General Specifications

DNP3 Communication Portfolio (FCN-500/FCN-RTU)

GS 34P02P22-02E

■ GENERAL

This General Specifications document describes the Distributed Network Protocol (DNP3) Communication Portfolio for STARDOM. The DNP3 Communication Portfolio generates a control application for FCN-500, FCN-RTU autonomous controllers. Using this portfolio, the FCN-500, FCN-RTU can perform DNP3 communication via a serial port or Ethernet port.

Notation in this document:
- The term “FCN” refers to the module consisting type autonomous controllers.
- The term “FCN-500” refers to the autonomous controllers with NFCP501/NFCP502 CPU module.
- The term “FCN-RTU” refers to the low power autonomous controllers with NFCP050 CPU module.

This document describes the functions of R4.30 or later that support the Master function and Outstation secure authentication function, and the R4.20 compatible functions of released before R4.20.

The latest version and the old version compatibility function have different types of POU. In the latest software environment, the R4.20 compatibility function can be use, but compatibility and new POUs cannot be mix .

For the R4.20 compatible function, refer to “■ Functional specifications <R4.20 compatible function>” to “■ DNP3 Field Device Profile <R4.20 compatible function>” (P.39 to P.60).

■ OPERATING ENVIRONMENT

● FCN-500

Communication type		Communication port
Serial communication	RS-232-C	CPU module (NFCP501, NFCP502) Serial port (*1)
		Serial communication module (NFLR111) Serial port
	RS-422/RS-485	Serial communication module (NFLR121) Serial port
Ethernet communication		CPU module (NFCP501, NFCP502) Ethernet port

*1: In a CPU duplex configuration, the CPU module serial port cannot be used.

● FCN-RTU

Communication type		Communication port
Serial communication	RS-232	CPU module (NFCP050) Serial port
	RS-422/RS-485	CPU module (NFCP050) Serial port
Ethernet communication		CPU module (NFCP050) Ethernet port

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■ FUNCTION SPECIFICATIONS

● DNP3 Communication Portfolio

Master Function

The Master function is a function in which the autonomous controller FCN-500/FCN-RTU operates as a master station in DNP3 communication. FCN handles data by using DNP3 communication commands with Outstation equipment such as RTU and IED as a master station. The communication mode provides serial communication and Ethernet communication (TCP).

Note: In Master function, serial communication or Ethernet communication is possible. Serial communication and Ethernet communication cannot be mixed.

Outstation Function

The Outstation function is a function that FCN operates as an Outstation in DNP3 communication. FCN responds to DNP3 communication command from Master station such as SCADA as Outstation. The communication mode provides serial communication and Ethernet communication (TCP/UDP).

Note: In Outstation function, serial communication or Ethernet communication is possible. Serial communication and Ethernet communication cannot be mixed.

Note: In a CPU duplex configuration, all change events will be reset at CPU switch-over.

For example, it is possible to perform serial communication in the Master function and perform Ethernet communication in the Outstation function, or perform Ethernet communication in the Master function and perform serial communication in the Outstation function.

Secure Authentication Function

In the Outstation function, communication can be performed using the SAv5 secure authentication function of DNP3 communication. The secure authentication function of DNP3 communication is based on the standard functions of IEC/TS 62351-5 and ISO/IEC 11770.

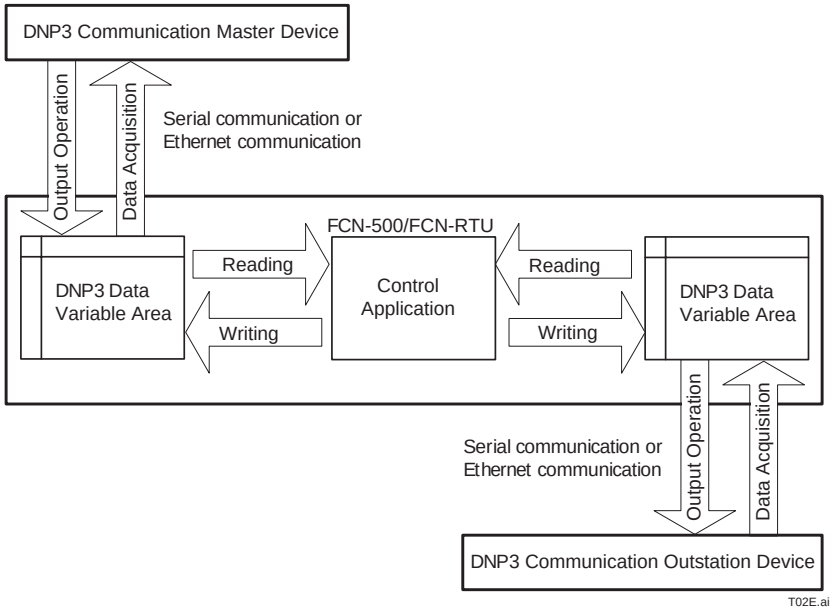

Figure DNP3 Data Access

● Connections

Communication function		Maximum connections
Master function	FCN-500	Up to 10 outstations
	FCN-RTU	Up to 5 outstations
Outstation function	FCN-500	Up to 2 master stations (*1)
	FCN-RTU	Up to 2 master stations (*1)

*1: Up to two master stations can be connected to one DNP3 data area.

● Data Variable Area Assign

Controller	Data Variable Area Assign POU	Assign POU number	
		Master + Outstation	Outstation
FCN-500	SD_CDNP_DD_ASSIGN _00100 (100 points)	Up to 10 POUs (*1)	Up to 1 POU (*1)
	SD_CDNP_DD_ASSIGN _00500 (500 points)	Up to 2 POUs (*1)	
FCN-RTU	SD_CDNP_DD_ASSIGN _00100 (100 points)	Up to 5 POUs (*2)	Up to 1 POU (*2)
	SD_CDNP_DD_ASSIGN _00500 (500 points)	Up to 1 POU (*2)	

Note: For details on the number of data points, refer to "■ Accessable data range".
*1: In FCN-500, up to 1000 points can be defined for the Master function and Outstation function.
Up to one data variable area allocation POU can be defined for Outstation function. Up to 100 points or 500 points can be defined.
When defining multiple data variable areas with different points, for example, 1 SD_CDNP_DD_ASSIGN_00500 POU and up to 5 SD_CDNP_DD_ASSIGN_00100 POUs can be definrd.
Or up to 10 SD_CDNP_DD_ASSIGN_00100 POUs can be defined. Then, 9 POUs can be assigned to the master function and 1 POU can be assigned to the outstation function. Up to two masters can be connected to one assigned POU for the Outstation function.
*2: In FCN-RTU, up to 500 points can be defined for the Master function and Outstation function.

■ ACCESSIBLE RANGE

The accessible device ranges, between the DNP3 communication device and FCN-500 and FCN-RTU, are shown in the table below:

● DNP3 Data Area Assign POU

Data type	IEC data type	Index range (*1)	
		SD_CDNP_DD_ASSIGN_00100	SD_CDNP_DD_ASSIGN_00500
Binary Input	BOOL	0 to 99	0 to 499
Diuble-Bit binary Input (*4)	UINT	0 to 99	0 to 499
Binary Output	BOOL	0 to 99	0 to 499
16-Bit Binary Counter	UINT	0 to 99	0 to 499
32-Bit Binary Counter	UDINT		
16-Bit Frozen Counter	UINT		
32-Bit Frozen Counter	UDINT		
16-Bit Analog Input	INT	0 to 99	0 to 499
32-Bit Analog Input	DINT		
Single-Precision Floating Point Analog Input	REAL		
Double-Precision Floating Point Analog Input	LREAL		
16-Bit Frozen Analog Input (*4)	INT	0 to 99	0 to 499
32-Bit Frozen Analog Input (*4)	DINT		
Single-Precision Floating Point Frozen Analog Input	REAL		
Double-Precision Floating Point Frozen Analog Input	LREAL		
16-Bit Analog Output	INT	0 to 99	0 to 499
32-Bit Analog Output	DINT		
Single-Precision Floating Point Analog Output	REAL		
Double-Precision Floating Point Analog Output	LREAL		
32-Octet String (*2)	STRING32	0 to 9	0 to 49
Security Statistics (*3)	UINT	0 to 17	0 to 17

*1: The Index area cannot be divided.
*2: The maximum length of “Octet String” is 32 octets.
*3: Used when SD_CDNP_OO_CFG_SECAUTH POU is defined in the Outstation function.
*4: Mastre function only.

■ LIST OF POU FUNCTIONS

● Data Area Assign POU

Master POU	Outstation POU	Function
SD_CDNP_DD_ASSIGN _00100		Assigning data variables (100 points)
SD_CDNP_DD_ASSIGN _00500		Assigning data variables (500 points)

● Communication Definition POU

Master POU	Outstation POU	Function
SD_CDNP_MM_RS_OPEN	SD_CDNP_OO_RS_OPEN	Starting DNP3 communication task for serial communication
SD_CDNP_MM_TCP_OPEN	SD_CDNP_OO_TCP_OPEN	Starting DNP3 communication task for Ethernet communication (TCP)
-	SD_CDNP_OO_UDP_OPEN	Starting DNP3 communication task for Ethernet communication (UDP)
SD_CDNP_MM_RS_PORT_SET	SD_CDNP_OO_RS_PORT_SET	Setting serial port
SD_CDNP_MM_TCP_PORT_SET	SD_CDNP_OO_TCP_PORT_SET	Setting ethernet TCP port
-	SD_CDNP_OO_UDP_PORT_SET	Setting ethernet UDP port
SD_CDNP_MM_CFG_DBMAP	SD_CDNP_OO_CFG_DBMAP	Setting database map
SD_CDNP_MM_CFG_SCAN_STAT	-	Setting static data scan
SD_CDNP_MM_CFG_SCAN_EVNT	-	Setting event scan
SD_CDNP_MM_CFG_POLL_COND	-	Setting polling and time synchronization condition
-	SD_CDNP_OO_CFG_EBUF_DTYP	Setting event buffer by data type
-	SD_CDNP_OO_CFG_UNSOL	Setting unsolicited response trigger condition
-	SD_CDNP_OO_CFG_SECAUTH	Setting secure authentication basic
-	SD_CDNP_OO_CFG_SA_USRKEY	Setting secure authentication user
-	SD_CDNP_OO_CFG_SA_ADDFNC	Setting secure authentication additional comand
-	SD_CDNP_OO_CFG_SA_MAXCNT	Setting secure authentication control constant
-	SD_CDNP_OO_CFG_SA_SECEVT	Setting secure authentication statistics event

● Control Command Transmission / Reception POU

Master POU	Outstation POU	Function
SD_CDNP_M_REQ_OSTN_CTRL	-	Sending control command

● Data Attribute Setting Command Send POU

Set the data attribute of Outstation by sending a command from Master.

Master POU	Outstation POU	Function
SD_CDNP_M_REQ_EVTC_ASGN	-	Sending event class assaign comand
SD_CDNP_M_REQ_DBNDWT_A16 SD_CDNP_M_REQ_DBNDWT_A32 SD_CDNP_M_REQ_DBNDWT_ASF SD_CDNP_M_REQ_DBNDWT_ADF	-	Sending analog input deadband write comand

● Data Attribute Definition POU

Define the data attribute as Outstation.

Master POU	Outstation POU	Function
-	SD_CDNP_O_EVTC	Defining event class
-	SD_CDNP_O_DBND_AI16 SD_CDNP_O_DBND_AI32 SD_CDNP_O_DBND_AISF	Defining analog input deadband
-	SD_CDNP_O_RANGE_AIO16 SD_CDNP_O_RANGE_AIO32 SD_CDNP_O_RANGE_AIOSF SD_CDNP_O_RANGE_AIODF	Defining analog input rangehigh/low

● Send Data Output Operation Command Send POU

Sends CROB(control relay output block) output command from master to binary output.
Sends AOB (analog output block) output command from master to analog output

Master POU	Outstation POU	Function
SD_CDNP_M_REQ_CROB_LATCH	-	Sending CROB latch type output operation command
SD_CDNP_M_REQ_CROB_PULSE	-	Sending CROB pulse type output operation command
SD_CDNP_M_REQ_AOB16_OUT SD_CDNP_M_REQ_AOB32_OUT SD_CDNP_M_REQ_AOBSF_OUT SD_CDNP_M_REQ_AOBDF_OUT	-	Sending analog output operation command
SD_CDNP_M_REQ_FREEZE_CT	-	Sending counter freese command
SD_CDNP_M_REQ_FREEZE_AI	-	Sending analog input freese command

● Receive Command Execution POU

Executes the request command from Master received at Outstation.

Master POU	Outstation POU	Function
-	SD_CDNP_O_CROB_PULSE	Executing CROB pulse type command output operation

● Data Access POU

Master POU	Outstation POU	Function
SD_CDNP_D_BI_RD		Reading binary input data
SD_CDNP_D_BO_RD		Reading binary output data
SD_CDNP_D_DBI_RD		Reading double bit binary data
SD_CDNP_D_CT16_RD SD_CDNP_D_CT32_RD		Reading binary counter data
SD_CDNP_D_FRZ_CT16_RD SD_CDNP_D_FRZ_CT32_RD		Reading frozen binary counter data
SD_CDNP_D_BI_WT		Writing binary input data
SD_CDNP_D_BO_WT		Writing binary output data
SD_CDNP_D_DBI_WT		Writing double bit binary input data
SD_CDNP_D_CT16_WT, SD_CDNP_D_CT16_WT_F SD_CDNP_D_CT32_WT, SD_CDNP_D_CT32_WT_F		Writing binary counter data
SD_CDNP_D_AI16_RD SD_CDNP_D_AI32_RD SD_CDNP_D_AISF_RD SD_CDNP_D_AIDF_RD		Reading analog input data
SD_CDNP_D_FRZ_AI16_RD SD_CDNP_D_FRZ_AI32_RD SD_CDNP_D_FRZ_AISF_RD SD_CDNP_D_FRZ_AIDF_RD		Reading frozen analog input data
SD_CDNP_D_AO16_RD SD_CDNP_D_AO32_RD SD_CDNP_D_AOSF_RD SD_CDNP_D_AODF_RD		Reading analog output data
SD_CDNP_D_OSTR32_RD		Reading octet string data
SD_CDNP_D_AI16_WT, SD_CDNP_D_AI16_WT_F SD_CDNP_D_AI32_WT, SD_CDNP_D_AI32_WT_F SD_CDNP_D_AISF_WT, SD_CDNP_D_AISF_WT_F SD_CDNP_D_AIDF_WT, SD_CDNP_D_AIDF_WT_F		Writing analog input data
SD_CDNP_D_AO16_WT, SD_CDNP_D_AO16_WT_F SD_CDNP_D_AO32_WT, SD_CDNP_D_AO32_WT_F SD_CDNP_D_AOSF_WT, SD_CDNP_D_AOSF_WT_F SD_CDNP_D_AODF_WT, SD_CDNP_D_AODF_WT_F		Writing analog output data
SD_CDNP_D_OSTR32_WT		Writing octet string data

■ DNP3 FIELD DEVICE PROFILE

●FCN as Master

Device Properties

DEVICE IDENTIFICATION	
Device Function:	● Master ○ Outstation
Vendor Name:	Yokogawa Electric Corporation
Device Name:	STARDOM FCN/FCJ
Device manufacturer's hardware version string: Device manufacturer's software version string:	DNP Group 0 - Attribute Objects are Not Supported. Following information can be confirmed by Resource Configurator “CPU Module Configuration” - “RAS Information” - Controller Model Name, Hardware Serial Number, Manufacturing Year and Month - Os Revision, Boot Program Revision/Build Number, Basic Software Revision/Build Number
Device Profile Document Version Number:	2016
DNP Levels Supported for:	Master Only Requests Responses ☒ ☒ None ☒ ☒ Level 1 ☒ ☒ Level 2 ☒ ☒ Level 3 ☒ ☒ Level 4 - except Device Attributes (Device Attributes will be configured by Logic Designer) , CROB command change events, AOB command change events, XML file configuration
Supported Function Blocks:	☐ Self-Address Support ☐ Data Sets ☐ File Transfer ☐ Virtual Terminal ☐ Mapping to IEC 61850 Object Models defined in a DNP3 XML file. ☐ Function code 31, activate configuration ☒ Secure Authentication (if checked then see “SECURITY PARAMETERS”)
Notable Additions:	- Serial and TCP connection can be used. - Up to ten connections can be used for FCN-500, and up to five connections for FCN-RTU. - Event buffer size can be expanded up to 135,000 events. - Every data types (BOOL/UINT/UDINT/INT/DINT/REAL/LREAL/STR32) can be used. - Pulse output operation can be operated. - Unsolicited response can be sent.
Methods to set Configurable Parameters:	☒ Software - Vender software named “Logic Designer” and “Resource Configurator” ☒ Protocol - Set via DNP3 (e.g. assign class, write deadband)
DNP3 XML Files Available On-line:	☒ None
External DNP3 XML Files Available Off-line:	☒ None
Connections Supported:	Configurable, selectable from Serial, IP Networking - Configurable by Logic Designer ☒ Serial (complete section “SERIAL CONNECTIONS”) ☒ IP Networking (complete section “IP NETWORKING”)
Conformance Testing:	☒ Self-tested, version
SERIAL CONNECTIONS	
Port Name:	For COM Ports of CPU Modules ☒ Fixed at COM1/COM2/COM3/COM4 - About the number of COM ports, refer to “STARDOM FCN/FCJ Guide” for each hardware model.
	For Serial Communication Modules ☒ Logical Port Name can be assigned by Resource Configurator
Serial Connection Parameters:	☒ Asynchronous - Data Bits: Selectable from 7, 8-bits (default = 8) - Start Bit: Fixed at 1-bit - Stop Bits: Selectable from 1, 2-bits (default = 1) - Parity: Selectable from NONE, EVEN, ODD (default = NONE)
	For COM Ports of CPU Modules - Configurable by STARDOM FCX Maintenance Page “COM Port Setting File”
	For Serial Communication Modules - Configurable by Resource Configurator

