# SIEMENS

# Synco™ 700
# Universal Controllers RMU7..B
# Operating Instructions

**Building Technologies**

# Contents

> *Please note that these Operating Instructions describe all controller settings and displays that can be accessed by the user.*
> *However, depending on the type of plant, not all functions are necessarily active.*
> *In case of doubt, please contact your heating engineer.*
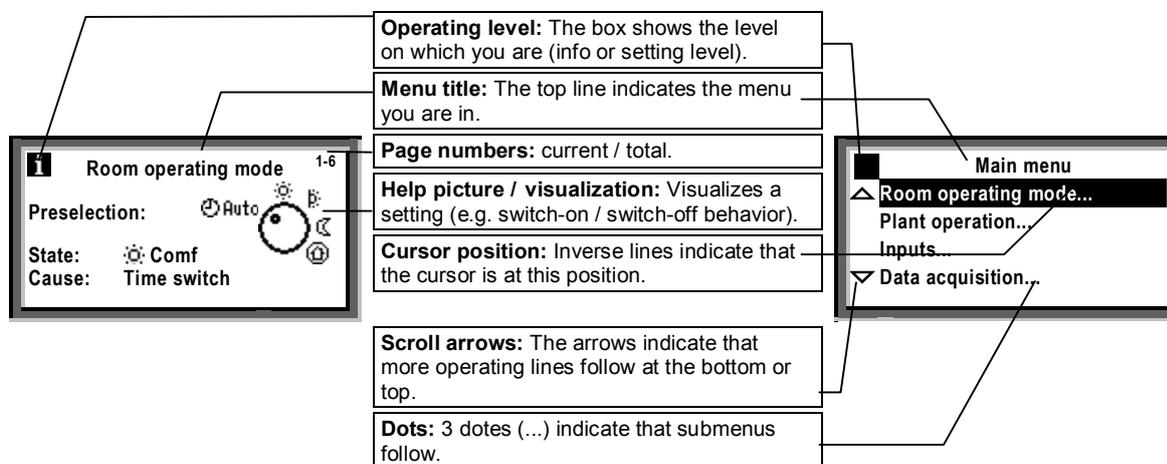
## Operating elements



Plug-in type operator unit
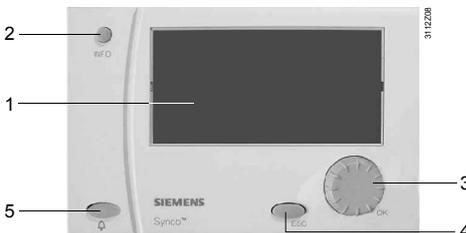


Detached operator unit

1 **Display**

2 **INFO button**
*Function 1*: Display of key plant data
*Function 2*: Display of information about the individual data
points on the current menu

3 **Select-and-push knob OK**
*Turn:* Selection of operating line and adjustment of
value
*Press:* Confirmation of operating line or value

4 **ESC button**
Going back to the previous menu

5 **Fault button ⍟ with LED**
*LED lit / flashes:* Display fault
*Press:* Acknowledgement of fault or reset

## Display

**Operating level:** The box shows the level
on which you are (info or setting level).

**Menu title:** The top line indicates the menu
you are in.

**Page numbers:** current / total.

**Help picture / visualization:** Visualizes a
setting (e.g. switch-on / switch-off behavior).

**Cursor position:** Inverse lines indicate that
the cursor is at this position.





**Scroll arrows:** The arrows indicate that
more operating lines follow at the bottom or
top.

**Dots:** 3 dotes (...) indicate that submenus
follow.

> *Other information provided in the form of pictures included, for example, the welcome picture or a pop-up window for setting values.*
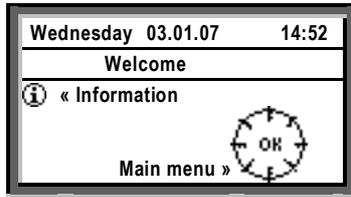
## Symbols and characters on the display

