SCHWAIGER®

Inhouse-Powerline

AV 200PRO

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Contents

1   Introduction

This chapter gives an overview of the HomePlug technology and briefly introduces the adapter. Practical examples are listed at the end of the chapter.

1.1   What does HomePlug stand for?

HomePlug ("Inhouse Powerline") is an intelligent, secure technology that lets you set up a home network easily, quickly and economically via your electrical wiring, without the need for complex and expensive dedicated cabling. The available performance and effort required for the installation also compares favourably to traditional methods—HomePlug technology now attains speeds you would expect from other LAN technologies.

1.2   AV200pro

The AV200pro combines the power industry and telecommunications and brings you one step closer to transparent cost statements for your consumption data. The energy data is transmitted from the intelligent power meter to your computer via the household electrical wiring. With a transmission speed

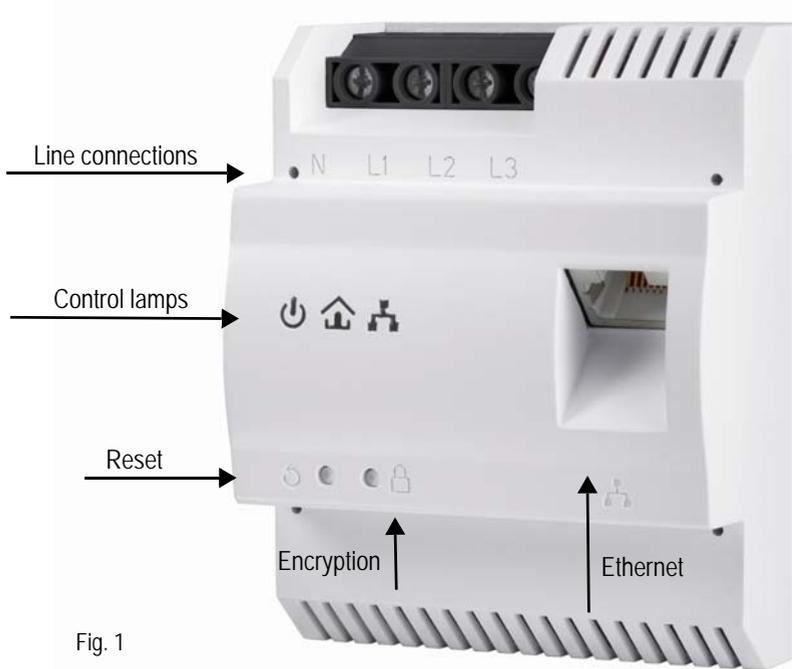of up to 200 Mbps, the AV200pro is also ideally suited for high-speed Internet.

Fig. 1

Line connections

Control lamps

Reset

Encryption

Ethernet

1.2.1 Functions

- Direct installation in the control cabinet or power distribution box
- Optional: three-phase network connection for optimal network coverage
- Integrated Quality-of-Service functions (QoS) for automatic data prioritisation
- Quality indicator LED for determining broadband status
- Ethernet port with Auto MDI/X
- Data transmission with a range up to 300 metres in the power grid
- Powerful 128-bit AES security for securing data transmission against unauthorised access

1.2.2   Ports

Line connections (Fig. 1)

This is where you connect the conductors to the corresponding line connections.

NOTE:

Single-phase connection: Neutral conductors and external conductors are connected to terminals N and L1.

Three-phase connection: Neutral conductors and external conductors are connected to terminals N and L1. The connection of external conductors L2 and L3 is optional and intended for optimising the signal transmission. The device is supplied with power via terminals N and L1.

The permitted conductor cross-section for connection to the terminals is 0.18 mm² to 6 mm².

Ethernet connection (Fig. 1)

This is where you connect the AV200pro via an Ethernet cable to the intelligent power meter (MUC) or another Ethernet device (e.g. Internet access device).

1.2.3   Control lamps

Power (Fig.1)

• Illuminates green when the AV200pro is ready to operate; flashes green when the AV200pro is in standby mode.

HomePlug (Fig. 1)

• Illuminates green if the bandwidth is optimal, i.e. the network connection is suitable e.g. for HD video streaming; flashes when data is being transmitted.
• Illuminates orange if the bandwidth is good, i.e. the network connection is suitable e.g. for SD video streaming; flashes when data is being transmitted.
• Illuminates red if the bandwidth is adequate, i.e. the network connection is still suitable for transmission of energy data or Internet access; flashes when data is being transmitted.

