HRM-701

DSMR compatibility
DSMR 5.0 and higher
Belgian e-MUCS H

UG-20859-EN, User Guide EN - HRM-701 R1

USER GUIDE
Heatermind 7.0
Tariff based - contactor controller

1. Introduction

Thank you for purchasing this product. We believe it will serve you for long time without any failure. This product complies with EU statutory safety and environmental requirements. The name of the product is trademarked and all the rights are reserved.

2. Explanation of used symbols

This symbol indicates a risk of your health e.g. from an electric shock

This sign indicates important information on commissioning and handling of the product. Please put extra attention to the part of the document preceded by this sign.

3. Intended use

The Heatermind 7.0 is intended for commercial use. The Heatermind 7.0 has been designed to interwork with the contactor and switch electrical appliances on when the electricity tariff is low and to switch them off when the tariff is high.

- The Heatermind should be connected via the P1 port of a smart meter which supports the DSMR 5.0 protocol or higher or the Belgian e-MUCS H protocol because the hardware relies on functions specific to these protocols.

- Warning:
  Heatermind 7.0 does **not** work with smart meters using DSMR 4.0, DSMR 4.2 nor DSMR 2.2.

4. Safety

- Please read this user guide in its entirety before installing this device. It contains important safety and user information.

- This product must only be installed in your electrical installation by a professional electrician.
- There is a risk of a fatal danger from electrical shock in case of improper work at the mains voltage!
- Consult an expert when in doubt as to the operation, the safety or the connection/installation of the device
- Products installed in your electrical installation must comply with strict European and Dutch safety standards. Your installation must comply with these as well.

- All terminals must only be used with wire-end sleeves.
- The power/voltage must be switched off in the installation area when installing. All wiring work must be performed with the voltage/power switched off.

- In case of damage caused by non-compliance with this User Guide, the warranty expires.

- Tech4U B.V. does not assume liability for any consequential damage.
- Tech4U B.V. does not assume any liability for damage to property or personal injury caused by improper use or failure to observe the safety information. In such cases the warranty expires.

- Before the installation, check the product and its cables for damage. If it can be assumed that safe operation is no longer possible, the device must be turned off and precautions are to be taken to ensure that it is not used unintentionally.
  It can be assumed that safe operation is no longer possible if:

  - the product is visibly damaged
  - the product no longer functions
  - the product was stored under unfavorable conditions for an extended period of time

- This device left the factory in perfect condition in terms of safety engineering.
- The user must observe the safety information and warnings contained in this User Guide to ensure the safe operation.

- This product must not become damp or wet.
- Do not expose the device to any high temperatures, dripping or splashing water, heavy mechanical stress or strong vibrations.

- Do not use this product in rooms or under unfavorable conditions where combustible gases, vapors or dust are or may be present. There is a danger of explosion!

- For safety and licensing reasons (CE), unauthorized conversion and/or modification of the system is not permitted.
- At industrial sites, the accident prevention regulations of the association of the industrial workers' societies for electrical equipment and utilities must be followed.
- In schools, training centers, computer and self-help workshops, handling of technical devices must be supervised by trained personnel in a responsible manner.
- Do not leave the packaging material lying around carelessly since such materials can become dangerous toys in the hands of children.

- The product is not protected against weather and therefore must be installed inside.

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5. What is in the box

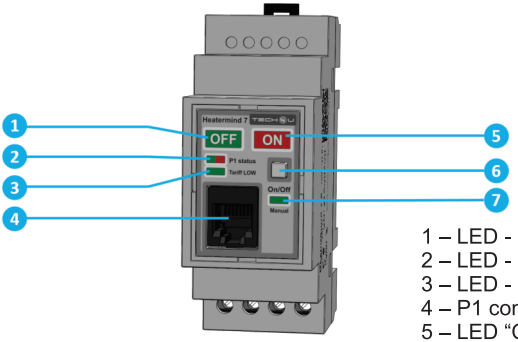
The Heatermind 7.0 comes with the following accessories:

1 – Heatermind 7.0
2 – User Guide
3 – RJ-12 cable 80 cm long

Figure 1. What is in the box

6. Device overview

An overview of the front panel of the Heatermind 7.0 is shown below:



1 – LED - “Contactor OFF”
2 – LED - “P1 status”
3 – LED - “Tariff LOW”
4 – P1 connector (RJ-12)
5 – LED “Contactor ON”
6 – Manual “ON / OFF” button
7 – LED “Manual” control

7. Terminal connectors

The HRM-701 device has terminal connectors for connection of the external contactor and “mains voltage” (230V/AC) sensor.

