

Libraries for Building Automation



Module Description for Connecting Thermokon WRF06LCD RS-485 Modbus® Multifunction Room Operating Units

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Every conceivable measure has been taken to ensure the accuracy and completeness of this documentation. However, as errors can never be fully excluded, we always appreciate any information or suggestions for improving the documentation.

We wish to point out that the software and hardware terms, as well as the trademarks of companies used and/or mentioned in the present manual, are generally protected by trademark or patent.

WAGO-I/O-PRO CAA Library for Building Technology

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Important Notes

To ensure fast installation and start-up of the units, we strongly recommend that the following information and explanations be carefully read and adhered to.

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Intended Use

For each individual application, the components are supplied from the factory with a dedicated hardware and software configuration. Modifications are only permitted within the framework of the possibilities documented in this document. All other changes to the hardware and/or software and the non-conforming use of the components entail the exclusion of liability on part of WAGO Kontakttechnik GmbH & Co. KG.

Please send your requests for modified and new hardware or software configurations directly to WAGO Kontakttechnik GmbH & Co. KG.

Scope of Validity

This application note is based on the stated hardware and software from the specific manufacturer, as well as the associated documentation. This application note is therefore only valid for the described installation. New hardware and software versions may need to be handled differently.

Please note the detailed description in the specific manuals.

Function Blocks

Master WRF06 (FbWRF06Master)

WAGO-I/O-PRO CAA Library Elements			
Category:		Building Technology	
Name:		FbWRF06Master	
Type:		Function <input type="checkbox"/>	Function block X <input checked="" type="checkbox"/> Program <input type="checkbox"/>
Name of library:		ThermokonWRF06_01.lib	
Applicable to:		See Release Note.	
Libraries Used:		SerComm.lib Serial_Interface_01.lib. mod_com.lib Modb_105.lib	
Input parameters:		Data type:	Comment:
bCOM_PORT		BYTE	No. of the serial interface used 1 -> Internal service interface 2 -> 1st plugged serial module 3 -> 2nd plugged serial module
cbCOM_BAUDRATE		COM_BAU DRATE	Baud rate: BAUD_9600 := 960 Default = BAUD_9600
Input/output parameters:		Data type:	Comment:
typWRF06		typWRF06	Data exchange between the master module and the slave modules
Graphical illustration:			
<div><div>FbWRF06Master</div><div><div>-bCOM_PORT</div><div>-cbCOM_BAUDRATE</div><div>-typWRF06 ▶</div></div></div>			

Function description:

The **FbWRF06Master** function block can be used to connect WRF06 multifunction room operating units with Modbus® protocol to the WAGO-I/O-SYSTEM. Modbus® communication is implemented via an RS-485 interface module.

The **FbWRF06Master** enables communication with the multifunction room operating units via an RS-485 serial interface module. The “**typWRF06**” variable facilitates the connection with other “WRF06” function blocks.

The number of serial interfaces used can be set at the “**bCOM_PORT**” input.

Example:

- 1 -> Internal service interface
- 2 -> 1st plugged serial module
- 3 -> 2nd plugged serial module

The baud rate is set at the “**cbCOM_BAUDRATE**” input. The baud rate set here must match the baud rate of the multifunction room operating units from Thermokon.

Hardware:

The RS-485 module (750-652) should be used as the interface. The function block configures the module with the following parameters:

Baud rate:	9600
Data bits:	8
Stop bits:	1
Parity:	Even
Duplex mode:	Half duplex

WRF06 Configuration (FbWRF06Config)

