

GS 34P02P22-02

■ 概要

この一般仕様書 (GS) では STARDOM の DNP3 通信ポートフォリオについて記述します。

DNP3 通信ポートフォリオは、自律型コントローラ FCN-500、FCN-RTU の制御アプリケーションを作成するためのポートフォリオです。この DNP3 通信ポートフォリオにより FCN-500、FCN-RTU は、シリアル通信または Ethernet 通信を用いて DNP3 (Distributed Network Protocol) 通信を簡単に行うことができます。本書では、自律型コントローラを以下のように表記します。

- モジュールタイプの自律型コントローラを「FCN」と記します。
- CPU モジュール NFCP501/NFCP502 を実装した自律型コントローラを「FCN-500」と記します。
- CPU モジュール NFCP050 を実装した自律型コントローラを「FCN-RTU」と記します。

■ 動作環境

●ハードウェア (FCN-500)

通信種別		通信ポート
シリアル通信	RS-232-C	CPU モジュール (NFCP501、NFCP502) シリアルポート (*1) シリアル通信モジュール (NFLR111) シリアルポート
	RS-422/RS-485	シリアル通信モジュール (NFLR121) シリアルポート
Ethernet 通信		CPU モジュール (NFCP501、NFCP502) Ethernet ポート

*1: CPU モジュールを二重化した場合には、CPU モジュールのシリアルポートは使用できません。

●ハードウェア (FCN-RTU)

通信種別		通信ポート
シリアル通信	RS-232	CPU モジュール (NFCP050) シリアルポート
	RS-422/RS-485	CPU モジュール (NFCP050) シリアルポート
Ethernet 通信		CPU モジュール (NFCP050) Ethernet ポート

■ 機能仕様

● DNP3 通信ポートフォリオ

DNP3 通信ポートフォリオは、DNP3 通信に対応した機器がシリアル通信または Ethernet 通信を用いて簡単に自律型コントローラ FCN-500、FCN-RTU のデータの収集を行うことができる POU です。

以下の通信機能をサポートしています。

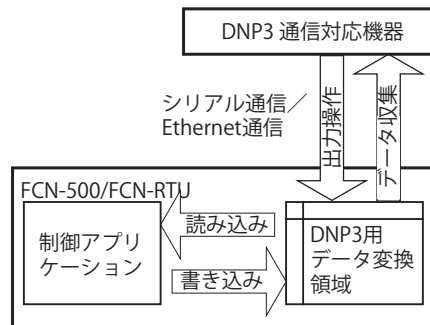
通信種別 (*3) (*4)	通信機能
シリアル通信 (*1)	Slave 接続可能なポート数: 2
Ethernet 通信 (*2)	Server 接続可能なクライアント数: 2

*1: FCN-500、FCN-RTU はスレーブとしてのみ動作可能です。

*2: FCN-500、FCN-RTU はサーバとしてのみ動作可能です。

*3: これらの通信のひとつのみ使用可能です。

*4: CPU 二重化の場合、CPU 切り替え発生時に変化イベントはリセットされます。



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■ アクセス可能なデータ範囲

DNP3 通信対応機器から FCN-500、FCN-RTU へアクセス可能なデータ範囲を下表に示します。

● DNP3 データ変数領域確保 POU (SD_CDNP_SS_ASSIGN)

データ種別	IEC データ型	Index 範囲
Binary Input	BOOL	0 ~ 499
Binary Output	BOOL	0 ~ 499
32-Bit Binary Counter	UDINT	0 ~ 499
32-Bit Analog Input	DINT	0 ~ 499 (*1)
Single-Precision Floating Point Analog Input	REAL	
32-Bit Analog Output	DINT	0 ~ 499 (*1)
Single-Precision Floating Point Analog Output	REAL	

*1: アナログデータのデータ型は、32-Bit Analog Input/Output (DINT)、または Single-Precision Floating Point Analog Input/Output (REAL) のいずれかを SD_CDNP_SS_ASSIGN の入力パラメータ "ANLG_TYPE" にて選択します。

● DNP3 データ変数領域確保 POU (SD_CDNP_SS_ASSIGN2)

