MICROENER

QUICK START GUIDE
PROTECTA LINE

FDE n°: 19AA0281100 Rev A

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CONTENTS

APPLICATION

The **PROTECTA** type complex protection in respect of hardware and software is a modular device. The modules are assembled and configured according to the requirements, and then the software determines the functions. This manual describes the common properties of the numerous possibilities. The individual characteristics of the specific applications are described in the manuals of the factory configurations.

MEETING THE DEVICE

In order to meet the device at the first time, this chapter describes information, which might be necessary for new users to get familiar with the basic properties of the device.

Power supply

The power supply module

Power supply module converts primary AC or DC primary voltage to required system voltages. In most cases of applications one power supply card is enough to provide the required power to the system. Redundant power supply cards extend system availability in case of outage of any power source.

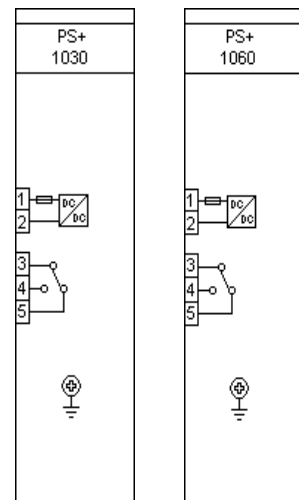Main features of the standard power supply modules are:
- 30W and 60W power versions (PS+1030, PS+1060)
- 80V-300VDC input range, AC power also supported
- Power connector (1-2):
  - Receptacle: Weidmüller SLA90/2
  - Plug: Weidmüller BLA2

The power supply module contains contacts for error signaling:
- Fault relay contacts (NC and NO): device fault contact and also assignable to user functions. All the three relay contact points are (NO, NC, COM) accessible to users
- Fault relay connector (3-4-5):
  - Receptacle: Weidmüller SLA90/3
  - Plug: Weidmüller BLA3

(For devices produced for special requirements please see technical details in the configuration manual of the devices.)

The standard power supply modules (rear view) are shown in *Figure 0-1*.

Figure 0-1 The standard power supply modules

The hardware modules of the device

For technical details of the modules of the **PROTECTA** type complex protection please see the document "**Hardware description**". The applied modules are listed in the document "**Configuration description**".
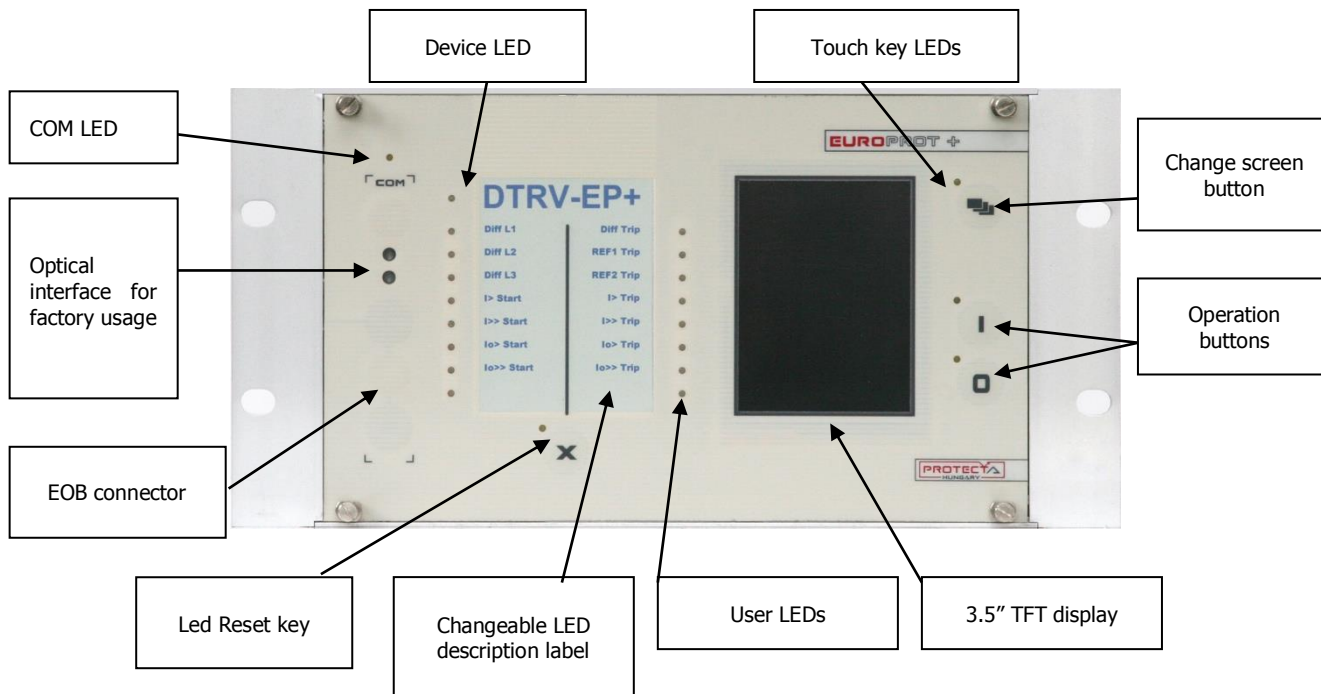
Fast startup

