



Netbiter EC300 Series

USER MANUAL

SCM-1202-012 2.2 ENGLISH



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1 Preface

1.1 About This Document

This manual describes how to install and configure Netbiter EC300 Series gateways.

For additional documentation and software downloads, FAQs, troubleshooting guides and technical support, please visit www.netbiter.com/support.

1.2 Document history

Version	Date	Description
1.0	2016-10-03	First release with new layout
2.0	2017-10-07	Update for model name NB301A/B
2.1	2017-11-06	Minor update
2.2	2017-11-13	Added EC320 technical specifications

1.3 Document Conventions

Ordered lists are used for instructions that must be carried out in sequence:

1. First do this
2. Then do this

Unordered (bulleted) lists are used for:

- Itemized information
- Instructions that can be carried out in any order

...and for action-result type instructions:

- ▶ This action...
 - ➔ leads to this result

Bold typeface indicates interactive parts such as connectors and switches on the hardware, or menus and buttons in a graphical user interface.

```
Monospaced text is used to indicate program code and other kinds of data input/output such as configuration scripts.
```

This is a cross-reference within this document: [Document Conventions, p. 4](#)

This is an external link (URL): www.hms-networks.com



This is additional information which may facilitate installation and/or operation.



This instruction must be followed to avoid a risk of reduced functionality and/or damage to the equipment, or to avoid a network security risk.



Caution

This instruction must be followed to avoid a risk of personal injury.



WARNING

This instruction must be followed to avoid a risk of death or serious injury.

2 Installation

2.1 Basic Installation Steps



This product contains parts that can be damaged by electrostatic discharge (ESD). Use ESD protective measures to avoid equipment damage.



Connecting power with reverse polarity or using the wrong type of power supply may damage the equipment. Make sure that the power supply is correctly connected and of the recommended type.

Make sure that you have all the necessary information about the capabilities and restrictions of your local network environment before installation.

1. Mount the unit on a flat surface or on a DIN rail using the adapter kit (optional).
2. Connect the slave devices and/or Ethernet network as needed.
3. For mobile networking (EC350), connect the mobile antenna and insert the SIM card.
4. Connect a suitable power supply and apply power.
5. Configure the unit.

Modbus Interfaces

Modbus devices can be connected to more than one interface and/or physical connection on Netbiter EC300 Series gateways. These interfaces must also be enabled in Netbiter Argos before they can be used. See the Netbiter Argos documentation for more information.

2.2 Factory Reset

Keep the **MODE** button pressed while powering on to reset to the factory default settings.

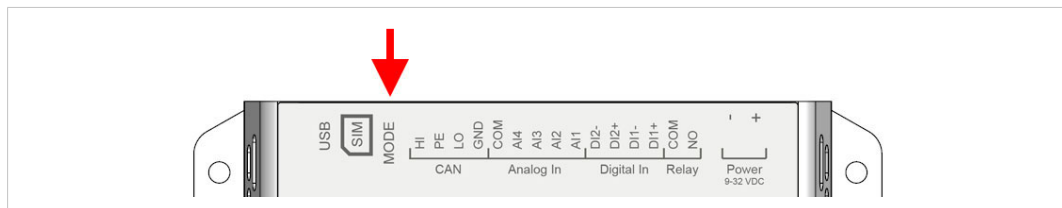


Fig. 1 Factory reset

2.3 Connectors

2.3.1 I/O Terminal Block

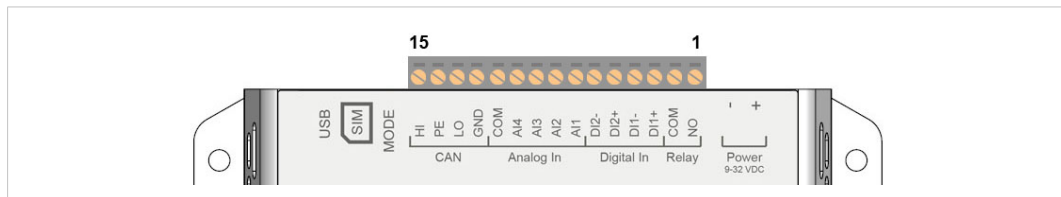


Fig. 2 Terminal block

Pin	Label	Function	Note
15	HI	CAN High	J1939
14	PE	CAN Shield	
13	LO	CAN Low	
12	GND	CAN Ground	
11	COM	Analog Input common	
10	AI4	Analog Input 4	0–20 mA or 0–10 VDC
9	AI3	Analog Input 3	0–20 mA or 0–10 VDC or PT100
8	AI2	Analog Input 2	0–20 mA or 0–10 VDC
7	AI1	Analog Input 1	0–20 mA or 0–10 VDC or PT100
6	DI2-	Digital Input 2	Dry contact type – do not apply power to these inputs
5	DI2+	Digital Input 2	
4	DI1-	Digital Input 1	
3	DI1+	Digital Input 1	
2	COM	Relay output common	Isolated inputs
1	NO	Relay output, NO	Rated load: 1 A @ 24 VDC

The analog inputs must be configured for voltage, current or PT100 input.

The digital inputs are of the dry contact type which require no control voltage.



Do not connect power to the digital inputs as this may damage the unit.



The relay output must be supplied from an isolating transformer using a secondary listed fuse rated at maximum 3.3 A and minimum 30 VDC.

2.3.2 Power Supply



Connecting power with reverse polarity or using the wrong type of power supply may damage the equipment. Make sure that the power supply is correctly connected and of the recommended type.

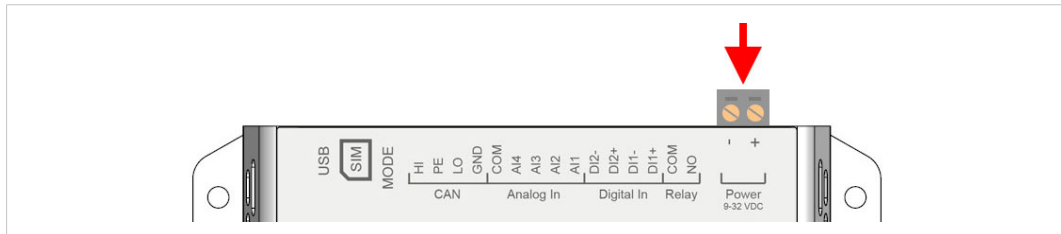


Fig. 3 Power supply connector

Connect a DC power supply of the recommended type to the + (plus) - (minus) terminals. See also [Technical Data, p. 23](#).