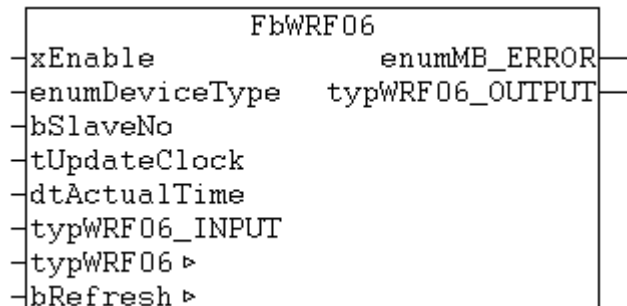
WAGO-I/O-PRO CAA Library Elements			
Category:		Building Technology	
Name:		FbWRF06Config	
Type:		Function <input type="checkbox"/>	Function block <input checked="" type="checkbox"/> Program <input type="checkbox"/>
Name of library:		ThermokonWRF06_01.lib	
Applicable to:		See Release Note	
Visualizations used:		ConfigWRF06	
Input parameters:		Data type:	Comment:
xEnable		BOOL	Enables the configuration interface
Input/output parameters:		Data type:	Comment:
typWRF06		typWRF06	Data exchange with the FbWRF06Master function block
Return value:		Data type:	Comment:
enumMB_ERROR		enumMB_ERROR	Indication of communication errors 16#00 = MB_NO_ERROR 16#01 = MB_NOT_SUPPORTED_FUNCTION 16#03 = MB_ILLEGAL_DATA 16#90 = MB_EXTENDED_SLAVE_ERROR 16#96 = MB_CRC_ERROR 16#97 = MB_ILLEGAL_NUMBER_OF_POINTS 16#98 = MB_OVERRUN 16#99 = MB_TIME_OUT
Graphical illustration:			
<div><div>FbWRF06Config</div><div><div>xEnable</div><div>enumMB_ERROR</div><div>typWRF06 ▸</div></div></div>			
Function description:			
<p>The FbWRF06Config function block is used to configure the WRF06 multifunction room operating units (WRF06LCD RS485 Modbus). The room operating units can only be configured in conjunction with the ConfigWRF06 visualization interface contained in the library.</p> <p>The “typWRF06” input/output variable allows communication with the master function block and must be connected at FbWRF06Master with the variables of the same name.</p> <p>A communication error can be identified by the error code displayed at the “enumMB_ERROR” output. The “enumMB_ERROR” enumeration is in the Modb_I05.lib.</p>			
Note:			
The configuration module and visualization interface is needed only once for each bus segment.			

WRF06 Control (FbWRF06)

WAGO-I/O-PRO CAA Library Elements			
Category:		Building Technology	
Name:		FbWRF06	
Type:		Function <input type="checkbox"/>	Function block <input checked="" type="checkbox"/> Program <input type="checkbox"/>
Name of library:		ThermokonWRF06_01.lib	
Applicable to:		See Release Note	
Input parameters:		Data type:	Comment:
xEnable		BOOL	Enables communication with the room operating unit
enumDeviceType		enum DeviceTyp	Type of WRF06 room operating unit
bSlaveNo		BYTE	Slave No. of the room operating unit
tUpdateClock		TIME	Time interval for synchronizing the clock on the display Default = t#0s (no update)
dtActualTime		DT	Actual time for synchronizing the clock on the display
typWRF06_INPUT		typWRF06_INPUT	Data structure with the input values to be written to the room operating unit (input register).
rExternalValue1 : rExternalValue4		REAL	Input for external measured value 1-4 (-3276.8..3276.7) (Package 1)
rSetPoint1Offset		REAL	Set point 1 Offset [K] (Package 2)
rSetPoint2Offset		REAL	Set point 2 Offset [K] (Package 2)
rBasicSetPoint1		REAL	Basic set point 1 [°C/°F] (Package 2)
rBasicSetPoint2		REAL	Basic set point 2 [°C/°F] (Package 2)
enumFanStage		enumFan Stage	Fan stage setting (Package 3)
xRoomOccupied		BOOL	Room occupancy setting (Package 4)
xAlarmMessage1 : xAlarmMessage4		BOOL	Display of alarm message 1-4 (Package 5)
enumControlMode		Enum Control Mode	Control mode setting (Package 6)
iManualSetAnalogOutput1		INT	Manual mode analog output 1 (-1..1023) (Automatic = -1) (Package 7)
iManualSetAnalogOutput2		INT	Manual mode analog output 2 (-1..1023) (Automatic = -1) (Package 7)
rExternalTemperature		REAL	External temperature specification (3276.7 for internal temperature sensor) [°C] (Package 7)

