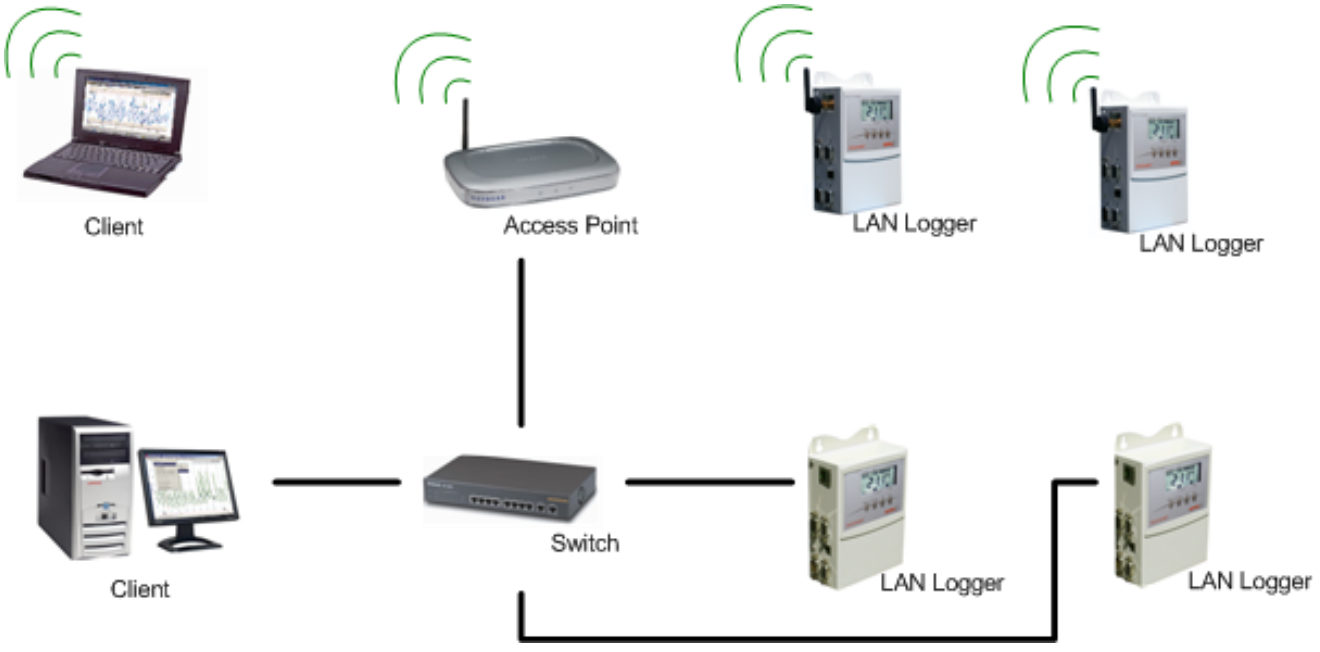
Ethernet module LAN / WLAN

Digi Device Connect ME / Wi-ME

Operation Manual

ab Firmware:
- LAN >=F3/E
- WLAN >=G/F



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Contents

In the interest of our customers we reserve the right to make any changes resulting from technical advances. Therefore, schemes, descriptions and extent of delivery are subject to change without notice!

Used symbols

Reference

IMPORTANT INFORMATION OR WARNING

Reference to resuming chapter or document

Introduction

ELPRO network datalogger series are designed for recording various physical signals like temperature and relative humidity via a network.

The data is stored in the internal memory and can be loaded to the PC via the LAN network. The system offers the very highest of data safety as the datalogger continues logging for months even in the event of a power failure running from its own internal lithium battery (Except LA8 and WA8). Multiple level alarm features are built in for local or network alarming in for any user set out of range conditions.

1. General Informations

1.1 IP Addressing

Static IP

The IP addressing determines the bases of the connection of a client on the datalogger. For constant access we recommend static IP. In elproLOG CONFIG the datalogger with the respective IP address is stored. If this is not fixed, the monitoring function of the elproLOG MONITOR cannot be ensured.

ATTENTION
For safety reason we recommend to use static IP adresses.

1.1.1 DHCP

Dynamic IP

If you want to use DHCP, configure the DHCP service in such a way that the assigned IP address of the dataloggers do not change.

For more details about the DHCP service ask your IT personel.

1.2 PoE- Power over Ethernet

Characteristics PoE

- No power sockets next to the datalogger
- Voltage supply over ethernet
- Special switch or Hub with support of PoE
- Use of the two unused pairs of wires.

Spare-wire

ATTENTION
We recommend power transmission over the two unused pairs (spare-wire).

1.3 WLAN - Wireless LAN

Check environment with your IT personel.

The Wireless LAN dataloggers are a common wireless client devices and support different standards such as IEEE802.11b and EEE802.11i.

> We recommend to use a standard (open shared) Access Point to connect to the datalogger(s) and to configure the settings for the internal wireless environment.

For more details see chapter 5. *How to Configure?*.

1.3.1 General Guidelines

We recommend to specified the following items before install a wireless environment:

- National Restrictions — **Environment**
  - Signal strenght, channel, etc.
- Place and location of the devices
- Client with elproLOG MONITOR should be connected over ethernet LAN.
- Standard Settings (Open shared) — **Access Point initial operation**
  - NO security settings
  - DHCP (For first configuration possibilities)
- Compatible with 802.11b adapters
- Wireless Security such as: — **Operation generally**
  - WPA/WPA2/ (Wireless Protected Access)
  - MAC Filter

1.3.2 Use Existing Wireless Environment

Previous, check the following points with your IT personel:

- ✔ Is it possible to insert new devices?
- ✔ Existing safety guidelines can be configured on the datalogger?

Insert datalogger in an existing enviroment

> Each additional node of a wireless network affects the entire Wireless environment.

- ✔ Is it possible to operate parallel with further wireless network?
- ✔ Other WLAN restrictions (channel,...)

to connect in parallel

1.3.3 Configure a new environment

Placement

We recommend to measure the environment previous, in order to be able to determine locations of the datalogger and access points. Wireless connection will be stronger the closer the devices are to the Access Point.

Measurment

Nuisance

Objects that can inhibit wireless communication include:

- Other wireless environments
- Microwave
- Refrigerators
- Metal cabinets
- Large aquariums
- Metallic-based UV tinted windows

Nuisance

2. Status of Datalogger

Unless otherwise specified, dataloggers are delivered with the following standard values.

Pre-configuration

If desired, ELPRO-BUCHS AG or your responsible distributor configure the required parameter for all ethernet dataloggers.

2.1 ECOLOG-NET Default Configuration at Delivery

Login	elpro	
Network Configuration	automatic configuration (DHCP)	
Serial Port Settings		
• TCP Server Settings	TCP Port 2101	
• Basic Serial Settings	- Baud Rate - Data Bits - Parity - Stop Bits - Flow Control	57600 8 None 1 None
• Advanced Serial Settings	Send after 5ms and 300 bytes	

2.2 Details on WLAN Datalogger

Wireless special

WH2, WP4 and WA8 have additional wireless settings as follows:

- Connect to any available wireless network (no SSID)
- Channel: auto-scan

We recommend to save the configured status. For more Information see chapter 3.5.1 *Backup / Restore*.

