IP using the command `AlarmCallBack=`*<ip address of the* TELES.NMS *server>.*

The support number is also dialed by TELES.iLCR 1BRI, 2BRI, 6BRI, and iLCR PRI Boxes when the box's Call Detail Recording (or CDR) buffer is 66% full. The **NMS Listen** application accepts the incoming call and receives the call data. The program keeps the connection open while the file is converted to ASCII format and saved as `CHA_0101991255_0.log` in the system's `Charges` directory of the NMS folder hierarchy (cf. Chapter 8.2 on page 83 ⇨). Once the file has been successfully converted and saved, the program signals the system to delete this portion of the memory and terminates the connection.

3.4.2 FAULT MANAGEMENT

The term *fault management* refers to the three methods of confirming the operational status of tested systems described above in the section on NMS Testing, Polling and Support Calls ⇨.

3.4.3 UPDATE MANAGEMENT

Update management is the term used to describe the process of ensuring that network elements operate using consistent and up-to-date routing information by automatically sending current routing tables to systems as needed.

3.4.4 JOB MANAGEMENT

The *job management* process consists of routine maintenance tasks that can be carried out automatically by defining jobs to be executed on selected systems at a pre-determined time. (In previous versions of TELES.NMS, the word *tasks* was used interchangeably with *jobs*.) The responsibilities for this process are distributed between three applications.

The **NMS Jobs** application is used to define the actions that are to be performed, determine when the job is to be run and which systems the job shall be executed on. The **NMS DoJob** program is responsible for carrying out the assigned jobs at the designated time. This application must be running on all workstations from which automated maintenance tasks are to be performed. The **NMS JobServer** application runs on the NMS server and coordinates the job management activities of all NMS workstations.

3.4.5 AUTOMATIC REGISTRATION

When an unknown system connects to TELES.NMS, the NMS Listen application can create database entries for the new system and supply the network element with appropriate configuration and routing information based on the system type and/or area code, etc. This procedure is referred to as *automatic registration*.

In order to make use of this feature, a **standard group for new systems** must be selected on the **General** tab of the NMS Configuration (advanced) dialog. In the NMS Desktop properties dialog (**Groups** tab), the **Update management** option must be active for this group and the **Automatic registration to update management** option must also be selected.

Second generation systems are entered in the database with their IP addresses and tag numbers as serial numbers. The TAG number is automatically entered as the routing directory. We recommend that you register these newer systems via IP and not via ISDN.

Configure the commands `RemoteCallback=<`*ip address of the* TELES.NMS *server*`> <`*time*`> <`*daymap*`>` and `AlarmCallBack=<`*ip address of the* TELES.NMS *server*`>` directly after the `Subscriber` section in the `pabx.cfg` and restart the system.

3.4.6 SELF-PROVISIONING

Self provisioning is possible for all TELES Access Gateway devices. The variable data for configuration are saved in a transfer database in the TELES.NMS MySQL server. The name of the database is `NMSInputConfig`. The name of the table is `inputconfig`. We recommend that you write the data into the database using an SQL script. TELES.NMS transfers the data into the TELES.NMS database cyclically every 10 minutes and deletes the transferred data from the transfer database. A protocol of the data transfer is saved in the directory `\\nms_data\Logging\Provisioning`.

Only one set of data can be generated for each serial number. Existing data sets can be changed by updating them.

The provisioning data must appear in the NMS database inputconfig and the CFGs in the files pabx.cfg, route.cfg and ip.cfg in one of the following directories:

`\\nms_data\Systemtypes\SystemTypeString\Provisioning\`

or:

```
\\nms_data\Systemtypes\SystemTypeString\Systems\
System-Name\Provisioning\
```

Bear in mind that configuration file settings are usually customized. Therefore it may be necessary to change the provisioning process according to your needs. Table 3.5 ⇨ contains a description of the data feed:

Table 3.5 Self-Provisioning Data Feed

Column	Description
AutoId	Automatically generated data set identification.
SerialNumber	A string consisting of the system's TAG number.
SystemType	A 12 will appear for VoIPBOX BRI.
RemotePassword	The password for remote access appear in cleartext.
IPAddress	Appears in the following format: `<IPaddr>/<mask>`
Gateway	Lists the gateway's IP address.
Customer	Lists either the customer's name or CPE number.
CountryCode	Customer's country code.
AreaCode	Customer's domestic area code.

OwnNumbers	Appears in the following format:
	`<port>:<num>`
	Multiple numbers can be separated by a comma. To define a range, use the following format:
	`<port>:<from>-<to>`

SIPUser	The SIP username appears here.
SIPPwd	The SIP password appears here.
BRICount	Lists the number of BRI ports.
FXCount	Lists the number of analog ports (0).
MobileCount	Lists the number of mobile ports (0).
MobileType	Type of mobile port (0)
PRICount	Lists the number of PRI ports (0).
VoIPChannels	Lists the number of VoIP channels (8).

Table 3.5 Self-Provisioning Data Feed *(continued)*

Column	Description
PtsnTE	Lists the connection type for the BRI ports: 0=NT 1=TE EXAMPLE: 0011 means that the first to BRI ports are TE and the last 2 are NT. Mobile ports are not counted. Enter a 3 in the script to set BRI ports 1 and 2 to TE. That is the sum of the set bits in decimal notation (8421=1111).
PtsnPP	Lists whether the PP or PMP protocol is used on the BRI port: 0=PMP 1=PP Mobile ports are not counted. Enter a 3 in the script to set BRI ports 1 and 2 to PP. That is the sum of the set bits in decimal notation (8421=1111).
InhibitNumbers	Lists blocked numbers, separated by a comma.
PrimOutProf	Name of the primary outgoing profile.
VoIPCodecs	Lists possible VoIP codecs. Default empty.
Advanced	Shows a description of advanced functionality. DELETE=delete the configuration information in the NMS database SYSTEMDELETE=delete the system from the NMS database
RouteToPtsn	Contains a list of numbers, separated by a comma, that are always routed to the backup ports (TE).

Example: The following script example shows how values are set for self-provisioning:

```
USE nmsinputconfig;

INSERT INTO inputconfig
(SerialNumber,SystemType,RemotePassword,IPAddress,Gateway,Customer,CountryCode,AreaCode,OwnNumbers,SIPUs
er,SIPPwd,BRICount,FXCount,MobileCount,MobileType,PRICount,VoIPChannels,PtsnTE,PtsnPP,InhibitNumbers,Pri
mOutProf,VoIPCodecs,Advanced,RouteToPtsn) VALUES('TAG580111111111111',12,'','192.168.0.110/
24','192.168.0.100/24','Muster1','+49','030','3:123-129; 4:567-569','voipbox1','voipbox1',4,' ',' ',' ','
',8,3,3,'0190,0180','due','g729,t38','','771,772,773');
```

Save the script on the NMS server.

Example: `E:\inputscript\inputconfig.sql`

To carry out the script, open the command window and change the directory to:

`D:\mysql\bin>`

Log onto the Mysql server with: `mysql -u nmsuser -p`

The password is: `nms`

Enter `\.` followed by the path for the script saved on the TELES.NMS server:

```
\. E:\inputscript\inputconfig.sql
```

Now the data will be written into the nmsinputconfig database. Within ten minutes, the data will be transferred to the TELES.NMS database. When the systems connect to TELES.NMS, they will be configured automatically.

The TELES.NMS server and NMS Listen must be running and the self-provisioning flag must be set (cf. Table 6.12 on page 42 ⇨).

3.4.7 SECURITY MEASURES

As the TELES.NMS software is used to manage mission-critical systems and sensitive customer data, a multi-level security concept is built into the software's architecture to prevent unauthorized use.

3.4.7.1 USER-LEVEL SECURITY

There are three levels of user-level security built into TELES.NMS.

The TELES.NMS User Manager allows you to custom select which users have access to each of the TELES.NMS programs. You can also use this program to assign specific rights to each user. For a detailed description of the TELES.NMS User Manager, please see Chapter 7.3 on page 62 ⇨.

3.4.7.2 SOFTWARE-LEVEL SECURITY

There are three layers of software-level security built into TELES.NMS.

1. The Windows 2000 Professional operating system used for the NMS Server computer limits access to network users explicitly granted permission by the network administrator.
2. If this additional security measure has been activated in the **Server** group on the **Security** tab of the **NMS Configuration** module, each module that attempts to connect to the NMS Server software must provide the proper password or access will be denied. (This password is assigned for each workstation.)
3. If the **MySQL Server Integrated** security option is selected on the **Security** tab of the **NMS Configuration** module, an additional password is required to access the MySQL Server software.

3.4.7.3 DATA SECURITY

The NMS Server computer is shipped with four hard disks. A single 60 GB disk is formatted with the following partitions:

- Drive C – 5000 MB W2000 NTFS primary
- Drive D – 20 GB NTFS logical including MySQL Server and TELES.NMS software
- Drive E – 5000 MB NTFS logical
- Drive F – approx. 30 GB MySQL database

4 NMS DATABASE COPY

The **NMS Database Copy** application is used to copy, convert, import and export TELES.NMS MySQL and SQL databases. Check to be sure that both the source and the destination databases are configured as ODBC System DSNs using the **NMS Configuration** module or the **ODBC Data Source Administrator** from the control panel.

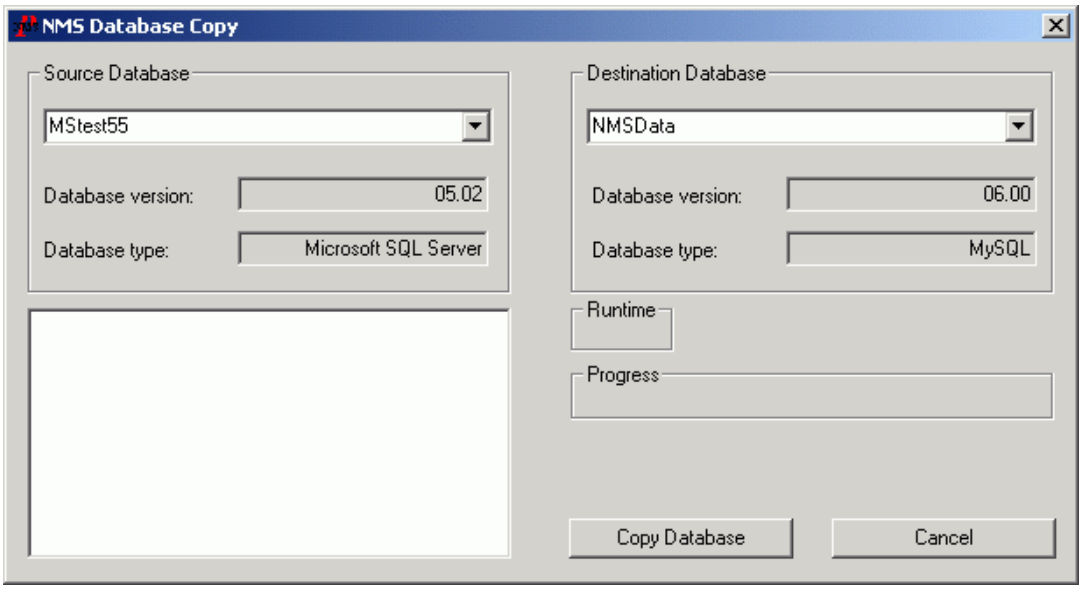


Figure 4.1 The NMS Database Copy Window

To convert your database, start **NMS Database Copy** and proceed as follows:

1. From the **Source Database** list, select the database from which you would like to extract information. (This list shows all System DSNs configured on your computer. If the desired data source is not shown in the list, follow the instructions in Chapter 10.4.3 on page 96 ⇨ for setting up data sources with System DSNs.)
2. From the **Destination Database** list, choose the database into which you would like to import the information. (This list shows all System DSNs configured on your computer. If the desired destination database is not shown in the list, follow the instructions in Chapter 10.4.3 on page 96 ⇨ for setting up data sources with System DSNs.)
3. Begin copying by pressing the **Copy Database** button.
4. The current contents of the destination database will be deleted when new information is copied to an existing database. If you are sure you want to proceed, confirm the prompt by clicking **Yes**. (To cancel the copy procedure, click **No**).

Database copies should only be made *offline* to ensure that the database is written correctly.

4.1 NMS CUSTOMER COPY

The **NMS Customer Copy** application is similar to the NMS Database Copy application described in Chapter 4 ⇨. Whereas the Database Copy tool is used to copy entire databases in offline mode, the Customer Copy module is intended for importing new and changed entries into the current NMS database while the system is running.

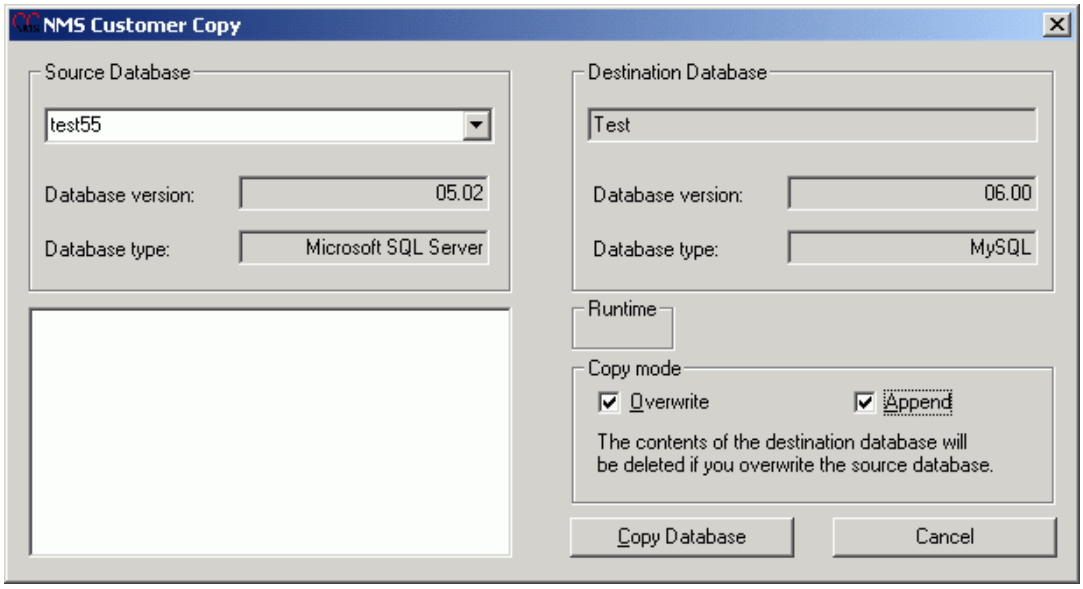


Figure 4.2 The NMS Customer Copy Window

To update your database, start **NMS Customer Copy** and proceed as follows:

1. From the **Source Database** list, select the database from which you would like to extract information. (This list shows all System DSNs configured on your computer. If the desired data source is not shown in the list, follow the instructions in Chapter 10.4.3 on page 96 ⇨ for setting up data sources with System DSNs.)
2. The **Destination Database** shows the current NMS database (as selected in the NMS Configuration application) into which the information will be imported.
3. In the **Copy Mode** group, select the **Overwrite** option to change existing entries if the source database contains identical entries. Mark the **Append** option to add new entries to the database.
4. Begin copying by clicking the **Copy Database** button.

4.2 NMS CONFIGURATION

There are two **NMS Configuration** modules supplied with the software. The **Advanced** module offers all of the options described below and is intended for the initial configuration of server systems. The **Client** module is limited to the network and security settings required for NMS workstations. Use the appropriate application for the system you are setting up and adjust the default settings to meet your needs.

Table 4.6 NMS Advanced Configuration

Option	Purpose
General Tab	
Group	A list of pre-defined groups is provided in the drop down list field. Unless you are implementing a configuration with NMS resources distributed across the network, leave the default value (NMC) unchanged. The group ID is shown to the left of the group name.
ODBC data source name	If a data source has already been configured as a System DSN in the ODBC Data Source Administrator, you can simply select the desired name from the list shown here. If you have not yet created a database entry in the ODBC driver list, press **New**. (See the instructions in Chapter 10.4.3 on page 96 ⇨.) To alter the settings for the current database, use the **Edit** button. If a different data source is selected here, all applications must be restarted, so that they will work with the newly selected database.
Own number	This setting defines the telephone number which should be sent to tested systems from this workstation as the calling party number. (If network elements' configurations contain `RemoteOrigination` entries, the number entered here must agree with one of the specified numbers.)
Global password	If entered, this password is saved as the remote administration password for new systems in the database.
Outside line access	If the workstation is connected to a PBX and you must dial a digit (such as 9 or 0) to access the public telephone network, enter that digit here (applies to the current PC).
Use outside line access	Mark this option to prefix the digit specified above to all outgoing calls placed from the current PC.
Start desktop without CAPI functions	Select this option when installing on TELES.NMS clients that are not allowed to run NMS testing and remote administration.
Standard group for new systems	Specify the default group to which new systems should be assigned when they are automatically added to the database.
Network Tab	
Server group	

Table 4.6 NMS Advanced Configuration *(continued)*

Option	Purpose
Update port	TCP port number used for communication between the NMS centers to update the common database maintained by the NMS Server. The default settings usually need not be altered.
Protocol port	TCP port number used for communication between the NMS centers to update the common database maintained by the NMS Server. The default settings usually need not be altered.
Network timeout	Maximum time (in seconds) the system should wait for client response. The default settings usually need not be altered.
Server name	Name of the computer containing the NMS Server. If this server module is running on the local system, enter *localhost*. If the current system is to be operated as an additional workstation or client, enter the name of the computer running the database and the server. The server name is resolved to an IP address using the Domain Naming System (DNS). If no DNS server is available, a *hosts* file must be created in the system directory. This file should contain IP addresses and computer names separated by tabulators.
Maximum clients	Maximum number of clients that may be connected to the NMS Server application.
Event Mail group	
SMTP Server	Enter the name of the SMTP server from which alarm messages are sent.
SMTP Server1 (reserve)	In this box, you can enter the name of a reserve SMTP server, which will send alarm messages if the default server fails.
SMTP Originator	Enter the e-mail address that sends alarm messages.
Logon group (activate if server requires logon information)	
User Name	Enter the user name.
Password	Enter the account's password.
Base64 encoding	Click here to activate or deactivate password encoding.
Server Tab	
Synchronize time	If this option is active, the time settings of all NMS computers in the center are synchronized every minute. This process is also used to verify client operation.
Maximum test duration	If a system test cannot be completed successfully within this time limit, TELES.NMS will automatically end the test.
Test all systems in daytime mode	If all network elements selected for testing should be tested during daytime mode, mark this option.

Table 4.6 NMS Advanced Configuration *(continued)*

Option	Purpose
Maximum test frequency	Enter a delay in minutes after which TELES.NMS should repeat the test cycle. A new cycle begins once all systems are tested and the time set here has expired.
Events group	
Log events also in WinNT-Event Log	Check this box if you would like events to be saved in the WinNT-Event Log.
Delete events older	Enter a value in hours after which you would like events to be deleted.
Save before delete	Check this box if you would like events to be saved before they are deleted.
CDRs group	
Save CDRs in Database	When this option is active, CDRs will be saved in the database.
Delete CDR Files	Click here to delete saved CDRs.
Mode group	
Standard mode	In daytime mode, every network element in the database is tested if the **Test all systems in daytime mode** option is marked above. If the above option is not selected, only NMC systems are tested during the daytime. In night mode, NMS tests only network elements for which the **At night** option is marked in the NMS System Editor.
Active mode	All systems are constantly tested. Daytime and night mode settings are irrelevant.
Inactive mode	The server is deactivated and does not test any systems. Access to the database is not allowed.
Traces	Select the messages you would like displayed in the server dialog: **Debug** All server activities **Warning** All warnings **Error** All errors **Synchro.** Every synchronization **Buffer** Enter the number of lines you would like to save in the error buffer. Once this limit is reached, old messages are overwritten by new information
Security Tab	
Database group	
Windows NT integrated	Login to the MySQL server takes place via the Windows 2000 network login. The same password and user name must be used for both Windows 2000 and for the MySQL server.
SQL Server integrated	Separate logons are used for Windows 2000 and the MySQL server. The default user is `nmsuser` and the default password is `nms`.

Table 4.6 NMS Advanced Configuration *(continued)*

Option	Purpose
User name	Login name for the MySQL server (`nmsuser`).
Password	Password for the MySQL server (`nms`).
Check security	Verifies whether the current security settings allow database access.
Server group	
Require authorization	Mark this option if security clearance is required between the NMS Desktop applications and the NMS Server. (inactive by default) If this additional security is desired, check the box and supply user name and password in the fields provided below.
User name	Login name for the NMS Server.
Password	Password for the NMS Server.
Directories Tab	
Working directory	The current working directory is displayed in this text field. Use the name server so select another directory. If you do not have a name server, you can enter the IP address into the **Working Directory** dialog box using the following format: \\192.168.1.1\nms_data
Browse All	Press this button to view the entire directory tree structure of the local system and select a working folder.
Browse Share	Press this button to view the local system's shared directories and select a working folder.

4.2.1 THE CLIENT CONFIGURATION MODULE

The **Client** configuration module contains only the network and security settings required for NMS workstations:

Use this configuration only on NMS workstations.

Table 4.7 NMS Client Configuration

Option	Purpose
Network Tab	
Server name	Name of the computer containing the NMS Server. If this server module is running on the local system, enter the server's IP address. You must then restart the server. If the current system is to be operated as an additional workstation, enter the IP address of the computer running the database and the server. The server name is resolved to an IP address using the Domain Naming System (DNS). If no DNS server is available, an IP address must be entered in the system directory.
Security Tab	
Require authorization	Mark this option if security clearance is required between the NMS Desktop applications and the NMS Server. (inactive by default) If this additional security is desired, check the box and supply user name and password in the fields provided below.
User name	Logon name for the NMS Server (`nmsuser`).
Password	Password for the NMS Server (`nms`).

4.3 CONFIGURING NETWORK ELEMENTS FOR NMS TESTING

4.3.1 SECOND GENERATION IGATE, VOIPGATE AND VOIPBOX BRI

In the case Second-generation iGATEs, VoIPGATEs and VoIPBOX BRIes all tests, polling and support settings occur via IP.

For each system that is to be tested, the following entries are required in the configuration file:

Remote Administration

Configure remote administration. A password and up to eight permitted numbers can be specified.

Polling & Support Settings

Second-generation iGATEs, VoIPGATEs and VoIPBOX BRIes poll TELES.NMS at a specified interval to signal their operational status. This shows TELES.NMS that the system is still up and running, and offers the opportunity for further actions such as routing table updates, etc. Both the TELES.NMS number and the time and day at which the calls should be placed are entered into the configuration file using the `RemoteCallback=<`*ip address of the* TELES.NMS *server*> <*time*> <*daymap*> command.