xSymbolFailure	BOOL	Display "Failure" symbol (Package 8)
xSymbolHeating	BOOL	Display "Heating" symbol (Package 8)
xSymbolCooling	BOOL	Display "Cooling" symbol (Package 8)
xSymbolWindow	BOOL	Display "Window open" symbol (Package 8)
xSymbolDewPoint	BOOL	Display "Dew point" symbol (Package 8)
xSymbolOff	BOOL	Display "Off" symbol (Package 8)
Input/output parameters:	Data type:	Comment:
typWRF06	typWRF06	Data exchange with the FbWRF06Master function block
bRefresh	BYTE	Input for an input register refresh (2#00000010 -> send Package 2 to the room operating unit). The input bits are returned after refresh. 'xxxx.xxx1' = Refresh Package 1 'xxxx.xx1x' = Refresh Package 2 'xxxx.x1xx' = Refresh Package 3 'xxxx.1xxx' = Refresh Package 4 'xxx1.xxxx' = Refresh Package 5 'xx1x.xxxx' = Refresh Package 6 'x1xx.xxxx' = Refresh Package 7 '1xxx.xxxx' = Refresh Package 8
Return value:	Data type:	Comment:
enumMB_ERROR	enumMB_ERROR	Indication of communication errors 16#00 = MB_NO_ERROR 16#01 = MB_NOT_SUPPORTED_FUNCTION 16#03 = MB_ILLEGAL_DATA 16#90 = MB_EXTENDED_SLAVE_ERROR 16#96 = MB_CRC_ERROR 16#97 = MB_ILLEGAL_NUMBER_OF_POINTS 16#98 = MB_OVERRUN 16#99 = MB_TIME_OUT
typWRF06_OUTPUT	typWRF06_OUTPUT	Data structure with the output values of the room operating unit (output register)
xButton_1 : xButton_4	BOOL	Status of button 1 : Status of button 4
rTemperature	REAL	Current room temperature [°C/°F]
rSetTemperature1Offset	REAL	Offset set point 1 [K]
rSetTemperature1Effective	REAL	Set point 1 effective value [°C/°F]
rSetTemperature2Offset	REAL	Offset set point 2 [K]
rSetTemperature2Effective	REAL	Set point 2 effective value [°C/°F]
enumFanStage	enumFanStage	Display of the fan stage
xRoomOccupied	BOOL	Display of room occupancy
wDigitalInput1	WORD	Status digital input 1
wDigitalInput2	WORD	Status digital input 2

enumControlMode	enum Control Mode_ OUTPUT	Current control status
rAnalogValueTemperature	REAL	Analog value of the temperature [V] (Device type: 2V, VNS)
rAnalogSetPoint	REAL	Analog value of the set point [V] (Device type: 2V, 2VPS)
rAnalogValueRoomOccupancy	REAL	Analog value of the room occupancy (Device type: 2VPS)
rAnalogSetPoint1	REAL	Analog value of set point 1 [V] (Device type: VSS)
rAnalogSetPoint2	REAL	Analog value of set point 2 [V] (Device type: VSS)
rAnalogSetPointNight	REAL	Analog value of the night set point [V] (Device type: VNS)
wDigitalInput3	WORD	Status digital input 3 (Device type: DI4)
wDigitalInput4	WORD	Status digital input 4 (Device type: DI4)
rControlVariableHeating	REAL	Output of Heating control variable [%] (Device type: AO2V, DO2R, DO2T, OVR, OVT) (Output for device type AOK in [V]), for DO2R and DO2T 0..1)
rControlVariableCooling	REAL	Output of Cooling control variable [%] (Device type: AO2V, DO2R, DO2T, OVR, OVT) (Output for device type AOK in [V]), for DO2R and DO2T 0..1)
rControlVariableHeatingCooling	REAL	Output of the Heating/Cooling control variable [%] (Device type: AOV, AOFV)
rFanSpeed	REAL	Output of the fan stage (Device type: AOFV)

Graphical illustration:

Function description:

The **FbWRF06** is used to read the current values of a room operating unit. In addition, this function block can be used to change the values of the input register.

The “**xEnable**” input enables cyclic reading of the values and writing of the parameters.

The “**enumDeviceType**” input specifies the device type.

The “**bSlaveNo**” input specifies the address of the WRF06 room operating unit.

When a value is changed at the “**typWRF06_INPUT**” input or if the input value of “**bRefresh**” > 2#00000000, the function block sends the values at the “**typWRF06_INPUT**” input to the room operating unit.

The “**tUpdateClock**” input specifies the interval for synchronizing the time. The time is specified at the “**dtActualTime**” input, with which the room operating unit should be synchronized. The time is not synchronized if the update time is t#0s.

The “**typWRF06**” input/output variable establishes communication with the master function block. It must be connected at **FbWRF06Master** with the variable of the same name.