2.3.3 USB Connector

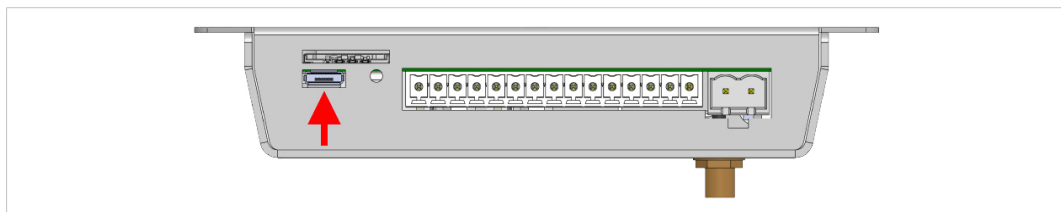


Fig. 4 USB connector

The USB micro B connector can be used to connect a computer to the unit for local configuration, firmware upgrades and troubleshooting.

2.3.4 SIM Card (EC350)

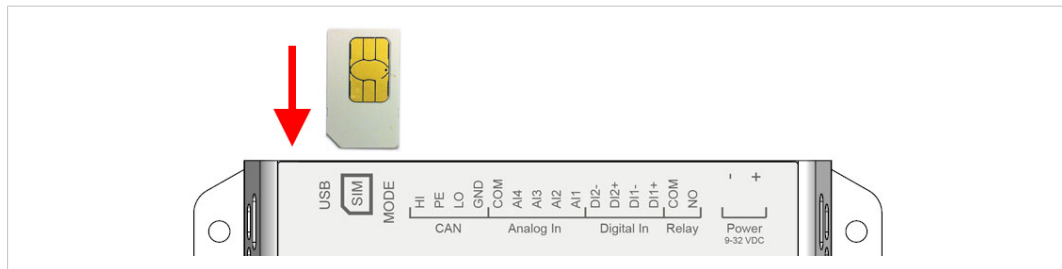


Fig. 5 Installing the SIM card

The SIM card must have a mobile data plan and allow text messaging. PIN code security must be disabled. Additional configuration in Netbiter Argos or in the local web interface is required.

Insert the SIM card carefully and push it firmly downwards until it clicks into place. Observe the position of the cut-off corner and the contact surfaces.



Make sure that the SIM card does not slip behind the holder.

2.3.5 Antenna Connectors (EC350)

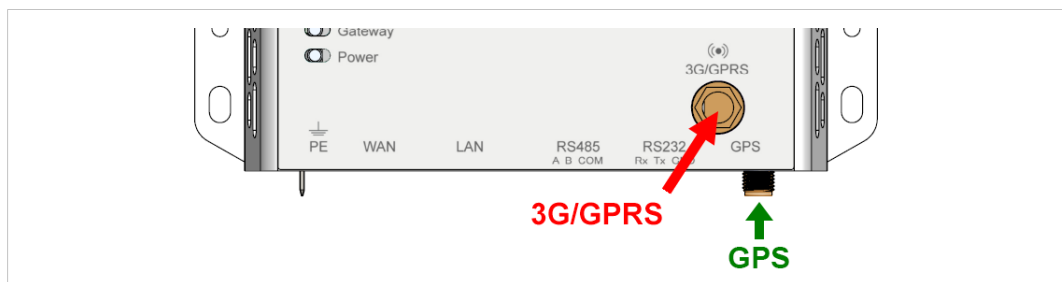


Fig. 6 EC350 antenna connectors

An external 3G/GPRS stub antenna is included with the unit¹. Other antennas are available from your supplier.

A GPS antenna (not included) must be connected to the GPS antenna connector to use the built-in GPS receiver. The GPS antenna connector also provides power for active GPS antennas.

1. Antenna not included when sold in the U.S.

2.3.6 RS-485 Serial Interface (3-pin)

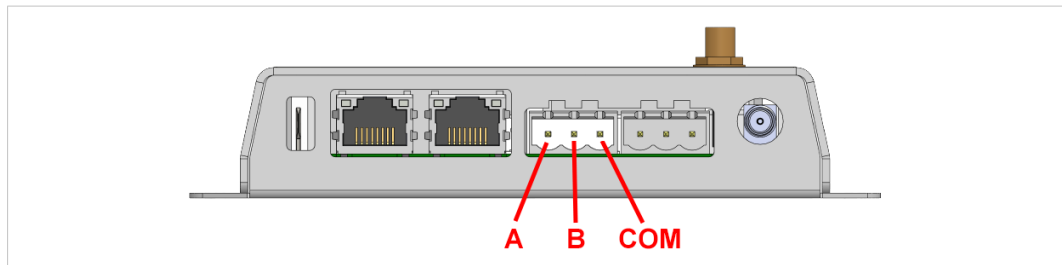


Fig. 7 RS-485 connector

The RS-485 interface can be used for multiple Modbus RTU devices.

RS-485 connector pin layout

Pin	Function
A	RS-485 A line
B	RS-485 B line
COM	RS-485 common

2.3.7 RS-232 Serial Interface (3-pin)

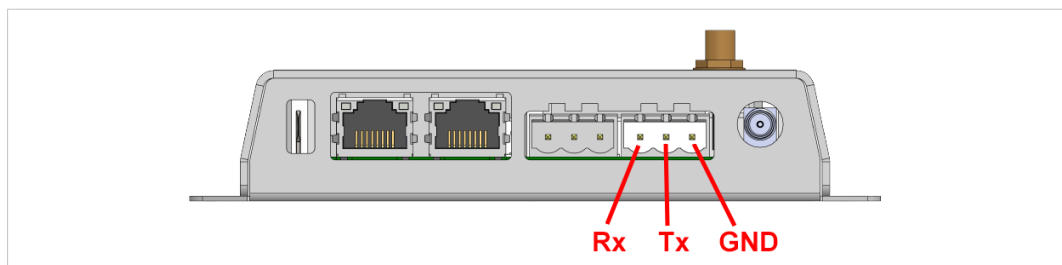


Fig. 8 RS-232 connector

The RS-232 interface can be used for a single Modbus RTU device.

