

CMe3000 User Manual

M-Bus Gateway for Fixed Network



Contents

| | |
|--|-----------|
| CONTENTS | 2 |
| 1 DOCUMENT NOTES | 4 |
| 1.1 COPYRIGHT AND TRADEMARK..... | 4 |
| 1.2 CONTACTS..... | 4 |
| 2 USING THIS MANUAL | 5 |
| 2.1 PURPOSE AND AUDIENCE | 5 |
| 2.2 MODELS | 5 |
| 2.3 ADDITIONAL AND UPDATED INFORMATION..... | 5 |
| 3 INTRODUCTION | 6 |
| 3.1 PRODUCT CONFIGURATION | 6 |
| 3.2 CAPABILITIES | 6 |
| 3.3 APPLICATIONS..... | 6 |
| 3.4 OVERVIEW | 7 |
| 4 PHYSICAL INSTALLATION | 8 |
| 4.1 MOUNTING | 8 |
| 4.1.1 Ethernet connection..... | 8 |
| 4.1.2 M-Bus 2-wire bus..... | 8 |
| 4.1.3 IR Interface with ABB electricity meters or CMeX Series modules..... | 8 |
| 4.1.4 Power supply | 8 |
| 5 APPLICATION DESCRIPTION | 9 |
| 5.1.1 Purpose | 9 |
| 5.2 OPERATION..... | 9 |
| 5.2.1 Watchdog restart..... | 9 |
| 5.2.2 Power on..... | 9 |
| 5.2.3 Normal operation..... | 9 |
| 5.3 INDICATIONS | 9 |
| 5.4 RESET TO FACTORY DEFAULT | 10 |
| 6 ADMINISTRATION OF THE PRODUCT | 11 |
| 6.1 LOGIN..... | 11 |
| 6.2 CHANGE IP SETTINGS..... | 12 |
| 6.3 CONFIGURE M-BUS TRANSPARENT SERVER SETTINGS | 15 |
| 6.4 CONFIGURE M-BUS TRANSPARENT LOCAL BAUD RATE | 17 |
| 6.5 CONFIGURE INTERNAL WEB INTERFACE SETTINGS..... | 18 |
| 6.6 SYSTEM..... | 21 |
| 6.6.1 Reboot..... | 21 |
| 6.7 FACTORY DEFAULTS | 21 |
| 6.8 FIRMWARE UPDATE | 21 |
| 7 TROUBLESHOOTING | 22 |
| 7.1 ALL LEDs ARE PERMANENTLY OFF..... | 22 |
| 7.2 RED LED IS PERMANENTLY ON | 22 |
| 7.3 CANNOT CONNECT TO THE PRODUCT USING TCP/IP | 22 |

| | | |
|-----------|---|-----------|
| 7.4 | CANNOT READ CONNECTED M-BUS SLAVES..... | 22 |
| 8 | TECHNICAL SPECIFICATIONS..... | 23 |
| 8.1 | CHARACTERISTICS..... | 23 |
| 8.2 | FACTORY DEFAULTS..... | 25 |
| 9 | TYPE APPROVALS..... | 26 |
| 10 | SAFETY AND ENVIRONMENT..... | 27 |
| 10.1 | SAFETY PRECAUTIONS..... | 27 |
| 11 | DOCUMENT HISTORY..... | 28 |
| 11.1 | DOCUMENT SOFTWARE AND HARDWARE APPLIANCE..... | 28 |
| 12 | REFERENCES..... | 29 |
| 12.1 | REFERENCES..... | 29 |
| 12.2 | TERMS AND ABBREVIATIONS..... | 29 |
| | 12.2.1 <i>Number representation</i> | 29 |

1 Document notes

All information in this manual, including product data, diagrams, charts, etc. represents information on products at the time of publication, and is subject to change without prior notice due to product improvements or other reasons. It is therefore recommended that customers contact Elvaco AB for the latest product information before purchasing a CMe3000 product.

The documentation and product are provided on an “as is” basis only and may contain deficiencies or inadequacies. Elvaco AB takes no responsibility for damages, liabilities or other losses by using this product.

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CMe3000 is a trademark of Elvaco AB, Sweden.

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2 Using this manual

2.1 Purpose and Audience

This manual provides information needed to mount, configure and use the CMe3000 product. It is intended for field engineers and developers.

2.2 Models

This manual covers CMe Series model CMe3000.

2.3 Additional and updated information

Latest documentation version is available on Elvaco web site at <http://www.elvaco.com>.

3 Introduction

This chapter summarizes the CMe3000 features and outlines the basic information needed to get started.

3.1 Product configuration

Use the table below to find out the capabilities of your CMe Series.

| Product name | Comments |
|--------------|---|
| CMe3000 | TCP/IP M-Bus master with M-Bus 2-wire interface |

Table 1 Product configuration

3.2 Capabilities

The CMe3000 is a stand-alone, DIN-mounted TCP/IP equipment with M-Bus protocol, intended to read values from any kind of meter supporting the M-Bus protocol.

The CMe3000 has the following key capabilities.

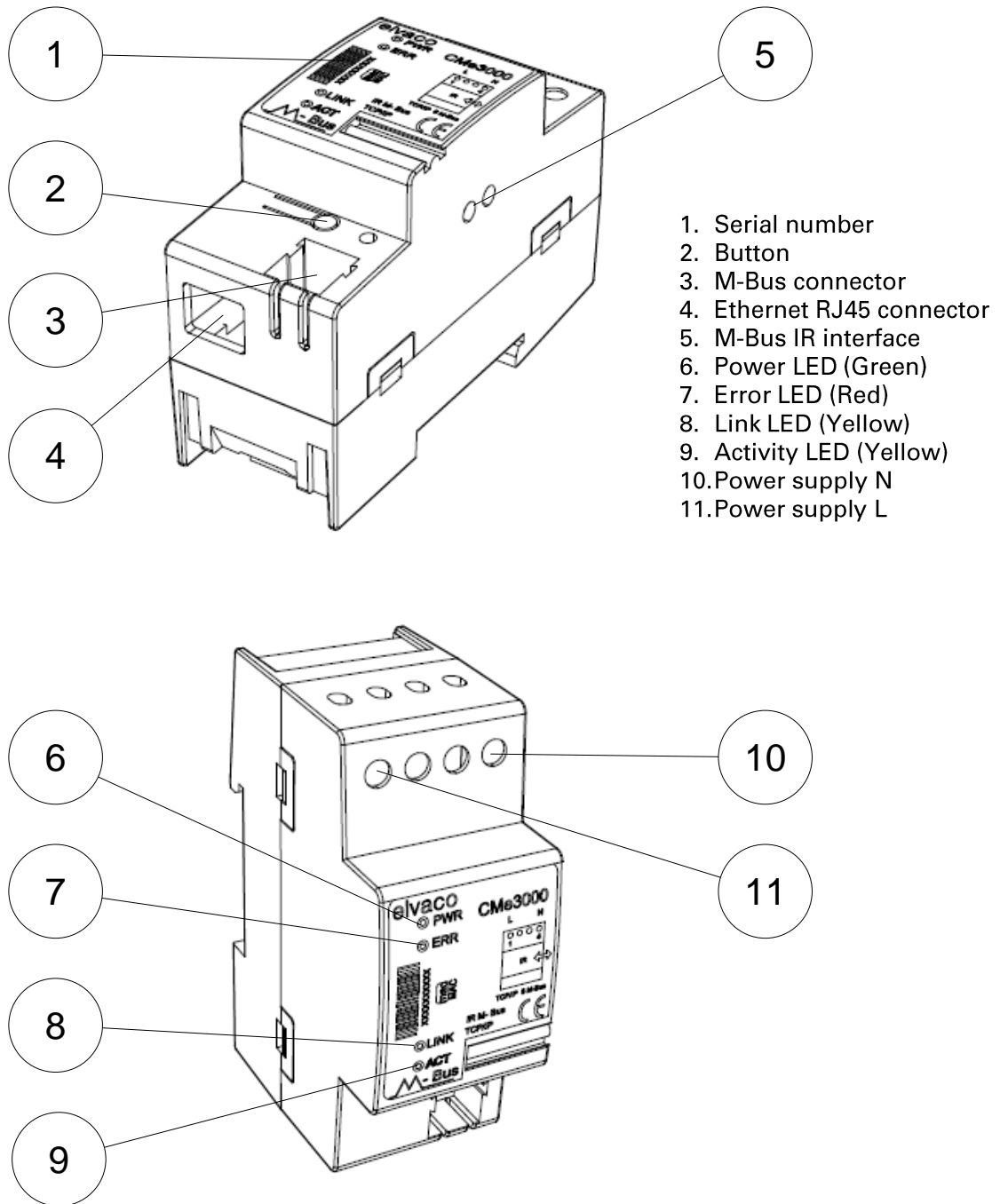
- Transparent TCP/IP communication to read meter values from any ABB electricity meter with IR interface
- Transparent TCP/IP communication to read meter values from any meter following the standard M-Bus protocol
- Connect up to 8 M-Bus slave devices
 - Expansion module series CMeX enables extra connected M-Bus slave devices using IR interface
- Remotely updatable application using internal web interface