When the system malfunctions, the support connection is set with `AlarmCallBack=<`*ip address of the* TELES.NMS *server*>.

Routing Table and File Transfer

Certain conventions must be observed with regard to file names on second-generation iGATEs, VoIPGATEs and VoIPBOX BRIes in order to ensure proper automatic file transfer via **NMS Jobs** and the update management service.

To ensure proper file transfer, the `PABX.CFG` must also define the following:

- the charge file with the `Log=[`*directory*`]cdr.log` entry
- the trace file using the `TraceLog=[`*directory*`]trace.log` entry
- the error file as `ActionLog=[`*directory*`]protocol.log`
- the failed file as `RRufLog=[`*directory*`]failed.log`

When the **NMS Jobs** module transfers files, the software searches for files by name. Therefore, the names of these files may not be altered.

The `RemotePassword` can be configured with the `MKPWD` program (see the appropriate Systems Manual).

Example: TELES.NMS connects to the system via ip at 11:00 p.m. for test purposes. The following entries in the `PABX.CFG` are necessary:

```
RemoteCallback=192.168.0.1 23:00 11111111      ; NMS polling
AlarmCallBack=192.168.0.1                      ; NMS support
```

4.3.2 ILCR AND FIRST GENERATION IGATE

iLCR and iGATE systems must be configured with certain specific parameters in order to ensure their cooperation with the TELES.NMS testing processes.

All tests and remote connections can occur via IP if the system contains a iLCR IP Board or a iLCR VoIP Board. For information on how to configure the system, please refer to the appropriate systems manual.

For each system that is to be tested, the following entries are required in the configuration file:

Remote Administration

Configure remote administration. A password and up to eight permitted numbers can be specified. The remote origination numbers entered must include the numbers of the Network Management System. Map the dial-in numbers for remote administration to the virtual remote administration numbers (`RemoteCode=`*BBB*).

The iLCR/iGATE drivers must be called in the `AUTOEXEC.BAT` so that they are automatically loaded when the iLCR or iGATE is restarted via remote administration.

Dial-In Number for Testing

Map the dial-in number for NMS testing to the virtual remote administration numbers with an asterisk ('*') added at the end. The system only accepts calls to this number when errors have occurred. In this case, the event log file is picked up. Otherwise, the system sends an alerting signal to tell TELES.NMS that it is still operational, and NMS then disconnects the call.

Activate the system's event log feature using the `ActionLog` command. The log file name must be configured as `protocol.log`, as the NMS software will retrieve only the file with this name. The remote administration numbers and test numbers must be within the system's number block. The cascaded PBX cannot use these numbers for data transfer.

Polling & Support Settings

iLCRs and iGATEs dial in to TELES.NMS at a specified interval to signal their operational status. This so-called "polling" call shows TELES.NMS that the system is still up and running, and offers the opportunity for further actions such as routing table updates, etc. Both the TELES.NMS number and the time and day at which the calls should be placed are entered into the configuration file using the `RemoteCallback=`*number time day* command.

When the system malfunctions, the support number set with `AlarmCallBack=`*number* is dialed instead.

Routing Table and File Transfer

Certain conventions must be observed with regard to file names on <lowercase>iLCR and iGATE systems in order to ensure proper automatic file transfer via **NMS Jobs** and the update management service. Two different methods may be used to store routing information, but in each case, the prerequisites must be met and the routing configuration type must be properly distinguished using the corresponding option in the System Editor (cf. Chapter 6.2 on page 44 ⇨).

a) On older systems, time-dependent routing information may be stored directly in the `PABX.CFG` file. As this method was common up to TELES.NMS Version 1.3, this configuration is assumed for systems imported from Version 1.3 databases, and the **New configuration type (routing)** option is left unmarked in the **System Editor** dialog.

b) For newer systems, time-dependent routing information is commonly stored in a separate file. In this case, the `PABX.CFG` must contain the `PermanentFile=route.cfg` entry. The `route.cfg` must then define the time-dependent routing files using `ExternFile= [`*directory*`\filename...]` entries. For newly created systems, this method is assumed and the **New configuration type (routing)** option is marked in the System Editor. NMS does not check the correctness of the entries nor does it attempt to determine whether or not the `ExternFiles` are present. In order to automatically update routing information, each number range subdirectory must contain a `route.cfg` file and all of the files defined therein with `ExternFile` entries.

To ensure proper file transfer, the `PABX.CFG` must also define

- the charge file with the `Log=[`*directory*`]charge.log` entry
- the trace file using the `TraceLog=[`*directory*`]trace.log` entry, and
- the error file as `ActionLog=[`*directory*`]protocol.log`.

When the **NMS Jobs** module transfers files, the software searches for files by name. Therefore, the names of these files may not be altered.

Example: TELES.NMS dial in to the system at 040 222 3589 for test purposes. Remote administration is

configured for 3588. The following entries in the PABX.CFG are necessary:

```
RemoteCode=3588
MapIn3588=3588 DATA
MapIn3589=3588* DATA
RemotePassword=TTV6
ActionLog=protocol.log
RemoteCallback=90303992800 15:00 00000001
AlarmCallBack=00303992801
```

The RemotePassword must be configured with the MKPWD program (see the corresponding Systems Manual).

4.3.3 ILCR XBRI/PRI BOXES

iLCR XBRI/PRI Boxes must be configured with certain specific parameters in order to ensure their cooperation with the TELES.NMS testing processes. For each system that is to be tested, the following prerequisites must be met:

Remote Administration

Configure remote administration in the configuration table by specifying a password (`RemotePassword`) and up to three numbers from which remote administration should be permitted (`RemoteOrigination`). The remote origination numbers entered must include the numbers of the Network Management System.

Dial-In Number for Testing

Map the dial-in number for NMS testing to the virtual remote administration numbers with an asterisk ('*') added at the end. The system only accepts calls to this number when errors have occurred. In this case, the event log file is picked up. Otherwise, the system sends an alerting signal to tell TELES.NMS that it is still operational, and NMS then disconnects the call.

Polling & Support Settings

Box-based systems dial in to TELES.NMS at a specified interval to signal their operational status. This so-called "polling" call shows TELES.NMS that the system is still up and running, and offers the opportunity for further actions such as routing table updates, etc. Depending on the version number, different settings are necessary to determine the polling interval for the iLCR XBRI/PRI Boxes:

- For dialer devices before version 3.01, the `RemoteCallback` parameter defined only the *number* for NMS polling.
- As of version 3.01, the `NMSPollNumber` parameter is used to specify the number.

In both cases, the `NMSPollInterval` command determines the interval at which the `RemoteCallback` or `NMSPollNumber` should be dialed.

As of version 3.01 the `EmergencyNumber` defines the support number to be called after critical errors such as power loss, etc. have occurred.

The following configuration table entries are necessary:

```
NMSPollNumber=90800123456               ; number for polling calls to NMS Listen
                                        ; 9 is dialed for an outside line,
                                        ; 0800123456 is the NMS polling number

NMSPollInterval=168:00:00               ; determines how often above number is dialed
                                        ; (in hhh:mm:ss format, here once per week)

EmergencyNumber=90800123457             ; number for support calls to NMS Listen
                                        ; 9 is dialed for an outside line,
                                        ; 0800123457 is the NMS support number
```

5 SERVER APPLICATIONS

The TELES Network Management System makes use of several server applications that regulate access to the common data shared by the local host. These programs run on the server computer and ensure the proper operation of the entire network. The server applications provide essential services to the other program modules.

5.1 NMS SERVER

The **NMS Server** application (`nmsserver.exe`) runs on the computer that maintains the common database and is responsible for synchronizing database access and coordinating TELES.NMS testing procedures. Before each action and every database access attempt, the NMS workstation asks the server for permission to carry out the desired task. If a system's database entry changes, the server informs all NMS workstations of the change.

The **NMS Server** application can be started by double-clicking the corresponding desktop icon. When the program is running, an **NMS Server** icon appears in the taskbar. When you move the mouse pointer over the taskbar icon, a tooltip message shows whether the **NMS Server** is active.

Right-clicking the taskbar icon displays a context menu with the following selection: **Trace…**, **Options…**, **About…** and **Exit**. Double-clicking the icon has the same effect as choosing **Trace…** from the context menu. In either case, the following window appears:

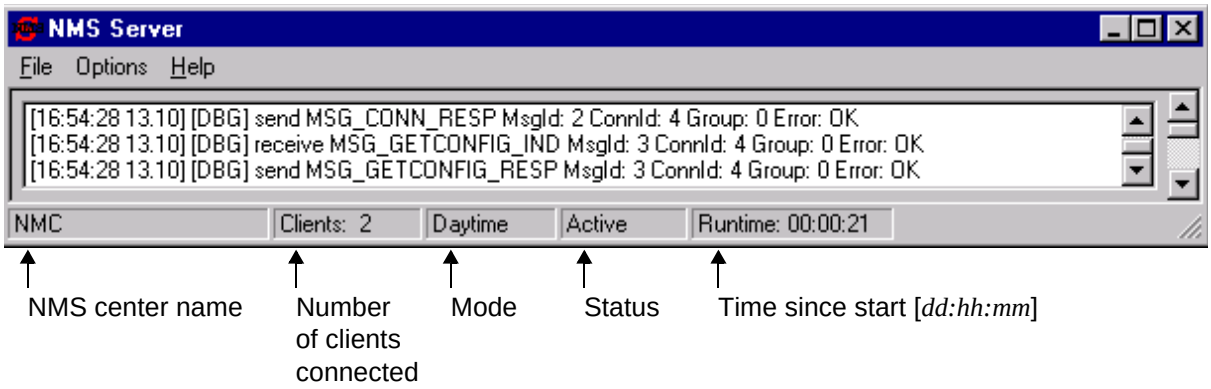


Figure 5.3 The NMS Server Window

The menus in the **NMS Server** dialog correspond to the options available from the context menu. The **File** menu is used to save and delete trace information and to quit the Server application. The **Options** menu displays the Server tab from the **NMS Configuration** module (cf. Table 4.6 on page 25 ⇨). **Help/About…** shows information such as program version number, memory and drive capacity.

5.2 NMS JOBSERVER

The **NMS JobServer** application keeps track of running jobs and manages jobs executed by the NMS DoJob applications running on the NMS workstations.

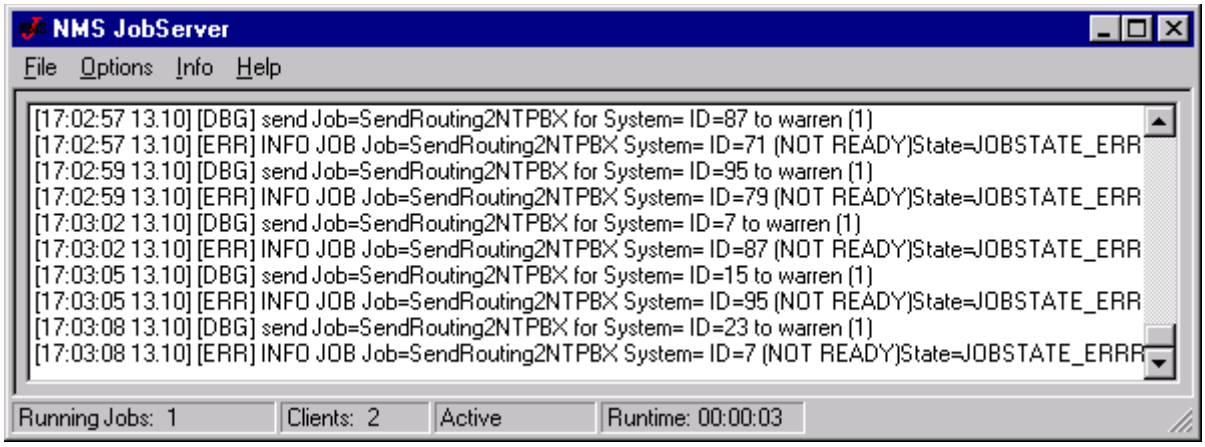


Figure 5.4 The NMS JobServer Window

The module's interface consists of a window with trace information similar to the NMS Server window. The **File** menu allows you to save or delete the trace information and exit the program. The **Options** menu contains the commands used to stop tracing and offers a selection of trace information to be displayed.

Table 5.8 NMS JobServer Options Menu

Option	Purpose
Deactivate	Stops the server from distributing systems for job processing. All jobs currently running on network elements are completed for those systems, but no new systems are processed by any of the active jobs.
Distribution Delay	Select the delay that should be used between the completion of an active job on one system and the execution of that same job on the next system. If **None** is selected, the job will immediately be executed on the next system. Otherwise, the server will wait 1–5 seconds before assigning the next system.
Pause Between Tries	This delay regulates the period of time that elapses before a job is re-executed on a system if it could not be successfully repeated on the first attempt.
Trace Debug Info	Include debug messages in the trace window
Trace Warnings	Include warnings in the trace window
Trace Errors	Include error messages in the trace window

The **Info** command opens a window displaying an overview of all defined jobs and their current status. The **Help** menu shows version and memory information.

6 THE NMS DESKTOP

The **NMS Desktop** application serves as the main NMS workspace.

After the password is entered, the **NMS Desktop** window appears with the following menus:

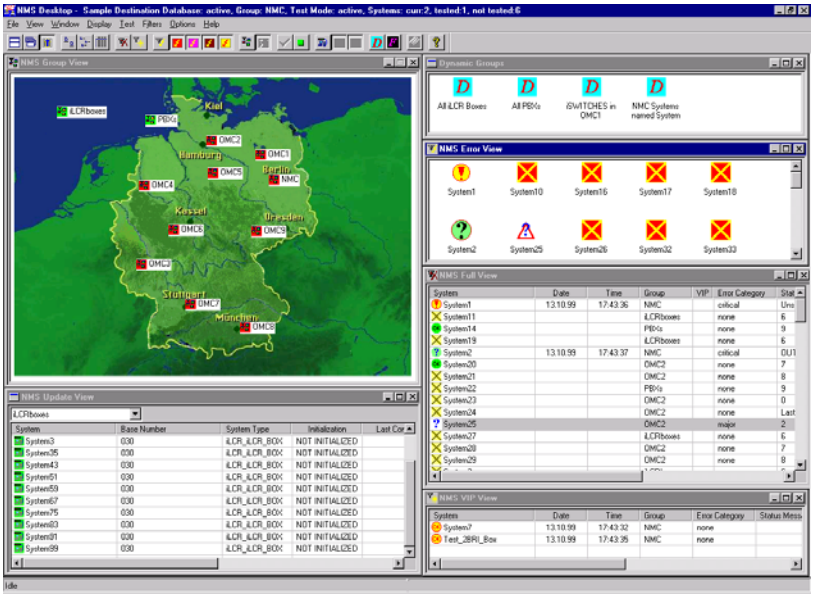


Figure 6.5 The NMS Desktop

- The **File** menu contains only the **Exit** command used to close the program.
- The **Edit** menu appears only if the **Dynamic Groups** window is active. The menu offers standard commands for working with dynamic groups including **Open Group**, **New Group**, **Edit Group**, **Rename Group**, **Delete Group** and **Find**.
- The **View** menu contains the option for displaying or hiding the toolbar and status bar and two commands which affect the way information is displayed in the panes in the lower portion of the main dialog. Both of these options are active by default.
  - Mark the **Gridlines** option to display the row and column boundaries on each of the panes in the main dialog.
  - The **Full Row Select** option highlights the entire row when information in one of the columns is selected.
- The **Window** menu contains options for displaying different NMS view windows. Each active window is listed in this menu to allow you to switch between the individual views.
- The **Display** menu allows you to launch the most important NMS views.
- The **Test** menu contains commands for starting and stopping the testing process.
- The **Filters** menu allows you to select which errors you would like displayed.
- The **Options** menu allows you to search for systems in the active window with the **Find** command, access the **Properties** and **reload the NMS database**. (Testing must be stopped in order to reload the database.)
- The **Help** menu shows program version and memory information.

The **toolbar** offers access to commonly used options and commands:

The first group of buttons controls window behavior (tile, cascade and scrolling). The second group regulates the way in which system icons are displayed within the active window (large/small icons, details). The remaining buttons are explained below in Table 6.9 ⇨. (Not all toolbar buttons are always available.)

Table 6.9 NMS Desktop Toolbar Buttons

Button	Purpose
	Shows all monitored systems in the **NMS Full View** window
	Shows all important systems in the **NMS VIP View** window
	Shows all systems returning errors in the **NMS Error View** window (The list can be filtered using the next four toolbar buttons.)
	Shows systems returning critical errors in the **NMS Error View** window
	Shows systems returning major errors in the **NMS Error View** window
	Shows systems returning minor errors in the **NMS Error View** window
	Shows systems returning warnings in the **NMS Error View** window
	Shows all groups in the **NMS Group View** window. Double-clicking a group icon with the left mouse key opens the **NMS Group Full View** for this group. Double-clicking the right mouse key opens the **NMS Group Error View**.
	Displays the map in the **NMS Group View**. This file can be specified using the **Background Bitmap** option on the **General** tab in the **Properties** dialog.
	Begins the NMS testing process (all systems marked for cyclic testing are dialed sequentially)
	Stops the NMS testing process
	Shows systems that participate in Update Management in the **NMS Update View** window
	Shows systems that were updated successfully in the **NMS Update View** window

Table 6.9 NMS Desktop Toolbar Buttons *(continued)*

Button	Purpose
	Shows systems that could not be successfully updated in the **NMS Update View** window
	Opens the Dynamic Groups window (shows the groups created using the Filter wizard)
	Starts the SQL query tool known as the Filter wizard (used to define dynamic groups)
	Launches the GATE Manager application and establishes a remote administration connection to the selected system
	Causes NMSDoJob and NMSListen to reload the directory of routing files
	Reloads the entire database
	Shows program information such as version number and copyright

The NMS Desktop consists of a number of windows – or views – that show the network elements according to importance, error or update status, group membership, etc. Each of these views is described in a separate subsection (see Chapter 6.3 ⇨ to Chapter 6.8 ⇨). In these windows, network elements are represented with icons that provide information on the systems' current status. These icons are described in Table 6.10 on page 38 ⇨.

Most common commands can be carried out in the NMS Desktop application with the aid of the context menu. The commands available from this menu are described in Table 6.11 on page 40 ⇨. Individual systems are maintained using the NMS System Editor (cf. Chapter 6.2 on page 44 ⇨).

Before you begin working with the NMS Desktop, use the program's properties dialog to adjust the application preferences to meet your needs (cf. Chapter 6.1 on page 41 ⇨).

Table 6.10 System Icons on the NMS Desktop

Icon	Description	Error
	Gray "X" in yellow square	System does not participate in cyclical testing. (iLCR Boxes will be displayed with this icon only.)
	Yellow "X" in red square	System does not participate in cyclical testing. A support call has been received from this system.

Icon	Description	Error
	OK in green circle	Test passed without errors.
	OK in yellow circle	A single brief error occurred on this system. The system is operational again.
	Exclamation mark in red circle	A new error has occurred for the first time.
	Exclamation mark in yellow circle	Several errors have occurred in succession.
	Black wrench on warning sign	The maintenance flag is set on this system
	Blue question mark (on warning sign)	The system has been maintained and is now ready for testing. (Warning sign only visible in large icon)

Depending upon the active view, one of three context menus is available for editing database entries and maintaining tested systems.

To access the menu shown to the right, right-click a system in the **NMS Full View**, **NMS VIP View** or **NMS Group Full View** (The latter view appears when a group is double-clicked with the left mouse key on the **NMS Group View** map or when a group in the **NMS Group View** is right-clicked and **Open Group Full View** is selected from the context menu. For more information about the **NMS Group View** context menu, see Chapter 6.5 on page 51 ⇨.

The commands shown in this context menu are explained in Table 6.11 on page 40 ⇨.

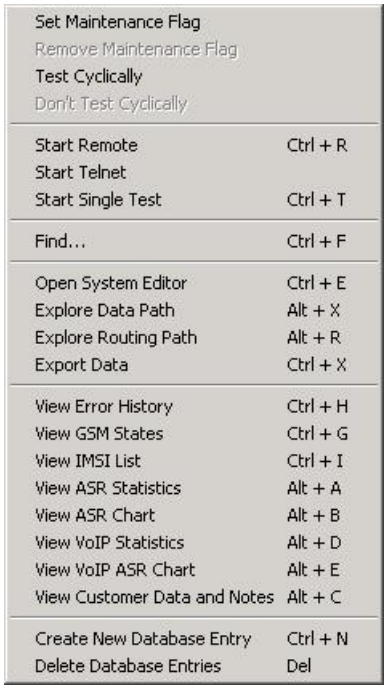


Table 6.11 NMS Desktop Context Menu Commands

Command	Purpose
Set Maintenance Flag	Select this option when an error has been detected and is being repaired. The system is excluded from the cyclic testing process. A construction symbol with a wrench appears. This visual signal is intended to prevent several people from attempting to rectify the same error condition.
Remove Maintenance Flag	Select this option when you have finished maintaining the system changes to the database entry. The system icon changes to a question mark.
Test Cyclically	Select this option to test this system in regular cycles.
Don't Test Cyclically	Select this option to exclude the system from regular testing cycles. A yellow square with an "X" appears as the system's icon.
Start Remote	Use GATE Manager to establish a remote administration connection to this system.
Start Single Test	Tests one or more selected systems by placing a data call to the system's dial-in number for NMS testing. Depending on the system's status, the call is either disconnected (if the system is operational), accepted (if an error has occurred) or not answered (if the system is not responding).
Find…	Opens a standard Find dialog, allowing you to search for system names in the active window.
Open System Editor	Select this option to access the system editor, in which the system's specific settings can be altered. This same dialog is also accessible by double-clicking the system's icon or by pressing the <F12> or <Enter> keys.
Explore Data Path	Select this option to open an Explorer window displaying the directory containing this system's data
Explore Routing Path	Select this option to open an Explorer window displaying the directory containing this system's routing path
View Error History	Opens a window that displays a list of the last error messages returned during NMS testing.
View GSM States	Opens a window that displays a table with GSM statistical information. Right-click in this window to export the data displayed.

Table 6.11 NMS Desktop Context Menu Commands *(continued)*

Command	Purpose
View IMSI List	Opens a window that lists various information about the IMSIs on the system. Compares IMSIs retrieved with the job **Get GSM States** with the active initial IMSIs. Right-click in this window to import initial IMSIs or export the data listed.
View ASR Statistics	Opens a window that lists ASR statistics for the last 15 to 46 days. To save database space, the statistics for the previous month are automatically deleted on the 15th of each month. Right-click to export statistics or to display charts from the **Statistic Tool**.
View ASR Chart	Opens a window that show a chart of ASR values.
View VoIP Statistics	VoIP statistics are displayed for the selected system for the last 15 to 46 days. To save database space, the statistics for the previous month are automatically deleted on the 15th of each month. Right-click to export statistics or to display charts from the **Statistic Tool**.
View VoIP ASR Chart	Opens a window that show a chart of ASR values for the selected system.
View Customer Data and Notes	Opens a window that displays the **Customer Data** entered in the **NMS System Editor**.
Create New Database Entry	Select this option to open the system editor dialog to enter settings for a new system.
Delete Database Entries	Select this option to permanently remove the system(s) from the NMS database.
Export Data	Data of one or more systems can be saved as Excel or txt files.