RS-232 connector pin layout

Pin	Function
Rx	Receive (input)
Tx	Transmit (output)
GND	Signal ground

2.3.8 Ethernet Ports (RJ45)

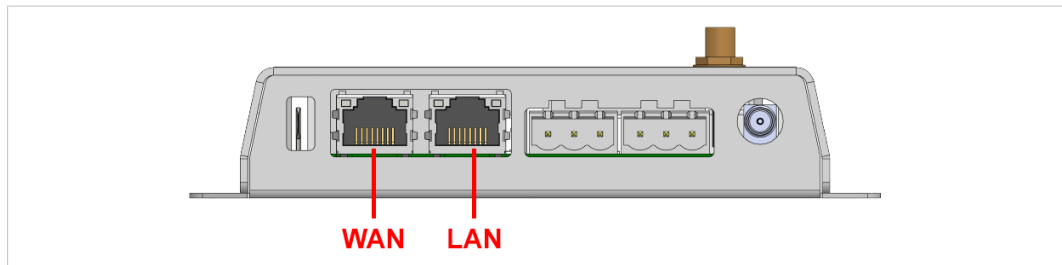


Fig. 9 Ethernet Ports

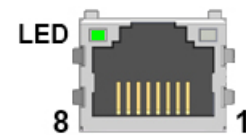
- WAN** Use for Internet and Netbiter Argos
LAN Use for EtherNet/IP, Modbus TCP and Remote Access



Never connect the LAN and WAN ports to the same logical network.

RJ45 pin layout

Pin	Function
1	TD+
2	TD-
3	RD+
4, 5, 7, 8	(reserved)
6	RD-



Ethernet Port LED

Indication	Function
Off	No traffic
Orange, flashing	Traffic (10 Mbit/s)
Green, flashing	Traffic (100 Mbit/s)

2.4 LED Indicators

All indicators will light up while the unit is starting up. When the startup sequence has completed they will indicate system status.

In case of an Uplink/WAN error, check the network and firewall settings. If using DHCP, also check that the DHCP server is active.



Fig. 10 EC350 LED indicators

LED	Indication	Meaning
Modem (EC350)	Off	Modem disabled
	Red	Modem failure
	Red, flashing	SIM card failure
	Orange	PIN code enabled on SIM card
	Orange, flashing	APN (Access Point Name) not set
	Green, flashing	Searching for mobile network
	Green	Connected to mobile network
CAN	Off	Port disabled
	Red	Port failure
	Green	Port enabled
RS232/RS485	Off	Port disabled
	Green	Port enabled
Uplink/WAN	Off	No link
	Red	No valid IP address
	Red, flashing	No connection to Netbiter Argos
Gateway	Green	Connected to Netbiter Argos
	Off	No power or initializing
	Red	Hardware failure
	Red, flashing	Application failure
Gateway	Green, flashing	Firmware update in progress
	Green	Unit is operational
	Off	No power
Power	Green	Unit has power

2.5 MODE Button

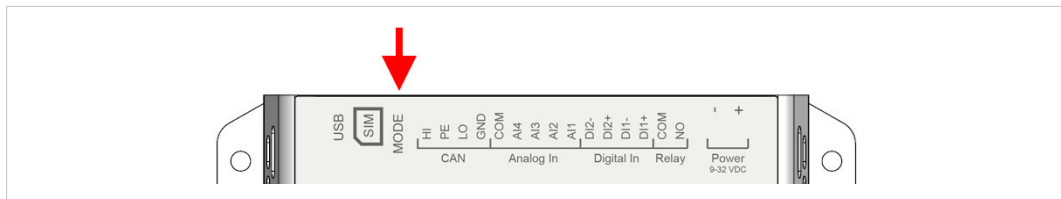


Fig. 11 Mode button

Factory Reset

Keep the **MODE** button pressed while powering on to reset the unit to the factory default settings.

Mobile Signal Strength Indication (EC350)



Fig. 12

Press and release the **MODE** button to make the top 5 LED indicators indicate mobile signal strength for 60 seconds.

LED indication	Meaning
2–5 green LEDs, flashing	Good to optimum signal
1 green LED, flashing	Acceptable signal
1 orange LED, flashing	Poor signal
1 red LED, flashing	No signal or unknown signal

If mobile signal strength is poor

- Make sure that the antenna is correctly installed and of the correct type.
- The antenna should normally be vertically oriented. Signal quality may in some cases be improved by changing the antenna angle.
- Try moving the unit to another position, or use an external antenna.

