EBERLE

IN STAT 868

Radio Frequency Single-Room Controls

Easy to operate wireless application

People

Products

Performance

HEATING

3 x RF transmission distance
with new Repeater

NEW

invensys
Controls

Radio Frequency Controls

Single-room control in the form of either thermal or electrothermal control has been state of the art in new buildings for years. In many existing buildings, however, there is increasing need to retrofit these systems for added comfort and energy savings. Radiators can be economically retrofitted with radiator thermostats. In the past, it has always been difficult to retrofit hot water floor heating systems that are not equipped with thermostats in their respective rooms.

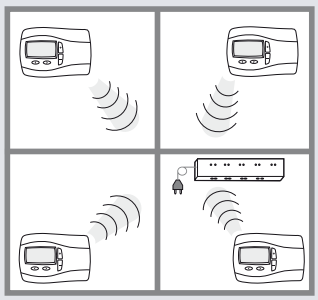
Today, these room units are still controlled with manually set flow controllers in central manifold cabinets installed on the relevant floor or in the basement. Unfortunately, solar irradiation or other sources of heat such as tiled stoves are rarely taken into account by this type of control system.

Eberle's innovative and simple solution to this problem is the use of a wireless RF single-room control system. This avoids the need for expensive wiring and redecoration. This trendsetting modular system combines the benefits of single-room control with the convenience of radio frequency control. The calculated actuation values are radio transmitted to the receiver, by means of the network-independent radio frequency room temperature controllers.

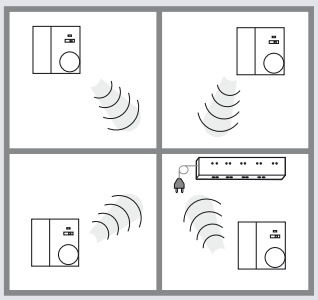
The receiver should ideally be installed in the manifold cabinet of the heating circuit. This means that the temperature is detected and controlled conveniently from any heating zone in the house without electrical cables having to be laid from the room temperature controller to the thermal actuator. This not only allows the heating system to be designed more flexibly, but also helps to reduce the time and costs involved in renovation or new built installations.

INSTAT 868 Radio Frequency Controller System – Applications

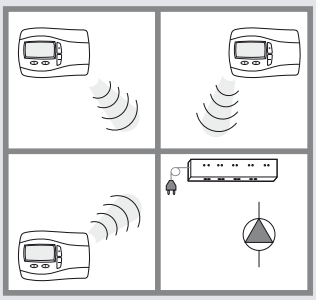
Transmission range in all examples: 1 concrete ceiling or 3 walls



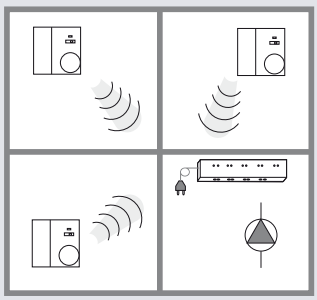
Clock thermostat function
per room
with 4-channel receiver or
6-channel receiver



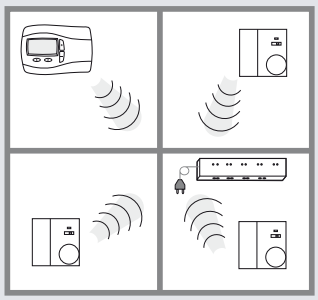
Analogue single-room controller
with 4-channel receiver or
6-channel receiver



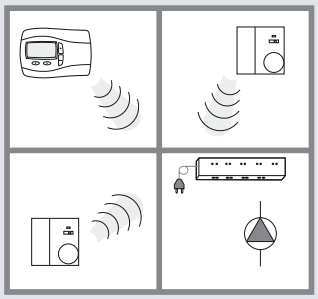
Clock thermostat function
per room
with 4-channel receiver or
6-channel receiver and heating
pump with pump logic



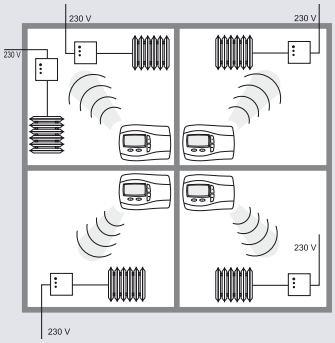
Analogue controller
with 4-channel receiver or 6-channel receiver and heating pump
with pump logic



