

U 468 931 003 281-1

Additional functions for one-channel radio frequency receivers

IN STAT 868 -a1

These additional instructions supplement the basic "Installation and Operating Instructions Radio receiver INSTAT 868-a1..."
Nr. 468 931 002 933
They only need to be used when the following functions are used:

• Switching operation with time control (master/slave)

• Pump logic

• Timer

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1. Description of the functions

All of the transmitters work with the same frequency of 868.95 MHz.

To ensure that the transmitters and the receivers understand each other (as though they were directly connected to each other by cables) and do not exchange commands with any other devices, the transmitters specify a connection number. This number is saved by all of the participants in the "Learning mode".

The receiver recognizes the function on the basis of the number of saved addresses.

Switching operation:
One address of a transmitter (room controller) will be saved

Switching operation with master/slave:
In addition to the address of the room controller, the address of the master is also saved

Timer output:
Two addresses (of the same transmitter) are saved.

Pump logic:
Three to six addresses are saved

Note:
The BR 1 jumper must be open in order to be able to use the functions described here

1.1 Function - switchina mode "One transmitter controls one switching output"

One transmitter controls the output for heating or cooling ON/OFF, see Point 2.1, Figures 1, 2, 3.

Only one transmitter will be taught in the "Learning mode" (*INSTAT 868-r* or *INSTAT 868-r1*).

The BR 1 jumper can be either open or closed when using this function.

1.2 Function - switching operation with master/slave

(In combination with the *INSTAT 868-r1* simple transmitter and the *INSTAT 868-r* clock thermostat)

This corresponds to the switching operation function. However, the temperatures of the room are influenced by an *INSTAT 868-r* radio clock thermostat (master).

If the master switches to the set-back temperatures 2 ↓ or 3 ↓, the slave is also set back accordingly. See Point 2.2, Figures 4, 5.

Master = *INSTAT 868-r* clock thermostat
Slave = *INSTAT 868-r1* simple transmitter

The master/slave function also influences the pump logic. See Figures 7, 8, 9.

2 different transmitters are taught via the "Learning mode".

Note:

- In the event of a master malfunction, the receiver will control the comfort temperature and the lamp will flash.
- In the event of a slave malfunction, the receiver will go into a state of alarm (see the basic instructions, Point 5.5).
- Only slaves (transmitters) in automatic operating mode will follow the master.
- The M/S function is independent of the operating mode of the master.
If the master is set to party or manual mode, the switching times of the week program are used. In case of frost protection T3 is used.
If the day program is activated, its switching times are used.

1.3 Function - pump logic

Up to 6 transmitters can switch a pump ON/OFF.

The pump will be switched off if none of the related transmitters demands for heat (within 10 minutes). See Point 4.1, Figure 7.

3 or more transmitters will be taught in the "Learning mode" (in the case of only 2 transmitters, one transmitter has to be taught twice).

The pump logic can be expanded to more than 6 transmitters by switching the relay outputs in parallel.

Pump logic in the case of master / slave

The pump receiver requires both the signals of the room controller as well as those of the corresponding master (clock thermostat). See Point 4.2 Figure 8 and Point 5

A slave uses the next lower clock thermostat as its master.

For this reason the master has to be first taught via the "Learning mode" before the corresponding slaves are taught. Then the next master is taught, etc. See Figures 10c, 10d.

In the case of large zones, relay receivers can be switched in parallel, whereby the master on each receiver is taught via the "Learning mode". In the case of the second receiver, only 5 slaves can then be taught.

1.4 Function - timer output "A transmitter controls as a timer output"

(Only possible with the *INSTAT 868-r* clock thermostat)

The output switches ON when the regulated temperature ↓ 3 (night) has been activated for the transmitter and the heating up period has not yet begun.

This output can e.g. be used to control the temperature set-back input (TA) of other controllers or to set back the boiler temperature, see Point 3, Figure 6.

The timer function is independent of the switching mode of the transmitter.

If the clock thermostat is set to party or manual mode, the switching times of the week program are used. In case of frost protection the output is always on

If the day program is activated, its switching times are used.