2.6 Wiring Examples

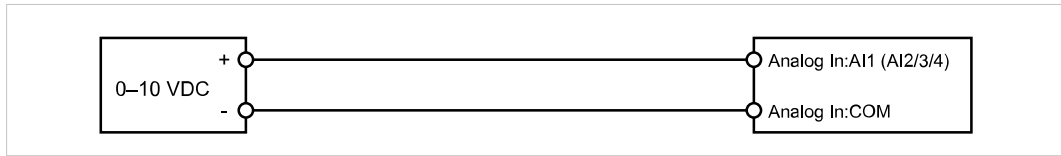


Fig. 13 Analog Input – Voltage Sensor

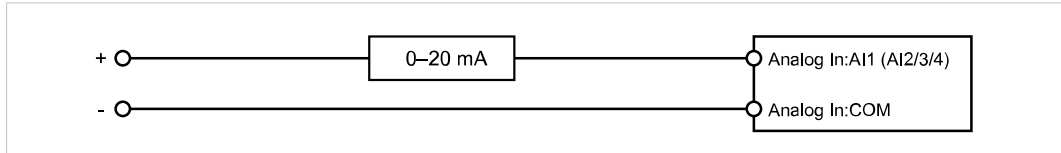


Fig. 14 Analog Input – 2-wire Current Sensor

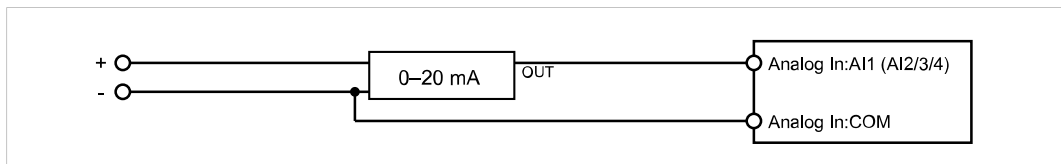


Fig. 15 Analog Input – 3-wire Current Sensor

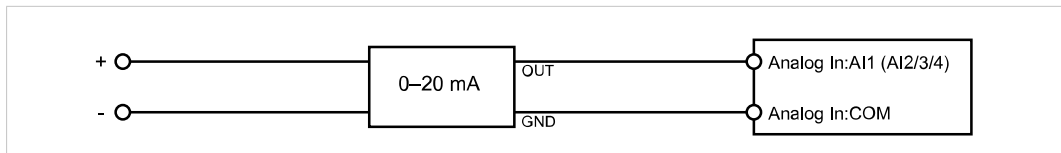


Fig. 16 Analog Input – 4-wire Current Sensor

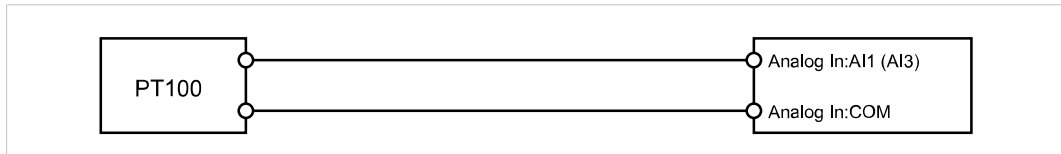


Fig. 17 Analog Input – Temperature Sensor

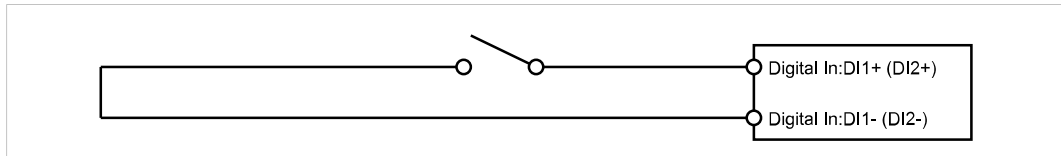


Fig. 18 Digital Input

! Do not connect a power source to the digital inputs as this may damage the unit.

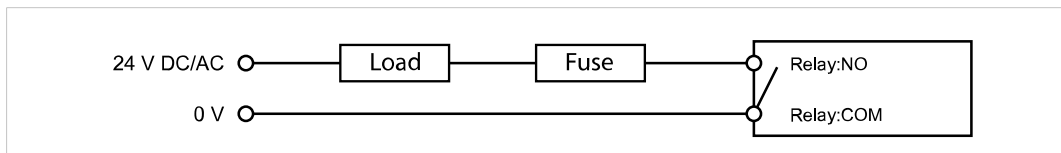


Fig. 19 Relay Output

! The relay output must be supplied from an isolated transformer using a secondary listed fuse rated at maximum 3.3 A and minimum 30 VDC.

3 Local Configuration



Local configuration is normally not required and should only be carried out when necessary. Please read the instructions below carefully.

The built-in web interface is primarily intended for informational purposes and troubleshooting. Netbiter Argos is always the preferred way of configuring the gateway. The only configuration changes that should be made using the local web interface are:

- Proxy settings (if required)
- Modem/Ethernet connection mode (EC350 only)
- Firmware updates

3.1 Connecting via USB

Connect a USB Micro B cable between the computer and the **USB** port on the Netbiter.

The USB device driver will automatically load and create a virtual network interface on the computer with an IP address in the range 169.254.200.xxx. The local web interface of the gateway can then be accessed by entering the IP address **169.254.200.200** in a web browser.

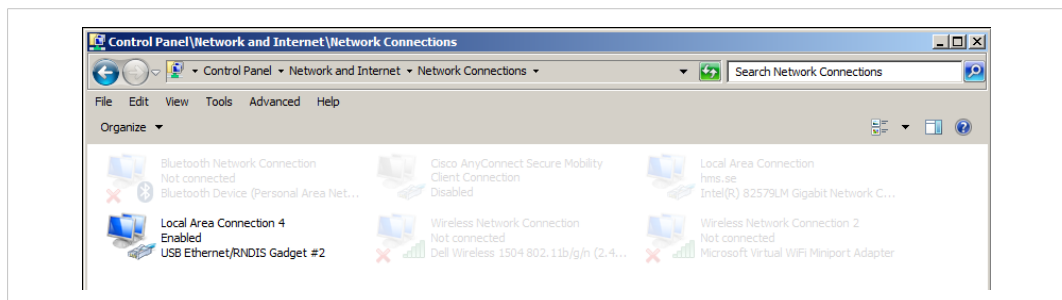


Fig. 20 Network Connections

3.2 Connecting via Ethernet

Connect an Ethernet cable between the computer and the **LAN** port on the Netbiter.

The default IP address of the LAN port interface is **10.200.1.1**. The connecting computer must have an IP address within the same subnet (10.200.1.xxx). The LAN IP address can be changed after logging in or from Netbiter Argos when the Netbiter is online.

3.3 Login

Enter the IP address of the gateway in a web browser to log in. The default user name is *admin*, and the password is the activation code that was supplied with the unit.

