

# **DOCUMENT DESCRIPTION: NALYSIS 2.0 USER MANUAL**

DWG #: A-820-J-530-4

# **REVISIONS**

TABLE 1			
Revision Number	Date Revised	Description of Revision	Revision By
1	03APR2019	Switched over from 820-0007-J-6 document which was for NAlysis 1.0. Add upgrade via YModem in Terminal application section; and WinGov section.	HKC
2	18JUL2019	Update WinGov section. Add System Requirements 1.1	HKC
3	5FEB2020	Update acronym list; add RDU LED indicator legend; add Export Data section for NCORDER; Inspect Data section has updated screenshots and instructions for fuel usage estimate; update Speed Indicator screenshots	HKC/LLH
4	30MAR2020	Updated new Stats tab interface, removed autobaud from section 3.0, Updated section 4.4 Setup Tab to support the newly designed GUI	BL
5	13JAN2021	Update Process(*bli) for info on .csv outputs, updates for mile post location being on plot control display, formatting updates NCorder Interface	JJ

# Page 2

# Table of Contents

1.0 N	alysis Software	6
1.1	SYSTEM REQUIREMENTS	6
2.0 In	istalling Nalysis	6
	alysis Startup	
	FORCE Interface	
	MENU	
4.1.1		
4.1.2 4.1.3		
4.1.3		
4.1.4		
4.1.6	1	
4.1.7		
	TERMINAL TAB	
	NFORCE TAB	
	SETUP TAB	
<b>4</b> .4.1		
4.4.2		
4.4.3	8	
4.4.4		
4.4.5		
4.4.5.		
4.4.5.		
4.4.6		
4.4.7	Load File	28
4.4.8	Save to File	29
4.5	DIAGNOSTIC TAB	30
4.6	RTD (REAL TIME DIAGNOSTIC) LOG	30
5.0 N	CORDER Interface	
	MENU	
5.1.1		
5.1.2		
5.1.3	6	
5.1.4	Capture	49
5.1.5		
5.1.6	Plot Options	51
5.1.7	Inspect Data	54
5.1.8		54
5.1.9		
5.1.10		
5.1.1	1	
5.2	TERMINAL TAB	59

# Page 3

5.3	NCORDER TAB	59
5.3.	1 Start/Stop	
5.3.2	2 Erase Log	
5.3.	3 Get Log Info	
5.4	DIAGNOSTIC TAB	
5.5	PROCESSING LOG FILE	
5.5.		
5.5.2	0	
5.5.	0	
5.5.4	8	
5.5.		
5.5.0	1	
5.5.1	- <b>I</b>	
6.0 N	NCOMPASS Interface	
6.1	MENU	
<b>0.1</b> 6.1.		
6.1.2		
6.2	TERMINAL TAB	
6.3	NCOMPASS TAB	
<b>0.5</b> 6.3.		
6.3.2	1	
6.3.	1	
6.3.4		
6.3.		
6.3.0		
6.3.		
6.3.0		
6.3.9		
6.4	Diagnostic Tab	
6.5	WEB PORTAL	
	WinGov Interface	
7.1	MENU	
7.1.		
7.1.2	0	
7.1.		
7.1.4	1	
7.1.	1	
7.2	TERMINAL TAB	
7.3	WINGOV REAL TIME TAB	
7.4	WINGOV ENG CONFIG TAB	
7.5	DIAGNOSTIC TAB	
8.0 7	Ferminal Interface	
8.1	Menu	
8.1.		
8.1.2		
	Page 4	

8.1.3	Capture	
8.1.4	Set	
8.1.5	Options	
8.1.6	Window	
8.1.7	Help	106
8.2	Ferminal Tab	
8.2.1	Help Button	
8.2.2	Exit	
8.2.3	Clear Screen	
8.2.4	Close RT	107
9.0 Ge	eneric Screen Tabs	
9.1	Ferminal Tab	
9.2 1	DIAGNOSTIC TAB	
9.2.1	Erase Fault	
9.2.2	Erase EPL	
9.2.3	Erase Stats	110
9.2.4	Flash Info	
9.2.5	Repair Cal	111
9.2.6	Previous	
9.2.7	Next	
9.2.8	Read Flash	
9.2.9	Read RAM	
10.0 A	Abbreviations used in NFORCE Download Files	
11.0	Speed Indicator Setting:	
	Customer Support	
14.0		

Page 5

# 1.0 Nalysis Software

The Nalysis software allows communication via RS-232 serial link to the *NForce, NCorder, NLIMIT NCOMPASS, WinGov* and *TERMINAL* screen (Windows Hyper Terminal).

The *NFORCE, NCORDER and NLIMIT* Systems have an integrated recording function which is continually operating while the system is functional. These systems record information and store it in three types of logs: 1) Faults, 2) Diagnostic, & 3) Statistics). This information can be downloaded using the Nalysis software program. This system scans all inputs and outputs – digitals and analogs – 10 times each second, and updates each log as required.

The Nalysis software also has the interface function to each of the system including the Terminal Interface (similar to the Hyper Terminal screen).

# 1.1 System Requirements

These are derived from Windows 7 requirements:

- Processor -1 gigahertz (GHz) or faster 32-bit (x86) or 64-bit (x64).
- ➢ RAM 4 GB with at least 2 GB of available space.
- Disk 16 GB available space (32-bit) or 20 GB (64-bit). NAlysis only takes up about 13 MB on the hard drive and will run on 32-bit or 64-bit systems.
- Graphics Card DirectX 9 graphics device with WDDM 1.0 or higher driver.

# 2.0 Installing Nalysis

> If you install the Nalysis for the first time, download the software from the following link:

https://nre-electronics.com/nredownloads.html

- From the web page, click on Download NALYSIS Installation Zip File or Download NAlysis Installation Executable
- If you downloaded the zip file, open the zip file, and double click on the Nalysis\_Installer\_xXX.exe that is in the zip file. You may get a security warning when you start the install. If you do, click on the Run button. Once the installer has started, follow the instructions.
- If you downloaded the executable, double-click on the file to install. You may get a security warning when you start the install. If you do, click on the Run button. Once the installer has started, follow the instructions.
- > You should see a desktop icon after the installation completes.



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Page 6

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# 3.0 Nalysis Startup

Open Nalysis from Laptop/Computer by clicking on the desktop icon and click on the required Application button to launch the specific Nalysis program.



Select the available Communication Port and click on Connect to establish communication between System and Nalysis

Co	ommuni	cations 🗖 🗖 🔀
	Port	-
	bps	115200 👻
		Connect

# Page 7

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# 4.0 NFORCE Interface

Open NForce application by clicking on its button:

Nalysis 2.0				X
Select Application				
NFORCE	NCOMPASS	NCORDER	TERMINAL	WINGOV

When selecting NFORCE, the user will first enter the Terminal tab of the NFORCE application. <u>Note</u>: The following functionality is only available on NForce systems that have Nalysis communications Drivers.

Nalys	is - [Na	lysis V820-0007	-h51	May 9, 2017]							
N	File	Download Log	Set	Capture	Options	Window	Help				_ # ×
											×
T	eminal	NForce Setup	Diar	nostic							
	SPORTS -									and the second s	
										FW Update	
										Auto	
										Manual	
										Manual	
										Help	
										exit	E
										Clear Screen	
										Clear Screen	
										Close RT	
										Close R1	
											*

# 4.1 Menu

There are pull down Menu available for various functions in the NFORCE application.

### 4.1.1 File

The File pull down menu is available for the following functions:

## Page 8

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Valys	lalysis - [Nalysis V820-0007-M59 December 4, 2018]								
N	File	Download Log	Set	Capture	Options	Window	Help		
		Disconnect							
		Firmware Update		•					
		Convert		+					
		Make NVision DB I	mport	Files					
		Admin							
		Exit							

#### **Connect/Disconnect**

• Allow User to Connect or Disconnect communication between NFORCE system and Nalysis.

#### Firmware Update

- Allow User to update Firmware to the NFORCE system
- To upgrade the *NFORCE* firmware, you must do the following:
  - ➤ Isolate the locomotive and shut down the engine(s).
  - Connect the communications cable to the front of the CPU board and your laptop.
  - Exit any real-time viewing screen in the Terminal or NFORCE tabs.
- For automatic update, ensure the Auto radio button is selected (software default)
- Select File->Firmware Update>CPU, an open file dialog similar to the one below will appear

## Page 9

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Nalysis - [Nalysis	V820-0007-h51 May 9, 2017]							_
	wnload Log Set Capture Options W	/indow Help						
rennia INFO	proce   Setup   Diagnostic							
							FW Update	
HELP					_		Auto	
GD	NRE CPU Binary File					(	Manual	
GF	Computer + Local	Disk (C:) ▶ ti ▶		÷ 49	Search ti		2	
GS	Organize 🔻 New folder					iii <b>-</b> □	0	
FS5 FSD						0 * LU		
FSE	Downloads	* Name	Date modified	Туре	Size			
	Desktop	ccsv5temp	11/8/2016 9:24 AM	File folder				
NFORCE	E Libraries						Help	
	Documents							
	👌 Music						ext	
	Pictures						Clear Screen	
	Videos 🖬						clear Screen	
							Close RT	
	Computer Sector Disconnected Network Drive (B: Sector Disconnected Network Disconnected Network Drive (B: Sector Disconnected Network Di						0.000 111	
	Local Disk (C:)							
	JLe (\calent01\users) (H:)							
		T						
	File name:			•	Binary Image	(*.ecm)	-	
					Open	Cancel		

- Browse to the location of the *NFORCE* firmware on your Laptop/Computer.
  - i.e.
    - The *NFORCE* firmware number = 820-0###-xXX.ecm (where ### = the NFORCE Firmware number, and xXX = Latest Revision)
- Double click on the \*.ecm file to upload the Firmware to the system

# CAUTION: DO NOT INTERRUPT COMMUNICATIONS DURING THIS PROCESS; it could cause a fatal fault inside the NFORCE.

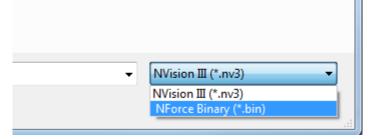
- Convert
  - To convert the RTD file with the ".bin" extension into a text file that is ready to analyze.
  - Convert an NVision 3 file to a CSV formatted file. The file was downloaded via the USB port on the NVision 3. This can also be used to convert a Fault or EPL ".bin" file that was downloaded from the NForce that has the binary download feature.

Nalys	Nalysis 2.0 - [Nalysis V820-0530-h01 April 3, 2019]								
N	File	Download Log	Set	Capture	Options	Window	Help		
		Disconnect							
		Firmware Update		•					
		Convert		•	NAI	/sis RTD (.BI	N)		
		Make NVision DB I	mport	Files	NVis	ion Fault/EF	PL (.NV3	or .bin)	
		Admin			NCo	mpass Fault	t/EPL (.BI	IN)	
		Exit							

Page 10

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• Then select the file type in the Open File Dialog window.



• Convert a Fault or EPL file that was downloaded from the NRE website that was transmitted by NCompass.

#### - Make NVision Import DB Files

- For Engineering use only. This will be greyed out for non-Admin users.
- Admin
  - Only available to the programmer.

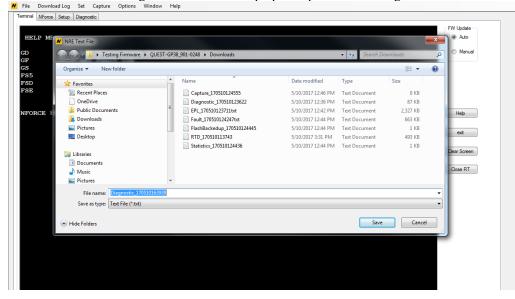
- Exit

• To exit NAlysis program.

#### 4.1.2 Download Log

This feature allows the User to perform the system log download from the pull down menu.

- Diagnostic
  - Diagnostic log download can be useful to observe the most recent performance of the locomotive. The log has all of the data download at 0.1 second intervals for around 1.5 to 2.0 minutes prior to taking the download.
  - Click on Diagnostic to download the Log to file. Save the file to a designated location on Laptop/Computer for viewing.
     Capture Options Window Help

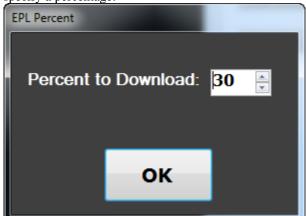


Page 11

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#### EPL

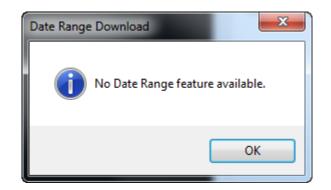
- The EPL stores long term locomotive data and can be used along with the Diagnostic and Fault downloads to provide a clear record of the operation and performance of the NFORCE system. When a fault is detected, the associated fault and data packets are recorded to both the fault record and the extended performance log. Certain events also cause data packets to be recorded to the EPL. A data packet is recorded to the EPL when the following events occur:
  - A monitored digital input signal changes state (turns ON or OFF)
  - A monitored analog signal changes by a pre-set threshold
  - A predefined number of minutes (typically 10 minutes to maximize recording memory) has passed since the last data packet was recorded
  - Downloads might only be performed if the locomotive is Isolated and is not Loading.
- Click on EPL to download the Log to file. Save the file to a designated location on Laptop/Computer for viewing.
  - Download using Percentage. This option will prompt you for a percentage if you're using a system that uses ASCII. If your system utilizes binary downloads, this option will automatically download 100% of the EPL. If not, then you'll get a prompt to specify a percentage:



Download using Date Range. This is more efficient than the percentage download, if your system has binary downloads available. If your system does not binary downloads, this option will inform you that the feature is not available.

#### Page 12

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#### Fault

- The Fault log can be useful to identify problem with Feedback signals such as Contactor Fault or an open Solenoid.
- Ensure that the locomotive is in Isolated and is not Loading. Initiate the file transfer by clicking on Fault to Download the Log file. Save the file to a designated location on Laptop/Computer for viewing.
- Statistics

The Statistics Log records various information that relates to the locomotive and its operation. Most of this information is cumulative and is referred to as statistics; whereas some information defines the parameters of the locomotive and the *NFORCE* System. All Lifetime Statistics are also stored in an external, non-volatile memory device which remains on the locomotive at all times. <u>Note</u>: For an NFORCE system that has NAlysis communication capability, a Statistics Log can be downloaded and saved from the *Setup* Tab (see Section 4.4)

The Statistics Report contains the following information:

- **Date/Time** (settable parameter) is the time and date of the download computer when data was downloaded from the *NFORCE*.
- **Firmware Version** indicates the version and revision of the *NFORCE* internal operating software.
- Loco ID (settable parameter) is the ID number of the locomotive from which data was removed. The ID number is composed of 5 alpha-numeric characters. Acceptable characters include numbers 0-9, letters a-z and letters A-Z. Space is used for blanks in the event the ID number is less than 5 characters in length.
- Wheel Diameter (settable parameter) is the diameter of the locomotive wheel in inches.
- **Axle Gen PPR** (settable parameter) is the pulses per revolution (PPR) of the incoming speed signal from the installed speed pick-up equipment.
- **Idle Parked** indicates the number of hours that the locomotive has spent with the engine at idle and the reverser in neutral.
- **Idle Working** indicates the number of hours the locomotive has spent with the engine at idle and the reverser set in either forward or reverse.
- Idle Limit Shutdown indicates the total hours the engine spent in *NFORCE* Shutdown mode.
- **Isolated** indicates the total hours the locomotive spent with the isolate/run switch in the isolate position.
- **Running** indicates the total engine run hours.

Page 13

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- **Shutdown** indicates the total engine shutdown hours (manual and automatic.)
- Stop, Notch 1-8 displays the time in hours spent at various throttle positions.
- Engine Run Times displays hours and minutes spent at each RPM setting.
- **Distance** displays miles traveled in forward, reverse and neutral.
- **Energy** displays total energy consumed in kWh.
- **RESTART COUNTS (ENGINE RESTART COUNTS)** displays the *Reason* for each engine *NFORCE*, each recorded for the *Lifetime* of the *Trip*.
- SHUTDOWN TIMES (UNABLE TO SHUTDOWN TIMES) displays the *Reason* for each engine shutdown failure and the associated number of hours accumulated.
- Report
  - Currently not available.
- Flash Backup
  - This option downloads the statistics log from a backup memory location in the NForce. The data is the same as the Statistics log.

#### 4.1.3 Set

This feature allows the User to set the System Real Time Clock, NForce Wheel Diameter, NForce Loco ID, NForce PPR, and Extended Performance Log. Download settings are available in the Set pull down menu.

#### System Real Time Clock

• To set the Real-Time Clock, click on System Real Time Clock

Date Time Select
Monday . May 15 -
10:57:18 AM
Set RTC
OK Cancel

#### Note:

- For systems with the Nalysis communications driver, choose Binary then click OK to set the system time and date (i.e. NCorder, NForce, and NCOMPASS)
- For systems without the Nalysis communications driver, choose ASCII then click OK to set the system time and date (i.e. NForce, and NLIMIT with Hyper Terminal communications)

Page 14

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#### - NForce Wheel Diameter

• To set Wheel Diameter, click on NForce Wheel Diameter

	×
Wheel Diameter	
¥0.0 🚔	
ОК	Cancel

- NForce Loco ID
  - To set Loco ID, click on NForce Loco ID

X	
Set Loco ID	
OK Cancel	

- NForce PPR
  - To set PPR, click on set NForce PPR

# Page 15

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	×
Set Loco ID	
OK Cancel	

#### Baud Rate

• To change the communication speed with the NForce, RDU, or NCorder unit. (Note: This may not be available for your NForce system). If successful, the bottom left corner will show the changed baud rate. This setting is temporary, depending on whether a Fault, EPL, or NCorder download occurs which will reset the baud rate to 115,200 after completion.

🔜 Set Baud Rate	×
Select Baud Rate	
◎ 230,400	
115,200	
Cancel	ОК

### 4.1.4 Capture

This feature will allow the User to capture the Real Time Updates of the NFORCE operation. Click on Capture and select Start to begin the process, select and save the file to the designated location then perform the operation that you need to capture. To stop the capture process, click on Capture pull down menu and select Stop.

## Page 16

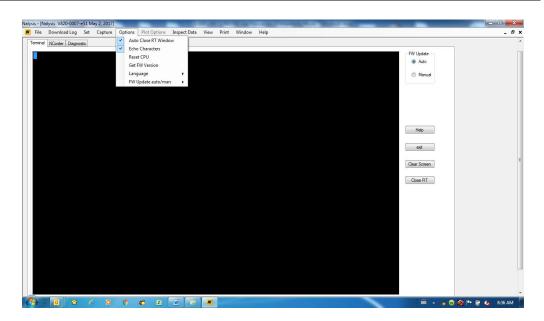
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Nalysis V820	0-0007-i51 Ma	y 12, 2017]										
		Capture Option	s Window	/ Help								
		Start										
	Setup Diagno	stic										
een Select						User Input		Record	Serial Monitor			
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play							tn4 Btn6	Btn8	Missed Msg: 0	qOut	Time Err: 6	
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ORCE 820-04	70-a00	MAIN										
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old	12345		3:0	GECT: 0	MR: 1		TMV24: 0	FW R: 0	VIG5: 2 VIGT: 4			
eel Dia (in)	40.0		4: 0	MGA: 0	BATI		LR: 74	SPD: 0	TE: 0			
tomer ID	NREE	BCT	1: 0	H20: 134	BC:	20	THP: 0	dTMI: 0	24T: 73			
kWh	NA											
ed (mph)	0		V: 0 V: 75	GATE: 0 RPM: 0		STANDBY IDLE						
ine State	RUNNING		: 0	ACC: 0	TIMR							
ottle	IDLE	RC:		THR: IDLE		0x00						
itation Limit	none	PID	: 0	EXC: none	EXCU	0x00						
Limit State	STANDBY											
E LAB TEST												
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Downloa     NForce     Part Select     Main     Nain     Analog     Analog     Aralog     Acce 820-04     ay 15, 2017     old     eel Dia (n)     tomer ID     kWn	d Log Set Setup Diagn Generator Digtalin 77 11:11:40 12345 40.0 NREE	Capture Option M NRE Text File Organize Favorites Recent P OneDriv Public D Public D Public D Public D Downlow Distop	Testing Fin New folder laces comments ds	rmware ► QUEST-( r	Name	e_1705120857	50	5/11/2017 2:22 5/12/2017 8:58	d Type 2 PM File folder 3 AM Text Docum	8≡ Size ent	р • 0 КВ	
Downloa     NForce     een Select     Main     Analog     Analog     ORCE 820-04     ay 15, 2017     old     eel Dia (n)     tomer ID     kWh     ed (mph )	d Log Set Setur Diagra Generator Digitalin 170-00 7 11:11:40 12345 40.0 NREE NA	Capture Option M NRE Text File Organize Favorites Recent P OneDriv Dublic D Downlow Disktop Capture Desktop Desktop	Testing Fin New folder laces comments ds	rmware ► QUEST-( r	Name	e_1705120857	50	5/11/2017 2:22 5/12/2017 8:58	d Type 2 PM File folder 3 AM Text Docum	8≡ Size ent	р • 0 КВ	
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e Download nal NForce en Select Main (play Analog DRCE 820-04 ay 15, 2017 old eel Dia (n) tomer ID kWh tomer ID kWh tel Ration Limit Limit State EE LAB TEST	Setue Degree Generator Digitalin 170-900 112345 40.0 NREE NA 0 RUNNING DLE none STANDBY CACTIVE	Capture Option M NRE Test File Organize * Corganize * Conganize *	Testing Fin New folder laces comments ds	rmware > QUEST-G	Name	e_1705120857	50	5/11/2017 2:22 5/12/2017 8:58	d Type 2 PM File folder 3 AM Text Docum	8≡ Size ent	р • 0 КВ	
e Download nal NForce en Select Main (play Analog DRCE 820-04 ay 15, 2017 old eel Dia (n) tomer ID kWh tomer ID kWh tel Ration Limit Limit State EE LAB TEST	Setue Degree Generator Digitalin 170-900 112345 40.0 NREE NA 0 RUNNING DLE none STANDBY CACTIVE	Capture Option M NRE Test File Organize * Programize * Provintes P	Testing Fin     New folder     laces     a     couments     ds     nts	rmware > QUEST-G	Name	e_1705120857	50	5/11/2017 2:22 5/12/2017 8:58	d Type 2 PM File folder 3 AM Text Docum	8≡ Size ent	р • 0 КВ	
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e Downloa nal NForce een Select	Setue Degree Generator Digitalin 170-900 112345 40.0 NREE NA 0 RUNNING DLE none STANDBY CACTIVE	Capture Option M NRE Test File Organize * * Favorites Recent Public D DoneDriv Public D DoneDriv DoneDriv Desttop Desttop Utures Desttop Utures Utures Utures Utures Utures Utures Utures Utures Utures Desttop	Testing Fin New folder laces comments ds nts cted Networl mme: Coptum	rmware > QUEST-C r k Drive (B) c)Drosts11124	Name	e_1705120857	50	5/11/2017 2:22 5/12/2017 8:58	d Type 2 PM File folder 3 AM Text Docum	8≡ Size ent	Р • • • • • • • • • • • • • • • • • • •	
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Downloa     Downloa     NForce     der Select     Main     Moin     dosy     Main     dosy     Analog     DRCE     820-04     ay     15, 2017     old     eel Dia     (n)     tormer ID     kWh     ed (mph.)     ine State     tation Limit     Limit     State     ELAB TEST	Setue Degree Generator Digitalin 170-900 112345 40.0 NREE NA 0 RUNNING DLE none STANDBY CACTIVE	Capture Option M NRE Test File Organize * Cryanize * Conganize * C	Testing Fin New folder laces comments ds nts ccted Networn mee: Copput ype: Text file	rmware > QUEST-C r k Drive (B) c)Drosts11124	Name	e_1705120857	50	5/11/2017 2:22 5/12/2017 8:58	1 Type 2PM File folder 3 AM Text Docum 99 AM Text Docum	USE Size	р • • • • • • • • • • • • • • • • • • •	
e Download nal NForce en Select Main (play Analog DRCE 820-04 ay 15, 2017 old eel Dia (n) tomer ID kWh tomer ID kWh tel Ration Limit Limit State EE LAB TEST	Setue Degree Generator Digitalin 170-900 112345 40.0 NREE NA 0 RUNNING DLE none STANDBY CACTIVE	Capture Option M NRE Test File Organize * Cryanize * Conganize * C	Testing Fin New folder laces comments ds nts ccted Networn mee: Copput ype: Text file	rmware > QUEST-C r k Drive (B) c)Drosts11124	Name	e_1705120857	50	5/11/2017 2:22 5/12/2017 8:58	1 Type 2PM File folder 3 AM Text Docum 99 AM Text Docum	USE Size	р • • • • • • • • • • • • • • • • • • •	
Downloa     NForce     Prove      Sector     Main     Main	Setue Degree Generator Digitalin 170-900 112345 40.0 NREE NA 0 RUNNING DLE none STANDBY CACTIVE	Capture Option M NRE Test File Organize * Cryanize * Conganize * C	Testing Fin New folder laces comments ds nts ccted Networn mee: Copput ype: Text file	rmware > QUEST-C r k Drive (B) c)Drosts11124	Name	e_1705120857	50	5/11/2017 2:22 5/12/2017 8:58	1 Type 2PM File folder 3 AM Text Docum 99 AM Text Docum	USE Size	р • • • • • • • • • • • • • • • • • • •	

#### 4.1.5 Options

Click on the Options pull down menu and the following screen will appear: •

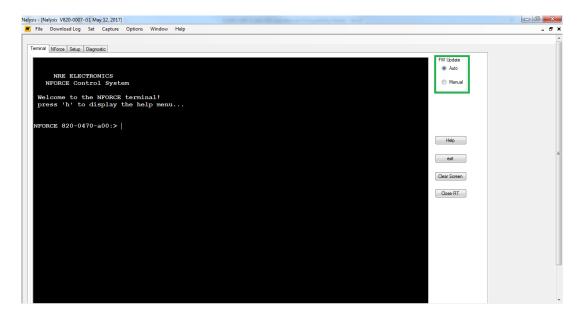
# Page 17



- If Auto Close RT Window is selected, real time screens will automatically close when exited, otherwise they remain open until the Close RT button is pressed.
- If Echo Characters is selected then key presses are echoed to the Terminal screen.
- Reset CPU will send the soft reset command to the NFORCE. If all reset conditions are met the NFORCE will reset without shutting down power.
- Get FW Version will retrieve the system's current firmware version (Nalysis communications driver required)
- Language allows the user to select display in English, Spanish or French. (Current set for English only)
- FW Update auto/man allows the user to select automatic or manual firmware update. This option functions the same as the FW Update radio buttons that appear on the top right of the Nalysis screen.