6.1 SETTING UP THE NMS DESKTOP

Once you have started the program and familiarized yourself with the interface components described in the preceding section, you may need to adjust the program's default settings to meet the specific requirements of your network environment.

The NMS Desktop application can be password-protected if desired. Directly after installation, no password is assigned. If you would like to use a password to guard against unauthorized access to the program, press the **New Password** button in the dialog that appears when the program is launched. Specify the desired password in the space provided. You will be asked to confirm the new password by entering it a second time. To change the existing password, first enter the old password before pressing the **New Password** button.

The program settings can be adjusted from the **Properties** dialog, available by selecting the corresponding command from the **Options** menu. The **Properties** dialog can also be password-protected as described above for the program itself. Separate passwords may be assigned for the NMS Desktop and the properties.

Table 6.12 NMS Desktop Properties

Option	Purpose
General Tab	
Outside line access	Shows the outside line access prefix configured for this computer (to alter this setting, use the NMS Configuration tool described in Chapter 4.2 ⇨)
Own number	Shows the telephone number assigned to this NMS computer (to alter this setting, use the NMS Configuration tool) – this number must be identical with the `RemoteOrigination` entry in the network elements' configuration files (i.e. 0303992800).
Group	The group to which the workstation belongs is displayed here. To change group assignments, use the NMS Configuration module.
Acoustic alarm (VIP View)	If this option is active, a warning tone is played when a VIP system returns an error message. (PC loudspeaker required).
Background bitmap	Select a bitmap file for use as a background image in the NMS Group View.
Check numbers on edit	Forces the query for remote and test numbers after editing a system.
Show systems which are OK in error views	Includes systems that are running properly in the Error View displays. If this option is not active, systems are removed from error view as soon as they pass cyclic testing without errors.
Colored Error Views	Click here to display color-coded errors in the NMS Error View. This option requires a display setting of more than 256 colors.
Groups Tab	
Group name	Select the group name from the list provided, or enter a new group name and press the **Create new group** button below.
Update management	When this option is marked, members of this group are enrolled in the update management process and receive updates and other current information when they connect to NMS.
Accept call if system is unknown	This option determines whether or not NMS should answer calls from systems that are not in the database.
Automatic registration to update management	When this option is marked, newly installed systems will be enrolled in the update management process and automatically receive updates and other current information when they connect to NMS.

Table 6.12 NMS Desktop Properties *(continued)*

Option	Purpose

Automatic configuration of new systems	Automatic configuration through self-provisioning occurs on systems that automatically log on with NMS Listen when the selected group is defined as **Standard group for new systems** in the TELES.NMS configuration. The provisioning data must appear in the NMS database `inputconfig` and the CFGs in the files `pabx.cfg`, `route.cfg` and `ip.cfg` in one of the following directories:
	`\\nms_data\Systemtypes\SystemTypeString\Provisioning\`
	or:
	`\\nms_data\Systemtypes\SystemTypeString\Systems\System-Name\Provisioning\`

Send time from update management	If the ISDN line does not provide the time, mark this option to send the time from the NMS workstation to boxes and PC-based LCR systems during update management. The time sent can be the original system time or the system time with an offset. The offset can be defined for each group in the `NMS_TimeOffset.ini` file on the NMS server (\\nms_data\NMSFiles\).
Send default table	First-generation systems only. Mark this option to automatically transfer a default configuration table to network elements that belong to the group. These tables are stored in the `DefaultTable` subdirectory of the `Routing` folder for each system type.
Send routing table	Activate this option send new routing tables to systems in this group.
Get statistics	First-generation systems only. Activate this option to retrieve statistical data from the network elements and insert them into the corresponding database.
Always accept call	This command leads TELES.NMS to answer all incoming calls from systems in this group, even if no new table information is available for updating.
Fault management	When this option is marked, members of this group participate in the fault management process.
Number of retries	Specify how often NMS should redial systems that do not respond to testing.
Change group name	Use this button to alter the name of the group. Select the desired group from the list above, edit the label and press this button to apply the changes. TIP: When changing default group names, use names containing the group ID to ensure that group name and ID are easily associated.
Create new group	Enter a new name in the field above and press this button to create a new group with this name. TIP: When creating new groups, use names containing the group ID to ensure that group name and ID are easily associated.
Delete group	Use this button to delete the group selected in the list above.

Table 6.12 NMS Desktop Properties *(continued)*

Option	Purpose
Day/Night Mode Tab	
Switch to day mode	Enter the time (in 24-hour format) at which daytime test mode should be activated.
Switch to night mode	Enter the time (in 24-hour format) at which night mode should be activated. (There must be at least one hour between day mode and night mode starts.)

6.2 THE NMS SYSTEM EDITOR

The NMS System Editor is used to configure the test behavior and error handling of each network element. The dialog appears in several different situations:

- when new systems are included in the database using the **Create new database entry** command from the context menu,
- when an existing system is double-clicked in one of the NMS Desktop view windows,
- when the **Open system editor** command is selected from the context menu,
- or when <Ctrl> + <E> is pressed while a system is selected.

With the aid of this dialog, the testing preferences for each individual system can be adjusted as needed. This is especially useful when settings for particular systems must differ from the settings for the group to which the system belongs. The dialog is shown in Figure 6.6 ⇨. The meaning of each of the available options is explained in Table 6.13 on page 46 ⇨.

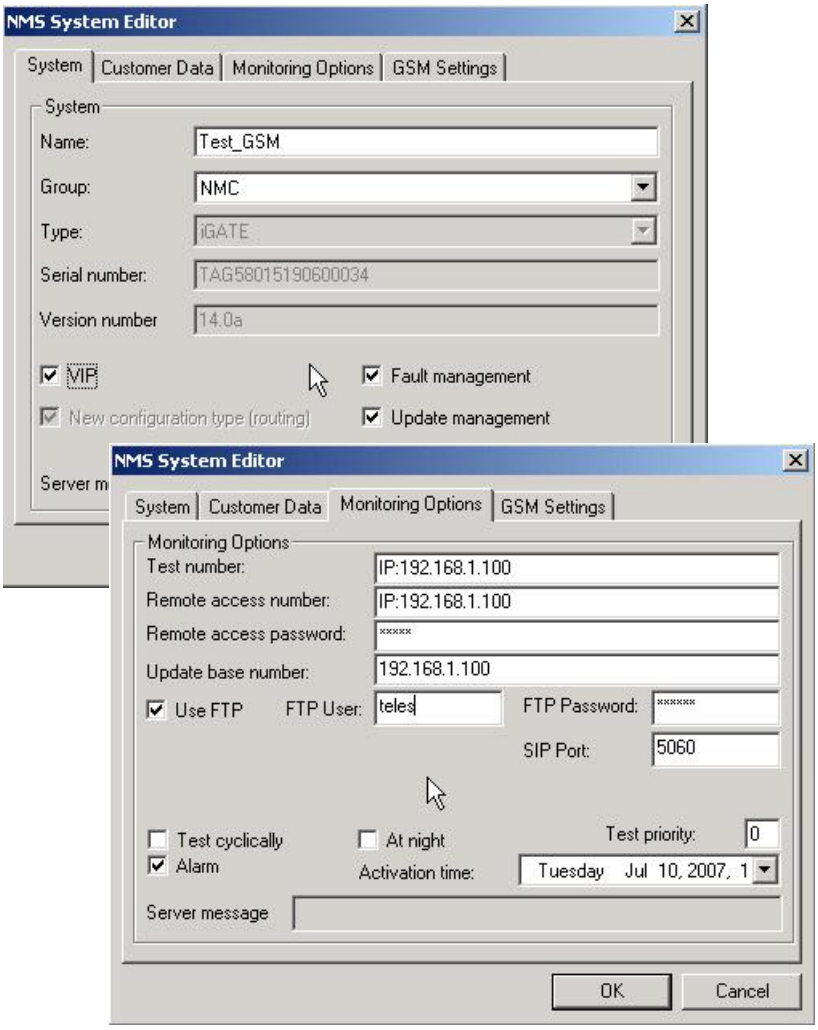


Figure 6.6 NMS System Editor Dialog (System and Monitoring Options Tabs)

The following table describes each of the options contained in the **NMS System Editor** dialog.

Table 6.13 NMS System Editor Dialog

Option	Purpose
System Tab	
Name	The system name entered here can be freely chosen, though it will also serve as the name for the system's working folder. Thus, the name should not contain spaces or special characters.
Group	By selecting a group from the list, you determine which group the system should be assigned to.
Type	This field displays the system type. When manually creating new systems, you can select the system type from the list provided.
Serial number	The box system's serial number is displayed here. (The serial number can only be entered manually when creating a new database entry). For second-generations, this is the TAG number. The FTP username is `teles`. The password it `tcs-ag`.
Version number	The system's software version number is displayed here.
VIP	If the system is of special importance, mark this option.
Fault management	Activating this option allows the system to participate in NMS testing routines
New configuration type (routing)	Mark this option if routing information for this system is stored in the `PermanentFile` (`route.cfg`) rather than in the `PABX.CFG`.
Update management	When this option is active, the system can retrieve routing updates when connected to a TELES.NMS computer.
Server message	Information supplied by the server is shown in this space (for example, if another user is currently accessing the data record, in which case no changes can be made in the entire System Editor dialog).
Customer Data Tab	
The information stored in the customer data fields has no influence on the testing process. The spaces allow the entry of customer-specific information such as who to contact when questions regarding a particular system arise. The fields may also be left empty. Lines may be longer than the visible space, and can be scrolled using the cursor.	
Server message	Information supplied by the server is shown in this space. (This field appears on all three tabs.)

Table 6.13 NMS System Editor Dialog *(continued)*

Option	Purpose
Monitoring Options Tab	
Test number	Telephone number to be dialed for NMS testing. If testing over IP, enter the IP address using the following syntax: `IP:`<*ip address*>.
Remote access number	Number to be dialed for remote administration access to this system. If testing over IP, enter the IP address using the following syntax: `IP:`<*ip address*>.
Remote access password	Password for remote administration access to this system.
Update base number	Enter the telephone number this system should send as calling line identification when it dials in to TELES.NMS to check for updates. If the database entry is created before the system dials in to NMS for the first time, this entry allows the incoming call to be associated with the proper database entry (i.e. `0303992800`), and is used to determine which routing tables are to be transferred.
Use FTP	Check here to allow FTP file transfer. Enter an **FTP User** and **FTP Password**. The default settings configured on iGATEs are `ip` and `ip`, respectively.
SIP Port	Enter port 5060 to send SIP Invite messages to systems that are to set up a remote connection TELES.NMS.
Test cyclically	This option determines whether or not this system should participate in regular test intervals.
At night	During the night, NMS monitors all systems in the database for which this option is active. The time of day at which NMS switches from daytime to night mode can be specified using the **Day/Night Mode** tab in the **Properties** dialog accessible from the **Options** menu. The modes are factory-set to switch at 8 a.m. and 8 p.m.
Test priority	This option determines the frequency with which the system is to be tested. Smaller numbers indicate shorter intervals between tests. Larger numbers signify longer intervals. **Examples**: 0 and 1 – the system is tested every cycle 2 – the system is tested every second cycle 3 – the system is tested every third cycle
Alarm	If this option is marked, an automated call is placed to the **Operator e-mail address** specified for this group on the **NE Events** tab of the NMS EventManager dialog when errors occur on this system.

Table 6.13 NMS System Editor Dialog *(continued)*

Option	Purpose
Activation time	Date and time at which testing of this system began (if active) or the time at which testing should be resumed (if deactivated).
Server message	Information supplied by the server is shown in this space (for example, if another user is currently accessing the data record, in which case no changes can be made in the entire System Editor dialog).
GSM Settings Tab	
GSM Settings shows a tree listing the system's controllers and their respective SIM cards. You can enter new controllers and SIMs here. If the  icon appears when a new controller is listed, the controller has no SIM and the entry will be automatically deleted.	
Delete All	Deletes the entire tree
Import (Gateway Data)	Imports IMSIs from the database of the job **Get GSM Status**.
Add controller	Appears when you right-click in the window. A dialog box from which you can enter new controllers appears when you select this option.
Add SIM	Appears when you right-click in the window. A dialog box from which you can enter new SIMs appears when you select this option. After you enter the SIM and click **OK**, a new dialog box appears. You can enter the new SIM's IMSI, a number, PIN and/or user data in the appropriate text boxes. All information entered here will then appear in the SIM's listing in the tree.
Delete	Appears when you right-click in the window or one of the entries in the tree. Selecting this option from the window itself will delete all entries. If you select this option by right-clicking an individual entry, only that entry will be deleted.
Edit Settings	Appears when you right-click a SIM entry. A new dialog box will then appear. You can edit the SIM's IMSI, number, PIN and/or user data in the appropriate text boxes. All changes will then appear in the SIM's listing in the tree.

6.3 ERROR VIEW

All systems that return error messages during testing are listed in a separate window. Filtering mechanisms allow the inclusion or exclusion of specific error types. When the **NMS Error View** window is active, the **Filter** menu options and the toolbar buttons for each filter are made available. The active filter types are marked in the **Filter** menu with a "check". Critical, major or minor errors can be displayed along with warnings.

The information displayed in this window includes system name, date and time of last contact, group, error category, the status message returned during last contact, the date and time the last maintenance sessions began and ended and the system type.

In order for systems to appear in the Error Views, they must be configured for fault management by marking the corresponding option in the system editor dialog.

Table 6.14 NMS Error View Filters for PC-based Systems

Filter	Button Description	Error Description
Critical errors 	Yellow lightning bolt on violet background	▪ Connection error related to Layer 1/2 error ▪ New configuration or extern file activated ▪ Errors occurred while activating configuration or extern file
Major errors 	Yellow lightning bolt on red background	▪ Message memory > 75% full
Minor errors 	Yellow lightning bolt on the checkered yellow-brown background	▪ Layer 1 error ▪ Layer 2 error ▪ Layer 1/2 reoperational ▪ Remote administration access ▪ Remote administration: invalid password ▪ Remote administration: invalid outgoing number ▪ Alternative routing threshold exceeded
Warnings 	Red lightning bolt on yellow background	▪ System (re)started ▪ System restarted via remote administration ▪ LCR software started

The categories for port errors of iLCR PC systems can be defined in the `NMSTools.ini` file (in `\\nms.data\NMSFiles\`), where `0` means no error, `1` means critical error, `2` means major error, `3` means minor error and `4` means warning.

When a system is right-clicked in the **NMS Error View** or **NMS Group Error View,** the context menu shown is adjusted to reflect the options available in this particular setting.

(The **NMS Group Error View** appears when a group is double-clicked with the right mouse key on the **NMS Group View** map.)

Several of the options described in Table 6.11 on page 40 ⇨ are also available in this context.

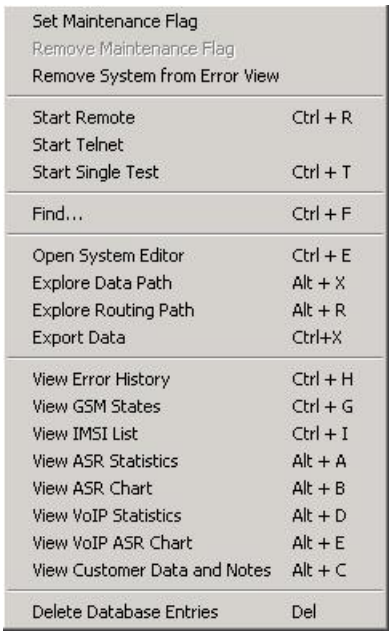


Table 6.15 Additional NMS Desktop Context Menu Commands (Error View)

Command	Purpose
Remove System from Error View	Select this option to remove the system from the error list after the error condition has been resolved and the system is operating properly. (Systems that do not participate in cyclic testing will be removed immediately.)
Export Data	Creates a text or Excel file with the data shown in the window for the selected system(s). Specify the desired file name, format and location in the resulting dialog.

6.4 FULL VIEW

The NMS Full View window shows all tested systems in tabular form or as icons. The following table explains each of the column titles used in the detailed list.

Table 6.16 NMS Full View Window Columns

Column Title	Column Content
System	Name of tested system
Serial Number	Serial number of system
Base Number	Base number of system

Table 6.16 NMS Full View Window Columns *(continued)*

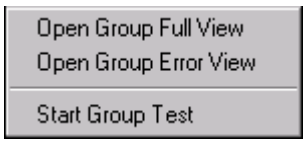
Column Title	Column Content
System Type	Type of system
Date	Date of last contact
Time	Time of last contact
Group	NMS testing group to which the system is assigned
VIP	Systems that have been assigned VIP status are marked with an "X"
Error Category	Lists the type of error that last occurred on this system
Status Message	Displays the status message delivered during the last contact with this system
Maintenance Begun	Shows the date and time the last maintenance session began
Maintenance End	Shows the date and time the last maintenance session ended

6.5 GROUP VIEW

The NMS Group View window shows all defined groups as icons. You may select a bitmap image for display in this window by selecting a file from the **Background bitmap** list on the General tab of the NMS Desktop properties. The files included with TELES.NMS are maps, which allow you to place the icon representing each group, e.g. according to its geographical location. You may use your own images as backgrounds by saving the desired files to your NMS installation path and selecting them from the **Background bitmap** list. The background image can be turned on and off using the corresponding button in the NMS Desktop toolbar.

This window is especially useful when reassigning systems to groups, as the selected systems can simply be dropped onto the desired group icon to assign them to the group.

The context menu at the right can be accessed by right-clicking any one of the defined groups in the NMS Group View window.



Select **Open Group Full View** to access the Group Full View menu (this view also appears when you double-click any group listed). **Open Group Error View** calls up the Group Error View window. To initiate testing for any group, select **Start Group Test**.

6.6 UPDATE VIEW

All systems that participate in the update process are also listed in a separate window. This window contains information including base number, system type, the dates and times of initialization, last contact and last update. The status message from the last update and the flags are also shown for each system.

Green icons represent systems that have been successfully updated.

Red icons symbolize systems that couldn't be successfully updated.

Table 6.17 NMS Update View Window Columns

Column Title	Column Content
System	Name of tested system
Serial Number	Serial number of system
Base Number	The update base number is displayed here as specified on the **Monitoring Options** tab of the NMS System Editor
System Type	Type of system
Initialization	Date and time the system first contacted NMS with a polling or support call
Last Contact	Date of last contact
Last Update	Date of last update
Update Status	Displays the status message delivered during the last contact with this system
Update RT.	Shows whether the **Update table** flag is set for this system or group (If the flag is set, an "X" appears in this column)
A.A.C.	Shows whether the **Always accept call** flag is set for this system or group (If the flag is set, an "X" appears in this column)
Upd. Conf.	Shows whether the configuration update flags are set for this system. If the **Update configuration from files** flag is set, an "F" appears in this column. When the **Update remote access numbers** flag is set, an "R" appears.

The context menu offers easy access to commands commonly required in this setting. Several of the options described in Table 6.11 on page 40 ⇨ are also available in this context. The options specific to the update process are described in the table below.

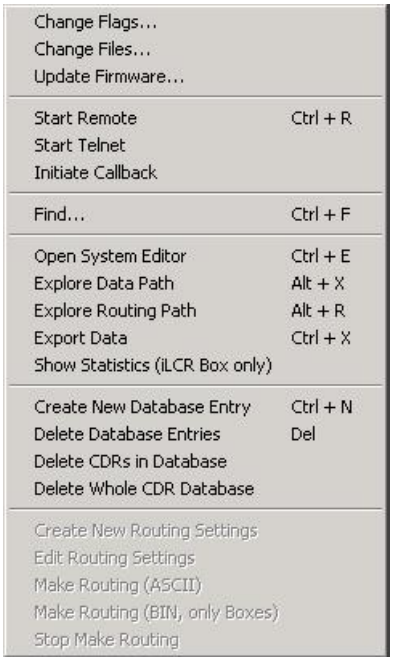


Table 6.18 Additional NMS Desktop Context Menu Commands (Update View)

Command	Purpose
Change Flags...	Opens a dialog with four flag options that can be set to alter the behavior of the selected system(s) during the update process (cf. Table 6.19 on page 55 ⇨).
Change Files...	Opens a dialog from which you can retrieve and process files from a PC-based system (see Chapter 6.9 on page 56 ⇨ for the correct syntax).
Update Firmware	After you set this flag, use the drop-down menu to select a version to be updated. When this flag is set, an **F** appears in the column **Upd. Conf.** The update will occur the next time the system connects with NMS Listen. Save firmware files here: `\\nms_data\Systemtypes\SystemTypeString\Firmware\`
Start Telnet	Sets up a telnet connection to the selected system.
Initiate Callback	A SIP Invite message is sent to the selected system that causes the system to set up a remote connection to TELES.NMS. TELES.NMS Listen then performs defined jobs such as provisioning or firmware updates.
Explore Data Path	Opens an Explorer window displaying the directory containing this system's data.

Table 6.18 Additional NMS Desktop Context Menu Commands (Update View)

Command	Purpose
Export Data	Creates a text or Excel file with the data shown in the window for the selected system(s). Specify the desired file name, format and location in the resulting dialog.
Show Statistics (iLCR Box only)	Select this option to display a window with statistics information for iLCR Boxes. (Statistics information for other system types is available from the NMS Statistics application.)
Delete CDRs in Database	Deletes the CDRs stored in the database for one or more selected systems.
Delete Whole CDR Database	Select this option to delete all CDRs for all systems stored in the database.

The **Change Flags** dialog shown in Figure 6.7 ⇨ appears with all of the options grayed, indicating that the flag status will be left "as is". Table 6.19 on page 55 ⇨ describes the purpose of each flag.

You can select several systems in the Update View window and change the settings for a particular flag, while leaving the others "untouched". To assign a flag to all selected systems, click the shaded check box until a check mark without shading appears. To remove a flag for all selected systems, click the shaded check box until it is clear.

Example: To clear the **always accept call** flag and update the remote administration numbers for all selected systems, check the options as shown to the left. (The **update table** flag remains unchanged for all systems.)

