Chapter 3: Push-buttons/PLANTEC

3.6 Multi-function push-button with room temperature control unit
System M multifunctional push button, 2-gang/4-gang with RTCU
Art. no. 6232../6236..

1. Function

The Merten multi-function push-button with the room temperature control unit (called "push-button" in the following) gives you four (2-gang push-button) or eight (4-gang push-button) operating surfaces. The push-buttons can be assigned different functions so that you can switch, dim, control the blinds or retrieve scenes, for example. Moreover, it has an integrated room temperature control unit with which you can implement different types of control.

The controller can be used for heating and cooling with infinitely variable INSTABUS positioning drives, or to control switch actuators. It is fitted with a display whose cover is designed as a rocker. You can use this to make the most important settings.

You can individually identify the keys using the labelling field in the middle. Each key has its own status LED. The devices can signal danger and alarm situations with a bell symbol; the 4-gang push-button even has an integrated buzzer. In addition, the 4-gang push-button has an integrated IR receiver so that the push-button functions can also be triggered using Merten IR remote controls.

The push-button is connected to the EIB by attaching it onto the flush-mounted module for the multi-function push-button with the room temperature control unit (art. no. 623299, called "flush-mounted module" in the following), and is parameterised using the EIB tool software (ETS). The stored key functions, the behaviour of the status LEDs and the buzzer, for example, are configured in this way.
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Operating and display elements:

![Diagram of push-button and RTCU]

- **A** Display
- **B** Status LED
- **C** Operational LED
- **D** IR receiver surface

1-8 Key numbering (only for 4-gang push-buttons). Pressing keys 1-8 on a Merten IR remote control triggers the function of the corresponding key on the 4-gang push-button.

How to put the push-button into operation

1. Press the programming button on the flush-mounted module. The red programming LED lights up.
2. Load down the physical address and application from the ETS into the flush-mounted module. The red programming LED goes out.

- Be sure to note the settings you have made in the ETS which are important for the user in the configuration table, since not all parameters that can be set are shown in the display of the push-button.

How to mount the MF push-button with RTCU

The flush-mounted module must be installed and have a physical address.

Push-button, 2-gang

You need a Merten System M frame to mount the 2-gang push-button.

1. Insert the push-button (B) into the frame (A).

What you need to know about the installation site

⚠️ Risk of fatal injury from electric current! All work carried out on the unit may only be performed by skilled electricians. Observe the country-specific regulations, as well as valid EIB guidelines!

In order for the integrated room temperature control unit to work best, you should keep in mind the following when selecting the right installation site:

- Mount the push-button inside the room and opposite the heat source, if possible.
- If possible, do not mount the push-button on external walls or in places where it is exposed to draught through windows and doors.
- Mount the push-button in the room in such a way that air can circulate around it easily, in other words, not between shelf units or behind curtains, for example.
- External sources of heat have a negative effect on the accuracy of the control unit. Ensure that external heat does not reach the device, e.g. due to direct sunlight or proximity of televisions, chimneys, heating pipes, dimmers, socket-outlets or other electrical loads which radiate heat.
- Mount the push-button at a height of 110-160 cm. This is where the temperature of the room air is best recorded, and the display can be easily read.
2. Attach the push-button with the frame (B) onto the flush-mounted module (A). Ensure that the contact pins on the back are not bent, but fit cleanly into the pin strip of the flush-mounted module.

3. Lever the display cover carefully from the housing on the left and right of the upper side using a flat screwdriver.

4. To protect the device against dismounting, secure the push-button to the retaining ring of the flush-mounted module with the screw (A) provided.

5. Place the display cover in the housing bottom first, pressing it firmly left and right simultaneously.

Now you can mark the labelling field (see below).

**Note on dismounting:**
In order to be able to remove the push-button from the flush-mounted module, you first have to remove the screw (dismounting safety feature).

**4-gang push-button**
To mount the 4-gang push-button, you need a Merten 2-gang frame without central bridge piece, M-PLAN (art. no. 5873 ..) design. Installation is not possible with any other frame.
1. Stick the two Velcro stickers together with the smaller in the centre of the larger.

2. Remove the adhesive surface of the smaller sticker and stick it in the recess on the back of the push-button housing.

3. Remove the adhesive surface of the larger sticker.

4. Insert the push-button (B) into the frame (A).

5. In the same way as the 2-gang push-button: Attach the push-button with the frame (B) onto the flush-mounted module (A). Ensure that the contact pins on the back are not bent, but fit cleanly into the pin strip of the flush-mounted module.