3.3 Applications

The CMe3000 fits into almost any kind of meter collection system. For example:

- Remote reading of an M-Bus compatible electricity meter
- Remote reading of a combination of meter types on a single bus-system, such as M-Bus compatible water meters, electricity meters and heat meters

3.4 Overview



- 1. Serial number
- 2. Button
- 3. M-Bus connector
- 4. Ethernet RJ45 connector
- 5. M-Bus IR interface
- 6. Power LED (Green)
- 7. Error LED (Red)
- 8. Link LED (Yellow)
- 9. Activity LED (Yellow)
- 10. Power supply N
- 11. Power supply L

Figure 1 CMe3000 Front View

4 Physical installation

This chapter covers the physical installation of the CMe3000.

4.1 Mounting

The CMe3000 should be mounted on a DIN-rail. The metallic clip on the bottom is used to mount and demount the unit from the DIN-rail. For safety reasons, a DIN-rail enclosure must cover the terminals.

4.1.1 Ethernet connection

Connect the TP-cable to the RJ45 connector (4). On successful connection to switch/hub, the yellow Link LED (8) should be permanently on.

4.1.2 M-Bus 2-wire bus

M-Bus is a multi-drop 2-wire bus, with no polarity. A cable of telephone type (i.e. EKKX 2x2x0.5 mm) or standard mains type (1.5 mm²) should be used. Connect the wiring to the connector (3). Do not exceed the maximum cable length of 1000 meters.

IMPORTANT

Please take the following in consideration:

- The internal M-Bus interface can handle up to 8 M-Bus slave devices. Overloading the bus will cause communication problems with the connected slaves.
- All connected M-Bus slave devices must have unique primary or secondary M-Bus addresses depending on addressing mode used

4.1.3 IR Interface with ABB electricity meters or CMeX Series modules

When the IR interface is used beside an ABB electricity meter or CMeX module, the IR shield (5) should be removed. The CMe3000 should be mounted on the left side of the ABB electricity meter or CMeX module. There shall be no space between the CMe3000 and the ABB electricity meter or CMeX module. (Do not remove the shield if not used beside an ABB electricity meter or CMeX module.)

4.1.4 Power supply

The installation should be performed by a qualified electrician or an installer with the required knowledge. The power supply must be protected with a 10 A circuit breaker of characteristic C or slow blow fuse. The power supply should be connected via a clearly marked, easily accessible and nearby switch so the unit can be switched off during service work.

The main supply should be connected to screw terminal (10) and screw terminal (11). Main supply voltage should be in the range of 100-240 VAC, 50/60 Hz. The CMe3000 will be running factory default settings when first powered up.

5 Application description

This chapter covers general application description of the product.

5.1.1 Purpose

The product is intended to be used for communication with M-Bus meters using transparent TCP/IP communication.

5.2 Operation

The product has different operation states depending on the current application task.

5.2.1 Watchdog restart

The product has an intelligent Watchdog functionality to enable stable operation. When any application error is discovered, the product will automatically reset and reinitialize again.

5.2.2 Power on

When powered on, the product has an internal boot time of approximately 10 seconds. During the boot time, the product will execute the following tasks:

- Initialize all settings
- Start necessary tasks for operation
- Start M-Bus transparent servers


5.2.3 Normal operation



During normal operation, the following tasks are executed:

- Listening for incoming requests on transparent TCP server
- Status indication (LED)
- User interaction (push-button)

5.3 Indications

The product is equipped with four LEDs. The red LED indicates M-Bus error or collision, the green LED shows mains connection and the yellow LEDs indicate current TCP/IP activity and status.

| ERR Red LED | Product state | Visual |
|----------------|-----------------------------------|---|
| Permanently on | Short circuit on M-Bus 2-wire bus |  |

| PWR Green LED | Product state | Visual |
|----------------|------------------|---|
| Off | No power supply |  |
| Permanently on | Normal operation |  |

| LINK Yellow LED | Product state | Visual |
|-----------------|---|--------|
| Off | The product is not connected to an active network | |
| Permanently on | The product is connected to a network | |

| ACT Gul LED | Product state | Visual |
|-------------|--|--------|
| Off | No communication in progress | |
| Flashing | Communication in progress in the network | |

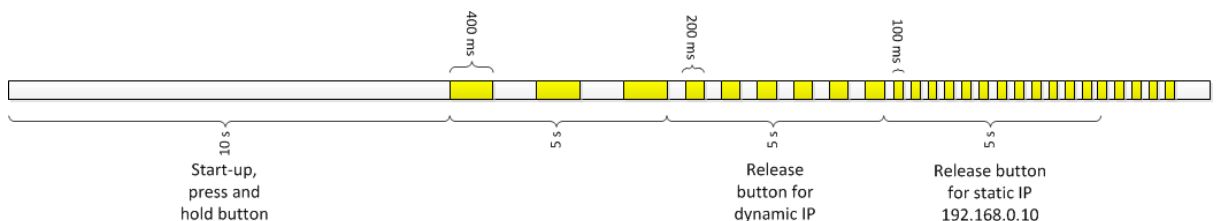
5.4 Reset to factory default

There are two alternatives when resetting the product to factory default;

- 1) Reset to use dynamic IP addressing
 - a. Press and hold the button during power-up and hold it for at least 15 seconds. The ACT LED will go from slow to fast flashing after 15 seconds. Release the button and the product will be reset to factory defaults and restart. After restart, the product will be given an IP address from available DHCP server.

- 2) Reset to use static IP
 - a. Press and hold the button during power-up and hold it for at least 20 seconds. The ACT LED will go from slow to fast flashing after 15 seconds. After 20 seconds, the ACT LED will flash even faster. Release the button and the product will be reset to factory defaults and restart. After restart, the product will be set to static IP address according to: IP: 192.168.0.10, MASK: 255.255.255.0, GATEWAY: 192.168.0.1

The product can also be reset using the internal web interface, please see section 8.2.

