WAGO I/O SYSTEM 750

Interoperability of the WAGO IEC60870-5-101 and -104 Protocol Library

Technical Information

Version 03.06.2009

WAGO® INNOVATIVE CONNECTIONS

WAGO Kontakttechnik GmbH & Co. KG
Hansastraße 27
D-32423 Minden

Phone: +49 (0) 571/8 87 – 0
Fax: +49 (0) 571/8 87 – 1 69

E-Mail: info@wago.com

Web: http://www.wago.com

Technical Support
Phone: +49 (0) 571/8 87 – 5 55
Fax: +49 (0) 571/8 87 – 85 55

E-Mail: support@wago.com

Every conceivable measure has been taken to ensure the correctness and completeness of this documentation. However, as errors can never be fully excluded we would appreciate any information or ideas at any time.

E-Mail: documentation@wago.com

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 trademark or patent protected.

TABLE OF CONTENTS

1 General Comments 5
1.1 Scope 5
1.2 Symbols 5

2 WAGO IEC 60870-5-101 6
2.1 Network Configuration 6
2.2 Physical Layer Transmission Speed 6
2.3 Link Layer Transmission Procedure 6
2.4 Address field of the Link 6
2.5 Telegram Length 7
2.6 Application Layer 7
2.6.1 Common Address of ASDU 7
2.6.2 Information Object Address 7
2.7 Cause of Transmission 7
2.8 Process Information 8
2.8.1 Monitor Direction 8
2.8.2 Control Direction 9
2.9 System Information 9
2.9.1 Monitor Direction 9
2.9.2 Control Direction 9
2.10 Parameter 9
2.10.1 Monitor Direction 9
2.10.2 Control Direction 10
2.11 Basic Application Functions 10
2.11.1 Station Initialization 10
2.11.2 Station Interrogation 10
2.11.3 Clock Synchronization 10
2.11.4 Command Transmission 10
2.11.5 Transmission of integrated Totals 11
2.11.6 Parameter loading 11
2.11.7 File transfer 11

3 WAGO IEC 60870-5-104 12
3.1 Network Configuration 12
3.2 Physical Layer Transmission Speed 12
3.3 Link Layer Transmission Procedure 12
3.4 Address field of the Link 12
3.5 Telegram Length 13
3.6 Application Layer 13
3.6.1 Common Address of ASDU 13
3.6.2 Information Object Address 13
3.7 Cause of Transmission 13
3.8 Process Information 14
3.8.1 Monitor Direction 14
3.8.2 Control Direction 15
3.9 System Information 15
3.9.1 Monitor Direction 15

3.9.2 Control Direction 15
3.10 Parameter 15
3.10.1 Monitor Direction 15
3.10.2 Control Direction 16
3.11 Basic Application Functions 16
3.11.1 Station Initialization 16
3.11.2 Station Interrogation 16
3.11.3 Clock Synchronization 16
3.11.4 Command Transmission 16
3.11.5 Transmission of integrated Totals 17
3.11.6 Parameter loading 17
3.11.7 File transfer 17

1 General Comments

1.1 Scope

The following overview collects the currently supported functionalities of the WAGO IEC60870-5 protocol libraries.

Protocol Library
WAGO IEC 60870-5-101
WAGO IEC 60870-5-104

1.2 Symbols

X	Function is supported
	Function is not supported
-	~~Function is not supported and it is not defined in the specification~~

2 WAGO IEC 60870-5-101

2.1 Network Configuration

X	Point-to Point
X	Multipoint
X	Multiple Point-to Point
X	Multipoint Star

2.2 Physical Layer Transmission Speed

	100 Bit/s
	200 Bit/s
X	300 Bit/s
X	600 Bit/s
X	1.200 Bit/s
X	2.400 Bit/s
X	4.800 Bit/s
X	9.600 Bit/s
X	19.200 Bit/s
X	38.400 Bit/s

2.3 Link Layer Transmission Procedure

X	Unbalanced Transmission
X	Balanced Transmission

2.4 Address field of the Link

X	one Octet
X	two Octet
	structured
X	unstructured
X	not available

2.5 Telegram Length

X	Maximum 255 characters (Number of Octets)