データ種別	IEC データ型	Index 範囲 (*4)
Binary Input	BOOL	0 ~ 499
Binary Output	BOOL	0 ~ 499
16-Bit Binary Counter	UINT	0 ~ 499 (*1)
32-Bit Binary Counter	UDINT	
16-Bit Frozen Counter	UINT	0 ~ 499 (*1)
32-Bit Frozen Counter	UDINT	
16-Bit Analog Input	INT	0 ~ 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 ~ 499 (*2)
32-Bit Analog Output	DINT	
Single-Precision Floating Point Analog Output	REAL	
Double-Precision Floating Point Analog Output	LREAL	
32-Octet String (*3)	STRING32	0 ~ 29

*1: Binary Counter データ領域は、16-Bit(UINT) および 32-Bit(UDINT) の先頭 Index 番号をオフセット番号として指定することができます。Binary Counter データ領域のオフセット番号の指定方法については SD_CDNP_SS_ASSIGN2 の入力パラメータ "CT16_OFFSET" および "CT32_OFFSET" を参照してください。

*2: Analog Input/Output データ領域は、16-Bit (INT)、32-Bit (DINT)、Single-Precision Floating Point (REAL) および Double-Precision Floating Point(LREAL) の先頭 Index 番号をオフセット番号として指定することができます。Analog Input/Output データ領域のオフセット番号の指定方法については SD_CDNP_SS_ASSIGN2 のパラメータ "AI16_OFFSET"、"AI32_OFFSET"、"AIF_OFFSET"、"AIF_OFFSET"、"AIDF_OFFSET"、"AO16_OFFSET"、"AO32_OFFSET"、"AOSF_OFFSET" および "AODF_OFFSET" を参照してください。

*3: Octet String の 1 データの最大長は 32-Octets (8-Bit データ × 32 文字) です。

*4: 最大 Index 番号は、SD_CDNP_SS_ASSIGN2 のパラメータ "BI_MAX_INDEX"、"AI_MAX_INDEX"、"BO_MAX_INDEX"、"AO_MAX_INDEX" および "CT_MAX_INDEX" によって指定することができます。Class 0 のポーリングおよび Class 0 のポーリングを含む Integrity Poll を行う場合、各データ型の最大 Index 番号を指定することによって使用する Index 範囲を制限してください。

■ POU 一覧

● DNP3 通信定義用 POU

DNP3 通信を行うために定義する POU を示します。

POU 名	機能
SD_CDNP_SS_ASSIGN	データ変数領域確保
SD_CDNP_SS_ASSIGN2	データ変数領域確保 (詳細データ型混在)
SD_CDNP_SS_RS_OPEN	シリアル通信スレーブ機能用通信タスク起動
SD_CDNP_SS_TCP_OPEN	Ethernet 通信サーバ機能用通信タスク起動

● データ属性定義用 POU

各データの属性を定義するために使用する POU を示します。

POU 名	機能
SD_CDNP_S_EVTG	イベントクラスのアサイン
SD_CDNP_S_DBND	Analog Input データの Deadband 値の設定
SD_CDNP_S_DBND_AO_LOCAL	Analog Output データのローカル操作 Deadband 値の設定
SD_CDNP_S_CROB	Binary Output データのラッチ型操作属性の設定
SD_CDNP_S_RANGE_AIO16	16 Bit Analog Input/Output のレンジの設定
SD_CDNP_S_RANGE_AIO32	32 Bit Analog Input/Output のレンジの設定
SD_CDNP_S_RANGE_AIOSF	Single-Precision Floating Point Analog Input/Output のレンジの設定
SD_CDNP_S_RANGE_AIODF	Double-Precision Floating Point Analog Input/Output のレンジの設定

● 要求実行用 POU

POU 名	機能
SD_CDNP_S_CROB_PULSE	Binary Output データに対するパルス型操作要求の実行

● タイムスタンプ付きデータ格納 POU

POU 名	機能
SD_CDNP_S_BI_WT_TS	タイムスタンプ付き Binary Input データの格納
SD_CDNP_S_CT16_WT_TS	タイムスタンプ付き 16-Bit Binary Counter データの格納
SD_CDNP_S_CT32_WT_TS	タイムスタンプ付き 32-Bit Binary Counter データの格納
SD_CDNP_S_AI16_WT_TS	タイムスタンプ付き 16-Bit Analog Input データの格納
SD_CDNP_S_AI32_WT_TS	タイムスタンプ付き 32-Bit Analog Input データの格納
SD_CDNP_S_AISF_WT_TS	タイムスタンプ付き Single-Precision Floating Point Analog Input データの格納
SD_CDNP_S_AIDF_WT_TS	タイムスタンプ付き Double-Precision Floating Point Analog Input データの格納