## Page 18

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#### 4.1.6 Window

• This feature allows you to select the screen options to either Terminal or Process file

Naly	Nalysis - [Nalysis V820-0007-M59 December 4, 2018]									
N	File	Download Log	Set	Capture	Options	Window	Help	1		
						Term	inal			
	Ferminal	NForce Setup	Diagn	ostic		Proce	ess file			

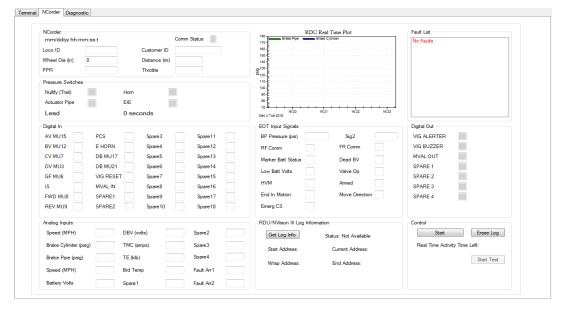
• When selecting Terminal from the Window pull down menu, the active screen will show the Terminal, NForce, Setup, or Diagnostic tabs if using NForce. If using the NCorder application, the Terminal option shows the

# Page 19

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#### Nalysis - [Nalysis V820-0007-i51 May 12, 2017]

Screen Select Main Display Analog	○ Generator ○ Exc ○ Digtalln ○	itation  Engine  Id	le Limit 🔘 IDRV (	CAN User Input	Btn3         Btn5         Btn7           Btn4         Btn6         Btn8	Stop	Serial Monitor Valid Msg: 675 qln Missed Msg: 0 qOut CRC ERR: 1 Unknown:	saved 0: Time Err: 46	
VFORCE 820-0		MAIN					CRCERR: 1 Unknown:		
May 15, 201									
way 15, 20	17 01.02.34	ACT1: 0	BCT2: 0	AIR: 71	BPPT: 64	IHP: 0	D14V: 4		
ocold	12345	ACT2: 0	BLC1: 48	MGV: 43	TMV13: 0	FW_V: 470	VIGS: 4		
neel Dia (in)	40.0	ACT3: 0	GFCT: 0	MR: 142	TMV24: 0	FW_R: 0	VIGT: 50		
ustomer ID	NREE	ACT4: 0	MGA: 0	BATI: 10	LR: 74	SPD: 0	TE: 0		
		BCT1: 0	H20: 134	BC: 20	THP: 0	dTMI: 0	24T: 73		
p kWh	NA	dMGV: 0	GATE: 0	NLST: STANDE	w.				
eed (mph)	0	BATV: 75	RPM: 0	GTHR: IDLE	21				
gine State	RUNNING	TMI: 0	ACC: 0	TIMR: 486					
rottle	IDLE	RC: 0	THR: IDLE	EXCL: 0x00					
citation Limit	none	PID: 0	EXC: none	EXCU: 0x00					
e Limit State	STANDBY								
	T ACTIVE AKE ERROR	1							



• When selecting Process file, the active screen will show the data screen that will allow user to either process the (\*.bli) file or open the (\*.pro) file from the File pull down menu for data viewing. See Processing Log File section for more details. (This feature is only applied to the NCorder application)

# Page 20

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#### 4.1.7 Help

Warning: Installing the latest NAlysis may not be compatible with your existing NForce, NCorder, or NCompass systems. Ensure that your systems are up-to-date before using the latest NAlysis by consulting release notes or FMI (field maintenance instruction) documents.

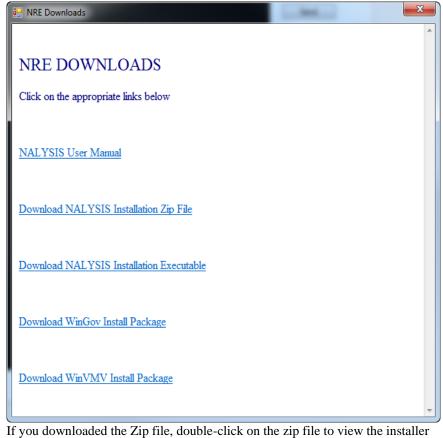
• This Help menu option contains information about NAlysis, Check for Software Updates, and Manual

Window	Help		
	A	bout	
	C	heck for Updates	
	N	fanual	

• Ensure that you have a network connection to the Internet, then click on *Check for Updates*. The following window will appear. Click on *Download NAlysis Installation Zip File* or *Installation Executable* link and follow the directions to save the file.

#### Page 21

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If you downloaded the Zip file, double-click on the zip file to view the installer file inside. Double-click on the installation executable to install

• To get the latest user manual, select the *Manual* option. You'll be greeted with the same options as the *Check For Updates option*. Click on the *NALYSIS User Manual* link to download.

# 4.2 Terminal Tab

This Terminal screen is similar to the Hyper Terminal screen. Type in "h" from the terminal prompt to view the list of Terminal Commands. This list of commands varies from one application to another as shown in Section 8.1 Terminal Tab.

#### Page 22

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# 4.3 NFORCE Tab

There is an NForce Tab available for systems that contain the Nalysis communications drivers. The following window will appear if you click on the NForce tab->Main->Analog. If the drivers are not available in the system, a "Disconnected" message will be displayed at the bottom right corner. This means you'll need to use the Terminal Interface.

creen Select				User Inp		Record	Serial Monitor		
	Generator Excl	itation 🔘 Engine 🛛 k	lle Limit 🔘 IDRV (	CAN	Btn3 Btn5 Btn7	Stop	Valid Msg: 675 qln Missed Msg: 0 qOut	saved 0: Time Err: 46	
splay Analog	⊚ Digitalln ⊚ I	DigitalOut		➡	Btn4 Btn6 Btn8		CRC ERR: 1 Unknown:	Time En. 40	
FORCE 820-0	470-a00	MAIN							
May 15, 201	7 01:02:54	ACT1: 0	BCT2: 0	AIR: 71	BPPT: 64	IHP: 0	D14V: 4		
cold	12345	ACT2: 0	BLC1: 48	MGV: 43	TMV13: 0	FW_V: 470	VIGS: 4		
heel Dia (in)	40.0	ACT3: 0	GFCT: 0	MR: 142	TMV24: 0	FW_R: 0	VIGT: 50		
istomer ID	NREE	ACT4: 0	MGA: 0	BATI: 10	LR: 74	SPD: 0	TE: 0		
		BCT1: 0	H20: 134	BC: 20	THP: 0	dTMI: 0	24T: 73		
p kWh	NA	dMGV: 0	GATE: 0	NLST: STAN					
eed (mph)	0	BATV: 75	RPM: 0	GTHR: IDLE	101				
gine State	RUNNING	TMI: 0	ACC: 0	TIMR: 486					
rottle	IDLE	RC: 0	THR: IDLE	EXCL: 0x00					
citation Limit	none	PID: 0	EXC: none	EXCU: 0x00					
e Limit State	STANDBY								
REE LAB TES									
REE LAB TES BILANCE BRA									

- This is a real-time screen of the NForce system that displays all of the Analogs reading and the active faults screen on the lower left (faults are displayed in Red).
- > To go to the different screen, simply click on the radio button on the Screen Select or Display.

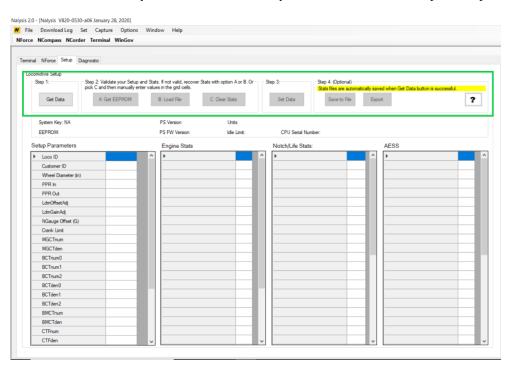
# Page 23

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#### 4.4 SETUP Tab

The Setup screen gives the User the ability to set and view the Parameters and accumulated Statistics saved in the NFORCE CPU, or in the EEPROM backup log. There are multiple options available from the Locomotive Setup box on the top of the Setup screen.

Note: This feature is only available on NFORCE systems that have the Flash updates capability.



#### 4.4.1 Get Data

Click on the Get Data button from the Locomotive Setup box to view the current parameter settings and accumulated statistics saved in the NForce CPU Board. The Parameters setting could also be verified and set manually from the Setup Parameters box on the left-hand side of the setup screen. If you want to change any of the parameters or statistics, double click on the field immediately to the right of the parameter or statistic. When you have selected the field, type backspace to delete the current setting, then enter the desired parameter or statistic value.

<u>Note</u>: Every time the Get Data button is clicked a copy of the current statistics and setup parameters are auto saved to: C:\NAlysisV2\StatsBackup\. The file name format is as follows Stats\_CUSTOMERID\_LOCOID\_DATE\_TIME.bin. The filename and auto save feature is indicated by the highlighted yellow line under Step 4.

#### Page 24

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Locationer (ID         CBG NEW         Eng #T Shudown frours)         20           Wheel Diameter (n)         40         Eng #T Shudown frours)         20           PPR In         60         Eng #T Shudown frours)         20           LudnOffreeLAg         2002         Index of frours)         30           LudnOffreeLAg         2002         Notch 1 frours)         Notch 2 frours)           NGsup Offset (G)         0         Notch 2 frours)         Notch 4 frours)           GCrark Limt         3         Notch 4 frours)         Notch 4 frours)           MGCTfarin         100         End end end         Notch 7 frours)           BCThumO         100         Notch 8 frours)         Notch 8 frours)	3 ^ 4 23 6 7 8	
Outcome         Differentiation           Wheel Dameter (n)         40           PPR In         60           PPR Out         60           LandfineAd;         2002           LandfineAd;         139           NGauge Offset (G)         0           Carak Linit         3           MGCTafen         100           BCTnum0         100	23 6 7 8	
PPR in         60         Stop frours)           PPR Qut         60         Netch 1 (hours)           LdmClarch4g         2002         Netch 1 (hours)           LdmClarch4g         139         Netch 3 (hours)           NGauge Offset (S)         0         Netch 3 (hours)           Crark Limt         3         Netch 5 (hours)           MGCTarin         100         Netch 7 (hours)           BCTnum0         100         Netch 8 (hours)	6 7 8	
PPR Out         60         Notch 1 (hours)           LdmGinAdj         202         Notch 2 (hours)           LdmGinAdj         139         Notch 2 (hours)           Nadue Offset (6)         0         Notch 4 (hours)           Cark Linit         3         Notch 4 (hours)           MGCTarum         100         Notch 7 (hours)           BCTnum0         100         Notch 7 (hours)	7	
Interview         Interview <thinterview< th="">         Interview         <thinterview< th="">         Interview         Interview</thinterview<></thinterview<>	8	
LdmGanAd         139         Notch 3 (hours)           NGauge Offset (G)         0         Notch 4 (hours)           Crark Linit         3         Notch 4 (hours)           MGC Truum         100         Notch 4 (hours)           MGCTafen         100         Notch 7 (hours)           BCTnum0         100         Notch 8 (hours)	_	
Noisuge Offset (S)         0         Notch 4 (hours)           Crark Linit         3         Notch 5 (hours)           MGCTrum         100         Notch 7 (hours)           BCTnum0         100         Notch 8 (hours)		
Corank Limit         3         Notch 5 (hours)           MGCTnum         100         Notch 5 (hours)         Notch 5 (hours)           MGCTden         100         Notch 7 (hours)         Notch 7 (hours)           BCTnum0         100         Notch 8 (hours)         Notch 8 (hours)	9	
MacTrum         100         Noteh 6 (hours)           MGCTden         100         Noteh 7 (hours)           BCTrum0         100         Noteh 8 (hours)	10	
MoCTden         100         Notch 7 hours)           BCTnun0         100         Notch 8 (hours)	11	
BCTnum0 100 Notch 8 (hours)	12	
	13	
PCTeren1 100 Ean 1 (hours)	14	
	15	
BCTnum2 100 Fan 2 (hours)	16	
BCTden0 100 Fan 3 (hours)	17	
BCTden1 100 Fan 4 (hours)	17	
BCTden2 100 Distance in Forward (km)	65.98	
BMCTnum 100 Distance in Reverse (km)	16.09	
BMCTden 100 Distance in Neutral (km)	16.09	
CTFnum 100 Total Energy (kWh)	21	
CTFden 100 v Energy (kWh)	22	

# 4.4.2 Flash and EEPROM Log Status

Click on the Get Data button will update the current status of the CPU Flash and EEPROM logs. This data is located above the Setup Parameters column. The top field shows the status of the system key:

- i. System Key OK. This indicates the EEPROM and CPU logs are synchronized and working properly.
- ii. System Key FAIL. This indicates that the system key in the CPU is different from EEPROM key stored. This can happen if one log becomes corrupt, the EEPROM fails or the CPU board is changed.
- iii. EEPROM BUSY. This indicates the EEPROM is currently being read. Upon successful read the System Key status will be updated.

The bottom field shows the status of the EEPROM.

- i. READING EEPROM DATA ATTEMPT #, where # is attempt 1, 2 or 3. This occurs when the NFORCE is first powered on. The EEPROM logs are being read and validated from the EEPROM.
- WRITING LOG1, READING LOG1, REPAIRING LOG1, WRITING LOG2, READING LOG2, REPAIRING LOG2. These indicate that data is currently being saved to the EEPROM logs and validated.
- iii. ACCUMULATING EEPROM STATS. This indicates that the EEPROM log has finished its read/write cycle and is idle until the next update period.

**<u>Note</u>**: While the EEPROM is busy reading or writing, all buttons in Step 2, Step 3 and Step 4 (Optional) will be greyed out until the EEPROM has finished reading.

NFORCE 820-0481-c11 Step 1: Step 2: Validate your Setup and St pick C and then manually enter val A: Get EEPROM	ats. If not valid, recover Stats with option A or B. Or Step 3: Step 4: (Optional) Les in the grid cells. B: Load File C. Clear Stats Set Data Save to File Export ?
System Key OK ACCUMULATING EEPROM STATS	PS Version: 6 Units: Metric PS FW Version: multi-mode 2 Idle Limit Disabled CPU Serial Number: 19-08-580-0074-1196
Setup Parameters	Engine Stats Notch/Life Stats: AESS
Loco ID 12345 Customer ID NREE	▶ Eng #1 Running (hours)         0         ∧         Idle Parked (hours)         0         ∧           Eng #1 Shutdown (hours)         0         ∧         Idle Working (hours)         0         ∧

Page 25

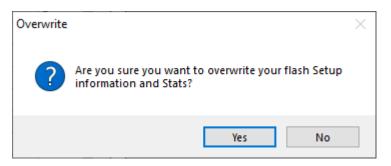
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#### 4.4.3 Get EEPROM

If the EEPROM status reads ACCUMULATING EEPROM STATS then the A: Get EEPROM button under the step 2 section will no longer be greyed out. Click this button to populate the Setup Parameter and Statistics tables with the values stored in the EEPROM log backup copy. The EEPROM log is a backup log and can be used to restore the statistics in the event of a CPU board failure or corruption.

#### 4.4.4 Set Data

If the Setup Parameters and Statistics in the table are correct, Click on the Set Data button and click YES. This will save all Parameter settings and Statistics to the CPU Flash log and Backup EEPROM log.



<u>Note</u>: All of the up-to-date Statistics will be erased and replaced with the current values from the table. Proceed with precaution.

#### 4.4.5 Clear Stats

#### 4.4.5.1 From Setup Tab (If equipped with Flash statistics)

If you want to clear the statistics, click on the C: Clear Stats button. You will see all of the accumulated statistics values get set to zero. Then click on the Set Data button to save (see section 4.4.4).

<u>Note</u>: Proceed with caution! NRE recommends you perform a stats log download before proceeding with any stats clearing commands.

# 4.4.5.2 From Terminal (If not equipped with Flash statistics)

- Clear Stats from Terminal Tab Interface
- 1. Many NFORCE systems running Terminal Interface have the ability to clear the statistics log via the FS0 screen. Check that your NFORCE system has this capability by navigating to the Terminal tab and typing 'FS0' without the single quotes. This would take you to a screen that looks like this:

#### Page 26

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Fer	minal	NForce	Setup	Diagnostic										
	wr	rmwa: data l data	a:	ey valio	dated		0	Firmwar La Long	e Instal st downl term st	lled load tart	tor (FS0) (yy/mm/dd): (yy/mm/dd): (yy/mm/dd): (yy/mm/dd):	18/10/24 18/10/24	4 4	
	Det Pow	ecteo erSuj E31 E31	d Pow oply PROM PROM	werSupp Firmwa System Update	ly RE re VE State Stage	V: 6 R: mult e: ACCU e: idle	i-mode MULAT	): 40 e x02 or ING STAT L776 sec	newer	er ID	9: GP40			
	Tri Lon	.p kWl Ig kWl	h - 5 h - 5	tivity : Fraction Fraction	n: n:	0 0								
				rip (A	-		(e) x:	it :>						

Make sure that you're able to see the E3PROM Activity Status is OK. If that's the case you'll also see the "(A) Clear ALL" option. Type 'A' (without the single quotes) to erase the stats.

- 2. The "Clear All" operation takes about 5 minutes as the NFORCE has to communicate to the power supply board and then onto the EEPROM that is in the harness. The FS0 screen provides feedback to the user that the interaction with the EEPROM is completed.
- 3. Once the stats are erased, the user will typically need to enter the following parameters again:
  - a. Wheel diameter
  - b. Locomotive ID number
  - c. Load meter calibration (if equipped) via the IO test sequence

Page 27

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#### 4.4.6 Export

This feature lets the User export Stats and Setup information to a .CSV file which can be saved for review or to be used again. Accept the default file or enter the new file name then save

	•				
Export Stats and S	etup				×
$\leftrightarrow$ $\rightarrow$ $\land$	« Lo	cal Disk (C:) > NAlysisV2 > StatsBackup	~	ē	℅ Search StatsBackup
Organize 🔻 Ne	w fold	er			!≡≡ ▼ (?)
This PC	^	Name	Date mod	ified	Type Size
3D Objects		Stats_20200127_013607	1/27/2020	1:38 PN	PM Microsoft Excel C
Desktop		Stats_20200123_010432	1/23/2020	1:04 PN	PM Microsoft Excel C
Documents		🕼 Stats_20200116_035813	1/16/2020	3:58 PN	PM Microsoft Excel C
👆 Downloads	- 10				
👌 Music					
Pictures					
📲 Videos					
素 Disconnected	N				
🏪 Local Disk (C:	) 🗸	<			2
File name:	Ctate	20200326_040409			~
Save as type:	CSV F	ile (*.csv)			~
∧ Hide Folders					Save Cancel

## 4.4.7 Load File

This feature allows a user to recover the statistics and setup configuration from a saved file. Select the "\*.bin" file and click on Open to complete the process. Then click on Set Data to write the parameters and statistics to the CPU and EEPROM.

