



**Easylon**  
Analyzer  
User Manual

For operation with Easylon Analyzer Box and Easylon VNI Interfaces

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## Preliminary Remark

This User Manual to the Easyton<sup>®</sup> Analyzer wants to be the user's guide to an effective work with this Easyton product.

Note: The current version of the Easyton Analyzer software is compatible with the old Easyton Analyzer Boxes as well as with Easyton VNI interfaces. The Analyzer Box is described in this document. Please refer to the separate documentation of the specific VNI interface is you are going to use this for network access.

Proceeding on the assumption that the user has excellent knowledge and experience in using Echelon's<sup>®</sup> LONWORKS<sup>®</sup> technology, this manual will not go into detail as far as terms and concepts of this field are concerned. We also assume that the use of Microsoft Windows<sup>™</sup> and the general rules of operation of programs working with this user surface are known.

The documentation is divided into the main parts

Introduction	background of Analyzer operation
Getting Started	describes the installation
Tutorial	tour through the use of the Analyzer
Troubleshooting Guide	helps you with some frequently occurring problems
Reference Manual	informs about Analyzer hardware and all commands

Appended are a glossary and an index.

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# 1

## Introduction

### 1.1 Background of Operation

The power of a local operating network lies in its distributed nature: each network node is an autonomous entity and can perform its tasks independently. But of course, the whole idea of using a network of nodes already indicates that these autonomous nodes with their "intelligent" NEURON<sup>®</sup> Chips become effective only when exchanging data. A valve controller needs input from various sensors in order to calculate the necessary adjustments. In Echelon's<sup>®</sup> LONWORKS<sup>®</sup> technology communication is done through a bus system, the local operating network, which can be divided into a number of logical "domains" and consist of several physical segments in which the actual data transport may be handled by any available media. Communication is governed by Echelon's LonTalk<sup>®</sup> protocol, which is implemented on the NEURON Chips.

Communication between the NEURON Chips is what makes the network operate. Communication is also the key to network maintenance: by monitoring the messages being sent around the network you can find out whether requests are answered correctly or whether certain nodes are not responding as they should. But the possibility of listening in on the ongoing communication in the local operating network is restricted: each NEURON Chip can only "hear" messages which are addressed to it, either explicitly or implicitly (if the NEURON Chip is part of an addressed group). This is where Gesytec's EasyLon<sup>®</sup> Analyzer comes to the rescue ...

## 1.2 Easylon Analyzer Overview

The Easylon Analyzer allows “eavesdropping” on whatever goes on in the local operating network; all communication on the network can be monitored from a PC running Windows. But the Easylon Analyzer does more: it can make use of the unique self-documentation feature of the LONWORKS technology to build an intelligible map of the network. Also, the consistency of the network can be checked (detection of multiple nodes with the same logical address, detection of unbound network variables).

The following picture gives an overview of the setup of the Easylon Analyzer in case it is operated with a special hardware— the Analyzer Box. The Analyzer Box consists of two main parts: the network node part with the NEURON Chip is active, acting like a normal node included the network and requesting specific information from other nodes. This is the part that generates the requests during network scans or browsing of network variables. The recorder part is passive, acting as a spy, by listening in on all communication on the network segment to which the Analyzer Box is connected. This is the part that reads packets into the packet buffer of the Analyzer, subsequently to be transferred to the PC for investigation by the user with the Analyzer program.

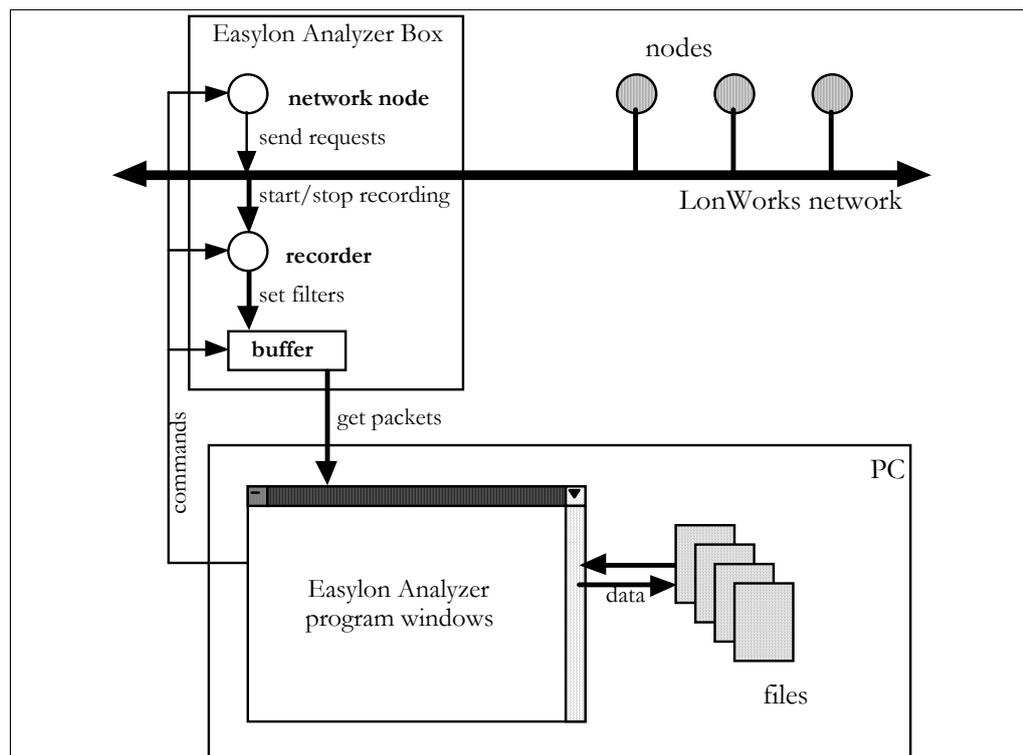


Figure 1: Easylon Analyzer Box and program in the network

The combination of the active network node part and the passive recorder part give the Easylon Analyzer its power of investigating nodes by communication helping the operator to install and maintain local operating networks easily. To help the user of the Easylon Analyzer in understanding on which levels the various commands of the Easylon Analyzer program take effect, the following conceptual levels can be identified:

**Level 0:     The NEURON Chip**

Inside the node's NEURON Chip the network variables (NVs) are stored. NVs on other nodes are accessible through the Analyzer's NEURON Chip, which can generate the appropriate messages to investigate the status of network variables. This is the level at which the Analyzer's NV Browser works: it shows the internal status of individual NEURON Chips and their NVs in the network.

**Level 1:     The network interconnections**

The nodes are connected in cooperating network. Cooperation between nodes is implemented on the basis of messages. The lowest unit in a network is a single, individually addressable node. The nodes are interconnected by a physical network which may consist of several "segments" of even different media. From another point of view—the communication view—the network is divided into logical "domains" with "subnets" and unique nodes in the subnets. Furthermore nodes can be part of "groups", which are defined in the context of the application. Messages are addressed to individual nodes and groups or broadcasted to subnets or entire domains. The Easylon Analyzer can thus request all nodes belonging to the domain to which it is set.

**Level 2:     The Easylon Analyzer's recorder and packet buffer**

Apart from a regular network node, which can generate messages to other nodes (e.g. to investigate the status of NVs) and receive reply messages which are addressed to it, the Easylon Analyzer contains a spying device, which can copy all messages being sent on the connected physical segment of the network to a "packet buffer". At this level the recording capabilities of the Easylon Analyzer work. This is also the level where filters are defined and set: using a filter causes a selection of messages to be recorded, others to be ignored.

**Level 3:     The Analyzer program window**

With the Analyzer software and the interconnection of the Analyzer to the PC, packets stored in the packet buffer of the Analyzer can be read into the active "Packets window". In a separate window, the "Nodes Window", information about NEURON Chips can be displayed, which is uploaded from the nodes in the domain to which the Analyzer is set. At this level, the various information is made visible to the Analyzer user. The "Get" commands link this level to the previous one.

**Level 4:     The PC's file system**

Finally, data which has been read from the Analyzer—either recorded in the packet buffer or directly requested in a network scan and uploaded subsequently—and displayed in an Analyzer program window can be stored in a file. Information stored in a file can be used in future sessions, e.g. when checking the current status of the network in comparison to a previously saved network description.

## 1.3 Network Interface

Additionally to the „Analyzer“ function the Easylon Analyzer Box can be used as a network interface. Installation of the appropriate software is described in the chapter „2.4 Network Interface Driver Installation“.

# 2

# Getting Started

## 2.1 Requirements

- PC running Microsoft Windows 2000 or later versions.
- The Easylon Analyzer program
- Analyzer Box or Easylon VNI Interface

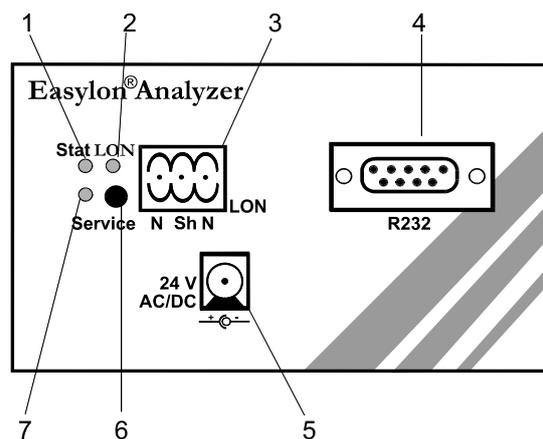
## 2.2 Installing the Hardware

This chapter describes the steps necessary to set up the Analyzer Box. For use of Easylon VNI interfaces refer to the respective manuals.

### Connection to the network

- ◆ Connect the Easylon Analyzer Box to the network segment you want to analyze. A connector plug for screw & plug front connector (fig. 2/3) is contained in the delivery.

**Attention** Make sure that interface type and baud rate of the Analyzer comply with the type and baud rate of your network. Check with the information given on the type label on the rear side.



**Figure 2:** The Easylon Analyzer hardware: Analyzer front panel

- 1 "Stat" LED: status indicator
- 2 LON LED: Network traffic
- 3 LonWorks network connector (3-pin plug & screw connector)
- 4 RS232 connector (9-pin D type)
- 5 Power-in connector
- 6/7 "Service" button and "Service" LED for the Analyzer's NEURON Chip

- ◆ Connect the Analyzer Box to the power supply you received with your Analyzer (fig. 2/5). The “Stat” LED (fig. 2/1) on the Analyzer’s front panel will be blinking after communication with the PC has been established.

### Connection to the PC

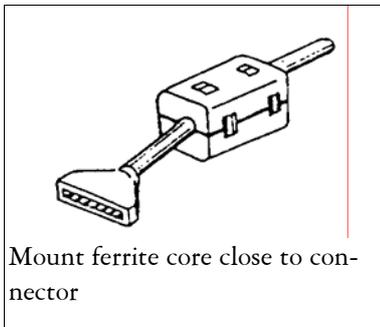
- ◆ Use the cable with the 9-pin D-type connectors on either side to attach the analyzer box (fig. 2/4) to the PC’s serial port.

#### Attention

You have to make sure that this serial port is the same as indicated in the “LNA.INI” file which you have to copy from the EasyLyon Analyzer installation disk to your windows environment, since the software connects to that port (cf. Installing the Software).

### Electromagnetic Compatibility

The Analyzer is a CE certified product and meets the intent of *Directive 89/336/EEC for Electromagnetic Compatibility* and amendment *93/31/EEC*.



To ensure electromagnetic compatibility in accordance with *Directive 89/336/EEC* for operation of the Analyzer the ferrite cores enclosed in the delivery have to be mounted around the LONWORKS and RS232 connection cables and around the power supply cable.

Please put the ferrite core around the cable close to the connector on the analyzer box end side. The distance between the ferrite core and the connector on the Analyzer face plate must not exceed 10 cm. Ensure, if necessary, that it will stay in place.

## 2.3 Installing the Software

**NOTE:**

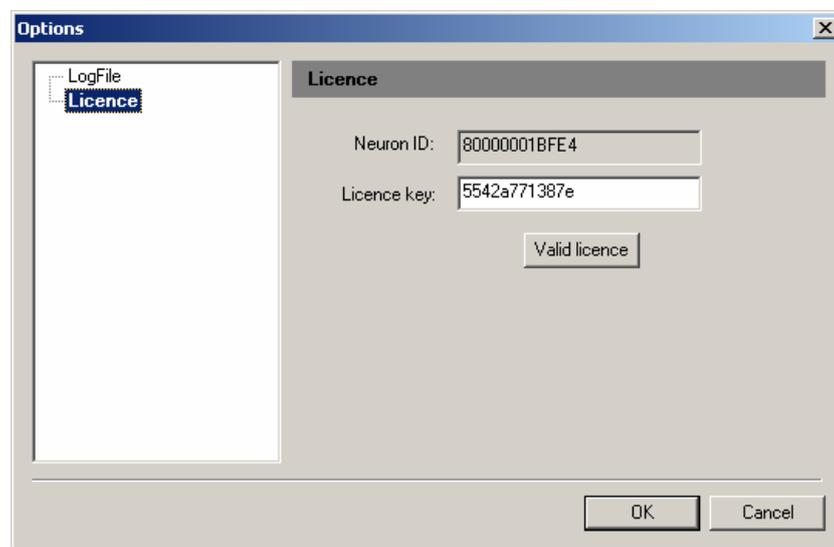
License key required.

If you are not using the Easylon Analyzer Box, the software is running in a demo mode as long as no license key is applied. In this mode every third packet is suppressed, all other functions can be used without restriction.

The license key is dependent on the Neuron ID of the network interface you are using to connect to the LonWorks network.

To enter the code start the Analyzer software, select "option" from the "analyzer" menu and enter the key code.

Be careful to use a matching Neuron ID and key code!



To install the software start the setup from the Easylon Analyzer installation CD. This will install the Analyzer program on your hard disk.

The Analyzer program can be stored to any directory. You will be prompted to accept the default C:/Analyzer directory or indicate a different one.

Along with the Analyzer program the „Network Interface Driver“ will be installed (see next page).

### LNA.INI

This file holds some initializing data for the Analyzer program; it also indicates to the Analyzer program which serial port of the PC is to be used to communicate with the Analyzer hardware. For different operating systems the settings in the LNA.INI file have to be modified according to the table below.

**Attention**

It is important, that the Analyzer program can find the LNA.INI file and the communication port entry in it. If this assignment can't be found, the Analyzer program will use COM1 as default port regardless of any other devices (mouse etc. ) connected.

In the LNA.INI file on the installation disk the PC's COM2 is set as port for communication with the Analyzer. It can be changed by editing the according line in the LNA.INI file.

```
.
[LNA]
COM=2
.
```

Other entries must be adjusted according to the operating system used. The AUTOPACKET entry can be modified from the Analyzer Program's menu as well.

	Win 3.x	Windows 95	Windows NT
COM	2	2	2
BAUDRATE	115200 (max)	115200 (max)	57600 max.
AUTOPACKET	0	0	0
WINCOM	0	0 / 1	1

Table 1: Settings in the LNA.INI file

## 2.4 Network Interface Driver Installation

The Analyzer Box can be used as a network interface. The network interface driver “lnadvr.exe” is contained on the disk along with the Analyzer software. The network driver for MS-DOS supplied with the EasyLyon Analyzer has been designed in accordance with the specifications of the Echelon Corporation. For information on the network driver interface which is required to develop applications, please refer to the “LONWORKS Host Application Programmer’s Guide” from Echelon.

The “lnadvr.exe” file is copied onto the hard disk of your computer by the Analyzer setup program. The network driver requires 1.1 Kbytes of resident program code.

### Installation

The network driver is installed in the system as device LON1 by adding in the “config.sys” file the line

```
device=lnadvr.exe /C{communication port}
```

or

```
devicehigh=lnadvr.exe /C{communication port}
```

{communication port} = 1 – 4 (COM1 – COM4)

### Options

The following options can be used:

**/C** Communication port setting (default = COM1)

**/D** Setting of device number

The device number may be in the range from 1 to 9 (LON1: – LON9:). If this option is not specified, the network driver will be defined as LON1: (default). If another network driver has already been installed with the same device number, this will result in the error message:

Invalid or duplicate device name

If the parameter /D is specified without entering a subsequent numerical value, the device number will be assigned automatically. If all possible device numbers have already been assigned to other network drivers, this will result in the error message:

LON1: ... LON9: already defined

**/B** Setting of communication baud rate

Setting	Baud rate
/B192	19,200
/B384	38,400
/B576	57,600
Default	115,200

The "lnadvr.exe" file can also be called from the DOS command line in the same manner as a normal program, to show all the network drivers installed in the system, the appurtenant device names and their storage requirements.

**/H** will display an explanation of the options

**/R** The option /R additionally enables modification of the device number.

Example: lnadvr -r13  
          changes the name LON1: to LON3:

If the first device number does not exist, or if the second number has already been assigned to another device driver, the message

Invalid or duplicate device name

will appear. The renaming of device names is not restricted to network interface devices defined by this network driver and can also be applied from a Windows DOS box as a global function for the entire system, including all Windows applications.

Instead of the slash '/' it is also possible to enter a minus character '-' to identify the options. No distinction is made between upper case and lower case characters.

The network driver supports only one Analyzer. If several of these are attached to the computer, the network driver must be installed an appropriate number of times in the "config.sys" file.

# 3

# Tutorial

During installation of a LONWORKS network communication connections and binding of network variables have to be checked. The EasyLyon Analyzer's box can be connected to the network and is used to generate a list of the available nodes in the domain to which it belongs itself. When using the EasyLyon Analyzer for maintenance and problem solving of existing networks, you will apply the filter and trigger functions more often or run consistency checks on the connected network and against a previously saved NEURON Chips and interconnections map.

This tutorial takes you through a typical session step by step. Not all steps are necessary, although some cannot be taken without the preparation in previous steps. You will find out the most efficient way of using the EasyLyon Analyzer only by putting the tool to good use in your own environment. Of course, Gesytec is always interested in your reactions and suggestions; send them to the address listed on the first page of this manual.

If you need specific commands and options that are not discussed in this tutorial, please check the reference manual (in chapter 5). The command descriptions in that chapter are listed by the order in which they appear in the menus and the order in which the menus appear in the menu bar. For an alphabetic list of commands, see the index.

## Step 1: Connecting the EasyLyon Analyzer hardware

The EasyLyon Analyzer makes use of a hardware device: the Analyzer Box or an EasyLyon VNI Interface. Connect the Analyzer Box (RS232 connector (fig. 2/4) to the PC using the cable with the 9-pin D type connectors. Make sure the cable is connected to the serial port of the PC which is indicated in the LNA.INI file in the "WINDOWS" directory. Connect the Analyzer to the network. Note that interface type and Baud rate should comply with that of the network segment to which it is connected. The type label of the Analyzer indicates its interface type.

Connect the Analyzer's power supply. The "Stat" LED (fig. 2/5) will start blinking.

