DNP3
Device Profile Document
For
ARE-M Series
Float Chargers
Single-Phase Input

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RECEIVING INSTRUCTIONS & GENERAL EQUIPMENT INFORMATION

Please Note: For your protection, the following information and the product manual should be read and thoroughly understood before unpacking, installing, or using the equipment.

UNIPOWER, LLC presents all equipment to the delivering carrier securely packed and in perfect condition. Upon acceptance of the package from us, the delivering carrier assumed responsibility for its safe arrival to you. Once you receive the equipment, it is your responsibility to document any damage the carrier may have inflicted, and to file your claim promptly and accurately.

1. PACKAGE INSPECTION

1.1 Examine the shipping crate or carton for any visible damage: punctures, dents, and any other signs of possible internal damage.

1.2 Describe any damage or shortage on the receiving documents, and have the carrier sign their full name.

1.3 If your receiving freight bill notes that a Tip-N-Tell is attached to your freight, locate it. If the Tip-N-Tell arrow has turned even partially blue, this means the freight has been tipped in transport. Make sure the carrier notes this on your receipt before you sign for the freight.

2. EQUIPMENT INSPECTION

2.1 Within fifteen days, open the crate and inspect the contents for damages. While unpacking, be careful not to discard any equipment, parts, or manuals. If any damage is detected, call the delivering carrier to determine appropriate action. They may require an inspection.

***SAVE ALL SHIPPING MATERIAL FOR THE INSPECTOR TO SEE!**

2.2 After the inspection has been made, call UNIPOWER. We will determine if the equipment should be returned to our plant for repair, or if some other method would be more expeditious. If it is determined that the equipment should be returned to UNIPOWER, ask the delivering carrier to send the packages back to UNIPOWER at the delivering carrier's expense.

2.3 If repair is necessary, we will invoice you for the repair so that you may submit the bill to the delivering carrier with your claim form.

2.4 It is your responsibility to file a claim with the delivering carrier. Failure to properly file a claim for shipping damages may void warranty service for any physical damages later reported for repair.

3. HANDLING

Equipment can be universally heavy or top-heavy. Use adequate humanpower or equipment for handling. Until the equipment is securely mounted, be careful to prevent the equipment from being accidentally tipped over.

4. NAMEPLATE

Each piece of UNIPOWER equipment is identified by a part number on the nameplate. Please refer to this number in all correspondence with UNIPOWER.

5. INITIAL SETTINGS

All equipment is shipped from our production area *fully checked and adjusted*. Do not make any adjustments until you have referred to the technical reference or product manual.

6. SPARE PARTS

To minimize downtime during installation or operation, we suggest you purchase spare fuses, circuit boards and other recommended components as listed on the Recommended Spare Parts List in the back of the product manual. If nothing else, we strongly recommend stocking spare fuses for all systems.

REVISION HISTORY

Revision	Reason for change	Checked/Approved By & Date
7	See PCO 45450	CJM / 9-4-19
8	See ECN 46140	JPR / 1-11-24

PROPRIETARY AND CONFIDENTIAL

DISCLAIMER

Data, descriptions, and specifications presented herein are subject to revision by UNIPOWER, LLC without notice. While such information is believed to be accurate as indicated herein, UNIPOWER, LLC makes no warranty and hereby disclaims all warranties, express or implied, with regard to the accuracy or completeness of such information. Further, because the product(s) featured herein may be used under conditions beyond its control, UNIPOWER, LLC hereby disclaims and excludes all warranties, express, implied, or statutory, including any warranty of merchantability, any warranty of fitness for a particular purpose, and any implied warranties otherwise arising from course of dealing or usage of trade. The user is solely responsible for determining the suitability of the product(s) featured herein for user's intended purpose and in user's specific application.

Throughout the remainder of this manual, "UNIPOWER" will mean "UNIPOWER, LLC."

PERSONNEL REQUIREMENTS

Installation, setup, operation, and servicing of this equipment should be performed by qualified persons thoroughly familiar with this Product Manual and Applicable Local and National Codes. A copy of this manual is included with the equipment shipment.

Table of Contents

1 DEVICE PROPERTIES

Unless otherwise noted, multiple boxes in the second column below should be selected for each parameter to indicate all capabilities supported or required. Parameters without checkboxes in the second column do not have capabilities and are included so the current value may be shown in the third column.

The items listed in the capabilities column below may be configurable to any of the options selected, or set to a fixed value when the device was designed. Item 1.1.10 contains a list of abbreviations for the possible ways in which the configurable parameters may be set. Since some parameters may not be accessible by each of these methods supported, an abbreviation for the configuration methods supported by each parameter is shown in the fourth column of the tables below.

This document may be used to show the device capabilities, the current value of each parameter, or both. If it is used to show the current values, the third column should be filled in even if a fixed parameter is selected in the capabilities section ("NA" may be entered for parameters that are Not Applicable).

If this document is used to show the current value of each parameter, the "Current Value" column applies to a single connection between a master and outstation. If the device has multiple or backup connections to other DNP devices that you wish to show in the Device Profile Document, see section 8.3.2 "Reference Device and Auxiliary Info" of Volume 8 Interoperability or duplicate the entire Device Profile Document for each communication link to a logical or physical DNP3 Device.

1.1 DEVICE IDENTIFICATION	**Capabilities**	**Current Value**	**If configurable, list methods**
1.1.1 **DEVICE FUNCTION:** *Masters send DNP requests, while Outstations send DNP responses. If a single physical device can perform both functions, a separate Device Profile Document must be provided for each function.*	○ Master ☒ Outstation	○ Master ☒ Outstation	
1.1.2 **VENDOR NAME:** *The name of the organization producing the device.*		UNIPOWER	
1.1.3 **DEVICE NAME:** *The model and name of the device, sufficient to distinguish it from any other device from the same organization.*		ARE-M	
1.1.4 **DEVICE MANUFACTURER'S HARDWARE VERSION STRING:**			
1.1.5 **DEVICE MANUFACTURER'S SOFTWARE VERSION STRING:**			
1.1.6 **DEVICE PROFILE DOCUMENT VERSION NUMBER:** *Version of the Device Profile Document is indicated by a whole number incremented with each new release. This should match the latest version shown in the Revision History at the beginning of this document.*		4	

1.1 DEVICE IDENTIFICATION	**Capabilities**	**Current Value**	**If configurable, list methods**
1.1.7 **DNP LEVELS SUPPORTED FOR:** *Indicate each DNP3 Level to which the device conforms fully. For Masters, requests and responses can be indicated independently.*	Masters Only Requests Responses ☐ ☐ None ☐ ☐ Level 1 ☐ ☐ Level 2 ☐ ☐ Level 3 Outstations Only Requests and Responses ☐ None ☐ Level 1 ☒ Level 2 ☐ Level 3		
1.1.8 **SUPPORTED FUNCTION BLOCKS:** .	☒ Self-Address Reservation ☐ Object 0 – attribute objects ☐ Data Sets ☐ File Transfer ☐ Virtual Terminal ☐ Mapping to IEC 61850 Object Models defined in a DNP3 XML file		
1.1.9 **NOTABLE ADDITIONS:** *A brief description intended to quickly identify for the reader the most obvious features the device supports in addition to the Highest DNP Level Supported. The complete list of features is described in the Implementation Table.*			
1.1.10 **METHODS TO SET CONFIGURABLE PARAMETERS:**	☐ XML – Loaded via DNP3 File Transfer ☐ XML – Loaded via other transport mechanism ☐ Terminal – ASCII Terminal Command Line ☐ Software – Vendor software named _____ ☐ Proprietary file loaded via DNP3 file transfer ☐ Proprietary file loaded via other transport mechanism ☒ Direct – Keypad on device front panel ☐ Factory – Specified when device is ordered ☐ Protocol – Set via DNP3 (e.g. assign class) ☒ Other – explain Web Browser.		

1.1 DEVICE IDENTIFICATION	Capabilities	Current Value	If configurable, list methods
1.1.11 **DNP3 XML FILES AVAILABLE ON-LINE:** *XML configuration file names that can be read or written through DNP3 File Transfer to a device* *A device's currently running configuration is returned by DNP3 on-line XML file read from the device.* *DNP3 on-line XML file write to a device will update the device's configuration when the Activate Configuration (function code 31) is received.* .	Rd Wr Filename Description of Contents ☐ dnpDP.xmlComplete Device Profile ☐ dnpDPcap.xmlDevice Profile Capabilities ☐ dnpDPcfg.xmlDevice Profile config. values ☐ ☐ _____*.xml_____ * The Complete Device Profile Document contains the capabilities, Current Value, and configurable methods columns. * The Device Profile Capabilities contains only the capabilities and configurable methods columns. * The Device Profile Config. Values contains only the Current Value column.		
1.1.12 **EXTERNAL DNP3 XML FILES AVAILABLE OFF-LINE:** *XML configuration file names that can be read or written from an external system, typically from a system that maintains the outstation configuration.* *External off-line XML file read permits an XML definition of a new configuration to be supplied from off-line configuration tools.* *External off-line XML file write permits an XML definition of a new configuration to be supplied to off-line configuration tools.*	Rd Wr Filename Description of Contents ☐ ☐ dnpDP.xmlComplete Device Profile ☐ ☐ dnpDPcap.xmlDevice Profile Capabilities ☐ ☐ dnpDPcfg.xmlDevice Profile config. values ☐ ☐ _____*.xml_____ * The Complete Device Profile Document contains the capabilities, Current Value, and configurable methods columns. * The Device Profile Capabilities contains only the capabilities and configurable methods columns. * The Device Profile Config. Values contains only the Current Value column.		
1.1.13 **CONNECTIONS SUPPORTED:**	☐ Serial (complete section 1.2) ☒ IP Networking (complete section 1.3) ☐ Other, explain _____		

1.2 SERIAL CONNECTIONS	**Capabilities**	**Current Value**	**If configurable, list methods**
1.2.1 **PORT NAME** *Name used to reference the communication port defined in this section.*			
1.2.2 **SERIAL CONNECTION PARAMETERS:**	☐ Asynchronous - 8 Data Bits, 1 Start Bit, 1 Stop Bit, No Parity ☐ Other, explain _____		
1.2.3 **BAUD RATE:**	☐ Fixed at _____ ☐ Configurable, range _____ to _____ ☐ Configurable, selectable from ____,____,____ ☐ Configurable, other, describe_____		

