Communications Point Data Base

Data 2481

For
Communications Protocol DNP3.0

For Use With Cooper Power Systems

Form 5, Form 5UDP, and Form 5 LS/UDP

Recloser Controls

Contents

Introduction

The F5 Recloser Control is available with the DNP3 communication protocol on any of the serial ports. This document provides details for users that need to interface to the control using this protocol.

The document is divided into sections that give an overview of the data dictionary for the control, describe configuration parameters to get started communicating, error indication definitions, and reference documents. Appendices provide the *DNP3 Device Profile Template* filled out for the F5 control and the data dictionary for accessing the control.

Class 0 data polls consist of *Binary Inputs* (Object 1 Variation 0), *Binary Counters* (Object 20 Variation 0), *Analog Inputs* (Object 30 Variation 0) and *Binary Output Status* (Object 10 Variation 2).

Report by Exception is supported. Event Classes are configurable using the *Assign Class* function. On device restart, the factory defined defaults are used for the event class content definitions until modified by the *Assign Class* function. See the data dictionary for factory class definitions. Configuration parameters are provided for future selection of the default object type for reporting counter and analog events.

Unsolicited Report by Exception is also supported as an extension to the report by exception capability. The implementation follows the rules defined for Unsolicited Report by Exception, i.e., it is enabled or disabled by a configuration parameter, and upon device reset, an unsolicited message will be sent without data. After confirmation no further messages will be sent until DNP messages to enable unsolicited operation are received by the control. Media access contention avoidance (collision avoidance) is performed according to the methods recommended in Chapter 7 of the DNP3 Data Link Layer document for full and half duplex operation. For half duplex operation, the random delay method is employed.

Data link and Unsolicited Application retries and timeouts are configurable. See the section *DNP Related Configuration Parameters* for more detail.

Data Dictionary Overview

Appendix B contains a listing of the data dictionary for the F5 Recloser Control. This section discusses items of interest from the data dictionary.

Class 0 and 1 Binary Inputs

1. The definition of the bit assignments depends on the custom logic specified for each control.

2. All binary input events are fixed as Class 1 data.

3. Event data is updated immediately on every change.

Class 0 through 3 Counters

1. When an incoming request specifies 16-bit counters, only the lower 16 bits of the 32 bit counters will be returned.

2. Counter events default to 16 bit without time.

3. Event data is updated on a 1 second basis.

Class 0 through 3 Analog Inputs

1. The data dictionary section that describes the analogs includes scale factors (for 16 bit variation) and units to translate the raw data.

2. Analog input events default to 16 bit without time.

3. Event data is updated on a 1 second basis.

Control Relay Output Block (CROB)

1. The data dictionary CROB section indicates whether the control point is pulsed or latched.

2. The section also specifies the default condition of a point on powerup or reset.

3. Each control point allow direct operates *may* be performed depending on the state of the "direct operate allowed" configuration point. When the configuration point is set "true" direct operate will be allowed as shown in the table. SBO is *always* allowed on all control points, but some points may *only* be controlled using SBO as shown on the table.

File ID objects in general

1. Internal objects consist of static read-only data, live read-only data, "special metering application" data, configuration parameters and time-tagged/alarm data.

2. All data objects are low byte - high byte (INTEL) format.

3. "File Name" column in section is the ASCII file ID for accessing data and any required arguments.

4. The only allowed operations on the objects are *read, response* or *write* (where appropriate).

5. Entire object must be read or written.

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6. Status of the last file write operation is found in the read-only file *WRERR*. This file is automatically over written with the status of the most recent write ACK information.

File ID, Static Data

1. See the F5 product data specification for more detail on the meaning of the data objects.

File ID, Live Data

1. See the F5 product data specification for more detail on the meaning of the data objects.

File ID, Special Metering Data

1. See the F5 product data specification for more detail on the meaning of the data objects.

2. Special Metering data is provided to unclutter Class 0 Analog data.

File ID, Configuration Data

1. See the F5 product data specification for more detail on the meaning of the data objects.

2. ACK/NAK codes are described in *Appendix B*.

File ID, Time-tagged and Alarm Data

1. See the F5 product data specification for more detail on the meaning of the data objects.

2. A variable number of records starting with the **next available** alarm are returned when all alarm records are requested, depending on the number of registered alarms and the condition being requested. The first requested record must be "0".

3. A variable number of records starting with the **next available** alarm are returned when all time-tagged data is requested. Additionally, each record is a variable size depending on the type of time-tagged record. The first requested record must be "0".

DNP Related Configuration Parameters

Each port has a fixed segment for the configuration object that is defined as follows:

Item name	Size (in bytes)	Description
Port Handle	4	Determined at run time, i.e. which port is accessed
Protocol ID	22	ASCII string "DNP 3.0 Rev nn"
Protocol Version	4	32 bit value of protocol implementation version
Protocol Revision	4	32 bit value of protocol implementation revision
Size	2	Size of protocol specific data area that is actually used
Remaining Comm Programming values	200	Protocol specific data.

For DNP implementations the remaining values in the 200 byte protocol specific area are:

Item name	Size (in bytes)	Range	Default	Description
Baud rate	2	300 - 38400	9600	Serial port speed (BPS)
Dead line sync	4	0 - 1000	0	Time for syncing to start of message. (in milliseconds)
Report-by-Exception (Master) Address	2	0 - 65534	1	Destination address of unsolicited report by exception info
Remote IED Address	2	0 - 65534	1	Address of this IED, i.e. this port of this control in the DNP network

Item name	Size (in bytes)	Range	Default	Description
Handshake Mode	2	0 - 2	2 (Transmit Enable)	Code for method of controlling handshake lines: 0. Normal RTS/CTS 1. CTS ignored/ RTS Strapped 2. CTS ignored/ RTS is "transmit enable"
Transmit enable delay	4	0 - 10000	5	Time to wait after transmit enable signal to start of data transmission. (in milliseconds)
Transmit disable delay	4	0 - 10000	5	Time to wait after transmit enable signal to start of data transmission. (in milliseconds)
Data link confirm mode	2	0 - 2	0 (Never)	Code to determine when the IED will request data link ACKs from master: 0. Never 1. Sometimes (When multi frame messages are sent) 2. Always
Number of data link retries for confirm	2	0 – 10	3	Number of data link layer retries
Data link confirm timeout	4	1 - 60000	30	Data link retry timeout period. Units are 10's of milliseconds
Application confirm timeout	4	1 - 60000	1000	Application layer retry timeout period from. Units are 10's of milliseconds
Unsolicited response minimum quantity for class 1	2	1 - 50	10	Minimum number of events in class 1 that will immediately generate an unsolicited response
Unsolicited response minimum quantity for class 2	2	1 - 50	25	Minimum number of events in class 2 that will immediately generate an unsolicited response
Unsolicited response minimum quantity for class 3	2	1 - 50	50	Minimum number of events in class 3 that will immediately generate an unsolicited response
Unsolicited response notification delay	2	0 - 6000	1500	Maximum time after an event occurs to generate an unsolicited response. Units are 10's of milliseconds. (0 = use minimum number of events only)
Unsolicited responses enabled	1	0 (False), 1 (True)	0 (False)	Bool to enable unsolicited response operation
Direct operate allowed	1	0 (False), 1 (True)	1 (True)	Bool to allow direct operate on applicable points
Select arm timeout	2	1-60	10	Maximum time after a valid select is received that an operate will be allowed. Units are seconds.
Write time request interval	2	0-65535	1440 (24 hours)	Time interval to set *Need Time* bit in **IIN** for requesting Master to write time. Units are minutes. (0 = Never set *Need Time* bit in **IIN**)

Item name	Size (in bytes)	Range	Default	Description
Analog data default format	2	0 - 1	1 (16 bit)	Code for default Class 0 method for representing analog data: 0. 32 bit floating point 1. 16 bit fixed point (Not used)
32 bit internal counter data default format	2	0 - 1	1 (16 bit)	Code for default Class 0 method for representing internal 32 bit counters data: 0. 32 bit counter 1. 16 bit counter (Not used)
Deadband for **VOLTAGE** related analogs	4	--	40000.00	IEEE 754 32 bit floating point value of report-by-exception deadband for all voltage related analogs
Deadband for **CURRENT** related analogs	4	--	20000.00	IEEE 754 32 bit floating point value of report-by-exception deadband for all current related analogs
Deadband for **POWER** related analogs	4	--	100000.00	IEEE 754 32 bit floating point value of report-by-exception deadband for all power and energy (KW, KVA, KVAR, KWHr) related analogs
Deadband for **POWER** FACTOR related analogs	4	--	2.00	IEEE 754 32 bit floating point value of report-by-exception deadband for all power factor related analogs
Deadband for **HARMONIC** related analogs	4	--	100.00	IEEE 754 32 bit floating point value of report-by-exception deadband for all harmonic related analogs
Deadband for **BATTERY** related analogs	4	--	30000.00	IEEE 754 32 bit floating point value of report-by-exception deadband for all battery voltage & current related analogs
Deadband for **DUTY** related analogs	4	--	100.00	IEEE 754 32 bit floating point value of report-by-exception deadband for all duty accumulator related analogs
Deadband for **Counters**	2	--	1000	Report-by-exception deadband for all counters
Deadband for **LINE FREQUENCY** related analogs	4	--	0.5	IEEE 754 32 bit floating point value of report-by-exception deadband for all battery voltage & current related analogs
Collision avoidance mode enabled	1	0 (False), 1 (True)	0 (False)	Bool to enable collision avoidance mode for transmitted data.
Number of collision avoidance retries	1	0 - 10	1	Number of retries to transmit data after collision avoidance is started.
Collision avoidance minimum backoff delay.	2	0-5000	50	Minimum time to delay before transmitting after collision avoidance is started. (in milliseconds)
Collision avoidance maximum backoff delay.	2	0-5000	200	Maximum time to delay before transmitting after collision avoidance is started. (in milliseconds)

Item name	Size (in bytes)	Range	Default	Description
Report-by-Exception method	2	0 - 1	1 (deadband)	Code for method used for report by exception of analog data: 0. deadband 1. threshold
High Threshold for **VOLTAGE** related analogs	4	--	40000.00	IEEE 754 32 bit floating point value of report-by-exception high threshold for all voltage related analogs
High Threshold for **CURRENT** related analogs	4	--	20000.00	IEEE 754 32 bit floating point value of report-by-exception high threshold for all current related analogs
High Threshold for **POWER** related analogs	4	--	50000.00	IEEE 754 32 bit floating point value of report-by-exception high threshold for all power and energy (KW, KVA, KVAR, KWHr) related analogs
High Threshold for **POWER** FACTOR related analogs	4	--	1.1	IEEE 754 32 bit floating point value of report-by-exception high threshold for all power factor related analogs
High Threshold for **HARMONIC** related analogs	4	--	100.00	IEEE 754 32 bit floating point value of report-by-exception high threshold for all harmonic related analogs
High Threshold for **BATTERY** related analogs	4	--	10000.00	IEEE 754 32 bit floating point value of report-by-exception high threshold for all battery voltage & current related analogs
High Threshold for **DUTY** related analogs	4	--	100.00	IEEE 754 32 bit floating point value of report-by-exception high threshold for all duty accumulator related analogs
Reserved	--	--	--	
High Threshold for **LINE FREQUENCY** related analogs	4	--	60.25	IEEE 754 32 bit floating point value of report-by-exception high threshold for all battery voltage & current related analogs
Low Threshold for **VOLTAGE** related analogs	4	--	-0.1	IEEE 754 32 bit floating point value of report-by-exception low threshold for all voltage related analogs
Low Threshold for **CURRENT** related analogs	4	--	-0.1	IEEE 754 32 bit floating point value of report-by-exception low threshold for all current related analogs
Low Threshold for **POWER** related analogs	4	--	-50000.00	IEEE 754 32 bit floating point value of report-by-exception low threshold for all power and energy (KW, KVA, KVAR, KWHr) related analogs
Low Threshold for **POWER** FACTOR related analogs	4	--	-1.1	IEEE 754 32 bit floating point value of report-by-exception low threshold for all power factor related analogs
Low Threshold for **HARMONIC** related analogs	4	--	-0.1	IEEE 754 32 bit floating point value of report-by-exception low threshold for all harmonic related analogs
Low Threshold for **BATTERY** related analogs	4	--	-20000.00	IEEE 754 32 bit floating point value of report-by-exception low threshold for all battery voltage & current related analogs
Low Threshold for **DUTY** related analogs	4	--	-0.1	IEEE 754 32 bit floating point value of report-by-exception low threshold for all duty accumulator related analogs
Low Threshold for **LINE FREQUENCY** related analogs	4	--	-49.75	IEEE 754 32 bit floating point value of report-by-exception low threshold for all battery voltage & current related analogs

Item name	Size (in bytes)	Range	Default	Description
Unsolicited Application Layer Retry Attempts.	0	0-10	0	Maximum number of application layer retry attempts after reporting event data. 0 is a special case of infinite retries.
Use Time-tagged variation for Binary Input Change when reporting Class 1/2/3	1	0 (False), 1 (True)	0 (False)	Bool to allow time tagging of Binary input change data (Object 2) when requesting Class 1/2/3 information. True = use with time variation" (variation 2). False = is "use without time variation" (variation 1)
Flush Event Buffers on Unsuccessful Unsolicited Report Attempt.	1	0 (False), 1 (True)	0 (False)	Bool to indicate action to perform on completion of retry attempts. True = dump all events in the event buffers after the number of retry attempts has been reached. False = disable unsolicited event reporting and retain events in buffers.
Class 0 configuration for Object 10 (binary output status)	1	0 (False), 1 (True)	1 (True)	Bool that indicates that all Binary output statuses (Object 10) will be returned in Class 0 poll. True indicates the items will be in the Class 0 request.
Class 0 configuration array for Object 1 (binary inputs)	64	0 (False), 1 (True)	1 (True)	Array of Bools with each entry in the array corresponding to the index into Object 1 (binary inputs). True indicates the item will be in the Class 0 request, and may be assigned to an event class (Class 1,2 or 3). False indicates the item will not be in the Class 0 request, may not be assigned to an event class (Class 1,2 or 3) and will be unassigned from any event class that it may have been assigned.
Class 0 configuration array for Object 20 (binary counters)	31	0 (False), 1 (True)	1 (True)	Array of Bools with each entry in the array corresponding to the index into Object 20 (binary counter). See description above.
Class 0 configuration array for Object 30 (analog inputs)	107	0 (False), 1 (True)	1 (True)	Array of Bools with each entry in the array corresponding to the index into Object 30 (analog input). See description above.

DNP Error Indications

The Internal Indications (IIN) bits from Section 3.6 of the *DNP3 Application Layer* document are defined as follows:

1st Octet

Bit 0   All stations message received.

As defined in Section 3.6.

Bit 1   Class 1 data available.

As defined in Section 3.6.

Bit 2   Class 2 data available.

As defined in Section 3.6.

Bit 3   Class 3 data available.

As defined in Section 3.6.

Bit 4   Time sync required from master.

As defined in Section 3.6.

Bit 5   Outstation is in local.

As defined in Section 3.6 for CROB points.

Configuration Parameters are not writeable when the outstation is in local.

Bit 6   Device Trouble.

As defined by Custom Logic for this control.

Bit 7   Device restart.

As defined in Section 3.6.

2nd Octet

Bit 0 Function code not implemented.

      As defined in Section 3.6.

Bit 1 Requested objects unknown.

      As defined in Section 3.6.

Bit 2 Parameters in the qualifier, range or data fields are invalid or out of range.

      As defined in Section 3.6.

      Writes to *Configuration Parameters* will set this bit to indicate that data could not be written. The file *WRERR* must be read to determine the cause of failure.

      CROB operations when the control is in local will set this bit to indicate the operation was not successful if the CROB point is dependent on supervisory status.

Bit 3 Event buffer overflow.

      As defined in Section 3.6.

Bit 4 Request understood but already executing.

      As defined in Section 3.6.

Bit 5 Current configuration is corrupted.

      Not used.

Bit 6 Reserved.

Bit 7 Reserved.

Unsolicited Report by Exception and Collision Avoidance

<u>Unsolicited Report by Exception</u>

Unsolicited Report by Exception (URBE) is supported as an extension to the report by exception capability. The implementation follows the rules defined for Unsolicited Report by Exception and those for a Level 3 device:

1. Unsolicited reporting is enabled or disabled by a configuration parameter.

2. Upon device reset, an unsolicited message will be sent without data. After confirmation no further messages will be sent until DNP messages to enable unsolicited event reporting are received by the control.

3. Contents of Class 1, 2 or 3 may be assigned or deassigned dynamically.

4. Unsolicited event reporting is enabled or disabled on a class-by-class basis.

5. Application Layer Retry functionality allows a finite number of retry attempts during unsolicited event reporting.

   - There is a configurable number of retry attempts in accordance with the DNP Technical Committee's TB9912-002 recommendation. The range is 0 to 10 attempts with 0 being the special case of infinite number of attempts.

   - There is a configurable action to perform on completion of retry attempts. When the number of retry attempts has been reached, the user may select to dump all events in the event buffers (binary input, analog input and counter events

   - While in Application layer retry mode, no new events (binary input, analog input and counter events) will be added to the message that is being retried.

   - If the control is not set to Flush Event Buffers on Unsuccessful Unsolicited Report Attempt , an enable unsolicited reporting message (Function 20) will be required to re-enable unsolicited reporting upon completion of Application Layer Retry attempts.

6. The Binary input change variation is user selectable to allow time tagging of data when requesting Class 1/2/3 information.). The default is False -use without time variation.

Collision Avoidance

Media access contention avoidance (collision avoidance) is performed according to the methods recommended in Chapter 7 of the DNP3 Data Link Layer document for full and half duplex operation. For half duplex operation, the random delay method is employed. In addition, a simplified method of collision avoidance is provided for fiber optic ring operation.

Collision Avoidance Method Selection

Two collision avoidance methods are available: The standard DNP method which utilizes the RS232 Data Carrier Detect (DCD) signal to monitor for an in-use communication system, and a simplified method which monitors the received data waiting for a "quiet" period to determine that the communication system is no longer in use. The collision avoidance method is determined by the configuration value for *Dead-Line-Sync*. If the value is set to zero, the standard DCD method is used. If the value is non-zero, the receive must not have activity for the timeout period selected before the system is considered not to be in use.

The control has provisions to prevent setting the DCD method if a DCD signal is not present, or if the communication channel is in use. In the case where parameters are being changed to the port *not* presently connected, DCD must not be active for this mode to take effect. A NAK will be returned from the control if DCD is active. In the case where parameters are being changed to the port presently connected, a complete request-response message transaction must occur before this method becomes active. If a complete exchange cannot be made, the port setting will revert to the previous mode.

Collision Avoidance Backoff Delay Settings

Regardless of which collision avoidance method is selected, after the system is determined not to be in use the random backoff delay timing is started before another response attempt is made. The values set for the minimum and maximum delays should determined with these characteristics in mind:

1. The lower the value for the minimum backoff delay, the higher the priority the control will have. A value of zero is usually reserved for the master station to allow it to have the highest priority.

2. The smaller the difference between the minimum and maximum delays, the greater the likelihood of collisions with other nodes.

3. Setting multiple controls with the same minimums and maximums is acceptable, since each device will compute a different random delay.

4. If the minimum is set equal to the maximum, the control will wait exactly that amount of time before retrying. Multiple devices cannot have the same settings in this case.

Summary of settings and uses

Operating Mode	URBE Enable	Collision Avoidance Enable	Collision Avoidance Method	Communication media
URBE, half duplex or simplex	On	On	Carrier Detect (DLS set to zero)	half duplex or simplex RS232, radio
URBE, half duplex or simplex	On	On	Dead Line Sync (DLS set non-zero)	half duplex or simplex RS232, radio, fiber optic ring
URBE, full duplex	On	Off	N/A	Full duplex RS232, radio
Polled	Off	Off	N/A	Full duplex RS232, radio

Configurable Class 0 Response

Overview

The components of a DNP Class 0 data poll response and processing/readout for Class 1/2/3 Event polls is configurable according to the user's needs. Configuration is performed via the *F5 Interface program* or another program that is capable of setting the port configuration parameters. When the control is interrogated for Class 0 data, only the configured data will be returned. Additionally, *Change Event* processing, Event Class assignment and read out is allowed only if the static point has been assigned to Class 0. All data in the F5, including data not mapped to class 0, can be read by a request for specific points

Configuration

a) A configuration screen is available under *Port n* setup of the *F5 Interface program*. Configuration screens consist of all of the objects original index numbers with a check box next to it. User checks the box to enable value to be in class 0 poll. The data values will not be reassignable to indices that were not defined at the factory.

b) User configuration can be performed on each of the factory defined class 0 items – binary inputs, counters, analog inputs and CROB output status.

c) Binary inputs, counters and analog inputs are configured on a point by point basis by index number. CROB output status is configured as a group, i.e., all the statuses or none will be returned depending on the configuration.

d) The configuration is stored in non-volatile memory.

Class 0 request handling

a) A request for class 0 data will only return data for points that have been configured.

b) Selected items are returned in order as defined. As an example, for Obj.1 if indices 0, 1, 3 are selected the data will be packed in the response.

c) The user is required to know a particular control's mapping in order interpret the results of the class 0 response. The mapping data may always be read back from the control in the communication port configuration object.

Change Event Handling

a) If item is enabled in class 0, it can be assigned (using the Assign Class command) to event classes 1/2/3.

b) Requests for event class 1/2/3 data will return data and the configued index.

References

DNP30 Basic 4, Rev. 01

DNP3 Subset Definitions, Version 1.00

DNP Control Relay Output Block Minimum Implementation, 3/8/96

DNP Floating Point Analog Input Variation Recommendations, DNP User's Group Technical Committee meeting minutes - February 19, 1997 & April 16, 1997.

F5 Recloser Control Product Data - DATA 2470

DNP Technical Bulletin 9912-002 – Unsolicited Event Reporting: Retry Configuration

Appendix A: F5 DNP3 Device Profile Template

DNP V3.00
DEVICE PROFILE DOCUMENT
This document must be accompanied by a table having the following headings:

Object Group	Request Function Codes Response Function Codes
Object Variation	Request Qualifiers Response Qualifiers
Object Name (optional)	

Vendor Name: Cooper Power Systems

Device Name: F5 Recloser Control

Highest DNP Level Supported:	Device Function:
For Requests 3	☐ Master ☑ Slave
For Responses 3	

Notable objects, functions, and/or qualifiers supported in addition to the Highest DNP Levels Supported (the complete list is described in the attached table):

Device uses *File Identifier* (Obj. 70 Var. 01) to access Read-only static & live data, configuration data, time-tagged data and alarm data.

Explanations for items that are configurable may be found in the *DNP Related Configuration Parameters* in this document.

Maximum Data Link Frame Size (octets):	Maximum Application Fragment Size (octets):
Transmitted 292	Transmitted 2048
Received 292	Received 2048

Maximum Data Link Re-tries:	Maximum Application Layer Re-tries:
☐ None	☑ None
☐ Fixed at	☐ Configurable, range None to 10
☑ Configurable, range None to 10	(Fixed is not permitted)

Requires Data Link Layer Confirmation:

   ☐ **Never**
   ☐ **Always**
   ☐ **Sometimes**   **If 'Sometimes', when?**
_____

   ☑ **Configurable If 'Configurable', how?___Via Item in configuration parameters_____**

Requires Application Layer Confirmation:

   ☐ **Never**
   ☐ **Always (not recommended)**
   ☑ **When reporting Event Data (Slave devices only)**
   ☐ **When sending multi-fragment responses (Slave devices only)**

   ☐   **Sometimes**   **If 'Sometimes', when?**
_____

   ☐ **Configurable If 'Configurable',**
how?_____

Timeouts while waiting for:

   Data Link Confirm   ☐ **None** ☐ **Fixed at _____** ☐ **Variable** ☑ **Configurable**
   Complete Appl. Fragment ☑ **None** ☐ **Fixed at _____** ☐ **Variable** ☐ **Configurable**
   Application Confirm   ☐ **None** ☐ **Fixed at _____** ☐ **Variable** ☑ **Configurable**
   Complete Appl. Response ☑ **None** ☐ **Fixed at _____** ☐ **Variable** ☐ **Configurable**

   Others
_____

   Attach explanation if 'Variable' or 'Configurable' was checked for any timeout

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Sends/Executes Control Operations:

   WRITE Binary Outputs   ☑ **Never** ☐ **Always**☐ **Sometimes** ☐ **Configurable**
   SELECT/OPERATE   ☐ **Never** ☑ **Always**☐ **Sometimes** ☐ **Configurable**
   DIRECT OPERATE   ☐ **Never** ☑ **Always**☐ **Sometimes** ☐ **Configurable**
   DIRECT OPERATE - NO ACK☑ **Never** ☐ **Always**☐ **Sometimes** ☐ **Configurable**

   Count > 1   ☑   **Never** ☐ **Always**☐ **Sometimes** ☐ **Configurable**
   Pulse On   ☐ **Never** ☐ **Always**☑ **Sometimes** ☐ **Configurable**
   Pulse Off   ☐ **Never** ☐ **Always**☑ **Sometimes** ☐ **Configurable**
   Latch On   ☐ **Never** ☐ **Always**☑ **Sometimes** ☐ **Configurable**

Latch Off Configurable	☐ **Never**	☐ **Always** ☑ **Sometimes**	☐
Queue Configurable	☑ **Never**	☐ **Always** ☐ **Sometimes**	☐
Clear Queue Configurable	☑ **Never**	☐ **Always** ☐ **Sometimes**	☐

Attach explanation if 'Sometimes' or 'Configurable' was checked for any operation.

FILL OUT THE FOLLOWING ITEM FOR MASTER DEVICES ONLY:

Expects Binary Input Change Events:

    ☐ Either time-tagged or non-time-tagged for a single event
    ☐ Both time-tagged and non-time-tagged for a single event
    ☐ Configurable (attach explanation)

FILL OUT THE FOLLOWING ITEMS FOR SLAVE DEVICES ONLY:

Reports Binary Input Change Events when no specific variation requested:
 	
   ☐ Never
   ☐ Only time-tagged
   ☑ Only non-time-tagged
   ☐ Configurable to send both, one or the other (attach explanation)
	Reports time-tagged Binary Input Change Events when no specific variation requested:
	
	   ☑ Never
	   ☐ Binary Input Change With Time
	   ☐ Binary Input Change With Relative Time
	   ☐ Configurable (attach explanation)

Sends Unsolicited Responses:
 	
   ☐ Never
   ☑ Configurable (attach explanation)
   ☐ Only certain objects
   ☐ Sometimes (attach explanation)
 	
   ☑ ENABLE/DISABLE UNSOLICITED
      Function codes supported
	Sends Static Data in Unsolicited Responses:
	
	   ☑ Never
	   ☐ When Device Restarts
	   ☐ When Status Flags Change
	
	No other options are permitted.

