

LUIS Gen3 Introduction

Three User Can Buses, All Autobaud!

RHOHM Rheostat Module Option

Closed Loop Vehicle Speed

No More USB Hub!

Improved Communications Reliability

Upgrade from Gen2 for \$4692



- HARDWARE CHANGES
- SOFTWARE CHANGES
 - GUI CONTROLS
 - HOME SCREEN
 - BEHIND THE SCENES
- GUI CONTROLS EXPLAINED
- HOME SCREEN TOOLS EXPLAINED
- WAVEMAKER SERVER
- SERVER PROPERTY
- GEN2 TO GEN3 CONVERSION
- USING GEN2 HW WITH GEN3 APP
- CONTACT INFO & PRICING

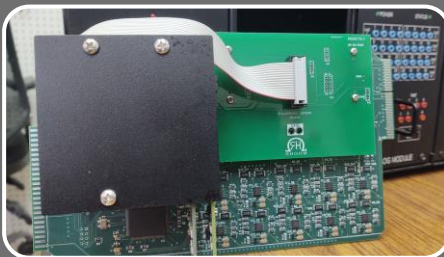
TOPICS OF DISCUSSION

GEN3 HARDWARE



Completely Revised Main Module

- New, significantly more powerful controller
- Eliminated internal USB hub (highest failure point)
- No relays, all solid state switching for increased reliability and repeatability
- 3 user CAN buses, all with auto baud rate detection and live status indication
- Improved serviceability with slide out PCB's similar to other modules



WaveMaker Control Board Replaced

- Dedicated controller board replaced with ribbon cable adapter to Main Module
- Improved PC communications reliability
- Removed USB connection; separate USB driver not required
- Centralized communications
- Eliminated processor EOL (End Of Life) issue
- Closed loop CAN bus now can be used to broadcast LUIS J1939 Sensor Data



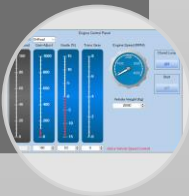
Rheostat Module Gen3 Option

- 16 channels available per module, up to 4 modules in a system
- Resistance range: 10 Ω – 1 M Ω , step size approximately 1 Ω
- Output can be set to open circuit for OOR testing
- Accurately simulates all known resistive element sensor types (pulled up or down)
- Voltage/Current protection: 24.5V/75mA
- Resistance channels are electrically bidirectional and support parallel/series channel chaining

GUI CONTROLS

- Formerly Closed Loop Control
- Select OnRoad or Industrial type (OnRoad links engine speed to vehicle speed, only on Gen3 hw)
- OnRoad Features: Define transmission gear ratio tables, set vehicle weight, set terrain grade
- Default gear ratio tables included for 8, 9, 10, 13 speed transmissions

Engine Control Panel



- Select tailshaft sensor type (Hall, VR, SPN 161, SPN 1623)
- Define rear axle ratio
- Define tire size
- Set units (metric or SAE)
- Set tone wheel teeth/rev
- Can be used in open loop or closed loop modes (only on Gen3 hw)

Vehicle Speed Control



- Select from user defined accelerator profiles (such as single APS, dual APS, IVS, Frequency throttle, PWM throttle, J1939, etc)
- Switch between profiles via drop down list
- Channel selection, interlocks, message setup all defined in profiles which can be exported/imported

Accelerator Control



- Access to all bits/parameters
- Selectable broadcast rate
- Assign to user CAN bus A, B, or C
- Switch to enable/disable broadcast

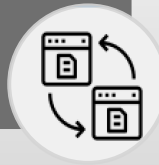
TSC1 Control



HOME SCREEN

- Convert config file controls from Gen2 to Gen3
- Convert config file controls from Gen3 to Gen2
- Results shown in window for clarity

Convert to
New Server



- Define accelerator profiles
- Several default examples included

Accelerators



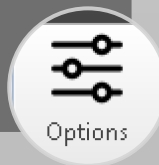
- Shows user CAN bus speeds and status
- Network server capable

Server List
(revised)



- Set default server (ie Gen2, Gen3, Network Server, etc)
- New controls placed on screen will be set to use the default server automatically

Options
(revised)



- Several fully defined default messages now included
- Icons to help distinguish rx/tx definitions

Datalink
Sensors
(revised)



- Device tree is now auto-expanded to show all modules
- When new firmware file is selected, text box shows what device the new file is valid for

Devices
(revised)



BEHIND THE SCENES

New LUIS Gen3 USB Driver

- More robust communications between PC and Gen3 hardware

Install/Uninstall Issues Addressed

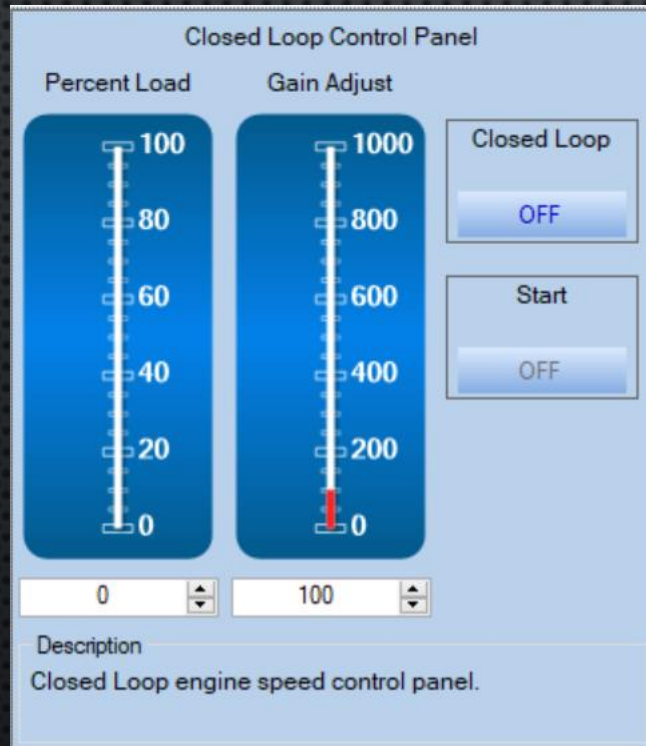
- Significant effort and tools expense invested to resolve issues with installation and removal
- New rev can be installed over existing Gen3 rev without need to uninstall previous Gen3 rev
- Gen2 must be manually uninstalled before installing Gen3
- Any issues with Gen2 manual uninstall can be resolved with installer guidance

