CODESYS DNP3 SL

Enables communication using the DNP3 protocol in CODESYS applications. A CODESYS PLC can be configured and used as an outstation.

Product description

The CODESYS DNP3 extension consists of a CODESYS library that provides IEC function blocks for communication using the DNP3 protocol. Both the configuration of the inputs and outputs and the actual communication are performed by using function blocks.

Supported data types:

- AnalogInput (Object 30 Variation 1, 2, 3, 4, 5, 6).
- AnalogInputDeadband (Object 34 Variation 3)
- AnalogOutput (Object 40 Variation 1, 2, 3, 4)
- BinaryCounter (Object 20 Variation 1, 2, 5, 6)
- BinaryInput (Object 1, Variation 1, 2)
- BinaryOutput (Object 10, Variation 1, 2)
- DoubleBitInput (Object 4, Variation 1, 2, 3)

Possibilities of data exchange:

- Reading and writing of the supported data types
- Unsolicited response with specification of sampling rate.

Supported transmission protocols:

- Serial connection
- TCP/IP

Not supported transmission protocols:

- UDP/IP communication
- IPv6
- TLS

Not supported data exchange operations:

- Event triggering

Conformance Test

To confirm compatibility with the DNP3 specification our implementation was tested using the Triangle Microworks Test Harness Version 3.30.0.0. The following test cases have been executed.

DNP3 IED Certification Procedure Subset Level 2 Version 2.7 2-March-2016, with tests 8.6.4.2/3 replaced as directed by TB2017-00

Testcase ID	Testcase name
6.1.2	Reset Link and Passive Confirm
6.3.2	Request Link Status
6.4.2	Test Retries
6.5.2	DIR and FCV Bits
6.6.2	Data Link Rejects Invalid Frames - Primary Frames
6.6.2.1	Invalid Start Octets
6.6.2.2	Invalid Primary Function Code
6.6.2.3	Invalid Destination Address
6.6.2.4	Invalid CRC
6.6.2.5	Invalid FCV
6.6.3	Data Link Rejects Invalid Frames - Secondary Frames
6.6.3.1	Invalid Start Octets
6.6.3.2	Invalid Secondary Function Code
6.6.3.3	Invalid Destination Address
6.6.3.4	Invalid CRC
6.7.2	Self-Address Support
7.2	Transport Layer
8.1.2	Binary Output Status
8.2.1.2.1	Binary Output, SBO, 0x28
8.2.1.2.2	Binary Output, SBO, 0x17
8.2.1.2.3	Binary Output, SBO, To Uninstalled Point
8.2.1.2.4	Binary Output, SBO, Execute Issued After Timeout
8.2.1.2.5	Binary Output, SBO, Execute To Different Point Than Select
8.2.1.2.6	Binary Output, SBO, Execute On Time Does Not Match Select On
8.2.1.2.7	Binary Output, SBO, Execute Off Time Does Not Match Select Of
8.2.1.2.8	Binary Output, SBO, Select Using a Supported Control Code, Ex
8.2.1.2.9	Binary Output, SBO, Select 0x28, Execute 0x17
8.2.1.2.10	Binary Output, SBO, Configurable Device
8.2.1.2.11	Binary Output, SBO, Same Sequence Number Select Retries
8.2.1.2.12	Binary Output, SBO, Incrementing Sequence Number Select Retri
8.2.1.2.13	Binary Output, SBO, Same Sequence Number Operate Retries
8.2.1.2.14	Binary Output, SBO, Incrementing Sequence Number Operate Retr
8.2.1.2.15	Binary Output, SBO, Sequence Number Checking
8.2.2.2.1	Binary Output, Direct Operate
8.2.2.2.2	Binary Output, Direct Operate To Uninstalled Point
8.2.2.2.3	Binary Output, Direct Operate, Configurable Device
8.2.3.2.1	Binary Output, Direct Operate, No Acknowledge

