



## Operating instructions Touch devices of the X2 operating system

The X2 operating system was designed for universal controllers and sensors. Devices based on the X2 operating system contain a multitude of standardized functions and application possibilities. From simple ventilation controllers for domestic applications to HVAC system solutions for entire buildings. There is a suitable solution for almost every application. With the EasySet program, the controllers can be conveniently read out, programmed and transferred to other controllers.

### Applications

These operating instructions apply to devices of the X2-series devices using the OPT1 series touch panel HMIs. The FC series is suitable for the Feller EDIZIOdue® frame.

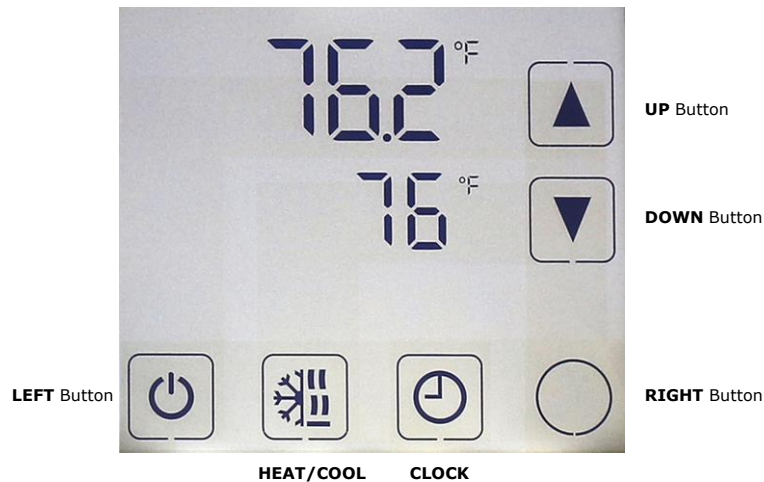
## Ordering

Model	Items	Description
OPT1-FC-HTNV-VC	40-500110	Remote operation terminal with an internal temperature and humidity sensor, a passive input and a voltage input for Feller EDIZIOdue® frames.
OPT1-FC-TNV-VC	40-500111	Remote operation terminal with an internal temperature sensor, a passive input and a voltage input for Feller EDIZIOdue® frames.
OPT1-F-HTNV-VC	40-500112	Remote operation terminal with an internal temperature and humidity sensor, a passive input and a voltage input.
OPT1-F-TNV-VC	40-500113	Remote operation terminal with an internal temperature sensor, a passive input and a voltage input.
OPT1-FA-TNV-VC	40-500136	Remote operation terminal with an internal temperature sensor, a passive input and a voltage input packed with AMM-AD-W.
OPT1-FU-TNV-VC	40-500116	Remote operation terminal with an internal temperature sensor, a passive input and a voltage input packed with AMM-UD-W.
OPT1-FA-HTNV-VC	40-500135	Remote operation terminal with an internal temperature and humidity sensor, a passive input and a voltage input packed with AMM-AD-W.
OPT1-FU-HTNV-VC	40-500137	Remote operation terminal with an internal temperature and humidity sensor, a passive input and a voltage input packed with AMM-UD-W.
OPT1-FE-TNV-VC	40-500139	Remote operation terminal with an internal temperature sensor, a passive input and a voltage input.
AMM-ED-W	40-510086	Frame and mounting plate for Feller EDIZIOdue
AMM-AD-W	40-510089	Frame and mounting plate for the square junction box
AMM-UD-W	40-510090	Frame and mounting plate for the rectangular junction box

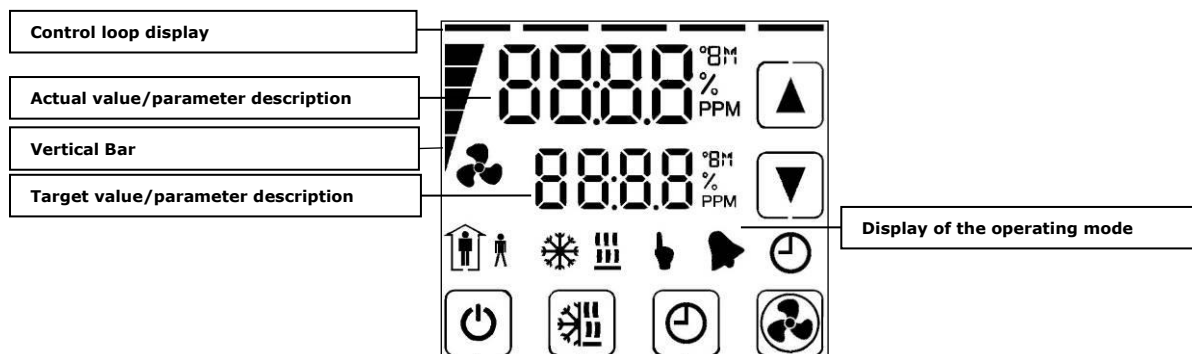
In addition, the various product descriptions and the programming instructions for technicians are contained in separate documents. This should facilitate the work with the different controllers and operating levels.

