

Fig. 1. MERLIN (without optional covers)

### GENERAL

The MERLIN (Rxx) family of room controllers provide flexible, configurable, demand-led control delivering tangible benefits to reduce energy spends and drives new levels of functionality and efficiency in today's buildings. These BACnet MS/TP-based room controllers include a configurable application supporting fan coil unit, chilled and hot ceiling as well as radiator heating applications. It is even possible to handle a mix of these applications in one controller.

Line voltage power supply and the flexible use of relays and triacs (24 VAC or 230 VAC), 24 VAC power supply for field devices, Sylk wall modules, and smart engineering and commissioning tools reduce the total installed cost.

### MERLIN OVERVIEW

	Order no.	power supply	Aos	Uis	Bis	Relays	Triacs	Total no. of I/Os	LED output	24 VAC output for field devices
Large controller (198x110x59 mm)	CLMERL2	230 VAC	2	6	0	4	4	16	1	300 mA <sup>C</sup>
	CLMERL6	24 VAC	6	10	0	4	4	24	0	600 mA
	CLMERL8	230 VAC	6	6 <sup>A</sup>	4 <sup>B</sup>	4	4	24	1	300 mA <sup>C</sup>
	IRM-RLC	Bulk pack with 10 terminal covers								
Small controller (162x110x59 mm)	CLMERS4	230 VAC	4	4	0	4	2	14	0	300 mA <sup>C</sup>
	CLMERS5	24 VAC	4	4	0	4	2	14	0	600 mA
	IRM-RSC	Bulk pack with 10 terminal covers								
Commissioning	BACA-A	WiFi Adapter with RJ45 cable								
	CLROOMUP	Android Application								
Wall modules	CLCMTR40, -H, -CO2, -H-CO2									
	CLCMTR42, -H, -CO2, -H-CO2									
	CLCM1T,2T,4T,5T,6T111									

<sup>A</sup> Of this model's six Uis, only two Uis support NTC; this model is thus not suitable for the hardwiring of wall modules requiring three Uis supporting NTC.  
<sup>B</sup> This models 4 binary-only inputs are labelled as UI1-UI4.  
<sup>C</sup> Or 320 mA for max. 2 minutes.

### FEATURES

- Designed to control terminal units such as 2- and 4-pipe fan coil units, chilled and hot ceilings, hydronic heating, and a mix of these applications.
- Support for 1-3 stage fans, variable fan speed drives (VSDs), thermal, floating, proportional actuators, and 6-way valve actuators (see section "Commissioning", pg. 7).
- Auto Mac-addressing.
- Fast commissioning using plug-and-play solutions, pre-defined applications and state-of-the-art commissioning via the CLROOMUP mobile application – eliminating the need for two people when commissioning.
- Reduced number of sensors because sensors are shared across different applications.
- BACnet BTL®-Listed as Advanced Application Controllers (B-AAC) rev 1.12.
- Two housing dimensions and several different I/O versions to match your individual needs.
- Universal mounting options, including terminal covers and color-coded terminals.
- 24 VAC aux. output voltage, allowing direct connection and powering of field devices.
- Two-wire polarity-insensitive bus interface to connect to Honeywell Sylk wall modules.

### SYSTEM OVERVIEW

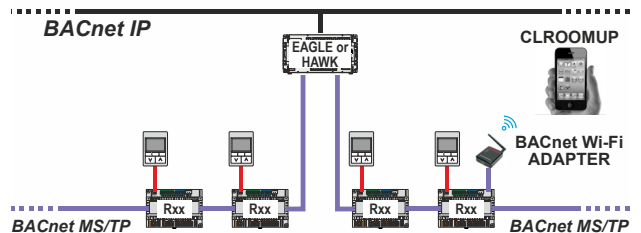


Fig. 2. MERLIN "Homepage" Example

## DIMENSIONS AND MOUNTING

### Housings

The controller is available in two housing sizes, both conforming to IP20:

- RLxx (large housing):  
W x L x H = 110 x 198 x 59 mm and
- RSxx (small housing):  
W x L x H = 110 x 162 x 59 mm

See also Fig. 3 and Fig. 4.

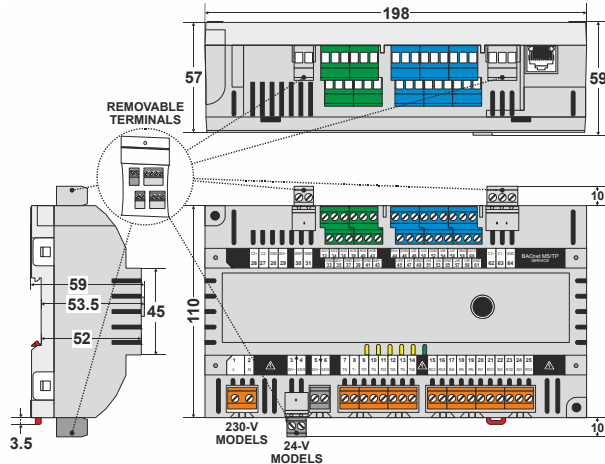


Fig. 3. RLxx dimensions (in mm)