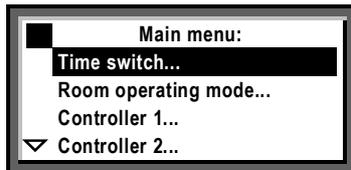| Symbol | Meaning | Symbol | Meaning |
|---|---|---|---|
| ⟳Auto | Virtual operating mode selector (dot indicates the current operating mode). | ◾ | Setting level – display and settings |
|  |  | ℹ | Info level – display of key plant data |
| ☼ | Room operating mode "Comfort". |  |  |
| ◗ | Room operating mode "Precomfort". |  |  |
| ☾ | Room operating mode "Economy". |  |  |
| ⌂ | Protection. | ⊙ | Time switch |
|  |  | 1 | Operation selector (Logic 1) or Logic 1 |
|  |  | $\sim^1$ | Trend 1 |
| ? | Help picture "Explanations relating to the query data point". | $\Sigma_{\Lambda}^1$ | Meter 1 |
|  |  | $\bigcirc^1$ | Pump 1 |
| ⧖ | Please wait – the controller is working | ▷1 | Controller 1 |
| ✓ | Value set | ⎕ | Holidays |
| 2.18 | Page numbers – current / total | X | Special day |
| ⍟ | Fault |  |  |

## Navigate menu

### Introduction
These Operating Instructions assist you in operating the controller in all standard situations (Readjust time ... etc.).
The Operating Instructions always give you the **Path** you need to follow through the menu to reach the relevant function – from the start display to the adjustable value
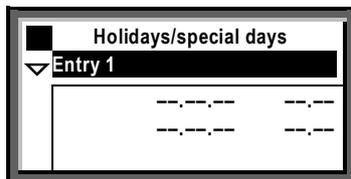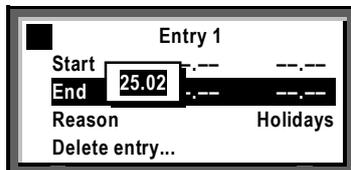
Start display:

```
┌─────────────────────────────────┐
│ Wednesday  03.01.07      14:52   │
│         Welcome                  │
│ ⓘ « Information                  │
│                    ╱⁺╲           │
│                   (  OK )        │
│         Main menu »  ╲₊╱         │
└─────────────────────────────────┘
```

▼

Main menu:

```
┌─────────────────────────────────┐
│ ■        Main menu:              │
│ Time switch...                   │
│   Room operating mode...         │
│   Controller 1...                │
│ ▽ Controller 2...                │
└─────────────────────────────────┘
```

▼

Submenu:

```
┌─────────────────────────────────┐
│ ■    Holidays/special days       │
│ ▽ Entry 1                        │
│                                  │
│        --.--.--      --.--       │
│        --.--.--      --.--       │
└─────────────────────────────────┘
```

▼

Setting the numerical value:

```
┌─────────────────────────────────┐
│ ■        Entry 1                 │
│ Start ┌──────┐.--      --.--     │
│ End   │25.02 │.--      --.--     │
│       └──────┘                   │
│ Reason              Holidays     │
│ Delete entry...                  │
└─────────────────────────────────┘
```

**Start page**
When not operated, the display always shows the start display – unless a fault has occurred.
1. Press the **OK** knob: The list of menus appear.

**Main menu:**
2. **Turn** the OK knob: The cursor advances from one line to the next.
3. The selected line appears with a black background and inverse text.
4. Select the required option.
5. Confirm by **pressing** the OK knob.

**Submenu**
6. Now, you are on the submenus.
7. The 3 dots (...) after the text indicate that additional submenus follow.
8. Follow the indicated path by turning the OK knob to find the line, then push to confirm.
9. At the end of the path you will reach the adjustable value.