The CPU module of the device is equipped with two powerful processors: one for performing the application functions (RDSP), the other one for processing the communication tasks (CDSP).

After power-up the RDSP processor starts-up with the previously saved configuration and parameters. Generally, the power-up procedure for the RDSP and application functions takes approx. 4-5 sec. During this period of time the "Device LED" (see

Figure 0-2) is yellow. If the protection functions are ready for operation the yellow LED turns to green, the protection functions are ready to trip after this short period. (During the restart procedure after a new downloaded configuration the LED is red for a short time. Latched red LED however means general error. In this case the protection functions are not available.)

The CDSP's start-up procedure is longer, because its operating system needs time to build its file system, initializing user applications such as HMI functions and IEC61850 software stack. The availability of the touch-screen of the front panel after about 25-30 seconds indicates successful termination of the start-up procedure.

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The front panel of the device

Figure 0-2 The front panel of the device

The structure of the human-machine interface of the device

The PROTECTA device HMI of the front panel contains the following elements:

Function	Description
16pcs user LEDs	Three-colors, 3mm circular LEDs
COM LED	Yellow, 3mm circular LED indicating EOB communication link and activity
Touch key LEDs	4pcs yellow, 3mm circular LEDs indicating touch key actions
Device LED	1pc three-colors, 3mm circular LEDs Green: normal device operation Yellow: device is in warning state Red: device is in alarm state
Touch keys	Four capacitive touch keys (On, Off, Page, LED acknowledgement)
Buzzer	Audible touch key pressure feedback
Changeable LED description label	Describes user LED functionality
3.5" or optional 5.7" display	320*240 pixels TFT display with resistive touch screen interface
Optical interface for factory usage	
EOB connector	**E**thernet **O**ver **B**oard: communication interface accomplishes isolated, non-galvanic Ethernet connection with the help of a magnetic attached EOB device. The EOB device has an RJ45 type connector supporting 10Base-T Ethernet connection to the user computer. This is a proprietary and patented solution from Protecta ltd.

Table 0-1 The elements of the front panel

Using the menu provided by the touch-screen

The main screen of the local LCD together with the "Change screen button" and the "Operation buttons" are shown in *Figure 0-3*.

Figure 0-3 The main screen

Touchscreen - The main control area where the user will enable functions and input values by touching the screen.

Change screen button - This hardware button changes the currently displayed screen for the subsequent one. The available screens and the order in which they appear by default are: the main screen, parameters, on-line, events, system settings and the custom screens which can be added by the user with the help of the EUROCAP software.

Operation buttons - These buttons can be used to define certain functions on customer-defined windows. For example, the user can set up these buttons to turn on / off a circuit breaker or increment/decrement the position of the tap charger of a transformer. For more information, please refer to the User-defined / custom screen section.

Lock icon – The factory setting of the device excludes the password protection function. When touching this icon, the picture changes, enabling all kind of operation. If this kind of limitation by password protection at operation is needed, then the password application can be set via WEB interface. In this case the icon is changing only if the correct password is entered.

