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GE Energy Services

Serial Status DCA Configuration Guide

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About this Guide

This guide describes how to configure the Serial Status (Serial Status Protocol) **Data Collection Application (DCA)**.

Purpose of this Guide

This document describes the purpose and use of each of the configuration parameters of the Serial Status **DCA**. This document makes no attempt to explain how the configuration process operates, it is limited to describing the format and content of the **DCA** configuration only.

Who Should Use this Guide

This document is intended for use by individuals responsible for the configuration of the Serial Status **DCA** in GE Energy Services **RTUs**. These people should be familiar with the operation and maintenance of **RTUs** in general, but may not be familiar with the GE Energy Services family of products.

Before reading this document, you should have a basic understanding of the GE Energy Services hardware environment, the configuration system, and the Serial Status **DCA**.

Additional Documentation

The following supporting texts are available:

- *Serial Status **DCA** Functional Specification (A166-0FS.WES)*
- *WESMAINT II Maintenance Facility Configuration Guide (B014-0CG.700)*
- *WESMAINT II+ Configuration Guide (B014-1CG.CCU)*
- *WIN User's Configuration Guide for the WESDAC D20 (B008-0CG.D20)*
- *WIN User's Configuration Guide for the CCU (B008-1CG.CCU)*
- *Config Pro Configuration System User's Guide (P012-0UG)*

Overview

The Serial Status **DCA** software is installed in GE Energy Services WESDAC equipment to provide an interface to Sub-Remote Units (**SRUs**) using the Serial Status communication protocol.

Product Perspective

The Serial Status **DCA** software is custom software installed in the GE Energy Services **Remote Terminal Unit (RTU)** to act as a data concentrator for one or more **SRUs** using the Serial Status communication protocol. After the system is installed, the **RTU** has the ability to function as a sub-master within a Supervisory Control and Data Acquisition (**SCADA**) system, which controls multiple **SRUs**. Figure 1 represents a complete system overview of how the Serial Status **DCA** interfaces with the WESDAC Interface Node (**WIN**) in a typical GE Energy Services **RTU**. The application is designed to communicate with **SRUs** via the Serial Status protocol. The Serial Status **DCA** receives data from the **SRUs** by polling for data in a master-slave relationship.

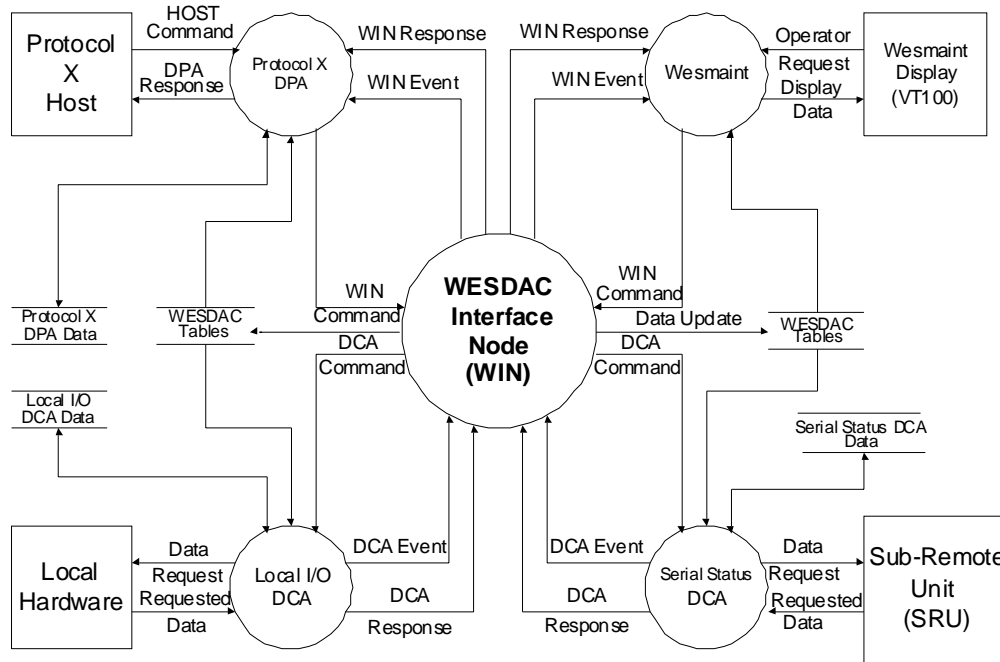


Figure 1 System Overview

Chapter 1: Configuring Tables

The Serial Status **DCA** configuration contains all of the data structures necessary to configure a **RTU** to poll devices using the Serial Status protocol.

1.1 Serial Status DCA Configuration Tables

The purpose of each configuration table is described below.