1.2 SERIAL CONNECTIONS	**Capabilities**	**Current Value**	**If configurable, list methods**
1.2.4 **HARDWARE FLOW CONTROL (HANDSHAKING):** *Describe hardware signaling requirements of the interface.* *Where a transmitter or receiver is inhibited until a given control signal is asserted, it is considered to require that signal prior to sending or receiving characters.* *Where a signal is asserted prior to transmitting, that signal will be maintained active until after the end of transmission.* *Where a signal is asserted to enable reception, any data sent to the device when the signal is not active could be discarded.*	□ None **RS-232 / V.24 / V.28 Options:** Before Tx, Asserts: □ RTS □ DTR Before Rx, Asserts: □ RTS □ DTR Always Asserts: □ RTS □ DTR Before Tx, Requires: Asserted Deasserted □ □ CTS □ □ DCD □ □ DSR □ □ RI □ □ □ Rx Inactive Before Rx, Requires: Asserted Deasserted □ □ CTS □ □ DCD □ □ DSR □ □ RI Always Ignores: □ CTS □ DCD □ DSR □ RI □ Other, explain _____ **RS-422 / V.11 Options:** □ Requires Indication before Rx □ Asserts Control before Tx □ Other, explain _____ **RS-485 Options:** □ Requires Rx inactive before Tx □ Other, explain _____		

1.2 SERIAL CONNECTIONS	**Capabilities**	**Current Value**	**If configurable, list methods**
1.2.5 **INTERVAL TO REQUEST LINK STATUS:** *Indicates how often to send Data Link Layer status requests on a serial connection. This parameter is separate from the TCP Keep-alive timer.*	☐ Not Supported ☐ Fixed at_____ seconds ☐ Configurable, range _____ to _____ seconds ☐ Configurable, selectable from ___,___,___ seconds ☐ Configurable, other, describe_____		
1.2.6 **SUPPORTS DNP3 COLLISION AVOIDANCE:** *Indicates whether a device uses a collision avoidance algorithm. Documentation by the vendor will provide information on collision avoidance schemes.*	☐ No ☐ Yes, explain _____		
1.2.7 **RECEIVER INTER-CHARACTER TIMEOUT:** *When serial interfaces with asynchronous character framing are used, this parameter indicates if the receiver makes a check for gaps between characters (i.e. extension of the stop bit time of one character prior to the start bit of the following character within a message). If the receiver performs this check and the timeout is exceeded then the receiver discards the current data link frame. A receiver that does not discard data link frames on the basis of inter-character gaps is considered to not perform this check.* *Where no asynchronous serial interface is fitted, this parameter is not applicable. In this case none of the options shall be selected.*	☐ Not checked ☐ No gap permitted ☐ Fixed at _____ bit times ☐ Fixed at _____ ms ☐ Configurable, range ____ to ____ bit times ☐ Configurable, range ____ to ____ ms ☐ Configurable, Selectable from ___,___,___bit times ☐ Configurable, Selectable from ____, ____, ____ ms ☐ Configurable, other, describe _____ ☐ Variable, explain ____		

1.2 SERIAL CONNECTIONS	**Capabilities**	**Current Value**	**If configurable, list methods**
1.2.8 **INTER-CHARACTER GAPS IN TRANSMISSION:** *When serial interfaces with asynchronous character framing are used, this parameter indicates whether extra delay is ever introduced between characters in the message, and if so, the maximum width of the gap.* *Where no asynchronous serial interface is fitted, this parameter is not applicable. In this case none of the options shall be selected.*	□ None (always transmits with no inter-character gap) □ Maximum _____ bit times □ Maximum _____ ms		

1.3 IP NETWORKING	**Capabilities**	**Current Value**	**If configurable, list methods**
1.3.1 **PORT NAME** *Name used to reference the communication port defined in this section.*	Ethernet Port	Ethernet Port	
1.3.2 **TYPE OF END POINT:**	☐ TCP Initiating (Master Only) ☒ TCP Listening (Outstation Only) ☐ TCP Dual (required for Masters) ☒ UDP Datagram (required)		DHCP/Keypad
1.3.3 **IP ADDRESS OF THIS DEVICE:**		192.168.10.73	DHCP/Keypad / Web
1.3.4 **SUBNET MASK:**		255.255.255.0	DHCP/Keypad / Web
1.3.5 **GATEWAY IP ADDRESS:**		192.168.10.1	DHCP/Keypad / Web
1.3.6 **ACCEPTS TCP CONNECTIONS OR UDP DATAGRAMS FROM:**	☒ Allows all (show as *.*.*.* in 1.3.7) ☐ Limits based on an IP address ☐ Limits based on list of IP addresses ☐ Limits based on a wildcard IP address ☐ Limits based on list of wildcard IP addresses ☐ Other validation, explain_____		
1.3.7 **IP ADDRESS(ES) FROM WHICH TCP CONNECTIONS OR UDP DATAGRAMS ARE ACCEPTED:**		*.*.*.*	
1.3.8 **TCP LISTEN PORT NUMBER:** *If Outstation or dual end point Master, port number on which to listen for incoming TCP connect requests. Required to be configurable for Masters and recommended to be configurable for Outstations.*	☐ Not Applicable (Master w/o dual end point) ☒ Fixed at 20,000 ☐ Configurable, range _____ to _____ ☐ Configurable, selectable from ____,____,____ ☐ Configurable, other, describe_____		

1.3 IP NETWORKING	**Capabilities**	**Current Value**	**If configurable, list methods**
1.3.9 **TCP LISTEN PORT NUMBER OF REMOTE DEVICE:** *If Master or dual end point Outstation, port number on remote device with which to initiate connection. Required to be configurable for Masters and recommended to be configurable for Outstations.*	☐ Not Applicable (Outstation w/o dual end point) ☒ Fixed at 20,000 ☐ Configurable, range _____ to _____ ☐ Configurable, selectable from ____,____,____ ☐ Configurable, other, describe_____		
1.3.10 **TCP KEEP-ALIVE TIMER:** *The time period for the keep-alive timer on active TCP connections.*	☒ Fixed at __55000_____ms ☐ Configurable, range _____ to _____ms ☐ Configurable, selectable from ____,____,____ms ☐ Configurable, other, describe_____		
1.3.11 **LOCAL UDP PORT:** *Local UDP port for sending and/or receiving UDP datagrams. Master may let system choose an available port. Outstation must use one that is known by the master.*	☒ Fixed at 20,000 ☐ Configurable, range _____ to _____ ☐ Configurable, selectable from ____,____,____ ☐ Configurable, other, describe_____ ☐ Let system choose (Master only)		
1.3.12 **DESTINATION UDP PORT FOR DNP3 REQUESTS (MASTER ONLY):**			
1.3.13 **DESTINATION UDP PORT FOR INITIAL UNSOLICITED NULL RESPONSES (UDP ONLY OUTSTATIONS):** *For a UDP only Outstation, the destination UDP port for sending initial unsolicited Null response*	☐ None ☒ Fixed at 20,000 ☐ Configurable, range _____ to _____ ☐ Configurable, selectable from ____,____,____ ☐ Configurable, other, describe_____		
1.3.14 **DESTINATION UDP PORT FOR RESPONSES:** *For a UDP only Outstation, the destination UDP port for sending all responses other than initial unsolicited Null Response.*	☐ None ☐ Fixed at 20,000 ☐ Configurable, range _____ to _____ ☐ Configurable, selectable from ____,____,____ ☐ Configurable, other, describe_____ ☒ Use source port number		

1.3 IP NETWORKING	**Capabilities**	**Current Value**	**If configurable, list methods**
1.3.15 **MULTIPLE OUTSTATION CONNECTIONS (MASTERS ONLY):** *Master only. Indicates whether multiple outstation connections are supported.*	☐ Supports multiple outstations (Masters only)		
1.3.16 **MULTIPLE MASTER CONNECTIONS (OUTSTATIONS ONLY):** *Outstation only. Indicates whether multiple master connections are supported and the method that can be used to establish connections.*	☐ Supports multiple masters (Outstations only) If supported, the following methods may be used: ☐ Method 1 (based on IP address) - required ☐ Method 2 (based on IP port number) - recommended ☐ Method 3 (browsing for static data) - optional		
1.3.17 **TIME SYNCHRONIZATION SUPPORT:**	☒ DNP3 LAN procedure (function code 24) ☒ DNP3 Write Time (not recommended over LAN) ☐ Other, explain _____ ☐ Not Supported		

1.4 LINK LAYER	**Capabilities**	**Current Value**	**If configurable, list methods**
1.4.1 **DATA LINK ADDRESS:** *Indicates if the link address is configurable over the entire valid range of 0 to 65,519. Data link addresses 0xFFF0 through 0xFFFF are reserved for broadcast or other special purposes.*	☐ Fixed at_____ ☒ Configurable, range ___0____ to __65,519__ ☐ Configurable, selectable from ____,____,____ ☐ Configurable, other, describe_____	4	Front Panel
1.4.2 **DNP3 SOURCE ADDRESS VALIDATION:** *Indicates whether the device will filter out messages not from a specific source address.*	☒ Never ☐ Always, one address allowed (shown in 1.4.3) ☐ Always, any one of multiple addresses allowed (each selectable as shown in 1.4.3) ☐ Sometimes, explain_____		
1.4.3 **DNP3 SOURCE ADDRESS(ES) EXPECTED WHEN VALIDATION IS ENABLED:** *Selects the allowed source address(es).*	☐ Configurable to any 16 bit DNP Data Link Address value ☐ Configurable, range _____ to _____ ☐ Configurable, selectable from ____,____,____ ☐ Configurable, other, describe_____		
1.4.4 **SELF ADDRESS SUPPORT USING ADDRESS 0XFFFC:** *If an Outstation receives a message with a destination address of 0xFFFC it shall respond normally with its own source address. It must be possible to disable the feature if supported.*	☒ Yes (only allowed if configurable) ☐ No	Enabled	Front Panel
1.4.5 **SENDS CONFIRMED USER DATA FRAMES:** *A list of conditions under which the device transmits confirmed link layer services (TEST_LINK_STATES, RESET_LINK_STATES, CONFIRMED_USER_DATA).*	☐ Always ☒ Sometimes, explain __If requested by master_____ ☐ Never		