**Setting the numerical value**
10. The numerical value appears as a pop-up
11. Adjust the value by **turning** the OK knob.
12. Then, confirm the value by **pressing** the OK knob.
13. The cursor now advances to the next value to be adjusted, or returns to the data point if there is no other value to be adjusted.
14. Press the ESC button to return to the previous entry box or menu.
15. When you press the ESC button several times, you will reach the start display again.

*With the majority of menus, you can display information about the option currently selected.*
*Press the **INFO** button.*

## Readjust time or dateTime of day/date

All data of the yearly time switch in your controller were entered when your plant was commissioned. If readjustments are required, use the **Time of day / date** menu.
**Summer and wintertime**
The same is true if you need to readjust the dates for the start of summer and wintertime.
*Note:* Do not enter the actual dates of changeover but, in accordance with international standards, the earliest possible dates for the start of summertime and winter-time!

The menu Time of day/date
- The time of day (e.g. 09:53)
- The date (e.g. July 25)
- The year (e.g. 2007)
- The start of daylight savings time (e.g. March 25)
- The start of standard time (e.g. October 25)

Path:   **Welcome > Main menu > Time of day/date... > ...**

*The change from wintertime to summertime, and vice versa, takes place automatically!*
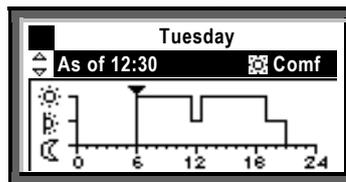
# Heat or cool per time switch program

In room operating mode ⏱ Auto, the controller operates according to the selected heating program.

**Time switch program**
In the time switch program, the start time and associated room operating mode have been entered for all periods of 24-hour heating / cooling operation. The heating program has been entered for you; if you wish, you can change the entries made (☞ Page 8) to satisfy your personal needs.

Example of a time program:



| As of 6:00 am | Comfort mode |
| As of 11:30 am | Precomfort mode |
| As of 12:30 pm | Comfort mode |
| As of 7:00 pm | Precomfort mode |
| As of 9:00 pm | Economy mode |

# Do not heat or cool per time switch program

**Select another room operating mode**
If you do not want to heat or cool according to the time switch program (i.e., not automatically), you need to change the preselection for the room operating mode.

**Setpoints**
The setpoints assigned to the room operating modes use the same symbols and designations.
Setting setpoints is described on ☞ page 7.

| Symbol | Room operating mode | Comments |
|--------|---------------------|----------|
| ☼ | Comfort | Plant ON, Heating / Cooling on comfort |
| ◗ | Precomfort | Plant ON, Heating / Cooling on precomfort |
| ☾ | Economy | Plant OFF, Sustained mode Heating / Cooling on economy; Night cooling and frost protection activated |
| ⊚ | Protection | Plant OFF, frost protection active |

> Path: **Welcome > Main menu > Room operating mode... > Preselection > ...**

> *Do not forget to switch back to **auto** when you only intend to heat/cool temporarily!*

# Operate aggregates per time switch 2

When your controller is configured with a time switch, the controlled aggregate (e.g. a pump) is switched on and off per the set time switch program.

If also configured with **[Time switch 2] op selector**, it must be set to **auto**, to automatically switch on and off the aggregate per the set time switch program.

If a **[time switch 2] op selector** is available and you do not want to control the aggregate per the time switch program, you can manually override it with the **[time switch 2] op selector** either **on** or **off**.

Example of a time program:
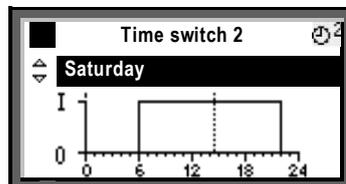


Switched on at 6:00 am – switched off at 10:00 pm

> Path: **Welcome > Main menu > [Time switch 2] op selector > Preselection:**

> *If you want to set the plant to **On** or **Off** for a limited period only, do not forget to return to **auto** in due time!*

# Room temperature

Your universal controller offers 4 room operating modes. Each room operating mode are assigned two temperature setpoints (heating and cooling).