The connection is performed via screw terminals.
Use of wire-end sleeves is required.

The terminal connector of the device is shown on the picture below:

1 - To contatcor’s coil
2 - To “mains voltage” sensor

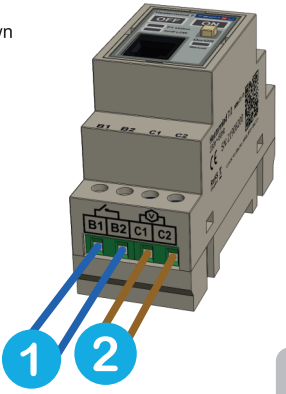


Figure 2. Overview

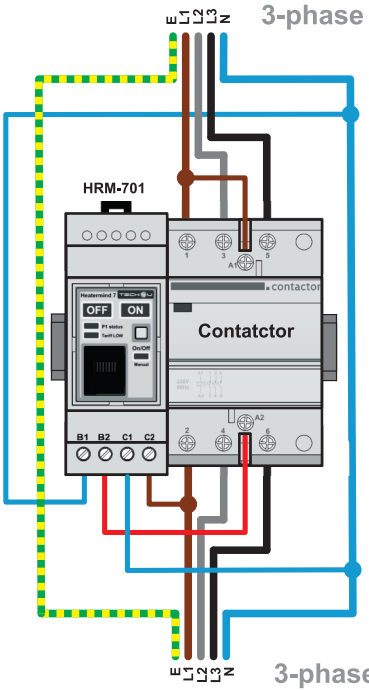
8. Installation (3-pole contactor)

The Heatermind 7.0 device is designed to be mounted on the standard DIN rail. It is 2 modules wide. Its relay can be used to control any contactor having a coil operating at 230 V/AC, 50 Hz.

The installation must only be performed by a specialist.
Note! The device must be powered down before connecting or changing the wiring.

It is recommended to install an appropriate overcurrent circuit breaker before the Heatermind section (not shown on the picture below).

The recommended installation diagram for the 3-pole contactor is presented on the picture below:



The wires to HRM-701 (B1, B2, C1, C2) Ø 1 mm^2

The wires to Contactors coil (A1, A2) Ø 1 mm^2

The wires to the contactor's poles (1,2,3,4,5,6) must be adjusted to the contactor's maximal load. For detailed information **please consult contactor's data sheet.** As an example for a 40 A resistive load, the wires must be Ø 6 mm^2 (AWG10)

Figure 3. Installation. 3-pole contactor

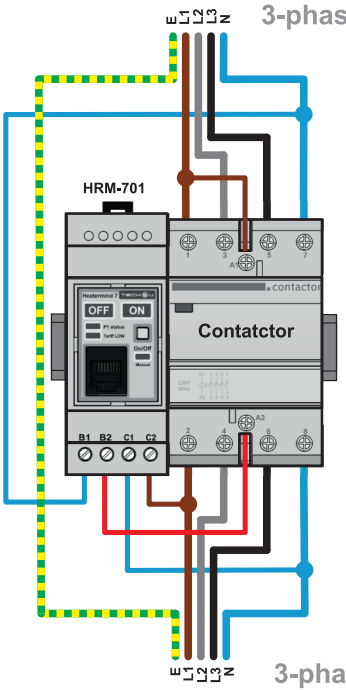
9. Installation (4-pole contactor)

The Heatermind 7.0 device is designed to be mounted on the standard DIN rail. It is 2 modules wide. Its relay can be used to control any contactor having a coil operating at 230 V/AC, 50 Hz.

The installation must only be performed by a specialist.
Note! The device must be powered down before connecting or changing the wiring.

It is recommended to install an appropriate overcurrent circuit breaker before the Heatermind section (not shown on the picture below).