●データアクセス用 POU

各種データ変数をアクセスするために使用する POU を示します。

POU 名	機能
SD_CDNP_S_BI_RD	Binary Input データの読み込み
SD_CDNP_S_BO_RD	Binary Output データの読み込み
SD_CDNP_S_CT16_RD	16 Bit Binary Counter データの読み込み
SD_CDNP_S_CT32_RD	32 Bit Binary Counter データの読み込み
SD_CDNP_S_AI16_RD	16 Bit Analog Input データの読み込み
SD_CDNP_S_AI32_RD	32 Bit Analog Input データの読み込み
SD_CDNP_S_AISF_RD	Single-Precision Floating Point Analog Input データの読み込み
SD_CDNP_S_AIDF_RD	Double-Precision Floating Point Analog Input データの読み込み
SD_CDNP_S_AO16_RD	16 Bit Analog Output データの読み込み
SD_CDNP_S_AO32_RD	32 Bit Analog Output データの読み込み
SD_CDNP_S_AOSF_RD	Single-Precision Floating Point Analog Output データの読み込み
SD_CDNP_S_AODF_RD	Double-Precision Floating Point Analog Output データの読み込み
SD_CDNP_S_OSTR32_RD	32 Octet String データの読み込み
SD_CDNP_S_BI_WT	Binary Input データの書き込み
SD_CDNP_S_BO_WT	Binary Output データの書き込み
SD_CDNP_S_CT16_WT	16 Bit Binary Counter データの書き込み
SD_CDNP_S_CT32_WT	32 Bit Binary Counter データの書き込み
SD_CDNP_S_AI16_WT	16 Bit Analog Input データの書き込み
SD_CDNP_S_AI32_WT	32 Bit Analog Input データの書き込み
SD_CDNP_S_AISF_WT	Single-Precision Floating Point Analog Input データの書き込み
SD_CDNP_S_AIDF_WT	Double-Precision Floating Point Analog Input データの書き込み
SD_CDNP_S_AO16_WT	16 Bit Analog Output データの書き込み
SD_CDNP_S_AO32_WT	32 Bit Analog Output データの書き込み
SD_CDNP_S_AOSF_WT	Single-Precision Floating Point Analog Output データの書き込み
SD_CDNP_S_AODF_WT	Double-Precision Floating Point Analog Output データの書き込み
SD_CDNP_S_OSTR32_WT	32 Octet String データの書き込み
SD_CDNP_S_BI_WT_F	Binary Input データおよび Flags の書き込み
SD_CDNP_S_BO_WT_F	Binary Output データおよび Flags の書き込み
SD_CDNP_S_CT16_WT_F	16 Bit Binary Counter データおよび Flags の書き込み
SD_CDNP_S_CT32_WT_F	32 Bit Binary Counter データおよび Flags の書き込み
SD_CDNP_S_AI16_WT_F	16 Bit Analog Input データおよび Flags の書き込み
SD_CDNP_S_AI32_WT_F	32 Bit Analog Input データおよび Flags の書き込み
SD_CDNP_S_AISF_WT_F	Single-Precision Floating Point Analog Input データおよび Flags の書き込み
SD_CDNP_S_AIDF_WT_F	Double-Precision Floating Point Analog Input データおよび Flags の書き込み
SD_CDNP_S_AO16_WT_F	16 Bit Analog Output データおよび Flags の書き込み
SD_CDNP_S_AO32_WT_F	32 Bit Analog Output データおよび Flags の書き込み
SD_CDNP_S_AOSF_WT_F	Single-Precision Floating Point Analog Output データおよび Flags の書き込み
SD_CDNP_S_AODF_WT_F	Double-Precision Floating Point Analog Output データおよび Flags の書き込み