1.4 LINK LAYER	**Capabilities**	**Current Value**	**If configurable, list methods**
1.4.6 **DATA LINK LAYER CONFIRMATION TIMEOUT:** *This timeout applies to any secondary data link message that requires a confirm or response (link reset, link status, user data, etc)*	☒ None ☐ Fixed at_____ms ☐ Configurable, range _____ to _____ms ☐ Configurable, selectable from ___,___,___ms ☐ Configurable, other, describe_____ ☐ Variable, explain _____		
1.4.7 **MAXIMUM DATA LINK RETRIES:** *The number of times the device will retransmit a frame that requests Link Layer confirmation.*	☒ Never Retries ☐ Fixed at _____ ☐ Configurable, range _____ to _____ ☐ Configurable, selectable from ____,____,____ ☐ Configurable, other, describe_____		
1.4.8 **MAXIMUM NUMBER OF OCTETS TRANSMITTED IN A DATA LINK FRAME:** *This number includes the CRCs. With a length field of 255, the maximum size would be 292.*	☒ Fixed at ____292____ ☐ Configurable, range _____ to _____ ☐ Configurable, selectable from ____,____,____ ☐ Configurable, other, describe_____	292	
1.4.9 **MAXIMUM NUMBER OF OCTETS THAT CAN BE RECEIVED IN A DATA LINK FRAME:** *This number includes the CRCs. With a length field of 255, the maximum size would be 292. The device must be able to receive 292 octets to be compliant.*	☒ Fixed at ____292____ ☐ Configurable, range _____ to _____ ☐ Configurable, selectable from ____,____,____ ☐ Configurable, other, describe_____	292	

1.5 APPLICATION LAYER	**Capabilities**	**Current Value**	**If configurable, list methods**
1.5.1 **MAXIMUM NUMBER OF OCTETS TRANSMITTED IN AN APPLICATION LAYER FRAGMENT OTHER THAN FILE TRANSFER:** *This size does not include any transport or frame octets.* • *Masters must provide a setting less than or equal to 249.* • *Outstations must provide a setting less than or equal to 2048.*	☒ Fixed at ____249____ ☐ Configurable, range _____ to _____ ☐ Configurable, selectable from ____,____,____ ☐ Configurable, other, describe_____	249	
1.5.2 **MAXIMUM NUMBER OF OCTETS TRANSMITTED IN AN APPLICATION LAYER FRAGMENT CONTAINING FILE TRANSFER:**	☐ Fixed at _____ ☐ Configurable, range _____ to _____ ☐ Configurable, selectable from ____,____,____ ☐ Configurable, other, describe_____		
1.5.3 **MAXIMUM NUMBER OF OCTETS THAT CAN BE RECEIVED IN AN APPLICATION LAYER FRAGMENT:** *This size does not include any transport or frame octets.* • *Masters must provide a setting greater than or equal to 2048.* • *Outstations must provide a setting greater than or equal to 249.*	☒ Fixed at ____249____ ☐ Configurable, range _____ to _____ ☐ Configurable, selectable from ____,____,____ ☐ Configurable, other, describe_____	249	
1.5.4 **TIMEOUT WAITING FOR COMPLETE APPLICATION LAYER FRAGMENT:** *Timeout if all frames of a message fragment are not received in the specified time. Measured from time first frame of a fragment is received until the last frame is received.*	☒ None ☐ Fixed at_____ms ☐ Configurable, range _____ to _____ms ☐ Configurable, selectable from ___,___,___ms ☐ Configurable, other, describe_____ ☐ Variable, explain _____		

1.5 APPLICATION LAYER	**Capabilities**	**Current Value**	**If configurable, list methods**
1.5.5 **MAXIMUM NUMBER OF OBJECTS ALLOWED IN A SINGLE CONTROL REQUEST FOR CROB (GROUP 12):**	☒ Fixed at __16__(enter 0 if controls are not supported) ☐ Configurable, range _____ to _____ ☐ Configurable, selectable from ____,____,____ ☐ Configurable, other, describe_____ ☐ Variable, explain _____	16	
1.5.6 **MAXIMUM NUMBER OF OBJECTS ALLOWED IN A SINGLE CONTROL REQUEST FOR ANALOG OUTPUTS (GROUP 41):**	☒ Fixed at ___16_____ (enter 0 if controls are not supported) ☐ Configurable, range _____ to _____ ☐ Configurable, selectable from ____,____,____ ☐ Configurable, other, describe_____ ☐ Variable, explain _____	16	
1.5.7 **MAXIMUM NUMBER OF OBJECTS ALLOWED IN A SINGLE CONTROL REQUEST FOR DATA SETS (GROUPS 85,86,87):**	☒ Fixed at ____0_____ (enter 0 if controls are not supported) ☐ Configurable, range _____ to _____ ☐ Configurable, selectable from ____,____,____ ☐ Configurable, other, describe_____ ☐ Variable, explain _____	0	
1.5.8 **SUPPORTS MIXING OBJECT GROUPS (AOBS, CROBS AND DATA SETS) IN THE SAME CONTROL REQUEST:**	☐ Not applicable – controls are not supported ☒ Yes ☐ No		

1.6 FILL OUT THE FOLLOWING ITEMS FOR MASTERS ONLY	**Capabilities**	**Current Value**	**If configurable, list methods**
1.6.1 **TIMEOUT WAITING FOR COMPLETE APPLICATION LAYER RESPONSE(MS):** *Timeout on Master if all fragments of a response message are not received in the specified time.*	☐ None ☐ Fixed at_____ms ☐ Configurable, range _____ to _____ms ☐ Configurable, selectable from ___,___,___ms ☐ Configurable, other, describe_____ ☐ Variable, explain _____		
1.6.2 **MAXIMUM APPLICATION LAYER RETRIES FOR REQUEST MESSAGES:** *The number of times a Master will retransmit an application layer request message if a response is not received. This parameter must never cause a Master to retransmit control or time sync messages. Outstations should never transmit retries.*	☐ None (required) ☐ Fixed at_____ ☐ Configurable, range _____ to _____ ☐ Configurable, selectable from ___,___,___ ☐ Configurable, other, describe_____ ☐ Variable, explain _____		
1.6.3 **INCREMENTAL TIMEOUT WAITING FOR FIRST OR NEXT FRAGMENT OF AN APPLICATION LAYER RESPONSE:**	☐ None ☐ Fixed at_____ms ☐ Configurable, range _____ to _____ms ☐ Configurable, selectable from ___,___,___ms ☐ Configurable, other, describe_____ ☐ Variable, explain _____		

1.7 FILL OUT THE FOLLOWING ITEMS FOR OUTSTATIONS ONLY	**Capabilities**	**Current Value**	**If configurable, list methods**
1.7.1 **TIMEOUT WAITING FOR APPLICATION CONFIRM OF SOLICITED RESPONSE MESSAGE:**	☒ None ☐ Fixed at_____ms ☐ Configurable, range _____ to _____ms ☐ Configurable, selectable from ___,___,___ms ☐ Configurable, other, describe_____ ☐ Variable, explain _____		
1.7.2 **HOW OFTEN IS TIME SYNCHRONIZATION REQUIRED FROM THE MASTER?**	☐ Never needs time ☐ Within ___ seconds after IIN1.4 is set ☒ Periodically every __21600__ seconds	21600	Front Panel
1.7.3 **DEVICE TROUBLE BIT IIN1.6:** *If IIN1.6 device trouble bit is set under certain conditions, explain the possible causes.*	☒ Never used ☐ Reason for setting_____		
1.7.4 **FILE HANDLE TIMEOUT:** *If there is no activity referencing a file handle for a configurable length of time, the outstation must do an automatic close on the file. The timeout value must be configurable up to 1 hour. When this condition occurs the outstation will send a File Transport Status Object (group 70 var 6) using a status code value of file handle expired (0x02).*	☒ Not applicable, files not supported ☐ Fixed at_____ms ☐ Configurable, range _____ to _____ms ☐ Configurable, selectable from ___,___,___ms ☐ Configurable, other, describe_____ ☐ Variable, explain _____		
1.7.5 **EVENT BUFFER OVERFLOW BEHAVIOR:**	☒ Discard the oldest event ☐ Discard the newest event ☐ Other, explain _____		
1.7.6 **EVENT BUFFER ORGANIZATION:** *Explain how event buffers are arranged (per Object Group, per Class, single buffer, etc,) and provide their sizes*	All events are stored in the same event buffer. The buffer can hold at most 15 events.		

1.7 FILL OUT THE FOLLOWING ITEMS FOR OUTSTATIONS ONLY	**Capabilities**	**Current Value**	**If configurable, list methods**
1.7.7 **SENDS MULTI-FRAGMENT RESPONSES:** *Indicates whether an Outstation sends multi-fragment responses (Masters do not send multi-fragment requests).*	☐ Yes ☒ No		
1.7.8 **DNP COMMAND SETTINGS PRESERVED THROUGH A DEVICE RESET:** *If any of these settings are written through the DNP protocol and they are not preserved through a restart of the Outstation, the Master will have to write them again anytime the Restart IIN bit is set.*	☐ Assign Class ☐ Analog Deadbands ☐ Data Set Prototypes ☐ Data Set Descriptors		

1.8 OUTSTATION UNSOLICITED RESPONSE SUPPORT	**Capabilities**	**Current Value**	**If configurable, list methods**
1.8.1 **SUPPORTS UNSOLICITED REPORTING:** *When the unsolicited response mode is configured "off", the device is to behave exactly like an equivalent device that has no support for unsolicited responses. If set to On, the Outstation will send a null Unsolicited Response after it restarts, then wait for an Enable Unsolicited Response command from the master before sending additional Unsolicited Responses containing event data.*	☐ Not Supported ☒ Configurable, selectable from On and Off	☐ Off ☒ On	Keypad
1.8.2 **MASTER DATA LINK ADDRESS:** *The destination address of the master device where the unsolicited responses will be sent.*	☐ Fixed at_____ ☒ Configurable, range __0_____ to __65,519_____ ☐ Configurable, selectable from ____,____,____ ☐ Configurable, other, describe_____	3	Keypad
1.8.3 **UNSOLICITED RESPONSE CONFIRMATION TIMEOUT:** *This is the amount of time that the outstation will wait for an Application Layer confirmation back from the master indicating that the master received the unsolicited response message. As a minimum, the range of configurable values must include times from one second to one minute. This parameter may be the same one that is used for normal, solicited, application confirmation timeouts, or it may be a separate parameter.*	☐ Fixed at _____ms ☒ Configurable, range __1000__ to __254000_ ms ☐ Configurable, selectable from ___,___,___ms ☐ Configurable, other, describe_____ ☐ Variable, explain _____	5 seconds	Keypad
1.8.4 **NUMBER OF UNSOLICITED RETRIES:** *This is the number of retries that an outstation transmits in each unsolicited response series if it does not receive confirmation back from the master. The configured value includes identical and regenerated retry messages. One of the choices must provide for an indefinite (and potentially infinite) number of transmissions.*	☐ None ☐ Fixed at _____ ☐ Configurable, range _____ to _____ ☒ Configurable, selectable from _0__, 254_, Inf_ ☐ Configurable, other, describe_____ ☐ Always infinite, never gives up	10	Front Panel