Default Counter Object/Variation:
 	
   ☐ No Counters Reported
   ☐ Configurable (attach explanation)
   ☑ Default Object 20
      Default Variation 02
   ☑ Point-by-point list attached
	Counters Roll Over at:
	
	   ☐ No Counters Reported
	   ☐ Configurable (attach explanation)
	   ☐ 16 Bits
	   ☐ 32 Bits
	   ☐ Other Value _____
	   ☑ Point-by-point list attached

Sends Multi-Fragment Responses: ☐ Yes ☑ No	

OBJECT			REQUEST (DNP message components parsed by the F5)		RESPONSE (DNP message components reported by the F5)	
Obj	Var	Description	Func Codes (dec)	Qual Codes (hex)	Func Codes (dec)	Qual Codes (hex)
1	0	Binary Input - All Variations	1,22	00,01,06		
1	1	Binary Input	1	00,01,06	129	00,01
1	2	Binary Input with Status	1	00,01,06		
2	0	Binary Input Change - All Variations	1	06,07,08		
2	1	Binary Input Change without Time	1	06,07,08	129,130	17, 28
2	2	Binary Input Change with Time	1	06,07,08	129	17, 28
2	3	Binary Input Change with Relative Time	1	06,07,08	129	17, 28
10	0	Binary Output - All Variations	1	00,01,06		
10	1	Binary Output				
10	2	Binary Output Status	1	00,01,06	129	00, 01
12	0	Control Block - All Variations				
12	1	Control Relay Output Block	3,4,5,6	17, 28	129	echo of request
12	2	Pattern Control Block	3,4,5,6	17, 28		
12	3	Pattern Mask	3,4,5,6	00,01		
20	0	Binary Counter - All Variations	1,7,8,9,10,22	00,01,06		
20	1	32-Bit Binary Counter	1, 7,8,9,10	00,01,06	129	00, 01
20	2	16-Bit Binary Counter	1, 7,8,9,10	00,01,06	129	00, 01
20	3	32-Bit Delta Counter	1	00,01,06		
20	4	16-Bit Delta Counter	1	00,01,06		
20	5	32-Bit Binary Counter without Flag	1, 7,	00,01,06	129	00, 01

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OBJECT			REQUEST (DNP message components parsed by the F5)		RESPONSE (DNP message components reported by the F5)	
Obj	Var	Description	Func Codes (dec)	Qual Codes (hex)	Func Codes (dec)	Qual Codes (hex)
			8, 9,10			
20	6	16-Bit Binary Counter without Flag	1, 7, 8, 9,10	00,01,06	129	00, 01
20	7	32-Bit Delta Counter without Flag	1	00,01,06		
20	8	16-Bit Delta Counter without Flag	1	00,01,06		
21	0	Frozen Counter - All Variations	1,22	00,01,06		
21	1	32-Bit Frozen Counter	1	00,01,06		
21	2	16-Bit Frozen Counter	1	00,01,06		
21	3	32-Bit Frozen Delta Counter	1	00,01,06		
21	4	16-Bit Frozen Delta Counter	1	00,01,06		
21	5	32-Bit Frozen Counter with Time of Freeze				
21	6	16-Bit Frozen Counter with Time of Freeze				
21	7	32-Bit Frozen Delta Counter with Time of Freeze				
21	8	16-Bit Frozen Delta Counter with Time of Freeze				
21	9	32-Bit Frozen Counter without Flag	1	00,01,06		
21	10	16-Bit Frozen Counter without Flag	1	00,01,06		
21	11	32-Bit Frozen Delta Counter without Flag				
21	12	16-Bit Frozen Delta Counter without Flag				
22	0	Counter Change Event - All Variations	1	06,07,08		
22	1	32-Bit Counter Change Event without Time	1	06,07,08	129,130	17, 28
22	2	16-Bit Counter Change Event without Time	1	06,07,08	129,130	17, 28
22	3	32-Bit Delta Counter Change Event without Time	1	06,07,08		

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OBJECT			REQUEST (DNP message components parsed by the F5)		RESPONSE (DNP message components reported by the F5)	
Obj	Var	Description	Func Codes (dec)	Qual Codes (hex)	Func Codes (dec)	Qual Codes (hex)
22	4	16-Bit Delta Counter Change Event without Time	1	06,07,08		
22	5	32-Bit Counter Change Event with Time	1	06,07,08	129	17, 28
22	6	16-Bit Counter Change Event with Time	1	06,07,08	129	17, 28
22	7	32-Bit Delta Counter Change Event with Time				
22	8	16-Bit Delta Counter Change Event with Time				
23	0	Frozen Counter Event - All Variations	1	06,07,08		
23	1	32-Bit Frozen Counter Event without Time	1	06,07,08		
23	2	16-Bit Frozen Counter Event without Time	1	06,07,08		
23	3	32-Bit Frozen Delta Counter Event without Time	1	06,07,08		
23	4	16-Bit Frozen Delta Counter Event without Time	1	06,07,08		
23	5	32-Bit Frozen Counter Event with Time				
23	6	16-Bit Frozen Counter Event with Time				
23	7	32-Bit Frozen Delta Counter Event with Time				
23	8	16-Bit Frozen Delta Counter Event with Time				
30	0	Analog Input - All Variations	1,22	00,01,06		
30	1	32-Bit Analog Input	1	00,01,06		
30	2	16-Bit Analog Input	1	00,01,06	129	00,01
30	3	32-Bit Analog Input without Flag	1	00,01,06		
30	4	16-Bit Analog Input without Flag	1	00,01,06	129	00,01
30	5	Short Floating Point Analog Input	1	00,01,06	129	00,01

OBJECT			REQUEST (DNP message components parsed by the F5)		RESPONSE (DNP message components reported by the F5)	
Obj	Var	Description	Func Codes (dec)	Qual Codes (hex)	Func Codes (dec)	Qual Codes (hex)
30	6	Long Floating Point Analog Input				
31	0	Frozen Analog Input - All Variations				
31	1	32-Bit Frozen Analog Input				
31	2	16-Bit Frozen Analog Input				
31	3	32-Bit Frozen Analog Input with Time of Freeze				
31	4	16-Bit Frozen Analog Input with Time of Freeze				
31	5	32-Bit Frozen Analog Input without Flag				
31	6	16-Bit Frozen Analog Input without Flag				
31	7	Short Floating Point Frozen Analog Input				
31	8	Long Floating Point Frozen Analog Input				
32	0	Analog Change Event - All Variations	1	06,07,08		
32	1	32-Bit Analog Change Event without Time	1	06,07,08		
32	2	16-Bit Analog Change Event without Time	1	06,07,08	129,130	17, 28
32	3	32-Bit Analog Change Event with Time				
32	4	16-Bit Analog Change Event with Time	1	06,07,08	129	17, 28
32	5	Short Floating Point Analog Change Event	1	06,07,08	129	17, 28
32	6	Long Floating Point Analog Change Event				
32	7	Short Floating Point Analog Change Event with Time				
32	8	Long Floating Point Analog Change Event with Time				

OBJECT			REQUEST (DNP message components parsed by the F5)		RESPONSE (DNP message components reported by the F5)	
Obj	Var	Description	Func Codes (dec)	Qual Codes (hex)	Func Codes (dec)	Qual Codes (hex)
33	0	Frozen Analog Event - All Variations				
33	1	32-Bit Frozen Analog Event without Time				
33	2	16-Bit Frozen Analog Event without Time				
33	3	32-Bit Frozen Analog Event with Time				
33	4	16-Bit Frozen Analog Event with Time				
33	5	Short Floating Point Frozen Analog Event				
33	6	Long Floating Point Frozen Analog Event				
33	7	Short Floating Point Frozen Analog Event with Time				
33	8	Long Floating Point Frozen Analog Event with Time				
40	0	Analog Output Status - All Variations	1	00,01,06		
40	1	32-Bit Analog Output Status	1	00,01,06		
40	2	16-Bit Analog Output Status	1	00,01,06		
40	3	Short Floating Point Analog Output Status				
40	4	Long Floating Point Analog Output Status				
41	0	Analog Output Block - All Variations				
41	1	32-Bit Analog Output Block	3,4,5,6	17,28		
41	2	16-Bit Analog Output Block	3,4,5,6	17,28		
41	3	Short Floating Point Analog Output Block				
41	4	Long Floating Point Analog Output				

OBJECT			REQUEST (DNP message components parsed by the F5)		RESPONSE (DNP message components reported by the F5)	
Obj	Var	Description	Func Codes (dec)	Qual Codes (hex)	Func Codes (dec)	Qual Codes (hex)
		Block				
50	0	Time and Date - All Variations				
50	1	Time and Date	1,2	07 where quantity = 1	129	echo of request
50	2	Time and Date with Interval				
51	0	Time and Date CTO - All Variations				
51	1	Time and Date CTO			129	07 where quantity = 1
51	2	Unsynchronized Time and Date CTO				
52	0	Time Delay - All Variations			129	07 where quantity = 1
52	1	Time Delay Coarse	23	07 where quantity = 1	129	07 where quantity = 1
52	2	Time Delay Fine	23	07 where quantity = 1	129	07 where quantity = 1
60	0					
60	1	Class 0 Data	1	06		
60	2	Class 1 Data	1	06,07,08		
			20,21,22	06		
60	3	Class 2 Data	1	06,07,08		
			20,21,22	06		
60	4	Class 3 Data	1	06,07,08		
			20,21,22	06		
70	1	File Identifier	2	1B	129	1B
80	1	Internal Indications	1	00,01		

OBJECT			REQUEST (DNP message components parsed by the F5)		RESPONSE (DNP message components reported by the F5)	
Obj	Var	Description	Func Codes (dec)	Qual Codes (hex)	Func Codes (dec)	Qual Codes (hex)
			2	00 index=7		
81	1	Storage Object				
82	1	Device Profile				
83	1	Private Registration Object				
83	2	Private Registration Object Descriptor				
90	1	Application Identifier				
101	1	Small Packed Binary-Coded Decimal				
101	2	Medium Packed Binary-Coded Decimal				
101	3	Large Packed Binary-Coded Decimal				
		No object (Cold Restart)				
		No object (Delay Measurement)	23		129	

Appendix B: F5 DNP3 Data Dictionary

F5 DNP 3.0 Protocol Device Profile Data Dictionary

December 3, 2001	v 1.32	Database v16

Document	Date	Database	Description
1.32	12/3/01	v16	Added fault event info (distance, magnitudes and magnitude time) to analog points
			Updated ESKOM CROBs
1.31	3/22/01	v15	Added combined trip/close point to CROBs
			Corrected counter index definitions
			Added Hot Line Tag items to protection profile object
			Moved triple single mode items to protection profile object
			Added Primary Voltage present threshold parameter to system info object
1.30	9/27/00	v15	Removed NPS items from protection profile object
			Removed NPS binary input status & counter definitions
			Removed Zero sequence voltage from analogs & histograms
			Removed battery charger fail/battery low voltage status and configuration object
1.29	7/21/00	v14	Added NPS items to protection profile object
			Added NPS binary input status & counter definitions
			Added Zero sequence voltage to analogs & histograms
			Added battery charger fail/battery low voltage status and configuration object
			Fixed indices for OCP counters
1.28	2/4/00	v13	Added Dynamic Phase Trip Enable parameter to Triple-Single object.
1.27	1/4/00	v12	Added source-to-load side voltage difference object.
			Added voltage difference data profile configuration items.
			Added voltage difference histogram configuration and reset items.
1.26	10/14/99	v11	Added Fault Location and Directional SEF items to protection profile object
1.25	6/14/99	v10	Added Triple single binary input status & CROB definitions
			Added trip/close safety delay, power factor sign (File ID, configuration)
1.24	2/24/99	v9	Corrected size of triple single configuration object
1.23	2/4/99	v9	Made all CROB point direct operate
1.22	1/18/99	v9	Added triple single configuration object file (File ID, configuration)
1.21	10/8/98	v8	Added additional SGF reclose intervals (File ID, configuration)
			Added calibration object files (File ID, configuration)
1.20	9/21/98	v7	Updated comm object for variable data size
1.19	8/5/98	v7	Added voltage-frequency status and CROB definitions
1.18	7/22/98	v7	Added Voltage-frequency items
			Made provisions for new voltage sensors
1.17	5/27/98		Corrected scale factors for 16 bit analogs
1.16	5/18/98		Added load side voltages.
			Added worksheet with error definitions
1.15	4/7/98		Changed number of low set & high set shots in protection profiles
1.14	4/7/98		Added new objects for phase-to-phase voltage and energy metering.
			Added relay-like items to protection profile object.
			Added sections for ESKOM specific binary inputs and CROB.
1.13	10/7/97		Added LS specific items

F5 DNP 3.0 Device Profile data dictionary

1.12	8/26/97	Updated the column heading for default counter and analog static and event variations.
1.11	7/25/97	Updated profile to match functionality of control.
1.10	5/15/97	Added fast trips disabled shots to lockout to protection profile parameters (File ID, configuration)
1.09	4/24/97	Updated scale factors in analogs.
1.08	4/17/97	Modified CROB to reflect inputs to port logic that are pulsed, not latched.
1.07	3/31/97	Recombined 16 & 32 bit counters into a single variation.
1.06	3/6/97	Added I/O definitions for SGF Block.
1.05	3/4/97	Fixed indices for analogs.
		Corrected order of status outputs in CROB
		Made file names unique.
1.04	2/25/97	Split 32 bit counter object into 32 and 16 bit objects.
		Fixed some typos on 32 bit floating point analogs.
1.03	2/11/97	Removed Confidential stuff and reformatted
1.02	2/11/97	Updated profile to match functionality of control.
1.01	10/4/96	Formatting changes and class assignments.
1.00	10/4/96	Initial release.

INPUT SUBSYSTEM

Binary Inputs

Description	Default Static Variation Obj 01 Var 01 Binary input w/o status		Default Event Variation Obj 02 Var 1 Binary input w/o time
	Index	Default Event Class	
Port status output from custom logic			
Voltage/frequency auto-restore blocked	00	1	
Voltage trip blocked	01	1	
Frequency trip blocked	02	1	
SGF target	03	1	
Ground fault target	04	1	
Phase 5-6 fault target	05	1	
Phase 3-4 fault target	06	1	
Phase 1-2 fault target	07	1	
AC power present	08	1	
Control OK	09	1	
Control lockout	10	1	
Recloser open	11	1	
Recloser closed	12	1	
Check Battery	13	1	
Recloser malfunction	14	1	
Reverse power flow	15	1	
Port status output from custom logic			
Normal profile active	16	1	
Fast trips disabled	17	1	
Battery test active	18	1	
Cold load pickup blocked	19	1	
Supervisory off	20	1	
Non reclosing active	21	1	
Ground trip blocked	22	1	
Above minimum trip	23	1	
Not used	24	1	
Not used	25	1	
Frequency trip target	26	1	
Voltage trip target	27	1	
Hot line tag active	28	1	
Alternate profile 3 active	29	1	
Alternate profile 2 active	30	1	
Alternate profile 1 active	31	1	
Port status output from custom logic			
Target counter on	32	1	
Operation counter on	33	1	
Duty accumulator on	34	1	

Description	Index	Default Event Class
Event recorder on	35	1
Data alarms on	36	1
Status alarms on	37	1
Data profiler on	38	1
Histograms on	39	1
* Z Phase voltage present	40	1
* Y Phase voltage present	41	1
* X Phase voltage present	42	1
Bushing 5-6 (* or C Phase) voltage present	43	1
Bushing 3-4 (* or B Phase) voltage present	44	1
Bushing 1-2 (* or A Phase) voltage present	45	1
SGF Block on	46	1
Active alarms present	47	1
Port status output from custom logic		
* Time delay 1 voltage transfer	48	1
* Source II disabled	49	1
* Source I disabled	50	1
* LS function disabled	51	1
* LS disabled	52	1
* LS not reset	53	1
* Tie active	54	1
* Sectionalizing active	55	1
Trip Circuit Disconnected	56	1
Control Door open	57	1
Not used	58	1
Not used	59	1
Not used	60	1
OCP lockout	61	1
* Time delay 3 LS auto reset	62	1
* Time delay 2 momentary function	63	1
* LS Controls Only		

F5 DNP 3.0 Device Profile data dictionary

INPUT SUBSYSTEM		
Binary Inputs		
Default Static Variation		Default Event Variation
Obj 01 Var 01 Binary input w/o status		Obj 02 Var 1 Binary input w/o time
Description	Index	Default Event Class
Port status output from custom logic		
Voltage/frequency auto-restore blocked	00	1
Voltage trip blocked	01	1
Frequency trip blocked	02	1
SGF target	03	1
Ground fault target	04	1
Phase 5-6 fault target	05	1
Phase 3-4 fault target	06	1
Phase 1-2 fault target	07	1
AC power present	08	1
Control OK	09	1
Control (or A Phase) lockout	10	1
Recloser (or A Phase) open	11	1
Recloser (or A Phase) closed	12	1
Check Battery	13	1
Recloser malfunction	14	1
Reverse power flow	15	1
Port status output from custom logic		
Normal profile active	16	1
Fast trips disabled	17	1
Battery test active	18	1
Cold load pickup blocked	19	1
Supervisory off	20	1
Non reclosing active	21	1
Ground trip blocked	22	1
Above minimum trip	23	1
Not used	24	1
Not used	25	1
Frequency trip target	26	1
Voltage trip target	27	1
Hot line tag active	28	1
Alternate profile 3 active	29	1
Alternate profile 2 active	30	1
Alternate profile 1 active	31	1
Port status output from custom logic		
Target counter on	32	1
Operation counter on	33	1
Duty accumulator on	34	1

Description	Index	Default Event Class
Event recorder on	35	1
Data alarms on	36	1
Status alarms on	37	1
Data profiler on	38	1
Histograms on	39	1
B Phase Lockout	40	1
B Phase Open	41	1
B Phase Closed	42	1
C Phase voltage present	43	1
B Phase voltage present	44	1
A Phase voltage present	45	1
SGF Block on	46	1
Active alarms present	47	1
Port status output from custom logic		
B Phase "Yellow Handle" Active	48	1
A Phase "Yellow Handle" Active	49	1
Single Phase Trip - Single Phase Lockout mode	50	1
Single Phase Trip - Three Phase Lockout mode	51	1
Three Phase Trip - Three Phase Lockout mode	52	1
C Phase Lockout	53	1
C Phase Open	54	1
C Phase Closed	55	1
Trip Circuit Disconnected	56	1
Control Door open	57	1
Not used	58	1
Not used	59	1
C Phase OCP Lockout	60	1
B Phase OCP Lockout	61	1
A Phase OCP Lockout	62	1
C Phase "Yellow Handle" Active	63	1

F5 DNP 3.0 Device Profile data dictionary

INPUT SUBSYSTEM

Counters

Description	Index	Default Event Class	Default Static Variation Obj 20 Var 2 16 bit Counter	Default Event Variation Obj 22 Var 2 16 bitCounter w/o time
Switch operation counters				
Number of phase 1-2 Operations	00	1		
Number of phase 3-4 Operations	01	1		
Number of phase 5-6 Operations	02	1		
Overcurrent protection target counters				
Number of phase 1-2 OCP targets	03	1		
Number of phase 3-4 OCP targets	04	1		
Number of phase 5-6 OCP targets	05	1		
Number of ground OCP targets	06	1		
Number of SGF OCP targets	07	1		
Number of adapted ground OCP targets	08	1		
Sequence coordination operation counters				
Number of phase 1-2 sequence coordination operations	09	2		
Number of phase 3-4 sequence coordination operations	10	2		
Number of phase 5-6 sequence coordination operations	11	2		
Number of ground sequence coordination operations	12	2		
Number of SGF sequence coordination operations	13	2		
Number of adapted ground sequence coordination operations	14	2		
Number of alarms information				
Number of inactive, unsuppressed & unchanged alarms	15	3		
Number of inactive, unsuppressed & changed alarms	16	3		
Number of inactive, suppressed & unchanged alarms	17	3		
Number of inactive, suppressed & changed alarms	18	3		
Number of active, unsuppressed & unchanged alarms	19	3		
Number of active, unsuppressed & changed alarms	20	3		
Number of active, suppressed & unchanged alarms	21	3		
Number of active, suppressed & changed alarms	22	3		
Number of profile records information				
Number of masked profile records	23	3		
Number of unmasked profile records	24	3		
Number of event records information				
Number of masked event records	25	1		
Number of unmasked event records	26	3		
Number of error event records information				

F5 DNP 3.0 Device Profile data dictionary

Description	Index	Default Event Class				
Number of masked error event records	27	1				
Number of unmasked error event records	28	3				
NOTE: Counters 15-28 roll over at 16 bits						

INPUT SUBSYSTEM				
Analog Inputs	Default Static Variation Obj 30 Var 2 16 bit			Default Event Variation Obj 32 Var 2 16 bit w/o time
Description	Index	Default Event Class	Multiplication Scale Factor	Units
Instantaneous current values				
Instantaneous current through bushing 1-2	00	2	0.1	Amps
Instantaneous current through bushing 3-4	01	2	0.1	Amps
Instantaneous current through bushing 5-6	02	2	0.1	Amps
Instantaneous ground current	03	2	0.1	Amps
Instantaneous souce-side line-to-neutral voltage				
Instantaneous voltage at bushing 1	04	2	2	Volts
Instantaneous voltage at bushing 3	05	2	2	Volts
Instantaneous voltage at bushing 5	06	2	2	Volts
Instantaneous power values				
Instantaneous power factor for phase 1-2	07	2	0.0001	
Instantaneous KVA for phase 1-2	08	2	1	KVA
Instantaneous KW for phase 1-2	09	2	1	KW
Instantaneous KVAR for phase 1-2	10	2	1	KVAR
Instantaneous power factor for phase 3-4	11	2	0.0001	
Instantaneous KVA for phase 3-4	12	2	1	KVA
Instantaneous KW for phase 3-4	13	2	1	KW
Instantaneous KVAR for phase 3-4	14	2	1	KVAR
Instantaneous power factor for phase 5-6	15	2	0.0001	
Instantaneous KVA for phase 5-6	16	2	1	KVA
Instantaneous KW for phase 5-6	17	2	1	KW
Instantaneous KVAR for phase 5-6	18	2	1	KVAR
Instantaneous total power factor	19	2	0.0001	
Instantaneous total KVA	20	2	1	KVA
Instantaneous total KW	21	2	1	KW
Instantaneous total KVAR	22	2	1	KVAR
Instantaneous current harmonic values				
Instantaneous THD current through bushing 1-2	23	3	0.01	%
Instantaneous THD current through bushing 3-4	24	3	0.01	%
Instantaneous THD current through bushing 5-6	25	3	0.01	%
Instantaneous THD ground current	26	3	0.01	%
Instantaneous voltage harmonic values				

Description	Index	Default Event Class	Multiplication Scale Factor	Units
Instantaneous THD voltage at bushing 1-2	27	3	0.01	%
Instantaneous THD voltage at bushing 3-4	28	3	0.01	%
Instantaneous THD voltage at bushing 5-6	29	3	0.01	%
Normal battery monitor parameters				
Unloaded battery voltage	30	3	0.01	Volts
Unloaded battery current	31	3	0.0001	Amps
Demand current values				
Demand current through bushing 1-2	32	2	0.1	Amps
Demand current through bushing 3-4	33	2	0.1	Amps
Demand current through bushing 5-6	34	2	0.1	Amps
Demand ground current	35	2	0.1	Amps
Demand voltage values				
Demand voltage at bushing 1-2	36	2	2	Volts
Demand voltage at bushing 3-4	37	2	2	Volts
Demand voltage at bushing 5-6	38	2	2	Volts
Demand power values				
Demand power factor for phase 1-2	39	2	0.0001	
Demand KVA for phase 1-2	40	2	1	KVA
Demand KW for phase 1-2	41	2	1	KW
Demand KVAR for phase 1-2	42	2	1	KVAR
Demand power factor for phase 3-4	43	2	0.0001	
Demand KVA for phase 3-4	44	2	1	KVA
Demand KW for phase 3-4	45	2	1	KW
Demand KVAR for phase 3-4	46	2	1	KVAR
Demand power factor for phase 5-6	47	2	0.0001	
Demand KVA for phase 5-6	48	2	1	KVA
Demand KW for phase 5-6	49	2	1	KW
Demand KVAR for phase 5-6	50	2	1	KVAR
Total Demand power factor	51	2	0.0001	
Total Demand KVA	52	2	1	KVA
Total Demand KW	53	2	1	KW
Total Demand KVAR	54	2	1	KVAR
Demand current harmonic values				
Demand THD current through bushing 1-2	55	3	0.01	%
Demand THD current through bushing 3-4	56	3	0.01	%
Demand THD current through bushing 5-6	57	3	0.01	%
Demand THD ground current	58	3	0.01	%

Description	Index	Default Event Class	Multiplication Scale Factor	Units
Demand voltage harmonic values				
Demand THD voltage at bushing 1-2	59	3	0.01	%
Demand THD voltage at bushing 3-4	60	3	0.01	%
Demand THD voltage at bushing 5-6	61	3	0.01	%
Duty accumulators information				
Phase 1-2 % Rated Duty Depleted	62	3	0.01	%
Phase 3-4 % Rated Duty Depleted	63	3	0.01	%
Phase 5-6 % Rated Duty Depleted	64	3	0.01	%
Instantaneous energy values				
Instantaneous energy through bushing 1-2	65	3	500	KWh
Instantaneous energy through bushing 3-4	66	3	500	KWh
Instantaneous energy through bushing 5-6	67	3	500	KWh
Total Instantaneous energy	68	3	500	KWh
Instantaneous source-side phase-to-phase voltage				
Instantaneous voltage from bushing 1 to 3	69	2	2	Volts
Instantaneous voltage from bushing 3 to 5	70	2	2	Volts
Instantaneous voltage from bushing 5 to 1	71	2	2	Volts
Demand phase-to-phase voltage values				
Demand voltage from bushing 1-2 to 3-4	72	2	2	Volts
Demand voltage from bushing 3-4 to 5-6	73	2	2	Volts
Demand voltage from bushing 5-6 to 1-2	74	2	2	Volts
Instantaneous load-side line-to-neutral voltage				
Instantaneous voltage at bushing 2	75	2	2	Volts
Instantaneous voltage at bushing 4	76	2	2	Volts
Instantaneous voltage at bushing 6	77	2	2	Volts
Instantaneous load-side phase-to-phase voltage				
Instantaneous voltage from bushing 2 to 4	78	2	2	Volts
Instantaneous voltage from bushing 4 to 6	79	2	2	Volts
Instantaneous voltage from bushing 6 to 2	80	2	2	Volts
Demand load-side line-to-neutral voltage				
Demand voltage at bushing 2	81	2	2	Volts
Demand voltage at bushing 4	82	2	2	Volts
Demand voltage at bushing 6	83	2	2	Volts
Instantaneous load-side phase-to-phase voltage				
Demand voltage from bushing 2 to 4	84	2	2	Volts
Demand voltage from bushing 4 to 6	85	2	2	Volts

Description	Index	Default Event Class	Multiplication Scale Factor	Units		
Demand voltage from bushing 6 to 2	86	2	2	Volts		
Instantaneous line frequency	87	1	0.005	Hz		
Instantaneous source-to-load side voltage difference						
Instantaneous voltage difference bushing 1 and 2	88	2	2	Volts		
Instantaneous voltage difference bushing 3 and 4	89	2	2	Volts		
Instantaneous voltage difference bushing 5 and 6	90	2	2	Volts		
Demand source-to-load side voltage difference						
Demand voltage difference bushing 1 and 2	91	2	2	Volts		
Demand voltage difference bushing 3 and 4	92	2	2	Volts		
Demand voltage difference bushing 5 and 6	93	2	2	Volts		
Most Recent Overcurrent Protection (OCP) info						
Year of most recent OCP event	94	0	1	Years		
Month of most recent OCP event	95	0	1	Months		
Day of most recent OCP event	96	0	1	Days		
Hour of most recent OCP event	97	0	1	Hours		
Minute of most recent OCP event	98	0	1	Minutes		
Second of most recent OCP event	99	0	1	Seconds		
Millisecond of most recent OCP event	100	0	1	Millisec		
Fault Current A phase from most recent OCP event	101	3	1	Amps		
Fault Current B phase from most recent OCP event	102	3	1	Amps		
Fault Current C phase from most recent OCP event	103	3	1	Amps		
Fault Current Ground from most recent OCP event	104	3	1	Amps		
Fault Distance from most recent OCP event	105	0	1			
Tested battery voltage	106	3	0.01	Volts		

OUTPUT SUBSYSTEM - Control Output Relay Block Operations and Status								
		Default Static Variation						
Description	Index	Obj	Var	Desc	Operation Type	Direct Operation Allowed	Default Condition	Comments
								Port Logic Input
Binary Output	00	12	01	CROB	Pulsed	X	Off	Cold load pickup Block
Binary Output	01	12	01	CROB	Latched	X	Off	Histogram off
Binary Output	02	12	01	CROB	Latched	X	Off	Profiler off
Binary Output	03	12	01	CROB	Latched	X	On	Status alarm recording on
Binary Output	04	12	01	CROB	Latched	X	On	Data alarm recording on
Binary Output	05	12	01	CROB	Latched	X	Off	Event Recorder off
Binary Output	06	12	01	CROB	Latched	X	Off	Test mode off
Binary Output	07	12	01	CROB	Pulsed	X	On	Normal profile enabled
Binary Output	08	12	01	CROB	Pulsed	X	Off	Alternate profile 1 enabled
Binary Output	09	12	01	CROB	Pulsed	X	Off	Alternate profile 2 enabled
Binary Output	10	12	01	CROB	Pulsed	X	Off	Alternate profile 3 enabled
Binary Output	11	12	01	CROB	Pulsed	X	Off	Non reclosing on
Binary Output	12	12	01	CROB	Pulsed	X	Off	Ground trip block on
Binary Output	13	12	01	CROB	Latched	X	Off	Hot line tag on
Binary Output	14	12	01	CROB	Pulsed	X	Off	Fast trips disabled
Binary Output	15	12	01	CROB	Pulsed	X	Off	Battery test on
Binary Output	16	12	01	CROB	Pulsed	X	Off	Lockout
Binary Output	17	12	01	CROB	Pulsed	X	Off	Close
Binary Output	18	12	01	CROB	Pulsed	X	Off	Reset targets
Binary Output	19	12	01	CROB	Pulsed	X	Off	SGF block on
Binary Output	20	12	01	CROB	Pulsed	X	Off	x Source I Disable
Binary Output	21	12	01	CROB	Pulsed	X	Off	x Source II Disable
Binary Output	22	12	01	CROB	Pulsed	X	Off	x LS Reset
Binary Output	23	12	01	CROB	Pulsed	X	Off	x LS Disable
Binary Output	24	12	01	CROB	Undefined	X	Undefined	Reserved
Binary Output	25	12	01	CROB	Undefined	X	Undefined	Reserved
Binary Output	26	12	01	CROB	Pulsed	X	Off	Frequency trip block
Binary Output	27	12	01	CROB	Pulsed	X	Off	Voltage trip block
Binary Output	28	12	01	CROB	Pulsed	X	Off	Voltage-frequency auto-restore block
Binary Output	29	12	01	CROB	Latched	X	Off	Combined Trip/Close
Binary Output	30 - 63	12	01	CROB	Undefined	X	Undefined	Reserved
								Assorted Histogram Resets
Binary Output	64	12	01	CROB	Pulsed	X	Off	Reset ALL histograms
Binary Output	65	12	01	CROB	Pulsed	X	Off	Reset Phase 1-2 current histogram
Binary Output	66	12	01	CROB	Pulsed	X	Off	Reset Phase 3-4 current histogram
Binary Output	67	12	01	CROB	Pulsed	X	Off	Reset Phase 5-6 current histogram
Binary Output	68	12	01	CROB	Pulsed	X	Off	Reset Ground current histogram
Binary Output	69	12	01	CROB	Pulsed	X	Off	Reset Phase 1 voltage histogram
Binary Output	70	12	01	CROB	Pulsed	X	Off	Reset Phase 3 voltage histogram
Binary Output	71	12	01	CROB	Pulsed	X	Off	Reset Phase 5 voltage histogram