INForce         Setue         Diagnetic           IFGRCE E2004779300         Impedial           Incord ID: 12245         Customer           Dispreter         Setue           System Key OK         Ide Linkt           Laco ID         12246           Customer         10245808718           Wheel Dameter (ID         NREE           Laco ID         12246           Customer (ID         NREE           Laco ID         12246           Customer (ID         NREE           Laco ID         1246           Customer (ID         NREE           Laco ID         40           PPR Ih         500           PPR Out         60           LamoSanAd)         450           NGauge Offset         0           Cark Limt         3	M Open             Organize             Organize             Pavorites             Pavorites             Pavorites             Public Documents	QUEST-GP38_901-0248 → Downloads →     Name     US8     Stats_20170515_025843.bin     Stats_20170515_025857.bin	Dete modified 5/11/2017 2:22 PM 5/15/2017 2:59 PM 5/15/2017 2:59 PM	<ul> <li>✓ ✓y Sec</li> <li>Type</li> <li>File folder</li> <li>BIN File</li> </ul>	arch Downloads		
FORCE         820.470.900           Importal         Importal           Loco ID         12345         Customer           System Key OK         Ide Linit         Ide Linit           Customer         1302-580-8718         Status           Loco ID         12345         Customer           Customer ID         1304         Status           PPR In         500         Linit/Grankdi,         1950           Linit/Grankdi,         1950         Linit/Grankdi,         450	M Open             Organize             Organize             Pavorites             Pavorites             Pavorites             Public Documents	QUEST-GP38_901-0248      Downloads      Name     US8     Stats_20170515_025843.bin	Date modified 5/11/2017 2:22 PM 5/15/2017 2:58 PM	<ul> <li>✓ ✓y Sec</li> <li>Type</li> <li>File folder</li> <li>BIN File</li> </ul>	arch Downloads BEE  The Development of the Developm		
Imperial     Inco ID: 12345     Customer     Serverson: 6 PS FW     System Key OK     Ide Linit     CPU Serial Number: 1322:550-3718     Loco ID     I2344     Loco ID     I2345     Viewel Dameter (n)     40     PPR In     500     LdmGan/d     1550     LdmGan/d     1550	Dominado Cryanize • New folder Frontes Description Construction Description D	QUEST-GP38_901-0248      Downloads      Name     US8     Stats_20170515_025843.bin	Date modified 5/11/2017 2:22 PM 5/15/2017 2:58 PM	<ul> <li>✓ ✓y Sec</li> <li>Type</li> <li>File folder</li> <li>BIN File</li> </ul>	arch Downloads BEE  The Development of the Developm		
Loco (D. 12345         Outomer           PS Version: 6         PS FW V           VSystem Key OK         Idle Limit           CPU Senal Number: 1302589/8718         Setur           Loco (D         1244           Customer (D         NREE           Wheel Dameter (n)         40           PPR Iot         50           Ldm/OReArd,         1950           Ldm/Gran/dg         450           NGauge Offset         0	D Organize • New folder	Name USB Stats_20170515_025843.bin	5/11/2017 2:22 PM 5/15/2017 2:58 PM	Type File folder BIN File	Size 2 KB		
PS Version: 6 PS FW W System Key OK ldle Linit CPU Senial Number: 1302-580-3718 Customer ID 1924 Customer ID 1924 Wheel Dameter (m) 40 PPR Io. 50 Ldm/Grienk-dg 1950 Ldm/Grienk-dg 450	Cryanica: Interviolute     Favorites     Concert Paces     OneDrive     Public Documents     Doumloads     Pictures     Destop     Libraries	USB Stats_20170515_025843.bin	5/11/2017 2:22 PM 5/15/2017 2:58 PM	File folder BIN File	Size 2 KB	0	
System Key OK         Ide Limit.           CPU Serial Number:         1302-580-8718           Lacos ID         1204           Customer ID         1704           Wheel Dameter (n)         40           PPR N         50           LdmOrlandarkaj         1950           LdmGrankaj         450           Visaga Offset         0	Favorites     Favorites     Creent Places     OneOrive     OneOrive     Downloads	USB Stats_20170515_025843.bin	5/11/2017 2:22 PM 5/15/2017 2:58 PM	File folder BIN File	Size 2 KB		
System Key OK         Ide Limit.           CPU Serial Number:         1302-580-8718           Lacos ID         1204           Customer ID         1704           Wheel Dameter (n)         40           PPR N         50           LdmOrlandarkaj         1950           LdmGrankaj         450           Visaga Offset         0	En X Favorites Recent Places OneOffice Public Documents Downloads En Downloads Downloads En Dektop Libraries	USB Stats_20170515_025843.bin	5/11/2017 2:22 PM 5/15/2017 2:58 PM	File folder BIN File	2 KB		
PU Setal Number         1302-580-9718           Loco ID         1254           Customr ID         NREE           Wheel Dameter (n)         40           PPR In         500           Opt Rot         60           LdmGBndg         450           NGauge Offset         0	Image: Second Places       OneDrive       Image: Public Documents       Image: Places       I	Stats_20170515_025843.bin	5/15/2017 2:58 PM	BIN File			
Setup           Loco ID         12343           Customer ID         NREE           Wheed Diameter (n)         40           PPR In         500           PPR Out         60           LdmGanAdj         1950           LdmGanAdj         450           NGauge Offset         0	OneDrive Understand						
Loco ID         12342           Customer ID         NREE           Wheel Diameter (n)         40           PPR In         500           PPR Out         60           LdmOffsetAdj         1950           LdmGainAdj         450           NGauge Offset         0	Downloads Pictures Desktop Dibraries	Stats_20170515_025857.bin	5/15/2017 2:59 PM	BIN File	2 KB		
Loco ID         12342           Customer ID         NREE           Wheel Diameter (n)         40           PPR In         500           PPR Out         60           LdmOffsetAdj         1950           LdmGainAdj         450           NGauge Offset         0	<ul> <li>Downloads</li> <li>Pictures</li> <li>Desktop</li> <li>Libraries</li> </ul>	H					
Customer ID         NREE           Wheel Diameter (n)         40           PPR In         500           PPR Out         60           LdmOffsetAdj         1950           LdmGainAdj         450           NGauge Offset         0	E Desktop	E					
Wheel Diameter (n)         40           PPR In         500           PPR Out         60           LdmOffsetAdj         1950           LdmGainAdj         450           NGauge Offset         0	Ca Libraries	E					
PPR In 500 PPR Out 60 LdmOffsetAdj 1950 LdmGainAdj 450 NGauge Offset 0							
LdmOffsetAdj 1950 LdmGainAdj 450 NGauge Offset 0							
LdmOffsetAdj 1950 LdmGainAdj 450 NGauge Offset 0							
LdmGainAdj 450 NGauge Offset 0	Documents						
NGauge Offset 0	- Music						
	Pictures     Videos						
	Videos						
MGCTnum 100	r Computer						
MGCTden 100	Disconnected Network Drive (	(B <sup>2</sup>					
BCTnum0 100	Local Disk (C:)	(m.					
BCTnum1 100	JLe (\calent01\users) (H:)	-					
BCTnum2 100	File name:			▼ Bina	rry File (*.bin)	-	
BCTden0 100	File fidfile.						
BCTden1 100					Open 🔻 Cancel		
BCTden2 100							
BMCTnum 100							
BMCTden 100						Open File	

# Page 28

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# 4.4.8 Save to File

This feature allows the user to save the current NFORCE Setup and Statistics file to Laptop/Computer for review or future use. Click on Save to File button and select the default or enter the new "\*.bin" file name then click on the Save button to complete the process.

Loco ID: 12345 Cutomer ID: NHEE I Me Paked fours) 120 Fig #I Running frouns) 120 Med Link SD (hours) 0 Get Smar PS Version: S PS FW Ver System Key VX Med Link Er CPU Set Number 1322:590718 Cutomer ID: NHEE Loco ID: 12345 Cutomer ID: NHEE Loco ID: 12345 Cutomer ID: NHEE Sature Sature Sature Sature Sature Sature Name Date modified Type Sate: 20170315;025837.bin Sr11;2017;22: PM File folder Sate: 20170315;025837.bin Sr12;2017;25: 9M BIN File 2 KB File folder Sate: 20170315;025837.bin Sr12;2017;25: 9M BIN File 2 KB File folder Sate: 20170315;02587.bin Sr12;2017;25: 9M BIN File 2 KB File folder File name Sate: 20170315;02587.bin Sr12;2017;25: 9M BIN File 2 KB File folder File name Sate: 20170315;02587.bin Sr12;2017;25: 9M BIN File Cate File name Sate: 20170515;02587.bin Sr25;2017;25: 9M BIN File Cate File name Sate: 20170515;02587.bin File na	le Download Log	Set Captu	ire Options Window Help				-
System Koy OK       lds Lunts         CPU Serial Number 1002-580-9718         South Mumber 1002-580-9718         South Number 1002-580-9718         Coos ID       12456         South NINEE       New Yolder         PR Dua 560       0 meDrive         PR Dua 560       0 medrified         Deciments       Statz 2017035 02587 bin       5/15/2017 2:59 PM         Bit Pairie       0 bit medrified       Name         Deciments       Name       190         BCTrun-1       100       Pictures       190         BCTrun-1       00       0       190				126 Eng #1 Running (hours)	36 Idle Limit SD (hours)		
P2 Send Number: 1302-580 471 <ul> <li>             • Tetting Firmware • QUEST-GP38_901-0248 • Downloads •             • • • • • • • • • • • •</li></ul>			NRE Binary File		Summer Hold		
Organize         Organize         New folder         Image: New folder           Loco ID         1248         Image: New folder         Name: Date modified         Type: Size           Meed Daamber (n)         AIE         Image: New folder         Image: New folder         Image: New folder           PPR In         500         Image: New folder         Image: New folder         Image: New folder         Image: New folder           Image: New folder         Image: New folder         Image: New folder         Image: New folder         Image: New folder           PPR In         500         Image: New folder         Image: New folder         Image: New folder         Image: New folder           Image: New folder         Image: New folder         Image: New folder         Image: New folder         Image: New folder           Image: New folder         Image: New folder         Image: New folder         Image: New folder         Image: New folder           Image: New folder         Image: New folder         Image: New folder         Image: New folder         Image: New folder           Image: New folder         Image: New folder         Image: New folder         Image: New folder         Image: New folder           Image: New folder         Image: New folder         Image: New folder         Image: New folder         Image: New folder			OOO + Testing Firmware + QUES	T-GP38_901-0248  ► Downloads  ►	✓ 4 Search Dow	mloads 🔎	
State         State         Name         Date modified         Type         Size           Cuctomer ID         NREE         Incompton         Size	PU Serial Number: 130	2-580-8718	Oversity and Newfolder		1 50		
Loco ID         1205         Yane         Date modified         Type         Size           Cautome ID         NREE         Incomposition         Size         Si		Setup	Organize  New folder	_		~	
Cuber of method         0 methode           Weed Dameter Mit of Documents         9 Multic Documents           PRR 0A         00           Marcine Mail         1950           Lumostanka         450           Nicauge Officed         0           Orack Linet 3         0           Marcine Mail         0           Moritaria         0           Concents         0           Marcine Mail         0           Marcine Mail         0           Marcine Mail         0           Marcine Mail         0           BCTham1         100           BCTam1         100           BCTam1         100           BCTam1         100           BCTam1         100           BCTam1         100           BCTam1         100           BCTam2         100           BCTam1         100           BCTam2         100           BCTam3         100           BCTam4         100           BCTam3         100           BCTam4         100           BCTam5         Save as type: Binacy File (* bin)           Bucctan         100 </td <td>Loco ID</td> <td></td> <td>🔆 Favorites</td> <td>▲ Name</td> <td>Date modified Type</td> <td>Size</td> <td></td>	Loco ID		🔆 Favorites	▲ Name	Date modified Type	Size	
Trade Color         0         0           PRR In         500           PPR In         500           PPR In         500           PPR In         500           PPR In         500           PR In         500           PPR In         500           PPR In         500           PPR In         500           PPR In         500           Provinods         500           Policit Documents         100           BCTown         100           BCTann1         100           BCTann1         100           BCTann1         100           BCTann1         100           BCTann2         100           BCTann1         100           BCTann2         100           BCTann3         100	Customer ID	NREE	Recent Places	🔒 USB	5/11/2017 2:22 PM File folder		
PPR h       60       Public Documents       Stds 20170515 025877.bin       5/d5/2017.259 PM       BIN File       2 K8         PPR 0.4       60       Downloads       Bin File       2 K8         LamGankd       60       Downloads       Bin File       2 K8         Cark Lint       3       Downloads       Bin File       2 K8         B Crann       100       Bin File       2 K8         B Crann1       100       Pictures       Bin File       2 K8         B Crann1       100       File rame: State 20170515 02123       File rame: State 20170515 02123         B Crann2       100       File rame: State 20170515 02123       File rame: State 20170515 02123         Save as type       Binary File (*.bin)       Save as type       Binary File (*.bin)         Hide Folders       Save as type       Save as type       Cancel		40	OneDrive	Stats_20170515_025843.bin	5/15/2017 2:58 PM BIN File	2 KB	
Prictures         Bud           LimGrands         450           Nosuge Offset         0           Cinclination         100           MGCTurun         100           RCTrund         100           BCTom/1         100           BCTom/2         100           BCTom/2         100           BCTand         100           Chrum2         Save as type           Binary File (* bin)         Save as type           Binary File (* bin)         Save as type           Binary File (* bin)		500		Stats_20170515_025857.bin	5/15/2017 2:59 PM BIN File	2 KB	
Laminariana 1950 Mange Offent 0 Cank Link 3 MCCTruen 100 BCTruen 100 BCTruen 100 BCTruen 100 BCTann1 100 BCTann2 100 BCTann2 100 BCTann1	PPR Out	60	· · · ·				
Lamband         430           Lamband         430           Nage (Fise 4)         0           Cank Lint         3           MGCTum         100           BCTum1         100           BCTum1         100           BCTum2         100           BCTum2         100           BCTum1         100           BCTden1         100           BCTden2         100           BCTden3         100           BCTden4         100           BCTden5         100           BCTden6         100           BCTden7         100           BMCTnum         100           BMCTen         100           CTFum         100           CTFum         100           CTFum         100           CTFum         100           CTFum         100           CTFum         100	LdmOffsetAdi	1950		=			
Cark Link         3           MGCTun         100           MGCTion         100           BCTun         100           BCTon         100           CTrou         100           CTrou         100           CTrou         100	LdmGainAdj	450	🧮 Desktop				
Cank Limit         3           MGCTuan         100           MGCTuan         100           BCTuan0         100           BCTuan1         100           BCTom2         100           BCTom3         100           BCTom4         100           BCTom4         100           BCTom5         00           BCTom6         100           BCTom7         100           BCTom6         100           BCTom6         100           BMCTom         100           BMCTom6         100           CTFJum         100	NGauge Offset	0	_				
MGCTam         100           MGCTam         100           BCTnam0         100           BCTnam1         100           BCTam2         100           BCTam4         100           BMCTam         100           CTFum         100           CTFden         100	Crank Limit	3					
MGCTam0 100 BCTnum1 100 BCTnum2 100 BCTden0 100 BCTden0 100 BCTden0 100 BCTden1 100 BCTden2 100 BCTden1 100 BMCTden 100 BMCTden 100 BMCTden 100 CTFrum 100 BMCTden 100 CTFrum 100	MGCTnum	100					
BCTnum0         100           BCTnum1         100           BCTnum1         100           BCTden0         100           BCTden1         100           BCTden2         100           BMCTorum         100           Hide Folders         Cancel	MGCTden	100					
BCTman1         100           BCTam2         100           BMCTam2         Save as type           Binary File (*bin)         100           CTrden         100	BCTnum0	100					
BCTden0         100         File name:         State_20170515_032153           BCTden1         100         File name:         State_20170515_032153           BMCTauri         100         Save as type:         Binary File (*.bin)           BMCTauri         100         Save as type:         Binary File (*.bin)           BMCTauri         100         Save as type:         Save as type:           CTFruin         100         File folders         Cancel	BCTnum1	100	I VIGEOS				
BCTden0         100           BCTden1         100           BCTden2         100           BMCTonn         100           BMCTonn         100           BMCTen4         100           BMCTen4         100           BMCTen4         100           BMCTen4         100           BMCTen4         100           File name:         Save as type           Binary File (*bin)         •           Hide Folders         Save           CTFden         100	BCTnum2	100	Computer				
BCTan1         100         File name: Stats_20170515_052133           BCTden2         100         save as type         Binary File (*.bin)           BWCTand         100             BWCTand         100             CTFrum         100          Save as type         Cancel           CTroden         100	BCTden0	100		*			
BCTen/2         100         Save as type:         Binary File (*,bin)           BMCTum         100	BCTden1	100					
BWCTnum         100           EMCTden         100           CTFrum         100           CTFden         100	BCTden2	100					
CTFrum         100         Hide Folders         Cancel           CTFden         100	BMCTnum	100	Save as type: Binary File (*.bin)				
CTFden 100 CTFden 100	BMCTden	100					
	CTFnum	100	<ul> <li>Hide Folders</li> </ul>		Save	Cancel	
	CTFden	100					
Vrs setpoint	VR setpoint	10	-	Ŧ	Ŧ	-	

Page 29

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# 4.5 Diagnostic Tab

This Diagnostic screen is similar to the FS5's memory screen from Hyper Terminal. This screen contains features that can be used for analyzing or trouble shooting the memory tables. See Section 8.2 Diagnostic Tab for more details.

# 4.6 RTD (Real Time Diagnostic) Log

- RTD log download can be useful to observe the most recent performance of the locomotive. The log has all of the data download at 0.1 second intervals from the time that the download is started until the time that the download is stopped. This download can capture complete tests without the restrictions of the Diagnostic download.
- > Click on the Nforce tab, then click on Main in the Screen Select section as shown below.

creen Select	Setup Diagnostic			Userlas		Record	Serial Monitor		
		ation () Engine ()	de Line (CIDDV)	CAN			Senal Monitor Valid Msg: 675 qln	saved 0;	
isplay				CAN	Btn3 Btn5 Btn7	Stop	Missed Msq: 0 qOut	Time Err: 46	
<ul> <li>Analog</li> </ul>	🔘 Digitalln 🛛 🗍	ligitalOut		+	Btn4 Btn6 Btn8		CRC ERR: 1 Unknown:		
FORCE 820-0	470-a00	MAIN							
May 15, 201	7 01:02:54	ACT1: 0	BCT2: 0	AIR: 71	BPPT: 64	IHP: 0	D14V: 4		
cold	12345	ACT2: 0	BLC1: 48	MGV: 43	TMV13: 0	FW_V: 470	VIGS: 4		
		ACT3: 0	GFCT: 0	MR: 142	TMV24: 0	FW_R: 0	VIGT: 50		
heel Dia (in)	40.0	ACT4: 0	MGA: 0	BATI: 10	LR: 74	SPD: 0	TE: 0		
istomer ID	NREE	BCT1: 0	H20: 134	BC: 20	THP: 0	dTMI: 0	24T: 73		
p kWh	NA								
eed (mph)	0	dMGV: 0	GATE: 0	NLST: STANI	DBY				
	RUNNING	BATV: 75	RPM: 0	GTHR: IDLE					
igine State		TMI: 0	ACC: 0	TIMR: 486					
rottle	IDLE	RC: 0	THR: IDLE	EXCL: 0x00					
citation Limit	none	PID: 0	EXC: none	EXCU: 0x00					
e Limit State	STANDBY								
REE LAB TES	TACTIVE	1							
GILANCE BRA	KE ERROR								

Click on the Stop button under the Record section on the screen shown below (zoomed from above screen view)



> Then click on the record button shown as the in the zoomed in picture above.

Page 30

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➤ The following screen will appear:

	00	P38_901-0248 > Downloads >	✓ 4 Searce	h Downloads 🔎	
	Organize 🔻 New folder			₩ - 0	
NFORCE           May 16, 2017 09:33:20           Locold         12345           Wheel Dia (n)         40.0           Customer ID         NREE           TrpkWh         NA           Speed (mph)         0           Engine State         RUNNING           Threttle         IDLE           Excitation Limit         none           Idle Limit State         STANDBY		Name USB Stats_20170515_025843.bin Stats_20170515_025857.bin	Date modified         Type           5/11/2017         2:22 PM         File folde           5/15/2017         2:59 PM         BIN File           5/15/2017         2:59 PM         BIN File	Size r 2 KB 2 KB	

- A default file name is created (LogType\_yyddmmhhmmss.bin, in this case it is RTD\_150707122503.bin), which the user may change to any other name. Once the user is satisfied with the filename and directory, clicking save will start the log download.
- The screen will return to the main data screen, although you may notice that the updates and serial monitor numbers are updating more quickly.

Display Analog	© Digitalln ⊚ E	ation Engine k	le Limit 💿 IDRV 🧃	CAN User Input	Btn3 Btn5 Btn7 Btn4 Btn6 Btn8	Stop	Serial Monitor Valid Msg: 382 qln: 259 Missed Msg: 0 qOut: 210 CRIC: 0 Unknown:	Saved: 372 Time Err: 0	
May 16, 201		MAIN			60	0			
		ACT1: 0 ACT2: 0	BCT2: 0 BLC1: 47	AIR: 71 MGV: 43	BPPT: 63 TMV13: 0	IHP: 0 FW V: 470	D14V: 4 VIGS: 2		
ocold	12345	ACT2: 0 ACT3: 0	GFCT: 0	MGV: 43 MR: 142	TMV24: 0	FW_V: 470 FW R: 0	VIGT: 673		
Vheel Dia (in)	40.0	ACT4: 0	MGA: 0	BATI: 10	LR: 74	SPD: 0	TE: 0		
Customer ID	NREE	BCT1: 0	H20: 134	BC: 20	THP: 0	dTMI: 0	24T: 73		
rip kWh	NA								
Speed (mph)	0	dMGV: 0	GATE: 0	NLST: STAND	3Y				
		BATV: 75	RPM: 0	GTHR: IDLE					
ingine State	RUNNING	TMI: 0	ACC: 0	TIMR: 900					
hrottle	IDLE	RC: 0	THR: IDLE	EXCL: 0x00					
excitation Limit	none	PID: 0	EXC: none	EXCU: 0x00					
die Limit State	STANDBY								
IREE LAB TES IGILANCE BRA									

Page 31

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Perform the locomotive testing that you want to capture. When you are finished with the testing, click on the Stop button under the record section to stop the download. The recording stopped message will be displayed as shown below.

File Downlo	ad Log Set Cap	ture Options	Window Help				- 6
Screen Select	Setup Diagnostic	citation (*) Engine	⊚ ldle Limit ⊚ II	RV © CAN	User hput Bin3 Bin5 Bin7 Sect Valid Mag: 1206 qh: 162	Saved: 1194	
					Bin6         Bin8         Missed Mag: 0         qCut: 132	Time Err: 0	
NFORCE 820-0	1470-a00	MAIN					
May 16, 201	17 09:41:16						
Locold	12345						
Wheel Dia (in)	40.0						
Customer ID	NREE				Recording		
Trip kWh	NA						
Speed (mph)	0				Real time recording has been stopped		
Engine State	RUNNING				real time recording has been scopped		
Throttle	IDLE						
Excitation Limit	none				ОК		
Idle Limit State	STANDBY						
		_					

The file will be saved as a .bin file instead of a .txt file. To convert the file to be imported into Excel, click on the File pull down menu and select Convert, and then select Diagnostic.

File Downlos Disconnec		Capture	Options	Winde	ow He	р							-
	 Update ▶	ostic											
Convert Admin Exit	•		gnostic It/EPL	0	ldle Limit	IDRV	© CA	N User	Btn3	Btn5 Btn7 Btn6 Btn8	Serial Monitor Valid Msg: 1206 Missed Msg: 0 CRC: 0	Saved: 1194 Time Err: 0	
NFORCE 820-0	470-a00		MAIN										
May 16, 201	7 09:41:16												
Locold	12345												
Wheel Dia (in)	40.0												
Customer ID	NREE												
Trip kWh	NA												
Speed (mph)	0												
Engine State	RUNNING												
Throttle	IDLE												
Excitation Limit	none												
Idle Limit State	STANDBY												
		_											



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> Click on the RTD download file that was just saved, and click on Open.

s - (Nalysis V820-0007-i51 File Download Log S	May 12, 2017] et Capture Options Window Help						
minal NForce Setup Di Screen Select Main © Generat	Real Time Log File	▶ QUEST-GP38_901-0248 ➤ Downloads ➤	- Anna - A	<b>- - 4</b> <sub>2</sub> €	Search Downloads	×	
	Organize 🔻 New folder				§= • 🔟	0	
NFORCE 820-0470-a00 May 16, 2017 09:41:1 .ocold 12345	Deblic Documents	Name USB RTD_170516093803.bin Stats_20170515_025843.bin	Date modified 5/11/2017 2:22 PM 5/16/2017 9:41 AM 5/15/2017 2:58 PM	Type File folder BIN File BIN File	Size 575 KB 2 KB	Ē	
Wheel Dia (m)         40.0           Dustomer ID         NREE           Trip kWh         NA           Speed (mph )         0           Engine State         RUNNINC           Throttle         IDLE           Excitation Limit         none           dle Limit State         STANDB <sup>o</sup>	Music     Pictures     Videos	Starts_20170515_023837.bin	5/15/2017 2:59 PM	BIN File	2 KB		
	Image: Computer           Image: Computer	B: D_170516093803.bin		- B	inary File (*.bin) Open 💌 Cancel	•	

> The following message will be displayed when the conversion is finished.

