

WAGO I/O SYSTEM 750

Libraries for Building Automation



Block Description for Connecting Thermokon Thanos MODBUS Room Operating Panels

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WAGO-I/O-PRO CAA library for building automation

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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 are 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 admitted 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.

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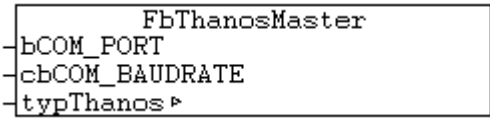
Scope of Validity

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 thanos (FbThanosMaster)

WAGO-I/O-PRO CAA Library Elements		
Category:	Building Automation	
Name:	FbThanosMaster	
Type:	Function <input type="checkbox"/>	Function block <input checked="" type="checkbox"/> Program <input type="checkbox"/>
Name of library:	ThermokonThanos_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 -> 1. connected serial module 3 -> 2nd connected serial module
cbCOM_BAUDRATE	COM_BAUDRATE	Baud rate: BAUD_19200 := 1920 Default = BAUD_19200
Input/output parameters:	Data type:	Comment:
typThanos	typThanos	Data exchange between the master block and the slave blocks
Graphical illustration:		
 <pre> FbThanosMaster - bCOM_PORT - cbCOM_BAUDRATE - typThanos </pre>		

Functional Description

The **FbThanosMaster** function block can be used to connect the Thanos MODBUS room operating panel to the WAGO-I/O-SYSTEM. MODBUS communication is implemented via an RS-485 serial interface module.

The **FbThanosMaster** allows for communication with the multi-function room operating panels via an RS-485 serial interface module. The "**typThanos**" variable facilitates the connection with other "Thanos" function blocks.

The number of the serial interfaces used can be set at the "**bcOM_PORT**" input.

Example:

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

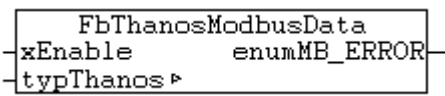
The baud rate is set at the "**cbCOM_BAUDRATE**" input. The baud rate set here must match the baud rate of the multi-function room operating panels from Thermokon.

Hardware:

The 750-652 RS-485 module is used as the interface. The function block configures the module with the following parameters:

Baud rate:	19200
Data bits:	8
Stop bits:	1
Parity:	Even
Duplex mode:	Half duplex

User-specific MODBUS Commands (FbThanosModbusData)

WAGO-I/O-PRO CAA Library Elements		
Category:	Building Automation	
Name:	FbThanosModbusData	
Type:	Function <input type="checkbox"/>	Function block <input checked="" type="checkbox"/> Program <input type="checkbox"/>
Name of library:	ThermokonThanos_01.lib	
Applicable to:	See Release Note	
Visualizations used:	ModbusDataThanos	
Input parameters:		
	Data type:	Comment:
xEnable	BOOL	Module enable
Input/output parameters:		
	Data type:	Comment:
typThanos	typThanos	Data exchange with the FbThanosMaster master 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:		
		
Functional Description		
<p>The FbThanosModbusData function block is used to send user-specific MODBUS commands to the Thanos room operating panel. It can be used to make changes in or to read the registers of the room operating panels specifically. The ModbusDataThanos visualization interface is used to control communication with the room operating panels.</p> <p>The "typThanos" input/output variable allows communication with the master function block and must be connected at FbThanosMaster 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> <p>Note: The communication module and visualization interface is needed only once for each bus segment.</p>		

Control of thanos (FbThanos)