## Step 2: Starting the Analyzer software



When starting the Analyzer software (by double-clicking its icon from within Windows), "Welcome" dialog box appears in which the network access device to be used has to be selecte

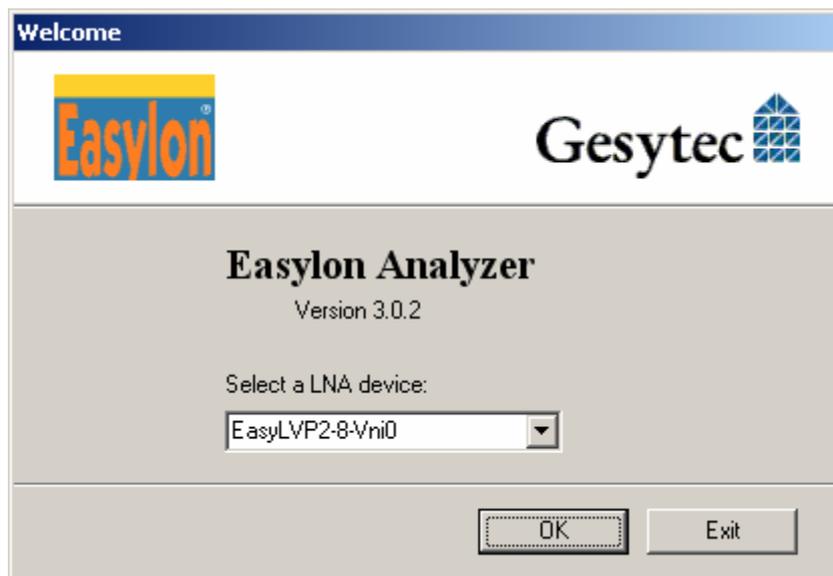


Figure 3: The “Welcome” dialog

If the network access hardware is running properly the text box should look like it is shown in the above figure (possibly with higher version numbers). You can always see the current software release in the “About Easyton Analyzer” dialog box.



Figure 4: The “About Easyton Analyzer” dialog box

If no connection exists between the PC and Analyzer Box, “comm\_err” is displayed in “About Easyton Analyzer”. In this case, please check the connection with the Analyzer and make sure the “LNA.INI” file is placed in the Windows home directory where it can be found by the Analyzer program (see “Installing the software”). This file indicates to the Analyzer program which serial port on the PC is to be initialized and used by the Analyzer software. A description of this file is given in chapter 5, the Reference Manual.

It is also possible that the text box displays a trash message. In this case, please read the appropriate section of the “Troubleshooting Guide” in chapter 4.

**NOTE:** Any changes you make to the connection or setup are not automatically updated in the Analyzer firmware text box. In order to update the information, you need to close the “About Easyylon Analyzer” box and reopen it by calling the “About Analyzer” command from the “Info” menu. This has to be done in order to initialize the communication between the PC and the Analyzer correctly. Before you haven’t seen the Analyzer firmware version in the “About Easyylon Analyzer” dialog box, you cannot use any of the functions of the Easyylon Analyzer.

### Step 3: Scanning a network domain

A unique feature of a LONWORKS network is its self-documentation ability: each NEURON Chip holds information on its network variables and will pass the information to another NEURON Chip in its domain, when it receives the appropriate request. The NEURON Chip inside the Analyzer can therefore use this standard functionality to actively extract information from all the other NEURON Chips in the same domain. The information is then passed on to the PC, where it can be inspected and stored for later use (e.g. in consistency checks, to find out whether some nodes are not responding or whether some network variables are not bound). The quality of the information gained by this depends on the NEURON Chip type (3150 or 3120) because of their different memory capacity as well as on the extent of information stored in the node by its manufacturer and the application programmer.

The network information is also used to enhance the functionality of the Analyzer program: packet information is displayed in an intelligible way using node names rather than node addresses and network variable names and types rather than cryptic hexadecimal message contents. Inspecting network variables and setting their values (with input variables) becomes possible with the “NV-Browser” command. Also, setting filters on the basis of network variables becomes possible, through the “New NV-Filter” command.

All in all, there are sufficient reasons for advising you to scan the network domain you want to investigate, prior to doing more specific analysis or trouble-finding work.

To obtain a map of the network domain that you want to check, you need to first determine which domain your Easyylon Analyzer hardware should be part of: the Easyylon Analyzer’s NEURON Chip can only generate messages to nodes which it has found in its own domain. Although a regular node can be part of two domains (to form a gateway between two domains, some nodes must have this double domain inclusion), this option is not supported in the Analyzer software: it would not make much sense, since you usually only analyze one domain at a time. However, concerning the recording of messages, the complete network traffic can be listened to.

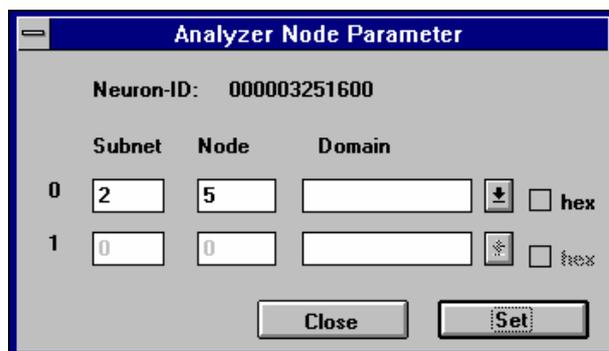


Figure 5: The “Analyzer Node Parameter” dialog box

You can set the domain to scan by choosing the “Analyzer Node” command from the “Analyzer” menu. The dialog box allows you to choose the domain name and give the Analyzer’s NEURON Chip a unique logical address (numbers of subnet and node) in that network domain.

Note that the first option in the displayed domain list is blank: this indicates the so-called “null-domain”. This type of domain has an identifier of 0 bytes length, which means no identifier has to be specified for the Analyzer’s NEURON Chip. If the nodes in your network belong to a null-domain (i.e. the domain ID for either the primary or secondary domain is defined as 0 bytes long), the Easylyon Analyzer will find all nodes belonging to this domain. By default, the Easylyon Analyzer hardware is set to the null-domain. Only if you are using non-zero domain identifiers and want to check a specific domain inside your network, you have to set the domain ID in the “Analyzer Node Parameter” dialog box.



Now you choose the “Scan Network” command from the “Analyzer” menu or you can click on the corresponding button on the toolbar and click “Scan”. Depending on the size of the domain to be scanned this can take a while, since a lot of messages are required to build a complete map of the nodes in the network, their network variables and their current status. When working with a substantial domain, this might be a good moment to take a short break while the Easylyon Analyzer is working for you ...

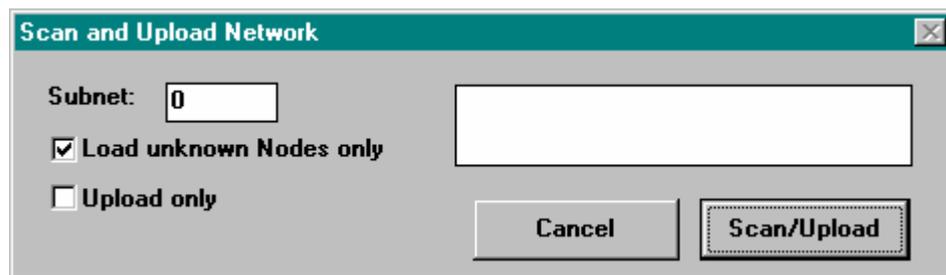


Figure 6: “Scan Network” in progress

#### Step 4: Analyzing the network's node map

When the EasyLyon Analyzer has finished scanning the network, a list of the network nodes will be displayed in the “Nodes” window. The information in this window includes the unique NEURON IDs, the ID strings defined by the programmers of the applications, the location, subnet and node numbers and the node self-documentation. The network variables are not shown in this Nodes window, but can be made visible through the “NV Browser” command in the “Info” menu, as is described in step 12 below.

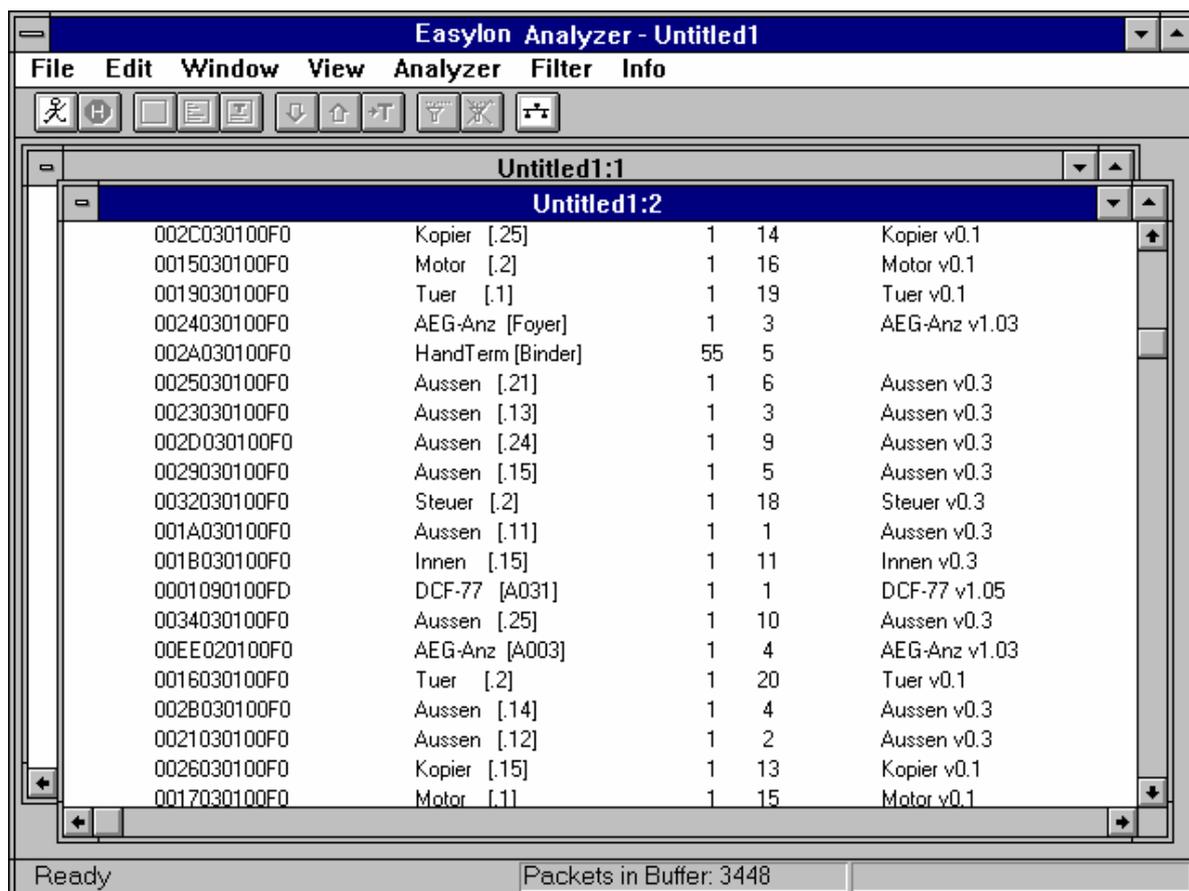


Figure 7: A Nodes window

If you have found some defects in the network's nodes map (e.g. when one or more nodes were not found and turned out to be powered down), you may want to re-scan the network after making some changes. You do not need to scan the entire network each time: by default the “Load unknown nodes only” option is enabled, causing only "new" nodes to be contacted. This may save a lot of time, but if you change some of the nodes already found (change their logical addresses or exclude them from the analyzed network domain), you may want to do a full re-scan. In that case you need to disable the “Load unknown nodes only” option by clicking the box.

## Step 5: Running a consistency check

The Nodes window gives information on the available nodes, not on the consistency of the domain (logical node addresses) or on the question whether network variables are bound or not. To obtain this information you will have to request a consistency report.

To do so, execute the “Consistency Report” command from the “View” menu. This command causes a report window to be opened, in which information on the previously scanned domain is displayed. The dialog box for this command allows enabling of the NEURON Chip level consistency and consistency on the level of network variables separately. By default, both parts of the report are generated and shown in the report window.

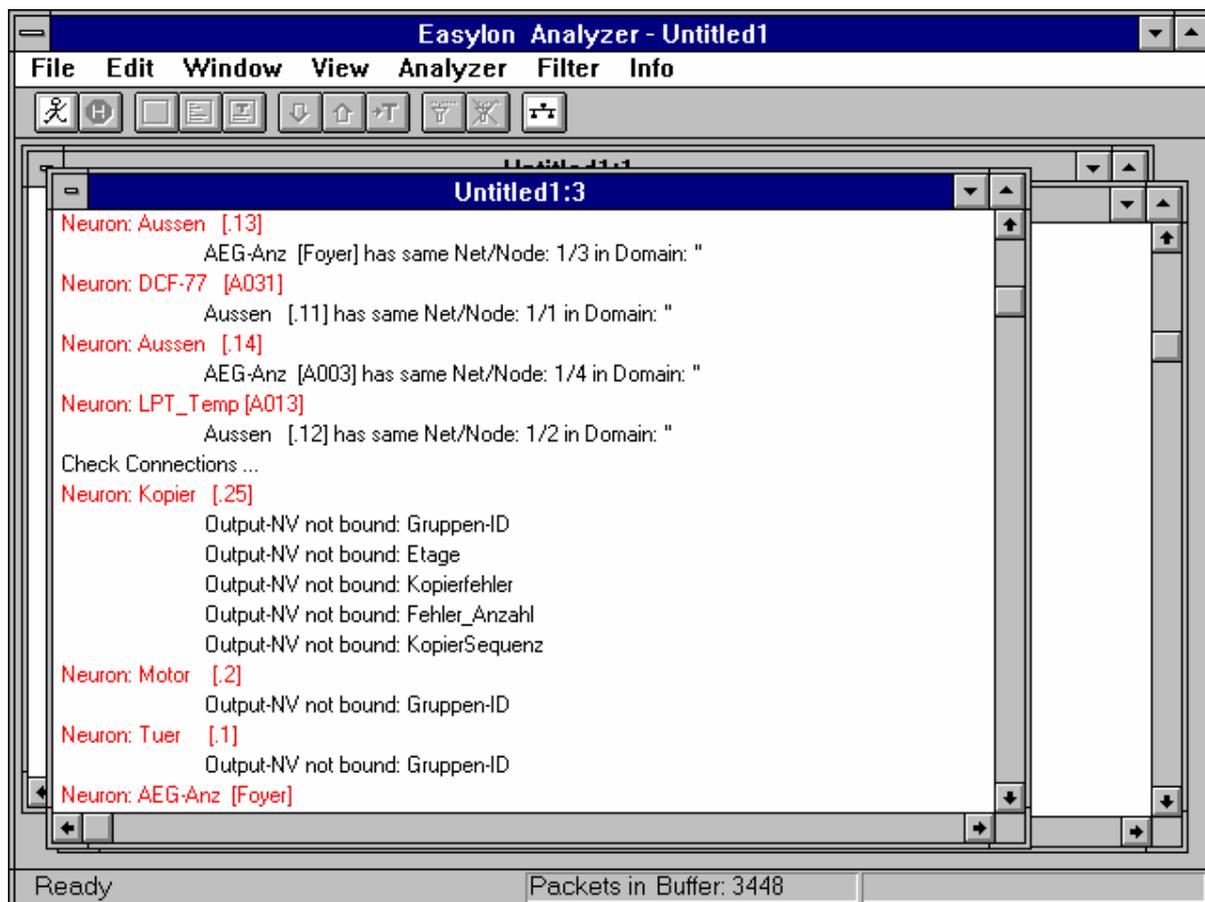


Figure 8: A Report window

## Step 6: Recording messages into the packet buffer



To start recording messages into the Easyylon Analyzer's packet buffer you click the [New Recording] button on the toolbar or select the "Start Recording" command from the "Analyzer" menu<sup>1</sup>. Note that the Packets window does not change its contents: The packets still have to be read into the PC explicitly. The status bar shows the number of recorded packets that are currently stored in the packet buffer and the packets per second recorded.

### NOTE

The packet buffer is limited in size and can only store a limited number of packets (about 18 000 with the current version). When the packet buffer is full, the oldest packets will be written over. Packet buffer memory is freed by transferring packets to the PC. This can be done with one of the "Get..." commands, which will always transfer the "oldest" packets first to the PC.

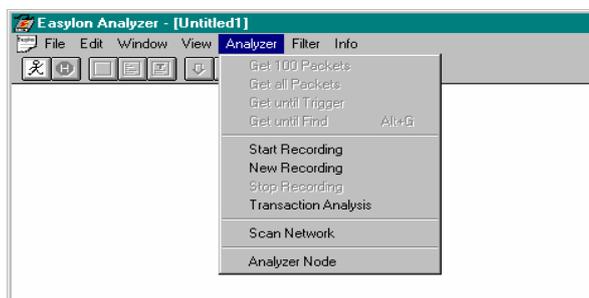


Figure 9: The "Analyzer" menu



Clicking on the [Stop Recording] button or selecting the "Stop Recording" command in the "Analyzer" menu causes the Easyylon Analyzer recorder to skip all further packets. The packet buffer stays untouched: the assembled packets can still be read into the PC after recording has stopped.

When restarting the recording of packets, you have the choice between "Start Recording", which resumes adding packets to the packet buffer again, or "New Recording", which first clears the packet buffer. Note that the [New Recording] button in the toolbar is associated with the "New Recording" command.

<sup>1</sup> There is a difference between the "New Recording" and the "Start Recording" commands, as for a "New Recording" the Analyzer's buffer will be cleared prior to recording.

## Step 7: Getting messages from the packet buffer

Messages that are recorded in the packet buffer of the Analyzer can be read into the packets window on the PC using one of the “Get...” commands from the “Analyzer” menu. The display of message information is controlled through the first three options in the “View” menu. By default, the Message Address and Message Data modes are selected and the information contains sending node, addressed node, type of message and time at which it was recorded.