Coming Soon

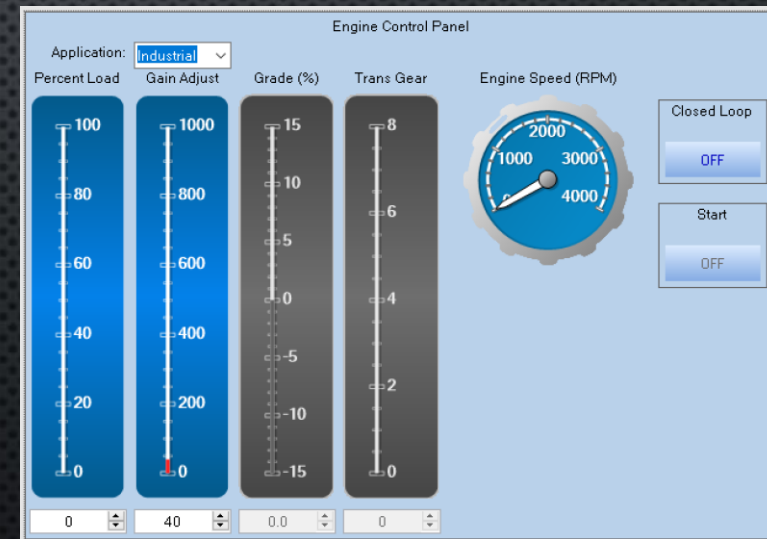
- Play back feature!
- LUIS Network Servers – Network capable control of LUIS Gen3 units with the ability to control several LUIS Gen3 simultaneously through local network connectivity. Additional hardware required.

CLOSED LOOP CONTROL → ENGINE CONTROL PANEL

LUIS GEN2

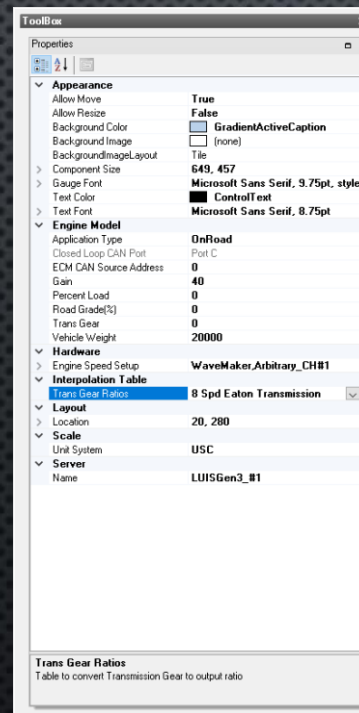
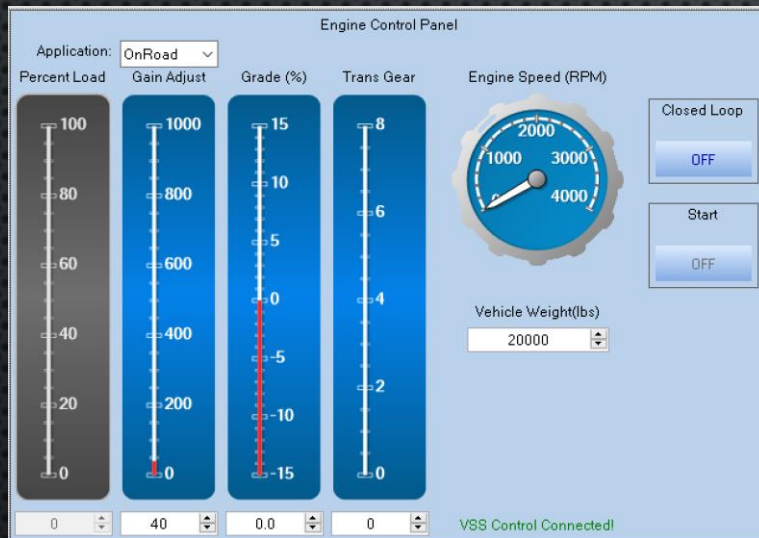


LUIS GEN3 (INDUSTRIAL)

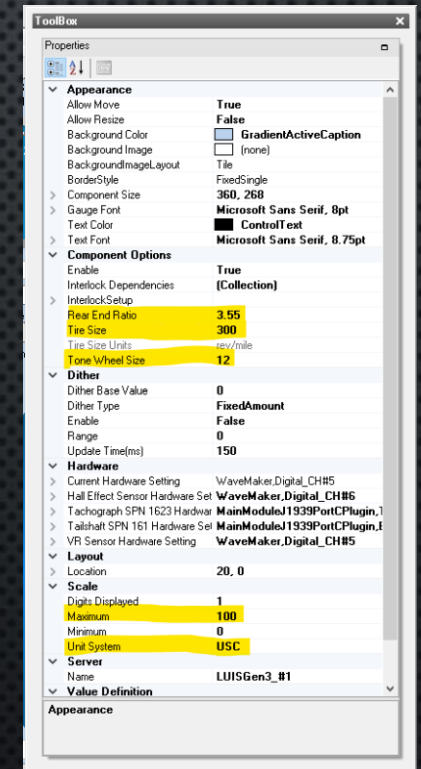
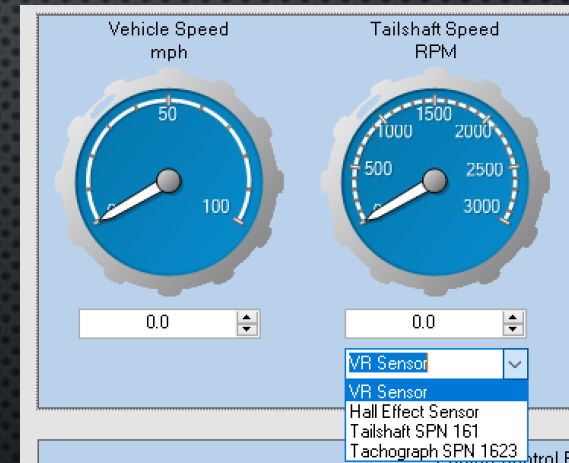