Description	Index	Default Static Variation			Operation Type	Direct Operation Allowed	Default Condition	Comments
		Obj	Var	Desc				
Binary Output	72	12	01	CROB	Pulsed	X	Off	Reset Phase 1-2 power factor histogram
Binary Output	73	12	01	CROB	Pulsed	X	Off	Reset Phase 1-2 KVA histogram
Binary Output	74	12	01	CROB	Pulsed	X	Off	Reset Phase 1-2 KW histogram
Binary Output	75	12	01	CROB	Pulsed	X	Off	Reset Phase 1-2 KVAR histogram
Binary Output	76	12	01	CROB	Pulsed	X	Off	Reset Phase 3-4 power factor histogram
Binary Output	77	12	01	CROB	Pulsed	X	Off	Reset Phase 3-4 KVA histogram
Binary Output	78	12	01	CROB	Pulsed	X	Off	Reset Phase 3-4 KW histogram
Binary Output	79	12	01	CROB	Pulsed	X	Off	Reset Phase 3-4 KVAR histogram
Binary Output	80	12	01	CROB	Pulsed	X	Off	Reset Phase 5-6 power factor histogram
Binary Output	81	12	01	CROB	Pulsed	X	Off	Reset Phase 5-6 KVA histogram
Binary Output	82	12	01	CROB	Pulsed	X	Off	Reset Phase 5-6 KW histogram
Binary Output	83	12	01	CROB	Pulsed	X	Off	Reset Phase 5-6 KVAR histogram
Binary Output	84	12	01	CROB	Pulsed	X	Off	Reset Phase Total power factor histogram
Binary Output	85	12	01	CROB	Pulsed	X	Off	Reset Phase Total KVA histogram
Binary Output	86	12	01	CROB	Pulsed	X	Off	Reset Phase Total KW histogram
Binary Output	87	12	01	CROB	Pulsed	X	Off	Reset Phase Total KVAR histogram
Binary Output	88	12	01	CROB	Pulsed	X	Off	Reset Positive sequence current magnitude
Binary Output	89	12	01	CROB	Pulsed	X	Off	Reset Positive sequence current angle
Binary Output	90	12	01	CROB	Pulsed	X	Off	Reset Negative sequence current magnitude
Binary Output	91	12	01	CROB	Pulsed	X	Off	Reset Negative sequence current angle
Binary Output	92	12	01	CROB	Pulsed	X	Off	Reset Zero sequence current magnitude
Binary Output	93	12	01	CROB	Pulsed	X	Off	Reset Zero sequence current angle
Binary Output	94	12	01	CROB	Pulsed	X	Off	Reset Positive sequence voltage magnitude
Binary Output	95	12	01	CROB	Pulsed	X	Off	Reset Positive sequence voltage angle
Binary Output	96	12	01	CROB	Pulsed	X	Off	Reset Negative sequence voltage magnitude
Binary Output	97	12	01	CROB	Pulsed	X	Off	Reset Negative sequence voltage angle
Binary Output	98	12	01	CROB	Pulsed	X	Off	Reset Phase 1-2 current THD histogram
Binary Output	99	12	01	CROB	Pulsed	X	Off	Reset Phase 3-4 current THD histogram
Binary Output	100	12	01	CROB	Pulsed	X	Off	Reset Phase 5-6 current THD histogram
Binary Output	101	12	01	CROB	Pulsed	X	Off	Reset Ground current THD histogram
Binary Output	102	12	01	CROB	Pulsed	X	Off	Reset Phase 1-2 voltage THD histogram
Binary Output	103	12	01	CROB	Pulsed	X	Off	Reset Phase 3-4 voltage THD histogram
Binary Output	104	12	01	CROB	Pulsed	X	Off	Reset Phase 5-6 voltage THD histogram
Binary Output	105	12	01	CROB	Pulsed	X	Off	Calibration Reset
Binary Output	106	12	01	CROB	Pulsed	X	Off	OCP Target Reset
Binary Output	107	12	01	CROB	Latched	X	Off	Alarm suppression on
Binary Output	108	12	01	CROB	Pulsed	X	Off	Unmask all system event recorder entries
Binary Output	109	12	01	CROB	Pulsed	X	Off	Mask all system event recorder entries
Binary Output	110	12	01	CROB	Pulsed	X	Off	Unmask all error event recorder entries
Binary Output	111	12	01	CROB	Pulsed	X	Off	Mask all error event recorder entries
Binary Output	112	12	01	CROB	Pulsed	X	Off	Unmask all profile recorder entries
Binary Output	113	12	01	CROB	Pulsed	X	Off	Mask all profile recorder entries
Binary Output	114	12	01	CROB	Pulsed	X	Off	Reset kWh

CROB

Description	Index	Default Static Variation Obj	Var	Desc	Operation Type	Direct Operation Allowed	Default Condition	Comments
Binary Output	115	12	01	CROB	Pulsed	X	Off	Reset Phase 1-3 voltage histogram
Binary Output	116	12	01	CROB	Pulsed	X	Off	Reset Phase 3-5 voltage histogram
Binary Output	117	12	01	CROB	Pulsed	X	Off	Reset Phase 5-1 voltage histogram
Binary Output	118	12	01	CROB	Pulsed	X	Off	Reset Phase 1 voltage histogram
Binary Output	119	12	01	CROB	Pulsed	X	Off	Reset Phase 3 voltage histogram
Binary Output	120	12	01	CROB	Pulsed	X	Off	Reset Phase 5 voltage histogram
Binary Output	121	12	01	CROB	Pulsed	X	Off	Reset Phase 2 voltage histogram
Binary Output	122	12	01	CROB	Pulsed	X	Off	Reset Phase 4 voltage histogram
Binary Output	123	12	01	CROB	Pulsed	X	Off	Reset Phase 6 voltage histogram
Binary Output	124	12	01	CROB	Pulsed	X	Off	Reset Line frequency histogram
Binary Output	125	12	01	CROB	Pulsed	X	Off	Reset Phase 1-2 voltage difference histogram
Binary Output	126	12	01	CROB	Pulsed	X	Off	Reset Phase 3-4 voltage difference histogram
Binary Output	127	12	01	CROB	Pulsed	X	Off	Reset Phase 5-6 voltage difference histogram
Binary Output	00	10	02	Status				Port Logic Input Status
Binary Output	01	10	02	Status				* Cold load pickup Block
Binary Output	02	10	02	Status				Histogram off
Binary Output	03	10	02	Status				Profiler off
Binary Output	04	10	02	Status				Status alarm recording on
Binary Output	05	10	02	Status				Data alarm recording on
Binary Output	06	10	02	Status				Event Recorder off
Binary Output	07	10	02	Status				Test mode off
Binary Output	08	10	02	Status				* Normal profile enabled
Binary Output	09	10	02	Status				* Alternate profile 1 enabled
Binary Output	10	10	02	Status				* Alternate profile 2 enabled
Binary Output	11	10	02	Status				* Alternate profile 3 enabled
Binary Output	12	10	02	Status				* Non reclosing on
Binary Output	13	10	02	Status				* Ground trip block on
Binary Output	14	10	02	Status				Hot line tag on
Binary Output	15	10	02	Status				* Fast trips disabled
Binary Output	16	10	02	Status				* Battery test on
Binary Output	17	10	02	Status				* Lockout
Binary Output	18	10	02	Status				* Close
Binary Output	19	10	02	Status				* Reset targets
Binary Output	20	10	02	Status				* SGF block on
Binary Output	21	10	02	Status				*x Source I Disable
Binary Output	22	10	02	Status				*x Source II Disable
Binary Output	23	10	02	Status				*x LS Reset
Binary Output	24	10	02	Status				*x LS Disable
Binary Output	25	10	02	Status				Reserved
Binary Output	26	10	02	Status				Reserved
Binary Output	27	10	02	Status				* Frequency trip block
Binary Output	28	10	02	Status				* Voltage trip block
Binary Output		10	02	Status				* Voltage-frequency auto-restore block

Description	Index	Default Static Variation			Operation Type	Direct Operation Allowed	Default Condition	Comments
		Obj	Var	Desc				
Binary Output	29	10	02	Status				Combined Trip/Close
Binary Output	30 - 63	10	02	Status				Reserved
								Assorted Histogram Resets
Binary Output	64	10	02	Status				* Reset ALL histograms
Binary Output	65	10	02	Status				* Reset Phase 1-2 current histogram
Binary Output	66	10	02	Status				* Reset Phase 3-4 current histogram
Binary Output	67	10	02	Status				* Reset Phase 5-6 current histogram
Binary Output	68	10	02	Status				* Reset Ground current histogram
Binary Output	69	10	02	Status				* Reset Phase 1 voltage histogram
Binary Output	70	10	02	Status				* Reset Phase 3 voltage histogram
Binary Output	71	10	02	Status				* Reset Phase 5 voltage histogram
Binary Output	72	10	02	Status				* Reset Phase 1-2 power factor histogram
Binary Output	73	10	02	Status				* Reset Phase 1-2 KVA histogram
Binary Output	74	10	02	Status				* Reset Phase 1-2 KW histogram
Binary Output	75	10	02	Status				* Reset Phase 1-2 KVAR histogram
Binary Output	76	10	02	Status				* Reset Phase 3-4 power factor histogram
Binary Output	77	10	02	Status				* Reset Phase 3-4 KVA histogram
Binary Output	78	10	02	Status				* Reset Phase 3-4 KW histogram
Binary Output	79	10	02	Status				* Reset Phase 3-4 KVAR histogram
Binary Output	80	10	02	Status				* Reset Phase 5-6 power factor histogram
Binary Output	81	10	02	Status				* Reset Phase 5-6 KVA histogram
Binary Output	82	10	02	Status				* Reset Phase 5-6 KW histogram
Binary Output	83	10	02	Status				* Reset Phase 5-6 KVAR histogram
Binary Output	84	10	02	Status				* Reset Phase Total power factor histogram
Binary Output	85	10	02	Status				* Reset Phase Total KVA histogram
Binary Output	86	10	02	Status				* Reset Phase Total KW histogram
Binary Output	87	10	02	Status				* Reset Phase Total KVAR histogram
Binary Output	88	10	02	Status				* Reset Positive sequence current magnitude
Binary Output	89	10	02	Status				* Reset Positive sequence current angle
Binary Output	90	10	02	Status				* Reset Negative sequence current magnitude
Binary Output	91	10	02	Status				* Reset Negative sequence current angle
Binary Output	92	10	02	Status				* Reset Zero sequence current magnitude
Binary Output	93	10	02	Status				* Reset Zero sequence current angle
Binary Output	94	10	02	Status				* Reset Positive sequence voltage magnitude
Binary Output	95	10	02	Status				* Reset Positive sequence voltage angle
Binary Output	96	10	02	Status				* Reset Negative sequence voltage magnitude
Binary Output	97	10	02	Status				* Reset Negative sequence voltage angle
Binary Output	98	10	02	Status				* Reset Phase 1-2 current THD histogram
Binary Output	99	10	02	Status				* Reset Phase 3-4 current THD histogram
Binary Output	100	10	02	Status				* Reset Phase 5-6 current THD histogram
Binary Output	101	10	02	Status				* Reset Ground current THD histogram
Binary Output	102	10	02	Status				* Reset Phase 1-2 voltage THD histogram
Binary Output	103	10	02	Status				* Reset Phase 3-4 voltage THD histogram

Description	Index	Default Static Variation			Operation Type	Direct Operation Allowed	Default Condition	Comments
		Obj	Var	Desc				
Binary Output	104	10	02	Status				* Reset Phase 5-6 voltage THD histogram
Binary Output	105	10	02	Status				* Calibration Reset
Binary Output	106	10	02	Status				* OCP Target Reset
Binary Output	107	10	02	Status				Alarm suppression on
Binary Output	108	10	02	Status				* Unmask all system event recorder entries
Binary Output	109	10	02	Status				* Mask all system event recorder entries
Binary Output	110	10	02	Status				* Unmask all error event recorder entries
Binary Output	111	10	02	Status				* Mask all error event recorder entries
Binary Output	112	10	02	Status				* Unmask all profile recorder entries
Binary Output	113	10	02	Status				* Mask all profile recorder entries
Binary Output	114	10	02	Status				* Reset kWh
Binary Output	115	10	02	Status				* Reset Phase 1-3 voltage histogram
Binary Output	116	10	02	Status				* Reset Phase 3-5 voltage histogram
Binary Output	117	10	02	Status				* Reset Phase 5-1 voltage histogram
Binary Output	118	10	02	Status				* Reset Phase 1 voltage histogram
Binary Output	119	10	02	Status				* Reset Phase 3 voltage histogram
Binary Output	120	10	02	Status				* Reset Phase 5 voltage histogram
Binary Output	121	10	02	Status				* Reset Phase 2 voltage histogram
Binary Output	122	10	02	Status				* Reset Phase 4 voltage histogram
Binary Output	123	10	02	Status				* Reset Phase 6 voltage histogram
Binary Output	124	10	02	Status				* Reset Line frequency histogram
Binary Output	125	10	02	Status				* Reset Phase 1-2 voltage difference histogram
Binary Output	126	10	02	Status				* Reset Phase 3-4 voltage difference histogram
Binary Output	127	10	02	Status				* Reset Phase 5-6 voltage difference histogram
								* Non-latching inputs, always read FALSE
								x LS Controls Only

OUTPUT SUBSYSTEM - Control Output Relay Block Operations and Status								
		Default Static Variation						
Description	Index	Obj	Var	Desc	Operation Type	Direct Operation Allowed	Default Condition	Comments
								Port Logic Input
Binary Output	00	12	01	CROB	Pulsed	X	Off	Cold load pickup Block
Binary Output	01	12	01	CROB	Latched	X	Off	Histogram off
Binary Output	02	12	01	CROB	Latched	X	Off	Profiler off
Binary Output	03	12	01	CROB	Latched	X	On	Status alarm recording on
Binary Output	04	12	01	CROB	Latched	X	On	Data alarm recording on
Binary Output	05	12	01	CROB	Latched	X	Off	Event Recorder off
Binary Output	06	12	01	CROB	Latched	X	Off	Test mode off
Binary Output	07	12	01	CROB	Pulsed	X	On	Normal profile enabled
Binary Output	08	12	01	CROB	Pulsed	X	Off	Alternate profile 1 enabled
Binary Output	09	12	01	CROB	Pulsed	X	Off	Alternate profile 2 enabled
Binary Output	10	12	01	CROB	Pulsed	X	Off	Alternate profile 3 enabled
Binary Output	11	12	01	CROB	Pulsed	X	Off	Non reclosing on
Binary Output	12	12	01	CROB	Pulsed	X	Off	Ground trip block on
Binary Output	13	12	01	CROB	Latched	X	Off	Hot line tag on
Binary Output	14	12	01	CROB	Pulsed	X	Off	Fast trips disabled
Binary Output	15	12	01	CROB	Pulsed	X	Off	Battery test on
Binary Output	16	12	01	CROB	Pulsed	X	Off	Phase A Trip/Lockout
Binary Output	17	12	01	CROB	Pulsed	X	Off	Phase A Close
Binary Output	18	12	01	CROB	Pulsed	X	Off	Reset targets
Binary Output	19	12	01	CROB	Pulsed	X	Off	SGF block on
Binary Output	20	12	01	CROB	Pulsed	X	Off	Phase B Trip/Lockout
Binary Output	21	12	01	CROB	Pulsed	X	Off	Phase B Close
Binary Output	22	12	01	CROB	Pulsed	X	Off	Phase C Trip/Lockout
Binary Output	23	12	01	CROB	Pulsed	X	Off	Phase C Close
Binary Output	24	12	01	CROB	Pulsed	X	Off	All Phases Trip/Lockout
Binary Output	25	12	01	CROB	Pulsed	X	Off	All Phases Close
Binary Output	26	12	01	CROB	Pulsed	X	Off	Frequency trip block
Binary Output	27	12	01	CROB	Pulsed	X	Off	Voltage trip block
Binary Output	28	12	01	CROB	Pulsed	X	Off	Voltage-frequency auto-restore block
Binary Output	29	12	01	CROB	Latched	X	Off	Phase A Combined Trip/Close
Binary Output	30	12	01	CROB	Latched	X	Off	Phase B Combined Trip/Close
Binary Output	31	12	01	CROB	Latched	X	Off	Phase C Combined Trip/Close
Binary Output	32 - 63	12	01	CROB	Undefined	X	Undefined	Reserved
								Assorted Histogram Resets
Binary Output	64	12	01	CROB	Pulsed	X	Off	Reset ALL histograms
Binary Output	65	12	01	CROB	Pulsed	X	Off	Reset Phase 1-2 current histogram
Binary Output	66	12	01	CROB	Pulsed	X	Off	Reset Phase 3-4 current histogram
Binary Output	67	12	01	CROB	Pulsed	X	Off	Reset Phase 5-6 current histogram
Binary Output	68	12	01	CROB	Pulsed	X	Off	Reset Ground current histogram
Binary Output	69	12	01	CROB	Pulsed	X	Off	Reset Phase 1 voltage histogram

Description	Index	Default Static Variation			Operation Type	Direct Operation Allowed	Default Condition	Comments
		Obj	Var	Desc				
Binary Output	70	12	01	CROB	Pulsed	X	Off	Reset Phase 3 voltage histogram
Binary Output	71	12	01	CROB	Pulsed	X	Off	Reset Phase 5 voltage histogram
Binary Output	72	12	01	CROB	Pulsed	X	Off	Reset Phase 1-2 power factor histogram
Binary Output	73	12	01	CROB	Pulsed	X	Off	Reset Phase 1-2 KVA histogram
Binary Output	74	12	01	CROB	Pulsed	X	Off	Reset Phase 1-2 KW histogram
Binary Output	75	12	01	CROB	Pulsed	X	Off	Reset Phase 1-2 KVAR histogram
Binary Output	76	12	01	CROB	Pulsed	X	Off	Reset Phase 3-4 power factor histogram
Binary Output	77	12	01	CROB	Pulsed	X	Off	Reset Phase 3-4 KVA histogram
Binary Output	78	12	01	CROB	Pulsed	X	Off	Reset Phase 3-4 KW histogram
Binary Output	79	12	01	CROB	Pulsed	X	Off	Reset Phase 3-4 KVAR histogram
Binary Output	80	12	01	CROB	Pulsed	X	Off	Reset Phase 5-6 power factor histogram
Binary Output	81	12	01	CROB	Pulsed	X	Off	Reset Phase 5-6 KVA histogram
Binary Output	82	12	01	CROB	Pulsed	X	Off	Reset Phase 5-6 KW histogram
Binary Output	83	12	01	CROB	Pulsed	X	Off	Reset Phase 5-6 KVAR histogram
Binary Output	84	12	01	CROB	Pulsed	X	Off	Reset Phase Total power factor histogram
Binary Output	85	12	01	CROB	Pulsed	X	Off	Reset Phase Total KVA histogram
Binary Output	86	12	01	CROB	Pulsed	X	Off	Reset Phase Total KW histogram
Binary Output	87	12	01	CROB	Pulsed	X	Off	Reset Phase Total KVAR histogram
Binary Output	88	12	01	CROB	Pulsed	X	Off	Reset Positive sequence current magnitude
Binary Output	89	12	01	CROB	Pulsed	X	Off	Reset Positive sequence current angle
Binary Output	90	12	01	CROB	Pulsed	X	Off	Reset Negative sequence current magnitude
Binary Output	91	12	01	CROB	Pulsed	X	Off	Reset Negative sequence current angle
Binary Output	92	12	01	CROB	Pulsed	X	Off	Reset Zero sequence current magnitude
Binary Output	93	12	01	CROB	Pulsed	X	Off	Reset Zero sequence current angle
Binary Output	94	12	01	CROB	Pulsed	X	Off	Reset Positive sequence voltage magnitude
Binary Output	95	12	01	CROB	Pulsed	X	Off	Reset Positive sequence voltage angle
Binary Output	96	12	01	CROB	Pulsed	X	Off	Reset Negative sequence voltage magnitude
Binary Output	97	12	01	CROB	Pulsed	X	Off	Reset Negative sequence voltage angle
Binary Output	98	12	01	CROB	Pulsed	X	Off	Reset Phase 1-2 current THD histogram
Binary Output	99	12	01	CROB	Pulsed	X	Off	Reset Phase 3-4 current THD histogram
Binary Output	100	12	01	CROB	Pulsed	X	Off	Reset Phase 5-6 current THD histogram
Binary Output	101	12	01	CROB	Pulsed	X	Off	Reset Ground current THD histogram
Binary Output	102	12	01	CROB	Pulsed	X	Off	Reset Phase 1-2 voltage THD histogram
Binary Output	103	12	01	CROB	Pulsed	X	Off	Reset Phase 3-4 voltage THD histogram
Binary Output	104	12	01	CROB	Pulsed	X	Off	Reset Phase 5-6 voltage THD histogram
Binary Output	105	12	01	CROB	Pulsed	X	Off	Calibration Reset
Binary Output	106	12	01	CROB	Pulsed	X	Off	OCP Target Reset
Binary Output	107	12	01	CROB	Latched	X	Off	Alarm suppression on
Binary Output	108	12	01	CROB	Pulsed	X	Off	Unmask all system event recorder entries
Binary Output	109	12	01	CROB	Pulsed	X	Off	Mask all system event recorder entries
Binary Output	110	12	01	CROB	Pulsed	X	Off	Unmask all error event recorder entries
Binary Output	111	12	01	CROB	Pulsed	X	Off	Mask all error event recorder entries
Binary Output	112	12	01	CROB	Pulsed	X	Off	Unmask all profile recorder entries

Description	Index	Default Static Variation			Operation Type	Direct Operation Allowed	Default Condition	Comments
		Obj	Var	Desc				
Binary Output	113	12	01	CROB	Pulsed	X	Off	Mask all profile recorder entries
Binary Output	114	12	01	CROB	Pulsed	X	Off	Reset kWh
Binary Output	115	12	01	CROB	Pulsed	X	Off	Reset Phase 1-3 voltage histogram
Binary Output	116	12	01	CROB	Pulsed	X	Off	Reset Phase 3-5 voltage histogram
Binary Output	117	12	01	CROB	Pulsed	X	Off	Reset Phase 5-1 voltage histogram
Binary Output	118	12	01	CROB	Pulsed	X	Off	Reset Phase 1 voltage histogram
Binary Output	119	12	01	CROB	Pulsed	X	Off	Reset Phase 3 voltage histogram
Binary Output	120	12	01	CROB	Pulsed	X	Off	Reset Phase 5 voltage histogram
Binary Output	121	12	01	CROB	Pulsed	X	Off	Reset Phase 2 voltage histogram
Binary Output	122	12	01	CROB	Pulsed	X	Off	Reset Phase 4 voltage histogram
Binary Output	123	12	01	CROB	Pulsed	X	Off	Reset Phase 6 voltage histogram
Binary Output	124	12	01	CROB	Pulsed	X	Off	Reset Line frequency histogram
Binary Output	125	12	01	CROB	Pulsed	X	Off	Reset Phase 1-2 voltage difference histogram
Binary Output	126	12	01	CROB	Pulsed	X	Off	Reset Phase 3-4 voltage difference histogram
Binary Output	127	12	01	CROB	Pulsed	X	Off	Reset Phase 5-6 voltage difference histogram
								Port Logic Input Status
Binary Output	00	10	02	Status				* Cold load pickup Block
Binary Output	01	10	02	Status				Histogram off
Binary Output	02	10	02	Status				Profiler off
Binary Output	03	10	02	Status				Status alarm recording on
Binary Output	04	10	02	Status				Data alarm recording on
Binary Output	05	10	02	Status				Event Recorder off
Binary Output	06	10	02	Status				Test mode off
Binary Output	07	10	02	Status				* Normal profile enabled
Binary Output	08	10	02	Status				* Alternate profile 1 enabled
Binary Output	09	10	02	Status				* Alternate profile 2 enabled
Binary Output	10	10	02	Status				* Alternate profile 3 enabled
Binary Output	11	10	02	Status				* Non reclosing on
Binary Output	12	10	02	Status				* Ground trip block on
Binary Output	13	10	02	Status				Hot line tag on
Binary Output	14	10	02	Status				* Fast trips disabled
Binary Output	15	10	02	Status				* Battery test on
Binary Output	16	10	02	Status				* Phase A Trip/Lockout
Binary Output	17	10	02	Status				* Phase A Close
Binary Output	18	10	02	Status				* Reset targets
Binary Output	19	10	02	Status				* SGF block on
Binary Output	20	10	02	Status				* Phase B Trip/Lockout
Binary Output	21	10	02	Status				* Phase B Close
Binary Output	22	10	02	Status				* Phase C Trip/Lockout
Binary Output	23	10	02	Status				* Phase C Close
Binary Output	24	10	02	Status				* All Phases Trip/Lockout
Binary Output	25	10	02	Status				* All Phases Close
Binary Output	26	10	02	Status				* Frequency trip block

Description	Index	Default Static Variation			Operation Type	Direct Operation Allowed	Default Condition	Comments
		Obj	Var	Desc				
Binary Output	27	10	02	Status	Status			* Voltage trip block
Binary Output	28	10	02	Status	Status			* Voltage-frequency auto-restore block
Binary Output	29	10	02	Status	Status			Phase A Combined Trip/Close
Binary Output	30	10	02	Status	Status			Phase B Combined Trip/Close
Binary Output	31	10	02	Status	Status			Phase C Combined Trip/Close
Binary Output	32 - 63	10	02	Status	Status			Reserved
								Assorted Histogram Resets
Binary Output	64	10	02	Status	Status			* Reset ALL histograms
Binary Output	65	10	02	Status	Status			* Reset Phase 1-2 current histogram
Binary Output	66	10	02	Status	Status			* Reset Phase 3-4 current histogram
Binary Output	67	10	02	Status	Status			* Reset Phase 5-6 current histogram
Binary Output	68	10	02	Status	Status			* Reset Ground current histogram
Binary Output	69	10	02	Status	Status			* Reset Phase 1 voltage histogram
Binary Output	70	10	02	Status	Status			* Reset Phase 3 voltage histogram
Binary Output	71	10	02	Status	Status			* Reset Phase 5 voltage histogram
Binary Output	72	10	02	Status	Status			* Reset Phase 1-2 power factor histogram
Binary Output	73	10	02	Status	Status			* Reset Phase 1-2 KVA histogram
Binary Output	74	10	02	Status	Status			* Reset Phase 1-2 KW histogram
Binary Output	75	10	02	Status	Status			* Reset Phase 1-2 KVAR histogram
Binary Output	76	10	02	Status	Status			* Reset Phase 3-4 power factor histogram
Binary Output	77	10	02	Status	Status			* Reset Phase 3-4 KVA histogram
Binary Output	78	10	02	Status	Status			* Reset Phase 3-4 KW histogram
Binary Output	79	10	02	Status	Status			* Reset Phase 3-4 KVAR histogram
Binary Output	80	10	02	Status	Status			* Reset Phase 5-6 power factor histogram
Binary Output	81	10	02	Status	Status			* Reset Phase 5-6 KVA histogram
Binary Output	82	10	02	Status	Status			* Reset Phase 5-6 KW histogram
Binary Output	83	10	02	Status	Status			* Reset Phase 5-6 KVAR histogram
Binary Output	84	10	02	Status	Status			* Reset Phase Total power factor histogram
Binary Output	85	10	02	Status	Status			* Reset Phase Total KVA histogram
Binary Output	86	10	02	Status	Status			* Reset Phase Total KW histogram
Binary Output	87	10	02	Status	Status			* Reset Phase Total KVAR histogram
Binary Output	88	10	02	Status	Status			* Reset Positive sequence current magnitude
Binary Output	89	10	02	Status	Status			* Reset Positive sequence current angle
Binary Output	90	10	02	Status	Status			* Reset Negative sequence current magnitude
Binary Output	91	10	02	Status	Status			* Reset Negative sequence current angle
Binary Output	92	10	02	Status	Status			* Reset Zero sequence current magnitude
Binary Output	93	10	02	Status	Status			* Reset Zero sequence current angle
Binary Output	94	10	02	Status	Status			* Reset Positive sequence voltage magnitude
Binary Output	95	10	02	Status	Status			* Reset Positive sequence voltage angle
Binary Output	96	10	02	Status	Status			* Reset Negative sequence voltage magnitude
Binary Output	97	10	02	Status	Status			* Reset Negative sequence voltage angle
Binary Output	98	10	02	Status	Status			* Reset Phase 1-2 current THD histogram
Binary Output	99	10	02	Status	Status			* Reset Phase 3-4 current THD histogram