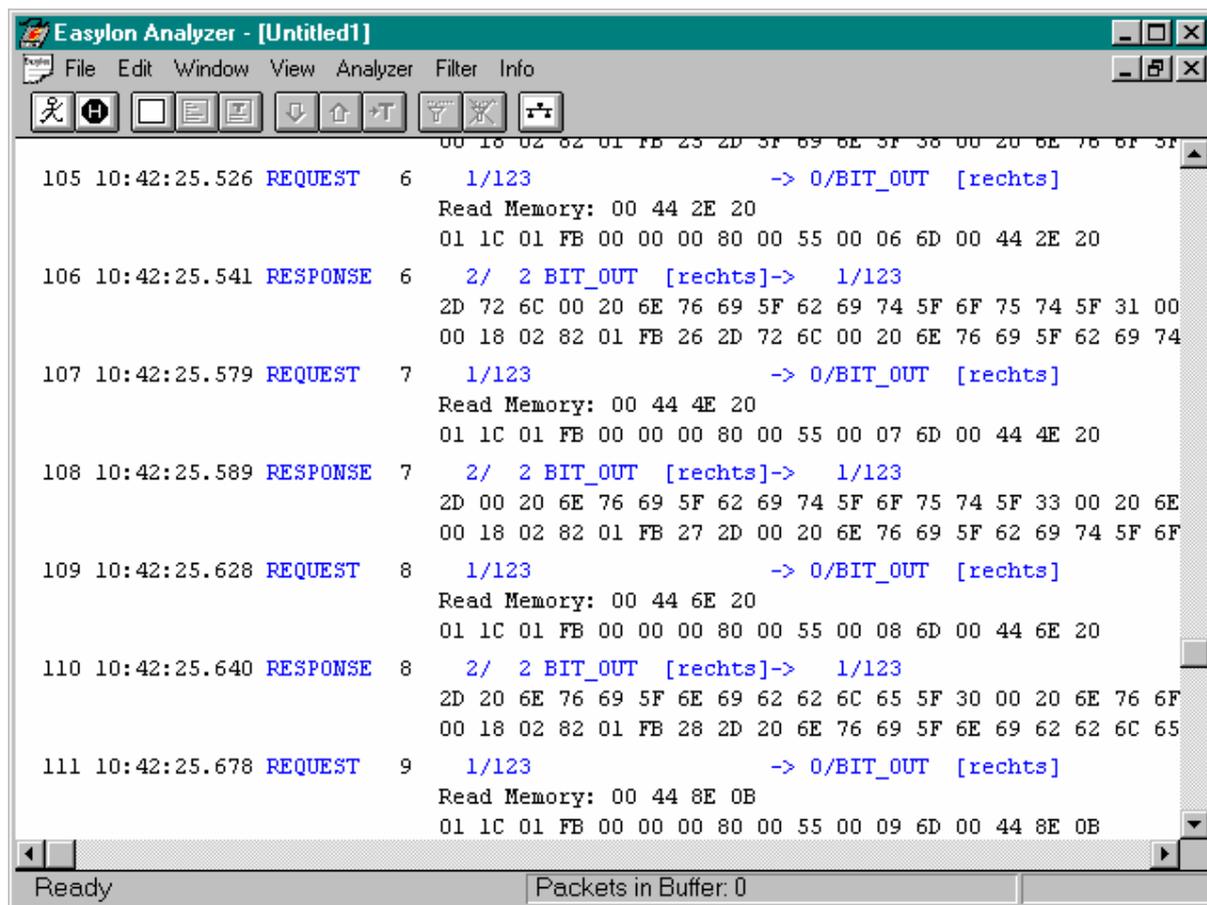


Figure 10: A Packets window with all display options selected

The “Get all packets” command causes reading of all packets which were available at the moment of issuing the command. Depending on the number of packets recorded into the packet buffer, this may take quite a while, due to the serial communication between the Analyzer and the PC. While the packets are transferred, the packet buffer is continuously filled again, unless recording is previously switched off.

If the “Get 100 Packets” command is used instead, at most 100 packets are read in from the packet buffer, and as many empty spots in that packet buffer become available for new packets to be recorded. The [Get 100 Packets] button is equivalent to the “Get 100 Packets” command.

In order to keep the information in the packets window manageable (e.g. to keep you from endless scrolling back and forth), the packets are divided in pages of 400 packets each. The “Prev Page” and “Next Page” commands and their associated buttons in the toolbar are

automatically enabled or disabled if appropriate. Through these commands you can efficiently navigate through large amounts of packets.

## Step 8: Finding specific messages

If you need to look at specific messages, for example if one of the nodes does not seem to answer on requests or seems to give an incorrect response, you may want to use the “Find” command. This will cause the next occurrence of the specified message to be displayed, i.e. the window is scrolled to the position where the specified message is found. Note that this may involve moving one or more pages down.

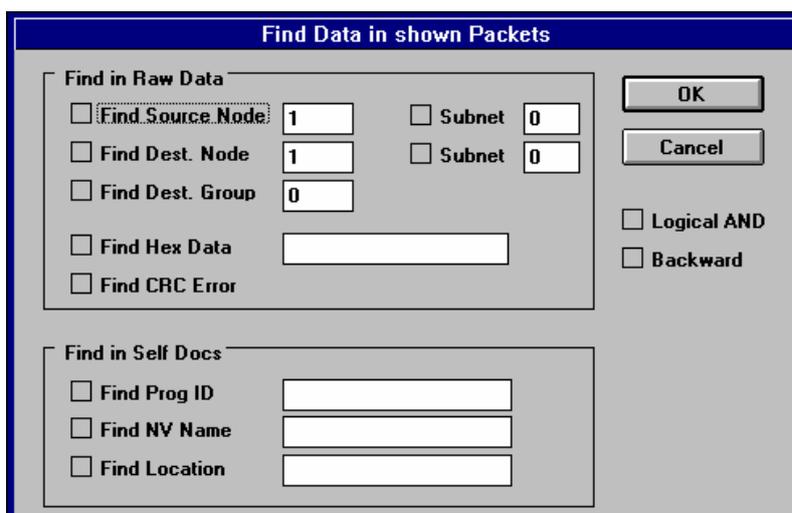


Figure 11: The “Find” dialog box

If you indicate search keys you must explicitly click the check box next to the key in order to enable it. Clicking an enabled check box disables the associated search key, but does not change the key description, so that it may be used again in future searches. You can use a number of keys in order to enlarge the set of searched packets or to reduce it (clicking the “Logical AND” option). Instead of using the subnet and node IDs of nodes or hexadecimal patterns from the message contents, you may want to search on the basis of Prog-IDs or locations or on the basis of network variable names. The lower part of the “Find” dialog box allows you to do this.

Check the “Backward” box to reverse searching from newer to older packets.

Searching for the next occurrence of the same packet can be done using the “Find Next” command (or pressing Ctrl-G). This command works from the previous packet that was found using the “Find” command, i.e. when selecting another packet by hand, this will not become the starting point for a renewed search. The search direction is depending on “Backward” box. Even if you have moved pages up or down since the last found packet was displayed, the “Find Next” will return to the correct page to show the first occurrence of a similar packet after the last found.

When looking for causes of problems in your network, you will want to move around the packets window and often return to the same selected packet. This is possible through the “Show Selection” command in the “View” menu, but only to a limited extent: some commands cause another packet to be selected. Of course you would expect this from the “Find”

and “Find Next” commands, but the “Next Page” and “Prev Page” commands also have this effect. When a new page is made visible, the selected packet becomes the first (when moving to the next page) or the last (when moving to the previous page) packet on the new page.

Apart from the “Show Selection”, there is a “Show Trigger” command, which scrolls the packets window to display a trigger packet (see step 10 below). The trigger packet is preceded by a “T” in the Packets window.

## Step 9:     **Setting filters**

Recording all packets into the Analyzer’s packet buffer, getting them into the PC and searching through pages full of packets to find the ones that show where a possible problem with your network lies may take a lot of time. You can minimize the time needed by having the Easylon Analyzer only record certain packets into the packet buffer. By defining and activating one or more filters the recorded information becomes more to the point. Remember: you cannot delete single packets from that window. To save yourself a lot of scrolling, installing filters on the Easylon Analyzer’s recording facility is a good idea. On the other hand, defining and activating too strict filters may keep you from detecting the clue to a solution of a network problem.

Using filters involves describing the characteristics of a filter and naming it, defining the filtering condition and actions associated with it and selecting several filters into a filter group. Finally this set of filters has to be activated. These steps are explained below along with their most important options. For a detailed description see the appropriate sections in the Reference Manual (in chapter 5).

For each filter to be defined you start with either the “New NV Filter” or the “New Address Filter” command in order to describe the filter, i.e. determine message characteristics to which the network traffic has to be compared to. The “New NV Filter” command works on the basis of network variables and allows selection of a certain network variable. Of course, the Analyzer program must know about the NVs of the connected network, so a scan and upload network has to be run before. It is also possible to use a previously saved network description which has been read in from file, but you have to make sure the description still fits the network domain you are analyzing.

Figure 12: The “New NV Filter” dialog box

To describe a filter for a certain network variable first select a node by ProgID/Location which contains the NV and subsequently select the network variable desired. The NV's I/O direction, its length and current value are shown, for SNVT type NVs the upper field gives the intelligible expression and the lower one the hexadecimal representation. The “Match Value” box allows specification of a certain value of the NV to be matched if used as a filter. This value has to be entered in hexadecimal notation. If you do not specify a match value, all occurrences of the network variable in the network communication will match the filter description.

It is also possible to define filters based on node addresses rather than on network variables. The “New Address Filter” command from the “Filter” menu causes the following dialog box to appear:

Figure 13: The “New Address Filter” dialog box

Describing filters on the basis of node addresses is done through identification of source or destination addresses and optionally indicating service type\_plus address format (broadcast, group or subnet/node).

If you want to use multiple filters you must give each filter a unique name, so that you can identify it in the “Filter Group”, “Modify Filter” or “Delete Filter” commands later on (otherwise, you will have to choose from a list of filters named “Untitled”).

After filters have been defined and named, filtering conditions have to be defined and commands need to be associated with these conditions. A filter definition merely describes some characteristics of packet, not how to use these for filtering. In the “Filter Group” command you determine both the filtering condition and the associated command for each of the previously defined filters. Furthermore you here compose a set of previously defined filters to the filter group you work with.

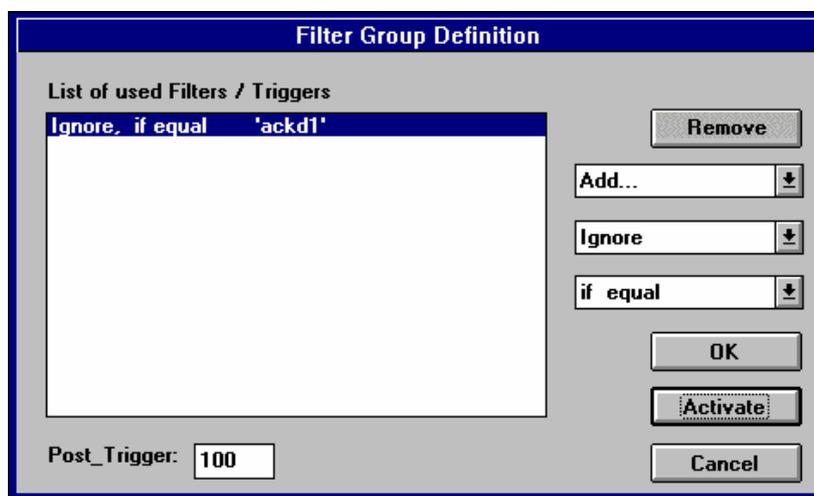


Figure 14: The “Filter Group” dialog box

To specify a filtering condition and associated command choose “Add...” first: the button to the right will display a pull-down menu with all available filters. Choose one and subsequently choose a filtering condition for it by clicking the lower pull-down menu button: the options for conditions are “if equal” or “if unequal”. Finally you have to indicate the action to be taken by the Easylon Analyzer when a filtering condition has been met: show the packet, ignore the packet or — and this last option is described in the following step of this tutorial— use the packet as a trigger.



After all this the defined filters can be activated through the “Activate Filters” command in the “Filter” menu or through the equivalent button in the toolbar. They can be deactivated through the “Deactivate Filters” command or through the equivalent button. This allows a flexible use of the filter option: you do not need to remove filter definitions if you want to temporarily deactivate them.



The filter definitions are saved to file (when you choose the “Save” command from the “File” menu) and can immediately be re-activated each time you run the Easylon Analyzer with this file. The file is the same as is used to store recordings of packets and uploaded network information.

## Step 10: Using triggers

When defining a filter you specify a certain type of messages to be recorded, or to be ignored. In some cases you will want the EasyLyon Analyzer hardware to stop recording automatically when a specific type of message arrives. This is possible using one of the defined filters as a trigger.

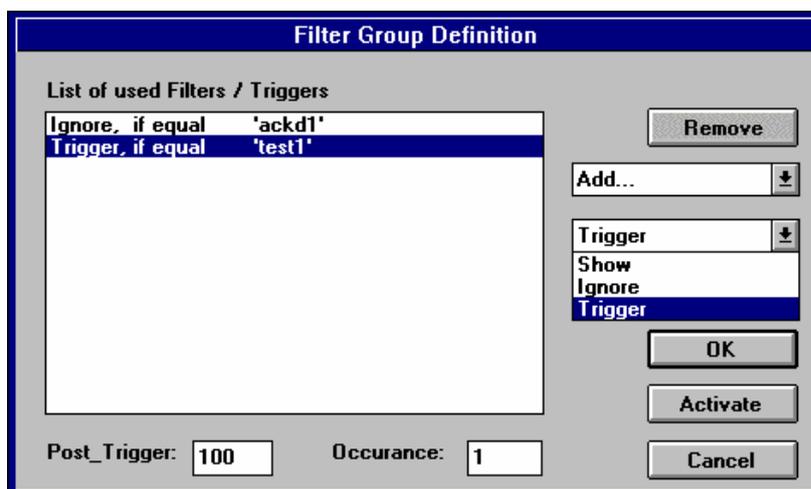


Figure 15: The “Filter Group” dialog box with Trigger command

Setting a trigger is done by first selecting a named filter, then choosing the “equal to” condition and finally assigning the “trigger” command to this filter. Further options for a trigger are the occurrence of the specified trigger packet type before recording will stop and the number of packets that shall be recorded after the (last) trigger has been detected.

Note that setting the trigger as explained above does not automatically activate it. You can do so by activating all filters through the “Activate Filters” command or the equivalent button in the toolbar. Instead, you can also activate all defined filters and triggers in the “Filter Group” dialog box, by clicking its “Activate” button.

## Step 11: Saving window contents to a file

To save the current contents of a window to file you simply choose one of the “Save” commands from the “File” menu. If the window contents was not saved before, EasyLyon Analyzer prompts you for a file name. This is the same dialog box as you would get when executing the “Save As” command on an already saved and named file. It allows you to navigate through your file system to determine where the file is to be placed, and of course it asks you to name the file.

When using the “Save As Text” command, the file format is readable by other applications (standard ASCII text), but only the packet information is written out and not all of the information available in the Packets window is stored. See the Reference Manual chapter for a description of the format used in this command. If you write out information to a text file the window remains untitled, and Analyzer will prompt you for a file name and location the next time you want to “Save” the file.

Saving a file overwrites the existing file with the same name. If you give an existing name in the “Save As” or “Save As Text” commands, you are asked whether the file should be replaced or not.

## Step 12: Using the NV Browser

The NV Browser allows investigating the status of network variables. This command is enabled if a network upload is available (i.e. after scanning the network or after reading in a previously saved network upload from file). On the basis of the self-documentation of the LONWORKS network, the Browser enables easy navigation through the network and inside each of the NEURON Chips in it:

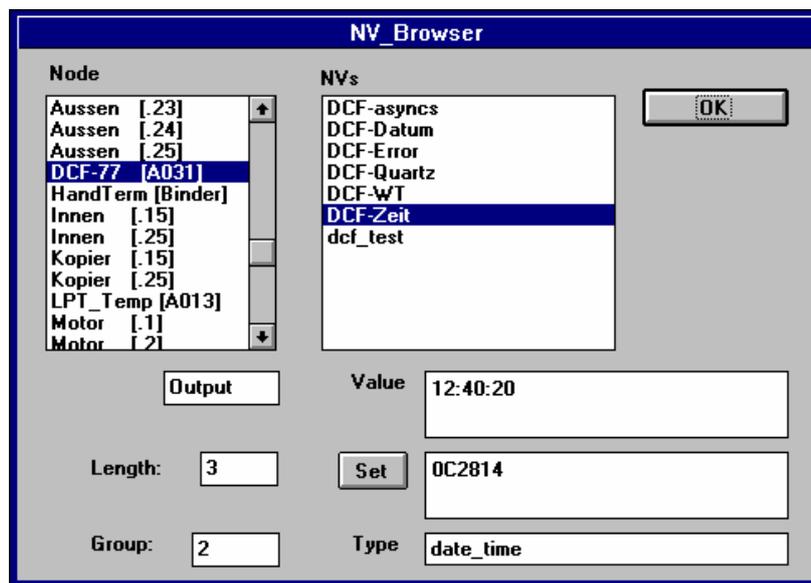


Figure 16: The “NV Browser” dialog box

Clicking one of the available nodes in the list on the left hand side makes the list of its NV names appear in the NV list to the right. By selecting one of these its current value is displayed. The value is updated each time the NV is selected.

If you have selected an input variable the allows setting the value of the variable: change the value in the “Set” window and click the “Set” button to do so. The type information is only given if the network variable is of the SNVT type; in such cases, the indicated value is interpreted, whereas the “Set” value is hexadecimal.

# 4

## Troubleshooting Guide

### The mouse dies when starting EasyLyon Analyzer

You have probably told Windows that the Analyzer is connected to the same serial port to which the mouse is attached. Since Windows does not check on connected mice and overrules the serial port allocation your mouse driver has been killed when starting the EasyLyon Analyzer.

Remedy: Change the serial port setting in "LNA.INI" file and restart windows.

### "comm\_err" in the "About EasyLyon Analyzer" box

This message indicates an error in the communication between the Analyzer Program on PC and the Analyzer hardware. First, the Analyzer might be switched off. If the Analyzer has power, at least one LED should be blinking. With packets detected on the network the LON LED is blinking with every detected packet.

Secondly, the connection between the Analyzer and the PC might not be correct: either the cable is not attached or possibly the wrong cable is used to make the connection. Some cables have different connection schemes, so make sure you are using only the cable which has been delivered with the EasyLyon Analyzer.

#### NOTE

In each of the above cases a change in the connection is not automatically detected by the Analyzer software. After making the change you will have to close the "About EasyLyon Analyzer" dialog box by clicking OK and re-open it by calling the "About Analyzer" command from the "Info" menu. This needs to be done before using the EasyLyon Analyzer, since the comm\_err status must be cleared. If you have not seen the message indicating the Analyzer firmware version number the EasyLyon Analyzer is not initialized correctly and cannot be used.

## Trash in the “About Easylon Analyzer” dialog box



**Figure 17:** The “About Easylon Analyzer” dialog box

In this case you have probably attached the Analyzer Box to a different serial port than what is written in “LNA.INI”. There is another device driver active on the serial port responding in an unintelligible protocol. This is what makes the trash appear in the “Firmware” text box.

**Remedy:** Change the settings in “LNA.INI” or change the connector on the PC to the correct serial port and restart the application.

## No packets are recorded

First of all, this might not be a problem at all: if no messages are generated on your network then the Easylon Analyzer will not detect any.

If the network should generate some messages (LON LED is blinking with every message detected) but none are detected by the Easylon Analyzer, it might be that you have made an error when defining filters: if you define too strict filtering conditions no messages of the specified type may occur on the network and the Analyzer’s packet buffer will remain empty.

**Remedy:** De-activate the filters and wait for messages to appear.

If the problem is not solved by deactivating filters, there might be a problem with the connection between the Analyzer and the network that you are trying to analyze.

**Remedy:** Check whether both ends of the network connection cable are plugged in. If they are and no connection seems to be there anyway try another connection cable or another plug-in slot on the network.

If nothing seems to work, try to upload the network first and activate the Nodes window to see whether the network has been found at all.