The one clock thermostat will be taught twice in the learning mode.

1.5 Teaching via the "Learning mode"

Teaching via the "Learning mode" is carried out in two steps.

"Teach/delete":

This step deletes all of the previous functions and teaches the first transmitter.

1. Simultaneously press the ⚠ and the "Reset" pushbuttons.
2. Release the "Reset" pushbutton.
3. When the lamp lights up, release the ⚠ pushbutton.
The signal tone will sound, the output will briefly switch on.
4. When the transmitter has been recognized, the signal tone will cease and the lamp will turn off.

"Teaching":

All of the other transmitters are taught via the "Learning mode"

1. Briefly press the ⚠ pushbutton
2. When the signal lamp lights up, release the pushbutton.
The signal tone will sound, the output will briefly switch on.
3. When the transmitter has been recognized, the signal tone will cease and the lamp will turn off.

1.6 Determining active connections

After pressing the "Reset" pushbutton, the connections taught in the "learning mode" are signalled by the signal lamp by briefly flashing.

Several connections are signalled by series of flashes.

A master lights up longer than a slave.

Number of flashes	Function
1	Switching operation
2	Timer and master/slave
3 or more times	Pump logic

2 Function - switching operation

One transmitter controls the output for heating or cooling ON/OFF. [Open the BR 1 jumper](#)

2.1 "Switching operation" without master One transmitter controls one switching output

A connection is established between one transmitter and one or more receivers for transmitting the ON/OFF information (see Figures 1,2,3).

Procedure:

1. Switch the transmitter (*INSTAT 868-r* or *INSTAT 868-r1*) into the "Learning mode".
2. Execute "Teach/delete"

a. Simultaneously press the ⚠ and "Reset" pushbuttons.

b. Release the "Reset" pushbutton.

c. When the lamp lights up, release the ⚠ pushbutton.
The signal tone will sound, the output will briefly switch on.

d. When the transmitter has been recognized, the signal tone will cease and the lamp will turn off.
3. Exit the "Learning mode" at the transmitter.

Figure 1

One transmitter (*INSTAT 868-r1*) controls a receiver

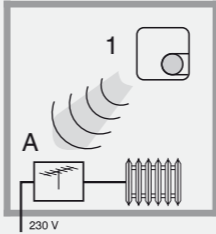


Figure 2

One transmitter (*INSTAT 6-r*) controls a receiver

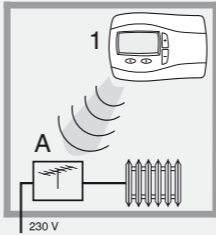
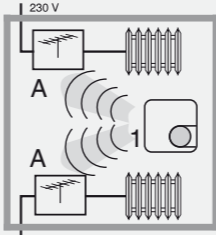


Figure 3

One transmitter controls several receivers. (also valid in the same manner for *INSTAT 868-r*)



Testing the switching operation function

without master: (direction of flow = normal)

- Receiver:

• Press "Reset".
The lamp should only briefly light up once.
- Transmitter:

• Set to 30 °C.
After approx. 30 s the output will switch on
- Transmitter:

• Set to 5 °C.
After approx. 30 s the output will switch off

2.2 Switching operation with master /slave (time control) A transmitter functions as a switching output

A connection is established between one transmitter and one or more receivers for transmitting the ON/OFF information.

An additional connection is established between the one master and all of the slaves for transmitting the time information (see Figures 4, 5).

The slaves therefore follow the time profile of the master.

The time profile is independent of the operating mode of the master.

If the master is set to party or manual mode, the switching times of the week program are used. In case of frost protection T3 is used.

If the day program is activated, its switching times are used.

Principle procedure according to Figure 5:

First simultaneously teach the master (1) via the "Learning mode" at all of its receivers (A...E), then teach the corresponding slaves (2, 3, 4).