The “**enumMB_ERROR**” output displays the communication error that has occurred.

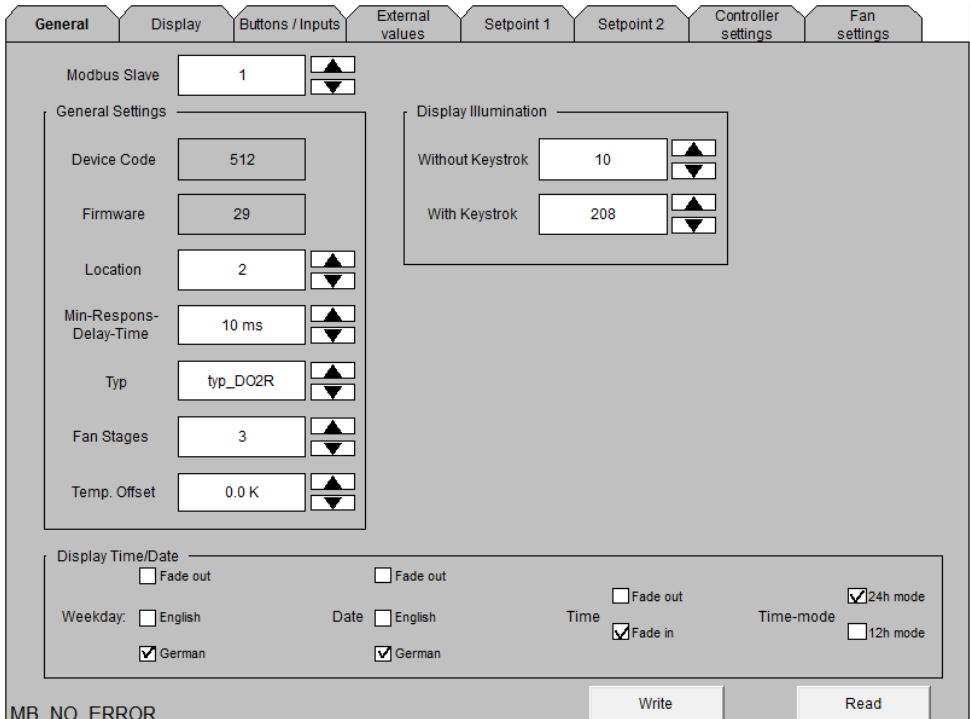
The output values of the room operating unit are displayed in the form of a data structure at the “**typWRF06_OUTPUT**” output.

Note:

- Configuration of the output values for the digital outputs is important for interpretation of the signals (see WRF06 Configuration Interface (ConfigWRF06)).
- The type of room operating unit must be set at the “**enumDeviceType**” input. Otherwise, the evaluation if necessary cannot be carried out correctly. The supported device types or input assignments are: typ_2V, typ_DI4, typ_AO2V, typ_DO2R, typ_DO2T, typ_OVR, typ_OVT, typ_2VPS, typ_AOV, typ_AOFV, typ_VSS, typ_VNS, typ_AOK.

Visualization Elements

WRF06 Configuration Interface (ConfigWRF06)

WAGO-I/O-PRO CAA Library Elements		
Category:	Building Technology	
Name:	ConfigWRF06	
Name of library:	ThermokonWRF06_01.lib	
Applicable to:	See Release Note	
Wildcard:	Data type:	Comment:
FbWRF06Config	Instance of FbWRF08 Config	Link between the visualization interface and the instance of FbWRF06Config
Graphical illustration:		
<p>1. General settings</p>  <p>The screenshot shows the 'General' tab selected. The 'Modbus Slave' is set to 1. Under 'General Settings', fields include Device Code (512), Firmware (29), Location (2), Min-Response-Delay-Time (10 ms), Typ (typ_DO2R), Fan Stages (3), and Temp. Offset (0.0 K). The 'Display Illumination' section has 'Without Keystrok' (10) and 'With Keystrok' (208). The 'Display Time/Date' section includes checkboxes for 'Fade out' and 'Fade in' for Time and Date, and 'Time-mode' with '24h mode' and '12h mode' options. At the bottom, there are 'Write' and 'Read' buttons and a status indicator 'MB_NO_ERROR'.</p>		