6. Press the lower part of the 4-gang push-button against the wall so that the velcro sticker on the back remains stuck to the wall.

7. Lever the display cover carefully from the housing on the left and right of the upper side using a flat screwdriver.
To protect the device against dismounting, secure the push-button to the retaining ring of the flush-mounted module with the screw (A) provided.

Place the display cover in the housing bottom first, pressing it firmly left and right simultaneously.

Now you can mark the labelling field (see below).

**Note on dismounting:**
In order to be able to remove the push-button from the flush-mounted module, you first have to remove the screw (dismounting safety feature).

**How to mark the labelling field**

1. Open the cover of the labelling field by lifting with a flat screwdriver in the recess.

2. Flip the cover (A) up and take out coloured foil strip (B).

To label foil strips, you need the Merten labelling software (art. no. 615022). You also need to download the format for the push-button from www.merten.com. With this software you can print foil strips in the format you wish.
You can also create and print corresponding foil strip templates with any layout program (for size defaults see the Figure below).

You will see the following symbols on the display:

- Comfort operation or workday. The heating is adjusted to the set comfort setpoint temperature. The flashing symbol means that the comfort extension is active.
- Standby operation or day off. The heating is adjusted to the set standby setpoint temperature.
- Night operation. The heating is adjusted to the set night setpoint temperature.

What you need to know about the keypad

The keys opposite each other can be parameterised as either individual keys or a key pair. Each key has its own status LED, which depending on the preconfiguration, briefly lights up, for example, when the corresponding key is pressed.

The 4-gang push-button is equipped with an IR receiver, with which you can control the push-button with any Merten IR remote control. Pressing keys 1-8 on the remote control triggers the function of the corresponding key on the 4-gang push-button (for key assignment, see “Operating and display elements” above).

What you need to know about the room temperature control unit and display

With the integrated room temperature control unit you can control temperature in various different ways. You can read and set important information on the display:
- Setpoint temperature
- Operating mode (comfort, standby, night, comfort extension)
- Workday/day off
- Display mode (setpoint temperature, current temperature, date etc.)
- Backlighting
- Setting time/switching time

Getting to know the display

Use transparent foil strips with a maximum thickness of 0.15 mm. Consult the operating instructions of your printer to find out which type of foil strips you can print.

Only use the colour foil from Merten as a base. This ensures that the key LEDs located underneath the labelling field can shine through.

Only for 4-gang push-buttons:
Two coloured foil strip versions are provided: one with a recess in the middle for the IR receiver, and one without a recess. If you want to control the push-button from a Merten IR remote control, you have to use the coloured foil strip with recess.

If you want to close the labelling field:
① Insert the colour foil in the labelling field of the push-button. Lay the labelled transparent foil strip on top of it.
② Press the cover closed so that it clicks into the push-button.
Using the control menu

There is a control menu to access the individual functions of the room temperature control unit. A rocker with three pressure points is integrated in the cover of the display: left, centre and right. With these keys you can access the control menu, scroll backwards and forwards and change individual values.

- Time control is active. Constant display: Time has been synchronised.
- Flashing display: Time has not been synchronised; the displayed time may not be accurate.
- Alarm, symbol flashing. With the 4-gang push-button an acoustic warning tone may also be emitted.

1 2 3 4 5 6 7 Weekday display.
Menu command ‘Setting the backlighting’ is activated.

Heating

Cooling

1 2 Display under “heating” or “cooling” symbols.
- For heating or cooling
  „1“: Setpoint temperature has not yet been reached. The controller is heating or cooling.
  „2“: Level 2 is activated. Is only shown if two-stage heating/cooling is set.
- For heating and cooling
  „1“: The controller is heating.
  „2“: The controller is cooling.

°C Temperature display in degrees Celsius
°F Temperature display in degrees Fahrenheit
88:88 Time display or value display

The menu structure is shown schematically in the following diagram:

**Push-button action**

- **Centre – long push-button action**
  - This takes you to the control menu.
  - Within the menu:
    - This saves a value and the standard display automatically reopens.
  - Within the menu this opens the next menu command.

- **Centre – short push-button action**

- **Left/right – short push-button action**
  - This changes the individual values in the control menu incrementally.

- **Left/right – long push-button action**
  - This changes the individual values automatically (fast forward or back).