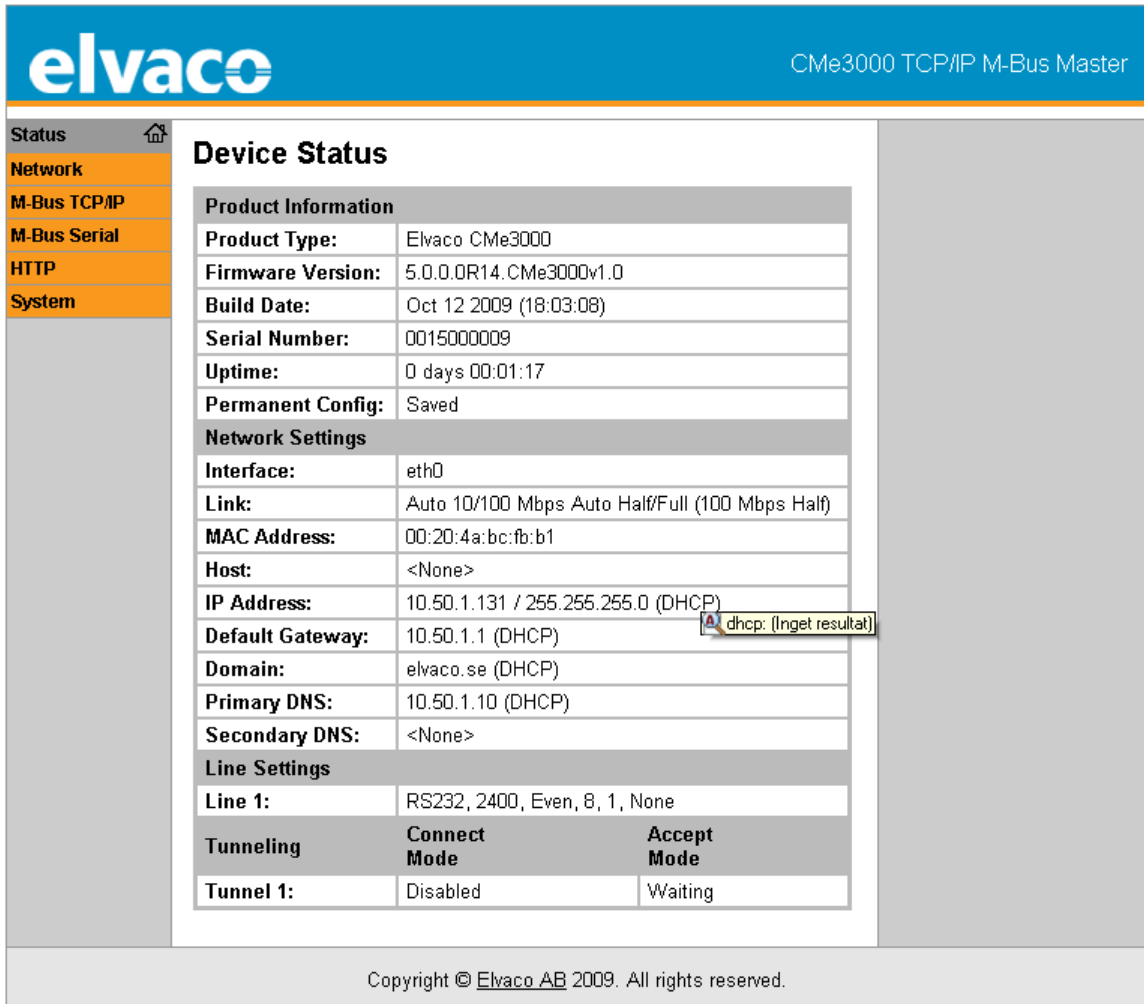


6 Administration of the product

This section covers how to configure the product using the internal web interface.

6.1 Login

Use a web browser (i.e. Internet Explorer, Firefox, Chrome) and type the IP address of the product in the address field. Login with username **admin** and password **admin**. Review product and status information of the product using this page, see Figure 2.



The screenshot shows the internal web interface for the Elvaco CMe3000 TCP/IP M-Bus Master. The page title is "Device Status". On the left, there is a navigation menu with the following items: Status, Network (highlighted), M-Bus TCP/IP, M-Bus Serial, HTTP, and System. The main content area displays the following information:

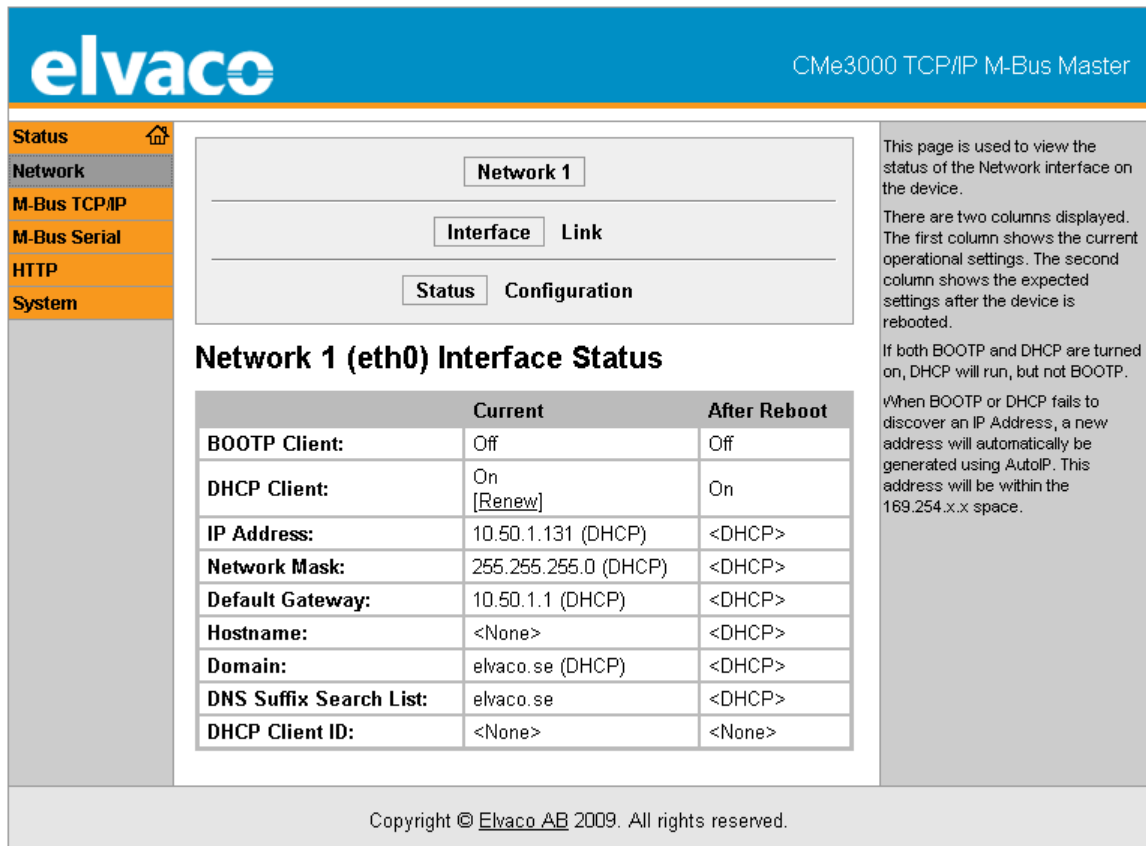
| Product Information | | |
|---------------------|--|-------------|
| Product Type: | Elvaco CMe3000 | |
| Firmware Version: | 5.0.0.0R14.CMe3000v1.0 | |
| Build Date: | Oct 12 2009 (18:03:08) | |
| Serial Number: | 0015000009 | |
| Uptime: | 0 days 00:01:17 | |
| Permanent Config: | Saved | |
| Network Settings | | |
| Interface: | eth0 | |
| Link: | Auto 10/100 Mbps Auto Half/Full (100 Mbps Half) | |
| MAC Address: | 00:20:4a:bc:fb:b1 | |
| Host: | <None> | |
| IP Address: | 10.50.1.131 / 255.255.255.0 (DHCP) | |
| Default Gateway: | 10.50.1.1 (DHCP) <small>dhcp: (Inget resultat)</small> | |
| Domain: | elvaco.se (DHCP) | |
| Primary DNS: | 10.50.1.10 (DHCP) | |
| Secondary DNS: | <None> | |
| Line Settings | | |
| Line 1: | RS232, 2400, Even, 8, 1, None | |
| Tunneling | Connect Mode | Accept Mode |
| Tunnel 1: | Disabled | Waiting |