Testcase ID	Testcase name
8.2.3.2.2	Binary Output, Direct Operate, No Acknowledge, To Uninstalled
8.2.3.2.3	Binary Output, Direct Operate, No Acknowledge, Configurable D
8.2.6.2	Binary Output, No Control When Status Code is Non-Zero
8.3.2	Analog Output Status
8.4.1.2.1	Analog Output, SBO, 0x28
8.4.1.2.2	Analog Output, SBO, 0x17
8.4.1.2.3	Analog Output, SBO, To Uninstalled Point
8.4.1.2.4	Analog Output, SBO, Execute Issued After Timeout
8.4.1.2.5	Analog Output, SBO, Execute Value does not match Select Value
8.4.1.2.6	Analog Output, SBO, Select 0x28, Execute 0x17
8.4.1.2.8	Analog Output, SBO, Same Sequence Number Select Retries
8.4.1.2.9	Analog Output, SBO, Incrementing Sequence Number Select Retri
8.4.1.2.10	Analog Output, SBO, Same Sequence Number Operate Retries
8.4.1.2.11	Analog Output, SBO, Incrementing Sequence Number Operate Retr
8.4.1.2.12	Analog Output, SBO, Sequence Number Checking
8.4.1.2.13	Analog Output, SBO, 32-bit values
8.4.2.2.1	Analog Output, Direct Operate
8.4.2.2.2	Analog Output, Direct Operate To Uninstalled Point
8.4.2.2.3	Analog Output, Direct Operate, Configurable Device
8.4.3.2.1	Analog Output, Direct Operate, No Acknowledge
8.4.3.2.2	Analog Output, Direct Operate, No Acknowledge, To Uninstalled
8.4.3.2.3	Analog Output, Direct Operate, No Acknowledge, Configurable D
8.6.2.2	Bad Function
8.6.3.2	Object Unknown
8.6.5.2	Broadcast Address and All Stations Indication, Write
8.6.5.3	Broadcast Address and All Stations Indication, Confirmed Resp
8.12.1	Collision Avoidance
8.13.2.3	Device Has Binary Inputs
8.14.2.3	Binary Input Change, Qualifier 0x06
8.14.2.4	Binary Input Change, Qualifier 0x07
8.14.2.5	Binary Input Change, Qualifier 0x08
8.14.2.6	Binary Input Change Without Confirm
8.14.2.7	Binary Input Change Without Time, Qualifier 0x06
8.14.2.8	Binary Input Change Without Time, Qualifier 0x07
8.14.2.9	Binary Input Change Without Time, Qualifier 0x08
8.14.2.11	Binary Input Change With Time, Qualifier 0x07
8.14.2.12	Binary Input Change With Time, Qualifier 0x08
8.14.2.14	Binary Input Change With Relative Time, Qualifier 0x07
8.14.2.15	Binary Input Change With Relative Time, Qualifier 0x08

Testcase ID	Testcase name
8.15.2	Read for Relative time binary change events; Relative time no
8.15.3	Read for Relative Time; Relative time supported
8.16.1.2.3	Device Responds With Binary Counters
8.16.2.2.2	Device Does Not Have Frozen Counters
8.17.2.3	Binary Counters, Event, 0x06
8.17.2.4	Binary Counters, Event, 0x07
8.17.2.5	Binary Counters, Event, 0x08
8.17.2.6	Binary Counters, Event Without Confirm
8.18.2.3	Device Has Analog Inputs
8.19.2.2	Analog Input Change
8.19.2.3	Analog Input Change Without Confirm
8.20.2.2	Multiple Read Requests
8.21.2.3	Device Has Double-bit Inputs
8.22.2.3	Double-bit Input Change, Qualifier 0x06
8.22.2.4	Double-bit Input Change, Qualifier 0x07
8.22.2.5	Double-bit Input Change, Qualifier 0x08
8.22.2.6	Double-bit Input Change Without Confirm
8.22.2.7	Double-bit Input Change Without Time, Qualifier 0x06
8.22.2.8	Double-bit Input Change Without Time, Qualifier 0x07
8.22.2.9	Double-bit Input Change Without Time, Qualifier 0x08
8.22.2.11	Double-bit Input Change With Time, Qualifier 0x07
8.22.2.12	Double-bit Input Change With Time, Qualifier 0x08
8.22.2.14	Double-bit Input Change With Relative Time, Qualifier 0x07
8.22.2.15	Double-bit Input Change With Relative Time, Qualifier 0x08
8.23.2.1.2	Device Support Binary inputs, Valid Request
8.23.2.2.2	Device Support Binary Output Status Points, Valid Request
8.23.2.2.3	Device Supports Binary Output Status, Out of Range Request
8.23.2.3.2	Device Support Counters, Valid Request
8.23.2.3.3	Device Supports Counters, Out of Range Request
8.23.2.4.1	Device Does Not Support Frozen Counters
8.23.2.5.2	Device Support Analog inputs, Valid Request
8.23.2.6.2	Device Support Analog Output Status, Valid Request
8.23.2.6.3	Device Supports Analog Output Status, Out of Range Request
8.25.2.3	Counter Events
8.26.3	No-Class Assignment

General information

Supplier:

CODESYS GmbH
Memminger Strasse 151
87439 Kempten
Germany

Support:

Technical support is not included with this product. To receive technical support, please purchase a CODESYS Support Ticket.

https://support.codesys.com

Item:

CODESYS DNP3 SL

Item number:

2303000025

Sales/Source of supply:

CODESYS Store
https://store.codesys.com

Included in delivery:

CODESYS Package

System requirements and restrictions

Programming System	CODESYS Development System Version 3.5.19.0 or higher
Runtime System	CODESYS Control for Linux SL V4.10.0.0 or higher
Supported Platforms / Devices	Note: Use the project “Device Reader” to find out the supported features of your device. “Device Reader” is available for free in the CODESYS Store.
Additional Requirements	-
Restrictions	-
Licensing	

	Single device license: The license can be used on the target device/PLC on which the CODESYS runtime system is installed. Licenses are activated on a software-based license container (soft container), which is permanently connected to the controller. Alternatively, the license can be stored on a CODESYS Key (USB dongle). By replugging the CODESYS Key, the license can be used on any other controller. Note: In demo mode, the software runs for two hours without a license. After that, a manual restart is required.
Required Accessories	CODESYS Key

Note: Technical specifications are subject to change. Errors and omissions excepted. The content of the current online version of this document applies.

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