■ DNP3 Field Device Profile

● 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"
Device manufacturer's software version string:	- "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 <input checked="" type="checkbox"/> None - partially supported <input checked="" type="checkbox"/> Level 1 <input checked="" type="checkbox"/> Level 2 - except Device Attributes (Device Attributes will be configured by Logic Designer) <input checked="" type="checkbox"/> Level 3 - except Device Attributes (Device Attributes will be configured by Logic Designer) <input checked="" type="checkbox"/> Level 4 - partially supported
Supported Function Blocks:	<input type="checkbox"/> Self-Address Support <input type="checkbox"/> Data Sets <input type="checkbox"/> File Transfer <input type="checkbox"/> Virtual Terminal <input type="checkbox"/> Mapping to IEC 61850 Object Models defined in a DNP3 XML file. <input type="checkbox"/> Function code 31, activate configuration <input type="checkbox"/> 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:	<input checked="" type="checkbox"/> Software - Vender software named "Logic Designer" and "Resource Configurator" <input checked="" type="checkbox"/> Protocol - Set via DNP3 (e.g. assign class, write deadband)
DNP3 XML Files Available On-line:	<input checked="" type="checkbox"/> None
External DNP3 XML Files Available Off-line:	<input checked="" type="checkbox"/> None
Connections Supported:	Configurable, selectable from Serial, IP Networking - Configurable by Logic Designer <input checked="" type="checkbox"/> Serial (complete section "SERIAL CONNECTIONS") <input checked="" type="checkbox"/> IP Networking (complete section "IP NETWORKING")
Conformance Testing:	<input checked="" type="checkbox"/> Self-tested, version
SERIAL CONNECTIONS	
Port Name:	For COM Ports of CPU Modules <input checked="" type="checkbox"/> Fixed at COM1/COM2/COM3/COM4 For Serial Communication Modules <input checked="" type="checkbox"/> Logical Port Name can be assigned by Resource Configurator
Serial Connection Parameters:	<input checked="" type="checkbox"/> 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 <input checked="" type="checkbox"/> Configurable, selectable from 300, 1200, 2400, 4800, 9600, 14400, 19200, 28800, 38400, 57600, 115200 (default = 9600) For Serial Communication Modules <input checked="" type="checkbox"/> 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 <input checked="" type="checkbox"/> Configurable, select from NONE, CTS, DSR (default = NONE) - Receive Flow Control <input checked="" type="checkbox"/> Configurable, select from NONE, RTS, DTR (default = NONE) - Send Validate <input checked="" type="checkbox"/> Configurable, select from NONE, DSR (default = NONE) - Receive Validate <input checked="" type="checkbox"/> Configurable, select from NONE, DSR, CD, DSR_CD (default = NONE) - Initial DTR state <input checked="" type="checkbox"/> Configurable, select from ON, OFF (default = OFF) RS-232 Options: for Serial Communication Modules - Send Flow Control <input checked="" type="checkbox"/> Fixed at CTS - Receive Flow Control <input checked="" type="checkbox"/> Configurable, select from NONE, RTS (default = NONE) - Send Signal Check <input checked="" type="checkbox"/> Configurable, select from NONE, DSR, CD, DSR_CD (default = NONE) - Receive Signal Check <input checked="" type="checkbox"/> Fixed at CD - Initial DTR state <input checked="" type="checkbox"/> Fixed at ON
Interval to Request Link Status:	<input checked="" type="checkbox"/> Not Supported
Supports DNP3 Collision Avoidance:	<input checked="" type="checkbox"/> 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 <input checked="" type="checkbox"/> Configurable range 10.0 to 5000.0 (ms), in units of 10 (ms) (default = 10.0(ms)). For Serial Communication Modules <input checked="" type="checkbox"/> 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:	<input checked="" type="checkbox"/> 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:	<input checked="" type="checkbox"/> None (always transmits with no inter-character gap)
Multiple Master Connections:	<input checked="" type="checkbox"/> Supports multiple masters (Up to two connections are possible)
IP NETWORKING	
Port Name:	
Type of End Point:	<input checked="" type="checkbox"/> TCP Listening
IP Address of this Device:	<input checked="" type="checkbox"/> Configurable by Resource Configurator "Set IP Address Dialog"
Subnet Mask:	
Gateway IP Address:	
TCP Connection Establishment:	<input checked="" type="checkbox"/> Allows all (when no IP address is listed in the "Packet Filter Setting File") <input checked="" type="checkbox"/> Limits based on list of IP address (when the IP addresses are listed in the "Packet Filter Setting File")
IP Address of Remote Device:	<input checked="" type="checkbox"/> Configurable by STARDOM FCX Maintenance Page "Packet Filter Setting File"
TCP Listen Port Number:	<input checked="" type="checkbox"/> 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:	<input checked="" type="checkbox"/> Not Applicable (Outstation w/o dual end point)
TCP Keep-alive Timer:	<input checked="" type="checkbox"/> Timer disabled
TCP Timeout:	Instead of Keep-alive timer, TCP disconnection will be checked with this timeout value. <input checked="" type="checkbox"/> 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. <input checked="" type="checkbox"/> 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:	<input checked="" type="checkbox"/> 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:	<input checked="" type="checkbox"/> Not Supported
Destination UDP Port for Initial Unsolicited Responses:	
Destination UDP Port for Responses:	
Multiple Master Connections:	<input checked="" type="checkbox"/> Supports multiple masters (Up to two connections are possible) If supported, the following methods may be used: <input checked="" type="checkbox"/> Method 2 (based on IP port number)
Time Synchronization Support:	<input checked="" type="checkbox"/> SNTP (Simple Network Time Protocol) - Configurable by STARDOM FCX Maintenance Page "SNTP Setting File" <input checked="" type="checkbox"/> DNP3 LAN procedure (function code 24) <input checked="" type="checkbox"/> 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) <input checked="" type="checkbox"/> Never when DNP3 Network Method is used (TIM_SYNC_REQ = TRUE) <input checked="" type="checkbox"/> Asserted at startup until first Time Synchronization request received <input checked="" type="checkbox"/> 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)	<input checked="" type="checkbox"/> 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 0xFFFF0 through 0xFFFF are reserved by DNP3 for special use.
DNP3 Source Address Validation:	<input checked="" type="checkbox"/> Always, one address allowed - Outstation will filter out requests not from the Master.
DNP3 Source Address Expected When Validation is Enables: (DNP3 Master Address)	<input checked="" type="checkbox"/> 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:	<input checked="" type="checkbox"/> No
Sends Confirmed User Data Frames:	<input checked="" type="checkbox"/> Never
Data Link Layer Confirmation Timeout:	<input checked="" type="checkbox"/> None
Maximum Data Link Retries:	<input checked="" type="checkbox"/> Never Retries
Maximum Number of Octets Transmitted in a Data Link Frame:	<input checked="" type="checkbox"/> Fixed at 292
Maximum Number of Octets that can be Received in a Data Link Frame:	<input checked="" type="checkbox"/> Fixed at 292
APPLICATION LAYER	
Maximum Number of Octets Transmitted in an Application Layer Fragment other than File Transfer:	<input checked="" type="checkbox"/> Fixed at 2048
Maximum Number of Octets Transmitted in an Application Layer Fragment containing File Transfer:	<input checked="" type="checkbox"/> File Transfer is Not Supported
Maximum Number of Octets that can be Received in an Application Layer Fragment :	<input checked="" type="checkbox"/> Fixed at 2048
Timeout Waiting for Complete Application Layer Fragment:	<input checked="" type="checkbox"/> Fixed at 15 seconds
Maximum Number of Objects Allowed in a Single Control Request for CROB:	<input checked="" type="checkbox"/> 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:	<input checked="" type="checkbox"/> 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:	<input checked="" type="checkbox"/> Not Supported
Supports Mixing Object Groups (AOBs, CROBs and Data Sets) in the Same Control Request:	<input checked="" type="checkbox"/> No

