

Library Description



Building



Automation



**WAGO-I/O-
PRO V2.3**

ThermokonJOY.lib

**WAGO-I/O-PRO Library for
Connecting
the Thermokon JOY Room
Control Devices**

Version 1.0.0



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Number Notation

Table 1: Number Notation

Number System	Example	Comment
Decimal	100	Normal notation
Hexadecimal	0x64	C notation
Binary	'100' '0110.0100'	In single quotes, nibble separated by a period

Font Conventions

Table 2: Font Conventions

Font Type	Explanation
<i>italic</i>	Names of paths and files are shown in italics, e.g.: <i>C:\Programs\WAGO-I/O-CHECK</i>
Menu	Menu options are shown in bold, e.g.: Save
>	A “greater than” symbol between two names denotes the selection of a menu option, e.g.: File > New
Input	Names of input or selection fields are shown in bold, e.g.: Start of measurement range
“Value”	Input or selection values are shown in quotation marks, e.g.: Enter the value “4 mA” under Start of measurement range .
[Button]	Button labels within the dialogs are shown in bold and enclosed in square brackets, e.g.: [Input]
[Key]	Key labels on the keyboard are shown in bold and enclosed in square brackets, e.g.: [F5]

Symbols

DANGER



Warning against personal injury!

Indicates a high-risk, imminently hazardous situation which, if not avoided, will result in death or serious injury.

DANGER



Do not work on components while energized!

Indicates a high-risk, imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING



Warning against personal injury!

Indicates a moderate-risk, potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION



Warning against personal injury!

Indicates a low-risk, potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

NOTICE



Warning against damage to property!

Indicates a potentially hazardous situation which, if not avoided, may result in damage to property.

ESD



Warning against damage to property caused by electrostatic discharge!

Indicates a potentially hazardous situation which, if not avoided, may result in damage to property.

Note



Important note!

Indicates a potential malfunction, but one which will not result in damage to property if not avoided.

Information



Additional Information

Refers to additional information which is not an integral part of this documentation (e.g., the Internet).

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Moreover, the persons named here must also be familiar with all of the products cited in this document, along with the operating instructions. They must also be capable of correctly predicting any hazards which may not arise until the products are combined.

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The sample applications described in this documentation represent concepts, that is, technically feasible applications. Whether these concepts can actually be implemented depends on various general conditions. For example, different versions of the hardware or software components may require different handling than that described here. Therefore, the descriptions contained in this documentation do not form the basis for assertion of a particular product characteristic.

Responsibility for safe use of a specific software or hardware configuration lies with the party that produces or operates the configuration. This also applies if one of the concepts described in this document was used for implementation of the configuration.

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Function Blocks:

1 FbJOY_Master

WAGO-I/O-PRO CAA Library Elements			
Category:		Building Technology	
Name:		FbJOY_Master	
Type:		Function <input type="checkbox"/>	Function block <input checked="" type="checkbox"/> Program <input type="checkbox"/>
Name of Library:		ThermokonJOY.lib	
Applicable to:		See Release Note	
Libraries used:		SerComm.lib Serial_Interface_01.lib mod_com.lib SysLibMem.lib Modb_i05.lib	
Input Parameter:		Data Type:	Comment:
bCOM_PORT		BYTE	No. of the serial interface used 1 -> Internal service interface 2 -> first connected serial interface 3 -> second connected serial interface
bPortJOY		BYTE	Master ID number Default setting = 1 Area: 1-MAX_JOYMASTER
Return value:		Data Type:	Comment:
eMBError		enumMB_ERROR	Indication of communication errors 0= MB_NO_ERROR 1= MB_NOT_SUPPORTED_FUNCTION 3= MB_ILLEGAL_DATA 144= MB_EXTENDED_SLAVE_ERROR 150= MB_CRC_ERROR 151= MB_ILLEGAL_NUMBER_OF_POINTS 152= MB_OVERRUN 153= MB_TIME_OUT
Graphical Illustration:			
<div><div>FbJOY_Master</div><div>bCOM_PORTeMBError</div><div>bPortJOY</div></div>			

Function Description:

The **“FbJOY_Master”** function block can be used to connect Thermokon JOY products to the WAGO-I/O-SYSTEM. Modbus RTU communication is implemented via the serial interface 750-652.

The number of the serial interface used is set by **“bCOM_PORT”**.

Example:

- 1 -> Internal service interface
- 2 -> first connected serial interface
- 3 -> second connected serial interface

The **“bPortJOY”** input serves to synchronize this module with the other JOY RTU function blocks.

To identify an error, the current error code is displayed at the output **“eMB_Error”**. The **“enumMB”** enumeration is found in Modb_I05.lib.

2 FbJOY

WAGO-I/O-PRO CAA Library Elements			
Category:		Building Technology	
Name:		FbJOY	
Type:		Function <input type="checkbox"/>	Function block <input checked="" type="checkbox"/> Program <input type="checkbox"/>
Name of Library:		ThermokonJOY.lib	
Applicable to:		See Release Note	
Libraries used:		SerComm.lib Serial_Interface_01.lib mod_com.lib Modb_i05.lib	
Input Parameter:		Data Type:	Comment:
xEnable		BOOL	Starts cyclical polling of the connected module Default: TRUE
bPortJOY		BYTE	Master ID number Default setting = 1 Area: 1- MAX_JOYMASTER
bSlaveNo		BYTE	Slave address of the device Default: 1
dtActualTime		DT	Current date and time for display on the JOY
rBasicSetpoint		REAL	Basic setpoint for the JOY device Default: 21
rSetpointAdjustment_In		REAL	Will override the actual setpoint adjustment if xSetSetpointAdjustment_In will be set.
xSetSetpointAdjustment_In		BOOL	Override actual setpoint adjustment on JOY (Edge controlled)
xDisableLocalControl		BOOL	TRUE= Disable local control buttons
Input/Output Parameter.:		Data Type:	Comment:
typConfigJOY		typConfigJOY	Configuration parameters
.bTimeFormat		BYTE	Display Time format 0: 24h(pm), 64= 12h(am), 255: Not displayed) Default: 0
.bDateFormat		BYTE	Display Date format 0: DD.MM.YY, 1: YY/MM/DD, 255: NOT displayed) Default: 0