## Display and Operation

### Key Layout



## Display and Operation



	Occupied (Comfort): All control functions according to setpoint
	Unoccupied (Standby, Economy): Setpoint and power reduced
<b>OFF</b>	Energy hold OFF (EHO): All outputs switched off, inputs for alarms monitored
	Heating active
	Cooling active
	Fan active
	Manual override, delay for release function
	Schedule set

**Idle Display**

- The idle display is activated if no key is pressed for 30 seconds.
- The idle display can be deactivated by the technician. In this case, the last active setpoint is still displayed.

**Display of control loop**

- Active when setpoint is changed. Large digits indicate the input value. Small digits indicate the setpoint. Horizontal bars at the top left indicate which control loop are displayed.

**Override of secondary set point in cascade control**

- With cascade control, manual override of the secondary circuit can be activated. This is defined by the technician in the controller settings.
- This allows the user to override the primary circuit (e.g. with VAV) and manually select the setpoint of the secondary circuit (control is then switched to constant volume flow mode). This function is helpful when tuning the VAV system. While the secondary loop is displayed, press UP/ DOWN button to change the setpoint. The hand symbol appears. Change the setpoint again to cancel the cascade override. The hand symbol disappears.

**Manual Mode**

- The hand symbol is displayed during a pending delay. For example, if a start-up delay is active. The controller remains switched off and displays the hand symbol until the delay has elapsed. Then the controller switches on and the hand symbol goes out.

**Status-LED**

- Most devices have a status LED. The status LED is defined in the product data sheet. In normal operation, the LED flashes briefly once every 5 seconds. The LED flashes every second when an alarm or fault condition is present.

**Power Failure**

- All device settings and time programs are stored and do not need to be reprogrammed. The switch-on behaviour on return of the power supply is set by the technician.
- If a real time clock is available, it will continue to run for at least 48 hours (after switching on for 10 hours). The time does not have to be entered again when the power supply returns.

**Error Messages**

- Err1: Communication error
- Err2: Internal error: Firmware version of the memory does not match firmware.
- Err3: Timer error: Set time and acknowledge error. If an error occurs again at a previously set time, the watch is faulty. Time switching functions are not guaranteed in this case.
- Err4: Configuration error: An assigned input is not activated or has failed. Check all settings and ensure that all inputs used are activated and functional.
- Err5: Copy error: Communication error with external memory AEC-PM1 or AEC-PM2.
- Err6: Copy error: Checksums of the data record are incorrect. The data record is invalid.

## Extended operating level

### Timer Switch

#### Note Accuracy

Warning: The TCX2-40863 and devices with a -C addition have a real-time clock. This clock is accurate to two seconds a day. Other TCX2 series devices calculate the time based on the processor's internal clock speed. This time source is accurate to approx. 2 minutes per day. If the controller uses its time program functions, it is therefore necessary to synchronize the time of these controllers at least every 24 hours with an exact time base.

#### Time Programs

Up to 12 time and weekday programs or annual holidays can be programmed (Pr01 to Pr12). Schedules can change the operating mode of the controller (on, off, busy, unoccupied), change the fan status, position an output directly or change a setpoint.



A flashing clock indicates that the time has not been set or that the terminal has been without power for more than 48 hours. The time must be set for the schedules to work.

The summer/winter time changeover can be activated by the technician via user parameters.

#### 1. Setting the Time

1.1. Press CLOCK button longer than 2 sec. → <b>SEL</b> and <b>Date or Time</b> (alternately) is displayed.	12:30 SEL
1.2. Press RIGHT button briefly to change the time and date: <b>minutes flashes:</b> UP/ DOWN button for adjustment, RIGHT key for storage <b>Hours flashes:</b> UP/ DOWN button for adjustment, RIGHT key for storage <b>DAY1 flashes:</b> UP/ DOWN button for adjustment, RIGHT key for saving the day of the week <b>Day of the month flashes:</b> UP/ DOWN button for adjustment, RIGHT key for storage <b>Month flashes:</b> UP/ DOWN button for adjustment, RIGHT key for storage <b>Year flashes:</b> UP/ DOWN button for adjustment, RIGHT key for storage	day7 SEL
1.3. Press LEFT button (1x) for back.	2006 SEL