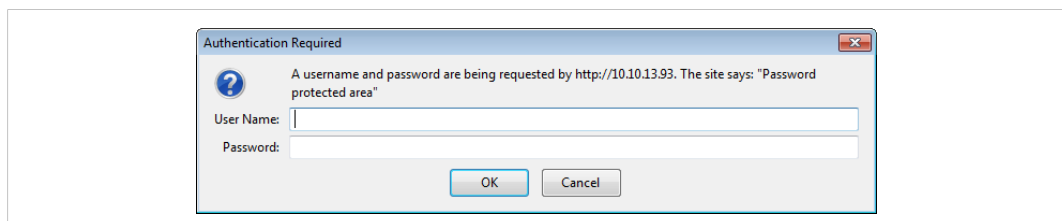


Fig. 21 Local configuration login

3.4 Status

The **Status** tabs present an overview of the configuration as well as detailed information about the current connections, which can be used when troubleshooting and when contacting Netbiter support.

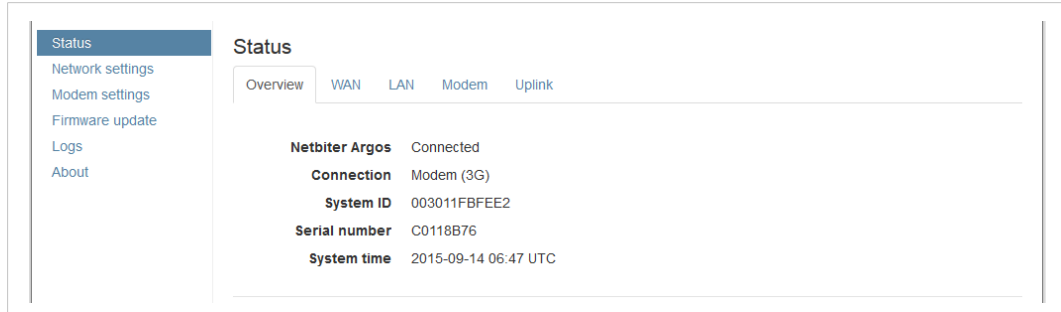


Fig. 22 Status – Overview

3.4.1 Status – WAN/LAN

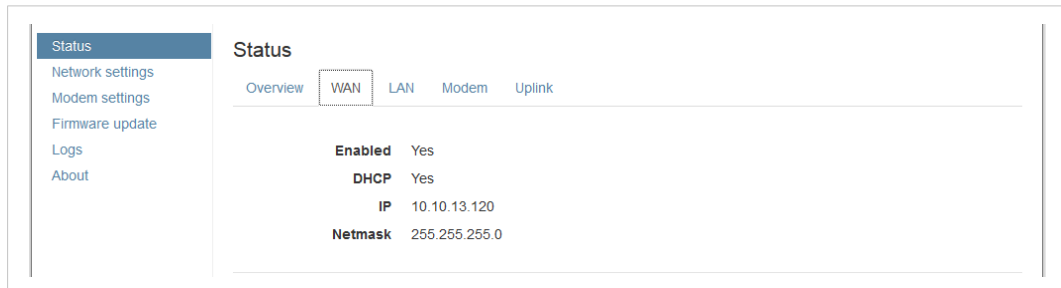


Fig. 23 WAN/LAN Status

The **WAN** and **LAN** status tabs present the current IP settings of the Ethernet interfaces.

3.4.2 Status – Uplink

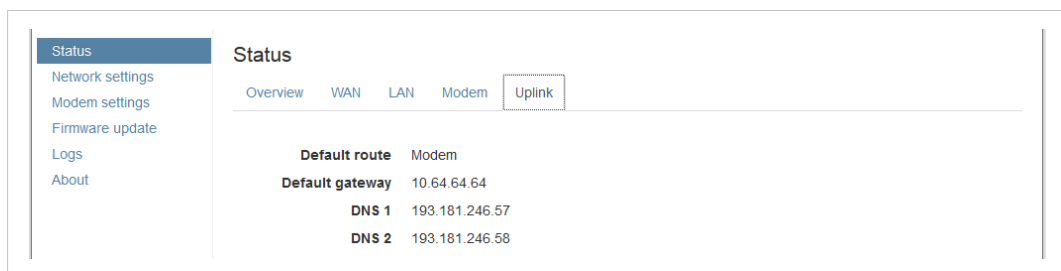


Fig. 24 Uplink Status

The **Uplink** status tab shows the default connection type (modem or Ethernet) and the default gateway and DNS servers for the uplink connection.

3.4.3 Status – Modem

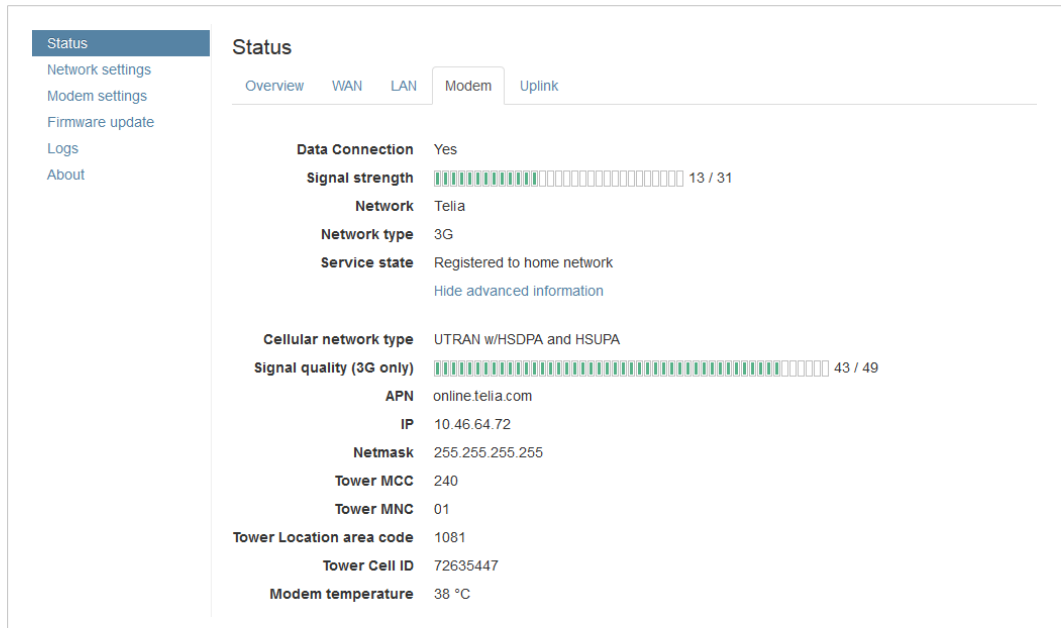


Fig. 25 Modem Status

The **Modem** status tab presents basic and advanced information about the current mobile network connection.