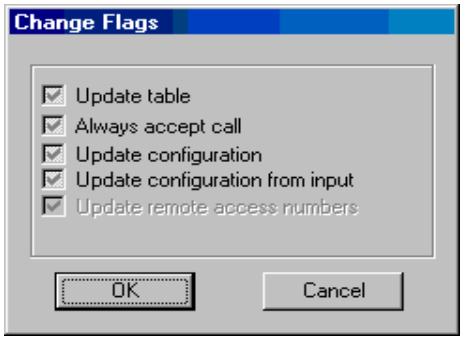


Figure 6.7 Change Flags Dialog

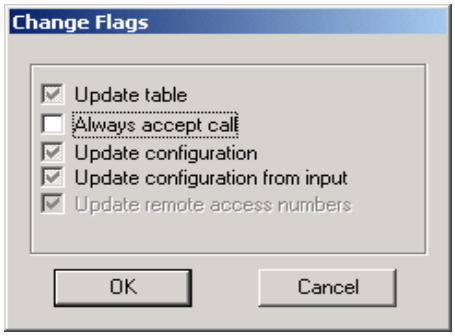


Table 6.19 NMS Update View Flags

Flag	Purpose
Update table	Select this option to update the routing table during the next connection. If this flag is not set, only status information will be exchanged during the next connection. No tables will be transferred.
Always accept call	This command leads TELES.NMS to answer all incoming calls from this system, even if no new table information is available for updating. If this option is not active, NMS accepts calls from a given system only if new update information is waiting for the system.
Update configuration	This command sends a new configuration table to the system upon connection.
Update configuration from input	When this flag is set, the system automatically receives an updated configuration with data in the NMS input database upon connection. A **C** appears in the column **Upd.Conf.** The provisioning data must appear in the NMS database `inputconfig` and the default CFGs in the files `pabx.cfg`, `route.cfg` and `ip.cfg` in one of the following directories: `\\nms_data\Systemtypes\SystemTypeString\Provisioning\` or: \\nms_data\Systemtypes\SystemTypeString\Systems\System-Name\Provisioning\
Update remote access numbers	When this flag is set, the remote administration access numbers specified in the configuration will be replaced upon connection with those specified in the System Editor.

If the flag settings for a particular system differ from the default settings for the group (as defined on the Groups tab of the NMS Desktop properties dialog), the system-specific setting takes priority. The flag Update remote access numbers is only considered if a routing table is to be tranferred.

6.7 VIP VIEW

The NMS VIP View window shows all systems that have been marked as VIPs in the System Editor. This window allows you to check the status of your most important systems from one central location, independent of system type, area code or whatever other criteria you may have used to assign your systems to groups.

The information displayed in this window is the same as that shown in Error View. The context menu shown here is also identical to that available from the Error View window.

6.8 DYNAMIC GROUPS

Network elements may be organized into functional groups with the help of the NMS Filter tool and so-called "Dynamic Groups". A new dynamic group can be created by selecting **New Group** from the context menu in the Dynamic Groups window or pressing the Filter Wizard button (marked with an "F") on the toolbar.

The Filter dialog allows you to define an SQL query using the information stored in the database to filter out a group of systems with common characteristics (such as all iLCR systems within the 040 area code). The resulting NMS Filter View dialog shows all systems that meet the selected search criteria. The query can be saved as a dynamic group using the corresponding option from the **File** menu. This type of group is referred to as "dynamic" because the contents of the group are updated when new systems fulfill the search criteria. If in the example above, a new iLCR is later installed within the 040 area code, it will be added to the dynamic group as soon as it is listed in the NMS database. (Choose **Refresh** from the **Edit** menu in Filter View to update window contents.)

The dynamic groups may also be used to collect systems for assignment to the standard NMS groups. To do so, define a query and then drag the displayed systems from the NMS Filter View window to either the desired group icon or into the corresponding Group Full View window. If necessary, use the NMS Desktop Properties dialog to rename existing groups or create new ones.

6.9 FILENAME PARSING

When a network element calls (second-generation systems, <lowercase>iLCR and iGATE only), it can pick up any number of files. You can set these file names in NMSDesktop using the following format:

The following options are possible:

- Wildcards: "`*`", "`?`"
- Range of characters: "`[...]`"
- Special fields: "`%date...%`", "`%time...%`"

6.9.1 RANGE OF CHARACTERS

Only complete bracket pairs are recognized. Square brackets within the range of characters are not permitted. To generate square brackets in the file name, you must type them twice ("`[[`" or "`]]`"). Single brackets are ignored. All upper case letters within the range of characters are converted to lower case.

Wildcards (*, ?) within the range can only be used for groups. Other wildcards are ignored. A dash (-) signifies a group (e.g. `[0-9a-z]`). The character before the dash must be of lesser value than that following the dash (according to ASCII, upper case letters are converted to lower case letters in advance). Otherwise, the dash is ignored. To use a dash as a character, you must type it twice (`--`).

6.9.2 SPECIAL FIELDS

Enclose special fields in percent signs (%). If the text between the percent signs does not correspond to a special field, the first percent sign is ignored, as are single percent signs. To use a percent sign as a character, type it in twice (%%).

Example: `%date...%`

`%time...%`

They differ only in their standard format (i.e. when they appear without a format specification or when an "`s`" appears in the format).

Example:

Table 6-1

`%date%`	`%date:s%`	`%date:Ymd%`	`%time:Ymd%`
`%time%`	`%time:%`	`%time:HM%`	`%date:HM%`

Upper and lower case letters are recognized for format specification, but not for field identifiers ("`date`", "`time`").

Table 6.20 ⇨ shows the various format specifications. Any characters not listed are accepted unchanged.

Table 6.20 Format Specification for `NMSParseFilename.txt`

Format	Description
`a`	Abbreviated name of a weekday
`A`	Complete name of a weekday
`b`	Abbreviated name of a month
`B`	Complete name of a month
`d`	Day of the month, in two digits (`01-31`)
d-<number>	Date when the number of days entered in `<number>` (up to 999) is subtracted from `d`. Other date values (e.g. `m` and `y`) adjust automatically.
`H`	Hour in 24-hour format (`00-23`)
`I`	Hour in 12-hour format (`01-12`)
`j`	Day of the year (`001-366`)
`m`	Month (`01-12`)
`M`	Minute (`00-59`)
`p`	AM/PM indicator for 12-hour format
`P`	Percent sign
`s`	Standard format (for date: `Ymd`; for time: `HM`)
`S`	Second (`00-59`)

Table 6.20 Format Specification for `NMSParseFilename.txt`

Format	Description
`U`	Week of the year with Sunday as first day of the week (`00-53`)
`w`	Day of the week with Sunday as first day (`0-6`)
`W`	Week in the year with Monday as first day of the week (`00-53`)
`y`	Year in two digits (`00-99`)
`Y`	Year in four digits
`#`	Leading zeros suppressed for following format specification (only for `dHIjmMSUwWyY`, otherwise ignored)
`##`	Pound sign
`!`	Escape, the next character will not be treated as a format specification
`!#`	Same as `##`
`!!`	Exclamation point

6.9.3 FORMATS FOR THE JOBS COPY/PROCESS START EXTERNAL TOOL PARAMETER

The following placeholders can also be entered in the **Start** and **Start External** test boxes.

Essentially all formats and placeholders are possible that can be used under **Filename**. For example, the following format will make sense: %date: m d% -> 11 25

Table 6.21 Additional Placeholders:

Placeholder	Definition
`<fn>`	filename
`<path>`	complete path for the file retrieved
`<relpath_nmsdata>`	path relative to the NMS data directory
`<relpath_systemtypes>`	path relative to system types
`<relpath_systems>`	path relative to the systems directory
`<path_system>`	system path
`<path_downloads>`	download directory
`<path_nmsdata>`	NMS data directory
`<path_nmsfiles>`	NMSFiles directory

Placeholder	Definition
<systemtype>	system type (integer value)
<systemname>	system name
<SHOW>	console window is displayed (for debugging purposes)

7 SUPPLEMENTARY MODULES

7.1 NMS EVENTVIEWER2

The NMS Event Viewer is an application module that displays NMS communication activities. The application tracks the events that take place during communication between NMS and network elements, such as systems that cannot be reached, or for which the password is incorrect. (The error history for individual tested systems is viewed separately from the NMS Desktop).

The program assists in identifying problem systems that repeatedly return the same error conditions, and helps in narrowing the range of possible causes.

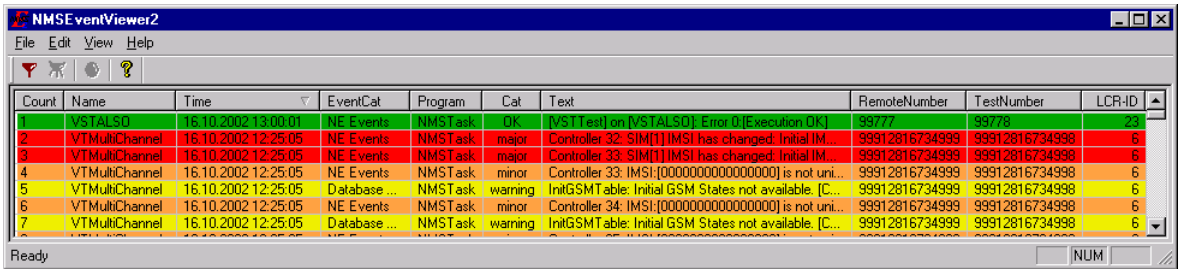


Figure 7.8 The NMS EventViewer2 Window

The user interface consists of a single window in tabular form. Events are numbered in the **Count** column. The **Name** column displays the name of the system on which the application is running. The **Time** column shows when the event occurred. **EventCat** shows the type of event that occurred. The **Program** column displays the program reporting the event, and **Cat** (category) indicates the urgency of the event. The **Text** column shows a more detailed account of the event. The last three columns display the system's **RemoteNumber**, **TestNumber** and **LCR-ID**.

You can alter column width according to standard Windows conventions and change the order of columns by dragging the column title.

The **File** menu allows you to exit the TELES.NMS EventViewer2. With the **Edit** menu, you can use the **Refresh** command to refresh the information on the screen, the **Export Data** command to export the window contents to an Excel or text file, the **Delete** command to delete one or more selected entries, and the **Delete Database** command to delete all of the entries. You can also change the text and background color so that the different warning categories are easily distinguishable. The **Edit** menu also appears when you right-click any entry in the TELES.NMS EventViewer2.

The **View** menu allows you to turn the **Toolbar** and **Status bar** on and off. The **Help** menu contains a single option displaying basic program information.

The toolbar contains buttons to set filters, remove filters and call up basic program information. When you click the filter icon, a dialog appears. Here you can set filters to limit the information displayed in the TELES.NMS EventViewer2. The following table details the individual filter options in this dialog.

Table 7.22 TELES.NMS EventViewer2 Filter Dialog

Option	Purpose
Name	TELES.NMS EventViewer2 will display only systems whose names match the entry in this box. Use an asterisk before and after your entry to include all system names containing these characters. For example, if you enter *iLCR*, all systems with "iLCR" in their names will be displayed. Leave the box empty to display all names.
Remote Number	If you enter a remote number in this box, only the systems with this remote number will be displayed. Use an asterisk before and after your entry to include all remote numbers containing the digits you have entered. Leave the box empty to display all remote numbers.
Test Number	If you enter a test number in this box, only the systems with this test number will be displayed. Use an asterisk before and after your entry to include all test numbers containing the digits you have entered. Leave the box empty to display all remote numbers.
Since	Check the **On** box to enable the drop-down date menu. When you click the arrow next to the drop-down menu, a calendar appears. If you click a date in the calendar, all events that have occurred since that date will be displayed in the TELES.NMS EventViewer2. If the **On** box is not checked, all events will be displayed.
Events	Only the checked events will appear.
Programs	Only the events reported by the checked programs will appear.
Category	Only the events with the checked warning categories will appear.
OK	Sets the filters entered and closes the dialog.
Reset	Removes all filters and closes the dialog. You can also reset the filters by clicking the **Remove Filters** button in the toolbar.
Cancel	Cancels any changes made and closes the dialog.

Event log files are stored in the `\Nms_data\Logging\Events` directory. Files are automatically named with a date and time stamp in *dd_mm_yyyy_hh_mm* format, such as `12_05_2004_00_28_01.log`, and a running number beginning with `0`, in case several files are created per minute.

7.2 NMS EVENTMANAGER

The NMS EventManager is a tool to help you define and optimize which events you would like to save in the database. You can also save events in the WinNT-Event Log by opening the TELES.NMS Configuration (advanced) program, clicking the **Server** tab, and checking the box next to **Log events also in WinNT-Event Log**.

When you open the NMS EventManager, the window in Figure 7.9 ⇨ appears. Click **Event saving** to select the events you would like to save and **Alarm sending** to select the events for which you would like e-mail notification to be sent. When you click **Alarm sending**, a box appears into which you can enter the e-mail address to which notifications will be sent.

In order to receive e-mails, the corresponding box must be checked in the system editor. Windows Messaging must be installed.

Both **Event saving** and **Alarm sending** contain the following tabs: **Program Events**, **Database Events**, **NE Events** (network element events) and **Info Events**. Each tab contains a list of NMS programs that report events. Only the events reported by the checked programs will be saved and/or sent.

Each event tab also contains a list of warning types: **OK**, **critical**, **major**, **minor**, and **warning**. Check the warning categories you would like saved and/or sent. Only the events registering the checked level of urgency will be saved and/or sent for the displayed tab.

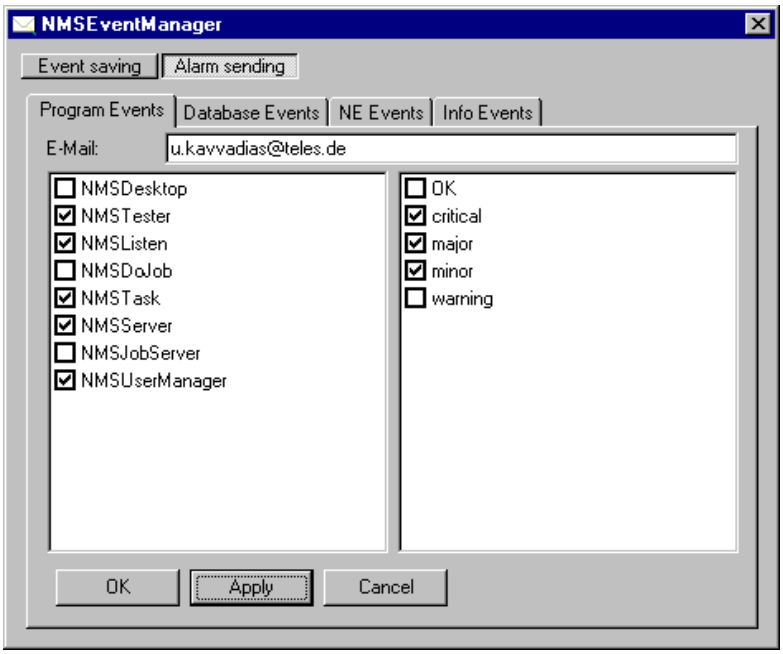


Figure 7.9 TELES.NMS EventManager

At the bottom of the window, click **Apply** to apply any changes, **OK** if the settings are satisfactory and **Cancel** to cancel any changes you have made. The window will then close automatically.

7.3 NMS USER MANAGER

The NMS User Manager is a stand-alone application module that enables you to define the specific rights of users with access to TELES.NMS.

The user interface consists of two windows, one for a quick overview of users and their rights and one to edit and enter user's rights. The first window is in tabular form and contains the following menus:

- The **File** menu allows you to reload any changes that have been made at other workstations or by other users since you last logged on to the NMS User Manager. The **Reload** button to the right of the table performs the same task. You can also exit the NMS User Manager from this menu.
- From the **User** menu, you can edit existing entries, enter new users and delete users you wish to remove from the User Manager. You can also click the corresponding buttons to the right of the table to perform any of these tasks.
- The **Help** menu shows program version and memory information.

The window shown in Figure 7.10 ⇨ appears when you select **New** or **Edit**, or when you double-click any of the users listed in the table. From this window you can enter specific users and their rights and edit the rights of users already entered. NMSUser is set as a default user with all rights.

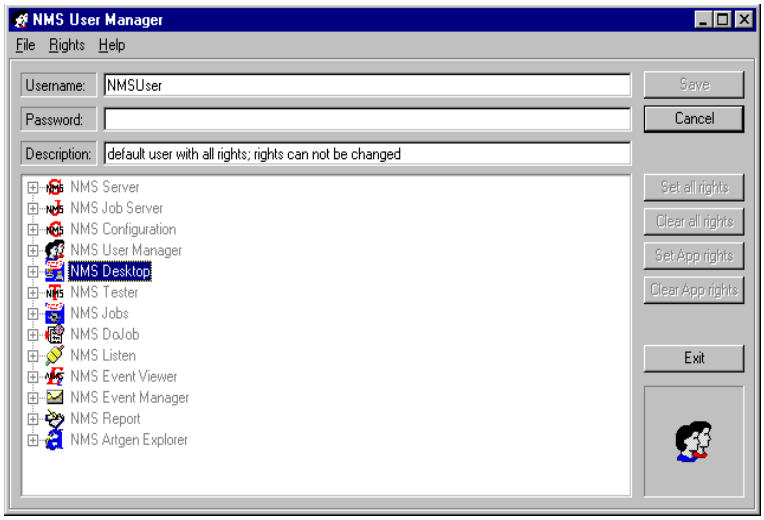


Figure 7.10 NMS User Manager

This window contains boxes where you can enter each specific user's username. Below this box the user's password can be entered. This password is valid for all applications to which the corresponding user has access. Below the password box you can enter a description of the user's access.

Below these boxes is an explorer menu listing all NMS applications. Clicking the plus at the left of each application causes a list of all possible access rights for that application to appear. In the checkbox next to each option you can select or clear a particular user's rights. You can also quickly assign or clear all NMS rights or all rights to a specific application from the **Rights** menu or by clicking the appropriate buttons on the right side of the window. Be sure and save any changes you have made before exiting. You can save from the **Rights** menu or by clicking the **Save** button to the right.

7.4 NMS JOBS

In addition to the automatic testing and monitoring features, TELES.NMS offers an application used to define routine tasks to simplify updates and recurring maintenance on network elements. While the program is installed on each NMS computer, only one computer at a time can run the **NMS Jobs** application. The program requires a special server application known as **NMS JobServer**, which must be running on the server. The **NMS JobServer** coordinates jobs much like the **NMS Server** application. In order to carry out jobs, the **NMS DoJob** application must be running on the server.

7.4.1 MAIN DIALOG

The **NMS Jobs** interface is similar to the **NMS Desktop**.

The toolbar shown above offers easy access to view options such as Tiling, Cascading, Large Icons, Small Icons and Detailed List view as well as filters, which allow you to specify which systems you would like displayed. The standard view windows and the Filter Wizard dialog can also be opened from the toolbar. A separate button provides program information such as version number and copyright.

There are two standard views available. The **Systems** window displays network elements, and the **Jobs** window shows defined tasks. The icons in the **Systems** window offer status information at a glance, and the icons shown in the **Jobs** window indicate job status. These icons are explained in the following table.

Table 7.23 NMS Jobs Icons

Icon	Description	Meaning
Jobs Window		
	Yellow "J" on red background	An error occurred while executing this job.
	Lavender "J" on light green background	Job successfully completed.
	Lavender "J" with yellow bar on green background	This job has been temporarily interrupted using the **Stop running job** command from the context menu.
	Yellow "J" on gray background	This job has been deactivated on the **General** tab of the job editor dialog.
	Yellow "C" with hourglass on brown background	New systems are currently being copied to this job. The job cannot be edited.
	Blue "!" on lavender background	This job is not correctly defined. System type or other information missing.
	Light blue "W" on green background	This job is currently running or "working".
	Light blue "W" with hourglass on green background	This working job will be stopped when file transfer is completed.
Systems Window		
	Light blue "S" on blue background	New system.

Icon	Description	Meaning
	Blue "S" on green background	This icon appears in the **Systems in Job** window when the job was successfully executed on this system.
	Yellow "S" on red background	This icon appears in the **Systems in Job** window if the system was not able to carry out the job successfully.
	Yellow "J" on blue background	New job.

Right-clicking on a job displays a context menu with the commands available for that particular job.

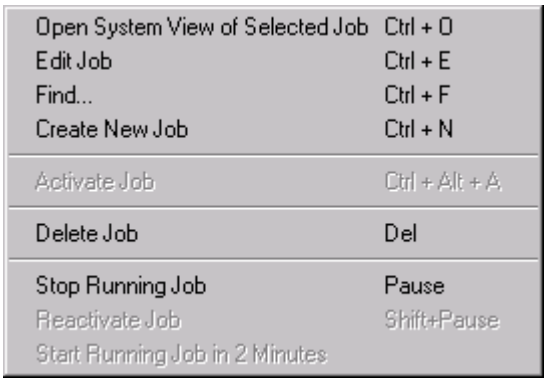


Table 7.24 NMS Jobs Context Menu Commands

Command	Purpose
Open System View of Selected Job	Opens the **Systems in Job** window displaying all of the systems to which this job has been assigned.
Edit Job	Allows you to alter the settings for an existing job.
Find...	Opens a standard Find dialog, allowing you to quickly locate jobs in the window.
Create New Job	When you click an empty portion of the Jobs window, you can use this option to define a new job, specify recurrence options and the actions which should be carried out.
Activate Job	Marks this job as active, enabling the recurrence options set on the **Timing** tab. (Choosing this command has the same effect as selecting the **Activate Job** option on the **General** tab.)
Delete Job	Deletes the selected job along with any system associations.

Command	Purpose
Stop Running Job	Interrupts the execution of a job that is currently active, allowing you to access the job settings. To deactivate the job indefinitely, open the job editor and deselect the **Activate Job** option on the **General** tab.
Reactivate Job	Resumes execution of a job that was previously temporarily interrupted using the above option.
Start Running Job in 2 Minutes	Begins execution of the selected job after a two-minute delay by changing the **Start Time** set on the **Timing** tab (this command is not available for jobs that are set to recur cyclically).

An additional context menu is available from the **Systems in Job** window, offering the additional commands described in Table 7.25 ⇨ below

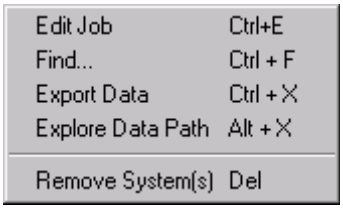


Table 7.25 Additional NMS Jobs Context Menu Commands (Systems in Job window)

Command	Purpose
Export Data	Creates a text or Excel file with the data shown in the window for the selected system(s). Specify the desired file name, format and location in the resulting dialog.
Explore Data Path	Opens an Explorer window displaying the directory containing this system's data
Remove System(s)	Removes the selected system(s) from the job Note: not during running jobs)

7.4.2 CREATING A JOB

To create a new job, proceed as follows:

1. Open the **Jobs** window
2. Create a new job with the job editor by clicking an empty area of the window with the right mouse key and selecting **Create new job** from the context menu.
3. A job editor dialog appears with various options for automating common tasks. These options are described in detail in the following section. When you have made all of the necessary settings, press **OK** to create the newly defined job.