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Figure 2 Internal web interface - Home

6.2 Change IP settings

The product supports both DHCP and static IP settings. To change settings, navigate to "Network" page. Current IP settings are shown as in Figure 3.



elvaco CMe3000 TCP/IP M-Bus Master

Status 

Network

M-Bus TCP/IP

M-Bus Serial

HTTP

System

Network 1

Interface **Link**

Status **Configuration**

Network 1 (eth0) Interface Status

| | Current | After Reboot |
|--------------------------------|-------------------------------|--------------|
| BOOTP Client: | Off | Off |
| DHCP Client: | On [Renew] | On |
| IP Address: | 10.50.1.131 (DHCP) | <DHCP> |
| Network Mask: | 255.255.255.0 (DHCP) | <DHCP> |
| Default Gateway: | 10.50.1.1 (DHCP) | <DHCP> |
| Hostname: | <None> | <DHCP> |
| Domain: | elvaco.se (DHCP) | <DHCP> |
| DNS Suffix Search List: | elvaco.se | <DHCP> |
| DHCP Client ID: | <None> | <None> |

This page is used to view the status of the Network interface on the device.

There are two columns displayed. The first column shows the current operational settings. The second column shows the expected settings after the device is rebooted.

If both BOOTP and DHCP are turned on, DHCP will run, but not BOOTP.

When BOOTP or DHCP fails to discover an IP Address, a new address will automatically be generated using AutoIP. This address will be within the 169.254.x.x space.

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Figure 3 Internal web interface - Network interface status

Click on "Configuration" to change current IP settings. Depending on settings changed, the product may need a reboot. Please see Figure 4 for available configuration.

The screenshot shows the elvaco web interface for the CMe3000 TCP/IP M-Bus Master. The left sidebar contains navigation links: Status, Network, M-Bus TCP/IP, M-Bus Serial, HTTP, and System. The main content area is titled "Network 1" and includes sub-sections for "Interface" and "Link". Below these are "Status" and "Configuration" buttons. The "Configuration" button is active, leading to the "Network 1 (eth0) Interface Configuration" page. This page features a table of configuration options:

| | |
|-------------------------|---|
| BOOTP Client: | <input type="radio"/> On <input checked="" type="radio"/> Off |
| DHCP Client: | <input checked="" type="radio"/> On <input type="radio"/> Off |
| IP Address: | <input type="text" value="<None>"/> |
| Default Gateway: | <input type="text" value="<None>"/> |
| Hostname: | <input type="text"/> |
| Domain: | <input type="text"/> |
| DHCP Client ID: | <input type="text"/> <input checked="" type="radio"/> Text <input type="radio"/> Binary |
| Primary DNS: | <input type="text" value="<None>"/> |
| Secondary DNS: | <input type="text" value="<None>"/> |

On the right side of the configuration page, there is explanatory text:

This page is used to configure the Network interface on the device. To see the effect of these items after a reboot, view the **Status** page.

The following items require a reboot to take effect:

- BOOTP Client On/Off
- DHCP Client On/Off
- IP Address
- DHCP Client ID

If BOOTP or DHCP is turned on, any configured IP Address, Network Mask, Gateway, Hostname, or Domain will be ignored. BOOTP/DHCP will auto-discover and eclipse those configuration items.

If both BOOTP and DHCP are turned on, DHCP will run, but not BOOTP.

When BOOTP or DHCP fails to discover an IP Address, a new address will automatically be generated using AutoIP. This address will be within the 169.254.x.x space.

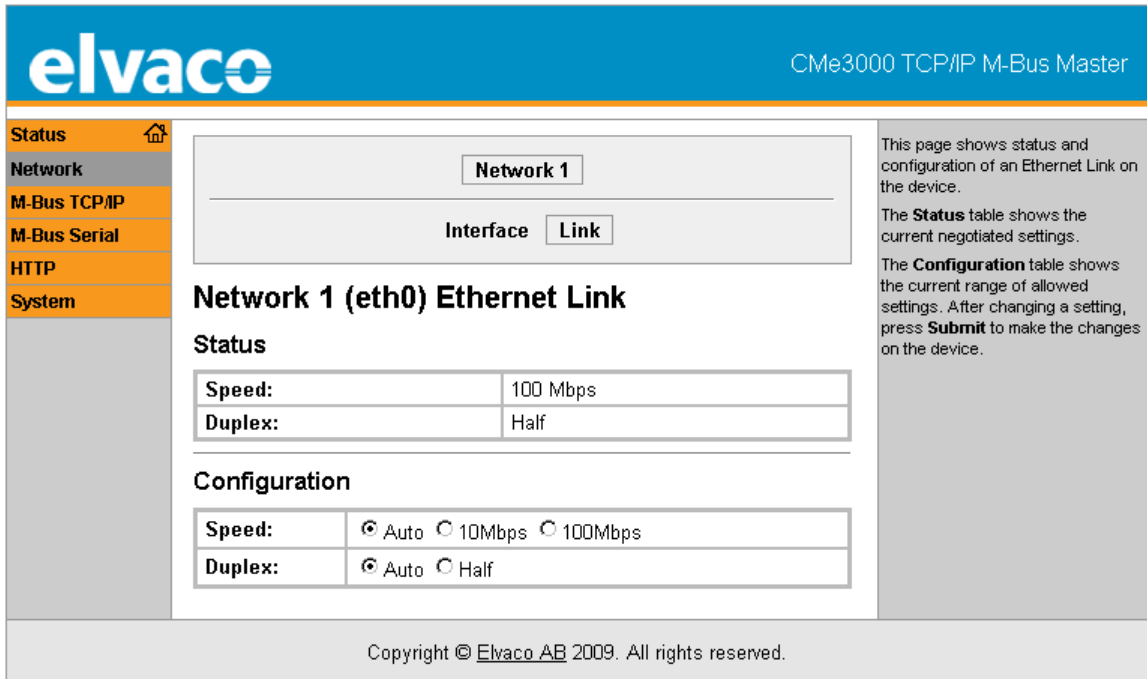
IP Address may be entered alone, in CIDR form, or with an explicit mask:
 192.168.1.1 (default mask)
 192.168.1.1/24 (CIDR)
 192.168.1.1 255.255.255.0 (explicit mask)

Hostname must begin with a letter, continue with letter, number, or hyphen, and must end with a letter or number.