Control Status Codes Supported:	<input checked="" type="checkbox"/> 1 – TIMEOUT <input checked="" type="checkbox"/> 2 – NO_SELECT <input checked="" type="checkbox"/> 3 – FORMAT_ERROR <input checked="" type="checkbox"/> 4 – NOT_SUPPORTED <input checked="" type="checkbox"/> 5 – ALREADY_ACTIVE <input type="checkbox"/> 6 – HARDWARE_ERROR <input type="checkbox"/> 7 – LOCAL <input checked="" type="checkbox"/> 8 – TOO_MANY_OBJS <input type="checkbox"/> 9 – NOT_AUTHORIZED <input type="checkbox"/> 10 – AUTOMATION_INHIBIT <input type="checkbox"/> 11 – PROCESSING_LIMITED <input type="checkbox"/> 12 – OUT_OF_RANGE <input type="checkbox"/> 13 – DOWNSTREAM_LOCAL <input type="checkbox"/> 14 – ALREADY_COMPLETE <input type="checkbox"/> 15 – BLOCKED <input type="checkbox"/> 16 – CANCELLED <input type="checkbox"/> 17 – BLOCKED_OTHER_MASTER <input type="checkbox"/> 18 – DOWNSTREAM_FAIL <input type="checkbox"/> 126 – RESERVED <input type="checkbox"/> 127 – UNDEFINED
ITEMS FOR OUTSTATIONS	
Timeout Waiting for Application Confirm of Solicited Response Message:	<input checked="" type="checkbox"/> 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:	<input checked="" type="checkbox"/> Never needs time <input checked="" type="checkbox"/> 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:	<input checked="" type="checkbox"/> Never used
File Handle Timeout:	<input checked="" type="checkbox"/> Not Applicable, Files Not Supported
Event Buffer Overflow Behavior:	<input checked="" type="checkbox"/> Discard the oldest event <input checked="" type="checkbox"/> 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:	<input checked="" type="checkbox"/> 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:	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> 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:	<input checked="" type="checkbox"/> Always
DNP Command Settings Preserved Through a Device Reset:	<input checked="" type="checkbox"/> Assign Class <input checked="" type="checkbox"/> Analog Deadbands
Supports configuration signature:	<input checked="" type="checkbox"/> Not Supported