4. From the **Systems** window, select the systems you would like to assign to the job, and drop their icons onto the job icon in the **Jobs** window when the "+" sign appears.

(In order to execute created jobs, the **NMS DoJob** application must be running on the workstation.)

You can also right-click the newly defined job in the Jobs window and select Open system view of selected job from the resulting context menu. A window titled Systems in Job Job name will open, displaying the systems that have been assigned to carry out this job. (You can also drop system icons into this window to assign network elements to the job.)

To view all jobs associated with a particular system, double click the network element's icon in the **Systems** window to display the **Jobs of System *System name*** window.

7.4.3 JOB EDITOR DIALOG

The job editor dialog appears when you create a new job or edit an existing job. The dialog consists of four property pages.

General Tab

Enter a **Job Name** in the field provided. An icon with this name will appear in the **Jobs** window. No spaces may be used in naming jobs. From the list provided under **System Type,** select the type of system for which this job will be used. This choice affects the list of options available on the **Commands** tab. The **Maximum Channels** drop-down list allows you to select the number of channels for the job. The **Activate Job** option is not marked by default when a new job is defined. The job will not be carried out until activated, regardless of the recurrence options selected on the **Timing** tab. This allows you to define new jobs without running all of them right away.

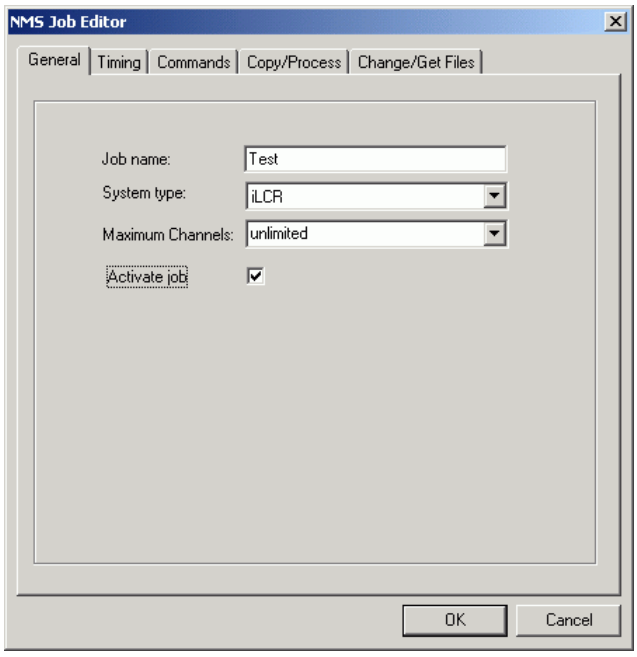


Figure 7.11 NMS Job Editor (General Tab)

If you prefer to *temporarily interrupt a running job* (e.g. for maintenance purposes) use the Stop running job option from the context menu. If the job remains activated (Activate job option marked) and recurrence options have been selected on the Timing tab, the job will restart at the scheduled time.

Timing Tab

NMS Jobs automatically executes jobs in preselected intervals. The recurrence options for each job are determined using this tab.

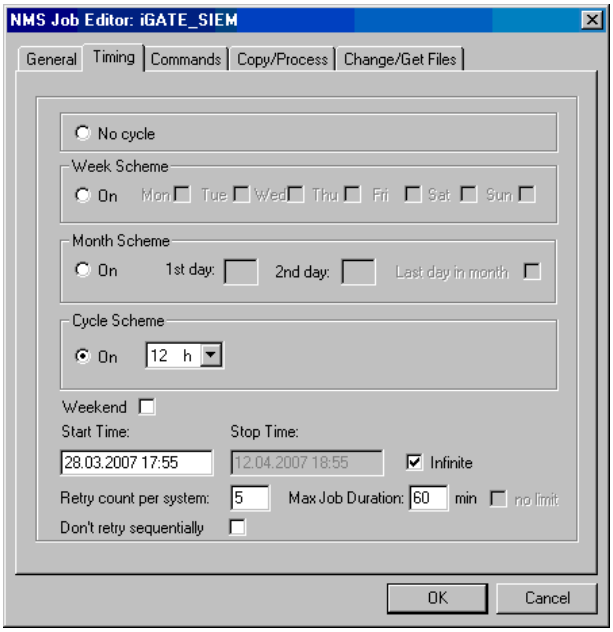
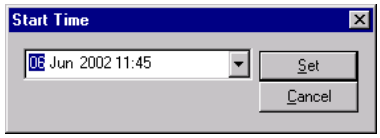


Figure 7.12 NMS Job Editor (Timing Tab)

NMS Jobs supports four different recurrence patterns for automated job execution:

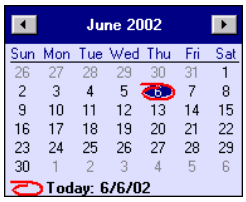
1. **No Cycle** for non-recurring jobs.
2. To repeat the job on a weekly basis, choose the **Week Scheme** by selecting **On**. Mark the days of the week on which the job should be carried out.
3. To repeat the job on a monthly basis, choose the **Month Scheme** by selecting **On** in the corresponding group. Up to three recurrences per month can be specified using the **1st day, 2nd day** and **Last day of month** options. Enter numbers from 1 to 28 and mark the corresponding option to run the job on the last day of the month.
4. To repeat the job in hourly intervals, turn the **Cycle Scheme On** and select the number of hours between recurrences. The job may not take longer than the time entered in the **Max Job Duration** field (default 60 minutes).

If the **Weekend** option is active in month or cycle scheme, the job will also be carried out if the chosen days fall on weekends.



Use the **Start Time** and **Stop Time** fields to specify the time period during which the job shall be executed. To do so, simply click in the field provided. A popup window appears, displaying the current setting. These values can be edited by clicking on the portion you would like to alter and using the keyboard to change the settings. The left and right arrow keys move the selection between the day, month, year and time values. The up and down arrow keys increase or decrease the value.

If you prefer, you may also use a calendar view to set the date. This appears when the pop-up list arrow is pressed.



Start Time also determines when recurring jobs begin.

In the event that a job cannot be successfully completed on the first attempt, several options are available for repeating the job. You can specify how often you would like TELES.NMS to attempt to reach each system using the **Retry count per system** field. The **Max Job Duration** option determines how long NMS will continue to try to carry out this task. If the no limit option is marked, the system will continue repeating until the job is completed successfully. The system will wait at least 10 seconds between repetitions. This delay may be increased by altering the corresponding option in the NMS JobServer's **Options** menu (see Chapter 5.2 on page 35 ⇨).

If the **Don't retry sequentially** option is selected and some systems do not complete the job successfully, these systems will be repeated before new systems are ordered to carry out the task. When a new job is defined, this option is not active. NMS attempts to execute the job on each system before retrying systems on which execution failed.

Commands Tab

One or more commands can be carried out automatically with the current job. The available options will depend on the individual systems. Mark the commands you would like to carry out.

When the **Update** command is selected, the **Restart** option is marked automatically and the **New Version Number** field becomes available. The version numbers that appear here correspond to the subdirectories contained within the `Firmware` folder for this system type. Select the version number to be upThe following table explains the purpose of each command.

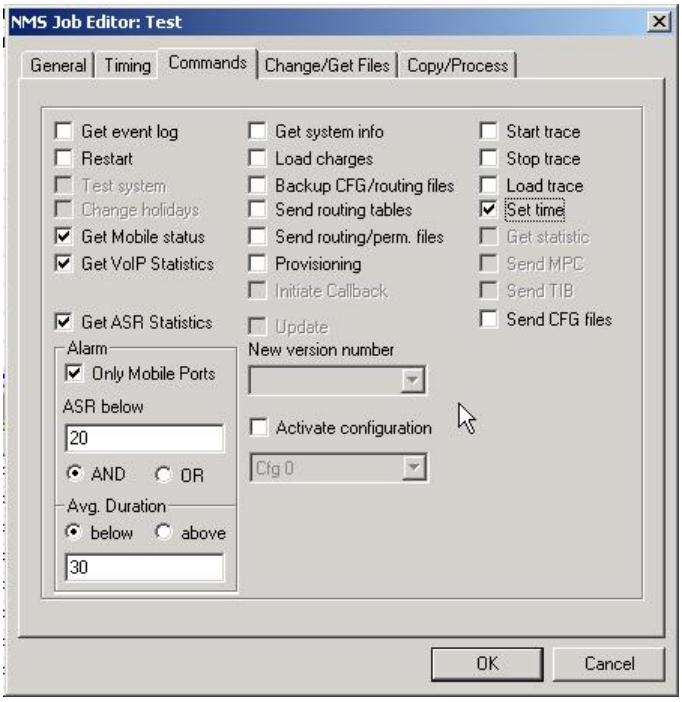


Figure 7.13 NMS Job Editor (Commands Tab)

Table 7.26 Commands Available from NMS Jobs

Command	Purpose
Get event log	Downloads the event log from the remote system(s) and saves to the `Errors` subdirectory for each system in the shared data path on the NMS server (see Chapter 8.2 on page 83 ⇨).
Get system info	Updates the NMS database with data from system.
Start trace	Starts Layer 2 & 3 trace on remote system(s).
Restart	Reboots remote system(s).
Load charges	Downloads charge information for outgoing calls placed via the remote system and saves the data in the `Charges` subdirectory for each system in the shared data path on the NMS server (see Chapter 8.2 on page 83 ⇨).
Stop trace	Stops tracing on remote system(s).
Test system	Places a call to the remote system's NMS testing number to verify operational status. This command tests the system in the same fashion as the NMS Desktop, but allows you to use several B channels for testing (see Chapter 3.4.1 on page 17 ⇨ for more information on this concept).
Backup CFG/routing files	Downloads the current configuration and routing files from remote system(s) and saves them to the corresponding `Backup` directory (see Chapter 8.2 on page 83 ⇨).
Load trace	Downloads trace data from remote system(s).
Change holidays	Replaces the `Holiday` entries in the system's configuration with information in the `holiday.cfg` file from the `Routing` directory for each system type (see Chapter 8.1 on page 82 ⇨).
Send routing tables	Sends the routing tables saved in the `Routing` subdirectory in the shared data path on the NMS server. If testing via IP, you must enter the **Update Base** number shown on the **Monitoring Options** sheet of the **NMS System Editor**. This number is the same as the area code. For second-generation systems, only the TAG number is allowed as the name of the routing directory. (see Chapter 8.1 on page 82 ⇨).

Table 7.26 Commands Available from NMS Jobs *(continued)*

Command	Purpose
Set time	Sets the network element's system time to agree with the current time on the local workstation. The time sent can be the original system time or the system time with an offset. The offset can be defined for each group in the `NMS_TimeOffset.ini` file on the NMS server (\\nms_data\NMSFiles\).
Get Mobile status	Retrieves and evaluates mobile status data. Compares IMSIs and records errors in case of irregularities. All systems with blocked ports will appear in light blue in all NMSDesktop views except **Update** and **Group** when this command is marked.
Send routing/perm. file	Sends the *complete* `route.cfg` file to the network elements, as well as the extern files. If testing via IP, you must enter the **Update Base** number shown on the **Monitoring Options** sheet of the **NMS System Editor**. This number is the same as the area code. For second-generation systems, only the TAG number is allowed as the name of the routing directory.
Get statistic	Gets statistical data from the network elements and inserts them into the corresponding database.
Get VoIP Statistics	NMS Jobs queries retrieves VoIP data. Statistics appear in NMSDesktop views as they appear for ASR values.
Provisioning	Activate this checkbox to perform provisioning with NMS Jobs (cf. Chapter 3.4.6 on page 19 ⇨).
Send MPC	Sends `bootrom.bin` file to iLCR 4BRI-IP Box for firmware update.
Initiate Callback	A SIP Invite is sent to all network elements through port 5060. The systems then set up a remote connection to TELES.NMS. When Initiate Callback is defined as job, no other jobs can be defined. NMS Listen then performs defined jobs, such Provisioning or Firmwareupdate (cf. Chapter 7.6 on page 76 ⇨).
Send TIB	Sends `tib.cfg` to iLCR 4BRI-IP Box.
Get ASR Statistics	Retrieves ASR data and sends an error message if either ASR 1 or ASR 2 falls below the percentage entered. ASR type is recorded in the error log. All systems with blocked ports will appear in light blue in all NMSDesktop views except **Update** and **Group** when this command is marked.

Table 7.26 Commands Available from NMS Jobs *(continued)*

Command	Purpose
Update	Updates the system software for the remote system. When this command is selected, the **Restart** option is marked automatically and the **New Version Number** list is made available. Select the version number to be uploaded. The version numbers that appear here correspond to the subdirectories contained within the `Firmware` folder for this system type in the shared data path on the NMS server (see Chapter 8.2 on page 83 ⇨).
Send CFG files	Uploads the configuration files stored in the `Config` subdirectory for each system in the shared data path on the server (see Chapter 8.1 on page 82 ⇨).
Alarm (group box)	Here you can limit alarm messages. When **Only Mobile Ports** is checked, an error message for mobile ports only will appear in the event viewer, depending on which options you select.
Activate configuration	Activates the configuration specified in the pop-up list. *(Available for PC-based systems only!)*

Copy/Process Tab

A common TELES.NMS maintenance task is the transfer of files to and from PC-based systems. (Box-based systems have no file system, and so no files can be transferred to these units.)

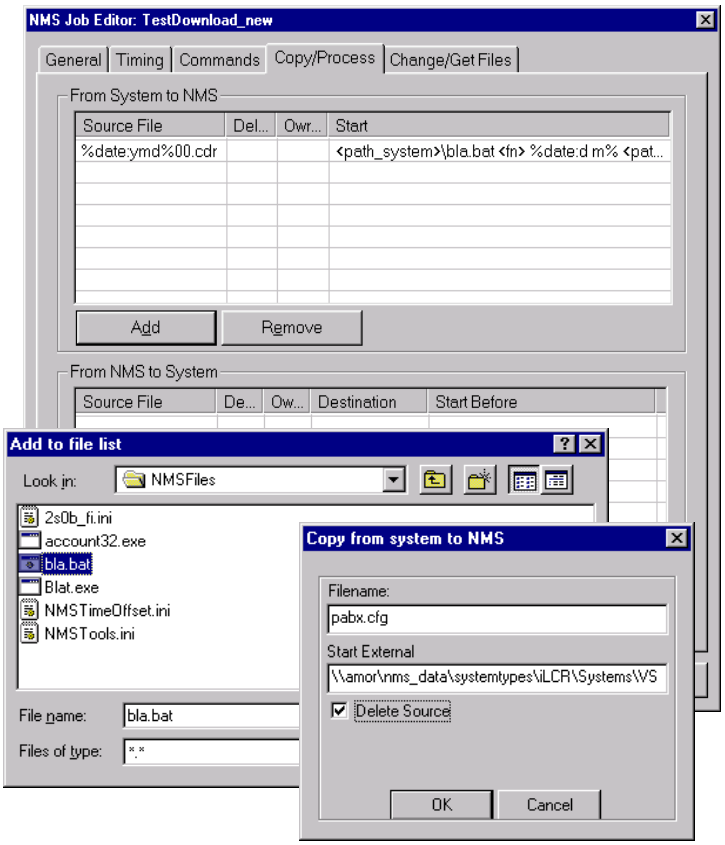


Figure 7.14 NMS Job Editor (Copy Tab)

To select files for transfer from the network elements to NMS, press the **Add** button shown in the **From System to NMS** section of the tab and type the **Filename** of the file you would like to download from the remote system in the appropriate text box of the editor that appears. If you enter a batch file in the **Start External** box, the application(s) entered will start automatically when the file is copied. For details on how to format batch processes, see Chapter 6.9 on page 56 ⇨. For each file, you can determine whether or not you would like to **Delete source**. The **Remove** button allows you to delete previously selected files from the transfer list.

In order for files to be copied from the network elements to NMS, they must be present in the `Uploads` subdirectory in the shared data path on the NMS server (see Chapter 8.1 on page 82 ⇨). The **Add** button opens a standard Windows browsing dialog with which you can select files for transfer to the system. To select several files at once, use the <Ctrl> and <Shift> keys according to the standard Windows conventions. Files selected for transfer are shown in the **From NMS to System** field. Double-click an entry to call up a dialog that allows you to select a **Destination** for the file and enter a batch file to **Start Before Copy**. For each file, you can determine whether or not you would like to **Delete Source**. When copying from a network element to TELES.NMS, use the syntax described in Chapter 6.9 on page 56 ⇨. The **Remove** button allows you to delete previously selected files from the transfer list.

Change/Get Files Tab

As of version 3.0, TELES.NMS can be used to exchange individual lines in network elements' configuration files.

When a new job is defined, the **Change/Get Files** tab is displayed as an empty table as shown at right.

To specify a new set of information to be exchanged, right-click in the empty portion of the table and select **New** from the context menu.

The dialog changes to allow you to specify the information you would like to replace. Specify the file name in which the change is to be made (when changing lines in box-based systems' configuration tables, enter `table` as the file name). Enter the new command sequence in the space provided, and the line it should replace (if applicable). Specify whether the information added is a change to an existing line, an addition or a deletion. Wildcards such as * and ? may be used to substitute for character sequences and single characters.

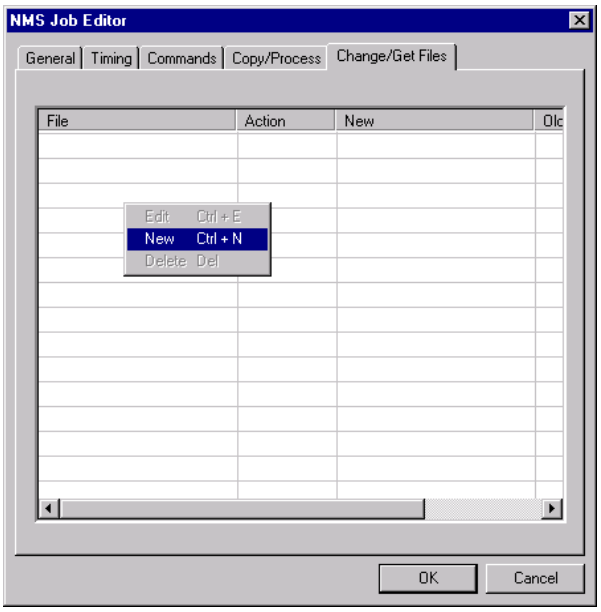
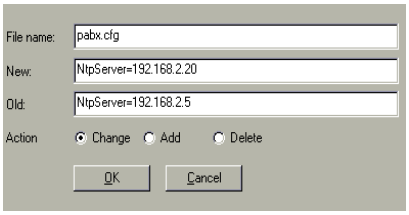
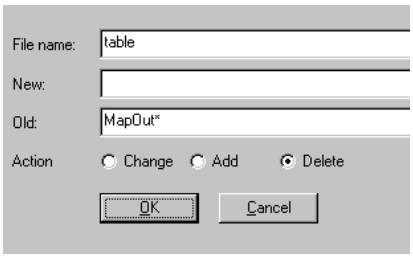


Figure 7.15 NMS Job Editor (Change/Get Files Tab)

Example 1 To replace the `NtpServer=192.168.2.5` with `NtpServer=192.168.2.20` in the `pabx.cfg`, enter the information as shown at right.



Example 2 To delete all `MapOut` entries from the configuration table, enter the information as shown at right.



Click the **OK** button contained within the **Change/Get Files** tab when you are finished defining the information you would like to exchange. The dialog reverts to the table view, where your change now appears in the list of lines to be altered. You can edit or delete any of these sequences later by selecting the corresponding command from the context menu.

7.5 NMS DOJOB

The **NMS DoJob** application is responsible for managing job execution. The program's interface consists of a settings dialog that appears when the program is launched, a taskbar icon and context menu, and a status dialog that displays information on active jobs.

7.5.1 SETTINGS DIALOG

When the **NMS DoJob** application is launched, the settings dialog shown at right appears, allowing you to alter the program's default settings.

On first launch, the dialog remains on screen until confirmed. After the program is first run, the window will only appear for 10 seconds. If the settings are not changed during this delay, the program will start using the configuration used during the last session

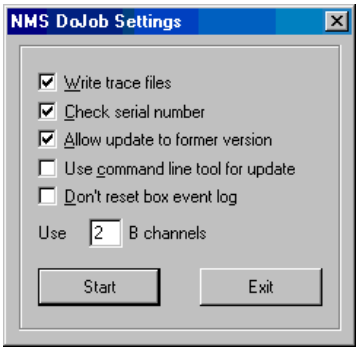


Figure 7.16 NMS DoJob Settings

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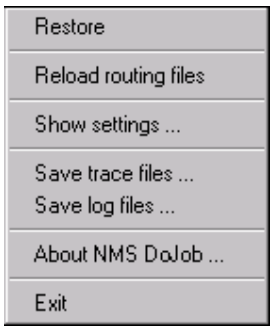
Table 7.27 NMS DoJob Settings

Option	Purpose
Write trace files	When this option is selected, program activity is logged to files stored in the installation directory. Two files named `DoJob`*number*`.trc` and `DoJob`*number*`.log` are created for each B channel used by the application, where *number* represents the B channel.
Check serial number	This option activates the serial number verification procedure, which requires that the system's serial number agree with the number entered in the database in order for jobs to be executed. If this option is not active and the application detects a serial number that deviates from the database entry, the information in the database is updated.
Allow update to former version	Set this flag to update the system software to a previous version.
Use command line tool for update	Selecting this option launches the external command line tool when updating the software on box-based systems.
Don't reset box event log	Leaves the event log unchanged when running jobs on box-based systems. (On PC-based systems, the event log is always saved as `protocol.tmp` and reset when jobs are executed.)
Use *x* B channels	In the field provided (represented here with *x*), enter the number of B channels DoJob should use for job execution

When working on an NMS PRI workstation, assign a large number of B channels (such as 20) to the NMS DoJob application and deactivate any channels you do not currently need by selecting them and pressing the Terminate Line button in the NMS DoJob Status window. This allows you to increase the number of channels later (using the Start Line button, without having to stop all running jobs and restart the DoJob program.

NMSDoJob includes internal redial per call attempt. This can be set in `NMSDevice.ini` in `d:\Winnt\System32\ISDN\TELES` on the workstation running NMSDoJob (CONNECT_RETRYS=). The default setting is three redial attempts.

7.5.2 CONTEXT MENU



The context menu offers access to the status dialog described below, provides commands for saving trace and log files and allows you to rescan the routing directory for new files (useful if you have added or removed files from the folder hierarchy since the application was started). The **About** command displays program information such as version number and copyright, and the **Exit DoJob** command quits the program.