In detail:

1. Simultaneously teach the master (1) at all of the receivers (A...E) as follows:

a) Activate the "Learning mode" of the master (1) (see its operating instructions)

b) Activate the "Learning mode" for all of the receivers involved (A, B, C, D, E) as follows:

Execute "Teach/delete"

1. Simultaneously press the ⚠ and the "Reset" pushbuttons.

2. Release the "Reset" pushbutton.

3. When the lamp lights up, release the ⚠ pushbutton.
The signal tone will sound, the output will briefly switch on.

4. When the receiver has been recognized, the signal tone will cease and the lamp will turn off.

c). Exit the "Learning mode" at the master
2. Teach the slave transmitter at its receivers as follows:

a) Activate the "Learning mode" at the slave, e.g. (2).

b) Activate the "Learning mode" at the receiver (B) as follows:

Execute "Teach"

1. Briefly press the ⚠ pushbutton

2. When the signal lamp lights up, release the pushbutton.
The signal tone will sound, the output will briefly switch on.

3. When the transmitter has been recognized, the signal tone will cease and the lamp will turn off.

c. Exit the "Learning mode" at the slave.

Testing the function switching operation with master/slave

- with master:

(direction of flow = normal)

Slave must be in the automatic operating mode
- Receiver:

• Press the "Reset" pushbutton.
The lamp must light up several times, first long for the master, then briefly for each slave
- Master (transmitter):

• Set to comfort temperature 1 (by changing the time), wait approx. 30 sec.
- Slave (transmitter)

• Press "Reset"
- Receiver:

• will briefly switch on 3 times

Figure 4

Simple master/slave function

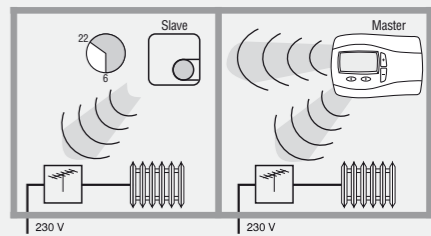
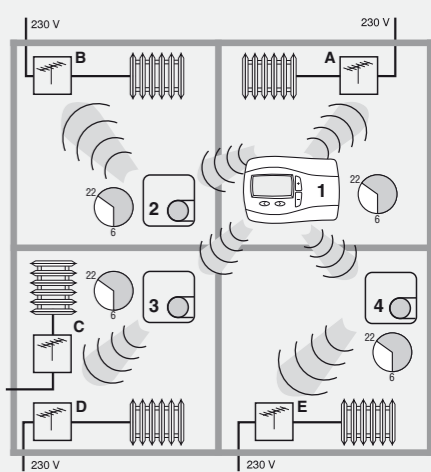


Figure 5

This figure shows an apartment with a master controller (1) (*INSTAT 868-r* clock thermostat), slave controllers (2, 3, 4) (*INSTAT 868-r1*) and receivers (A...E) (*INSTAT 868-a1*).

When the master e.g. switches to the set-back mode at night, the temperature is also reduced in the rooms controlled by the slaves.



3. Function - Timer output

Open the BR 1 jumper

“A transmitter functions as a timer output”

(only possible in the case of the *INSTAT 868-r* timer thermostat)

The INSTAT 868-a1 receiver can also be used to control the the temperature set-back input (TA) of other controllers. The output is switched ON when the set-back temperature is activated (see Figure 6).

The output switches ON when the set-back temperature \downarrow_3 (night) has been activated on the transmitter and the heating up phase has not yet begun.

The timer function is independent of the operating mode of the transmitter.

If the clock thermostat is set to party or manual mode, the switching times of the week program are used. In case of frost protecton the output is always on.

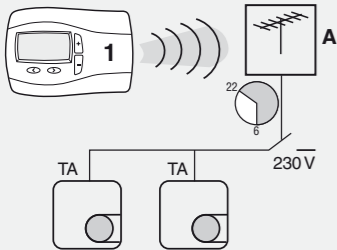
If the day program is activated, its switching times are used.

The one transmitter (*INSTAT 868-r* clock thermostat) must be taught via the “Learning mode” twice **in order to activate** the timer function (see Figure 6).