Ethernet (Fig. 1)

• Illuminates green if there is a connection to the Ethernet network; flashes when data is being transmitted.

1.2.4 Buttons

Encryption button (Fig. 1)

Data encryption at the touch of a button; for a functional description of the encryption button, please continue reading in chapter .

Reset button (Fig. 1)

The device is restarted by pressing the reset button.

1.3 Sample applications

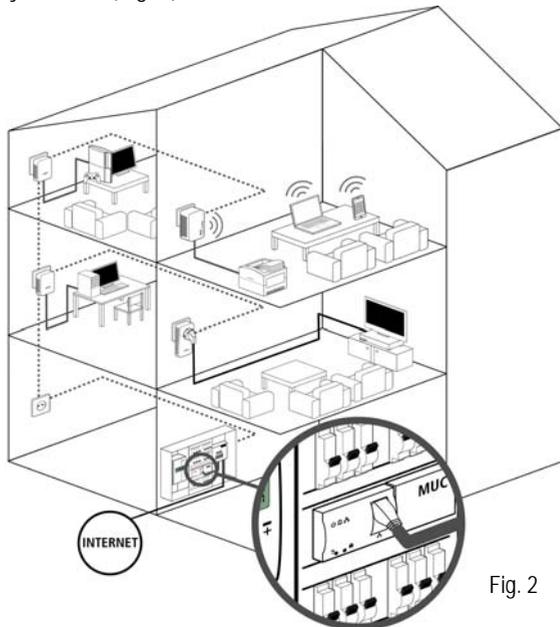Use AV200pro to set up a network easily, quickly and economically via the mains supply network (Fig. 2)

Fig. 2

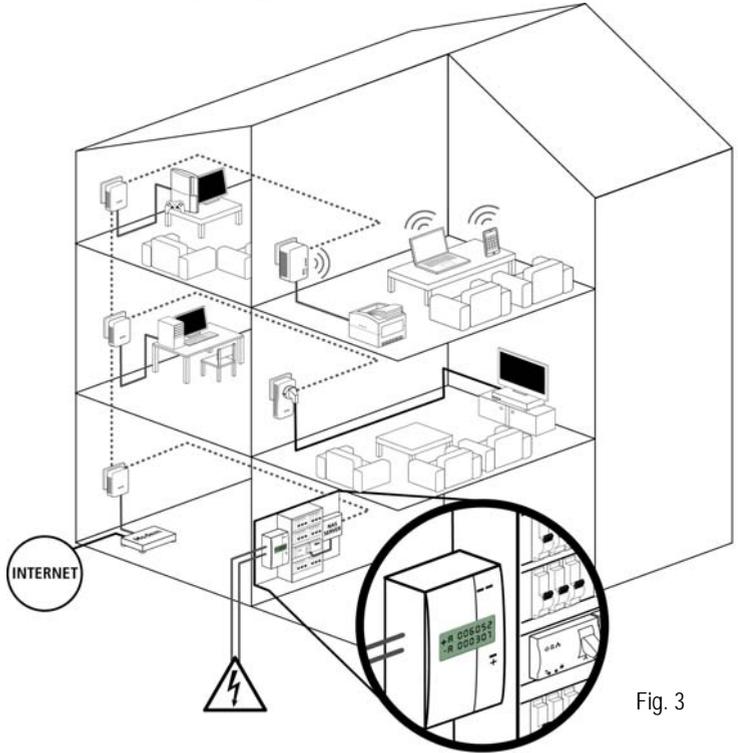**AV200pro as a link between the power industry and telecommunications for recording energy data (Fig. 3)**

Fig. 3

2   Installation

In this chapter we describe the electrical installation of the AV200pro on the top-hat rail in the power distribution box.

Systemvoraussetzungen

• **Operating systems**: Windows XP (32 bit), Windows Vista Home Premium (32 bit/64 bit), Windows 7 Home Premium (32 bit/64 bit), Linux (Ubuntu), Mac (OS X) or all operating systems with network support
• **Ethernet connection**

2.1   Important safety instructions

All safety and operating instructions should be read and understood before using the device, and should be kept for future reference.