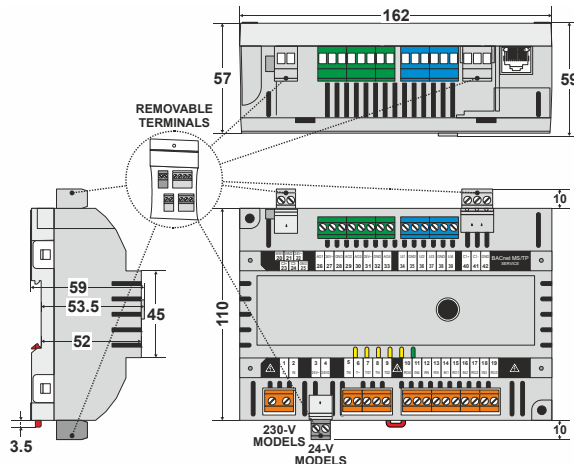


Fig. 4. RSxx dimensions (in mm)

The unit is suitable for mounting on a standard rail, on walls, as well as in wiring cabinets or fuse boxes.

### Terminal Protection Covers for IP30

In the case of controllers mounted outside of a cabinet, before applying power to the device, Terminal Protection Covers (10-pc. bulk packs, order no.: IRM-RLC for large housings and IRM-RSC for small housings) must be mounted so as to provide IP30.

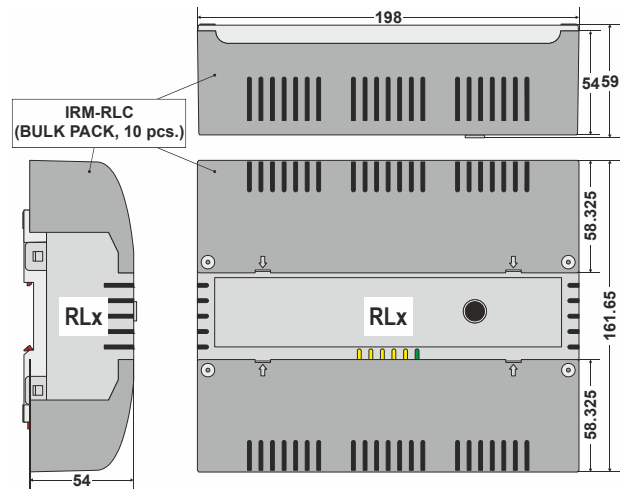


Fig. 5. Large housing, with terminal protection covers, dimensions (in mm)

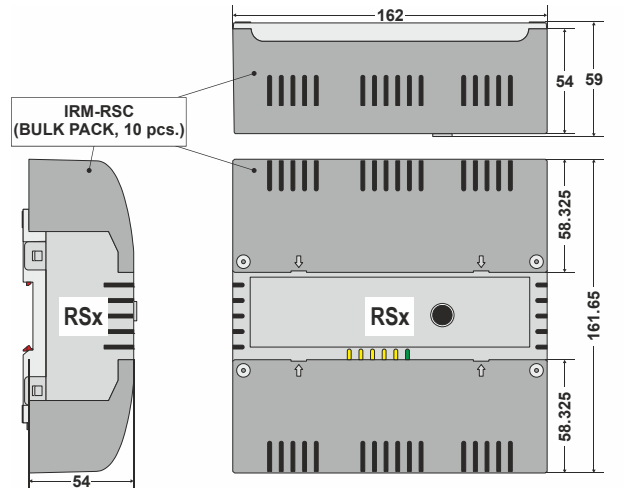


Fig. 6. Small housing, with terminal protection covers, dimensions (in mm)

## TERMINAL ASSIGNMENT

### General

For a complete list of all terminals and a description of their functions, see Table 1 and Table 5.

### Communication Interfaces

All models of the controller feature the following communication interfaces:

- A Sylk Bus interface for connection to CLCMTR40x/42x Wall Modules;
- A BACnet MS/TP interface;
- An RJ45 connector for connection of the BACnet WiFi Adapter.