Baud Rate:	For COM Ports of CPU Modules ☒ Configurable, selectable from 300, 1200, 2400, 4800, 9600, 14400, 19200, 28800, 38400, 57600, 115200 (default = 9600) - About the list of baud rates, refer to “STARDOM FCN/FCJ Guide” for each hardware model.
	For Serial Communication Modules ☒ Configurable, selectable from 300, 1200, 2400, 4800, 9600, 14400, 19200, 28800, 38400, 57600, 76800, 115200 (default = 9600)
Hardware Flow Control (Handshaking):	RS-232 Options: for COM Ports of CPU Modules - Send Flow Control ☒ Configurable, select from NONE, CTS, DSR (default = NONE) - Receive Flow Control ☒ Configurable, select from NONE, RTS, DTR (default = NONE) - Send Validate ☒ Configurable, select from NONE, DSR (default = NONE) - Receive Validate ☒ Configurable, select from NONE, DSR, CD, DSR_CD (default = NONE) - Initial DTR state ☒ Configurable, select from ON, OFF (default = OFF)
	RS-232 Options: for Serial Communication Modules - Send Flow Control ☒ Fixed at CTS - Receive Flow Control ☒ Configurable, select from NONE, RTS (default = NONE) - Send Signal Check ☒ Configurable, select from NONE, DSR, CD, DSR_CD (default =NONE) - Receive Signal Check ☒ Fixed at CD - Initial DTR state ☒ Fixed at ON
Interval to Request Link Status:	☒ Not Supported ☒ Configurable, range 2.5 to 1800 seconds - Specify with the parameter “LINK_STAT_INTRVL” of “SD_CDNP_MM_RS/TCP_PORT_SET”
Supports DNP3 Collision Avoidance:	☒ Other, explain
	- with the parameter “INTER_CHAR_TOUT” of “SD_CDNP_OO_RS_PORT_SET”
	For RS-232-C Communication Modules and RS-232-C Serial Ports - “Full-duplex” or “Half-duplex with Hardware Flow Control” can be used.
	For RS-422 Communication Modules and RS-422 Serial Port of FCN-RTU CPU Modules - “4-wire” and “Full-duplex” should be configured.
Receiver Inter-Character Timeout:	- with the parameter “INTER_CHAR_TIMEOUT” of “SD_CDNP_MM_RS_PORT_SET”
	For COM Ports of CPU Modules ☒ Configurable range 10.0 to 5000.0 (ms), in units of 10 (ms) (default = 10.0(ms)).
	For Serial Communication Modules ☒ Configurable range 1.5 to 100.0 (character time) (or 1.5 (character time) to 100000.0 (ms)) (default = 4.0 (character time)).
Unit of Receiver Inter-Character Timeout:	☒ Configurable, selectable from “Character Time” or “Millisecond” - with the parameter “USE_CHAR_TIME_UNIT“ of “SD_CDNP_MM_RS_PORT_SET” “UNIT_CHAR_TIME”=TRUE: Character time is used as the unit of the timeout value (default) “UNIT_CHAR_TIME”=FALSE: Millisecond is used as the unit of the timeout value
Inter-Character Gaps in Transmission:	☒ None (always transmits with no inter-character gap)
Multiple Master Connections:	☒ Supports multiple masters (Up to two connections are possible)
IP NETWORKING	
Port Name:	
Type of End Point:	☒ TCP Initiating
IP Address of this Device:	☒ Configurable by Resource Configurator “Set IP Address Dialog”
Subnet Mask:	
Gateway IP Address:	
Accept TCP Connections or UDP Diagrams from:	☒ Limits based on IP address - The IP address must be specified with the parameter “DEST_IP_ADDR” of “SD_CDNP_MM_TCP/UDP_PORT_SET”.
IP Address(es) from with TCP Connections or UDP Datagrams are accepted:	It can be confirmed with the parameter “CONNECT_INFO” of “SD_CDNP_MM_TCP_OPEN”.
TCP Listen Port Number:	☒ Not Applicable (Master w/o dual end point)
TCP Listen Port Number of Remote Device:	☒ Fixed at 20000 ☒ Configurable range 0 to 65535 (20000 and 20050 or more are recommended)
TCP Keep-alive Timer:	☒ Timer disabled

TCP Timeout:	Instead of Keep-alive timer, TCP disconnection will be checked with this timeout value. ☒ Configurable by Logic Designer (range 5 to 3600 seconds) (default = 5 (sec)) - with the parameter "RESP_TIMEOUT" of "SD_CDNP_MM_TCP_PORT_SET" - Master will re-connect to the TCP/UDP socket of the outstation, if no response is received within the time.
TCP Listen Port Number of Remote Device:	☒ Fixed at 20000 ☒ Configurable range 0 to 65535 (20000 and 20050 or more are recommended)
Local UDP Port:	☒ Fixed at 20000 (as the default port number) ☒ Configurable, range 1 to 65535
Multiple Outstation Connections:	☒ Supports multiple outstations (Up to ten connections are possible for FCN-500, and up to five for FCN-RTU)
Time Synchronization Support:	☒ SNTP (Simple Network Time Protocol) - Configurable by STARDOM FCX Maintenance Page "SNTP Setting File"
	☒ DNP3 LAN procedure (function code 24) ☒ DNP3 Write Time (not recommended over LAN) - Configurable by Logic Designer - with the parameter "TIME_SYNC_METHOD" and "TIME_SYNC_INTVL" of "SD_CDNP_MM_RS/TCP/UDP_PORT_SET" - DNP3 Network Method can be used when SNTP cannot be used.
LINK LAYER	
Data Link Address: (DNP3 Outstation Address) Data link addresses 0xFFF0 through 0xFFFF are reserved for broadcast or other special purposes.	☒ Configurable, range 0 to 0xffff - Configurable by Logic Designer - with the parameter "SRC_ADDR" of "SD_CDNP_MM_RS/TCP_OPEN" "SRC_ADDR" (= DNP3 Master Address of STARDOM FCN) - Data Link Address can be used for DNP3 Source Address Validation at the Master. - Specify the address in range from 0x0000 to 0xFFEF. - Addresses in the range 0xFFF0 through 0xFFFF are reserved by DNP3 for special use.
DNP3 Source Address Validation:	☒ Always, one address allowed - Outstation will filter out requests not from the Master.
DNP3 Source Address Expected when Validation is Enables: (DNP3 Master Address)	☒ Configurable to any 16 bit DNP Data Link Address value - Configurable by Logic Designer - with the parameter "DEST_ADDR" of "SD_CDNP_MM_RS/TCP_OPEN" "DEST_ADDR" (= Outstation Address to communicate with STARDOM FCN Master function) - DNP3 Source Address is used for DNP3 Source Address Validation at the Outstation.
Self Address Support Using Address 0xFFFC:	☒ No
Sends Confirmed User Data Frames:	☒ Never ☒ Always
Data Link Layer Confirmation Timeout:	☒ None ☒ Configurable, range 10 to 600 seconds - with the parameter "RESP_TIMEOUT" of "SD_CDNP_MM_RS/TCP_PROT_SET"
Maximum Data Link Retries:	☒ Never Retries
Maximum Number of Octets Transmitted in a Data Link Frame:	☒ Fixed at 292
Maximum Number of Octets that can be Received in a Data Link Frame:	☒ Fixed at 292
APPLICATION LAYER	
Maximum Number of Octets Transmitted in an Application Layer Fragment other than File Transfer.	☒ Fixed at 2048
Maximum Number of Octets Transmitted in an Application Layer Fragment containing File Transfer:	☒ File Transfer is Not Supported
Maximum Number of Octets that can be Received in an Application Layer Fragment :	☒ Fixed at 2048
Timeout Waiting for Complete Application Layer Fragment:	☒ Fixed at 15 seconds
Maximum Number of Objects Allowed in a Single Control Request for CROB:	☒ Fixed at 1(enter 0 if controls are not supported for CROB)

Maximum Number of Objects Allowed in a Single Control Request for Analog Outputs:	☒ Fixed at 1(enter 0 if controls are not supported for Analog Outputs)
Maximum Number of Objects Allowed in a Single Control Request for Data Sets:	☒ Not Supported
Supports Mixing Object Groups (AOBs, CROBs and Data Sets) in the Same Control Request:	☒ No
Control Status Codes Supported:	☒ 1 – TIMEOUT ☒ 2 – NO_SELECT ☒ 3 – FORMAT_ERROR ☒ 4 – NOT_SUPPORTED ☒ 5 – ALREADY_ACTIVE ☐ 6 – HARDWARE_ERROR ☐ 7 – LOCAL ☒ 8 – TOO_MANY_OBJS ☐ 9 – NOT_AUTHORIZED ☐ 10 – AUTOMATION_INHIBIT ☐ 11 – PROCESSING_LIMITED ☐ 12 – OUT_OF_RANGE ☐ 13 – DOWNSTREAM_LOCAL ☐ 14 – ALREADY_COMPLETE ☐ 15 – BLOCKED ☐ 16 – CANCELLED ☐ 17 – BLOCKED_OTHER_MASTER ☐ 18 – DOWNSTREAM_FAIL ☐ 126 – RESERVED ☐ 127 – UNDEFINED
BROADCAST FUNCTIONALITY	
This section indicates which functions are supported by the device when using broadcast addresses. Note that this section shows only entries that may have a meaningful purpose when used with broadcast requests.	
Support for broadcast functionality:	● Configurable
Write functions (FC = 2) supported with broadcast requests:	Write clock (g50v1 with qualifier code 07) ● Configurable, other (described elsewhere) Write last recorded time (g50v3 with qualifier code 07) ● Configurable, other (described elsewhere) Clear restart (g80v1 with qualifier code 00 and index = 7, value = 0) ● Configurable, other (described elsewhere) Write to any other group / variation / qualifier code ● Disabled
Direct operate functions (FC = 5) supported with broadcast requests:	● Disabled
Direct operate, no acknowledgement functions (FC = 6) supported with broadcast requests:	● Disabled
Immediate freeze functions (FC = 7) supported with broadcast requests:	● Disabled
Immediate freeze, no acknowledgement functions (FC = 8) supported with broadcast requests:	● Configurable, other (described elsewhere)
Freeze and clear functions (FC = 9) supported with broadcast requests:	● Disabled
Freeze and clear, no acknowledgement functions (FC = 10) supported with broadcast requests:	● Configurable, other (described elsewhere)

Freeze at time functions (FC = 11) supported with broadcast requests:	● Disabled
Freeze at time, no acknowledgement functions (FC = 12) supported with broadcast requests:	● Disabled
Cold restart functions (FC = 13) supported with broadcast requests:	● Configurable, other (described elsewhere)
Warm restart functions (FC = 14) supported with broadcast	● Configurable, other (described elsewhere)
Initialize data functions (FC = 15) supported with broadcast requests:	● Disabled
Initialize application functions (FC = 16) supported with broadcast requests:	● Configurable, other (described elsewhere)
Start application functions (FC = 17) supported with broadcast requests:	● Configurable, other (described elsewhere)
Stop application functions (FC = 18) supported with broadcast requests:	● Configurable, other (described elsewhere)
Save configuration functions (FC = 19) supported with broadcast requests:	● Disabled
Enable unsolicited functions (FC = 20) supported with broadcast requests:	● Disabled
Disable unsolicited functions (FC = 21) supported with broadcast requests:	● Disabled
Assign class functions (FC = 22) supported with broadcast requests:	● Disabled
Record current time functions (FC = 24) supported with broadcast requests:	● Enabled
Activate configuration functions (FC = 31) supported with broadcast requests:	● Disabled

This Device Properties is referred to “DNP3 SPECIFICATION DEVICE PROFILE, Version 2016, April-2016”.

●Capabilities for Device Database

This section is not included in this Master Station Profile.

●FCN as Outstation

Device Properties

DEVICE IDENTIFICATION	
Device Function:	○ Master ● Outstation
Vendor Name:	Yokogawa Electric Corporation
Device Name:	STARDOM FCN/FCJ
Device manufacturer's hardware version string: Device manufacturer's software version string:	DNP Group 0 - Attribute Objects are Not Supported. Following information can be confirmed by Resource Configurator “CPU Module Configuration” - “RAS Information” - Controller Model Name, Hardware Serial Number, Manufacturing Year and Month - Os Revision, Boot Program Revision/Build Number, Basic Software Revision/Build Number
Device Profile Document Version Number:	2016
DNP Levels Supported for:	Outstations Only Requests and Responses ☒ ☒ None ☒ ☒ Level 1 ☒ ☒ Level 2 ☒ ☒ Level 3 ☒ ☒ Level 4 - except Device Attributes (Device Attributes will be configured by Logic Designer) , CROB command change events, AOB command change events, XML file configuration
Supported Function Blocks:	☐ Self-Address Support ☐ Data Sets ☐ File Transfer ☐ Virtual Terminal ☐ Mapping to IEC 61850 Object Models defined in a DNP3 XML file. ☐ Function code 31, activate configuration ☒ Secure Authentication (if checked then see “SECURITY PARAMETERS”)
Notable Additions:	- Serial, TCP and UDP connection can be used - Up to two connections can be used for FCN-500, and FCN-RTU - Event buffer size can be expanded up to 135,000 events. - Every data type (BOOL/UINT/UDINT/INT/DINT/REAL/LREAL/STR32) can be used. - Pulse output operation can be operated. - Unsolicited response can be sent.
Methods to set Configurable Parameters:	☒ Software - Vender software named “Logic Designer” and “Resource Configurator” ☒ Protocol - Set via DNP3 (e.g. assign class, write deadband)
DNP3 XML Files Available On-line:	☒ None
External DNP3 XML Files Available Off-line:	☒ None
Connections Supported:	Configurable, selectable from Serial, IP Networking - Configurable by Logic Designer ☒ Serial (complete section “SERIAL CONNECTIONS”) ☒ IP Networking (complete section “IP NETWORKING”)
Conformance Testing:	☒ Self-tested, version
SERIAL CONNECTIONS	
Port Name:	For COM Ports of CPU Modules ☒ Fixed at COM1/COM2/COM3/COM4 - About the number of COM ports, refer to “STARDOM FCN/FCJ Guide” for each hardware model.
	For Serial Communication Modules ☒ Logical Port Name can be assigned by Resource Configurator
Serial Connection Parameters:	☒ Asynchronous - Data Bits: Selectable from 7, 8-bits (default = 8) - Start Bit: Fixed at 1-bit - Stop Bits: Selectable from 1, 2-bits (default = 1) - Parity: Selectable from NONE, EVEN, ODD (default = NONE)
	For COM Ports of CPU Modules - Configurable by STARDOM FCX Maintenance Page “COM Port Setting File”
	For Serial Communication Modules - Configurable by Resource Configurator

Baud Rate:	For COM Ports of CPU Modules ☒ Configurable, selectable from 300, 1200, 2400, 4800, 9600, 14400, 19200, 28800, 38400, 57600, 115200 (default = 9600) - About the list of baud rates, refer to “STARDOM FCN/FCJ Guide” for each hardware model.
	For Serial Communication Modules ☒ Configurable, selectable from 300, 1200, 2400, 4800, 9600, 14400, 19200, 28800, 38400, 57600, 76800, 115200 (default = 9600)
Hardware Flow Control (Handshaking):	RS-232 Options: for COM Ports of CPU Modules - Send Flow Control ☒ Configurable, select from NONE, CTS, DSR (default = NONE) - Receive Flow Control ☒ Configurable, select from NONE, RTS, DTR (default = NONE) - Send Validate ☒ Configurable, select from NONE, DSR (default = NONE) - Receive Validate ☒ Configurable, select from NONE, DSR, CD, DSR_CD (default = NONE) - Initial DTR state ☒ Configurable, select from ON, OFF (default = OFF)
	RS-232 Options: for Serial Communication Modules - Send Flow Control ☒ Fixed at CTS - Receive Flow Control ☒ Configurable, select from NONE, RTS (default = NONE) - Send Signal Check ☒ Configurable, select from NONE, DSR, CD, DSR_CD (default =NONE) - Receive Signal Check ☒ Fixed at CD - Initial DTR state ☒ Fixed at ON
Interval to Request Link Status:	☒ Not Supported ☒ Configurable, range 2.5 to 1800 seconds - when the value “UINT#2” is specified with the parameter “CXN_CHK_METHOD” of “SD_CDNP_OO_TCP/UDP_PORT_SET”, the Interval will be half the time of the specified with the parameter “CXN_CHK_TIMEOUT”
Supports DNP3 Collision Avoidance:	☒ Other, explain
	For RS-232-C Communication Modules and RS-232-C Serial Ports - “Full-duplex” or “Half-duplex with Hardware Flow Control” can be used.
	For RS-422 Communication Modules and RS-422 Serial Port of FCN-RTU CPU Modules - “4-wire” and “Full-duplex” should be configured.
Receiver Inter-Character Timeout:	- with the parameter “INTER_CHAR_TIMEOUT” of “SD_CDNP_OO_RS_PORT_SET”
	For COM Ports of CPU Modules ☒ Configurable range 10.0 to 5000.0 (ms), in units of 10 (ms) (default = 10.0(ms)).
	For Serial Communication Modules ☒ Configurable range 1.5 to 100.0 (character time) (or 1.5 (character time) to 100000.0 (ms)) (default = 4.0 (character time)).
Unit of Receiver Inter-Character Timeout:	☒ Configurable, selectable from “Character Time” or “Millisecond” - with the parameter “UNIT_CHAR_TIME“ of “SD_CDNP_OO_RS_PORT_SET” “UNIT_CHAR_TIME”=TRUE: Character time is used as the unit of the timeout value (default) “UNIT_CHAR_TIME”=FALSE: Millisecond is used as the unit of the timeout value
Inter-Character Gaps in Transmission:	☒ None (always transmits with no inter-character gap)
Multiple Master Connections:	☒ Supports multiple masters (Up to two connections are possible)
IP NETWORKING	
Port Name:	
Type of End Point:	☒ TCP Listening ☒ UDP Datagram
IP Address of this Device:	☒ Configurable by Resource Configurator “Set IP Address Dialog”
Subnet Mask:	
Gateway IP Address:	
Accept TCP Connections or UDP Datagrams from:	☒ Allows all (when no IP address is listed in the “Packet Filter Setting File”) ☒ Limits based on IP address - when a destination IP address is specified with the parameter “DEST_IP_ADDR1” of “SD_CDNP_OO_TCP/UDP_PORT_SET” ☒ Limits based on list of IP address - when two destination IP addresses are specified with the parameter “DEST_IP_ADDR1” and “DEST_IP_ADDR2” of “SD_CDNP_OO_TCP/UDP_PORT_SET”, or the IP addresses are listed in the “Packet Filter Setting File”
IP Address(es) from with TCP Connections or UDP Datagrams are accepted:	It can be confirmed with the parameter “ CONNECT_INFO ” of “ SD_CDNP_OO_TCP_OPEN ” and “SD_CDNP_OO_UDP_OPEN”.