*for Germany: NAV = Niederspannungsanschlussverordnung (Low-voltage Connection Ordinance) of 3 September 2010

Installation may be performed by a qualified electrician only (in acc. with German Low Voltage Connection Ordinance (NAV)*, Part 2, §13).

Components powered by the mains supply have to be secured with a circuit breaker.

• The device is intended for installation on the top-hat rail in the installation area of overvoltage category 3 or lower.
• Never open the device. There are no user-serviceable parts inside the device.
• Use the device in a dry location only.
• Do not insert any objects into the openings of the device.
• Slots and openings on the case serve as ventilation. Never block or cover them.
• Do not keep the device in direct sunlight.
• Never set up the device near a heater or radiator.
• The device should be located only where sufficient ventilation can be ensured.
• Never use the device with a power supply that does not meet the specifications provided on the rating plate.
• In the event of damage, contact customer service. This applies, for example, if

•liquid has been spilled on the device or objects have fallen into the device. wenn das Gerät Regen oder Wasser ausgesetzt war.

•the device has been exposed to rain or water.

•the device does not work, even though the operating instructions have been followed properly.

•the device's case is damaged.

2.2   Electrical installation

❶ Install the AV200pro properly on the top-hat rail.

Take into account the vertical installation alignment of the device, so that the mains power supply comes from above

❷ Now connect the conductors according to the line connections.

When connecting to the sockets, make sure the conductor cross-section is 0.18 mm² to 6 mm².

•Single-phase connection: Neutral conductors and external conductors are connected to terminals N and L1 (see Fig. 4).

•Three-phase connection: Neutral conductors and external conductors are connected to terminals N and L1. The connection of external conductors L2 and L3 is optional and intended for optimising the signal transmission. The device is supplied with power via terminals N and L1 (see Fig. 5).
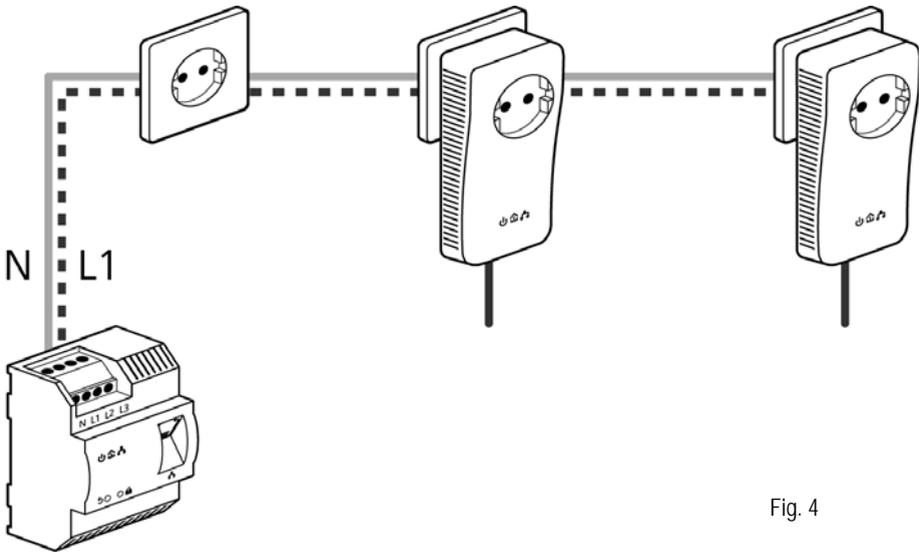
Single-phase connection

N L1

Fig. 4

Three-phase connection

In general, connection of the AV200pro to one phase is adequate, even for communicating over multiple phases. To optimise the data transmission, however, we recommend the three-phase connection.

❸ After installing the protective cover, the AV200pro can be connected via Ethernet to the desired network device (e.g. MUC, Internet access device).