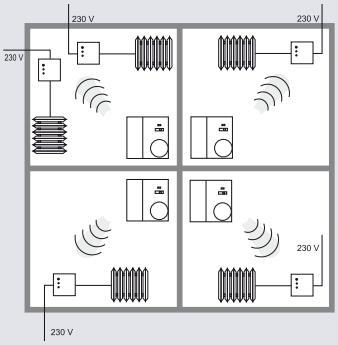
Clock thermostat with analogue
single-room controller with
4-channel-receiver or 6-channel-
receiver
Master – Slave function



Clock thermostat with analogue
single-room controller and with
4-channel-receiver or 6-channel-
receiver
Master – Slave function and
heating pump with pump logic



Clock thermostat
with 1-channel receiver



Analogue controller
with 1-channel receiver or outlet
radio frequency receiver

General Information on Radio Frequency Systems

The *INSTAT 868* radio frequency controller range offers ideal wireless transmitters and receivers for any type of application. For each heating zone, either the *INSTAT 868-r1* radio frequency transmitter with analogue temperature setting or the *INSTAT 868-r/rd* digital clock thermostat is used, and both can be combined with the *INSTAT 868-a1A* 1-channel receiver. For several heating circuits, 4- or 6-channel *INSTAT 868-a4/a6* receivers are used, which can be expanded and combined with each other as desired. For mobile electric heaters, such as wall-mounted heaters or towel dryers, the *INSTAT 868-a1S* outlet radio frequency receiver is the ideal solution and can also be delivered in combination with an *INSTAT 868-r1* radio frequency transmitter as an *INSTAT 868-r1S/Set* radio frequency set. The advantage of this version is that both of the devices are matched to each other ex factory and are ready for operation.

Commissioning

Commissioning of the *INSTAT 868* radio frequency controller range is easy. The radio frequency transmitter is assigned to the radio frequency receiver by starting the learning mode with a single key combination.

Safety and reliability

The transmitting frequency of *868 MHz* is used for such applications throughout. The transmission reliability is ensured by internal test procedures and signal repetitions.

The digital radio frequency clock thermostat (transmitter)

3 pre-set programs with up to 6 switching events per day, automatic summer/winter time change, a combined holiday and party function, an optimum start function (room temperature is reached at the time set), manual operation, protection against frost and unauthorized access.

Optimised ease of operation is is achieved with only 4 buttons and a and a clear, large LCD display that indicates the day, time of day and temperature.

Using this *INSTAT 868-r* clock thermostat, it is possible to set up a timer control system together with analogue transmitter *INSTAT 868-r1...* and *INSTAT 868-a1/a4/a6* wireless receivers.

Radio frequency room temperature controller (transmitter with analogue temperature setting)

Thanks to the *analogue* temperature setting function, the *INSTAT 868-r1* radio frequency room temperature controller can be operated quickly. Using the day / night / automatic / off selector switch, it is possible to set a set-back temperature e.g. *manually* or in combination with an *INSTAT 868-r* radio frequency clock thermostat.

An internal slide switch makes it possible to select either *"heating"* or *"cooling"*.

The setting of the temperature at the *INSTAT 868-r1H* is limited between 17...24 °C.

Radio frequency receivers

There is a suitable radio frequency receiver for every type of application:

1-channel receiver
INSTAT 868-a1A
for wall mounting

4-channel receiver
INSTAT 868-a4 and

6-channel receiver
INSTAT 868-a6
all ready to plug in for 230 V AC including standard mounting rail

Outlet radio frequency receiver
INSTAT 868-a1S for 230 V AC

In the event of a fault, each radio frequency receiver provides an *optical* and *acoustic* indication as well as an *emergency program*, i. e. the heating system is controlled at 30 % of the full heating power to permanently safeguard *frost protection*.

RF repeater for INSTAT 868

INSTAT 868-rep
amplifier for RF signals.