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Figure 4 Internal web interface - Network interface configuration

The product will use auto speed and auto duplex from factory defaults. Change settings by clicking "Link". See Figure 5.



The screenshot shows the elvaco web interface for the CMe3000 TCP/IP M-Bus Master. The interface is divided into a left sidebar with navigation options (Status, Network, M-Bus TCP/IP, M-Bus Serial, HTTP, System) and a main content area. The main content area is titled "Network 1 (eth0) Ethernet Link" and contains a "Status" table and a "Configuration" table. The "Status" table shows the current negotiated settings: Speed: 100 Mbps and Duplex: Half. The "Configuration" table shows the current range of allowed settings: Speed: Auto (selected), 10Mbps, 100Mbps and Duplex: Auto (selected), Half. A "Link" button is visible in the top right of the main content area. A right sidebar contains explanatory text about the Status and Configuration tables. The footer of the interface reads "Copyright © Elvaco AB 2009. All rights reserved."

elvaco CMe3000 TCP/IP M-Bus Master

Status 

Network

M-Bus TCP/IP

M-Bus Serial

HTTP

System

Network 1

Interface **Link**

Network 1 (eth0) Ethernet Link

Status

| | |
|---------|----------|
| Speed: | 100 Mbps |
| Duplex: | Half |

Configuration

| | |
|---------|--|
| Speed: | <input checked="" type="radio"/> Auto <input type="radio"/> 10Mbps <input type="radio"/> 100Mbps |
| Duplex: | <input checked="" type="radio"/> Auto <input type="radio"/> Half |

This page shows status and configuration of an Ethernet Link on the device.

The **Status** table shows the current negotiated settings.

The **Configuration** table shows the current range of allowed settings. After changing a setting, press **Submit** to make the changes on the device.

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Figure 5 Internal web interface - Network link configuration

6.3 Configure M-Bus Transparent server settings

The product handles incoming TCP/IP connections and establishes a transparent link to the M-Bus interface. Use the M-Bus TCP/IP settings page to configure the TCP/IP server settings, see Figure 6.

The screenshot shows the internal web interface for the elvaco CMe3000 TCP/IP M-Bus Master. The interface has a blue header with the elvaco logo and the title 'CMe3000 TCP/IP M-Bus Master'. On the left is a navigation menu with items: Status, Network, M-Bus TCP/IP (highlighted), M-Bus Serial, HTTP, and System. The main content area has three tabs: 'Statistics' (selected), 'Accept Mode', and 'Disconnect Mode'. Below the tabs is a 'Statistics' section with a table of 'Aggregate Counters' and 'Connect 1' through 'Connect 12' connection times. All values are currently zero. A right-hand sidebar contains a note: 'This page displays all the Tunnel Statistics and the current status of both the Accept Mode and the Connect Mode tunnels.'

| Aggregate Counters | |
|--------------------------------|-----------------|
| Completed Accepts: | 0 |
| Completed Connects: | 0 |
| Disconnects: | 0 |
| Dropped Accepts: | 0 |
| Dropped Connects: | 0 |
| Octets forwarded from Serial: | 0 |
| Octets forwarded from Network: | 0 |
| Accept Connection Time: | 0 days 00:00:00 |
| Connect 1 Connection Time: | 0 days 00:00:00 |
| Connect 2 Connection Time: | 0 days 00:00:00 |
| Connect 3 Connection Time: | 0 days 00:00:00 |
| Connect 4 Connection Time: | 0 days 00:00:00 |
| Connect 5 Connection Time: | 0 days 00:00:00 |
| Connect 6 Connection Time: | 0 days 00:00:00 |
| Connect 7 Connection Time: | 0 days 00:00:00 |
| Connect 8 Connection Time: | 0 days 00:00:00 |
| Connect 9 Connection Time: | 0 days 00:00:00 |
| Connect 10 Connection Time: | 0 days 00:00:00 |
| Connect 11 Connection Time: | 0 days 00:00:00 |
| Connect 12 Connection Time: | 0 days 00:00:00 |

Figure 6 Internal web interface - M-Bus TCP/IP statistics

Click "Accept Mode" to change TCP server listening port and keep-alive settings, see Figure 7.

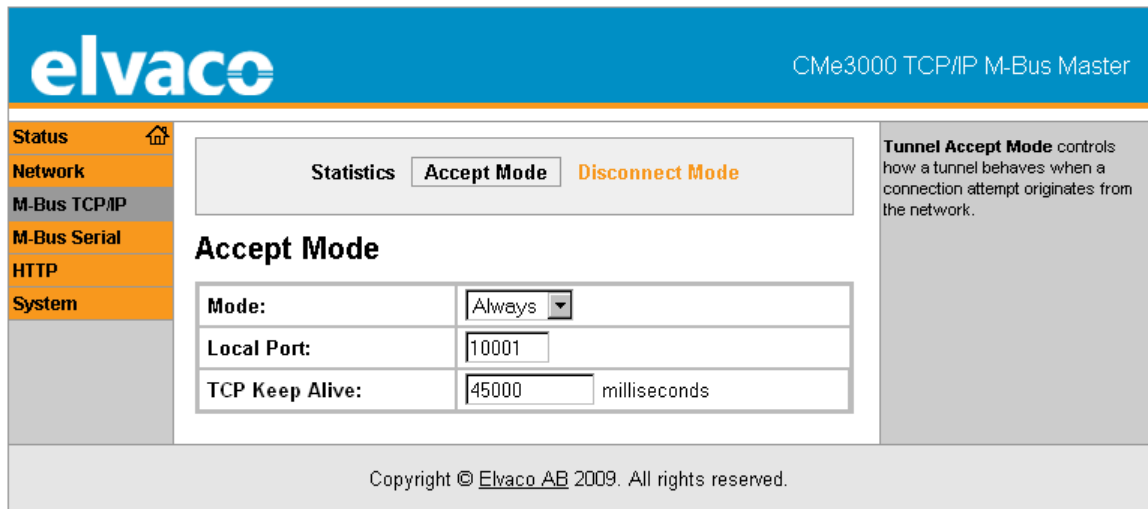


Figure 7 Internal web interface - M-Bus TCP/IP accept mode

Click "Disconnect Mode" to change disconnect timeout, see Figure 8.

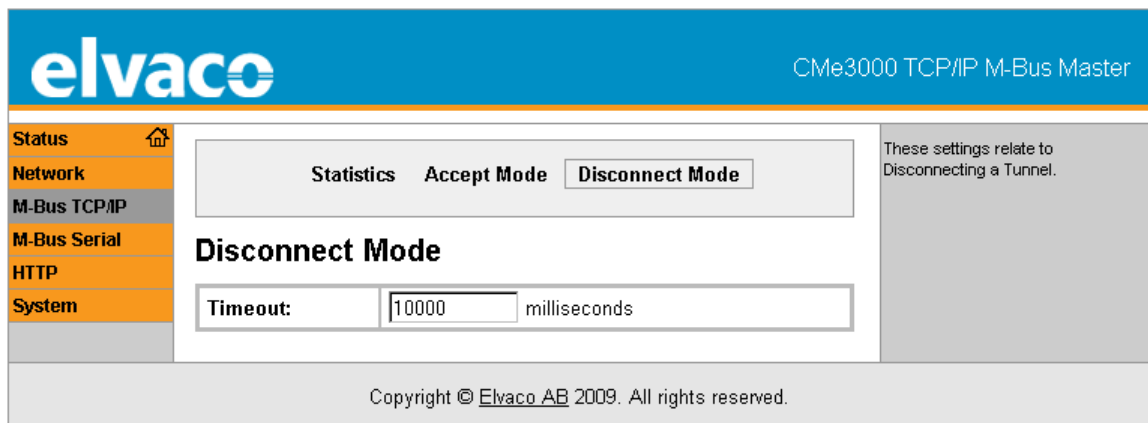


Figure 8 Internal web interface - M-Bus TCP/IP disconnect mode

6.4 Configure M-Bus Transparent local baud rate

Click "M-Bus Serial" to view M-Bus local serial line statistics, see Figure 9.