	20-0007-i51 May 12, 20							_ <b>_ _ _ _</b>
File Downlo	ad Log Set Captu	ire Options Wind	ow Help					_ 5
Terminal NForce	Setup Diagnostic							
Screen Select	) Generator () Excit	ation 🔘 Engine 🛛 🔘	ldle Limit 💿 IDRV	© CAN	Btn3 Btn5 Btn7 S	Missed Msg: 0	qln:162 Saved: qOut:132 Time Er Unknown:	
NFORCE 820-0	470-a00	MAIN						
May 16, 201	7 09:41:16							
Locold	12345							
Wheel Dia (in)	40.0							
Customer ID	NREE				File tot to CSV			
Trip kWh	NA				File txt to CSV			
Speed (mph)	0				File conversion complete			
Engine State	RUNNING				The contestion complete			
Throttle	IDLE							
Excitation Limit	none				ок			
Idle Limit State	STANDBY							
		í l						



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To view the RTD's text file, open the RTD.txt file by using the Download Analyzer program (820-0442-x##.xls, where ## = latest revision). The example data file will be displayed like below.

A         B         C         D         E         F         G         H         J         K         L         N         N         P         Q         R         S         T         U         V	A7	▼ : X v	f <sub>x</sub> (	DATE																																	
2		А	В	с	D	Е	F	G	н	I	J	к	L	м	N	P	Q	R	s	т	U	v	w	х	Y	z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK
A         A         A         B	1																																				
A         A         A         A         B         C         C         B         B         B         B         B         C         C         B         B         B         B         B         B         B         B         B         B         B         B         B         C         B         B         B         B         B         B         B         B         B         C         B	2																																				
A         A	3																																				
DATE         TIME         TYME         TYME <th< td=""><td>L .</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th<>	L .																																				
DATE         TIME         TVPE         10         12         <	5																																				
8         5/16/2017         09:39:14.3         data         0         0         1         0         0         7         3         0         0         0         0         0         7         0         7         0         7         0         7         0         7         0         7         0         7         0         1         10         75         20         0         0         0         5         0          0         5/16/2017         09:39:14.4         data         0         0         7         0         1         10         75         20         0         0         0         5         0           1         5/16/2017         09:39:14.6         data         0         0         1         0         0         7         0         1         10         75         20         0         0         4         0         0         1         0 <td>_</td> <td></td>	_																																				
5/16/2017         99:39:14.4         data         0         0         1         0         0         7         0         0         7         0         1         0         7         0         1         0         7         0         1         0         0         0         7         0         1         0         7         0         1         0         7         0         1         0         7         0         1         0	7		-	-	10t	12t	15t	16t	17t	20t	21t			6t 🗄	7t 8	t 9t	ACC	ACT1	ACT2	ACT3	ACT4	actp		ALS	aux			BC	BCT1	BCT2	BLC1	BPPT	BUZZ	BWR	D14V	dMGV	dTN
5/16/2017         09:39:14.5         data         0         0         1         0         0         1         0         0         1         0         0         1         0         0         0         1         0         0         1         0							0	1	0		0		0	0	0 (	0 0	0	0							1				0								0
1       5/16/2017       09:39:14.6       data       0       0       1       0       0       0       1       0       0       0       1       0	1					0	0	1	0	0	0	73	0	0	0 (	0 0	0	0	-		0	0		0	1				0	0					5	0	0
2       5/16/2017       09:39:14.7       data       0       0       1       0       0       0       1       0	0				-		0	1	0		0		0	0	0 (	0 0	0	0	-			-			1											-	0
3         5/16/2017         09:39:14.8         data         0         0         1         0         0         7         0         0         0         1         0         0         0         1         0	_						0	1			0		0	0	0 (	0 0	0																				0
4       5/16/2017       09:39:14.9       data       0       0       0       0       7       0	_				-			-						0	0 (	0 0																					0
5         5/16/2017         09:39:15.0         data         0         0         0         0         7         0					-	-	0	1					-	0	0 (	0 0	0																				0
6         5/16/2017         09:39:15.1         data         0         0         1         0         0         1         0         0         1         0	-														-																						0
7         5/16/2017         09:39:15.2         data         0         0         1         0         0         7         3         0         0         0         0         7         3         0						-	-	-	-		-		-	-	-		-		-			-							-					-		-	0
8         5/16/2017         09:39:15.3         data         0         0         0         1         0	-				-										-			-																			0
5/16/2017         09:39:15.4         data         0	_							-	-				-	-	-	0 0	-		-			-							-	-				-		-	0
b         f         f         0	-				-			-						-	-	0 0		-																			0
1       5/16/2017       09:39:15.7       data       0       0       1       0       0       7       0						-	-				-		-	×	· ·	0 0	-																				0
2 5/16/2017 09:39:15.7 dat 0 0 0 1 1 0 0 0 1 0 0 1 0 0 0 0 1 0					-	-	-	-					-	0	0 (	0 0		-																			0
5/16/2017       09:39:15.8       data       0       0       1       0       0       1       0       0       0       1       0       0       0       1       0       0       0       1       0       0       0       1       0       0       0       1       0       0       0       1       0       0       1       0	-					-	-	-	-		-		-	0	0 (	0 0	-		-																		0
5/16/2017 09:39:15.9 data 0 0 0 1 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0						-	-	-	-		-		-	0	0 (	0 0	-	-	-					-	-				-	-			-	-	-		0
	-				-	-	-	-	-		-			-	· ·	0 0	-		-		-	-		-	-					-						-	0
5/15/201/ U9:39:16.0 data U 0 0 1 0 0 0 73 0 0 0 0 0 0 0 0 0 0 0 0 1 0 1 0 47 64 0 0 4 0	-													-			-																-	-			0
5 5/16/2017 09:39:16.1 data 0 0 0 1 0 0 0 73 0 0 0 0 0 0 0 0 0 0 0 73 0 1 10 75 20 0 0 47 63 0 0 4 0																									_												0

Page 34

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# 5.0 NCORDER Interface

Access the NCorder application using the application bar:



# 5.1 Menu

5.1.1 File

Download Log Se		e options	Flot Option	s inspectio		Finit	window	neip				
Disconnect Firmware Update												
Open (*.pro)												
Process (*.bli)												
Admin	(920-0005) 1 AM	) FRA Vigilance		0t#920-K0012 n Status 🔳			State Pipe	RDU Rea Brake	1 Time Plot Cylinder		Fault List No Faults	
Exit	5	Custom		_		32.0					NO FBUILS	
Wheel Dia (mm) 1	016		e (km) 0.00			31.5						
PPR 6		Throttle				31.0 20.5						
Pressure Switches						30.0						
Nullify (Trail)		Hom				29.5						
Actuator Pipe		EIE				29.0	-					
LEAD		Vigilance Tir	meaut in (	) seconds		E	9:16	9:17	9:18	9:19		
						Apr 3 Tu					Dire 10.1	
Digital In AV MU15	PCS	MSN	D	SPRD			nput Signals – ressure (psi)	NA	Sig2		Digital Out VIG ALERTER	
BV MU12	E HORN	LSNE		SPRD	-			INA	FR Comm		VIG ALER TER	
CV MU7	DB MU17	GND		SPRD		RFC					MVAL OUT	
DV MU3	DB MU21	SPRE		SPRD			er Batt Status		Dead BV		SPARE 1	
GF MU6	VIG RESE			SPRD		Low B	Batt Volts		Valve Op		SPARE 2	
IS	MVAL IN	SPRE		SPRD		HVM			Armed		SPARE 3	
FWD MU8	MU10	SPRE	) 🔳	SPRD		End I	n Motion		Move Direction	in 📃	SPARE 4	
REV MU9	ESND	SPRE		SPRD		Emerg	CS					
Analog Inputs						RDU/	NVIsion 3 Log	Information	1		Control	
Speed (KPH)	0.0	DBV (volts)	63.0	AB POS	0	G	et Log Info		Status: Normal		Stop	irase Log
Brake Cylinder (psig)	28.9	TMC(A)	855.6	H20 TMP	80		art Address:	7010	Current Address:	7691	Real Time Activity Time Left:	59.3 min
Brake Pipe (psig)	32.2	TE (klb)	42.0	Spare4		56	an muufess:	/013	Current Address:	/031		
Spare		Brd Temp	40.6	Fault Arr1	0x0	W	rap Address:	15104	End Address:	15104		
											Missed Msg: 0	
Battery Volts	62.9	IB POS	6	Fault Arr2	Ox0						Misseu Msg. u	

#### - Connect/Disconnect

Allow User to Connect or Disconnect communication between NCorder system and Nalysis.

Firmware Update

Page 35

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Steps to install an update revision of the event recorder's operating firmware:

- 1. Connect the Serial Communications Cable (NRE Part No. 058-0001-000) to the Serial port on the Laptop/Computer. Connect the other end to diagnostic port (Lemo connector) on the Remote Download Box (RDU).
- 2. Select File->Firmware Update->CPU.

Nalys	is - (M	Nalysis V820-0007-	57 A	pril 2, 201	.8]		_		
~	File	Download Log	Set	Captur	e Options	Plot O	ptions	Inspect Data	View
		Disconnect		1					
		Firmware Update	•	CP	U				
		Open (*.pro)	►	ST					
		Process (*.bli)	•	(920,0005	) FRA Vigilan	e Timina	K##	920-K0012	
		Admin		18 AM		se mining	Comm St	_	
		Exit	16.0	15	Cust	omer ID	NREE		
		Wheel Dia (mm)	101			ance (km)			
				•					
		PPR	60		Thre	ttle	IDLE		
		Pressure Switches	-						
		Nullify (Trail)			Hom				

- From the NRE CPU Binary File window box, locate the up-to-date file on the Laptop/Computer hard drive or network. Select the following file options:
  - NCorder model number 920-0001-000 use 820-0249-xXX.ecm, where XX = Latest Revision
  - NCorder model numbers 920-0005-000 and 920-0006-000 use 820-0303-xXX.ecm, where XX = Latest Revision

Page 36

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🔵 🛡 📗 🕨 Computer 🕨 Win	dows (C:) 🕨 ECM	▼ 4;	Search ECM	٩
ganize 🔻 New folder			: :==	• 🛯 🔞
Favorites	Name	Date modified	Туре	Size
Desktop	820-0303-x27.ecm	3/29/2018 4:09 PM	ECM File	240 KB
<ul> <li>OneDrive</li> <li>Recent Places</li> <li>Libraries</li> <li>Documents</li> <li>Music</li> <li>Pictures</li> <li>Videos</li> <li>Computer</li> <li>Disconnected Network Drive</li> <li>Windows (C:)</li> </ul>				
File name: 820	-0303-x27.ecm	Ŧ	Binary Image (*.ecr Open 🛛	n)  Cancel

the Firmware Update.

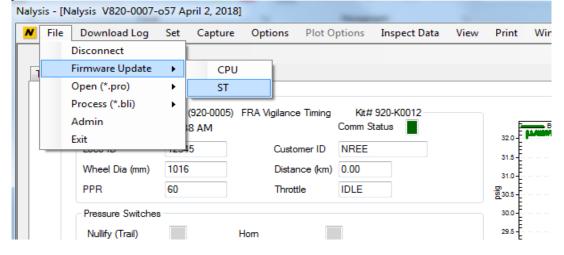
CAUTION: DO NOT INTERRUPT COMMUNICATIONS OR TURN OFF THE NCORDER OR RDU DURING THE UPDATE PROCESS; it could cause a fatal fault inside the event recorder.

Nalysis	- [Na	Ilysis V820-0007-	o57 Apr	il 2, 2018]	-										÷.,
<b>N</b>	File	Download Log	Set	Capture	Options PI	ot Options	Inspect Data	View	Print	Window	Help				
Ter	minal	NCorder Diagno:	stic		Remaining: 22 se		nware Update: C	:\ECM\82	10-0303-x2	7.ecm			ſ		
	R	DU 820-0246-a14		- 6	s Uploaded: 2764	8 bytes							L	Cancel	
		-NCorder 820-0303 Apr 03, 2018 0				Comm S	tatus		32.0	Brake Pipe	Brake Cylin	der	, and the second second	No Faults	
		Loco ID	12345		Customer	ID NREE			31.5						
		Wheel Dia (mm)	1016		Distance	(km) 0.00			31.0-						
		PPR	60		Throttle	IDLE			8 30.5						

- To install an update revision of the remote download units' (RDU) operating firmware:
  - Page 37

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- 1. Connect the Serial Communications Cable (NRE Part No. 058-0001-000) to the proper serial port on the portable computer. Connect the other end to diagnostic port on the Remote Download Box.
- 2. Select File->Firmware Update->ST



3. Locate the updated RDU Firmware file (820-0246-xXX.st4, where XX = Latest Revision) on the Laptop/Computer or network.

NRE CPU Binary File	the Special Purchases	ingent films	For Hody	- 100		X
Computer > Winde	ows (C:) 🕨 ST4		<b>- - i i j</b>	Search ST4		م
Organize 🔻 New folder				::=: ·		?
Desktop	Name	Date modified	Туре	Size		
Downloads	820-0246-x14.st4	3/29/2018 4:09 PM	ST4 File	61 KB		
🗐 Recent Places						
<ul> <li>□ Libraries</li> <li>□ Documents</li> <li>□ Music</li> <li>□ Pictures</li> <li>□ Videos</li> <li>!■ Computer</li> <li>□ Disconnected Network Drive</li> </ul>						
🕌 Windows (C:) 👻						
File name: 820-(	)246-x14.st4		•	Binary Image (*.st4) Open	Cancel	• •

4. Select Open. The progress status of the file upload appears in the Uploading New Software dialog box.

# CAUTION: DO NOT INTERRUPT COMMUNICATIONS DURING THIS PROCESS; it could cause a fatal fault inside the RDU.

Page 38

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Nalysis - [Nalysis V820-0007-0	57 April 2, 2018]		-						
N File Download Log	Set Capture	Options Plot O	ptions Inspect	Data View	Print	Window	Help		
Terminal NCorder Diagnos	tic	Remaining: 4 seconds Uploaded: 19464 Byt		ate: C:\ST4\820	)-0246-x14	4.st4			Cancel
RDU 820-0246-a14									
- NCorder 820-0303	-a27 (920-0								
Apr 03, 2018 09	):19:38 AM		Comm Status			Brake Pipe	Brake Cylind	er	No Faults
Loco ID	12345	Customer ID	NREE		32.0-				
Wheel Dia (mm)	1016	Distance (km)	0.00		31.0				
PPR	60	Throttle	IDLE		- 230.5				

 After the RDU is updated, its status will be "Initializing..." If this status does not change to "Normal" after 2 to 3 minutes, power cycle the NCorder and RDU. The status will be "Normal" if the RDU is functioning correctly.
 RDU/NVision 3 Log Information

Status: Initializing
Current Address: 7701
End Address: 15104

#### RDU/NVision 3 Log Information

Get Log Info	Status: Normal
Start Address: 7829	Current Address: 7701
Wrap Address: 15104	End Address: 15104

6. If you are downloading the data with a USB thumb drive, this will be displayed:

## Page 39

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RDU/NVision 3 Log Information

Get Log Info	atus: USB Downloading
Start Address: 64	Current Address: 3427
Wrap Address: 15104	End Address: 15104

7. There are LEDs on the RDU (Remote Data Unit) indicate certain overlapping behaviors also:

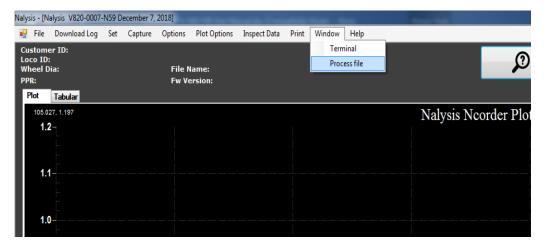
Action	Indicator	dicator Behavior			or	
Data upload to USB	UPLOAD IN PROGRESS	Flashing Fast	Flashing Fast			
Data upload to USB is done	UPLOAD Complete	Solid	Solid		Blue	
RDU getting data from NCORDER	UPLOAD IN PROGRESS	Flashes for each packet received from NCorder		Green		
Problem with Memory Stick	Combination of UPLOAD IN PROGRESS and UPLOAD COMPLETE	Flashing Fast	Flashing Fast	Green	Blue	
Normal Operation	STATUS 1	Flashing onc second	Flashing once per second		Green	

# Page 40

Fault Indicator	STATUS 2	Solid	Red
RDU Power Up; or Memory Stick is inserted on startup	STATUS 2	Flashing Fast	Red

## - Open (\*.pro)

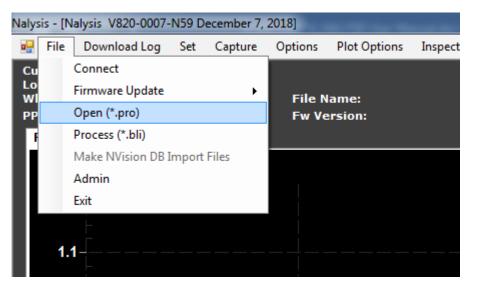
• To open a \*.pro file, make sure that you're in the Process File mode by going to the Window pull down menu and clicking on Process file. If you're already in the Process File mode, you'll see the Plot and Tabular tabs



• Go to the File pull down menu and click on Open (\*.pro) and select the file to be processed from the Log file window

## Page 41

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- Process (\*.bli)
  - This feature allows the User to process the \*.bli file from a previous download
  - Go to File pull down menu and click on Process (\*.bli)>NCorder>##% and select the \*.bli file to be processed from the Log file window

Nalys	is - [N	Nalysis V820-0007-1	N59 D	ecember 7,	2018]		-	_	
•	File	Download Log	Set	Capture	Options	Plot Options	Inspect Data	Print	Wi
Cu		Connect							
Lo WI		Firmware Update		•	File N	ame:			
PP		Open (*.pro)				rsion:			
F		Process (*.bli)							
		Make NVision DB In	nport	Files					
		Admin							
		Exit							
		-							
	1.	1							
	1.	0							
		ŀ							
-	Adm	in							
		<ul> <li>Only availab</li> </ul>	le to	the Progra	mmer				

Exit

To Exit NAlysis

#### Page 42

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## 5.1.2 Download Log

 There is a Download Log pull down menu available for downloading logs on the NCorder system. This will provide you with a way to view and diagnose problems that occur during its operation. The NCorder log can be downloaded at either 100 Percent, Date Range, or Since Last.
 Nalysis - [Nalysis V820-0007-N59 December 7, 2018]

	<b>7</b> 2	- 1. m	alysis vozo 0007		cember 7,	LOIDJ			
o l		File	Download Log	Set	Capture	Options	Plot Opt	ions	Inspect Da
		stome		•	10	0% Downlo	ad		
		:o ID: eel D			B	y Date Rang	e		
	P				Si	nce Last			
ľ	Р	ot	Tabular						
		51.807	7, 1.200						
		1.2	2						
		1.1							
			_						

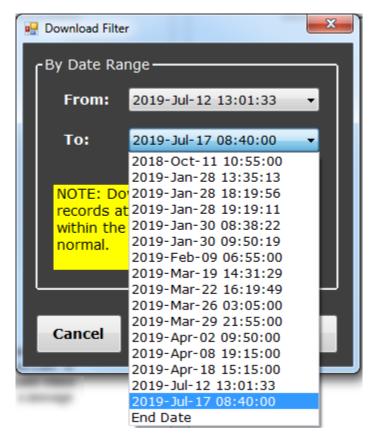
• After any of those selections, you'll be prompted with where to save the file:

MRE Binary Log Image           Image		✓ <sup>4</sup> y Search	NCorder Downl	oads 🔎
Organize 🔻 New folder			:==	• 👔
Secent Places A Name	Date modified	Туре	Size	
<ul> <li>□ Documents</li> <li>J Music</li> <li>■ Pictures</li> <li>▼ Videos</li> </ul>	No items match your sea	rch.		
R Computer Disconnected Ne Vindows (C:)				
File name: Ncorder_180403103645.bli Save as type: Binary File (*.bli)				•
) Hide Folders		Sav	re (	Cancel

If you selected By Date Range, you'll be shown a list of possible dates. You cannot pick the same date for both the *From* and *To*; nor can you pick a *From* date that is later than the *To* date. The *End Date* option is so that you can get the most recent data. Note that the date-time options have a resolution showing to the hour. That could mean several minutes into the hour and not exactly on the hour as the display might suggest.

Page 43

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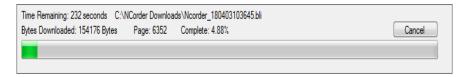
If you selected 100% Download or Since Last, the following summary window appears. Since Last uses the last 100% Download or Since Last. It does not reference Date Range downloads. In addition, in some cases where the NCorder log has recorded past the Since Last reference point, a message appears saying "No since last available".

Log Download
Log Downloading from Start Date: 5/04/2018 16:04:39 End Date: 6/04/2018 8:54:29 Start Page: 64 End Page: 116 Wrap Page: 0 Download Pages: 64 to 116 0 to 0
ОК

Page 44

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• The progress bar will show the status of the downloading process. You must be in Terminal mode to see the progress bar.

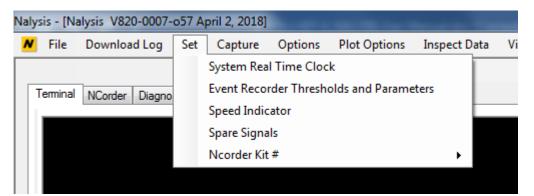


• Once the downloading is complete, the following pop-up window will be displayed. Click OK to complete.

Event Recorder Log
Download Complete
ОК

#### 5.1.3 Set

This feature allows the User to set the System Real Time Clock, Event Recorder Threshold and Parameters, Speed Indicator, Spare Signals, and NCorder Kit#. These settings are available in the Set pull down menu.



- System Real Time Clock

To set the Real Time Clock, click on System Real Time Clock

#### Page 45

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×
Date Time Select
Wednesday, April 25 -
8:35:27 AM
Set RTC
OK Cancel

You should see a confirmation dialog with "RTC time set". If not, then try again; and/or switch from Binary to ASCII before clicking OK.

Real Time Clock	
RTC time Set	
ОК	

<u>Note</u>: For systems with the Nalysis communications driver Select Binary then click OK to set the system time and date (i.e. NCorder, NForce, and NCOMPASS)

# Page 46

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#### - Event Recorder Threshold and Parameters

To set thresholds and parameters, click on the Set menu item, the submenu item - Event Recorder Thresholds and Parameter. Enter the required values and click on OK to accept the new settings. (see NCORDER manuals for more information for settings)

	1	×
NCorder Thresholds ar	id Parami	sters
Interval (secs)	1	Loco ID 12345
Brake Cylinder (psi)	3	Diam (in) 40 🚔
Brake Pipe (psi)	5	Num Axles 4
DBV (volts)	5	PPR 60 -
TMC (amps)	106_	TMC Scale 1000 🚔
Speed (MPH)	1.0	Cust. ID NREC
EOT Type	-	
and the second		States Black
ОК	Cancel	Default

#### Speed Indicator

- Ensure the locomotive is stopped.
- NALYSIS must establish communications with the Speed Indicator before any communication operation can be completed. This is done by connecting the communications (or download) cable (NRE P/N: 058-0001-000) from the Speed Indicator's communication port (Lemo connector on the back of the speed indicator) to a portable computer (or Laptop).
- Launch NCORDER NALYSIS
- Select Set->Speed Indicator

For Imperial Units, the following panel will be displayed:

## Page 47

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	×
Speed Indicator Settings	
Overspeed (MPH) 60 🚖	
Wheel Diameter (in) 40 🚔	
Pulses/rev (ppr) 60 🔻	
Units Metric	
Send Cancel	
Recovery <0.5mph for 30sec ♥	

- Locomotive Overspeed can be set between 20 and 100 MPH (32-160 KPH)
- Wheel Diameter can be set between 32.0" and 47.0" (813 mm and 1192 mm)
- For the Recovery selection box:
  - Check box for MVOS braking control
  - Un-check box for excitation reduction control

For Metric Units, the following panel will be displayed:

Speed Indicator Settings
Overspeed (KPH) 90 🛬
Wheel Diameter (mm) 1046 🚖
Pulses/rev (ppr) 60 -
Units (a) Metric (b) Imperial
Send Cancel
Recovery <0.5mph for 30sec

- Locomotive Overspeed can be set between 20 and 100 MPH (32-160 KPH)
- Wheel Diameter can be set between 32.0" and 47.0" (813 mm and 1192 mm)
- For the Recovery selection box:
  - Check box for MVOS braking control
  - Un-check box for excitation reduction control Page 48

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• Once your parameters are set, click on Send

#### Spare Signals

• This feature allows the User to manually set up the Spare Signals layout for viewing of the Real-Time Signal Update screen

					×
Set Signals					
IDRV01		DIGIN 23		DIGIN 30	<b></b>
IDRV04	<b></b>	DIGIN 24	<b>•</b>	DIGIN 31	<b></b>
IDRV06	<b></b>	DIGIN 25	<b></b>	DIGIN 32	
DIGIN 15	<b></b>	DIGIN 26	<b>•</b>	DIGIN 33	<b></b>
DIGIN 16	<b></b>	DIGIN 27	<b></b>	DIGIN 34	<b></b>
DIGIN 21	<b></b>	DIGIN 28	<b></b>	DIGIN 35	<b></b>
DIGIN 22	<b></b>	DIGIN 29		DIGIN 36	
ОК	Cancel				

Note: This feature is only supported on the Stand-Alone Event Recorder

#### - NCorder Kit#

• This feature allows the User to set the NCorder Kit number that is applied to the specific application. Once the NCorder Kit number is set, the Nalysis application will display their default setting for Real Time Update signals.

