

Cascade Configuration Tool Version 1.0.10

Installation and Operations Manual

In order to consistently bring you the highest quality, full featured products, we reserve the right to change our specifications and designs at any time.

Please read the following information before installing.

BEFORE BEGINNING INSTALLATION OF THIS MURPHY PRODUCT:

- Read and follow all installation instructions.
- Please contact FW MURPHY if you have any questions.

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Introduction

Cascade Configuration Tool is a PC-based configuration software for the Cascade controller. The easy-to-use interface enables you to modify the parameters of the Cascade as shown in Table 1.

File transfer utilities for configuration and firmware upgrades are provided so that once the configuration is set, it may be downloaded from your PC to the Cascade via a serial or USB connection.

Installation

System Requirements

A RS485/232 to USB adapter is required for transferring the configuration from the Configuration Tool to the Cascade.

While the Configuration software will function on any PC or laptop running Windows, it will not perform transfers using the USB driver unless the operating system supports USB. USB supported operating systems include Win98SE, NT, XP, Vista and Windows7.

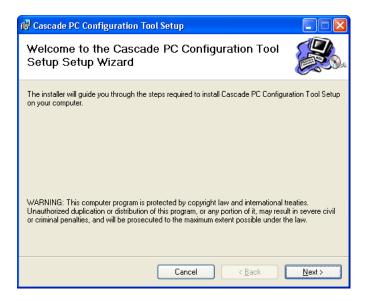
Serial transfers using standard communication ports (COM1, COM2) should be possible on all Windows platforms.

The Cascade Configuration Tool software and USB driver provide efficient use of your hard drive, using only 3-5 MB of disk space after installation.

Installation Instructions

Follow the steps below to install the Cascade Configuration Tool software on a PC or laptop.

1. Insert the CD101 CD into your computer CD drive. The installation menu is displayed. Click [Next] to continue.



2. You will be asked for a destination folder for the program. You can accept the suggested directory or you can select a different directory by clicking [Browse] and browsing to the destination folder. Once the destination folder is determined, click [Next] to continue. (Note: click [Disk Cost...] to check disk space).

🕫 Cascade PC Configuration Tool Setup
Select Installation Folder
The installer will install Cascade PC Configuration Tool Setup to the following folder. To install in this folder, click "Next". To install to a different folder, enter it below or click "Browse".
Folder: C:\Program Files\FWMurphy\Cascade PC Configuration Tool Setup\ Disk Cost
Cancel < <u>B</u> ack <u>N</u> ext >

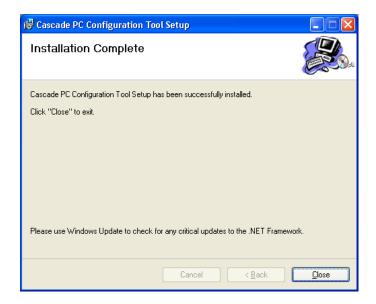
3. To check to see your available disk drive space, click [Disk Cost...]. The following screen is displayed. When finished, click [OK]. This will return you to the previous screen. Click [Next] to continue.

The list below includes the dr	r <mark>ation Tool Setup Disk Sp</mark> ives you can install Cascade PC		:up to, along
with each drive's available ar	· ·		
Volume	Disk Size	Available	Require
🖃 A:	OKB	OKB	04
🖃 C:	34GB	14GB	7648k
🖵 H:	816GB	90GB	01
🖳 🗐 🖓	816GB	90GB	01
🖳 N:	816GB	90GB	OF
2 0:	136GB	20GB	01
<			>
			ОК

4. The Wizard will now install the program. This may take several minutes. The following screen is displayed during the installation.

🔂 Cascade PC Configuration Tool Setup	
Installing Cascade PC Configuration Tool Setup	
Cascade PC Configuration Tool Setup is being installed.	
Please wait	
Cancel < Back	Next >

5. When the installation is complete, the following screen is displayed. Click [Close].



Installing USB Driver

Tools Needed

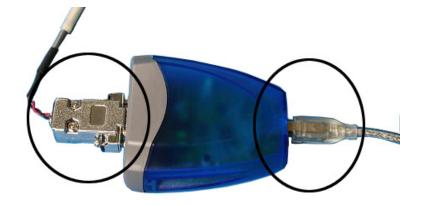


Installation

To use the USB connection device to download the configuration into the Cascade controller, you will need to use the Murphy installation kit. Follow the instructions listed below to connect the computer and device:

NOTE: The installation kit provides everything needed to connect the Cascade to your PC.

- 1. Connect the programming cable end with the db9 connect to the RS485 to USB converter.
- 2. Connect the USB cable to the USB to RS485 converter.



3. Connect the opposite end of the programming cable to the Cascade 10 position connector.



- 4. Connect the opposite end of the USB cable to the PC.
- 5. Connect Battery (+) to position 1 on the 15 position terminal block.