1. Activate the “Learning mode” at the transmitter (1).
 - a. Activate the “Learning mode” at the receiver (A) as follows:
Execute “Teach/delete”
 1. Simultaneously press the Δ and the “Reset” pushbuttons.
 2. Release the “Reset” pushbutton.
 3. When the lamp lights up, release the Δ pushbutton.
The signal tone will sound, the output will briefly switch on.
 4. When the transmitter has been recognized, the signal tone will cease and the lamp will turn off.
2. Leave the same transmitter (1) in the “Learning mode”
 - a. Reteach the same receiver (A) as follows:
Execute “Teach”
 1. Briefly press the Δ pushbutton.
 2. When the signal lamp lights up, release the pushbutton.
The signal tone will sound, the output will briefly switch on.
 3. When the transmitter has been recognized, the signal tone will cease and the lamp will turn off.
3. Exit the “Learning mode” at the transmitter.

Figure 6

Timer function



TA = Temperature set-back input of the temperature-controller

Testing the “Timer output” function

- | | |
|--------------|--|
| Receiver: | • Press the “Reset” pushbutton.
The lamp must light up twice. |
| Transmitter: | • Set the set-back temperature 3 (by changing the time) |
| Receiver: | • The lamp must turn off after approx. 30 s. |
| Transmitter: | • Set the comfort temperature 1 (by setting the time) |
| Receiver | • The lamp must turn off after approx. 30 s. |

4 Function - pump logic

Up to 6 transmitters can switch a pump ON/OFF.

The pump will be switched off when none of the transmitters demands for heat (within a period of 10 minutes).

At least 3 transmitters must have been taught in the “Learning mode” in order to activate the pump logic. Open the **BR 1 jumper**.

4.1 Pump logic – without master:

Connections are established between several transmitters and one receiver for transmitting the pump information (see Figure 7).

Principle procedure:

Teach all of the transmitters in sequence.

If the *INSTAT 868-r* clock thermostat is also being used, teach it last (A different sequence or combination would cause a master/slave relationship. See Figure 10).

In detail (according to Figure 7):

1. Teach the first transmitter (not clock thermostat) as follows:
 - a) Activate the “Learning mode” at the transmitter (1).
 - b) Activate the “Learning mode” at the receiver (A) as follows:
Execute “Teach/delete”
 1. Simultaneoulsy press the Δ and the “Reset” pushbuttons.
 2. Release the “Reset” pushbutton.
 3. When the lamp lights up, relese the Δ pushbutton.
The signal tone will sound, the output will briefly switch on.
 4. When the transmitter has been recognized, the signal tone will cease and the lamp will turn off.
 - c) Exit the “Learning mode” at the transmitter.
2. Teach all of the other transmitters as follows:
 - a) Activate the “Learning mode” at the transmitter (2).
 - b) Activate the “Learning mode” at the same receiver (A) as follows:
Execute “Teach”
 1. Briefly press the Δ pushbutton.
 2. When the signal lamp lights up, release the pushbutton.
The signal tone will sound, the output will briefly switch on.
 3. When the transmitter has been recognized, the signal tone will cease and the lamp will turn off.
 - c) Exit the “Learning mode” at the transmitter.
3. Execute Point 2 for all of the other transmitters.

Note:

If only one transmitter is to be used, teach this one transmitter 3 times without exiting the “Learning mode” at the transmitter.

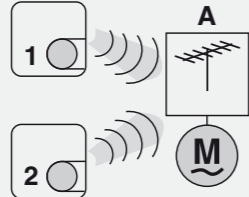
If only two transmitters are to be used, teach one of the two transmitters twice without exiting the “Learning mode” at the transmitter!

If more than 6 transmitters are required, use an additional *INSTAT 868-a1* receiver.

Switch the relay outputs in parallel.

Figure 7

Pump logic with two transmitters



Testing the pump logic function

- | | |
|---------------------------|---|
| without master: | (direction of flow = normal) |
| Receiver: | • Press “Reset”.
The lamp must light up the same number of times as transmitters are taught via the “Learning mode”. |
| At <u>one</u> transmitter | • Set to 30 °C.
Then the lamp must turn on after approx. 30 s. |
| At all transmitters: | • Set to 5 °C.
The lamp switches off
This could last up to 20 min. |

4.2 Pump logic – with master and slaves:

Connections are established between several transmitters and one receiver for transmitting the pump information.