## No nodes are shown after scanning the network

The first problem might be that the domain settings for the EasyLyon Analyzer's NEURON Chip are such that no nodes can be found, since there is no such domain in your network. Check and change the domain setting for this NEURON Chip using the "Analyzer Node" command and retry the network scan. Note that the nodes in your network may be in 2 domains (for possible gateway functions), but the NEURON Chip in the Analyzer only belongs to one domain: the one you are trying to analyze.

If the domain setting is OK but still no nodes are found when scanning the network, you might not have connected the Analyzer to the network, or the network might not be operating. The network to be uploaded then does not contain any active nodes except the Analyzer. So queries from this node are not answered and the EasyLyon Analyzer finds no nodes: the "Scan Network" dialog box briefly shows the message "Start Scan" and then exits without further messages.



Check the connection between the Analyzer and the network you want to analyze and try scanning the network again after you have first started a "New Recording".

If the status bar shows >0 packets in Analyzer's packet buffer after the unsuccessful scan, the network seems to have no active nodes, i.e. the nodes in your network may not be powered on or some other reason may exist for the EasyLyon Analyzer to not find any nodes.

**Remedy:** Check the power LEDs on some of your nodes. If they are on and you are certain that they belong to the domain that you are trying to scan something else is wrong in your network. It might be that all of your network nodes are switched off-line and cannot respond to any queries of the Analyzer's NEURON Chip anymore. The methods to find back and revive these nodes are device-specific and cannot be covered by this User Manual.

## One node does not show up in the network scan

If one and always the same node in your network does not show up in a network scan, although the EasyLyon Analyzer initially indicates the correct total number of nodes available in your network ("Scanning <#> of <total>" is displayed during the network scan) probably your Analyzer's NEURON Chip has the same subnet and node ID as the NEURON Chip of the node not found. This effectively hides messages coming from this node: the EasyLyon Analyzer will always discard a response it assumes originating from itself.

**Remedy:** Change the logical address of the Analyzer's NEURON Chip by choosing the "Analyzer Node" command and typing in numbers that are not used in your network. The simplest is to use a subnet number that is not used in the network domain you want to analyze. When scanning the network again, you can choose the "Load unknown Nodes only" option to save time. This should cause the missing node to appear.

## Scanning the network results in a comm\_err

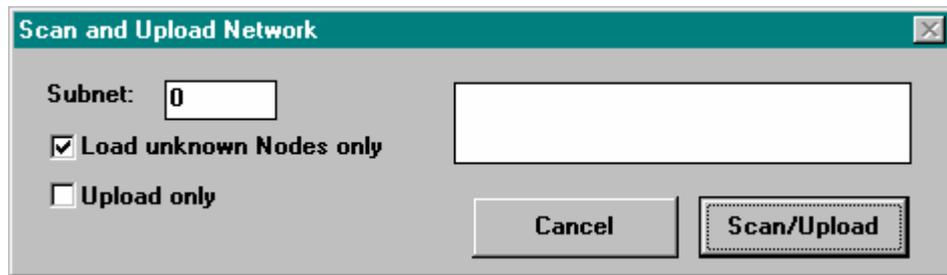


Figure 18: The “Scan Network” dialog box

If the network is not terminated properly a comm\_err may occur when scanning the network.

Remedy:

Check the bus termination of the network and reset the interface between Analyzer and network by choosing the “About Analyzer” command in the “Info” menu. This should clear the status of the Easylon Analyzer hardware and the buffers between the this device and the PC. Then retry scanning the network. If the problem does not seem to disappear you might have to reset both the network and the Analyzer to get them back into synchronization. Remember that in any case you will have to issue the “About Analyzer” command to reset the status of the Easylon Analyzer hardware and its connection to the PC before trying any further commands like scanning the network or recording and reading in packets.

## 5

## Reference Manual

## 5.1 Hardware Reference

This chapter refers to the Easylon Analyzer Box

## 5.1.1 General information

**Dimensions**

The Easylon Analyzer Box dimensions are 169 x 105 x 59 mm without connectors.

**Power supply**

Input Voltage	12–24 V AC/DC
Power consumption	about 8 W
Connectors	Jack connector

**Operating conditions**

Temperature	operating	0 – 50 °C (32 to 122 F)
	non-operating	-20 – 80 °C (-4 to +176 F)
Humidity		90%, non-condensing
Protection class		IP20
EMC		EN55022 Level B E-Field accord. IEC801-3 Burst accord. IEC-4/3
CE Compliance		DIN EN 50081-1 DIN EN 50082-2
UL Compliance		V01

## 5.1.2 Technical information

The Easylon Analyzer hardware consists of two main parts: the network node part with the NEURON Chip and the recorder part. The specifications of these and the interfaces to network and PC and of diagnostic indicators are as follows:

**Network node part**

CPU		Echelon NEURON Chip 3150 <sup>®</sup> Chip, 10 MHz
Memory	EPROM	32 Kbytes, 70 ns
	SRAM	24 Kbytes, 55 ns

**Recorder part**

CPU		Motorola MC 68331, 14,72 MHz
Memory	Flash-EPROM	1 Mbytes
	SRAM	512 Kbytes

**Network Interface**

On each Analyzer only one of the following network interfaces is available. Check the type label!

- FTT-10: 78 kbps, free topology transceiver
- TPT/XF 1250: 1,25 Mbps, transformer coupled twisted pair
- TPT/XF 78: 78 kbps, transformer coupled twisted pair

**PC Interface**

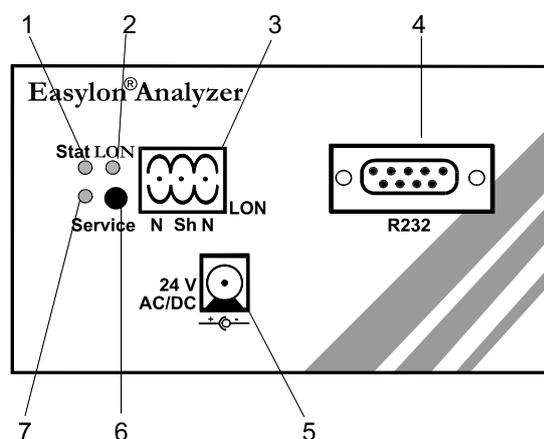
Connector	COM:	RS232 interface for serial connection to the PC with Analyzer software
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**Diagnostics**

LED	3 indicators on the front panel (details see below)
Watchdog	voltage level supervision

**5.1.3 LED Indicators**

The Analyzer is equipped with 3 LED indicators on the front panel. The purpose of these and the meaning of the signals they will give you are as follows:



**Figure 19:** The Easylon Analyzer's front panel

**Stat**

**cont.** If this LED is **continuously on**, a general error has occurred making correct functioning of the Analyzer impossible. For instance a communication error

- during the firmware download may have occurred. Try to reboot the Analyzer by briefly disconnecting the power supply and choosing again the "About Analyzer" command from the Info menu. If the error recurs, contact your technical support engineer.
- 1 Hz** This LED is **blinking steadily** (at 1 Hz) when Analyzer box and program are running correctly.
- 4 Hz** This LED is **blinking fast** when the Analyzer is recording packets into its packet buffer.
- LON** This LED is switched on whenever communication packets are registered on the network segment to which the EasyLyon Analyzer is connected.
- SERVICE** If this LED is on, an "MIP" error has occurred in the network node part of the Analyzer. The LED is attached to the service pin of the NEURON Chip and has the same function as a service LED on other nodes. This LED should be off before being able to use the EasyLyon Analyzer.

### 5.1.4 Format of the "LNA.INI" file

The "LNA.INI" file contains initializing data for the Analyzer software. First of all, the serial port to be used on the PC is identified here. Also, a list of the last 4 opened files is kept in "LNA.INI": these files show up in the "File" menu for fast access.

The file format looks is as follows:

```
[LNA]
COM=2
BAUDRATE=115200
AUTOPACKET=0

[Recent File List]
File1=C:\EASYLON\TEST\HAUSNETZ.LNA
...
```

Settings with respect to the different operating systems are given in Table 1:

	Win 3.x	Windows 95	Windows NT
COM	2	2	2
BAUDRATE	115200 (max)	115200 (max)	57600 max.
AUTOPACKET	0	0	0
WINCOM	0	0 / 1	1

Table 1: Settings in the LNA.INI file

**NOTE:**

The LNA part is important since this indicates to the Analyzer program where the connection to the Analyzer is made. In the LNA.INI file you received with the EasyLyon Analyzer the port is set to COM=2, If this file cannot be found —remember it must be in the Windows home directory— the communication port defaults to COM1 of the PC.

On most PCs this port is used for the mouse. So, if the Analyzer program cannot find the "LNA.INI" file with a different assignment, the mouse will die when starting the program. Make sure this section of the file and the serial port used to communicate to the EasyLyon Analyzer hardware correspond and that the file is placed in the Windows home directory.

The "Recent File List" may be empty when you have not opened and saved files with Analyzer before. Whenever you open or save a file from the Easylon Analyzer program the file-name is added to the list. Only the last four opened files are shown in the "File" menu.

## 5.2 Command Reference

### 5.2.1 The File Menu

The commands in the “File” menu let you handle files, print window contents, or exit from Analyzer. The various commands are explained below.

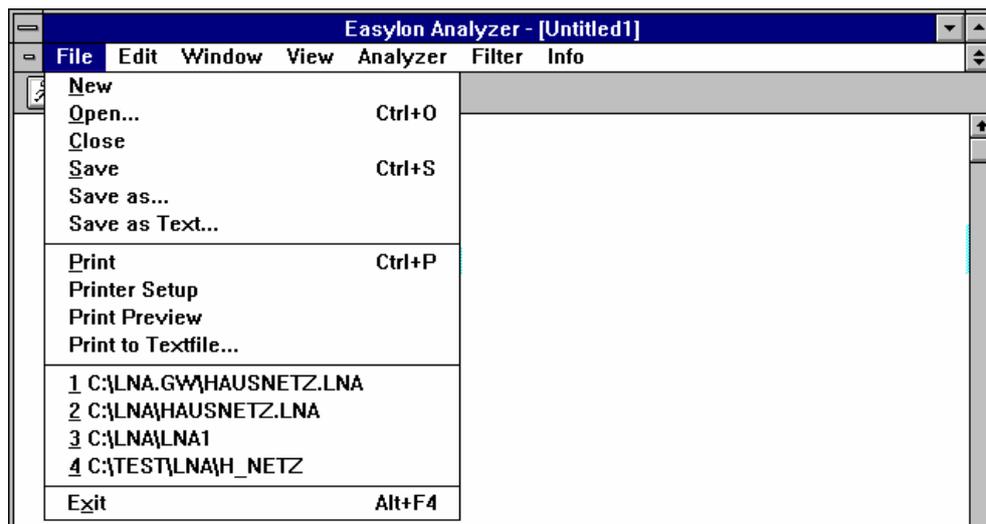


Figure 20: The File menu in its pulled-down state.

#### New

The “New” command causes a new file to be opened for storage of subsequently collected packets, possibly combined with uploaded NEURON Chip information. When this command is issued an empty window appears with a temporary title (EasyLyon Analyzer - (Untitled#)), with # being a counter for the new windows in one session). This title is used until the contents of the window are saved in a file. By default a new file comes up with the packets window, of course without any packets being displayed.

#### Open

The “Open” command allows an existing file to be opened. Issuing this command causes a dialog box to appear, allowing you to navigate through your file system and open the needed file. This dialog box is shown below:

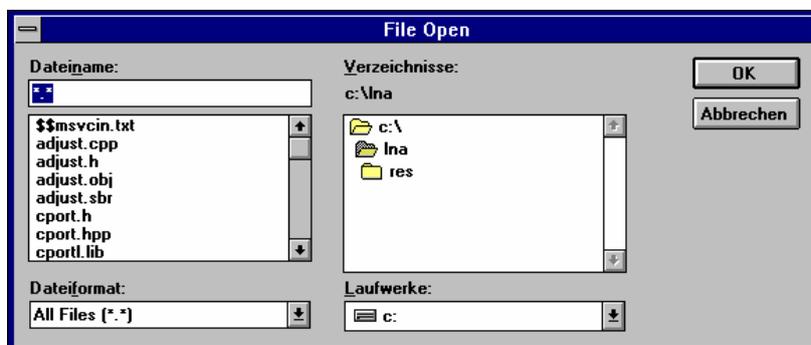


Figure 21: The “Open” dialog box

The “Directories” scroll box shows the current directory at the top with subdirectories below. By double-clicking on one of the subdirectories it is opened and the possibly nested directories are shown. Changing to a different disk drive is done by clicking the button next to the “Drives” box and choosing a drive from the pull-down list.

On the left side a file scroll box is shown listing the files available in the currently selected subdirectory. A filter on the files to be listed can be selected by clicking the button next to the “File format” box and choosing one of the available file formats from the pull-down list.

When opening a file it will come up with the “Packets” window showing the packets saved in the last session. The window will show the file name as its title. If no packets have been saved in the file, the window will remain empty. By choosing the “Nodes” command from the “Window” menu, you can make a previously uploaded and saved network description visible (if a network description was saved in the file).

You can also choose this command by typing <Ctrl-O>.

### Close

The “Close” command causes the file with the topmost window to be closed. All its windows will disappear. If the contents of this file was changed since the last time it was saved, a dialog box will appear asking whether it should be saved prior to closing. Clicking “Yes” will save the current contents of the file (the file name is in the title bar of all windows belonging to that file). If the file has not been saved before and it is “[Untitled]”, the “Close” command then functions as the “Save as...” command described below. Clicking “No” causes the current file contents to be discarded and all its windows to be closed. Clicking “Cancel” makes the dialog box disappear without changes to either the file or the displayed window.

Note that this does not work when closing a window through the standard MS Windows close box, since Windows does not know about the combination of windows that are related to one single file. However, closing the last window of a file will cause the “Save” prompt to appear.

Closing the last active window (either through this command in the “File” menu or through standard Windows close commands — double-clicking the upper left box in the window or pressing Ctrl-F4) causes the Easylon Analyzer program to display a minimal menu bar, containing a limited set of available commands.

### Save

If the active window has already a saved file attached to it (the filename is used in the window title), the “Save” command causes the current contents to be saved to the associated file on the haddisk. Previous file contents are overwritten. Always the complete current information is saved, i.e. the Packets window contents and the result of the last scan and upload with the latest states and values queried from the network nodes and NVs.

If no file was yet attached to the active window, the “Save” command behaves like the “Save As...” command described below.

You can also choose this command by typing <Ctrl-S>.

### Save as...

The “Save As...” command allows saving the contents of the active window (and associated windows, if a network upload and consistency check have been done) into a file. A dialog box is displayed asking for a filename and letting you navigate through the PC’s file system and decide where to place the file.



Figure 22: The “Save as...” dialog box

The directory structure to the right lets you select a directory by double-clicking it. On the left side, the files existing in the selected directory are shown. Give the name of the file to be saved in the text box above the file list, and click “OK” to save.

**Save as Text** The “Save as Text...” command allows saving the contents of the active Packets window in ASCII format. Not all of the data available in a normal Analyzer Packets window are written to the text file: only the packet number, time stamp, message type, the group number and group member of acknowledge and response messages inside a group addressed transaction and address information are saved, separated by tabs (and one packet to a line). This format, as shown below, is independent of the view format in the Packets window.

```

Gesytec Easylon Analyzer Version 1.50
25.4.1995
1 10:10:05.321 ACKD 0 S1 N1 G2 H_Netz 4 80010A0C1C
2 10:10:05.325 ACK 0 S1 N4 S1 N1 G2 M2 H_Netz 4
3 10:10:05.327 ACK 0 S1 N3 S1 N1 G2 M1 H_Netz 4
4 10:10:05.329 ACK 0 S1 N5 S1 N1 G2 M3 H_Netz 4
5 10:10:05.613 ACKD 0 S1 N2 G1 H_Netz 11 80000B60
6 10:10:05.623 ACK 0 S1 N4 S1 N2 G1 M2 H_Netz 11
7 10:10:05.626 ACK 0 S1 N5 S1 N2 G1 M3 H_Netz 11
8 10:10:05.628 ACK 0 S1 N3 S1 N2 G1 M1 H_Netz 11
9 10:10:06.181 ACKD 0 S1 N14 G9 Aufzug 3 800602050009
10 10:10:06.187 ACK 0 S1 N20 S1 N14 G9 M3 Aufzug 3
11 10:10:06.189 ACK 0 S1 N17 S1 N14 G9 M1 Aufzug 3
12 10:10:06.282 REM/MSG 0 S1 N14 G9 Aufzug 0A 3 800602050009
13 10:10:06.286 ACKD 0 S1 N1 G2 H_Netz 5 80010A0C1D
14 10:10:06.294 ACK 0 S1 N18 S1 N14 G9 M2 Aufzug 3
15 10:10:06.296 ACK 0 S1 N5 S1 N1 G2 M3 H_Netz 5
16 10:10:06.298 ACK 0 S1 N4 S1 N1 G2 M2 H_Netz 5
17 10:10:06.383 REM/MSG 0 S1 N1 G2 H_Netz 0C 5 80010A0C1D
18 10:10:06.390 ACK 0 S1 N3 S1 N1 G2 M1 H_Netz 5
19 10:10:06.484 ACKD 0 S1 N13 G8 Aufzug 4 800601020001
20 10:10:06.492 ACK 0 S1 N18 S1 N13 G8 M2 Aufzug 4
21 10:10:06.495 ACK 0 S1 N19 S1 N13 G8 M3 Aufzug 4
22 10:10:06.497 ACK 0 S1 N17 S1 N13 G8 M1 Aufzug 4

```

Figure 23: Sample result of “Save as Text...”

**Print** The “Print” command allows the contents of the active window to be printed to a connected printer. If no printer has been selected, the program will prompt you to do so prior to executing this command. The layout of the appearing printer dialog box and the options available for printing depend on the particular printer driver software that is used. Note that the screen layout may be different from the format that is used in printing the data on paper.

You can also choose this command by typing <Ctrl-P>.

**Print to Text** The "Print to Text" command directs the contents of the current window (Packets, Nodes, Report) to be printed into a text file rather than on a printer, as with the normal "Print"

command. Thus list entries are separated by blanks and lines are terminated with a carriage return.