6. Connect Battery (-) to position 2 on the16 position terminal block.



Programming Mode



Flip dip switch number 1 to the closed position (up) on the rear of the Cascade. This will allow the controller to power up in the programming mode. Once all programming cables and power are connected to the Cascade, initiate power. The controller should now be in programming mode.

The Cascade's green LED to the right of AUTO will flash very quickly. This LED turns off briefly while the right-hand bank of LEDs flash "on" for proper bulb verification. Once the bank of LEDs flash and remain off, the green light to the right of AUTO will have a slower steady flash. In the first bank of LEDs labeled "OVER SPEED", the bottom red LED remains on. This is the first parameter and indicates you are now in Programming Mode.

Once the program is loaded successfully, flip the number 1 dip switch to the open position and remove power from the controller.

Application GUI Overview

This section provides instructions for launching the Cascade Configuration Tool, identifies the application features that are accessible through the menu bar, and defines general navigation.

Launching the Application

To launch the application you either double-click the Cascade Configuration Tool application

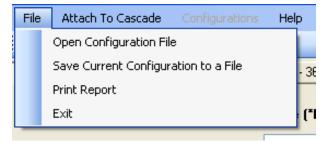
icon **multiplicated** on your desktop, or select "Cascade Configuration Tool Design" from the list of programs under your "Start" menu. The following dialog box is displayed.

🔤 FW Murphy CD101 (Autostart)	PC Configuration Tool		
File Attach To Cascade Configurati	ions Help		
📴 🖬 🇞 🎒 🛛 🞯			
Parameter 1 · 12 Parameter 13 · 26 Pa	arameter 28 - 36 Parameter 37 - 48	Parameter 48 - 59 Reserved	Firmware Version: Unknown
Configuration	Value (*Default)	Configuration Value (Binary)	Copyright © FW Murphy Inc. 2006
1. Engine Speed Source	~		This is a PC based configuration tool
2. Crank Attempts	~		Cascade Autostart Engine Controller
3. Crank Timer	×		Firmware Revision: 2.1.28 or higher
4. Crank Rest Timer	Image: State Control Parameter 13 - 26 Parameter 28 - 36 Parameter 37 - 48 Parameter 48 - 59 Reserved Image: State Delay Timer Value ("Default) Configuration Value (Binary) Copyright © FW Murphy Inc. 2006 Crank Attempts Image: State Delay Timer Image: State Delay Timer Image: State Delay Timer Image: State Delay Timer Selecting an Engine Speed Source and the form 's configuration to all uses to create a configuration to all uses to create to configuration to all uses to create a configuration		
5. Start Delay Timer	~		
6. Stop Delay Timer	~		factory defaults.
7. Preheat Timer	Image: Parameter 13 - 26 Parameter 28 - 36 Parameter 37 - 48 Parameter 48 - 53 Reserved Configuration Value ("Default) Configuration Value (Binary) Copyright © PW Murphy Inc. 2006 1. Engine Speed Source Image: Parameter 28 - 36 Image: Parameter 28 - 36 Parameter 37 - 48 Parameter 48 - 53 Reserved Firmware Version: Unknown 1. Engine Speed Source Image: Parameter 28 - 36 Image: Parameter 28 - 36 Parameter 37 - 48 Parameter 48 - 53 Reserved This is a PC based configuration tool used to create configuration tool used to cre		
8. Extended Preheat Timer	~		Write or Read the Form's
9. Warmup Timer	¥		to / from a unit by using
10. Cooldown Timer	~		Device'.
11. Bypass Timer	~		
12. Energize to Stop Timer	~		
Ν	Not Used for Selected Speed Source	Red is not the default Value	
[]c	communicating with Cascade		.;;

Menus and Tool Bars



The tool bar provides one-click access to opening an existing file and saving the currently displayed file. These same functions are available from the "File" drop-down menu. The "File" menu also provides the ability to print a report. (Note: The Report selection will only print a report of the current configuration to a printer connected to the PC and will not display the report.)



Selecting "Attach to Cascade" provides the ability to connect to an existing Cascade once all cabling is connected and power is initiated on the controller. Once connected, the configuration from the Cascade can be downloaded and viewed.



Selecting "Configurations" allows you to write to a device, read from a device, restore the initial configuration or set to the factory defaults. The Configurations menu item is grayed out and unavailable when not directly connected to a device.

NOTE: The PC and device must be linked in order to have access to the Configurations menu item.

FW Murphy CD101	(Autostart) PC	Configu
File Attach To Cascade	Configurations	Help
: 💕 🔒 🗞 🎒 🛛 📀		

Selecting "Help" provides access to the Instruction and Operations manual, information about the PC Configuration Tool and the User's Manual.