When pressing the "**Change screen button"** – as an example - the windows shown in *Figure 0-4* can be seen and applied one-by-one, cyclically.
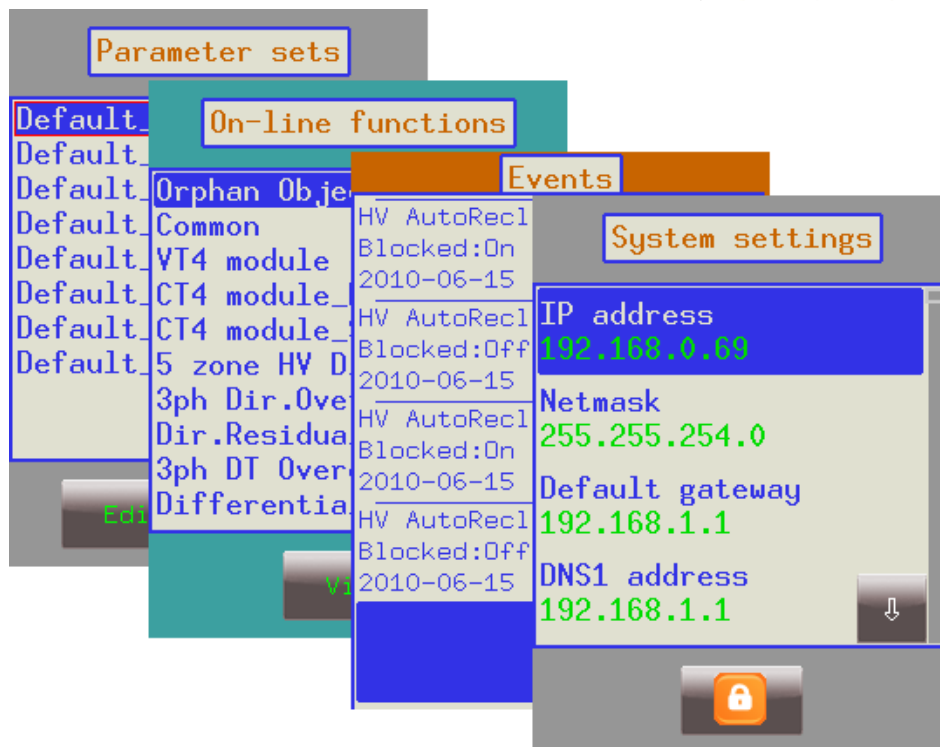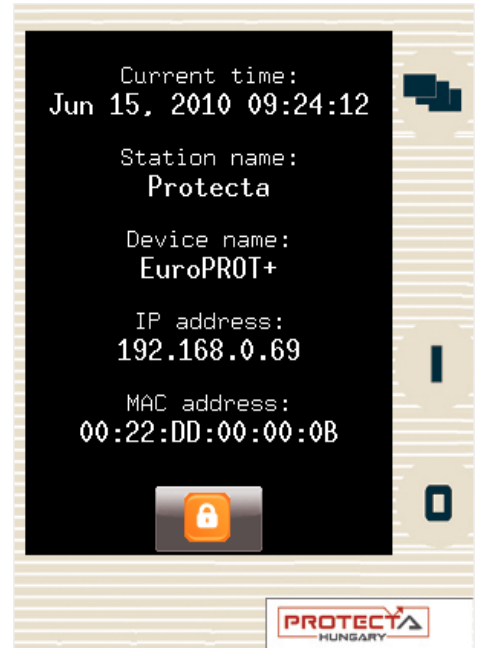
Figure 0-4 Some screens displayed on the LCD

Touch the navigation icons or the displayed text lines to perform any actions via the LCD screen. For further details see the document "**LCD touch-screen interface description**".

Properties of the Ethernet communication

The built-in 5 port Ethernet switch allows PROTECTA to be connected to IP/Ethernet based networks. The following Ethernet ports are available:

On the front panel of the device:

- EOB (Ethernet over Board) 10 Base-Tx user interface

On the rear side of the CPU unit (See *Figure 0-5* and Table 0-2):

- Station Bus (100Base-FX Ethernet)
- Redundant Station Bus (100Base-FX Ethernet)
- Process bus (100Base-FX Ethernet in preparation)
- Optional 10/100Base-Tx port via RJ-45 connector

CPU version	Station bus	Redundant Station bus	EOB	RJ-45	Process bus	Legacy port/protocol
CPU+0001	Yes	No	Yes	Yes	Prep	No
CPU+0002	Yes	Yes	Yes	No	Prep	No
CPU+0003	Yes	Yes	Yes	No	No	No

Table 0-2 The versions of the Ethernet communication

Interface types:

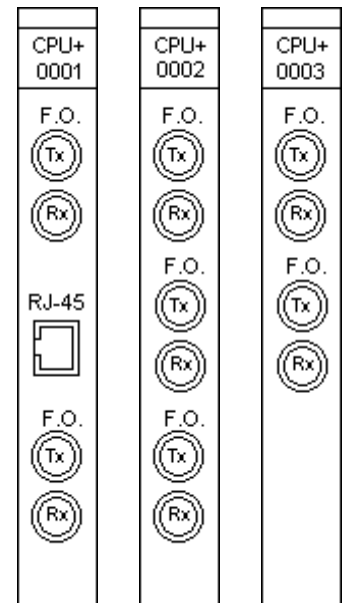On the front panel of the device:

- EOB interface: attachable to the front panel by a proprietary magnetic connector, the connector box ends in RJ45 8/8 plug. It is 10Base-T Full duplex interface.