2. Display settings

General	Display	Buttons / Inputs	External values	Setpoint 1	Setpoint 2	Controller settings	Fan settings															
Modbus Slave <input type="text" value="1"/>																						
<div>Display</div> <div> Updating interval <input type="text" value="5 s"/> </div> <div> Room Temperature in °C or °F <input checked="" type="checkbox"/> Room Temperature with tenth digit <input checked="" type="checkbox"/> Room occupied after Reset <input checked="" type="checkbox"/> display room occupancy <input checked="" type="checkbox"/> Display fan stage <input checked="" type="checkbox"/> Text Room temperature Row 1 <input type="text"/> Text Room temperature Row 2 <input type="text" value="Raumtemperatur"/> </div>																						
<div>Alarm Messages</div> <table border="1"> <thead> <tr> <th></th> <th>Alarm Message 1</th> <th>Alarm Message 2</th> <th>Alarm Message 3</th> <th>Alarm Message 4</th> </tr> </thead> <tbody> <tr> <td>Row 1</td> <td><input type="text"/></td> <td><input type="text"/></td> <td><input type="text"/></td> <td><input type="text"/></td> </tr> <tr> <td>Row 2</td> <td><input type="text"/></td> <td><input type="text"/></td> <td><input type="text"/></td> <td><input type="text"/></td> </tr> </tbody> </table>									Alarm Message 1	Alarm Message 2	Alarm Message 3	Alarm Message 4	Row 1	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	Row 2	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	Alarm Message 1	Alarm Message 2	Alarm Message 3	Alarm Message 4																		
Row 1	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>																		
Row 2	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>																		
<div>Display Values</div> <div> <input checked="" type="checkbox"/> Room temperature <input checked="" type="checkbox"/> Time <input type="checkbox"/> Date <input checked="" type="checkbox"/> External value 1 <input type="checkbox"/> External value 2 <input type="checkbox"/> External value 3 <input type="checkbox"/> External value 4 <input type="checkbox"/> Set Point 1 offset <input checked="" type="checkbox"/> Set Point 1 effective <input type="checkbox"/> Set Point 2 offset <input type="checkbox"/> Set Point 2 effective </div>																						
MB_NO_ERROR <div>Write</div> <div>Read</div>																						

3. Configuration of the buttons and inputs

General	Display	Buttons / Inputs	External values	Setpoint 1	Setpoint 2	Controller settings	Fan settings
Modbus Slave <input type="text" value="1"/>							
<div>Button Configuration</div> <div> Button 1 <input type="text" value="without_special_function"/> Button 2 <input type="text" value="Set_point_Minus"/> Button 3 <input type="text" value="Fan_stage_Plus_with_AUTO"/> Button 4 <input type="text" value="Room_occupied_unoccupied_toggle"/> </div>							
<div>Input Configuration</div> <div> digital input 1 <input type="text" value="none_function"/> digital input 2 <input type="text" value="none_function"/> digital input 3 only device typ_DI4 <input type="text" value="none_function"/> digital input 4 only device typ_DI4 <input type="text" value="none_function"/> </div>							
MB_NO_ERROR <div>Write</div> <div>Read</div>							

4. Settings of the external measured values

General	Display	Buttons / Inputs	External values	Setpoint 1	Setpoint 2	Controller settings	Fan settings
Modbus Slave <input type="text" value="1"/>							
External value 1 display with tenth digit <input checked="" type="checkbox"/>				External value 2 display with tenth digit <input type="checkbox"/>			
Unit External value 1				Text External value 1			
Row 1 <input type="text"/>				Row 1 <input type="text"/>			
Row 2 <input type="text"/>				Row 2 <input type="text"/>			
Row 3 <input type="text"/>				Row 3 <input type="text"/>			
External value 3 display with tenth digit <input type="checkbox"/>				External value 4 display with tenth digit <input type="checkbox"/>			
Unit External value 3				Text External value 4			
Row 1 <input type="text"/>				Row 1 <input type="text"/>			
Row 2 <input type="text"/>				Row 2 <input type="text"/>			
Row 3 <input type="text"/>				Row 3 <input type="text"/>			
MB_NO_ERROR				Write		Read	