ONROAD CLOSED LOOP APPLICATION (REQUIRES GEN3 HW)

ENGINE CONTROL PANEL



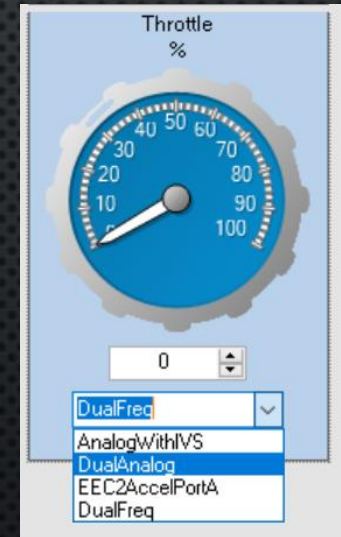
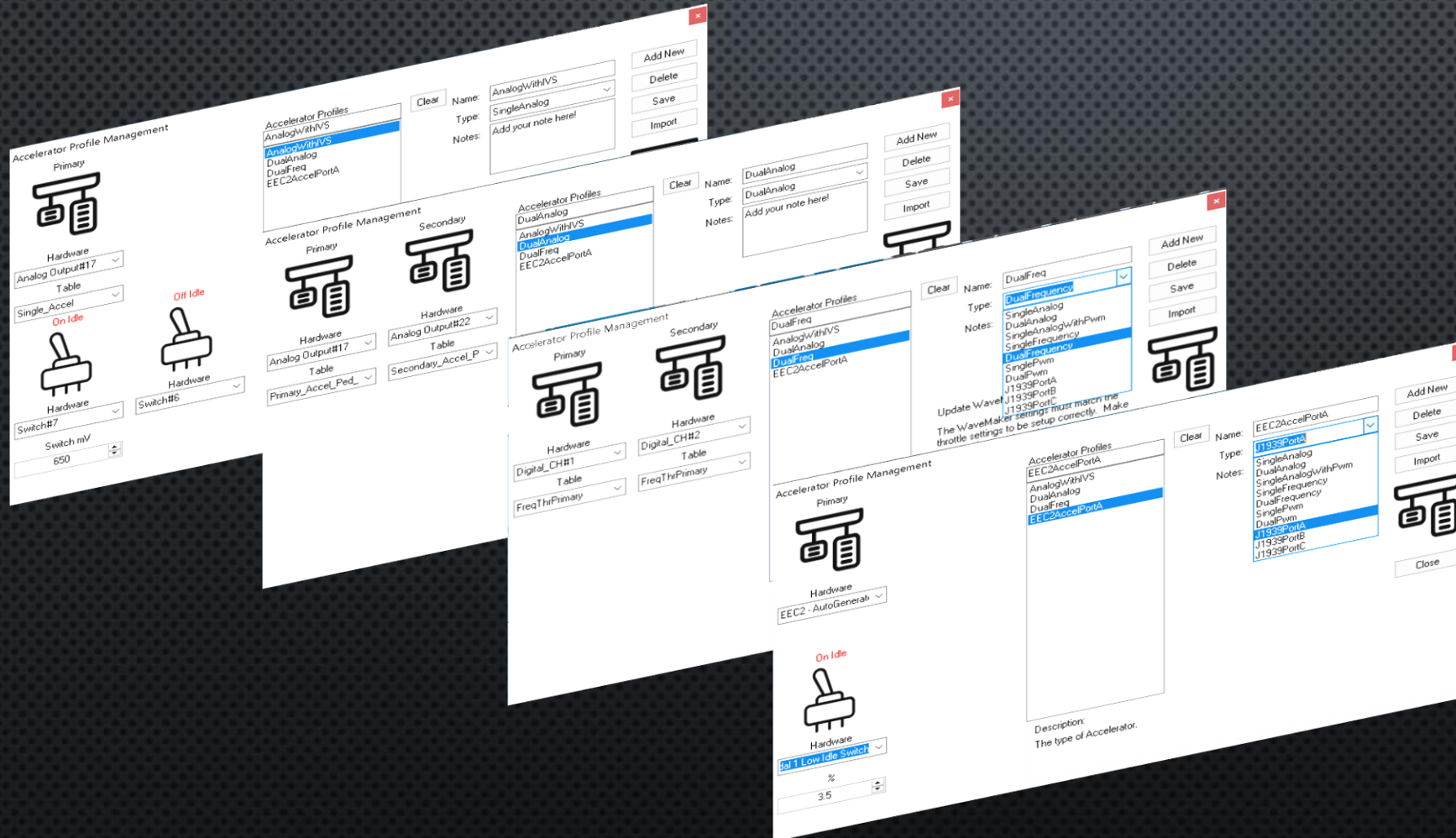
VEHICLE SPEED CONTROL