Status dialog

The status window offers an overview of the activities on each B channel assigned to the DoJob application. The window appears in tabular form, listing for each channel the current job, the number dialed, connection status, command being executed and an error message, if any. The **Terminate Line(s)** button allows you to deactivate a selected B channel. Channels deactivated can be reactivated using the **Start Line(s)** button. Click **Abort Job(s)** to cancel the execution of the current job on the selected channel. This frees the channel for the next pending job.

7.6 NMS LISTEN

The **NMS Listen** application serves to accept incoming calls from network elements and provide these with current routing tables or complete configuration files as necessary. The application also stores cached information on the contents of the `Nms_data` directory structure to speed up the transfer of new routing tables and thus keep connection time to a minimum.

TELES infrastructure systems dial in to the **NMS Listen** application at a specified interval to signal their operational status (second-generation systems call TELES.NMS using a TCP channel). This so-called *polling* call shows TELES.NMS that the system is still up and running, and offers the opportunity for further actions such as routing table updates, etc. Systems can also be configured to contact TELES.NMS at a separate *support* number when errors occur. Listen can also take calls with a video or speech service indicator.

When the application is launched, the **Listen Settings** dialog appears, prompting you to specify both of these numbers and the number of B channels you would like to reserve for the program.

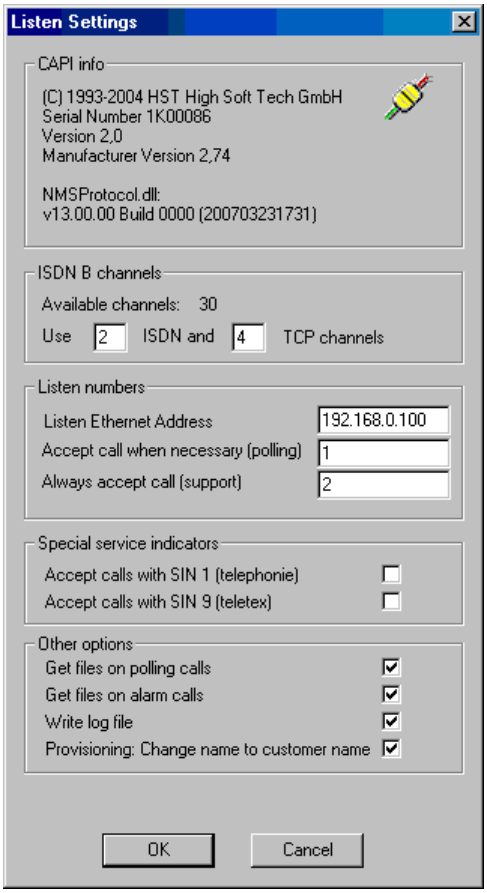


Figure 7.17 Listen Numbers

If an incoming call identifies the calling system with both CLI and serial number, the Always search for base number option determines which is used to find the system in the NMS database. This option can only be set via the registry.

A taskbar icon represents the application's connection status. A green icon signalizes "ready" status. The application is prepared to accept incoming calls. A yellow icon represents connection establishment negotiations on the D channel, and a red icon indicates an active connection. A context menu appears when the taskbar icon is clicked using the right mouse key. This menu offers seven options, allowing you to open the application's dialog window, to reload routing files, to show routing files, to show listen numbers, to show standard group properties, to show call statistic and to exit the application.

If telephony or teletex are activated in the **Special Service Indicator,** NMSListen will take these calls in addition to data calls.

The program's main window displays offers Channel and Logbook views. The **Channel** view shows information on each reserved B channel in tabular form. This includes the channel status, the calling party number transmitted by the network element, the system name, type and serial number, the software version of the connected system and the action currently being performed on this system.

The **Logbook** view will be displayed after the **Listen Settings** dialog is confirmed. It shows all incoming calls from the network elements. Icons colored red show where problems have occurred.

If the Write log file option is set in the Listen Numbers dialog, log files will be written to disk in the **nms_data\Logging\Listen** directory of the workstation every midnight.

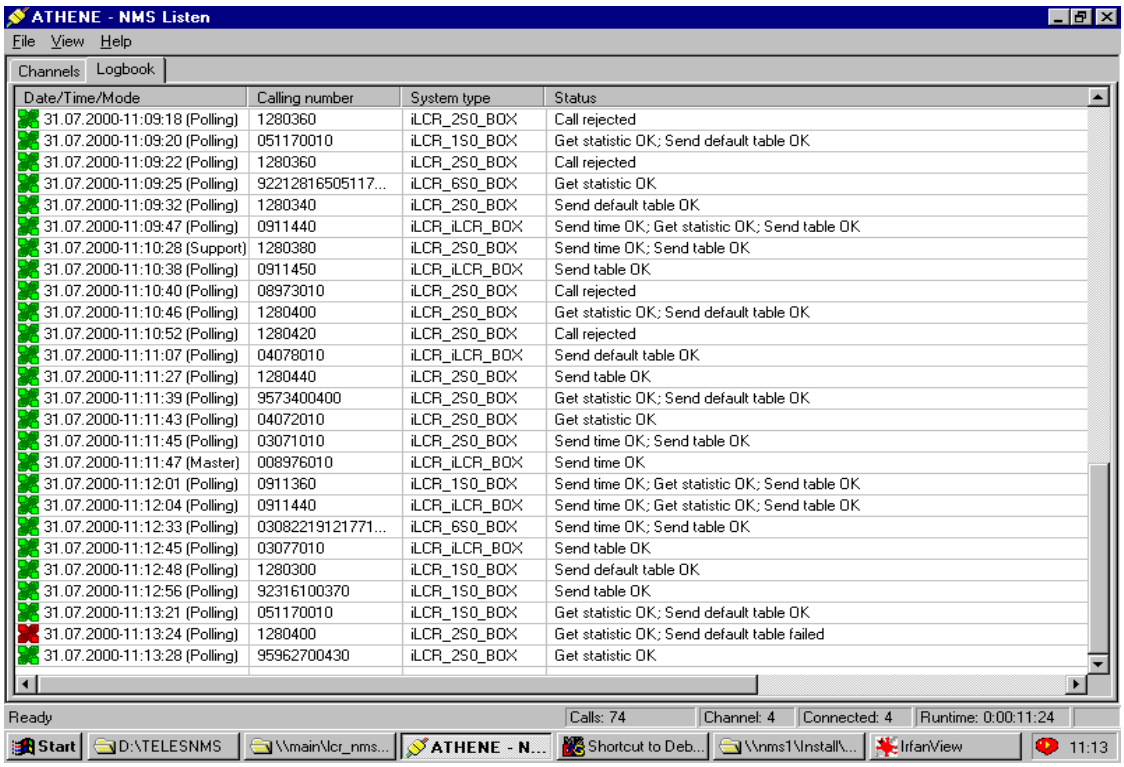


Figure 7.18 NMS Listen Logbook

The **Standard Group Properties** command on the **View** menu opens a dialog that displays the current settings for the **standard group for new systems**. This group is selected on the **General** tab of the NMS Configuration dialog (see Table 4.6 on page 25 ⇨). The individual options for this group are configured on the **Groups** tab of the **NMS Desktop Properties** dialog (see Table 6.12 on page 42 ⇨).

Figure 7.19 NMS Listen Standard Group Properties

The **Routing Tables** command on the **View** menu opens a dialog that displays the current routing tables assigned to each system type and area code. If you have changed the contents of the `Routing` subdirectories this has to be reloaded.
This can be done via the context menu or via the **File** command of the NMS Listen window.

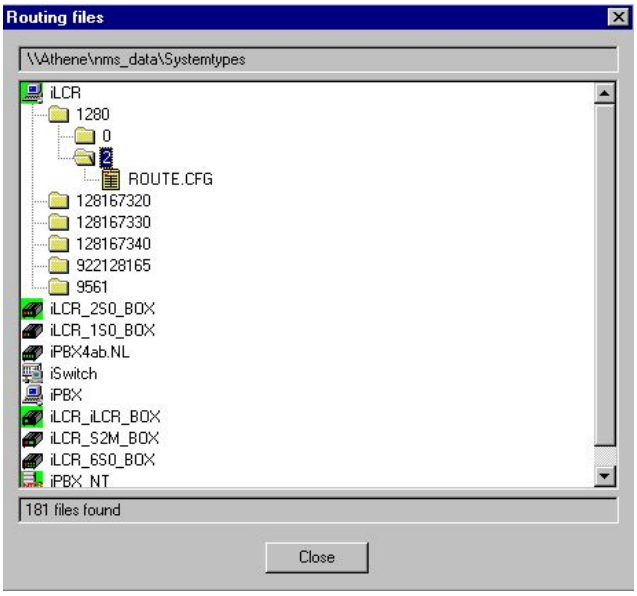


Figure 7.20 NMS Listen Routing Table Assignments

To be able to view the routing table assignments, a routing table has to be placed inside each area directory, which are one directory level below the Routing directory.

7.6.1 UPDATE MANAGEMENT AND INCOMING CALLS

The most important condition for accepting incoming calls is whether the system is in update management or not. For known systems, update management must be set for the system (in group or through the system editor). For unknown systems, update management must be set for the standard group. The call will be rejected if this is not the case.
Support calls will be handled based on the device:

- 1BRI, 2BRI, 6BRI, 4BRI-IP, PRI boxes
- ilCR-PC
- iGATE
- iGATE-C
- VoIPGATE
- Second-generation iGATE
- Second-generation VoIPGATE
- VoIPBOX BRI

1BRI, 2BRI, 6BRI, and PRI Boxes

These systems communicate what they need. Lists evaluate this information and react accordingly. If the box requests a table, the type of table sent, default table or routing table, depends on the flag set, as with the iLCR Boxes.

If the system wants to provide charge data or the eventlog, this is only possible if the system is already known or, in the case of unknown systems, the "automatic registration to update management" flag is set in the standard group.

In the case of the GetStatistic flag, handling occurs as with the iLCR Boxes.

iICR PC, iGATE,iGATE-C and VoIPGATE

Systems in the database receive a routing table if the "update table" flag has been set for the system. If this flag has not been set for the system, but the "send default table" flag has been set for the group, the system receives a default table.

If the system is not in the database, the flags in the standard group determine whether a table is sent, and if, then which one. Furthermore, the eventlog (protocol log) is picked up with each support call.

Polling Calls

For a polling call of a system in the database, whether a call is accepted is decided on the basis of the flags in the Group Properties (the same for all system types):

- Automatic registration to update management
- Send default table (first-generation box-based systems only)
- Send routing table (except when the "update system" flag has been deactivated for an individual system)
- Get statistic (first-generation box-based systems only)
- Always accept call (except when the "always accept call" flag has been deactivated for an individual system)
- Send time from update management

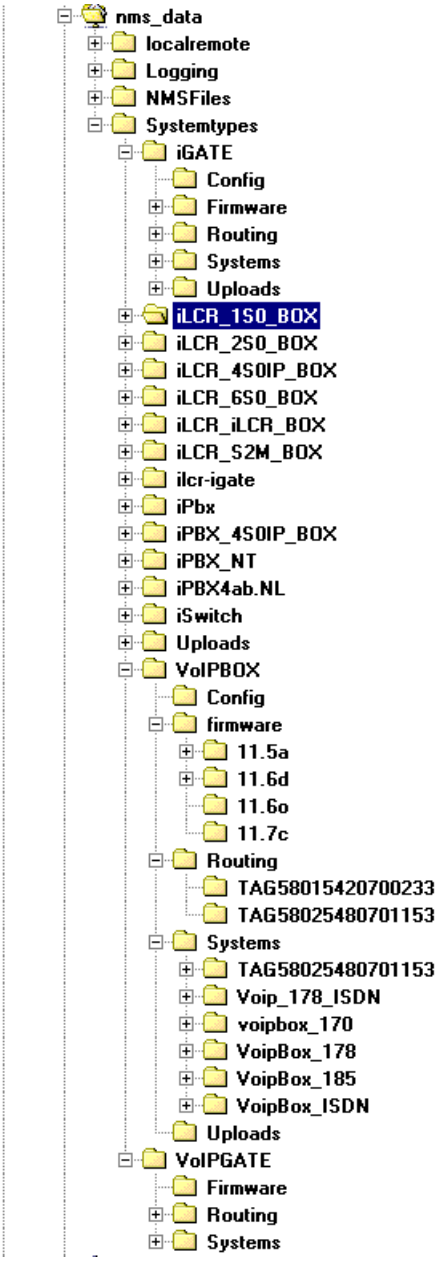
If the call should come in without CLI, the "accept unknown system =yes or no" flag in the standard group (usually NMC) determines whether the call is accepted.

If the calling system is not in the database, the call will only be accepted if the "accept call if system is unknown" flag or the "automatic registration to update management" flag or the "send default table" flag has been set in the standard group. In the case of a polling call, only those actions the user specifies with the flags in the Group-Properties are carried out by the NMS Listen.

The following applies for (accepted) polling and support calls: ChangeRemoteNumber and ConfigFromFile only works with 1BRI, 2BRI, 6BRI, 4BRI-IP and PRI boxes. GetStatistic also works with an iLCR Box.

8 SYSTEM DATA DIRECTORIES

The `Nms_Data` directory on the server must be shared to allow other NMS workstations to access the common data. This directory is contained within the installation directory (typically `D:\TELESNMS`). Leave the folder name unchanged in the **Share Name** field. Assign full access rights and confirm the settings with **OK**. The diagram below shows a typical folder hierarchy created by TELES.NMS.



The directory structure on your NMS computers will be similar to the sample tree shown here. The contents of these directories are described in more detail in the following sections.

The hierarchical nature of this data structure allows for the distinction of generic information pertaining to systems of a certain type (such as default configurations, routing files and firmware) and system-specific data such as backups, charges and error logs.

The subdirectories under `Systems` correspond to the names of each of your systems as entered in the common database. Each of these system-specific directories may contain subdirectories with data transferred from the system or intended for transfer to the system.

8.1 GENERIC INFORMATION FOR SYSTEMS OF SAME TYPE

Config

Configuration information may be stored generically for all systems of a particular type, or separately for each system requiring special settings. When the **Send CFG-files** command is carried out using the **NMS Jobs** module, configuration files stored in the corresponding directory are transferred. If there is no specific `Config` directory for a system, the files in the generic `Config` directory for this system type are transferred instead.

Firmware

Each system type has its own `Firmware` directory, containing subdirectories with different versions of the software. These subdirectories have to be created manually and named after the software version. For PC-based systems, they should contain only the uncompressed driver files (not the compressed self-extracting archive in `.exe` format!). For box-based systems, both `.bin` and `.upd` files should be located here. When the **Update** command is marked on the **Commands** tab of the **NMS Jobs** module, the names of these subdirectories appear in the **New Version Number** list. When the **Update** job is executed, the contents of the selected version subdirectory are transferred to the system.

Systems

This directory contains system-specific data. The names of the subdirectories in the `Systems` directory correspond to the names of the systems in the database.

Uploads

This directory is used to store miscellaneous files for transfer to PC-based systems. Files in this directory can be automatically transferred using the **NMS Jobs** module (see the section on the "Copy/Process Tab" on page 73 ⇨).

Routing

Routing information is organized according to system type. Further distinctions are made using subdirectories. Separate subfolders may be used for number ranges requiring different routing instructions. Use subdirectories correlating to the first digits of area codes in which your systems are located (or even whole numbers of certain systems). Each area code folder may also contain further subdirectories corresponding to each software version used, and/or group ID folders.

With the file `NMSTools.ini` you can determine that the appropriate routing files exist for all system types in the same routing directory (e.g. `iLCR_2BRI_Box\Routing`). The file can be found in the server directory `D:\TELESNMS\NMS_DATA\NMSFILES`.

When the **Send Routing Tables** command is carried out using the **NMS Jobs** module, routing information is picked up from the system and replaced with the information stored in the deepest `Routing` subdirectory on the NMS Server. See the directory structure on page 5-83.

The lowest folder has the highest priority. When routing information is updated, TELES.NMS first looks for routing files *(or a version-specific subdirectory containing these)* in the appropriate group ID folder. If this information is not stored there, or no group ID directory is found, the software looks "up the tree" one level for an area code folder. If no routing information is stored there either, the "No routing table available" message will appear in the NMS Desktop when a routing table update is attempted.

For box based systems any comments contained in routing files will be removed. The `route.cfg` files stored in these folders should contain only routing entries (mappings) – *no configuration commands should be present in these files as such commands could conflict with the current configuration and make the system unreachable!*
(Use the NMS Jobs module to exchange individual configuration commands in the header portion of the configuration table. See the section on the "Change/Get Files Tab" on page 74 ⇨ for more information on this procedure.)

The folders *may* contain `holiday.cfg` files used to (re)define the `Holiday` entries in the system's configuration file.

For PC-based systems such as iLCRs and iGATE systems, each of the `Routing` subdirectories must contain the files used to define routing settings and specify other routing files. While older systems may store routing information in the `PABX.CFG` alone, a `route.cfg` file must be present in this directory to allow NMS to automatically update the routing entries in the system's `PABX.CFG` file. Newer systems use the `route.cfg` `PermanentFile` and optional `ExternFile`s containing time-dependent routing information. All routing files defined with `ExternFile` must also be contained within this directory in addition to the mandatory `route.cfg`.

For iLCR Boxes, each of the `Routing` subdirectories contains a `route.cfg` or a binary file in `.hex` format with the complete configuration required for the proper operation of the box.

For TELES.iLCR 1BRI, 2BRI and 6BRI Boxes, each of the `Routing` subdirectories contains either a binary file in `.hex` format with the complete configuration or a `route.cfg` file with routing information only. If a `.hex` file is present, this will be used and the ASCII version ignored.

8.2 SYSTEM-SPECIFIC DATA

Backup

Each system may have its own `Backup` directory within the folder hierarchy. When the **Backup CFG/Routing files** command is carried out using the **NMS Jobs** module, a new subdirectory is created, named with the current date and time. A backup of all critical files is then copied to this directory. For PC-based systems, these include the `STARTPBX.BAT`, `PABX.CFG`, `route.cfg` (if existent), all `ExternFile`s used for routing, any `NightFile`s and tib.cfg (if existent). For box-based systems, the configuration table is backed up in hexidecimal and ASCII formats.

Charges

Each system may have its own `Charges` directory within the folder hierarchy. This directory contains all charge information on calls placed by this particular system. For PC-based LCR systems, this directory may contain `charge.log` files with automatically generated names such as `CHA_060720041530_0.LOG`. (The files are automatically named beginning with `CHA` followed by a date and time stamp in *ddmmyyyyhhmm* format and a running number beginning with `0`, in case several files are created per minute.)

For TELES.iLCR 1BRI, 2BRI and 6BRI Boxes, this directory will contain a single file named `CHA_010120041255_0.log`. This file is sent automatically to TELES.NMS and appended when new data comes in.

Config

Systems that require special settings which deviate from the standard configuration for network elements of this type may have their own `Config` directory within the folder hierarchy. When the **Send CFG files** command is carried out using the **NMS Jobs** module, configuration files stored in the corresponding directory are transferred. If there is no specific `Config` directory for a system, the files in the generic `Config` directory for this system type are transferred instead.

Downloads

Each PC-based system may have its own `Downloads` directory within the folder hierarchy. This directory is used to store miscellaneous files downloaded from systems using the GATE Manager software or with the **NMS Jobs** module (see the section on the "Copy/Process Tab" on page 73 ⇨).

Errors

Each system may have its own `Errors` directory within the folder hierarchy. The directory contains event logs for this particular system. For boxes and PC-based systems, this directory may contain `protocol.log` files with automatically generated names such as `PRO_100920041845_0.LOG`. (The files are automatically named beginning with `PRO` followed by a date and time stamp in *ddmmyyyyhhmm* format and a running number beginning with `0`, in case several files are created per minute.)

9 NMS TESTING, POLLING AND SUPPORT PROCEDURES

9.1 GENERAL INFORMATION ON TESTING

TELES.NMS tests network elements in regular intervals by placing a data call to the system. If the system is operational, it responds with an alerting signal to tell TELES.NMS that it is still working properly. NMS then disconnects the call. If an error has occurred, the system accepts the call, and NMS picks up the event log.

The test cycle frequency and the maximum duration of each individual test can be specified on the **Server** tab of the **NMS Configuration** module. Specify a shorter test duration if a large number of systems is to be tested. If only a few systems need to be tested, a longer test duration value may be entered to allow the software more time for communication with each system.

All systems are tested sequentially during the first test cycle. In the second cycle, systems are tested according to the **Test priority** assigned in the **NMS System Editor**. This value determines how often the system is tested.

When the automatic test routine is running, the systems excluded from testing are represented by yellow squares containing an "X". Only the systems for which the **Test cyclically** option is marked in the System Editor participate in the test process.

9.2 SWITCHING BETWEEN DAYTIME AND NIGHT MODES

In daytime mode, every network element in the database is tested if the **Test all systems in daytime mode** option is marked on the **Server** tab of the **NMS Configuration** dialog. In night mode, NMS tests only network elements for which the **At night** option is marked in the NMS System Editor. The times at which TELES.NMS switches between daytime and night modes are specified (in 24-hour format) on the **Day/Night Mode** tab of the NMS Desktop properties dialog.

9.3 ALARM FEATURE (AUTOMATED CALL)

For information on receiving e-mail alarm notification, please see Chapter 7.2 on page 61 ⇨.

9.4 BEGINNING THE TEST CYCLE

The automatic test cycle can be initiated using the **Start Testing** button in the taskbar or by selecting **Start** from the **Test** menu. During the first test cycle, all systems are tested sequentially. In the second cycle, systems are tested according to the **Test priority** assigned in the **NMS System Editor**. This value determines how often the system is tested (see Table 6.13 on page 46 ⇨).

9.5 MONITORING THE TEST PROCESS

System settings cannot be changed while the test cycle is running. Systems returning error messages appear with red icons. Green icons represent operational systems. The **NMS Error View** window shows all systems that have returned error messages for a quick overview of systems that may require attention. These systems are marked with different icons depending on the type of error that has occurred (see Table 6.10 on page 38 ⇨).

The test process can be interrupted at any time using the **Stop Testing** button in the taskbar or be selecting **Stop** from the **Test** menu.

9.6 PERFORMING MAINTENANCE DURING THE TEST CYCLE

While the test process is running, you can select any system and open the System Editor to change test behavior or open a maintenance connection via remote access.

Before you begin making changes to a system's settings, be sure to choose the **Set maintenance flag** command from the context menu to be certain that the system is not concurrently accessed by more than one person. In earlier TELES.NMS versions, this flag was a visual signal only – the system was not completely locked and the cyclic testing process was not interrupted. As of version 2.71, cyclic testing is stopped. When you have finished with maintenance, be sure to choose the **Remove maintenance flag** command from the context menu. The system will remain in the Error View and the icon will change to a question mark. Once the system passes testing, the icon will change to the "OK" symbol and the system may be removed from the Error View with the **Delete systems from error view** command from the context menu.