Description	Index	Default Static Variation			Operation Type	Direct Operation Allowed	Default Condition	Comments
		Obj	Var	Desc				
Binary Output	100	10	02	Status				* Reset Phase 5-6 current THD histogram
Binary Output	101	10	02	Status				* Reset Ground current THD histogram
Binary Output	102	10	02	Status				* Reset Phase 1-2 voltage THD histogram
Binary Output	103	10	02	Status				* Reset Phase 3-4 voltage THD histogram
Binary Output	104	10	02	Status				* Reset Phase 5-6 voltage THD histogram
Binary Output	105	10	02	Status				* Calibration Reset
Binary Output	106	10	02	Status				* OCP Target Reset
Binary Output	107	10	02	Status				Alarm suppression on
Binary Output	108	10	02	Status				* Unmask all system event recorder entries
Binary Output	109	10	02	Status				* Mask all system event recorder entries
Binary Output	110	10	02	Status				* Unmask all error event recorder entries
Binary Output	111	10	02	Status				* Mask all error event recorder entries
Binary Output	112	10	02	Status				* Unmask all profile recorder entries
Binary Output	113	10	02	Status				* Mask all profile recorder entries
Binary Output	114	10	02	Status				* Reset kWh
Binary Output	115	10	02	Status				* Reset Phase 1-3 voltage histogram
Binary Output	116	10	02	Status				* Reset Phase 3-5 voltage histogram
Binary Output	117	10	02	Status				* Reset Phase 5-1 voltage histogram
Binary Output	118	10	02	Status				* Reset Phase 1 voltage histogram
Binary Output	119	10	02	Status				* Reset Phase 3 voltage histogram
Binary Output	120	10	02	Status				* Reset Phase 5 voltage histogram
Binary Output	121	10	02	Status				* Reset Phase 2 voltage histogram
Binary Output	122	10	02	Status				* Reset Phase 4 voltage histogram
Binary Output	123	10	02	Status				* Reset Phase 6 voltage histogram
Binary Output	124	10	02	Status				* Reset Line frequency histogram
Binary Output	125	10	02	Status				* Reset Phase 1-2 voltage difference histogram
Binary Output	126	10	02	Status				* Reset Phase 3-4 voltage difference histogram
Binary Output	127	10	02	Status				* Reset Phase 5-6 voltage difference histogram
								* Non-latching inputs, always read FALSE
								x LS Controls Only

CONSTANT DATA (Read-only)

Description	Index	Obj	Var	Desc	File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
File Identifier		70	01		ID001	00	"Readme File" - Interesting information about control	200	0000
File Identifier		70	01		ID002	00	Control manufacturing information		
							Control type identifier	4	0000
							Software version	4	0004
							Data dictionary version	4	0008
							Catalog part number of control	21	000C
							Serial number of control	21	0021
							Customization (custom logic) identifier	21	0036
							Pad	1	004B
							Date of final test	2	004C
							Time of final test	4	004E
							Obligatory copyright	81	0052
							Pad	1	00A3
File Identifier		70	01		CO001	00	Presently connected comm port and protocol information		
							Comm port ID	2	0000
							Protocol ID	22	0002
							Protocol version	4	0018
							Protocol revision	4	001C
						01	Comm port 1 port and protocol information		
							Comm port ID	2	0000
							Protocol ID	22	0002
							Protocol version	4	0018
							Protocol revision	4	001C
						02	Comm port 2 port and protocol information		
							Comm port ID	2	0000
							Protocol ID	22	0002
							Protocol version	4	0018
							Protocol revision	4	001C
						03	Comm port 3 port and protocol information		
							Comm port ID	2	0000
							Protocol ID	22	0002
							Protocol version	4	0018
							Protocol revision	4	001C

HISTORICAL and MISC. LIVE DATA (Read-only)

Description	Index	Static Obj	Var	Desc	File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
File Identifier		70	01	01	HS001	00	Current Fundamental Histogram		
							Phase 1-2 Current Under Band Bin	2	0000
							Phase 1-2 Current Bin 1	2	0002
							Phase 1-2 Current Bin 2	2	0004
							Phase 1-2 Current Bin 3	2	0006
							Phase 1-2 Current Bin 4	2	0008
							Phase 1-2 Current Bin 5	2	000A
							Phase 1-2 Current Bin 6	2	000C
							Phase 1-2 Current Bin 7	2	000E
							Phase 1-2 Current Bin 8	2	0010
							Phase 1-2 Current Bin 9	2	0012
							Phase 1-2 Current Bin 10	2	0014
							Phase 1-2 Current Over Band Bin	2	0016
							Max Phase 1-2 Demand Sample	4	0018
							Date of Max Phase 1-2 Demand Sample	2	001C
							Time of Max Phase 1-2 Demand Sample	4	001E
							Min Phase 1-2 Demand Sample	4	0022
							Date of Min Phase 1-2 Demand Sample	2	0026
							Time of Min Phase 1-2 Demand Sample	4	0028
							Date of Phase 1-2 Demand Record Clear	2	002C
							Time of Phase 1-2 Demand Record Clear	4	002E
						01	Phase 3-4 Current Under Band Bin	2	0000
							Phase 3-4 Current Bin 1	2	0002
							Phase 3-4 Current Bin 2	2	0004
							Phase 3-4 Current Bin 3	2	0006
							Phase 3-4 Current Bin 4	2	0008
							Phase 3-4 Current Bin 5	2	000A
							Phase 3-4 Current Bin 6	2	000C
							Phase 3-4 Current Bin 7	2	000E
							Phase 3-4 Current Bin 8	2	0010
							Phase 3-4 Current Bin 9	2	0012
							Phase 3-4 Current Bin 10	2	0014
							Phase 3-4 Current Over Band Bin	2	0016
							Max Phase 3-4 Demand Sample	4	0018
							Date of Max Phase 3-4 Demand Sample	2	001C
							Time of Max Phase 3-4 Demand Sample	4	001E
							Min Phase 3-4 Demand Sample	4	0022
							Date of Min Phase 3-4 Demand Sample	2	0026
							Time of Min Phase 3-4 Demand Sample	4	0028
							Date of Phase 3-4 Demand Record Clear	2	002C

Description	Index	Static		Desc	File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
		Obj	Var						
							Time of Phase 3-4 Demand Record Clear	4	002E
						02	Phase 5-6 Current Under Band Bin	2	0000
							Phase 5-6 Current Bin 1	2	0002
							Phase 5-6 Current Bin 2	2	0004
							Phase 5-6 Current Bin 3	2	0006
							Phase 5-6 Current Bin 4	2	0008
							Phase 5-6 Current Bin 5	2	000A
							Phase 5-6 Current Bin 6	2	000C
							Phase 5-6 Current Bin 7	2	000E
							Phase 5-6 Current Bin 8	2	0010
							Phase 5-6 Current Bin 9	2	0012
							Phase 5-6 Current Bin 10	2	0014
							Phase 5-6 Current Over Band Bin	2	0016
							Max Phase 5-6 Demand Sample	4	0018
							Date of Max Phase 5-6 Demand Sample	2	001C
							Time of Max Phase 5-6 Demand Sample	4	001E
							Min Phase 5-6 Demand Sample	4	0022
							Date of Min Phase 5-6 Demand Sample	2	0026
							Time of Min Phase 5-6 Demand Sample	4	0028
							Date of Phase 5-6 Demand Record Clear	2	002C
							Time of Phase 5-6 Demand Record Clear	4	002E
						03	Ground Demand Current Under Band Bin	2	0000
							Ground Demand Current Bin 1	2	0002
							Ground Demand Current Bin 2	2	0004
							Ground Demand Current Bin 3	2	0006
							Ground Demand Current Bin 4	2	0008
							Ground Demand Current Bin 5	2	000A
							Ground Demand Current Bin 6	2	000C
							Ground Demand Current Bin 7	2	000E
							Ground Demand Current Bin 8	2	0010
							Ground Demand Current Bin 9	2	0012
							Ground Demand Current Bin 10	2	0014
							Ground Demand Current Over Band Bin	2	0016
							Max Ground Demand Sample	4	0018
							Date of Max Ground Demand Sample	2	001C
							Time of Max Ground Demand Sample	4	001E
							Min Ground Demand Sample	4	0022
							Date of Min Ground Demand Sample	2	0026
							Time of Min Ground Demand Sample	4	0028
							Date of Ground Demand Record Clear	2	002C
							Time of Ground Demand Record Clear	4	002E

Description	Index	Static			File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
		Obj	Var	Desc					
						04	Source-Side Voltage Fundamental Histogram		
							Phase 1 Voltage Under Band Bin	2	0000
							Phase 1 Voltage Bin 1	2	0002
							Phase 1 Voltage Bin 2	2	0004
							Phase 1 Voltage Bin 3	2	0006
							Phase 1 Voltage Bin 4	2	0008
							Phase 1 Voltage Bin 5	2	000A
							Phase 1 Voltage Bin 6	2	000C
							Phase 1 Voltage Bin 7	2	000E
							Phase 1 Voltage Bin 8	2	0010
							Phase 1 Voltage Bin 9	2	0012
							Phase 1 Voltage Bin 10	2	0014
							Phase 1 Voltage Over Band Bin	2	0016
							Max Phase 1 Voltage Sample	4	0018
							Date of Max Phase 1 Voltage Sample	2	001C
							Time of Max Phase 1 Voltage Sample	4	001E
							Min Phase 1 Voltage Sample	4	0022
							Date of Min Phase 1 Voltage Sample	2	0026
							Time of Min Phase 1 Voltage Sample	4	0028
							Date of Phase 1 Voltage Record Clear	2	002C
							Time of Phase 1 Voltage Record Clear	4	002E
						05	Phase 3 Voltage Under Band Bin	2	0000
							Phase 3 Voltage Bin 1	2	0002
							Phase 3 Voltage Bin 2	2	0004
							Phase 3 Voltage Bin 3	2	0006
							Phase 3 Voltage Bin 4	2	0008
							Phase 3 Voltage Bin 5	2	000A
							Phase 3 Voltage Bin 6	2	000C
							Phase 3 Voltage Bin 7	2	000E
							Phase 3 Voltage Bin 8	2	0010
							Phase 3 Voltage Bin 9	2	0012
							Phase 3 Voltage Bin 10	2	0014
							Phase 3 Voltage Over Band Bin	2	0016
							Max Phase 3 Voltage Sample	4	0018
							Date of Max Phase 3 Voltage Sample	2	001C
							Time of Max Phase 3 Voltage Sample	4	001E
							Min Phase 3 Voltage Sample	4	0022
							Date of Min Phase 3 Voltage Sample	2	0026
							Time of Min Phase 3 Voltage Sample	4	0028
							Date of Phase 3 Voltage Record Clear	2	002C
							Time of Phase 3 Voltage Record Clear	4	002E

Description	Index	Static Obj	Var	Desc	File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
						06	Phase 5 Voltage Under Band Bin	2	0000
							Phase 5 Voltage Bin 1	2	0002
							Phase 5 Voltage Bin 2	2	0004
							Phase 5 Voltage Bin 3	2	0006
							Phase 5 Voltage Bin 4	2	0008
							Phase 5 Voltage Bin 5	2	000A
							Phase 5 Voltage Bin 6	2	000C
							Phase 5 Voltage Bin 7	2	000E
							Phase 5 Voltage Bin 8	2	0010
							Phase 5 Voltage Bin 9	2	0012
							Phase 5 Voltage Bin 10	2	0014
							Phase 5 Voltage Over Band Bin	2	0016
							Max Phase 5 Voltage Sample	4	0018
							Date of Max Phase 5 Voltage Sample	2	001C
							Time of Max Phase 5 Voltage Sample	4	001E
							Min Phase 5 Voltage Sample	4	0022
							Date of Min Phase 5 Voltage Sample	2	0026
							Time of Min Phase 5 Voltage Sample	4	0028
							Date of Phase 5 Voltage Record Clear	2	002C
							Time of Phase 5 Voltage Record Clear	4	002E
							Power Histogram		
						07	Phase 1-2 Power Factor Under Band Bin	2	0000
							Phase 1-2 Power Factor Bin 1	2	0002
							Phase 1-2 Power Factor Bin 2	2	0004
							Phase 1-2 Power Factor Bin 3	2	0006
							Phase 1-2 Power Factor Bin 4	2	0008
							Phase 1-2 Power Factor Bin 5	2	000A
							Phase 1-2 Power Factor Bin 6	2	000C
							Phase 1-2 Power Factor Bin 7	2	000E
							Phase 1-2 Power Factor Bin 8	2	0010
							Phase 1-2 Power Factor Bin 9	2	0012
							Phase 1-2 Power Factor Bin 10	2	0014
							Phase 1-2 Power Factor Over Band Bin	2	0016
							Max Phase 1-2 Power Factor Sample	4	0018
							Date of Max Phase 1-2 Power Factor Sample	2	001C
							Time of Max Phase 1-2 Power Factor Sample	4	001E
							Min Phase 1-2 Power Factor Sample	4	0022
							Date of Min Phase 1-2 Power Factor Sample	2	0026
							Time of Min Phase 1-2 Power Factor Sample	4	0028
							Date of Phase 1-2 Power Factor Record Clear	2	002C
							Time of Phase 1-2 Power Factor Record Clear	4	002E

Description	Index	Static			File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
		Obj	Var	Desc					
						08	Phase 1-2 KVA Under Band Bin	2	0000
							Phase 1-2 KVA Bin 1	2	0002
							Phase 1-2 KVA Bin 2	2	0004
							Phase 1-2 KVA Bin 3	2	0006
							Phase 1-2 KVA Bin 4	2	0008
							Phase 1-2 KVA Bin 5	2	000A
							Phase 1-2 KVA Bin 6	2	000C
							Phase 1-2 KVA Bin 7	2	000E
							Phase 1-2 KVA Bin 8	2	0010
							Phase 1-2 KVA Bin 9	2	0012
							Phase 1-2 KVA Bin 10	2	0014
							Phase 1-2 KVA Over Band Bin	2	0016
							Max Phase 1-2 KVA Sample	4	0018
							Date of Max Phase 1-2 KVA Sample	2	001C
							Time of Max Phase 1-2 KVA Sample	4	001E
							Min Phase 1-2 KVA Sample	4	0022
							Date of Min Phase 1-2 KVA Sample	2	0026
							Time of Min Phase 1-2 KVA Sample	4	0028
							Date of Phase 1-2 KVA Record Clear	2	002C
							Time of Phase 1-2 KVA Record Clear	4	002E
						09	Phase 1-2 KW Under Band Bin	2	0000
							Phase 1-2 KW Bin 1	2	0002
							Phase 1-2 KW Bin 2	2	0004
							Phase 1-2 KW Bin 3	2	0006
							Phase 1-2 KW Bin 4	2	0008
							Phase 1-2 KW Bin 5	2	000A
							Phase 1-2 KW Bin 6	2	000C
							Phase 1-2 KW Bin 7	2	000E
							Phase 1-2 KW Bin 8	2	0010
							Phase 1-2 KW Bin 9	2	0012
							Phase 1-2 KW Bin 10	2	0014
							Phase 1-2 KW Over Band Bin	2	0016
							Max Phase 1-2 KW Sample	4	0018
							Date of Max Phase 1-2 KW Sample	2	001C
							Time of Max Phase 1-2 KW Sample	4	001E
							Min Phase 1-2 KW Sample	4	0022
							Date of Min Phase 1-2 KW Sample	2	0026
							Time of Min Phase 1-2 KW Sample	4	0028
							Date of Phase 1-2 KW Record Clear	2	002C
							Time of Phase 1-2 KW Record Clear	4	002E

Description	Index	Static Obj	Var	Desc	File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
						10	Phase 1-2 KVAR Under Band Bin	2	0000
							Phase 1-2 KVAR Bin 1	2	0002
							Phase 1-2 KVAR Bin 2	2	0004
							Phase 1-2 KVAR Bin 3	2	0006
							Phase 1-2 KVAR Bin 4	2	0008
							Phase 1-2 KVAR Bin 5	2	000A
							Phase 1-2 KVAR Bin 6	2	000C
							Phase 1-2 KVAR Bin 7	2	000E
							Phase 1-2 KVAR Bin 8	2	0010
							Phase 1-2 KVAR Bin 9	2	0012
							Phase 1-2 KVAR Bin 10	2	0014
							Phase 1-2 KVAR Over Band Bin	2	0016
							Max Phase 1-2 KVAR Sample	4	0018
							Date of Max Phase 1-2 KVAR Sample	2	001C
							Time of Max Phase 1-2 KVAR Sample	4	001E
							Min Phase 1-2 KVAR Sample	4	0022
							Date of Min Phase 1-2 KVAR Sample	2	0026
							Time of Min Phase 1-2 KVAR Sample	4	0028
							Date of Phase 1-2 KVAR Record Clear	2	002C
							Time of Phase 1-2 KVAR Record Clear	4	002E
						11	Phase 3-4 Power Factor Under Band Bin	2	0000
							Phase 3-4 Power Factor Bin 1	2	0002
							Phase 3-4 Power Factor Bin 2	2	0004
							Phase 3-4 Power Factor Bin 3	2	0006
							Phase 3-4 Power Factor Bin 4	2	0008
							Phase 3-4 Power Factor Bin 5	2	000A
							Phase 3-4 Power Factor Bin 6	2	000C
							Phase 3-4 Power Factor Bin 7	2	000E
							Phase 3-4 Power Factor Bin 8	2	0010
							Phase 3-4 Power Factor Bin 9	2	0012
							Phase 3-4 Power Factor Bin 10	2	0014
							Phase 3-4 Power Factor Over Band Bin	2	0016
							Max Phase 3-4 Power Factor Sample	4	0018
							Date of Max Phase 3-4 Power Factor Sample	2	001C
							Time of Max Phase 3-4 Power Factor Sample	4	001E
							Min Phase 3-4 Power Factor Sample	4	0022
							Date of Min Phase 3-4 Power Factor Sample	2	0026
							Time of Min Phase 3-4 Power Factor Sample	4	0028
							Date of Phase 3-4 Power Factor Record Clear	2	002C
							Time of Phase 3-4 Power Factor Record Clear	4	002E
						12	Phase 3-4 KVA Under Band Bin	2	0000

Description	Index	Static			File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
		Obj	Var	Desc					
							Phase 3-4 KVA Bin 1	2	0002
							Phase 3-4 KVA Bin 2	2	0004
							Phase 3-4 KVA Bin 3	2	0006
							Phase 3-4 KVA Bin 4	2	0008
							Phase 3-4 KVA Bin 5	2	000A
							Phase 3-4 KVA Bin 6	2	000C
							Phase 3-4 KVA Bin 7	2	000E
							Phase 3-4 KVA Bin 8	2	0010
							Phase 3-4 KVA Bin 9	2	0012
							Phase 3-4 KVA Bin 10	2	0014
							Phase 3-4 KVA Over Band Bin	2	0016
							Max Phase 3-4 KVA Sample	4	0018
							Date of Max Phase 3-4 KVA Sample	2	001C
							Time of Max Phase 3-4 KVA Sample	4	001E
							Min Phase 3-4 KVA Sample	4	0022
							Date of Min Phase 3-4 KVA Sample	2	0026
							Time of Min Phase 3-4 KVA Sample	4	0028
							Date of Phase 3-4 KVA Record Clear	2	002C
							Time of Phase 3-4 KVA Record Clear	4	002E
						13	Phase 3-4 KW Under Band Bin	2	0000
							Phase 3-4 KW Bin 1	2	0002
							Phase 3-4 KW Bin 2	2	0004
							Phase 3-4 KW Bin 3	2	0006
							Phase 3-4 KW Bin 4	2	0008
							Phase 3-4 KW Bin 5	2	000A
							Phase 3-4 KW Bin 6	2	000C
							Phase 3-4 KW Bin 7	2	000E
							Phase 3-4 KW Bin 8	2	0010
							Phase 3-4 KW Bin 9	2	0012
							Phase 3-4 KW Bin 10	2	0014
							Phase 3-4 KW Over Band Bin	2	0016
							Max Phase 3-4 KW Sample	4	0018
							Date of Max Phase 3-4 KW Sample	2	001C
							Time of Max Phase 3-4 KW Sample	4	001E
							Min Phase 3-4 KW Sample	4	0022
							Date of Min Phase 3-4 KW Sample	2	0026
							Time of Min Phase 3-4 KW Sample	4	0028
							Date of Phase 3-4 KW Record Clear	2	002C
							Time of Phase 3-4 KW Record Clear	4	002E
						14	Phase 3-4 KVAR Under Band Bin	2	0000
							Phase 3-4 KVAR Bin 1	2	0002

Description	Index	Static			File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
		Obj	Var	Desc					
							Phase 3-4 KVAR Bin 2	2	0004
							Phase 3-4 KVAR Bin 3	2	0006
							Phase 3-4 KVAR Bin 4	2	0008
							Phase 3-4 KVAR Bin 5	2	000A
							Phase 3-4 KVAR Bin 6	2	000C
							Phase 3-4 KVAR Bin 7	2	000E
							Phase 3-4 KVAR Bin 8	2	0010
							Phase 3-4 KVAR Bin 9	2	0012
							Phase 3-4 KVAR Bin 10	2	0014
							Phase 3-4 KVAR Over Band Bin	2	0016
							Max Phase 3-4 KVAR Sample	4	0018
							Date of Max Phase 3-4 KVAR Sample	2	001C
							Time of Max Phase 3-4 KVAR Sample	4	001E
							Min Phase 3-4 KVAR Sample	4	0022
							Date of Min Phase 3-4 KVAR Sample	2	0026
							Time of Min Phase 3-4 KVAR Sample	4	0028
							Date of Phase 3-4 KVAR Record Clear	2	002C
							Time of Phase 3-4 KVAR Record Clear	4	002E
						15	Phase 5-6 Power Factor Under Band Bin	2	0000
							Phase 5-6 Power Factor Bin 1	2	0002
							Phase 5-6 Power Factor Bin 2	2	0004
							Phase 5-6 Power Factor Bin 3	2	0006
							Phase 5-6 Power Factor Bin 4	2	0008
							Phase 5-6 Power Factor Bin 5	2	000A
							Phase 5-6 Power Factor Bin 6	2	000C
							Phase 5-6 Power Factor Bin 7	2	000E
							Phase 5-6 Power Factor Bin 8	2	0010
							Phase 5-6 Power Factor Bin 9	2	0012
							Phase 5-6 Power Factor Bin 10	2	0014
							Phase 5-6 Power Factor Over Band Bin	2	0016
							Max Phase 5-6 Power Factor Sample	4	0018
							Date of Max Phase 5-6 Power Factor Sample	2	001C
							Time of Max Phase 5-6 Power Factor Sample	4	001E
							Min Phase 5-6 Power Factor Sample	4	0022
							Date of Min Phase 5-6 Power Factor Sample	2	0026
							Time of Min Phase 5-6 Power Factor Sample	4	0028
							Date of Phase 5-6 Power Factor Record Clear	2	002C
							Time of Phase 5-6 Power Factor Record Clear	4	002E
						16	Phase 5-6 KVA Under Band Bin	2	0000
							Phase 5-6 KVA Bin 1	2	0002
							Phase 5-6 KVA Bin 2	2	0004

Description	Index	Static			File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
		Obj	Var	Desc					
							Phase 5-6 KVA Bin 3	2	0006
							Phase 5-6 KVA Bin 4	2	0008
							Phase 5-6 KVA Bin 5	2	000A
							Phase 5-6 KVA Bin 6	2	000C
							Phase 5-6 KVA Bin 7	2	000E
							Phase 5-6 KVA Bin 8	2	0010
							Phase 5-6 KVA Bin 9	2	0012
							Phase 5-6 KVA Bin 10	2	0014
							Phase 5-6 KVA Over Band Bin	2	0016
							Max Phase 5-6 KVA Sample	4	0018
							Date of Max Phase 5-6 KVA Sample	2	001C
							Time of Max Phase 5-6 KVA Sample	4	001E
							Min Phase 5-6 KVA Sample	4	0022
							Date of Min Phase 5-6 KVA Sample	2	0026
							Time of Min Phase 5-6 KVA Sample	4	0028
							Date of Phase 5-6 KVA Record Clear	2	002C
							Time of Phase 5-6 KVA Record Clear	4	002E
						17	Phase 5-6 KW Under Band Bin	2	0000
							Phase 5-6 KW Bin 1	2	0002
							Phase 5-6 KW Bin 2	2	0004
							Phase 5-6 KW Bin 3	2	0006
							Phase 5-6 KW Bin 4	2	0008
							Phase 5-6 KW Bin 5	2	000A
							Phase 5-6 KW Bin 6	2	000C
							Phase 5-6 KW Bin 7	2	000E
							Phase 5-6 KW Bin 8	2	0010
							Phase 5-6 KW Bin 9	2	0012
							Phase 5-6 KW Bin 10	2	0014
							Phase 5-6 KW Over Band Bin	2	0016
							Max Phase 5-6 KW Sample	4	0018
							Date of Max Phase 5-6 KW Sample	2	001C
							Time of Max Phase 5-6 KW Sample	4	001E
							Min Phase 5-6 KW Sample	4	0022
							Date of Min Phase 5-6 KW Sample	2	0026
							Time of Min Phase 5-6 KW Sample	4	0028
							Date of Phase 5-6 KW Record Clear	2	002C
							Time of Phase 5-6 KW Record Clear	4	002E
						18	Phase 5-6 KVAR Under Band Bin	2	0000
							Phase 5-6 KVAR Bin 1	2	0002
							Phase 5-6 KVAR Bin 2	2	0004
							Phase 5-6 KVAR Bin 3	2	0006

Description	Index	Static			File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
		Obj	Var	Desc					
							Phase 5-6 KVAR Bin 4	2	0008
							Phase 5-6 KVAR Bin 5	2	000A
							Phase 5-6 KVAR Bin 6	2	000C
							Phase 5-6 KVAR Bin 7	2	000E
							Phase 5-6 KVAR Bin 8	2	0010
							Phase 5-6 KVAR Bin 9	2	0012
							Phase 5-6 KVAR Bin 10	2	0014
							Phase 5-6 KVAR Over Band Bin	2	0016
							Max Phase 5-6 KVAR Sample	4	0018
							Date of Max Phase 5-6 KVAR Sample	2	001C
							Time of Max Phase 5-6 KVAR Sample	4	001E
							Min Phase 5-6 KVAR Sample	4	0022
							Date of Min Phase 5-6 KVAR Sample	2	0026
							Time of Min Phase 5-6 KVAR Sample	4	0028
							Date of Phase 5-6 KVAR Record Clear	2	002C
							Time of Phase 5-6 KVAR Record Clear	4	002E
						19	Total Power Factor Under Band Bin	2	0000
							Total Power Factor Bin 1	2	0002
							Total Power Factor Bin 2	2	0004
							Total Power Factor Bin 3	2	0006
							Total Power Factor Bin 4	2	0008
							Total Power Factor Bin 5	2	000A
							Total Power Factor Bin 6	2	000C
							Total Power Factor Bin 7	2	000E
							Total Power Factor Bin 8	2	0010
							Total Power Factor Bin 9	2	0012
							Total Power Factor Bin 10	2	0014
							Total Power Factor Over Band Bin	2	0016
							Max Total Power Factor Sample	4	0018
							Date of Max Total Power Factor Sample	2	001C
							Time of Max Total Power Factor Sample	4	001E
							Min Total Power Factor Sample	4	0022
							Date of Min Total Power Factor Sample	2	0026
							Time of Min Total Power Factor Sample	4	0028
							Date of Total Power Factor Record Clear	2	002C
							Time of Total Power Factor Record Clear	4	002E
						20	Total KVA Under Band Bin	2	0000
							Total KVA Bin 1	2	0002
							Total KVA Bin 2	2	0004
							Total KVA Bin 3	2	0006
							Total KVA Bin 4	2	0008

Description	Index	Static Obj	Var	Desc	File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
							Total KVA Bin 5	2	000A
							Total KVA Bin 6	2	000C
							Total KVA Bin 7	2	000E
							Total KVA Bin 8	2	0010
							Total KVA Bin 9	2	0012
							Total KVA Bin 10	2	0014
							Total KVA Over Band Bin	2	0016
							Max Total KVA Sample	4	0018
							Date of Max Total KVA Sample	2	001C
							Time of Max Total KVA Sample	4	001E
							Min Total KVA Sample	4	0022
							Date of Min Total KVA Sample	2	0026
							Time of Min Total KVA Sample	4	0028
							Date of Total KVA Record Clear	2	002C
							Time of Total KVA Record Clear	4	002E
						21	Total KW Under Band Bin	2	0000
							Total KW Bin 1	2	0002
							Total KW Bin 2	2	0004
							Total KW Bin 3	2	0006
							Total KW Bin 4	2	0008
							Total KW Bin 5	2	000A
							Total KW Bin 6	2	000C
							Total KW Bin 7	2	000E
							Total KW Bin 8	2	0010
							Total KW Bin 9	2	0012
							Total KW Bin 10	2	0014
							Total KW Over Band Bin	2	0016
							Max Total KW Sample	4	0018
							Date of Max Total KW Sample	2	001C
							Time of Max Total KW Sample	4	001E
							Min Total KW Sample	4	0022
							Date of Min Total KW Sample	2	0026
							Time of Min Total KW Sample	4	0028
							Date of Total KW Record Clear	2	002C
							Time of Total KW Record Clear	4	002E
						22	Total KVAR Under Band Bin	2	0000
							Total KVAR Bin 1	2	0002
							Total KVAR Bin 2	2	0004
							Total KVAR Bin 3	2	0006
							Total KVAR Bin 4	2	0008
							Total KVAR Bin 5	2	000A