ACCELERATOR

PROFILES

CONTROL



TSC1

GUI CONTROL

Torque/Speed Control#1			
Speed Control/Limit	0.000	RPM	SPN 898
Torque Control/Limit	0	%	SPN 518
Control Purpose	P1_Accel_Oper		SPN 3350
Torque-High Res	p000	%	SPN 4191
Control Mode Priority	Highest		SPN 897
Control Conditions	Transient_Disen		SPN 696
Control Modes	Disabled		SPN 695
Broadcast Rate	ms_10	ms	SPN 3349
Counter	15	<input type="checkbox"/> Enable	SPN 4206
Checksum	3	<input checked="" type="checkbox"/> Enable	SPN 4207
Source Address	0		
Destination Address	0		
Broadcast Enable	<input type="checkbox"/>		SAE J1939

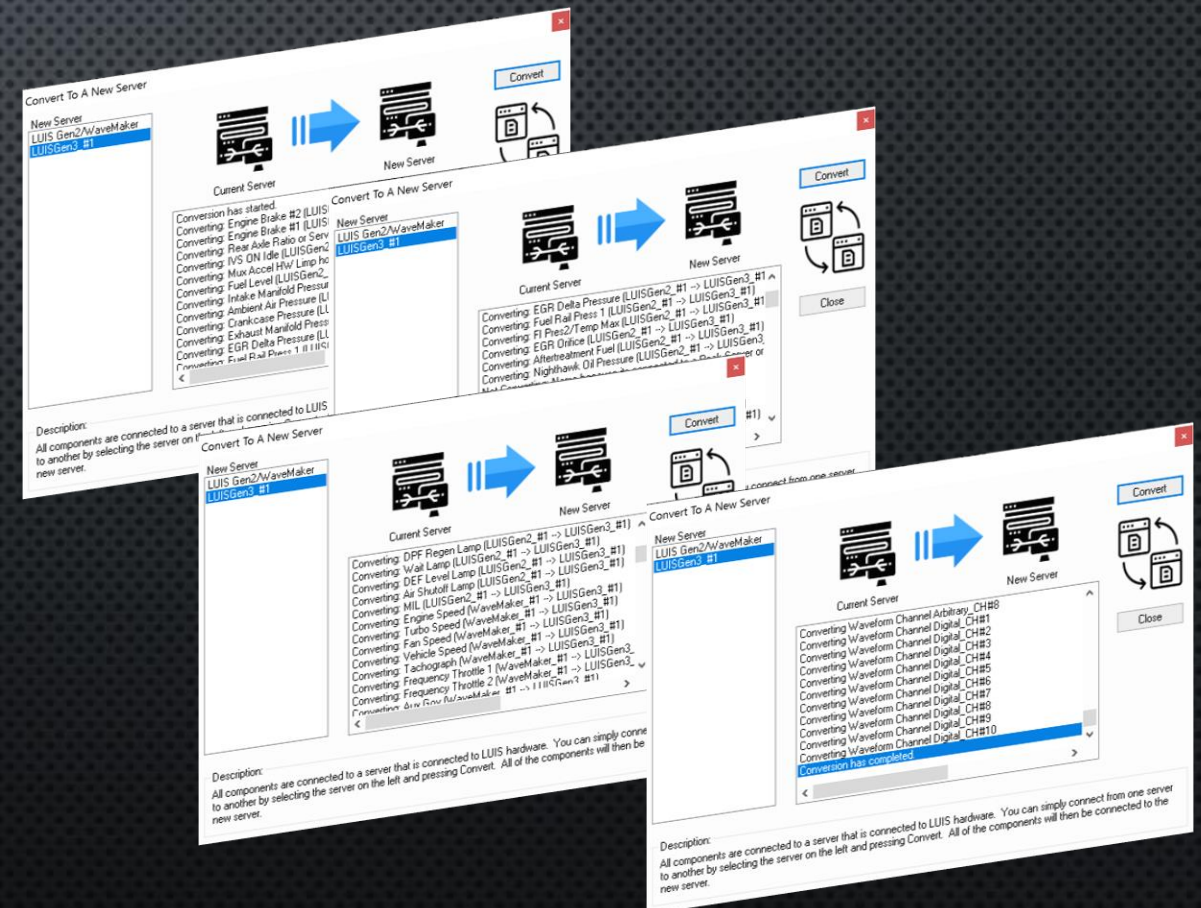
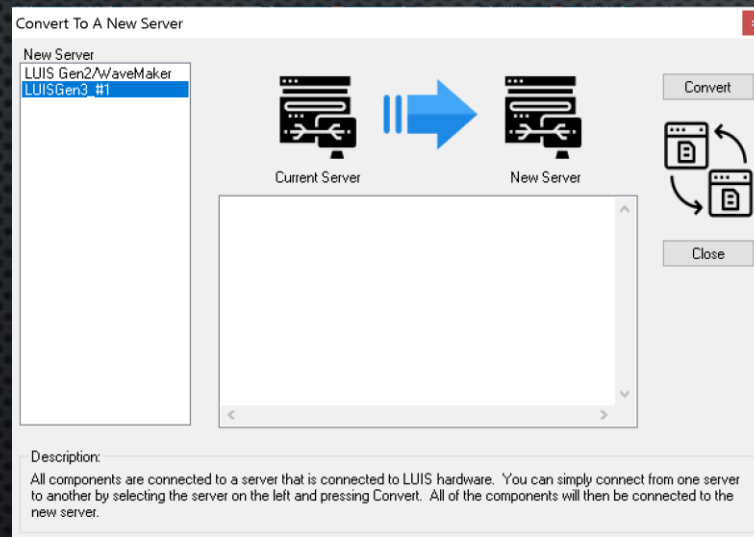
PROPERTIES