1.9 OUTSTATION UNSOLICITED RESPONSE TRIGGER CONDITIONS	**Capabilities**	**Current Value**	**If configurable, list methods**
1.9.1 **NUMBER OF CLASS 1 EVENTS:**	☐ Class 1 not used to trigger Unsolicited Responses ☒ Fixed at _____1_____ ☐ Configurable, range _____ to _____ ☐ Configurable, selectable from ____,____,____ ☐ Configurable, other, describe_____		
1.9.2 **NUMBER OF CLASS 2 EVENTS:**	☒ Class 2 not used to trigger Unsolicited Responses ☐ Fixed at _____ ☐ Configurable, range _____ to _____ ☐ Configurable, selectable from ____,____,____ ☐ Configurable, other, describe_____		
1.9.3 **NUMBER OF CLASS 3 EVENTS:**	☒ Class 3 not used to trigger Unsolicited Responses ☐ Fixed at _____ ☐ Configurable, range _____ to _____ ☐ Configurable, selectable from ____,____,____ ☐ Configurable, other, describe_____		
1.9.4 **TOTAL NUMBER EVENTS FROM ANY CLASS:**	☒ Total Number of Events not used to trigger Unsolicited Responses ☐ Fixed at _____ ☐ Configurable, range _____ to _____ ☐ Configurable, selectable from ____,____,____ ☐ Configurable, other, describe_____		
1.9.5 **HOLD TIME AFTER CLASS 1 EVENT:** *A configured value of 0 indicates that responses are not delayed due to this parameter.*	☐ Class 1 not used to trigger Unsolicited Responses ☒ Fixed at _____0_____ ms ☐ Configurable, range _____ to _____ ms ☐ Configurable, selectable from ____,____,____ ms ☐ Configurable, other, describe_____		
1.9.6 **HOLD TIME AFTER CLASS 2 EVENT:** *A configured value of 0 indicates that responses are not delayed due to this parameter.*	☒ Class 2 not used to trigger Unsolicited Responses ☐ Fixed at _____ ms ☐ Configurable, range _____ to _____ ms ☐ Configurable, selectable from ____,____,____ ms ☐ Configurable, other, describe_____		

1.9 OUTSTATION UNSOLICITED RESPONSE TRIGGER CONDITIONS	**Capabilities**	**Current Value**	**If configurable, list methods**
1.9.7 **HOLD TIME AFTER CLASS 3 EVENT:** *A configured value of 0 indicates that responses are not delayed due to this parameter.*	☒ Class 3 not used to trigger Unsolicited Responses ☐ Fixed at _____ ms ☐ Configurable, range _____ to _____ ms ☐ Configurable, selectable from ____,____,____ ms ☐ Configurable, other, describe_____		
1.9.8 **HOLD TIME AFTER EVENT ASSIGNED TO ANY CLASS:** *A configured value of 0 indicates that responses are not delayed due to this parameter.*	☐ Class events not used to trigger Unsolicited Responses ☒ Fixed at _____0____ ms ☐ Configurable, range _____ to _____ ms ☐ Configurable, selectable from ____,____,____ ms ☐ Configurable, other, describe_____		
1.9.9 **RETRIGGER HOLD TIMER:** *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) ☒ Hold-time timer will not be retriggered for each new event detected (guaranteed update time)		
1.9.10 **OTHER UNSOLICITED RESPONSE TRIGGER CONDITIONS:**	_____ _____ _____		

1.10 OUTSTATION PERFORMANCE	**Capabilities**	**Current Value**	**If configurable, list methods**
1.10.1 **MAXIMUM TIME BASE DRIFT (MILLISECONDS PER MINUTE):** *If the protocol is synchronized by DNP, what is the clock drift rate over the full operating temperature range.*		5 milliseconds / minute	
1.10.2 **WHEN DOES OUTSTATION SET IIN1.4?**	☐ Never ☒ Asserted at startup until first Time Synchronization request received ☐ Periodically, range ____to____ seconds ☐ Periodically, selectable from ____,____,___ seconds ☒ Range _60_ to _65534_ seconds after last time sync ☐ Selectable from___,___,___seconds after last time sync ☐ When time error may have drifted by range ____to____ ms ☐ When time error may have drifted by selectable from ____,____,___	21600 seconds (6 hrs)	Front panel Keypad
1.10.3 **MAXIMUM INTERNAL TIME REFERENCE ERROR WHEN SET VIA DNP (MS):** *The difference between the time set in a DNP Write Time message, and the time actually set in the Outstation.*		50 milliseconds + LAN delay	
1.10.4 **MAXIMUM DELAY MEASUREMENT ERROR (MS):** *The difference between the time reported in the delay measurement response and the actual time between receipt of the delay measurement request and issuing the delay measurement reply.*		10 milliseconds	
1.10.5 **MAXIMUM RESPONSE TIME (MS):** *The amount of time an Outstation will take to respond upon receipt of a valid request. This does not include the message transmission time.*		20 milliseconds	

1.10 OUTSTATION PERFORMANCE	**Capabilities**	**Current Value**	**If configurable, list methods**
1.10.6 **MAXIMUM TIME FROM START-UP TO IIN 1.4 ASSERTION (MS):**		0 milliseconds	
1.10.7 **MAXIMUM EVENT TIME-TAG ERROR FOR LOCAL BINARY AND DOUBLE-BIT I/O (MS):** *The error between the time-tag reported and the absolute time of the physical event. This error includes the Internal Time Reference Error.*		2100 milliseconds	
1.10.8 **MAXIMUM EVENT TIME-TAG ERROR FOR LOCAL I/O OTHER THAN BINARY AND DOUBLE-BIT DATA TYPES (MS):**		2100 milliseconds	

1.11 INDIVIDUAL FIELD OUTSTATION PARAMETERS:	**Value of Current Setting**	**If configurable, list methods**
1.11.1 **USER-ASSIGNED LOCATION NAME OR CODE STRING (SAME AS G0V245):**		
1.11.2 **USER-ASSIGNED ID CODE/NUMBER STRING (SAME AS G0V246):**		
1.11.3 **USER-ASSIGNED NAME STRING FOR THE OUTSTATION (SAME AS G0V247):**		
1.11.4 **DEVICE SERIAL NUMBER STRING (SAME AS G0V248):**		

2 MAPPING TO IEC 61850 OBJECT MODELS

This optional section allows each configuration parameter or point in the DNP Data map to be tied to an attribute in the 61850 object models. The 61850 mappings are stored in the XML version of the Device Profile Document as a list of XPath references to the tags representing real-time data from DNP under each data point (for example value, timestamp, and quality for Analog inputs) paired with an IEC 61850 Object Reference in the form of a flattened ACSI (Abstract Communication Service Interface) name of the object and attributes as specified in IEC 61850 parts 7-4 and 7-3. The XPath reference into the DNP XML file may also contain a reference to a constant value, a formula or conditional expression involving one or more XML tags, or a reference to a configuration parameter that is not associated with a particular data point.

A graphical or table representation may be generated from the XML and shown here in the printed version of the Device Profile Document to give an idea of the Logical Devices, Logical Notes, and Attributes available via the DNP interface. The following is an example table format:

IEC 61850 Object	DNP3 XPATH Reference	Comments

3 CAPABILITIES AND CURRENT SETTINGS FOR DEVICE DATABASE (OUTSTATION ONLY)

The following tables identify the capabilities and current settings for each DNP3 data type. Each data type also provides a table defining the data points available in the device or a description of how this information can be obtained if the database is configurable. Tables for data types not supported may be deleted. Additional columns may be added to the point list table if necessary.

3.1 SINGLE-BIT BINARY INPUTS Static (Steady-State) Group Number: **1** Event Group Number: **2**	**Capabilities**	**Current Value**	**If configurable, list methods**
3.1.1 **STATIC VARIATION REPORTED WHEN VARIATION 0 REQUESTED:**	☒ Variation 1 – Single-bit Packed format ☒ Variation 2 – Single-bit with flag ☐ Based on point Index (add column to table below)	Variation #1	
3.1.2 **EVENT VARIATION REPORTED WHEN VARIATION 0 REQUESTED:**	☐ Variation 1 – without time ☒ Variation 2 – with absolute time ☐ Variation 3 – with relative time ☐ Based on point Index (add column to table below)		
3.1.3 **EVENT REPORTING MODE:** *When responding with event data and more than one event has occurred for a data point, an Outstation may include all events or only the most recent event. All events are typically reported for Binary Inputs.*	☐ Only most recent ☒ All events		
3.1.4 **BINARY INPUTS INCLUDED IN CLASS 0 RESPONSE:** *If Binary Inputs are not included in the Class 0 response, Binary Input Events (group 2) may not be reported.*	☒ Always ☐ Never ☐ Only if point is assigned to Class 1, 2, or 3 ☐ Based on point Index (add column to table below)		
3.1.5 **DEFINITION OF BINARY INPUT POINT LIST:** *List all addressable points. Points that do not exist (for example, because an option is not installed) shall be omitted from the table.*	☒ Fixed, list shown in table below ☐ Configurable(current list may be shown in table below) ☐ Other, explain_____		

Point Index	Name	Default Class Assigned to Events (1, 2, 3 or none)	Name for State when value is 0	Name for State when value is 1	Description
0	LVDC Alarm	1	Clear	Set	DC output voltage < user settable voltage if Set
1	HVDC Alarm	1	Clear	Set	DC output voltage > user settable voltage if Set
2	HVSD Alarm	1	Clear	Set	Charger is in High voltage shutdown mode if Set
3	NC Alarm	1	Clear	Set	DC amps < user settable minimum if Set
4	OC Alarm	1	Clear	Set	DC amps > user settable maximum if Set
5	GND+	1	Clear	Set	Positive ground fault detected if set
6	GND-	1	Clear	Set	Negative ground fault detected if set
7	ACF	1	Clear	Set	AC input failure detected if set
8	EQ	1	Clear	Set	Equalization in progress if set
9	VLVA	1	Clear	Set	Very low voltage detected if set
10	HBTA	1	Clear	Set	High battery temperature detected if set
11	RECTF	1	Clear	Set	Rectifier failure detected if set
12	SUMM	1	Clear	Set	Summary alarm condition detected if set
13	Remote Equalize	1	Clear	Set	Local interface board input forcing equalization mode