WAGO-I/O-PRO CAA Library Elements		
Category:	Building Automation	
Name:	FbThanos	
Type:	Function <input type="checkbox"/>	Function block <input checked="" type="checkbox"/> Program <input type="checkbox"/>
Name of library:	ThermokonThanos_01.lib	
Applicable to:	See Release Note	
Input parameters:	Data type:	Comment:
xEnable	BOOL	Enables communication with the room operating panel
bSlaveNo	BYTE	Slave No. of the room operating panel
xAdditionalInput	BOOL	Reads the status of the digital inputs and status buttons (TRUE activates read)
dtActualTime	DT	Actual time for synchronizing the clock on the display (wRefreshInput bit 1)
typThanosInputPanel	typThanos InputPanel	Data structure with input values to be written to the room operating panel (input register).
bDefaultFanStage	BYTE	Fan stage setting 0 = Fan OFF 1 = Stage 1 2 = Stage 2 3 = Stage 3 (wRefreshInput bit 2)
xDefaultFanAuto	BOOL	Fan mode FALSE = Manual mode TRUE = Automatic mode (wRefreshInput bit 2)
bDefaultRoomOccupancy	BYTE	Room occupancy setting 0 = Room not occupied 1 = Room occupied 2 = Stand-by (wRefreshInput bit 3)
wBypassTimeReTrigger	WORD	Lowering delay setting [s] (wRefreshInput bit 4)
bSchowMessageNr	BYTE	Messages to display setting 0 = No message 1..8 = Message 1..8 (wRefreshInput bit 5)
typThanosInputExternal TempHumi	typThanos Input External TempHumi	External temperature and humidity value setting (wRefreshInput bit 6)
rExternalTemperature	REAL	Setting for external temperature [°C] 3276.7 = Internal sensor
rExternalHumidity	REAL	Setting for external humidity 3276.7 = Internal sensor

typThanosFeedback	typThanos Feedback	Function feedback (wRefreshInput bit 7)
xFeedbackLight0 : xFeedbackLight9	BOOL	Light function feedback TRUE = Light ON FALSE = Light OFF
xFeedbackBlind0 : xFeedbackBlind9	BOOL	Blind feedback TRUE = Blind DOWN FALSE = Blind UP
xFeedbackUniversal0 : xFeedbackUniversal9	BOOL	Universal function feedback TRUE = Universal ON FALSE = Universal OFF
typThanosInput ExternalValues	typThanos Input External Values	External value setting (wRefreshInput bit 8)
rExternalValue1 : rExternalValue6	REAL	External value setting
typThanosInputSetPoint	typThanos Input SetPoint	Individual set point setting (Set point 1-3 wRefreshInput bit 9) (Set point 4-6 wRefreshInput bit 10)
rOffsetSetPoint1 : rOffsetSetPoint6	REAL	Setting of the offset of the respective set points
rBasicSetPoint1 : rBasicSetPoint6	REAL	Setting of the respective basic set point
typThanosInputController1 : typThanosInputController6	typThanos Input Controller	Controller value setting (Controller 1-6 wRefreshInput bit 11-16)
rActualValue	REAL	Actual value setting
bOccupancy	BYTE	Room occupancy setting 0 = Not occupied 1 = Occupied 2 = Stand-by
xEnergyHoldOff	BOOL	Energy hold-off setting TRUE = Activated FALSE = Not activated
bControllerMode	BYTE	Controller mode setting 0 = Controller OFF 1 = Heating 2 = Cooling 3= Controller automatic
rBasicSetPoint	REAL	Basic set point setting
xDewPoint	BOOL	Dew point setting TRUE = Active FALSE = Inactive
wTriggerBypassTime	WORD	Lowering delay setting [s]
rDefaultSetPointOffset	REAL	Set point offset [K] setting