Requests Application Confirmation:	For event responses: <input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Configurable For non-final fragments: <input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Configurable
Supports Clock Management	<input checked="" type="checkbox"/> Yes (support both DNP3 time synchronization and SNTP)
OUTSTATION UNSOLICITED RESPONSE SUPPORT	
Supports Unsolicited Reporting:	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> 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:	<input checked="" type="checkbox"/> Configurable, range 0 to 0xFFFF - 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 0xFFFF0 through 0xFFFF are reserved by DNP3 for special use.
Unsolicited Response Confirmation Timeout:	<input checked="" type="checkbox"/> 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:	<input checked="" type="checkbox"/> 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:	<input checked="" type="checkbox"/> 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:	<input checked="" type="checkbox"/> 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:	<input checked="" type="checkbox"/> 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:	<input checked="" type="checkbox"/> Total Number of Events not used to trigger Unsolicited Responses
Hold Time After Class 1 Event:	<input checked="" type="checkbox"/> 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:	<input checked="" type="checkbox"/> 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:	<input checked="" type="checkbox"/> 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:	<input checked="" type="checkbox"/> Class events not used to trigger Unsolicited Responses
Retrigger Hold Time:	<input checked="" type="checkbox"/> Hold-time timer will be retriggered for each new event detected (may get more changes in next response)
Other Unsolicited Response Trigger Conditions:	<input checked="" type="checkbox"/> NONE
INDIVIDUAL FIELD OUTSTATION PARAMETERS	
Analog Data Type:	<input checked="" type="checkbox"/> 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:	<input checked="" type="checkbox"/> 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:	<input checked="" type="checkbox"/> Configurable - All Points - as the Default Deadband Value; - with the parameter "ANLG_DBND_VAL" of "SD_CDNP_SS_ASSIGN" (default = 0.0) <input checked="" type="checkbox"/> Fixed at 0.0 - All Points - with "SD_CDNP_SS_ASSIGN2" <input checked="" type="checkbox"/> Configurable - Per Point - by "SD_CDNP_S_DBND" - DNP3 Analog Input Deadband Value Setting POU (SD_CDNP_S_DBND); <input checked="" type="checkbox"/> Configurable - Per Point - by Master
Time Value for all DNP3 protocol time stamps reported and time synchronization messages:	<input checked="" type="checkbox"/> 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:	<input checked="" type="checkbox"/> Configurable - Per Connection by "SD_CDNP_SS_RS/TCP_OPEN" with "SD_CDNP_SS_ASSIGN2"