Transmitter Repeater Receiver

Radio Frequency Transmitter – Clock Thermostat with Digital Display

IN STAT+ 868

ENVIRONMENTALLY OPTIMISED SOLUTIONS

Radio frequency Clock Thermostat (Transmitter)

Battery operated clock thermostat with a large LCD digital display for actual temperature, time, etc. 3 pre-set programs with up to 6 switching events per day, automatic summer-/ winter time change, a combined holiday- and party function, an optimum start function and protection against frost and unauthorized persons. Selection of continuous control by PWM or ON/OFF control. Can be used for "Heating only" or "Cooling only".

General Technical Data

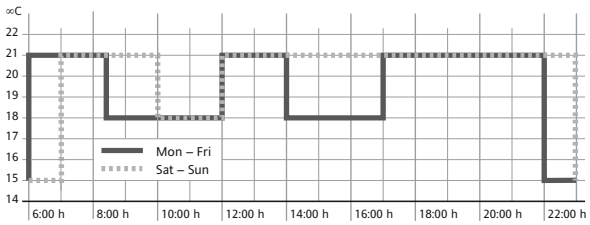
Type	**INSTAT+ 868**
Article No.	0536 21 296 903
Control method optionally	Fuzzy (similar to PID) with output pulse-width modulation or ON/OFF configurable
Cycle period for PWM	Approx. 10 minutes (sum of switch-off and switch-on times)
Supply voltage	Two 1.5 V batteries* (Alcaline LR06)
Frequency	868 MHz
Transmission range	1 ceiling or 3 walls
Temperature set-value	5 ... 32 °C (0.1 K resolution)
Degree of protection / color	IP 30, insulated
Dimensions (W x H x D)	137 x 96,5 x 31,3 mm

* included; battery life approx. 5 years

Pre-set programs

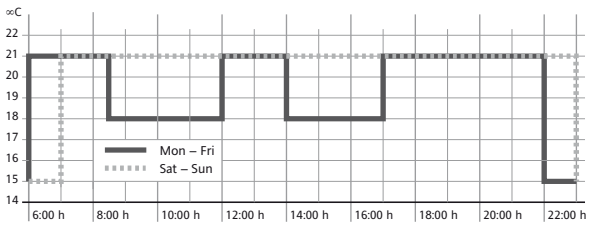
Program 1 (home during the day)

Monday to Friday						
Events	1	2	3	4	5	6
Time	6:00	8:30	12:00	14:00	17:00	22:00
Temperature °C	21,0	18,0	21,0	18,0	21,0	15,0
Saturday and Sunday						
Events	1	2	3	4	5	6
Time	7:00	10:00	12:00	14:00	17:00	23:00
Temperature °C	21,0	18,0	21,0	21,0	21,0	15,0



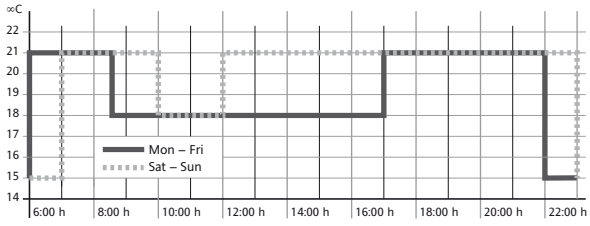
Program 2 (home for lunch and on weekends)

Monday to Friday						
Events	1	2	3	4	5	6
Time	6:00	8:30	12:00	14:00	17:00	22:00
Temperature °C	21,0	18,0	21,0	18,0	21,0	15,0
Saturday and Sunday						
Events	1	2	3	4	5	6
Time	7:00	10:00	12:00	14:00	17:00	23:00
Temperature °C	21,0	21,0	21,0	21,0	21,0	15,0



Program 3 (at work all day)

Monday to Friday						
Events	1	2	3	4	5	6
Time	6:00	8:30	12:00	14:00	17:00	22:00
Temperature °C	21,0	18,0	18,0	18,0	21,0	15,0
Saturday and Sunday						
Events	1	2	3	4	5	6
Time	7:00	10:00	12:00	14:00	17:00	23:00
Temperature °C	21,0	18,0	21,0	21,0	21,0	15,0



Radio Frequency Transmitter – With Analogue Temperature Setting

IN STAT 868 -r1

IN STAT 868 -r1o

Radio frequency room temperature controller (transmitter)

Battery-powered, electronic room temperature controller with rotary knob for setpoint adjustment. The room temperature controller is placed freely – no wiring needed – in the room (wall mounting), for wireless radio transmission of the actuating values to a receiver.