Properties	
Appearance	
Allow Move	True
Allow Resize	False
Background Color	GradientActiveCaption
Background Image	(none)
BackgroundImageLayout	Tile
BorderStyle	FixedSingle
Component Size	370, 357
ForeColor	ControlText
Text Font	Microsoft Sans Serif, 8.75pt
Component Options	
Interlock Dependencies	(Collection)
InterlockSetup	
Dither	
Dither Base Value	0
Dither Type	FixedAmount
Enable	False
Range	0
Update Time(ms)	100
Hardware	
Hardware Setup	MainModule1939PortCPlugin.TSC1 - AutoGen
Layout	
Location	680, 20
Server	
Name	LUISGen3_#1
Value Definition	
Checksum Enable	True
Control Mode Priority	Highest
Control Modes	Disabled
Control Purpose	P1_Accel_Operator
Counter Enable	False
Destination Address	0
Requested Speed Control Conditions	Transient_Disengaged_Non_Lockup_Conditio
Requested Speed Limit	0.000
Requested Torque - High Resolution	p000
Requested Torque Limit	0
Transmission Rate	ms_10
TSC1 Enable	False
Appearance	

CONVERT TO NEW SERVER

START CONVERSION ON LOADED
CONFIG FILE

RESULTS



SERVER LIST

LUIS GEN2

LUIS GEN3 CONNECTED TO
GEN2 HW

Server Management

Servers

- LUISGen2_#1
- LUISGen2_#1
- WaveMaker_#1

Name: LUISGen2_#1

Server Type: LUIS Gen2

Interface Type: Pipe

Pipename: LUISGen2_#1

IP Address: 127.0.0.1

Port: 0

Description: Standard Pipe connection to Server

NetName: Cummins_Net

Status: Connected

Buttons: Add New, Delete, Save, Close, Reconnect

Description:
Create or Add Servers to be used in the configuration. To Add a Server, click Add and give it a name. Configure and click Save.

Server Management

Servers

- LUISGen2_#1
- LUISGen2_#1
- WaveMaker_#1
- PeakAdapter_#1
- LUISGen3_#1

Name: LUISGen2_#1

Server Type: LUIS Gen2

Pipename: LUISGen2_#1

Network Address: 127.0.0.1

Network Port: 0

Description: Standard Pipe connection to Server

NetName: Cummins_net

CAN Baud (Port A): 250000

CAN Baud (Port B): 250000

CAN Baud (Port C): 250000

Status: Connected

Buttons: Add New, Delete, Save, Reconnect, Close

Description:
Create or Add Servers to be used in the configuration. To Add a Server, click Add and give it a name.

SERVER LIST

(STATUS IS REFRESHED BY CLICKING ON **LUISGEN3_#1**)

LUIS GEN3, ECM OFF

CAN A , B, C HAVE LISTEN-ONLY STATUS (BLUE) AT 500K

LUIS GEN3, ECM ON

CAN A, B ARE LISTEN ONLY (NO DEVICES PRESENT TO ACK OR TX/RX)

CAN C HAS CONNECTED STATUS (GREEN) AT 500K

Server Management

Servers

LUISGen3_#1	Name: LUISGen3_#1	Add New
LUISGen2_#1	Server Type: LUIS Gen3	Delete
WaveMaker_#1	Pipename: LUISGen3_#1	Save
PeakAdapter_#1	Network Address: 127.0.0.1	
LUISGen3_#1	Network Port: 0	
	Description: Standard connection to Server	
	NetName: Cummins_net	
	CAN Baud (Port A): 500000	Reconnect
	CAN Baud (Port B): 500000	Connected
	CAN Baud (Port C): 500000	Listen Only
	CAN Baud Auto Detected	Bus Error
	Status: Connected	Close

Description:
Create or Add Servers to be used in the configuration. To Add a Server, click Add and give it a name.

Server Management

Servers

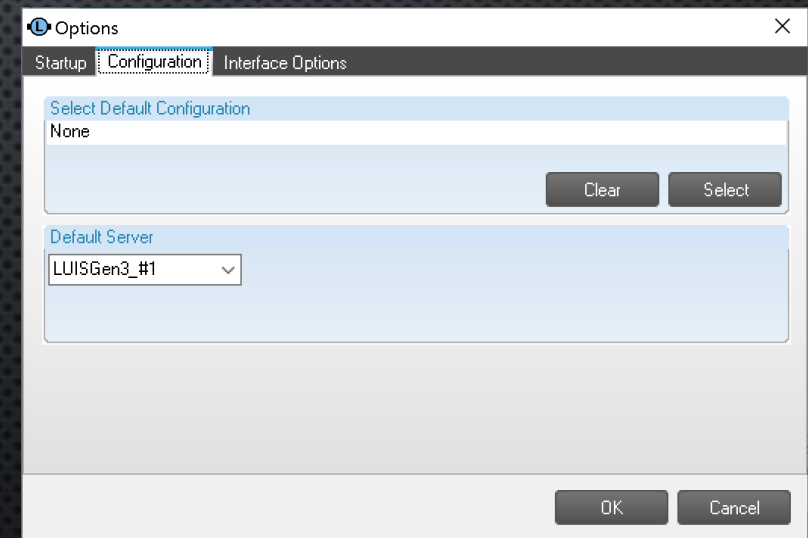
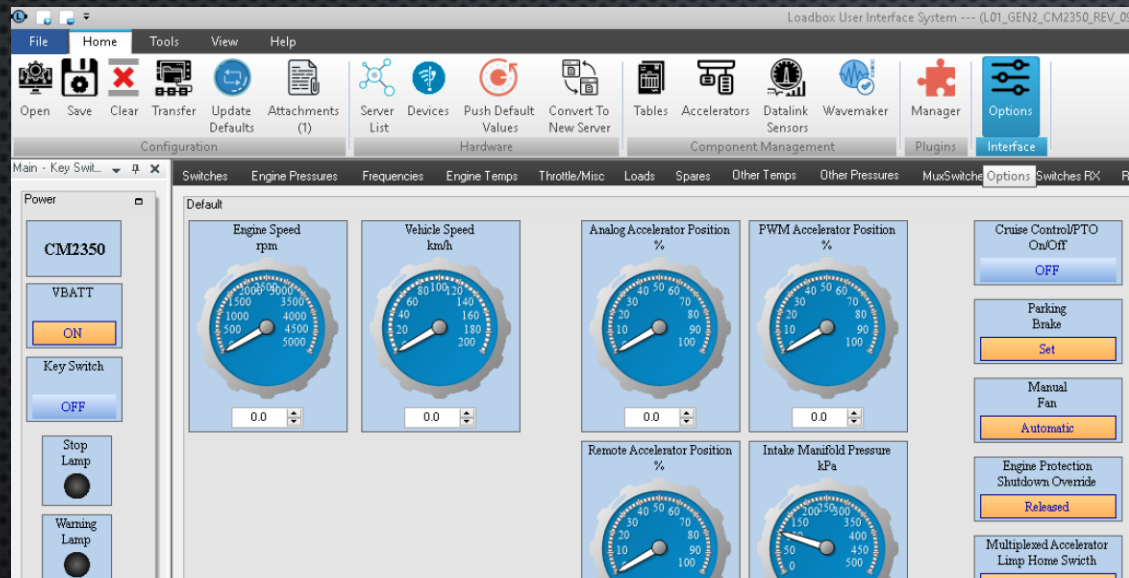
LUISGen3_#1	Name: LUISGen3_#1	Add New
LUISGen2_#1	Server Type: LUIS Gen3	Delete
WaveMaker_#1	Pipename: LUISGen3_#1	Save
PeakAdapter_#1	Network Address: 127.0.0.1	
LUISGen3_#1	Network Port: 0	
	Description: Standard connection to Server	
	NetName: Cummins_net	
	CAN Baud (Port A): 500000	Reconnect
	CAN Baud (Port B): 250000	Connected
	CAN Baud (Port C): 500000	Listen Only
	CAN Baud Auto Detected	Bus Error
	Status: Connected	Close