	Help	2	
		Configurator IOM	
et.		Cascade IOM	ter
-		About PC Configurator	Ē
v	alue	(*Default)	Confi

Navigating Cascade Configuration Tool

Navigating the Cascade Configuration Tool application interface is versatile and easy. It contains one window and it has four sections of information for each tab. Each tab contains a similar format although not identical. See the illustration below.

FW Murphy CD101 (Autosta Fle Attach To Cascade Conlig Cascade Quint	urations Help			FW Murphy CD101 (Autoste 1) PC Configuration Tool File Attach To Cacade Config attace Help		
Parameter 1 · 12 Parameter 13 · 26 Configuration	Parameter 28 - 36 Farameter 37 - 48 F Value ("Default)	Configuration Value (Binary)	Firmware Version: Unknown Copyright © FW Murphy Inc. 2006	Parameter 1 · 12 Parameter 13 · 26 Parameter 28 · 36 Parameter 37 · 48 Configuration Value ("Default)	Parameter 48 · 59 Reserved Configuration Value (Binary)	Firmware Version: Unknown Copyright © FW Murphy Inc. 2006
1. Engine Speed Source 2. Crank Attempts 3. Crank Timer 4. Crank Rest Timer 5. Stat Delay Timer 5. Stat Delay Timer 7. Preheal Timer 8. Extended Preheat Timer 9. Warmup Timer 10. Cooldown Timer 11. Bypass Timer 12. Energize to Stop Timer	Not Ured for Selected Speed Source		This is a PC based configuration tool used to create configuration tool used to create configurations for the Model. (2010) Firmwate Revision: 2.1.20 or higher This Process can be Stated by Selecting an Engine Speed Source and the form will prefit with Catolog defaults. Or Loss of the File "Open" and select a file to set the form. Or Write or Read the Form's configuration Write or Read the Form's configuration The Configuration Survey of Connect to Device I.	28. Initial PowerUp Mode 23. Di Possure Cark Disconnect Dilay Enter Cark Disconnect Fireq Enter Cark Disconnect Fireq Enter Cark Disconnect Fireq 31. 10 Digit 32. 1s Digit 33. 1000s Digit 34. 100s Digit 35. 10s Digit 36. 1s Digit WK Required for Selected Speed		This is a PC based configuration tool used to create configuration tool caceade Aving and Engine Chronolog Firmware Revision: 2.1.28 or higher This Thoeses can be Stated by Selecting an Engine Speed Source and the form will pell with factory detaults. Or the Tilk' Open' and select a file to set the form. Of Write or Read the Form's configuration to an or high sping Avine 1 or with pulling Avine 1 or with pulling Avine 1 or with pulling Denice1.

Here is what each section contains:

(A)The configuration section a list of items that can be configured.

(B) The Value (*Default) section contains drop-down boxes from which the user can select a value.

(C) The Configuration Value (Binary) section contains the binary value for what is selected in section (B).

NOTE: This section will indicate to the user when the default value has been altered by turning the binary values to the right red.

(D) The Help section provides context sensitive help for each of the values to be entered.

NOTE: The Help is displayed when the box is selected.

(E) This section is displayed on screens requiring additional user input.

NOTE: Sections (B) and (E) are the only sections to which the user can make changes.

Guidelines for Configuring the Cascade Configuration Tool

This section provides guidelines for setting up common configuration items in Cascade Configuration Tool.

There is a logical sequence to follow when configuring the Cascade. These sequences will be explained in four separate topics. They are:

- Defining the System
- System of Operation
- System of Interface

Defining the System

The first step in defining the system is to gather information for setting up your analog and/or digital devices and control outputs. For your convenience, you may want to make a checklist of this information for entering into the Cascade Configuration Tool. Once this information has been entered, it will be available for subsequent configuration options.

The following items from the Main Menu List allow you to define the system. Refer to the context sensitive help contained in the product for information on field options you will be entering.

Parameters

Parameter 1-12	Parameter 13-26	Parameter 28-36	Parameter 37-48	Parameter 48-59	Reserved
1. Engine Speed Source	13. Aux input Bypass Timer	28. Initial Power-up Mode	37. Overspeed Setpoint	Flywheel Tooth Count	20. Reserved
2. Crank Attempts	14. Cranking Abutment Delay	29. Oil Pressure Crank Disconnect Delay	38. Underspeed Setpoint	48. 100's Digit	21. Reserved
3. Crank Timer	15. Remote Start Signal Type	30. Nominal Generator Frequency	39. Underspeed Response	49. 10's Digit	27. Reserved
4. Crank Rest Timer	16. Low Oil Pressure	Enter Crank Disconnect Freg.	40. Low Press Shutdown Setpoint	50. 1's Digit	45. Reserved
5. Start Delay Timer	17. High Engine Temp.	31. 10's Digit	41. Hi Eng Temp. Shutdown Setpoint	Run Speed	46. Reserved
6. Stop Delay Timer	18. Digital Input 3 (Aux Input 1)	32. 1's Digit	42. Lo Batt Voltage Setpoint	51. 1000's Digit	47. Reserved
7. Preheat Timer	19. Digital Input 4 (Aux input 2)	Enter Crank Disconnect RPM	43. Hi Batt Voltage Setpoint	52. 100's Digit	55. Reserved
8. Extended Preheat Timer	22. Fuel Relay Control	33. 1000's Digit	44. Weak Battery Voltage Setpoint	53. 10's Digit	56. Reserved
9. Warm-up Timer	23. Auxiliary Output 1	34. 100's Digit		54. 1's Digit	57. Reserved
10. Cool-down Timer	24. Auxiliary Output 2	35. 10's Digit		59. Fault Code SPN Conversion Method	58. Reserved
11. Bypass Timer	25. Auxiliary Output 3	36. 1's Digit			60. Reserved
12. Energize to Stop Timer	26. Auxiliary Output 4				61-63. Reserved