The master must always be taught before the slaves are taught.

Principle procedure

 (according to Figure 8):

The master (1) of the respective zone is first taught before its slaves (2, 3) are taught. Further master/slaves are taught according to the same principle.

In detail:

1. Teach the master (*INSTAT 868-r* clock thermosat) as follows:
 - a) Activate the “Learning mode” at the master (1).
 - b) Activate the “Learning mode” at the receiver (A) as follows:
Execute “Teach/delete”.
 1. Simultaneously press the Δ and the “Reset” pushbuttons.
 2. Release the “Reset” pushbutton.
 3. When the lamp turns on, release the Δ pushbutton.
The signal tone will sound, the output will briefly switch on.
 4. When the transmitter has been recognized, the signal tone will cease and the lamp will turn off.
 - c) Exit the “Learning mode” at the transmitter.
2. Teach all of the other transmitters as follows:
 - a) Activate the “Learning mode” at the transmitter (2).
 - b) Activate the “Learning mode” at the same receiver (A) as follows:
Execute “Teach”
 1. Briefly press the Δ pushbutton.
 2. When the signal lamp turns off, release the pushbutton.
The signal tone will sound, the output will briefly switch on.
 3. When the transmitter has been recognized, the signal tone will cease and the lamp will turn off.
 - c) Exit the “Learning mode” at the transmitter.
3. Execute Point 2 for all of the other transmitters.

Note:

If only one master and one slave are being used, teach the one slave twice without exiting the “Learning mode” at the slave.

If more than 5 slaves are required, use an additional *INSTAT 868-a1* receiver. Simultaneously teach the master at all of the receivers.

Switch the relay outputs in parallel.

Testing the function - pump logic with master

with master: (direction of flow = normal)

Slave must be in automatic operating mode

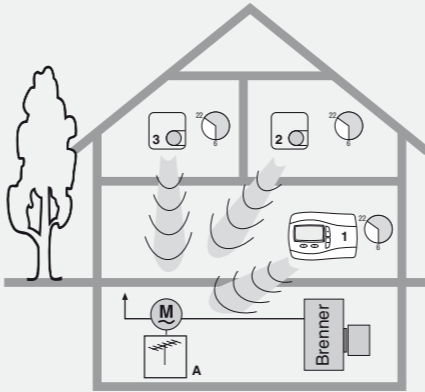
- | | |
|----------------------------|---|
| Receiver: | • Press “Reset”.
The lamp must light up the same number of times as the number of transmitters taught. The lamp must <u>first</u> light up <u>longer</u> for the master, then <u>shorter</u> for the slaves. |
| At <u>one</u> transmitter | • Set to 30 °C.
then the lamp must turn on after approx. 30 s. |
| At <u>all</u> transmitters | • Set to 5 °C.
The lamp switches off
This could last up to 20 min. |

Figure 8

Pump logic with master and slaves

Each transmitter affects the pump (pump logic)

If the room controllers are no longer demanding for heat, the pump will also switch off. The time profile of the master also affects the slaves.



5 Switching operation with pump logic and master/slave

This is a combination of “Switching operation with master/slave” and “Pump logic”. Each controller (transmitter) controls one room. The master controls its room and also affects the time control in all of the other rooms. The pump will also switch off when none of the rooms require any more warmth.

Principle procedure (according to Figure 9):

Figure 10

The receiver of the pump (F) is handled in the same manner as a receiver in one of the rooms. However, each time it must also be taught via the “Learning mode”.

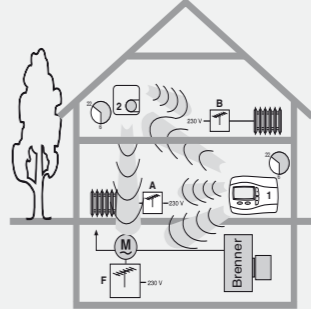
In detail (see Figure 9):

- Simultaneously teach the master (1) at all of its receivers (A...E + F [pump receiver]) (according to Point 2.2.1). Remain in the “Learning mode” until all of the receivers have been taught.
- Teach the slave (2) at both its receiver (B) and at the pump receiver (F) (according to Point 2.2.2). Remain in the “Learning mode” until all of the receivers have been taught. In Figure 9, teach the slave (2) at the pump logic receiver (F) twice, also see the note in 4.2.