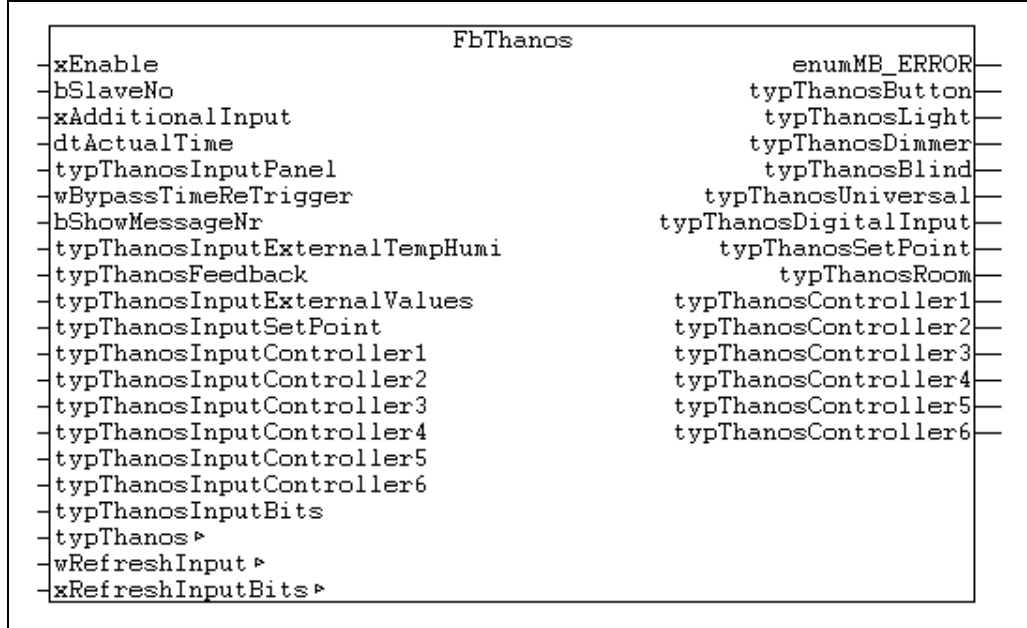
typThanosInputBits	typThanosInputBits	Input bits of the room operating panel setting (xRefreshInputBits)
xSymbolFailure	BOOL	Display "Error" symbol TRUE = Display FALSE = Hide
xSymbolHeating	BOOL	Display "Heating" symbol
xSymbolCooling	BOOL	Display "Cooling" symbol
xSymbolWindow	BOOL	Display "Window" symbol
xSymbolDewPoint	BOOL	Display "Dew point" symbol
xKeyLock	BOOL	Lock key TRUE = Lock FALSE = Do not lock
xLockRoomOccupancy	BOOL	Lock room occupancy
xLockFanStage	BOOL	Lock fan stage
xLockSetPoint	BOOL	Lock set point
xActivateIllumination	BOOL	Activate display illumination permanently TRUE = Switch ON FALSE = Default
Input/output parameters:		
typThanos	typThanos	Data exchange with the FbThanosMaster master function block
wRefreshInput	WORD	Transfer of the input values to the input register (value is reset after transfer) 'xxxx.xxxx.xxxx.xxx1' = Transfer time 'xxxx.xxxx.xxxx.xx1x' = Fan control 'xxxx.xxxx.xxxx.x1xx' = Room occupancy 'xxxx.xxxx.xxxx.1xxx' = Lowering delay 'xxxx.xxxx.xxx1.xxxx' = Display messages 'xxxx.xxxx.xx1x.xxxx' = External temperature & humidity 'xxxx.xxxx.x1xx.xxxx' = Feedback 'xxxx.xxxx.1xxx.xxxx' = External values 'xxxx.xxx1.xxxx.xxxx' = Set point settings Set point 1-3 'xxxx.xx1x.xxxx.xxxx' = Set point settings Set point 4-6 'xxxx.x1xx.xxxx.xxxx' = Controller 1 setting 'xxxx.1xxx.xxxx.xxxx' = Controller 2 setting 'xxx1.xxxx.xxxx.xxxx' = Controller 3 setting 'xx1x.xxxx.xxxx.xxxx' = Controller 4 setting 'x1xx.xxxx.xxxx.xxxx' = Controller 5 setting '1xxx.xxxx.xxxx.xxxx' = Controller 6 setting
xRefreshInputBits	BOOL	Transfer of input bits (typThanosInputBits) (Variable is reset after transfer) TRUE = Transfer input bits