3.2 DOUBLE-BIT INPUT POINTS Static (Steady-State) Group Number: **3** Event Group Number: **4**	**Capabilities**	**Current Value**	**If configurable, list methods**
3.2.1 **STATIC VARIATION REPORTED WHEN VARIATION 0 REQUESTED:**	☐ Variation 1 – Double-bit Packed format ☐ Variation 2 – Double-bit with flag ☐ Based on point Index (add column to table below)		
3.2.2 **EVENT VARIATION REPORTED WHEN VARIATION 0 REQUESTED:**	☐ Variation 1 – without time ☐ Variation 2 – with absolute time ☐ Variation 3 – with relative time ☐ Based on point Index (add column to table below)		
3.2.3 **EVENT REPORTING MODE:** *When responding with event data and more than one event has occurred for a data point, an Outstation may include all events or only the most recent event. All events are typically reported for Double-bit Inputs.*	☐ Only most recent ☐ All events		
3.2.4 **DOUBLE-BIT INPUTS INCLUDED IN CLASS 0 RESPONSE:** *If Double-bit Inputs are not included in the Class 0 response, Double-bit Input Events (group 4) may not be reported.*	☐ Always ☐ Never ☐ Only if point is assigned to Class 1, 2, or 3 ☐ Based on point Index (add column to table below)		
3.2.5 **DEFINITION OF DOUBLE-BIT INPUT POINT LIST:** *List all addressable points. Points that do not exist (for example, because an option is not installed) shall be omitted from the table.*	☐ Fixed, list shown in table below ☐ Configurable(current list may be shown in table below) ☐ Other, explain_____		

Point Index	Name	Default Class Assigned to Events (1, 2, 3 or none)	Name for State when value is 0 (Intermediate)	Name for State when value is 1 (Off)	Name for State when value is 2 (On)	Name for State when value is 3 (Indeterminate)	Description
0							
1							
2							
: :	Add more rows as necessary						

3.3 BINARY OUTPUT STATUS AND CONTROL RELAY OUTPUT BLOCK Binary Output Status Group Number: **10** Binary Output Event Group Number: **11** CROB Group Number: **12** Binary Output Command Event Object Num: **13**	**Capabilities**	**Current Value**	**If configurable, list methods**
3.3.1 **MINIMUM PULSE TIME ALLOWED WITH TRIP, CLOSE, AND PULSE ON COMMANDS:**	☐ Fixed at _____ms (hardware may limit this further) ☐ Based on point Index (add column to table below)		
3.3.2 **MAXIMUM PULSE TIME ALLOWED WITH TRIP, CLOSE, AND PULSE ON COMMANDS:**	☐ Fixed at _____ms (hardware may limit this further) ☐ Based on point Index (add column to table below)		
3.3.3 **BINARY OUTPUT STATUS INCLUDED IN CLASS 0 RESPONSE:** *If Binary Output Status points are not included in the Class 0 response, Binary Output Status Events (group 11) may not be reported.*	☒ Always ☐ Never ☐ Only if point is assigned to Class 1, 2, or 3 ☐ Based on point Index (add column to table below)		
3.3.4 **REPORTS OUTPUT COMMAND EVENT OBJECTS:**	☒ Never ☐ Only upon a successful Control ☐ Upon all control attempts		
3.3.5 **EVENT VARIATION REPORTED WHEN VARIATION 0 REQUESTED:**	☐ Variation 1 – without time ☐ Variation 2 – with absolute time ☐ Based on point Index (add column to table below)		
3.3.6 **COMMAND EVENT VARIATION REPORTED WHEN VARIATION 0 REQUESTED:**	☐ Variation 1 – without time ☐ Variation 2 – with absolute time ☐ Based on point Index (add column to table below)		
3.3.7 **EVENT REPORTING MODE:** *When responding with event data and more than one event has occurred for a data point, an Outstation may include all events or only the most recent event.*	☐ Only most recent ☐ All events		

3.3.8 **COMMAND EVENT REPORT MODE:** When responding with event data and more than one event has occurred for a data point, an Outstation may include all events or only the most recent event.	☐ Only most recent ☐ All events		
3.3.9 **MAXIMUM TIME BETWEEN SELECT AND OPERATE:**	☐ Not Applicable ☒ Fixed at __4__ seconds ☐ Configurable, range _____ to _____ seconds ☐ Configurable, selectable from___,___,___seconds ☐ Configurable, other, describe_____ ☐ Variable, explain _____ ☐ Based on point Index (add column to table below)		
3.3.10 **DEFINITION OF BINARY OUTPUT STATUS/CONTROL RELAY OUTPUT BLOCK (CROB) POINT LIST:** *List all addressable points. Points that do not exist (for example, because an option is not installed) shall be omitted from the table.*	☒ Fixed, list shown in table below ☐ Configurable(current list may be shown in table below) ☐ Other, explain_____		

Point Index	Name	Supported Control Operations											Name for State when value is 0	Name for State when value is 1	Default Class Assigned to Events (1, 2, 3 or none)		Description
		Select/Operate	Direct Operate	Direct Operate – No Ack	Pulse On	Pulse Off	Latch On	Latch Off	Trip	Close	Count > 1	Cancel Currently Running Operation			Change	Command	
0	LVDC Alarm	✓	✓	✓			✓	✓					Enabled	Disabled	none	none	Enable for LVDC Alarm
1	HVDC Alarm	✓	✓	✓			✓	✓					Enabled	Disabled	none	none	Enable for HVDC Alarm
2	HVSD Alarm	✓	✓	✓			✓	✓					Enabled	Disabled	none	none	Enable for HVSD Alarm
3	NC Alarm	✓	✓	✓			✓	✓					Enabled	Disabled	none	none	Enable for NC Alarm
4	OC Alarm	✓	✓	✓			✓	✓					Enabled	Disabled	none	none	Enable for OC Alarm
5	GND+/-	✓	✓	✓			✓	✓					Enabled	Disabled	none	none	Enable for GND+/- Fault Alarm
6	ACF	✓	✓	✓			✓	✓					Enabled	Disabled	none	none	Enable for ACF Alarm
7	EQ	✓	✓	✓			✓	✓					Enabled	Disabled	none	none	Enable for EQ Alarm
8	VLVA	✓	✓	✓			✓	✓					Enabled	Disabled	none	none	Enable for VLV Alarm
9	HBTA	✓	✓	✓			✓	✓					Enabled	Disabled	none	none	Enable for HBT alarm output
10	RECTF	✓	✓	✓			✓	✓					Enabled	Disabled	none	none	Enable for RECTF Alarm
11	SUM LVDC	✓	✓	✓			✓	✓					Enabled	Disabled	none	none	Enable LVDC alarm for summary alarm output
12	SUM HVDC	✓	✓	✓			✓	✓					Enabled	Disabled	none	none	Enable HVDC alarm for summary alarm output
13	SUM HVSD	✓	✓	✓			✓	✓					Enabled	Disabled	none	none	Enable HVSD alarm for summary alarm output
14	SUM NC	✓	✓	✓			✓	✓					Enabled	Disabled	none	none	Enable NC alarm for summary alarm output
15	SUM OC	✓	✓	✓			✓	✓					Enabled	Disabled	none	none	Enable OC alarm for summary alarm output
16	SUM GND+/-	✓	✓	✓			✓	✓					Enabled	Disabled	none	none	Enable GND+/- Fault alarm for summary alarm output
17	SUM ACF	✓	✓	✓			✓	✓					Enabled	Disabled	none	none	Enable ACF alarm for summary alarm output
18	SUM EQ	✓	✓	✓			✓	✓					Enabled	Disabled	none	none	Enable EQ alarm for summary alarm output
19	SUM VLVA	✓	✓	✓			✓	✓					Enabled	Disabled	none	none	Enable VLV alarm for summary alarm output
20	SUM HBTA	✓	✓	✓			✓	✓					Enabled	Disabled	none	none	Enable high battery temperature for summary alarm output
21	SUM RECTF	✓	✓	✓			✓	✓					Enabled	Disabled	none	none	Enable RECTF alarm for summary alarm output
22	TCO Enable	✓	✓	✓			✓	✓					Enabled	Disabled	none	none	Enable battery temperature based output voltage adjustment

3.4 COUNTERS/FROZEN COUNTERS Static Counter Group Number: **20** Static Frozen Counter Group Number: **21** Counter Event Group Number: **22** Frozen Counter Event Group Number: **23**	**Capabilities**	**Current Value**	**If configurable, list methods**
3.4.1 **STATIC COUNTER VARIATION REPORTED WHEN VARIATION 0 REQUESTED:**	☐ Variation 1 – 32-bit with flag ☐ Variation 2 – 16-bit with flag ☐ Variation 5 – 32-bit without flag ☐ Variation 6 – 16-bit without flag ☐ Based on point Index (add column to table below)		
3.4.2 **COUNTER EVENT VARIATION REPORTED WHEN VARIATION 0 REQUESTED:**	☐ Variation 1 – 32-bit with flag ☐ Variation 2 – 16-bit with flag ☐ Variation 5 – 32-bit with flag and time ☐ Variation 6 – 16-bit with flag and time ☐ Based on point Index (add column to table below)		
3.4.3 **COUNTERS INCLUDED IN CLASS 0 RESPONSE:** *If Counters are not included in the Class 0 response, Counter Events (group 22) may not be reported.*	☐ Always ☐ Never ☐ Only if point is assigned to Class 1, 2, or 3 ☐ Based on point Index (add column to table below)		
3.4.4 **COUNTER EVENT REPORTING MODE:** *When responding with event data and more than one event has occurred for a data point, an Outstation may include all events or only the most recent event. All events are typically reported for Counters.*	☐ Only most recent ☐ All events		
3.4.5 **STATIC FROZEN COUNTER VARIATION REPORTED WHEN VARIATION 0 REQUESTED:**	☐ Variation 1 – 32-bit with flag ☐ Variation 2 – 16-bit with flag ☐ Variation 5 – 32-bit with flag and time ☐ Variation 6 – 16-bit with flag and time ☐ Variation 9 – 32-bit without flag ☐ Variation 10 – 16-bit without flag ☐ Based on point Index (add column to table below)		

3.4 COUNTERS/FROZEN COUNTERS Static Counter Group Number: **20** Static Frozen Counter Group Number: **21** Counter Event Group Number: **22** Frozen Counter Event Group Number: **23**	**Capabilities**	**Current Value**	**If configurable, list methods**
3.4.6 **FROZEN COUNTER EVENT VARIATION REPORTED WHEN VARIATION 0 REQUESTED:**	☐ Variation 1 – 32-bit with flag ☐ Variation 2 – 16-bit with flag ☐ Variation 5 – 32-bit with flag and time ☐ Variation 6 – 16-bit with flag and time ☐ Based on point Index (add column to table below)		
3.4.7 **FROZEN COUNTERS INCLUDED IN CLASS 0 RESPONSE:** *If Frozen Counters are not included in the Class 0 response, Frozen Counter Events (group 23) may not be reported.*	☐ Always ☐ Never ☐ Only if point is assigned to Class 1, 2, or 3 ☐ Based on point Index (add column to table below)		
3.4.8 **FROZEN COUNTER EVENT REPORTING MODE:** *When responding with event data and more than one event has occurred for a data point, an Outstation may include all events or only the most recent event. All events are typically reported for Frozen Counters.*	☐ Only most recent ☐ All events		
3.4.9 **COUNTERS ROLL OVER AT:**	☐ 16 Bits (65,535) ☐ 32 Bits (4,294,967,295) ☐ Other Fixed Value _____ ☐ Configurable; range _____ to_____ ☐ Configurable, selectable from ___,___,___ ☐ Configurable, other, describe_____ ☐ Based on point Index (add column to table below)		
3.4.10 **COUNTERS FROZEN BY MEANS OF:**	☐ Master Request ☐ Freezes itself without concern for time of day ☐ Freezes itself and requires time of day ☐ Other, explain _____		