The INSTAT 868-r1 selector switch allows the user to manually influence timer operation (master/slave), comfort, night temperature and off for each control zone.

General Technical Data

Type	**INSTAT 868-r1**	**INSTAT 868-r1o**
Article No.	0536 10 291 900	0536 11 291 902
Adjustable temperature	5 ... 30 °C	5 ... 30 °C
Timer	Energy saving/timer*/party function for periodic temperature setback *possible also without master	Timer function
Indicator lamp red	For learning mode and battery low	For learning mode and battery low
Switch external	Timer / day / night / off	
Switch internal	Slide switch heating / cooling switchover Pushbutton for learning mode and reset	Pushbutton for learning mode and reset
Temperature set-back	Approx. 2 K or 4 K (internal jumper) or via master controller e.g. INSTAT 868-r	
Control method optionally	Fuzzy (similar to PID) with output Pulse-width modulation or ON/OFF (internal jumper)	Fuzzy (similar to PID) with output Pulse-width modulation
Cycle period for PWM	Approx. 10 minutes (sum of switch-off and switch-on)	Approx. 10 minutes (sum of switch-off and switch-on)
Temperature sensor	Internal	Internal
Supply voltage	Two 1.5 V batteries* (Alcaline LR03)	Two 1.5 V batteries* (Alcaline LR03)
Frequency	868 MHz	868 MHz
Transmission range	1 ceiling or 3 walls	1 ceiling or 3 walls
Antenna	Internal	Internal
Degree of protection / color	IP 30 insulated	IP 30 insulated
Dimensions	75 x 75 x 25.5 mm	75 x 75 x 25.5 mm

* included; battery life approx. 3 years

Radio Frequency Receiver – INSTAT 868-a Series

1-channel / 4-channel / 6-channel radio frequency receiver /

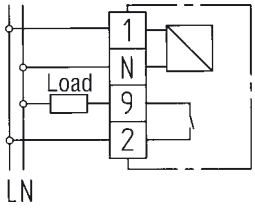
The **1-channel radio frequency receiver** converts the transmission signals into control signals for electrical devices. With valve protection function and emergency program.

The **4 and 6-channel radio frequency receivers** convert the transmission signals into control signals for electrical devices. Ready for direct connection to a 230 V AC outlet. Clamps provided for 230 V AC actuators. A separate supply voltage is required for 24 V AC. Pump logic and timer function for connection of further analogue INSTAT 868-r1 radio frequency transmitters. Valve test function, radio transmission test function, emergency program. Shipped with standard mounting rail for installation.

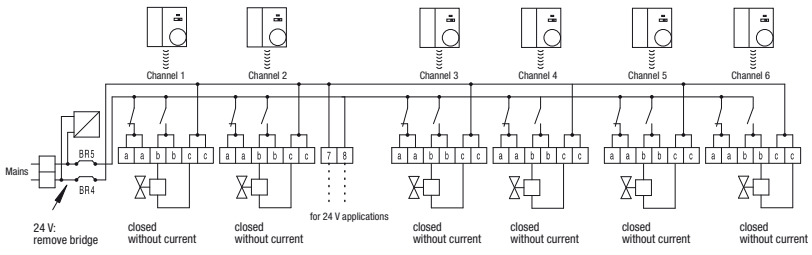
General Technical Data

Type	**INSTAT 868-a1A**	**INSTAT 868-a4**	**INSTAT 868-a6**
Article No.	0536 30 140 002	0536 40 140 002	0536 60 140 002
Supply voltage	AC 230 V 50/60 Hz	AC 230 V 50/60 Hz	AC 230 V 50/60 Hz
Power consumption	1,5 VA	3 VA	3 VA
Relay for load	1 NO contact 16 (2) A, potential-free Max. 20 actuators 230 V, 3 W Max. 8 actuators 24 V, 3 W	4 changeover switches 8 (2) A, potential-free Max. 10 actuators 230 V, 3 W per load relay Max. 4 actuators 24 V, 3 W per load relay	6 changeover switches 8 (2) A, potential-free Max. 10 actuators 230 V, 3 W per load relay Max. 4 actuators 24 V, 3 W per load relay
Touchbutton	1 x learning mode, 1 x reset	1 x learning mode per channel 1 x Reset	1 x learning mode per channel 1 x Reset
Displays	1 LED red (Heating on/interferences)	1 LED red per channel (Heating on/interferences) 1 LED green (operation)	1 LED red per channel (Heating on/interferences) 1 LED green (operation)
Antenna	intern	Internal	Internal
Degree of protection	IP 30	IP 40	IP 40
Color	Pure white (similar to RAL 9010)	Pure white (similar to RAL 9010)	Pure white (similar to RAL 9010)
Mounting type	Surface mounting	Standard mounting rail for beigepackt	Standard mounting rail for wall mounting included
Dimensions (W x H x D)	75 x 75 x 27 mm	372 x 42 x 65 mm	450 x 42 x 65 mm