The recommended installation diagram for the 4-pole contactor is presented on the picture below:



The wires to HRM-701 (B1, B2, C1, C2) Ø 1 mm^2

The wires to Contactors coil (A1, A2) Ø 1 mm^2

The wires to the contactor's poles (1,2,3,4,5,6,7,8) must be adjusted to the contactor's maximal load. For detailed information **please consult contactor's data sheet.** As an example for a 40 A resistive load, the wires must be Ø 6 mm^2 (AWG10)

Figure 4. Installation. 4-pole contactor

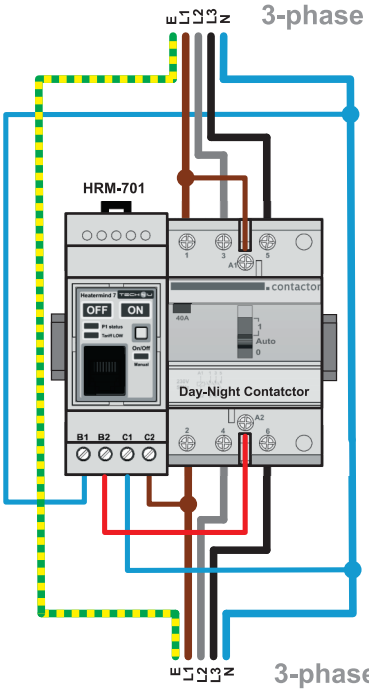
10. Installation (3-pole Day-Night contactor)

The Heatermind 7.0 device is designed to be mounted on the standard DIN rail. It is 2 modules wide. Its relay can be used to control any contactor having a coil operating at 230 V/AC, 50 Hz.

The installation must only be performed by a specialist.
Note! The device must be powered down before connecting or changing the wiring.

It is recommended to install an appropriate overcurrent circuit breaker before the Heatermind section (not shown on the picture below).

The recommended installation diagram for the 3-ple “Day Night” contactor is presented on the picture below:



The wires to HRM-701 (B1, B2, C1, C2) Ø 1 mm^2

The wires to Contactors coil (A1, A2) Ø 1 mm^2

The wires to the contactor’s poles (1,2,3,4,5,6) must be adjusted to the contactor’s maximal load. For detailed information **please consult contactor’s data sheet.** As an example for a 40 A resistive load, the wires must be Ø 6 mm^2 (AWG10)

Figure 5. Installation. 3-pole contactor

11. Powering up

Once the device wiring is done, one can turn on the power.
After that, the LED “OFF” 1 will light up, indicating, that the Hetermind is in disconnected position / in “OFF” state.

At the same time, LED “P1 status” starts to blink red, meaning lack of connection with the Smart Meter.
Generally, flashing of “P1 status” LED 2 indicates proper operation of the internal microprocessor.

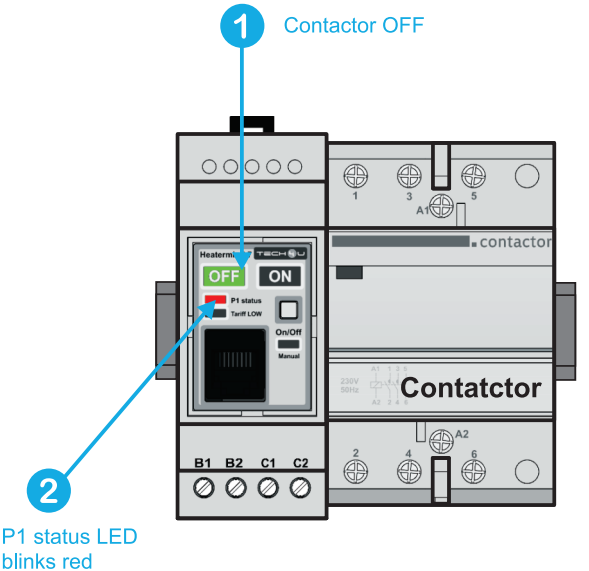


Figure 6. Powering up.