Nalysis - [N	alysis V820-0007-	o57 April 2, 2	018]			
N File	Download Log	Set Capt	ure Options	Plot Options	Inspect Data	View
Teminal	NCorder Diagnos RDU 820-0246-a14 NCorder 820-0303 Apr 03, 2018 10	3-a27 (920-00	05) FRA Vigilanc	e Timing Kit# Comm S	920-K0012 itatus	
	Loco ID Wheel Dia (mm) PPR	12345 1016 60		nce (km) 0.00 tle IDLE		

Note: This feature is only supported on the Stand-Alone Event Recorder

#### 5.1.4 Capture

• This feature is not available on the NCorder application

Page 49

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#### Nalysis - [Nalysis V820-0007-e51 May 2, 2017] V File Download Log Set Capture Plot Options Inspect Data . a x Auto Close RT Wind Ferminal NCorder Diagr Echo Characters Reset CPU FW Update O Auto Get FW Version Language Manual FW Update auto/man Help coit Clear Screen Close RT ø X W 🔝 🖊 0 0

#### 5.1.5 Options

• Click on the Options pull down menu and the following screen will appear:

- If Auto Close RT Window is selected, real time screens will automatically close when exited, otherwise they remain open until the Close RT button is pressed. (This feature is not available on the NCorder application)
- If Echo Characters is selected then key presses are echoed to the Terminal screen. (This feature is not available on the NCorder application)
- Reset CPU will send the soft reset command to the NFORCE. If all reset conditions are met the NFORCE will reset without shutting down power. (This feature is not available on the NCorder application)
- Get FW Version will retrieve the system's current firmware version (Nalysis communications driver required)
- Language allows the user to select display in English, Spanish or French. (Current set for English only)
- FW Update auto/man allows the user to select automatic or manual firmware update. This option functions the same as the FW Update radio buttons that appear on the top right of the Nalysis screen.

#### Page 50

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# 5.1.6 Plot Options

Nalysis - [Nalysis V820-0007-N59 December 7, 2018]									
N File	Download Log	Set	Capture	Options	Plot Options	Inspect Data	Print	Window	Help
					Units				
Terminal	NCorder Diagno	stic			Mile Post	t			
	Hoordon Diagno	000			Wheel Di	ameter			
					Change	plot signals			

- The Plot Options allow User to set the following options for Plotting presentation:
  - > Units
    - Allow User to change units to either Metric/Imperial

	×
Ncorder Units	
Pressures	psi 🔻
Dia/Speed/Dist	imperial 🔻
ок са	ancel

# Page 51

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#### Mile Post

- Allow User to set Distance to plotting
- The mile post is displayed in

	×
Mile Post	Direction
Distance (mi)	<ul> <li>ascending</li> </ul>
0.0 💂	decending
ОК	Cancel

# Wheel Diameter

Allow User to set the Wheel Diameter for plotting

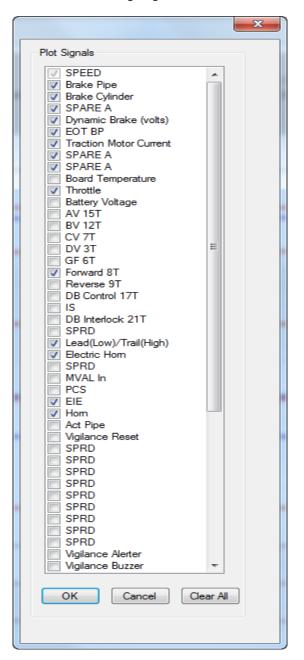
	x
Wheel Diameter Change	
Diameter (in)	
25.0 🛫	
OK Cancel	

# Page 52

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Change plot signals

Allow User to select the required Signals for plotting. See Processing Log File section for more details.





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## 5.1.7 Inspect Data

• Use this to perform an inspection on the downloaded log for further investigation, click on Inspect Data to navigate through the various options

alysis - [N	lalysis V820-0007-	-N59 D	ecember 7,	2018]					
N File	Download Log	Set	Capture	Options	Plot Options	Inspect Data	Print	Window	Help
						FRA Scar	า		
Termina	NCorder Diagno	stic				Fuel Estir	mate		
l —						Duty Cyc	:le		

• See Processing Log File section for more details

#### 5.1.8 View

• Feature to zoom in and out of the plotting data. See Processing Log File for more details.

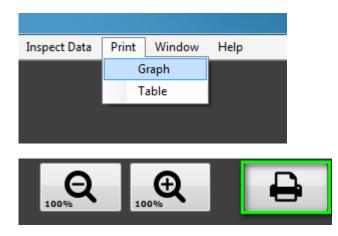
Nalysis - [Nalysis V820-0007-NS9 Decen	iber 7, 2018]	And in case of the local division of the loc	Concession in the local division of the loca				Number of Street	- 6 ×
🙀 File Download Log Set Ca	pture Options Plot Options Inspect Data Print Window Help							- # ×
Customer ID: NREE Loco ID: 12345 Wheel Dia: 40.0in PPR: 60 Pot	File Name: C\TestData\ RDU FW Version: NA Ncorder FW Version: 828-0498-x00	Ø	No search criteria. Use button with magnifier to set up search criteria.	M	8	M		₽
Flot Tabular 6/27/2018 13:38, 1:200		Ncorder						

# Page 54

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#### 5.1.9 Print

- Print the data in either Graph or Table form. See Processing Log File section for more details. You can pick from the menu or the button located to the upperright with the printer icon.
- Printing the graph uses a lighter background to reduce printer ink.



## 5.1.10 Window

• This feature allows Users to select the screen options to switch to Terminal screen or the Process file screen

Inspect Data	Print	Window Help
		Terminal
		Process file

• When selecting Terminal from the Window pull down menu, the active screen will show the Real-Time Signals Update screen.

## Page 55

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File Download Log Set Capture Options Plot Options Inspect Data View	Print Window Help	-
eminal NCorder Diagnostic		
RDU 820-0246-s14 NCorder 820-0303-s27 mm/dd/yy hh:mm:ss t Comm Status	RDU Real Time Plot	Fault List
Loco ID         12255         Customer ID         NREE           Wheel Dia (n)         40         Distance (m)            PPR         60         Throttle		
Pressure Switches Nulify (Trai) Ham Actuator Pipe EIE Lead O seconds	100 100 100 100 100 100 100 100	
Digital In	EOT Input Signals	Digital Out
AV MU15 PCS Spare3 Spare11	BP Pressure (psi) Sig2	VIG ALERTER
BV MU12 E HORN Spare4 Spare12	RF Comm FR Comm	VIG BUZZER
CV MU7 DB MU17 Spare5 Spare13	Marker Batt Status Dead BV	MVALOUT
DV MU3 DB MU21 Spare6 Spare14	Low Batt Volts Valve Op	SPARE 1
GF MU6 VIG RESET Spare7 Spare15	HVM Armed	SPARE 2
IS MVAL IN Spare8 Spare16		SPARE 3
FWD MU8 SPARE1 Spare9 Spare17	End In Motion Move Direction	SPARE 4
REV MU9 SPARE2 Spare10 Spare18	Emerg CS	
Analog Inputs	RDU/NVision 3 Log Information	Control
Speed (MPH) DBV (volts) Spare2	Get Log Info Status: Normal	Start Erase Log
Brake Cylinder (psig) TMC (amps) Spare3	Start Address: Current Address:	Real Time Activity Time Left:
Brake Pipe (psig) TE (klb) Spare4		
Spare Brd Temp Fault Arr1	Wrap Address: End Address:	
Battery Volts Spare 1 Fault Arr2		

• When selecting Process file, the active screen will show the data screen that will allow User to either process the (\*.bli) file or open the (\*.pro) file from the File pull down menu for data viewing. See Processing Log File section for more details.

ser 10: 0: Dia: Tabular	File Name: Fw Version:	Ø	No search criteria. Use button with magnifier to set up search criteria.	K Ø	M	
1 abbdg 14, 1571 2- .0		 Nalysis Ncorder Plot				-Phi Carbo Dat Every: Dat Every: Dat Espeni: Man Speed: Man Speed:
9						Zonal Label: – Tonal Value:
5						
2						

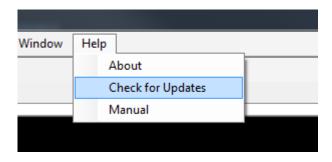


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## 5.1.11 Help

Warning: Installing the latest NAlysis may not be compatible with your existing NForce, NCorder, or NCompass systems. Ensure that your systems are up-to-date before using the latest NAlysis by consulting release notes or FMI (field maintenance instruction) documents.

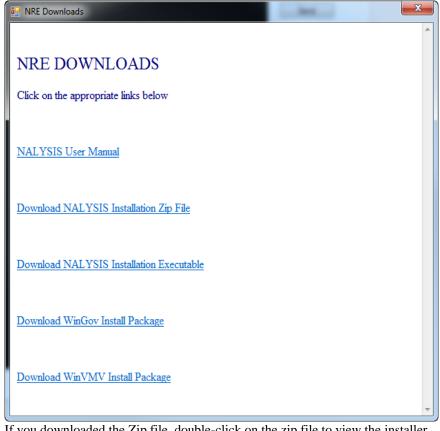
• This Help menu option contains information about NAlysis, Check for Software Updates, and Manual



• Ensure that you have a network connection to the Internet, then click on *Check for Updates*. The following window will appear. Click on *Download NAlysis Installation Zip File* or *Installation Executable* link and follow the directions to save the file.

## Page 57

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If you downloaded the Zip file, double-click on the zip file to view the installer file inside. Double-click on the installation executable to install

• To get the latest user manual, select the *Manual* option. You'll be greeted with the same options as the *Check For Updates option*. Click on the *NALYSIS User Manual* link to download.

## Page 58

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# 5.2 Terminal Tab

This Tab screen is not supported on the NCorder Application.

# 5.3 NCorder Tab

This Tab screen displays the Real Time Signals update of the NCorder application

ile Download Log Set	t Capture Options P	lot Options Inspect D	ata View	Print Window Help		-
minal NCorder Diagnostic						
RDU 820-0246-a14						
-NCorder 820-0303-a27	7 (920-0006) FRA Vigilance Ti				l Time Plot	Fault List
Apr 06, 2018 02:37	:42 PM	Comm Status		0.110 - Brake Pipe - Brake 0.108 -	C)linder	
Loco ID	345 Customer	ID NREC		0.106		
Wheel Dia (in) 40		(mi) 0.00		0.104		
PPR 60	Throttle	IDLE		·ago.100		
Pressure Switches				0.098		
Nulify (Trail)	Hom			0.094		
Actuator Pipe	EIE			0.090		
LEAD	Vigilance Tim	eout in 0 seconds		14:36 14:37 Apr 6 Fri 2018	14:38 14:39	
Digital In				EOT Input Signals		Digital Out
AV MU15	PCS SPRD	SPRD		BP Pressure (psi) NA	Sig2	VIG ALERTER
BV MU12	E HORN SPRD	SPRD		RF Comm	FR Comm	VIG BUZZER
CV MU7	DB MU17 SPRD	SPRD		Marker Batt Status	Dead BV	MVAL OUT
DV MU3	DB MU21 SPRD	SPRD		Low Batt Volts	Valve Op	SPARE 1
GF MU6	VIG RESET SPRD	SPRD				SPARE 2
IS	MVAL IN SPRD	SPRD		HVM	Amed	SPARE 3
FWD MU8	SPRD SPRD	SPRD		End In Motion	Move Direction	SPARE 4
REV MU9	SPRD SPRD	SPRD		Emerg CS		
Analog Inputs				RDU/NVIsion 3 Log Information		Control
Speed (MPH)	0 DBV (volts)	0.0 SPARE A	27601	Get Log Info	Status: Normal	Stop Erase Log
Brake Cylinder (psig)	0.0 TMC(A)	0.0 SPARE A	27608	Start Address: 64	Current Address: 3426	Real Time Activity Time Left: 57.8 min
Brake Pipe (psig)	0.0 TE (klb)	0.0 Spare4				
Spare	Brd Temp	32.2 Fault Arr1	0x10	Wrap Address: 15104	End Address: 15104	
Battery Volts	65.6 SPARE A	4399 Fault Arr2	0x0			Missed Msg: 0
115200bps, English Conne						

#### 5.3.1 Start/Stop

In the bottom-right corner, The Start button when pressed toggles to Stop and vice versa. Use this to get real-time activity that can provide validation of the installation of your NCorder. Note that the real-time activity will automatically stop querying the NCorder after 60 minutes.

Control	
Stop	Erase Log
Real Time Activity Time	e Left: 59.8 min
Missed Msg: 0	

Page 59

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## 5.3.2 Erase Log

Use the erase log button to clear the RDU and NCorder logs. If you have an RDU connected, you'll see a dialog with two checkboxes. This is an automated process that will enable the OK button when it has completed.

RD	U Status	_ `
	Checks Status Automatically	
	✓ Flash Erased	
	Syncing memory	
	ОК	

When both checkboxes are checked and the OK button is enabled, you'll know that the erase procedure finished properly.

RDU Status			
Checks Status Automatically			
✓ Flash Erased			
Memory Synced			
ОК			

If the dialog informs you of an error, make sure that your RDU and NCorder are connected and retry Erase Log. Three attempts are made to erase the Flash before failure.

## Page 60

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RDU Status	
Checks Status Automatically	
Erase Flash failed! NCorder not responding	
Waiting to Sync Memory	
ОК	

If the Syncing fails,

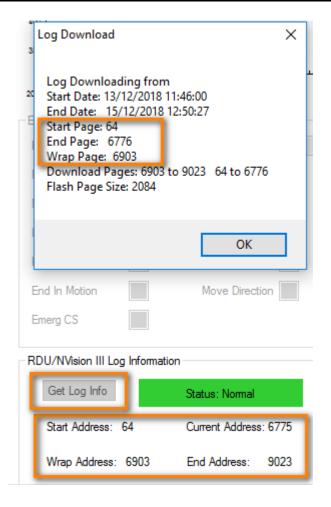
RDU Status
Checks Status Automatically
✓ Flash Erased
Sync failed. Check RDU link then retry.
ОК

# 5.3.3 Get Log Info

The button Get Log Info will retrieve flash information from the RDU that is useful for Engineering. During a 100% download from the RDU, these addresses coincide with the Log Download pop-up window.

# Page 61

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# 5.4 Diagnostic Tab

This Tab screen show the memory table and only use for troubleshooting purpose. The Erase Fault, Erase EPL, and Erase Stats buttons are do not apply to the NCorder and will be disabled when NCorder is selected as the application. See Section 8.2 Diagnostic Tab for more details.

#### Page 62

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_		reog		cupit		option	13	lot op	tions	mapee	C D'ULU	view	FILL	Window	пер					
minal	NCorder	Diagnos	stic																	
1		3	4 5	6	7	8 9	) 10	11	12	13 14	15 1	6		Fault	Bank1 Flash Informat Bank1 is Enabled		Device ID dada	Maker ID 2c2c	Ready	
3 4						-							Erase	Stats	Page 64	Start 64	End 1344	Wrap 64	Stats: 0	
5 6 7															Bank2 Flash Informat Bank2 is Enabled		Device ID dada	Maker ID 2c2c	Ready	
8															Page 64	Start 64	End 1344	Wrap 64	Stats: 0	
1	0		_	_			_		-					n Info iir Cal	Flash Status	Status: 0	Cali	bration Data OK		
1															Version: 56291.0.0	Status. U	Gui			
1	5														Bad Blocks: 0 Micron 2Gb					
1	7											-								
	Access Number:	116		F	reviou	s	N	ot	R	ead Flash										
3ank	Number:	1	•						R	lead RAM										

## Page 63

# 5.5 Processing Log File

## 5.5.1 File Processing

This feature allows the .bli file from a previous download to be converted into 3 different outputs. The first output is a .pro output file that can be viewed using the NAlysis plot. Two types of .csv files will also be processed into the same directory allowing the user to view tabular data in excel. The files will have the same name as the .pro file, one of which with FRA appended to the name. The FRA output has the 0-distance point at the time of download and increasing as time moves towards the first data point. The non-FRA .csv file has the 0-distance point at the first data point and increases with time. If the download is large multiple excel files will be output so that the files are not too large for excel to properly open. These files are all one continues file, for example, the first data point of section2 file is the data point immediately following the last data point of the section1 file.

Nal	ysis	- [Na	lysis V820-0007-	-p57 A	pril 5, 2018]		-		_	_		last annual front i an		
~	F	ile	Download Log	Set	Capture	Options	Plot Options	Inspect Data	View	Print	Window Help		- 8	×
											Terminal			
	Terr	minal	NCorder Diagno	ostic							Process file			
													FW Update	
													Auto	
													Manual	
													Help	
													exit	
													- Colt	
													Clear Screen	
													Close RT	
	17													
	10.42	1150	00bps, English Co		od									-
	/M3	,1152	ooops, English Co	unect	eu				_	_				.::

1. To process the downloaded bli file, click on Window->Process File

- The following screen will appear

#### Page 64

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mer 1D: D: Dia: Tabilar	File Name: Fw Version:		Ø	No search criteria. Use button with magnifier to set up search criteria.	M	8 N	Q 200%	Ð
Tabular 54, 1.171		Nalvsis	Ncorder Plot					
.2-								
							Plot Control	
							Plot Every: Plot Signals:	
							Max Speed:	Max Speed:
.0								
9								
							Total Label:	Total Value:
8								
7								
.6-								
.5-								
.3-								
4								
3								
2								
1								
0	20 40	60	80	100	120	140		

- 1. Select File->Process (\*bli)
- 2. An open file dialog similar to the one below will appear

🔏 Log File									X
🚱 🔍 🛛 🕽 + Computer + OS (C:) + Nalysis +						<b>▼</b> <sup>4</sup> 9	Search Nalysis		٩
Organize 🔻 New folder							83	•	0
H Videos	*	Name	Date modified	Туре	Size				
Computer  CS(C:)  Apps CCSSTemplate  dell Diagnostic/WinSEC Drivers EVRUploads install Intel MSOCache Nalysis Manual	Ш	Manual Ncorder_140317132847.bli	20/03/2014 2:20 PM 17/03/2014 1:29 PM		11 KB				
	Ŧ								
File name: Ncorder_140317132847.bli						T	BLI (*.bli) Open 🚽	Cancel	•

3. Locate the \*.bli file that you want to process and click Open.

Page 65

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4. Now a save file dialog similar to the one below will appear with a new \*.pro file name created.

Cog Processed File					×
🔾 🗢 📙 🕨 Computer	▶ OS (C:) ▶ Nalysis ▶				👻 🍫 Search Nalysis 🖌
Organize 🔻 New folder					III 🕶 🔞
🔆 Favorites	Name	Date modified	Type Siz	e	
E Desktop Downloads Recent Places Propbox	🕌 Manual	20/03/2014 2:20 PM	File folder		
<ul> <li>☐ Libraries</li> <li>☐ Documents</li> <li>∂ Music</li> <li>☐ Pictures</li> <li>☐ Subversion</li> </ul>					
Videos					
	ysis\Ncorder_140317132847.pro				
Save as type: Process	ed File (*.pro)				
Hide Folders					Save

The software needs to convert the binary file to a processed file for plotting.

- 5. Click on Save will start the file conversion from \*.bli to a \*.pro file.
  - CSV files are also created in the same folder. The file with the FRA designation contains distance calculations for every record with the last record being the start, or zero distance, position.
  - The other CSV file uses distance calculations for legacy users.
- 6. Once completed, NAlysis will ask if you wish to plot the file at this time.

File Process	
Do you wish to plot the p	processed file
Yes	No

 Click the Yes button to begin, if you choose No, you can always plot the file later by selecting File->Open->Event Recorder Log from the main menu

## 5.5.2 File Plotting

When plotting the file is selected, the following window appears. See Plot Options section for more information on plotting

#### Page 66

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🖳 NCorder		
Log Header		
Manufacturer:	NRE	
FW Version:	820-0303-b19	
NCorder S/N:	NA	
Wheel Diameter:	40.0	
Loco ID:	15362	
Customer:	NREE	
		Print
		ОК

You can print this header for your records

# Page 67

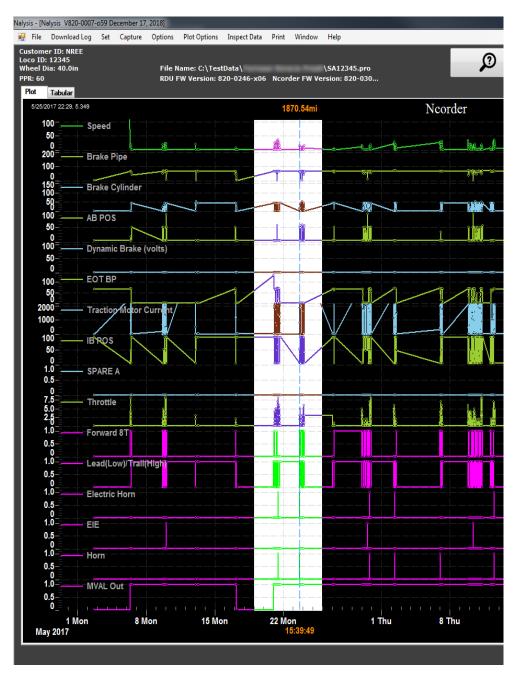


Below is a sample plot:

# Page 68

# Page 69

To zoom in on an area, hold down on the left mouse button and drag the cursor over the area of interest (white area below) and release the mouse button. Alternatively, click on the area of interest until you see an orange vertical line appear which means you have clicked on a data point. Then use the button with the magnifying glass with the "+" to zoom in.