Basic information

Data Connection	Indicates if data connection is established
Signal strength	The strength of the mobile signal
Network	Mobile network operator
Network type	Mobile network type (3G or GSM)
Service state	Network registration status

Advanced information

Cellular network type	Network type details
Signal quality (3G only)	Signal-to-noise ratio of the 3G signal. 0 = -24 dB, 49 = 0 dB
APN	Access Point Name
IP, Netmask	IP settings for the modem connection
Tower MCC	Country code of the connected base station
Tower MNC	Network code of the connected base station
Tower Location Area Code	Area code of the connected base station
Tower Cell ID	Cell ID of the connected base station
Modem temperature	The temperature of the modem in °C

3.5 Network Settings – WAN

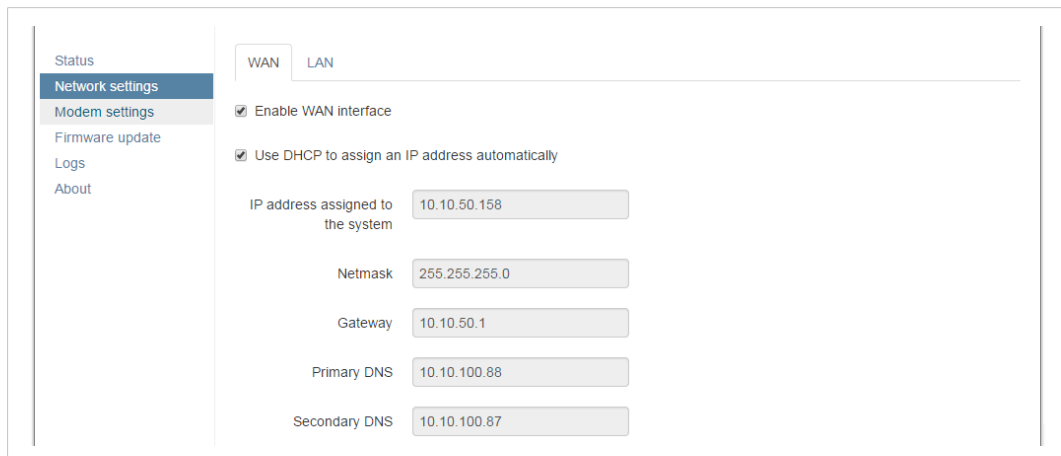


Fig. 26 WAN settings

The **WAN** interface should be enabled when connecting to Netbiter Argos via Ethernet.

When DHCP is enabled the unit will automatically receive the settings for IP address, subnet mask, default gateway, and DNS. Contact your network administrator if in doubt.

3.5.1 Proxy Settings

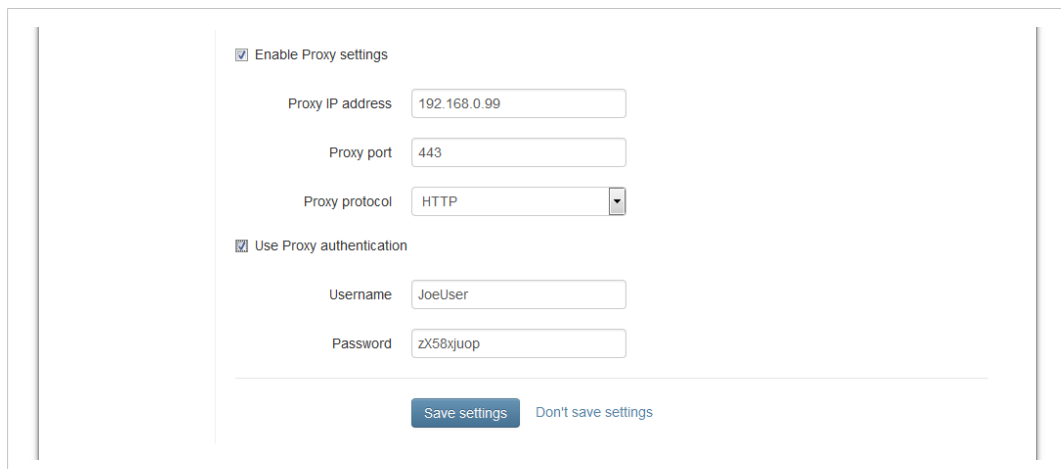


Fig. 27 Proxy settings

If you are connecting to the Internet via a proxy, check **Enable Proxy settings**, select the **Proxy protocol** and fill in the IP address and port number for the proxy server. If the proxy requires authentication, check **Use Proxy authentication** and fill in the username and password.



The proxy password must not contain blank spaces.

Click on **Save settings** when finished.

For information about supported proxy types, see [Technical Data, p. 23](#).

3.6 Network Settings – LAN

The **LAN** interface must be enabled when using EtherNet/IP or Modbus TCP applications and when using the Netbiter Remote Access service.

These settings can also be made in Netbiter Argos. See the Netbiter Argos documentation.