3. Digi Device Discovery Tool

3.1 Overview

The main challenge is getting the Digi Module to associate with the network. Once this is accomplished the digi can be further configured by using the Digi Device Discovery web interface.

3.1.1 Status at Delivery

At delivery the datalogger is ready for use. Only the respective IP address or special wireless settings have to be configured.

3.1.2 Digi Device Discovery

Here, the most important features can be configured, i.e. you can make TCP/IP settings, restart the module and open the web interface.

Chapter 3.2 Digi Device Discovery Start Screen

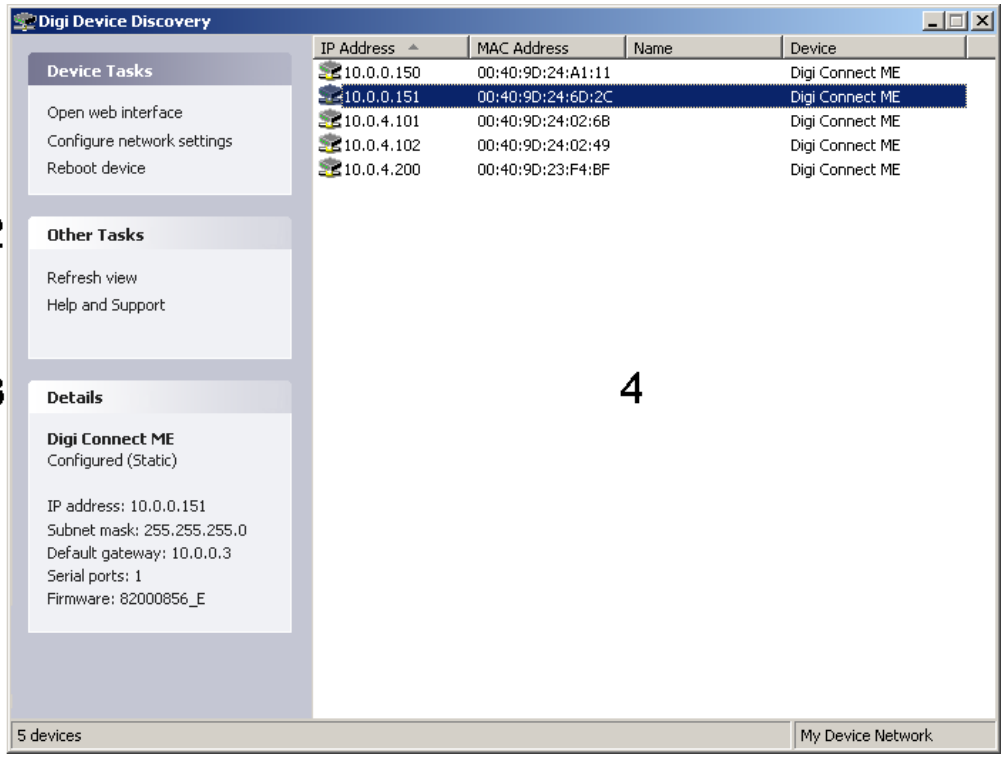
3.1.3 Web Interface

The web interface is needed for configuring the network parameters of the datalogger. (e.g. wireless specification)

Chapter 3.3 Web Interface Overview

3.2 Digi Device Discovery Start Screen

Run Digi Device Discovery software by click on Start - Program - Elpro - Elpro Device Discovery.



1 Device Task

- Open web interface
- Configure network settings
- Restart device

2 Other Task

- Refresh view
- Help and Support

3 Details

- Shows the most important characteristics of the marked datalogger

4 Main view

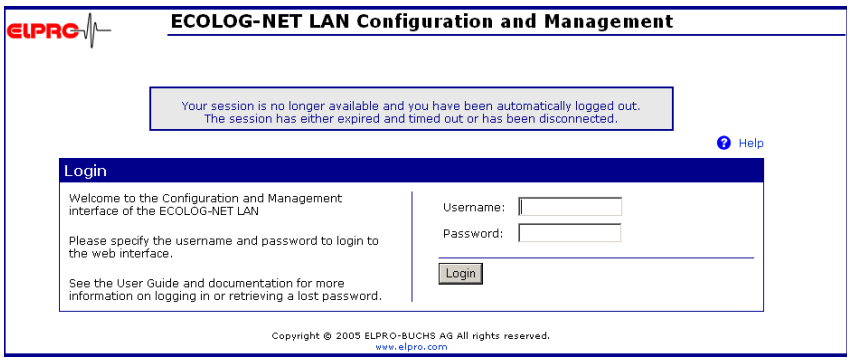
- Shows all found devices in the same network.

3.3 Web Interface Overview

Start the "Web Interface" by double-clicking the relevant datalogger in the Digi Device Discovery or via the "Open web interface" link.

3.3.1 Start screen

User mask login



For more information about the menus.

Help

Username: elpro

Passwort: elpro

Login

See chapter 3.4.3 *Users*

1 Home

"Home" shows the General LAN and WLAN network configurations.

2 Configuration

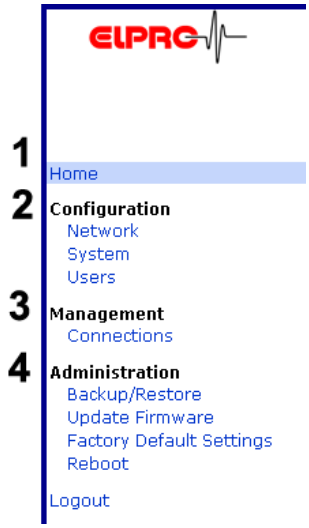
Necessary values for the network and user parameters.

3 Management

Overview of current settings and connecting conditions.

4 Administration

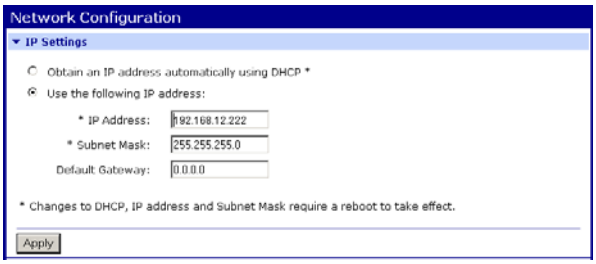
General administration possibilities of the Digi Device Diysovery are available.