Depending on the selected room operating mode, your controller switches the setpoints per a time program (☞ page 6) or controls continuously to the setpoint for the selected room operating mode.

The following setpoints are available. The default factory settings represent the recommended setpoints.

You can change the comfort and precomfort setpoints as needed. The economy setpoint cannot be set at the user level.

| Symbol | Setpoint Room operating mode | Impact on the room? | Guide value | |
|---|---|---|---|---|
| | | | Heating | Cooling |
| ☼ | Comfort | This is the setpoint for the occupied room. Ensuring comfortable conditions | 21 °C | 24 °C |
| ◗ | Precomfort | This is the energy saving setpoint for the room to ensure that comfortable conditions are reached quickly when changing to comfort mode | 19 °C | 28 °C |
| ☾ | Economy | Plant OFF. A maximum / minimum temperature is ensured in the room (sustained mode) | 15 °C | 30 °C |
| ⊚ | Protection | Plant OFF. Frost protection active | ---- | ---- |

# Room humidity

If your plant also includes room humidity control, the universal controller allows you to change the humidity setpoint limits in comfort and precomfort room operating modes.

Your controller changes the setpoints according to a time switch program, or maintains the setpoint of the selected operating mode depending on the room operating mode.

The following setpoints are available.
The default factory settings represent the recommended setpoints.

| Symbol | Setpoint | Impact on the room? | Upper setpoint | Lower setpoint |
|---|---|---|---|---|
| ☼ | Comfort | This is the setpoint for the occupied room. Ensuring comfortable conditions | 60 % | 40 % |
| ◗ | Precomfort | This is the energy saving setpoint for the space to ensure that comfortable conditions will be reached quickly when changing to comfort mode | 80 % | 20 % |

# Change daily heating / cooling periods

**General**
In the time switch program, you can set the daily heating and cooling periods to suit your individual needs.
Each day can accommodate a maximum of 6 switching points; a room setpoint is assigned to each time period.

In addition to the weekdays (Monday through Sunday), you can program a special day, that is, a special 24-hour heating and cooling program.
The special day is activated when you make an entry in **Holidays**.

Changes on the controller are possible only if the controller's time switch defines the program.
If an external operator station controls the program, changes can only be made from that station.

**Observe the following prior to making entries:**
- First enter the start time for the heating/cooling phase and then the room operating mode for the phase.
- The following room operating modes ☼, ☽, and ☾ are available. Set the corresponding setpoints in menu **Controller 1** and **Controller 2** (☞ page 7).
- You can copy any 24-hour heating / cooling program to other days.

**Change and delete times and setpoints**
1. Select the required day.
2. In the diagram, advance the pointer ▼ to the time to be changed.
3. Set the desired time.
   Delete the time: Reset the time via **00:00** until **––:––** appears.
4. Select the desired operating mode.
5. If required, set additional times and select additional setpoints.

Path:   **Welcome > Main menu > Time switch... > ...**

**Enter additional switching points**
1. Select the desired day.
2. In the diagram, advance pointer ▼ to the **last** point in time of the current program.
3. Turn the OK knob by one notch; **––:––       ––––––** appears.
4. Set the desired start time.
5. Set the desired room operating mode.

**Copy a 24-hour heating / cooling program**
1. Select the day to be copied.
2. Turn the OK knob clockwise until **Copy to:** appears.
3. Press the OK knob.
4. The menu for the day selection (week sections, individual weekdays, special day) appears.
5. Select the desired weekday or week section.
6. Copy (press the OK knob).

**Create a new 24-hour program**
The controller is supplied with a 24-hour program for every day (including special days). This means that you will never have to create a new 24-hour program, but only change an existing program.

**Operating voltage off – heating / cooling program lost?**
In the event of a power failure, the 24-hour programs entered will be maintained, independent of the duration of the power failure.