As soon as at least one other HomePlug adapter has been connected and plugged into the mains supply, a HomePlug network is set up. Secure the HomePlug network against unauthorised access by using the encryption button. For information on how to proceed, refer to Chapter 'Configuring the
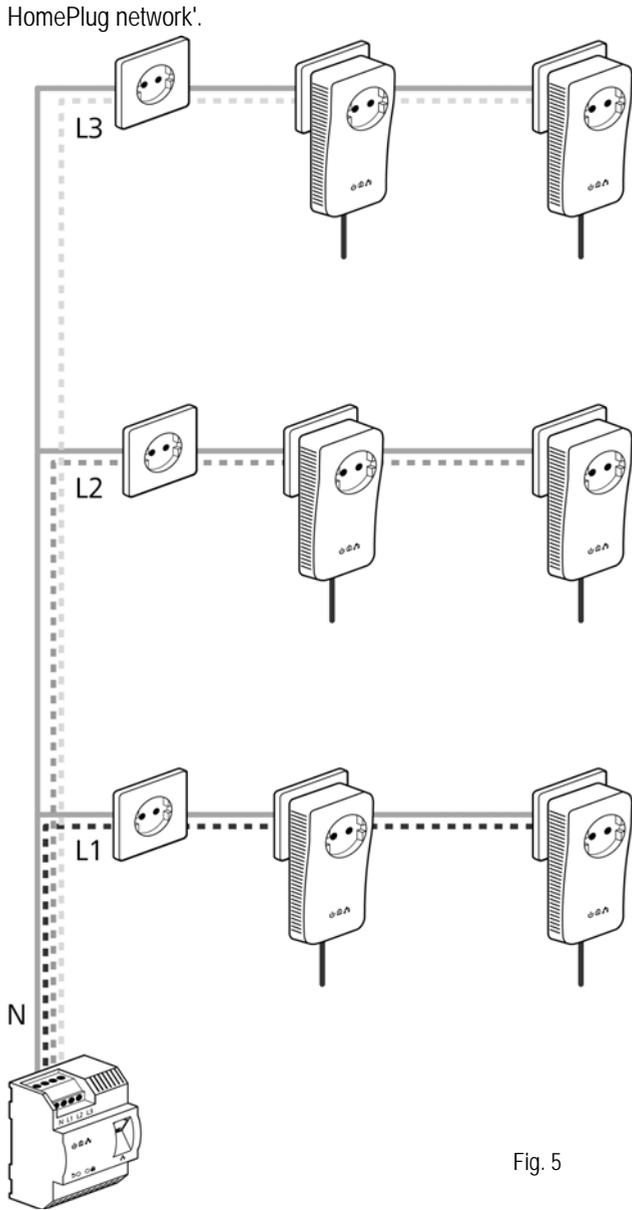
HomePlug network'.

Fig. 5

AV200pro

3   Configuring the HomePlug network

Use the encryption button to set up custom encryption for your network.

3.1   Encrypting the HomePlug network at the touch of a button

To encrypt a Homeplug network simply press the encryption button that is located on the device. Pressing this button will encrypt your network with a randomly generated password.

Adapters cannot be configured while in Standby mode.

The following section contains exact instructions on the basis of possible network scenarios:

Encrypting a new HomePlug network consisting of an AV200pro adapters and another HomePlug adapter
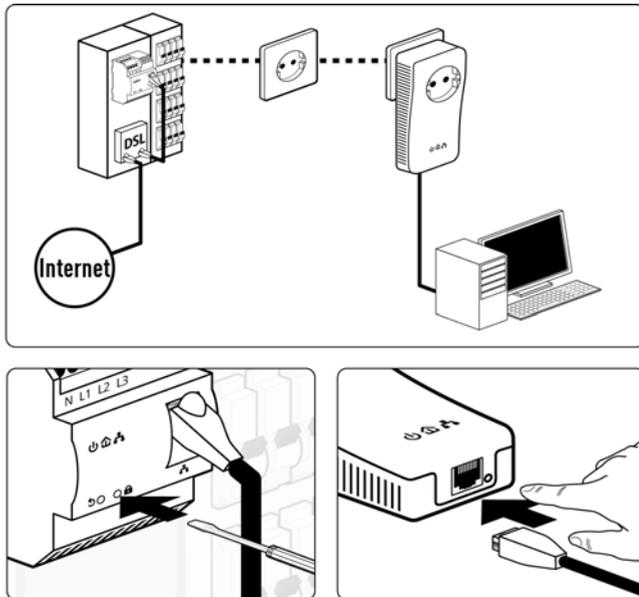

Fig. 6

*If the adapters are still in their factory default states, press the encryption buttons on both adapters for **at least ten seconds**, until the Power LED goes out and starts to flash.*

AV200pro

Once both adapters have been successfully connected, press each encryption button for **one second within two minutes of one another**. That's it! Your HomePlug network is now protected against unauthorized access.