The screenshot shows the 'M-Bus Serial' statistics page. The navigation menu on the left includes Status, Network, M-Bus TCP/IP, M-Bus Serial (selected), HTTP, and System. The main content area has two tabs: 'Statistics' (active) and 'Configuration'. The 'Statistics' tab displays the following data:

| | Receiver | Transmitter |
|------------------------|----------|-------------|
| Bytes: | 0 | 0 |
| Breaks: | 0 | 0 |
| Parity Errors: | 0 | |
| Framing Errors: | 0 | |
| Overrun Errors: | 0 | |
| No Rx Buffer Errors: | 0 | |
| Queued Receive Bytes: | 0 | |
| Queued Transmit Bytes: | 0 | |

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Figure 9 Internal web interface - M-Bus Serial statistics

Click "Configuration" to change local M-Bus baud rate, see Figure 10.

The screenshot shows the 'M-Bus Serial' configuration page. The navigation menu on the left is the same as in Figure 9. The main content area has two tabs: 'Statistics' and 'Configuration' (active). The 'Configuration' tab displays the following configuration:

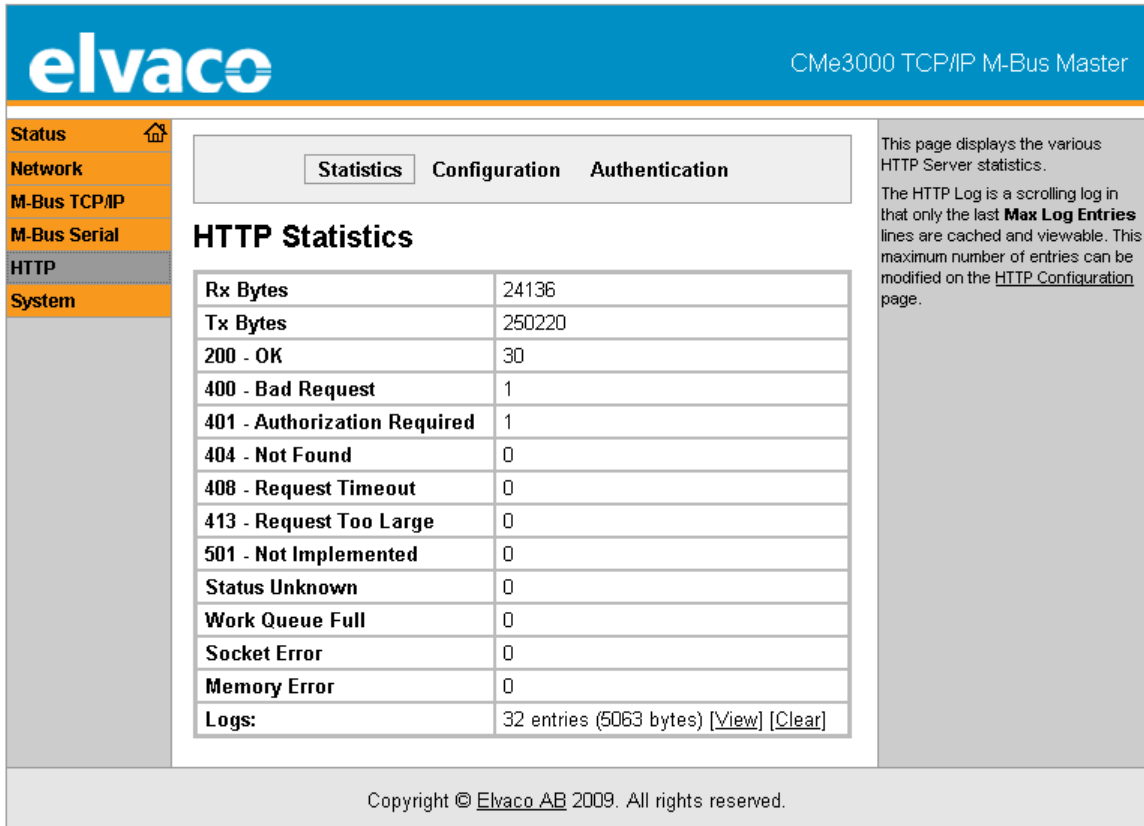
| | Configuration | Status |
|------------|---------------|--------|
| Baud Rate: | 2400 | 2400 |

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Figure 10 Internal web interface - M-Bus Serial configuration

6.5 Configure internal web interface settings

Click "HTTP" to view internal web interface statistics. The internal web interface can handle different users and HTTPS when required, see Figure 11.



The screenshot shows the elvaco internal web interface for the CMe3000 TCP/IP M-Bus Master. The interface has a blue header with the elvaco logo and the title "CMe3000 TCP/IP M-Bus Master". On the left, there is a navigation menu with items: Status (with a home icon), Network, M-Bus TCP/IP, M-Bus Serial, HTTP (highlighted), and System. The main content area has three tabs: Statistics (selected), Configuration, and Authentication. Below the tabs, the "HTTP Statistics" section displays a table of statistics and a log entry.

| HTTP Statistics | |
|------------------------------|--|
| Rx Bytes | 24136 |
| Tx Bytes | 250220 |
| 200 - OK | 30 |
| 400 - Bad Request | 1 |
| 401 - Authorization Required | 1 |
| 404 - Not Found | 0 |
| 408 - Request Timeout | 0 |
| 413 - Request Too Large | 0 |
| 501 - Not Implemented | 0 |
| Status Unknown | 0 |
| Work Queue Full | 0 |
| Socket Error | 0 |
| Memory Error | 0 |
| Logs: | 32 entries (5063 bytes) View Clear |

On the right side of the interface, there is a text box explaining the HTTP statistics: "This page displays the various HTTP Server statistics. The HTTP Log is a scrolling log in that only the last **Max Log Entries** lines are cached and viewable. This maximum number of entries can be modified on the [HTTP Configuration](#) page."

At the bottom of the interface, there is a copyright notice: "Copyright © Elvaco AB 2009. All rights reserved."

Figure 11 Internal web interface - HTTP statistics

Click "Configuration" to change internal web interface server settings, see Figure 12.

CMe3000 TCP/IP M-Bus Master

Status

Network

M-Bus TCP/IP

M-Bus Serial

HTTP

System

Statistics | Configuration | Authentication

HTTP Configuration

HTTP Server: On Off

HTTP Port:

HTTPS Port:

HTTPS Protocols

SSL3: Enable Disable

TLS1.0: Enable Disable

TLS1.1: Enable Disable

Max Timeout: seconds

Max Bytes:

Logging: On Off

Max Log Entries:

Log Format:

Current Configuration

| | |
|------------------|--|
| HTTP Status: | On (running) |
| HTTP Port: | 80 |
| HTTPS Port: | 443 |
| HTTPS Protocols: | SSL3, TLS1.0, TLS1.1 |
| Max Timeout: | 10 seconds |
| Max Bytes: | 40960 |
| Logging: | On |
| Max Log Entries: | 50 |
| Log Format: | %h %t "%r" %s %B "%{Referer}i" "%{User-Agent}i" |
| Logs: | 34 entries (5392 bytes) [View] [Clear] |

Both the **HTTP Port** and **HTTPS Port** (SSL) can be overridden. The HTTP Server will only listen on the **HTTPS Port** when an **SSL Certificate** is configured for the device and at least one SSL protocol version is enabled in **HTTPS Protocols**.