Description:
Create or Add Servers to be used in the configuration. To Add a Server, click Add and give it a name.

OPTIONS

TOOLBAR LOCATION

SELECT DEFAULT SERVER FOR NEW
GUI CONTROLS



DATALINK SENSORS

TRANSMIT EXAMPLE


Datalink Sensor Simulation Management

Message Definition:

Name: TSC1 - AutoGenerated Do Not Modify

Desc: Torque/Speed Control 1

ID: 201326592 Hex: 0C000000

Rate: 10 ms ☒ Transmit ☐ Receive via Peak Adapter 

Length: 8 bytes ☐ Receive via Peak Adapter

Message Parameter Definition:


Name: SPN 695 - Engine Override

Start Bit: 1

Length: 2 bits

Resolution: 1

Offset: 0



AMB - Ambient Conditions
AT115 - Aftertreatment 1 Service
AT11T11 - Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Information
CDVS1 - Cruise Control/Vehicle Speed 1
CM1 - Cab Message 1
DD - Dash Display
DLCC1 - Direct Lamp Control Command 1
DPFC1 - Diesel Particulate Filter Control 1
EBC1 - Electronic Brake Controller 1
EEC1 - Electronic Engine Controller 1
EEC2 - AutoGenerated Do Not Modify
EFL/P1 - Engine Fluid Level/Pressure 1
EDI - Engine Operating Information
ET1 - Engine Temperature 1
ETC1 - AutoGenerated Do Not Modify
FD1 - Fan Drive 1
ICI - Intake/Exhaust Conditions 1
PTO - Power Takeoff Information
SHUTDN - Shutdown
Tachograph - AutoGenerated Do Not Modify
TSC1 - AutoGenerated Do Not Modify

SPN 695 - Engine Override Control Mode
SPN 636 - Reg Speed Conditions
SPN 897 - Control Mode Priority
SPN 898 - Speed Limit
SPN 518 - Torque Limit
SPN 3349 - Transmission Rate
SPN 3350 - Control Purpose
SPN 4191 - Torque High Res
SPN 4206 - Message Counter
SPN 4207 - Message Checksum

Byte	Start Bit
1	1
2	9
3	17
4	25
5	33
6	41
7	49
8	57

Description:
These are the Messages that can be broadcasted from the LUIS device.

RECEIVE EXAMPLE


Datalink Sensor Simulation Management

Message Definition:

Name: EEC1 - Electronic Engine Controller 1

Desc: Engine related parameters

ID: 217056256 Hex: 0CF00400

Rate: 20 ms ☐ Transmit ☒ Receive via Peak Adapter 

Length: 8 bytes ☒ Receive via Peak Adapter

Message Parameter Definition:


Name: SPN 899 - Engine Torque

Start Bit: 1

Length: 4 bits

Resolution: 1

Offset: 0



AMB - Ambient Conditions
AT115 - Aftertreatment 1 Service
AT11T11 - Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Information
CDVS1 - Cruise Control/Vehicle Speed 1
CM1 - Cab Message 1
DD - Dash Display
DLCC1 - Direct Lamp Control Command 1
DPFC1 - Diesel Particulate Filter Control 1
EBC1 - Electronic Brake Controller 1
EEC1 - Electronic Engine Controller 1
EEC2 - AutoGenerated Do Not Modify
EFL/P1 - Engine Fluid Level/Pressure 1
EDI - Engine Operating Information
ET1 - Engine Temperature 1
ETC1 - AutoGenerated Do Not Modify
FD1 - Fan Drive 1
ICI - Intake/Exhaust Conditions 1
PTO - Power Takeoff Information
SHUTDN - Shutdown
Tachograph - AutoGenerated Do Not Modify
TSC1 - AutoGenerated Do Not Modify