12. Connection with the Smart Meter

Connect the HRM-701 to the smart meter using the included RJ-12 cable (1) as shown in the figure 6 below:

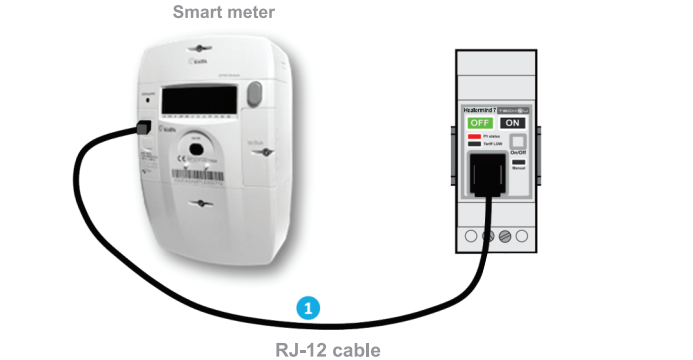


Figure 7 Connecting the Heatermind to the smart meter

When the connection is made (1), and the first valid P1 message has been received by the HRM-701, (within 20 seconds (2)), the P1 status LED will change colour to green and start blinking (3) .This indicates successful communication between the HRM-701 and the smart meter.

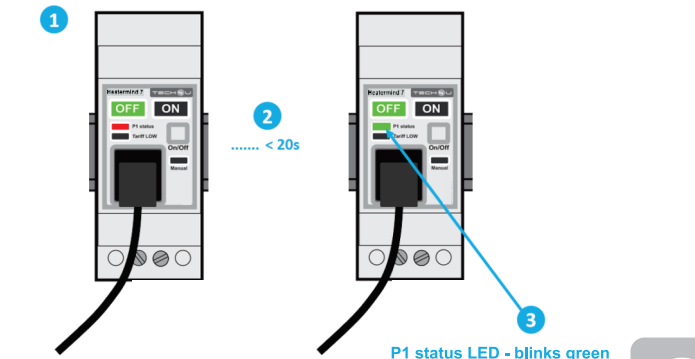


Figure 8 The connection between the HRM-701 and the smart meter.

13. Electricity tariffs

The electricity tariffs are set by energy companies. In the Netherlands and Belgium there are two tariffs. High (also called normal or day tariff) and low (also called off-peak or night tariff).

The low tariff is cheaper. In the Netherlands it is indicated on the smart meter as T1 or simply 1 while in Belgium it is indicated on the smart meter by T2 or 2. The period when each tariff is imposed varies per country and even per region within the country.

The region in which you install the HRM-701 does not matter as the device communicates directly with the smart meter and determines the low and high tariff.

An example is shown in figure 8:
(This example is based on the tariff schedule in Limburg (Netherlands) and North-Brabant).

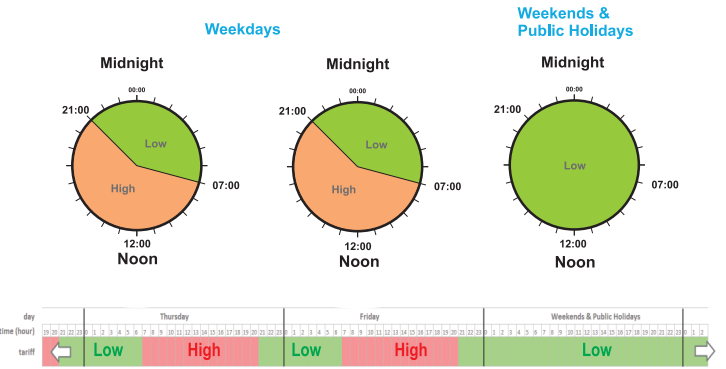


Figure 9. An example of the tariff schedule.

14. Automatic mode

The HRM-701 is by default set to work in automatic mode. The device turns on automatically when the P1 cable is connected. In automatic mode the device will turn the load on whenever the tariff changes to “low” and turn the load off whenever the tariff changes to “high”.

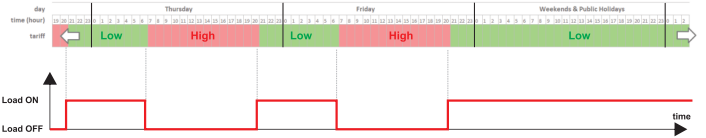


Figure 10. Automatic mode

The device indicates when the tariff is “low” through the “Tariff LOW” LED 1

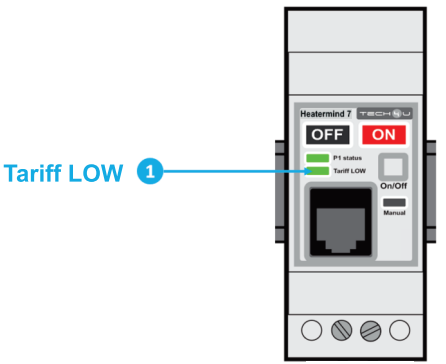


Figure 11. Tariff low indication LED

15. Manual control

The HRM-701 can always manually switch the connected contactor on or off. The manual mode is indicated by the “Manual” LED.