Below is a list of the parameters that the Cascade will ask you to define.

NOTE: For further information on the parameters, see Appendix A - Tables in this document.

System of Operation

The sequences to be defined for system of operation determine the day-to-day, normal operation of your equipment. The following items from the Main Menu List allow you to define the system of operation. Refer to the chapter titled "Main Menu List - Screen Definitions" for information on field options you will be entering.

File

Open Configuration Item

This feature allows the user to open a saved configuration from a location on the PC.

Save Current Configuration to a File

This feature allows the user to save a configuration into a file on the PC. This will allow the use of configuration at a later date.

Print Report

This feature prints a report of all the parameters in the configuration using the default printer of the PC.

Exit

This closes the configuration tool.

Attach to Cascade

Connect

This allows the configuration tool to communicate to the Cascade once all the cabling is connected and power is initiated on the controller.

Configurations

Write to Device

To download a configuration to the Cascade controller, first make sure the PC is connected to the controller via USB to RS45 converter and the controller is in programming mode. In the "Configurations" menu, click "Write to Device". You will now see a text box with a message that states "Successful Write to Device."

After downloading the configuration, remove the USB to RS485 converter cable from the Cascade, take the controller out of programming mode and cycle the power. The controller will now power up with the new configuration installed.

Read from Device

To upload a configuration from the Cascade controller, first make sure the PC is connected to the controller via USB to RS45 converter and the controller is in programming mode. Click on "Configurations" then click "Read from Device". After uploading the configuration, the parameters will be shown in the configuration value row. To distinguish if the parameter I not a default parameter, the small configuration value boxes will be red.

Restore Initial Configuration

This feature allows the user to restore the Cascade's configuration to the configuration software from when the initial "Read from Device" was selected. This allows the user to make changes to a configuration originally pulled from the Cascade, then go back to view, compare, or load the original configuration before changes were made.

Set to Factory Defaults

This feature enables the user to reset the factory defaults of the Cascade without having to manually do so.

Help

Configurator IOM

Click this menu item to obtain an Installation and Operations Manual for the Cascade Configuration Tool.

Cascade IOM

Click this menu item to access the Installation and Operations Manual for the Cascade. This will open a window browser and redirect the user to the Cascade product home page on the FW Murphy web site. Under the Literature Tab of this page, the current IOM is listed and provided in a PDF format. This feature is only available on a PC that is connected to the internet.

About PC Configurator Tool

This identifies the software version of the configuration tool.

Appendix A - Tables

Table 1. Parameter Values and Corresponding LED Indication LEDs shown here form a binary code indicating the configuration value. Shown from Top to bottom the LEDs read from Left to Right (see Fig.1). A filled dot means LED is ON.