3.4 Menu Configuration

3.4.1 Network - LAN module

IP Settings

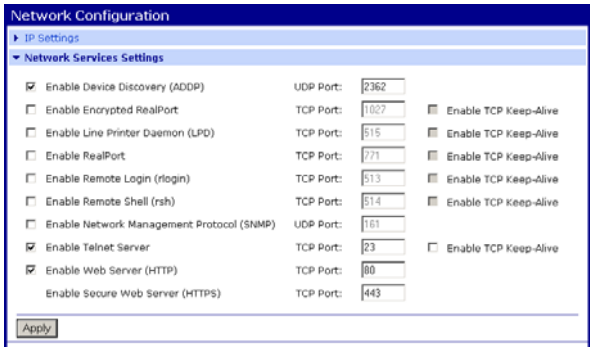


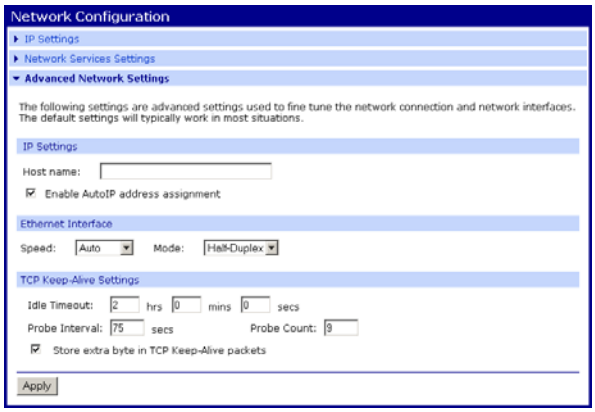
In order to integrate the datalogger in an existing network, an IP number must be assigned. It must be in the same range as the client's IP number.

Network Service Settings

Advanced Network Settings

Network Service Settings and Advanced Network Settings are not changed.

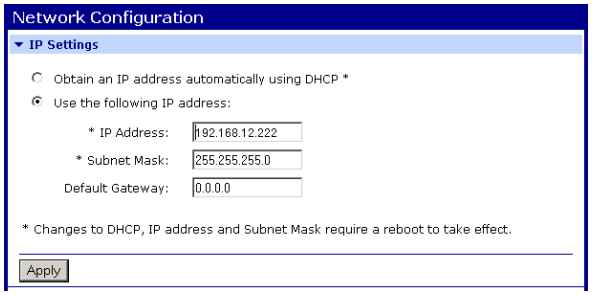




3.4.2 Network - WLAN module

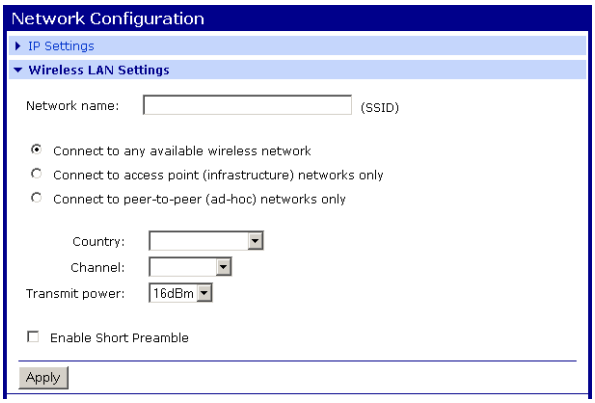
This wireless network interface can be used to communicate to wireless networks using 802.11b technology. Contact your administrator or consult your wireless access point documentation for the settings required to setup the wireless network configuration.

IP Settings



In order to integrate the datalogger in an existing network, an IP number must be assigned. It must be in the same range as the client's IP number.

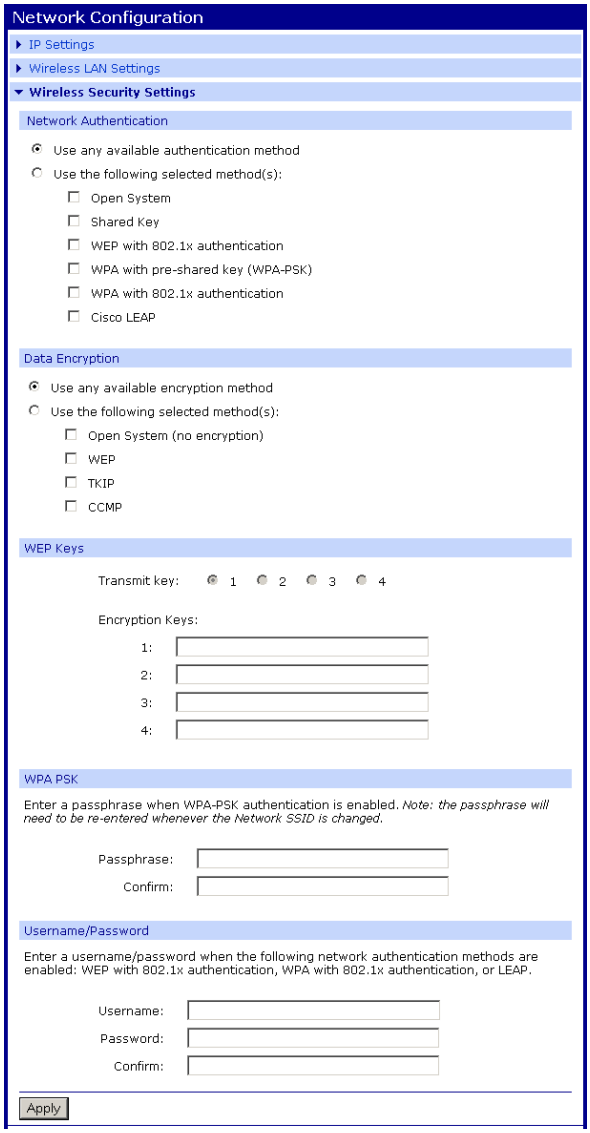
Wireless LAN Settings



Different connection settings can be stored. Please consider the respective delimitation data of the used access points.

- SSID (Network name)
- Country
- Channel
- Transmit power

Wireless Security Settings



Wireless Security Settings are used to make specific settings for WEP or WPA.

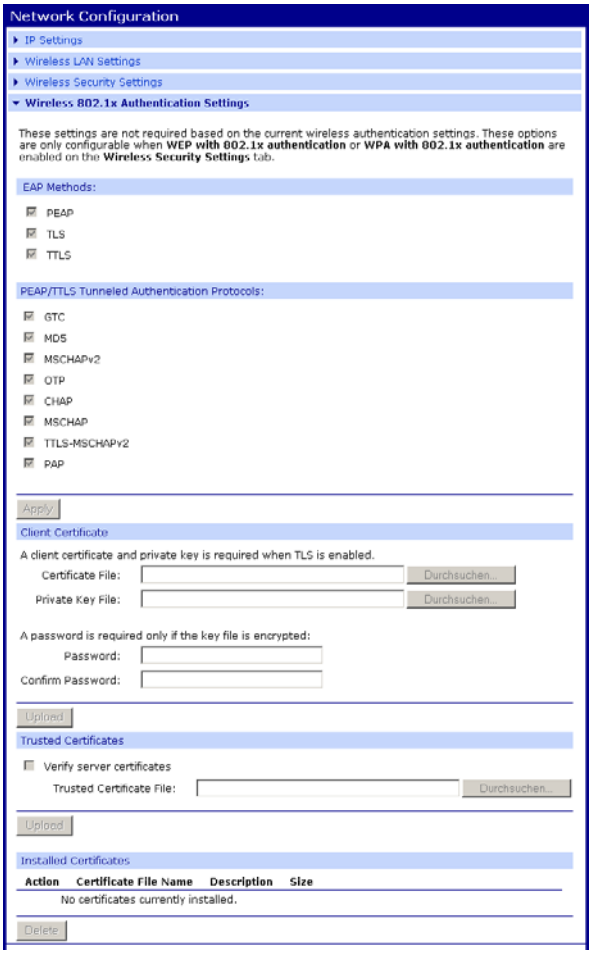
- authentication method
- Encryption method
- WEP Keys
- WPA PSK
- Username/password

Security key

Different key combinations and lengthen can be stored. Please consider the respective delimitation data of the used access points.