5. Configuration of set point 1 (set point 1)

General	Display	Buttons / Inputs	External values	Setpoint 1	Setpoint 2	Controller settings	Fan settings
Modbus Slave <input type="text" value="1"/>							
Display Set Point 1 with tenth digit <input checked="" type="checkbox"/>							
Adjustment Set Point 1 effective or offset <input checked="" type="checkbox"/>							
Display Set Point 1 Basic Set Point + Offset or Control Set Point <input checked="" type="checkbox"/>							
Set Point 1							
upper adjustable range Set Point 1 <input type="text" value="3.0"/>				Unit Set Point 1 Row 1 <input type="text" value="°C"/>			
Lower adjustable range Set Point 1 <input type="text" value="-3.0"/>				Unit Set Point 1 Row 2 <input type="text"/>			
Jumping distance Set Point 1 <input type="text" value="0.5"/>				Unit Set Point 1 Row 3 <input type="text"/>			
Set Point 1 after Reset <input type="text" value="22.0"/>				Text Set Point 1 Row 1 <input type="text"/>			
				Text Set Point 1 Row 2 <input type="text" value="Sollwert 1"/>			
MB_NO_ERROR				Write		Read	

6. Configuration of set point 2 (set point 2)

General	Display	Buttons / Inputs	External values	Setpoint 1	Setpoint 2	Controller settings	Fan settings
Modbus Slave <input type="text" value="1"/>							
<div>Display</div> <div> Set Point 2 with tenth digit <input checked="" type="checkbox"/> Adjustment Set Point 2 effective or offset <input checked="" type="checkbox"/> </div>							
<div>Set Point 2</div> <div> <div> upper adjustable range Set Point 2 <input type="text" value="3.0"/> Lower adjustable range Set Point 2 <input type="text" value="-3.0"/> Jumping distance Set Point 2 <input type="text" value="0.5"/> Set Point 2 after Reset <input type="text" value="22.0"/> </div> <div> Unit Set Point 2 Row 1 <input type="text" value="°C"/> Unit Set Point 2 Row 2 <input type="text"/> Unit Set Point 2 Row 3 <input type="text"/> Text Set Point 2 Row 1 <input type="text"/> Text Set Point 2 Row 2 <input type="text" value="Sollwert 2"/> </div> </div>							
MB_NO_ERROR				Write		Read	

7. Configuration of the controller

General	Display	Buttons / Inputs	External values	Setpoint 1	Setpoint 2	Controller settings	Fan settings
Modbus Slave <input type="text" value="1"/>							
<div>General settings</div> <div> Night-lowering <input type="text" value="4.0 K"/> Night-lowering after <input type="text" value="0 min"/> Control Mode <input type="text" value="Control_auto"/> </div>				<div>General settings Setpoint 1</div> <div> PWM-Cycle time <input type="text" value="15 min"/> Dead zone between heating and cooling <input type="text" value="4.0 K"/> Antifreeze <input type="text" value="6.0 K"/> min. control variable with control variable > 0 <input type="checkbox"/> </div>			
<div>Parameter heating Setpoint1</div> <div> Proportional range xP <input type="text" value="4.0 K"/> Reset time Tn <input type="text" value="100 min"/> max. Control variable <input type="text" value="100 %"/> min. Control variable <input type="text" value="0 %"/> </div>				<div>Parameter cooling Setpoint 1</div> <div> Proportional range xP <input type="text" value="4.0 K"/> Reset time Tn <input type="text" value="100 min"/> max. Control variable <input type="text" value="100 %"/> min. Control variable <input type="text" value="0 %"/> </div>			
MB_NO_ERROR				Write		Read	