				Parameter			
Description	LED Bank 1	Value (*= default)	LED Bank 2	# Description	LED Bank 1	Value (*= default)	LED Bank 2
Engine Speed Source	000000	Magnetic Pickup*	00000	13 Aux Input Bypass	00000	30 Sec*	00000
		Generator AC	00000	Timer		1 Min	00000
		J1939 (ECU)	00000			2 Min	00000
2 Crank Attempts	000000	3*	00000	1		3 Min	00000
		5	00000			4 Min	00000
		10	00000			5 Min	0000
		Continuous	00000	-		6 Min	00000
3 Crank Timer	000000	5 Sec	00000			7 Min	00000
		10 Sec	00000			8 Min	00000
		15 Sec*	00000			9 Min	\mathbf{OOOO}
		20 Sec	00000			10 Min	00000
		25 Sec	00000			15 Min	$\mathbf{O}\mathbf{O}\mathbf{O}\mathbf{O}\mathbf{O}$
		30 Sec	0000			20 Min	00000
						25 Min	
		45 Sec	00000				
-		60 Sec	00000	1		30 Min	$\bigcirc \bullet \bullet \bullet \bigcirc \bigcirc$
Crank Rest Timer	000000	5 Sec	00000			35 Min	$\bigcirc \bullet \bullet \bullet \bullet \bullet$
		10 Sec	00000			40 Min	$ \bullet \circ \circ \circ \circ$
		15 Sec*	00000			45 Min	0000
		20 Sec	00000			50 Min	00000
		25 Sec	00000			55 Min	0000
				1			
		30 Sec	0000	14 Creation 14		1 Hr	
		45 Sec	00000	14 Cranking Motor	000000	Disabled*	00000
		60 Sec	00000	Abutment Protection Delay		1.00 s	00000
Start Delay Timer	000000	0 Sec*	00000	(Current crank attempt is		1.25 s	00000
(auto mode only)	-	5 Sec	00000	aborted if an RPM greater		1.50 s	00000
(j/		10 Sec	000000	than 10 is not detected		1.75 s	00000
		15 Sec		after this delay from start		2.00 s	0000
		30 Sec	00000	of crank has expired)		2.25 s	00000
		60 Sec	00000			2.50 s	$\bigcirc \bigcirc $
3 Stop Delay Timer	000000	0 Sec*	00000	(MPU and J1939 speed		2.75 s	00000
(auto mode only)		5 Sec	00000	source only)		3.00 s	\mathbf{OOOO}
		10 Sec	00000			3.25 s	00000
		15 Sec	00000			3.50 s	00000
		30 Sec	00000			3.75 s	00000
		60 Sec	0000	-		4.00 s	$\bigcirc \bigcirc $
7 Preheat Timer	\bigcirc	0 Sec*	00000			4.25 s	$\bigcirc \bullet \bullet \bullet \circ \bigcirc$
		5 Sec	00000			4.50 s	\bigcirc
		10 Sec	00000			4.75 s	00000
		15 Sec	00000			5.00 s	0000
		20 Sec	00000	15 Remote Start Signal	000000	Maintained*	00000
		25 Sec	00000	Type	20222	Momentary	00000
		30 Sec	00000	16 Digital Input 1	000000	Lo Oil Press (Open/Fault)	00000
		45 Sec	00000			Lo Oil Press (Close/Fault)*	00000
		60 Sec	00000	17 Digital Input 2	000000	Hi Eng Temp (Open/Fault)	00000
B Extended Preheat	000000	0 Sec*	00000			Hi Eng Temp (Close/Fault)*	00000
luring Crank (only used if		5 Sec	00000	18 Digital Input 3	000000	Not Used*	00000
preheat timer is also set		10 Sec	00000	(Auxiliary Input 1)		Winter/Summer	00000
				(Auxiliary Input 1)			00000
o a non-zero value)		15 Sec	00000	1		Momentary Stop	
		20 Sec	00000	1		Immediate Warning	00000
must be less than or		25 Sec	00000	1		Delayed Warning	00000
equal to crank timer)		30 Sec	00000	1		Immediate Shutdown	00000
		45 Sec	00000	1		Delayed Shutdown	00000
		60 Sec	00000	1		Delayed Aux Input Shtdwn	00000
9 Warmup Timer	000000	0 min.*	00000	1		Run/Idle (Line Fill)	00000
• warnap rinci		1 min.	00000	1		Auxiliary Crank Disconnect	00000
				1			
		5 min.	00000	40. 01.11.11.1		Remote Reset (Clear Faults)	00000
		10 min.	00000	19 Digital Input 4	000000	Not Used*	00000
0 Cooldown Timer	000000	0 min.*	00000	(Auxiliary Input 2)		Winter/Summer	00000
		1 min.	00000			Momentary Stop	00000
		5 min.	00000	1		Immediate Warning	00000
		10 min.		1		Delayed Warning	00000
1 Duncos Timor	0000000			4			
1 Bypass Timer	$\bigcirc \bigcirc $	0 Sec	00000	1		Immediate Shutdown	00000
		5 Sec	00000	1		Delayed Shutdown	00000
		10 Sec*	00000	1		Delayed Aux Input Shtdwn	$\bigcirc \bigcirc $
		15 Sec	00000	1		Run/Idle (Line Fill)	00000
		20 Sec	00000	1		Auxiliary Crank Disconnect	00000
				1		Remote Reset (Clear Faults)	
		25 Sec	0000	10 Evel D 1 - 0 - 1 - 1			00000
-		30 Sec	00000	22 Fuel Relay Control	000000	Energized to Run*	00000
2 Energize to Stop	000000	15 Sec*	00000	(non ECU Engines) Note:		Energized to Stop	00000
Timer		30 Sec	00000	On ECU engines, fuel relay			
Timer							