Event Class Assign:	<input checked="" type="checkbox"/> 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)
	<input checked="" type="checkbox"/> Configurable - Per Point - with "SD_CDNP_S_EVTC" <input checked="" type="checkbox"/> Configurable - Per Point - by Master
Preservation of Class Assign through a Device Reset:	<input checked="" type="checkbox"/> No - (If any of Class Assign are written by a Master, the Master will have to write them again.) <input checked="" type="checkbox"/> Yes - (with "SD_CDNP_S_EVTC")
Preservation of Analog Input Deadband Settings Per Point through a Device Reset:	<input checked="" type="checkbox"/> No - (If any of Analog Input Deadbands are written by a Master, the Master will have to write them again) <input checked="" type="checkbox"/> Yes - (with "SD_CDNP_S_DBND")
File Handling:	<input checked="" type="checkbox"/> Not Supported
Control Relay Output Block (CROB) Operation:	<input checked="" type="checkbox"/> Yes
Analog Output Block (AOB) Operation:	<input checked="" type="checkbox"/> Yes
Latch model CROB Operation Attribute:	<input checked="" type="checkbox"/> 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 <input checked="" type="checkbox"/> 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:	<input checked="" type="checkbox"/> Definable - Per Point - with "SD_CDNP_S_CROB_PULSE" (effective with "SD_CDNP_SS_ASSIGN2")
Binary Output Change Event generating by remote operation:	<input checked="" type="checkbox"/> 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.
Analog Output Change Event generating by remote operation:	
Binary Counter Change Event generating by remote Freeze and Clear operation:	<input checked="" type="checkbox"/> 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:	<input checked="" type="checkbox"/> 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	<input checked="" type="checkbox"/> Variation 2 - with flag
Event Variation reported when variation 0 requested or in response to Class polls	<with "SD_CDNP_SS_ASSIGN"> <input checked="" type="checkbox"/> Variation 2 - with absolute time <with "SD_CDNP_SS_ASSIGN2"> <input checked="" type="checkbox"/> Variation 1 - without time (optional) <input checked="" type="checkbox"/> 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	<input checked="" type="checkbox"/> All events
Binary Inputs included in Class 0 response:	<input checked="" type="checkbox"/> Always
Binary Inputs Event Buffer Organization:	<input checked="" type="checkbox"/> 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.	<input checked="" type="checkbox"/> 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.	<input checked="" type="checkbox"/> Fixed at 60000 ms (accuracy will be the control task execution period)
Binary Output Status included in Class 0 response:	<input checked="" type="checkbox"/> Always
Static Variation reported when variation 0 requested or in response to Class polls:	<input checked="" type="checkbox"/> Variation 2 - output status with flags
Event Variation reported when variation 0 requested or in response to Class polls:	<with "SD_CDNP_SS_ASSIGN"> <input checked="" type="checkbox"/> Variation 2 - status with time <with "SD_CDNP_SS_ASSIGN2"> <input checked="" type="checkbox"/> Variation 1 - status without time (optional) <input checked="" type="checkbox"/> 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:	<input checked="" type="checkbox"/> All events
Maximum Time between Select and Operate:	<input checked="" type="checkbox"/> 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:	<input checked="" type="checkbox"/> 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"> <input checked="" type="checkbox"/> Variation 1 - 32-bit with flag <with "SD_CDNP_SS_ASSIGN2"> <input checked="" type="checkbox"/> 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"> <input checked="" type="checkbox"/> Variation 5 - 32-bit with flag and time <with "SD_CDNP_SS_ASSIGN2"> <input checked="" type="checkbox"/> Based on point index (Variation 5 or 6) (default) <input checked="" type="checkbox"/> 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:	<input checked="" type="checkbox"/> Always
Counter Event reporting mode	<input checked="" type="checkbox"/> All events
Static Frozen Counter Variation reported when variation 0 requested or in response to Class polls:	<with "SD_CDNP_SS_ASSIGN2"> <input checked="" type="checkbox"/> 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"> <input checked="" type="checkbox"/> Based on point index (Variation 5 or 6) (default) <input checked="" type="checkbox"/> 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:	<input checked="" type="checkbox"/> Always (default) <input checked="" type="checkbox"/> 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:	<input checked="" type="checkbox"/> All frozen events - Frozen Counter Event can be handled with "SD_CDNP_SS_ASSIGN2"