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
typThanosButton	typThanosButton	Data structure with the button states
xButton_1 : xButton_31	BOOL	Status of button 1 : Status of button 31 (Status query of buttons 16-31 must be enabled via xAdditionalInput)
typThanosLight	typThanosLight	Output of the current lighting status
xLight0 : xLight9	BOOL	Light 1 status : Light 9 status TRUE = Light ON FALSE = Light OFF
typThanosDimmer	typThanosDimmer	Output of the current status of the dimmer switch
xDimmerSwitchPlus0 : xDimmerSwitchPlus9	BOOL	Status of dimmer switch 1 + : Status of dimmer switch 9 + TRUE = Pressed FALSE = No pressed
xDimmerSwitchMinus0 : xDimmerSwitchMinus9	BOOL	Status of dimmer switch 1 - : Status of dimmer switch 9 - TRUE = Pressed FALSE = No pressed
typThanosBlind	typThanosBlind	Output of the current status of the blind functions
xBlind0 : xBlind9	BOOL	Output of current blind status 1 : Output of current blind status 9 TRUE = Blind DOWN FALSE = Blind UP
xBlindPlus0 : xBlindPlus9	BOOL	Status of blind switch 1 + : Status of blind switch 9 + TRUE = Pressed FALSE = Not pressed
xBlindMinus0 : xBlindMinus9	BOOL	Status of blind switch 1 -: Status of blind switch 9 - TRUE = Pressed FALSE = Not pressed

typThanosUnsiversal	typThanos Universal	Output of the current status of the universal functions
xUniversal0 : xUniversal9	BOOL	Status of universal function 1 : Status of universal function 9 TRUE = ON FALSE = OFF
typThanosDigitalInput	typThanos Digital Input	Output of the current status of the digital inputs. The values displayed depend on the configuration (status query must be enabled via xAdditionalInput).
wDigitalInput1 : wDigitalInput4	WORD	Status of digital input 1 : Status of digital input 4
typThanosSetPoint	typThanos SetPoint	Output of the current set points
rCurrentOffsetSetPoint1 : rCurrentOffsetSetPoint6	REAL	Current offset of set point 1 [°C] : Current offset of set point 6 [°C]
rSetPointEffective1 : rSetPointEffective6	REAL	Current set point 1 [°C] : Current set point 6 [°C]
typThanosRoom	typThanos Room	Output of the current room status
rTemperature	REAL	Output of current room temperature [°C]
rHumidity	REAL	Output of the current room humidity [%]
xFanAuto	BOOL	Output of the fan mode TRUE = Automatic FALSE = Manual
bFanStage	BYTE	Output of the current fan stage 0 = OFF 1 = Stage 1 2 = Stage 2 3 = Stage 3
xRoomOccupancy	BOOL	Output of the current room occupancy TRUE = Room occupied FALSE = Room not occupied
typThanosController1 : typThanosController6	typThanos Controller	Output of the current status of controller 1 : Output of the current status of controller 6
rVariableHeating	REAL	Variable heating
rVariableCooling	REAL	Variable cooling
xPWM_SignalHeating	BOOL	PWM signal heating
xPWM_SignalCooling	BOOL	PWM signal cooling
bControlMode	BYTE	Current control mode 0 = OFF 1 = Heating 2 = Cooling 3 = Heating automatic mode 4 = Cooling automatic mode
bFanStageController	BYTE	Current controller fan stage 0 = OFF 1 = Stage 1 2 = Stage 2 3 = Stage 3

rControllerSetPoint Effective	REAL	Effective controller set point [°C]
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Graphical illustration:



Functional description:

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

The "**xEnable**" input enables the function block.

The "**bSlaveNo**" input specifies the MODBUS address of the Thanos room operating panel.

The "**wRefreshInput**" input can be used to write the values at the respective inputs to the input register of the room operating panel. "**xRefreshInputBits**" triggers the transfer of values at the "**typThanosInputBits**" input. After successful transfer of the input values, the respective statuses of "**wRefreshInput**" and "**wRefreshInput**" are again reset.