Circuit diagrams



INSTAT 868-a1A



INSTAT 868-a6

Actuator connection open without current, terminals a/c. Actuator connection closed without current, terminals b/c.

Radio Frequency Receiver – INSTAT 868-a Series

INSTAT 868-a8U | INSTAT 868-a8U/24 V | INSTAT 868-a1S*

8-channel radio frequency receiver / outlet radio frequency receiver

INSTAT 868-a8U 8-channel radio frequency receiver with integrated real time clock, automatic adjustment of summer / winter time, timer for up to 8 independent zones, switching Heating-Cooling via external signal (e.g. via Hygrostats when dewing), programming of the clock and the transmitter with removed cover is possible, as well as INSTAT 868-a8U/24 V for switching of 24 V actuators, pump logic (switching off of the pump when all valves are closed), Heating control (Can be switched off whenn all valves are closed), Valve-/pump protection (valve/pump runs once a day), dewing point control, safe operation in case of faults (30 % heating), switching power each contact max. 10 actuators of 3 W, robust switching output (relay), outputs can be connected in parallel, ready to plug in for 230 V by transformer for 24 V, mounting on DIN-Rail for wall-mounting.

The **868-a1 S outlet radio frequency receiver** for INSTAT 868 radio frequency transmitters converts the transmission signals into control signals for electrical devices. Universally applicable for controlling electrical heaters (electric radiators, wall-mounted heating system, towel dryers).

General Technical Data

Type	**INSTAT 868-a8U**	**INSTAT 868-a8U/24 V**	**INSTAT 868-a1S***
Article No.	0536 80 140 002	0536 80 060 002	0536 37 140 002
Supply voltage	AC 230 V 50/60 Hz	AC 230 V 50/60 Hz	AC 230 V 50/60 Hz
Power consumption	4 VA	50 VA	1.5 VA
Relay for load	7 NO contact; 4 (2) A 8 channel potential-free changeover switches	6 NO contact; 4 (2) A channel 7, 8 potential-free changeover switches	1 NO contact 16 (2) A
Touchbutton	mode-, plus-, minus- and OK-button	mode-, plus-, minus- and OK-button	1 x learning mode, 1 x Reset
Displays	display with back lighting	display with back lighting	1 LED red (Heating on/interferences)
Aerial	variants for connection of an external aerial	variants for connection of an external aerial	internal aerial
Degree of protection	IP 54	IP 54	IP 20/II according to EN 60730-1
Color	Pure white (similar to RAL 9010)	Pure white (similar to RAL 9010)	Pure white (similar to RAL 9010)
Mounting type	on DIN-Rail	on DIN Rail	plug in
Dimensions (W x H x D)	305 x 90 x 68 mm incl. DIN Rail	380 x 90 x 68 mm incl. DIN Rail	71 x 142 x x 21,1 mm

***Also available as set**

Benefit: Transmitter and receiver are matched to each other ex factory and ready for operation.

Type	**INSTAT 868-r1S/r1 Set**	**INSTAT 868a1S/r1o Set**
Article No.	0536 01 140 002	0536 04 140 002
consists of	INSTAT 868-r1 and INSTAT 868a1S	INSTAT 868-r1o and INSTAT 868a1S

Type	**INSTAT 868-a1S/r Set**
Artikel-Nr.	0536 02 140 002
consists of INSTAT 868a1S	INSTAT 868-r and

RF Repeater - INSTAT 868-rep Series

IN STAT 868 -rep

IN STAT 868 -repS

RF Repeater for INSTAT 868 r...