*First, write down a 7-day schedule for daily switching times and operating modes – this will facilitate entry into the controller!*

# Holiday periods or special days

You can enter a total of 16 holiday periods and special days.
During a holiday period, there is no heating / cooling program active, but only the same room operating mode. On special day(s), the special day program is active.

**Date**
Enter on the submenus **Entry 1, Entry 2, Entry 3,** etc., the holiday period or special day:
- Operating line **start**:
  Date, year and time of day for the start of holidays or special day.
- Operating line **end**:
  Date, year and time of day for the end of holidays or special day.
- Operating line **reason**: Holidays or special day

Every entry can be cancelled:
- Delete entry...

**Room operating mode (for holidays).**
Enter the desired room operating mode in the operating line **room operating mode holidays**.
The following choices are available:
- Economy ☾ or
- Protection ⊕.

The entry will apply to all holiday periods.

**Heating / cooling program (for special day)**
Enter the heating / cooling program for the special days in **Time switch**.

The heating/cooling program applies to all special days.

Path:   **Welcome > Main menu > Holidays/special days > Entry 1 > ...**

Path:   **Welcome > Main menu > Room operating mode > Room operating mode holidays > ...**

*Before making entries, prepare a yearly time schedule for all holiday periods!*

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Building Technologies            Change daily heating / cooling periods                  2015-03-31

## Display plant operating state

If, during automatic heating / cooling operation, you want to know your plant's current operating state (the room operating mode), go to the info level:

1. Go back to the start display by pressing the ESC button.
2. Press the INFO button.

The room operating mode is displayed as follows:

```
┌─────────────────────────────┐
│ [i]  Room operating mode  1-5│
│                              │
│ Preselection   ⏱Auto        │
│                              │
│ State    ☼ Comf             │
│ Cause:   Time switch         │
└─────────────────────────────┘
```
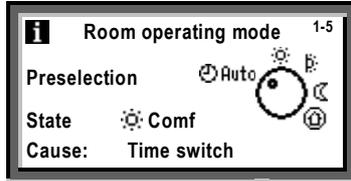
Meanings:

**Preselection**
The selected room operating mode.
In the example shown, the selector is set to ⏱Auto.

**State**
This is the current state.
In the example, heating or cooling at the comfort setpoint.

**Cause**
Here, the reason for the current state is given.
Possible reasons:
- Operating mode contact (manual changeover).
- Operating mode selector.
- Occupancy button on the room unit.
- Timer button on the room unit.
- Special day
- Holidays
- Time switch for the time program (as displayed).

## Display current plant data

In addition to plant data on the info pages, the submenus configured functions allow you to query additional plant data.

Data queries are explained on ☞ page 9 based on the function **data acquisition > Trend channel**.

You find the following data via the following paths:

**Trend.**
**Main menu > Data acquisition > Trend channel 1...2 >**
Display of trend recordings of characteristics.

**Meter.**
**Main menu > Data acquisition > Meter 1...2 >**
The meters are used to acquire consumption values. The current meter reading, the date and the reading of the last 15 months are displayed.

> *The names of the submenus used in these operating instructions may have been replaced by clear-text names as defined by your service engineer.*

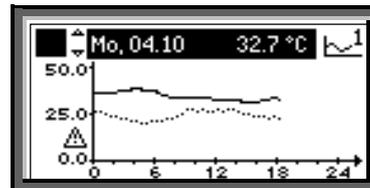## Display measured value trends

**Data acquisition**... allows you to display the progression of up to 2 measured values (**trend channel...2**). This trend function shows measured value trends over the last 8 minutes, the last 8 hours, the last 24 hours or the last 6 days.

**Display measured value trend:**
1. Select the **Data acquisition**… menu.
2. Select the required **Trend channel 1...2** or the measured value in clear-text; the 24-hour view of the current day appears.