1	10:10:05.32	ACKD	4	1/ 1	DCF-77 [A031]	-> Group: 2	Domain: H_Netz
					DCF-Zeit -> Group	10:12:28	
2	10:10:05.32	ACK	4	1/ 4	AEG-Anz [A003]	-> 1/ 1	DCF-77 [A031] Domain: H_Netz
3	10:10:05.32	ACK	4	1/ 3	AEG-Anz [Foyer]	-> 1/ 1	DCF-77 [A031] Domain: H_Netz
4	10:10:05.32	ACK	4	1/ 5		-> 1/ 1	DCF-77 [A031] Domain: H_Netz
5	10:10:05.61	ACKD	11	1/ 2	LPT_Temp [A013]	-> Group: 1	Domain: H_Netz
					Temperatur -> Group	17.2	
6	10:10:05.62	ACK	11	1/ 4	AEG-Anz [A003]	-> 1/ 2	LPT_Temp [A013] Domain: H_Netz
7	10:10:05.62	ACK	11	1/ 5		-> 1/ 2	LPT_Temp [A013] Domain: H_Netz
8	10:10:05.62	ACK	11	1/ 3	AEG-Anz [Foyer]	-> 1/ 2	LPT_Temp [A013] Domain: H_Netz
9	10:10:06.18	ACKD	3	1/ 14	Kopier [.25]	-> Group: 9	Domain: Aufzug
					Kopier_Status -> Group	02050009	
10	10:10:06.18	ACK	3	1/ 20	Tuer [.2]	-> 1/ 14	Kopier [.25] Domain: Aufzug

Figure 24: Print to text

**Print preview** The "Print preview" command displays a preview on the screen of the results using the "Print" command.

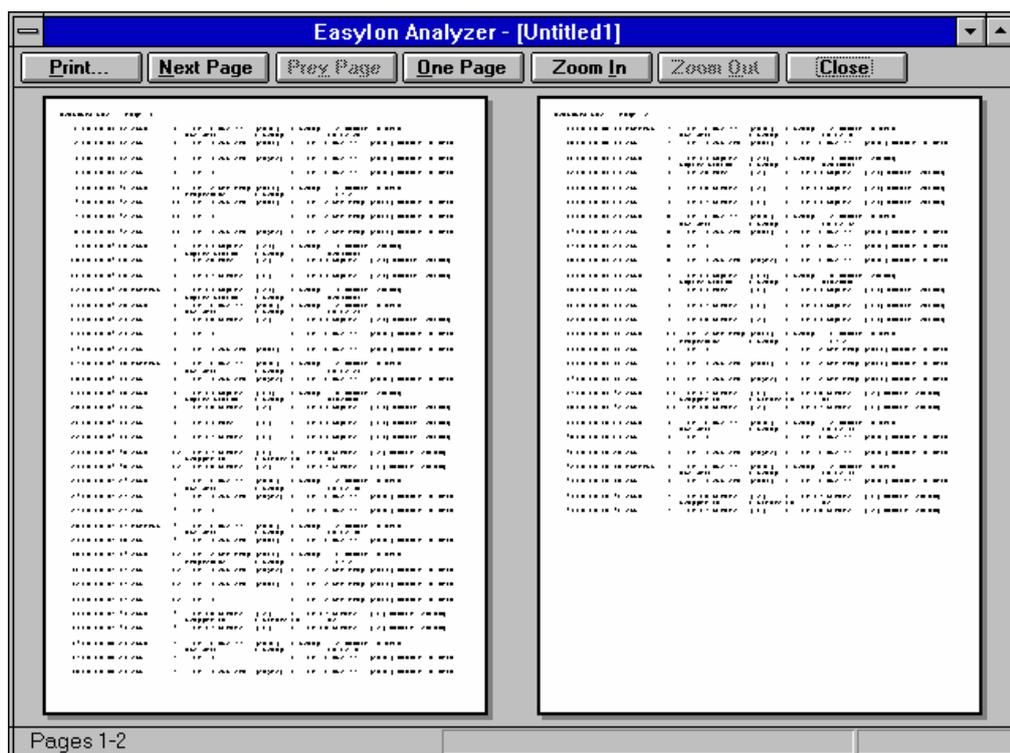


Figure 25: Print preview

Within the full page view window, you can use zoom and paging buttons to look at specific details in the window contents to be printed. From this window you can execute a "Print" command by clicking the "Print..." button. You can also switch between displaying one page at a time or two pages side by side. To exit this window click the "Close" button.

- Printer Setup** The “Print Setup” command causes a dialog box to appear allowing you to select the printer for the window contents that you may want to print. The appearing dialog box and the options available for printing depend on the particular printer driver software that is used.
- Recent Files** Up to 4 files are listed as the most recently opened and saved files you have been working on. This allows for faster opening of often used files than navigating through your file system as you would have to using the “Open” command. If you open or close a file it appears as the first listed in the active file list inside the “File” menu.
- Exit** The “Exit” menu causes a dialog box to appear prompting you for an acknowledgement of your wish to exit the program. Clicking “OK” causes all open windows to be closed before the program exits. This may cause further dialog boxes to appear, asking whether window contents should be saved prior to closing. Clicking “Cancel” in any of the appearing dialog boxes causes the closing down of the program to be interrupted at that point.

## 5.2.2 The Edit Menu

In the “Edit” menu the only active commands in the current version of Easylon Analyzer are the “Find” commands. These allow you to search for specific packets inside the already available ones, i.e. to search inside the contents of the active Packets window.

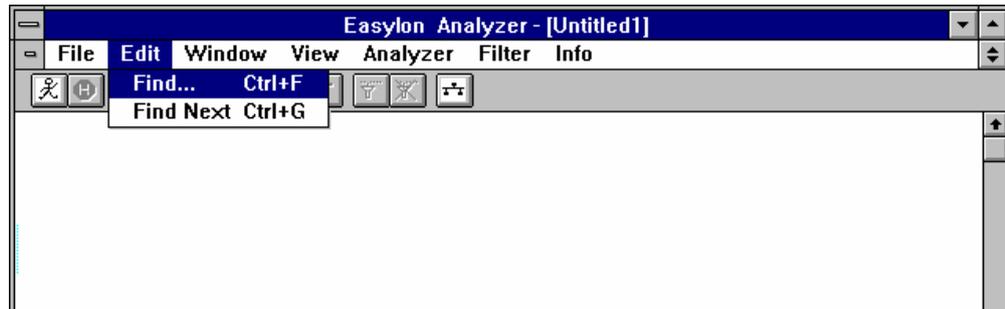


Figure 26: The Edit menu in its pulled-down state.

### Find...

The “Find” command allows you to search for a specific packets inside the active window contents. Choosing this command makes a dialog box appear in which you can indicate the type of message you want to search for. The search keys include source node, destination node or group, message contents (given as hexadecimal data).

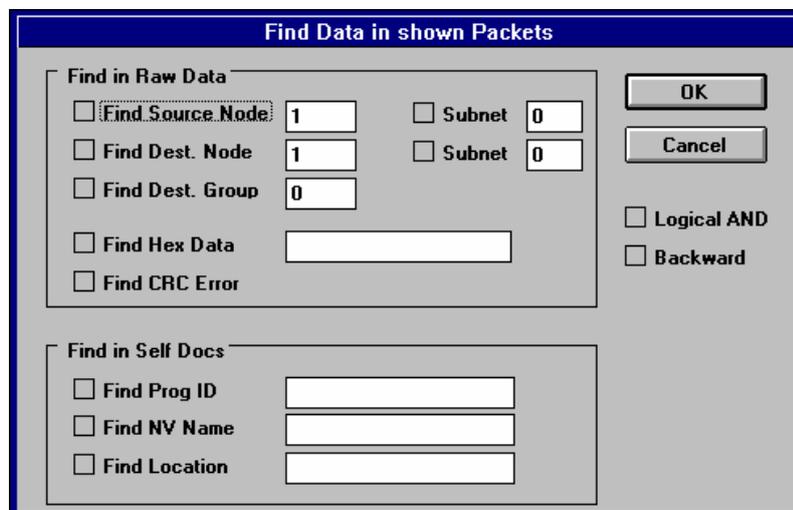


Figure 27: The “Find” dialog box

The options in the “Find” dialog box are grouped in two main fields: one relating to the raw message data (this can be used at any time) and one relating to NEURON Chip and network variable names (this can only be used when such names are available, i.e. after a network scan has been performed or read in from file). The raw message data can be searched using the source node/subnet or destination node/subnet or group. Make sure you click the appropriate check box next to the specification you have indicated in order to enable the entered search key.

The self-documented data can be used to define a search key on the basis of node or network variable names. Clicking the “Logical AND” box to the right makes the selected search keys

work in combination, i.e. through this option you narrow down the search for a specific packet.

Check the "Backward" box to reverse searching from newer to older packets.

You can also activate this menu by typing <Ctrl-F>.

**Find Next**

The "Find Next" command causes a search for the next occurrence of the packet that was searched before (even if such a packet was not found during the previous search). This command allows you to search repeated occurrences of similar packets without having to answer a dialog box every time.

The "Find Next" command takes the previously found message as the starting point for the renewed search. Even if another packet was selected, a "Get until Find" command or a "Show Trigger" was executed, the "Find Next" returns to the previously found message before searching in the same direction as with the previous "Find" command for the next packet complying with the same specifications.

The "Find Next" command can also be called by typing <Ctrl-G>.

### 5.2.3 The Window Menu

The commands in the “Window” menu allow you to look at three main parts of information gained using the Easylyon Analyzer and to display or hide the toolbar and status bar.

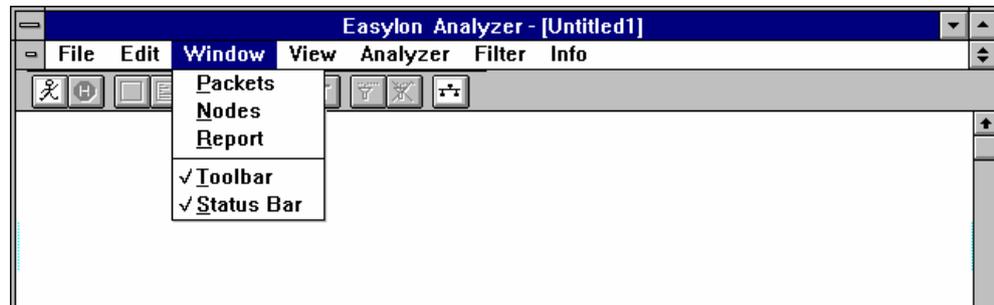


Figure 28: The “Window” menu in its pulled-down state.

**Packets** The “Packets” command causes the “Packets” window to appear, i.e. the message packets previously read in from the Analyzer using a “Get...” command appear in the active window. If no packets have been read in yet, the window remains empty.

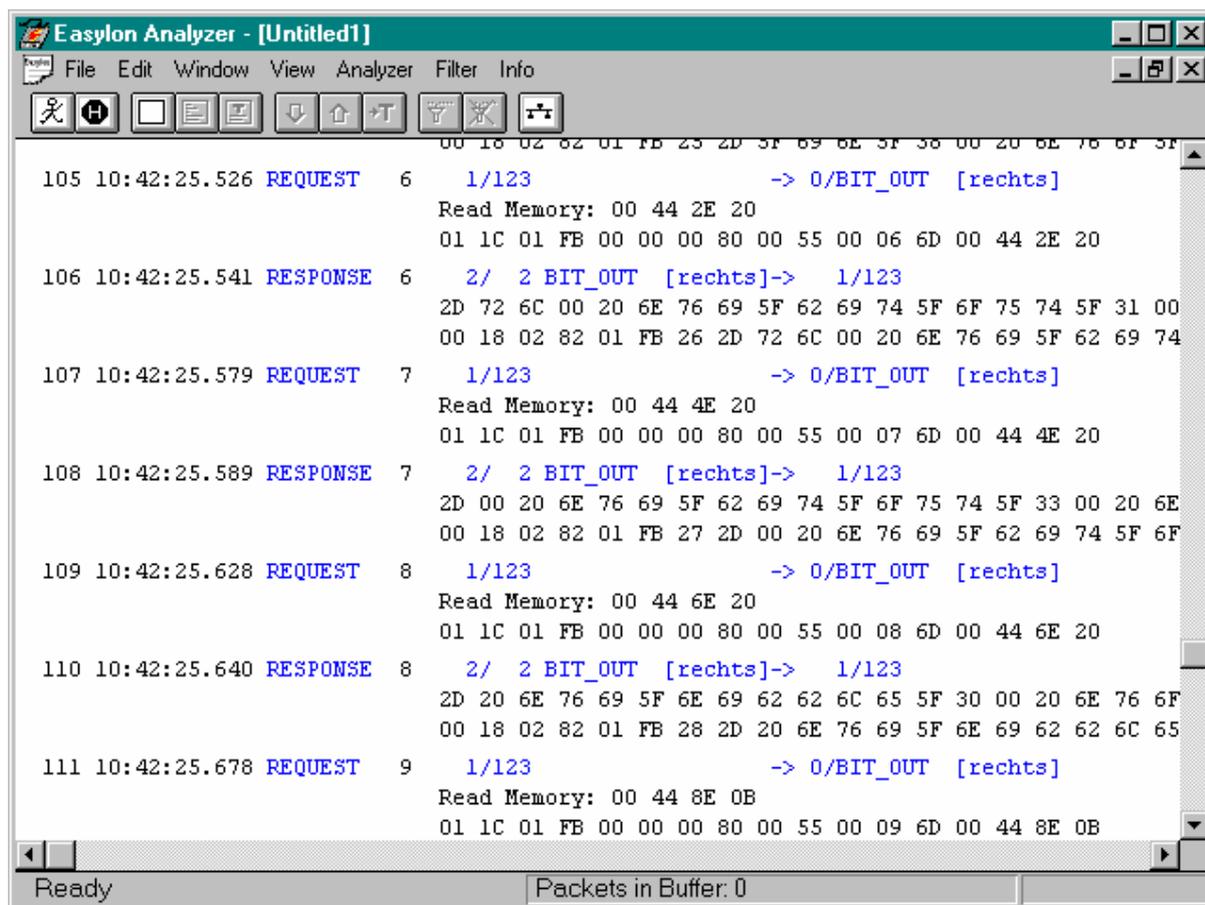


Figure 29: A Packets window

Packets can be shown in a number of different formats, which are controlled by commands from the “View” menu. See that section for more details.

The Packet window in figure 29 above displays the following information:

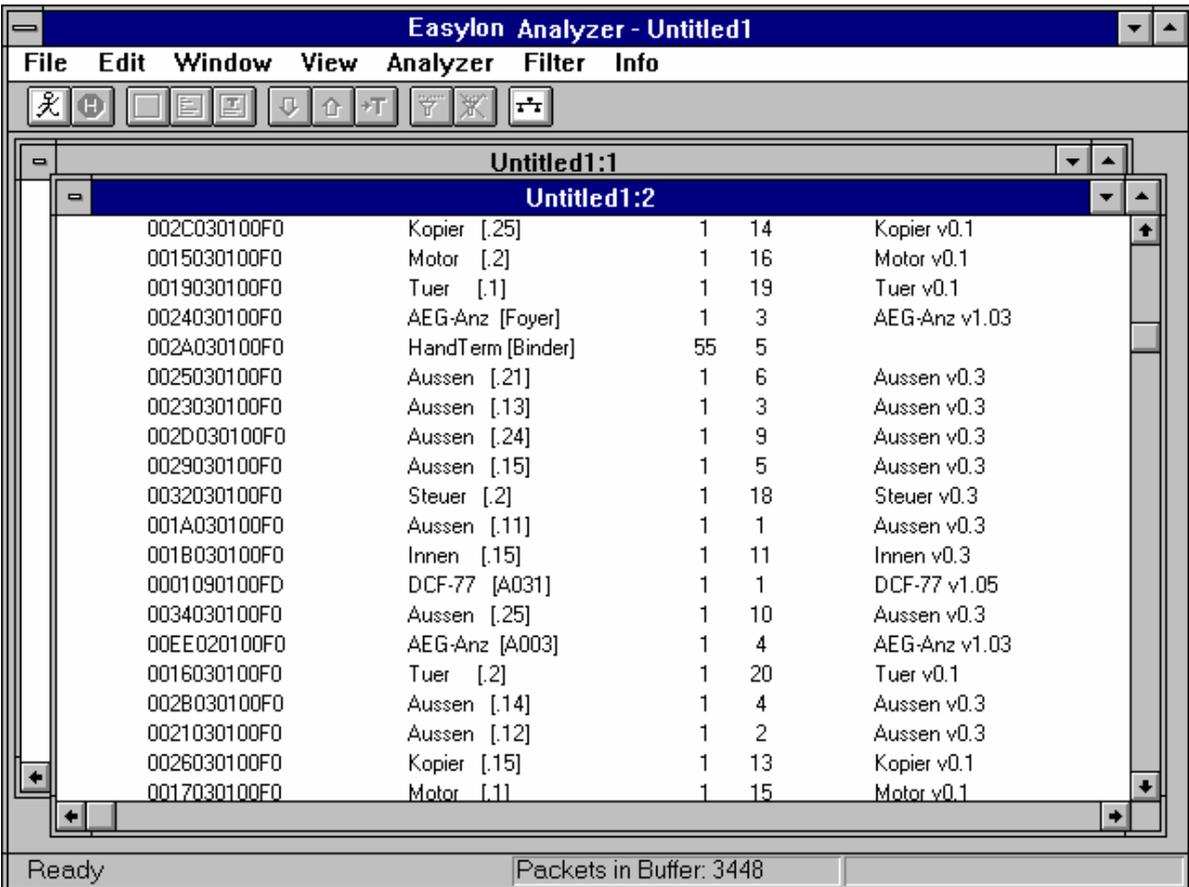
Sequence number, time stamp, service type, transaction number, subnet, node, node name and location of the source node and of the destination node, network domain, followed by the message data. Message data can be explicit messages or NVs with values, which in case of SNVT type NVs are displayed as formatted values.

Sequence numbers are continuous as received on the PC even if recording was interrupted by the user or messages are missing because older messages have been overwritten. In case of missing packets a dotted red line is inserted.

The “T” mark in front of the sequence number indicates trigger packets.

## Nodes

The “Nodes” command causes the “Nodes” window to appear. If no network was scanned or a previously executed network upload has not been saved in the current file this window will remain empty.