9.7 CYCLIC TESTING VIA MORE THAN ONE B CHANNEL

NMS Tester is a new module allowing cyclic testing via more than one B channel. The number of available channels and the reserved channels for the single test are displayed. The desired number of B channels to be reserved for testing can be entered in the dialog box.

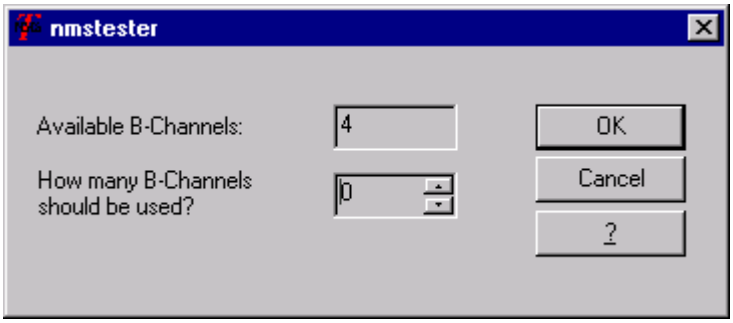


Figure 9.21 NMS Tester

9.8 EVALUATING TEST RESULTS

TELES infrastructure systems can distinguish three different error conditions during the testing process:

1. The system is operating properly. The incoming call from TELES.NMS reaches the system, which responds with an alerting signal to tell TELES.NMS that it is still working properly. NMS then disconnects the call.
2. Errors have occurred in the system. The incoming call from TELES.NMS is accepted. Either the system was rebooted, Layer 1 or 2 errors occurred on a port, or an attempt was made to access the system with an invalid password. These irregularities are saved in the event log. This data is picked up and parsed for errors during connections to TELES.NMS (see Table 6.14 on page 49 ⇨). The detailed error information contained in this file can then be used to correct the error conditions.
3. The system does not respond to the incoming call from TELES.NMS. This may have one or more causes:
   – the system is not configured for testing,
   – the system is overloaded and cannot accept the call, or
   – the system is turned off or crashed.

9.9 TROUBLESHOOTING ERROR CONDITIONS

Error Condition 2:

1. Evaluate the `protocol.log` file. The system name appears in the log file and in the Error View window. Check the possible causes:
   – System rebooted via remote administration either manually or as a result of iLCR HUB Board failure. Check to see if the system is now operating properly again.
   – An error occurred on a port. Check to see if the error persists.
2. Check the system with a remote administration connection. If the error persists, reboot the system and check again.

Error Condition 3:

1. Repeat the test. If no `protocol.log` file is transferred, the system is overloaded and cannot respond. If the connection is established, evaluate the `protocol.log` file and continue as described above under Error 2.
2. Establish a remote administration connection and check that the test number is properly configured.
3. If the system does not respond to calls, it may require on-site service.

The information returned during testing depends upon the system type. (For box-based systems, for example, TELES.NMS 14.0 only treats `ErrorCode` values greater than `0` as errors.) For information on the errors that may occur for each system type, consult the corresponding chapters in the TELES Infrastructure Systems Manual.

9.10 REMOTE ADMINISTRATION

TELES.NMS integrates the GATE Manager software for remote administration connections to monitored systems. To make use of this option, use the System Editor to enter a remote administration password and number for each system in the database.

Select the desired system from one of the NMS view windows and right-click the system icon to access the context menu. Choose the **Start Remote** option from the context menu to establish a remote administration connection to the system.

NMS Desktop windows cannot be closed while remote administration is active.

9.10.1 INCOMING CALLS FROM NETWORK ELEMENTS

During the polling and support processes, network elements place data calls to TELES.NMS. The way these calls are handled depends upon several factors including the number dialed (polling or support number), the flags set for each system (or the group to which it belongs) and the system status at the time the call is placed.

Figure 9.22 ⇨ below shows how TELES.NMS handles these incoming calls. Table 9.28 ⇨ through Table 9.31 ⇨ explain the decisions that are made during the process and the procedures that are carried out if the call is accepted.

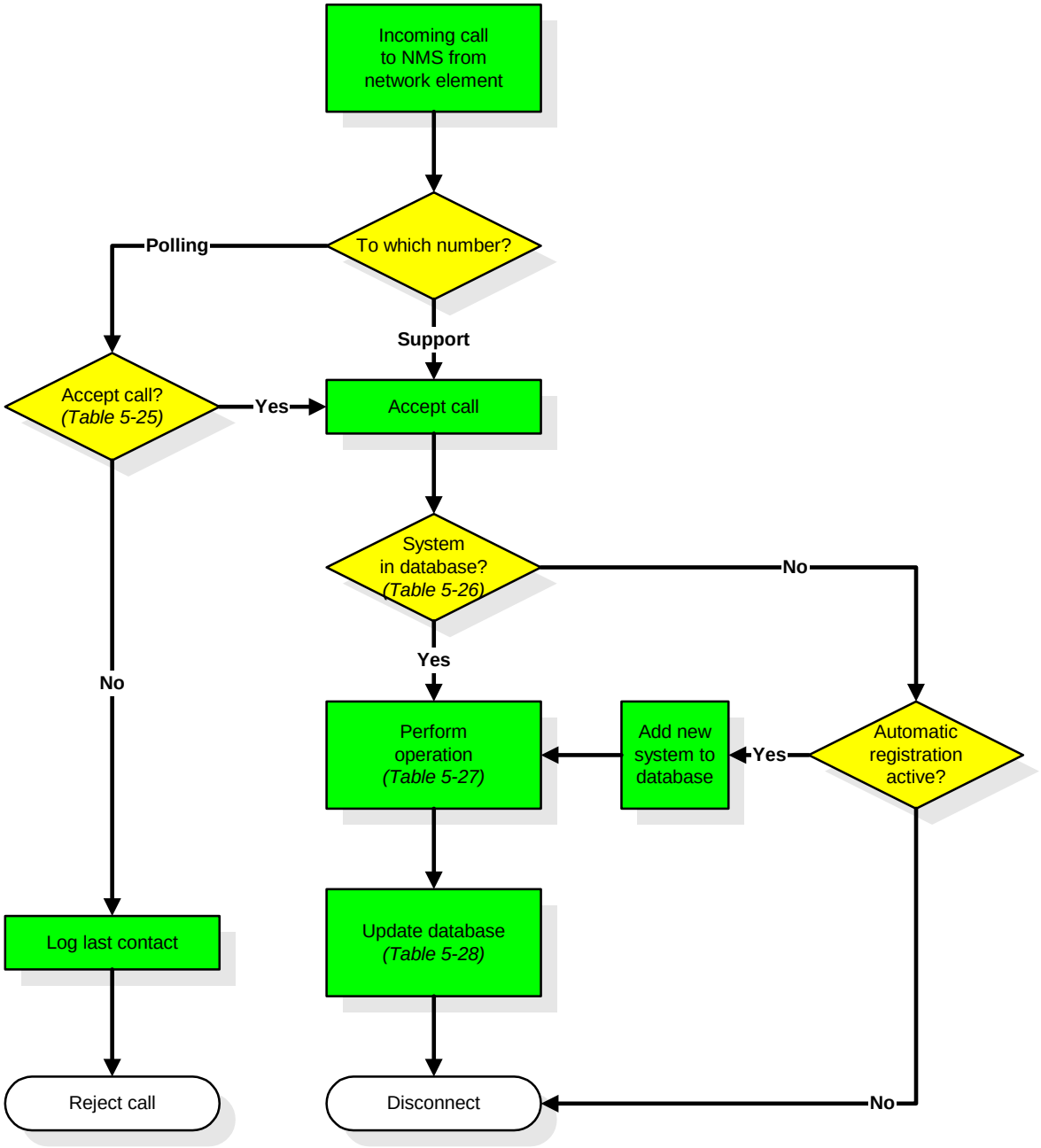


Figure 9.22 Incoming call to TELES.NMS

Whether or not calls to the NMS polling and support numbers are accepted depend on several factors described in the following table. If any one of these conditions is true, the call is accepted and operations are carried out as illustrated in Figure 9.22 ⇨.

Table 9.28 NMS Call Acceptance Factors

	Factor
1.	Was the call placed to the support number?
2.	Has the **Update Table** flag been set for this system? (Defined in the **Change Flags** dialog available from the Update View context menu – see Chapter 6.19 on page 55 ⇨.)
3.	Is the **Update Routing Table** option active for this group? (Defined on the **Groups** tab of the NMS Desktop Properties dialog described in Table 6.12 ⇨.)
4.	Is the **Send Default Table** option active for this group? (Defined on the **Groups** tab of the NMS Desktop Properties dialog described in Table 6.12 ⇨.)
5.	Is the **Get Statistics** option active for this group? (Defined on the **Groups** tab of the NMS Desktop Properties dialog described in Table 6.12 ⇨.)
6.	Has the **Always Accept Call** flag been set for this system? (Defined in the **Change Flags** dialog available from the Update View context menu – see Chapter 6.19 on page 55 ⇨.)
7.	Is the **Always Accept Call** option active for this group? (Defined on the **Groups** tab of the NMS Desktop Properties dialog described in Table 6.12 ⇨.)
8.	Is the **Update remote access numbers** flag set for this system? (Defined in the **Change Flags** dialog available from the Update View context menu – see v.) *This factor only applies to* TELES.iLCR 1 BRI, 2BRI, iLCR 4BRI-IP Boxes and 6BRI Box*es and* iLCR PRI Box*es.*
9.	Is **Accept call if system is unknown** active for this group? (Defined on the **Groups** tab of the NMS Desktop Properties dialog described in Table 6.12 ⇨.) *This factor is only considered if the calling system does not identify itself with a calling party number.*

After an incoming call is accepted, the NMS Listen application must search the database to determine which system is calling in order to determine the appropriate actions. Depending on the information provided with the call, the database can be searched either by Calling Line Identification (CLI) or by serial number. The following table shows when each of these methods is used. There are four different possibilities. For each possibility, the information provided (CLI and/or serial number) is marked with an "X".

Table 9.29 NMS Database Search Criteria

	CLI	SN	Result
1.			If neither CLI nor serial number are included with the incoming call, the database cannot be searched and the call is rejected.
2.		X	Search database by serial number
3.	X		Search database by Calling Line Identification
4.	X	X	If the **Always search for base number** option has been marked in the NMS Listen startup dialog, the database will be searched by Calling Line Identification. If this option is not active, the database will be searched by serial number.

Once an incoming call is accepted and the system has been found in the database, the operations performed depend upon the type of system calling.

Table 9.30 ⇨ lists the procedures carried out for each system type.

Table 9.30 NMS Operations Performed on each System Type

System Type	Operation
All systems	1. Get system info
Box-based systems	1. Pick up and parse event log (in case of errors) 2. If the table is sent (in case of emergency; if flag is set in case of polling): - Pick up current routing table from box - Convert table from BIN to ASCII format - Merge new routing info with box configuration (see Chapter 8.1 on page 82 ⇨) - Change remote number if necessary - Convert table back to BIN from ASCII format - Send new table back 3. Send time if necessary (if requested by box, or if flag has been set) 4. Pick up statistics data (only if flag in Group Properties has been set)
PC-based systems	1. Pick up event log (`protocol.log`) and parse for errors 2. First-generation systems only: If the table is sent (if flag is set): - Get routing information (`route.cfg`) and parse for extern files - Send routing information and extern files 3. Second-generation systems only: If the flag is set, the `route.cfg` is sent.

Once the operations described in Table 9.30 ⇨ above are completed, the NMS database is updated to reflect the changes. The changes made to the database depend on the conditions described in the following table.

Table 9.31 Conditions Resulting in NMS Database Activity

Condition	Database Activity
With all incoming calls	Log last contact time
With all connections	Update system information
If routing table is updated	Log last update time, reset **Update Table** flag
If errors have occurred on the system	Log last error message
If statistics data is downloaded from system	Update statistics in database

9.11 TESTING SYSTEMS IN GROUPS

To organize tested systems into groups, assign them to the same group by selecting the desired group from the list provided on the **System** tab of the NMS System Editor, or by dragging the network element's icon and dropping it on the desired group icon in the NMS Group View.

Network elements may be organized into functional groups with the help of the NMS Filter tool and so-called "Dynamic Groups". See Chapter 6.8 ⇨ for more information on this concept.

The dynamic groups may also be used to collect systems for assignment to the standard NMS groups. To do so, define a query and then drag the displayed systems from the NMS Filter View window to either the desired group icon or into the corresponding Group Full View window. If necessary, use the NMS Desktop Properties dialog to rename existing groups or create new ones.

10 APPENDIX

10.1 UPDATING FIRMWARE

As new firmware versions often introduce new commands to the configuration, or change the way in which existing commands are interpreted, TELES recommends editing the configuration files of the systems that are to be updated before the new software is installed on the network elements.

Use the Change/Get Files Tab ⇨ of the **NMS Jobs** tool to define a job that will alter the configuration as necessary. Depending on the existing software version and the version you will be updating to, it may be necessary to change, add, or delete lines in the existing configuration before installing the new software.

Once this step is complete, you may then run a second job that uses the **Update** command to install the new software on the selected network elements.

10.2 MONITORING SEVERAL BOXES ON A SINGLE ISDN LINE

If several older iLCR 2BRI Boxes are connected to the same ISDN line (configured for Point-to-Point operation), NMS would not normally be capable of distinguishing one box from the next during incoming polling calls, as each would send the same Calling Party Number (CgN).

In order to use TELES.NMS to monitor boxes operating under these circumstances, it is necessary to assign the boxes to a separate group that participates in update management and for which the **Always accept call** flag is set on the **Group Properties** tab.

Thus configured, NMS will always accept polling calls from these systems, download the serial number from the calling system and search the database for an entry with this serial number. In this fashion, NMS can locate the corresponding database entry, or create a new entry with the Calling Party Number and an additional index based on the serial number to uniquely identify the network element and distinguish it from the other boxes calling in from the same line.

For newer boxes (as of version 4.5), this workaround is no longer necessary, as the `NMSPollCLI` command may be used to send the serial number in place of the calling party number as calling line identification.

10.3 REMOVING THE SOFTWARE

The TELES.NMS software can be removed using the **Add/Remove Programs** Control Panel. Select the TELES.NMS entry from the list of applications and press the **Add/Remove** button. Any files created after installation in the NMS directories (new databases, etc.) must be manually removed.

10.4 INSTALLING THE TELES.NMS CLIENT

You can install the TELES.NMS client to access and administer network elements from a remote desktop.

The installation process consists of the following steps:

1. Install MyODBC drivers
2. Install TELES.NMS client software

The following preparations are necessary in order to operate the TELES.NMS client software:

- Set up NMS database as System DSN (see Chapter 10.4.3 on page 96 ⇨)
- Share directory for common files (see Chapter 8 on page 81 ⇨)
- Set system preferences for **NMS Desktop** (see Chapter 6.1 on page 41 ⇨)
- The client software can be installed on a PC running Windows NT, Windows 2000 or Windows XP.
- The client PC must be connected to the TELES.NMS server with an Ethernet connection of at least 10 MB.

10.4.1 INSTALLING THE MYODBC DRIVERS

Install the software from the CD included in the package contents. Select **Install MyODBC**. Accept the License Agreement and follow the instructions provided on your screen.

10.4.2 INSTALLING THE TELES.NMS CLIENT SOFTWARE

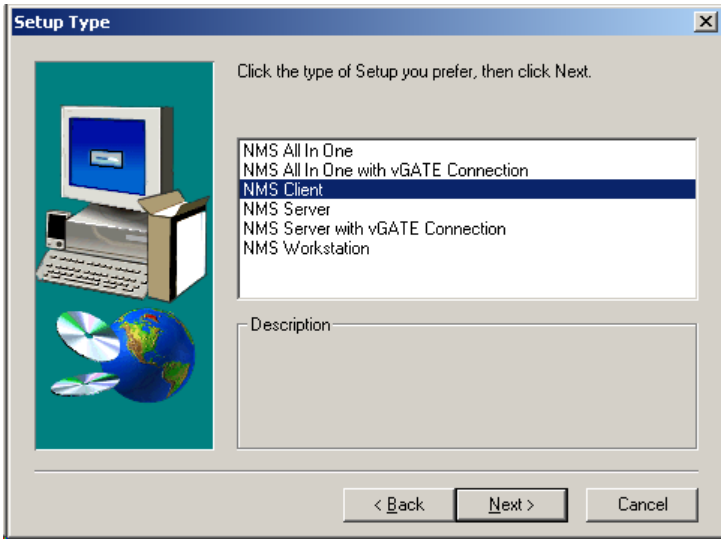
When you have finished installing the MyODBC software, you may proceed with the installation of the TELES.NMS client software from the same CD.

The following modules are included in the client software:

- Configuration (advanced)
- Configuration (client)
- Desktop
- EventManager
- EventViewer2
- Jobs
- UserManager

Follow these steps to install the software:

- Select **Install NMS**.
- Click **Next** and **Browse** or **Next** to select an directory for the software.
- Continue to click **Next** until you reach the **Setup Type** menu.
- Select **NMS Client**.
- Answer each query and click **Finish**.

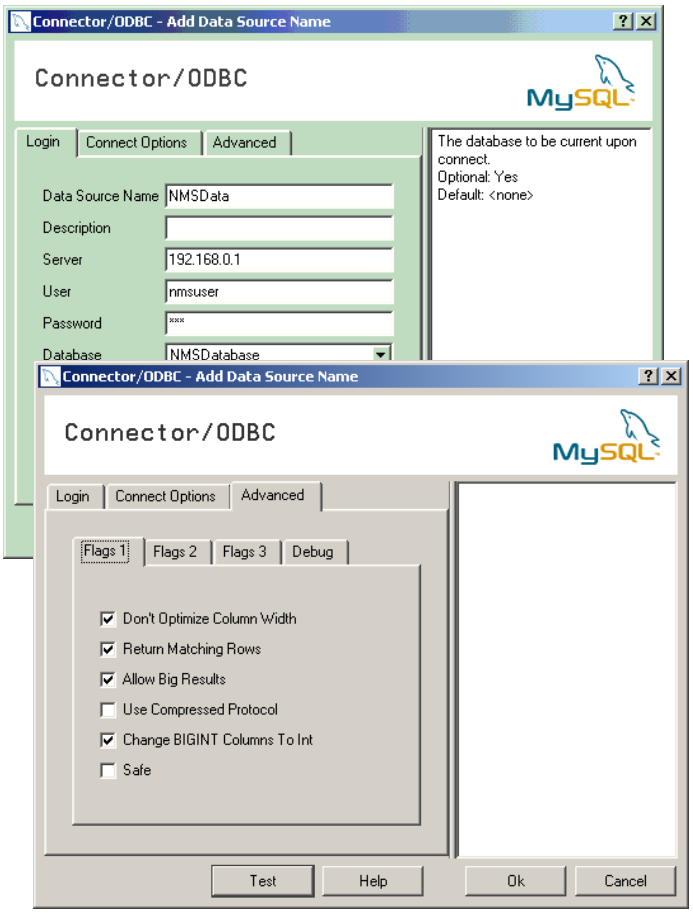


10.4.3 SETTING UP DATA SOURCES WITH SYSTEM DSNS

MySQL Server

To set up a database on a MySQL server as a System DSN, proceed as follows:

1. Start the **NMS Configuration (advanced)** tool. Press the **New** button to create a new ODBC data source.
2. From the resulting dialog, select the **MySQL Database** option.
3. A wizard appears to help you create an ODBC data source that you can use to connect to a MySQL Database. On the **Login** sheet of the **MySQL Database DSN Configuration** window, enter a name for this data source and the **Server**'s IP address. Enter **nmsuser** in the **User** field and **nms** in the **Password** field. Select **NMS Database** from the **Database** list.
4. On the **Advanced** sheet, **Flags 1**, activate the following checkboxes:
   - Don't Optimize Column Width
   - Return Matching Rows
   - Allow Big Results
   - Change BIGINT Columns To Int
5. Click **Test**
6. **Success; connection was made!** must appear. Click **OK**.
7. Click **OK** in the ODBC Connector to finalize the database connection.



10.4.4 TELES.NMS CLIENT CONFIGURATION

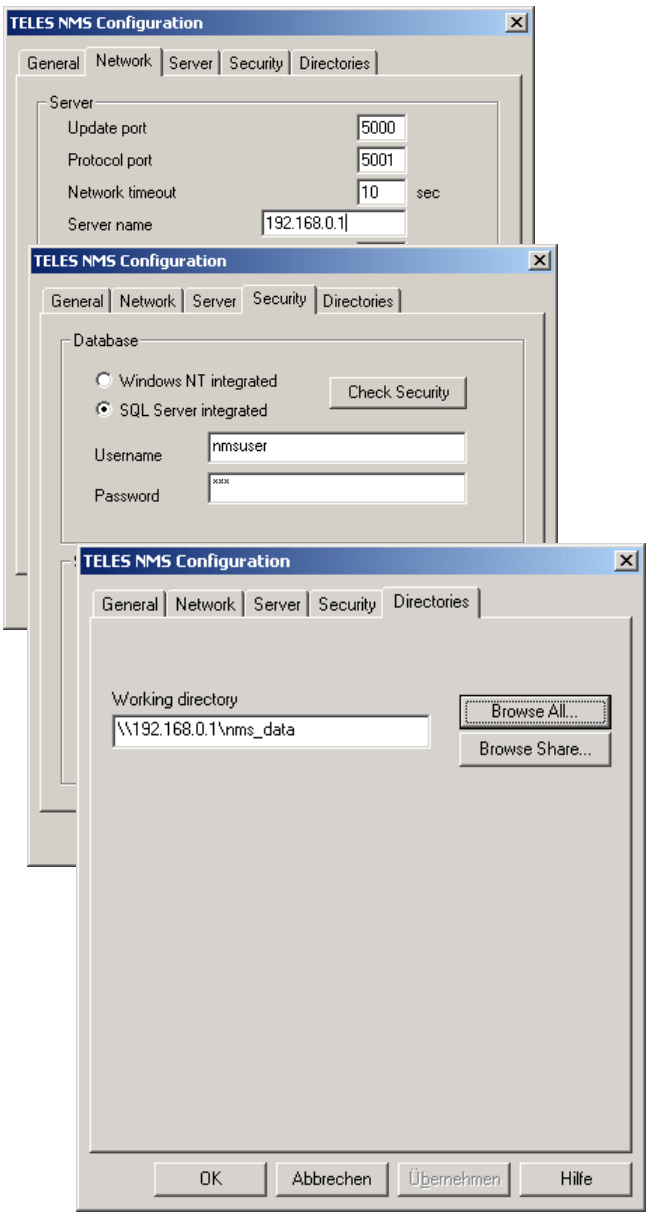
Before configuring the TELES.NMS client, you must disable TCP filtering on the TELES.NMS server. Enable TCP filtering again following configuration unless you have installed the GATE Manager on the client. In this case, be sure to secure the network with a firewall. Network data transfer with the GATE Manager cannot occur if TCP filtering is active.