TCP Listen Port Number:	☒ Fixed at 20000 (as the default port number) ☒ Configurable, range 1 to 65535 - with the parameter “PORT_NO” of “SD_CDNP_OO_TCP_PORT_SET” - When specify the TCP port number, check to ensure the number that has not been used for the other TCP ports by different communications. - Then, specify a reasonable port number, except zero. - When connecting to two master stations, specify different number for each connection. - And without a conflict of TCP port number, 20050 can be the candidate of the second connection.
TCP Listen Port Number of Remote Device:	☒ Not Applicable (Outstation w/o dual end point)
TCP Keep-alive Timer:	☒ Timer disabled
TCP/UDP Timeout:	Instead of Keep-alive timer, TCP disconnection will be checked with this timeout value. ☒ Configurable by Logic Designer (range 5 to 3600 seconds) (default = 5 (sec)) - with the parameter “CXN_CHK_TIMEOUT” of “SD_CDNP_OO_TCP/TCP_PORT_SET/UDP_PORT_SET”, when “UINT#0” is specified with the parameter “CXN_CHK_METHOD” - Outstation will close the TCP/UDP socket, if no data is received from the Master within the time.
	Unsolicited NULL response can be sent periodically to keep the connection for the unsolicited responses. ☒ Configurable by Logic Designer - when “UINT#1” is specified with the parameter “TIMEOUT_METHOD” of “SD_CDNP_OO_TCP/UDP_PORT_SET” - If no message is received for a while, after “TIMEOUT” is over, an unsolicited NULL response will be sent. - Then, if a confirmation is received, TCP/UDP connection will be kept, but if not, after “APPL_CNF_TOUT” is over, TCP/UDP connection will be closed and reopened to wait for the next/new connection.
Local UDP Port:	☒ Fixed at 20000 (as the default port number) ☒ Configurable, range 1 to 65535
Destination UDP port for initial unsolicited null responses (UDP only Outstations):	
Destination UDP port for responses (UDP only Outstations):	☒ Configurable, range 1 to 65535 ☒ Use local port number (default) Outstations must use one that is known by the Master. (default: when the parameter “DEST_PORT_NO” of “SD_CDNP_OO_UDP_PORT_SET” is not specified, or zero is specified)
Multiple Outstation Connections:	☒ Supports multiple masters (Up to two connections are possible) If supported, the following methods may be used: ☒ Method 1 (based on IP address) ☒ Method 2 (based on IP port number)
Time Synchronization Support:	☒ SNTP (Simple Network Time Protocol) - Configurable by STARDOM FCX Maintenance Page “SNTP Setting File”
	☒ DNP3 LAN procedure (function code 24) ☒ DNP3 Write Time (not recommended over LAN) - DNP3 Network Method can be used when SNTP cannot be used.
When Does Outstation Set IIN1.4?	when DNP3 Network Method is not used (CLK_VALID_PERIOD=0) ☒ Never
	when DNP3 Network Method is used (CLK_VALID_PERIOD!=0) ☒ Asserted at startup until first Time Synchronization request received ☒ Range 5 to 60 minutes after last time sync (default is 30 minutes)
LINK LAYER	
Data Link Address: (DNP3 Outstation Address)	☒ Configurable, range 0 to 0xffff - Configurable by Logic Designer - with the parameter “SRC_ADDR“ of “SD_CDNP_OO_RS/TCP/UDP_OPEN” “SRC_ADDR” (= DNP3 Outstation Address of STARDOM FCN/FCJ) - Data Link Address can be used for DNP3 Source Address Validation at the Master. - Specify the address in range from 0x0000 to 0xFFEF. - Addresses in the range 0xFFF0 through 0xFFFF are reserved by DNP3 for special use.
DNP3 Source Address Validation:	☒ Always, one address allowed - Outstation will filter out requests not from the Master.
DNP3 Source Address Expected when Validation is Enables: (DNP3 Master Address)	☒ Configurable to any 16 bit DNP Data Link Address value - Configurable by Logic Designer - with the parameter “DEST_ADDR” of “SD_CDNP_OO_RS/TCP/UDP_OPEN” “DEST_ADDR” (= DNP3 Master Address to communicate with STARDOM FCN Outstation Function) - DNP3 Source Address is used for DNP3 Source Address Validation at the Outstation.

Self Address Support Using Address 0xFFFC:	☒ No
Sends Confirmed User Data Frames:	☒ Never
Data Link Layer Confirmation Timeout:	☒ None ☒ Configurable, range 10 to 600 seconds - with the parameter “APPL_CNF_TIMEOUT” of “SD_CDNP_OO_RS/TCP/UDP_PROT_SET”
Maximum Data Link Retries:	☒ Never Retries
Maximum Number of Octets Transmitted in a Data Link Frame:	☒ Fixed at 292
Maximum Number of Octets that can be Received in a Data Link Frame:	☒ Fixed at 292
APPLICATION LAYER	
Maximum Number of Octets Transmitted in an Application Layer Fragment other than File Transfer.	☒ Fixed at 2048
Maximum Number of Octets Transmitted in an Application Layer Fragment containing File Transfer:	☒ File Transfer is Not Supported
Maximum Number of Octets that can be Received in an Application Layer Fragment :	☒ Fixed at 2048
Timeout Waiting for Complete Application Layer Fragment:	☒ Fixed at 15 seconds
Maximum Number of Objects Allowed in a Single Control Request for CROB (group 12):	☒ Fixed at 1(enter 0 if controls are not supported for CROB)
Maximum Number of Objects Allowed in a Single Control Request for Analog Outputs (group 41):	☒ Fixed at 1(enter 0 if controls are not supported for Analog Outputs)
Maximum Number of Objects Allowed in a Single Control Request for Data Sets (groups 85, 86, 87):	☒ Not Supported
Supports Mixing Object Groups (AOBs, CROBs and Data Sets) in the Same Control Request:	☒ No
Control Status Codes Supported:	☒ 1 – TIMEOUT ☒ 2 – NO_SELECT ☒ 3 – FORMAT_ERROR ☒ 4 – NOT_SUPPORTED ☒ 5 – ALREADY_ACTIVE ☐ 6 – HARDWARE_ERROR ☐ 7 – LOCAL ☒ 8 – TOO_MANY_OBJS ☐ 9 – NOT_AUTHORIZED ☐ 10 – AUTOMATION_INHIBIT ☐ 11 – PROCESSING_LIMITED ☐ 12 – OUT_OF_RANGE ☐ 13 – DOWNSTREAM_LOCAL ☐ 14 – ALREADY_COMPLETE ☐ 15 – BLOCKED ☐ 16 – CANCELLED ☐ 17 – BLOCKED_OTHER_MASTER ☐ 18 – DOWNSTREAM_FAIL ☐ 126 – RESERVED ☐ 127 – UNDEFINED
ITEMS FOR OUTSTATIONS	
Timeout Waiting for Application Confirm of Solicited Response Message:	☒ Configurable, range 10 to 600 seconds (default = 10 (sec)) - with the parameter “APPL_CNF_TIMEOUT” of “SD_CDNP_OO_RS/TCP/UDP_PORT_SET”

How often is Time Synchronization Required from the Master:	☒ Never needs time ☒ Periodically, between 100 and 1800 seconds - IIN1.4 will be set at startup and every 30 minutes (1800 seconds) after the last “Time Synchronization”, when the parameter “CLK_VAR_ID_PERIOD” of “SD_SDNP_OO_RS/TCP/UDP_OPEN” is set to “TRUE”
Device Trouble Bit IIN1.6:	☒ Never used
File Handle Timeout:	☒ Not Applicable, Files Not Supported
Event Buffer Overflow Behavior:	☒ Discard the oldest event ☒ Discard the newest event - Selectable with the parameter “NEWEST_EVNT_DEL” of “SD_SDNP_OO_CFG_EBUF_DTYP” “NEWEST_EVNT_DEL” = FALSE: Discard the Oldest Event (default) “NEWEST_EVNT_DEL” = TRUE: Discard the Newest Event
Event Buffer Organization:	When the output parameter “EBUF_CFG” of “SD_CDNP_OO_CFG_EBUF_DYTP” is connected to the input parameter “EBUF_CFG” of “SD_CDNP_OO_RS/TCP/UDP_OPEN”.
	☒ Per Object Group. The number of events for each object group can be specified with “SD_CDNP_OO_CFG_EBUF_DTYP”
Sends Multi-Fragment Responses:	☒ Yes
Last Fragment Confirmation:	☒ Always
DNP Command Settings Preserved Through a Device Reset:	☒ Assign Class ☒ Analog Deadbands
Supports configuration signature:	☒ Not Supported
Requests Application Confirmation:	For event responses: ● Yes ○ No ○ Configurable For non-final fragments: ● Yes ○ No ○ Configurable
Supports Clock Management	☒ Yes (support both DNP3 time synchronization and SNTP)
OUTSTATION UNSOLICITED RESPONSE SUPPORT	
Supports Unsolicited Reporting:	☒ Yes ☒ No ☒ Configurable, selectable from On or Off - When the output parameter “UNSOL_CFG” of “SD_CDNP_OO_UNSOL” is connected to the input parameter “UNSOL_CFG” of “SD_CDNP_OO_RS/TCP/UDP_OPEN”.
	Note for Serial Connection - Unsolicited Response must be used with the Point-to-point connection
	Note for Serial Communication Modules - “Full-duplex” should be selected for Duplex Operation by Resource Configurator
Master Data Link Address:	☒ Configurable, range 0 to 0xFFEF - The same master address is used for both solicited and unsolicited responses with the parameter “DEST_ADDR” of “SD_CDNP_OO_RS/TCP/UDP_PORT_SET”. - Addresses in the range 0xFFF0 through 0xFFFF are reserved by DNP3 for special use.
Unsolicited Response Confirmation Timeout:	☒ Configurable, range 10 to 600 seconds (default=10 (sec)) - The same value of “Application Layer Confirmation” is used with the parameter “APPL_CNF_TIMEOUT” of “SD_CDNP_OO_RS/TCP/UDP_PORT_SET”
Number of Unsolicited Retries:	☒ Configurable, range 0 to 10 (default=3) - with the parameter “RETRY_NUM” of “SD_CDNP_OO_CFG_UNSOL”
OUTSTATION UNSOLICITED RESPONSE TRIGGER CONDITIONS	
Number of Class 1 Events:	☒ Configurable, range 1 to 100 (default=5) - with the parameter “TRG_C1_EVENT_NUM” of “SD_CDNP_OO_CFG_UNSOL”
Number of Class 2 Events:	☒ Configurable, range 1 to 100 (default=5) - with the parameter “TRG_C2_EVENT_NUM” of “SD_CDNP_OO_CFG_UNSOL”
Number of Class 3 Events:	☒ Configurable, range 1 to 100 (default=5) - with the parameter “TRG_C3_EVENT_NUM” of “SD_CDNP_OO_CFG_UNSOL”
Total Number Events from Any Class:	☒ Total Number of Events not used to trigger Unsolicited Responses

Hold Time After Class 1 Event: A value of 0 indicates that responses are not delayed due to this parameter.	☒ Configurable, range 0 to 10 seconds (default=5 seconds) - with the parameter “TRG_C1_HOLD_TIME” of “SD_CDNP_OO_CFG_UNSOL”
Hold Time After Class 2 Event: A value of 0 indicates that responses are not delayed due to this parameter.	☒ Configurable, range 0 to 10 seconds (default=5 seconds) - with the parameter “TRG_C2_HOLD_TIME” of “SD_CDNP_OO_CFG_UNSOL”
Hold Time After Class 3 Event: A value of 0 indicates that responses are not delayed due to this parameter.	☒ Configurable, range 0 to 300 seconds (default=5 (sec)) - with the parameter “TRG_C3_HOLD_TIME” of “SD_CDNP_OO_CFG_UNSOL”
Hold Time After Event Assigned to Any Class:	☒ Class events not used to trigger Unsolicited Responses
Retrigger Hold Time: The hold-time timer may be retriggered for each new event detected (increased possibly of capturing all the changes in a single response) or not retriggered (giving the master a guaranteed update time).	☒ Hold-time timer will be retriggered for each new event detected (may get more changes in next response)
Other Unsolicited Response Trigger Conditions:	☒ NONE
SECURITY PARAMETERS	
DNP3 device support for secure authentication:	☒ Fixed at 5
Maximum number of users:	☒ Fixed at 1 ☒ Configurable, selectable from up to 4 users
Security message response timeout:	☒ Configurable, range 1 to 120 seconds (default = 1 (sec))
Aggressive mode of operation (receive):	● Yes, accepts aggressive mode requests
Aggressive mode of operation (issuing):	● Yes, issues aggressive mode requests
Session Key change interval:	☒ Can be disabled When enabled: ☒ Configurable, range 60 to 7200 seconds (default = 60 (sec))
Session Key change message count:	☒ Configurable, range 100 to 10000
Maximum error count: (SAv2 only)	☒ Not applicable (not using SAv2) ☐ Configurable, range 0 to 10
MAC algorithm requested in a challenge exchange:	☒ HMAC-SHA-256 (truncated to the leftmost 8 octets) ☒ HMAC-SHA-256 (truncated to the leftmost 16 octets)
Key wrap algorithm to encrypt session keys:	☒ AES-128 ☒ AES-256
Cipher Suites used with DNP implementations using TLS:	☒ Not relevant – TLS is not used
Change cipher request timeout:	☒ Not relevant – TLS is not used
Number of Certificate Authorities supported:	0
Certificate Revocation check time:	☒ Not relevant – TLS is not used

Additional critical function codes:	Additional function codes that are to be considered as “critical”: ☒ 0 (Confirm) ☒ 1 (Read) ☒ 7 (Immediate freeze) ☒ 8 (Immediate freeze – no ack) ☒ 9 (Freeze-and-clear) ☒ 10 (Freeze-and-clear – no ack) ☒ 22 (Assign Class) ☒ 129 (Response) ☒ 130 (Unsolicited Response)
Other critical fragments:	
Support for remote update key	☒ Remote update key change by symmetric cryptography Supported key change methods: ☒ AES-128 key wrap with SHA-1-HMAC ☒ AES-256 key wrap with SHA-256-HMAC ☐ Remote update key change by asymmetric cryptography
“Default” user credentials are permitted to expire:	☒ Yes ☐ No
Secure Authentication enabled:	☒ Configurable, selectable from On and Off ☐ Always On
Length of the challenge data:	☐ Fixed at octets ☒ Configurable, range 4 to 64octets ☐ Configurable, selectable from octets ☐ Configurable, other, describe
Maximum statistic counts (SAv5):	Max Authentication Failures: ☐ Not applicable (not using SAv5) ☒ Fixed at 5 Max Reply Timeouts: ☐ Not applicable (not using SAv5) ☒ Fixed at 3 Max Authentication Rekeys: ☐Not applicable (not using SAv5) ☒ Fixed at 3 Max Error Messages Sent: ☐ Not applicable (not using SAv5) ☒ Fixed at 2
BROADCAST FUNCTIONALITY	
This section indicates which functions are supported by the device when using broadcast addresses. Note that this section shows only entries that may have a meaningful purpose when used with broadcast requests.	
Support for broadcast functionality:	● Enabled
Write functions (FC = 2) supported with broadcast requests:	Write clock (g50v1 with qualifier code 07) ● Enabled Write last recorded time (g50v3 with qualifier code 07) ● Enabled Clear restart (g80v1 with qualifier code 00 and index = 7, value = 0) ● Enabled Write to any other group / variation / qualifier code ● Enabled
Direct operate functions (FC = 5) supported with broadcast requests:	● Enabled
Direct operate, no acknowledgement functions (FC = 6) supported with broadcast requests:	● Enabled
Immediate freeze functions (FC = 7) supported with broadcast requests:	● Enabled
Immediate freeze, no acknowledgement functions (FC = 8) supported with broadcast requests:	● Enabled

Freeze and clear functions (FC = 9) supported with broadcast requests:	● Enabled
Freeze and clear, no acknowledgement functions (FC = 10) supported with broadcast requests:	● Enabled
Freeze at time functions (FC = 11) supported with broadcast requests:	● Disabled
Freeze at time, no acknowledgement functions (FC = 12) supported with broadcast requests:	● Disabled
Cold restart functions (FC = 13) supported with broadcast requests:	● Configurable, other (described elsewhere)
Warm restart functions (FC = 14) supported with broadcast	● Configurable, other (described elsewhere)
Initialize data functions (FC = 15) supported with broadcast requests:	● Disabled
Initialize application functions (FC = 16) supported with broadcast requests:	● Configurable, other (described elsewhere)
Start application functions (FC = 17) supported with broadcast requests:	● Configurable, other (described elsewhere)
Stop application functions (FC = 18) supported with broadcast requests:	● Configurable, other (described elsewhere)
Save configuration functions (FC = 19) supported with broadcast requests:	● Enabled
Enable unsolicited functions (FC = 20) supported with broadcast requests:	● Enabled
Disable unsolicited functions (FC = 21) supported with broadcast requests:	● Enabled
Assign class functions (FC = 22) supported with broadcast requests:	● Enabled
Record current time functions (FC = 24) supported with broadcast requests:	● Enabled
Activate configuration functions (FC = 31) supported with broadcast requests:	● Disabled

This Device Properties is referred to “DNP3 SPECIFICATION DEVICE PROFILE, Version 2016, April-2016”.

●Capabilities for Device Database

SINGLE-BIT BINARY INPUT POINTS **Static (Steady-State) Object Number: 1** **Event Object Number: 2**	
Static Variation reported when variation 0 requested or in response to Class polls	☒ Variation 2 - with flag
Event Variation reported when variation 0 requested or in response to Class polls	☒ Variation 1 - without time (optional) ☒ Variation 2 - with absolute time (default) - "without time" can be selected by "All event data without time stamp" bit of the parameter "EVENT_OPT" of "SD_CDNP_DD_ASSIGN_*" POU.
Event reporting mode	☒ All events
Binary Inputs included in Class 0 response:	☒ Always
Binary Inputs Event Buffer Organization:	☒ Configurable, range 0 to 135,000 (default=500) - with the parameter "BI_EBUF_SIZE" of "SD_CDNP_OO_CFG_EBUF_DYTP" - Total maximum event size for all data types is 135,000.
BINARY OUTPUT STATUS AND CONTROL RELAY OUTPUT BLOCK **Binary Output Status Object Number: 10** **Binary Output Event Object Number: 11** **CROB Object Number: 12**	
Minimum pulse time allowed with Trip, Close and Pulse On/Off commands.	☒ Fixed at 0 ms (accuracy will be the control task execution period) - However, the 0-ms On-time for Trip/Close/Pulse On commands and the 0-ms Off-time for Trip/Close/Pulse Off commands are not allowed.
Maximum pulse time allowed with Trip, Close and Pulse On/Off commands.	☒ Fixed at 60000 ms (accuracy will be the control task execution period)
Binary Output Status included in Class 0 response:	☒ Always
Static Variation reported when variation 0 requested or in response to Class polls:	☒ Variation 2 - output status with flags
Event Variation reported when variation 0 requested or in response to Class polls:	☒ Variation 1 – status without time (optional) ☒ Variation 2 – status with time (default) - "without time" can be selected by "All event data without time stamp" bit of the parameter "EVENT_OPT" of "SD_CDNP_DD_ASSIGN_*" POU.
Event reporting mode:	☒ All events
Maximum Time between Select and Operate:	☒ Configurable, range from 1 to 600 seconds (default=5) - with the parameter "SELECT_TIMEOUT" of "SD_CDNP_OO_RS/TCP/UDP_PORT_SET"
Binary Outputs Event Buffer Organization:	☒ Configurable, range 0 to 135,000 (default=0) - with the parameter "BO_EBUF_SIZE" of "SD_CDNP_OO_CFG_EBUF_DYTP" - Total maximum event size for all data types is 135,000.
COUNTERS/FROZEN COUNTERS **Static Counter Object Number: 20** **Static Frozen Counter Object Number: 21** **Counter Event Object Number: 22** **Frozen Counter Event Object Number: 23**	
Static Counter Variation reported when variation 0 requested or in response to Class polls	☒ Based on point index (Variation 1 or 2)
Counter Event Variation reported when variation 0 requested or in response to Class polls	☒ Based on point index (Variation 5 or 6) (default) ☒ Based on point index (Variation 1 or 2) (without time - optional) - "without time" can be selected by "All event data without time stamp" bit of the parameter "EVENT_OPT" of "SD_CDNP_DD_ASSIGN_*" POU.
Counter included in Class 0 response:	☒ Always
Counter Event reporting mode	☒ C: All events
Static Frozen Counter Variation reported when variation 0 requested or in response to Class polls:	☒ Based on point index (Variation 1 or 2) - Frozen Counter can be handled with "SD_CDNP_SS_ASSIGN2"