Here's the zoomed in white area:

Page 70

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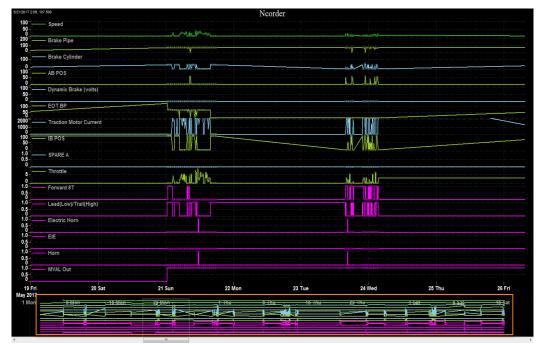
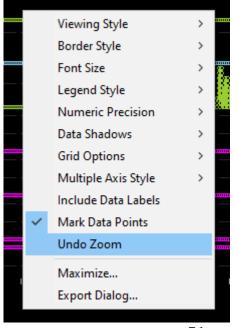


Figure 1. Note the mini graph at the bottom after zooming in and the scroll bar. This mini graph provides a reference point for the zoomed in area relative to the entire date range. With your mouse wheel, you can scroll forward or backwards through the time line.

To zoom out, right-click on the plot area and select "Undo Zoom" from the context menu. Alternatively, use the button with magnifying glass with the "-".





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Plot Control	
Plot Every: 1 of 1080	
Plotting: 16 of 16 sig	nals
Max Speed: 2.3 mi	/hr
Date: 2020-1	
Time 10:17:	
Distance: 0.78 m	
Mile Post: 0.00	
Total Time: 0.30 h	Irs
Total Distance: 1.48 m	ui.
Date	24-12-2020
Time	10:25:31.10
Speed (mi/hr)	2.3
Distance (mi)	0.31
Brake Pipe (psi)	0.0
Brake Cylinder (psi)	0.0
IB POS	4000.0
Dynamic Brake (volts)	
EOT BP	0.0
Traction Motor Current	
Fault Arr 1	22.0
Fault Arr 2	0.0
Throttle	NOTCHE
Forward 8T	1
	0
Electric Horn	1
EIE	0
Horn	0
MVAL Out	0
	- -
Dage	<u>. 72</u>

To the right of the graph is a synopsis of the recorder's data

Page 72

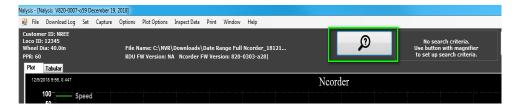
There is also the option to add or remove signals (Plot Signals). Select NCorder Set->Plot Signals the following window will appear. Choose up to 16 different signals. If you select more than 16, only the first 16 will be plotted. And Speed cannot be removed shown below with the checkbox greyed out.

Page 73

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### 5.5.3 Searching

Options to find a specific signal(s) or time are available. Click the button showing the magnifying glass with the question mark.



You will see a Search Criteria window that defaults to search by Time

🖳 Search Criteria	<b>—X</b> —
Select Search Criteria Search By: O Time O Signals Select Time 12/19/2018 T 10:55:04 AM	
Select Signals Brake Cylinder SPARE A Dynamic Brake (volts) EOT BP Traction Motor Current SPARE A SPARE	
Cancel	ок

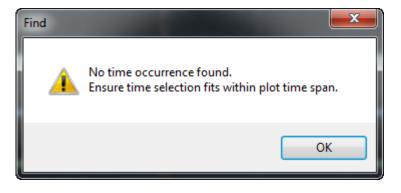
Search by Time allows you to specify to the second of the day. After specifying the time, click OK. If it exists, a pop-up appears confirming the Speed, Date, Time, and Distance; and the plot will automatically move to that date and time. Notice above that the widgets for the Select Signals option will be disabled when Search By Time is selected.

#### Page 74

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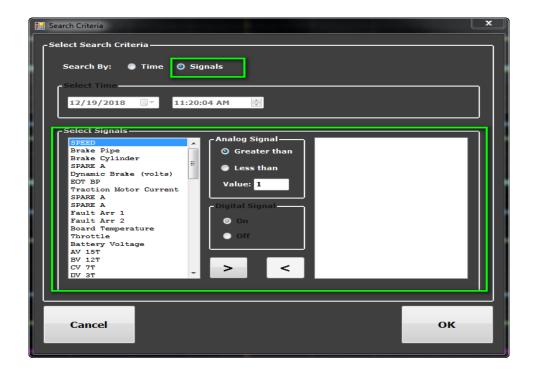
If the time doesn't find it, there will be a "No time occurrence found." message.



To search by Signals, select the Signals option that will enable the widgets in the Select Signals group.

# Page 75

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- 1. Select the Signal, specify greater than or less than, and click the ">" button.
- 2. Select multiple signals if desired

# Page 76

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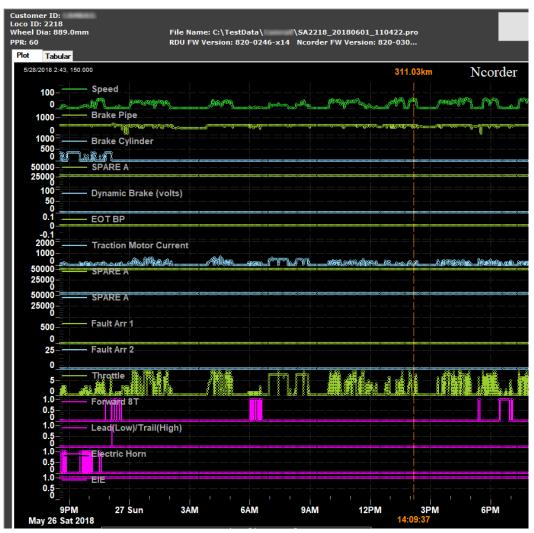
Select Search Criteria Search By: Time O Signals Select Time 12/19/2018 V 11:20:04 AM	
Select Signals SPEED Brake Cylinder SPARE A Dynamic Brake (volts) EOT BP Traction Motor Current SPARE A SPARE A Fault Arr 1 Fault Arr 2 Board Temperature Throttle Battery Voltage AV 157 EV 127 CV 77 DV 3T	Brake Pipe>15.0 DV 3T On GF 6T On EOT BP>7.0
Cancel	ок

3. Then click OK. The plot will move to the first occurrence, if it finds the record that meets all the search criteria.

# Page 77

#### 5.5.4 Mile Post Menu Item

Select a point on the plot to create the mile post. An orange vertical line shows where the cursor is.



# Page 78

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Ncorder		311.03km	
Mile Post			
Distance (km)	<ul> <li>ascending</li> <li>decending</li> </ul>		
ОК	Cancel		

Now select Plot Options->Mile Post, the following will appear

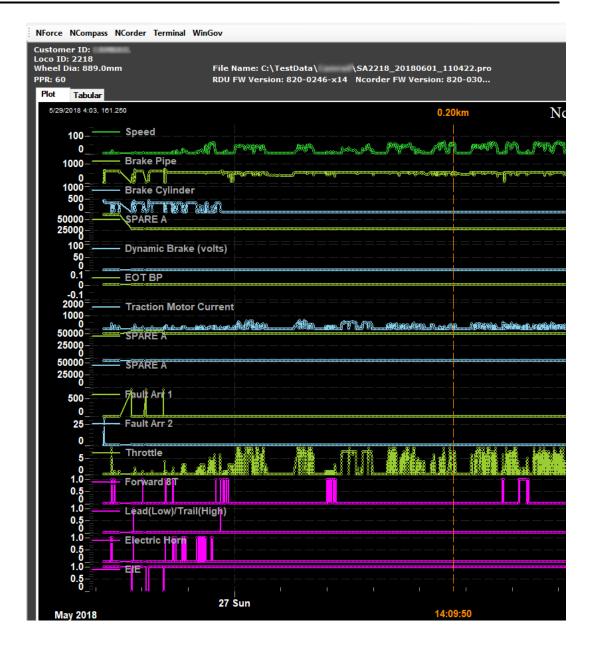
Select the new distance value and direction and click OK. For example, enter 0.0.

×
Direction
ascending
O decending
Cancel

The distance readings will now be adjusted to the mile post selection, and the plot will be redrawn. Notice the distance is now 0.20 at our mile post selection. The Mile post postion will be displayed in the Plot control window to the right of the plot.

# Page 79

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### Page 80

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Plot Every: 1 of 266 Plotting: 15 of 16 signals Max Speed: 3.5 mi/hr Date: 2021-01-04 Time 14:59:57 Distance: 0.00 mi Mile Post: 0.00 Total Time: 0.09 hrs Total Distance: 0.21 mi Date 4-1-2021 Time 15:01:11.10 Speed (mi/hr) 2.4 Distance (mi) 0.05 Eng RPM 0.0
Max Speed:       3.5 mi/hr         Date:       2021-01-04         Time       14:59:57         Distance:       0.00 mi         Mile Post:       0.00         Total Time:       0.09 hrs         Total Distance:       0.21 mi         Date       4-1-2021         Time       15:01:11.10         Speed (mi/hr)       2.4         Distance (mi)       0.05         Eng RPM       0.0
Date:       2021-01-04         Time       14:59:57         Distance:       0.00 mi         Mile Post:       0.00         Total Time:       0.09 hrs         Total Distance:       0.21 mi         Date       4-1-2021         Time       15:01:11.10         Speed (mi/hr)       2.4         Distance (mi)       0.05         Eng RPM       0.0
Time 14:59:57 Distance: 0.00 mi Mile Post: 0.00 Total Time: 0.09 hrs Total Distance: 0.21 mi Date 4-1-2021 Time 15:01:11.10 Speed (mi/hr) 2.4 Distance (mi) 0.05 Eng RPM 0.0
Distance: 0.00 mi Mile Post: 0.00 Total Time: 0.09 hrs Total Distance: 0.21 mi Date 4-1-2021 Time 15:01:11.10 Speed (mi/hr) 2.4 Distance (mi) 0.05 Eng RPM 0.0
Mile Post:       0.00         Total Time:       0.09 hrs         Total Distance:       0.21 mi         Date       4-1-2021         Time       15:01:11.10         Speed (mi/hr)       2.4         Distance (mi)       0.05         Eng RPM       0.0
Total Time: 0.09 hrs Total Distance: 0.21 mi Date 4-1-2021 Time 15:01:11.10 Speed (mi/hr) 2.4 Distance (mi) 0.05 Eng RPM 0.0
Total Time:       0.09 hrs         Total Distance:       0.21 mi         Date       4-1-2021         Time       15:01:11.10         Speed (mi/hr)       2.4         Distance (mi)       0.05         Eng RPM       0.0
Total Distance: 0.21 mi Date 4-1-2021 Time 15:01:11.10 Speed (mi/hr) 2.4 Distance (mi) 0.05 Eng RPM 0.0
Date         4-1-2021           Time         15:01:11.10           Speed (mi/hr)         2.4           Distance (mi)         0.05           Eng RPM         0.0
Time         15:01:11.10           Speed (mi/hr)         2.4           Distance (mi)         0.05           Eng RPM         0.0
Speed (mi/hr)         2.4           Distance (mi)         0.05           Eng RPM         0.0
Distance (mi) 0.05 Eng RPM 0.0
Eng RPM 0.0
DBV 70.0
MGA 0.0
MGV 0.0
TMI 0.0
HP 0.0
Throttle IDLE
Water -148.0
BP Pres 18.0
BC Pres 0.0
Brake Pipe (PSI) 0.0
EIE 1
HORN 0
MVAL OUT 1

#### 5.5.5 **Inspect Data Menu Item**

### FRA Scan

Plot Options	Inspect Data	Print	Window	Help
	FRA Scan	1		
	Fuel Estir	nate		
	Duty Cyc	le		



7

🖳 NCorder	
FRA Scan	
SPEED OK Brake Pipe OK Brake Cylinder OK IB POS OK EOT BP FAIL Traction Motor Current FAIL Forward 8T OK Reverse 9T OK PCS Never On EIE Never On Horn OK MVAL Out OK	
Print OK	

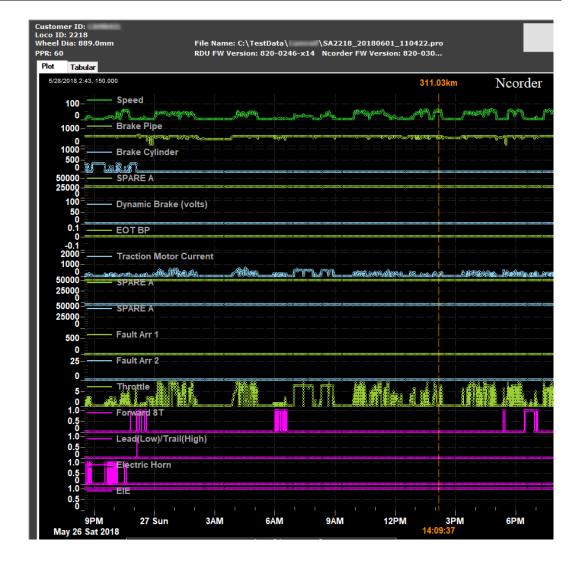
Select Inspect Data->FRA Scan and the following window will be shown. Results can be printed.

#### **Fuel Estimate**

Select a point on the plot. An orange vertical line shows where the cursor is.

Page 82

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Select Inspect Data->Fuel Estimate.

Plot Options	Inspect Data	Print	Window	Help
	FRA Scan	I		
	Fuel Estin	nate		
	Duty Cyc	le		

The following window appears:

# Page 83

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🖳 Estimate Fuel Usage	×
Step 1: Select the Range to calculate fuel. Cursor O Entire log OUsage to cursor O	is where you clicked on the plot. Usage from cursor
Step 2: Enter Fuel Estimates for Each Throttle	Calculated Fuel Usage
O Liters/Hr ● Gallons/Hr	
Step 2b: Enter fuel usage per throttle, — or use Load Table below.	
Loco Туре:	
Dynamic Brake:	
Low Idle:	
Idle:	
Notch 1:	
Notch 2:	
Notch 3:	
Notch 4:	
Notch 5: Notch 6:	
Notch 6:	
Notch 7:	
Load Save Step 3: Table Table Calculate	Step 4: Print

- 1. Select the range for the fuel calculation
  - a. Entire log the calculation uses the whole log and ignores any cursors.
  - b. Usage to cursor calculates up to where the orange vertical line occurs. If there is no cursor, no calculation occurs.
  - c. Usage from cursor starts calculation from where the orange vertical line occurs. If there is no cursor, the entire log is assumed.
- 2. Select the Units.
- 3. Enter the Loco Type along with numeric values for each of the throttle positions.

Page 84

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4. Click Calculate button.

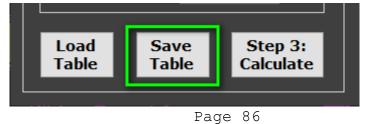
🖳 Estimate Fuel Usage	×
┌Step 1: Select the Range to calculate fuel. Cursor is where you clicked on the plot.—	
O Entire log 🛛 Usage to cursor 🔍 Usage from cursor	
	]
Step 2: Enter Fuel Estimates for Each Throttle Calculated Fuel Usage	
Step 2a: Pick units of fuel	
O Liters/Hr O Gallons/Hr	
Step 2b: Enter fuel usage per throttle, ───	
or use Load Table below.	
Loco Type: SD40	
Dynamic Brake: 1	
Low Idle: 1	
Idle: 5	
Notch 1: 10	
Notch 2: 20	
Notch 3: 30	
Notch 4: 40	
Notch 5: 50	
Notch 6: 60	
Notch 7: 70	
Notch 8: 80	
Load Save Step 3: Step 4:	
Table   Table   Calculate   Print	

# Page 85

🚽 Estimate Fuel Usage × Step 1: Select the Range to calculate fuel. Cursor is where you clicked on the plot. O Entire log Usage to cursor Usage from cursor Step 2: Enter Fuel Estimates for Each Throttle-Calculated Fuel Usage Step 2a: Pick units of fuel-Locomotive Type SD40 O Liters/Hr Gallons/Hr Usage in liters Dynamic Brake 0.0 Low idle 0.0 Step 2b: Enter fuel usage per throttle, -or use Load Table below. Idle 204.1 Notch 1: 23.7 Loco Type: SD40 Notch 2: 55.8 Notch 3: 48.6 Dynamic Brake: 1 Notch 4: 107.0 Notch 5: 137.4 Low Idle: 1 Notch 6: 186.2 Notch 7: 355.8 5 Idle: Notch 8: 160.5 10 Notch 1: Total: 1279.0 Notch 2: 20 Notch 3: 30 Notch 4: 40 Notch 5: 50 Notch 6: 60 70 Notch 7: 80 Notch 8: Load Save Step 3: Step 4: Table Table Calculate Print

The estimated fuel usage for each throttle position will be displayed on the right. You can print the fuel estimate using the Print button.

If you wish to save the table for future calculations you can do this by clicking Save Table button.



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→ ★ ↑ → This PC → Local Disk (C:) → NAlysisV.	2 → FuelTables		✓ Õ	FuelTables
ganize 🔻 New folder				
3D Objects ^ Name ^	Date modified	Туре	Size	
Desktop	1/10/2020 2:05 PM	FTL File	1 KB	
Documents V1_SDGP38Liters.ftl	1/10/2020 2:06 PM	FTL File	1 KB	
Downloads 📄 V1_SDGP40Gallons.ftl	1/10/2020 2:07 PM	FTL File	1 KB	
Music 📄 V1_SDGP40Liters.ftl	1/10/2020 2:07 PM	FTL File	1 KB	
Pictures V1_SW1500Gallons.ftl	1/10/2020 2:08 PM	FTL File	1 KB	
Videos V1_SW1500Liters.ftl	1/10/2020 2:08 PM	FTL File	1 KB	
🛫 attach (\\nrecen				
Local Disk (C:)				
🛫 HChau (\\calent 🗡				
File name: MySD40.ftl				
Save as type: Fuel Table (*.ftl)				

Click on Load Table to load a previously saved fuel table.



# Page 87

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$\rightarrow$ $\land$ $\uparrow$ $\land$ $\land$ This PC $\rightarrow$ Loc	al Disk (C:) > NAlysisV2 > FuelTables	*	ن ب Sear	ch FuelTables
ganize 🔻 New folder				≣≣ ▼ 🔟
OneDrive - NRE	^ Name ^	Date modified	Туре	Size
This PC	MySD40.ftl	1/14/2020 10:01 AM	FTL File	1 KB
-	V1_SDGP38Gallons.ftl	1/10/2020 2:05 PM	FTL File	1 KB
3D Objects	V1_SDGP38Liters.ftl	1/10/2020 2:06 PM	FTL File	1 KB
Desktop	V1_SDGP40Gallons.ftl	1/10/2020 2:07 PM	FTL File	1 KB
Documents	V1_SDGP40Liters.ftl	1/10/2020 2:07 PM	FTL File	1 KB
🖶 Downloads	V1_SW1500Gallons.ftl	1/10/2020 2:08 PM	FTL File	1 KB
👌 Music	V1_SW1500Liters.ftl	1/10/2020 2:08 PM	FTL File	1 KB
Pictures				
Videos				
🛖 attach (\\nrecent02) (B:)				
Local Disk (C:)	v			
File name: MySD4	40.ftl		✓ Fuel File (	*.ftl)

# **Duty Cycle**

Select a point on the plot. An orange vertical line shows where the cursor is.

Page 88

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Select Inspect Data->Duty Cycle.

Plot Options	Inspect Data	Print	Window	Help
	FRA Scan	1		
	Fuel Estimate			
	Duty Cycle			

The following window will be displayed:

# Page 89

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🖳 NCorder 💼 🔳 💌
Range Find Signal
Usage to cursor
Usage from cursor
Entire log
OK Cancel
h.

Select the range for the duty cycle calculation and click OK. The following should now appear

🖳 NCorder				
Duty Cycle				
Throttle Notch	Time in Notch			
Dynamic Brake Low idle Idle	0.00 0.00 126.13			
Notch1: Notch2: Notch3:	44.65 30.02 23.78			
Notch4: Notch5: Notch6:	13.54 9.62 4.59			
Notch7: Notch8: Total:	3.14 0.80 256.3			
Time is in hours				
Print OK				
	.#			

The results may be printed by selecting Print.

# Page 90

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# 5.5.6 **Print Options**

Inspect Data	Print	Window	Help
	Graph		
	Table		
Graph			

a. When select the Graph print option, the Print out will show Plot form of data.

Table

b. When select the Table print option, the Print out will show the Tabular form of data.

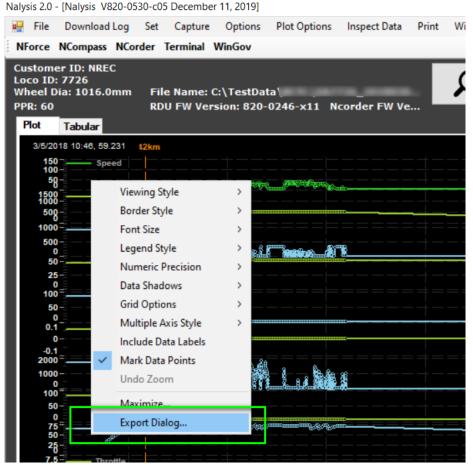
#### 5.5.7 Data Export

Data can be exported from the plot although we do not recommend it since the process may be slow and the data has already been nicely outputted as CSV files as part of the conversion of the BLI file. However, if you must:

1. With your mouse, right-click on the plot to see the context menu appear

# Page 91

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2. Select *Export Dialog*... And you'll see the following dialog. Select your options. Note: It is not recommended to use the Test/Data option as the data is already exported for you in the form of CSV files. See above reference to FRA output. Also, the features of this export dialog are from a third-party control and are not designed by NRE.

# 6.0 NCOMPASS Interface

The Application Selection of the Nalysis software program contains the NCOMPASS application that will allow communications between the Laptop/Computer and the NCOMPASS system. To allow communications between the NCOMPASS and the portable computer, connect the Serial Communications Cable (NRE Part No. 058-0001-000) between the communications port of the NFORCE NCOMPASS board and the portable computer. Computers without serial ports will require a USB to serial adaptor (NRE Calgary part # 735-0046-000). The NFORCE cover needs to be removed to access the communications port on the faceplate of the NCOMPASS board. The Nalysis software must establish communications before any communications occur.

Page 92

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Nalysis 2.0			x
Select Application			
NFORCE	NCORDER	TERMINAL	WINGOV

#### If the NCompass button is selected as shown above, then the following screen will appear:

sis - [Nalysis V820-0007-i51 May 12, 2017] File Download Log Set Capture (			
File Download Log Set Capture (	Options Window Help		_ 8 :
Ferminal NCompass Diagnostic			
eminai Noonipass Diagnostic			
FW Version: NA	Date Time NA:		
Setup	Operation	GPS	Start
NFID: NA	RSSI: NA	Time: NA	Stat
APN: internet.com -	SIM Detected: NA	Latitude: NA	
ArN: Internet.com			
	Connection Type: NA	Longitude: NA	
WiFi Ncorder	Radio Model: NA	Altitude: NA	
Satellite	Socket State	Speed: NA	
Get Send	NA	Sats in View: NA	
CanNet	RSSI Real Time Plot	SNR Plot	
CHANNEL STATE:	35 -	80	
FAULT BUFFER: NA	30	80	
RTD BUFFER: NA	25		
EPL ADDR1: NA			
EPL ADDR2: NA	15	40	
DEVICE KEY: NA	10-	22	
FAULT ADDR1: NA	5-		
FAULT ADDR2: NA	0		
	May 15 Mon 2017		
This terminal command is not supported		Dia	agnostic
This terminal command is not supported Press 'h' for list of supported terminal commands Use NALYSIS PC Software (NForce tab)	sor		
1			

#### 6.1 Menu

These are the only menu options available in the NCOMPASS application.

#### 6.1.1 File

Only Disconnect, Firmware Updates, and Exit from the pulldown menu apply.