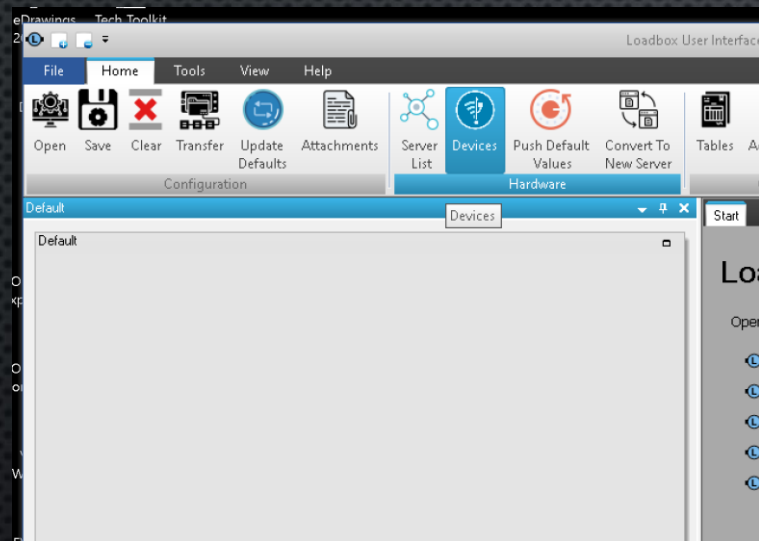
SPN 899 - Engine Torque Mode
SPN 4154 - Actual Engine - Percent Torque High Resolution
SPN 512 - Driver's Demand Engine - Percent Torque
SPN 513 - Actual Engine - Percent Torque
SPN 130 - Engine Speed
SPN 1493 - Source Address of Controlling Device for Engine Cor
SPN 1675 - Engine Starter Mode
SPN 2432 - Engine Demand - Percent Torque

Byte	Start Bit
1	1
2	9
3	17
4	25
5	33
6	41
7	49
8	57

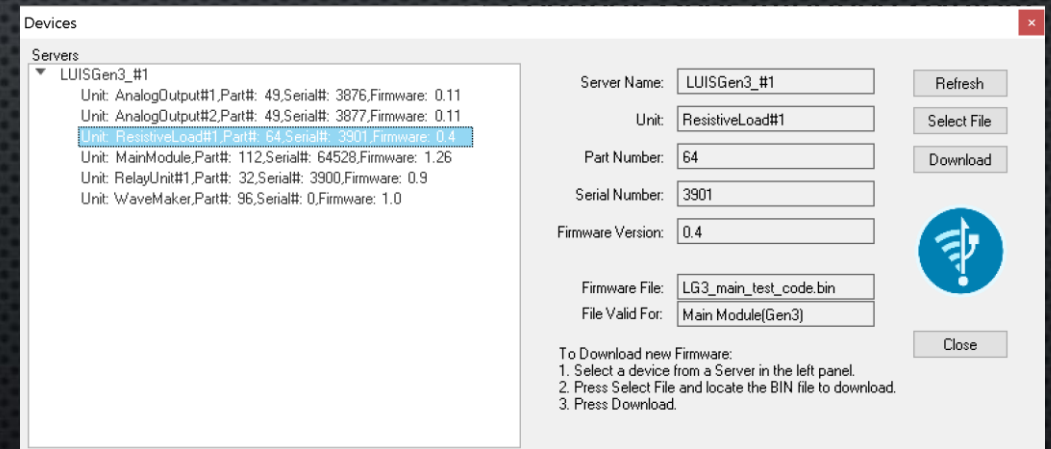
Description:
These are the Messages that can be broadcasted from the LUIS device.