Parameter		Value (* J.C. W		Parameter		Value (* defects)	
Description	LED Bank 1	Value (*= default)	LED Bank 2	# Description	LED Bank 1	Value (*= default)	LED Bank 2
Auxiliary Output 1	$\bigcirc \bigcirc $	Not Used*	00000			Lo Oil Press Shutdown	00000
		Warmup	00000			Hi Eng Temp. Shutdown	00000
		Cooldown	00000			Overspeed Shutdown	00000
		Warmup/Cooldown	00000			Overcrank Shutdown	00000
		Preheat	00000			Alternator Fail/Battery	
		Engine Running	0000			High/Low/Weak	$\bigcirc \bigcirc $
		At Load	00000			Engine Speed Up	$\bigcirc \bigcirc $
		Lo Oil Press Shutdown	00000			Engine Speed Down	$\bigcirc \bigcirc $
		Hi Eng Temp. Shutdown	00000			Common Alarm	00000
		Overspeed Shutdown	00000			Controller in	
		Overcrank Shutdown	00000			AUTO mode	$\bigcirc \bullet \bullet \bullet \bullet \bullet$
		Alternator Fail/Battery				Shutdown	00000
		High/Low/Weak				Loss of Speed	
		Engine Speed Up	00000			Signal Fault	•0000
		Engine Speed Down	0000			Underspeed Fault	00000
				20 Initial Dawar Lin	000000		
		Common Alarm	0000	28 Initial Power-Up		Power-Up in Manual*	00000
		Controller in		Mode		Power-Up in Automatic	00000
		AUTO mode		29 Oil Pressure Crank		Not Used*	00000
		Shutdown	00000	Disconnect Delay		0 s	00000
		Loss of Speed		(non-ECU engines		0.25 s	00000
		Signal Fault	0000	only)		0.50 s	00000
		Underspeed Fault	00000			0.75 s	00000
Auxiliary Output 2	000000	Not Used*	00000			1.00 s	0000
<i>·</i> · ·		Warmup	00000			1.25 s	00000
		Cooldown	00000			1.50 s	00000
							00000
		Warmup/Cooldown	00000			1.75 s	
		Preheat	00000			2.00 s	00000
		Engine Running	00000			2.25 s	$\bigcirc \bigcirc $
		At Load	00000			2.50 s	\bigcirc
		Lo Oil Press Shutdown	00000			2.75 s	00000
		Hi Eng Temp. Shutdown	00000			3.00 s	00000
		Overspeed Shutdown	00000			3.25 s	$\bigcirc \bullet \bullet \bullet \odot \bigcirc$
		Overcrank Shutdown	00000			3.50 s	\bigcirc
		Alternator Fail/Battery				3.75 s	0000
		High/Low/Weak	00000			4.00 s	0000
		Engine Speed Up	00000			4.25 s	00000
		Engine Speed Down				4.50 s	$\bullet 0 0 \bullet \bullet$
		Common Alarm	0000			4.75 s	
		Controller in				5.00 s	$\bullet \bigcirc \bullet \bigcirc \bullet \bigcirc \bullet$
		AUTO mode	00000	30 Nominal Generator	00000	50 Hz	00000
		Shutdown	00000	Frequency (genset only)		60 Hz*	00000
			•0000				
		Loss of Speed		31 Crank Disconnect		0	00000
		Signal Fault	●0000●	Freq (Generator AC		1	00000
		Underspeed Fault		speed source only)		2*	00000
Auxiliary Output 3	000000	Not Used*	00000	(10's digit)		3	00000
		Warmup	00000	(4	00000
		Cooldown	00000			5	00000
		Warmup/Cooldown	00000			6	00000
		Preheat	00000	32 Crank Disconnect	000000	0*	00000
		Engine Running	00000	Freg. (Generator AC		1	00000
		At Load	00000	speed source only)		2	00000
						3	
		Lo Oil Press Shutdown	00000	(1's digit)			00000
		Hi Eng Temp. Shutdown	00000			4	00000
		Overspeed Shutdown	00000			5	00000
		Overcrank Shutdown	00000			6	00000
		Alternator Fail/Battery				7	00000
						8	00000
		High/Low/Weak	00000				
		Engine Speed Up	00000			9	00000
		Engine Speed Down		33 Crank Disconnect	00000	0*	00000
		Common Alarm	0000	RPM (ECU or MPU		1	00000
		Controller in		speed source only)		2	00000
		AUTO mode	$\bigcirc \bullet \bullet \bullet \bullet$	(1000's digit)		3	00000
		Shutdown	00000			4	00000
		Loss of Speed				5	00000
		Signal Fault	●0000●			6	00000
						7	00000
		Underspeed Fault				8	
Auxiliary Output 4	00000	Not Used*	00000				
		Warmup	00000			9	00000
		Cooldown	00000	34 Crank Disconnect		0	00000
				RPM (ECU or MPU		1	00000
		Warmup/Cooldown	00000	speed source only)		2	00000
		Preheat	00000	speed source only)		L	
		Engine Running	00000				
			00000				

 Table 1. Parameter Values and Corresponding LED Indication (continued)

 LEDs shown here form a binary code indicating the configuration value. Shown from Top to bottom the LEDs read from Left to Right (see Fig.1). A filled dot means LED is ON.