To disable TCP filtering, right-click **My Network Places**, select **Properties**, right-click **LAN-1**, select **Properties**, mark **Internet Protocol (TCP/IP)** and click **Properties**. In the window that appears, click **Advanced**. Another window appears. On the **Options** sheet, mark **TCP/IP filtering** and click **Properties**. In the window that appears, activate **Permit All** above the **TCP Ports** column **OK**.

To access the TELES.NMS applications from a remote client, you must first configure the connection to the TELES.NMS server as follows:

1. Open **NMSConfiguration (advanced)**.
2. Click the **Network** tab.
3. Enter the IP address of the NMS server in the **Server name** field.
4. Click the **Security** tab.
5. Under **Database**, click **SQL Server integrated**, enter **nmsuser** in the **Username** field and **nms** in the **Password** field.
6. Click the **Directories** tab.
7. Click **Browse All**.
8. Select the **nms_data** directory from the NMS Server in your network and click **OK**. If your network does not have a DNS server, enter the NMS server's IP address here in the following format:
   \\192.168.1.1\nms_data
9. A message appears, telling you that you have selected a directory that you cannot access over the network. Click **OK**.

The client is now configured.



The server's IP address must be entered on the NMSConfiguration (advanced) application here: NMS Configuration | Network| Server. You must then restart the NMS server.

10.5 UPDATING TELES.NMS

10.5.1 ON A WINDOWS2000 PROFESSIONAL SERVER

IF you are updating from a version before TELES.NMS Version 6.1, please contact the TELES service department for assistance. To update from a later version, follow these instructions:

- Shut down the TELES.NMS server and close all TELES.NMS applications. Uninstall the old version of TELES.NMS.

- Stop the WinMysqlAdmin Service by right-clicking the  icon in the right-hand corner of the taskbar and selecting **WinNT -> Stop the Service** from the context menu. The traffic light will then turn red.
- Restart the WinMysqlAdmin Service by selecting **WinNT->Start the Service** from the same context menu, so that the traffic light turns green.
- Start the MSDOS command prompt at **Start | Programs | Accessories | Command Prompt**
- Enter `D:` and press **Return**
- Enter `cd mysql\bin` and press **Return**
- Enter `mysql -u nmsuser -p` and press **Return**
- Enter `password:nms` and press **Return**
- Enter the command `\.` (backslash period space) and enter the path to the script (in this example, on the D: drive):
  `D:\TELESNMS\Database\MyDiff_60_70.sql`
- Press the **Return** key
- Enter `exit` to exit `mysql`

- Stop the WinMysqlAdmin Service by right-clicking the  icon in the right-hand corner of the taskbar and selecting **WinNT -> Stop the Service** from the context menu. The traffic light will then turn red.
- Restart the WinMysqlAdmin Service by selecting **WinNT->Start the Service** from the same context menu, so that the traffic light turns green.
- Start NMS Advanced Config and check your settings!

Now you can restart the TELES.NMS server and all TELES.NMS applications.

10.5.2 UNINSTALLING OLD NMS

1. Uninstall TELES.NMS

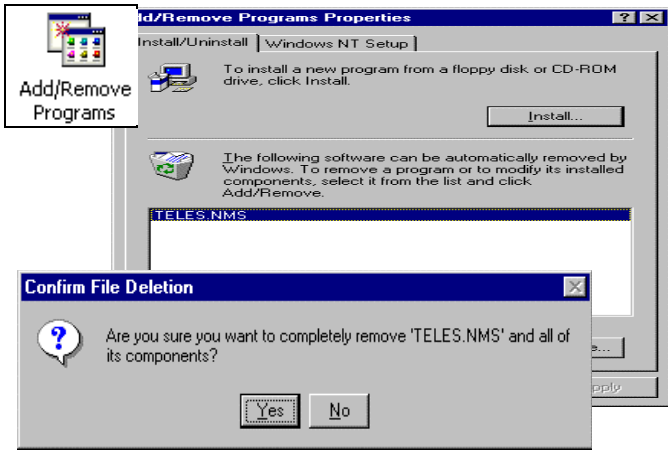
   – Select **Add/Remove Programs** from Programs / Control Panel.

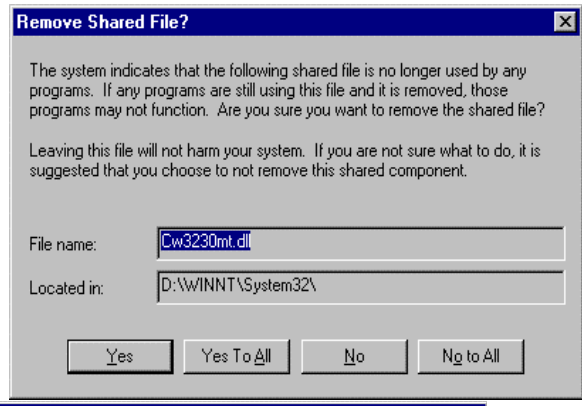
   – Uninstall Teles.NMS with **Remove**.

   – Confirm with **Yes**.

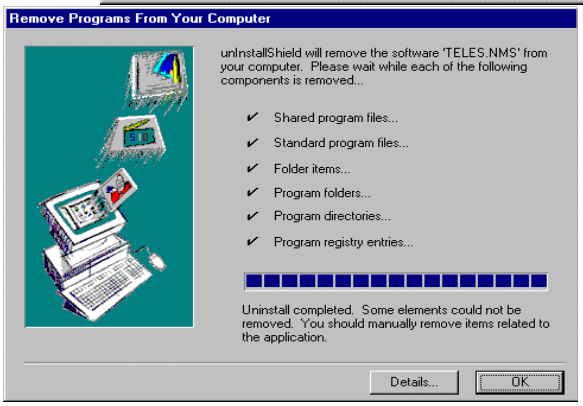
   – Select **YES To All**...

   – End with **OK**.





2. Uninstall WinRemote from the workstation the same way

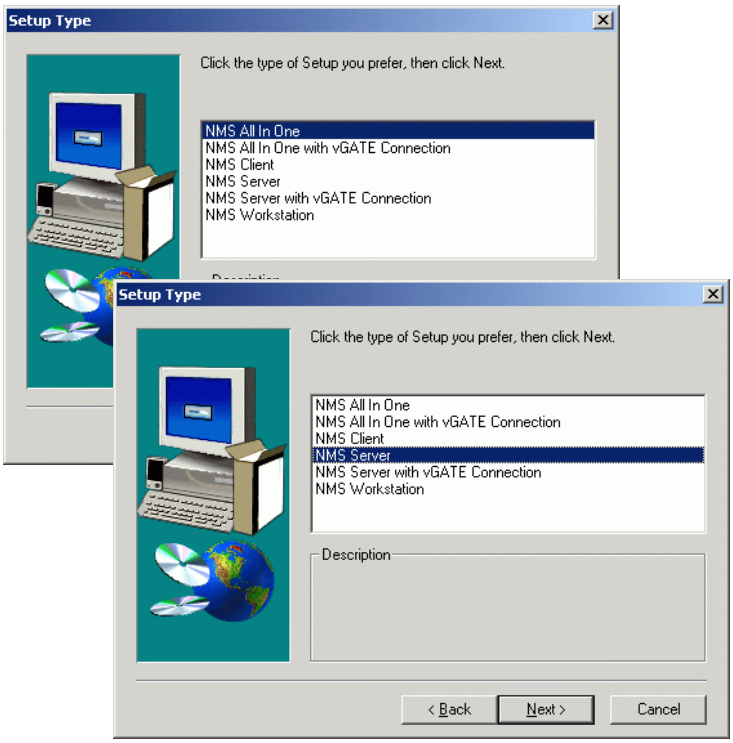


10.5.3 INSTALLING NEW NMS 14.0

10.5.3.1 INSTALLING ON A SERVER OR ALL-IN-ONE

To install NMS, follow these steps:

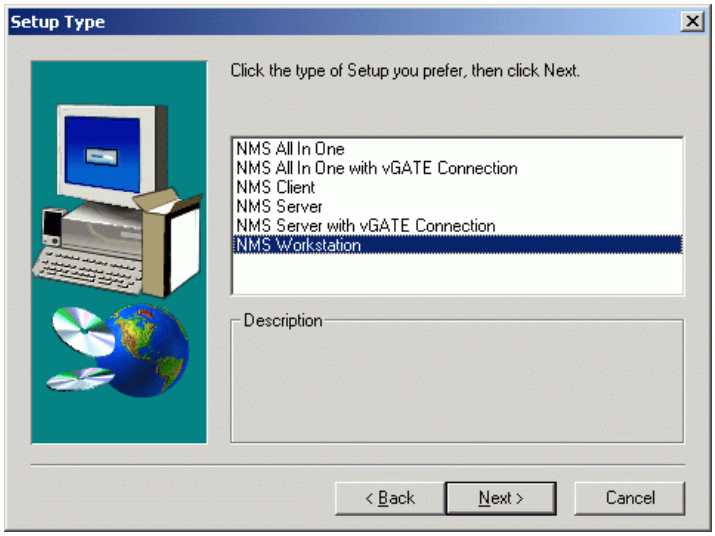
- Put the NMS CD into the CD drive.
- If it is not already installed, install Internet Explorer 6.0. It is included on the CD.
- Select Install NMS. The **Welcome...** dialog appears.
  Click **Next**.
- Choose the destination folder **D:\Telesnms**.
  Click **Next**.
- Set the NMS data path to **D:\Telesnms\nms_data**.
  Click **Next**.
- If installing on a combined server and workstation, select **NMS All In One** the **Setup Type** dialog. If installing on a stand-alone server, select **NMS Server**.
  Click **Next.** Confirm Program Folder **TELES.NMS**.
  Click **Next**.



- Do you want to create icons on the desktop?
  Click **Yes**.
- Confirm the following 2 registry information messages with **OK**.
- Setup is finished.
  Select **Yes, I want to restart my computer now**.
  Click **Finish**.

10.5.3.2 INSTALLING ON A WORKSTATION

To install NMS on a stand-alone workstation, follow these steps:



- Put the NMS CD into the CD drive.
- Select Install NMS. The **Welcome...** dialog appears.
  Click **Next**.
- Choose the destination folder **D:\Telesnms**.
  Click **Next**.
- Set the NMS data path to **D:\Telesnms\nms_data**.
  Click **Next**.
- Choose **NMS Workstation** from the **Setup Type** dialog.
  Click **Next**.
- Confirm Program Folder **TELES.NMS**.
  Click **Next**.
- Do you want to create icons on the desktop?
  Click **Yes**.
- Confirm the following 2 registry information messages with **OK**.
- Setup is finished. Select **Yes, I want restart my computer now**.
  Click **Finish**.

10.5.4 SETTING UP ODBC LINK TO THE NEW DATABASE

To set up an ODBC link to a new database, follow these steps:

- Start the **NMS Configuration (Advanced)** module by double-clicking its icon on the desktop.

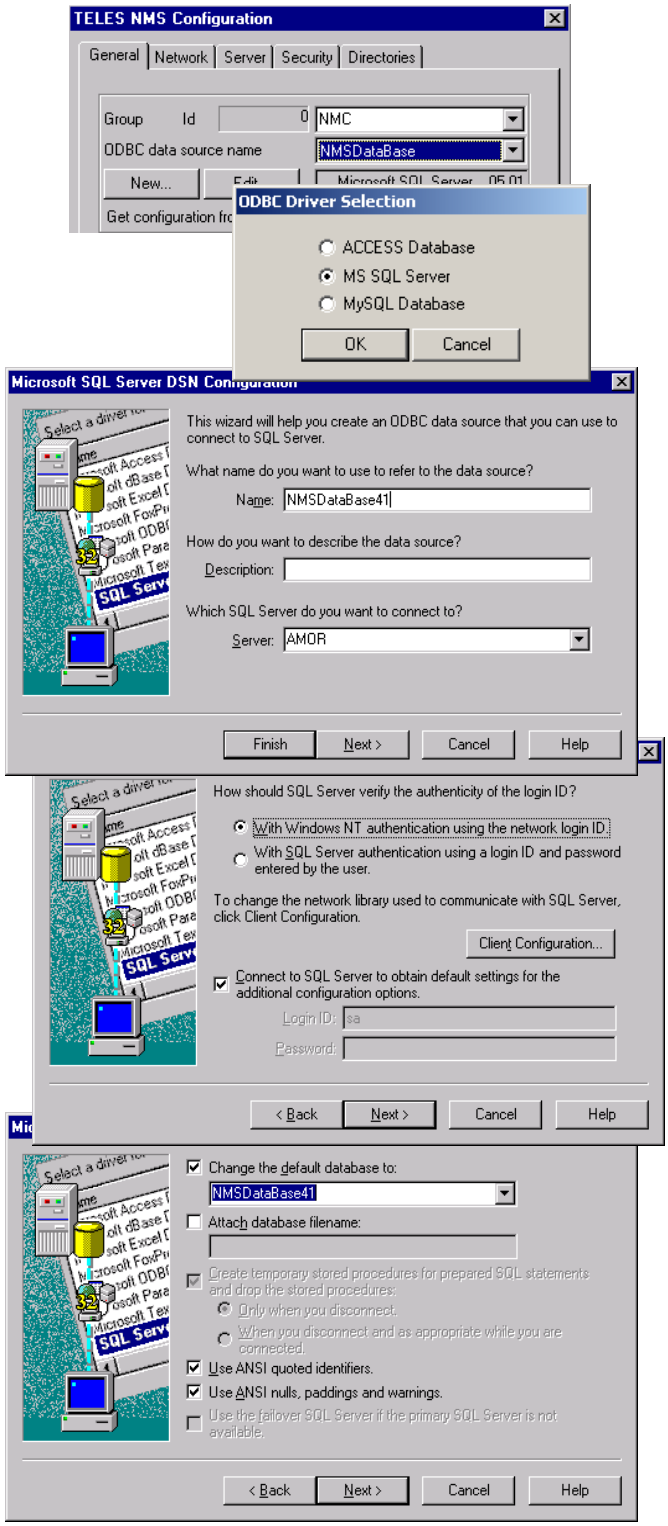
- Press the **New...** button to create a new ODBC data source.

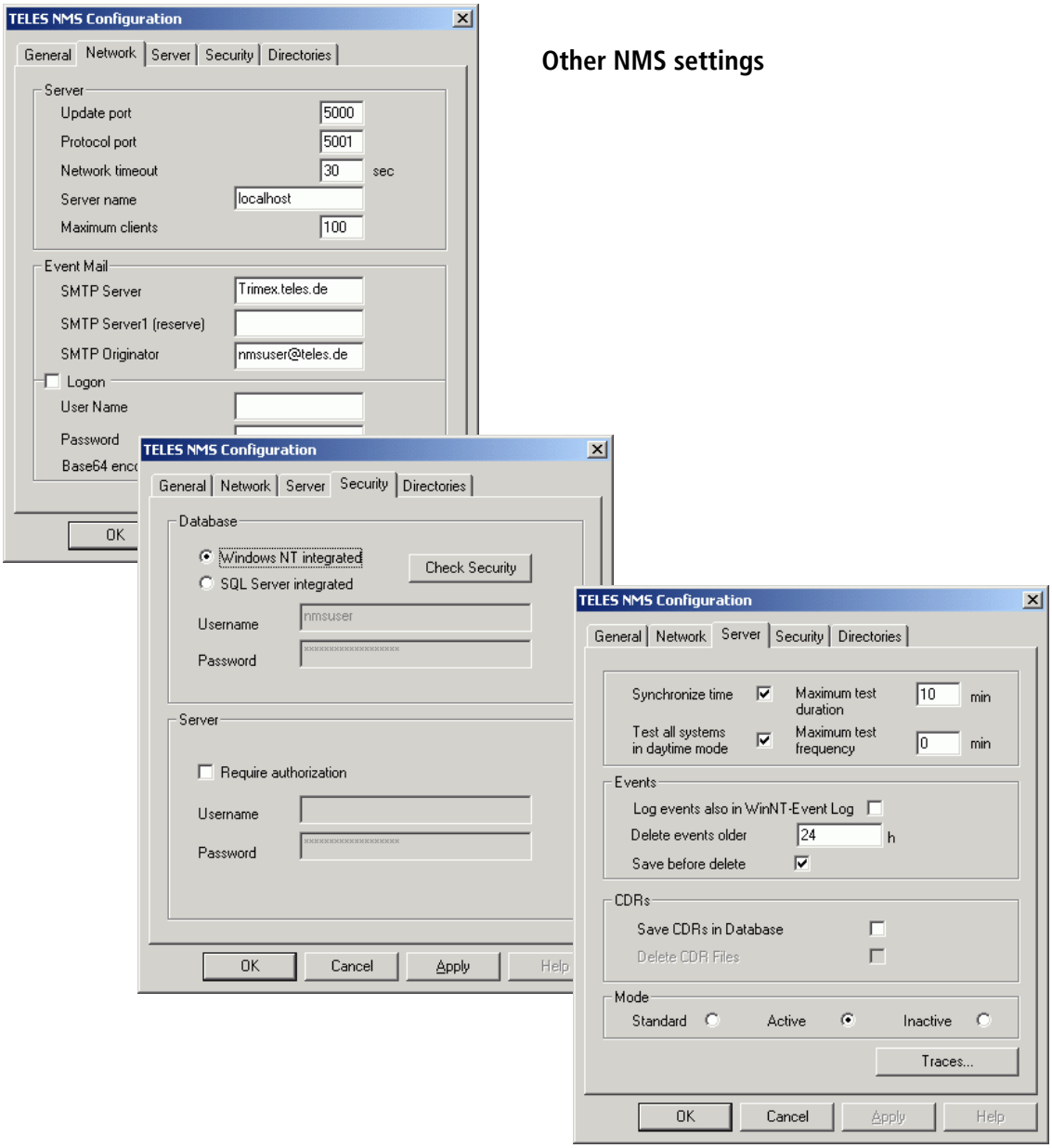
- From the resulting dialog, select the **MS SQL Server** option.
- A wizard appears to help you create an ODBC data source to connect to the SQL database.

- Enter a name for this data source in the box provided. Specify the name of the SQL Server you are setting up. You can select a server from the list or enter the server name manually.
  Click **Next**.

- Click **Next** again.
- Check **Change the default database to** to select the new NMSDatabase name. Click **Next** and then click **Finish.**

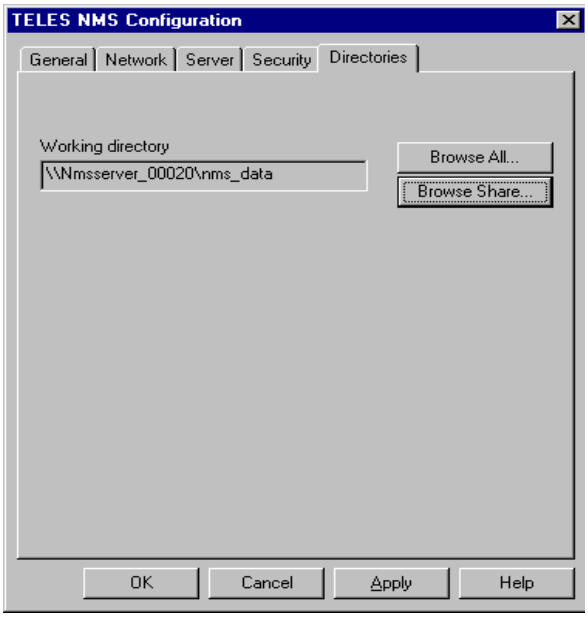
  Finally, click **OK**.





Other NMS settings

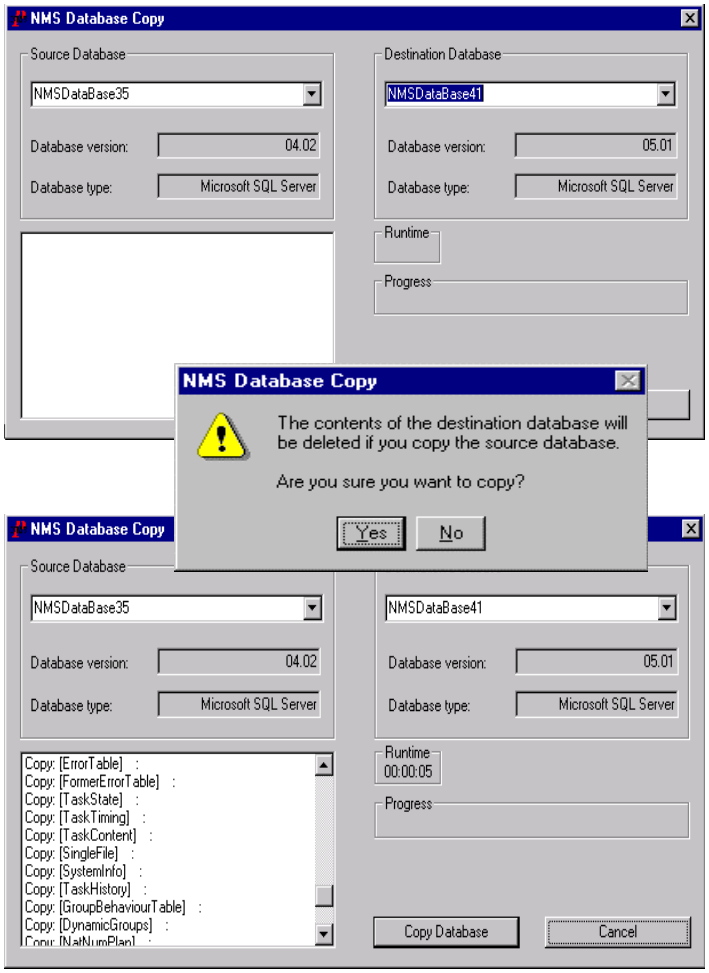
- On the **Directories** tab of the NMS configuration dialog, click the **Browse Share...** button and select the \\NMSServer\nms_data directory. Click **OK**.



10.5.5 COPYING THE OLD DATABASE INTO THE NEW DATABASE

To copy the old database into the new database, follow these steps:

- Start NMS Database Copy and copy the old NMSDatabase into the new NMSDatabase.
  After selecting the Source and Destination database. Click the **Copy Database** button.
- Confirm with **Yes**.
- After successfully copying the database, end the dialog with **Cancel**.
- The NMS software can now be started as usual.



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