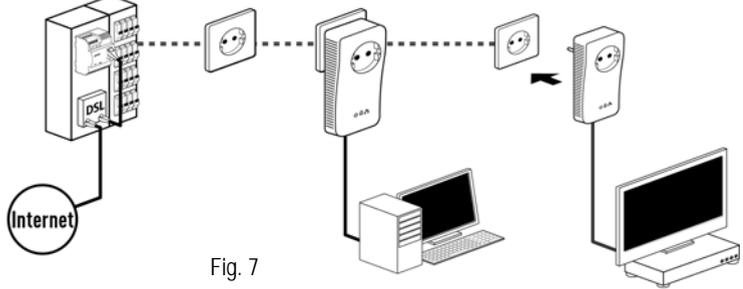**Expanding an existing HomePlug network with a new AV200pro**

Fig. 7

If you have already secured your existing HomePlug network using the encryption button, use the same method to integrate other adapters. Once you have successfully connected the new AV200pro, first press the encryption button of one of your network's existing adapters (**one second**), then press the encryption button of your new AV200pro (**one second**) **within two minutes**. That's it! The new AV200pro is now integrated in your network.

To integrate additional adapters in your network, repeat the above steps.

Excluding an AV200pro from your network

Fig. 8

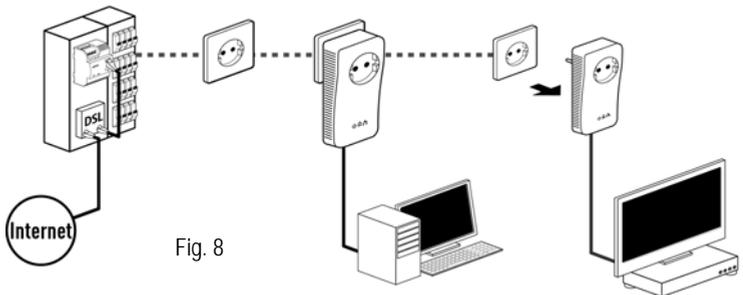To exclude an AV200pro from an existing network, press its encryption button **for at least ten seconds**. The device will be assigned a new randomly generated password and will thus no longer be able to access the network. To integrate the adapter in a different HomePlug network, follow the steps described above, depending on whether you are setting up a new network or adding the adapter to an existing one.

4   Appendix

4.1   Technical data

	AV200pro
Standards	Ethernet specification IEEE 802.3, IEEE 802.3x, IEEE 802.3u Auto MDI/X HomePlug AV
Protocols	CSMA/CD
Transfer rate	200 Mbps
Transfer procedure	Asynchronous
Modulation	OFDM—1155 Carrier, 1024/256/64-QAM, QPSK, BPSK
Data path	Ethernet <-> power supply
Range	300 m via power supply
Security	128-bit AES encryption via power supply
Button	Encryption button Reset button
LEDs	Power HomePlug Ethernet
HomePlug connection	Single-phase and three-phase connection via terminal (0.18.– 6 mm²)
Device interface	Ethernet RJ45
Power consumption	4.6 VA (max.) 3.6 VA (typ.) 0.8 VA (stand-by) with max. 0.1A
Power supply	230 VAC 50/60 Hz
Environment	Humidity (non-condensing): 10-90% Storage: -25°C – 70°C Operation: -25°C – 55°C
Configuration	Via software under Windows XP (32 bit), Windows Vista (32 bit/64 bit), Windows 7 (32 bit/64 bit), Linux or any other operating system with network support
Warranty	2 years

4.2   Disposal of old devices

To be used in the countries of the European Union and other European countries with a separate collecting system:

The icon with crossed-out wastebasket on the device means that this adapter is an electrical or electronic device that falls within the scope of application of the German Electrical and Electronic Equipment Act ("Elektrogesetz"). Since 24 March 2006, these types of devices may no longer be disposed of with household waste. Rather, in Germany, they can be given to a municipal collection point free of charge. Contact your municipal government to find out the address and hours of the nearest collection point.