Description	Index	Static Obj	Var	Desc	File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
							Total KVAR Bin 6	2	000C
							Total KVAR Bin 7	2	000E
							Total KVAR Bin 8	2	0010
							Total KVAR Bin 9	2	0012
							Total KVAR Bin 10	2	0014
							Total KVAR Over Band Bin	2	0016
							Max Total KVAR Sample	4	0018
							Date of Max Total KVAR Sample	2	001C
							Time of Max Total KVAR Sample	4	001E
							Min Total KVAR Sample	4	0022
							Date of Min Total KVAR Sample	2	0026
							Time of Min Total KVAR Sample	4	0028
							Date of Total KVAR Record Clear	2	002C
							Time of Total KVAR Record Clear	4	002E
							Sequence Component Current Histogram		
						23	Positive Sequence Current Magnitude Under Band Bin	2	0000
							Positive Sequence Current Magnitude Bin 1	2	0002
							Positive Sequence Current Magnitude Bin 2	2	0004
							Positive Sequence Current Magnitude Bin 3	2	0006
							Positive Sequence Current Magnitude Bin 4	2	0008
							Positive Sequence Current Magnitude Bin 5	2	000A
							Positive Sequence Current Magnitude Bin 6	2	000C
							Positive Sequence Current Magnitude Bin 7	2	000E
							Positive Sequence Current Magnitude Bin 8	2	0010
							Positive Sequence Current Magnitude Bin 9	2	0012
							Positive Sequence Current Magnitude Bin 10	2	0014
							Positive Sequence Current Magnitude Over Band Bin	2	0016
							Max Positive Sequence Magnitude Sample	4	0018
							Date of Max Positive Sequence Magnitude Sample	2	001C
							Time of Max Positive Sequence Magnitude Sample	4	001E
							Min Positive Sequence Magnitude Sample	4	0022
							Date of Min Positive Sequence Magnitude Sample	2	0026
							Time of Min Positive Sequence Magnitude Sample	4	0028
							Date of Positive Sequence Magnitude Record Clear	2	002C
							Time of Positive Sequence Magnitude Record Clear	4	002E
						24	Positive Sequence Current Angle Under Band Bin	2	0000
							Positive Sequence Current Angle Bin 1	2	0002
							Positive Sequence Current Angle Bin 2	2	0004
							Positive Sequence Current Angle Bin 3	2	0006
							Positive Sequence Current Angle Bin 4	2	0008
							Positive Sequence Current Angle Bin 5	2	000A

Description	Index	Static Obj	Var	Desc	File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
							Positive Sequence Current Angle Bin 6	2	000C
							Positive Sequence Current Angle Bin 7	2	000E
							Positive Sequence Current Angle Bin 8	2	0010
							Positive Sequence Current Angle Bin 9	2	0012
							Positive Sequence Current Angle Bin 10	2	0014
							Positive Sequence Current Angle Over Band Bin	2	0016
							Max Positive Sequence Angle Sample	4	0018
							Date of Max Positive Sequence Angle Sample	2	001C
							Time of Max Positive Sequence Angle Sample	4	001E
							Min Positive Sequence Angle Sample	4	0022
							Date of Min Positive Sequence Angle Sample	2	0026
							Time of Min Positive Sequence Angle Sample	4	0028
							Date of Positive Sequence Angle Record Clear	2	002C
							Time of Positive Sequence Angle Record Clear	4	002E
						25	Negative Sequence Current Magnitude Under Band Bin	2	0000
							Negative Sequence Current Magnitude Bin 1	2	0002
							Negative Sequence Current Magnitude Bin 2	2	0004
							Negative Sequence Current Magnitude Bin 3	2	0006
							Negative Sequence Current Magnitude Bin 4	2	0008
							Negative Sequence Current Magnitude Bin 5	2	000A
							Negative Sequence Current Magnitude Bin 6	2	000C
							Negative Sequence Current Magnitude Bin 7	2	000E
							Negative Sequence Current Magnitude Bin 8	2	0010
							Negative Sequence Current Magnitude Bin 9	2	0012
							Negative Sequence Current Magnitude Bin 10	2	0014
							Negative Sequence Current Magnitude Over Band Bin	2	0016
							Max Negative Sequence Magnitude Sample	4	0018
							Date of Max Negative Sequence Magnitude Sample	2	001C
							Time of Max Negative Sequence Magnitude Sample	4	001E
							Min Negative Sequence Magnitude Sample	4	0022
							Date of Min Negative Sequence Magnitude Sample	2	0026
							Time of Min Negative Sequence Magnitude Sample	4	0028
							Date of Negative Sequence Magnitude Record Clear	2	002C
							Time of Negative Sequence Magnitude Record Clear	4	002E
						26	Negative Sequence Current Angle Under Band Bin	2	0000
							Negative Sequence Current Angle Bin 1	2	0002
							Negative Sequence Current Angle Bin 2	2	0004
							Negative Sequence Current Angle Bin 3	2	0006
							Negative Sequence Current Angle Bin 4	2	0008
							Negative Sequence Current Angle Bin 5	2	000A
							Negative Sequence Current Angle Bin 6	2	000C

Description	Index	Static			File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
		Obj	Var	Desc					
							Negative Sequence Current Angle Bin 7	2	000E
							Negative Sequence Current Angle Bin 8	2	0010
							Negative Sequence Current Angle Bin 9	2	0012
							Negative Sequence Current Angle Bin 10	2	0014
							Negative Sequence Current Angle Over Band Bin	2	0016
							Max Negative Sequence Angle Sample	4	0018
							Date of Max Negative Sequence Angle Sample	2	001C
							Time of Max Negative Sequence Angle Sample	4	001E
							Min Negative Sequence Angle Sample	4	0022
							Date of Min Negative Sequence Angle Sample	2	0026
							Time of Min Negative Sequence Angle Sample	4	0028
							Date of Negative Sequence Angle Record Clear	2	002C
							Time of Negative Sequence Angle Record Clear	4	002E
						27	Zero Sequence Current Magnitude Under Band Bin	2	0000
							Zero Sequence Current Magnitude Bin 1	2	0002
							Zero Sequence Current Magnitude Bin 2	2	0004
							Zero Sequence Current Magnitude Bin 3	2	0006
							Zero Sequence Current Magnitude Bin 4	2	0008
							Zero Sequence Current Magnitude Bin 5	2	000A
							Zero Sequence Current Magnitude Bin 6	2	000C
							Zero Sequence Current Magnitude Bin 7	2	000E
							Zero Sequence Current Magnitude Bin 8	2	0010
							Zero Sequence Current Magnitude Bin 9	2	0012
							Zero Sequence Current Magnitude Bin 10	2	0014
							Zero Sequence Current Magnitude Over Band Bin	2	0016
							Max Zero Sequence Magnitude Sample	4	0018
							Date of Max Zero Sequence Magnitude Sample	2	001C
							Time of Max Zero Sequence Magnitude Sample	4	001E
							Min Zero Sequence Magnitude Sample	4	0022
							Date of Min Zero Sequence Magnitude Sample	2	0026
							Time of Min Zero Sequence Magnitude Sample	4	0028
							Date of Zero Sequence Magnitude Record Clear	2	002C
							Time of Zero Sequence Magnitude Record Clear	4	002E
						28	Zero Sequence Current Angle Under Band Bin	2	0000
							Zero Sequence Current Angle Bin 1	2	0002
							Zero Sequence Current Angle Bin 2	2	0004
							Zero Sequence Current Angle Bin 3	2	0006
							Zero Sequence Current Angle Bin 4	2	0008
							Zero Sequence Current Angle Bin 5	2	000A
							Zero Sequence Current Angle Bin 6	2	000C
							Zero Sequence Current Angle Bin 7	2	000E

Description	Index	Static			File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
		Obj	Var	Desc					
							Zero Sequence Current Angle Bin 8	2	0010
							Zero Sequence Current Angle Bin 9	2	0012
							Zero Sequence Current Angle Bin 10	2	0014
							Zero Sequence Current Angle Over Band Bin	2	0016
							Max Zero Sequence Angle Sample	4	0018
							Date of Max Zero Sequence Angle Sample	2	001C
							Time of Max Zero Sequence Angle Sample	4	001E
							Min Zero Sequence Angle Sample	4	0022
							Date of Min Zero Sequence Angle Sample	2	0026
							Time of Min Zero Sequence Angle Sample	4	0028
							Date of Zero Sequence Angle Record Clear	2	002C
							Time of Zero Sequence Angle Record Clear	4	002E
						29	Sequence Component Voltage Histogram		
							Positive Sequence Voltage Magnitude Under Band Bin	2	0000
							Positive Sequence Voltage Magnitude Bin 1	2	0002
							Positive Sequence Voltage Magnitude Bin 2	2	0004
							Positive Sequence Voltage Magnitude Bin 3	2	0006
							Positive Sequence Voltage Magnitude Bin 4	2	0008
							Positive Sequence Voltage Magnitude Bin 5	2	000A
							Positive Sequence Voltage Magnitude Bin 6	2	000C
							Positive Sequence Voltage Magnitude Bin 7	2	000E
							Positive Sequence Voltage Magnitude Bin 8	2	0010
							Positive Sequence Voltage Magnitude Bin 9	2	0012
							Positive Sequence Voltage Magnitude Bin 10	2	0014
							Positive Sequence Voltage Magnitude Over Band Bin	2	0016
							Max Positive Sequence Magnitude Sample	4	0018
							Date of Max Positive Sequence Magnitude Sample	2	001C
							Time of Max Positive Sequence Magnitude Sample	4	001E
							Min Positive Sequence Magnitude Sample	4	0022
							Date of Min Positive Sequence Magnitude Sample	2	0026
							Time of Min Positive Sequence Magnitude Sample	4	0028
							Date of Positive Sequence Magnitude Record Clear	2	002C
							Time of Positive Sequence Magnitude Record Clear	4	002E
						30	Positive Sequence Voltage Angle Under Band Bin	2	0000
							Positive Sequence Voltage Angle Bin 1	2	0002
							Positive Sequence Voltage Angle Bin 2	2	0004
							Positive Sequence Voltage Angle Bin 3	2	0006
							Positive Sequence Voltage Angle Bin 4	2	0008
							Positive Sequence Voltage Angle Bin 5	2	000A
							Positive Sequence Voltage Angle Bin 6	2	000C
							Positive Sequence Voltage Angle Bin 7	2	000E

Description	Index	Static Obj	Var	Desc	File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
							Positive Sequence Voltage Angle Bin 8	2	0010
							Positive Sequence Voltage Angle Bin 9	2	0012
							Positive Sequence Voltage Angle Bin 10	2	0014
							Positive Sequence Voltage Angle Over Band Bin	2	0016
							Max Positive Sequence Angle Sample	4	0018
							Date of Max Positive Sequence Angle Sample	2	001C
							Time of Max Positive Sequence Angle Sample	4	001E
							Min Positive Sequence Angle Sample	4	0022
							Date of Min Positive Sequence Angle Sample	2	0026
							Time of Min Positive Sequence Angle Sample	4	0028
							Date of Positive Sequence Angle Record Clear	2	002C
							Time of Positive Sequence Angle Record Clear	4	002E
						31	Negative Sequence Voltage Magnitude Under Band Bin	2	0000
							Negative Sequence Voltage Magnitude Bin 1	2	0002
							Negative Sequence Voltage Magnitude Bin 2	2	0004
							Negative Sequence Voltage Magnitude Bin 3	2	0006
							Negative Sequence Voltage Magnitude Bin 4	2	0008
							Negative Sequence Voltage Magnitude Bin 5	2	000A
							Negative Sequence Voltage Magnitude Bin 6	2	000C
							Negative Sequence Voltage Magnitude Bin 7	2	000E
							Negative Sequence Voltage Magnitude Bin 8	2	0010
							Negative Sequence Voltage Magnitude Bin 9	2	0012
							Negative Sequence Voltage Magnitude Bin 10	2	0014
							Negative Sequence Voltage Magnitude Over Band Bin	2	0016
							Max Negative Sequence Magnitude Sample	4	0018
							Date of Max Negative Sequence Magnitude Sample	2	001C
							Time of Max Negative Sequence Magnitude Sample	4	001E
							Min Negative Sequence Magnitude Sample	4	0022
							Date of Min Negative Sequence Magnitude Sample	2	0026
							Time of Min Negative Sequence Magnitude Sample	4	0028
							Date of Negative Sequence Magnitude Record Clear	2	002C
							Time of Negative Sequence Magnitude Record Clear	4	002E
						32	Negative Sequence Voltage Angle Under Band Bin	2	0000
							Negative Sequence Voltage Angle Bin 1	2	0002
							Negative Sequence Voltage Angle Bin 2	2	0004
							Negative Sequence Voltage Angle Bin 3	2	0006
							Negative Sequence Voltage Angle Bin 4	2	0008
							Negative Sequence Voltage Angle Bin 5	2	000A
							Negative Sequence Voltage Angle Bin 6	2	000C
							Negative Sequence Voltage Angle Bin 7	2	000E
							Negative Sequence Voltage Angle Bin 8	2	0010

Description	Index	Static			File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
		Obj	Var	Desc					
							Negative Sequence Voltage Angle Bin 9	2	0012
							Negative Sequence Voltage Angle Bin 10	2	0014
							Negative Sequence Voltage Angle Over Band Bin	2	0016
							Max Negative Sequence Angle Sample	4	0018
							Date of Max Negative Sequence Angle Sample	2	001C
							Time of Max Negative Sequence Angle Sample	4	001E
							Min Negative Sequence Angle Sample	4	0022
							Date of Min Negative Sequence Angle Sample	2	0026
							Time of Min Negative Sequence Angle Sample	4	0028
							Date of Negative Sequence Angle Record Clear	2	002C
							Time of Negative Sequence Angle Record Clear	4	002E
							Current Harmonic Histogram		
						33	Phase 1-2 Current THD Under Band Bin	2	0000
							Phase 1-2 Current THD Bin 1	2	0002
							Phase 1-2 Current THD Bin 2	2	0004
							Phase 1-2 Current THD Bin 3	2	0006
							Phase 1-2 Current THD Bin 4	2	0008
							Phase 1-2 Current THD Bin 5	2	000A
							Phase 1-2 Current THD Bin 6	2	000C
							Phase 1-2 Current THD Bin 7	2	000E
							Phase 1-2 Current THD Bin 8	2	0010
							Phase 1-2 Current THD Bin 9	2	0012
							Phase 1-2 Current THD Bin 10	2	0014
							Phase 1-2 Current THD Over Band Bin	2	0016
							Max Phase 1-2 Current THD Sample	4	0018
							Date of Max Phase 1-2 Current THD Sample	2	001C
							Time of Max Phase 1-2 Current THD Sample	4	001E
							Min Phase 1-2 Current THD Sample	4	0022
							Date of Min Phase 1-2 Current THD Sample	2	0026
							Time of Min Phase 1-2 Current THD Sample	4	0028
							Date of Phase 1-2 Current THD Record Clear	2	002C
							Time of Phase 1-2 Current THD Record Clear	4	002E
						34	Phase 3-4 Current THD Under Band Bin	2	0000
							Phase 3-4 Current THD Bin 1	2	0002
							Phase 3-4 Current THD Bin 2	2	0004
							Phase 3-4 Current THD Bin 3	2	0006
							Phase 3-4 Current THD Bin 4	2	0008
							Phase 3-4 Current THD Bin 5	2	000A
							Phase 3-4 Current THD Bin 6	2	000C
							Phase 3-4 Current THD Bin 7	2	000E
							Phase 3-4 Current THD Bin 8	2	0010

Description	Index	Static Obj	Var	Desc	File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
							Phase 3-4 Current THD Bin 9	2	0012
							Phase 3-4 Current THD Bin 10	2	0014
							Phase 3-4 Current THD Over Band Bin	2	0016
							Max Phase 3-4 Current THD Sample	4	0018
							Date of Max Phase 3-4 Current THD Sample	2	001C
							Time of Max Phase 3-4 Current THD Sample	4	001E
							Min Phase 3-4 Current THD Sample	4	0022
							Date of Min Phase 3-4 Current THD Sample	2	0026
							Time of Min Phase 3-4 Current THD Sample	4	0028
							Date of Phase 3-4 Current THD Record Clear	2	002C
							Time of Phase 3-4 Current THD Record Clear	4	002E
						35	Phase 5-6 Current THD Under Band Bin	2	0000
							Phase 5-6 Current THD Bin 1	2	0002
							Phase 5-6 Current THD Bin 2	2	0004
							Phase 5-6 Current THD Bin 3	2	0006
							Phase 5-6 Current THD Bin 4	2	0008
							Phase 5-6 Current THD Bin 5	2	000A
							Phase 5-6 Current THD Bin 6	2	000C
							Phase 5-6 Current THD Bin 7	2	000E
							Phase 5-6 Current THD Bin 8	2	0010
							Phase 5-6 Current THD Bin 9	2	0012
							Phase 5-6 Current THD Bin 10	2	0014
							Phase 5-6 Current THD Over Band Bin	2	0016
							Max Phase 5-6 Current THD Sample	4	0018
							Date of Max Phase 5-6 Current THD Sample	2	001C
							Time of Max Phase 5-6 Current THD Sample	4	001E
							Min Phase 5-6 Current THD Sample	4	0022
							Date of Min Phase 5-6 Current THD Sample	2	0026
							Time of Min Phase 5-6 Current THD Sample	4	0028
							Date of Phase 5-6 Current THD Record Clear	2	002C
							Time of Phase 5-6 Current THD Record Clear	4	002E
						36	Ground Demand Current THD Under Band Bin	2	0000
							Ground Demand Current THD Bin 1	2	0002
							Ground Demand Current THD Bin 2	2	0004
							Ground Demand Current THD Bin 3	2	0006
							Ground Demand Current THD Bin 4	2	0008
							Ground Demand Current THD Bin 5	2	000A
							Ground Demand Current THD Bin 6	2	000C
							Ground Demand Current THD Bin 7	2	000E
							Ground Demand Current THD Bin 8	2	0010
							Ground Demand Current THD Bin 9	2	0012

Description	Index	Static Obj	Var	Desc	File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
							Ground Demand Current THD Bin 10	2	0014
							Ground Demand Current THD Over Band Bin	2	0016
							Max Ground Current THD Sample	4	0018
							Date of Max Ground Current THD Sample	2	001C
							Time of Max Ground Current THD Sample	4	001E
							Min Ground Current THD Sample	4	0022
							Date of Min Ground Current THD Sample	2	0026
							Time of Min Ground Current THD Sample	4	0028
							Date of Ground Current THD Record Clear	2	002C
							Time of Ground Current THD Record Clear	4	002E
							Voltage Harmonic Histogram		
						37	Phase 1-2 Voltage THD Under Band Bin	2	0000
							Phase 1-2 Voltage THD Bin 1	2	0002
							Phase 1-2 Voltage THD Bin 2	2	0004
							Phase 1-2 Voltage THD Bin 3	2	0006
							Phase 1-2 Voltage THD Bin 4	2	0008
							Phase 1-2 Voltage THD Bin 5	2	000A
							Phase 1-2 Voltage THD Bin 6	2	000C
							Phase 1-2 Voltage THD Bin 7	2	000E
							Phase 1-2 Voltage THD Bin 8	2	0010
							Phase 1-2 Voltage THD Bin 9	2	0012
							Phase 1-2 Voltage THD Bin 10	2	0014
							Phase 1-2 Voltage THD Over Band Bin	2	0016
							Max Phase 1-2 Voltage THD Sample	4	0018
							Date of Max Phase 1-2 Voltage THD Sample	2	001C
							Time of Max Phase 1-2 Voltage THD Sample	4	001E
							Min Phase 1-2 Voltage THD Sample	4	0022
							Date of Min Phase 1-2 Voltage THD Sample	2	0026
							Time of Min Phase 1-2 Voltage THD Sample	4	0028
							Date of Phase 1-2 Voltage THD Record Clear	2	002C
							Time of Phase 1-2 Voltage THD Record Clear	4	002E
						38	Phase 3-4 Voltage THD Under Band Bin	2	0000
							Phase 3-4 Voltage THD Bin 1	2	0002
							Phase 3-4 Voltage THD Bin 2	2	0004
							Phase 3-4 Voltage THD Bin 3	2	0006
							Phase 3-4 Voltage THD Bin 4	2	0008
							Phase 3-4 Voltage THD Bin 5	2	000A
							Phase 3-4 Voltage THD Bin 6	2	000C
							Phase 3-4 Voltage THD Bin 7	2	000E
							Phase 3-4 Voltage THD Bin 8	2	0010
							Phase 3-4 Voltage THD Bin 9	2	0012

Description	Index	Static Obj	Var	Desc	File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
							Phase 3-4 Voltage THD Bin 10	2	0014
							Phase 3-4 Voltage THD Over Band Bin	2	0016
							Max Phase 3-4 Voltage THD Sample	4	0018
							Date of Max Phase 3-4 Voltage THD Sample	2	001C
							Time of Max Phase 3-4 Voltage THD Sample	4	001E
							Min Phase 3-4 Voltage THD Sample	4	0022
							Date of Min Phase 3-4 Voltage THD Sample	2	0026
							Time of Min Phase 3-4 Voltage THD Sample	4	0028
							Date of Phase 3-4 Voltage THD Record Clear	2	002C
							Time of Phase 3-4 Voltage THD Record Clear	4	002E
						39	Phase 5-6 Voltage THD Under Band Bin	2	0000
							Phase 5-6 Voltage THD Bin 1	2	0002
							Phase 5-6 Voltage THD Bin 2	2	0004
							Phase 5-6 Voltage THD Bin 3	2	0006
							Phase 5-6 Voltage THD Bin 4	2	0008
							Phase 5-6 Voltage THD Bin 5	2	000A
							Phase 5-6 Voltage THD Bin 6	2	000C
							Phase 5-6 Voltage THD Bin 7	2	000E
							Phase 5-6 Voltage THD Bin 8	2	0010
							Phase 5-6 Voltage THD Bin 9	2	0012
							Phase 5-6 Voltage THD Bin 10	2	0014
							Phase 5-6 Voltage THD Over Band Bin	2	0016
							Max Phase 5-6 Voltage THD Sample	4	0018
							Date of Max Phase 5-6 Voltage THD Sample	2	001C
							Time of Max Phase 5-6 Voltage THD Sample	4	001E
							Min Phase 5-6 Voltage THD Sample	4	0022
							Date of Min Phase 5-6 Voltage THD Sample	2	0026
							Time of Min Phase 5-6 Voltage THD Sample	4	0028
							Date of Phase 5-6 Voltage THD Record Clear	2	002C
							Time of Phase 5-6 Voltage THD Record Clear	4	002E
							Phase-to-phase Voltage Fundamental Histogram		
						40	Phase 1-3 Voltage Under Band Bin	2	0000
							Phase 1-3 Voltage Bin 1	2	0002
							Phase 1-3 Voltage Bin 2	2	0004
							Phase 1-3 Voltage Bin 3	2	0006
							Phase 1-3 Voltage Bin 2	2	0008
							Phase 1-3 Voltage Bin 5	2	000A
							Phase 1-3 Voltage Bin 2	2	000C
							Phase 1-3 Voltage Bin 7	2	000E
							Phase 1-3 Voltage Bin 8	2	0010
							Phase 1-3 Voltage Bin 9	2	0012

Description	Index	Static		Desc	File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
		Obj	Var						
							Phase 1-3 Voltage Bin 10	2	0014
							Phase 1-3 Voltage Over Band Bin	2	0016
							Max Phase 1-3 Voltage Sample	4	0018
							Date of Max Phase 1-3 Voltage Sample	2	001C
							Time of Max Phase 1-3 Voltage Sample	4	001E
							Min Phase 1-3 Voltage Sample	4	0022
							Date of Min Phase 1-3 Voltage Sample	2	0026
							Time of Min Phase 1-3 Voltage Sample	4	0028
							Date of Phase 1-3 Voltage Record Clear	2	002C
							Time of Phase 1-3 Voltage Record Clear	4	002E
						41	Phase 3-5 Voltage Under Band Bin	2	0000
							Phase 3-5 Voltage Bin 1	2	0002
							Phase 3-5 Voltage Bin 2	2	0004
							Phase 3-5 Voltage Bin 3	2	0006
							Phase 3-5 Voltage Bin 4	2	0008
							Phase 3-5 Voltage Bin 5	2	000A
							Phase 3-5 Voltage Bin 6	2	000C
							Phase 3-5 Voltage Bin 7	2	000E
							Phase 3-5 Voltage Bin 8	2	0010
							Phase 3-5 Voltage Bin 9	2	0012
							Phase 3-5 Voltage Bin 10	2	0014
							Phase 3-5 Voltage Over Band Bin	2	0016
							Max Phase 3-5 Voltage Sample	4	0018
							Date of Max Phase 3-5 Voltage Sample	2	001C
							Time of Max Phase 3-5 Voltage Sample	4	001E
							Min Phase 3-5 Voltage Sample	4	0022
							Date of Min Phase 3-5 Voltage Sample	2	0026
							Time of Min Phase 3-5 Voltage Sample	4	0028
							Date of Phase 3-5 Voltage Record Clear	2	002C
							Time of Phase 3-5 Voltage Record Clear	4	002E
						42	Phase 5-1 Voltage Under Band Bin	2	0000
							Phase 5-1 Voltage Bin 1	2	0002
							Phase 5-1 Voltage Bin 2	2	0004
							Phase 5-1 Voltage Bin 3	2	0006
							Phase 5-1 Voltage Bin 4	2	0008
							Phase 5-1 Voltage Bin 5	2	000A
							Phase 5-1 Voltage Bin 6	2	000C
							Phase 5-1 Voltage Bin 7	2	000E
							Phase 5-1 Voltage Bin 8	2	0010
							Phase 5-1 Voltage Bin 9	2	0012
							Phase 5-1 Voltage Bin 10	2	0014

Description	Index	Static Obj	Var	Desc	File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
							Phase 5-1 Voltage Over Band Bin	2	0016
							Max Phase 5-1 Voltage Sample	4	0018
							Date of Max Phase 5-1 Voltage Sample	2	001C
							Time of Max Phase 5-1 Voltage Sample	4	001E
							Min Phase 5-1 Voltage Sample	4	0022
							Date of Min Phase 5-1 Voltage Sample	2	0026
							Time of Min Phase 5-1 Voltage Sample	4	0028
							Date of Phase 5-1 Voltage Record Clear	2	002C
							Time of Phase 5-1 Voltage Record Clear	4	002E
							Load-Side Voltage Fundamental Histogram		
						43	Phase 2 Voltage Under Band Bin	2	0000
							Phase 2 Voltage Bin 1	2	0002
							Phase 2 Voltage Bin 2	2	0004
							Phase 2 Voltage Bin 3	2	0006
							Phase 2 Voltage Bin 2	2	0008
							Phase 2 Voltage Bin 5	2	000A
							Phase 2 Voltage Bin 2	2	000C
							Phase 2 Voltage Bin 7	2	000E
							Phase 2 Voltage Bin 8	2	0010
							Phase 2 Voltage Bin 9	2	0012
							Phase 2 Voltage Bin 10	2	0014
							Phase 2 Voltage Over Band Bin	2	0016
							Max Phase 2 Voltage Sample	4	0018
							Date of Max Phase 2 Voltage Sample	2	001C
							Time of Max Phase 2 Voltage Sample	4	001E
							Min Phase 2 Voltage Sample	4	0022
							Date of Min Phase 2 Voltage Sample	2	0026
							Time of Min Phase 2 Voltage Sample	4	0028
							Date of Phase 2 Voltage Record Clear	2	002C
							Time of Phase 2 Voltage Record Clear	4	002E
						44	Phase 4 Voltage Under Band Bin	2	0000
							Phase 4 Voltage Bin 1	2	0002
							Phase 4 Voltage Bin 2	2	0004
							Phase 4 Voltage Bin 3	2	0006
							Phase 4 Voltage Bin 4	2	0008
							Phase 4 Voltage Bin 5	2	000A
							Phase 4 Voltage Bin 4	2	000C
							Phase 4 Voltage Bin 7	2	000E
							Phase 4 Voltage Bin 8	2	0010
							Phase 4 Voltage Bin 9	2	0012
							Phase 4 Voltage Bin 10	2	0014

Description	Index	Static			File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
		Obj	Var	Desc					
							Phase 4 Voltage Over Band Bin	2	0016
							Max Phase 4 Voltage Sample	4	0018
							Date of Max Phase 4 Voltage Sample	2	001C
							Time of Max Phase 4 Voltage Sample	4	001E
							Min Phase 4 Voltage Sample	4	0022
							Date of Min Phase 4 Voltage Sample	2	0026
							Time of Min Phase 4 Voltage Sample	4	0028
							Date of Phase 4 Voltage Record Clear	2	002C
							Time of Phase 4 Voltage Record Clear	4	002E
						45	Phase 6 Voltage Under Band Bin	2	0000
							Phase 6 Voltage Bin 1	2	0002
							Phase 6 Voltage Bin 2	2	0004
							Phase 6 Voltage Bin 3	2	0006
							Phase 6 Voltage Bin 4	2	0008
							Phase 6 Voltage Bin 5	2	000A
							Phase 6 Voltage Bin 6	2	000C
							Phase 6 Voltage Bin 7	2	000E
							Phase 6 Voltage Bin 8	2	0010
							Phase 6 Voltage Bin 9	2	0012
							Phase 6 Voltage Bin 10	2	0014
							Phase 6 Voltage Over Band Bin	2	0016
							Max Phase 6 Voltage Sample	4	0018
							Date of Max Phase 6 Voltage Sample	2	001C
							Time of Max Phase 6 Voltage Sample	4	001E
							Min Phase 6 Voltage Sample	4	0022
							Date of Min Phase 6 Voltage Sample	2	0026
							Time of Min Phase 6 Voltage Sample	4	0028
							Date of Phase 6 Voltage Record Clear	2	002C
							Time of Phase 6 Voltage Record Clear	4	002E
							Load-Side Phase-to-phase Voltage Histogram		
						46	Phase 2-4 Voltage Under Band Bin	2	0000
							Phase 2-4 Voltage Bin 1	2	0002
							Phase 2-4 Voltage Bin 2	2	0004
							Phase 2-4 Voltage Bin 3	2	0006
							Phase 2-4 Voltage Bin 2	2	0008
							Phase 2-4 Voltage Bin 5	2	000A
							Phase 2-4 Voltage Bin 2	2	000C
							Phase 2-4 Voltage Bin 7	2	000E
							Phase 2-4 Voltage Bin 8	2	0010
							Phase 2-4 Voltage Bin 9	2	0012
							Phase 2-4 Voltage Bin 10	2	0014