3.4 COUNTERS/FROZEN COUNTERS Static Counter Group Number: **20** Static Frozen Counter Group Number: **21** Counter Event Group Number: **22** Frozen Counter Event Group Number: **23**	**Capabilities**	**Current Value**	**If configurable, list methods**
3.4.11 **DEFINITION OF COUNTER/FROZEN COUNTER POINT LIST:** *List all addressable points. Points that do not exist (for example, because an option is not installed) shall be omitted from the table.*	☐ Fixed, list shown in table below ☐ Configurable(current list may be shown in table below) ☐ Other, explain_____		

Point Index	Name	Default Class Assigned to Counter Events (1, 2, 3 or none)	Frozen Counter Exists (Yes or No)	Default Class Assigned to Frozen Counter Events (1, 2, 3 or none)	Description
0					
1					
2					
: :	Add more rows as necessary				

3.5 ANALOG INPUT POINTS Static (Steady-State) Group Number: **30** Event Group Number: **32**	**Capabilities**	**Current Value**	**If configurable, list methods**
3.5.1 **STATIC VARIATION REPORTED WHEN VARIATION 0 REQUESTED:**	☒ Variation 1 – 32-bit with flag ☒ Variation 2 – 16-bit with flag ☒ Variation 3 – 32-bit without flag ☒ Variation 4 – 16-bit without flag ☒ Variation 5 – single-precision floating point with flag ☐ Variation 6 – double-precision floating point with flag ☐ Based on point Index (add column to table below)	2	
3.5.2 **EVENT VARIATION REPORTED WHEN VARIATION 0 REQUESTED:**	☒ Variation 1 – 32-bit without time ☒ Variation 2 – 16-bit without time ☒ Variation 3 – 32-bit with time ☒ Variation 4 – 16-bit with time ☒ Variation 5 – single-precision floating point w/o time ☐ Variation 6 – double-precision floating point w/o time ☒ Variation 7 – single-precision floating point with time ☐ Variation 8 – double-precision floating point with time ☐ Based on point Index (add column to table below)	2	
3.5.3 **EVENT REPORTING MODE:** *When responding with event data and more than one event has occurred for a data point, an Outstation may include all events or only the most recent event. Only the most recent event is typically reported for Analog Inputs.*	☒ Only most recent ☐ All events		
3.5.4 **ANALOG INPUTS INCLUDED IN CLASS 0 RESPONSE:** *If Analog Inputs are not included in the Class 0 response, Analog Input Events (group 32) may not be reported.*	☒ Always ☐ Never ☐ Only if point is assigned to Class 1, 2, or 3 ☐ Based on point Index (add column to table below)		
3.5.5 **HOW DEADBANDS ARE SET:**	☒ A. Global Fixed ☐ B. Configurable through DNP ☐ C. Configurable via other means ☐ D. Other, explain _____ ☐ Based on point Index - column specifies which of the options applies, B, C, or D	Points 0-2, 8-16 = 0.15V Points 5,6 = 1.0V Points 3,4 = 0.0V Point 7 = .10V	

3.5 ANALOG INPUT POINTS Static (Steady-State) Group Number: **30** Event Group Number: **32**	**Capabilities**	**Current Value**	**If configurable, list methods**
3.5.6 **ANALOG DEADBAND ALGORITHM:** *simple - just compares the difference from the previous reported value* *integrating - keeps track of the accumulated change* *other - indicating another algorithm*	☒ Simple ☐ Integrating ☐ Other, explain _____		
3.5.7 **DEFINITION OF ANALOG INPUT POINT LIST:** *List all addressable points. Points that do not exist (for example, because an option is not installed) shall be omitted from the table.*	☒ Fixed, list shown in table below ☐ Configurable(current list may be shown in table below) ☐ Other, explain_____		

Point Index	Name	Default Class Assigned to Events (1, 2, 3 or none)	Transmitted Value[1]		Scaling[2]		Units	Resolution[3]	Description
			Minimum	Maximum	Multiplier	Offset			
0	DC Volts External	1	0 / 0.0	16383 / 163.83	0.01	0.0	Volts	.01	Output voltage of the charger as measured on output of charger.
1	DC Volts Internal	1	0 / 0.0	16383 / 163.83	0.01	0.0	Volts	.01	Output voltage of the charger as measured before the DC breaker.
2	DC Amps	1	0 / 0.0	14745 / 147.45	0.01	0.0	Amps	.01	DC Ampere output of charger
3	Voltage Rating	1	2400 / 24.0	13000 / 130.0	0.01	0.0	Volts	1.0	Charger Output voltage rating (depends on model)
4	Ampere Rating	1	600 / 6.0	10000 / 100.0	0.01	0.0	Amps	1.0	Charger Output Ampere rating (depends on model)

[1] The minimum and maximum transmitted values are the lowest and highest values that the outstation will report in DNP analog input objects. These values are integers if the outstation transmits only integers. If the outstation is capable of transmitting both integers and floating-point, then integer and floating-point values are required for the minimums and maximums.

For example, a pressure sensor is able to measure 0 to 500 kPa. The outstation provides a linear conversion of the sensor's output signal to integers in the range of 0 to 25000 or floating-point values of 0 to 500.000. The sensor and outstation are used in an application where the maximum possible pressure is 380 kPa. For this input, the minimum transmitted value would be stated as 0 / 0.0 and the maximum transmitted value would be stated as 19000 / 380.000.

*[2] The scaling information for each point specifies how data transmitted in integer variations (16 bit and 32 bit) is converted to engineering units when received by the Master (i.e. scaled according to the equation: scaled value = multiplier * raw + offset). Scaling is not applied to Floating point variations since they are already transmitted in engineering units.*

[3] Resolution is the smallest change that may be detected in the value due to quantization errors and is given in the units shown in the previous column. This parameter does not represent the accuracy of the measurement.

Point Index	Name	Default Class Assigned to Events (1, 2, 3 or none)	Transmitted Value[1]		Scaling[2]		Units	Resolution[3]	Description
			Minimum	Maximum	Multiplier	Offset			
5	Battery Temperature	1	-1500 / -15.0	14900 / 149.00	0.01	0.0	Celsius	0.014	Temperature of the battery as measured using an external temperature sensor.
6	Control Board Temperature	1	-500 / -5.00	10000 / 100.00	0.01	0.0	Celsius	.01	Temperature of the Charger Control board
7	TC Voltage Offset	1	-900 / -9.00	1500 / 15.00	0.01	0.0	Volts	.01	Temperature Compensation Voltage used to adjust battery voltage based on battery temperature.
8	Over current Voltage Offset	1	0 / 0.0	16383 / 163.83	0.01	0.0	Volts	.01	Voltage offset controller is using to reduce output amps to < current limit
9	Load Share Voltage Offset	1	0 / 0.0	195 / 1.95	0.01	0.0	Volts	.01	Load Sharing offset (compensation) voltage
10	Manual Equalize Time Remaining	1	0 / 0.0	32767 / 32767.0	1.0	0	Minutes	1	Time left for manual equalization mode.
11	AC Fail EQ Time	1	0 / 0.0	32767 / 32767.0	1.0	0	Minutes	1	Time left for AC Failure equalization mode.
12	Periodic EQ Time	1	0 / 0.0	32767 / 32767.0	1.0	0	Minutes	1	Time left for Periodic equalization mode.
13	Charger Mode	1	0 / 0.0	400 / 4.0	0.01	0	N/A	1	The charger's mode
14	Number of Cells	1	0 / 0.0	60 / 60.0	1.0	0.0	N/A	1.0	Number of cells that make up the battery string.
15	Control Board Revision	1	0 / 0.0	32767 / 327.67	0.01	0.0	N/A	N/A	Software Version of charger control board
16	DNP3 Board Software Revision	None	0 / 0.0	32767 / 327.67	0.01	0.0	N/A	N/A	Revision of DNP3 Communication board Software
17	DNP3 Level	None	0 / 0.0	2 / 2.0	1.00	0.0	N/A	N/A	Level of DNP3 compliance as per Interoperability Specification

3.6 ANALOG OUTPUT STATUS AND ANALOG OUTPUT CONTROL BLOCK Analog Output Status Group Number: **40** Analog Output Control Block Group Number: **41** Analogue Output Event Group Number: **42** Analogue Output Command Event Group Number: **43**	**Capabilities**	**Current Value**	**If configurable, list methods**
3.6.1 **STATIC ANALOG OUTPUT STATUS VARIATION REPORTED WHEN VARIATION 0 REQUESTED:**	☒ Variation 1 – 32-bit with flag ☒ Variation 2 – 16-bit with flag ☒ Variation 3 – single-precision floating point with flag ☐ Variation 4 – double-precision floating point with flag ☐ Based on point Index (add column to table below)	2	
3.6.2 **ANALOG OUTPUT STATUS INCLUDED IN CLASS 0 RESPONSE:** *If Analog Output Status points are not included in the Class 0 response, Analog Output Events (group 42) may not be reported.*	☒ Always ☐ Never ☐ Only if point is assigned to Class 1, 2, or 3 ☐ Based on point Index (add column to table below)		
3.6.3 **REPORTS OUTPUT COMMAND EVENT OBJECTS:**	☒ Never ☐ Only upon a successful Control ☐ Upon all control attempts		
3.6.4 **EVENT VARIATION REPORTED WHEN VARIATION 0 REQUESTED:**	☐ Variation 1 – 32-bit without time ☐ Variation 2 – 16-bit without time ☐ Variation 3 – 32-bit with time ☐ Variation 4 – 16-bit with time ☐ Variation 5 – single-precision floating point w/o time ☐ Variation 6 – double-precision floating point w/o time ☐ Variation 7 – single-precision floating point with time ☐ Variation 8 – double-precision floating point with time ☐ Based on point Index (add column to table below)	Not supported	