CCMP uses the Advanced Encryption Standard (AES) algorithm.

Wireless 802.1xAuthentication Settings

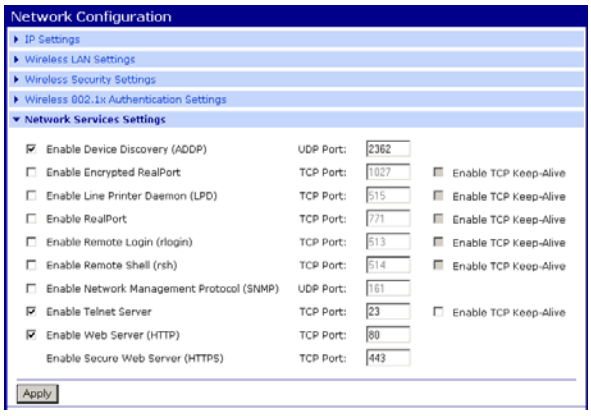


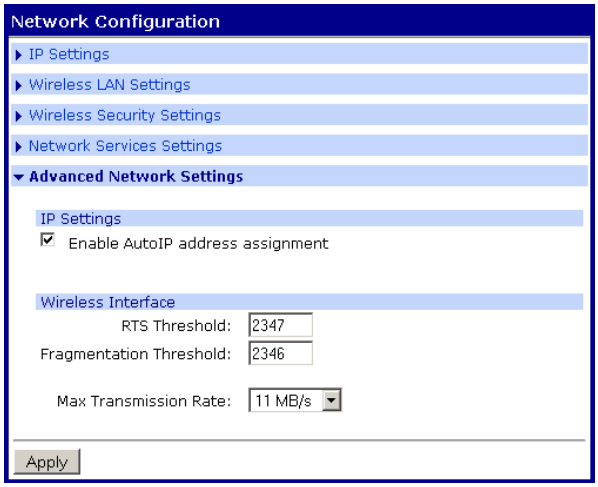
These options are only configurable when "WEP with 802.1x authentication" or "WPA with 802.1x authentication" are enabled on the "Wireless Security Settings" tab.

Network Service Settings

Advanced Network Settings

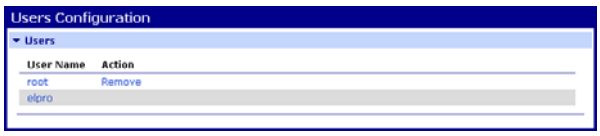
Network Service Settings and Advanced Network Settings are not changed.

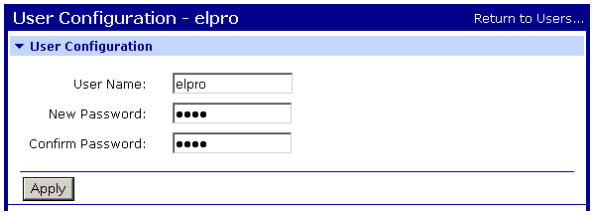




3.4.3 Users

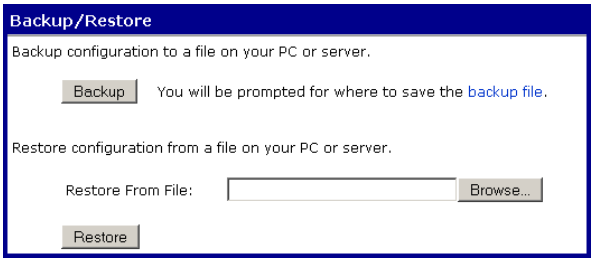
All necessary standard settings for an usual environment where given by the user elpro. For special settings like "Serial Port" changes contact ELPRO-BUCHS AG.





3.5 Menu Administration

3.5.1 Backup / Restore



The configuration of this digi device can be saved to a file. This configuration file can be used to configure this or any other digi device module.

ATTENTION

IP address is stored as well!

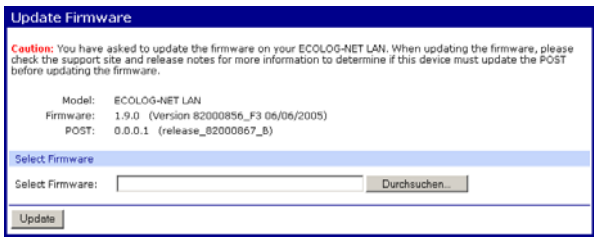
Backup

Press on "Backup " to save a *.cfg file to your workspace.

Restor

With click on "Restore" you request to load the *.cfg configuration file from your workspace.

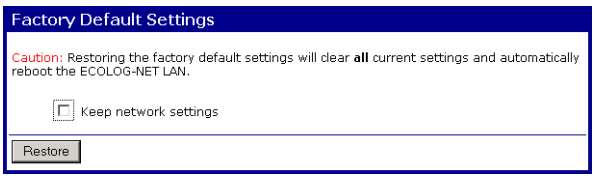
3.5.2 Update Firmware



New firmware updates can be made.

Contact ELPRO-BUCHS AG to check the possible Firmware Version for your devices.

3.5.3 Factory Default Settings- Software Reset



Restoring the factory default settings will clear all current settings and set the module back to the default configuration.

Kapitel 2.1 *ECOLOG-NET Default Configuration at Delivery*

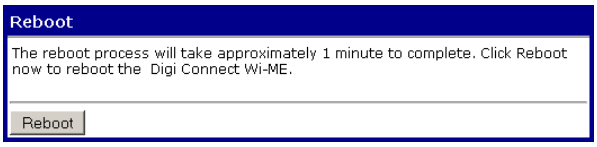
Choosing this option will restore the settings your Digi device server originally shipped with. Check Keep network settings to keep the current network settings such as the IP address.

Reboot

After the reset, a reboot has to be made with the Digi Device Discovery tool.

- Run "Digi Device Discovery"
- Mark device
- Run "Restart Device

3.5.4 Reboot



We recommend to restart the module after each change.

Different possibilities for reboot or restart the device:

- by Power OFF / ON
- by start the Digi Device Discovery Tool -> choos Reboot
- or by using the Web Interface -> Reboot

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4. Reset to Status at Delivery- Hardware Reset

4.1 HOTBOX-PRO Version Information

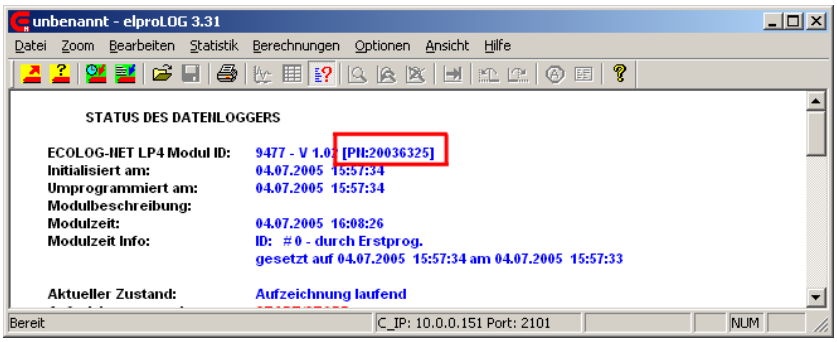
The HOTBOX-PRO devices have to be sent back to ELPRO-BUCHS AG.