**Table 1. RSxx Room Controller: Overview of terminals and functions**

term.	printing	function	RS4	RS5
1, 2	"L", "N"	Power supply (230 VAC)	X	--
3, 4	"24V~", "24V0"	230V models: aux. output voltage (24 VAC) for all triacs; 24V models: power supply (24 VAC) and aux. output voltage (24 VAC) for all triacs	X	X
5	"TN"	Aux. term. for triac neutral wiring (internally connected with terminal 8)	X	X
6	"T~"	Triac input voltage (24 VAC / 230 VAC) for all triacs; triac-switched	X	X
7	"T01"	Triac-switched output	X	X
8	"TN"	Aux. term. for triac neutral wiring (internally connected with terminal 5)	X	X
9	"T02"	Triac-switched output	X	X
10, 11	"RO4", "IN4"	Output of Relay 4, Input for Relay 4	type 2	type 2
12, 13	"RN", "RN"	Aux. terminals for relay neutral wiring	X	X
14, 15	"IN1", "RO1"	Input for Relay 1, Output of Relay 1	type 1	type 1
16, 17	"IN2", "RO2"	Input for Relay 2, Output of Relay 2	type 1	type 1
18, 19	"IN3", "RO3"	Input for Relay 3, Output of Relay 3	type 1	type 1
20, 21	"WM1", "WM2"	Removable interface for Sylk Bus	X	X
22, 23, 24, 25	"24V~", "C2+", "C2-", "24V0"	Not used.	--	--
26	"AO1"	Analog Output 1	type 2	type 2
27	"24V~"	24 VAC power for field devices	X	X
28	"GND"	Ground for AOs	X	X
29	"AO2"	Analog Output 2	type 1	type 1
30	"AO3"	Analog Output 3	type 1	type 1
31	"24V~"	24 VAC power for field devices	X	X
32	"GND"	Ground for AOs	X	X
33	"AO4"	Analog Output 4	type 1	type 1
34	"UI1"	Universal Input 1	type 1	type 1
35	"GND"	Ground for UIs	X	X
36	"UI2"	Universal Input 2	type 1	type 1
37	"UI3"	Universal Input 3	type 1	type 1
38	"GND"	Ground for UIs	X	X
39	"UI4"	Universal Input 4	type 1	type 1
40, 41, 42	"C1+", "C1-", "GND"	Removable BACnet MS/TP interface and corresponding GND	X	X

Relay output types: See Table 2. Universal input types: See Table 3. Analog output types: See Table 4.

**Table 2. Relay output types and characteristics**

	type 1 (standard)	type 2 (high in-rush current)
corresponding ROs of RSxx	RO1, RO2, RO3	RO4
corresponding ROs of RLxx	RO2, RO3	RO1, RO4
contact	N.-O.	N.-O.
min. load	5 VAC, 100 mA	24 VAC, 40 mA
switching voltage range	15 ... 253 VAC	15 ... 253 VAC
max. continuous load at 250 VAC (cos φ = 1)	4 A	10 A
max. continuous load at 250 VAC (cos φ = 0.6)	4 A	10 A
in-rush current (20 ms)	--	80 A
usage	fan motor	light switching and fan motor

**NOTE:** The max. sum load of all relay currents at the same time is 14 A.

**Table 3. Universal input types and characteristics**

	type 1	type 2	type 3
	UI1, UI2, UI3, UI4, UI5, UI6	UI7, UI8, UI9, UI10	UI1, UI2, UI3, UI4 (RL8, only)
dry contact (closed: res. <10 kΩ; open: res. > 20 kΩ; max. 0.2 Hz; pull-up voltage: 10 V)	X	X	--
dry contact (closed: res. <10 kΩ; open: res. > 20 kΩ; max. 0.2 Hz; pull-up voltage: 24 V)	--	--	X
fast binary (=counter) input (max. 30 Hz; pulse ON = min. 16 ms; pulse OFF = min. 16 ms; closed: voltage < 1 V; open: voltage > 5 V; pull-up voltage: 10 V)	X	X	--
fast binary (=counter) input (max. 30 Hz; pulse ON = min. 16 ms; pulse OFF = min. 16 ms; closed: voltage < 1 V; open: voltage > 5 V; pull-up voltage: 24 V)	--	--	X
0(2) ... 10 V	X	X	--
NTC20kΩ	X	--	--
SetPoint and FanSpdSW (from CLCM1T,2T,4T,5T,6T111)	X	--	--
NTC10kΩ	X	--	--
PT1000 + Ni1000TK5000	--	X	--

**Table 4. Analog output types and characteristics**

	type 1	type 2	type 3	type 4	type 5
output voltage	0...11 V				
output current	0...1 mA	0...5 mA	0...10 mA	0...20 mA	-1...+1 mA
min. accuracy	±150 mV				
max. ripple	±100 mV				
accuracy at zero point	0...200 mV				±150 mV