Description	Index	Static Obj	Var	Desc	File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
							Phase 2-4 Voltage Over Band Bin	2	0016
							Max Phase 2-4 Voltage Sample	4	0018
							Date of Max Phase 2-4 Voltage Sample	2	001C
							Time of Max Phase 2-4 Voltage Sample	4	001E
							Min Phase 2-4 Voltage Sample	4	0022
							Date of Min Phase 2-4 Voltage Sample	2	0026
							Time of Min Phase 2-4 Voltage Sample	4	0028
							Date of Phase 2-4 Voltage Record Clear	2	002C
							Time of Phase 2-4 Voltage Record Clear	4	002E
						47	Phase 4-6 Voltage Under Band Bin	2	0000
							Phase 4-6 Voltage Bin 1	2	0002
							Phase 4-6 Voltage Bin 2	2	0004
							Phase 4-6 Voltage Bin 3	2	0006
							Phase 4-6 Voltage Bin 4	2	0008
							Phase 4-6 Voltage Bin 5	2	000A
							Phase 4-6 Voltage Bin 6	2	000C
							Phase 4-6 Voltage Bin 7	2	000E
							Phase 4-6 Voltage Bin 8	2	0010
							Phase 4-6 Voltage Bin 9	2	0012
							Phase 4-6 Voltage Bin 10	2	0014
							Phase 4-6 Voltage Over Band Bin	2	0016
							Max Phase 4-6 Voltage Sample	4	0018
							Date of Max Phase 4-6 Voltage Sample	2	001C
							Time of Max Phase 4-6 Voltage Sample	4	001E
							Min Phase 4-6 Voltage Sample	4	0022
							Date of Min Phase 4-6 Voltage Sample	2	0026
							Time of Min Phase 4-6 Voltage Sample	4	0028
							Date of Phase 4-6 Voltage Record Clear	2	002C
							Time of Phase 4-6 Voltage Record Clear	4	002E
						48	Phase 6-2 Voltage Under Band Bin	2	0000
							Phase 6-2 Voltage Bin 1	2	0002
							Phase 6-2 Voltage Bin 2	2	0004
							Phase 6-2 Voltage Bin 3	2	0006
							Phase 6-2 Voltage Bin 4	2	0008
							Phase 6-2 Voltage Bin 5	2	000A
							Phase 6-2 Voltage Bin 6	2	000C
							Phase 6-2 Voltage Bin 7	2	000E
							Phase 6-2 Voltage Bin 8	2	0010
							Phase 6-2 Voltage Bin 9	2	0012
							Phase 6-2 Voltage Bin 10	2	0014
							Phase 6-2 Voltage Over Band Bin	2	0016

Description	Index	Static Obj	Var	Desc	File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
							Max Phase 6-2 Voltage Sample	4	0018
							Date of Max Phase 6-2 Voltage Sample	2	001C
							Time of Max Phase 6-2 Voltage Sample	4	001E
							Min Phase 6-2 Voltage Sample	4	0022
							Date of Min Phase 6-2 Voltage Sample	2	0026
							Time of Min Phase 6-2 Voltage Sample	4	0028
							Date of Phase 6-2 Voltage Record Clear	2	002C
							Time of Phase 6-2 Voltage Record Clear	4	002E
						49	Line Frequency Under Band Bin	2	0000
							Line Frequency Bin 1	2	0002
							Line Frequency Bin 2	2	0004
							Line Frequency Bin 3	2	0006
							Line Frequency Bin 4	2	0008
							Line Frequency Bin 5	2	000A
							Line Frequency Bin 6	2	000C
							Line Frequency Bin 7	2	000E
							Line Frequency Bin 8	2	0010
							Line Frequency Bin 9	2	0012
							Line Frequency Bin 10	2	0014
							Line Frequency Over Band Bin	2	0016
							Max Line Frequency Sample	4	0018
							Date of Max Line Frequency Sample	2	001C
							Time of Max Line Frequency Sample	4	001E
							Min Line Frequency Sample	4	0022
							Date of Min Line Frequency Sample	2	0026
							Time of Min Line Frequency Sample	4	0028
							Date of Line Frequency Record Clear	2	002C
							Time of Line Frequency Record Clear	4	002E
							Source-to-Load Side Voltage Difference Histograms		
						50	Phase 1-2 Voltage Diff Under Band Bin	2	0000
							Phase 1-2 Voltage Diff Bin 1	2	0002
							Phase 1-2 Voltage Diff Bin 2	2	0004
							Phase 1-2 Voltage Diff Bin 3	2	0006
							Phase 1-2 Voltage Diff Bin 4	2	0008
							Phase 1-2 Voltage Diff Bin 5	2	000A
							Phase 1-2 Voltage Diff Bin 6	2	000C
							Phase 1-2 Voltage Diff Bin 7	2	000E
							Phase 1-2 Voltage Diff Bin 8	2	0010
							Phase 1-2 Voltage Diff Bin 9	2	0012
							Phase 1-2 Voltage Diff Bin 10	2	0014
							Phase 1-2 Voltage Diff Over Band Bin	2	0016

Description	Index	Static Obj	Var	Desc	File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
							Max Phase 1-2 Voltage Diff Sample	4	0018
							Date of Max Phase 1-2 Voltage Diff Sample	2	001C
							Time of Max Phase 1-2 Voltage Diff Sample	4	001E
							Min Phase 1-2 Voltage Diff Sample	4	0022
							Date of Min Phase 1-2 Voltage Diff Sample	2	0026
							Time of Min Phase 1-2 Voltage Diff Sample	4	0028
							Date of Phase 1-2 Voltage Diff Record Clear	2	002C
							Time of Phase 1-2 Voltage Diff Record Clear	4	002E
						51	Phase 3-4 Voltage Diff Under Band Bin	2	0000
							Phase 3-4 Voltage Diff Bin 1	2	0002
							Phase 3-4 Voltage Diff Bin 2	2	0004
							Phase 3-4 Voltage Diff Bin 3	2	0006
							Phase 3-4 Voltage Diff Bin 4	2	0008
							Phase 3-4 Voltage Diff Bin 5	2	000A
							Phase 3-4 Voltage Diff Bin 6	2	000C
							Phase 3-4 Voltage Diff Bin 7	2	000E
							Phase 3-4 Voltage Diff Bin 8	2	0010
							Phase 3-4 Voltage Diff Bin 9	2	0012
							Phase 3-4 Voltage Diff Bin 10	2	0014
							Phase 3-4 Voltage Diff Over Band Bin	2	0016
							Max Phase 3-4 Voltage Diff Sample	4	0018
							Date of Max Phase 3-4 Voltage Diff Sample	2	001C
							Time of Max Phase 3-4 Voltage Diff Sample	4	001E
							Min Phase 3-4 Voltage Diff Sample	4	0022
							Date of Min Phase 3-4 Voltage Diff Sample	2	0026
							Time of Min Phase 3-4 Voltage Diff Sample	4	0028
							Date of Phase 3-4 Voltage Diff Record Clear	2	002C
							Time of Phase 3-4 Voltage Diff Record Clear	4	002E
						52	Phase 5-6 Voltage Diff Under Band Bin	2	0000
							Phase 5-6 Voltage Diff Bin 1	2	0002
							Phase 5-6 Voltage Diff Bin 2	2	0004
							Phase 5-6 Voltage Diff Bin 3	2	0006
							Phase 5-6 Voltage Diff Bin 4	2	0008
							Phase 5-6 Voltage Diff Bin 5	2	000A
							Phase 5-6 Voltage Diff Bin 6	2	000C
							Phase 5-6 Voltage Diff Bin 7	2	000E
							Phase 5-6 Voltage Diff Bin 8	2	0010
							Phase 5-6 Voltage Diff Bin 9	2	0012
							Phase 5-6 Voltage Diff Bin 10	2	0014
							Phase 5-6 Voltage Diff Over Band Bin	2	0016

Description	Index	Static Obj	Var	Desc	File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
							Max Phase 5-6 Voltage Diff Sample	4	0018
							Date of Max Phase 5-6 Voltage Diff Sample	2	001C
							Time of Max Phase 5-6 Voltage Diff Sample	4	001E
							Min Phase 5-6 Voltage Diff Sample	4	0022
							Date of Min Phase 5-6 Voltage Diff Sample	2	0026
							Time of Min Phase 5-6 Voltage Diff Sample	4	0028
							Date of Phase 5-6 Voltage Diff Record Clear	2	002C
							Time of Phase 5-6 Voltage Diff Record Clear	4	002E
File Identifier		70	01		PP009	00	Available TCC Names		
							Available TCC 1 ID	18	0000
							Available TCC 2 ID	18	0012
							Available TCC 3 ID	18	0024
							Available TCC 4 ID	18	0036
							Available TCC 5 ID	18	0048
							Available TCC 6 ID	18	005A
							Available TCC 7 ID	18	006C
							Available TCC 8 ID	18	007E
							Available TCC 9 ID	18	0090
							Available TCC 10 ID	18	00A2
							Available TCC 11 ID	18	00B4
							Available TCC 12 ID	18	00C6
							Available TCC 13 ID	18	00D8
							Available TCC 14 ID	18	00EA
							Available TCC 15 ID	18	00FC
							Available TCC 16 ID	18	010E
							Available TCC 17 ID	18	0120
							Available TCC 18 ID	18	0132
							Available TCC 19 ID	18	0144
							Available TCC 20 ID	18	0156
File Identifier		70	01		PM001	00	Battery parameters		
							Unloaded battery voltage	4	0000
							Unloaded battery current	4	0004
File Identifier		70	01		PM002	00	Battery test parameters		
							Loaded battery voltage	4	0000
							Loaded battery current	4	0004
File Identifier		70	01		CA001	00	Measured baseline values using present calibration		
							Voltage at bushing 1	4	0000
							Voltage at bushing 3	4	0004
							Voltage at bushing 5	4	0008
							Current through bushing 1-2, low range channel	4	000C
							Current through bushing 3-4, low range channel	4	0010

Description	Index	Static			File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
		Obj	Var	Desc					
							Current through bushing 5-6, low range channel	4	0014
							Current through bushing 1-2, high range channel	4	0018
							Current through bushing 3-4, high range channel	4	001C
							Current through bushing 5-6, high range channel	4	0020
							Ground imbalance current, high range channel	4	0024
							Ground imbalance current, low range channel	4	0028
							Ground imbalance current, sensitive fault channel	4	002C
							Current through bushing 3-4, mid range channel	4	0030
							Current through bushing 1-2, mid range channel	4	0034
							Ground imbalance current, mid range channel	4	0038
							Current through bushing 5-6, mid range channel	4	003C
							Power factor for bushing 1-2	4	0040
							Power factor for bushing 3-4	4	0044
							Power factor for bushing 5-6	4	0048
							Unloaded battery voltage	4	004C
							Battery current	4	0050
							Voltage at bushing 2	4	0054
							Voltage at bushing 4	4	0058
							Voltage at bushing 6	4	005C
File Identifier		70	01		CA003		Calibration results		
						00	Bit-mapped calibration results	2	0000
File Identifier		70	01		CO999		DNP Error info		
						00	Internal error code info	2	0000
							Offset in object (if error code is a NAK)	2	0002

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Description	Index	Static Obj	Var	Desc	File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
SPECIAL METERING APPLICATIONS (Read-only)									
File Identifier		70	01		ME010	00	Instantaneous Current Harmonics		
							Harmonic current through bushing 1-2	4	0000
							Harmonic current through bushing 3-4	4	0004
							Harmonic current through bushing 5-6	4	0008
							Harmonic ground current	4	000C
						01	2nd Harmonic current through bushing 1-2	4	0000
							2nd Harmonic current through bushing 3-4	4	0004
							2nd Harmonic current through bushing 5-6	4	0008
							2nd Harmonic ground current	4	000C
						02	3rd Harmonic current through bushing 1-2	4	0000
							3rd Harmonic current through bushing 3-4	4	0004
							3rd Harmonic current through bushing 5-6	4	0008
							3rd Harmonic ground current	4	000C
						03	4th Harmonic current through bushing 1-2	4	0000
							4th Harmonic current through bushing 3-4	4	0004
							4th Harmonic current through bushing 5-6	4	0008
							4th Harmonic ground current	4	000C
						04	5th Harmonic current through bushing 1-2	4	0000
							5th Harmonic current through bushing 3-4	4	0004
							5th Harmonic current through bushing 5-6	4	0008
							5th Harmonic ground current	4	000C
						05	6th Harmonic current through bushing 1-2	4	0000
							6th Harmonic current through bushing 3-4	4	0004
							6th Harmonic current through bushing 5-6	4	0008
							6th Harmonic ground current	4	000C
						06	7th Harmonic current through bushing 1-2	4	0000
							7th Harmonic current through bushing 3-4	4	0004
							7th Harmonic current through bushing 5-6	4	0008
							7th Harmonic ground current	4	000C
						07	8th Harmonic current through bushing 1-2	4	0000
							8th Harmonic current through bushing 3-4	4	0004
							8th Harmonic current through bushing 5-6	4	0008
							8th Harmonic ground current	4	000C
						08	9th Harmonic current through bushing 1-2	4	0000
							9th Harmonic current through bushing 3-4	4	0004

Description	Index	Static Obj	Var	Desc	File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
							9th Harmonic current through bushing 5-6	4	0008
							9th Harmonic ground current	4	000C
						09	10th Harmonic current through bushing 1-2	4	0000
							10th Harmonic current through bushing 3-4	4	0004
							10th Harmonic current through bushing 5-6	4	0008
							10th Harmonic ground current	4	000C
						10	11th Harmonic current through bushing 1-2	4	0000
							11th Harmonic current through bushing 3-4	4	0004
							11th Harmonic current through bushing 5-6	4	0008
							11th Harmonic ground current	4	000C
						11	12th Harmonic current through bushing 1-2	4	0000
							12th Harmonic current through bushing 3-4	4	0004
							12th Harmonic current through bushing 5-6	4	0008
							12th Harmonic ground current	4	000C
						12	13th Harmonic current through bushing 1-2	4	0000
							13th Harmonic current through bushing 3-4	4	0004
							13th Harmonic current through bushing 5-6	4	0008
							13th Harmonic ground current	4	000C
						13	14th Harmonic current through bushing 1-2	4	0000
							14th Harmonic current through bushing 3-4	4	0004
							14th Harmonic current through bushing 5-6	4	0008
							14th Harmonic ground current	4	000C
						14	15th Harmonic current through bushing 1-2	4	0000
							15th Harmonic current through bushing 3-4	4	0004
							15th Harmonic current through bushing 5-6	4	0008
							15th Harmonic ground current	4	000C
File Identifier		70	01		ME011		Instantaneous voltage harmonic values		
						00	Harmonic voltage at bushing 1-2	4	0000
							Harmonic voltage at bushing 3-4	4	0004
							Harmonic voltage at bushing 5-6	4	0008
						01	2nd Harmonic voltage at bushing 1-2	4	0000
							2nd Harmonic voltage at bushing 3-4	4	0004
							2nd Harmonic voltage at bushing 5-6	4	0008
						02	3rd Harmonic voltage at bushing 1-2	4	0000
							3rd Harmonic voltage at bushing 3-4	4	0004
							3rd Harmonic voltage at bushing 5-6	4	0008

Description	Index	Static			File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
		Obj	Var	Desc					
						03	4th Harmonic voltage at bushing 1-2	4	0000
							4th Harmonic voltage at bushing 3-4	4	0004
							4th Harmonic voltage at bushing 5-6	4	0008
						04	5th Harmonic voltage at bushing 1-2	4	0000
							5th Harmonic voltage at bushing 3-4	4	0004
							5th Harmonic voltage at bushing 5-6	4	0008
						05	6th Harmonic voltage at bushing 1-2	4	0000
							6th Harmonic voltage at bushing 3-4	4	0004
							6th Harmonic voltage at bushing 5-6	4	0008
						06	7th Harmonic voltage at bushing 1-2	4	0000
							7th Harmonic voltage at bushing 3-4	4	0004
							7th Harmonic voltage at bushing 5-6	4	0008
						07	8th Harmonic voltage at bushing 1-2	4	0000
							8th Harmonic voltage at bushing 3-4	4	0004
							8th Harmonic voltage at bushing 5-6	4	0008
						08	9th Harmonic voltage at bushing 1-2	4	0000
							9th Harmonic voltage at bushing 3-4	4	0004
							9th Harmonic voltage at bushing 5-6	4	0008
						09	10th Harmonic voltage at bushing 1-2	4	0000
							10th Harmonic voltage at bushing 3-4	4	0004
							10th Harmonic voltage at bushing 5-6	4	0008
						10	11th Harmonic voltage at bushing 1-2	4	0000
							11th Harmonic voltage at bushing 3-4	4	0004
							11th Harmonic voltage at bushing 5-6	4	0008
						11	12th Harmonic voltage at bushing 1-2	4	0000
							12th Harmonic voltage at bushing 3-4	4	0004
							12th Harmonic voltage at bushing 5-6	4	0008
						12	13th Harmonic voltage at bushing 1-2	4	0000
							13th Harmonic voltage at bushing 3-4	4	0004
							13th Harmonic voltage at bushing 5-6	4	0008
						13	14th Harmonic voltage at bushing 1-2	4	0000
							14th Harmonic voltage at bushing 3-4	4	0004
							14th Harmonic voltage at bushing 5-6	4	0008

Description	Index	Static			File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
		Obj	Var	Desc					
						14	15th Harmonic voltage at bushing 1-2	4	0000
							15th Harmonic voltage at bushing 3-4	4	0004
							15th Harmonic voltage at bushing 5-6	4	0008
File Identifier		70	01		ME006	00	Instantaneous current sequence component values		
							Positive sequence current magnitude	4	0000
							Positive sequence current angle	4	0004
							Negative sequence current magnitude	4	0008
							Negative sequence current angle	4	000C
							Zero sequence current magnitude	4	0010
							Zero sequence current angle	4	0014
File Identifier		70	01		ME007	00	Instantaneous voltage sequence component values		
							Positive sequence voltage magnitude	4	0000
							Positive sequence voltage angle	4	0004
							Negative sequence voltage magnitude	4	0008
							Negative sequence voltage angle	4	000C
File Identifier		70	01		DE006	00	Demand current sequence component values		
							Positive sequence current magnitude	4	0000
							Positive sequence current angle	4	0004
							Negative sequence current magnitude	4	0008
							Negative sequence current angle	4	000C
							Zero sequence current magnitude	4	0010
							Zero sequence current angle	4	0014
File Identifier		70	01		DE007	00	Demand voltage sequence component values		
							Positive sequence voltage magnitude	4	0000
							Positive sequence voltage angle	4	0004
							Negative sequence voltage magnitude	4	0008
							Negative sequence voltage angle	4	000C
File Identifier		70	01		IM001	00	Duty accumulators information		
							Phase 1-2 % Rated Duty Depleted	4	0000
							Phase 3-4 % Rated Duty Depleted	4	0004
							Phase 5-6 % Rated Duty Depleted	4	0008

CONFIGURATION DATA

Description	Index	Static			File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
		Obj	Var	Desc					
File Identifier		70	01		PP001		1st set of overcurrent protection parameters (Protection Profile)		
						0	Phase Min Trip For Normal Sequence	2	0000
							Ground Min Trip For Normal Sequence	2	0002
							Phase Shots To Lockout	2	0004
							Ground Shots To Lockout	2	0006
							Fast Trips Disabled Shots To Lockout	2	0008
							Phase High Current Lockout Enable - Shot 1	1	000A
							Phase High Current Lockout Enable - Shot 2	1	000B
							Phase High Current Lockout Enable - Shot 3	1	000C
							Pad	1	000D
							Phase High Current Lockout Threshold - 1	4	000E
							Phase High Current Lockout Threshold - 2	4	0012
							Phase High Current Lockout Threshold - 3	4	0016
							Ground High Current Lockout Enable - Shot 1	1	001A
							Ground High Current Lockout Enable - Shot 2	1	001B
							Ground High Current Lockout Enable - Shot 3	1	001C
							Pad	1	001D
							Ground High Current Lockout Threshold - 1	4	001E
							Ground High Current Lockout Threshold - 2	4	0022
							Ground High Current Lockout Threshold - 3	4	0026
							Phase Reclose Interval 1	4	002A
							Phase Reclose Interval 2	4	002E
							Phase Reclose Interval 3	4	0032
							Ground Reclose Interval 1	4	0036
							Ground Reclose Interval 2	4	003A
							Ground Reclose Interval 3	4	003E
							Sequence Reset Time	4	0042
							Trip Precedence (GROUND, PHASE)	1	0046
							Close Retry Enable	1	0047
							Target Reset Mode (AUTO, MANUAL)	1	0048
							Pad	1	0049
							Maximum Sequence Coordination Shots	2	004A
							Sequence Coordination Enable	1	004C
							Pad	1	004D
							Disc Reset Time	4	004E
							Phase Min Trip For Hot Line Tag	2	0052
							Ground Min Trip For Hot Line Tag	2	0054
							Hot Line tag Mode (AUTO, MANUAL)	1	0056
							Pad	1	0057
							SGF Enable	1	0058

Description	Index	Static			File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
		Obj	Var	Desc					
							Pad	1	0059
							SGF Min Trip	2	005A
							SGF Definite Trip Time	4	005C
							SGF Shots To Lockout	2	0060
							SGF Reclose Interval 1	4	0062
							SGF Reclose Interval 2	4	0066
							SGF Reclose Interval 3	4	006A
							SGF Reset Time	4	006E
							SGF Directional Enable	1	0072
							Pad	1	0073
							Max Torque Angle	2	0074
							Voltage Threshold	2	0076
							Torque Angle Width	2	0078
							CLP Enable	1	007A
							Pad	1	007B
							Phase Min Trip For CLP	2	007C
							Ground Min Trip For CLP	2	007E
							External CLP Activation Time	4	0080
							Auto CLP Activation Time	4	0084
							Auto CLP Arming Time Delay	4	0088
							CLP Reclose Interval	4	008C
							CLP Shots To Lockout	2	0090
							Auto CLP Mode (OFF, CURRENT, VOLTAGE)	1	0092
							Phase CLP HCLO Enable	1	0093
							Phase CLP HCLO Threshold	4	0094
							Ground CLP HCLO Enable	1	0098
							Pad	1	0099
							Ground CLP HCLO Threshold	4	009A
							Auto Momentary Non Reclose Enable	1	009E
							Pad	1	009F
							Auto NRC Arming Time Delay	4	00A0
							Auto NRC Activation Time	4	00A4
							TCC ID (name) used during first phase operation	18	00A8
							TCC ID (name) used during second phase operation	18	00BA
							TCC ID (name) used during third phase operation	18	00CC
							TCC ID (name) used during fourth phase operation	18	00DE
							TCC ID (name) used during first ground operation	18	00F0
							TCC ID (name) used during second ground operation	18	0102
							TCC ID (name) used during third ground operation	18	0114
							TCC ID (name) used during fourth ground operation	18	0126
							TCC ID (name) used during phase cold load pickup	18	0138
							TCC ID (name) used during ground cold load pickup	18	014A

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Description	Index	Static Obj	Var	Desc	File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
							TCC ID (name) used during phase hot line tag	18	015C
							TCC ID (name) used during ground hot line tag	18	016E
							TCC ID (name) used during phase fast trips disabled	18	0180
							TCC ID (name) used during ground fast trips disabled	18	0192
							Adaptive Extended Ground Min Trip Enable	1	01A4
							Pad	1	01A5
							Extended Ground Min Trip Min Trip %	4	01A6
							Extended Ground Min Trip Lower Limit	4	01AA
							Extended GMT Filter Time Constant	4	01AE
							Phase Low Set Enable - Shot 1	1	01B2
							Phase Low Set Enable - Shot 2	1	01B3
							Phase Low Set Enable - Shot 3	1	01B4
							Phase Low Set Enable - Shot 4	1	01B5
							Phase Low Set Time	4	01B6
							Phase High Set Enable - Shot 1	1	01BA
							Phase High Set Enable - Shot 2	1	01BB
							Phase High Set Enable - Shot 3	1	01BC
							Phase High Set Enable - Shot 4	1	01BD
							Phase High Set Time	4	01BE
							Phase High Set Current	4	01C2
							Ground High Set Enable - Shot 1	1	01C6
							Ground High Set Enable - Shot 2	1	01C7
							Ground High Set Enable - Shot 3	1	01C8
							Ground High Set Enable - Shot 4	1	01C9
							Ground High Set Time	4	01CA
							Ground High Set Current	4	01CE
							Nominal Line-to-Line Voltage	4	01D2
							Source Positive Seq Impedance Real	2	01D6
							Source Positive Seq Impedance Imag	2	01D8
							Source Zero Seq Impedance Real	2	01DA
							Source Zero Seq Impedance Real	2	01DC
							Line Zero Seq Impedance Per Distance Units Real	2	01DE
							Line Zero Seq Impedance Per Distance Units Imag	2	01E0
							Line Positive Seq Impedance Per Distance Units Real	2	01E2
							Line Positive Seq Impedance Per Distance Units Imag	2	01E4
							Distance Units	2	01E6
							Triple - Single mode (Ganged = 0; 1-phase trip, 3 phase lockout = 1:1-phase trip, 1-phase lockout = 2)	1	01E8
							Dynamic Phase Trip Enable	1	01E9
File Identifier		70	01		PP002	00	2nd set of overcurrent protection parameters (Protection Profile)	(see above)	(see above)

Description	Index	Static Obj	Var	Desc	File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
File Identifier		70	01		PP003	00	3rd set of overcurrent protection parameters (Protection Profile)	(see above)	(see above)
File Identifier		70	01		PP004	00	4th set of overcurrent protection parameters (Protection Profile)	(see above)	(see above)
File Identifier		70	01		PP010	00	Requested TCC data (requires arg to specify which TCC from 1-20)		
							Magic Number	4	0000
							ARRAY of TCC Point Information	512	0004
							TCC Identifier String	18	0204
							Nominal Frequency (50, 60)	1	0216
							Pad	1	0217
							TCC Editor Control	2	0218
							Time Multiplier	8	021A
							Time Adder	8	0222
							Minimum Response Time	8	022A
							High Trip Time	8	0232
							High Trip Current Ratio	8	023A
File Identifier		70	01		HS002		Current Fundamental Histogram Config		
						00	Phase 1-2 Current Histogram Lower Limit	4	0000
							Phase 1-2 Current Histogram Upper Limit	4	0004
						01	Phase 3-4 Current Histogram Lower Limit	4	0000
							Phase 3-4 Current Histogram Upper Limit	4	0004
						02	Phase 5-6 Current Histogram Lower Limit	4	0000
							Phase 5-6 Current Histogram Upper Limit	4	0004
						03	Ground Current Histogram Lower Limit	4	0000
							Ground Current Histogram Upper Limit	4	0004
							Voltage Fundamental Histogram Config		
						04	Phase 1-2 Voltage Histogram Lower Limit	4	0000
							Phase 1-2 Voltage Histogram Upper Limit	4	0004
						05	Phase 3-4 Voltage Histogram Lower Limit	4	0000
							Phase 3-4 Voltage Histogram Upper Limit	4	0004
						06	Phase 5-6 Voltage Histogram Lower Limit	4	0000
							Phase 5-6 Voltage Histogram Upper Limit	4	0004
							Power Histogram Config		
						07	Phase 1-2 Power Factor Histogram Lower Limit	4	0000
							Phase 1-2 Power Factor Histogram Upper Limit	4	0004
						08	Phase 1-2 KVA Histogram Lower Limit	4	0000
							Phase 1-2 KVA Histogram Upper Limit	4	0004
						09	Phase 1-2 KW Histogram Lower Limit	4	0000