Figure 9

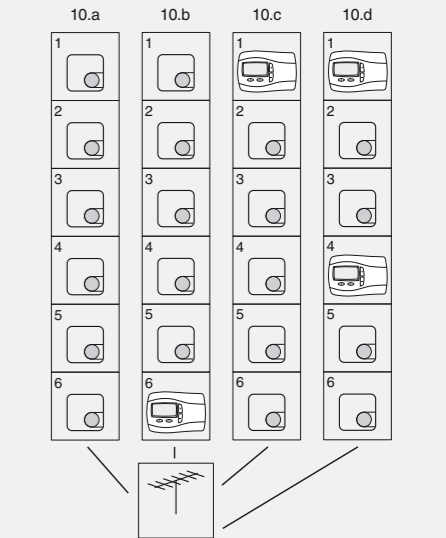
Regulation of a single room with master/slave and pump logic.

Each transmitter controls its own room. Each transmitter also affects the pump (pump logic). The *INSTAT 868-r* master affects time control at the slave.



Testing the function

Test separately according to the instructions in “Testing the function switching operations with master”, see 2.2. and “Testing the function pump logic with master”, see 4.2



10.a: 6 simple transmitters function as pump logic.

10.b: 5 simple transmitters and one clock thermostat function as pump logic (the clock thermostat must be taught last).

10.c: One master with 5 slaves function as pump logic.

10.d: Zone regulation with 2 zones (1-3, 4-6). Each zone with one master and 2 slaves

Note:

It is also possible to teach less than 6 transmitters.

6 Brief instructions

“Teach/ delete”

- | | | | |
|--------------------|--------------------|-----|--|
| At the transmitter | At the receiver | 1.5 | <ul style="list-style-type: none">• Bring into “Learning mode”• Simultaneously press the Δ and “Reset” pushbuttons.• Release the “Reset” pushbutton.• When the lamp turns on, release the Δ pushbutton
– Signal tone will sound
The output will briefly switch on• When the transmitter has been recognized – signal tone will sound and the signal lamp will turn off |
| “Teach” | At the transmitter | 1.5 | <ul style="list-style-type: none">• Bring into “Learning mode”• Briefly press the Δ pushbutton• When the lamp lights up, release the Δ pushbutton• Signal tone will sound, output will (briefly) switch on• When the transmitter has been recognized - signal tone will cease + signal lamp will turn off |

- | | | | |
|--|----------------|------|---|
| Switching operation function | without master | 2.1. | • “Teach/delete” |
| Switching operation function | with master | 2.2. | <ul style="list-style-type: none">• First simultaneously “teach/delete” the master (clock thermostat) at <u>all</u> of the receivers, then• “teach” each slave (simple transmitter) at <u>its</u> receiver |
| Timer function | | • | “Teach/delete” the clock thermostat, then leave the transmitter in “Learning mode” and
• “teach” only the receiver a second time |
| Pump logic function | without master | 4.1 | <ul style="list-style-type: none">• “Teach/delete” the first transmitter• Subsequently “teach” all of the other transmitters (“teach” the clock thermostat last)
(At least 3 transmitters must be taught) |
| | with master | 4.2 | <ul style="list-style-type: none">• First “teach/delete” the master (clock thermostat) at the pump logic receiver and then• “teach” the slaves (simple transmitter) at the pump logic receiver• If necessary, “teach” an additional master (at least 3 transmitters must be taught) |
| Switching operation with pump logic and master/slave | | 5 | <ul style="list-style-type: none">• First simultaneously “teach/delete” the master at <u>all</u> of the receivers (including the pump logic receiver), then• “teach” the slave at <u>its</u> receiver <u>and</u> at the pump logic receiver |