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

The "**typThanos**" input/output variable establishes communication with the master function block. It must be connected at **FbThanosMaster** with the variable of the same name.

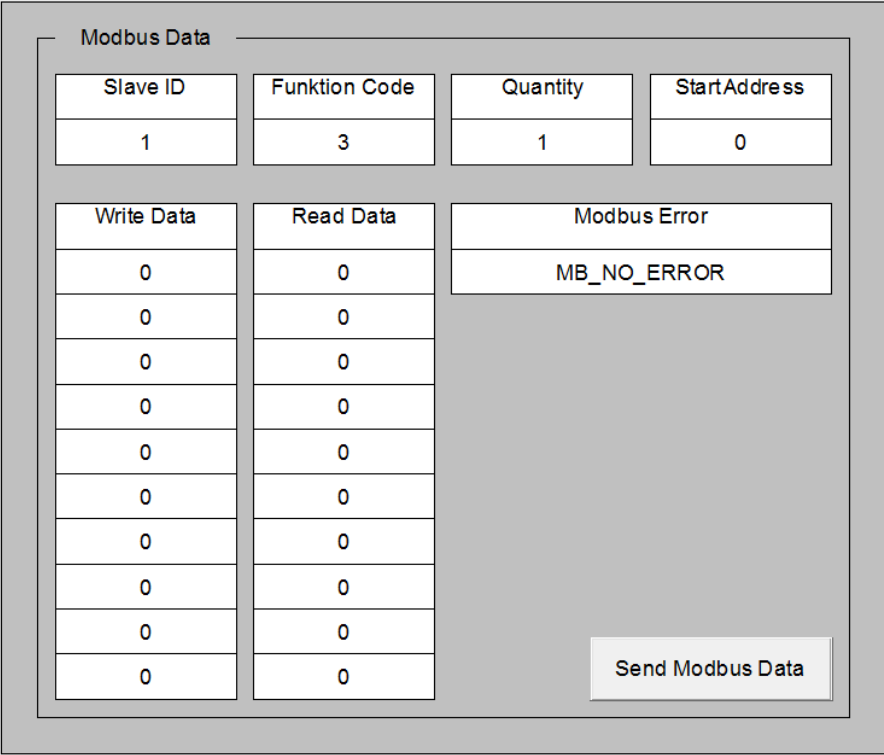
The status of the room operating panel can be evaluated via the outputs available at the function block.

Note:

- Configuration of the output values for the digital outputs is important for interpretation of the signals.
- Not all outputs of the room operating panel except the buttons and digital inputs if necessary are read in each program cycle.
- The input values are only transferred when requested (see "**wRefreshInput**" and "**xRefreshInputBits**" inputs).

Visual Display Elements

Input Interface for MODBUS Commands (ModbusDataThanos)

WAGO-I/O-PRO CAA Library Elements		
Category:	Building Automation	
Name:	ModbusDataThanos	
Name of library:	ThermokonThanos_01.lib	
Applicable to:	See Release Note	
Wildcard:	Data type:	Comment:
FbThanosModbusData	Instance of FbThanos Modbus Data	Link between the visualization interface and the instance of FbThanosModbusData
Graphical illustration:		
		

Functional description:

The **ModbusDataThanos** visualization can be used to transfer MODBUS commands to the room operating panel.

Input field	Function		
Slave ID	MODBUS address of the room operating panel		
Function code	MODBUS function code		
	Hex.	Dec.	Description
	0x01	1	Read bit position(s)
	0x02	2	
	0x03	3	Read register
	0x04	4	
	0x05	5	Write single bit
	0x06	6	Write single register
	0x0F	15	Write multiple bits
0x10	16	Write multiple registers	
Quantity	Quantity of data to write		
Start Address	Start address from which the data should be written to the registers.		
Write Data	Data to write (from top to bottom)		
Read Data	Data to read (from top to bottom)		
Modbus Error	MODBUS error code		



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