Description	Index	Static Obj	Var	Desc	File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
							Phase 1-2 KW Histogram Upper Limit	4	0004
						10	Phase 1-2 KVAR Histogram Lower Limit	4	0000
							Phase 1-2 KVAR Histogram Upper Limit	4	0004
						11	Phase 3-4 Power Factor Histogram Lower Limit	4	0000
							Phase 3-4 Power Factor Histogram Upper Limit	4	0004
						12	Phase 3-4 KVA Histogram Lower Limit	4	0000
							Phase 3-4 KVA Histogram Upper Limit	4	0004
						13	Phase 3-4 KW Histogram Lower Limit	4	0000
							Phase 3-4 KW Histogram Upper Limit	4	0004
						14	Phase 3-4 KVAR Histogram Lower Limit	4	0000
							Phase 3-4 KVAR Histogram Upper Limit	4	0004
						15	Phase 5-6 Power Factor Histogram Lower Limit	4	0000
							Phase 5-6 Power Factor Histogram Upper Limit	4	0004
						16	Phase 5-6 KVA Histogram Lower Limit	4	0000
							Phase 5-6 KVA Histogram Upper Limit	4	0004
						17	Phase 5-6 KW Histogram Lower Limit	4	0000
							Phase 5-6 KW Histogram Upper Limit	4	0004
						18	Phase 5-6 KVAR Histogram Lower Limit	4	0000
							Phase 5-6 KVAR Histogram Upper Limit	4	0004
						19	Total Power Factor Histogram Lower Limit	4	0000
							Total Power Factor Histogram Upper Limit	4	0004
						20	Total KVA Histogram Lower Limit	4	0000
							Total KVA Histogram Upper Limit	4	0004
						21	Total KW Histogram Lower Limit	4	0000
							Total KW Histogram Upper Limit	4	0004
						22	Total KVAR Histogram Lower Limit	4	0000
							Total KVAR Histogram Upper Limit	4	0004
							Sequence Component Current Histogram Config		
						23	Pos Seq Current Mag Histogram Lower Limit	4	0000
							Pos Seq Current Mag Histogram Upper Limit	4	0004
						24	Pos Seq Current Angle Histogram Lower Limit	4	0000
							Pos Seq Current Angle Histogram Upper Limit	4	0004
						25	Neg Seq Current Mag Histogram Lower Limit	4	0000
							Neg Seq Current Mag Histogram Upper Limit	4	0004
						26	Neg Seq Current Angle Histogram Lower Limit	4	0000
							Neg Seq Current Angle Histogram Upper Limit	4	0004
						27	Zero Seq Current Mag Histogram Lower Limit	4	0000
							Zero Seq Current Mag Histogram Upper Limit	4	0004
						28	Zero Seq Current Angle Histogram Lower Limit	4	0000
							Zero Seq Current Angle Histogram Upper Limit	4	0004
							Sequence Component Voltage Histogram Config		
						29	Pos Seq Voltage Mag Histogram Lower Limit	4	0000
							Pos Seq Voltage Mag Histogram Upper Limit	4	0004

Description	Index	Static			File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
		Obj	Var	Desc					
						30	Pos Seq Voltage Angle Histogram Lower Limit	4	0000
							Pos Seq Voltage Angle Histogram Upper Limit	4	0004
						31	Neg Seq Voltage Mag Histogram Lower Limit	4	0000
							Neg Seq Voltage Mag Histogram Upper Limit	4	0004
						32	Neg Seq Voltage Angle Histogram Lower Limit	4	0000
							Neg Seq Voltage Angle Histogram Upper Limit	4	0004
							Harmonic Current Histogram Config		
						33	Phase 1-2 Current THD Histogram Lower Limit	4	0000
							Phase 1-2 Current THD Histogram Upper Limit	4	0004
						34	Phase 3-4 Current THD Histogram Lower Limit	4	0000
							Phase 3-4 Current THD Histogram Upper Limit	4	0004
						35	Phase 5-6 Current THD Histogram Lower Limit	4	0000
							Phase 5-6 Current THD Histogram Upper Limit	4	0004
						36	Ground Current THD Histogram Lower Limit	4	0000
							Ground Current THD Histogram Upper Limit	4	0004
							Harmonic Voltage Histogram Config		
						37	Phase 1-2 Voltage THD Histogram Lower Limit	4	0000
							Phase 1-2 Voltage THD Histogram Upper Limit	4	0004
						38	Phase 3-4 Voltage THD Histogram Lower Limit	4	0000
							Phase 3-4 Voltage THD Histogram Upper Limit	4	0004
						39	Phase 5-6 Voltage THD Histogram Lower Limit	4	0000
							Phase 5-6 Voltage THD Histogram Upper Limit	4	0004
							Phase-to-phase Voltage Histogram Config		
						40	Phase 1-3 Voltage Histogram Lower Limit	4	0000
							Phase 1-3 Voltage Histogram Upper Limit	4	0004
						41	Phase 3-5 Voltage Histogram Lower Limit	4	0000
							Phase 3-5 Voltage Histogram Upper Limit	4	0004
						42	Phase 5-1 Voltage Histogram Lower Limit	4	0000
							Phase 5-1 Voltage Histogram Upper Limit	4	0004
							Load side Voltage Histogram Config		
						43	Phase 2 Voltage Histogram Lower Limit	4	0000
							Phase 2 Voltage Histogram Upper Limit	4	0004
						44	Phase 4 Voltage Histogram Lower Limit	4	0000
							Phase 4 Voltage Histogram Upper Limit	4	0004
						45	Phase 6 Voltage Histogram Lower Limit	4	0000
							Phase 6 Voltage Histogram Upper Limit	4	0004
							Load side Phase-to-phase Voltage Histogram Config		
						46	Phase 2-4 Voltage Histogram Lower Limit	4	0000
							Phase 2-4 Voltage Histogram Upper Limit	4	0004
						47	Phase 4-6 Voltage Histogram Lower Limit	4	0000

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Description	Index	Static Obj	Var	Desc	File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
							Phase 4-6 Voltage Histogram Upper Limit	4	0004
						48	Phase 6-2 Voltage Histogram Lower Limit	4	0000
							Phase 6-2 Voltage Histogram Upper Limit	4	0004
							Line frequency Histogram Config		
						49	Line frequency Histogram Lower Limit	4	0000
							Line frequency Histogram Upper Limit	4	0004
							Source-to-Load side Voltage Difference Histogram Config		
						50	Phase 1-2 Voltage Diff Histogram Lower Limit	4	0000
							Phase 1-2 Voltage Diff Histogram Upper Limit	4	0004
						51	Phase 3-4 Voltage Diff Histogram Lower Limit	4	0000
							Phase 3-4 Voltage Diff Histogram Upper Limit	4	0004
						52	Phase 5-6 Voltage Diff Histogram Lower Limit	4	0000
							Phase 5-6 Voltage Diff Histogram Upper Limit	4	0004
File Identifier		70	01		PR001	00	Profile Recorder Control	2	0000
							Profile Recorder Time Interval	2	0002
							Profile Recorder Start Time	2	0004
							Profile Recorder Duration Time	2	0006
							Profile Recorder Start Day	2	0008
							Profile Recorder End Day	1	000A
							Phase 1-2 Current Profile Enable	1	000B
							Phase 3-4 Current Profile Enable	1	000C
							Phase 5-6 Current Profile Enable	1	000D
							Ground Current Profile Enable	1	000E
							Phase 1 Voltage Profile Enable	1	000F
							Phase 3 Voltage Profile Enable	1	0010
							Phase 5 Voltage Profile Enable	1	0011
							Phase 1-2 Current THD Profile Enable	1	0012
							Phase 3-4 Current THD Profile Enable	1	0013
							Phase 5-6 Current THD Profile Enable	1	0014
							Ground Current THD Profile Enable	1	0015
							Phase 1-2 Current 2nd Harmonic Profile Enable	1	0016
							Phase 3-4 Current 2nd Harmonic Profile Enable	1	0017
							Phase 5-6 Current 2nd Harmonic Profile Enable	1	0018
							Ground Current 2nd Harmonic Profile Enable	1	0019
							Phase 1-2 Current 3rd Harmonic Profile Enable	1	001A
							Phase 3-4 Current 3rd Harmonic Profile Enable	1	001B
							Phase 5-6 Current 3rd Harmonic Profile Enable	1	001C
							Ground Current 3rd Harmonic Profile Enable	1	001D
							Phase 1-2 Current 4th Harmonic Profile Enable	1	001E
							Phase 3-4 Current 4th Harmonic Profile Enable	1	001F
							Phase 5-6 Current 4th Harmonic Profile Enable	1	0020
							Ground Current 4th Harmonic Profile Enable	1	

Description	Index	Static			File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
		Obj	Var	Desc					
							Phase 1-2 Current 5th Harmonic Profile Enable	1	0021
							Phase 3-4 Current 5th Harmonic Profile Enable	1	0022
							Phase 5-6 Current 5th Harmonic Profile Enable	1	0023
							Ground Current 5th Harmonic Profile Enable	1	0024
							Phase 1-2 Current 6th Harmonic Profile Enable	1	0025
							Phase 3-4 Current 6th Harmonic Profile Enable	1	0026
							Phase 5-6 Current 6th Harmonic Profile Enable	1	0027
							Ground Current 6th Harmonic Profile Enable	1	0028
							Phase 1-2 Current 7th Harmonic Profile Enable	1	0029
							Phase 3-4 Current 7th Harmonic Profile Enable	1	002A
							Phase 5-6 Current 7th Harmonic Profile Enable	1	002B
							Ground Current 7th Harmonic Profile Enable	1	002C
							Phase 1-2 Current 8th Harmonic Profile Enable	1	002D
							Phase 3-4 Current 8th Harmonic Profile Enable	1	002E
							Phase 5-6 Current 8th Harmonic Profile Enable	1	002F
							Ground Current 8th Harmonic Profile Enable	1	0030
							Phase 1-2 Current 9th Harmonic Profile Enable	1	0031
							Phase 3-4 Current 9th Harmonic Profile Enable	1	0032
							Phase 5-6 Current 9th Harmonic Profile Enable	1	0033
							Ground Current 9th Harmonic Profile Enable	1	0034
							Phase 1-2 Current 10th Harmonic Profile Enable	1	0035
							Phase 3-4 Current 10th Harmonic Profile Enable	1	0036
							Phase 5-6 Current 10th Harmonic Profile Enable	1	0037
							Ground Current 10th Harmonic Profile Enable	1	0038
							Phase 1-2 Current 11th Harmonic Profile Enable	1	0039
							Phase 3-4 Current 11th Harmonic Profile Enable	1	003A
							Phase 5-6 Current 11th Harmonic Profile Enable	1	003B
							Ground Current 11th Harmonic Profile Enable	1	003C
							Phase 1-2 Current 12th Harmonic Profile Enable	1	003D
							Phase 3-4 Current 12th Harmonic Profile Enable	1	003E
							Phase 5-6 Current 12th Harmonic Profile Enable	1	003F
							Ground Current 12th Harmonic Profile Enable	1	0040
							Phase 1-2 Current 13th Harmonic Profile Enable	1	0041
							Phase 3-4 Current 13th Harmonic Profile Enable	1	0042
							Phase 5-6 Current 13th Harmonic Profile Enable	1	0043
							Ground Current 13th Harmonic Profile Enable	1	0044
							Phase 1-2 Current 14th Harmonic Profile Enable	1	0045
							Phase 3-4 Current 14th Harmonic Profile Enable	1	0046
							Phase 5-6 Current 14th Harmonic Profile Enable	1	0047
							Ground Current 14th Harmonic Profile Enable	1	0048
							Phase 1-2 Current 15th Harmonic Profile Enable	1	0049
							Phase 3-4 Current 15th Harmonic Profile Enable	1	004A
							Phase 5-6 Current 15th Harmonic Profile Enable	1	004B
							Ground Current 15th Harmonic Profile Enable	1	004C
							Phase 1-2 Voltage THD Profile Enable	1	004D

Description	Index	Static			File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
		Obj	Var	Desc					
							Phase 3-4 Voltage THD Profile Enable	1	004E
							Phase 5-6 Voltage THD Profile Enable	1	004F
							Phase 1-2 Voltage 2nd Harmonic Profile Enable	1	0050
							Phase 3-4 Voltage 2nd Harmonic Profile Enable	1	0051
							Phase 5-6 Voltage 2nd Harmonic Profile Enable	1	0052
							Phase 1-2 Voltage 3rd Harmonic Profile Enable	1	0053
							Phase 3-4 Voltage 3rd Harmonic Profile Enable	1	0054
							Phase 5-6 Voltage 3rd Harmonic Profile Enable	1	0055
							Phase 1-2 Voltage 4th Harmonic Profile Enable	1	0056
							Phase 3-4 Voltage 4th Harmonic Profile Enable	1	0057
							Phase 5-6 Voltage 4th Harmonic Profile Enable	1	0058
							Phase 1-2 Voltage 5th Harmonic Profile Enable	1	0059
							Phase 3-4 Voltage 5th Harmonic Profile Enable	1	005A
							Phase 5-6 Voltage 5th Harmonic Profile Enable	1	005B
							Phase 1-2 Voltage 6th Harmonic Profile Enable	1	005C
							Phase 3-4 Voltage 6th Harmonic Profile Enable	1	005D
							Phase 5-6 Voltage 6th Harmonic Profile Enable	1	005E
							Phase 1-2 Voltage 7th Harmonic Profile Enable	1	005F
							Phase 3-4 Voltage 7th Harmonic Profile Enable	1	0060
							Phase 5-6 Voltage 7th Harmonic Profile Enable	1	0061
							Phase 1-2 Voltage 8th Harmonic Profile Enable	1	0062
							Phase 3-4 Voltage 8th Harmonic Profile Enable	1	0063
							Phase 5-6 Voltage 8th Harmonic Profile Enable	1	0064
							Phase 1-2 Voltage 9th Harmonic Profile Enable	1	0065
							Phase 3-4 Voltage 9th Harmonic Profile Enable	1	0066
							Phase 5-6 Voltage 9th Harmonic Profile Enable	1	0067
							Phase 1-2 Voltage 10th Harmonic Profile Enable	1	0068
							Phase 3-4 Voltage 10th Harmonic Profile Enable	1	0069
							Phase 5-6 Voltage 10th Harmonic Profile Enable	1	006A
							Phase 1-2 Voltage 11th Harmonic Profile Enable	1	006B
							Phase 3-4 Voltage 11th Harmonic Profile Enable	1	006C
							Phase 5-6 Voltage 11th Harmonic Profile Enable	1	006D
							Phase 1-2 Voltage 12th Harmonic Profile Enable	1	006E
							Phase 3-4 Voltage 12th Harmonic Profile Enable	1	006F
							Phase 5-6 Voltage 12th Harmonic Profile Enable	1	0070
							Phase 1-2 Voltage 13th Harmonic Profile Enable	1	0071
							Phase 3-4 Voltage 13th Harmonic Profile Enable	1	0072
							Phase 5-6 Voltage 13th Harmonic Profile Enable	1	0073
							Phase 1-2 Voltage 14th Harmonic Profile Enable	1	0074
							Phase 3-4 Voltage 14th Harmonic Profile Enable	1	0075
							Phase 5-6 Voltage 14th Harmonic Profile Enable	1	0076
							Phase 1-2 Voltage 15th Harmonic Profile Enable	1	0077
							Phase 3-4 Voltage 15th Harmonic Profile Enable	1	0078
							Phase 5-6 Voltage 15th Harmonic Profile Enable	1	0079
							Phase 1-2 Power Factor Profile Enable	1	007A

Description	Index	Static		Desc	File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
		Obj	Var						
							Phase 3-4 Power Factor Profile Enable	1	007B
							Phase 5-6 Power Factor Profile Enable	1	007C
							Total Power Factor Profile Enable	1	007D
							Phase 1-2 KVA Profile Enable	1	007E
							Phase 3-4 KVA Profile Enable	1	007F
							Phase 5-6 KVA Profile Enable	1	0080
							Total KVA Profile Enable	1	0081
							Phase 1-2 KW Profile Enable	1	0082
							Phase 3-4 KW Profile Enable	1	0083
							Phase 5-6 KW Profile Enable	1	0084
							Total KW Profile Enable	1	0085
							Phase 1-2 KVAR Profile Enable	1	0086
							Phase 3-4 KVAR Profile Enable	1	0087
							Phase 5-6 KVAR Profile Enable	1	0088
							Total KVAR Profile Enable	1	0089
							Phase 1 to 3 Voltage Profile Enable	1	008A
							Phase 3 to 5 Voltage Profile Enable	1	008B
							Phase 5 to 1 Voltage Profile Enable	1	008C
							Phase 1-2 kWh Profile Enable	1	008A
							Phase 3-4 kWh Profile Enable	1	008B
							Phase 5-6 kWh Profile Enable	1	008C
							Total kWh Profile Enable	1	008D
							Phase 2 Voltage Profile Enable	1	008E
							Phase 4 Voltage Profile Enable	1	008F
							Phase 6 Voltage Profile Enable	1	0090
							Phase 2 to 4 Voltage Profile Enable	1	0091
							Phase 4 to 6 Voltage Profile Enable	1	0092
							Phase 6 to 2 Voltage Profile Enable	1	0093
							Line Frequency Profile Enable	1	0094
							Phase 1-2 Voltage Difference Profile Enable	1	0095
							Phase 3-4 Voltage Difference Profile Enable	1	0096
							Phase 5-6 Voltage Difference Profile Enable	1	0097
File Identifier		70	01		AL001 n	00	Data Alarm Cfg (requires arg to specify which Alarm Cfg)		0000
							Data alarm ID (same as input arg)	2	0000
							Alarm enable	1	0002
							Pad	1	0003
							Alarm activation limit	4	0004
							When to record event (OFF, ACTIVE, INACTIVE, BOTH)	1	0008
							When to trigger a profile recording (OFF, ACTIVE, INACTIVE, BOTH)	1	0009
							Alarm priority (0...127)	1	000A
							Pad	1	000B
							Alarm activation delay filter	4	000C

Description	Index	Static Obj	Var	Desc	File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
File Identifier		70	01		AL005 n	00	Status Alarm Cfg (requires arg to specify which Alarm Cfg)		0000
							Data alarm ID (same as input arg)	2	0000
							Alarm enable	1	0002
							Pad	1	0003
							When to record event (OFF, ACTIVE, INACTIVE, BOTH)	1	0004
							When to trigger a profile recording (OFF, ACTIVE, INACTIVE, BOTH)	1	0005
							Alarm priority (0...127)	1	0006
							Pad	1	0007
							Alarm activation delay filter	4	0008
File Identifier		70	01		DE008	00	Demand Metering Programming data		
							Demand voltage and current filter tau	4	0000
							Demand power values filter tau	4	0004
							Demand harmonics filter tau	4	0008
							Demand sequence components filter tau	4	000C
File Identifier		70	01		IM002	00	Duty Accumulator Preset		
							Preset Phase 1-2 % Rated Duty Depleted	4	0000
							Preset Phase 3-4 % Rated Duty Depleted	4	0004
							Preset Phase 5-6 % Rated Duty Depleted	4	0008
							Date Of Last Preset	2	000C
							Time Of Last Preset	4	000E
File Identifier		70	01		IM004	00	Operation Counter Preset		
							Preset Phase 1-2 Operation Counter	4	0000
							Preset Phase 3-4 Operation Counter	4	0004
							Preset Phase 5-6 Operation Counter	4	0008
							Date Of Last Preset	2	000C
							Time Of Last Preset	4	000E
File Identifier		70	01		CT002	00	Sequence Coordination Counters Preset		
							Preset Ground Seq Coord Counter	4	0000
							Preset Phase 1-2 Seq Coord Counter	4	0004
							Preset Phase 3-4 Seq Coord Counter	4	0008
							Preset Phase 5-6 Seq Coord Counter	4	000C
							Preset SGF Seq Coord Counter	4	0010
							Preset Adapted Ground Seq Coord Counter	4	0014
							Date Of Last Preset	2	0018
							Time Of Last Preset	4	001A
File Identifier		70	01		CT004	00	OCP Target Counters Preset		
							Preset Ground Target Counter	4	0000
							Preset Phase 1-2 Target Counter	4	0004
							Preset Phase 3-4 Target Counter	4	0008

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Description	Index	Static Obj	Var	Desc	File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
							Preset Phase 5-6 Target Counter	4	000C
							Preset SGF Target Counter	4	0010
							Preset Adapted Ground Target Counter	4	0014
							Date Of Last Preset	2	0018
							Time Of Last Preset	4	001A
File Identifier		70	01		ID003	00	System Information		
							Nominal Line Frequency (50,60)	1	0000
							Voltage Sensor Configuration	1	0001
							Phantom Phase Reference	1	0002
							Bushing Voltage Phase Rotation	1	0003
							Voltage Sensor Quality	1	0004
							RIF Type	21	0005
							Reclose Time Adjuster	4	001A
							Phase 1-2 Duty Figure of Merit	4	001E
							Phase 3-4 Duty Figure Of Merit	4	0022
							Phase 5-6 Duty Figure Of Merit	4	0026
							Reserved	4	002A
							CT Ratio	4	002E
							Primary "Voltage Present" threshold	4	0032
							User defined ID string	82	0036
							Bushing 1 Nominal RIF Input Voltage Enum	1	0088
							Bushing 2 Nominal RIF Input Voltage Enum	1	0089
							Bushing 3 Nominal RIF Input Voltage Enum	1	008A
							Bushing 4 Nominal RIF Input Voltage Enum	1	008B
							Bushing 5 Nominal RIF Input Voltage Enum	1	008C
							Bushing 6 Nominal RIF Input Voltage Enum	1	008D
							Bushing 1 Adjusted Voltage Sensor Ratio	4	008E
							Bushing 2 Adjusted Voltage Sensor Ratio	4	0092
Note: Adjusted Voltage Sensor Ratio =					Bushing 3 Adjusted Voltage Sensor Ratio			4	0096
(Voltage sensor ratio * Nominal RIF input voltage)/120					Bushing 4 Adjusted Voltage Sensor Ratio			4	009A
							Bushing 5 Adjusted Voltage Sensor Ratio	4	009E
							Bushing 6 Adjusted Voltage Sensor Ratio	4	00A2
							Bushing 1 Phase Angle Correction	4	00A6
							Bushing 2 Phase Angle Correction	4	00AA
							Bushing 3 Phase Angle Correction	4	00AE
							Bushing 4 Phase Angle Correction	4	00B2
							Bushing 5 Phase Angle Correction	4	00B6
							Bushing 6 Phase Angle Correction	4	00BA
							Power Factor sign convention	2	00BE
File Identifier		70	01		SW001	00	Switch Characteristics Data Configuration		
							Close Retry Interval	4	0000
							Maximum Number Retry Attempts	2	0004

Description	Index	Static Obj	Var	Desc	File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
File Identifier		70	01		SW002		00 Switch Characteristics Data Configuration		
							Min Trip Pulse	2	0000
							Min Close Pulse	2	0002
							Max Trip Time	2	0004
							Max Close Time	2	0006
File Identifier		70	01		CA002		00 Measured Calibration Values		
							Phase 1-2 Voltage	4	0000
							Phase 3-4 Voltage	4	0004
							Phase 5-6 Voltage	4	0008
							Phase 1-2 Current	4	000C
							Phase 3-4 Current	4	0010
							Phase 5-6 Current	4	0014
							Phase 1-2 Power Factor	4	0018
							Phase 3-4 Power Factor	4	001C
							Phase 5-6 Power Factor	4	0020
							Battery Voltage	4	0024
							Battery Current	4	0028
File Identifier		70	01		ID004		00 Scale Factor Data		
							Analog input channel 1 Scale Factor	4	0000
							Analog input channel 2 Scale Factor	4	0004
							Analog input channel 3 Scale Factor	4	0008
							Analog input channel 4 Scale Factor	4	000C
							Analog input channel 5 Scale Factor	4	0010
							Analog input channel 6 Scale Factor	4	0014
							Analog input channel 7 Scale Factor	4	0018
							Analog input channel 8 Scale Factor	4	001C
							Analog input channel 9 Scale Factor	4	0020
							Analog input channel 10 Scale Factor	4	0024
							Analog input channel 11 Scale Factor	4	0028
							Analog input channel 12 Scale Factor	4	002C
							Analog input channel 13 Scale Factor	4	0030
							Analog input channel 14 Scale Factor	4	0034
							Analog input channel 15 Scale Factor	4	0038
							Analog input channel 16 Scale Factor	4	003C
File Identifier		70	01		ID005		00 Analog channel assignment data		
							Analog input channel 1 logical assignment	2	0000
							Analog input channel 2 logical assignment	2	0002
							Analog input channel 3 logical assignment	2	0004
							Analog input channel 4 logical assignment	2	0006
							Analog input channel 5 logical assignment	2	0008
							Analog input channel 6 logical assignment	2	000A

Description	Index	Static Obj	Var	Desc	File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
							Analog input channel 7 logical assignment	2	000C
							Analog input channel 8 logical assignment	2	000E
							Analog input channel 9 logical assignment	2	0010
							Analog input channel 10 logical assignment	2	0012
							Analog input channel 11 logical assignment	2	0014
							Analog input channel 12 logical assignment	2	0016
							Analog input channel 13 logical assignment	2	0018
							Analog input channel 14 logical assignment	2	001A
							Analog input channel 15 logical assignment	2	001C
							Analog input channel 16 logical assignment	2	001E
							Analog input channel 17 logical assignment	2	0020
							Analog input channel 18 logical assignment	2	0022
							Analog input channel 19 logical assignment	2	0024
							Analog input channel 20 logical assignment	2	0026
File Identifier		70	01		PM003	00	Power Monitor Programming Data		
							PM Chan 1 Scale Factor	4	0000
							PM Chan 2 Scale Factor	4	0004
							PM Chan 3 Scale Factor	4	0008
							PM Chan 4 Scale Factor	4	000C
File Identifier		70	01		CO002	00	Currently Connected Comm Port Programming Data		
							Port Handle	4	0000
Note:	Number of remaining **Comm Programming** values depends on protocol implementation.						Protocol ID	22	0004
							Protocol Version	4	001A
							Protocol Revision	4	001E
							Size	2	0022
							Baud Rate	4	0024
							Sync Time	4	0028
							Remote Address	2	002C
							Master Address	2	002E
							Handshake Mode	2	0030
							Tx Enable Delay	4	0032
							Tx Disable Delay	4	0036
							Remaining Comm Programming values	nn	003A
						01	Port 1 Programming Data		
							Port Handle	4	0000
							Protocol ID	22	0004
							Protocol Version	4	001A
							Protocol Revision	4	001E
							Size	2	0022
							Baud Rate	4	0024
							Sync Time	4	0028

Description	Index	Static			File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
		Obj	Var	Desc					
							Remote Address	2	002C
							Master Address	2	002E
							Handshake Mode	2	0030
							Tx Enable Delay	4	0032
							Tx Disable Delay	4	0036
							Remaining Comm Programming values	nn	003A
						02	Port 2 Programming Data		
							Port Handle	4	0000
							Protocol ID	22	0004
							Protocol Version	4	001A
							Protocol Revision	4	001E
							Size	2	0022
							Baud Rate	4	0024
							Sync Time	4	0028
							Remote Address	2	002C
							Master Address	2	002E
							Handshake Mode	2	0030
							Tx Enable Delay	4	0032
							Tx Disable Delay	4	0036
							Remaining Comm Programming values	nn	003A
						03	Port 3 Programming Data		
							Port Handle	4	0000
							Protocol ID	22	0004
							Protocol Version	4	001A
							Protocol Revision	4	001E
							Size	2	0022
							Baud Rate	4	0024
							Sync Time	4	0028
							Remote Address	2	002C
							Master Address	2	002E
							Handshake Mode	2	0030
							Tx Enable Delay	4	0032
							Tx Disable Delay	4	0036
							Remaining Comm Programming values	nn	003A
File Identifier		70	01		LS001	00	LS Configuration		
							Utility Code (to specifiy special versions)	2	0000
							Feeder ID	2	0002
							LS Function (Tie, sectionalizer)	1	0004
							Auto reset (on, off)	1	0005
							Auto reset time delay	4	0006
							Auto close on auto reset (on, off)	1	000A
							Auto close on manual reset (on, off)	1	000B

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Description	Index	Static Obj	Var	Desc	File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
							Reset on manual trip (on, off)	1	000C
							Allow close (on, off)	1	000D
							Reset on manual close (on, off)	1	000E
							Disable source side LS (on, off)	1	000F
							Disable load side LS (on, off)	1	0010
							Disable LS (on, off)	1	0011
							Source voltage loss response mode (3 phase, single phase)	1	0012
							Pad	1	0013
							Source side voltage loss transfer time	4	0014
							Source side action on loss of voltage loss transfer (None, trip, close)	1	0018
							Source side ground trip block function (None, latched, momemtary)	1	0019
							Source side non-reclose function (None, latched, momemtary)	1	001A
							Source side alternate profile function (None, latched, momemtary)	1	001B
							Source side alternate profile number	2	001C
							Source side switch mode function (on, off)	1	001E
							Pad	1	001F
							Source side momentary time	4	0020
							Load side voltage loss response mode (3 phase, single phase)	1	0024
							Pad	1	0025
							Load side voltage loss transfer time	4	0026
							Load side action on loss of voltage loss transfer (None, trip, close)	1	002A
							Load side ground trip block function (None, latched, momemtary)	1	002B
							Load side non-reclose function (None, latched, momemtary)	1	002C
							Load side alternate profile function (None, latched, momemtary)	1	002D
							Load side alternate profile number	2	002E
							Load side switch mode function (on, off)	1	0030
							Pad	1	0031
							Load side momentary time	4	0032
File Identifier		70	01		VF001	00	Voltage-Frequency Protection Configuration		
							Voltage sensing load shed mode (3 or single phase)	1	0000
							Under frequency load shed trip enable	1	0001
							Over frequency load shed trip enable	1	0002
							Under voltage load shed trip enable	1	0003
							Over voltage load shed trip enable	1	0004
							Pad	1	0005
							Under frequency load shed trip point	4	0006
							Over frequency load shed trip point	4	000A
							Under voltage load shed trip point	4	000E
							Over voltage load shed trip point	4	0012