Frozen Counter Event Variation reported when variation 0 requested or in response to Class polls:	☒ Based on point index (Variation 5 or 6) (default) ☒ Based on point index (Variation 1 or 2) (without time - optional) - "without time" can be selected by "All event data without time stamp" bit of the parameter "EVENT_OPT" of "SD_CDNP_DD_ASSIGN_*" POU.
Frozen Counters included in Class 0 response:	☒ Always (default) ☒ Never (optional) - "Never" can be selected by "Frozen counter class 0 response stop" bit of the parameter "CLASS0_OPT" of "SD_CDNP_DD_ASSIGN_*" POU.
Frozen Counter Event reporting mode:	☒ All frozen events
Counter Roll Over at:	☒ Based on point index (16 Bits or 32 Bits)
Counter frozen by means of:	☒ Master Request
Counters Event Buffer Organization:	☒ Configurable, range 0 to 270,000 for FCN-500, 135,000 for FCN-RTU (default=500) - with the parameter "CT_EBUF_SIZE" of "SD_CDNP_OO_CFG_EBUF_DYTP" - Total maximum event size for all data types is 135,000.
Reports counter events for change of value:	☒ Yes for all counters ☒ No for all counters ☒ Configurable, based on point Index
ANALOG INPUT POINTS **Static (Steady-State) Object Number: 30** **Event Object Number: 32** **Analog Input Deadband Object Number: 34**	
Static Variation reported when variation 0 requested or in response to Class polls:	☒ Based on point index (Variation 1, 2, 5 or 6)
Event Variation reported when variation 0 requested or in response to Class polls:	☒ Based on point index (Variation 3, 4, 7 or 8) (default) ☒ Based on point index (Variation 1, 2, 5 or 6) (without time - optional) - "without time" can be selected by "All event data without time stamp" bit of the parameter "EVENT_OPT" of "SD_CDNP_DD_ASSIGN_*" POU.
Event reporting mode	☒ All events
Analog Inputs included in Class 0 response:	☒ Always
How Deadbands are set:	☒ Configurable through DNP ☒ Configurable via other means - Configurable with "SD_CDNP_O_DBND" POU for each point.
Analog Deadband Algorithm:	☒ Simple - just compare the difference from the previous reported value ☒ Integrating - keeps track of the accumulated change - Specify the parameter "DBND_ALGORITHM" with "SD_CDNP_OO_CFG_EBUF_*" POU.
Analog Inputs Event Buffer Organization:	☒ Configurable, range 0 to 135,000 (default=500) - with the parameter "AI_EBF_SIZE" of "SD_CDNP_OO_CFG_EBUF_DYTP" - Total maximum event size for all data types is 135,000.
ANALOG OUTPUT STATUS AND ANALOG OUTPUT CONTROL BLOCK **Analog Output Status Object Number: 40** **Analog Output Control Block Object Number: 41** **Analog Output Event Object Number: 42**	
Static Analog Output Status Variation reported when variation 0 requested or in response to Class polls:	☒ Based on point index (Variation 1, 2, 3 or 4)
Analog Output Status included in Class 0 response:	☒ Always
Event Variation reported when variation 0 requested or in response to Class polls:	☒ Based on point index (Variation 3, 4, 7 or 8) (default) ☒ Based on point index (Variation 1, 2, 5 or 6) (without time - optional) - "without time" can be selected by "All event data without time stamp" bit of the parameter "EVENT_OPT" of "SD_CDNP_DD_ASSIGN_*" POU.
Event reporting mode:	☒ All events
Maximum Time between Select and Operate:	☒ Configurable, range from 1 to 600 seconds (default=5) - with the parameter "SELECT_TIMEOUT" of "SD_CDNP_OO_RS/TCP/UDP_PORT_SET"
Analog Outputs Event Buffer Organization:	☒ Configurable, range 0 to 135,000 (default=0) - with the parameter "AO_EVNT_BUFF_SIZ" of "SD_CDNP_OO_CFG_EBUF_DYTP" - Total maximum event size for all data types is 135,000.

OCTET STRING POINTS **Static (Steady-State) Object Number: 110** **110Event Object Number: 111**	
Event reporting mode:	☒ All events - Octet String Event can be handled with “SD_CDNP_SS_ASSIGN2”
Octet Strings included in Class 0 response:	☒ Always (default) ☒ Never (optional) - “Never” can be selected by “Octet string class 0 response stop” bit of the parameter “CLASS0_ OPT” of “SD_CDNP_DD_ASSIGN_*” POU.
Maximum number of octets that can be handled in an Octet String Data:	☒ Fixed at 32-Octets
Octet Strings Event Buffer Organization:	☒ Configurable, range 0 to 135,000 (default=0) - with the parameter “CT_EVNT_BUFF_SIZ” of “SD_CDNP_OO_CFG_EBUF_DYTP” - Total maximum event size for all data types is 135,000.
Object Group Selection	☒ Fixed, group 110 for all objects

This Capabilities for Device Database is referred to “DNP3 SPECIFICATION DEVICE PROFILE Version 2016, April-2016.”

●Common with Master

Implementation Table

DNP OBJECT GROUP & VARIATION			REQUEST (FCN/FCJ will parse)		RESPONSE (FCN/FCJ will respond)	
Group Number	Variation Number	Description	Function Codes (dec)	Qualifier Codes (hex)	Function Codes (dec)	Qualifier Codes (hex)
1	0	Binary Input - Any variation (Variation 0 is used to request default variation)	1 (read), 22 (assign class)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)		
1	1	Binary Input - Packed format	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
1	2	Binary Input - With flags	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
2	0	Binary Input Change Event - Any variation (Variation 0 is used to request default variation)	1 (read)	06 (all), 07, 08 (limited qty)		
2	1	Binary Input Change Event without Time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
2	2	Binary Input Change Event - With absolute time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
2	3	Binary Input Change Event - With relative time	1 (read)	06 (no range, or all), 07, 08 (limited qty)	129 (response), 130 (unsol. resp.)	17, 28 (index)
3	0	Double-Bit Binary Input – any variation	1 (read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 28 (index)		
3	1	Double-bit Binary Input – Packed format	1 (read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 28 (index)	129 (response), 130 (unsol. resp.)	17, 28 (index)
3	2	Double-bit Binary Input – With flags	1 (read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 28 (index)	129 (response), 130 (unsol. resp.)	17, 28 (index)
4	0	Double-Bit Binary Input Change Event	1 (read)	06 (no range, or all), 07, 08 (limited qty)		
4	1	Double-bit Binary Input Event – Without time	1 (read)	06 (no range, or all), 07, 08 (limited qty)	129 (response), 130 (unsol. resp.)	17, 28 (index)
4	2	Double-bit Binary Input Event – With absolute time	1 (read)	06 (no range, or all), 07, 08 (limited qty)	129 (response), 130 (unsol. resp.)	17, 28 (index)
4	3	Double-bit Binary Input Event – With relative time	1 (read)	06 (no range, or all), 07, 08 (limited qty)	129 (response), 130 (unsol. resp.)	17, 28 (index)
10	0	Binary Output Status - Any variation (Variation 0 is used to request default variation)	1 (read) 22 (assign class)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)		

DNP OBJECT GROUP & VARIATION			REQUEST (FCN/FCJ will parse)		RESPONSE (FCN/FCJ will respond)	
Group Number	**Variation Number**	**Description**	**Function Codes (dec)**	**Qualifier Codes (hex)**	**Function Codes (dec)**	**Qualifier Codes (hex)**
10	1	Binary Output Status - Packed format	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
10	2	Binary Output Status - Output status with flags	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
11	0	Binary Output Event - Any variation (Variation 0 is used to request default variation)	1 (read)	00, 01 (start-stop), 06 (all)		
11	1	Binary Output Event - Status without time	1 (read)	00, 01 (start-stop), 06 (all)	129 (response) 130 (unsol. resp.)	17, 28 (index)
11	2	Binary Output Event - Status with time	1 (read)	00, 01 (start-stop), 06 (all)	129 (response) 130 (unsol. resp.)	17, 28 (index)
12	1	Binary Output Command - Control relay output block (CROB)	03 (select), 04 (operate), 05 (direct perate), 06 (direct op, no ack)	17, 28 (index)	129 (response)	17, 28 (index)
20	0	Counter – Any variation (Variation 0 is used to request default variation)	1 (read), 22 (assign class)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)		
			7 (freeze), 8 (freeze no ack), 9 (freeze & clear), 10 (frz & clr, no ack)	00, 01 (start-stop), 06 (all)		
20	1	Counter - 32-bit with flag	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
20	2	Counter - 16-bit with flag	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
20	5	Counter - 32-bit without flag	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
20	6	Counter - 16-bit without flag	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
21	0	Frozen Counter -Any variation (Variation 0 is used to request default variation)	1 (read) 22 (assign class)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)		
21	1	Frozen Counter - 32-bit with flag	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)

DNP OBJECT GROUP & VARIATION			REQUEST (FCN/FCJ will parse)		RESPONSE (FCN/FCJ will respond)	
Group Number	**Variation Number**	**Description**	**Function Codes (dec)**	**Qualifier Codes (hex)**	**Function Codes (dec)**	**Qualifier Codes (hex)**
21	2	Frozen Counter - 16-bit with flag	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
21	5	Frozen Counter - 32-bit with flag and time	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
21	6	Frozen Counter - 16-bit with flag and time	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
21	9	Frozen Counter - 32-bit without flag	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
21	10	Frozen Counter -16-bit without flag	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
22	0	Counter Change Event - Any variation (Variation 0 is used to request default variation)	1 (read)	06 (all), 07, 08 (limited qty)		
22	1	Counter Change Event - 32-bit with flag and time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
22	2	Counter Change Event - 16-bit with flag and time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
22	5	Counter Change Event -32-bit with flag and time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
22	6	Counter Change Event -16-bit with flag and time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
23	0	Frozen Counter Change Event - Any variation (Variation 0 is used to request default variation)	1 (read)	06 (all), 07, 08 (limited qty)		
23	1	Frozen Counter Change Event - 32-bit with flag	1 (read)	06 (all), 07, 08 (limited qty)	129 (response)	17, 28 (index)
23	2	Frozen Counter Change Event - 16-bit with flag	1 (read)	06 (all), 07, 08 (limited qty)	129 (response)	17, 28 (index)
23	5	Frozen Counter Change Event - 32-bit with flag and time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response)	17, 28 (index)
23	6	Frozen Counter Change Event - 16-bit with flag and time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response)	17, 28 (index)
30	0	Analog Input - Any variation (Variation 0 is used to request default variation)	1 (read), 22 (assign class)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)		
			7 (freeze), 8 (freeze no ack),	00, 01 (start-stop), 06 (no range, or all),		

DNP OBJECT GROUP & VARIATION			REQUEST (FCN/FCJ will parse)		RESPONSE (FCN/FCJ will respond)	
Group Number	Variation Number	Description	Function Codes (dec)	Qualifier Codes (hex)	Function Codes (dec)	Qualifier Codes (hex)
30	1	Analog Input - 32-bit with flag	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
30	2	Analog Input - 16-bit with flag	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
30	3	Analog Input - 32-bit without flag	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
30	4	Analog Input -16-bit without flag	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
30	5	Analog Input - Single-precision floating point with flag	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
30	6	Analog Input - Double-precision floating point with flag	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
31	0	Frozen Analog Input - Any variation	1 (read)	06 (no range, or all), 07, 08 (limited qty)		
			22 (assign class)	00, 01 (start-stop),06 (no range, or all),07, 08 (limited qty),17, 27, 28 (index)		
31	1	Frozen Analog Input - 32-bit with flag	1 (read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index)	129 (response), 130 (unsol. resp.)	00, 01 (start-stop), 17, 28 (index)
31	2	Frozen Analog Input - 16-bit with flag	1 (read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index)	129 (response), 130 (unsol. resp.)	00, 01 (start-stop), 17, 28 (index)
31	3	Frozen Analog Input - 32-bit with time-of-freeze	1 (read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index)	129 (response), 130 (unsol. resp.)	00, 01 (start-stop), 17, 28 (index)
31	4	Frozen Analog Input - 16-bit with time-of-freeze	1 (read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index)	129 (response), 130 (unsol. resp.)	00, 01 (start-stop), 17, 28 (index)
31	5	Frozen Analog Input - 32-bit without flag	1 (read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index)	129 (response), 130 (unsol. resp.)	00, 01 (start-stop), 17, 28 (index)
31	6	Frozen Analog Input - 16-bit without flag	1 (read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index)	129 (response), 130 (unsol. resp.)	00, 01 (start-stop), 17, 28 (index)
31	7	Frozen Analog Input - Singleprecision, floating-point with flag	1 (read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index)	129 (response), 130 (unsol. resp.)	00, 01 (start-stop), 17, 28 (index)

DNP OBJECT GROUP & VARIATION			REQUEST (FCN/FCJ will parse)		RESPONSE (FCN/FCJ will respond)	
Group Number	Variation Number	Description	Function Codes (dec)	Qualifier Codes (hex)	Function Codes (dec)	Qualifier Codes (hex)
31	8	Frozen Analog Input - Doubleprecision,	1 (read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index)	129 (response), 130 (unsol. resp.)	00, 01 (start-stop), 17, 28 (index)
32	0	floating-point with	1 (read)	06 (all), 07, 08 (limited qty)		
32	1	flag	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
32	2	Analog Input Change Event -16-bit without time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
32	3	Analog Input Change Event - 32-bit with time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
32	4	Analog Input Change Event - 16-bit with time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
32	5	Analog Input Change Event - Single-precision floating point without time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
32	6	Analog Input Change Event - Double-precision floating point without time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
32	7	Analog Input Change Event - Single-precision floating point with time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
32	8	Analog Input Change Event - Double-precision floating point with time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
33	0	Frozen Analog Input Change Event - any variation	1 (read)	06 (all), 07, 08 (limited qty)		
33	1	Frozen Analog Input Change Event - 32-bit without time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
33	2	Frozen Analog Input Change Event - 16-bit without time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
33	3	Frozen Analog Input Change Event - 32-bit with time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
33	4	Frozen Analog Input Change Event - 16-bit with time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
33	5	Frozen Analog Input Change Event - single-precision, floatingpoint without time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)

DNP OBJECT GROUP & VARIATION			REQUEST (FCN/FCJ will parse)		RESPONSE (FCN/FCJ will respond)	
Group Number	**Variation Number**	**Description**	**Function Codes (dec)**	**Qualifier Codes (hex)**	**Function Codes (dec)**	**Qualifier Codes (hex)**
33	6	Frozen Analog Input Change Event - double-precision, floating-point without time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
33	7	Frozen Analog Input Change Event - single-precision, floatingpoint with time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
33	8	Frozen Analog Input Change Event - double-precision, floating-point with time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
34	0	Analog Input Deadband - Any variation (Variation 0 is used to request default variation)	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)		
34	1	Analog Input Deadband - 16-bit	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
			2 (write)	00, 01 (start-stop), 07, 08 (limited qty), 17, 28 (index)		
34	2	Analog Input Deadband - 32-bit	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
			2 (write)	00, 01 (start-stop), 07, 08 (limited qty), 17, 28 (index)		
34	3	Analog Input Deadband - Single-precision floating point	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop) 17, 28 (index)
			2 (write)	00, 01 (start-stop), 07, 08 (limited qty), 17, 28 (index)		
40	0	Analog Output Status – Any variation (Variation 0 is used to request default variation)	1 (read) 22 (assign class)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)		
40	1	Analog Output Status -32-bit with flag	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
40	2	Analog Output Status - 16-bit with flag	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
40	3	Analog Output Status - Single-precision floating point with flag	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
40	4	Analog Output Status - Double-precision floating point with flag	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)

DNP OBJECT GROUP & VARIATION			REQUEST (FCN/FCJ will parse)		RESPONSE (FCN/FCJ will respond)	
Group Number	Variation Number	Description	Function Codes (dec)	Qualifier Codes (hex)	Function Codes (dec)	Qualifier Codes (hex)
41	1	Analog Output Command - 32-bit	03 (select), 04 (operate), 05 (direct operate), 06 (direct op, no ack)	17, 28 (index)	129 (response)	17, 28 (index)
41	2	Analog Output Command - 16-bit	03 (select), 04 (operate), 05 (direct operate), 06 (direct op, no ack)	17, 28 (index)	129 (response)	17, 28 (index)
41	3	Analog Output Command - Single-precision floating point	03 (select), 04 (operate), 05 (direct operate), 06 (direct op, no ack)	17, 28 (index)	129 (response)	17, 28 (index)
41	4	Analog Output Command - Double-precision floating point	03 (select), 04 (operate), 05 (direct operate), 06 (direct op, no ack)	17, 28 (index)	129 (response)	17, 28 (index)
42	0	Analog Output Change Event - Any variation (Variation 0 is used to request default variation)	1 (read)	06 (all), 07, 08 (limited qty)		
42	1	Analog Output Change Event - 32-bit without time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
42	2	Analog Output Change Event - 16-bit without time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
42	3	Analog Output Change Event - 32-bit with time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
42	4	Analog Output Change Event - 16-bit with time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
42	5	Analog Output Change Event - Single-precision floating point without time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
42	6	Analog Output Change Event - Double-precision floating point without time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
42	7	Analog Output Change Event - Single-precision floating point with time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
42	8	Analog Output Change Event - Double-precision floating point with time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)

DNP OBJECT GROUP & VARIATION			REQUEST (FCN/FCJ will parse)		RESPONSE (FCN/FCJ will respond)	
Group Number	**Variation Number**	**Description**	**Function Codes (dec)**	**Qualifier Codes (hex)**	**Function Codes (dec)**	**Qualifier Codes (hex)**
50	1	Time and Date - Absolute time	1 (read)	07 (limited qty = 1)	129 (response)	07 (limited qty = 1)
			2 (write)	07 (limited qty = 1)		
50	3	Time and Date - Absolute time at last recorded time	2 (write)	07 (limited qty = 1)		
51	1	Time and Date CTO – absolute time, synchronized.			129 (response), 130 (unsol. resp.)	07 (limited qty = 1)
51	2	Time and Date CTO – absolute time, unsynchronized.			129 (response), 130 (unsol. resp.)	07 (limited qty = 1)
52	2	Time Delay - Fine			129 (response)	07 (limited qty = 1)
60	1	Class Objects - Class 0 Data	1 (read)	06 (all)		
			22 (assign class)	06 (all)		
60	2	Class Objects - Class 1 Data	1 (read)	06 (all), 07, 08 (limited qty)		
			20 (enable unsol) 21 (disable unsol) 22 (assign class)	06 (all)		
60	3	Class Objects - Class 2 Data	1 (read)	06 (all), 07, 08 (limited qty)		
			20 (enable unsol) 21 (disable unsol) 22 (assign class)	06 (all)		
60	4	Class Objects - Class 3 Data	1 (read)	06 (all), 07, 08 (limited qty)		
			20 (enable unsol) 21 (disable unsol) 22 (assign class)	06 (all)		
80	1	Internal Indications	1 (read)	00, 01 (start-stop)		
			2 (write)	00 index=7 (start-stop)		
110	0	Octet String (range is 0 to 29, up to 32-octets can be handled)	22 (assign class)	00, 01 (start-stop), 06 (all), 17, 28 (index)		
			1 (read)	00, 01 (start-stop) 06 (all), 17, 28 (index)	-	-
	string length		-	-	129 (response)	17, 28 (index)
			2 (write)	00, 01 (start-stop) 17, 28 (index)	-	-
111	0	Octet String Event (range is 0 to 29, up to 32-octets can be handled)	1 (read)	06 (all), 07, 08 (limited qty)	-	-
	string length		-	-	129 (response)	17, 28 (index)
					130 (unsol. resp.)	17, 28 (index)

DNP OBJECT GROUP & VARIATION			REQUEST (FCN/FCJ will parse)		RESPONSE (FCN/FCJ will respond)	
Group Number	**Variation Number**	**Description**	**Function Codes (dec)**	**Qualifier Codes (hex)**	**Function Codes (dec)**	**Qualifier Codes (hex)**
No Object (function code only)			23 (delay measurement)			
No Object (function code only)			24 (recode current time)			

This Implementation Table is referred to “DNP3 SPECIFICATION, Volume 6 Part2, Objects, DNP3 OBJECT LIBRARY Version 2.05, 11-June-2009” and “DNP3 Technical Bulletin TB2015-001 Object Groups 110-115”.