3.6 ANALOG OUTPUT STATUS AND ANALOG OUTPUT CONTROL BLOCK Analog Output Status Group Number: **40** Analog Output Control Block Group Number: **41** Analogue Output Event Group Number: **42** Analogue Output Command Event Group Number: **43**	**Capabilities**	**Current Value**	**If configurable, list methods**
3.6.5 **COMMAND EVENT VARIATION REPORTED WHEN VARIATION 0 REQUESTED:**	☐ Variation 1 – 32-bit without time ☐ Variation 2 – 16-bit without time ☐ Variation 3 – 32-bit with time ☐ Variation 4 – 16-bit with time ☐ Variation 5 – single-precision floating point w/o time ☐ Variation 6 – double-precision floating point w/o time ☐ Variation 7 – single-precision floating point with time ☐ Variation 8 – double-precision floating point with time ☐ Based on point Index (add column to table below)	Not supported	
3.6.6 **EVENT REPORTING MODE:** *When responding with event data and more than one event has occurred for a data point, an Outstation may include all events or only the most recent event.*	☐ Only most recent ☐ All events	Not supported	
3.6.7 **COMMAND EVENT REPORTING MODE:** *When responding with event data and more than one event has occurred for a data point, an Outstation may include all events or only the most recent event.*	☐ Only most recent ☐ All events	Not supported	
3.6.8 **MAXIMUM TIME BETWEEN SELECT AND OPERATE:**	☐ Not Applicable ☒ Fixed at _4___ seconds ☐ Configurable, range _____ to _____ seconds ☐ Configurable, selectable from___,___,___seconds ☐ Configurable, other, describe_____ ☐ Variable, explain _____ ☐ Based on point Index (add column to table below)		

3.6 ANALOG OUTPUT STATUS AND ANALOG OUTPUT CONTROL BLOCK Analog Output Status Group Number: **40** Analog Output Control Block Group Number: **41** Analogue Output Event Group Number: **42** Analogue Output Command Event Group Number: **43**	**Capabilities**	**Current Value**	**If configurable, list methods**
3.6.9 **DEFINITION OF ANALOG OUTPUT STATUS/ANALOG OUTPUT CONTROL BLOCK POINT LIST:** *List all addressable points. Points that do not exist (for example, because an option is not installed) shall be omitted from the table.*	☒ Fixed, list shown in table below ☐ Configurable(current list may be shown in table below) ☐ Other, explain_____		

Point Index	Name	Supported Control Operations			Transmitted Value		Scaling[4]		Units	Resolution[5]	Default Event Assigned Class (1, 2, 3 or none)		Description
		Select/Operate	Direct Operate	Direct Operate – No ACK	Minimum	Maximum	Multiplier	Offset			Change	Com-mand	
0	Float Voltage Set point	✓	✓	✓	0 / 0.0	16383 / 163.83	.01	0.0	Volts	.01	none	none	Desired Float Voltage output
1	Equalize Voltage Set point	✓	✓	✓	0 / 0.0	16383 / 163.83	.01	0.0	Volts	.01	none	none	Desired Equalization Voltage output
2	Current Limit Set Point	✓	✓	✓	480 / 4.80	11000 / 110.00	.01	0.0	Amperes	.01	none	none	Desired Current limit on output 80% -> 100% of rated amp output
3	No Charge Alarm Set Point	✓	✓	✓	0 / 0.0	500 / 5.00	.01	0.0	Amperes	.01	none	none	The No Charge Alarm triggers below this set point.
4	Manual Equalization Time Remaining	✓	✓	✓	0 / 0.0	15420 / 15420.0	1.0	0.0	Minutes	1	none	none	Manual Equalization time remaining in minutes.
5	HVDC set point	✓	✓	✓	0 / 0.0	16383 / 163.83	.01	0.0	Volts	.01	none	none	Desired Voltage output over which will activate the High voltage alarm
6	HVSD set point	✓	✓	✓	0 / 0.0	16383 / 163.83	.01	0.0	Volts	.01	none	none	Desired Voltage output over which will activate the High voltage shutdown alarm as well as trip AC input breaker.
7	LVDC set point	✓	✓	✓	0 / 0.0	16383 / 163.83	.01	0.0	Volts	.01	none	none	Desired Voltage output under which will activate the Low voltage alarm
8	Ground Fault Set Point	✓	✓	✓	0 / 0.0	20000 / 20000.0	1.0	0.0	Ohms	1	none	none	A ground fault will occur if a resistance < this set point is found between ground and either of the +/- terminals
8	VLVA set point	✓	✓	✓	18 / 18.0	26.4 / 26.4	1.0	0.0	Volts	1	none	none	Desired Voltage output under which will activate the Very Low voltage alarm
8	High Battery temp	✓	✓	✓	0 / 0.0	200 / 200.0	1.0	0.0	°C	1	none	none	Desired Battery temp over which will activate the Battery High temp alarm
9	Temp Comp	✓	✓	✓	-1000 / -10.0	-10 / -0.10	.01	0.0	mV /cell /°C	.1	none	none	Temperature Compensation in mV per cell per degree Celsius

*[4] The scaling information for each point specifies how data transmitted in integer variations (16 bit and 32 bit) is converted to engineering units when received by the Master (i.e. scaled according to the equation: scaled value = multiplier * raw + offset). Scaling is not applied to Floating point variations since they are already transmitted in engineering units.*

[5] Resolution is the smallest change that may be detected in the value due to quantization errors and is given in the units shown in the previous column. This parameter does not represent the accuracy of the measurement.

3.7 SEQUENTIAL FILE TRANSFER Group Number: 70	**Capabilities**	**Current Value**	**If configurable, list methods**
3.7.1 **FILE TRANSFER SUPPORTED:**	☐ Yes ☒ No (do not complete any further entries in section 3.7)		
3.7.2 **FILE AUTHENTICATION:** *Indicates whether a valid authentication key must be obtained prior to open and delete requests.*	☐ Always ☐ Sometimes, explain _____ ☐ Never		
3.7.3 **FILE APPEND MODE:** *Indicates if a file can be opened and appended to versus just overwritten.*	☐ Always ☐ Sometimes, explain _____ ☐ Never		
3.7.4 **PERMISSIONS SUPPORT:** *Indicates the device is capable of using the indicated permissions.*	☐ Owner Read Allowed: 0x0100 ☐ Owner Write Allowed: 0x0080 ☐ Owner Execute Allowed: 0x0040 ☐ Group Read Allowed: 0x0020 ☐ Group Write Allowed: 0x0010 ☐ Group Execute Allowed: 0x0008 ☐ World Read Allowed: 0x0004 ☐ World Write Allowed: 0x0002 ☐ World Execute Allowed: 0x0001		
3.7.5 **MULTIPLE BLOCKS IN A FRAGMENT:** *File data is transferred in a series of blocks of a maximum specified size. This indicates whether only a single block or multiple blocks will be sent in fragment.*	☐ Yes ☐ No		
3.7.6 **MAX NUMBER OF FILES OPEN AT ONE TIME:**	☐ Fixed at _____(enter 0 if files are not supported) ☐ Configurable, range _____ to _____ ☐ Configurable, selectable from ____,____,____ ☐ Configurable, other, describe_____		
3.7.7 **DEFINITION OF FILE NAMES THAT MAY BE READ OR WRITTEN:**	☐ Fixed, list shown in table below ☐ Configurable(current list may be shown in table below) ☐ Other, explain_____		

File Name	Default Class Assigned to Events (1, 2, 3 or none)	Authentication Required for:			Description
		Read	Write	Delete	
Add more rows as necessary					

3.8 OCTET STRING POINTS Static (Steady-State) Group Number: **110** Event Group Number: **111**	**Capabilities**	**Current Value**	**If configurable, list methods**
3.8.1 **EVENT REPORTING MODE:** *When responding with event data and more than one event has occurred for a data point, an Outstation may include all events or only the most recent event.*	☐ Only most recent ☐ All events		
3.8.2 **OCTET STRINGS INCLUDED IN CLASS 0 RESPONSE:** *If Octet Strings are not included in the Class 0 response, Octet String Events (group 111) may not be reported.*	☐ Always ☒ Never ☐ Only if point is assigned to Class 1, 2, or 3 ☐ Based on point Index (add column to table below)		
3.8.3 **DEFINITION OF OCTET STRING POINT LIST:** *List all addressable points. Points that do not exist (for example, because an option is not installed) shall be omitted from the table.*	☐ Fixed, list shown in table below ☐ Configurable(current list may be shown in table below) ☐ Other, explain_____		

Point Index	Name	Default Class Assigned to Events (1, 2, 3 or none)	Description
0			
1			
2			
: :	Add more rows as necessary		

3.9 VIRTUAL TERMINAL PORT NUMBERS (POINTS) Static (Steady-State) Group Number: **112** Event Group Number: **113**	**Capabilities**	**Current Value**	**If configurable, list methods**
3.9.1 **DEFINITION OF VIRTUAL TERMINAL PORT NUMBERS:** *List all addressable points. Points that do not exist (for example, because an option is not installed) shall be omitted from the table.*	☐ Fixed, list shown in table below ☐ Configurable(current list may be shown in table below) ☐ Other, explain_____	Not supported	

Virtual Port Number (Point Index)	Name	Default Class Assigned to Events (1, 2, 3 or none)	Description
0			
1			
2			
: :	Add more rows as necessary		

3.10 DATA SET PROTOTYPE Group Number: **85** Variation Number: **1** Duplicate this table for each Data Set Prototype defined	**Capabilities**	**Current Value**	**If configurable, list methods**
3.10.1 **DEFINITION OF DATA SET PROTOTYPES:**	☐ Fixed, a Data Set Prototype is shown in table below ☐ Configurable, list methods:_____ (a currently defined Data Set Prototype may be shown in table below) ☐ Other, explain_____	Not supported	
3.10.2 **DESCRIPTION:**	_____ _____		

Element Number	Descriptor Code (check one)							Element Description	Data Type Code (check one)									Maximum Data Length	Ancillary Value: ID= Identifier number UUID= UUID value NSPC= Prototype namespace NAME= Prototype name DAEL= Data element name CTLS= Control status name CTLV= Control value name
	ID	UUID	NSPC	NAME	DAEL	CTLS	CTLV		NONE	VSTR	UINT	INT	FLT	OSTR	BSTR	TIME	UNCD		
0	X							Mandatory DNP identifier			X								
1		X						UUID assigned to prototype						X					
2																			
:								Add more rows as necessary											