Table 1. Parameter Values and Corresponding LED Indication (continued)

LEDs shown here form a binary code indicating the configuration value. Shown from Top to bottom the LEDs read from Left to Right (see Fig.1). A filled dot means LED is ON.

Parameter	1			Parameter			
Description	LED Bank 1	Value (*= default)	LED Bank 2	# Description	LED Bank 1	Value (*= default)	LED Bank 2
(100's digit)		3	00000			235 deg F	00000
		4	00000			240 deg F	$\bigcirc \bigcirc $
		5*	0000			245 deg F	$\bigcirc \bigcirc $
		6	00000			250 deg F	$\bigcirc \bigcirc $
		7	00000	42 Lo Batt Voltage		Warning Disabled	00000
		8	00000	Setpoint.		8.5V	00000
Crank Disconnect		*	00000	1		9.0V	00000
Crank Disconnect	$\bullet \bigcirc \bigcirc \bigcirc \bigcirc \bullet \bullet \bullet$	0	00000			9.5V	00000
RPM (ECU or		1	00000			10.0V	00000
MPU speed source		2	00000			10.5V*	$\mathbf{OO}\mathbf{OO}$
only) (10's digit)		3	00000			11.0V	$\mathbf{OO} \mathbf{O} \mathbf{O}$
	4*	00000			11.5V	$\bigcirc \bigcirc $	
		5	0000			18.0V	00000
	6	00000			19.0V	00000	
	7	00000			20.0V	$\bigcirc \bigcirc $	
	8	00000			21.0V	$\bigcirc \bigcirc $	
		9			22.0V	00000	
Crank Disconnect	00000	0*	00000			22.5V	0000
RPM (ECU or MPU		1	00000			23.0V	00000
speed source only)		2	00000			23.5V	00000
(1's digit)		3	00000	43 Hi Batt Voltage	000000	Warning Disabled	00000
		4	00000	Setpoint.		12.5V	00000
		5	0000	Setpoint.		13.0V	00000
		6	00000			13.5V	
		7	00000			14.0V	
		8	00000				
Overspeed Setpoint	9	00000	_		14.5V*		
	5%	00000			15.0V	00000	
(% above run speed))	10%*	00000			16.0V	00000
		15%	00000			24.5V	00000
		20%	00000			25.0V	0000
		25%	00000			25.5V	00000
		30%	00000			26.0V	$\bigcirc \bigcirc $
	35%	00000			26.5V	$\bigcirc \bullet \bullet \bigcirc \bigcirc$	
	40%	00000			27.0V	$\bigcirc \bullet \bullet \bigcirc \bullet$	
	45%	00000			28.0V	$\bigcirc \bullet \bullet \bullet \bigcirc \bigcirc$	
	50%	00000	4		29.0V	$\bigcirc \bullet \bullet \bullet \bullet \bullet$	
	5%	00000			30.0V	00000	
Setpoint (% below		10%	00000			31.0V	
run speed		15%	00000	44 Weak Battery		Warning disabled	00000
		20%*	00000	Voltage Setpoint		6.0 V	00000
		25%	00000			6.5 V	00000
		30%	0000			7.0 V	00000
		35%	00000			7.5 V	00000
		40%	00000			8.0 V	$\bigcirc \bigcirc $
		45%	00000			8.5 V	\bigcirc
		50%	00000			9.0 V	00000
Underspeed		None	00000			9.5 V	00000
Response		Warning*	00000			12.0 V	0000
		Shutdown	00000			13.0 V	00000
Lo Oil Press	00000	Disabled (no shutdown)	00000			14.0 V	00000
Shutdown Setpoint		0 PSI	00000			15.0 V	0000
(ECU eng. only)		5 PSI	00000			16.0 V	0000
- J.		10 PSI	00000			17.0 V	
		15 PSI	00000			18.0 V	00000
		20 PSI	0000			19.0 V	00000
		25 PSI	00000			20.0 V	0000
		30 PSI*	00000	48 Flywheel Tooth	••0000	0	00000
		35 PSI	00000	Count (MPU speed		1*	00000
		40 PSI	00000	source only)		2	
		45 PSI	00000	(100's digit)		3	00000
		50 PSI	00000	49 Flywheel Tooth	••0000	0	
		55 PSI	00000	Count (MPU speed		1	00000
		60 PSI	$\bigcirc \bigcirc \bigcirc \bigcirc \bigcirc \bigcirc \bigcirc \bigcirc$	source only)		2	00000
	00000	Disabled (no shutdown)	00000	, j,			
Hi Eng Temp.		190 deg F	00000	(10's digit)		3	
Hi Eng Temp. Shutdown Setpoint		195 deg F	00000			4	00000
Shutdown Setpoint			00000			5	0000
		200 deg F		1		6*	$\mathbf{OO} \mathbf{O} \mathbf{O}$
Shutdown Setpoint		200 deg F 205 deg F	00000				0
Shutdown Setpoint		205 deg F				7	$\bigcirc \bigcirc \bullet \bullet \bullet \bullet$
Shutdown Setpoint		205 deg F 210 deg F	0000			8	00000
Shutdown Setpoint		205 deg F 210 deg F 215 deg F					
Shutdown Setpoint		205 deg F 210 deg F	0000			8	00000