#### 2. Activating or deactivating the time programs

2.1. Press CLOCK button longer than 2 sec. → <b>SEL</b> and <b>Date or Time</b> (alternately) is displayed.	See Picture 1.1.
2.2. Press UP button → <b>PRO</b> and <b>SEL</b> is displayed.	Pro SEL
2.3. Press RIGHT button: Schedule status indicates whether it is <b>OFF</b> or <b>ON</b> When status is ON =  in the display. Press the RIGHT button to change the status.	Pro OFF
2.4. Press LEFT button (1x) for back to the submenu.	Pro ON 

## 3. Create weekly plans

3.1. Press CLOCK button longer than 2 sec. → <b>SEL</b> and <b>Date or Time</b> (alternately) is displayed.	See Picture 1.1.
3.2. Press UP button → <b>PRO and SEL</b> is displayed. Set time program to <b>ON or OFF</b> with RIGHT button Change to Pr 01 - Pr 12 with the UP or DOWN button.	Pr01-12 SEL
3.3. Press RIGHT button to select the following: no = switching time not activated OP = Operating mode ON (normal operation), ECO (reduced operation) or OFF (protective operation) LP = setpoint of a control loop (setting range from 0-100%) AO = Positioning of the analog output (output must be in manual mode!) FAN = Fan control (fan stages from FSP0-3 and Auto) do = positioning of the digital output (output must be in manual mode!) Hday = Season schedule (holidays) A function can be selected by pressing the UP or DOWN button. Press RIGHT key to complete the selection.	OP Pr01

## 4. Selection of a switching time

4.1. Press CLOCK button longer than 2 sec. → <b>SEL</b> and <b>Date or Time</b> (alternately) is displayed.	See Picture 1.1.
4.2. Press UP button → <b>PRO and SEL</b> are displayed	2.2.
4.3. Press RIGHT button while <b>PRO-ON or OFF</b> is displayed: Press UP or DOWN button to select between programs (point 3.3.) 1 - 12.	2.3. 3.2.
4.4. Press the RIGHT button and select the desired program (e.g. Pr01), Press the UP or DOWN button to scroll through the possible selections to see which function (no/OP/LP... etc.) is to be assigned to e.g. Pr01. In this case, the control loop (LP) on program 1 (Pr01) is selected. (1.bar indicates that step 1 is complete).	LP Pr01
Press the RIGHT button to set the desired time. This is done using the UP and DOWN buttons from 00:00 - 23:45 (2. bars indicate that step 2 is complete). Continue with RIGHT button.	08:30 Pr01

## 5. Selection of the day

<b>DAY1</b> and <b>Pr01</b> are now displayed on the screen: To execute the time program on Monday (Day1), press the UPPER button. At the top of the display 3 horizontal bars appear. In order <b>not</b> to execute the time program on Monday, press the LOWER button. The 3 bars disappear from the display. Press the RIGHT button to go to the next day. Repeat this procedure to set DAY2 - DAY7 (Tuesday to Sunday). (3. bars indicate that step 3 is complete). Continue with RIGHT button.	DAY1 Pr01
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## 6. Selection of connections (using LP01 as an example)

For all mode changes, it is necessary to select the output or the control loop in this step. For example, for setpoint LP01, LP02, etc. or for an output the number of the output to be changed. In this concrete example, LP01 (control loop 01) is set to Pr01 (program 01). The connection has already been defined in point 4.4. There it is also possible to choose between the different connections or outputs. (4 bar indicates that step 4 is complete). Continue with RIGHT button	LP01 Pr01
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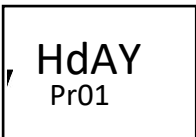
## 7. Selection of the setpoint

Press the UP or DOWN button to select the desired setpoint, operating mode or position of an output. (See <b>item 3.3</b> for more information on entering and selecting data) (5. bars indicate that step 5 is complete). After pressing the RIGHT key, you have returned to <b>point 3.2</b> . Now you can start creating the weekly schedules for programs 2 - 12. Appropriate times, weekdays as well as control loops or outputs can then be specified.	25.0% Pr01
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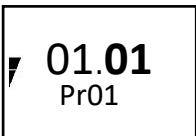
## Create holiday schedules (only from V1.3)

Holiday schedules take precedence over weekly schedules in mode. While a vacation schedule is active, the controller is in protective mode. Other weekly plans are still active. It is also possible to manually override the controller in holiday mode.