4.3   Warranty conditions

The warranty is given to purchasers of the manufacturer's products in addition to the warranty conditions provided by law and in accordance with the following conditions:

1   Warranty coverage

a)   The warranty covers the equipment delivered and all its parts. Parts will, at the manufacturer's sole discretion, be replaced or repaired free of charge if, despite proven proper handling and adherence to the operating instructions, these parts became defective due to fabrication and/or material defects. Alternatively, the manufacturer reserves the right to replace the defective product with a comparable product with the same specifications and features. Operating manuals and possibly supplied software are excluded from the warranty.

b)   Material and service charges shall be covered by the manufacturer, but not shipping and handling costs involved in transport from the buyer to the service station and/or to the manufacturer.

c)   Replaced parts become property of the manufacturer.

d)   The manufacturer is authorized to carry out technical changes (e.g. firmware updates) beyond repair and replacement of defective parts in order to bring the equipment up to the current technical state. This does not result in any additional charge for the customer. A legal claim to this service does not exist.

2   Warranty period
The warranty period for this product is two years. This period begins at the day of delivery from the manufacturer's dealer. Warranty services carried out by the manufacturer do not result in an extension of the warranty period nor do they initiate a new warranty period. The warranty period for installed replacement parts ends with the warranty period of the device as a whole.

3   Warranty procedure

a)   If defects appear during the warranty period, the warranty claims must be made immediately, at the latest within a period of 7 days.

b)   In the case of any externally visible damage arising from transport (e.g. damage to the housing), the person carrying out the transportation and the sender should be informed immediately. On discovery of damage which is not externally visible, the transport company and the sender are to be immediately informed in writing, at the latest within 3 days of delivery.

c)   Transport to and from the location where the warranty claim is accepted and/or the repaired device is exchanged, is at the purchaser's own risk and cost.

d)   Warranty claims are only valid if a copy of the original purchase receipt is returned with the device. The manufacturer reserves the right to require the submission of the original purchase receipt.

4   Suspension of the warranty
All warranty claims will be deemed invalid

a)   if the label with the serial number has been removed from the device,

b)   if the device is damaged or destroyed as a result of acts of nature or by environmental influences (moisture, electric shock, dust, etc.),

c)   if the device was stored or operated under conditions not in compliance with the technical specifications,

d)   if the damage occurred due to incorrect handling, especially to non-observance of the system description and the operating instructions,

e)   if the device was opened, repaired or modified by persons not contracted by the manufacturer,

f)   if the device shows any kind of mechanical damage, or

g)   if the warranty claim has not been reported in accordance with 3a) or 3b).

5   Operating mistakes

If it becomes apparent that the reported malfunction of the device has been caused by unsuitable hardware, software, installation or operation, the manufacturer reserves the right to charge the purchaser for the resulting testing costs.

6   Additional regulations

a)   The above conditions define the complete scope of the manufacturer's legal liability.

b)   The warranty gives no entitlement to additional claims, such as any refund in full or in part. Compensation claims, regardless of the legal basis, are excluded. This does not apply if e.g. injury to persons or damage to private property are specifically covered by the product liability law, or in cases of intentional act or culpable negligence.

c)   Claims for compensation of lost profits, indirect or consequential detriments, are excluded.

d)   The manufacturer is not liable for lost data or retrieval of lost data in cases of slight and ordinary negligence.

e)   In the case that the intentional or culpable negligence of the manufacturer's employees has caused a loss of data, the manufacturer will be liable for those costs typical to the recovery of data where periodic security data back-ups have been made.

f)   The warranty is valid only for the first purchaser and is not transferable.

g)   The court of jurisdiction is located in Aachen, Germany in the case that the purchaser is a merchant. If the purchaser does not have a court of jurisdiction in the Federal Republic of Germany or if he moves his domicile out of Germany after conclusion of the contract, the manufacturer's court of jurisdiction applies. This is also applicable if the purchaser's domicile is not known at the time of institution of proceedings.

h)   The law of the Federal Republic of Germany is applicable. The UN commercial law does not apply to dealings between the manufacturer and the purchaser.

MANUFACTURER INFORMATION

Dear customer,
should you require technical assistance and your dealer or installer was
not able to help, please contact our technical support.

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