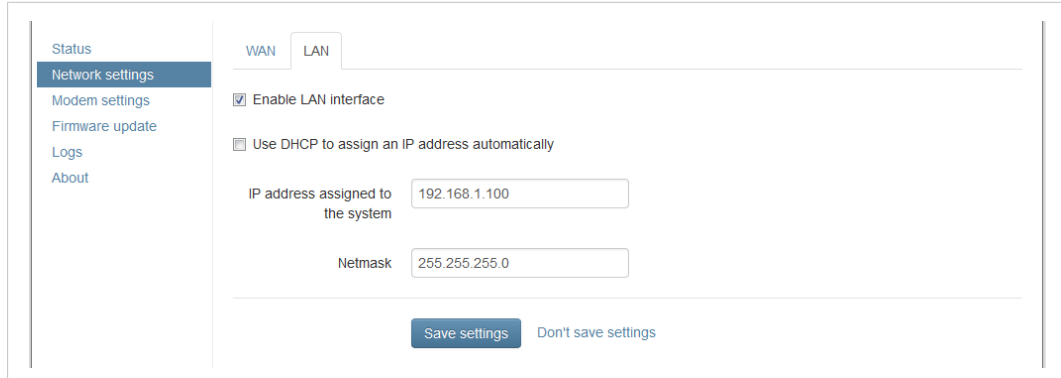
The screenshot shows a web-based configuration interface for LAN settings. On the left is a navigation menu with options: Status, Network settings (highlighted), Modem settings, Firmware update, Logs, and About. The main content area has two tabs: WAN and LAN (selected). Under the LAN tab, there are two checkboxes: 'Enable LAN interface' (checked) and 'Use DHCP to assign an IP address automatically' (unchecked). Below these are two input fields: 'IP address assigned to the system' with the value '192.168.1.100' and 'Netmask' with the value '255.255.255.0'. At the bottom are two buttons: 'Save settings' (highlighted) and 'Don't save settings'.

Fig. 28 LAN settings

To avoid potential address conflicts when setting a static IP address and netmask for the LAN port, use only the address spaces that are reserved for private networks:

- 10.0.0.1 – 10.255.255.254
- 172.16.0.1 – 172.31.255.254
- 192.168.0.1 – 192.168.255.254



Do not connect the LAN and WAN ports to the same logical network.

Click on **Save settings** when finished.

3.7 Firmware Update

Firmware updates can also be made through Netbiter Argos. See the *Netbiter Argos documentation*.

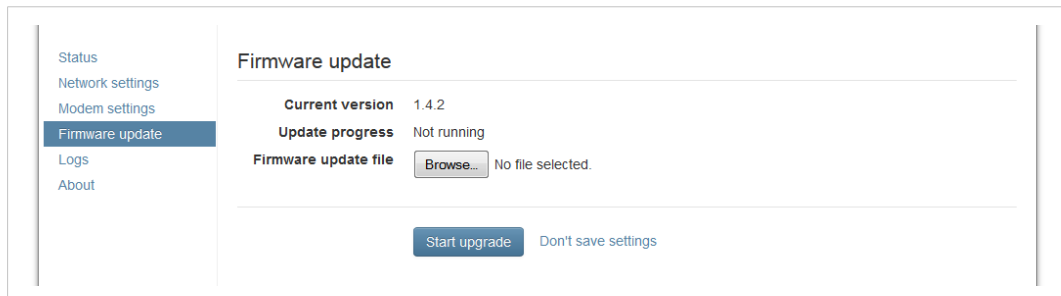


Fig. 29 Firmware update



The Netbiter gateway must be connected to the Internet to ensure that the internal clock has synchronized the time and date before updating the firmware.

1. Download the latest firmware from www.netbiter.com/support.
2. Click on **Browse** and select the firmware file you downloaded.
3. Click on **Start upgrade** to start the update.



Do not close the web page while the update is in progress.

3.8 Modem Settings (EC350)

Modem settings and information about the mobile connection.

These settings can also be made in Netbiter Argos. A SIM card with SMS capability is required. See the *Netbiter Argos documentation*.

Fig. 30 Modem settings (EC350)

Use modem as primary connection to Argos When enabled, mobile networking will be used as default as long as the signal strength is adequate. If the WAN interface is also enabled the gateway will automatically switch to Ethernet networking if mobile communication is interrupted.

APN The APN (Access Point Name) is the identifier for the mobile network. The APN is supplied by the network operator for the SIM card.

User/Password Required by some mobile network operators.

Click on **Save settings** when finished.



SIM cards with active PIN codes cannot be used in Netbiter EC350. PIN code security cannot be disabled in the local configuration or in Netbiter Argos. To disable the PIN code, install the SIM card in a mobile phone and follow the instructions from the manufacturer.

A EtherNet/IP Implementation

See also the *Netbiter Argos documentation* on how to configure EtherNet/IP.

A.1 Client

Connection Type

UCMM (Class 1 and 3 connection not supported)

Adapter Timeout

1000 ms

Services

The following services are implemented:

Code	Service Name	Addressing	Note
0x0E	Get_Attribute_Single	Class, Instance, Attribute	
0x10	Set_Attribute_Single	Class, Instance, Attribute	
0x4C	Read_Tag_Service	Symbolic Segment Addressing	Can be used to access Controller Tags. Vendor specific service code (see note below).
0x4D	Write_Tag_Service		



Read_Tag_Service and Write_Tag_Service using symbolic segment addressing is only supported by some PLCs. Please refer to the PLC vendor's documentation for more information.

A.2 Adapter

A.2.1 Identity Object (0x01)

Class Attributes

No attributes are implemented.

Instances

Instance 1 is implemented with the following attributes:

ID	Access	Name	Value
1	Get	Vendor ID	90
2	Get	Device Type	100
3	Get	Product Code	85
4	Get	Revision	1
5	Get	Status	1
6	Get	Serial Number	...
7	Get	Product Name	Netbiter

Services

The following services are implemented:

Code	Class	Instance	Service Name
0x01	No	Yes	Get_Attribute_All
0x0E	No	Yes	Get_Attribute_Single

A.2.2 TCP/IP Interface Object (0xF5)

Class Attributes

The following class attributes are implemented:

ID	Access	Name
1	Get	Revision

Instances

Instance 1 is implemented with the following attributes:

ID	Access	Name
1	Get	Status
2	Get	Configuration Capability
3	Get	Configuration Control
4	Get	Physical Link Object
5	Get	Interface Configuration
6	Get	Hostname
13	Get/Set	Encapsulation Inactivity Timeout

Services

The following services are implemented:

Code	Class	Instance	Service Name
0x0E	No	Yes	Get_Attribute_Single
0x10	No	Yes	Set_Attribute_Single

A.2.3 Ethernet Link Object (0xF6)

Class Attributes

No attributes are implemented (= Rev 1).