If you don’t press any key within a period of approximately one minute, the room temperature control unit automatically returns to the standard display. The values before the retrieval of the menu are restored, and any changes made are **not stored**.
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Standard display
Here you see an example of the standard display:

| 3 | 20°C |

- Comfort operating mode
- Actual temperature 20°C
- Heating is active in order to reach the comfort setpoint temperature
- Clock symbol is permanently displayed: time has been synchronised with the time switch (e.g., Merten’s year time switch REG-K).
- Clock symbol flashes: Time has not (yet) been synchronised.
- Weekday display 3 = Wednesday

Note that the display of the weekday depends on the presettings (ETS -> card "Display" corresponds to parameter "Display '1'").

Setting the setpoint temperature
From the standard display:
1x centre key - long push-button action
The menu command "Set setpoint temperature" is shown with the value last set, for example 24°C.

You see the setpoint temperature of the currently active operating mode (comfort, standby or night, in each case either for heating or cooling). You can only change this setpoint temperature. To change the setpoint temperature of a different operating mode, you must first change the operating mode.

Depending on the preset option, this new setpoint temperature is only valid until the next change in the operating mode, or is permanently valid.

Depending on the setting, you can only change the values within the defined limits (offset), for example within a minimum of 16°C and a maximum of 26°C. You cannot set a value below or above these limit values.

If the appropriate setting has been made, the 4-gang push-button emits a warning tone as soon as you try to exceed these limit values.

You can change the value in 0.5 degree increments by pressing the left or right key on the display.

Store the required new setpoint temperature by a long push-button action on the centre key.
The new setpoint temperature is stored; the standard display reopens.

Setting the operating mode
From the standard display:
1x centre key - long push-button action
1x centre key - short push-button action
The "Set operating mode" menu command is shown with the last operating mode set and the corresponding symbol, for example, b 2, house with person = operating mode (b = base mode) "comfort".

Change to the next operating mode by pressing the left or right key on the display.

Store the required new operating mode with a long push-button action on the central key.

b 0 = Night operation
The heating is set to the night setpoint temperature (e.g. 15°C).

b 1 = Standby operation
Select this operating mode when you are not in the room over a longer period of time. The heating is set to the standby setpoint temperature (e.g. 18°C).

b 2 = Comfort mode
Select this operating mode if you are staying in the room. The heating is set to the comfort setpoint temperature (e.g. 21°C).

b 3 = Comfort extension
Select this operating mode if you want to suppress the night operation temporarily. The heating is set to the comfort setpoint temperature (e.g. 21°C).

The new operating mode is stored; the standard display can be seen.

Setting workday/day off
From the standard display:
1x centre key - long push-button action
2x centre key - short push-button action
The "Set workday/day off" menu command is shown, for example, h 1 = Working day (h = here).
You can set the room temperature control unit with an external time switch in such a way that certain weekdays are considered as workdays (e.g. Mon-Fri), and others as days off. Depending on the setting, the heating can be reduced, for example, on non-working days during the day, in order to save energy. If you nevertheless want to heat the room on a day considered a day off or vice versa, you can make the appropriate setting here.

1. Change between a day off and a workday by pressing the left or right button on the display.
2. Store the required new setting by a long push-button action on the central key.

- h 0 = Day off
- h 1 = Workday

The new setting is stored; the standard display is shown.

Setting the display mode
From the standard display:
1x centre key - long push-button action
3x centre key - short push-button action

The "Set display mode" menu command is shown with the display mode last set, for example, d 0 = actual temperature (d = display).

1. Change to the required display mode by pressing the left or right button on the display.
2. Store the required new setting by a long push-button action on the central key.

- d 0 = Actual temperature (without decimal point)
- d1 = Setpoint temperature (to 0.5 degree accuracy)
- d 2 = Actual and setpoint temperature alternately
- d 3 = Date
- d 4 = Time
- d 5 = Alternating date and time
- d 6 = Actual/setpoint temperature and date/time alternately
- d 7 = Actual/setpoint temperature and time alternately

The new setting is stored; the standard display is shown.

Setting background illumination
From the standard display:
1x centre key - long push-button action
4x centre key - short push-button action

The "Set backlighting" menu command is shown with the brightness level last set, for example, L 8 = brightness level 8 (l = luminosity).

1. Change to the required brightness level 1 (dark) to 10 (light) by pressing the left or right key on the display.
2. Store the required new setting by a long push-button action on the central key.

The new brightness level is stored; the standard display is shown.