**Navigate views:**
1. Turn the OK knob counter clockwise to jump back the display by 1 day, and vice versa.
2. Starting with the current 24-hour view, you reach the view of the last 8 hours by turning the OK knob in clockwise direction. Turn the OK knob clockwise again and you reach the view of the last 8 minutes, turn counter clockwise to return.
3. Press the ESC button to go back to the previous menu.

The measured value trend is presented as follows:

```
┌─────────────────────────────┐
│ ■ ↕ Mo, 04.10   32.7 °C  〰¹│
│ 50.0┤                        │
│     │   ___                  │
│ 25.0┤ ⋯⋯      ⋯⋯⋯           │
│  ⚠  │                        │
│  0.0┼──┬──┬──┬──┬──→        │
│     0  6  12  18  24         │
└─────────────────────────────┘
```

> Path:   **Welcome > Main menu > Data acquisition… > Trend channel 1...2.**

# Fault

If a fault has occurred in the plant, it will appear on the display and the LED inside the fault button will flash or be lit. Proceed as follows:

**LED flashes:**
1. Press the ⚲ button to acknowledge the fault.
2. If the LED is still lit, the fault still exists **or** the button must be pressed again to unlock.

**LED lit:**
1. Correct the fault.
2. If the LED is still lit, the fault can be unlocked by pressing the ⚲ button.
   Unlocking is possible only after the cause of fault has been removed.

Contact your HVAC if the fault is not corrected.

Additional information about the display of faults:

**Menu Faults current.**
Displays current faults. The following information is displayed about each fault:
- Source (e.g. pump 1).
- The fault number (for the service engineer).
- The date and the time of day the fault occurred.

**Fault history...**
Displays the last 10 faults. The information given is the same as that provided for current faults.

**Fault status message bus.**
If your plant includes multiplied networked devices, faults from other controllers are displayed on your controller.

**Fault indication on the setting level**
Display the current fault by pressing the ESC button for 2 seconds.

> Path:   **Welcome > Main menu > Faults...**

# Required information for HVAC engineer

Your controller has characteristic data that enable your HVAC engineer to offer support, to answer your questions about the plant, etc. The information is available in the **Device information...** submenus.

| Operating line | Explanation, example |
|---|---|
| Plant type | A01. |
| Plant type adapted | Yes. |
| File name | AEFB01 U3B HQ. |
| Device type | RMU730B-1. |
| Software version | Of the controller. |
| Hardware version | Of the controller. |

> Path:   **Welcome > Main menu > Device information... > Controller... > ...**

# Save energy without sacrificing comfort

- During the day, do not allow the room temperature to exceed 21 °C when heating. Each additional degree increases heating costs by 6 to 7 %
- During the day, do not allow the room temperature to fall below 24 °C when cooling. Each degree below that level increases the cooling costs
- Guide values for the room temperature in living and working spaces during heating and cooling periods:
  – Daytime during heating period: Precomfort = 19 °C, Comfort = 20...22 °C.
  – Daytime during the cooling period: Precomfort = 28 °C, Comfort = 22...24 °C.
  – Night time during the heating period: Economy = 14...18 °C. Protect objects sensitive to low temperatures, such as plants!
  – Night time during the cooling period: Economy = 29...31 °C.
- Ensure that there are no curtains, furniture or other objects in front of or behind air inlets and outlets They have an impact on air circulation and can cause drafts

- Closed shutters and blinds reduce heat loss
- Closing blinds in due time during the cooling season reduces the impact of solar radiation, thus saving cooling costs
- Make sure air filters are checked and replaced at regular intervals

If your plant uses a room unit with temperature and humidity sensor, it should not be exposed to thermal and moisture disturbances since these affect the control function. For this reason, the following applies to the reference room where the sensor is located:
- Avoid drafts through open doors
- Avoid heat gains from people, machines and lighting
- Ensure that there are no curtains, furniture or other objects in front of temperature and humidity sensors

> *Energy savings conserve our natural resources, thus contributing actively to environmental protection!*

Subject to change

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Fault

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