On the rear side of the CPU unit (See *Figure 0-5* and Table 0-2):

- 100Base-FX Ethernet: ST type, 1300nm/MM, for 50μm/125μm or 62.5μm/125μm fiber
- 10/100 Base-TX Ethernet: RJ45-8/8

The embedded WEB-server supports the following actions:

- Modifying user parameters
- Checking events list and disturbance records
- Managing the Password
- Online displaying measured data and generated binary information
- Performing commands
- Providing remote or local firmware upgrade possibility
- Performing administrative tasks

Figure 0-5 The versions of the CPU units

The Ethernet connection

There are several ways to be connected to an Ethernet network.
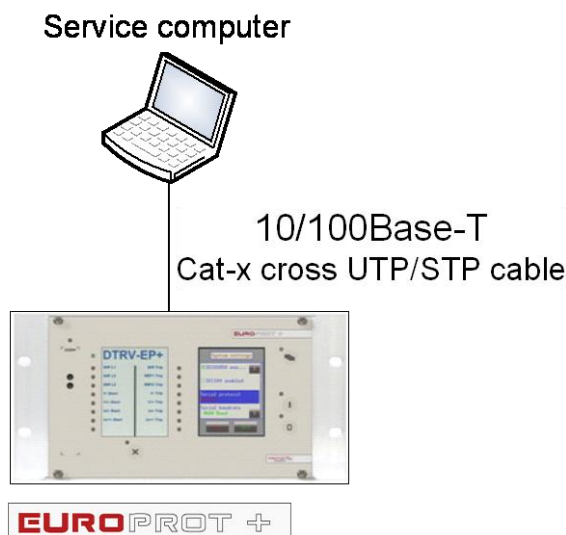
Using the EOB connection

Attach the magnetic EOB connector to the front panel of the device. The magnets assure the correct position of the adapter. Connect the other end of the cable to the RJ-45 socket of a computer: *Figure 0-6*. (The RJ-45 connector of the cable can also be connected to an Ethernet switch. In this connection all IED-s on the network with client functionalities, e.g. a computer, has access to the device.)
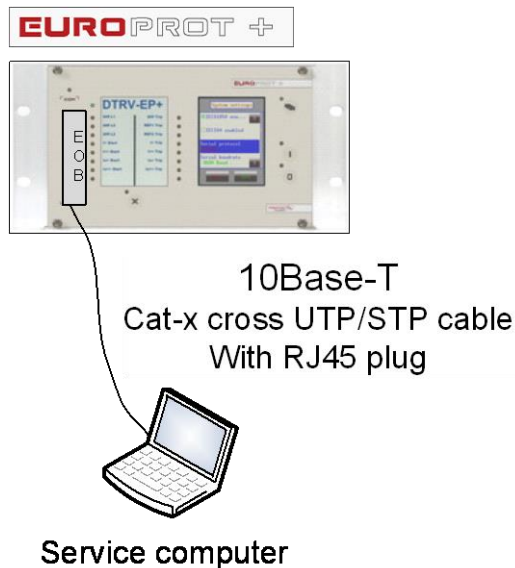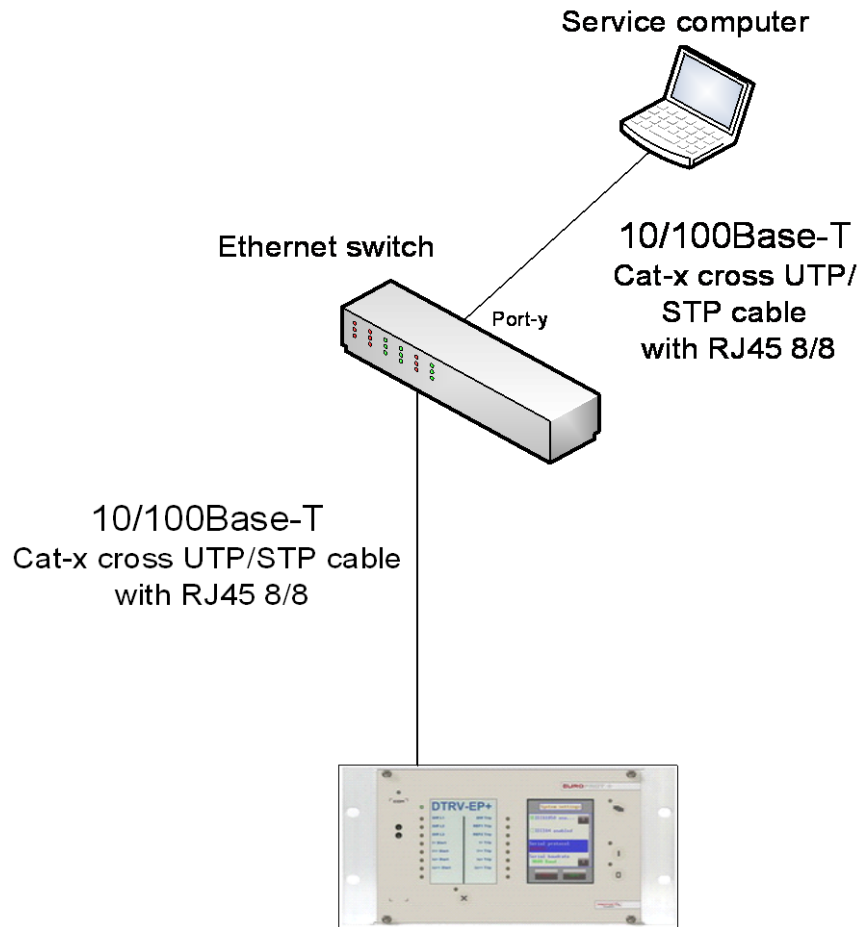