**Table 5. RLxx Room Controllers: Overview of terminals and functions (by model)**

term.	printing	function	RL2	RL6	RL8
1, 2	"L", "N"	Power supply (230 VAC)	X	--	X
3, 4	"24V~", "24V0"	Power supply (24 VAC)	--	X	--
5, 6	"24V~", "24V0"	Aux. output voltage (24 VAC) for all triacs	X	X	X
7	"TN"	Aux. terminal for triac neutral wiring (internally connected with terminals 10 + 13)	X	X	X
8	"T~"	Triac input voltage (24 VAC / 230 VAC) for all triacs; triac-switched	X	X	X
9	"T01"	Triac-switched output	X	X	X
10	"TN"	Aux. terminal for triac neutral wiring (internally connected with terminals 7 + 13)	X	X	X
11	"T02"	Triac-switched output	X	X	X
12	"T03"	Triac-switched output	X	X	X
13	"TN"	Aux. terminal for triac neutral wiring (internally connected with terminals 7 + 10)	X	X	X
14	"T04"	Triac-switched output	X	X	X
15	"RC4"	Not used.	--	--	--
16, 17	"RO4", "IN4"	Output of Relay 4, Input for Relay 4	type 2	type 2	type 2
18	"RN"	Aux. terminal for relay neutral wiring	X	X	X
19	"RN"	Aux. terminal for relay neutral wiring	X	X	X
20, 21	"IN1", "RO1"	Input for Relay 1, Output of Relay 1	type 2	type 2	type 2
22, 23	"IN2", "RO2"	Input for Relay 2, Output of Relay 2	type 1	type 1	type 1
24, 25	"IN3", "RO3"	Input for Relay 3, Output of Relay 3	type 1	type 1	type 1
26, 27, 28, 29	"C2+", "C2-", "24V0", "24V~"	Not used.	--	--	--
30, 31	"WM1", "WM2"	Removable interface for Syk Bus	X	X	X
32	"AO1"	Analog Output 1	type 3	type 3	type 4
33	"GND"	Ground for AOs	X	X	X
34	"AO2"	Analog Output 2	type 3	type 3	type 3
35	"24V~"	24 VAC power for field devices	X	X	X
36	"AO3"	Analog Output 3	--	type 1	type 5
37	"GND"	Ground for AOs	--	X	X
38	"AO4"	Analog Output 4	--	type 1	type 5
39	"24V~"	24 VAC power for field devices	--	X	X
40	"AO5"	Analog Output 5	--	type 1	type 1
41	"GND"	Ground for AOs	--	X	X
42	"AO6"	Analog Output 6	--	type 1	type 1
43	"24V~"	24 VAC power for field devices	--	X	X
44	"24V~"	24 VAC power for field devices	X	--	X
45	"LED"	Output to LED of CLCM4T,5T,6T111	X	--	X
46	"GND"	Ground for UIs	X	X	X
47	"UI1"	Universal Input 1	type 1	type 1	type 3 (BI)
48	"UI2"	Universal Input 2	type 1	type 1	type 3 (BI)
49	"GND"	Ground for UIs	X	X	X
50	"UI3"	Universal Input 3	type 1	type 1	type 3 (BI)
51	"UI4"	Universal Input 4	type 1	type 1	type 3 (BI)
52	"GND"	Ground for UIs	X	X	X
53	"UI5"	Universal Input 5	type 1	type 1	type 1
54	"UI6"	Universal Input 6	type 1	type 1	type 1
55	"GND"	Ground for UIs	X	X	X
56	"UI7"	Universal Input 7	--	type 2	type 2
57	"UI8"	Universal Input 8	--	type 2	type 2
58	"GND"	Ground for UIs	--	X	X
59	"UI9"	Universal Input 9	--	type 2	type 2
60	"UI10"	Universal Input 10	--	type 2	type 2
61	"GND"	Ground for UIs	--	X	X
62, 63, 64	"C1+", "C1-", "GND"	Removable BACnet MS/TP interface and corresponding GND	X	X	X

Relay output types: See Table 2. Universal input types: See Table 3. Analog output types: See Table 4.

\*OPTIONAL FUSE (TO PROTECT CONTROLLER'S INTERNAL TRANSFORMER, WHICH HAS ONLY A NON-RESETTABLE FUSE).