WAGO-I/O-PRO CAA Library Elements		
.bDisplayTemperature	BYTE	Display Temperature: 0: Room temperature, 1: Absolute setpoint (Basis+SetpointAdjustment), 2: Setpoint offset (SetpointAdjustment) Default: 0
.bBrightnessLCD	BYTE	LCD brightness: 0-100% Default: 90%
.bBrightnessRing	BYTE	Ring brightness: 0-100% Default: 20%
.xEnglishLanguage	BOOL	Language change: TRUE= English FALSE= German Default: FALSE
.xDegreesFahrenheit	BOOL	Display Temperature in °F: TRUE= °F FALSE= °C Default: FALSE
.xEnableOccupancy	BOOL	TRUE= Use On/Off Button as Occupancy button Default: TRUE
.rStepsFanControl	REAL	Amount of Fan stages Default: 3
.rFanMinimum	REAL	Minimum fan value for output rFanStage Default: 0
.rFanMaximum	REAL	Maximum fan value for output rFanStage Default: 100
.bFanType	BYTE	Fan type= 0: Fan with AUTOMATIC, 1: Fan without AUTOMATIC, 2: Fan with AUTOMATIC, without MANUAL OFF Default: 0
.rMaxSetpointAdjustment	REAL	Adjustment range of set point (0-10): 1: +/-1 2: +/-2 3: +/-3 Default: 3
.rStepSetpointAdjustment	REAL	Determines the step size of the set point (0-10): 0.5= 0.5K 1= 1K Default: 0.5
.wDeviceType	WORD	Device type in Hex
.wFirmwareVersion	WORD	Firmware version in Hex
.xReadConfig	BOOL	Read actual configuration of the device.
.xWriteConfig	BOOL	Write actual configuration on the device. Attention: EEPROM memory, don't write it cyclic.

Return Value:	Data Type:	Comment:
eMError	enumMB_ERROR	Indication of communication errors 0= MB_NO_ERROR 1= MB_NOT_SUPPORTED_FUNCTION 3= MB_ILLEGAL_DATA 144= MB_EXTENDED_SLAVE_ERROR 150= MB_CRC_ERROR 151= MB_ILLEGAL_NUMBER_OF_POINTS 152= MB_OVERRUN 153= MB_TIME_OUT
rRoomTemperature	REAL	Current temperature
rSetpointTemperature	REAL	Setpoint temperature
rSetpointAdjustment_Out	REAL	Setpoint offset in K
rFanStage	REAL	Actual fan stage 0: off 1: stage 1 2: stage 2 3: stage 3 -255 (=0xFF01hex): Auto stage 1 -254 (=0xFF02hex): Auto stage 2 -253 (=0xFF03hex): Auto stage 3
xFanAutomatic	BOOL	Fan stage is in automatic mode
xRoomOccupied	BOOL	Room occupied by On/Off Button
Graphical Illustration:		
<div><div>FbJOY</div><div><div><div>xEnable</div><div>bPortJOY</div><div>bSlaveNo</div><div>dtActualTime</div><div>rBasicSetpoint</div><div>rSetpointAdjustment_In</div><div>xSetSetpointAdjustment_In</div><div>xDisableLocalControl</div><div>typConfigJOY ▶</div></div><div><div>eMError</div><div>rRoomTemperature</div><div>rSetpointTemperature</div><div>rSetpointAdjustment_Out</div><div>rFanStage</div><div>xFanAutomatic</div><div>xRoomOccupied</div><div>▶ typConfigJOY</div></div></div></div>		

Function Description:

The **FbJOY** reads the data from the JOY room control device.

A continuous TRUE signal at the **"xEnable"** input activates the readout process, and a FALSE signal deactivates it.

The function block is synchronized with the communication module (FbJOY_Master) via the **"bPortJOY"** input.

The device address is specified at the **"bSlaveNo"** input. By assigning different addresses, you can address multiple devices via one serial I/O module. This input is assigned "1" by default.

"dtActualTime" is used for displaying the date and time on the JOY device. The actual time of the controller can be read out by using the library SysLibRTC.

Input **"rBasicSetpoint"** forms the setpoint basis for **"rSetpointTemperature"**.

If the input **"xSetSetpointAdjustment_In"** are TRUE, the setpoint value **"rSetpointAdjustment_In"** will override the setpoint values **"rSetpointAdjustment_Out"**. For example to reset the setpoint to a basic setting.

The local operation can be deactivated via **"xDisableLocalControl"**.

The JOY configuration is stored in the **"typConfigJOY"** structure and should therefore be declared RETAIN PERSISTENT in the program.

To identify an error, the current error code is displayed at the output **"eMB_Error"**. The **"enumMError"** enumeration is found in Modb_I05.lib.

The actual measured room temperature will be outputted on **"rRoomTemperature"**.

The current setpoint temperature is output on **"rSetpointTemperature"** and the temperature adjustment on **"rSetpointAdjustment_Out"**.

"rFanStage" outputs in steps (typJOY.rStepsFanControl) the actual fan stage 0-100% and -256= Automatic, the values depends on the settings typJOY.rFanMinimum and typJOY.rFanMaximum.

"xFanAutomatic" is TRUE if fan stage is in automatic mode.

"xRoomOccupied" indicate if room is occupied by the On/Off Button.

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