The **Max Timeout** value specifies the maximum amount of time to wait for a request from a client. The **Max Bytes** value specifies the maximum number of bytes allowed in a client request. Both of these value are used to help prevent Denial of Service (DoS) attacks against the HTTP Server.

The HTTP Log is a scrolling log in that only the last **Max Log Entries** lines are cached and viewable.

Log Format Directives

- %a remote IP address (could be a proxy)
- %b bytes sent excluding headers
- %B bytes sent excluding headers (0 = '-')
- %h remote host (same as '%a')
- {h}i header contents from request (h = header string)
- %m request method
- %p ephemeral local port value used for request
- %q query string (prepend with '?' or empty '-')
- %t timestamp HH:MM:SS (same as Apache "%(H%M%S)t" or "%(T)t")
- %u remote user (could be bogus for 401 status)
- %U URL path info
- %r first line of request (same as "%m %U%q <version>")
- %s return status

The max length for each directive is 64 bytes. The exception is '%r' where each element is limited to 64 bytes (i.e. method, URL path info, and query string).

Figure 12 Internal web interface - HTTP configuration

Click "Authentication" to change security settings, see Figure 13.

elvaco
CMe3000 TCP/IP M-Bus Master

Status

Network

M-Bus TCP/IP

M-Bus Serial

HTTP

System

Statistics
Configuration
Authentication

HTTP Authentication

URI:

Realm:

AuthType: None Basic Digest
 SSL SSL/Basic SSL/Digest

Username:

Password:

Current Configuration

| | |
|-----------|--------------------------------|
| URI: | / [Delete] |
| Realm: | config |
| AuthType: | Digest |
| Users: | admin [Delete] |

The HTTP Server can be configured with many different authentication directives. The authentication is hierarchical in that any URI can be given an authentication directive in order to override a parent URI authentication directive.

The **URI** must begin with / to refer to the filesystem.

The different **AuthType** values offer various levels of security. From the least to most secure:

None
no authentication necessary

Basic
encodes passwords using Base64

Digest
encodes passwords using MD5

SSL
page can only be accessed over SSL (no password)

SSL/Basic
page can only be accessed over SSL (encodes passwords using Base64)

SSL/Digest
page can only be accessed over SSL (encodes passwords using MD5)

Note that **SSL** by itself does not require a password but all data transferred to and from the HTTP Server is encrypted.

There is no real reason to create an authentication directive using **None** unless you want to override a parent directive that uses some other **AuthType**.

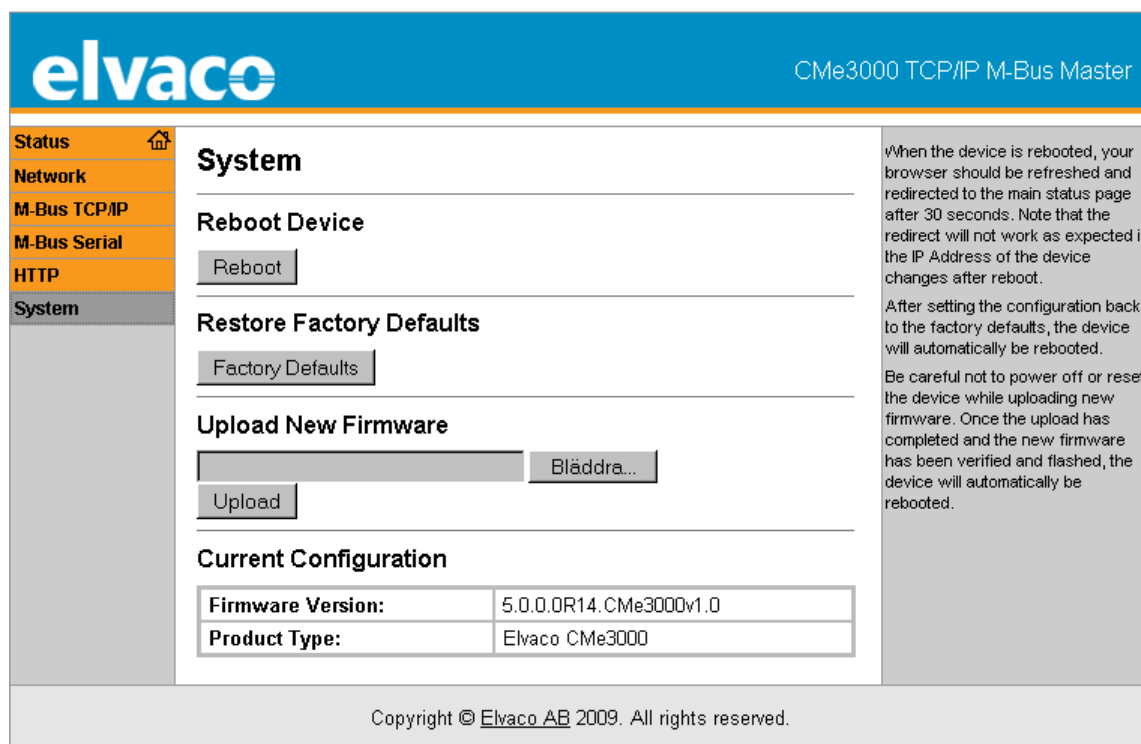
Multiple users can be configured within a single authentication directive.

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Figure 13 Internal web interface - HTTP authentication

6.6 System

On the System page, the product can be rebooted, reset to factory defaults and the firmware can be upgraded. Click "System" to enter the System page, see Figure 14.



System

Reboot Device

Reboot

Restore Factory Defaults

Factory Defaults

Upload New Firmware

Bläddra...

Upload

Current Configuration

| | |
|-------------------|------------------------|
| Firmware Version: | 5.0.0.0R14.CMe3000v1.0 |
| Product Type: | Elvaco CMe3000 |

When the device is rebooted, your browser should be refreshed and redirected to the main status page after 30 seconds. Note that the redirect will not work as expected if the IP Address of the device changes after reboot.

After setting the configuration back to the factory defaults, the device will automatically be rebooted.

Be careful not to power off or reset the device while uploading new firmware. Once the upload has completed and the new firmware has been verified and flashed, the device will automatically be rebooted.

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Figure 14 Internal web interface - System

6.6.1 Reboot

Click the "Reboot" button to reboot the device. Boot time is approximately 10 seconds.

6.7 Factory defaults

Reset to factory defaults by clicking the button "Factory defaults". See Table 3 for default settings. The product can also be reset to factory defaults by pressing the button on power up for 5 seconds, see section 5.4.

6.8 Firmware update

The product can be remotely updated by uploading new firmware in the internal web interface. Use the button "Browse" to select the firmware file and click "Upload" to start firmware update process. The latest firmware file can be found on Elvaco web site, <http://www.elvaco.com>.

Firmware file name should be named cme3000.romz.

7 Troubleshooting

7.1 All LEDs are permanently off

There is a problem with the supply voltage. Please verify 100-240 VAC. If the problem persists, the product may be malfunctioning. Please contact Elvaco support.