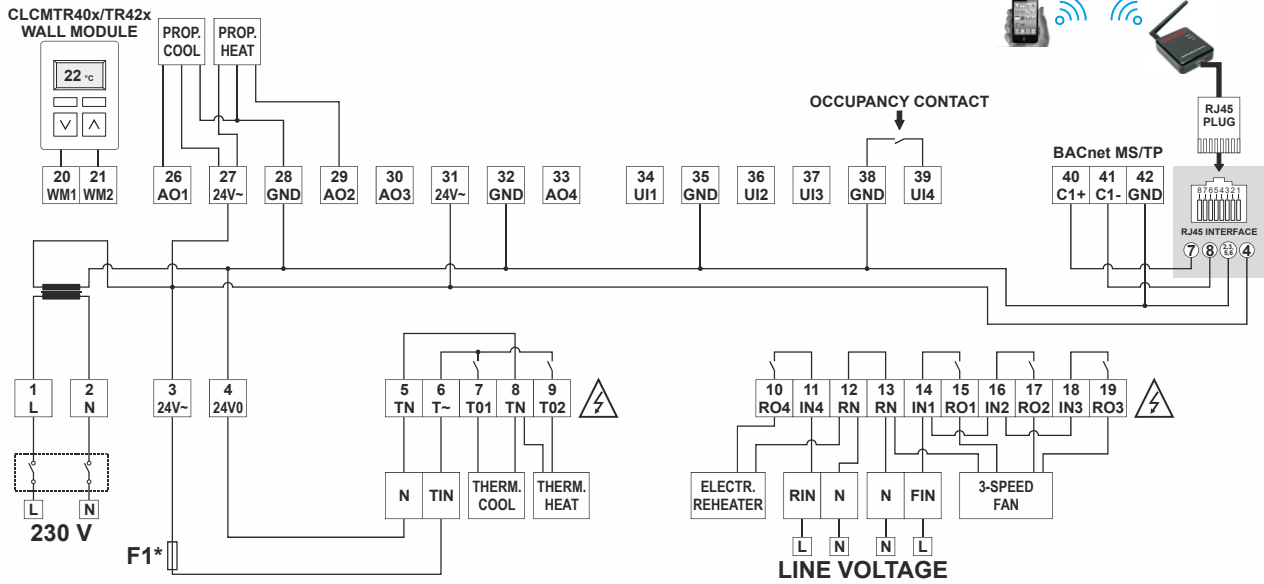


Fig. 7. RS4 example wiring (230-V model)

\*OPTIONAL FUSE (TO PROTECT CONTROLLER'S INTERNAL TRANSFORMER, WHICH HAS ONLY A NON-RESETTABLE FUSE).

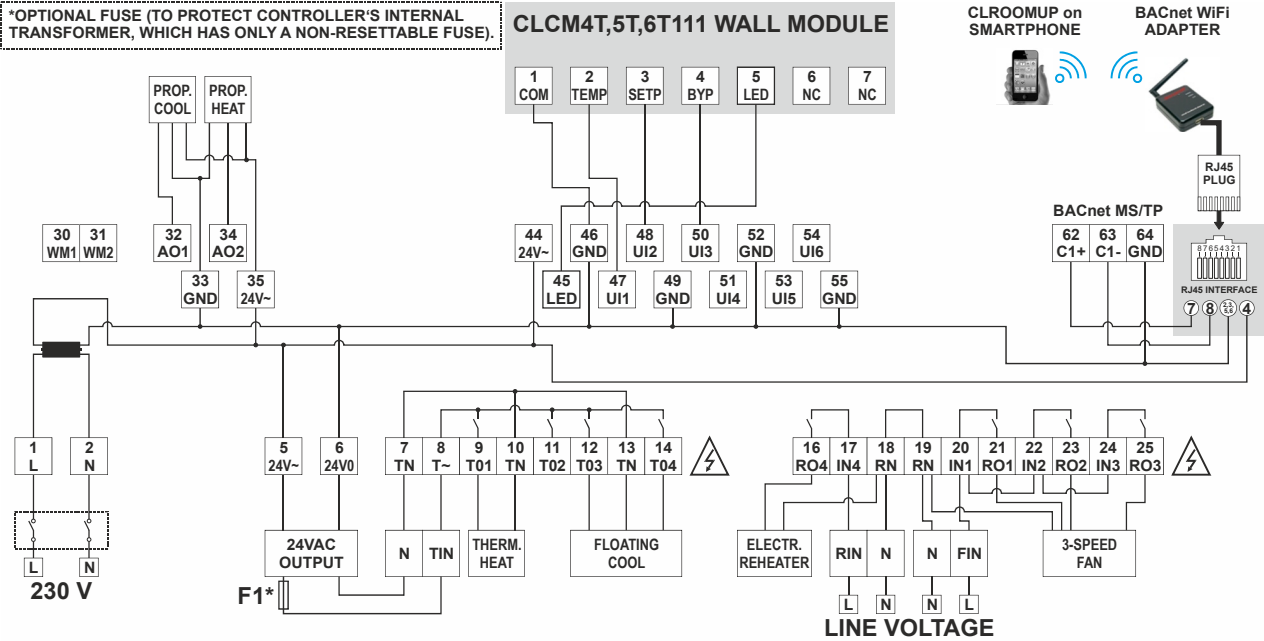


Fig. 8. RL2 example wiring (230-V model)

## ELECTRICAL DATA

### RL2, RL8, RS4 (230 VAC)

Power via terminals 1 + 2: 230 VAC +10% / -15%, 50/60 Hz.  
 Max. power consumption (when unloaded): 8 W.  
 Max. power consumption (when loaded): 18 W.  
 The controller is "unloaded" when it has no external load. Thus, the only load on the controller is the inherent load (8 W) of the electronics, themselves. The heat dissipation then amounts to 8 W. The controller is "loaded" when – besides the inherent load – an additional sum load resulting from max. **300 mA** (irrespective as to whether it is supplied by the controller's internal transformer or by an external source) is applied to the 24 VAC output terminals. The max. unloaded output voltage at terminals 3 and 4 (RSxx) or terminals 5 and 6 (RLxx), respectively, is 33 VAC (typically: 29.5 VAC).

### RL6, RS5 (24 VAC)

Power via terminals 3+4: 24 VAC ±20%, 50/60 Hz.  
 Max. current consumption (when unloaded): 300 mA.  
 Max. current consumption (when loaded): 900 mA.  
 The controller is "loaded" when – besides the inherent load (300 mA) – an additional sum load resulting from max. **600 mA** is applied to the 24 VAC output terminals. The max. unloaded output voltage at terminals 3 and 4 (RSxx) or terminals 5 and 6 (RLxx), respectively, is identical with the output voltage of the external supplying transformer.