The screenshot shows the Easylon Analyzer software interface. The main window is titled "Easylon Analyzer - Untitled1" and contains a menu bar (File, Edit, Window, View, Analyzer, Filter, Info) and a toolbar. A sub-window titled "Nodes" is open, displaying a list of network nodes. The list has four columns: Node ID, Node Name, Subnet, and Node Number. The data is as follows:

Node ID	Node Name	Subnet	Node Number
002C030100F0	Kopier [25]	1	14
0015030100F0	Motor [.2]	1	16
0019030100F0	Tuer [.1]	1	19
0024030100F0	AEG-Anz [Foyer]	1	3
002A030100F0	HandTerm [Binder]	55	5
0025030100F0	Aussen [.21]	1	6
0023030100F0	Aussen [.13]	1	3
002D030100F0	Aussen [.24]	1	9
0029030100F0	Aussen [.15]	1	5
0032030100F0	Steuer [.2]	1	18
001A030100F0	Aussen [.11]	1	1
001B030100F0	Innen [.15]	1	11
0001090100FD	DCF-77 [A031]	1	1
0034030100F0	Aussen [.25]	1	10
00EE020100F0	AEG-Anz [A003]	1	4
0016030100F0	Tuer [.2]	1	20
002B030100F0	Aussen [.14]	1	4
0021030100F0	Aussen [.12]	1	2
0026030100F0	Kopier [.15]	1	13
0017030100F0	Motor [.1]	1	15

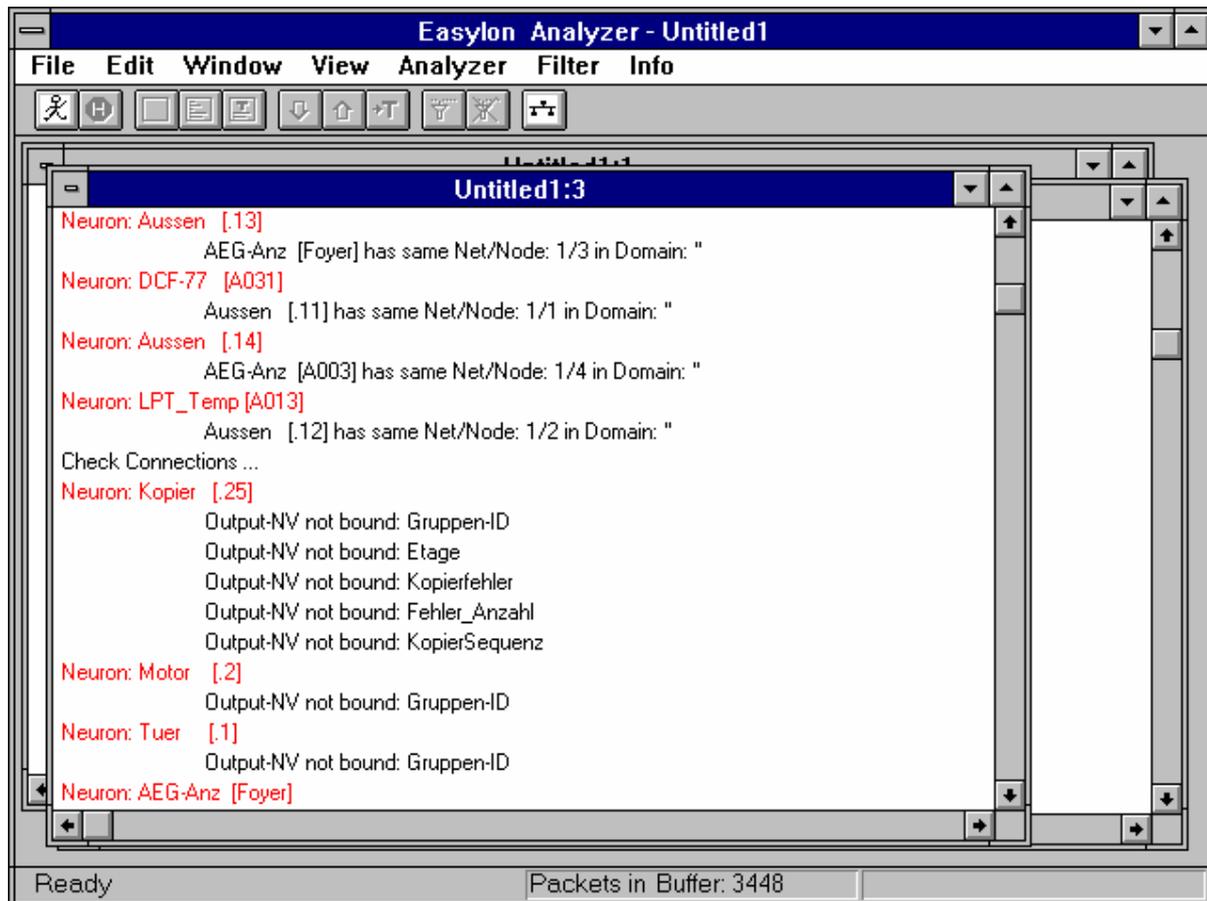
The status bar at the bottom of the window shows "Ready" and "Packets in Buffer: 3448".

Figure 30: A Nodes window

The Nodes window contains a description of the available nodes in domain that you are analyzing, including NEURON IDs, ID string and location, subnet and node numbers and the contents of the node self-documentation.

Calling the “Scan Network” command from the “Analyzer” menu will automatically open the Nodes window.

**Report** The “Report” command causes the “Report” window to appear, showing information generated through the “Consistency Report” command previously. If this command was not yet executed the window will remain empty.



**Figure 31:** A Report window

The Report window contains status information on the NEURON Chips in the domain that you are analyzing and status on the network variables in the network. Both of these parts of the information are optionally displayed, depending on the options chosen when generating the report. See the “Consistency Report” command in the “View” menu for more details.

**Toolbar** The “Toolbar” command toggles the toolbar on and off. The toolbar is located immediately below the menu bar and offers short cuts for the most used commands of Analyzer in the form of buttons.

Buttons that can be selected are shown in white. When the command cannot be executed or does not have a meaning in the current context its color is Grey and nothing happens when clicking it.

Below is a list of buttons available on the toolbar together with the command names that they are associated with. For detailed information on these functions, we refer to the manual entries for each of these commands.



**Figure 32:** The toolbar

	New Recording (clears Analyzer buffer first)
	Stop Recording
	Delete Packets
	Get 100 Packets
	Get until Trigger
	Next Page
	Prev Page
	Show Trigger
	Activate Filters
	Deactivate Filters
	Scan Network

**Status Bar** The “Status Bar” command toggles the status bar on and off. The status bar is shown on the bottom of the active window and displays on the left side additional menu information. In its center the number of packets in the Analyzer’s buffer is displayed. On the right hand side information on currently recorded packets per second is given.

### 5.2.4 The View Menu

The “View” menu contains commands which allow you to control the representation of the shown information on the screen. Also, a consistency report can be made and shown, on the basis of a network description that was made earlier.

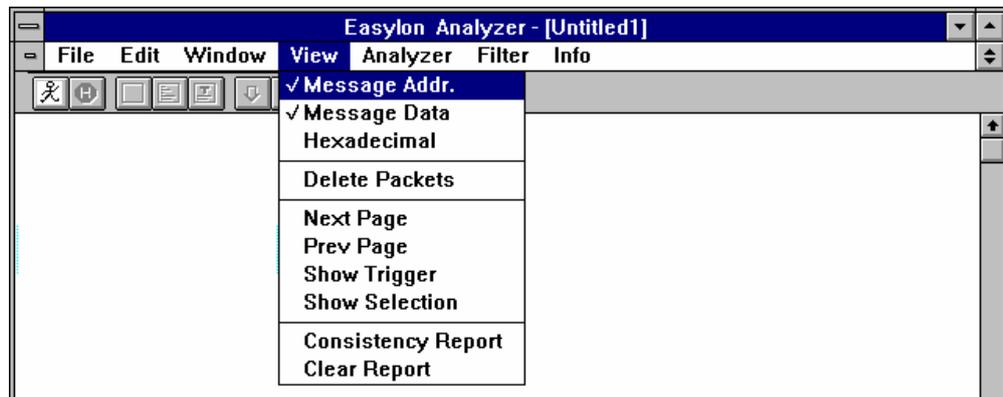


Figure 33: The View menu in its pulled-down state.

#### Message Addr.

The “Message Address” command will show the Message Address part of the displayed packets information in the Packets window (see figure 34 below). When Message Address view is active, the command name is ticked in the menu.

The Message Address view is only valid in the Packets window and may be combined with Message Data and/or Hexadecimal display options.

By default, the Message Address view is switched on when opening a file.

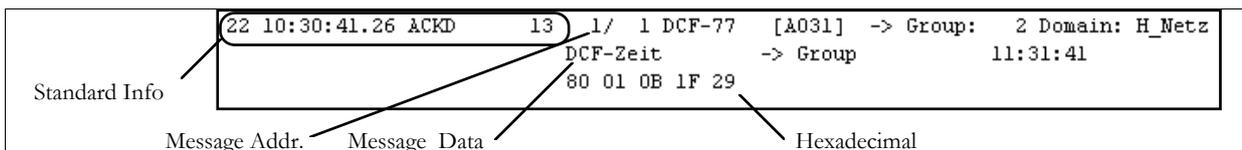


Figure 34: Display option of the View menu

#### Message Data

The “Message Data” command will show the Message Data part of the displayed packets information in the Packets window (see figure 34 above). When Message Data view is active, the command name is ticked in the menu.

The Message Data view is only valid in the Packets window and may be combined with Message Type and/or Hexadecimal display options.

By default, the Message Data view is switched on when opening a file.

**Hexadecimal** The “Hexadecimal” command will show the data of the displayed packets in hexadecimal notation (see figure 34 above). When Hexadecimal view is active, the command name is ticked in the menu.

The “Hexadecimal” view is only valid in the Packets window and may be combined with Message Address and/or Message Data display options.

By default, the Hexadecimal view is switched off when opening a file.

**Delete Packets** The “Delete Packets” command causes all packets displayed in the active Packets window to be deleted. This command does not affect the packets that are still remaining in the packet buffer of the Analyzer nor those already saved to file.



This command can also be called through the corresponding button in the toolbar.

**Next Page** The “Next Page” command will display the next page of the packets window. If a next page is not available the command is disabled.

Packets window pages are not related to printable pages but to displayable pages inside the Windows system. The windows used only permit up to 64K possible positions within the displayed information set, due to limitations set on the positioning of the scroll box on the right-hand side of the window.

When all packets do not fit into the same window anymore a new window is opened as a next page.



The “Next Page” command is also available as a button in the toolbar, indicating an arrow pointing down.

The command can also be issued using the keyboards “PageDn” key.

**Prev Page** The “Prev Page” command will display the previous page of the packets window. If a previous page is not available, the menu is disabled.

The pages are not related to printable pages, but to displayable pages inside the Windows system. The windows used only permit up to 64K possible positions within the displayed information set, due to limitations set on the positioning of the scroll box on the right-hand side of the window.



The “Prev Page” command is also available as a button in the toolbar, indicating an arrow pointing up.

The command can also be issued using the keyboards “PageUp” key.

**Show Trigger** The “Show Trigger” command causes the active window to scroll to the page and position where the trigger packet is located. The trigger packet is selected (highlighted with a blue background). If no trigger was read in from the Analyzer’s packet buffer yet this command is disabled.



The “Show Trigger” command is also available in the form of a button on the toolbar.

**Show Selection**

The “Show Selection” command causes the active packet window to scroll to make a previously selected message visible. The selection may have been made by hand or by executing a find command. This command is useful when looking at the wider context of a certain message before investigating the message further: when scrolling away from the packet it does not need to be searched again if no other selection has been made since then.

Returning to a previous selection does not function if a Page-related command (Next Page or Prev Page) has been executed, since these commands have as a side-effect that either the first or the last packet of the newly displayed page are selected. The selected packet cannot be on a different page from the one currently displayed.

Since no selection is possible in the Nodes or Report windows, the “Show Selection” command does not work in these windows.

**Consistency-Report**

The “Consistency Report” command enables the production of a consistency report between the currently attached window and the contents of a NEURON Chips window, which is either read in from a file or uploaded from the network previous to executing the “Consistency Report” command.

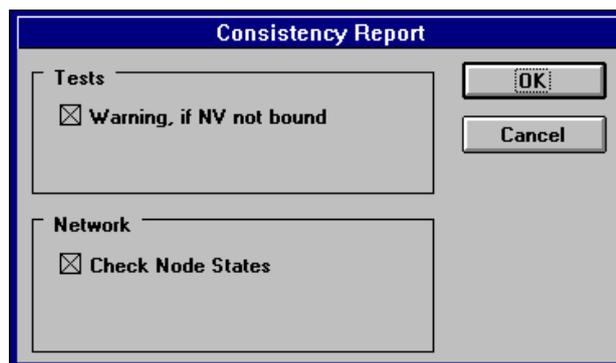


Figure 35: The “Consistency Report” dialog box

When generating a consistency report, you can choose to have network consistency and/or network variable binding checks included. This is done through clicking the appropriate check boxes in the dialog box. By default, both checks are included.

If network variables are not bound, nodes are not available etc., the consistency report show this in normal readable text. The report is generated through the Analyzer’s NEURON Chip, which is capable of generating directed messages to all other NEURON Chips on the same domain, requesting the status of network variables and internal NEURON Chip states to be reported to it.

**Clear Report**

The “Clear Report” command causes the existing Report window to be cleared. The contents of this window will never be saved, since the consistency report is the result of an analysis on the basis of network information. A new consistency report can be generated from information uploaded from the network or stored with the “Save” command at any time.

## 5.2.5 The Analyzer Menu

The commands in the “Analyzer” menu are divided into four functional groups, which are all related to the EasyLyon Analyzer’s hardware.

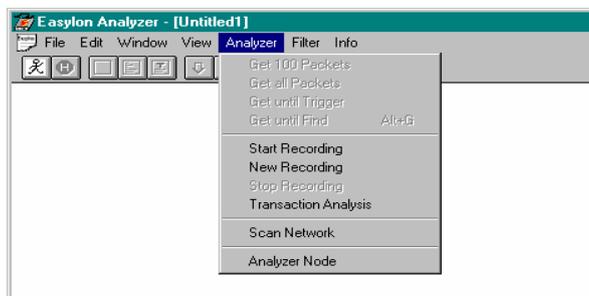


Figure 36: The Analyzer menu in its pulled-down state.

### Get 100 Packets

The “Get 100 Packets” command causes the next 100 packets to be collected from the Analyzer hardware, i.e. the PC receives the next 100 packets that are stored in the packet buffer of the Analyzer. Note that there is no selection of packets: the first 100 packets available in the Analyzer’s packet buffer are read in. Reading packets causes the number of remaining packets in the packet buffer to decrease, as is visible in the middle of the status bar.



The command is available through a button on the toolbar.

### NOTE

All “Get...” commands can be used while recording continues.

### Get all Packets

The “Get all Packets” command causes all remaining packets in the Analyzer’s packet buffer to be transferred to the PC. This causes the packet buffer to become empty.

If the packet buffer was completely filled before new packets have been read into the PC, a hiatus in the listed packets appears. Since there is no way of keeping track of the number of skipped packets, numbering of the packets in the window continues where it was. A possible hiatus in the shown packets is indicated as a red dotted line.

### Get until Trigger

The “Get until Trigger” command causes all packets to be read in up to and including the last recorded trigger packet. If no trigger packet was yet recorded, this command behaves like the “Get all Packets” command. Trigger packets are set in the “Filter” menu and allow control of the packet buffer in the Analyzer: if a certain packet type is associated with the trigger command, the Analyzer will either stop recording immediately messages after the trigger packet arrives or after a specified number of packets have arrived following this trigger. Additionally, the trigger function can be set to accept several occurrences of the trigger type packet before terminating recording.

In the Packet window a trigger packet is marked with a “T” in front of the sequence number.



The command is available through a button in the toolbar.

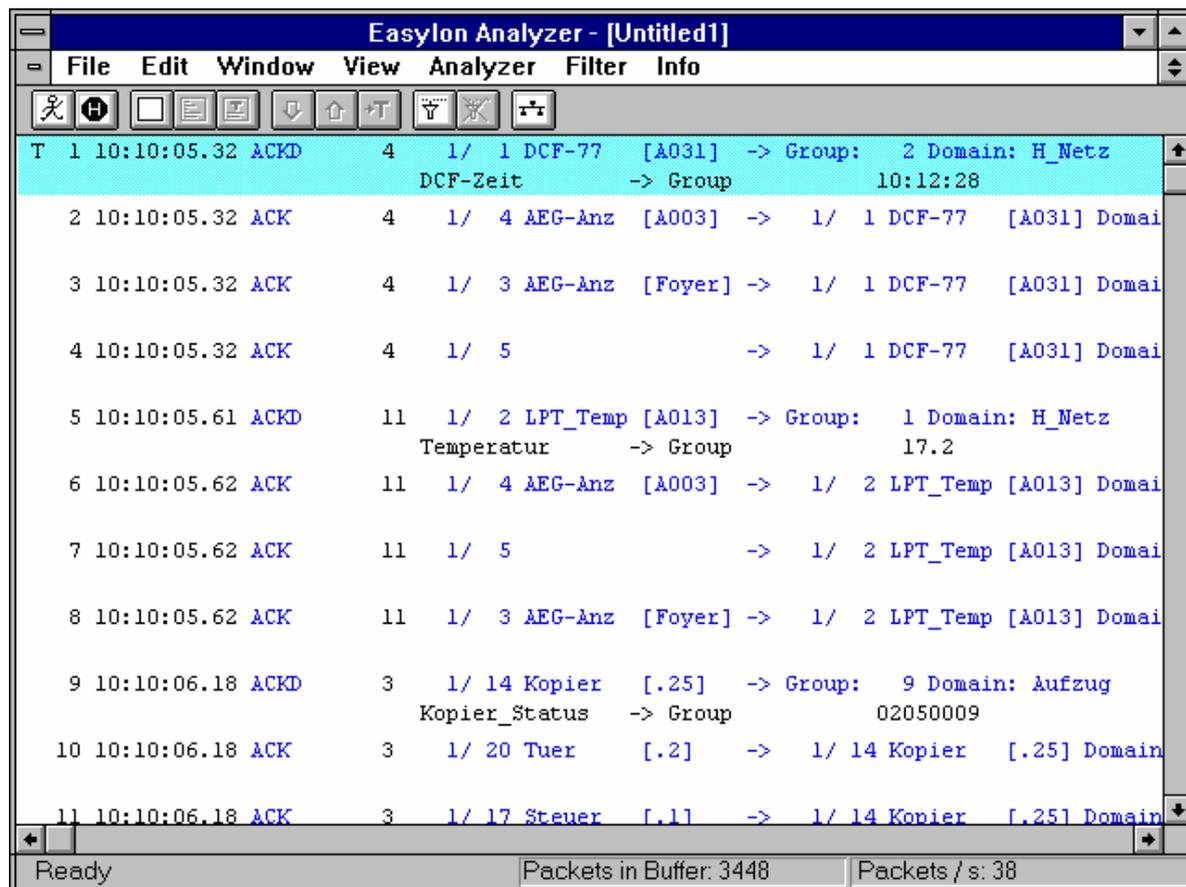


Figure 37: Packet window with trigger

See the “Filter Group” menu for explanation about setting a trigger and determining the number of packets to be recorded after the trigger has occurred. See the Tutorial section in the User Manual for more explanation on how to use combined filters and triggers in analyzing the status of the network.

**Get until Find** The “Get until Find” command causes a all packets to be read in from the Analyzer’s packet buffer until a packet arrives which is previously defined in the “Find” command of the “Edit” menu.

You can also choose this command by typing <Alt-G>.

**Start Recording** The “Start Recording” command tells the Analyzer to start recording packets from the network into its packet buffer. If the Analyzer was already recording, this command has no effect.

**New Recording** The “New Recording” command causes the Analyzer to delete the contents of its packet buffer and restart recording packets from the network. Note that this command does not change the contents of the visible window. If the Status Bar is visible the number of recorded packets starts increasing (unless no traffic occurs on the domain or all occurring packets are filtered out by the activated filter group). After new packets have arrived, these can be read into the PC using one of the various “Get ...” commands from this “Analyzer” menu.



You can also choose this command through clicking the button in the toolbar.