4.2 ECOLOG-NET LP4,WP4 Version Information

4.2.1 PCB no. 2003xxxx

Devices until PCB number [2003xxxx] have to be sent back to ELPRO-BUCHS AG.

The PCB number is shown in the status of the datalogger.



Status view

4.2.2 PCB no.2004xxxx

For reset the devices with PCB number [2004xxxx] see chapter 4.5 *Reset module ECOLOG-NET*.

Reset LP4 / WP4

4.3 ECOLOG-NET LH2, WH2

For reset the ECOLOG-NET LH2 and WH2 devices, see chapter 4.5 *Reset module ECOLOG-NET*.

Reset LH2 / WH2

4.4 ECOLOG-NET LA8, WA8

For reset the ECOLOG-NET LA8 and WA8 devices, see chapter 4.5 *Reset module ECOLOG-NET*.

Reset LA8 / WA8

4.5 Reset module ECOLOG-NET

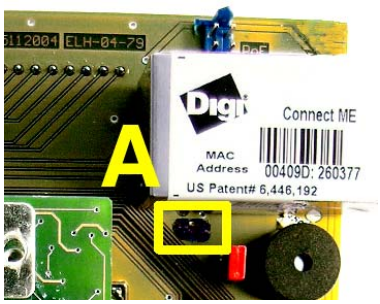
In order to set the equipment on the delivery status back, the device floor must be removed. The reset possibility is next to the ethernet module.

LH2, WH2, LP4, WP4, LA8, WA8

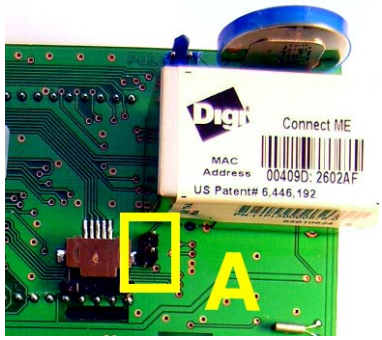
Afterwards following the next steps:

1. Place jumper in position A. — *1. Place Jumper*
2. Connect the power supply with the device. — *2. Power on*
3. Wait, until the orange/green LED of the Digi module flash in a code of 1-1-5.
4. ATTENTION: Do not remove power supply! — *4. Remove Jumper*
5. Wait for less than 1 minute.
6. If the orange or green LED is flashing, the device is in configuration at delivery status. — *6. Conclusion*
7. Close the device by place the device floor. — *7. Close the device*
8. Configure IP Adresse and network settings if needed. — *8. Network settings*

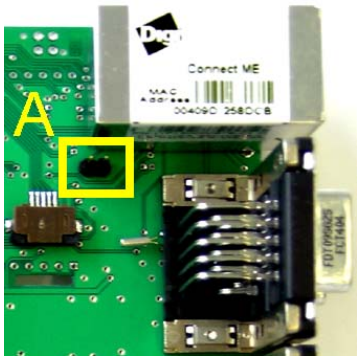
LH2 / WH2



LP4 / WP4



LA8 / WA8



5. How to Configure?

5.1 Configure a LAN Datalogger

To identify a datalogger in a LAN / WLAN environment, each datalogger gets a unique address. This address is made of 3 different parts, these parts are called: IP Address & Subnet Mask & Default Gateway.

To avoid communication problems, the system administrator should release the network addresses prior installation! Consequently, the address information must be entered manually into each datalogger.

ECOLOG-NET - this is the ELPRO datalogger family with LAN or WLAN communication capabilities.

5.1.1 Pre-configuration for LAN Installation

1. Power-up the datalogger
2. Connect the ECOLOG-NET L... datalogger to your pc by using a crossover LAN cable.
3. Watch the status LEDs located on the LAN module:
   - As soon as a stable link between the datalogger and the pc has been established, the orange LED is alight permanently
   - Blinking of the green LED indicates data traffic.
   - Other status see ☞ chapter 6.3 *LED Status Overview*.
4. Configer IP address

Power ON

LED status (until 1min. delay)

5.1.2 Configuration for WLAN Installation

To set-up an ECOLOG-NET W... logger you are going to need a running Access Point with dhcp Client and a pc/lap-top connected to it. This Access Point has to propagate its SSID and the following security settings have to be switched off: WEP, WPA and MAC filtering. (Open shared)

Requirements

For more details about these settings talk to your IT department or refer to the documentation of the used access-point.

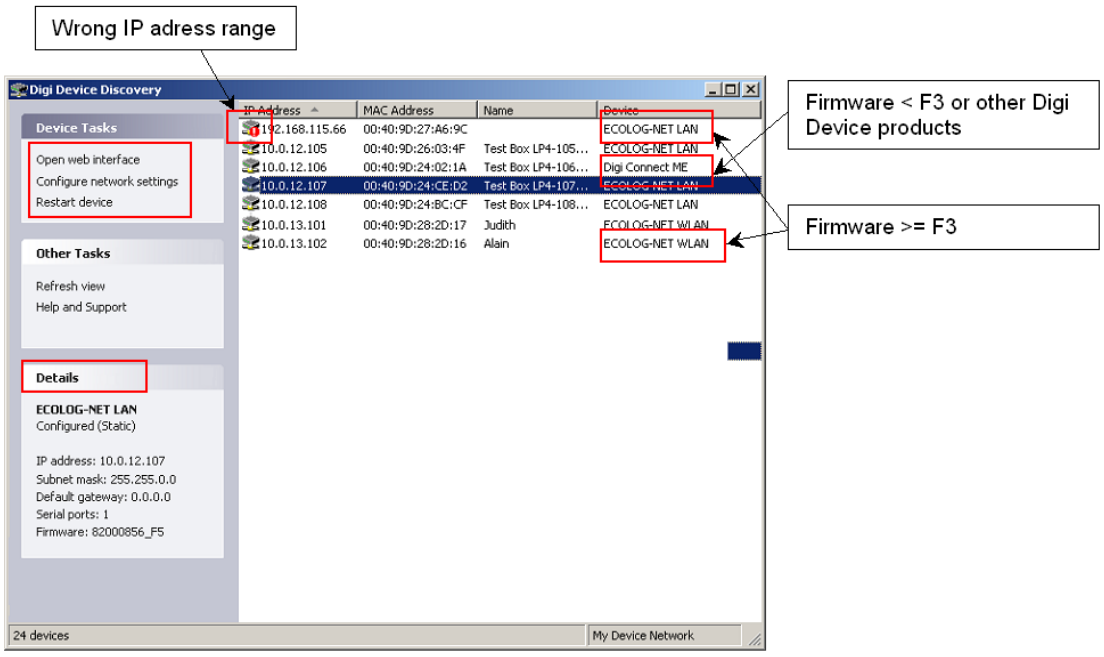
If you face problems by switching off all security settings on the access-point in use, we recommend using temporarily a second access-point just for the set-up of the dataloggers.