Parameter				Parameter			
# Description	LED Bank 1	Value (*= default)	LED Bank 2	# Description	LED Bank 1	Value (*= default)	LED Bank 2
50 Flywheel Tooth	00000	0	00000	53 Run Speed	••0•0•	0*	00000
Count (MPU speed		1	00000	(ECU or MPU		1	00000
source only)		2	00000	speed source only)		2	00000
(1's digit)		3	00000	(10's digit)		3	00000
(1 5 digit)		4		-		4	00000
		5				5	00000
		6				6	00000
		7				7	$\bigcirc \bigcirc $
		8*	00000			8	00000
		9	00000			9	00000
51 Run Speed (ECU or MPU	••000••	0	00000	54 Run Speed (ECU or MPU		0*	00000
		1*	00000			1	00000
speed source only)		2 Speed sol	speed source only)	y)	2	00000	
(1000's digit)		3	00000	(1's digit)		3	00000
		4	00000			4	00000
52 Run Speed	00000	0	00000			5	$\bigcirc \bigcirc $
(ECU or MPU	•••••	1				6	$\bigcirc \bigcirc $
speed source only) (100's digit)		2	00000	59 Fault Code SPN Conversion Method (ECU Eng. only) Note: if the ECU is using version 4, any of these options will work.		7	$\bigcirc \bigcirc $
		3	00000			8	00000
		4	00000			9	00000
		5			•••0	Version 1 & 4 *	00000
		6	00000			Version 2 & 4	00000
		7	00000			Version 3 & 4	00000
		8*	00000				
		9	00000				

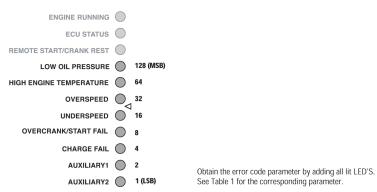
NOTE: Not all configuration parameters are used. Some are skipped because they are reserved for future expansion.

Table 2. LED States for Normal Operating Mode

LED	<u>OFF</u>	<u>ON</u>	Slow Blink	Fast Blink
AUTO	Manual Start Mode	Auto Start Mode		
Engine Running	Engine is not Running	Engine is Running	Engine is cranking	
ECU Status	Non-ECU configuration	Valid CAN Activity (no errors, Error Active state)	Wait-to-Start	Bus Off/Error Passive/Failed Address Claim
Remote Start/Crank Rest	Remote start input is inactive and manual start has not been initiated	Remote Start active	In Crank Rest or one of the prestart states (startdelay, preheat, waitecu, wait rpm)	No J1939 data when ECU is on
Low Oil Pressure	Pressure is above setpoint or low oil pressure input is inactive	Pressure is below setpoint or low oil pressure input active	Fault code SPN 100 received AND ECU warning/shutdown active	No pressure data (ECU only)
High Engine Temperature	Temperature is below setpoint or high engine temperature input is inactive	Temperature is above setpoint or high engine temperature input is active	Fault code SPN 110 received AND ECU warning/shutdown active	No temperature data (ECU only)
Overspeed	Engine speed below overspeed setpoint	Engine speed above overspeed setpoint		No speed data (ECU) or loss of speed (non-ECU)
Underspeed	Engine speed above underspeed setpoint	Engine speed below underspeed setpoint		No speed data (ECU) or loss of speed (non-ECU)
Overcrank/Start Fail	Failure to start has not occurred	Overcrank start failure (crank attempts exceeded)	Start Condition Failure (RPM not below 10 or crank disconnect input is on before attempting crank)	Start Condition Failure (ECU-related) CAN Hw Bus Error preventing start
Charge Fail	Alternator warning lamp terminal voltage is above threshold or charge fail input is inactive	Alternator warning lamp terminal volt- age is below threshold or charge fail input is active	Battery Voltage is below low voltage warn- ing setpoint	Battery Voltage is above high voltage warning setpoint
Auxiliary 1	Auxiliary input 1 is inactive	Auxiliary input 1 is active	ECU Warning (malfunction or Amber lamps on)	ECU Shutdown (Red Stop or Protect lamps on)
Auxiliary 2	Auxiliary input 2 is inactive	Auxiliary input 2 is active	Weak Battery	

Table 3. Error Codes LED States





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