●Common with Outstation

Implementation Table

DNP OBJECT GROUP & VARIATION			REQUEST (FCN/FCJ will parse)		RESPONSE (FCN/FCJ will respond)	
Group Number	Variation Number	Description	Function Codes (dec)	Qualifier Codes (hex)	Function Codes (dec)	Qualifier Codes (hex)
1	0	Binary Input - Any variation (Variation 0 is used to request default variation)	1 (read), 22 (assign class)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)		
1	1	Binary Input - Packed format	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
1	2	Binary Input - With flags	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
2	0	Binary Input Change Event - Any variation (Variation 0 is used to request default variation)	1 (read)	06 (all), 07, 08 (limited qty)		
2	1	Binary Input Change Event without Time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
2	2	Binary Input Change Event - With absolute time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
10	10	Binary Output Status - Any variation (Variation 0 is used to request default variation)	1 (read) 22 (assign class)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index)		
10	1	Binary Output Status - Packed format	1 (read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
10	2	Binary Output Status - Output status with flags	1 (read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
11	0	Binary Output Event - Any variation (Variation 0 is used to request default variation)	1 (read)	00, 01 (start-stop), 06 (no range, or all)		
11	1	Binary Output Event - Status without time	1 (read)	00, 01 (start-stop), 06 (no range, or all)	129 (response) 130 (unsol. resp.)	17, 28 (index)
11	2	Binary Output Event - Status with time	1 (read)	00, 01 (start-stop), 06 (no range, or all)	129 (response) 130 (unsol. resp.)	17, 28 (index)
12	1	Binary Output Command - Control relay output block (CROB)	03 (select), 04 (operate), 05 (direct perate), 06 (direct op, no ack)	17, 27, 28 (index)	129 (response)	17, 28 (index)

DNP OBJECT GROUP & VARIATION			REQUEST (FCN/FCJ will parse)		RESPONSE (FCN/FCJ will respond)	
Group Number	Variation Number	Description	Function Codes (dec)	Qualifier Codes (hex)	Function Codes (dec)	Qualifier Codes (hex)
20	0	Counter – Any variation (Variation 0 is used to request default variation)	1 (read), 22 (assign class)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index)		
			7 (freeze), 8 (freeze no ack), 9 (freeze & clear), 10 (frz & clr, no ack)	00, 01 (start-stop), 06 (no range, or all)		
20	1	Counter - 32-bit with flag	1 (read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
20	2	Counter - 16-bit with flag	1 (read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
20	5	Counter - 32-bit without flag	1 (read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
20	6	Counter - 16-bit without flag	1 (read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
21	0	Frozen Counter -Any variation (Variation 0 is used to request default variation)	1 (read) 22 (assign class)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index)		
21	1	Frozen Counter - 32-bit with flag	1 (read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
21	2	Frozen Counter - 16-bit with flag	1 (read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
21	5	Frozen Counter - 32-bit with flag and time	1 (read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
21	6	Frozen Counter - 16-bit with flag and time	1 (read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
21	9	Frozen Counter - 32-bit without flag	1 (read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
21	10	Frozen Counter -16-bit without flag	1 (read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
22	0	Counter Change Event - Any variation (Variation 0 is used to request default variation)	1 (read)	06 (no range, or all), 07, 08 (limited qty)		
22	1	Counter Change Event - 32-bit with flag and time	1 (read)	06 (no range, or all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)

DNP OBJECT GROUP & VARIATION			REQUEST (FCN/FCJ will parse)		RESPONSE (FCN/FCJ will respond)	
Group Number	**Variation Number**	**Description**	**Function Codes (dec)**	**Qualifier Codes (hex)**	**Function Codes (dec)**	**Qualifier Codes (hex)**
22	2	Counter Change Event - 16-bit with flag and time	1 (read)	06 (no range, or all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
22	5	Counter Change Event -32-bit with flag and time	1 (read)	06 (no range, or all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
22	6	Counter Change Event -16-bit with flag and time	1 (read)	06 (no range, or all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
23	0	Frozen Counter Change Event - Any variation (Variation 0 is used to request default variation)	1 (read)	06 (no range, or all), 07, 08 (limited qty)		
23	1	Frozen Counter Change Event - 32-bit with flag	1 (read)	06 (no range, or all), 07, 08 (limited qty)	129 (response)	17, 28 (index)
23	2	Frozen Counter Change Event - 16-bit with flag	1 (read)	06 (no range, or all), 07, 08 (limited qty)	129 (response)	17, 28 (index)
23	5	Frozen Counter Change Event - 32-bit with flag and time	1 (read)	06 (no range, or all), 07, 08 (limited qty)	129 (response)	17, 28 (index)
23	6	Frozen Counter Change Event - 16-bit with flag and time	1 (read)	06 (no range, or all), 07, 08 (limited qty)	129 (response)	17, 28 (index)
30	0	Analog Input - Any variation (Variation 0 is used to request default variation)	1 (read), 22 (assign class)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index)		
			7 (freeze), 8 (freeze no ack),	00, 01 (start-stop), 06 (no range, or all),		
30	1	Analog Input - 32-bit with flag	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 27, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
30	2	Analog Input - 16-bit with flag	1 (read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
30	3	Analog Input - 32-bit without flag	1 (read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
30	4	Analog Input -16-bit without flag	1 (read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
30	5	Analog Input - Single-precision floating point with flag	1 (read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
30	6	Analog Input - Double-precision floating point with flag	1 (read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
32	0	Analog Input Change Event - Any variation (Variation 0 is used to request default variation)	1 (read)	06 (no range, or all), 07, 08 (limited qty)		

DNP OBJECT GROUP & VARIATION			REQUEST (FCN/FCJ will parse)		RESPONSE (FCN/FCJ will respond)	
Group Number	**Variation Number**	**Description**	**Function Codes (dec)**	**Qualifier Codes (hex)**	**Function Codes (dec)**	**Qualifier Codes (hex)**
32	1	Analog Input Change Event - 32-bit without time	1 (read)	06 (no range, or all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
32	2	Analog Input Change Event -16-bit without time	1 (read)	06 (no range, or all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
32	3	Analog Input Change Event - 32-bit with time	1 (read)	06 (no range, or all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
32	4	Analog Input Change Event - 16-bit with time	1 (read)	06 (no range, or all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
32	5	Analog Input Change Event - Single-precision floating point without time	1 (read)	06 (no range, or all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
32	6	Analog Input Change Event - Double-precision floating point without time	1 (read)	06 (no range, or all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
32	7	Analog Input Change Event - Single-precision floating point with time	1 (read)	06 (no range, or all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
32	8	Analog Input Change Event - Double-precision floating point with time	1 (read)	06 (no range, or all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
34	0	Analog Input Deadband - Any variation (Variation 0 is used to request default variation)	1 (read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index)		
34	1	Analog Input Deadband - 16-bit	1 (read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
			2 (write)	00, 01 (start-stop), 07, 08 (limited qty), 17, 27, 28 (index)		
34	2	Analog Input Deadband - 32-bit	1 (read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
			2 (write)	00, 01 (start-stop), 07, 08 (limited qty), 17, 27, 28 (index)		
34	3	Analog Input Deadband - Single-precision floating point	1 (read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index)	129 (response)	00, 01 (start-stop) 17, 28 (index)
			2 (write)	00, 01 (start-stop), 07, 08 (limited qty), 17, 27, 28 (index)		

DNP OBJECT GROUP & VARIATION			REQUEST (FCN/FCJ will parse)		RESPONSE (FCN/FCJ will respond)	
Group Number	**Variation Number**	**Description**	**Function Codes (dec)**	**Qualifier Codes (hex)**	**Function Codes (dec)**	**Qualifier Codes (hex)**
40	0	Analog Output Status – Any variation (Variation 0 is used to request default variation)	1 (read) 22 (assign class)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index)		
40	1	Analog Output Status -32-bit with flag	1 (read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
40	2	Analog Output Status - 16-bit with flag	1 (read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
40	3	Analog Output Status - Single-precision floating point with flag	1 (read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
40	4	Analog Output Status - Double-precision floating point with flag	1 (read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
41	1	Analog Output Command - 32-bit	03 (select), 04 (operate), 05 (direct operate), 06 (direct op, no ack)	17, 27, 28 (index)	129 (response)	17, 28 (index)
41	2	Analog Output Command - 16-bit	03 (select), 04 (operate), 05 (direct operate), 06 (direct op, no ack)	17, 27, 28 (index)	129 (response)	17, 28 (index)
41	3	Analog Output Command - Single-precision floating point	03 (select), 04 (operate), 05 (direct operate), 06 (direct op, no ack)	17, 27, 28 (index)	129 (response)	17, 28 (index)
41	4	Analog Output Command - Double-precision floating point	03 (select), 04 (operate), 05 (direct operate), 06 (direct op, no ack)	17, 27, 28 (index)	129 (response)	17, 28 (index)
42	0	Analog Output Change Event - Any variation (Variation 0 is used to request default variation)	1 (read)	06 (no range, or all), 07, 08 (limited qty)		
42	1	Analog Output Change Event - 32-bit without time	1 (read)	06 (no range, or all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
42	2	Analog Output Change Event - 16-bit without time	1 (read)	06 (no range, or all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
42	3	Analog Output Change Event - 32-bit with time	1 (read)	06 (no range, or all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)

DNP OBJECT GROUP & VARIATION			REQUEST (FCN/FCJ will parse)		RESPONSE (FCN/FCJ will respond)	
Group Number	**Variation Number**	**Description**	**Function Codes (dec)**	**Qualifier Codes (hex)**	**Function Codes (dec)**	**Qualifier Codes (hex)**
42	4	Analog Output Change Event - 16-bit with time	1 (read)	06 (no range, or all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
42	5	Analog Output Change Event - Single-precision floating point without time	1 (read)	06 (no range, or all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
42	6	Analog Output Change Event - Double-precision floating point without time	1 (read)	06 (no range, or all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
42	7	Analog Output Change Event - Single-precision floating point with time	1 (read)	06 (no range, or all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
42	8	Analog Output Change Event - Double-precision floating point with time	1 (read)	06 (no range, or all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
50	1	Time and Date - Absolute time	1 (read)	07 (limited qty = 1)	129 (response)	07 (limited qty = 1)
			2 (write)	07 (limited qty = 1)		
50	3	Time and Date - Absolute time at last recorded time	2 (write)	07 (limited qty = 1)		
52	2	Time Delay - Fine			129 (response)	07 (limited qty = 1)
60	1	Class Objects - Class 0 Data	1 (read)	06 (no range, or all)		
			22 (assign class)	06 (no range, or all)		
60	2	Class Objects - Class 1 Data	1 (read)	06 (no range, or all), 07, 08 (limited qty)		
			20 (enable unsol) 21 (disable unsol) 22 (assign class)	06 (no range, or all)		
60	3	Class Objects - Class 2 Data	1 (read)	06 (no range, or all), 07, 08 (limited qty)		
			20 (enable unsol) 21 (disable unsol) 22 (assign class)	06 (no range, or all)		
60	4	Class Objects - Class 3 Data	1 (read)	06 (no range, or all), 07, 08 (limited qty)		
			20 (enable unsol) 21 (disable unsol) 22 (assign class)	06 (no range, or all)		
80	1	Internal Indications	1 (read)	00, 01 (start-stop)		
			2 (write)	00 index=7 (start-stop)		

DNP OBJECT GROUP & VARIATION			REQUEST (FCN/FCJ will parse)		RESPONSE (FCN/FCJ will respond)	
Group Number	**Variation Number**	**Description**	**Function Codes (dec)**	**Qualifier Codes (hex)**	**Function Codes (dec)**	**Qualifier Codes (hex)**
110	0	Octet String (range is 0 to 29, up to 32-octets can be handled)	22 (assign class)	00, 01 (start-stop), 06 (no range, or all), 17, 27, 28 (index)		
			1 (read)	00, 01 (start-stop) 06 (no range, or all), 17, 27, 28 (index)	-	-
	string length		2 (write)	00, 01 (start-stop) 17, 27, 28 (index)	-	-
111	0	Octet String Event (range is 0 to 29, up to 32-octets can be handled)	1 (read)	06 (no range, or all), 07, 08 (limited qty)	129 (response)	17, 28 (index)
	string length		-	-	130 (unsol. resp.)	17, 28 (index)
120	0	Authentication – Assign Class	22 (assign class)	06 (no range, or all)		
120	1	Authentication - Challenge	32 (auth. req.)	5B (free format)	131 (auth. resp.)	5B (free format)
120	2	Authentication - Reply	32 (auth. req.)	5B (free format)	131 (auth. resp.)	5B (free format)
120	3	Authentication - Aggressive Mode Request	any of 1 to 31	07 (limited qty=1)	129 (response),	07 (limited qty=1)
		Authentication - Aggressive Mode Request			130 (unsol.. resp.)	07 (limited qty=1)
120	4	Authentication - Session Key Status Request	32 (auth. req.)	07 (limited qty=1)		
120	5	Authentication - Session Key Status			131 (auth. resp.)	5B (free format)
120	6	Authentication - Session Key Change	32 (auth. req.)	5B (free format)		
120	7	Authentication - Error	32 (auth. req.)	5B (free format)	131 (auth. resp.)	5B (free format)
120	9	Authentication - HMAC	any of 1 to 31	5B (free format)	129 (response)	5B (free format)
		Authentication - HMAC				
120	10	Authentication – User Status Change	32 (auth. req.)	5B (free format)		
120	11	Authentication – Update Key Change Request	32 (auth. req.)	5B (free format)		
120	12	Authentication – Update Key Change Reply	32 (auth. req.)		131 (auth. resp.)	5B (free format)
120	13	Authentication – Update Key Change	32 (auth. req.)	5B (free format)		
120	15	Authentication – Update Key Change Confirmation	32 (auth. req.)	5B (free format)	131 (auth. resp.)	5B (free format)
121	0	Security Statistic	1 (read)	00, 01 (start-stop), 06 (no range, or all), 17, 28 (index)		
121	1	Security Statistic	1 (read)	00, 01 (start-stop), 06 (no range, or all), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
No Object (function code only)			23 (delay measurement)			
No Object (function code only)			24 (recode current time)			

This Implementation Table is referred to “DNP3 SPECIFICATION, Volume 6 Part2, Objects, DNP3 OBJECT LIBRARY Version 2.05, 11-June-2009” and “DNP3 Technical Bulletin TB2015-001 Object Groups 110-115”.

■ FUNCTION SPECIFICATIONS <R4.20 COMPATIBILITY FUNCTION>

● DNP3 Communication Portfolio

DNP3 Communication Portfolio is a POU that enables DNP3 communication protocol support devices to easily acquire data from FCN-500 and FCN-RTU autonomous controllers via serial communication or Ethernet communication. The following communication functions are supported:

Communication type (*3) (*4)	Communication function
Serial communication (*1)	Slave Up to two ports can be communicated
Ethernet communication (*2)	Server Up to two client can be connected

*1: Serial communication is possible only when the FCN-500 and FCN-RTU operates as a slave.
*2: FCN-500 and FCN-RTU operates as a server.
*3: Only one of these communications can be used.
*4: In a CPU duplex configuration, all change events will be reset at CPU switch-over.

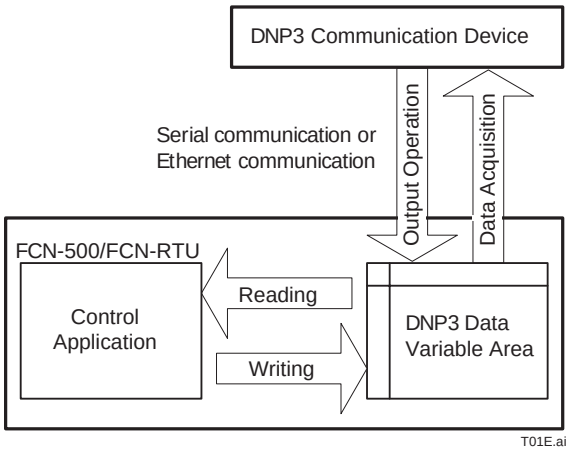

Figure DNP3 Data Access

■ ACCESSIBLE RANGE <R4.20 COMPATIBILITY FUNCTION>

The accessible device ranges, between the DNP3 communication device and FCN-500 and FCN-RTU, are shown in the table below:

● SD_CDNP_SS_ASSIGN POU

Data type	IEC data type	Index range
Binary Input	BOOL	0 to 499
Binary Output	BOOL	0 to 499
32-Bit Binary Counter	UDINT	0 to 499
32-Bit Analog Input	DINT	0 to 499 (*1)
Single-Precision Floating Point Analog Input	REAL	
32-Bit Analog Output	DINT	0 to 499 (*1)
Single-Precision Floating Point Analog Output	REAL	

1*: One of “32-Bit Analog Input/Output”(DINT) or “Single-Precision Floating Point Analog Input/Output”(REAL) can be selected by the parameter “ANLG_TYPE” of the DNP3 data variable area assigning POU ”SD_CDNP_SS_ASSIGN”.