#### 6.1.2 Help

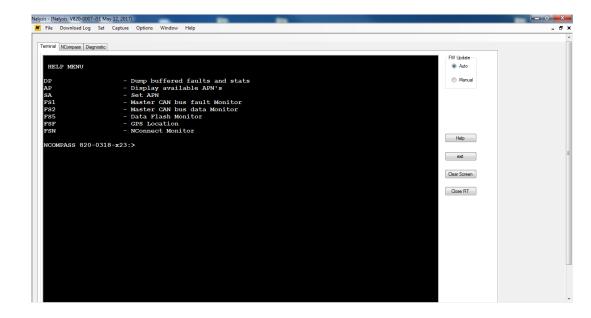
See section 4.1.7

# 6.2 Terminal Tab

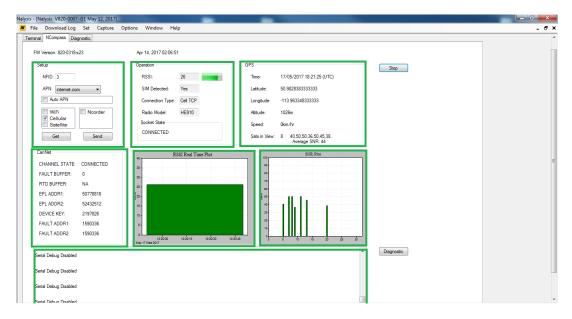
This Terminal screen behaves similar to the Hyper Terminal screen that has all of the NCOMPASS Terminal Commands from the Help menu. Type in "h" from the terminal prompt to see the available commands from the system.

# Page 93

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# 6.3 NCompass Tab



#### **6.3.1 Setup** This is the initial communications setting from NCOMPASS to the Web Portal.

# Page 94

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Setup	
NFID: NA	
APN: internet.co	om 🔹
Auto APN	
WiFi Cellular Satellite	Ncorder
Get	Send

# 6.3.2 Operation

This is the Real Time communication statistics.

Operation	
RSSI:	NA
SIM Detected:	NA
Connection Type:	NA
Radio Model:	NA
Socket State	
NA	

RSSI: SIM Detected: Connection Type:

Socket State:

Signal strength of either the cellular, or satellite (depends on which is being used) Yes or No, depends on whether a SIM card has been detected or not Type of medium being used for server communications (None, WiFi, Cellular, Satellite) If the NCompass is trying to connect via the cellular module, the state of the socket will be shown, useful for debugging

# Page 95

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# 6.3.3 GPS

This shows the location of the Locomotive from the Global Position Satellite. Whe the Start button is clicked, it will update the fields seen below.

GPS	
Time:	NA
Latitude:	NA
Longitude:	NA
Altitude:	NA
Speed:	NA
Sats in View:	NA

- All 1's indicates no GPS module present
- All 2's indicates GPS fix is poor

# Page 96

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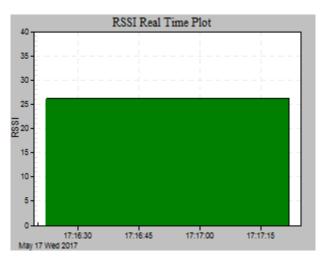
# 6.3.4 CanNet

This is the CANBUS status from NCOMPASS and NFORCE communications.

CanNet	
CHANNEL STATE:	
FAULT BUFFER:	NA
RTD BUFFER:	NA
EPL ADDR1:	NA
EPL ADDR2:	NA
DEVICE KEY:	NA
FAULT ADDR1:	NA
FAULT ADDR2:	NA

# 6.3.5 **RSSI Real Time Plot**

This is the Real Time Plot of the Received Signal Strength Indicator (RSSI). It is a measure of the power level that a RF client device is receiving from an access point.

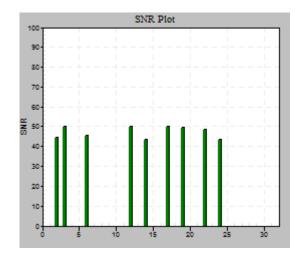


#### 6.3.6 SNR Plot

This is the Signal to Noise Ratio plot. It is defined as the ratio of signal power to the noise power, often expressed in decibels.

# Page 97

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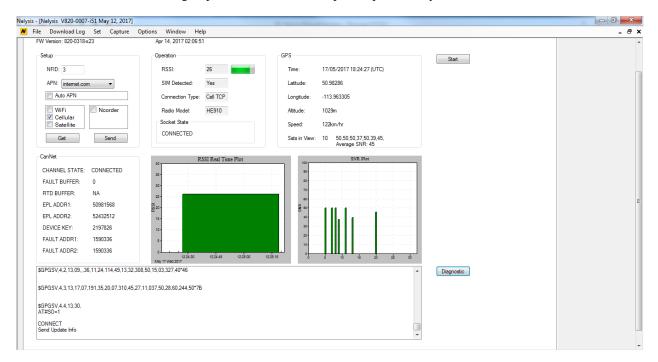


#### 6.3.7 Terminal screen

This screen contain the same information as the Terminal Tab screen.

#### 6.3.8 Start Button

Click the start button that will start real time data acquisition with the NCompass. There are four group boxes which will be updated periodically



NFID: Current NCompass NFID (NFORCE ID) designation APN: Current APN (Access Point Network) setting Auto APN Select whether APN is tried automatically, or manually Server communication medium to use, in this example Cellular only (indicated by check box)

Page 98

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The user can change the NFID (enter new number), select an APN from the drop-down list, then select auto or manual APN cycling, and add/remove server medium. Once new values are selected, click on Send.

If the NCompass accepts the new parameters, the following message will appear:

Serial	×
Radio Parameter Setu	p Successful
	ОК

Page 99

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#### 6.3.9 Diagnostic Button

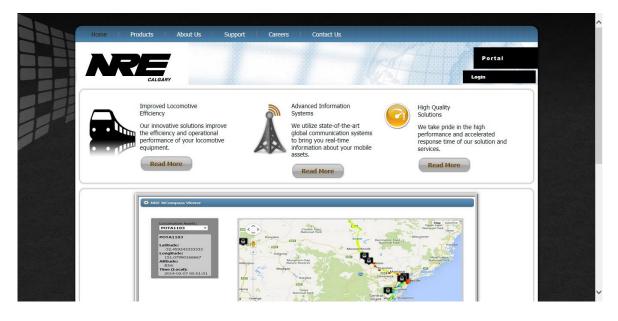
Clicking on Diagnostic button will output diagnostic messages to the Terminal screen and to the list box at the bottom of the NCompass tab. Messages relating to the connection can be helpful. Switching to the NCompass tab will automatically turn off the Diagnostics.

# 6.4 Diagnostic Tab

This Diagnostic screen is similar to the FS5 memory screen from Hyper Terminal. This screen holds features that can be used for analyzing or troubleshooting the memory tables. See section 8.2 for more details.

### 6.5 Web Portal

When NCompass is installed on your system, you can take advantage of the NRE's website portal for tracking your fleet. Through the portal, you can locate your assets, gauge their performance, and note how they are being used. See our Website for more general information: http://nre-electronics.com/index.php?option=com\_content&view=category&layout=blog&id=44&Itemid=67 Information can also be found in the NCOMPASS System Installation Guide (A-580-J-0056-3.doc or PDF).



# 7.0 WinGov Interface

Access the WinGov application via the start bar.

### Page 100

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You'll have access to four tabs when the application loads: Terminal, WinGov Real Time, WinGov Eng Config, and Diagnostic tabs, of which the latter is not necessary for most routine tasks.

autysis a	2.0	[INDITION AND THE PROPERTY OF	00000	cor march	1,2015	1		
File	Dov	wnload Log	Set	Options	Help			
Tem	ninal	WinGov Real	Time	WinGov Eng	Config	Diagnostic		

# 7.1 Menu

#### 7.1.1 File

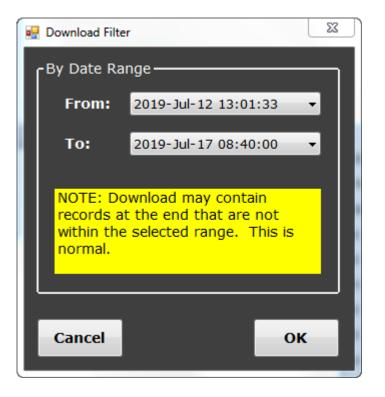
- Disconnect closes communication port
- Firmware Update allows selection of new ECM file to load and update
- Open allows selection of recorded real-time data to be loaded. Make sure that you switch to the WinGov Real Time tab (see below) to view the recorded data.
- Process changes a binary file (that was downloaded from the Governor) to be converted to a CSV (comma separated values) file
- Exit close the application

# 7.1.2 Download Log

- All downloads 100% of the Governor log
- Range Prompts user for a date range that will be faster in most cases than a 100% download. If you want to get the last records recorded choose "End Date" from the "To" drop down.

#### Page 101

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#### 7.1.3 Set

• Real time clock – set the date-time of the Governor's clock

#### 7.1.4 Options

- Auto Close RT Window enables the automatic closing of the RT screen
- FW Update Auto/Manual
  - Auto automatic loading and updating of firmware after the file is selected
  - Manual prompts user for directions.

#### 7.1.5 Help

About - Version information about NAlysis

Check for Update – Takes user to NRE Calgary's website for latest NAlysis software Manual – Takes user to NRE's Calgary website for latest NAlysis manual

# 7.2 Terminal Tab

Type 'H' into the black area of the screen to get further available options

### Page 102

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		- FW Update
tuator HELP MENU		Auto
- PID Control Screen	STAT - Statistics Help	Manual
- Debug Screen	DUMP - Dump RAM Log	
- Master CAN Bus Data Monitor Screen	FD - Dump Flash Page	
- Speed & Position Screen	FT - Flash Page Time List	
- Fault Tracker	FAR - Flash Address Reset (DF)	
- EEPROM Monitor Screen	FB1 - Flash Address Block 1 (DF)	
- Analog Input Data Monitor Screen	FB2 - Flash Address Block 2 (DF)	Send
- Digital Input Monitor Screen	FP64 - Flash Address Page 64 (DF)	
- Resolver Monitor Screen	FP65 - Flash Address Page 65 (DF)	Help
- Load Regulator Monitor Screen	BBT - Create Bad Block Table	
- Ram/Flash Logging	ERASE- Erase flash	
- Calibrate Fuel Rack Position	RTCD - Dump RTC RAM	exit
- Engine Protection Info	RTCE - Erase RTC RAM	
- Engine Configuration Info	BD - Dump Tx Buffer	Clear Screen
- Stepper Motor Info	ADC - Dump Raw ADC values	
- Statistics		
		Close RT
uator 820-0441-j11-END:>		

# 7.3 WinGov Real Time Tab

Monitor real-time data by clicking the "Start" button which will toggle the text to "Stop". Press "Stop" to end real-time queries to the Governor. Note that exiting this tab to enter the Terminal tab will automatically stop the real-time queries.

# Page 103

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ystem PU Temp 50.0 Di Pressure 0.6 Vir Pressure 13.1 .R. Voltage 0.3 Start	Engine Speed (RPM)	Resolver Position Fuel Rack Position 101.11: 1.54 1.54	Control Control Drive 0 Error 269 I State 0 d State 0 Adjust Rate 2	Status Engine Shutting Down L.R. 0 RPM Setpoint 259	
igitals AV BV DV		DT	Shut Downs NO SHUTDOW	I CONDITIONS	
100			or Real Time Plot		
Actual DDM	Setpoint L.R.				
	Setpoint L.K.	CPU temp			- 12
000-					+12
900	Setbourt C.K.	CPU temp			-11 -10
000 - 900 - 800 -	Sepont LR.				-11
000 - 900 - 800 -	Setpont L.K.				-11
000 - 900 - 800 -	Seiponi L.K.				-11
000 - 900 - 800 -					-11
000 - 900 - 800 -					-11
000 - 900 - 700 - 600 - 500 - 400 -					11 10 90 80 70 70 70 50 50 40
000 - 900 - 800 - 700 - 600 - 500 - 400 -					
000 - 900 - 700 - 600 - 500 - 400 -					11 10 90 80 70 70 70 50 50 40

# 7.4 WinGov Eng Config Tab

Load, edit, save, and set the Governor's configuration.

D Settings	Engine Configuration				LR Configuration		Actuator Configuration	
P Gain (kp) 400.0	Config Name:	16-710-	G3-CN		Constant Down	14	Resolver Constant	-0.0101
Gain (ki) 0.60	Over Speed RPM:	930.0			Constant Up	2	Stepper P Term	40000
) Gain (kd) 0.0	Startup RPM:	225.0			Constant Up Low Notch	10	Stepper Rate Min	200
	Crank Control:	35.0			Max Rate Down	2	Stepper Rate Max	1500
	Min Oil Pressure:	6.0			Max Rate Up	0.3	Stepper Stallguard IScale	20
	Fixed Reference Li	ad Regulato	or:		Max Rate Up Low Notch	1		
		MAX RACK	MAX AB	RPM	Max Rate Up Low LR	0.8		
	STOP	1.64	0	0	Low LR Threshold	75		
	LOW IDLE	1.64	3	200	Min Rate Down	0.2		
gine Configuration Files	Notch-1	1.62	5 8	269	Min Rate Up	0.2		
jine Configuration Files	Notch-1 Notch-2 Notch-3		-		Min Rate Up ORS Rate Down	0.2 6		
	Notch-2	1.52	8	343	ORS Rate Down	6		
Open Save	Notch-2 Notch-3	1.52 1.38	8 10	343 490				
Open Save	Notch-2 Notch-3 Notch-4	1.52 1.38 1.30	8 10 7	343 490 568	ORS Rate Down	6		
gine Configuration Files Open Save vernor Setup Get Send	Notch-2 Notch-3 Notch-4 Notch-5	1.52 1.38 1.30 1.24	8 10 7 14	343 490 568 651	ORS Rate Down Diff Rate Down	6		

# 7.5 Diagnostic Tab

Does not apply to Governor.

# Page 104

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# 8.0 Terminal Interface

The Terminal Interface is available for NFORCE/NLIMIT systems. These are systems that do not contain the NAlysis communications drivers. The NAlysis software program only contains the program selections that allow communications between the Laptop/Computer and the NFORCE/NLIMIT system through Hyper Terminal.



# 8.1 Menu

The Menu options in this Terminal Interface are similar to the NFORCE Interface but are limited to some setting due to the absence of Nalysis communications drivers.

#### 8.1.1 File

This menu is available to User. See Section 4.1.1 for details.

#### 8. YModem

For some embedded applications like Equipment Blower Panel (EBP) and Rad Fan Panel (RFP), the Firmware Update uses a Binary option instead of the CPU (.ecm) or ST (\*.st4). In this situation, use the Binary option which uses the YModem protocol.

Nalysis 2.0 - [Nalysis V820-0530-h01 April 3, 2019]								
N File	Download Log Set Capture	Options Window	/ Help					
	Disconnect							
	Firmware Update	CPU						
	Convert •	ST						
	Make NVision DB Import Files	Binary						
	Admin							
	Exit							

When you have selected the file, the download will begin and will appear similar to this screenshot.

#### Page 105

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y 515 Z.N	) - [Nalysis V820-0:	000-1101	r April 5, 20	15]					
/ File	Download Log	Set	Capture	Options	Window	Help			
	🖳 Updating Firmv	vare							×
Term				_					_
	fStatus					_			
RI	Sending fi	le cor	tonte						
S			icenco						
*:									
*			_					38.7%	
*:				_	_	_		38.7%	
*:	L								
*:									
*:					C 7	ncel			
*:					Ca	incer			
*:[[									
	rmware Key								
	rmware Size								
	rmware CRC								
Ma	in Firmware	e wi	ll sta	rt in.	Sendi	ing L!			
	*********								
**	1) Load M					lem **			
**	2) Run Ex					**	-		
		****	*****	*****	*****	*****			
	nding 1!								
E.C.	asing Flash	1							
Rm	asing Done								
ET.	asing Done								
**	********	****	*****	*****	*****	*****			
**	Starting	Y-M	odem U	pload		**			
**	Press 'A'					**			
**	********				*****	*****			
CCO	cccccccc-	CByte	es Tra	nsferr	ed: 0				
	tes Transf								
	tes Transf								
	tes Transf								
	tes Transf								
	vtes Transf								

#### 8.1.2 Download Log

This menu is available to User. See Section 4.1.2 for details.

#### 8.1.3 Capture

This menu is available to User. See Section 4.1.4 for details.

#### 8.1.4 Set

This menu is available to User. See Section 4.1.3 for details.

#### 8.1.5 **Options**

This menu is available to User. See Section 4.1.5 for details.

#### 8.1.6 Window

This menu is available to User. See Section 4.1.6 for details.

#### 8.1.7 Help

This menu is available to User. See Section 4.1.7 for details.

### 8.2 Terminal Tab

This Terminal screen behaves similar to the Hyper Terminal screen that has all of the NForce Terminal Commands from the Help menu. Type in "h" from the terminal prompt to see the Page 106

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available commands from the system. See Terminal Interface Guide A-820-J-001-X (X = latest revision) for more details on Hyper Terminal communications.

Download L	og Set Capture Options Window Help	
al I		
		FW Update
LP MENU		<ul> <li>Auto</li> </ul>
	- Get clock value (yy/mm/dd hh:mm:ss.tt)	Manual
	- Get Diagnostics log	
	- Get Fault log	
	- Get Stats log	
	- Get FLASH Backed Up Stats Log	
[data]	- Set Real Time Clock (SC YYMMDDhhmmss)	
[data]	- Set Wheel Diameter (SD ##)	
[data]	- Set Loco ID (SI ###### 5 characters)	
: ###	- Set Extended Performance Log Download %	Help
	- Stats	
	- Fault Log	exit
	- Main Display	
	- Active Faults	Clear Screen
)	- I/O Test	
	- Load Test	Close RT
		Close R1
DRCE 820-	-0013-b11:>	

In addition, there are optional radio buttons on the right-hand side of the Terminal screen that can be used as follows:

#### 8.2.1 Help Button

Click on the Help button will bring up the Help menu from the Terminal prompt screen.

#### 8.2.2 Exit

Click on the Exit button will exit any active screen and return to the terminal prompt screen.

#### 8.2.3 Clear Screen

Click on Clear Screen will clear all the messages from the Terminal prompt screen.

#### 8.2.4 Close RT

Click on Close RT will close the Real-Time updates from system and return to the Terminal prompt screen.

<u>Note</u>: The Terminal prompt screen always has a BLACK background. Any other screen will have a WHITE background (Active screen).

#### Page 107

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#### NALYSIS USER MANUAL

Valysis - [Nalysis V820-0007-i51 May 12, 2017]	
M File Download Log Set Capture Options Window Help	_ # ×
NFORCE Real Time: Default Display (FS6) TIME: 09:42:36 DATE: 17/05/17 FAULT: NREE LAB TEST ACTIVE	FW Update     @ Auto     Manual
SPD:         0.2         Km/h         TMA:         0         MGA:         0         MGV:         0         BFA:         13           LMT:         none         TMV13:         0         TMV2:         1         ACT1:         1         ACT2:         0           HP:         0         IDEAL HP:         0         ACT3:         0         ACT4:         0           RC:         0.0 %         LR%:         98.6         LRW:         74.0         BATV:         75.0           PID:         0         WATER:         60 C         AIR:         29 C         THR:         0	
Digital Inputs: GR:L PAR:L FPC:H GR RST:L TrSeq:L AV:L BV:L CV:L DV:L GF:L WS:L LTS:L IS:R GFC:L ER:H AC1:L AC2:L MC01:L MC02:L MC03:L MC04:L Digital Outputs:	Help ext Gear Screen
TR:L AC1:L AC2:L HER:H GR RST:L GFC:L WS:L SND:L Transistion Control Status: Monitoring Speed Series FF	Close RT
'e' to exit	

### Page 108

# 9.0 Generic Screen Tabs

## 9.1 Terminal Tab

This Terminal screen is similar to the Hyper Terminal screen. Type in "H" from the terminal prompt to view the list of Terminal Commands. This list of commands varies from one application to another as shown in the following example.

Nalysis - [Nalysis V820-0007-I51 May 12, 2017]		
M File Download Log Set Capture Options Window Help		_ @ ×
		*
Terminal NForce Setup Diagnostic		
	FW Update	
HELP MENU	<ul> <li>Auto</li> </ul>	
GD - Get Diagnostics log	Manual	
GF - Get Fault log GS - Get Stats log		
FS5 - Real Time: Fault Log Monitor		
FSD - Test: I/O Test		
FSE - Test: Load Test		
NFORCE 820-0470-a00:>	Help	
	exit	E
	Clear Screen	
	Close RT	
		*

<u>Note</u>: This Tab screen only available for the NFORCE/NLIMIT applications that is supported by Hyper Terminal.

## 9.2 Diagnostic Tab

This Diagnostic screen is similar to the FS5 memory screen from Hyper Terminal. This screen has the following features that can be used for analyzing or troubleshooting the memory tables.

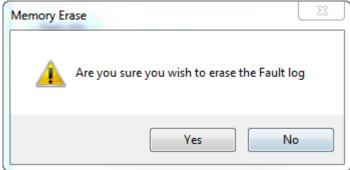
#### Page 109

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	1	2	3	4	5	6	7	8	9	-	11		13			16	h		Fault	Bank1 Flash Informat	tion			
1	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	=		EPL	Bank1 is Enabled	Status	Device ID f1f1	Maker ID ecec	Ready
2 3	ff	ff	ff	ff	ff ff	ff ff	ff	ff	ff	ff	ff	ff ff	ff	ff ff	ff	ff	H			Page 2172	Start 64	End 2752	Wrap 128	Stats: 2
4	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	L		Stats					
5	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	1	н		Bank2 Flash Informat	tion			
6	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	1	Н		Bank2 is Enabled	Status	Device ID f1f1	Maker ID ecec	Ready
7	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff		Н		Page 17317	Start 3520	End 43520	Wrap 0	Stats: (
8	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff		н		Page 17317	Start 3520	End 43520	wrap u	Stats: (
9	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff		L						
10	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff			Info	Flash Status				
11	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff			r Cal	Task: 0	Status: 0	Calit	ration Data OK	
12	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	L	1-		Version: 2.4.1				
13	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	÷			Bad Blocks: 6				
14	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	Ð							
15	ff	ff ff	Ð			Samsung 1Gb																		
16 17	-	π ff	ff	π ff	π ff	π ff	π ff	ff	ff	π ff	π ff	π ff	π ff	π ff	π ff	ff	Ð							
	ccess																							
	umbe		27					-				1		d Flas										
en	umbe		27				Previo	ous		Ne	a		Head	d Has	n									
nk N	umbe	r:	2	*								1	Rea	d RAI	м									

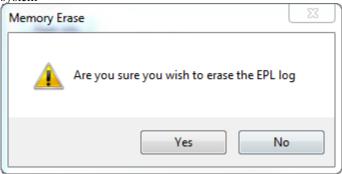
#### 9.2.1 Erase Fault

Click on the Erase Fault button and select "Yes" will erase the Fault Log from the system



#### 9.2.2 Erase EPL

Click on the Erase EPL button and select "Yes" will erase the Extended Log from the system



### 9.2.3 Erase Stats

Click on the Erase Stats button and select "Yes" will erase the Statistics Log from the system

Page 110

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Memory E	rase
<u> </u>	Are you sure you wish to erase all statistics information?
	Yes No

#### 9.2.4 Flash Info

Click on the Flash Info button will display the Flash information of the system

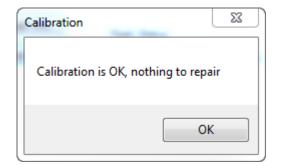
Bank1 Flash Informa	tion			
Bank1 is Enabled	Status	Device ID f1f1	Maker ID ecec	Ready
Page 176	Start 64	End 2752	Wrap 128	Stats: 2
- Bank2 Flash Informa	tion			
Bank2 is Enabled	Status	Device ID f1f1	Maker ID ecec	Ready
Page 17636	Start 3520	End 43520	Wrap 0	Stats: 0
Flash Status				
Task: 0	Status: 0	Calib	pration Data OK	
Version: 2.4.1				
Bad Blocks: 6				
Samsung 1Gb				

### 9.2.5 Repair Cal

Click on the Repair Cal button will repair the calibration table if necessary. Otherwise the following pop up window will show

### Page 111

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#### 9.2.6 **Previous**

This selection is used for trouble shooting purpose only.