**NOTE** The buffer contents is cleared before recording starts

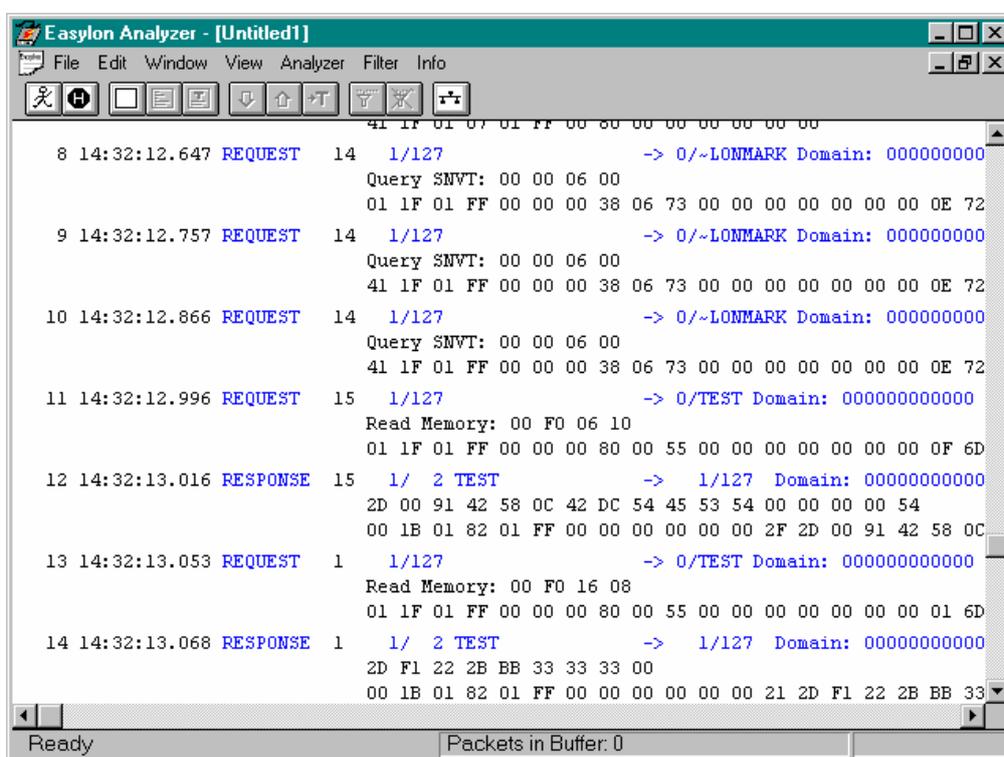
**Stop Recording** The “Stop Recording” command causes the Analyzer to stop collecting packets into its packet buffer.



You can also choose this command through the button in the toolbar.

**Transaction Analysis** Selecting “Transaction Analysis” will clear the packet buffer and start recording using a special filter. This filter is used to record erroneous transactions. Only the last two retries of a lost transaction are stored. If the packet buffer stays empty, no transaction error has been detected.

The "Get packets" command is used to show the result of the transaction analysis in the Packets Window.



**Figure 38:** Packets window of Transaction Analysis

The "Stop recording" command stops the transaction analysis, but the transaction error filter is still activated. To clear this filter, the "Deactivate filters" command must be used.

**Scan Network** The “Scan Network” command allows a network description to be uploaded, either as a complete new scan or as an extension of a previously saved (and currently opened) network scan.

Choosing this command makes a dialog box appear, in which options for the scan can be set:

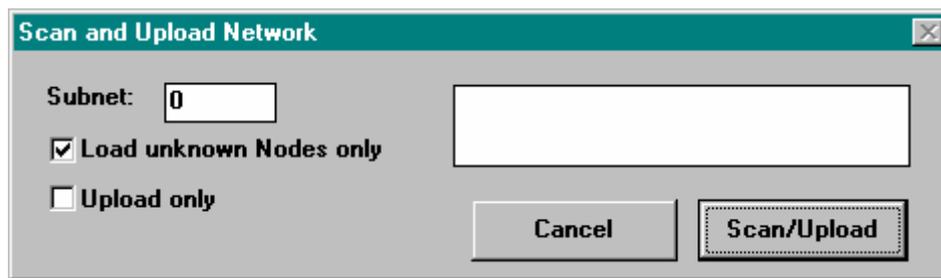


Figure 39: Scan Network dialog box

Scanning of all nodes of a domain can take quite a while if the domain has a large number of nodes. If you want to scan the network for possibly added nodes (e.g. when you found some nodes were missing in a first scan, and you found that they were not powered on yet, you want to do a new scan after switching the missing nodes on), you do not need to scan the entire network. Choosing the “Load unknown Nodes only” can save a lot of time.

During the network scan the dialog box shows the progress: the total number of nodes found and an index counting the number of nodes already scanned. The total number of nodes in the current domain is determined first; after this each single node is addressed for its network variables and further internal status information. All information is stored in the temporary database on the PC for further use by the Analyzer program.



You can also choose this command by clicking the corresponding button in the toolbar.

#### Analyzer Node

The “Analyzer Node” command allows controlling the network-related settings of the Analyzer’s NEURON Chip, i.e. its subnet and node numbers and the domain to which the Analyzer belongs. You can use the pop-up menu next to the domain field to choose from the available domain names. If no network scan has yet been done this list will be empty. The default domain to which the Analyzer belongs as a network node is the Null-Domain.

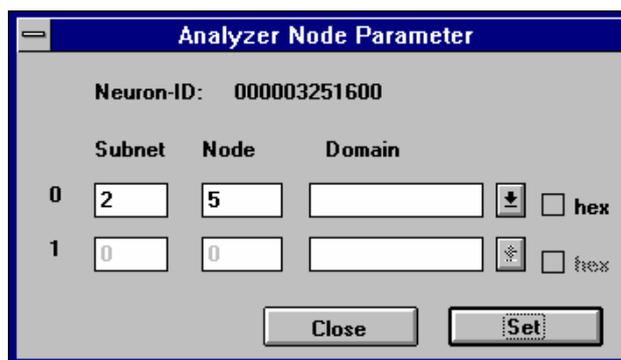


Figure 40: The “Analyzer Node Parameter” dialog box

The menu allows setting the subnet and node IDs of the Analyzer. Make sure the subnet/node ID that you indicate is not yet used in the domain to be analyzed, since this will make any node with the same subnet/node ID invisible to the Analyzer. The safest and easiest method to avoid this problem is to give the Analyzer a subnet ID which is not used by any of the nodes in the domain that you want to analyze.

## 5.2.6 The Filter Menu

The commands in the “Filter” menu allow definition and activating of filters and triggers. These determine which packets are recorded by the EasyIon Analyzer hardware and which are ignored.

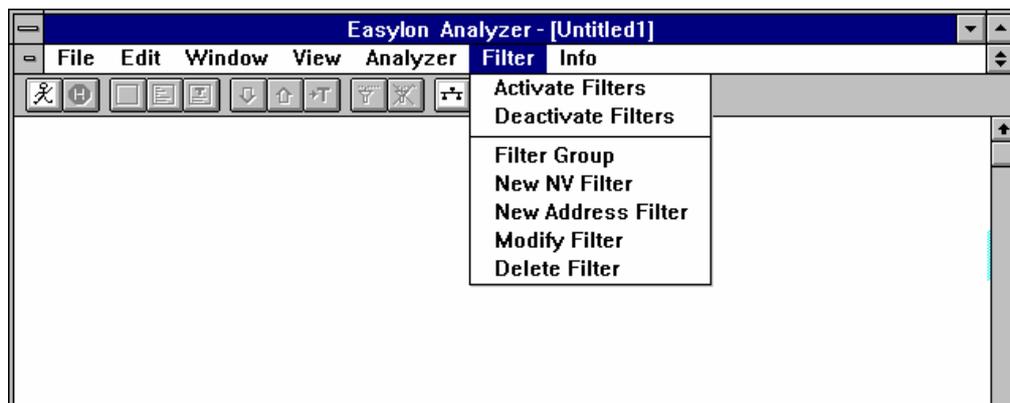


Figure 41: The Filter menu in its pulled-down state.

### Activate Filters

The “Activate Filters” command causes the previously defined filter group to be activated. Whenever the filter group has been changed or any of the filters have been modified, the filters have to be explicitly activated before newly added or modified filters can take effect in the Analyzer.



Activating the filters can also be done by clicking the appropriate button on the toolbar. Before you can activate filters you have to select your current filters first with the “Filter Group” command. The “Activate Filters” command is enabled only after doing so. Activating filters can also be done directly from the “Filter Group” dialog box.

### Deactivate Filters

The “Deactivate Filters” command causes the defined filter group to become deactivated; the Analyzer will from this moment on record all packets.



Deactivating all filters can also be done by clicking the appropriate button on the toolbar.

**Filter Group** The “Filter Group” command allows setting of filters, i.e. selecting filter descriptions which have been made previously through the “New NV-Filter” or “New Address-Filter” commands and associating these to actual filtering conditions. In the filter descriptions you specify a certain type of packet, on the basis of sender and addressed nodes identification, message type or parts of the message contents. See the corresponding command descriptions for more details on the filter definitions.

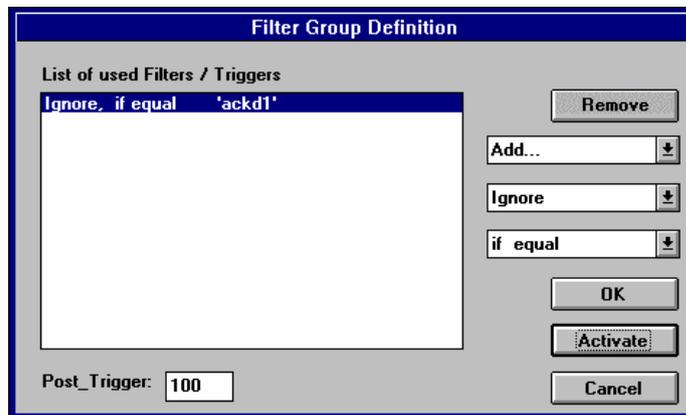


Figure 42: Filter Group Definition dialog box

When first opening the “Filter Group” dialog box, the list of filters in the group is empty. You add filters, conditions and associated commands to the list by clicking the “Add” button. This shows the list of available filters, according to the previously defined and named filters.

After you have added a filter you need to define a condition (equal to, not equal to, ...) for the comparisons that are made between each message packet and the filter specification by the Easylon Analyzer hardware when listening in on the network communications. You do this through the lower pull-down menu: click the arrow and select the desired condition.

Finally you have to define an action to be taken by the Analyzer when an actual packet matches the filter and assigned condition. This action can be to show the packet, to ignore it or to trigger on it. Use the middle pull-down menu for these commands. If you choose “show”, all packets matching the filter and assigned condition will be recorded in the Analyzer’s packet buffer and can be made visible through one of the “Get...” commands.

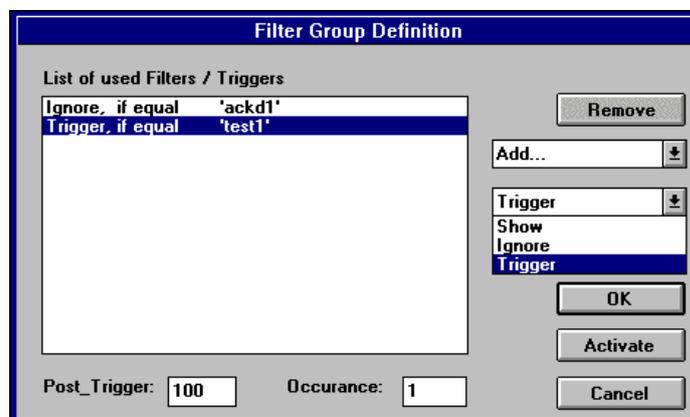


Figure 43: The command menu inside the Filter Group dialog box

When you choose to ignore the specified type of packets any packets matching the filter are ignored, regardless of whether they fit a type description for a filter associated with the “show” command. With combinations of filter descriptions associated to the “show” and “ignore” commands it is possible to define a hybrid type of set of packets to be recorded by the Analyzer. For example, you might want to record all packets sent to node number 4 except when coming from node number 0. To get this effect, you define a filter matching all packets with destination node 4 and associate the “show” command to it; also, you define a filter matching all packets initiated from node 0 and associate the “ignore” command to it.

The “Trigger” command causes the Analyzer to stop recording when a packet matching the filter used as trigger has been found (you can indicate a later occurrence of this trigger packet as well). A number of messages to be recorded after the trigger event can be specified in the Post Trigger box. This option is used when you want to investigate a specific packet occurrence (in most cases you will be looking for an error condition which leads to subsequent errors). Using the trigger command, you can size down the number of recorded and subsequently shown packets to concentrate on a certain condition or status appearing in the network. The “Get until Trigger” command helps to quickly find the trigger event.

Also (and perhaps a more important use), you may use triggers to detect some seldom appearing packets in a domain and freeze it and the preceding and following messages in the packet buffer. So you are able to make investigations to the point, especially if you use the “occurrence” and Post Trigger settings with deliberation. The Analyzer can observe the network for hours (even without a PC connected) and will keep the interesting log of the network traffic—the buffer contents will not be overwritten after the trigger event. Effects of the trigger event can be studied (e.g. when a network variable with a too high value is propagated through the network, you need to see how the other nodes respond to the error condition).



The selected filters with their associated conditions and commands are listed. Only these filters will be used by the Analyzer. They can be activated from within this Filter Group dialog box or through the “Activate Filters” command or corresponding button.

## New NV Filter

The “New NV Filter” command enables the definition of a filter through the use of network variables. This menu is only available if a scan of the network has been made previously or if a network description has been read in from a file. Note that in the latter case you must be certain that the network description in the file matches the actual status of your network. It might be useful to look at the consistency report for this.

The New NV Filter dialog box allows you to browse through all known nodes in the current domain and subsequently indicate a certain network variable as the base definition of a filter.

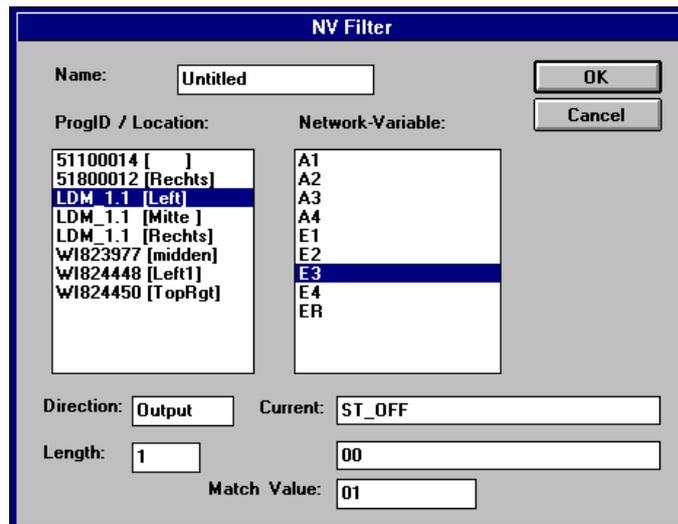


Figure 44: New NV Filter dialog box

On the left a list of available nodes is displayed. Selecting one of these nodes makes a list of its network variables appear on the right, of which you can select one. If you want to define more than one filter, you should name each filter individually; if you do not name the filter it will appear in the filter description list of the “Filter Group” command as “Untitled”.

When selecting a network variable its current value is queried from the network and displayed in the “New NV Filter” dialog box. You can make the filter description more specific by entering a “Match Value”: in that case only messages with the selected NV having this value will be identified by the Easylon Analyzer and are then handled according to the settings in the Filter Group dialog box. This option is useful when trying to detect a specific error condition without wanting to read in all messages surrounding it.

**New Address Filter** The “New Address Filter” command enables the definition of a filter packet type on the basis of network addresses rather than using the network variables. You want to do this when checking all messages travelling to one specific node or a group of nodes or all packets generated by a single node.

Figure 45: The “New Address Filter” dialog box

The dialog box contains a number of pop-up menus hidden behind the buttons to the right of each option box. Clicking the button enables you to choose one of the available options.

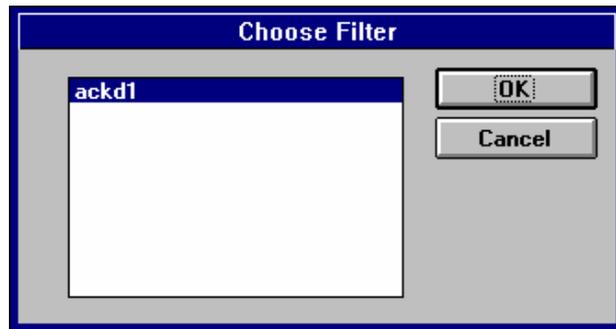
Selecting a sender node (Source Address) is always specific: you indicate the subnet and node ID and the ProgID.

You can also specify a filter on the basis of addressed nodes (Destination Address). In this option, you can choose subnets, specific nodes or groups (if these have been defined). The selected “Address Format” influences the possible entries for the Destination Address. Possible choices are “subnet/node”, “broadcast” or “group”.

By combining the sender and addressed node specifications, you can narrow down the filter description to only cover traffic between two individual nodes.

Note that you must name the address filter if you want to work with multiple filters: you need to be able to specify the correct filter descriptions by name in the “Filter Group” command. Not naming a filter causes it to appear as “Untitled” in the filter menu of the “Filter Group” dialog box.

**Modify Filter** The “Modify Filter” command allows changing previously made filter descriptions. This command causes a dialog box to appear through which you can choose the filter to be modified. Select the filter you want to modify and click “OK”. This takes you into the same dialog box as when choosing either “New NV Filter” or “New Address Filter”. The only difference is that the name of the filter has been filled in the appropriate text box. You cannot change the name of the filter in this case.



**Figure 46:** The “Modify Filter” dialog box

**Delete Filter** The “Delete Filter” command allows deleting a filter. This effectively removes the filter description, i.e. when calling the “Filter Group” command to install a new filter the deleted filter will not appear in the list of available filters anymore.

If you want to temporarily disable a filter, you do not want to delete it and rewrite the filter description later on: instead, you will want to use the “Filter Group” command to remove the filter from the list of used filters.

For selection of the filter to be deleted the “Choose Filter” dialog box is offered.

## 5.2.7 The Info Menu

The “Info” menu contains commands that provide status information on the network, its nodes, the network variables and the Easylyon Analyzer hardware, the Analyzer. Some of the commands allow changes to be made to the values of some settings and variables (notably the “NEURON Status” and the “NV-Browser” commands).

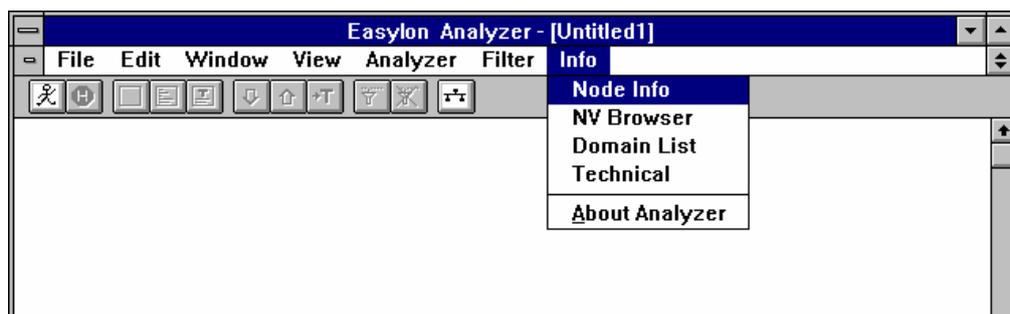


Figure 47: The Info menu in its pulled-down state

**Node Info** The “Node Info” command enables reading and setting the status of individual nodes in the domain that is being analyzed.