● SD_CDNP_SS_ASSIGN2 POU

Data type	IEC data type	Index range (*4)
Binary Input	BOOL	0 to 499
Binary Output	BOOL	0 to 499
16-Bit Binary Counter	UINT	0 to 499 (*1)
32-Bit Binary Counter	UDINT	
16-Bit Frozen Counter	UINT	0 to 499 (*1)
32-Bit Frozen Counter	UDINT	
16-Bit Analog Input	INT	0 to 499 (*2)
32-Bit Analog Input	DINT	
Single-Precision Floating Point Analog Input	REAL	
Double-Precision Floating Point Analog Input	LREAL	

16-Bit Analog Output	INT	0 to 499 (*2)
32-Bit Analog Output	DINT	
Single-Precision Floating Point Analog Output	REAL	
Double-Precision Floating Point Analog Output	LREAL	
32-Octet Strings (*3)	STRINGS32	0 to 29

*1: "16-Bit Binary Counter"(UINT) and "32-Bit Binary Counter"(UDINT) can be configured by the parameters "CT16_OFFSET" and "CT32_OFFSET" of the DNP3 data variable area assigning with detail data types POU "SD_CDNP_SS_ASSIGN2".

*2: "16-Bit Analog Input/Output"(INT), "32-Bit Analog Input/Output"(DINT), "Single-Precision Floating Point Analog Input/Output"(REAL) and "Double-Precision Floating Point Analog Input/Output"(LREAL) can be configured by the parameters "AI16_OFFSET", "AI32_OFFSET", "AISF_OFFSET", "AIDF_OFFSET", "AO16_OFFSET", "AO32_OFFSET", "AOSF_OFFSET" and "AODF_OFFSET" of the DNP3 data variable area assigning with detail data types POU "SD_CDNP_SS_ASSIGN2".

*3: The maximum length of "Octet String" is 32 octets.

*4: Maximum index number can be configured by the parameters "BI_MAX_INDEX", "AI_MAX_INDEX", "BO_MAX_INDEX", "AO_MAX_INDEX", and "CT_MAX_INDEX" of the DNP3 data variable area assigning with detail data types POU "SD_CDNP_SS_ASSIGN2".
The index range for "Class 0 Poll" or "Integrity Poll" needs to be limited by specifying each data type's maximum index number.

■ LIST OF POU FUNCTIONS <R4.20 COMPATIBILITY FUNCTION>

● DNP3 Communicaton POU

The table below presents POUs that are defined to start DNP3 communication:

POU name	Function
SD_CDNP_SS_ASSIGN	Assigning data variables to a specific memory
SD_CDNP_SS_ASSIGN2	Assigning data variables to a specific memory with detail data types
SD_CDNP_SS_RS_ OPEN	Starting DNP3 communication task for serial communication
SD_CDNP_SS_TCP_ OPEN	Starting DNP3 communication task for Ethernet communication

● Data Attribute POU

The table below presents POUs that are defined to assign attributes for individual data variables:

POU name	Function
SD_CDNP_S_EVTC	Assigning event class
SD_CDNP_S_DBND	Setting analog input deadband value
SD_CDNP_S_DBND_AO_LOCAL	Setting analog output local operation deadband value
SD_CDNP_S_CROB	Setting binary output operation attribute
SD_CDNP_S_RANGE_AIO16	Setting 16-bit analog input/output range
SD_CDNP_S_RANGE_AIO32	Setting 32-bit analog input/output range
SD_CDNP_S_RANGE_AIOSF	Setting single-precision floating point analog input/output range
SD_CDNP_S_RANGE_AIODF	Setting double-precision floating point analog input/output range

● Command Execution POU

POU name	Function
SD_CDNP_S_CROB_PULSE	Executing binary output pulse model command operation

● Time Stamped Data Storing POU

POU name	Function
SD_CDNP_S_BI_WT_TS	Storing binary input time stamped data
SD_CDNP_S_CT16_WT_TS	Storing 16-bit binary counter time stamped data
SD_CDNP_S_CT32_WT_TS	Storing 32-bit binary counter time stamped data
SD_CDNP_S_AI16_WT_TS	Storing 16-bit analog input time stamped data
SD_CDNP_S_AI32_WT_TS	Storing 32-bit analog input time stamped data
SD_CDNP_S_AISF_WT_TS	Storing single-precision floating point analog input time stamped data
SD_CDNP_S_AIDF_WT_TS	Storing double-precision floating point analog input time stamped data

● Data Access POU

The table below presents POUs that are used to access various data variables:

POU name	Function
SD_CDNP_S_BI_RD	Reading binary input data
SD_CDNP_S_BO_RD	Reading binary output data
SD_CDNP_S_CT16_RD	Reading 16-bit binary counter data
SD_CDNP_S_CT32_RD	Reading 32-bit binary counter data
SD_CDNP_S_AI16_RD	Reading 16-bit analog input data
SD_CDNP_S_AI32_RD	Reading 32-bit analog input data
SD_CDNP_S_AISF_RD	Reading single-precision floating point analog input data
SD_CDNP_S_AIDF_RD	Reading double-precision floating point analog input data
SD_CDNP_S_AO16_RD	Reading16-bit analog output data
SD_CDNP_S_AO32_RD	Reading 32-bit analog output data
SD_CDNP_S_AOSF_RD	Reading single-precision floating point analog output data
SD_CDNP_S_AODF_RD	Reading double-precision floating point analog output data
SD_CDNP_S_OSTR32_RD	Reading 32-octet string data
SD_CDNP_S_BI_WT	Writing binary input data
SD_CDNP_S_BO_WT	Writing binary output data
SD_CDNP_S_CT16_WT	Writing 16-bit binary counter data
SD_CDNP_S_CT32_WT	Writing 32-bit binary counter data
SD_CDNP_S_AI16_WT	Writing 16-bit analog input data
SD_CDNP_S_AI32_WT	Writing 32-bit analog input data
SD_CDNP_S_AISF_WT	Writing single-precision floating point analog input data
SD_CDNP_S_AIDF_WT	Writing double-precision floating point analog input data
SD_CDNP_S_AO16_WT	Writing 16-bit analog output data
SD_CDNP_S_AO32_WT	Writing 32-bit analog output data
SD_CDNP_S_AOSF_WT	Writing single-precision floating point analog output data
SD_CDNP_S_AODF_WT	Writing double-precision floating point analog output data
SD_DCNP_S_OSTR32_WT	Writing 32-octet string data
SD_CDNP_S_BI_WT_F	Writing binary input data with flags
SD_CDNP_S_BO_WT_F	Writing binary output data with flags
SD_CDNP_S_CT16_WT_F	Writing 16-bit binary counter data with flags
SD_CDNP_S_CT32_WT_F	Writing 32-bit binary counter data with flags
SD_CDNP_S_AI16_WT_F	Writing 16-bit analog input data with flags
SD_CDNP_S_AI32_WT_F	Writing 32-bit analog input data with flags
SD_CDNP_S_AISF_WT_F	Writing single-precision floating point analog input data with flags
SD_CDNP_S_AIDF_WT_F	Writing double-precision floating point analog input data with flags
SD_CDNP_S_AO16_WT_F	Writing 16-bit analog output data with flags
SD_CDNP_S_AO32_WT_F	Writing 32-bit analog output data with flags
SD_CDNP_S_AOSF_WT_F	Writing single-precision floating point analog output data with flags
SD_CDNP_S_AODF_WT _F	Writing double-precision floating point analog output data with flags

■ DNP3 FIELD DEVICE PROFILE <R4.20 COMPATIBILITY FUNCTION>

●Device Properties

DEVICE IDENTIFICATION	
Device Function:	● Outstation (as Serial Communication Slave & TCP Server station)
Vendor Name:	Yokogawa Electric Corporation
Device Name:	STARDOM FCN/FCJ
Device manufacturer's hardware version string:	DNP Group 0 - Attribute Objects are Not Supported. Following information can be confirmed by Resource Configurator “CPU Module Configuration” - “RAS Information” - Controller Model Name, Hardware Serial Number, Manufacturing Year and Month - Os Revision, Boot Program Revision/Build Number, Basic Software Revision/Build Number
Device manufacturer's software version string:	
Device Profile Document Version Number:	2016
DNP Levels Supported for:	Outstations Only Requests and Responses ☒ None - partially supported ☒ Level 1 ☒ Level 2 - except Device Attributes (Device Attributes will be configured by Logic Designer) ☒ Level 3 - except Device Attributes (Device Attributes will be configured by Logic Designer) ☒ Level 4 - partially supported
Supported Function Blocks:	☐ Self-Address Support ☐ Data Sets ☐ File Transfer ☐ Virtual Terminal ☐ Mapping to IEC 61850 Object Models defined in a DNP3 XML file. ☐ Function code 31, activate configuration ☐ Authentication (if checked then see “SECURITY PARAMETERS”)
Notable Additions:	- Serial and TCP connection can be used. - Up to two connections can be used. - Event buffer size can be expanded up to 135,000 events. - Every data types (BOOL/UINT/UDINT/INT/DINT/REAL/LREAL/STR32) can be used. - Pulse output operation can be operated. - Unsolicited response can be sent.
Methods to set Configurable Parameters:	☒ Software - Vender software named “Logic Designer” and “Resource Configurator” ☒ Protocol - Set via DNP3 (e.g. assign class, write deadband)
DNP3 XML Files Available On-line:	☒ None
External DNP3 XML Files Available Off-line:	☒ None
Connections Supported:	Configurable, selectable from Serial, IP Networking - Configurable by Logic Designer ☒ Serial (complete section “SERIAL CONNECTIONS”) ☒ IP Networking (complete section “IP NETWORKING”)
Conformance Testing:	☒ Self-tested, version
SERIAL CONNECTIONS	
Port Name:	For COM Ports of CPU Modules ☒ Fixed at COM1/COM2/COM3/COM4 - “Never” can be selected by “Octet string class 0 response stop” bit of the parameter “CLASS0_OPT” of “SD_CDNP_DD_ASSIGN_*” POU.
	For Serial Communication Modules ☒ Logical Port Name can be assigned by Resource Configurator
Serial Connection Parameters:	☒ Asynchronous - Data Bits: Selectable from 7, 8-bits (default = 8) - Start Bit: Fixed at 1-bit - Stop Bits: Selectable from 1, 2-bits (default = 1) - Parity: Selectable from NONE, EVEN, ODD (default = NONE)
	For COM Ports of CPU Modules - Configurable by STARDOM FCX Maintenance Page “COM Port Setting File”
	For Serial Communication Modules - Configurable by Resource Configurator

Baud Rate:	For COM Ports of CPU Modules ☒ Configurable, selectable from 300, 1200, 2400, 4800, 9600, 14400, 19200, 28800, 38400, 57600, 115200 (default = 9600) - About the list of baud rates, refer to “STARDOM FCN/FCJ Guide” for each hardware model.
	For Serial Communication Modules ☒ Configurable, selectable from 300, 1200, 2400, 4800, 9600, 14400, 19200, 28800, 38400, 57600, 76800, 115200 (default = 9600)
Hardware Flow Control (Handshaking):	RS-232 Options: for COM Ports of CPU Modules - Send Flow Control ☒ Configurable, select from NONE, CTS, DSR (default = NONE) - Receive Flow Control ☒ Configurable, select from NONE, RTS, DTR (default = NONE) - Send Validate ☒ Configurable, select from NONE, DSR (default = NONE) - Receive Validate ☒ Configurable, select from NONE, DSR, CD, DSR_CD (default = NONE) - Initial DTR state ☒ Configurable, select from ON, OFF (default = OFF)
	RS-232 Options: for Serial Communication Modules - Send Flow Control ☒ Fixed at CTS - Receive Flow Control ☒ Configurable, select from NONE, RTS (default = NONE) - Send Signal Check ☒ Configurable, select from NONE, DSR, CD, DSR_CD (default =NONE) - Receive Signal Check ☒ Fixed at CD - Initial DTR state ☒ Fixed at ON
Interval to Request Link Status:	☒ Not Supported
Supports DNP3 Collision Avoidance:	☒ Other, explain
	For RS-232-C Communication Modules and RS-232-C Serial Ports - “Full-duplex” or “Half-duplex with Hardware Flow Control” can be used.
	For RS-422 Communication Modules and RS-422 Serial Port of FCN-RTU CPU Modules - “4-wire” and “Full-duplex” should be configured.
Receiver Inter-Character Timeout:	- with the parameter “INTER_CHAR_TOUT” of “SD_CDNP_SS_RS_OPEN”
	For COM Ports of CPU Modules ☒ Configurable range 10.0 to 5000.0 (ms), in units of 10 (ms) (default = 10.0(ms)).
	For Serial Communication Modules ☒ Configurable range 1.5 to 100.0 (character time) (or 1.5 (character time) to 100000.0 (ms)) (default = 4.0 (character time)).
Unit of Receiver Inter-Character Timeout:	☒ Configurable, selectable from “Character Time” or “Millisecond” - with the parameter “UNIT_CHAR_TIM“ of “SD_CDNP_SS_RS_OPEN” “UNIT_CHAR_TIM”=TRUE: Character time is used as the unit of the timeout value (default) “UNIT_CHAR_TIM”=FALSE: Millisecond is used as the unit of the timeout value
Inter-Character Gaps in Transmission:	☒ None (always transmits with no inter-character gap)
Multiple Master Connections:	☒ Supports multiple masters (Up to two connections are possible)
IP NETWORKING	
Port Name:	
Type of End Point:	☒ TCP Listening
IP Address of this Device:	☒ Configurable by Resource Configurator “Set IP Address Dialog”
Subnet Mask:	
Gateway IP Address:	
TCP Connection Establishment:	☒ Allows all (when no IP address is listed in the “Packet Filter Setting File”) ☒ Limits based on list of IP address (when the IP addresses are listed in the “Packet Filter Setting File”)
IP Address of Remote Device:	☒ Configurable by STARDOM FCX Maintenance Page “Packet Filter Setting File”
TCP Listen Port Number:	☒ Configurable , range 0 to 65535 (default = 20000) - with the parameter “PORT_NO” of “SD_CDNP_SS_TOPEN” - When specify the TCP port number, check to ensure the number that has not been used for the other TCP ports by different communications. - Then, specify a reasonable port number, except zero. - When connecting to two clients, specify different number for each connection. - And without a conflict of TCP port number, 20050 can be the candidate of the second connection.
TCP Listen Port Number of Remote Device:	☒ Not Applicable (Outstation w/o dual end point)
TCP Keep-alive Timer:	☒ Timer disabled

TCP Timeout:	Instead of Keep-alive timer, TCP disconnection will be checked with this timeout value. ☒ Configurable by Logic Designer (range 5 to 3600 seconds) (default = 5 (sec)) - with the parameter “TIMEOUT” of “SD_CDNP_SS_TCP_OPEN” - Outstation will close the TCP socket, if no data is received from the Master within the time.
	Unsolicited NULL response can be sent periodically to keep the connection for the unsolicited responses. ☒ Configurable by Logic Designer - by the following bit of the parameter “OPTION” of “SD_CDNP_SS_TCP_OPEN” “OPTION”=DWORD#16#00000004: Keep TCP connection by sending unsolicited NULL response bit - If no message is received for a while, after “TIMEOUT” is over, an unsolicited NULL response will be sent. - Then, if a confirmation is received, TCP port connection will be kept, but if not, after “APPL_CNF_TOUT” is over, TCP port connection will be closed and re-opened to prepare the next re-connection.
TCP Response Delay Time:	☒ Configurable by Logic Designer (range 20 to 500 (ms)) (default = 20 (ms)) - with the parameter “DELAY” of “SD_CDNP_TCP_OPEN” - Outstation will take the delay interval time between each response message.
Local UDP Port:	☒ Not Supported
Destination UDP Port for Initial Unsolicited Responses:	
Destination UDP Port for Responses:	
Multiple Master Connections:	☒ Supports multiple masters (Up to two connections are possible) If supported, the following methods may be used: ☒ Method 2 (based on IP port number)
Time Synchronization Support:	☒ SNTP (Simple Network Time Protocol) - Configurable by STARDOM FCX Maintenance Page “SNTP Setting File”
	☒ DNP3 LAN procedure (function code 24) ☒ DNP3 Write Time (not recommended over LAN) - Configurable by Logic Designer - with the parameter “TIM_SYNC_REQ” of “SD_CDNP_RS_OPEN/TCP_OPEN” “TIM_SYNC_REQ”=FALSE: Time Synchronization is not required (default) “TIM_SYNC_REQ”=TRUE: Time Synchronization is required - DNP3 Network Method can be used when SNTP cannot be used.
When Does Outstation Set IIN1.4?	when DNP3 Network Method is not used (TIM_SYNC_REQ = FALSE) ☒ Never
	when DNP3 Network Method is used (TIM_SYNC_REQ = TRUE) ☒ Asserted at startup until first Time Synchronization request received ☒ Periodically, every 30 minutes after the last “Time Synchronization”
	- Refer to “Time Synchronization Support” at section “IP NETWORKING” for the detail.
LINK LAYER	
Data Link Address: (DNP3 Outstation Address)	☒ Configurable, range 0 to 0xffff - Configurable by Logic Designer - with the parameter “SRC_ADDR” of “SD_CDNP_SS_RS_OPEN/TCP_OPEN” “SRC_ADDR” (= DNP3 Outstation Address of STARDOM FCN/FCJ) - Data Link Address can be used for DNP3 Source Address Validation at the Master. - Specify the address in range from 0x0000 to 0xFFEF. - Addresses in the range 0xFFF0 through 0xFFFF are reserved by DNP3 for special use.
DNP3 Source Address Validation:	☒ Always, one address allowed - Outstation will filter out requests not from the Master.
DNP3 Source Address Expected When Validation is Enables: (DNP3 Master Address)	☒ Configurable to any 16 bit DNP Data Link Address value - Configurable by Logic Designer - with the parameter “DST_ADDR” of “SD_CDNP_SS_RS_OPEN/TCP_OPEN” “DST_ADDR” (= DNP3 Master Address to communicate with STARDOM FCN/FCJ) - DNP3 Source Address is used for DNP3 Source Address Validation at the Outstation.
Self Address Support Using Address 0xFFFC:	☒ No
Sends Confirmed User Data Frames:	☒ Never
Data Link Layer Confirmation Timeout:	☒ None
Maximum Data Link Retries:	☒ Never Retries