3.11 DATA SET DESCRIPTOR CONTENTS AND CHARACTERISTICS Group Number: **86** Variation Number: **1** Duplicate this table for each Data Set Descriptor defined	**Capabilities**	**Current Value**	**If configurable, list methods**
3.11.1 **DEFINITION OF DATA SET DESCRIPTORS:**	☐ Fixed, a Data Set Descriptor is shown in table below ☐ Configurable(current list may be shown in table below) ☐ Other, explain_____	Not supported	
3.11.2 **DESCRIPTION:**	_____ _____		
3.11.3 **DATA SET PROPERTIES:**	☐ Readable ☐ Writable ☐ Outstation maintains a static data set ☐ Outstation generates a data set event ☐ Data set defined by master	Not supported	
3.11.4 **DEFAULT EVENT ASSIGNED CLASS:**	☐ Class 1 ☐ Class 2 ☐ Class 3	Not supported	
3.11.5 **STATIC DATA SET INCLUDED IN CLASS 0 RESPONSE:**	☐ Always ☐ Never ☐ Only if point is assigned to Class 1, 2, or 3	Not supported	

Element Number	Descriptor Code (check one)						Element Description	Data Type Code (check one)									Maximum Data Length	Ancillary Value: ID= Identifier number NAME= Prototype name DAEL= Data element name CTLS= Control status name CTLV= Control value name PTYP= UUID and name of elements
	ID	NAME	DAEL	CTLS	CTLV	PTYP		NONE	VSTR	UINT	INT	FLT	OSTR	BSTR	TIME	UNCD		
0	X						Mandatory DNP identifier			X								
1																		
2																		
:							Add more rows as necessary											

3.12 DATA SET DESCRIPTOR – POINT INDEX ATTRIBUTES

Group Number: **86**
Variation Number: **3**

The following table is optional and correlates data set elements to point indexes of standard DNP3 Data Objects. The element number below refers to the position in the present value (object 87) or event (object 88) data set and will not match the element number in the data set descriptor or data set prototype tables above.

Duplicate this table for each Data Set Descriptor defined

Element Number	Link to Standard Data Point	
	Group Number	Point Index
0		
1		
2		
: :	Add more rows as necessary	

4 IMPLEMENTATION TABLE

The following implementation table identifies which object groups and variations, function codes and qualifiers the device supports in both requests and responses. The *Request* columns identify all requests that may be sent by a Master, or all requests that must be parsed by an Outstation. The *Response* columns identify all responses that must be parsed by a Master, or all responses that may be sent by an Outstation.

NOTE	The implementation table must list all functionality required by the device whether Master or Outstation as defined within the DNP3 IED Conformance Test Procedures. Any functionality beyond the highest subset level supported is indicated by highlighted rows. Any Object Groups not provided by an outstation or not processed by a Master are indicated by ~~strikethrough~~ (note these Object Groups will still be parsed).

4.1 LEVEL 2 DNP3 IMPLEMENTATION (DNP3-L2)

This section describes the second smallest subset of the DNP3 Application Layer. This implementation level is called Level 2 (L2).

4.1.1 Intended Use

This level contains a few more features than the Level 1 implementation. It is intended for communications between a master station or data concentrator and a device that could be called either a large Intelligent Electronic Device (IED) or a small Remote Terminal Unit (RTU). Typically, the input and output points of such a device would be local to the device.

4.1.2 General Description

A Level 2 Outstation implementation is the same as a Level 1 Outstation implementation with the following additions:

- A Level 2 Outstation accepts FREEZE requests on Binary Counter objects (not Analog Input objects or Frozen Counters). See *Freeze Operations in appendix*.
- A Level 2 Outstation parses READ requests for variation 0 of specific objects.
- A Level 2 Outstation parses READ requests for variations 1, 2 and 3 of Binary Input Change objects.
- A Level 2 Outstation parses READ requests for Frozen Counter objects and may report Frozen Counter objects (but not Frozen Delta Counters)

4.1.3 Implementation Table

The following Table describes the objects, function codes, and qualifiers used in a Level 2 DNP3 implementation.

DNP Object Group & Variation			**Request** Master may issue outstation must parse		**RESPONSE** Master must parse Outstation may issue	
Group Num	**Var Num**	**Description**	**Function Codes (dec)**	**Qualifier Codes (hex)**	**Function Codes (dec)**	**Qualifier Codes (hex)**
1	0	Binary Input – Any Variation	1 (read)	06 (no range, or all)		
1	1*	Binary Input – Packed format			129 (response)	00, 01 (start-stop)
1	2	Binary Input – With flags			129 (response)	00, 01 (start-stop)
2	0	Binary Input Event – Any Variation	1 (read)	06 (no range, or all) 07, 08 (limited qty)		

2	1	Binary Input Event – Without time		06 (no range, or all) 07 08 (limited qty)	129 (response) 130 (unsol.resp)	17, 28 (index)
2	2*	Binary Input Event – With absolute time		06 (no range, or all) 07 08 (limited qty)	129 (response) 130 (unsol.resp)	17, 28 (index)
2	3	Binary Input Event – With relative time		06 (no range, or all) 07 08 (limited qty)	129 (response) 130 (unsol.resp)	17, 28 (index)
10	0	Binary Output – Any Variation	1 (read)	06 (no range, or all)		
10	2*	Binary Output – Output status with flags			129 (response)	00, 01 (start-stop)
12	1	Binary Command – Control relay output block (CROB)	3 (select) 4 (operate) 5 (direct op) 6 (dir. op, no ack)	17, 28 (index)	129 (response)	echo of request
~~20~~	~~0~~	~~Counter – Any Variation~~	~~1 (read) 7 (freeze) 8 (freeze noack) 9 (freeze clear) 10(frz. cl. noack)~~	~~06 (no range, or all)~~	-	-
~~20~~	~~1~~	~~Counter – 32-bit with flag~~	-	-	~~129 (response)~~	~~00, 01 (start-stop)~~
~~20~~	~~2~~	~~Counter – 16-bit with flag~~	-	-	~~129 (response)~~	~~00, 01 (start-stop)~~
~~20~~	~~5~~	~~Counter – 32-bit without flag~~	-	-	~~129 (response)~~	~~00, 01 (start-stop)~~
~~20~~	~~6~~	~~Counter – 16-bit without flag~~	-	-	~~129 (response)~~	~~00, 01 (start-stop)~~
~~21~~	~~0~~	~~Frozen Counter – Any Variation~~	~~1 (read)~~	~~06 (no range, or all) 07 08 (limited qty)~~	-	-
~~21~~	~~1~~	~~Frozen Counter – 32-bit with flag~~	-	-	~~129 (response)~~	~~00, 01 (start-stop)~~
~~21~~	~~2~~	~~Frozen Counter – 16-bit with flag~~	-	-	~~129 (response)~~	~~00, 01 (start-stop)~~
~~21~~	~~9~~	~~Frozen Counter – 32-bit without flag~~	-	-	~~129 (response)~~	~~00, 01 (start-stop)~~
~~21~~	~~10~~	~~Frozen Counter – 16-bit without flag~~	-	-	~~129 (response)~~	~~00, 01 (start-stop)~~
~~22~~	~~0~~	~~Counter Event – Any variation~~	~~1 (read)~~	~~06 (no range, or all)~~	-	-
~~22~~	~~1~~	~~Counter Event – 32-bit with flag~~	-	-	~~129 (response) 130 (unsol.resp)~~	~~17, 28 (index)~~
~~22~~	~~2~~	~~Counter Event – 16-bit with flag~~	-	-	~~129 (response) 130 (unsol.resp)~~	~~17, 28 (index)~~
30	0	Analog Input – Any variation	1 (read)	06 (no range, or all)		
30	1	Analog Input – 32-bit with flag	1 (read)	06 (no range, or all)	129 (response)	00, 01 (start-stop)
30	2*	Analog Input – 16-bit with flag	1 (read)	06 (no range, or all)	129 (response)	00, 01 (start-stop)
30	3	Analog Input – 32-bit without flag	1 (read)	06 (no range, or all)	129 (response)	00, 01 (start-stop)
30	4	Analog Input – 16-bit without flag	1 (read)	06 (no range, or all)	129 (response)	00, 01 (start-stop)
30	5	Analog Input – Single-prec flt-pt with flag	1 (read)	06 (no range, or all)		
32	0	Analog Input Event – Any variation	1 (read)	06 (no range, or all) 07 08 (limited qty)		
32	1	Analog Input Event – 32-bit without time			129 (response) 130 (unsol. resp)	17, 28 (index)
32	2*	Analog Input Event – 16-bit without time			129 (response) 130 (unsol. resp)	17, 28 (index)
40	0	Analog Output Status – Any Variation	1 (read)	06 (no range, or all)		
40	1	Analog Output Status – 32 bit with flag	1 (read)	06 (no range, or all)		
40	2*	Analog Output Status – 16-bit with flag	1 (read)	06 (no range, or all)	129 (response)	00, 01 (start-stop)
40	3	Analog Output – Single-prec flt-pt with flag	1 (read)	06 (no range, or all)		
41	2	Analog Output – 16-bit	3 (select) 4 (operate) 5 (direct op) 6 (dir. op, no ack)	17,28 (index)	129 (response)	echo of request
50	1	Time and Date – Absolute time	2 (write)	07 (limited qty = 1)		
51	1	Time and Date CTO – Absolute time, synchronized			129 (response) 130 (unsol.resp)	07 (limited qty) (qty = 1)
51	2	Time and Date CTO – Absolute time, unsynchronized			129 (response) 130 (unsol.resp)	07 (limited qty) (qty = 1)
52	1	Time Delay – Coarse			129 (response)	07 (limited qty) (qty = 1)
52	2	Time Delay – Fine			129 (response)	07 (limited qty) (qty = 1)
60	1	Class Objects – Class 0 data	1 (read)	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.)	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.)	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.)	06 (no range, or all)		

80	1	Internal Indications – Packed format	2 (write)	00 (start-stop) index=7		
No Object (function code only)			13 (cold restart)			
No Object (function code only)			14 (warm restart)			
No Object (function code only)			23 (delay meas.)			
No Object (function code only)			24 (rec. cur. time)			

Note: * - Default variation reported for variation 0.

5 PRODUCT SUPPORT

Product support can be obtained using the following addresses and telephone numbers.

Manufacturing facility:
UNIPOWER, LLC
65 Industrial Park Rd
Dunlap, TN 37327
United States

Phone: +1-954-346-2442
Toll Free: 1-800-440-3504
Web site – www.unipowerco.com

When contacting UNIPOWER, please be prepared to provide:

1. The product model number, spec number, S build number, and serial number - see the equipment nameplate on the front panel
2. Your company's name and address
3. Your name and title
4. The reason for the contact
5. If there is a problem with product operation:
   - Is the problem intermittent or continuous?
   - What revision is the firmware?
   - What actions were being performed prior to the appearance of the problem?
   - What actions have been taken since the problem occurred?