Follow the next steps to etablish a connection:

1. Specify the required devices and placement — *Specification*
2. Specify the required IP addresses and network security settings:.
   - IP range, SSID, Channel, Security
3. Start Access Point and Laptop in default configuration. (Open shared) — *Power ON*
4. Power-up the datalogger and watch the status LEDs located on the WLAN module:
   - As soon as a stable link between the datalogger and the access-point has been established, the orange LED is alight permanently. — *Check LED status (delay up to 1 min.)*
   - Blinking of the green LED indicates data traffic.
   - Other status see ☞ chapter 6.3 *LED Status Overview*
5. Configure "Network Settings" via Web interface — *IP settings*
   - Menu Configuration -> Network -> IP Settings
   - After "Apply" start reboot procedure.
6. Configure Access Point to required IP settings:
   - Set IP address of the Access Point.
7. Configure required "Wireless LAN Settings" on the datalogger (SSID, Channel,...): — *WLAN Settings datalogger*
   - After click on "Apply" change to "Wireless Security Settings".
8. Configure "Wireless Security Settings" on the datalogger (WEP, WPA,...):
   - After click on "Apply" reboot the datalogger.
9. Configure Access Point and Laptop to required Wireless Network Settings (SSID, Security,...) — *WLAN Settings Access Point, Client*
10. Check if datalogger has connected to existing environment.
    - via ping
    - via Digi Device Discovery Tool
    - via logfile of the Access Point

ⓘ All devices on your network must use the same security mode in order to communicate.

5.2 Example: Different Digi Device Discovery Views



Wrong IIP adress range

IP address or subnet mask of the datalogger are in a different address range then the required computer or laptop.

Exclamation mark

Firmware < F3

ECOLOG-NET L... datalogger delivered before 12/2005 use Firmware < F3. Possible other Digi devices are shown in the same way.

Firmware < F3
other Digi Device

Firmware >=F3

From firmware version F3 or higher includes user configuration and further WLAN configuration possibilities. See Details for your firmware version.

see chapter 3.5.2 *Update Firmware*

Firmware >=F3

5.3 Example: Configure Network Settings Ad hok (LAN)

Requirements

In this example following settings for datalogger are required:

- IP: 192.168.112.201
- SN: 255.255.254.0

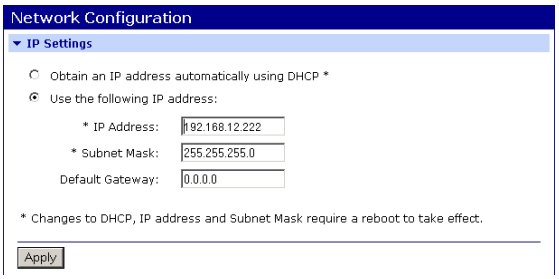
Procedure

1. Note your configuration on your laptop. (Printscreen)
2. Change the IP adress and subnet mask of your laptop to:
   - IP: 192.168.112.10
   - SN: 255.255.254.0
3. Connect the dataloggers via red crossover cable directly to your laptop and power on.
4. Now change the dataloggers IP and subnet to the required settings.
5. Connect the dataloggers to the customer LAN.
6. Check Configuration via the customers pc with Digi Device Discovery tool.
7. If no red exclamation mark -> the dataloggers are configured in the correct way, and elproLOG and Monitor should run.
8. If exclamation mark -> check the IP adress and subnet mask of the required customer pc/laptop with the network administrator.
9. Change settings back on your laptop.

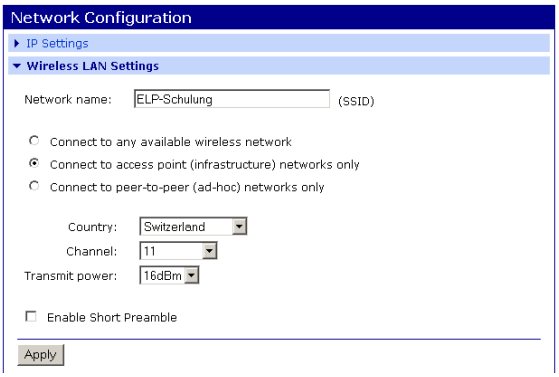
The subnet mask should be 255.255.254.0 or similar but not 255.255.255.0 in this example.A computer subnet mask with 255.255.255.0 could not connect properly to the datalogger.