Instances

Instance 1 is implemented with the following attributes:

ID	Access	Name
1	Get	Interface Speed
2	Get	Interface Flags
3	Get	Physical Address

Services

The following services are implemented:

Code	Class	Instance	Service Name
0x0E	No	Yes	Get_Attribute_Single

B Technical Data

B.1 Technical Specifications

Product name	Netbiter EC310	Netbiter EC320, EC350
Model name	NB301B	NB301A
Order code	NB1007-C	EC320: NB1021 EC350: NB1005-C EC350 (no antenna): NB1008-C
Mobile communication	–	Quad-band GSM/GPRS: 850, 900, 1800, 1900 MHz EC350 only: 5-band 3G + GSM/GPRS
Antenna connector	–	SMA female
Ethernet interfaces (WAN/LAN)	10/100 Mbit/s, RJ45 connector	
Relay output (NO)	Max. 24 V AC/DC, 1 A	
Digital inputs (DI1, DI2)	Dry contact type	
Analog inputs (AI1 - AI4)	0 to 20 mA, R = 3.3 %, A/D = 0.1 mV+0.15 % 0 to 10 VDC, R = 1.7 %, A/D = 0.1 mV+0.15 % AI1 and AI3 also support PT100, -50 to +150 °C (16-bit)	
Serial port 1	RS-232 up to 115.2 kbit/s	
Serial port 2 (isolated)	RS-485 up to 115.2 kbit/s	
Supported protocols	Modbus-RTU, Modbus-TCP, EtherNet/IP, J1939	
Max. connected devices	32	
Baud rates	1200 to 115200 baud	
Proxy support	SOCKS (authentication: none, username/password) WEB (authentication: none, basic)	
Alarm messaging	E-mail, SMS	
Mounting	Screw mount or DIN rail using optional mounting kit	
Dimensions (L x W x H)	92 x 135 x 27 mm	
Operating temperature	-40 to +65 °C	
Storage temperature	-45 to +85 °C	
Housing class	IP20	
Input voltage range	9 to 32 VDC	
Recommended power supply	24 VDC, 25 W	
Power consumption, typical	2.5 W @ 24 VDC	4.5 W @ 24 VDC
Certifications	See www.netbiter.com/support	

B.2 Installation Drawings

Dimensions (EC350)

All measurements are in millimeters.

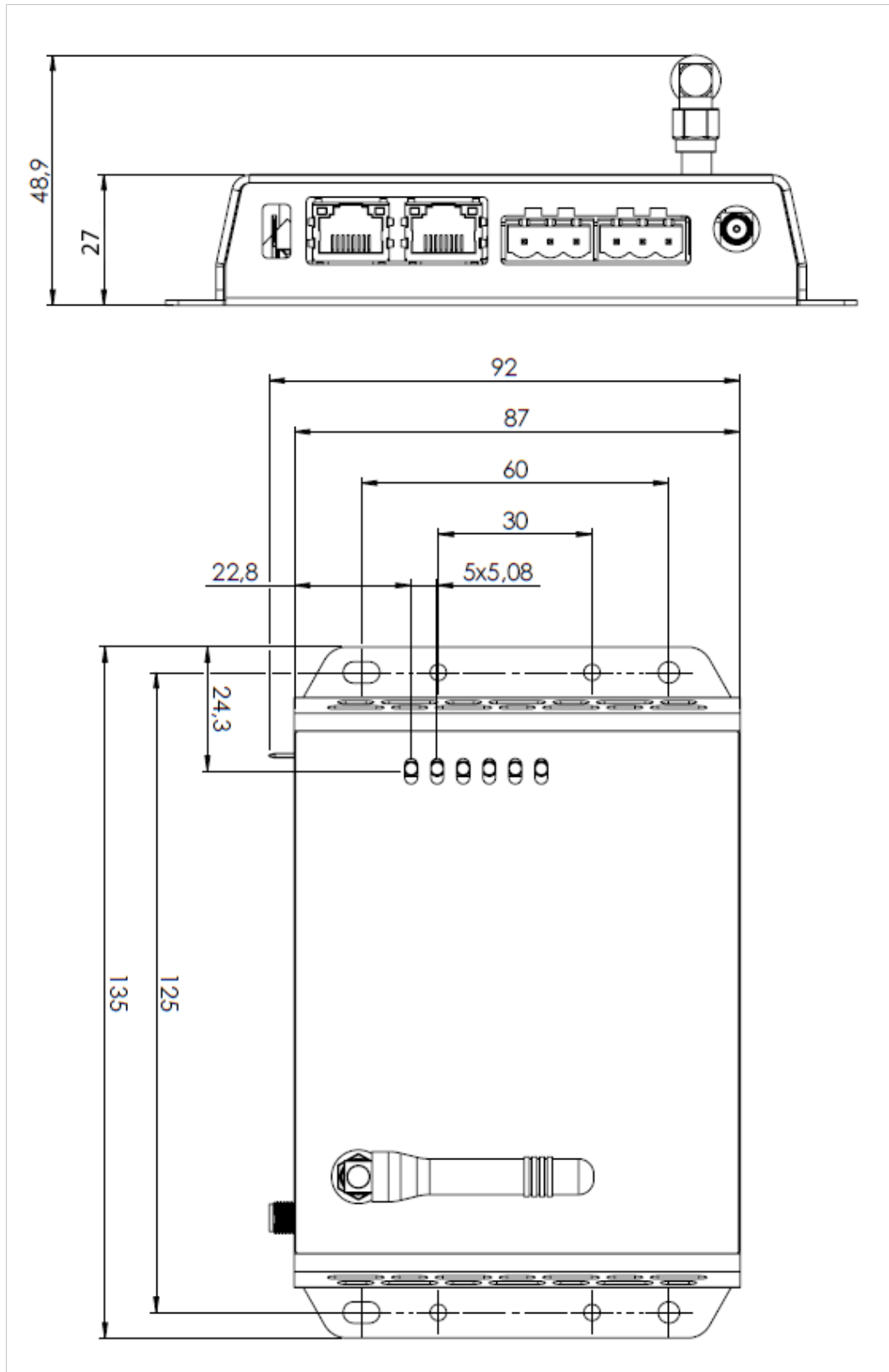


Fig. 31 EC350 dimensions

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