8. Configuration of the fan stages

General	Display	Buttons / Inputs	External values	Setpoint 1	Setpoint 2	Controller settings	Fan settings																								
Modbus Slave <input type="text" value="1"/>																															
Parameter heating Setpoint1 <table border="1"> <tr> <td>Fan stage 1</td> <td><input type="text" value="10 %"/></td> <td>▲▼</td> </tr> <tr> <td>Fan stage 2</td> <td><input type="text" value="30 %"/></td> <td>▲▼</td> </tr> <tr> <td>Fan stage 3</td> <td><input type="text" value="70 %"/></td> <td>▲▼</td> </tr> <tr> <td>min. Fan stage</td> <td><input type="text" value="Fan_off"/></td> <td>▲▼</td> </tr> </table>				Fan stage 1	<input type="text" value="10 %"/>	▲▼	Fan stage 2	<input type="text" value="30 %"/>	▲▼	Fan stage 3	<input type="text" value="70 %"/>	▲▼	min. Fan stage	<input type="text" value="Fan_off"/>	▲▼	Parameter cooling Setpoint 1 <table border="1"> <tr> <td>Fan stage 1</td> <td><input type="text" value="10 %"/></td> <td>▲▼</td> </tr> <tr> <td>Fan stage 2</td> <td><input type="text" value="30 %"/></td> <td>▲▼</td> </tr> <tr> <td>Fan stage 3</td> <td><input type="text" value="70 %"/></td> <td>▲▼</td> </tr> <tr> <td>min. Fan stage</td> <td><input type="text" value="Fan_off"/></td> <td>▲▼</td> </tr> </table>				Fan stage 1	<input type="text" value="10 %"/>	▲▼	Fan stage 2	<input type="text" value="30 %"/>	▲▼	Fan stage 3	<input type="text" value="70 %"/>	▲▼	min. Fan stage	<input type="text" value="Fan_off"/>	▲▼
Fan stage 1	<input type="text" value="10 %"/>	▲▼																													
Fan stage 2	<input type="text" value="30 %"/>	▲▼																													
Fan stage 3	<input type="text" value="70 %"/>	▲▼																													
min. Fan stage	<input type="text" value="Fan_off"/>	▲▼																													
Fan stage 1	<input type="text" value="10 %"/>	▲▼																													
Fan stage 2	<input type="text" value="30 %"/>	▲▼																													
Fan stage 3	<input type="text" value="70 %"/>	▲▼																													
min. Fan stage	<input type="text" value="Fan_off"/>	▲▼																													
Configuration page for Devices with fan control																															
MB_NO_ERROR				Write		Read																									

Function description:

The individual configuration parameters of the multifunction room operating units can be set in the ConfigWRF06 visualization. In addition, the visualization interface allows you to view the existing settings. There are input elements on the interface for each displayable text of the room operating unit.

Note:

- Pay attention to the type when configuring the WRF06 room operating unit. Not all settings are relevant for all types (see WRF06 RS-485 Modbus® protocol description).
- Visualization requires the **FbWRF06Config** function block.
- The interface is only available if the **FbWRF06Config** function block has been enabled using the "**xEnable**" input at the function block.
- Configuration options of the digital inputs

Input Configuration	WRF06LCD Function	Output values of typWRF06_OUTPUT
none_function	No action	Status (normally open contact)
open_contact	No action	Status (normally closed contact)
open_dew_point	Dew point (normally closed contact)	Status (normally closed contact)
open_energy_hold_off	Window contact (normally closed contact)	Status (normally closed contact)

open_alarm_message	Alarm message (normally closed contact)	Status (normally closed contact)
open_room_occupancy	Room occupancy (normally closed contact)	Status (normally closed contact)
open_message	Message (normally closed contact)	Status (normally closed contact)
open_controller_auto_off	Controller Auto/Off (normally closed contact)	Status (normally closed contact)
open_control_heating_cooling	Heating/cooling (normally closed contact)	Status (normally closed contact)
open_counter_rising_edge	No action	Counter of the rising edges between two read cycles (normally closed contact)
open_counter_rising_falling_edge	No action	Counter of the rising and falling edges between two read cycles (normally closed contact)
open_impulse_time	No action	Measurement of the impulse time in 100 ms between two read cycles (normally closed contact)
open_reset_set_temperature_1	Reset of set point 1 to base set point (normally closed contact)	Status (normally closed contact)
close_contact	No action	Status (normally open contact)
close_dew_point	Dew point (normally open contact)	Status (normally open contact)
close_energy_hold_off	Window contact (normally open contact)	Status (normally open contact)
close_alarm_message	Alarm message (normally open contact)	Status (normally open contact)
close_room_occupancy	Room occupancy (normally open contact)	Status (normally open contact)
close_message	Message (normally open contact)	Status (normally open contact)
close_controller_auto_off	Controller Auto/Off (normally open contact)	Status (normally open contact)
close_control_heating_cooling	Heating/cooling (normally open contact)	Status (normally open contact)

close_counter_rising_edge	No action	Counter of the rising edges between two read cycles (normally open contact)
close_counter_rising_falling_edge	No action	Counter of the rising and falling edges between two read cycles (normally open contact)
close_impulse_time	No action	Measurement of the impulse time in 100 ms between two read cycles (normally open contact)
close_reset_set_temperature_1	Reset of set point 1 to base set point (normally open contact)	Status (normally open contact)



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