Counter Roll Over at:	<with "SD_CDNP_SS_ASSIGN"> <input checked="" type="checkbox"/> 32 Bits (4,294,967,295) <with "SD_CDNP_SS_ASSIGN2"> <input checked="" type="checkbox"/> Based on point index (16 Bits or 32 Bits)
Counter frozen by means of:	<input checked="" type="checkbox"/> Master Request - Frozen command can be handled with "SD_CDNP_SS_ASSIGN2"
Counters Event Buffer Organization:	<input checked="" type="checkbox"/> 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:	<input checked="" type="checkbox"/> 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:	<input checked="" type="checkbox"/> Yes for all counters <input checked="" type="checkbox"/> 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". <input checked="" type="checkbox"/> 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"> <input checked="" type="checkbox"/> Variation 1 - 32-bit with flag (DINT) <input checked="" type="checkbox"/> 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"> <input checked="" type="checkbox"/> 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"> <input checked="" type="checkbox"/> Variation 3 - 32-bit with time (DINT) <input checked="" type="checkbox"/> 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"> <input checked="" type="checkbox"/> Based on point index (Variation 3, 4, 7 or 8) (default) <input checked="" type="checkbox"/> 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	<input checked="" type="checkbox"/> All events
Analog Inputs included in Class 0 response:	<input checked="" type="checkbox"/> Always
How Deadbands are set:	<input checked="" type="checkbox"/> Configurable through DNP <input checked="" type="checkbox"/> 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:	<input checked="" type="checkbox"/> Simple - just compare the difference from the previous reported value
Analog Inputs Event Buffer Organization:	<input checked="" type="checkbox"/> 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"> <input checked="" type="checkbox"/> Variation 1 - 32-bit with flag (DINT) <input checked="" type="checkbox"/> Variation 3 - single-precision floating point with flag (REAL) - "DINT" or "REAL" is selectable with the parameter "ANLG_TYPE" of "SD_CDNP_ASSIGN" <with "SD_CDNP_SS_ASSIGN2"> <input checked="" type="checkbox"/> Based on point index (Variation 1, 2, 3 or 4)
Analog Output Status included in Class 0 response:	<input checked="" type="checkbox"/> Always
Event Variation reported when variation 0 requested or in response to Class polls:	<with "SD_CDNP_SS_ASSIGN"> <input checked="" type="checkbox"/> Variation 3 - 32-bit with time (DINT) <input checked="" type="checkbox"/> Variation 7 - single-precision floating point with time (REAL) - "DINT" or "REAL" is selectable with the parameter "ANLG_TYPE" of "SD_CDNP_ASSIGN" <with "SD_CDNP_SS_ASSIGN2"> <input checked="" type="checkbox"/> Based on point index (Variation 3, 4, 7 or 8) (default) <input checked="" type="checkbox"/> 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:	<input checked="" type="checkbox"/> All events
Maximum Time between Select and Operate:	<input checked="" type="checkbox"/> 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:	<input checked="" type="checkbox"/> 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:	<input checked="" type="checkbox"/> All events - Octet String Event can be handled with "SD_CDNP_SS_ASSIGN2"
Octet Strings included in Class 0 response:	<input checked="" type="checkbox"/> Always (default) <input checked="" type="checkbox"/> 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:	<input checked="" type="checkbox"/> Fixed at 32-Octets - Octet String can be handled with ASSIGN2 POU
Octet Strings Event Buffer Organization:	<input checked="" type="checkbox"/> 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	<input checked="" type="checkbox"/> 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)
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)

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	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)
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)

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)
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)
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)		

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)
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)
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)

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	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)
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)	-	-
	-		-	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)	-	-
	-		-	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”

■ ご注文時指定事項

● DNP3 通信ポートフォリオライセンス

DNP3 通信ポートフォリオライセンスは、FCN-500 および FCN-RTU の CPU モジュールにバンドルされています。

● ソフトウェア媒体

ソフトウェア媒体などのソフトウェア提供形態については、「GS 34P02P20-02 アプリケーションポートフォリオ (FCN-500/FCN-RTU)」を参照してください。

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