15.1. Manual OFF

To turn the HRM-701 off during low tariff, press the “ON/OFF” button on the Hetermind device. Doing so immediately turns the load off. The system will revert back to the automatic mode automatically on the next tariff change.

Only for “Day and Night” contactor

In case the “Day Night” contactor is used, one can flip the switch on the contactor to the “0" position. Doing so immediately turns the load off. It also prevents the system from automatically reverting to the automatic mode on the next tariff change. The system will only revert back to automatic mode when the switch is manually flipped back to the “auto” position.

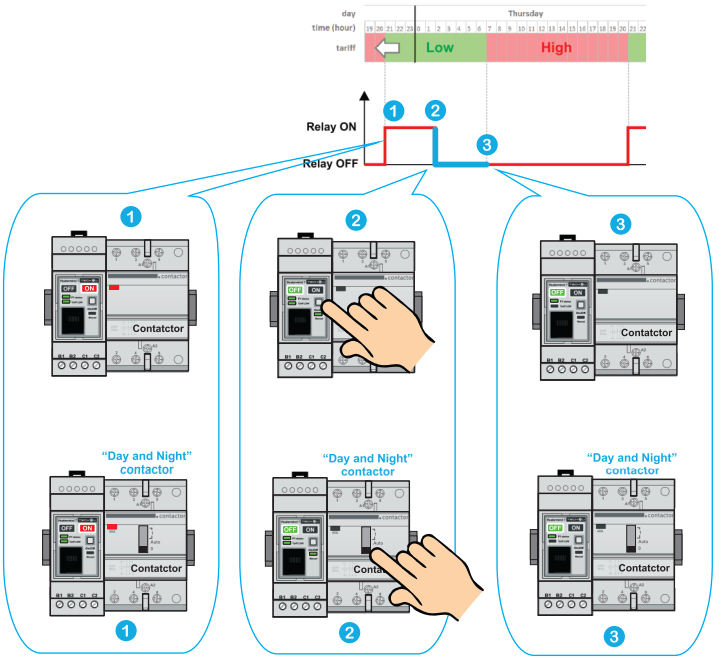


Figure 12. Manual “off” mode using the “ON/OFF” button.

15.2. Manual ON

To turn the HRM-701 on during high tariff, press the “ON/OFF” button on the Hetermind device. Doing so immediately turns the load on.
The system will revert back to the automatic mode automatically on the next tariff change.

Only for “Day and Night” contactor

In case the “Day Night” contactor is used, one can flip the switch on the contactor to the “1” position. Doing so immediately turns the load on.
The system will revert back to the automatic mode automatically on the next tariff change.

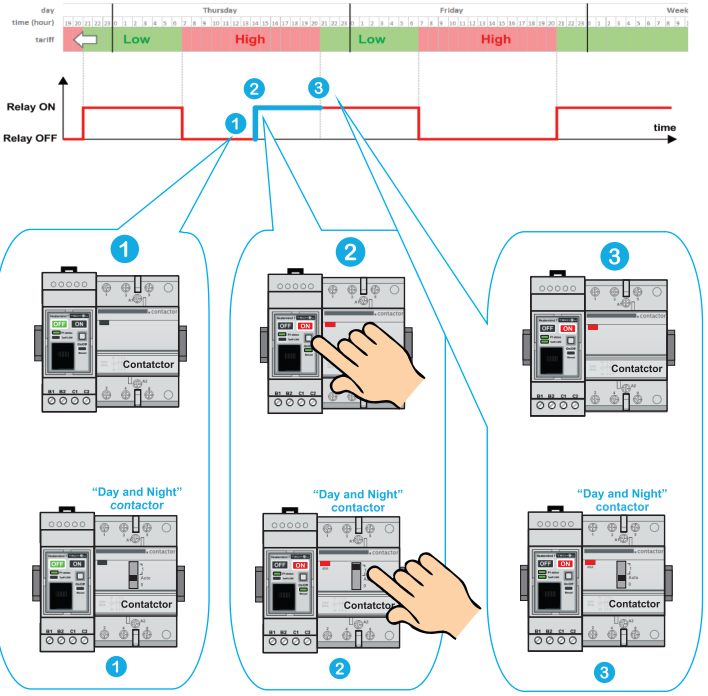


Figure 13. Manual ON mode.