Maximum Number of Octets Transmitted in a Data Link Frame:	☒ Fixed at 292
Maximum Number of Octets that can be Received in a Data Link Frame:	☒ Fixed at 292
APPLICATION LAYER	
Maximum Number of Octets Transmitted in an Application Layer Fragment other than File Transfer.	☒ Fixed at 2048
Maximum Number of Octets Transmitted in an Application Layer Fragment containing File Transfer:	☒ File Transfer is Not Supported
Maximum Number of Octets that can be Received in an Application Layer Fragment :	☒ Fixed at 2048
Timeout Waiting for Complete Application Layer Fragment:	☒ Fixed at 15 seconds
Maximum Number of Objects Allowed in a Single Control Request for CROB:	☒ Fixed at 1(enter 0 if controls are not supported for CROB)
Maximum Number of Objects Allowed in a Single Control Request for Analog Outputs:	☒ Fixed at 1(enter 0 if controls are not supported for Analog Outputs)
Maximum Number of Objects Allowed in a Single Control Request for Data Sets:	☒ Not Supported
Supports Mixing Object Groups (AOBs, CROBs and Data Sets) in the Same Control Request:	☒ No
Control Status Codes Supported:	☒ 1 – TIMEOUT ☒ 2 – NO_SELECT ☒ 3 – FORMAT_ERROR ☒ 4 – NOT_SUPPORTED ☒ 5 – ALREADY_ACTIVE ☐ 6 – HARDWARE_ERROR ☐ 7 – LOCAL ☒ 8 – TOO_MANY_OBJS ☐ 9 – NOT_AUTHORIZED ☐ 10 – AUTOMATION_INHIBIT ☐ 11 – PROCESSING_LIMITED ☐ 12 – OUT_OF_RANGE ☐ 13 – DOWNSTREAM_LOCAL ☐ 14 – ALREADY_COMPLETE ☐ 15 – BLOCKED ☐ 16 – CANCELLED ☐ 17 – BLOCKED_OTHER_MASTER ☐ 18 – DOWNSTREAM_FAIL ☐ 126 – RESERVED ☐ 127 – UNDEFINED
ITEMS FOR OUTSTATIONS	
Timeout Waiting for Application Confirm of Solicited Response Message:	☒ Configurable, range 10 to 600 seconds (default = 10 (sec)) - with the parameter “APPL_CNF_TOUT” of “SD_CDNP_SS_RS_OPEN/TCP_OPEN”
How often is Time Synchronization Required from the Master:	☒ Never needs time ☒ Periodically, between 100 and 1800 seconds - IIN1.4 will be set at startup and every 30 minutes (1800 seconds) after the last “Time Synchronization”, when the parameter “TIM_SYNC_REQ” of “SD_SDNP_SS_RS_OPEN/TCP_OPEN” is set to “TRUE”
Device Trouble Bit IIN1.6:	☒ Never used
File Handle Timeout:	☒ Not Applicable, Files Not Supported

Event Buffer Overflow Behavior:	☒ Discard the oldest event ☒ Discard the newest event - Selectable with the parameter “NWST_EVT_DEL” of “SD_SDNP_SS_RS_OPEN/TCP_OPEN” “NWST_EVT_DEL”=FALSE: Discard the Oldest Event (default) “NWST_EVT_DEL”=TRUE: Discard the Newest Event
Event Buffer Organization:	☒ Per Object Group.
	Event buffer sizes are configurable for each Object Group - at range from 0 to 135,000
	- Configurable with the following parameters of “SD_CDNP_SS_RS_OPEN/TCP_OPEN” “BI_EVT_SIZE” - Binary Input event buffer size (default = 500) “CT_EVT_SIZE” - Binary Counter event buffer size (default = 500) “AI_EVT_SIZE” - Analog Input event buffer size (default = 500) - The flowing parameters are effective with “SD_CDNP_SS_ASSIGN2” POU. “BO_EVT_SIZE” - Binary Output event buffer size (default = 0) “AO_EVT_SIZE” - Analog Output event buffer size (default = 0) “OSTR_EVT_SIZE” - Octet String event buffer size (default = 0) (range from 0 to 67,500) “FRZ_CT_EVT_SIZE” - Frozen Counter event buffer size (default = 0)
	Within the following conditions; - Maximum event size of the all event buffers for all connections is 135,000. - Maximum event size for CPU Module with 64 MB or less main memory, with Java in use is 3500. - However, the octet string event size will be doubled and added to the total event size.
Sends Multi-Fragment Responses:	☒ Yes ☒ No
	<for event data> - The maximum number of the application layer multi-fragment is configurable with the parameter “FRGMNT_RESP” of “SD_CDNP_RS_OPEN/TCP_OPEN” “FRGMNT_RESP”=1 to 100: Maximum number of multi-fragment (1:Single-Fragment) “FRGMNT_RESP”=0: Multi-Fragment for all requested event (default) - for “SD_CDNP_SS_RS_OPEN” “FRGMNT_RESP”=UINT#16#8000: Auto configuration maximum number by baud rate also can be used.
	<for static data> - Static data can be sent with multi-fragment responses, if it is necessary.
Last Fragment Confirmation:	☒ Always
DNP Command Settings Preserved Through a Device Reset:	☒ Assign Class ☒ Analog Deadbands
Supports configuration signature:	☒ Not Supported
Requests Application Confirmation:	For event responses: ● Yes ○ No ○ Configurable For non-final fragments: ● Yes ○ No ○ Configurable
Supports Clock Management	☒ Yes (support both DNP3 time synchronization and SNTP)
OUTSTATION UNSOLICITED RESPONSE SUPPORT	
Supports Unsolicited Reporting:	☒ Yes ☒ No ☒ Configurable, selectable from On or Off - with the parameter “UNSOL_ALLOWED” of “SD_CDNP_SS_RS_OPEN/TCP_OPEN” “UNSOL_ALLOWED”=TRUE: Unsolicited Response mode is ON “UNSOL_ALLOWED”=FALSE: Unsolicited Response mode is OFF (default)
	Note for Serial Connection - Unsolicited Response must be used with the Point-to-point connection
	Note for Serial Communication Modules - “Full-duplex” should be selected for Duplex Operation by Resource Configurator
Master Data Link Address:	☒ Configurable, range 0 to 0xFFEF - The same master address is used for both solicited and unsolicited responses with the parameter “DST_ADDR” of “SD_CDNP_SS_RS_OPEN/TCP_OPEN”. - Addresses in the range 0xFFF0 through 0xFFFF are reserved by DNP3 for special use.
Unsolicited Response Confirmation Timeout:	☒ Configurable, range 10 to 600 seconds (default=10 (sec)) - The same value of “Application Layer Confirmation” is used with the parameter “APPL_CNF_TOUT” of “SD_CDNP_SS_RS_OPEN/TCP_OPEN”

Number of Unsolicited Retries:	☒ Configurable, range 0 to 10 (default=3) - with the parameter “UNSOL_RETRY_NUM” of “SD_CDNP_SS_RS_OPEN/TCP_OPEN”
OUTSTATION UNSOLICITED RESPONSE TRIGGER CONDITIONS	
Number of Class 1 Events:	☒ Configurable, range 1 to 100 (default=5) - with the parameter “UNSOL_C1_TRG_NUM” of “SD_CDNP_SS_RS_OPEN/TCP_OPEN”
Number of Class 2 Events:	☒ Configurable, range 1 to 100 (default=5) - with the parameter “UNSOL_C2_TRG_NUM” of “SD_CDNP_SS_RS_OPEN/TCP_OPEN”
Number of Class 3 Events:	☒ Configurable, range 1 to 100 (default=5) - with the parameter “UNSOL_C3_TRG_NUM” of “SD_CDNP_SS_RS_OPEN/TCP_OPEN”
Total Number Events from Any Class:	☒ Total Number of Events not used to trigger Unsolicited Responses
Hold Time After Class 1 Event:	☒ Configurable, range 0 to 10 seconds (default=5 seconds) - with the parameter “UNSOL_C1_TRG_HOLD” of “SD_CDNP_SS_RS_OPEN/TCP_OPEN”
Hold Time After Class 2 Event:	☒ Configurable, range 0 to 10 seconds (default=5 seconds) - with the parameter “UNSOL_C2_TRG_HOLD” of “SD_CDNP_SS_RS_OPEN/TCP_OPEN”
Hold Time After Class 3 Event:	☒ Configurable, range 0 to 10 seconds (default=5 seconds) - with the parameter “UNSOL_C3_TRG_HOLD” of “SD_CDNP_SS_RS_OPEN/TCP_OPEN”
Hold Time After Event Assigned to Any Class:	☒ Class events not used to trigger Unsolicited Responses
Retrigger Hold Time:	☒ Hold-time timer will be retriggered for each new event detected (may get more changes in next response)
Other Unsolicited Response Trigger Conditions:	☒ NONE
INDIVIDUAL FIELD OUTSTATION PARAMETERS	
Analog Data Type:	☒ Configurable by Logic Designer; - with the parameter “ANLG_TYPE” of “SD_CDNP_SS_ASSIGN” “ANLG_TYPE”=0: REAL (Single-Precision Floating Point) (default) “ANLG_TYPE”=1: DINT (32-Bit Integer)
Detail Data Types:	☒ Configurable by Logic Designer; - with the following parameters of “SD_CDNP_SS_ASSIGN2” “CT_MAX_INDEX” and “CT16/CT32_OFFSET” - Binary Counter data area “AI_MAX_INDEX” and “AI16/AI32/AISF/AIDF_OFFSET” - Analog Input data area “AO_MAX_INDEX” and “AO16/AO32/AOSF/AODF_OFFSET” - Analog Output data area
Analog Input Deadbands:	☒ Configurable - All Points - as the Default Deadband Value; - with the parameter “ANLG_DBND_VAL” of “SD_CDNP_SS_ASSIGN” (default = 0.0) ☒ Fixed at 0.0 – All Points – with “SD_CDNP_SS_ASSIGN2”
	☒ Configurable - Per Point - by “SD_CDNP_S_DBND” - DNP3 Analog Input Deadband Value Setting POU (SD_CDNP_S_DBND);
	☒ Configurable - Per Point - by Master
Time Value for all DNP3 protocol time stamps reported and time synchronization messages:	☒ Configurable, selectable from “Local Time” or “UTC” - by the following bit of the parameter “OPTION” of “SD_CDNP_SS_ASSIGN/ASSIGN2” “OPTION”=DWORD#16#00000001: UTC “OPTION”=DWORD#16#00000000: Local Time (default) - The UTC time base has been used for the effective date since January 1, 2008.
Unsolicited Response:	☒ Configurable – Per Connection by “SD_CDNP_SS_RS/TCP_OPEN” with “SD_CDNP_SS_ASSIGN2”
Event Class Assign:	☒ Configurable - All Points - as the default event class for each data type;
	- with the following parameters of “SD_CDNP_SS_ASSIGN/ASSIGN2” “BI_EVT_CLASS”=0/1/2/3 - Binary Input event class (default = 1) “CT_EVT_CLASS”=0/1/2/3 - Binary Counter event class (default = 3) “AI_EVT_CLASS”=0/1/2/3 - Analog Input event class (default = 2)
	- with the following parameters of “SD_CDNP_SS_ASSIGN2” “BO_EVT_CLASS”=0/1/2/3 - Binary Output event class (default = 0) “AO_EVT_CLASS”=0/1/2/3 - for Analog Output event class (default = 0) “OSTR_EVT_CLASS”=0/1/2/3 - for Octet String event class (default = 0) “FRZ_CT_EVT_CLASS”=0/1/2/3 - Frozen Counter event class (default=0)
	☒ Configurable - Per Point - with “SD_CDNP_S_EVTC”
	☒ Configurable - Per Point - by Master
Preservation of Class Assign through a Device Reset:	☒ No - (If any of Class Assign are written by a Master, the Master will have to write them again.) ☒ Yes - (with “SC_CDNP_S_EVTC”)

Preservation of Analog Input Deadband Settings Per Point through a Device Reset:	☒ No - (If any of Analog Input Deadbands are written by a Master, the Master will have to write them again) ☒ Yes - (with “SD_CDNP_S_DBND”)
File Handling:	☒ Not Supported
Control Relay Output Block (CROB) Operation:	☒ Yes
Analog Output Block (AOB) Operation:	☒ Yes
Latch model CROB Operation Attribute:	☒ Configurable - All Points - as the default Latch model CROB operation attribute; - with the parameter “CROB_ATTRIB” of “SD_CDNP_SS_ASSIGN/ASSIGN2” “CROB_ATTRIB”=0: No operation is enabled (default) “CROB_ATTRIB”=1: Latch ON/OFF operation is enabled
	☒ Configurable - Per Point - with the parameter “ATTRIB” of “SD_CDNP_S_CROB” “ATTRIB”=0: No operation is enabled (default) “ATTRIB”=1: Latch ON/OFF operation is enabled
Pulse Model CROB Operation Execution:	☒ Definable - Per Point - with “SD_CDNP_S_CROB_PULSE” (effective with “SD_CDNP_SS_ASSIGN2”)
Binary Output Change Event generating by remote operation: Analog Output Change Event generating by remote operation:	☒ Selectable by Logic Designer; - by the following bit of the parameter “OPTION” of “SD_CDNP_SS_ASSIGN2” “OPTION”=DWORD#16#00000020: Output events will be generated by Remote operation of CROB commands or Analog output operation commands from the master station. This option will be effective with following configurations. - BO/AO_EVT_CLASS != 0 (by SD_CDNP_SS_ASSIGN2 POU or SD_CDNP_S_EVTC POU) - BO/AO_EVT_SIZE != 0 (by SD_CDNP_SS_RS_OPEN or SD_CDNP_SS_TCP_OPEN POU) And for Binary Outputs, “Latch Model CROB Operation Attribute” or “Pulse Model CROB Operation Command Executing POU” must be defined.
Binary Counter Change Event generating by remote Freeze and Clear operation:	☒ Selectable by Logic Designer; - by the following bit of the parameter “OPTION” of “SD_CDNP_SS_ASSIGN2” “OPTION”=DWORD#16#00000040: Binary Counter Change events will be generated by Remote Freeze and Clear operation commands from the master station. This option will be effective with following configuration. - “CT_EVT_CLASS” != 0 (by SD_CDNP_SS_ASSIGN2 POU or SD_CDNP_S_EVTC POU) - “CT_EVT_SIZE” != 0 (by SD_CDNP_SS_RS_OPEN or SD_CDNP_SS_TCP_OPEN POU)
Octet String Change Event generating by remote operation:	☒ Selectable by Logic Designer; - by the following bit of the parameter “OPTION” of “SD_CDNP_SS_ASSIGN2” “OPTION”=DWORD#16#00000080: Octet String Change events will be generated by Remote operation commands from the master station. This option will be effective with following configuration. - “OSTR_EVT_CLASS” != 0 (by SD_CDNP_SS_ASSIGN2 POU or SD_CDNP_S_EVTC POU) - “OSTR_EVT_SIZE” != 0 (by SD_CDNP_SS_RS_OPEN or SD_CDNP_SS_TCP_OPEN POU)

This Device Properties is referred to “DNP3 SPECIFICATION DEVICE PROFILE, Version 2016, April-2016”.

●Capabilities for Device Database

SINGLE-BIT BINARY INPUT POINTS **Static (Steady-State) Object Number: 1** **Event Object Number: 2**	
Static Variation reported when variation 0 requested or in response to Class polls	☒ Variation 2 - with flag
Event Variation reported when variation 0 requested or in response to Class polls	<with “SD_CDNP_SS_ASSIGN”> ☒ Variation 2 - with absolute time
	<with “SD_CDNP_SS_ASSIGN2”> ☒ Variation 1 - without time (optional) ☒ Variation 2 - with absolute time (default) - “without time” is selectable with the following bit of the parameter “OPTION” of “SD_CDNP_SS_ASSIGN2” “OPTION” = DWORD#16#00004000: All event data without time stamp bit
Event reporting mode	☒ All events
Binary Inputs included in Class 0 response:	☒ Always
Binary Inputs Event Buffer Organization:	☒ Configurable, range 0 to 135000 (default=500) - with the parameter “BI_EVT_SIZE“ of “SD_CDNP_SS_RS_OPEN/TCP_OPEN” - Total maximum event size for all data types and all connections is 135000.
BINARY OUTPUT STATUS AND CONTROL RELAY OUTPUT BLOCK **Binary Output Status Object Number: 10** **Binary Output Event Object Number: 11** **CROB Object Number: 12**	
Minimum pulse time allowed with Trip, Close and Pulse On/Off commands.	☒ Fixed at 0 ms (accuracy will be the control task execution period) - However, the 0-ms On-time for Trip/Close/Pulse On commands and the 0-ms Off-time for Trip/Close/Pulse Off commands are not allowed.
Maximum pulse time allowed with Trip, Close and Pulse On/Off commands.	☒ Fixed at 60000 ms (accuracy will be the control task execution period)
Binary Output Status included in Class 0 response:	☒ Always
Static Variation reported when variation 0 requested or in response to Class polls:	☒ Variation 2 - output status with flags
Event Variation reported when variation 0 requested or in response to Class polls:	<with “SD_CDNP_SS_ASSIGN”> ☒ Variation 2 - status with time
	<with “SD_CDNP_SS_ASSIGN2”> ☒ Variation 1 – status without time (optional) ☒ Variation 2 – status with time (default) - “without time” is selectable with the following bit of the parameter “OPTION” of “SD_CDNP_SS_ASSIGN2” “OPTION” = DWORD#16#00004000: All event data without time stamp bit
Event reporting mode:	☒ All events
Maximum Time between Select and Operate:	☒ Configurable, range from 1 to 600 seconds (default=5) - with the parameter “SBO_SEL_TOUT” of “SD_CDNP_SS_RS_OPEN/TCP_OPEN” - SBO operation is effective with “SD_CDNP_SS_ASSIGN2”
Binary Outputs Event Buffer Organization:	☒ Configurable, range 0 to 135000 (default=0) - with the parameter “BO_EVT_SIZE“ of “SD_CDNP_SS_RS_OPEN/TCP_OPEN” - Total maximum event size for all data types and all connections is 135000.
COUNTERS/FROZEN COUNTERS **Static Counter Object Number: 20** **Static Frozen Counter Object Number: 21** **Counter Event Object Number: 22** **Frozen Counter Event Object Number: 23**	
Static Counter Variation reported when variation 0 requested or in response to Class polls	<with “SD_CDNP_SS_ASSIGN”> ☒ Variation 1 - 32-bit with flag
	<with “SD_CDNP_SS_ASSIGN2”> ☒ Based on point index (Variation 1 or 2)