## COMMISSIONING

### Configurable Application

All models are delivered with the configurable application already included in the controller. The configurable application has the advantage that it is proven and quickly commissioned using the CLROOMUP commissioning tool available in the Google Playstore (URL: <https://play.google.com/store>) running on an Android Smart device.

**NOTE:** Before configuring, if as yet no WLAN is present, the commissioning engineer will require a BACnet WiFi Adapter (order no.: BACA-A) to establish wireless communication between his Android Smart device and the controller.

### Example Application Types

The configurable application supports the following application types:

- The **FCU application type** supports 1-, 2-, and 3-stage or var.-speed fan. It also supports water cooling, water heating (2-pipe or 4-pipe), electric re-heating, and dx-cooling (incl. fan interlock). It supports PID and, optionally, cascade control as well as min. temperature limitation. This type may be used in combination with other types.
- The **chilled/heated ceiling application type** uses PID with dewpoint protection (2-pipe or 4-pipe). It also supports 6-way valve on AO.
- The **radiator heating** application type uses PID and, optionally, min. temperature limitation.
- The **underfloor heating** application type uses PID and, optionally, max. temperature limitation.

- The **intake air** application type uses PID and, optionally, min. temperature limitation and air quality control.
- Those inputs/outputs not needed by the configurable application are available for use as free I/Os (like the I/Os of an I/O module) by the plant controller – see also MERLIN Room Controller – Installation & Commissioning Instructions (EN1Z-1015GE51).
- The use of different application types is limited by the number of I/Os supported by the given model.

### Supported Actuators

The application supports a variety of actuators.

**Table 6. Supported actuators**

Supported actuators / Application	Analog 0(2)...10 V	Floating	PWM	Stage 1	Stage 2, Stage 1+2	6-way valve 0...10 V	ON / OFF
FCU Cooling	X	X	X	--	--	--	--
FCU Heating	X	X	X	--	--	--	--
FCU DX-Cooling	--	--	X	X	X	--	--
FCU E-Heating	--	--	X	X	X	--	--
Ceiling Cooling	X	X	X	--	--	X	--
Ceiling Heating	X	X	X	--	--	X	--
Ceil. Switch via 2-way Cool	--	--	--	--	--	--	X
Ceil. Switch via 2-way Heat	--	--	--	--	--	--	X
Ceil. Switch over 3-way	--	--	--	--	--	--	X
Radiator Heating	X	X	X	--	--	--	--
Underfloor Heating	X	X	X	--	--	--	--
Intake Air	X	X	--	X	--	--	--
FreeAO	X	X	X	X	X	--	--
FreeBO	--	--	--	--	--	--	X

### Supported Sensors

A variety of sensors (e.g., room temperature sensors, supply temperature sensors, condensation switch, window sensors, occupancy sensors, card readers, etc.) may be used to optimize control quality.

### Supported Operating Modes

The application supports a variety of different operating modes (e.g., occupied, standby, unoccupied, building protection, fan automatic/manual/fan, only [FCU application type, only], night purge [intake air application type, only]).

### Automatic MAC Addressing

In contrast to many other MS/TP controllers, MERLIN features automatic MAC addressing. There is thus no need to manually set the MAC address.

### BACnet MS/TP Master/Slave Functionality

During configuration, the commissioning engineer can identify (e.g., using the CLROOMUP configuration tool) which of the controllers located on a given BACnet MS/TP bus are so-called "Masters," and which are so-called "Slaves." The engineer is not allowed to assign more than a single Master to each Slave; this is the only action which he is required to perform. The Slave controller will inform its Master that it has

been assigned to be its Slave. The given application in the Master controller defines how this group (consisting of Master and Slave) reacts to sensor inputs.

Examples:

- Activation of a window contact (indicating an opened window) will cause the application to stop heating/cooling.
- Each Master and each Slave needs to have its own ceiling cold water temperature sensor and its own condensation contact.
- Occupancy will be detected if one of the occupancy sensors detects occupancy.
- A key card will be detected if one of the key card sensors detects a key card.
- Occupancy override from one of the connected wall modules will trigger an occupancy override.
- The last setpoint change (temperature setpoint or fan speed setpoint) on one of the wall modules (CLCMTR40x / TR42x) will define the setpoint (NOTE: All CLCMTR42x wall modules will show the actual settings used by the controllers).
- For such sensor values as temperature, CO<sub>2</sub>, and humidity, the average value is used (thus improving system robustness against failures of a single sensor and having a better average value of the room.)
- The Master shares schedule, heat/cool mode, actuator positions, etc. with its Slave(s).