The INSTAT 868-rep and the INSTAT 868-repS are amplifiers of RF signals. These Repeaters repeat the received signals of the INSTAT 868-r transmitter automatically. They increase the distance of radio transmission between INSTAT 868-r... RF-thermostats and INSTAT 868-a... receivers and they enable an improvement of the received signal qualitiy of a receiver. 2 repeaters can be used in sequence and they insert themselves automatically into already existing radio links of the INSTAT 868 system. Only one Repeater is necessary for many existing radio links, working automatically without any action from the user. There is an indication of received signal strength via 3 LEDs and an indication of available mains power. The INSTAT 868-repS can be directly inserted into a "SchuKo" socket outlet. The mains plug can still be used. Maximum 2 Repeaters can work in sequence increasing if the normal transmission distance in the environment up to 90 m.

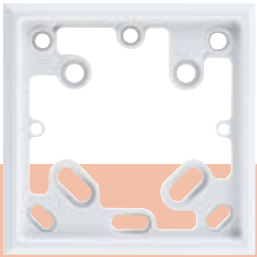
General technical data

Order type	**INSTAT 868-rep**	**INSTAT 868-repS**
Order No	0536 91...	0536 90...
Socket outlet	–	max 16 A
Operating voltage	230 V~ (195 ... 253 V) 50/60 Hz	
Power consumption	< 1.5 W	
Operating temperature	0 ... +40 °C (no dewing)	
Storage temperature	–20 ... +60°C	
Antenna	internal	
Carrier frequency	868,95 MHz	
Software class	A	
Degree of pollution	2	
Shock load voltage	2,5 kV	
Ball test temperature pressure limit	75°C	
Voltage and current for EMC electromagnetic capacity tests	230V	
Degree of protection	IP 20	
Class of protection	II	
Weight	~140 g	

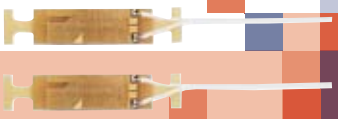
Working Principles

TS+ and Accessoires

TS+



ARA 1 E



TS 193 683 (Dew sensor)

Accessories

The **TS+**, a thermal actuator is robust and silent. The manual position makes installation and commissioning very easy. Clear indication of the the current status and the stroke position. Small compact design, unique adjustment mechanism, protection type IP 54 can be mounted in all orientations, small stroke, 230 V and 24 V version (each normally closed), low power consumption.

Plastic Adapter Frame for variable mounting of control units on nearly every internationally used flush-mounted box. To complement the device design and for covering poorly fitting flush-mounted boxes, or for flush-mounted boxes that are larger than the bottom plate of the controller. When mounting on flush-mounted boxes with horizontal fixing holes, the **ARA 1 E** adapter frame must be ordered for **INSTAT 868-r1 and INSTAT 868-a1A**.

TS 193 683 for dewing point control for INSTAT 868-a8U via additional dew sensor.

General technical data

Order type	**TS+ 5.11/230**	**TS+ 6.11/24**	**ARA 1 E**	**TS 193 683 (Dew sensor)**
Order no.	0499 10 011 015	0491 10 011 015	007 63 2399 001	000 193 683 000
Supply voltage	230 V~ 50 Hz	24 V~ 50 Hz		
Power input	2,5 W			
Thermal actuator	open/closed			
Valve type	normally closed			
Connecting cable and length	2 x 0,5 mm^2, 100 cm long (cable length can be modified on request) free core cable ends			10 m
Protection type	IP 54			
Isolation	Class II			
Stroke	4,5 mm			
Available valve connections	M 30 x 1,5 mm			
Weight	~120 g			
Dimensions	46 mm Ø, 66 mm height			
Storage temperature	–25...70°C			
Operating temperature	0...50°C			
to be used for:			INSTAT 868-r1, INSTAT 868-r1o, INSTAT 868-a1	INSTAT 868-a8U
+ self-tapping screws			SS 001 (Article-no 007 10 3188 001)	

EBERLE

EBERLE Controls GmbH
Klingenhofstraße 71
D-90411 Nürnberg
T +49(0)911 56 93 0
F +49(0)911 56 93 536
E-Mail: info.eberle@invensys.com
www.eberle.de

468 931 003 063 – 1.000 – 02.10

invensys™
Controls