Counter Event Variation reported when variation 0 requested or in response to Class polls	<with “SD_CDNP_SS_ASSIGN”> ☒ Variation 5 - 32-bit with flag and time
	<with “SD_CDNP_SS_ASSIGN2”> ☒ Based on point index (Variation 5 or 6) (default) ☒ Based on point index (Variation 1 or 2) (without time - optional) - “without time” is selectable with the following bit of the parameter “OPTION” of “SD_CDNP_SS_ASSIGN2” “OPTION” = DWORD#16#00004000: All event data without time stamp bit
Counter included in Class 0 response:	☒ Always
Counter Event reporting mode	☒ All events
Static Frozen Counter Variation reported when variation 0 requested or in response to Class polls:	<with “SD_CDNP_SS_ASSIGN2”> ☒ Based on point index (Variation 1 or 2) - Frozen Counter can be handled with “SD_CDNP_SS_ASSIGN2”
Frozen Counter Event Variation reported when variation 0 requested or in response to Class polls:	<with “SD_CDNP_SS_ASSIGN2”> ☒ Based on point index (Variation 5 or 6) (default) ☒ Based on point index (Variation 1 or 2) (without time - optional) - “without time” is selectable with the following bit of the parameter “OPTION” of “SD_CDNP_SS_ASSIGN2” “OPTION” = DWORD#16#00004000: All event data without time stamp bit
Frozen Counters included in Class 0 response:	☒ Always (default) ☒ Never (optional) - “Never” can be selected by following bit of the parameter “OPTION” of “SD_CDNP_SS_ASSIGN2” “OPTION” = DWORD#16#00000100: Frozen counter class 0 response stop bit - Frozen Counter can be handled with “SD_CDNP_SS_ASSIGN2”
Frozen Counter Event reporting mode:	☒ All frozen events - Frozen Counter Event can be handled with “SD_CDNP_SS_ASSIGN2”
Counter Roll Over at:	<with “SD_CDNP_SS_ASSIGN”> ☒ 32 Bits (4,294,967,295)
	<with “SD_CDNP_SS_ASSIGN2”> ☒ Based on point index (16 Bits or 32 Bits)
Counter frozen by means of:	☒ Master Request - Frozen command can be handled with “SD_CDNP_SS_ASSIGN2”
Counters Event Buffer Organization:	☒ Configurable, range 0 to 135000 (default=500) - with the parameter “CT_EVT_SIZE” of “SD_CDNP_SS_RS_OPEN/TCP_OPEN” - Total maximum event size for all data types is 135000.
Frozen Counters Event Buffer Organization:	☒ Configurable, range 0 to 135000 (default=0) - with the parameter “FRZ_CT_EVT_SIZE” of “SD_CDNP_SS_RS_OPEN/TCP_OPEN” - Total maximum event size for all data types and all connections is 135000. - Frozen Counter Event can be handled with “SD_CDNP_SS_ASSIGN2”
Reports counter events for change of value:	☒ Yes for all counters ☒ No for all counters - Selectable with the parameter “CT_EVT_CLASS” of “SD_CDNP_SS_ASSIGN/ASSIGN2” and “CT_EVT_SIZE” of “SD_CNDP_SS_RS/TCP_OPEN”. ☒ Configurable, based on point Index - Configurable with the parameter “EVT_CLASS” of “SD_CDNP_S_EVTC” or assign class command from SCADA/Master.
ANALOG INPUT POINTS **Static (Steady-State) Object Number: 30** **Event Object Number: 32** **Analog Input Deadband Object Number: 34**	
Static Variation reported when variation 0 requested or in response to Class polls:	<with “SD_CDNP_SS_ASSIGN”> ☒ Variation 1 - 32-bit with flag (DINT) ☒ Variation 5 - single-precision floating point with flag (REAL) - “DINT” or “REAL” is selectable with the parameter “ANLG_TYPE” of “SC_CDNP_ASSIGN”
	<with “SD_CDNP_SS_ASSIGN2”> ☒ Based on point index (Variation 1, 2 or 5)

Event Variation reported when variation 0 requested or in response to Class polls:	<with “SD_CDNP_SS_ASSIGN”> ☒ Variation 3 - 32-bit with time (DINT) ☒ Variation 7 - single-precision floating point with time (REAL) - “DINT” or “REAL” is selectable with the parameter “ANLG_TYPE” of “SC_CDNP_ASSIGN”
	<with “SD_CDNP_SS_ASSIGN2”> ☒ Based on point index (Variation 3, 4, 7 or 8) (default) ☒ Based on point index (Variation 1, 2, 5 or 6) (without time - optional) - “without time” is selectable with the following bit of the parameter “OPTION” of “SD_CDNP_SS_ASSIGN2” “OPTION” = DWORD#16#00004000: All event data without time stamp bit
Event reporting mode	☒ All events
Analog Inputs included in Class 0 response:	☒ Always
How Deadbands are set:	☒ Configurable through DNP ☒ Configurable via other means - Configurable with “SD_CDNP_S_DBND” POU for each point with SD_CDNP_SS_ASSIGN2 POU. - Configurable with the parameter “ANLG_DBND_VAL” of SD_CDBP_SS_ASSIGN POU for all points.
Analog Deadband Algorithm:	☒ Simple - just compare the difference from the previous reported value
Analog Inputs Event Buffer Organization:	☒ Configurable, range 0 to 135000 (default=500) - with the parameter “AI_EVT_SIZE” of “SD_CDNP_SS_RS_OPEN/TCP_OPEN” - Total maximum event size for all data types and all connections is 135000.
ANALOG OUTPUT STATUS AND ANALOG OUTPUT CONTROL BLOCK **Analog Output Status Object Number: 40** **Analog Output Control Block Object Number: 41** **Analog Output Event Object Number: 42**	
Static Analog Output Status Variation reported when variation 0 requested or in response to Class polls:	<with “SD_CDNP_SS_ASSIGN”> ☒ Variation 1 - 32-bit with flag (DINT) ☒ Variation 3 - single-precision floating point with flag (REAL) - “DINT” or “REAL” is selectable with the parameter “ANLG_TYPE” of “SC_CDNP_ASSIGN”
	<with “SD_CDNP_SS_ASSIGN2”> ☒ Based on point index (Variation 1, 2, 3 or 4)
Analog Output Status included in Class 0 response:	☒ Always
Event Variation reported when variation 0 requested or in response to Class polls:	<with “SD_CDNP_SS_ASSIGN”> ☒ Variation 3 - 32-bit with time (DINT) ☒ Variation 7 - single-precision floating point with time (REAL) - “DINT” or “REAL” is selectable with the parameter “ANLG_TYPE” of “SC_CDNP_ASSIGN”
	<with “SD_CDNP_SS_ASSIGN2”> ☒ Based on point index (Variation 3, 4, 7 or 8) (default) ☒ Based on point index (Variation 1, 2, 5 or 6) (without time - optional) - “without time” is selectable with the following bit of the parameter “OPTION” of “SD_CDNP_SS_ASSIGN2” “OPTION” = DWORD#16#00004000: All event data without time stamp bit
Event reporting mode:	☒ All events
Maximum Time between Select and Operate:	☒ Configurable, range from 1 to 600 seconds (default=5) - with the parameter “SBO_SEL_TOUT” of “SD_CDNP_SS_RS_OPEN/TCP_OPEN” - SBO operation is effective with “SD_CDNP_SS_ASSIGN2”
Analog Outputs Event Buffer Organization:	☒ Configurable, range 0 to 135000 (default=0) - with the parameter “AO_EVT_SIZE“ of “SD_CDNP_SS_RS_OPEN/TCP_OPEN” - Total maximum event size for all data types and all connections is 135000.
OCTET STRING POINTS **Static (Steady-State) Object Number: 110** **110Event Object Number: 111**	
Event reporting mode:	☒ All events - Octet String Event can be handled with “SD_CDNP_SS_ASSIGN2”
Octet Strings included in Class 0 response:	☒ Always (default) ☒ Never (optional) - “Never” is selectable with the following bit of the parameter “OPTION” of “SD_CDNP_SS_ASSIGN2” “OPTION” = DWORD#16#00000400: Octet string class 0 response stop bit - Octet String can be handled with “SD_CDNP_SS_ASSIGN2”

Maximum number of octets that can be handled in an Octet String Data:	☒ Fixed at 32-Octets - Octet String can be handled with ASSIGN2 POU
Octet Strings Event Buffer Organization:	☒ Configurable, range 0 to 135000 (default=0) - with the parameter “OSTR_EVT_SIZE” of “SD_CDNP_SS_RS_OPEN/TCP_OPEN” - Total maximum event size for all data types and all connections is 135000. - Octet String Event can be handled with “SD_CDNP_SS_ASSIGN2”
Object Group Selection	☒ Fixed, group 110 for all objects

This Capabilities for Device Database is referred to “DNP3 SPECIFICATION DEVICE PROFILE Version 2016, April-2016.”

●Implementation Table

DNP OBJECT GROUP & VARIATION			REQUEST (FCN/FCJ will parse)		RESPONSE (FCN/FCJ will respond)	
Group Number	Variation Number	Description	Function Codes (dec)	Qualifier Codes (hex)	Function Codes (dec)	Qualifier Codes (hex)
1	0	Binary Input - Any variation (Variation 0 is used to request default variation)	1 (read), 22 (assign class)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)		
1	1	Binary Input - Packed format	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
1	2	Binary Input - With flags	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
2	0	Binary Input Change Event - Any variation (Variation 0 is used to request default variation)	1 (read)	06 (all), 07, 08 (limited qty)		
2	1	Binary Input Change Event without Time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
2	2	Binary Input Change Event - With absolute time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
10	0	Binary Output Status - Any variation (Variation 0 is used to request default variation)	1 (read) 22 (assign class)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)		
10	1	Binary Output Status - Packed format	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
10	2	Binary Output Status - Output status with flags	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
11	0	Binary Output Event - Any variation (Variation 0 is used to request default variation)	1 (read)	00, 01 (start-stop), 06 (all)		
11	1	Binary Output Event - Status without time	1 (read)	00, 01 (start-stop), 06 (all)	129 (response) 130 (unsol. resp.)	17, 28 (index)
11	2	Binary Output Event - Status with time	1 (read)	00, 01 (start-stop), 06 (all)	129 (response) 130 (unsol. resp.)	17, 28 (index)
12	1	Binary Output Command - Control relay output block (CROB)	03 (select), 04 (operate), 05 (direct perate), 06 (direct op, no ack)	17, 28 (index)	129 (response)	17, 28 (index)

DNP OBJECT GROUP & VARIATION			REQUEST (FCN/FCJ will parse)		RESPONSE (FCN/FCJ will respond)	
Group Number	Variation Number	Description	Function Codes (dec)	Qualifier Codes (hex)	Function Codes (dec)	Qualifier Codes (hex)
20	0	Counter – Any variation (Variation 0 is used to request default variation)	1 (read), 22 (assign class)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)		
			7 (freeze), 8 (freeze no ack), 9 (freeze & clear), 10 (frz & clr, no ack)	00, 01 (start-stop), 06 (all)		
20	1	Counter - 32-bit with flag	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
20	2	Counter - 16-bit with flag	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
20	5	Counter - 32-bit without flag	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
20	6	Counter - 16-bit without flag	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
21	0	Frozen Counter -Any variation (Variation 0 is used to request default variation)	1 (read) 22 (assign class)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)		
21	1	Frozen Counter - 32-bit with flag	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
21	2	Frozen Counter - 16-bit with flag	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
21	5	Frozen Counter - 32-bit with flag and time	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
21	6	Frozen Counter - 16-bit with flag and time	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
21	9	Frozen Counter - 32-bit without flag	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
21	10	Frozen Counter -16-bit without flag	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
22	0	Counter Change Event - Any variation (Variation 0 is used to request default variation)	1 (read)	06 (all), 07, 08 (limited qty)		
22	1	Counter Change Event - 32-bit with flag	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)

DNP OBJECT GROUP & VARIATION			REQUEST (FCN/FCJ will parse)		RESPONSE (FCN/FCJ will respond)	
Group Number	Variation Number	Description	Function Codes (dec)	Qualifier Codes (hex)	Function Codes (dec)	Qualifier Codes (hex)
22	2	Counter Change Event - 16-bit with flag	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
22	5	Counter Change Event -32-bit with flag and time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
22	6	Counter Change Event -16-bit with flag and time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
23	0	Frozen Counter Change Event - Any variation (Variation 0 is used to request default variation)	1 (read)	06 (all), 07, 08 (limited qty)		
23	1	Frozen Counter Change Event - 32-bit with flag	1 (read)	06 (all), 07, 08 (limited qty)	129 (response)	17, 28 (index)
23	2	Frozen Counter Change Event - 16-bit with flag	1 (read)	06 (all), 07, 08 (limited qty)	129 (response)	17, 28 (index)
23	5	Frozen Counter Change Event - 32-bit with flag and time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response)	17, 28 (index)
23	6	Frozen Counter Change Event - 16-bit with flag and time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response)	17, 28 (index)
30	0	Analog Input - Any variation (Variation 0 is used to request default variation)	1 (read), 22 (assign class)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)		
30	1	Analog Input - 32-bit with flag	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
30	2	Analog Input - 16-bit with flag	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
30	3	Analog Input - 32-bit without flag	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
30	4	Analog Input -16-bit without flag	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
30	5	Analog Input - Single-precision floating point with flag	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
30	6	Analog Input - Double-precision floating point with flag	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
32	0	Analog Input Change Event - Any variation (Variation 0 is used to request default variation)	1 (read)	06 (all), 07, 08 (limited qty)		
32	1	Analog Input Change Event - 32-bit without time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)

DNP OBJECT GROUP & VARIATION			REQUEST (FCN/FCJ will parse)		RESPONSE (FCN/FCJ will respond)	
Group Number	**Variation Number**	**Description**	**Function Codes (dec)**	**Qualifier Codes (hex)**	**Function Codes (dec)**	**Qualifier Codes (hex)**
32	2	Analog Input Change Event -16-bit without time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
32	3	Analog Input Change Event - 32-bit with time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
32	4	Analog Input Change Event - 16-bit with time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
32	5	Analog Input Change Event - Single-precision floating point without time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
32	6	Analog Input Change Event - Double-precision floating point without time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
32	7	Analog Input Change Event - Single-precision floating point with time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
32	8	Analog Input Change Event - Double-precision floating point with time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
34	0	Analog Input Deadband - Any variation (Variation 0 is used to request default variation)	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)		
34	1	Analog Input Deadband - 16-bit	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
			2 (write)	00, 01 (start-stop), 07, 08 (limited qty), 17, 28 (index)		
34	2	Analog Input Deadband - 32-bit	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
			2 (write)	00, 01 (start-stop), 07, 08 (limited qty), 17, 28 (index)		
34	3	Analog Input Deadband - Single-precision floating point	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop) 17, 28 (index)
			2 (write)	00, 01 (start-stop), 07, 08 (limited qty), 17, 28 (index)		
40	0	Analog Output Status – Any variation (Variation 0 is used to request default variation)	1 (read) 22 (assign class)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)		

DNP OBJECT GROUP & VARIATION			REQUEST (FCN/FCJ will parse)		RESPONSE (FCN/FCJ will respond)	
Group Number	Variation Number	Description	Function Codes (dec)	Qualifier Codes (hex)	Function Codes (dec)	Qualifier Codes (hex)
40	1	Analog Output Status -32-bit with flag	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
40	2	Analog Output Status - 16-bit with flag	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
40	3	Analog Output Status - Single-precision floating point with flag	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
40	4	Analog Output Status - Double-precision floating point with flag	1 (read)	00, 01 (start-stop), 06 (all), 07, 08 (limited qty), 17, 28 (index)	129 (response)	00, 01 (start-stop), 17, 28 (index)
41	1	Analog Output Command - 32-bit	03 (select), 04 (operate), 05 (direct operate), 06 (direct op, no ack)	17, 28 (index)	129 (response)	17, 28 (index)
41	2	Analog Output Command - 16-bit	03 (select), 04 (operate), 05 (direct operate), 06 (direct op, no ack)	17, 28 (index)	129 (response)	17, 28 (index)
41	3	Analog Output Command - Single-precision floating point	03 (select), 04 (operate), 05 (direct operate), 06 (direct op, no ack)	17, 28 (index)	129 (response)	17, 28 (index)
41	4	Analog Output Command - Double-precision floating point	03 (select), 04 (operate), 05 (direct operate), 06 (direct op, no ack)	17, 28 (index)	129 (response)	17, 28 (index)
42	0	Analog Output Change Event - Any variation (Variation 0 is used to request default variation)	1 (read)	06 (all), 07, 08 (limited qty)		
42	1	Analog Output Change Event - 32-bit without time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
42	2	Analog Output Change Event - 16-bit without time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
42	3	Analog Output Change Event - 32-bit with time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
42	4	Analog Output Change Event - 16-bit with time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)

DNP OBJECT GROUP & VARIATION			REQUEST (FCN/FCJ will parse)		RESPONSE (FCN/FCJ will respond)	
Group Number	**Variation Number**	**Description**	**Function Codes (dec)**	**Qualifier Codes (hex)**	**Function Codes (dec)**	**Qualifier Codes (hex)**
42	5	Analog Output Change Event - Single-precision floating point without time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
42	6	Analog Output Change Event - Double-precision floating point without time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
42	7	Analog Output Change Event - Single-precision floating point with time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
42	8	Analog Output Change Event - Double-precision floating point with time	1 (read)	06 (all), 07, 08 (limited qty)	129 (response) 130 (unsol. resp.)	17, 28 (index)
50	1	Time and Date - Absolute time	1 (read)	07 (limited qty = 1)	129 (response)	07 (limited qty = 1)
			2 (write)	07 (limited qty = 1)		
50	3	Time and Date - Absolute time at last recorded time	2 (write)	07 (limited qty = 1)		
52	2	Time Delay - Fine			129 (response)	07 (limited qty = 1)
60	1	Class Objects - Class 0 Data	1 (read)	06 (all)		
			22 (assign class)	06 (all)		
60	2	Class Objects - Class 1 Data	1 (read)	06 (all), 07, 08 (limited qty)		
			20 (enable unsol) 21 (disable unsol) 22 (assign class)	06 (all)		
60	3	Class Objects - Class 2 Data	1 (read)	06 (all), 07, 08 (limited qty)		
			20 (enable unsol) 21 (disable unsol) 22 (assign class)	06 (all)		
60	4	Class Objects - Class 3 Data	1 (read)	06 (all), 07, 08 (limited qty)		
			20 (enable unsol) 21 (disable unsol) 22 (assign class)	06 (all)		
80	1	Internal Indications	1 (read)	00, 01 (start-stop)		
			2 (write)	00 index=7 (start-stop)		

DNP OBJECT GROUP & VARIATION			REQUEST (FCN/FCJ will parse)		RESPONSE (FCN/FCJ will respond)	
Group Number	**Variation Number**	**Description**	**Function Codes (dec)**	**Qualifier Codes (hex)**	**Function Codes (dec)**	**Qualifier Codes (hex)**
110	0	Octet String (range is 0 to 29, up to 32-octets can be handled)	22 (assign class)	00, 01 (start-stop), 06 (all), 17, 28 (index)		
			1 (read)	00, 01 (start-stop) 06 (all), 17, 28 (index)	-	-
	string length		-	-	129 (response)	17, 28 (index)
			2 (write)	00, 01 (start-stop) 17, 28 (index)	-	-
111	0	Octet String Event (range is 0 to 29, up to 32-octets can be handled)	1 (read)	06 (all), 07, 08 (limited qty)	-	-
	string length		-	-	129 (response)	17, 28 (index)
					130 (unsol. resp.)	17, 28 (index)
No Object (function code only)			23 (delay measurement)			
No Object (function code only)			24 (recode current time)			

This Implementation Table is referred to “DNP3 SPECIFICATION, Volume 6 Part2, Objects, DNP3 OBJECT LIBRARY Version 2.05, 11-June-2009” and “DNP3 Technical Bulletin TB2015-001 Object Groups 110-115”.

■ ORDERING INFORMATION

DNP3 Communication Portfolio Licenses for FCN-500 and FCN-RTU runtime environment are bundled with CPU module.

For the type of software media supplied, refer to the separate GS, “Application Portfolios” (publication number GS 34P02P20-02E).

■ TRADEMARK ACKNOWLEDGMENTS

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