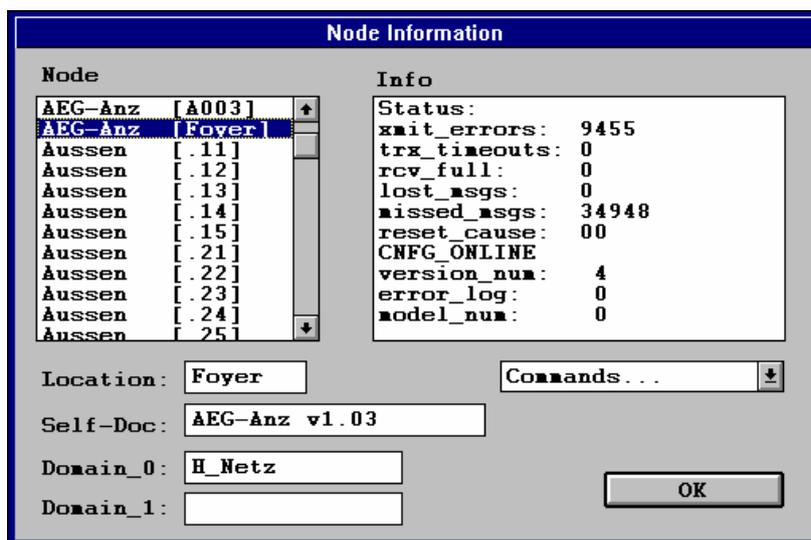


Figure 48: The “Node Information” dialog box

The available nodes are listed to the left; selecting one of them will make its status visible to the right and some more information below the nodes list. If you have defined the “Location” field for the node, this will show in the appropriate text box. This location can be changed in the “Node Info” dialog box: type the new location in this text box and choose “Write Location” from the “Commands...” pop-up menu. The other available commands are shown below:

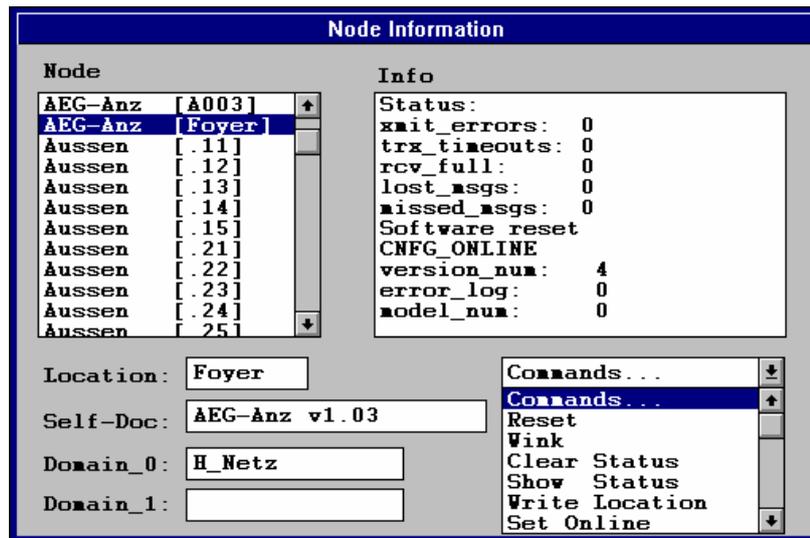


Figure 49: The “Commands” list in the Node Information dialog box

- “Reset” Causes a software reset to be executed on the selected node.
- “Wink” Causes a wink signal to be sent to the selected node. The way in which a node reacts on receiving a wink signal is hardware and application-dependent.
- “Clear Status” Causes the status of the selected node’s NEURON Chip to be cleared, i.e. the runtime-dependent status indicators are reset.
- “Show Status” Causes the current NEURON Chip status to be read in and displayed in the dialog box. This command is also executed each time a node is selected from the list of available nodes.
- “Write Location” Causes the location you have typed into the “Location” text box to be written into the NEURON Chip.
- “Set Online” and "Set Offline" Cause the NEURON Chip to be set online or offline.
- “clear F1FE” Causes the EEPROM checksum of the NEURON Chip to be cleared. s

**NV Browser** The “NV Browser” command allows reading and changing the status of network variables in the domain to which the Analyzer is connected. Since this implies information about the network the NV is available only after scanning the network.

When calling the NV the following dialog box appears:

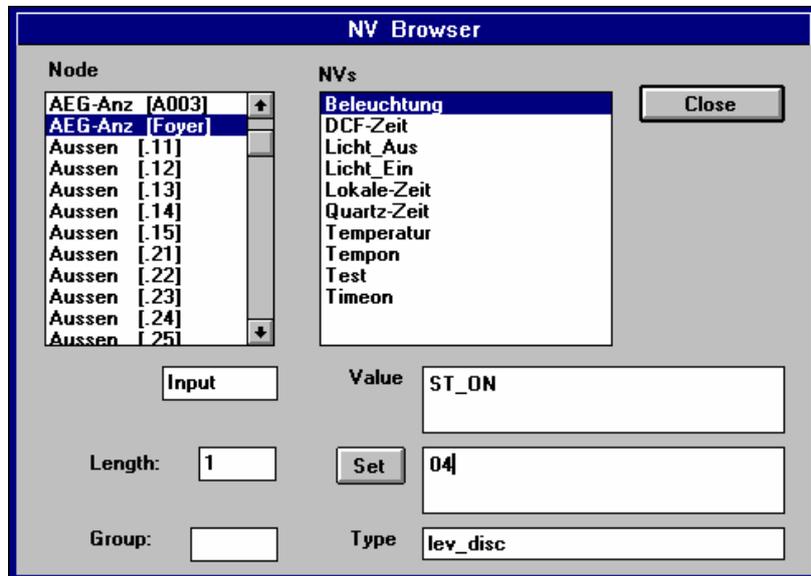


Figure 50: The “NV Browser” dialog box

To investigate the status of network variables you need to first select a node. The nodes are listed by their self-documented names in the “Nodes” box to the left. Clicking one of the available nodes makes the NVs of that node appear to the right.

Choosing one of the NVs causes its current value to be read from the NEURON Chip and to be displayed in the “Value” box. To the left its “Input” or “Output” direction is displayed and below the length of the NV in bytes.

If an input variable has been selected, the “Set” button and according input box are activated. The format of both the “Value” and the “Set” field depend on the type of network variable. The standard network variable types supported by LONWORKS technology are restricted to certain values and the “Set” button behaves accordingly: the button is disabled until the format matches the prescribed number of digits.

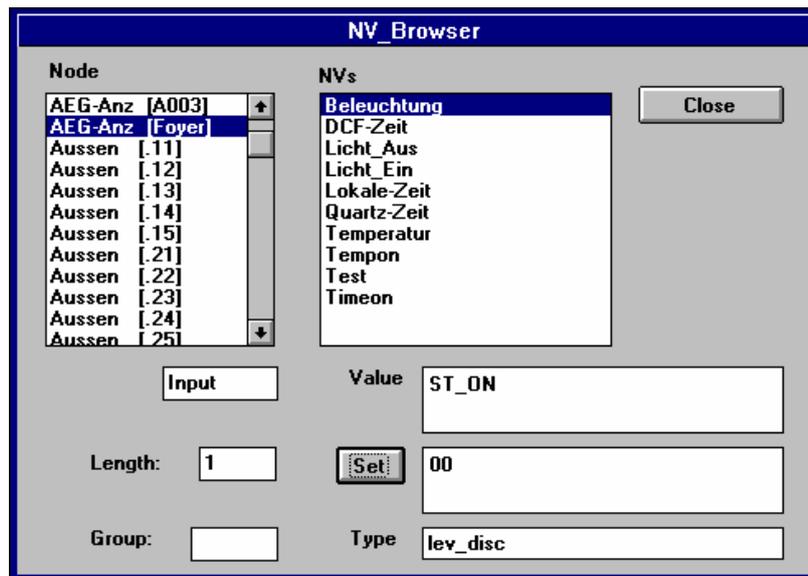


Figure 51: Changing the value of a network variable

When the “Set” button is enabled you can change the value of the network variable according to the set value by clicking the button. The NV is updated in the node and the “Value” field will display the new status.

In some cases an input NV cannot be read from the node, although it can still be set. This happens in the case of write-only registers in the node’s application, which cannot be read back. The “Value” field will show “unknown” in these cases.

When a group membership applies to the network variable, this group is shown in the corresponding box on the lower left side of the dialog box.

Clicking “Close” causes the NV Browser window to disappear. Note that clicking “Close” does not cause a possible change in the “Set” box to be propagated to the indicated network variable before closing the NV Browser. Any change in input variables needs to be done explicitly by clicking the “Set” button for that variable.

**Domain List** The "Domain List" command causes a list of known domains to be displayed. If no domains were found on the network that you are analyzing (e.g. when all nodes are in the null-domain only), the list remains empty. Otherwise, a list of domain names is shown.

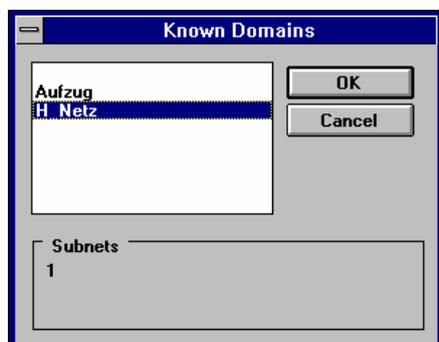


Figure 52: The “Domain List” dialog box

**Technical** The “Technical” command allows investigation of the NEURON Chips in the active domain, including all network variables, on a very technical level.

**ATTENTION** Since the information given is on a fairly low technical level and modifications can destroy applications and hardware past cure it is not advisable to anyone but experts in LONWORKS technology to use the information or change the settings in this dialog box. The explanation given here is restricted to how to display the various types of information and does not include an explanation on the meaning of all items.

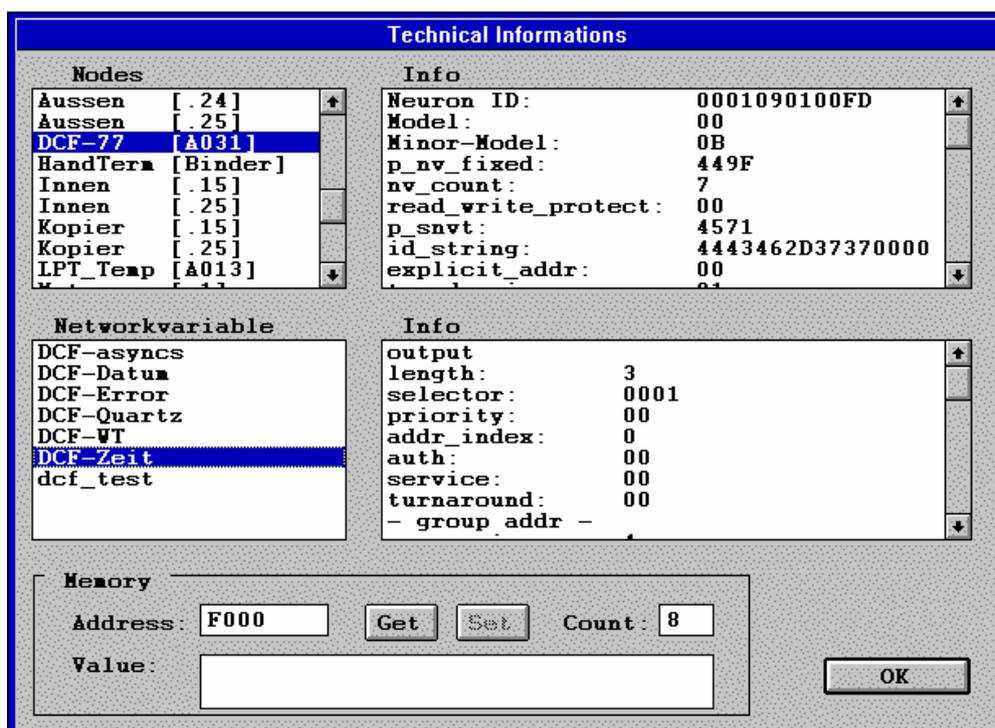


Figure 53: The “Technical Information” dialog box

The dialog box opens with a list of available nodes in the top left field. Selecting one of these nodes causes its information to become visible in the top right field. You can scroll up and down to view parts of the information that are not visible due to the restricted field size. You can select lines of information, but it is not possible to change anything here.

When selecting a node its network variables become visible in the list below the nodes list. Selecting one of these network variables causes technical information about that variable to be displayed to the right. Again, no information can be changed here.

The area on the bottom of the dialog box is marked with “Memory” and is the most dangerous of the “Technical” command. With the buttons and text fields in this area you can change the contents of the NEURON Chip’s memory on the basis of hexadecimal memory dumps. Change the address to the location you want to investigate and click “Get” to display a number of bytes (in hexadecimal notation) in the “Value” field. The “count” field allows you to determine the number of digits displayed in the “value” field. Changing this “Value” field and clicking the “Set” button causes the changed value to be written out to the indicated location in the selected node’s NEURON Chip.

**ATTENTION** Since the program of the NEURON Chip and its configuration (e.g. the communication parameters and program start address, etc.) are stored in this memory area, you may effectively

kill the NEURON Chip by overwriting certain memory contents. This can lead to permanent loss of the affected NEURON Chip, since it may not know how to communicate on the network anymore. It is therefore not advisable to anyone but absolute experts to use this feature of the Easylon Analyzer.

#### About Analyzer

The “About Analyzer” command causes a box to appear displaying information about the Easylon Analyzer version (both program and firmware). The box contains a text field indicating the Easylon Analyzer firmware version, which is displayed if the Analyzer is powered on and connected.



Figure 54: The “About Easylon Analyzer” box

Selecting this command will always resume communication from the Analyzer program to the Analyzer. If the text “comm\_err” is displayed then the communication with the PC cannot take place due to either the Analyzer not being switched on or the connection with the PC not being in working order. The first problem should be easy to detect (no LED is blinking on the Analyzer front panel) and solved. The second problem could be in the hardware (connectors not plugged in or cable corrupted) or in the software on the PC (the correct serial port not being initialized): make sure the file “LNA.INI” is placed in the Windows home directory in order to make the correct serial connection available from within the Windows environment.

#### NOTE

If you correct possible problems (like switching on the Analyzer or plugging in the communication cable to the PC) you must close and re-open the “About Easylon Analyzer” box before you can start working. Only after a working connection has been established with the Analyzer you can use the functionality of the Easylon Analyzer.

# 6

# Appendices

## 6.1 Glossary

<b>Address Filter</b>	A type of filter, based on logical addresses of sending and/or addressed nodes. An address filter is defined using the “New Address Filter” command in the “Filter” menu.
<b>Analyzer hardware</b>	Apart from the software program running on a PC under Windows, important functions of the EasyLyon Analyzer are realized on a hardware device, the Analyzer Box.
<b>Consistency Report</b>	A report on the logical consistency of a scanned network domain (NEURON Chip addresses and network variable bindings). A consistency report is generated when choosing the “Consistency-Report” command from the “View” menu.
<b>Filter</b>	Definition of certain characteristics of a message packet. Principally the Filters apply to address characteristics (Address Filters) or to NV characteristics (NV Filters). Filters are used to control the recording of packets meeting or failing the description given in the filter definition. The appropriate conditions and commands for the use of the filters are assigned in the -> “Filter Group” command, where as well a selection of the applicable filters is made from the defined filters list. Filters are described, set and activated through commands in the “File” menu.
<b>Filter Group</b>	Combination of different filters associated with filtering conditions and commands. Only the filters in the Filter Group list are used to control the recording of packets into the Analyzer’s buffer. The “Filter Group” is defined through this command in the “Filter” menu.
<b>Network</b>	LONWORKS network to be analyzed with the EasyLyon Analyzer. Several analysis functions of the EasyLyon Analyzer only apply to the network domain to which it is set, although packets from all domain are recorded.
<b>Nodes window</b>	The window in which node information is shown. This window is made visible when choosing the “Nodes” command from the “View” menu.
<b>NV</b>	A utility allowing investigation and setting of network variables in the analyzed network domain. This utility is available through the “NV-Browser” command in the “Info” menu (only after the network domain has been scanned).
<b>NV Filter</b>	A type of filter, based on network variable names. An NV-filter is defined using the “New NV Filter” command in the “Filter” menu.

<b>Packet buffer</b>	A software FIFO implemented in the DRAM of the recorder part of the Easylon Analyzer Hardware. Depending on packet size up to 18 000 packets can be held in the current version.
<b>Packets window</b>	The window in which packet information is shown. This window is made visible when choosing the “Packets” command from the “View” menu.
<b>Analyzer Box</b>	High performance LONWORKS node from Gesytec. Apart from the NEURON Chip and LONWORKS network interface the Analyzer Box provide a Motorola 683xx CPU.
<b>Recorder</b>	The part of the Easylon Analyzer hardware which records messages from the network into the packet buffer applying the user-defined filters. The recorder can be switched on and off through the “Start Recording”, “New Recording” and “Stop Recording” commands from the “Analyzer” menu.
<b>Report window</b>	The window in which a consistency report is shown. This window is displayed when choosing the “Report” command from the “View” menu.
<b>Scanning</b>	Scanning a network domain, i.e. using the Easylon Analyzer to request information from the network nodes. Scanning a network domain is done through choosing the “Scan Network” command from the “Analyzer” menu.
<b>Selection</b>	In the Easylon Analyzer software and this manual, a “selection” designates the selected single packet in the packets window. Selection of a packet is done manually, through clicking on the packet, as an effect of the “Find” commands from the “Edit” menu, or as a side-effect of some of the commands in the “View” menu. There is no way of selecting more than one single packet.
<b>Status Bar</b>	The bottom part of the Analyzer window, showing comments on selected menu items, the number of packets currently recorded in the Analyzer’s packet buffer and, while recording, the number of packets per second. The status bar is displayed by default, but can be switched off (and on again) through the “Status Bar” command in the “View” menu.
<b>Toolbar</b>	A set of buttons displayed immediately below the menu bar of the Easylon Analyzer window enabling fast access to a number of often-used commands. The toolbar is displayed by default, but can be switched off (and on again) through the “Toolbar” command from the “View” menu.
<b>Trigger</b>	A special use of a filter, allowing the recording of messages to stop at occurrence of a packet meeting the characteristics of this filter. A specified number of packets can be recorded after the trigger event. A trigger can be set through the “Filter Group” command in the “Filter” menu.
<b>Uploading</b>	See “Scanning”.

## 6.2 List of short-cuts

Keys	Command	Menu
Ctrl + N	New	File
Ctrl + O	Open	File
Ctrl + S	Save	File
Ctrl + P	Print	File
Ctrl + F	Find	Edit
Ctrl + G	Find Next	Edit
Alt + G	Get until Find	Analyzer
Alt + F4	Exit	File



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