5.4 Example: Overview WPA-PSK Settings with AES

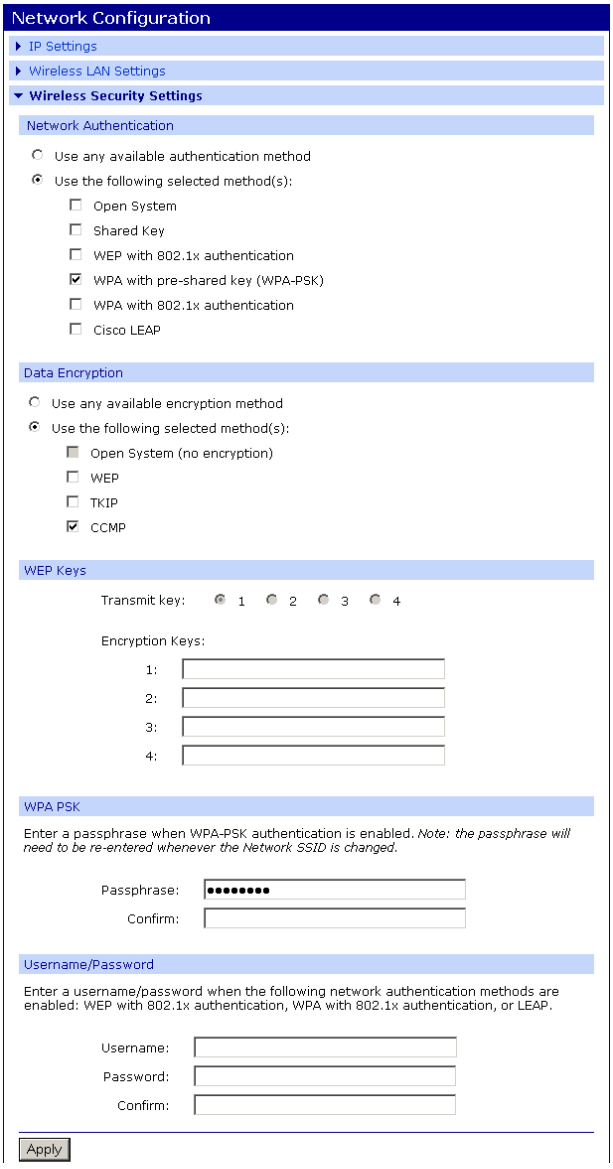
IP Settings



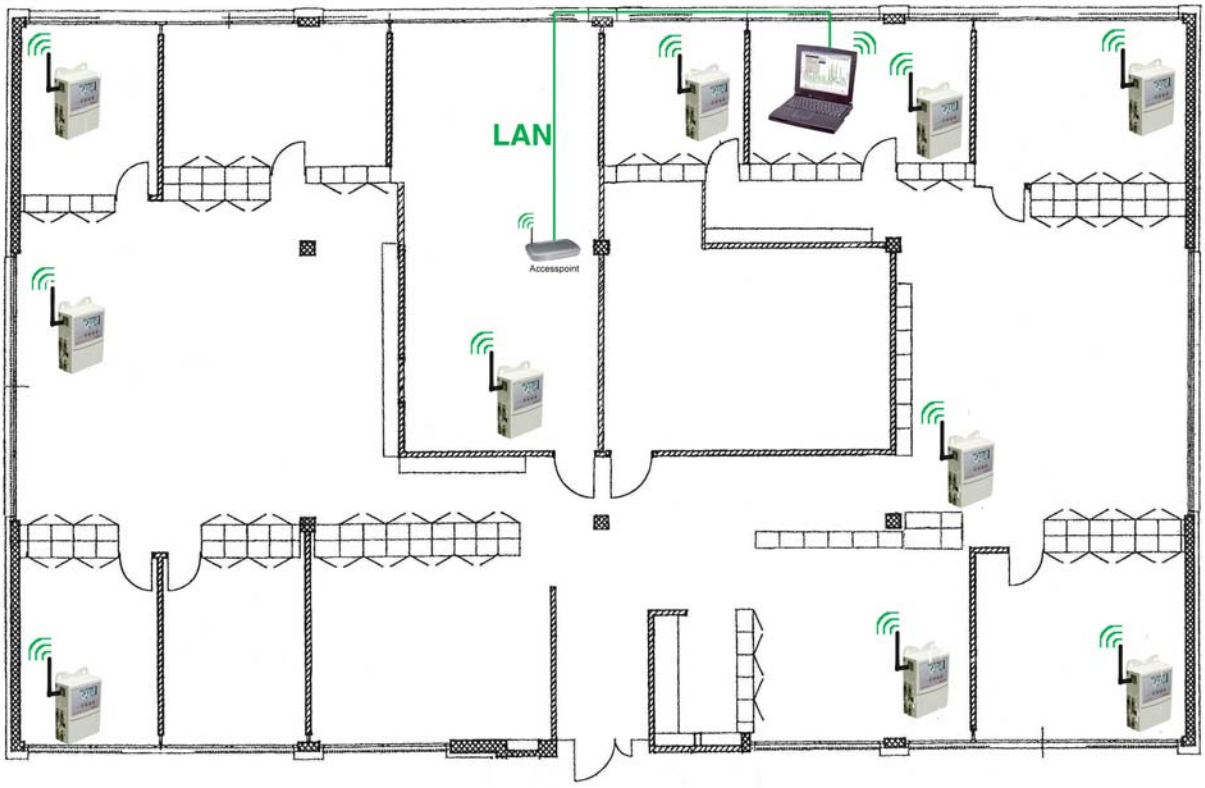
Wireless LAN Settings



Wireless LAN Settings



5.5 Example: ELPRO Internal Testing Environment



In our internal testing environment we are using following Conditions:

- Communication ranges below 10m
- No solid obstacles in between
- Different Access Points like:
  - Belkin Pre-N Router
  - Linksys WRT54G
  - Dlink DWL2000AP+

This are symple Access Points for small testing environment. To find out a suitable Access Point area, restrictions and dimension have to be checked.

6. Module Specifications

6.1 LAN devices

6.1.1 Environmental

Operating temperature: -40ºC to +85ºC (-40ºF to +185ºF)
Relative humidity: 5% to 90% (non-condensing)
Altitude: 12,000 ft (3657.6 m)

6.1.2 Network Interface

- Standard: IEEE 802.3
- Physical Layer: 10/100Base-T
- Data rate: 10/100 Mbps
- Mode: half-duplex or ful-duplex
- Connector: RJ-45

6.2 Wireless LAN devices

6.2.1 Environmental

Operating temperature: -20ºC to +75ºC (-4ºF to +176ºF)
Relative humidity: 5% to 90% (non-condensing)
Altitude: 12,000 ft (3657.6 m)

6.2.2 Network Interface

Standard: IEEE 802.11b
Frequency: 2.4 GHz
Data rate up to 11 Mbps with automatic fallback
Modulation:

- CCK (11/5 Mbps), DQPSK (2 Mbps), DBPSK (1 Mbps)

Transmit power: 16 dBm typical

6.2.3 Sensitivity

1Mbps: -92 dBm 5.5Mbps: -87 dBm
2 Mbps: -89dBm 11Mbps: -82 dBm

Receive Sensitivity

Antenna connector: 1 x RP-SMA

6.2.4 Wreless Security

WEP (Wired Equivalent Privacy)

- 64/128-bit encryption (RC4)

WPA2/802.11i

- 128-bit TKIP/AES encryption
- 802.1x EAP authentication
  - LEAP (WEP only), PEAP, TTLS, TLS
  - GTC, MD5, OTP, PAP, CHAP, MSCHAP, MSCHAPv2, TTLS-MSCHAPv2
  - GTC, MD5, OTP, PAP, CHAP, MSCHAP, MSCHAPv2, TTLS-MSCHAPv2
- Enterprise and Pre-Shared Key (PSK) mode

CCMP basiert auf dem Advanced Encryption Standard (AES).

6.3 LED Status Overview

When a problem is encountered on a digi module, the network activity LED will flash with a 3 digit code. Here is a listing of the most common codes encountered.

Code	Meaning	Resolution
1-1-1	Initialisation • All test passed • starting EOS	Modul started correct No action required
1-1-5	The device is being reset to factory defaults.	Jumper is set. Execute reset as per description. No action required
2-2-5	The application image is corrupted.	Device has to be send back to ELPRO Buchs AG.

7. Glossary

Access Point — Base station or central node device that provides the client with wireless network connection within a certain range.

Ad hoc — Supports direct peer-to-peer communication, i.e. direct network card to network card connection.

Broadband — Broadband describes the range of frequency of a carrier medium (cable, wireless channel). The wider the band of frequencies, the more information can be transmitted in a given amount of time.

Broadcast — A broadcast in a computer network environment sends data packets from one destination simultaneously to all the participating devices on the network . A broadcast is mainly used when the address of the recipient is unknown. Similarly, a broadcast sends the same message to multiple recipients at the same time. Every broadcast recipient must automatically accept the delivered message and decide whether the message must be processed. The recipient can judge the relevance of the message and discard any message deemed inappropriate.

Client — Whether in a network or standalone workstation, a client is the required workstation or laptop. The elproLOG software (Version 3.30.x upwards) is installed on the client to enable readout at the network-integrated Ecolog-Net dataloggers.