TABLE NAME	DESCRIPTION
A166APPL	The Main Application configuration table is used to define global settings for the entire Serial Status application. These parameters pertain to all channels and SRUs connected within the system.
A166PORT	The Port Configuration table contains data related to the communication port set-up for each communication port used by the Serial Status DCA .

Table 1 Serial Status DCA Configuration Tables

1.2 Configuration Sequence

The following is a list of the steps required to configure the Serial Status **DCA**:

1. Edit the Serial Status **DCA** configuration. Prepare it according to the guidelines in this document and the specific use for which the Serial Status **DCA** is required.
2. Edit the configuration for the other applications that will run on the product. Prepare them according to their own configuration guides.
3. Generate the configuration and download it to the product using a GE Energy Services Configuration System. The list of applications to be compiled must include the Serial Status **DCA**, application **A166**.
4. Restart the product. If the Serial Status **DCA** encounters an error during its initialization, it will log a message to the **WESMAINT** Error Log and then, depending on the severity of the

error, terminate or continue with its run-time function.

5. Check for error messages. Log into the WESMAINT maintenance interface, select the System Functions item from the Main Menu, and then select the Error Log item from the System Functions Menu. If any error messages are displayed, correct the problem as described in *Appendix A*., and repeat steps 3 through 5.

When the Serial Status DCA has successfully validated all the configuration parameters, configuration is complete.

Chapter 2: Configuring the Main Application Table (A166APPL)

The Main Application configuration table is used to define global settings for the entire Serial Status **DCA**. These parameters pertain to all channels and **SRUs** connected within the system. The Main Application configuration must contain a single record.

Name	Range	Description
DCA Index	Index into the System Point Database	The indexed System Point Database table record must contain the WESDAC database point counts for this application. The DCA Index is automatically configured and so may not be visible.

Table 2 Main Application Configuration Table Parameters

Chapter 3: Configuring the Port Table (A166PORT):

The Port table contains the relevant configuration information for communication port setup. Each record in the Port table defines the communication parameters for a single communication port.

Name	Range	Description
Communication Port	Any valid communication port (hardware dependent)	This parameter contains the ASCII descriptor for the communication port to use. For example, for the D20 valid communication ports are "COM1" through "COM7".
Message Timeout	50 .. 65535	This parameter defines the total message timeout in milliseconds. Received messages must be completed in this time frame to be considered valid responses. Message timeout is measured from the end of command transmission to the end of the response. A typical value would be 500 character times. The character time for 9600 baud is 2 ms
Inter-Character Timeout	2 char times .. 65535	This parameter specifies the maximum time, in milliseconds, that may expire between received characters. If this time expires, the message is considered to be finished. A typical value would be 3 character times. The character time for 9600 baud is 2 ms
Retries Before Failure	00 .. 65535	This parameter defines the number of times to retry a message before reporting a communication failure. A typical value is 3.
Failures Before Off-line	1 .. 65535	This parameter defines the number of consecutive communication failures that cause a SRU to be taken off-line. A typical value is 3.

Table 3 Port Configuration Table Parameters

The following port parameters are fixed and can not be changed by user.

- Baud rate is set at 9600 baud
- All modem control signals are disabled.

Chapter 4: Configuring Win for the Serial Status DCA

This chapter describes how to configure the **WIN** application to work with the Serial Status **DCA**. The **WIN** application allocates the WESDAC data points for all applications. In order to work properly the Serial Status **DCA** must have its own record within the **WIN** application's System Point Database. This record is referenced by the **DCA** Offset specified in the Main Application configuration table. Additional information on configuring **WIN** can be found in the **WIN** Configuration Guide listed in the *Additional Documentation* section of this document.

4.1 WESDAC Point Allocation

The Serial Status **DCA** requires the following number of points. Additional points configured will be initialized, but will never come on-line or be used by the Serial Status **DCA**.

Digital Inputs: 15 per configured **SRU**

Digital Outputs: 1 per configured **SRU**

Device Status: 1 per configured **SRU**

For more information on the order of the configured points, refer to the *Serial Status DCA Functional Specification* listed in the *Additional Documentation*.

Appendix A: Messages Logged by the Serial Status DCA

This appendix contains a description of all error messages posted to the **WESMAINT** Error Log by the Serial Status **DCA**. This appendix also provides an explanation of all output return codes returned by the Serial Status **DCA**.

During startup, the Serial Status **DCA** checks its configuration tables for invalid entries. If no configuration errors are encountered the **DCA** attempts to spawn a number of processes during start-up. If any invalid data is found or a problem is encountered while starting one of the processes, an error message is logged to the **WESMAINT** Error Log.