DEVICES

TOOLBAR LOCATION

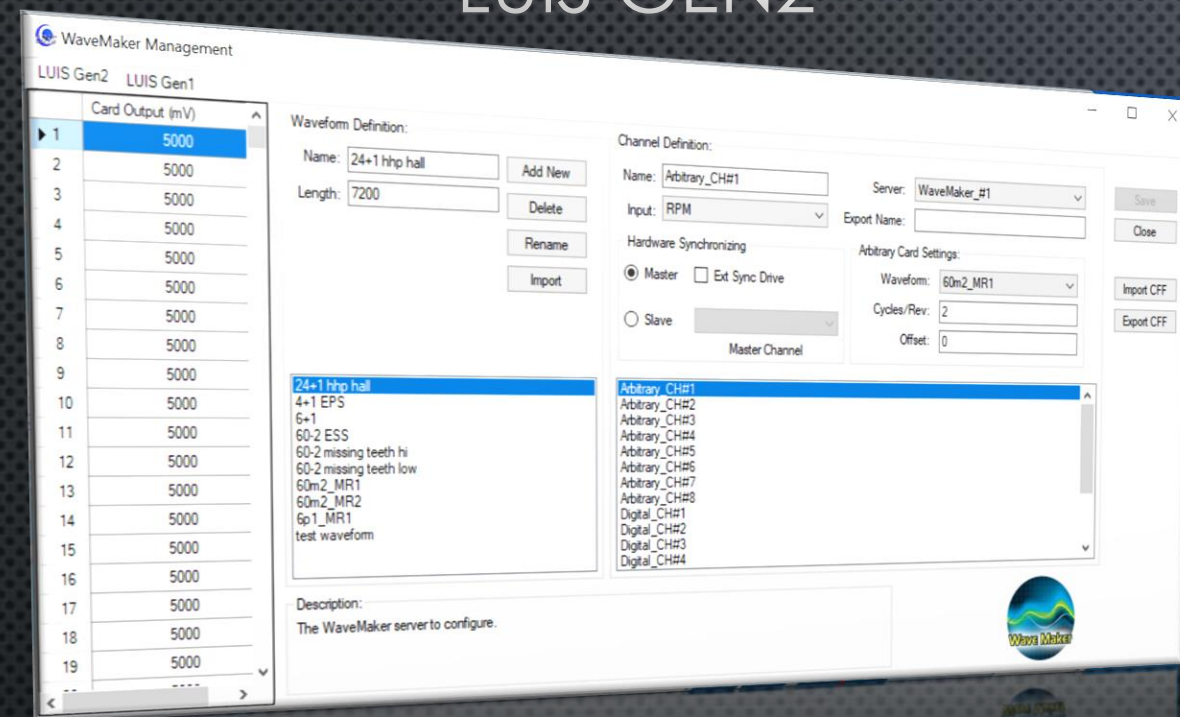


AUTO EXPANDED, INFO ON FILE SELECTION

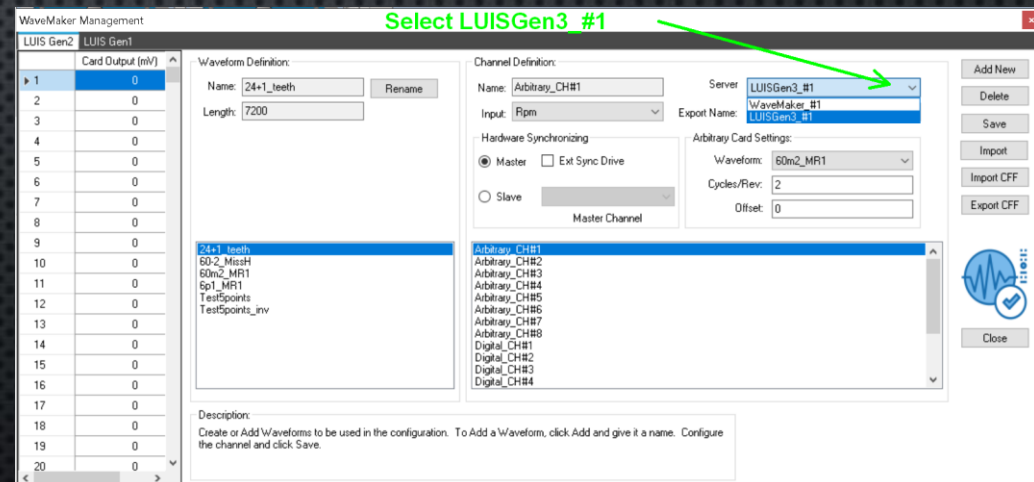


WAVEMAKER SETUP

LUIS GEN2

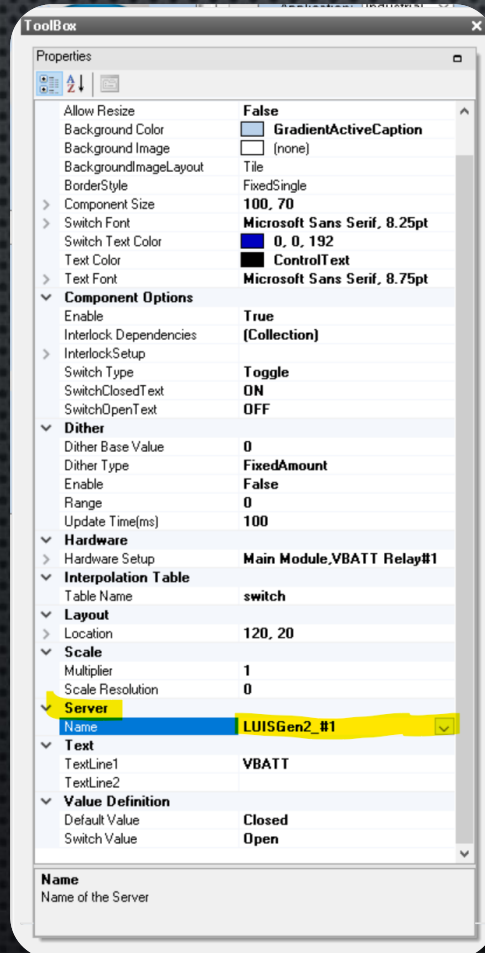


LUIS GEN3

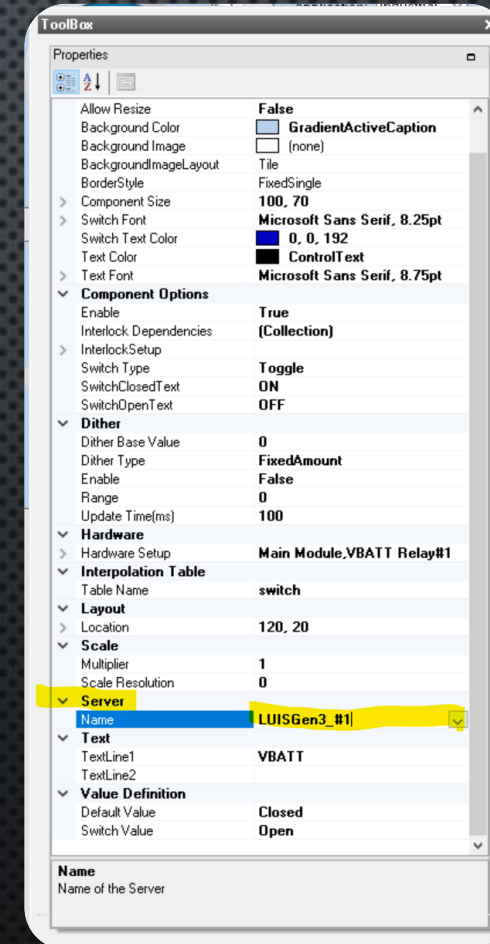


IMPORTANT SETTING IN “PROPERTIES” FOR EACH CONTROL!

CONTROLLING LUIS GEN2 HW



CONTROLLING LUIS GEN3 HW



GEN2 TO GEN3 CONVERSION

- REPLACE MAIN MODULE ASSEMBLY
- REPLACE WAVEMAKER CONTROL BOARD
- INSTALL LUIS GEN3 PC APP
- INSTALL RHEOSTAT MODULE (OPTIONAL)

GEN2 HW WITH GEN3 APP

- MAIN MODULE FIRMWARE MUST BE UPDATED TO REV 0.34+
- WAVEMAKER MODULE FIRMWARE MUST BE UPDATED TO REV 0.34+