7.2 Red LED is permanently on

This indicates an error on the M-Bus 2-wire bus.

Please verify no short-circuit of the M-Bus bus. The voltage of the bus should be between 24 VDC and 30 VDC.

7.3 Cannot connect to the product using TCP/IP

Please verify TCP/IP settings in the internal web interface:

- TCP port used for communication
- IP address
- Ethernet link settings

7.4 Cannot read connected M-Bus slaves

Please verify M-Bus status:

- Voltage over M-Bus slave device should be between 24 VDC and 30 VDC
- All M-Bus slave devices must have unique secondary or primary M-Bus addresses depending on addressing mode
- M-Bus slave device baud rates

If you still have problems getting your CMe Series running, please contact Elvaco support, see contact information section 1.2.

8 Technical specifications

8.1 Characteristics

| Type | Value | Unit | Comments |
|-------------------------------------|--|------|--|
| Mechanics | | | |
| Casing material | Polyamide | - | |
| Protection class | IP20 | - | |
| Dimensions (w x h x d) | 35 x 90 x 65 | mm | 2 DIN modules |
| Weight | 100 | g | |
| Mounting | DIN rail | - | Mounted on DIN rail (DIN 50022) 35 mm |
| Electrical connections | | | |
| Supply voltage | Screw terminal | - | Cable 0.75-2.5 mm ² , 0.5 Nm tightening torque. |
| M-Bus master port | Pin terminal | - | Solid wire 0.6-0.8 Ø mm |
| Network | RJ45 | - | Ethernet |
| Electrical characteristics | | | |
| Nominal voltage | 100-240 | VAC | +/- 10% |
| Frequency | 50/60 | Hz | |
| Power consumption (max) | <2.5 | W | |
| Power consumption (nom) | <1 | W | |
| Installation category | CAT 3 | - | |
| Environmental specifications | | | |
| Operating temperature | -20 to +55 | °C | |
| Operating humidity max | 80 % RH at temperatures up to 31 °C, decreasing linearly to 50 % RH at 40 °C | - | |
| Operating altitude | 0-2000 | m | |
| Pollution degree | Degree 2 | - | |
| Usage environment | Indoors, can be extended with IP67 enclosure for outdoor use | - | |
| Storage temperature | -40 to +85 | °C | |
| User interface | | | |
| Green LED | Power | - | |
| Red LED | Error | - | |
| Yellow LEDs | Status Ethernet | - | |

| | | | |
|--|-----------------------------|-------|---|
| Push button | Factory reset | - | |
| Configuration | Web interface (HTTP) | - | |
| M-Bus | | | |
| Interfaces | IR, integrated M-Bus Master | - | |
| Maximum number of M-Bus devices (software limit) | 256 | - | |
| Transparent M-Bus | TCP/IP | - | Software limit does not apply to Transparent M-Bus mode |
| Integrated M-Bus Master | | | |
| M-Bus standard | EN 13757 | - | |
| M-Bus baud rate | 300 and 2400 | bit/s | |
| Nominal voltage | 28 | VDC | |
| Maximum unit loads | 8/12 | T/mA | Can be extended using CMeX10-13S Series |
| M-Bus search modes | Primary, secondary | - | |
| Maximum cable length | 1000 | M | 100 nF/km, maximum 90 Ω |
| General | | | |
| Software/firmware update | Web interface | - | |
| Fixed network (Ethernet) | | | |
| Speed and duplex | Auto 10/100 | Mbit | Half/Full duplex |
| Communication protocols | | | |
| TCP Transparent M-Bus @ 300 and 2400 baud TCP Console for configuration HTTP internal web server for configuration | | | |

Table 2 Technical specifications

8.2 Factory defaults

| Name | Value | Unit | Comments |
|--|---------|-------|--|
| BOOTP Client | Off | - | |
| DHCP Client | On | - | IP address, default gateway, hostname, domain, DNS from DHCP |
| Ethernet Speed | Auto | - | |
| Ethernet Duplex | Auto | - | |
| M-Bus TCP/IP Server | Enabled | - | |
| M-Bus TCP/IP Port | 10001 | - | |
| M-Bus TCP/IP Server Keep Alive | 45 | s | |
| M-Bus TCP/IP Server disconnect timeout | 10 | s | |
| M-Bus Serial local baud rate | 2400 | Bit/s | |
| Internal web interface username | admin | - | |
| Internal web interface password | admin | - | |

Table 3 Factory defaults

9 Type approvals

CMe Series is designed to comply with the directives and standards listed below.

| Approval | Description |
|-----------------|----------------------------|
| EMC | EN 61000-6-2, EN 61000-6-3 |
| Safety | EN 61010-1, CAT 3 |

Table 4 Type approvals

10 Safety and environment

10.1 Safety precautions

The following safety precautions must be observed during all phases of the operation, usage, service or repair of any CMe Series product. Users of the product are advised to convey the following safety information to users and operating personnel and to incorporate these guidelines into all manuals supplied with the product. Failure to comply with these precautions violates safety standards of design, manufacture and intended use of the product. Elvaco AB assumes no liability for customer's failure to comply with these precautions.

All instructions must be carefully read before CMe3000 is installed and used. They contain important information about how the product is used properly.

The installation of CMe3000 should not be started before the technical specifications are fully understood. The work must be performed in the order listed in this manual, and only by qualified personnel. The work must also be done in accordance with national electrical specifications and applicable local regulations.

In order to avoid the product being damaged by static electricity, an ESD wristband should be worn when handling the product.

To prevent hazardous power levels, the M-Bus 2-wire cable should be disconnected from the M-Bus slave or other installations.

The product is intended for permanent connection to the M-Bus slaves through the M-Bus 2-wire cable. The M-Bus master's 2-wire cable must be properly dimensioned, and if necessary, it must be possible to disconnect the M-Bus slaves from the 2-wire cable.

The labelling of the product may not be changed, removed or made unrecognizable.

11 Document History

| Version | Date | Description | Author |
|---------|------------|--|---------------|
| 1.0 | 2010-01-21 | First draft | David Vonasek |
| 1.1 | 2010-07-01 | Added information of reset possibilities for static IP settings. | David Vonasek |
| 2.0 | 2011-03-17 | Minor changes | Ericha Bloom |
| | 2014-05-22 | Added LED images | Ericha Bloom |
| | 2016-08-16 | Added text in section 4.1.4 | Ericha Bloom |

11.1 Document software and hardware appliance

| Type | Version | Date | Comments |
|----------|---------|---------|----------|
| Hardware | >R1A | 2010-01 | Released |
| Software | >=1.5.0 | 2010-12 | Released |

12 References

12.1 References

- [1] EN-13757-1, EN-13757-2, EN-13757-3
Communication System for meters and remote reading of meters – Part1, Part2 and Part3

12.2 Terms and Abbreviations

| Abbreviation | Description |
|--------------|---|
| AMR | Automatic Meter Reading |
| Product | In this document CMe3000 |
| OTAP | Over The Air Provisioning |
| DIB | Data Information Block (M-Bus data block) |
| DIF | Data Information Field (M-Bus data block information) |
| VIF | Value Information Field (M-Bus value block information) |
| Device | In this document; M-Bus slave or other metering slave |

12.2.1 Number representation

Decimal numbers are represented as normal number, i.e. 10 (ten).

Hexadecimal numbers are represented with prefix 0x, i.e. 0x0A (ten)

Binary numbers are represented with prefix 0b, i.e. 0b00001010 (ten)