Messages logged to the **WESMAINT** Error Log by the **DCA** will be pre-pended with a process name. This name will be one of the following:

A166:

A166-<x>-<yy>: Where <x> is one of E, C or S
<yy> is a process number

Expressions in angular brackets like "<xx>", are filled with the appropriate values by the **DCA**.

A.1 Fatal Error Messages

Fatal error messages indicate the application is suspending due to either an invalid critical configuration parameter, or a critical process initialization sequence failed.

F001: Unable to locate table <table_name>

Cause

- The **DCA** was unable to locate one of its required configuration tables.

Remedy:

- Ensure the <table_name> table exists and is comprised of at least one record.

F002: Unable to locate WESDAC_<x> table**Cause**

- The **DCA** was unable to locate one of the required WESDAC data base tables.

Remedy:

- Ensure the WESDAC_<x> table exists in the **WIN** application and is comprised of at least one record. Refer to the chapter on configuring **WIN** for more information on configuring WESDAC points.

F003: Insufficient WESDAC_<x> points, <y> req'd**Cause**

- There are not enough WESDAC data points allocated to the Serial Status **DCA**.

Remedy:

- Ensure the **DCA** Index configured in A166APPL refers to the correct **WIN** CFG_DCA record.
- Refer to the Configuring **WIN** for the Serial Status **DCA** chapter, and ensure the required number of data points are allocated for the Serial Status **DCA** in the appropriate **WIN** System Point Database record. The WESDAC point types are described in the following table.

WESDAC Name	Point Type
WESDAC_1	Digital Inputs
WESDAC_2	Digital Outputs
WESDAC_3	Accumulators
WESDAC_4	Analog Inputs
WESDAC_5	Analog Outputs
WESDAC_6	Devices

Table 4 WESDAC Point Types**F004: Unable to open a channel to WIN****Cause**

- The **DCA** was unable to initiate communications with **WIN**.

Remedy:

- Contact the Customer Service Department and report this error.

F005: Not enough memory !!!**Cause**

- The **DCA** was unable to allocate enough memory to start the Serial Status **DCA**.

Remedy:

- Reduce the amount of memory used by this or other applications in the system.
- Contact the Customer Service Department and report this error.

F006: Error creating event exchange, status=<x>

Cause

- The system was unable to create a message exchange for the event process. This message exchange is vital to the operation of the entire application.

Remedy:

- Contact the Customer Service Department and report this error.

F007: Unable to spawn event process

Cause

- The system was unable to start the event process. The event process is vital to the operation of the entire application.

Remedy:

- Contact the Customer Service Department and report this error.

F008: Event message exchange has been deleted

Cause

- The event process message exchange has been deleted.

Remedy:

- Contact the Customer Service Department and report this error.

F009: get_pointer failed, status = <x>

Cause

- The **DCA** was unable to locate the **SOE** buffer in memory.

Remedy:

- Contact the Customer Service Department and report this error.

F100: More than one record in A166APPL

Cause

- The Main Application configuration table contains more than one record.

Remedy:

- Ensure table A166APPL is comprised of a single record.

F101: Invalid DCA Index in A166APPL

Cause

- The **DCA** Index configured in the Main Application configuration table does not point to a valid record in the **WIN_CFG_DCA** table.

Remedy:

- Ensure the CFG_DCA table in the WIN application is configured with a record containing the WESDAC points to be allocated for the Serial Status DCA.
- Ensure the DCA Index configured in A166APPL points to the correct record in the WIN CFG_DCA table.

A.2 Non-Fatal Error Messages

These messages indicate the application has encountered a non-fatal configuration error or a non-fatal stage of process initialization failed. The application will not suspend as a whole, but rather attempt to run in a limited or reduced capacity.

E001: Child Died !!!**Cause**

- One of the Serial Status DCA processes stopped unexpectedly. If this error occurs, the system has become unstable.

Effect:

- Serial Status DCA functionality will become unreliable.

Remedy:

- Contact the Customer Service Department and report this error.

E002: Error creating message exchange, sts=<x>**Cause**

- The system was unable to create one of the required message exchanges.

Effect:

- One scan and one communication process will not be started. As a result, the Serial Status DCA will be unable to communicate over one of the configured communication ports.

Remedy:

- Note the return status, <x>, and contact the Customer Service Department to report this error.

E003: Unable to spawn com process, rec <x>**Cause**

- The system encountered an error while trying to spawn one of the communication processes.

Effect:

- One of the communication processes will not be started. As a result, the Serial Status DCA will be unable to communicate over the communication port configured in record <x> of A166PORT.

Remedy:

- Contact the Customer Service Department and report this error.

E004: Unable to spawn scan process, rec <x>

Cause

- The system encountered an error while trying to spawn one of the scan processes.