Figure 0-6 Using the EOB connection

Using the RJ-45 connection

The CPU version 0001 (see above) also has an RJ-45 socket. Using a UTP cross-cable with RJ-45 connector at both ends, the device can be connected directly to a computer: *Figure 0-7*. (The RJ-45 connector of the cable can also be connected to an Ethernet switch. In this connection all IED-s on the network with client functionalities, e.g. a computer, has access to the device: *Figure 0-8*.) (For information purposes the UTP cross-cable is explained in *Figure 0-10*.)

Figure 0-7 Using the RJ-45 connection to connect a computer directly

Figure 0-8 Using the RJ-45 connection to connect computers via Ethernet switch

Using the ST type fiber optic connection

The ST type fiber optic connector of the 100Base-FX Ethernet provides connection to an Ethernet switch with identical fiber optic input. Using this connection all IED-s on the network with client functionalities, e.g. a computer, has access to the device: *Figure 0-9*.
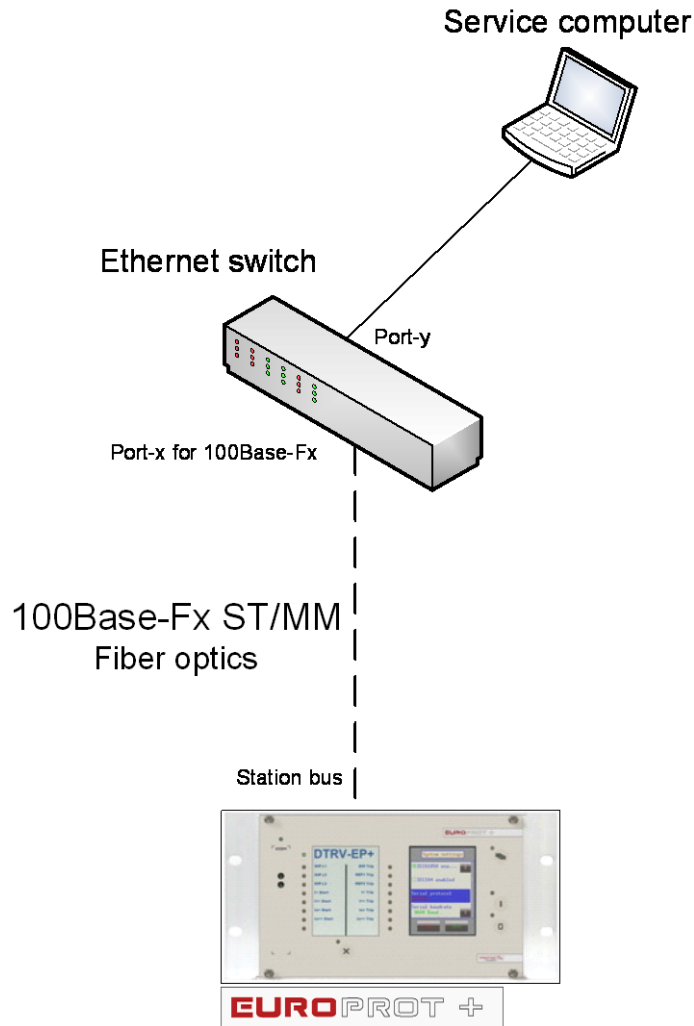
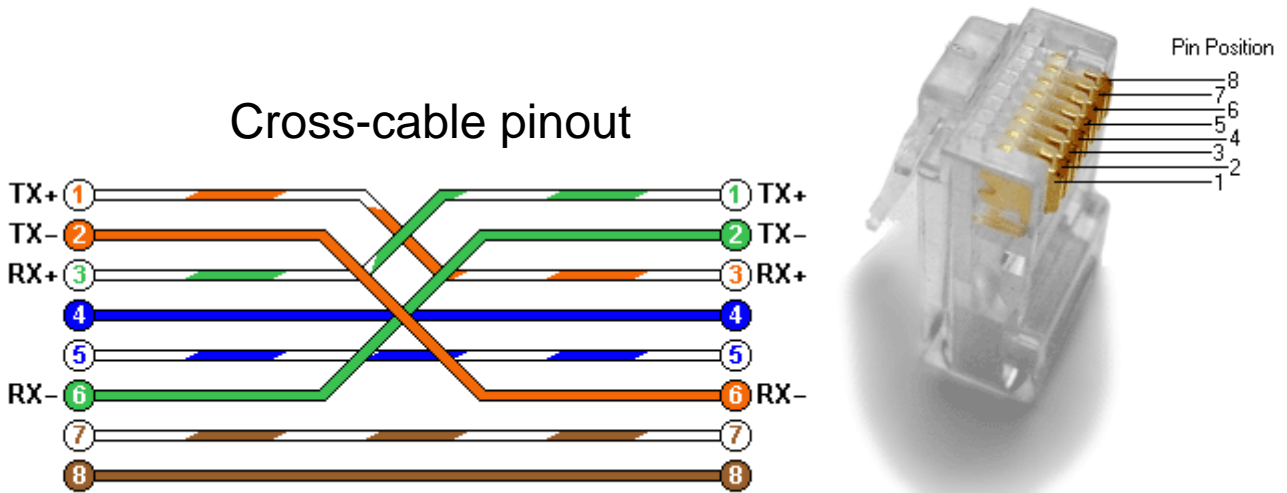*Figure 0-9 Using the ST type fiber optic connection to connect computers via optical Ethernet switch*

Figure 0-10 Pinout of the cross-cable

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Settings needed for Ethernet connection

The PROTECTA devices can be accessed over Ethernet based protocols only. That's why it is extremely important to set up the network before accessing the device.

IP settings:

The device operates with fixed IPv4 addressing. Dynamically assigned IP addresses are at present not supported. It is suggested to use the private address range as defined in RFC1918.