2.6 Application Layer

2.6.1 Common Address of ASDU

X	one Octet
X	two Octet
	structured
X	unstructured

2.6.2 Information Object Address

X	one Octet
X	two Octet
X	three Octet
	structured
X	unstructured

2.7 Cause of Transmission

X	one Octet
X	two Octet

2.8 Process Information

2.8.1 Monitor Direction

X	<1> Single-point information
X	<2> Single-point information with CP24Time2a time tag
X	<3> Double-point information
X	<4> Double-point information with CP24Time2a time tag
	<5> Step position information
	<6> Step position information with CP24Time2a time tag
X	<7> Bitstring of 32 bits
X	<8> Bitstring of 32 bits with CP24Time2a time tag
X	<9> Measured value, normalized value
X	<10> Measured value, normalized value with CP24Time2a time tag
X	<11> Measured value, scaled value
X	<12> Measured value, scaled value with CP24Time2a time tag
X	<13> Measured value, short floating point value
X	<14> Measured value, short floating point with CP24Time2a time tag
X	<15> Integrated totals
X	<16> Integrated totals with CP24Time2a time tag
	<17> Event of protection equipment with time tag
	<18> Blocked animation of protection equipment with CP24Time2a time tag
	<19> Blocked activation of protection equipment with CP24Time2a time tag
	<20> Blocked single-point information with status change detection
	<21> Measured value, normalized without quality identifier
X	<30> Single-point with CP56Time2a time tag
X	<31> Double-point with CP56Time2a time tag
	<32> Step position with CP56Time2a time tag
X	<33> Bitstring of 32 bits with CP56Time2a time tag
X	<34> Measured value, normalized value CP56Time2a time tag
X	<35> Measured value, scaled value with CP56Time2a time tag
X	<36> Measured value, short floating point with CP56Time2a time tag
X	<37> Integrated totals with CP56Time2a time tag
	<38> Event of protection equipment with CP56Time2a time tag
	<39> Blocked animation of protection equipment with CP56Time2a time tag
	<40> Blocked activation of protection equipment with CP56Time2a time tag

2.8.2 Control Direction

X	<45> Single command
X	<46> Double command
	<47> Regulating step command
X	<48> Set point command, normalized value
X	<49> Set point command, scaled value
X	<50> Set point command, short floating point value
X	<51> Bitstring of 32 bits
X	<64> Bitstring of 32 bits with CP56Time2a time tag

2.9 System Information

2.9.1 Monitor Direction

X	<70> End of initialization

2.9.2 Control Direction

X	<100> Interrogation command
X	<101> Counter interrogation command
	<102> Read command
X	<103> Clock synchronization command
	<104> Test command
X	<105> Reset process command
	<106> Delay acquisition command
	<107> Test command with CP56Time2a time tag

2.10 Parameter

2.10.1 Monitor Direction

	<110> Parameter of measured value, normalized value
	<111> Parameter of measured value, scaled value
X	<112> Parameter of measured value, short floating point value
X	<113> Parameter activation

2.10.2 Control Direction

	<120> File ready
	<121> Section ready
	<122> Call directory, select file, call file
	<123> last section, last segment
	<124> Acknowledge file, acknowledge section
	<125> Segment
	<126> Directory

2.11 Basic Application Functions

2.11.1 Station Initialization

	Remote Initialization

2.11.2 Station Interrogation

X	Global
	Group 1 ... Group 16

2.11.3 Clock Synchronization

X	Clock synchronization

2.11.4 Command Transmission

X	Direct command transmission
X	Direct setpoint-command transmission
	Select and Execute command
	Select and Execute setpoint command
X	No additional definition
X	Short command execution time
X	Long command execution time
X	persistent command

2.11.5 Transmission of integrated Totals

X	Counter read
X	General request counter
X	Counter restore with reset
X	Counter restore without reset
	Counter reset
	Request counter group 1
	Request counter group 2
	Request counter group 3
	Request counter group 4

2.11.6 Parameter loading

	Threshold value
	Smoothing factor
	low limit for transmission of measured values
	high limit for transmission of measured values

2.11.7 File transfer

	Transmission of files in monitoring direction
	Transmission of files in command direction

3 WAGO IEC 60870-5-104

3.1 Network Configuration

-	~~Point-to Point~~
-	~~Multipoint~~
-	~~Multiple Point-to Point~~
-	~~Multipoint Star~~

3.2 Physical Layer Transmission Speed

-	~~100 Bit/s~~
-	~~200 Bit/s~~
-	~~300 Bit/s~~
-	~~600 Bit/s~~
-	~~1.200 Bit/s~~
-	~~2.400 Bit/s~~
-	~~4.800 Bit/s~~
-	~~9.600 Bit/s~~
-	~~19.200 Bit/s~~
-	~~38.400 Bit/s~~

3.3 Link Layer Transmission Procedure

-	~~Unbalanced Transmission~~
-	~~Balanced Transmission~~

3.4 Address field of the Link

-	~~one Octet~~
-	~~two Octet~~
-	~~structured~~
-	~~unstructured~~
-	~~not available~~