Description	Index	Static Obj	Var	Desc	File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
							Frequency load shed time delay	4	0016
							Voltage load shed time delay	4	001A
							Voltage sensing restoration mode (3 or single phase)	1	001E
							Frequency restoration enable	1	001F
							Voltage restoration enable	1	0020
							Pad	1	0021
							Frequency restoration low limit	4	0022
							Frequency restoration high limit	4	0026
							Volatge restoration low limit	4	002A
							Voltage restoration high limit	4	002E
							Restoration time delay	4	0032
							Minimum voltage for frequency measurement	4	0036
File Identifier		70	01		PP011	00	Triple - Single Configuration (Not used in DB 15 and higher)		0000
							Triple - Single mode (Ganged = 0; 1-phase trip, 3 phase lockout = 1;1-phase trip, 1-phase lockout = 2)	1	0000
							Dynamic Phase Trip Enable	1	0001
File Identifier		70	01		CA999	00	Calibration Factors **FACTORY USE ONLY**		
Note: Calibration Factors are for factory use only.							Reserved	4	0000
Control misoperation may result if modified without authorization.							Reserved	4	0004
							Reserved	4	0008
							Reserved	4	000C
							Reserved	4	0010
							Reserved	4	0014
							Reserved	4	0018
							Reserved	4	001C
							Reserved	4	0020
							Reserved	4	0024
							Reserved	4	0028
							Reserved	4	002C
							Reserved	4	0030
							Reserved	4	0034
							Reserved	4	0038
							Reserved	4	003C
							Reserved	4	0040
							Reserved	4	0044
							Reserved	4	0048
							Reserved	4	004C
							Reserved	4	0050
							Reserved	4	0054
							Reserved	4	0058
							Reserved	4	005C
							Reserved	4	0060
							Reserved	4	0064
							Reserved	4	0068

Description	Index	Static			File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
		Obj	Var	Desc					
							Reserved	4	006C
							Reserved	4	0070
							Reserved	4	0074
							Reserved	4	0078
							Reserved	4	007C
							Reserved	4	0080
							Reserved	4	0084
							Reserved	4	0088
							Reserved	4	008C
							Reserved	4	0090
							Reserved	4	0094
							Reserved	4	0098
							Reserved	4	009C
							Reserved	2	00A0
							Reserved	4	00A2
File Identifier		70	01		PM999	00	Battery Monitor Calibration Factors **FACTORY USE ONLY**		
							Reserved	4	0000
Note: Battery Monitor Cal Factors are for factory use only.									
Control misoperation may result if modified without authorization.									
							Reserved	4	0004
							Reserved	4	0008
							Reserved	4	000C
							Reserved	2	0010
							Reserved	4	0012
File Identifier		70	01		MO001	00	Manual Operations Delays		
							Close delay	2	0000
							Trip delay	2	0002

| Description | Index | Static | | | File Name | Record Number | Comments | Data Size (in bytes) | Start Offset in Record (Hex) |
		Obj	Var	Desc					
TIME-TAGGED & ALARM DATA (Read-only)									
File Identifier		70	01		EV003 0		Error event recorder information		
						00	Event type ID code	2	0000
							Time that event occurred	4	0002
							Date that event occurred	2	0006
							Size of optional data	2	0008
							Type of optional data	2	000A
							Optional data	variable	000C
						nn	Event type ID code	2	0000
							Time that event occurred	4	0002
							Date that event occurred	2	0006
							Size of optional data	2	0008
							Type of optional data	2	000A
							Optional data	variable	000C
File Identifier		70	01		EV003 1		System event recorder information		
						00	Event type ID code	2	0000
							Time that event occurred	4	0002
							Date that event occurred	2	0006
							Size of optional data	2	0008
							Type of optional data	2	000A
							Optional data	variable	000C
						nn	Event type ID code	2	0000
							Time that event occurred	4	0002
							Date that event occurred	2	0006
							Size of optional data	2	0008
							Type of optional data	2	000A
							Optional data	variable	000C
File Identifier		70	01		EV003 2		Profile recorder information		
						00	Event type ID code	2	0000
							Time that event occurred	4	0002
							Date that event occurred	2	0006
							Size of optional data	2	0008
							Type of optional data	2	000A
							Optional data	variable	000C
						nn	Event type ID code	2	0000
							Time that event occurred	4	0002
							Date that event occurred	2	0006
							Size of optional data	2	0008
							Type of optional data	2	000A

Description	Index	Static Obj	Var	Desc	File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
							Optional data	variable	000C
File Identifier		70	01		AL003 0	00	Active Alarms information		
							Alarm ID code	2	0000
							Alarm priority	2	0002
							Time that alarm last became active	4	0004
							Date that alarm last became active	2	0008
							Time that alarm last became inactive	4	000A
							Date that alarm last became inactive	2	000E
						nn	Alarm ID code	2	0000
							Alarm priority	2	0002
							Time that alarm last became active	4	0004
							Date that alarm last became active	2	0008
							Time that alarm last became inactive	4	000A
							Date that alarm last became inactive	2	000E
File Identifier		70	01		AL003 1	00	Inactive Alarms information		
							Alarm ID code	2	0000
							Alarm priority	2	0002
							Time that alarm last became active	4	0004
							Date that alarm last became active	2	0008
							Time that alarm last became inactive	4	000A
							Date that alarm last became inactive	2	000E
						nn	Alarm ID code	2	0000
							Alarm priority	2	0002
							Time that alarm last became active	4	0004
							Date that alarm last became active	2	0008
							Time that alarm last became inactive	4	000A
							Date that alarm last became inactive	2	000E
File Identifier		70	01		AL003 2	00	Active & Changed Alarms information		
							Alarm ID code	2	0000
							Alarm priority	2	0002
							Time that alarm last became active	4	0004
							Date that alarm last became active	2	0008
							Time that alarm last became inactive	4	000A
							Date that alarm last became inactive	2	000E
						nn	Alarm ID code	2	0000
							Alarm priority	2	0002
							Time that alarm last became active	4	0004
							Date that alarm last became active	2	0008
							Time that alarm last became inactive	4	000A

Description	Index	Static Obj	Var	Desc	File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
							Date that alarm last became inactive	2	000E
File Identifier		70	01		AL003 3	00	Inactive & Changed Alarms information		
							Alarm ID code	2	0000
							Alarm priority	2	0002
							Time that alarm last became active	4	0004
							Date that alarm last became active	2	0008
							Time that alarm last became inactive	4	000A
							Date that alarm last became inactive	2	000E
						nn	Alarm ID code	2	0000
							Alarm priority	2	0002
							Time that alarm last became active	4	0004
							Date that alarm last became active	2	0008
							Time that alarm last became inactive	4	000A
							Date that alarm last became inactive	2	000E
File Identifier		70	01		AL003 4	00	Active/Suppressed Alarms information		
							Alarm ID code	2	0000
							Alarm priority	2	0002
							Time that alarm last became active	4	0004
							Date that alarm last became active	2	0008
							Time that alarm last became inactive	4	000A
							Date that alarm last became inactive	2	000E
						nn	Alarm ID code	2	0000
							Alarm priority	2	0002
							Time that alarm last became active	4	0004
							Date that alarm last became active	2	0008
							Time that alarm last became inactive	4	000A
							Date that alarm last became inactive	2	000E
File Identifier		70	01		AL003 5	00	Inactive/Suppressed Alarms information		
							Alarm ID code	2	0000
							Alarm priority	2	0002
							Time that alarm last became active	4	0004
							Date that alarm last became active	2	0008
							Time that alarm last became inactive	4	000A
							Date that alarm last became inactive	2	000E
						nn	Alarm ID code	2	0000
							Alarm priority	2	0002
							Time that alarm last became active	4	0004
							Date that alarm last became active	2	0008
							Time that alarm last became inactive	4	000A

Description	Index	Static Obj	Var	Desc	File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
							Date that alarm last became inactive	2	000E
File Identifier		70	01		AL003 6	00	Active/Changed/Suppressed Alarms information		
							Alarm ID code	2	0000
							Alarm priority	2	0002
							Time that alarm last became active	4	0004
							Date that alarm last became active	2	0008
							Time that alarm last became inactive	4	000A
							Date that alarm last became inactive	2	000E
						nn	Alarm ID code	2	0000
							Alarm priority	2	0002
							Time that alarm last became active	4	0004
							Date that alarm last became active	2	0008
							Time that alarm last became inactive	4	000A
							Date that alarm last became inactive	2	000E
File Identifier		70	01		AL003 7	00	Inactive/Changed/Suppressed Alarms information		
							Alarm ID code	2	0000
							Alarm priority	2	0002
							Time that alarm last became active	4	0004
							Date that alarm last became active	2	0008
							Time that alarm last became inactive	4	000A
							Date that alarm last became inactive	2	000E
						nn	Alarm ID code	2	0000
							Alarm priority	2	0002
							Time that alarm last became active	4	0004
							Date that alarm last became active	2	0008
							Time that alarm last became inactive	4	000A
							Date that alarm last became inactive	2	000E
File Identifier		70	01		CE001	00	Control critical event information		
							Event type ID code	2	0000
							Time that event occurred	4	0002
							Date that event occurred	2	0006
							Size of data	2	0008
							Type of data	2	000A
							Event data	18	000C
File Identifier		70	01		CE002	00	Control powerdown event information		
							Event type ID code	2	0000
							Time that event occurred	4	0002
							Date that event occurred	2	0006
							Size of data	2	0008

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Description	Index	Static			File Name	Record Number	Comments	Data Size (in bytes)	Start Offset in Record (Hex)
		Obj	Var	Desc					
							Type of data	2	000A
							Event data	18	000C

ACK/NAK CODE DEFINITIONS

Definitions used for status of File ID operations

Index	Description
0	ACK, function was successful
1	NAK, Generic unsuccessful indication
2	Reserved
3	NAK, Parameter value too high
4	NAK, Parameter value too low
5	NAK, Parameter enum type illegal
6	NAK, Alarm recorder full
7	NAK, Status alarm recorder full
8	NAK, Data alarm recorder full
9	NAK, Supervisory operation not allowed
10	NAK, Parameter is too low relative to another parameter
11	NAK, Parameter is too high relative to another parameter
12	NAK, Requested TCC name not found
13	Reserved
14	Reserved
15	Reserved
16	Reserved
17	Reserved
18	Reserved
19	Reserved
20	Reserved
21	Reserved
22	Reserved
23	NAK, Parameter conflicts with another parameter

F5 DNP 3.0 Device Profile data dictionary

INPUT SUBSYSTEM

Binary Inputs - ESKOM version

Description	Index	Default Event Class	Default Static Variation: Obj 01 Var 01 Binary input w/o status	Default Event Variation: Obj 02 Var 1 Binary input w/o time
Port status output from custom logic				
Voltage/frequency auto-restore blocked	00	1		
Voltage trip blocked	01	1		
Frequency trip blocked	02	1		
SEF target	03	1		
Ground fault target	04	1		
Phase 5-6 fault target	05	1		
Phase 3-4 fault target	06	1		
Phase 1-2 fault target	07	1		
AC power present	08	1		
Control OK	09	1		
Control lockout	10	1		
Recloser open	11	1		
Recloser closed	12	1		
Check Battery	13	1		
Recloser malfunction	14	1		
Reverse power flow	15	1		
Port status output from custom logic				
Normal profile active	16	1		
Fast trips disabled	17	1		
Battery test active	18	1		
Cold load pickup blocked	19	1		
Local	20	1		
ARC On	21	1		
Ground trip blocked	22	1		
Above minimum trip	23	1		
Not Used	24	1		
Not Used	25	1		
Frequency trip target	26	1		
Voltage trip target	27	1		
Hot line tag active	28	1		
Alternate profile 3 active	29	1		
Alternate profile 2 active	30	1		
Alternate profile 1 active	31	1		
Port status output from custom logic				
Target counter on	32	1		
Operation counter on	33	1		
Duty accumulator on	34	1		

Class 0 - 3, Eskom Binarys

Description	Index	Default Event Class
Event recorder on	35	1
Data alarms on	36	1
Status alarms on	37	1
Data profiler on	38	1
Histograms on	39	1
Not Used	40	1
Not Used	41	1
Not Used	42	1
Bushing 5-6 voltage present	43	1
Bushing 3-4 voltage present	44	1
Bushing 1-2 voltage present	45	1
SEF On	46	1
Active alarms present	47	1
Port status output from custom logic		
Not Used	48	1
Not Used	49	1
Not Used	50	1
Not Used	51	1
Not Used	52	1
Not Used	53	1
Not Used	54	1
Not Used	55	1
Trip Circuit Disconnected	56	1
Control Door open	57	1
SEF Off	58	1
ARC Off	59	1
Remote	60	1
OCP Lockout	61	1
Not Used	62	1
Not Used	63	1

OUTPUT SUBSYSTEM - Control Output Relay Block Operations and Status -- ESKOM Version

Description	Index	Default Static Variation			Operation Type	Direct Operation Allowed	Default Condition	Comments
		Obj	Var	Desc				
								Port Logic Input
Binary Output	00	12	01	CROB	Latched	X	Off	Combined Trip/Close
Binary Output	01	12	01	CROB	Latched	X	Off	Combined SEF on/off
Binary Output	02	12	01	CROB	Latched	X	Off	Combined ARC on/off
Binary Output	03	12	01	CROB	Latched	X	Off	Combined Earth Fault on/off
Binary Output	04	12	01	CROB	Latched	X	Off	Hot Line tag on/off
Binary Output	05	12	01	CROB	Pulsed	X	On	Normal profile enabled (Active Low)
Binary Output	06	12	01	CROB	Pulsed	X	Off	Alternate profile 1 enabled (Active Low)
Binary Output	07	12	01	CROB	Pulsed	X	Off	Alternate profile 2 enabled (Active Low)
Binary Output	08	12	01	CROB	Pulsed	X	Off	Alternate profile 3 enabled (Active Low))
Binary Output	09	12	01	CROB	Pulsed	X	Undefined	Reserved
Binary Output	10	12	01	CROB	Pulsed	X	Undefined	Reserved
Binary Output	11	12	01	CROB	Pulsed	X	Off	ARC on
Binary Output	12	12	01	CROB	Pulsed	X	Undefined	Reserved
Binary Output	13	12	01	CROB	Pulsed	X	Undefined	Reserved
Binary Output	14	12	01	CROB	Pulsed	X	Off	Fast trips disabled
Binary Output	15	12	01	CROB	Pulsed	X	Off	Battery test on
Binary Output	16	12	01	CROB	Pulsed	X	Off	Lockout
Binary Output	17	12	01	CROB	Pulsed	X	Off	Close
Binary Output	18	12	01	CROB	Pulsed	X	Off	Reset targets
Binary Output	19	12	01	CROB	Pulsed	X	Off	SEF on
Binary Output	20	12	01	CROB	Undefined	X	Undefined	Reserved
Binary Output	21	12	01	CROB	Undefined	X	Undefined	Reserved
Binary Output	22	12	01	CROB	Undefined	X	Undefined	Reserved
Binary Output	23	12	01	CROB	Undefined	X	Undefined	Reserved
Binary Output	24	12	01	CROB	Pulsed	X	Off	ARC off
Binary Output	25	12	01	CROB	Pulsed	X	Off	SEF off
Binary Output	26	12	01	CROB	Pulsed	X	Off	Frequency trip block
Binary Output	27	12	01	CROB	Pulsed	X	Off	Voltage trip block
Binary Output	28	12	01	CROB	Pulsed	X	Off	Voltage-frequency auto-restore block
Binary Output	29	12	01	CROB	Pulsed	X	Off	Cold load pickup Block
Binary Output	30	12	01	CROB	Latched	X	Off	Histogram off
Binary Output	31	12	01	CROB	Latched	X	Off	Profiler off
Binary Output	32	12	01	CROB	Latched	X	On	Status alarm recording on
Binary Output	33	12	01	CROB	Latched	X	On	Data alarm recording on
Binary Output	34	12	01	CROB	Latched	X	Off	Event Recorder off
Binary Output	35	12	01	CROB	Latched	X	Off	Test mode off
Binary Output	36 - 63	12	01	CROB	Undefined	X	Undefined	Reserved
								Assorted Histogram Resets
Binary Output	64	12	01	CROB	Pulsed	X	Off	Reset ALL histograms
Binary Output	65	12	01	CROB	Pulsed	X	Off	Reset Phase 1-2 current histogram

Description	Index	Default Static Variation			Operation Type	Direct Operation Allowed	Default Condition	Comments
		Obj	Var	Desc				
Binary Output	66	12	01	CROB	Pulsed	X	Off	Reset Phase 3-4 current histogram
Binary Output	67	12	01	CROB	Pulsed	X	Off	Reset Phase 5-6 current histogram
Binary Output	68	12	01	CROB	Pulsed	X	Off	Reset Ground current histogram
Binary Output	69	12	01	CROB	Pulsed	X	Off	Reset Phase 1 voltage histogram
Binary Output	70	12	01	CROB	Pulsed	X	Off	Reset Phase 3 voltage histogram
Binary Output	71	12	01	CROB	Pulsed	X	Off	Reset Phase 5 voltage histogram
Binary Output	72	12	01	CROB	Pulsed	X	Off	Reset Phase 1-2 power factor histogram
Binary Output	73	12	01	CROB	Pulsed	X	Off	Reset Phase 1-2 KVA histogram
Binary Output	74	12	01	CROB	Pulsed	X	Off	Reset Phase 1-2 KW histogram
Binary Output	75	12	01	CROB	Pulsed	X	Off	Reset Phase 1-2 KVAR histogram
Binary Output	76	12	01	CROB	Pulsed	X	Off	Reset Phase 3-4 power factor histogram
Binary Output	77	12	01	CROB	Pulsed	X	Off	Reset Phase 3-4 KVA histogram
Binary Output	78	12	01	CROB	Pulsed	X	Off	Reset Phase 3-4 KW histogram
Binary Output	79	12	01	CROB	Pulsed	X	Off	Reset Phase 3-4 KVAR histogram
Binary Output	80	12	01	CROB	Pulsed	X	Off	Reset Phase 5-6 power factor histogram
Binary Output	81	12	01	CROB	Pulsed	X	Off	Reset Phase 5-6 KVA histogram
Binary Output	82	12	01	CROB	Pulsed	X	Off	Reset Phase 5-6 KW histogram
Binary Output	83	12	01	CROB	Pulsed	X	Off	Reset Phase 5-6 KVAR histogram
Binary Output	84	12	01	CROB	Pulsed	X	Off	Reset Phase Total power factor histogram
Binary Output	85	12	01	CROB	Pulsed	X	Off	Reset Phase Total KVA histogram
Binary Output	86	12	01	CROB	Pulsed	X	Off	Reset Phase Total KW histogram
Binary Output	87	12	01	CROB	Pulsed	X	Off	Reset Phase Total KVAR histogram
Binary Output	88	12	01	CROB	Pulsed	X	Off	Reset Positive sequence current magnitude
Binary Output	89	12	01	CROB	Pulsed	X	Off	Reset Positive sequence current angle
Binary Output	90	12	01	CROB	Pulsed	X	Off	Reset Negative sequence current magnitude
Binary Output	91	12	01	CROB	Pulsed	X	Off	Reset Negative sequence current angle
Binary Output	92	12	01	CROB	Pulsed	X	Off	Reset Zero sequence current magnitude
Binary Output	93	12	01	CROB	Pulsed	X	Off	Reset Zero sequence current angle
Binary Output	94	12	01	CROB	Pulsed	X	Off	Reset Positive sequence voltage magnitude
Binary Output	95	12	01	CROB	Pulsed	X	Off	Reset Positive sequence voltage angle
Binary Output	96	12	01	CROB	Pulsed	X	Off	Reset Negative sequence voltage magnitude
Binary Output	97	12	01	CROB	Pulsed	X	Off	Reset Negative sequence voltage angle
Binary Output	98	12	01	CROB	Pulsed	X	Off	Reset Phase 1-2 current THD histogram
Binary Output	99	12	01	CROB	Pulsed	X	Off	Reset Phase 3-4 current THD histogram
Binary Output	100	12	01	CROB	Pulsed	X	Off	Reset Phase 5-6 current THD histogram
Binary Output	101	12	01	CROB	Pulsed	X	Off	Reset Ground current THD histogram
Binary Output	102	12	01	CROB	Pulsed	X	Off	Reset Phase 1-2 voltage THD histogram
Binary Output	103	12	01	CROB	Pulsed	X	Off	Reset Phase 3-4 voltage THD histogram
Binary Output	104	12	01	CROB	Pulsed	X	Off	Reset Phase 5-6 voltage THD histogram
Binary Output	105	12	01	CROB	Pulsed	X	Off	Calibration Reset
Binary Output	106	12	01	CROB	Pulsed	X	Off	OCP Target Reset
Binary Output	107	12	01	CROB	Latched	X	Off	Alarm suppression on
Binary Output	108	12	01	CROB	Pulsed	X	Off	Unmask all system event recorder entries

Description	Index	Default Static Variation			Operation Type	Direct Operation Allowed	Default Condition	Comments
		Obj	Var	Desc				
Binary Output	109	12	01	CROB	Pulsed	X	Off	Mask all system event recorder entries
Binary Output	110	12	01	CROB	Pulsed	X	Off	Unmask all error event recorder entries
Binary Output	111	12	01	CROB	Pulsed	X	Off	Mask all error event recorder entries
Binary Output	112	12	01	CROB	Pulsed	X	Off	Unmask all profile recorder entries
Binary Output	113	12	01	CROB	Pulsed	X	Off	Mask all profile recorder entries
Binary Output	114	12	01	CROB	Pulsed	X	Off	Reset kWh
Binary Output	115	12	01	CROB	Pulsed	X	Off	Reset Phase 1-3 voltage histogram
Binary Output	116	12	01	CROB	Pulsed	X	Off	Reset Phase 3-5 voltage histogram
Binary Output	117	12	01	CROB	Pulsed	X	Off	Reset Phase 5-1 voltage histogram
Binary Output	118	12	01	CROB	Pulsed	X	Off	Reset Phase 1 voltage histogram
Binary Output	119	12	01	CROB	Pulsed	X	Off	Reset Phase 3 voltage histogram
Binary Output	120	12	01	CROB	Pulsed	X	Off	Reset Phase 5 voltage histogram
Binary Output	121	12	01	CROB	Pulsed	X	Off	Reset Phase 2 voltage histogram
Binary Output	122	12	01	CROB	Pulsed	X	Off	Reset Phase 4 voltage histogram
Binary Output	123	12	01	CROB	Pulsed	X	Off	Reset Phase 6 voltage histogram
Binary Output	124	12	01	CROB	Pulsed	X	Off	Reset Line frequency histogram
Binary Output	00	10	02	Status				Port Logic Input Status
Binary Output	01	10	02	Status				Combined Trip/Close
Binary Output	02	10	02	Status				Combined SEF on/off
Binary Output	03	10	02	Status				Combined ARC on/off
Binary Output	04	10	02	Status				Combined Earth Fault on/off
Binary Output	05	10	02	Status				Hot Line tag on/off
Binary Output	06	10	02	Status				** Normal profile enabled
Binary Output	07	10	02	Status				** Alternate profile 1 enabled
Binary Output	08	10	02	Status				** Alternate profile 2 enabled
Binary Output	09	10	02	Status				** Alternate profile 3 enabled
Binary Output	10	10	02	Status				Reserved
Binary Output	11	10	02	Status				Reserved
Binary Output	12	10	02	Status				ARC on
Binary Output	13	10	02	Status				Reserved
Binary Output	14	10	02	Status				Reserved
Binary Output	15	10	02	Status				Fast trips disabled
Binary Output	16	10	02	Status				Battery test on
Binary Output	17	10	02	Status				Lockout
Binary Output	18	10	02	Status				Close
Binary Output	19	10	02	Status				Reset targets
Binary Output	20	10	02	Status				SEF on
Binary Output	21	10	02	Status				Reserved
Binary Output	22	10	02	Status				Reserved
Binary Output	23	10	02	Status				Reserved
Binary Output	24	10	02	Status				* ARC off

Description	Index	Default Static Variation			Operation Type	Direct Operation Allowed	Default Condition	Comments
		Obj	Var	Desc				
Binary Output	25	10	02	Status				* SEF off
Binary Output	26	10	02	Status				* Frequency trip block
Binary Output	27	10	02	Status				* Voltage trip block
Binary Output	28	10	02	Status				* Voltage-frequency auto-restore block
Binary Output	29	10	02	Status				* Cold load pickup Block
Binary Output	30	10	02	Status				Histogram off
Binary Output	31	10	02	Status				Profiler off
Binary Output	32	10	02	Status				Status alarm recording on
Binary Output	33	10	02	Status				Data alarm recording on
Binary Output	34	10	02	Status				Event Recorder off
Binary Output	35	10	02	Status				Test mode off
Binary Output	36 - 63	10	02	Status				Reserved
								Assorted Histogram Resets
Binary Output	64	10	02	Status				* Reset ALL histograms
Binary Output	65	10	02	Status				* Reset Phase 1-2 current histogram
Binary Output	66	10	02	Status				* Reset Phase 3-4 current histogram
Binary Output	67	10	02	Status				* Reset Phase 5-6 current histogram
Binary Output	68	10	02	Status				* Reset Ground current histogram
Binary Output	69	10	02	Status				* Reset Phase 1 voltage histogram
Binary Output	70	10	02	Status				* Reset Phase 3 voltage histogram
Binary Output	71	10	02	Status				* Reset Phase 5 voltage histogram
Binary Output	72	10	02	Status				* Reset Phase 1-2 power factor histogram
Binary Output	73	10	02	Status				* Reset Phase 1-2 KVA histogram
Binary Output	74	10	02	Status				* Reset Phase 1-2 KW histogram
Binary Output	75	10	02	Status				* Reset Phase 1-2 KVAR histogram
Binary Output	76	10	02	Status				* Reset Phase 3-4 power factor histogram
Binary Output	77	10	02	Status				* Reset Phase 3-4 KVA histogram
Binary Output	78	10	02	Status				* Reset Phase 3-4 KW histogram
Binary Output	79	10	02	Status				* Reset Phase 3-4 KVAR histogram
Binary Output	80	10	02	Status				* Reset Phase 5-6 power factor histogram
Binary Output	81	10	02	Status				* Reset Phase 5-6 KVA histogram
Binary Output	82	10	02	Status				* Reset Phase 5-6 KW histogram
Binary Output	83	10	02	Status				* Reset Phase 5-6 KVAR histogram
Binary Output	84	10	02	Status				* Reset Phase Total power factor histogram
Binary Output	85	10	02	Status				* Reset Phase Total KVA histogram
Binary Output	86	10	02	Status				* Reset Phase Total KW histogram
Binary Output	87	10	02	Status				* Reset Phase Total KVAR histogram
Binary Output	88	10	02	Status				* Reset Positive sequence current magnitude
Binary Output	89	10	02	Status				* Reset Positive sequence current angle
Binary Output	90	10	02	Status				* Reset Negative sequence current magnitude
Binary Output	91	10	02	Status				* Reset Negative sequence current angle
Binary Output	92	10	02	Status				* Reset Zero sequence current magnitude
Binary Output	93	10	02	Status				* Reset Zero sequence current angle

| Description | Index | Default Static Variation | | | Operation Type | Direct Operation Allowed | Default Condition | Comments |
		Obj	Var	Desc				
Binary Output	94	10	02	Status				* Reset Positive sequence voltage magnitude
Binary Output	95	10	02	Status				* Reset Positive sequence voltage angle
Binary Output	96	10	02	Status				* Reset Negative sequence voltage magnitude
Binary Output	97	10	02	Status				* Reset Negative sequence voltage angle
Binary Output	98	10	02	Status				* Reset Phase 1-2 current THD histogram
Binary Output	99	10	02	Status				* Reset Phase 3-4 current THD histogram
Binary Output	100	10	02	Status				* Reset Phase 5-6 current THD histogram
Binary Output	101	10	02	Status				* Reset Ground current THD histogram
Binary Output	102	10	02	Status				* Reset Phase 1-2 voltage THD histogram
Binary Output	103	10	02	Status				* Reset Phase 3-4 voltage THD histogram
Binary Output	104	10	02	Status				* Reset Phase 5-6 voltage THD histogram
Binary Output	105	10	02	Status				* Calibration Reset
Binary Output	106	10	02	Status				* OCP Target Reset
Binary Output	107	10	02	Status				Alarm suppression on
Binary Output	108	10	02	Status				* Unmask all system event recorder entries
Binary Output	109	10	02	Status				* Mask all system event recorder entries
Binary Output	110	10	02	Status				* Unmask all error event recorder entries
Binary Output	111	10	02	Status				* Mask all error event recorder entries
Binary Output	112	10	02	Status				* Unmask all profile recorder entries
Binary Output	113	10	02	Status				* Mask all profile recorder entries
Binary Output	114	10	02	Status				* Reset kWh
Binary Output	115	10	02	Status				* Reset Phase 1-3 voltage histogram
Binary Output	116	10	02	Status				* Reset Phase 3-5 voltage histogram
Binary Output	117	10	02	Status				* Reset Phase 5-1 voltage histogram
Binary Output	118	10	02	Status				* Reset Phase 1 voltage histogram
Binary Output	119	10	02	Status				* Reset Phase 3 voltage histogram
Binary Output	120	10	02	Status				* Reset Phase 5 voltage histogram
Binary Output	121	10	02	Status				* Reset Phase 2 voltage histogram
Binary Output	122	10	02	Status				* Reset Phase 4 voltage histogram
Binary Output	123	10	02	Status				* Reset Phase 6 voltage histogram
Binary Output	124	10	02	Status				* Reset Line frequency histogram
								* Non-latching inputs, always read FALSE
								** Non-latching inputs, always read TRUE

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