To connect to a standalone device just plug the EOB cable into your computer or use the RJ-45 connector on the back panel of the device. (In this case you need a crossover UTP cable).
The computer should be set to use fixed IP settings. The addresses must be in the same network range.

To connect the device to a station or corporate network, contact the system administrator for available IP address, gateway address, net-mask, DNS and NTP server addresses.

WEB browser settings:

Please make sure your browser does not use proxy server while accessing the PROTECTA device.

Contact your system administrator to add an exception if there is a proxy server on your network.

Using WEB browsers

A compatible web browser and an Ethernet connection is needed in order to access the device interface. To properly display the data on the screen, it is recommended that the user have a screen resolution of at least 1024x768. The following web browsers can be used:

- Microsoft Internet Explorer 7.0 or higher version.
- Mozilla Firefox 1.5 or higher version.
- Apple Safari 2.0.4 or higher version
- Google Chrome 1.0 or higher version
- Opera 9.25 or higher version

Javascript must also be enabled within your browser.

Type the IP address of the device into your browser's address bar. (The IP address can be read on the main screen of the local LCD, see *Figure 0-3*.) Follow the usual procedures of WEB browsing.

Please see the details in the document "**Remote user interface description**".

Les performances et les caractéristiques indiquées dans ce document peuvent être modifiées à tout moment et n'engagent MicroEner qu'après confirmation.

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