3.5 Telegram Length

-	~~Maximum 255 characters (Number of Octets)~~

3.6 Application Layer

3.6.1 Common Address of ASDU

-	~~one Octet~~
X	two Octet
X	structured
X	unstructured

3.6.2 Information Object Address

-	~~one Octet~~
-	~~two Octet~~
X	three Octet
	structured
X	unstructured

3.7 Cause of Transmission

-	~~one Octet~~
X	two Octet

3.8 Process Information

3.8.1 Monitor Direction

X	<1> Single-point information
-	~~<2> Single-point information with CP24Time2a time tag~~
X	<3> Double-point information
-	~~<4> Double-point information with CP24Time2a time tag~~
	<5> Step position information
-	~~<6> Step position information with CP24Time2a time tag~~
X	<7> Bitstring of 32 bits
-	~~<8> Bitstring of 32 bits with CP24Time2a time tag~~
X	<9> Measured value, normalized value
-	~~<10> Measured value, normalized value with CP24Time2a time tag~~
X	<11> Measured value, scaled value
-	~~<12> Measured value, scaled value with CP24Time2a time tag~~
X	<13> Measured value, short floating point value
-	~~<14> Measured value, short floating point with CP24Time2a time tag~~
X	<15> Integrated totals
-	~~<16> Integrated totals with CP24Time2a time tag~~
-	~~<17> Event of protection equipment with time tag~~
-	~~<18> Blocked animation of protection equipment with CP24Time2a time tag~~
-	~~<19> Blocked activation of protection equipment with CP24Time2a time tag~~
	<20> Blocked single-point information with status change detection
	<21> Measured value, normalized without quality identifier
X	<30> Single-point with CP56Time2a time tag
X	<31> Double-point with CP56Time2a time tag
	<32> Step position with CP56Time2a time tag
X	<33> Bitstring of 32 bits with CP56Time2a time tag
X	<34> Measured value, normalized value CP56Time2a time tag
X	<35> Measured value, scaled value with CP56Time2a time tag
X	<36> Measured value, short floating point with CP56Time2a time tag
X	<37> Integrated totals with CP56Time2a time tag
	<38> Event of protection equipment with CP56Time2a time tag
	<39> Blocked animation of protection equipment with CP56Time2a time tag
	<40> Blocked activation of protection equipment with CP56Time2a time tag

3.8.2 Control Direction

X	<45> Single command
X	<46> Double command
	<47> Regulating step command
X	<48> Set point command, normalized value
X	<49> Set point command, scaled value
X	<50> Set point command, short floating point value
X	<51> Bitstring of 32 bits
X	<64> Bitstring of 32 bits with CP56Time2a time tag

3.9 System Information

3.9.1 Monitor Direction

X	<70> End of initialization

3.9.2 Control Direction

X	<100> Interrogation command
X	<101> Counter interrogation command
	<102> Read command
X	<103> Clock synchronization command
-	~~<104> Test command~~
X	<105> Reset process command
-	~~<106> Delay acquisition command~~
	<107> Test command with CP56Time2a time tag

3.10 Parameter

3.10.1 Monitor Direction

	<110> Parameter of measured value, normalized value
	<111> Parameter of measured value, scaled value
X	<112> Parameter of measured value, short floating point value
X	<113> Parameter activation

3.10.2 Control Direction

	<120> File ready
	<121> Section ready
	<122> Call directory, select file, call file
	<123> last section, last segment
	<124> Acknowledge file, acknowledge section
	<125> Segment
	<126> Directory

3.11 Basic Application Functions

3.11.1 Station Initialization

	Remote Initialization

3.11.2 Station Interrogation

X	Global
	Group 1 ... Group 16

3.11.3 Clock Synchronization

X	Clock synchronization

3.11.4 Command Transmission

X	Direct command transmission
X	Direct setpoint-command transmission
	Select and Execute command
	Select and Execute setpoint command
X	No additional definition
X	Short command execution time
X	Long command execution time
X	persistent command

3.11.5 Transmission of integrated Totals

X	Counter read
X	General request counter
X	Counter restore with reset
X	Counter restore without reset
X	Counter reset
	Request counter group 1
	Request counter group 2
	Request counter group 3
	Request counter group 4

3.11.6 Parameter loading

	Threshold value
	Smoothing factor
	low limit for transmission of measured values
	high limit for transmission of measured values

3.11.7 File transfer

	Transmission of files in monitoring direction
	Transmission of files in command direction

WAGO Kontakttechnik GmbH & Co. KG
Postfach 2880 • D-32385 Minden
Hansastraße 27 • D-32423 Minden
Phone: 05 71/8 87 – 0
Fax: 05 71/8 87 – 1 69
E-Mail: info@wago.com

Web: http://www.wago.com