## OPERATOR INTERFACES

### LEDs

The controller features the following LEDs:



Fig. 9. Controller LEDs

Table 7. Description of LED behaviors

symbol	color	function, description
T2	yellow	Not used
R2	yellow	Not used
T1	yellow	LED indicating transmission of communication signals via the BACnet MS/TP interface
R1	yellow	LED indicating reception of communication signals via the BACnet MS/TP interface.
	yellow	Status LED indicating firmware problems, hardware problems, etc.
	green	Power LED indicating firmware problems, hardware problems, etc.
	red	Not used.

### Service Button

The controller's Service Button is used to trigger dedicated events.

## COMMUNICATION INTERFACES

### BACnet MS/TP Interface

The controller features an RS485 interface (RLx: terminals 62, 63, and 64; RSx: terminals 40, 41, and 42) suitable for BACnet MS/TP communication. The terminal block containing it is black. The cable length affects the baud rate. See Table 8.

Table 8. Baud rate vs. max. cable length

baud rate	max. cable length (L)
9.6, 19.2, 38.4, 57.6, and 76.8 kbps	1200 m
115.2 kbps	800 m

For information on wire gauge, max. permissible cable length, possible shielding and grounding requirements, and the max. number of devices which can be connected to a bus, refer to standard EIA-485.

### RJ45 Connector for BACnet WiFi Adapter

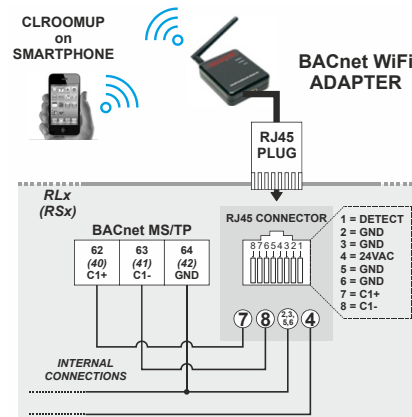


Fig. 10. RJ45 interface and BACnet WiFi Adapter



## CAUTION

It is permitted to connect **only** the BACnet WiFi Adapter to this RJ45 connector. Do **not** connect IP!

A BACnet WiFi Adapter can be connected to the controller's RJ45 connector in order to establish wireless communication with an Android Smart device so that the application engineer can configure the controller (using the CLROOMUP configuration tool).

**NOTE:** When the BACnet WiFi Adapter is connected to the controller's RJ45 connection, it is powered by the controller. It is then prohibited to simultaneously power the BACnet WiFi Adapter via a wall adapter. When, on the other hand, the BACnet WiFi Adapter is instead connected to the controller's BACnet MS/TP interface, it is prohibited to simultaneously use an RJ45 plug; instead, the BACnet WiFi Adapter must then be powered by a wall adapter (standard 5-V USB wall adapter with micro USB connector).

### Wall Modules

The CLCMTR40x / TR42x Wall Modules can be used in conjunction with the controller to perform room temperature



sensing, setpoint adjustment, fan speed manual override, and occupancy override.

**NOTE:** The use of CLCMTR42x in combination with MERLIN requires firmware version 1.0.3 or higher in the wall module.

## I/O TERMINALS



### CAUTION

Failure to observe the following max. permissible current outputs of the power output terminals will result in damage to the device.

### Max. Current Output of Power Output Terminals of 230 VAC Controllers

The 24 VAC power output terminals of the 230 VAC RLxx controllers are terminals 5, 6, 35, 39, 43, and 44 plus pin 4 of the controller's RJ45 interface. Two of these terminals (typically: 5 and 6) will be used to supply the triacs.

The 24 VAC power output terminals of the 230 VAC RSxx controllers are terminals 3, 4, 27, and 31 plus pin 4 of the controller's RJ45 interface. Two of these terminals (typically: 3 and 4) will be used to supply the triacs.

Regardless of whether the triacs are supplied by the controller's internal transformer or by an external source, the max. permissible combined current output of the aforementioned 24 VAC power output terminals is 300 mA (or 320 mA for max. 2 minutes).

Consequently, if only those two 24 VAC power output terminals used to supply the triacs already have the max. permissible combined current output of 300 mA (or 320 mA for max. 2 minutes), then the current output of the remaining 24 VAC power output terminals must, of course, equal zero.

### Max. Current Output of Power Output Terminals of 24 VAC Controllers

The 24 VAC power output terminals of the 24 VAC RLxx controllers are terminals 5, 6, 35, 39, 43, and 44 plus pin 4 of the controller's RJ45 interface.

The 24 VAC power output terminals of the 24 VAC RSxx controllers are terminals 3, 4, 22, 23, 24, 25, 27, and 31 plus pin 4 of the controller's RJ45 interface.

The max. permissible combined current output of these 24 VAC power output terminals is 300 mA.

## Relay Outputs



### CAUTION

Mixing of different voltages (e.g., 24 V and 230 V) within the relay block is not allowed.

The terminal blocks containing the controller's relay outputs are orange. Relay output types: See Table 2.

**NOTE:** If inductive components are to be connected to the relays and if these relays switch more often than once every two minutes, these components must be prevented from causing harmful interference to radio or television reception (conformance with EN 45014).