Setting the internal time and switching times
From the standard display:
1x centre key - long push-button action
5x centre key - short push-button action

The clock symbol and "t 0" are displayed (t = time).
You can now scroll through with the left or right display key to adjust the time or switching times:
- $t_0 =$ time (either transmitted from the external time switch or from the internal clock)
- $t_{1.1}$ to $t_{1.4} =$ time channel 1, switching time 1-4
- $t_{2.1}$ to $t_{2.4} =$ time channel 2, switching time 1-4

If the time is updated by an external time switch, the updated time is displayed here. If you change this time manually, it will be overwritten again by the time switch during the next update.

The control menu allows you to adjust only the switching times which have been preprogrammed via the ETS. Switching times which are not defined in the ETS are shown when they are called up in the display with "--:--" and cannot be set using the keys on the display.

1. Press the left or right key on the display to set the required time ($t_{...}$).
2. Press the centre key for a long time. The hour display for the selected time/switching time starts to flash.
3. Press the left or right key on the display to set the hours as required (short push-button action = step-by-step adjustment, long push-button action = continuous adjustment).
4. Press the centre key briefly. The minute digits now flash.
5. Press the left or right key on the display to set the minutes as required (short push-button action = step-by-step adjustment, long push-button action = continuous adjustment).
6. Press the centre key briefly. The set time ($t_{...}$) appears again.
7. Store the required new setting by pressing the centre button for a long period.

The new time/switching time is saved; the standard display is shown.

We recommend that you synchronise the time via an external time switch to guarantee precision over a long period of time.

Selecting the setpoint temperature or operation mode directly

You can define in ETS whether you retrieve and adjust the setpoint temperature or operating mode directly by a right/left push-button action or whether none of these functions is activated.

If this function is activated:

1. Press the right or left key - short push-button action

The menu command “Set setpoint temperature” or “Set operating mode” is displayed with the last set value. Change the value by pressing the left or right key on the display. The value is adopted directly. It is not necessary to store it. After approximately five seconds the room temperature control unit returns automatically to the standard display.

Other displays

- **ER...**
  This signal is shown together with an error number when an error occurs, e.g. after an initialisation or power failure, or if the actual temperature is not correctly recorded, for example.

- **A 1 ... A 5**
  This signal is shown during the initialisation phase (for approx. 1 minute). No action is necessary.
4. Technical data

Initialisation: Due to the limitation of the telegram rate, a telegram cannot be generated until at least 17 sec. after the initialisation.

Display elements: Green LED to indicate that the device is ready, can be switched off via parameters.
- 4 status LEDs (art. no. 6232..)
- 8 status LEDs (art. no. 6236..)

Operating elements: 4 keys (art. no. 6232..)
- 8 keys (art. no. 6236..)
- 3 keys to navigate menu
- IR receiver (art. no. 6236..)

Power supply: from flush-mounted module
Connection: PEI, 10-pole pin strip

Ambient temperature:
- Operation: -5°C to +45°C
- Storage: -25°C to +55°C
- Transport: -25°C to +70°C

Max. humidity: 93 %

Measuring accuracy: ± 1 K, depending on installation site, offset can be parameterised

Type of controller: 2-step control, continuous PI control, switching PI control (PWM)

Controller mode:
- Heating with one controller output
- Cooling with one controller output
- Heating and cooling with separate controller outputs
- 2-step heating with 2 controller outputs
- 2-step cooling with 2 controller outputs

Type of protection: IP 20

5. Settings in the EIB tool software

Selection in the product database

Manufacturer: Merten
Product family: 1.5 Multi-function push-button
Product type: 1.5.06 System M
Name of range: Multi-function with RTR 1814/1.X

Media type: Twisted Pair
Product name: System M multi-function push-button with RTCU 2-gang
Order number: 6232 xx
Product name: System M multi-function push-button with RTCU 4-gang
Order number: 6236 xx

Manufacturer: Merten
Product family: 7.1 Heating/Single room
Product type: 7.1.17 System M controller
Name of range: Multi-function with RTR 1814/1.X

Media type: Twisted Pair
Product name: System M multi-function push-button with RTCU 2-gang
Order number: 6232 xx
Product name: System M multi-function push-button with RTCU 4-gang
Order number: 6236 xx

To guarantee the full functionality of the applications under ETS2, the ETS2 program from version 1.2 onwards and Service Release A or higher should be used. If you have any queries, please contact the Merten InfoLine.
### Application overview

**To operate the multi-function push-button with flush-mounted module (art. no. 623299) you can select the following applications:**

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