DHCP — The DHCP (Dynamic Host Configuration Protocol), backed by an appropriate server, enables dynamic allocation of an IP address and other configuration parameters to computers on a network (e.g. internet or LAN). DHCP allows a new computer to be added to an existing network without further configuration steps. Without DHCP, a relatively complicated Setup is required; the IP address and other required parameters such as netmask, gateway, DNS server, WINS server, etc. must be entered manually. DHCP can automate the assignment of these parameters when starting a new computer to a network.

Ethernet — A collective term for a series of baseband networks with different topologies which all use the CSMA/CD access method. It has become the most widespread LAN technology in use.

Ethernet Connection — Networking cables connect the PCs on a network to the central network hub or switch. Most Ethernet networks use a type of cable known as Twisted Pair Cable (also known as Category 5 cable) .A RJ45 network connector is used.

Firewall	A security application which protects a server, a subnet or all end user resources from unauthorized access or outside attacks. The firewall can perform these functions for a single standalone computer, it can be integrated in routers or switches and it can be integrated as a software program in the operating system.
Flow Control	Function on the network layer of the OSI model (Layer 3) which manages the rate of data flow so that the data can be handled at an efficient pace; i.e. it prevents a fast sender overflowing the receive buffer of a slower recipient by allowing the sender to send only as much data as the recipient can cope with.
Gateway	A gateway operates at the highest level (Layer 7) of the OSI model and enables communication between computers that are integrated in otherwise incompatible networks. A gateway essentially works like a router but, in addition, acts at higher levels performing code and protocol conversion (character sets).
Hub	An active (cf. switch) or passive junction device that connects multiple network lines from various workstations on one single line.
IEEE	Institute of Electrical and Electronic Engineers - a technical committee with more than 350,000 members in more than 150 countries. The IEEE publishes technical literature to inform the membership of new and further developments, initiates conferences and is responsible for creating, enforcing and promoting industrial standards.
IEEE 802	The IEEE 802 is an individual working group responsible for developing standards for the two lower layers in the ISO/OSI reference module for local networks.
IEEE 802.11	The IEEE 802.11 is an individual working group responsible developing standards for wireless local area network technology. These wireless local area networks are often called Wireless LAN, WLAN or WiFi.
Intranet	A private network based on internet technology which implements IP as network protocol and uses web-based applications.
IP	Internet Protocol; the main function of IP is to find the ideal path for transmission of data packets from the sender via several networks to the recipient (routing). IP operates at the network layer of the OSI model (Layer 3). Delivery is packet-oriented and connectionless.

LAN	Local Area Network; a computer network that spans a relatively small area. Most LANs are confined to a single building or part of one building (one level) and are controlled by one administrative authority. Usually LANs also use a file server concept for data, disk and periphery management which allows all network users shared access to the information.
MAC Address	Media Access Control; a unique hardware address that identifies network components. The MAC address is usually on the back side of the device. The MAC address is 48 bits long and MAC addressing operates at the data link layer (Layer 2) of the OSI model.
Peer to Peer	A type of network in which each workstation has equivalent capabilities and responsibilities. This differs from client/server architectures, in which some computers are dedicated to serving the others. The advantage of peer-to-peer systems is the simplicity; it requires no special knowledge of network programming. The primary disadvantage of peer-to-peer systems is the security vulnerability which can result in unauthorized data access.
Router	Network components which operate at the network layer of the OSI model (Layer 3). As opposed to hubs and switches, routers are always protocol-dependent (e.g. IP router).
SSID	A Service Set Identifier (SSID) is a wireless network name based on a sequence of characters that uniquely names a wireless local area network (in accordance with IEEE 802.11). Each wireless LAN has a configurable, so-called SSID or ESSID (Extended Service Set IDentifier) to enable the user machine to identify the wireless network. The SSID string can have a maximum of 32 characters. It is configured in the access point of a wireless LAN and is shared among all clients who require access. The character string is transmitted unencrypted with each packet.
Subnet Mask	Addresses subnets by masking IP address bits. It determines the size of the subnet. Within a subnet, data can be directly transferred directly from one host to another without a router or gateway when both hosts share a subnet mask. The subnet mask is very similar in structure to an IP address in that it also has four parts.
Switch	Network components which operate at the data link layer of the OSI model (Layer 2). Each port on a switch is a separate Ethernet segment. This enables simultaneous network access to various ports. Additionally, the switch identifies the location of the connected stations on the basis of the sender

	address contained in the Ethernet packets (i.e. it knows where to send packets by watching where packets are coming from and learning). A switch can transmit packets to the correct ports after a short learning time.
USB	The Universal Serial Bus is a standard interface which is used to connect additional devices to a PC over serial lines. It is important to distinguish between USB1.1 (up to 12 MBit/s) and USB2.0 (up to 480 MBit/s). Peripheral devices can be can plugged in and out at the USB port on-line without restarting the system (hotplug).
VPN	Virtual Private Network; a private communicating network which carries data on public networking infrastructure (i.e. the Internet) using special cryptographic tunneling protocols (PPTP, L2TP and IPSec) to provide the necessary confidentiality. VPN servers can set up one or more VPN tunnels. Components with VPN passthrough can merely be tunneled.
WEP	Wired Equivalent Privacy; security standard for wireless LAN. It provides user authentication as well as data encryption and decryption capabilities for data security. WEP operates with static keys and supports two key lengths (64/128 bits); the user determines 40/104 bits.
Wireless LAN	A wireless network. IEEE 802.11 is the applicable standard for wireless networks. A wireless LAN allows mobile users portable wireless access to company networks, E-mail and the Internet. The 802.11a standard operates in the 5 GHz band and provides data transfer rates of up to 54 MBit/s; the 802.11b standard operates in the 2.4 GHz band with a transfer rate of 11 MBit/s; the 802.11g standard also operates in the 2.4 GHz band with a transfer rate of 54 MBit/s / 108 MBit/s and is compatible with the 802.11b standard.
WPA	Extra security functions for wireless LANs. Due to the fact the IEEE 802.11i did not appear until 2004, WPA was released to provide a few features in advance to combat the weaknesses of WEP. WPA offers dynamic key management using TKIP and port-based authentication in accordance with IEEE 802.1x.

8. ELPRO Customer Service Information

If you need support from the ELPRO - customer service, please hold the following information ready. This information is very important for trouble shouting:

Datalogger

- ID and MAC address
- If possible *.mdf files
- Which were the preceding actions, before problems arose?

Additional Hardware

- Other Elpro devices involved (alarm interface,...)
- USB converters, printers, firewalls, hubs, switches, routers, accesspoints
- LAN/WLAN specifications (IP settings, special routing, WAN,...)

System

- Screen shot of error message
- elproLOG Standard, NET, QLS, MONITOR, MONITOR-PLUS, CONFIG version and type installed
- How was the software installed? (user rights,...)
- Installed Software
  - is the software running local or on a server
  - operating system, version, service pack, cpu, ram; if possible screen shot.

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9. Revision History

Author	Datum	Version	Description
JB	19.04.2007	d	New Format, Structur and Examples
JB	06.04.2006	c	Correction
JB	09.03.2005	b	New Nr. IT6001A
JB	09.03.2005	a	EN5101;Add Pos.6
JB	01.11.2004	-	First edition EN5101

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