### Relay Current Limitations

If the triacs are supplied with current from an external source, then a maximum of two relays may be loaded with a max. of 4 A per relay – even if two triacs are each simultaneously loaded with max. 300 mA.

If the triacs are supplied with current from an internal source, a maximum of two relays may be loaded as follows: a max. load of 4 A for a relay serving a fan and a max. load of 10 A for a relay serving a reheat – even if one triac is simultaneously loaded with 300 mA.

### Triac Outputs

**NOTE:** Recommended fuse (F1): 1.25 A time-lag fuse (IEC). User must consider the correct voltage and max. breaking capacity / interrupting rate (line voltage urgently requires high breaking capacity / interrupting rate).

The terminal blocks containing the controller's triac outputs are orange.

These triac outputs can be configured (using, e.g., the CLROOMUP configuration tool) for a variety of different functions, e.g., for connection to either a floating drive or to a thermal actuator. Once the triac outputs have been configured, the corresponding devices can then be connected to them directly.

**NOTE:** The VC6983 actuator is intended for use at relay outputs, only and must not be used at the controller's triac outputs.

### Triac Current Limitations

The max. allowed current with which the ensemble of a controller's triacs may be loaded is dependent upon whether the outputs are supplied by the controller's internal transformer or by an external current supply.

Specifically, if the triacs are supplied with 24 VAC current by the controller's internal transformer, the ensemble of a controller's triacs may be loaded with 300 mA (or 320 mA for a max. of 2 minutes); when supplied by an external source, this value is doubled.

However, regardless of whether the triacs are supplied internally or externally, a single triac must never be loaded with a current of more than 300 mA (320 mA for max. 2 minutes).

Nevertheless, the ensemble of triacs can be loaded for very short periods of time (on the order of milliseconds) with a current on the order of 2500 mA typically encountered when switching on multiple thermal actuators.

## Universal Inputs

The terminal blocks containing the controller's universal inputs are blue. Universal input types: See Table 3.

The universal inputs are protected against voltages of max. 29 VAC and 30 VDC (due to, e.g., miswiring).

## Bias Resistors

Each universal input is equipped with one bias resistor.

## Analog Outputs

The terminal blocks containing the controller's analog outputs are green. Analog output types: See Table 4.

The analog outputs of the RLxx controllers (large housing) are protected against voltages of max. 29 VAC and 30 VDC (due to, e.g., miswiring).

**NOTE:** Connecting 24 VAC to any analog output of the RSxx controller (small housing) will damage the hardware.

## Free I/O Option

The limitations – including model-dependent limitations – apply.

## TROUBLESHOOTING

All units feature a Status LED, Power LED, and Service Button for commissioning and troubleshooting. See also sections "LEDs", and "Service Button".

Check if the Status LED's behavior is changed if you switch the power OFF/ON. Please contact Honeywell if this does not solve the problem.

## ACCESSORIES

### Terminal Protection Cover

Required for wall mounting. Bulk pack, set of ten covers.

- For LARGE controllers, order no.: **IRM-RLC**
- For SMALL controller, order no.: **IRM-RSC**

## APPROVALS, CERTIFICATIONS, AND STANDARDS

### Approvals and Certifications

- UL 60730-1, Standard for Automatic Electric Controls for Household and Similar Use, Part 1: General Requirements;

- CAN/CSA-E60730-1:02, Standard for Automatic Electrical Controls for Household and Similar Use, Part 1: General Requirements;
- Complementary listing for UL916, CSA C22.2 No. 205;
- BTL-listed, BACnet AAC profile;
- SASO-approved;
- CE-approved;
- FCC part 15B-compliant.

## Classification according to EN 60730-1

EN 60730 sub part: EN 60730-2-9

Environmental conditions: For use in home (residential, commercial, and light-industrial) environments

Construction: Independently mounted electronic control unit with fixed wiring; panel-mounted on DIN rail

Action: type 1.C

Rated impulse voltage: 230 V circuits: 2500 V  
24 V circuits: 500 V

Pollution degree: 2

Protection against shock: Class 0 (without terminal cover)  
Class II (with terminal cover)

Software class: A

## Classification according to EN 60529

(Degree of protection provided by enclosures)

IP20. In the case of controllers mounted outside of a cabinet, before applying power to the device, Terminal Protection Covers (10-pc. bulk packs, order no.: IRM-RLC for large housings and IRM-RSC for small housings) must be mounted so as to provide IP30.

## Ambient Environmental Limits

### 5...95% r.H., non-condensing

Operating temperature (floor/ceiling mounting): 0 ... +40 °C

Operating temperature (wall/rail mounting): 0 ... +50 °C

Storage temperature: -20 ... +70 °C

### Trademark Information

BACnet™ is a trademark of ASHRAE Inc.

Manufactured for and on behalf of the Connected Building Division of Honeywell Products and Solutions SARL, Z.A. La Pièce, 16, 1180 Rolle, Switzerland by its Authorized Representative:

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