Effect:

- One of the scan processes will not be started. As a result, the Serial Status **DCA** will be unable to communicate over the communication port configured in record <x> of A166PORT.

Remedy:

- Contact the Customer Service Department and report this error.

E005: Com message exchange has been deleted

Cause

- One of the communication process message exchanges has been deleted.

Effect:

- One of the communication processes will no longer function. As a result, the Serial Status **DCA** will be unable to communicate over one of the communication ports.

Remedy:

- Contact the Customer Service Department and report this error.

E010:Unable to open <com_port>, status = <x>

Cause

- The **DCA** was unable to open the requested communication port.

Effect:

- The Serial Status **DCA** will be unable to communicate over the specified communication port, <com_port>

Remedy:

- Ensure the specified communication port, <com_port>, is not already used in another record in A166PORT, or by another application.
- Ensure the specified port name is supported by the hardware platform being used. Valid port names for the D20 are COM0 to COM7. COM0 is normally used for WESMAINT.

E011: <com_port> unable to set parameters, status = <x>

Cause

- The system was unable to set the communication parameters for the specified communication port.

Effect:

- The Serial Status **DCA** will be unable to communicate over the port, <com_port>.

Remedy:

- Note the return status, <x>, and contact the Customer Service Department to report this error.

E012: <com_port> unable to set timers, status = <x>**Cause**

- The system was unable to set the communication timers for the specified communication port.

Effect:

- The Serial Status **DCA** will be unable to communicate over the port, <com_port>.

Remedy:

- Note the return status, <x>, and contact the Customer Service Department to report this error.

E013: <com_port> unable to turn RTS on, status = <x>**Cause**

- The system was unable to turn on RTS for the specified communication port.

Effect:

- The Serial Status **DCA** will not be able to reset the Serial Status Board connected to the port, <com_port>.

Remedy:

- Possible hardware failures:
- D20 serial port failure.
- Serial Status Board failure.

E100: A166PORT rec <x>, Invalid Baud Rate**Cause**

- One of the Baud Rates configured in the Port table is not supported by the **DCA**.

Effect:

- The communication port defined by record <x> in A166PORT will not be initialized or used by the **DCA**.

Remedy:

- Baud rate for the Serial Status **DCA** must be set at 9600.

E101: A166PORT rec <x>, Invalid Com Failures**Cause**

- One of the Failures Before Off-line parameters configured in the Port table is too small.

Effect:

- The communication port defined by record <x> in A166PORT will not be initialized or used by the **DCA**.

Remedy:

- Ensure the Failures Before Off-line parameter configured in record <x> of A166PORT is not zero.

A.3 Warning Messages

Warning messages indicate recoverable run-time errors, either within the application or through one of the software interfaces. The application will attempt to handle these errors without suspending or jeopardizing the integrity of the system. If a warning message occurs repeatedly, contact the Customer Service Department to report the error.

W001: *Req_x failed, status = <x>*

W002: *Send_x failed, status = <x>*

W003: *WIN_read failed*

W004: *WIN_write failed*

W005: *<COMX> reset*

W006: *Reset Status DCA on <COMX>*

W007: *Rxed invalid resp: <Received Message in Hex format>*

A.4 Information Messages

Information messages indicate the application is taking some special action based on certain configuration or initialization criteria.

I001: *No A166APPL table, deleting.*

Cause

- The **DCA** could not find the Main Application configuration table. If the Main Application configuration cannot be located, the application assumes the user does not want it to run.

Effect:

- The Serial Status **DCA** will delete itself from the system.

Remedy:

- If the Serial Status **DCA** is intended to run, ensure the Main Application configuration table,

I100: *A166PORT rec <x>, Flow Control <Flow Control Value>, disabling*

Cause

- One or more modem signals are enabled.

Effect:

- Modem signals will default to disabled.

Remedy:

- All modem signals must be disabled.

I101:A166PORT rec <x>, Resp Timeout < <min>, defaulting**Cause**

- The Response Timeout configured in one of the port records is too small

Effect:

- The Response Timeout in record <x> of A166PORT will default to a typical value (1000 character times).

Remedy:

- Refer to the chapter entitled Configuring the Port Table and ensure a valid Response Timeout is configured in record <x> of A166PORT.

I102:A166PORT rec <x>, Char Timeout < <min>, defaulting**Cause**

- The Inter-Character Timeout configured in one of the port records is too small.

Effect:

- The Inter-Character Timeout in record <x> of A166PORT will default to a typical value (5 character times).

Remedy:

- Refer to the chapter entitled Configuring the Port Table and ensure a valid Inter- Character Timeout is configured in record <x> of A166PORT.

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