16. Failure to communicate with the smart meter

If the device cannot communicate with the smart meter (e.g. due to the RJ-12 cable becoming dislodged) for more than 20 seconds, the “P1 status” LED will start blinking red and the relay will automatically disconnect the load (even in manual ON mode).

When communication is reestablished the HRM-701 will revert back to automatic mode, (unless the manual OFF mode is enabled through the contactor switch), after the first full P1 telegram has been received.

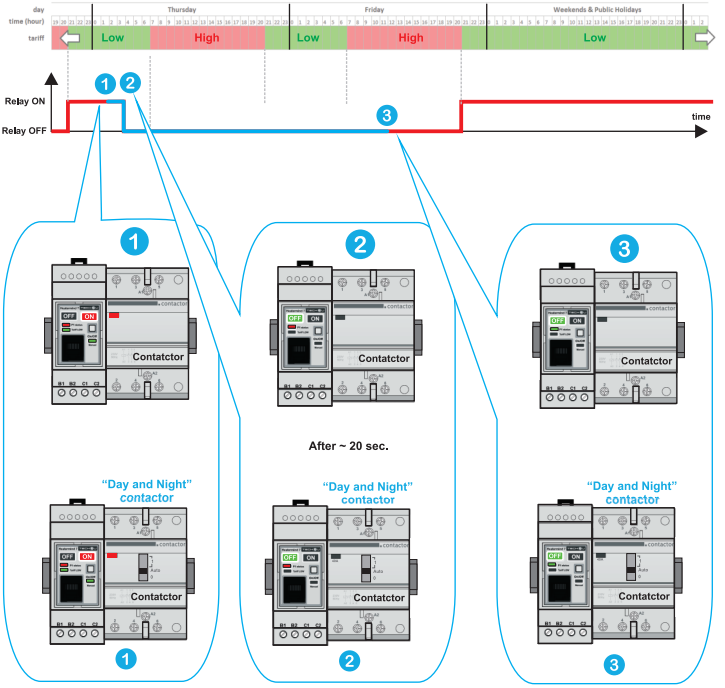


Figure 14. Failure to communicate with the smart meter.

17. Maintenance

Regularly inspect technical safety of the system, e.g. for damage to the connection lines. Servicing or repair must only be carried out by a specialist.

If it can be assumed that safe operation is no longer possible, the device must be turned off and precautions are to be taken to ensure that it is not used unintentionally.

It can be assumed that operation without danger is no longer possible if parts of the device have any visible damage, the system no longer works or severe mechanical stain has occurred.

18. Disposal

Dispose of the product according to the applicable statutory provisions at the end of its service life.

19. Declaration of Conformity

The description of this device and the declaration of conformity can be found on: http://www.tech4u.info/product-info/HRM-701/

20. More info

More information about this product as well as the newest documentation can be found on the following web page:

https://www.tech4u.info/product-info/HRM/HRM-701/

CE RoHS Compliant

21. Technical specification:

Compatible with Smart Meter standards:	DSMR 5.0, ESMR 5.0, e-MUCs-H (DSMR 502)
Operating voltage:	230 V/AC, 50/60 Hz
Installation:	DIN-RAIL, 35 mm
P1 power consumption:	max 130 mA
Dedicated for contactor coil:	230 V/AC, 50/60 Hz,
Voltage sensor:	230 V/AC, 50/60 Hz
Storage temperature:	-10°C to +50°C
Operating temperature:	-10°C to +50°C
Ambience conditions:	Air humidity: Max. 90% rel. humidity, non-condensing
Package dimensions:	120 x 86 x 35,5 mm
Package weight:	100 g
Warranty:	2 years

For use with any contactors equipped with 230V/AC coil.
For detailed contactor specification - please consult the contactor's datasheet.

22. Legal notice