#### 9.2.7 Next

This selection is used for trouble shooting purpose only.

#### 9.2.8 Read Flash

This selection is used for trouble shooting purpose only.

#### 9.2.9 Read RAM

This selection is used for trouble shooting purpose only.

## Page 112

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# 10.0 Abbreviations used in NFORCE Download Files

TIME	Time in hours, minutes, seconds and 1/10th seconds for each record.
DATE	Date in day/month/year (fault and extended logs)
2t	Alarm trainline input (attendant call.)
3t	DV throttle trainline input.
5t	Emergency Sand trainline input.
6t	Generator field trainline input.
7t	CV throttle trainline input.
8t	Forward direction trainline input.
9t	Reverser direction trainline input.
10t	Wheel slip trainline input.
10msT	gate pulse off for WS TMI 6 or WS ATMV6
12t	BV throttle trainline input.
13t	Control and fuel pump trainline input.
15t	AV throttle trainline input.
16t	Engine run trainline input.
17t	Dynamic Brake setup trainline input.
20t	Dynamic Brake warning trainline input.
21t	Dynamic Brake excite trainline input.
22t	Air Compressor Control trainline input.
23t	Manual Sand trainline input.
24t	Dynamic Brake reference voltage trainline input.
24vcb	24V control circuit breaker digital input.
26t	Ground Relay Reset trainline input.
AATS or AIR	Ambient Air temperature sensor (°C).
ABDR	Compressor 2 Air Dryer Magnet Valve digital output.
ABR	Alarm Bell coil drive digital output.
AC1P	Auxiliary Power GS1 relay digital output.
AC2P	Auxiliary Power GS2 relay digital output.
AC3P	Auxiliary Power GS3 relay digital output.
ACC	speed acceleration
acc1	Auxiliary Power GS1 contactor feedback digital input.

## Page 113

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acc2	Auxiliary Power GS2 contactor feedback digital input.
acc3	Auxiliary Power GS3 contactor feedback digital input.
ACCEL	speed acceleration multiplied by 161 then divided by 10000. Conversion to KPH acceleration.
ACCEL or ACC	Wheel acceleration (mph/s x 10).
ACINV	A/C Inverter enable digital output.
acmp1	Air Compressor 1 Over Temperature digital input.
acmp2	Air Compressor 2 Over Temperature digital input.
acomp	Air Compressor Over Temperature digital input.
acrst	A/C Reset Switch digital input.
АСТ1, АСТ2, АСТ3, АСТ4, АСТ5, АСТ6	Traction motor armature currents (Adc), 0 - 2000 A.
ACV	Auxiliary AC Bus voltage (Vac).
АНР	Auxiliary Power (hp).
aux	Auxiliary generator digital input.
AUXFL	Auxiliary Power Fault digital output.
AV, BV, CV, DV	Governor valve solenoid digital outputs.
b	B contactor feedback digital input.
В	B contactor coil digital output.
BATCT	64V battery charging current sensor, 0-200A
BC	Brake cylinder pressure sensor (PSI), 0 - 200 PSI.
BCT1, BCT2, BCT3	Grid resistor current sensors (Adc), 0 – 1000 A.
BDR	Compressor 1 Air Dryer Magnet Valve digital output.
Bf(a)	Battery field contactor feedback digital input.
BF(A)	Battery field contactor coil digital output.
BFCT	Battery field current sensor, 0-100A
BMT, BMT1, BMT2	Dynamic brake grid blower current sensor (Adc), 0 - 200 A.
br	Braking relay feedback digital input.
BR	Braking relay coil digital output.
BUZZ	NLIMIT warning buzzer digital output.
BWR	Brake warning relay digital output.
bwr	Brake warning relay feedback digital input.
c1flt	Chopper 1 Fault digital input.
C1JT	Chopper 1 Junction model temperature (°C).
c2flt	Chopper 2 Fault digital input.
C2JT	Chopper 2 Junction model temperature (°C).

c3flt	Chopper 3 Fault digital input.
СЗЈТ	Chopper 3 Junction model temperature (°C).
c4flt	Chopper 4 Fault digital input.
C4JT	Chopper 4 Junction model temperature (°C).
c5flt	Chopper 5 Fault digital input.
C5JT	Chopper 5 Junction model temperature (°C).
c6flt	Chopper 6 Fault digital input.
СбЈТ	Chopper 6 Junction model temperature (°C).
САВНТ	Cabin Heater currents (Adc), 0 - 66A.
cc1	CC1 contactor feedback digital input.
CC1	CC1 contactor coil digital output.
cc2	CC2 contactor feedback digital input.
CC2	CC2 contactor coil digital output.
cc3	CC3 contactor feedback digital input.
CC3	CC3 contactor coil digital output.
cer	Chopper enable relay digital input.
chcb	Chopper circuit breaker digital input.
CHT1	Chopper 1 base plate temperature (°C).
CHT2	Chopper 2 base plate temperature (°C).
СНТЗ	Chopper 3 base plate temperature (°C).
СНТ4	Chopper 4 base plate temperature (°C).
СНТ5	Chopper 5 base plate temperature (°C).
СНТ6	Chopper 6 base plate temperature (°C).
crl	Compressor relay feedback digital input.
CRL	Compressor relay coil digital output.
СТА	Air compressor current (Aac), 0 - 200 A.
СТВ	Equipment blower current (Aac), 0 - 200 A .
СТС	LVPS current (Aac), 0 - 200A
СТD	72 V battery charging current (Adc), 0 - 200 A.
CTE	24 V battery charging current (Adc), 0 - 200 A.
CTF	DC bus current (Adc), 0 - 2000 A.
СТБ	Fireman's Heater current (Adc), 0 - 66A.
СТН	Cabin heater currents (Adc), 0 - 66A.
D14V	D14 companion alternator voltage (Vac).
dACT	delta all traction motor currents

dact1-6	delta ACT currents
dadt	Wheel acceleration rate of change control signal.
DB%	Dynamic brake handle percentage control signal.
DBBL	Dynamic brake grid blower current (Adc), 0 - 200 A.
dbco	Dynamic brake cutout digital input.
DBTMV12	Traction motor 1&2 differential voltage in DB (Vdc), 0 - 1739 V.
DBTMV14	Traction motor 1&4 differential voltage in DB (Vdc), 0 - 1739 V.
DBTMV25	Traction motor 2&5 differential voltage in DB (Vdc), 0 - 1739 V.
DBTMV34	Traction motor 3&4 differential voltage in DB (Vdc), 0 - 1739 V.
DBTMV36	Traction motor 3&6 differential voltage in DB (Vdc), 0 - 1739 V.
dc1, dc2, dc3, dc4	Grid shorting contactor feedback digital input.
DC1, DC2, DC3, DC4	Grid shorting contactor coil digital output.
DCI	DC bus current (Adc), 0 - 2000 A.
DCV	DC bus voltage (Vdc), 0 - 1739 V.
dD14V	Companion alternator output voltage rate of change, volts AC / s.
dMGV	Change (delta) in generator voltage.
dTMI	Change (delta) in average traction motor current.
dtmi1-6	filtering of ACT input signals
dtmv1	Change (delta) TMV input
DUTY1	DC chopper 1 duty cycle output (% x 100).
DUTY2	DC chopper 2 duty cycle output (% x 100).
DUTY3	DC chopper 3 duty cycle output (% x 100).
DUTY4	DC chopper 4 duty cycle output (% x 100).
DUTY5	DC chopper 5 duty cycle output (% x 100).
DUTY6	DC chopper 6 duty cycle output (% x 100).
ebc	Equipment blower contactor feedback digital input.
EBC	Equipment blower contactor coil digital output.
ECMP	Engine computer main power relay digital output.
efcut	effective cut (RC cut)
efs	Engine filter switch digital input.
EOPT	Engine Oil Pressure Transducer (psi), 0 – 200 psi.
EOTS	Engine Oil Temperature Sensor (°C).
EPDO	Engine Protection Defeat digital output.
EXC LMT	Excitation limit message. This field is loaded by any control module that is limiting or reducing rate charging for a specific reason. Please see the operating manual for a complete list of possible excitation

	reduction messages possible.
EXCL, EXCU and EXC3 (or EXC1-16, EXC17-32 or EXC33- 48)	excitation limit message can only display most recent message, although more than one can be active at a time. We can decode these hex numbers to analyze for multiple active limits
fbmcb	Filter blower circuit breaker digital input.
fc1, fc2, fc3	Fan contactor feedback digital input.
FC1, FC2, FC3	Fan contactor coil driver digital output.
fcfa	Equipment blower high speed FCFA contactor feedback digital input.
fcfb	Equipment blower high speed FCFB contactor feedback digital input.
FCFR	Equipment blower high speed contactor coils digital output.
fcs	Equipment blower low speed contactor feedback digital input.
FCSR	Equipment blower low speed contactor coil digital output.
FLT1-5	Active faults, used to see when faults are set. You will see full messages for these in the fault and EPL logs.
fpc	Fuel pump control digital input.
fpcr	Fuel pump control relay digital input.
Fs, fs1a, fs1b, fs2a, fs2b	Field shunt contactor feedback digital input.
FS, FS1A, FS1B, FS2A, FS2B	Field shunt contactor coil digital output.
FTRt	forward transition recovery time
FTSF	forward sand magvalve control
FUEL	NGAUGE Fuel Level.
fvs	Filter Vacuum Switch digital input.
FW_R	firmware revision number
FW_V	firmware version number
FWVER	Firmware version installed at that instance of the record
g1brk	GS1 main circuit breaker digital input.
G1EE	GS1 engine enable digital output.
g1fan	GS1 fan control relay digital input.
g1fcb	GS1 filter fan breaker digital input.
G1FLT	GS1 fault digital output.
G1H20	GS1 water temperature (°F)
g1oil	GS1 oil level digital input.
g1ots	GS1 rectifier over temperature digital input.
G1P1I	GS1 phase 1 current (Aac), 0 - 2000 A.
G1P3I	GS1 phase 1 current (Aac), 0 - 2000 A.
G1PSI	GS1 oil pressure (PSI).

G1RPM	GS1 rpm.
G1SRV	GS1 service engine digital output.
G1STA	GS1 engine start digital output.
G1VRO	GS1 voltage regulator on digital output.
g2brk	GS2 main circuit breaker digital input.
G2EE	GS2 engine enable digital output.
g2fan	GS2 fan control relay digital input.
g2fcb	GS2 filter fan breaker digital input.
G2FLT	GS2 fault digital output.
G2H20	GS2 water temperature (°F)
g2oil	GS2 oil level digital input.
g2ots	GS2 rectifier over temperature digital input.
G2P1I	GS2 phase 1 current (Aac), 0 - 2000 A.
G2P3I	GS2 phase 1 current (Aac), 0 - 2000 A.
G2PSI	GS2 oil pressure (PSI).
G2RPM	GS2 rpm.
G2SRV	GS2 service engine digital output.
G2STA	GS2 engine start digital output.
G2VRO	GS2 voltage regulator on digital output.
g3brk	GS3 main circuit breaker digital input.
G3EE	GS3 engine enable digital output.
g3fan	GS3 fan control relay digital input.
g3fcb	GS3 filter fan breaker digital input.
G3FLT	GS3 fault digital output.
G3H20	GS3 water temperature (°F)
g3oil	GS3 oil level digital input.
g3ots	GS3 rectifier over temperature digital input.
G3P1I	GS3 phase 1 current (Aac), 0 - 2000 A.
G3P3I	GS3 phase 1 current (Aac), 0 - 2000 A.
G3PSI	GS3 oil pressure (PSI).
G3RPM	GS3 rpm.
G3SRV	GS3 service engine digital output.
G3STA	GS3 engine start digital output.
G3VRO	GS3 voltage regulator on digital output.
GATE	SCR Gate fire analog output, (0 - 4095).

gfa	Generator field contactor feedback digital input.
GFA	Generator field contactor coil digital output.
gfc	Generator field contactor feedback digital input.
GFC	Generator field contactor coil digital output.
GFCT	Generator field current sensor (Adc), 0 - 200A.
gfd	Generator field decay contactor feedback digital input.
GFD	Generator field decay contactor coil digital output.
gr	Ground relay digital input.
GRCNT	Ground relay events count while motoring.
grco	Ground relay cutout switch digital input.
GRID1, GRID2, GRID3	Grid 1 current sensor (Adc), 0 - 1000 A.
GRN	NLIMIT Green indicator led digital output.
grrst	Ground relay reset switch digital input.
GRRST	Automatic ground relay reset coil digital output.
grrst	ground relay reset switch
GVSR	Governor Servo relay coil digital output.
hbap	Hand brake applied digital input.
hbrl	Hand brake released digital input.
hdrst	Headlight reset switch digital input.
her	Hot Engine relay feedback digital input.
HER	Hot Engine relay coil digital output.
hlrst	headlight reset switch
HOLD 1 and 2	hold gate
HPLAT	traction power prior to gate hold
IDEAL	Ideal brake power (hp).
Idiff	differential between minimum and maximum ACT readings
	state of idle limit control, standby, restart, pre S/D, shutdown,
Idle limit	disabled
iout1	4-20mA control output, may be used to drive NFIELD BFD
ips	Independent pressure switch digital input.
is	Isolation switch status digital input.
J ACT	J1939 engine communication activity.
JOK	J1939 engine communication OK.
ldsnd or ldsd	Lead truck sand switch digital input.
los	Governor low oil switch digital input

LR	Engine load regulator % of maximum field, 0-100%.
LRW	Engine load regulator wiper voltage (Vdc), 0-80 V.
lsc	Load shed contactor coil digital output.
LSC	Load shed contactor feedback digital input.
lssw	Yard mode selector switch digital input.
lt1, lt2, ltt1, ltt2	Load test transfer contactor feedback digital input.
LTR	Load test transfer pilot relay coil digital output.
ltsw or lttsw	Load Test selector switch digital input.
LTT1, LTT2	Load test transfer contactor coil digital output.
lvflt	LVPS fault digital input.
LVPS	LVPS power (hp).
m1	M1 contactor feedback digital input.
M1	M1 contactor coil digital output.
m2, m3, m4, m5, m6	M contactor feedback digital inputs.
maxD and MaxD1	Maximum differential traction motor current in WS recovery
mb-b	Braking position switchgear feedback digital input.
mb-m	Motoring position switchgear feedback digital input.
mco1, , mco6	Traction motor cutout solenoid feedback digital inputs.
MCO1,, MCO6	Traction motor cutout solenoid drive digital outputs.
mco16, mco25, mco34,	Traction motor cutout solenoid feedback digital inputs.
mco43, mco52, mco61	Traction motor cutout solenoid feedback digital inputs.
MCOR	Traction motor cutout relay coil digital output.
mcos1,, mcos6	Traction motor cutout request switch digital inputs.
mcosw	Motor cutout switch
mcs16, mcs25, mcs34	Traction motor cutout switch digital inputs.
MFR	Motor fail relay coil digital output.
MGA	Main generator output current (Adc), 0 – 4800 A.
MGCT	Main generator output current sensor (Adc), 0 – 2000 A.
MGV	Main generator output voltage (Vdc), 0 – 1250 V.
minD, minD1	Minimum differential traction motor current in WS recovery, D1 is at 10ms
mmd1-6	Minimum/maximum differential traction motor current
MR	Main air reservoir pressure (PSI), 0 - 200 PSI.
MR2PT	Secondary air reservoir pressure (psi), 0 – 200 psi.
MRPT	Main air reservoir pressure (psi), 0 - 200 psi.

msand	Manual sand trainline digital input.
mtr	Motor relay feedback digital input.
MTR	Motor relay coil digital output.
MTRA	Motor 1-3 relay coil digital output.
MV1SF	Forward truck lead axle sanding magnet valve digital output.
MV1SR	Forward truck rear axle sanding magnet valve digital output.
MV2SF	Rear truck lead axle sanding magnet valve digital output.
MV2SR	Rear truck leading axle sanding magnet valve digital output.
MVBD	Compressor blow down magnet valve drive digital output.
MVCC	Compressor control magnet valve drive digital output.
MVFC	Fan clutch magnet valve drive digital output.
MVSH	Fan shutter magnet valve drive digital output.
NHC	Heater contactor drive digital output.
nsr	No speed relay feedback digital input.
NSR	No speed relay coil digital output.
ovrd	Idle limit override switch
p1,, p6	P contactor feedback digital inputs.
P1,, P6	P contactor coil digital outputs.
p12, p25, p34	P contactor feedback digital inputs.
P25, P34	P contactor coil digital outputs.
ра	Local control breaker digital input.
Parallel	P contactor feedback digital input.
pcr	Pneumatic control relay digital input.
pcs	Pneumatic control switch digital input.
PID	Excitation magnitude of change control signal.
plst2	pulse gate off timer
PRIME or PMR	Engine Prime drive digital output.
prog	Chopper programming digital input.
rate	Loading rate at instance of record (% x 10).
RC	Rate Control excitation control signal, 0-100%.
rcl	Remote system active digital input.
RED	NLIMIT Red indicator led digital output.
RPM	Engine rpm.
RTSR	Reverse sand magvalve control
run	Isolation switch status digital input.

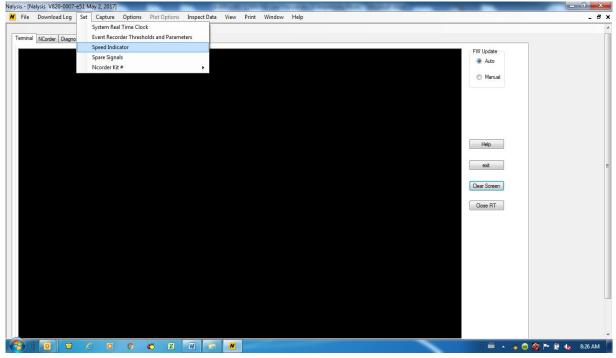
rv1, , rv6	Forward reverser contactor feedback digital inputs.
rvf	Reverser pilot relay feedback digital input.
RVF	Reverser pilot relay coil digital output.
rv-f	Forward reverser switchgear interlock digital inputs.
rvf16, rvf25, rvf34	Forward position reverser switchgear interlock digital inputs.
rvr	Reverser pilot relay feedback digital input.
RVR	Reverser pilot relay coil digital output.
rv-r	Reverse reverser switchgear interlock digital input.
rvr43, rvr52, rvr61	Reverse position reverser switchgear interlock digital inputs
s13,s14,s16,s24,s25,s34,s36	Series-parallel contactor feedback digital input.
\$13,\$14,\$16,\$24,\$25,\$34,\$ 36	Series-parallel contactor drive digital output.
SAND	Sanding relay digital output.
sb	Series bridge contactor feedback digital input.
SB	Series bridge contactor drive digital output.
sdovr	Shutdown override switch digital input.
sf	Generator shunt field contactor feedback digital input.
SF	Generator shunt field contactor coil digital output.
shpc	Shore power contactor digital input.
shpr	Shore power pilot relay digital input.
SLOWR	Code to show reason NFORCE is applying a slow control rate (PID to 100)
spc	Spotter contactor feedback digital input.
spot	Spotter switch digital input.
SPR	Spotter contactor coil digital output.
sprD, sprD1	Maximum differential TMI minus minimum differential TMI (spread differential), and spread differential at 10 ms
SPx10	Locomotive ground speed as detected by the axle generator (mph x 10).
SSR	Slow Speed relay coil digital output.
START	Engine start digital output.
start	Engine start switch digital input.
STOPC	Code to show reason NFORCE is applying stop charge (PID to zero)
TCO 1	Truck 1 cutout indicator light digital output.
TCO 2	Truck 2 cutout indicator light digital output.
THOLD	Gate hold due to TMV slip correction

ТНР	Traction power (hp).			
THROTTLE	Control stand throttle position.			
tlpr	Turbo lube pump relay digital input			
TLPR	Turbo lube pump relay drive digital output			
ТМІ	Average traction motor armature current			
TMI1,, TMI6	Traction motor armature currents (Adc), 0 - 2000 A.			
tmigp	Gate pulse timer for WS TMI 1-4			
TMT1,, TMT6	Traction motor modeled temperatures (°C).			
TMV1	Traction motor 1 voltage (Vdc), 0 - 1739 V.			
TMV1,, TMV6	Traction motor voltages (Vdc), 0 - 1739 V.			
TMV12	Traction motor 1&2 differential voltage (Vdc), 0 - 1739 V.			
TMV14	Traction motor 1&4 differential voltage (Vdc), 0 - 1739 V.			
TMV2	Traction motor 2 voltage (Vdc), 0 - 1739 V.			
TMV25	Traction motor 2&5 differential voltage (Vdc), 0 - 1739 V.			
TMV34	Traction motor 3&4 differential voltage (Vdc), 0 - 1739 V.			
TMV36	Traction motor 3&6 differential voltage (Vdc), 0 - 1739 V.			
TMVAV	Average traction motor armature voltage (Vdc), 0 - 1739 V.			
TR	Transition relay coil digital output.			
trks1	Truck 1 cutout request switch digital inputs.			
trks2	Truck 2 cutout request switch digital inputs.			
VRC	Voltage regulator change relay coil digital output.			
WATER	Engine radiator coolant temperature (°F).			
WLR	Wheel slip light relay coil digital output.			
YEL	NLIMIT Yellow indicator led digital output.			

# 11.0 Speed Indicator Setting:

- Ensure the locomotive is stopped.
- NALYSIS must establish communications with the Speed Indicator before any communication operation can be completed. This is done by connecting the communications (or download) cable (NRE P/N: 058-0001-000) from the Speed Indicator's communication port (Lemo connector on the back of the speed indicator) to a portable computer (or Laptop).
- > Launch NCORDER NALYSIS and select "Speed Indicator" from the Set pulldown menu.

#### Select Set->Speed Indicator



#### Page 124

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For Imperial Units, the following panel will be displayed

Speed Indicator Settings	×	(
[		
Overspeed (MPH) 60		
Wheel Diameter (in) 4	0.0 ≑	
Pulses/rev (ppr) 6	0 ~	
Units		
• Metric O Imper	ial	
Penalty Recovery Options	5:	
0 Speed LATCH	$\sim$	
Cancel	Send	

- Locomotive Overspeed can be set between 20 and 100 MPH (32-160 KPH)
- Wheel Diameter can be set between 32.0" and 47.0" (813 mm and 1192 mm)

For Metric Units, the following panel will be displayed

🖶 Speed Indicator Settings		×		
Overspeed (KPH)	90	÷		
Wheel Diameter (mm)	1046	÷		
Pulses/rev (ppr)	60	~		
Units				
O Metric 🛛 Imp	erial			
Penalty Recovery Optic	ons:			
1.6 KPH Window		~		
Cancel	Se	nd		
Locomotive Oversp	eed can l	be set l	between 20	) ;

Locomotive Overspeed can be set between 20 and 100 MPH (32-160 KPH) Page 125

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Wheel Diameter can be set between 32.0" and 47.0" (813 mm and 1192 mm)

# 12.0 Customer Support

For general questions regarding the Analysis/Download Software program, contact NRE Calgary technical support personnel.

Before contacting NRE Calgary with questions about this product or any of its ancillary equipment, carefully review the contents of this guide. If you are unable to find an explanation for problems with your equipment, gather the following information prior to contacting NRE Calgary:

- The *System* Type (NFORCE, NCORDER, NCOMPASS, WinGov, or NLIMIT) and Part Number that is experiencing problems
- The version number of the System Internal Operating Firmware
- The serial number of the *System*
- The type of locomotive with the installed System
- The version number of the Nalysis software program
- The type of Laptop/Computer being used
- A detailed description of the problem(s)

#### NRE Calgary Co.

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#### Page 126

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