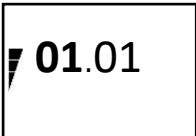
### 1. Selection of a holiday schedule

1.1. Press CLOCK button longer than 2 sec. <b>→SEL</b> and <b>Date or Time</b> (alternately) is displayed.	<b>See Picture 1.1.</b>
1.2. Press UP button <b>→PRO</b> and <b>SEL</b> is displayed. Set time program to <b>ON</b> or <b>OFF</b> with RIGHT button Change to Pr 01 - Pr 12 with the UP or DOWN button.	<b>See Picture 3.2.</b>
1.3. Press RIGHT button to select the following: no = switching time not activated OP = Operating mode ON (normal operation), ECO (reduced operation) or OFF (protective operation) LP = setpoint of a control loop (setting range from 0-100%) AO = Positioning of the analog output (output must be in manual mode!) FAN = Fan control (fan stages from FSP0-3 and Auto) do = positioning of the digital output (output must be in manual mode!) <b>Hday = Season schedule (holidays)</b>  A function can be selected by pressing the UP or DOWN button. Press RIGHT button to complete the selection. (1. bar indicates that step 1 is completed)	

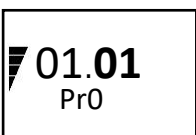
### 2. Selection of the first month of the holiday schedule

Select the first month of the holiday schedule, where "1" stands for January and "12" for December. The month flashes. Press the UP or DOWN button to select the month. Press the RIGHT button to complete the operation. (2. bars indicate that step 2 is complete).	
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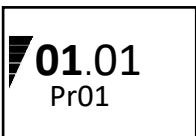
### 3. Selection of the first day of the holiday schedule

Select the first day of the holiday schedule. The day flashes. Press the UP or Down button to select the day. Press the RIGHT button to complete the operation. (3. bars indicate that step 3 is complete).	
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### 4. Selection of the last month of the holiday schedule

Select the last month of the holiday schedule, where "1" stands for January and "12" for December. The month flashes. Press the UP or DOWN button to select the month. Press the RIGHT button to complete the operation. (4. bars indicate that step 4 is complete).	
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### 5. Selection of the last day of the holiday schedule

Select the last day of the holiday schedule. The day flashes. Press the UP or DOWN button to select the day. Press the RIGHT button to complete the operation. (5. bars indicate that step 5 is complete).  After pressing the RIGHT button, you have returned to <b>point 3.2.</b> Now you can start creating the weekly schedules for programs 2 - 12. Appropriate times, weekdays as well as control loops or outputs can then be specified.	
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### Modification of heating - cooling - ventilation only - automatic

Press HEAT/COOL button longer than 2 sec.

→ **SEL** and **H-C** are displayed. You are now in Heating, Cooling and Ventilation mode. There are 5 different setting options:

Option 1: Cooling:

Cooling only. The controller remains in cooling mode only and does not switch to heating.

H-C  
SEL  


Option 2: Cooling with fan:

The controller is in fan-only mode. The fan is controlled according to the controller specification or setpoint. The mechanical cooling is deactivated or is not switched to it.

H-C  
SEL  
  


Option 3: Heating:

Heating only. The controller remains in heating mode only and does not switch to cooling.

H-C  
SEL  


Option 4: Heating with fan:

The controller is in pure heating mode. The fan is controlled according to the controller specification or setpoint. The mechanical heating is deactivated or is not connected to it.

H-C  
SEL  
  
  


Option 5: Auto operation:

Heating and cooling change automatically as required. This must be set with function 3FU (heating and cooling mode).

H-C  
Auto



### Display of input and output states


#### 1. Selection of input or output type

<p>Press RIGHT button longer than 2 sec.          You are now in input or output mode to recognize the current controller status.          There are 4 different display options:          UI = Display of universal inputs          Ao = Display of analog outputs          FAN = Fan display          do = Display of digital, 3-point or PWM outputs</p> <p><b>Note: The deactivated inputs are not displayed!</b>          Continue with the RIGHT button.</p>	<div>UI... SEL</div>
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#### 2. Select input or output

<p>Press the UP or DOWN button to select the desired input or output.          Press RIGHT button to complete the process. The displayed image shows a universal output 1 with a value of 25%. Universal input 2 is deactivated on the second image.</p> <p>Pressing the LEFT button takes you to the higher level. Here you have the possibility to select the different inputs and outputs.</p> <p>The displayed values are not adjustable in this display but only visible!</p>	<div>UI 1 25%</div> <p>or</p> <div>UI 2 OFF</div>
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#### 3. Display of the total running time for digital outputs

<p>Press RIGHT button longer than 2 sec.</p> <p>Press UP or DOWN button until <b>SEL</b> and <b>do</b> are displayed. Then press the RIGHT button to go to the desired output. Press the RIGHT key again to display the total runtime.          Press the LEFT key to return to the selection of inputs and outputs.</p> <p>This display of a total runtime is <b>only</b> shown for digital outputs with an active time-of-flight meter.</p> <p>Large digits show the selected output do01 - do06,          The small digits show the total running time in hours.</p> <p>If the runtime is greater than 9999 hours, one bar appears on the right-hand side for every 10,000 hours.</p> <p>The example on the right corresponds to 50345 hours runtime.          (Maximum term is 65535 hours = 7.5 years)</p>	<div>do 1 345 </div>
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