

# User Guide for Roadstar OBU

*LEAR CORPORATION*

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## Reference section

Below are the reference documents for Locomate Roadstar.

- J2735 2016 Specification
- J2945 2016 Specification
- IEEE1609.2 2016 Specification
- IEEE1609.3 2016 Specification
- IEEE1609.4 2016 Specification
- IEEE1609.12 2016 Specification

## Chapter 1

# Overview of LocoMate

### 1.1 Introducing LocoMate

LocoMate is a brand name of V2X products from Lear Corporation. Lear offers V2X products for both vehicle and infrastructure. All V2X products have been designed to be installed in automotive environment. These devices provide communication from vehicle to vehicle, vehicle to infrastructure and vehicle to pedestrian. It helps provide safety and data services to the vehicle users.

### 1.2 V2X vs DSRC

V2X communication can happen with any wireless communication technologies. Underlying wireless technology could be anything from WiFi, BlueTooth, DSRC or Cellular. However, currently in US, wireless technology chosen for V2X is called DSRC. Cellular V2X is another possibility. This technology is being standardized in 3GPP but will take multiple years before users can see V2X based on Cellular technology.

### 1.3 DSRC Overview

DSRC is “a two-way short-to-medium-range wireless communications capability that permits very high data transmission critical in communications-based active safety applications,” according to the U.S. Department of Transportation’s Intelligent Transportation Systems Joint Program Office, which heads up much of the research related to DSRC. The Federal Communications Commission set aside 75 MHz of spectrum around the 5.9 GHz band (5.850-5.925 GHz) band in 1999 to be used for vehicle-related safety and mobility systems.

DSRC stands for Dedicated Short Range Communications. It is "Dedicated" because 75MHz of spectrum around 5.9GHz frequency was dedicated by FCC for automotive safety. It is "Short Range" because the range expected is around 300m in all directions. DSRC uses exactly the same technology as WiFi where the radio senses the channel to see if the channel is free. If the channel is free, the radio transmits a packet on the air. This method is called CSMA/CA (Carrier Sense Multiple Access / Collision Avoidance).

If the radio senses that the channel is busy, it backs off for a random time interval before attempting to sense again.

## 1.4 ADAS sensors Vs V2X

ADAS (Advanced Driver Assistance Systems) uses multiple sensors such as radar, infrared and camera. These sensors are used to detect obstacles such as vehicles on the blind spot, vehicle leaving lanes, vehicles stopped in front etc. If these sensors already providing needed support, why do we need V2X sensor ?

The main difference between currently deployed ADAS sensors and V2X is that ADAS sensors are able to detect obstacles only if they are in line of sight. However, if an obstacle is not in line of sight, ADAS sensors won't help detect such obstacles and provide driver assistance. For example, if a vehicle is approaching from a blind corner, ADAS sensors won't see it and won't be able to provide real-time assistance to avoid a collision. However, V2X has the ability to detect vehicles that are not in line of sight. V2X will be part of ADAS sensors and will be installed in every vehicle once the USDOT mandate happens. With existing sensors and V2X, there is room for sensor fusion between line-of-sight sensors and V2X. This fusion will provide solid driver assistance (whether an obstacle is visible or not).

## 1.5 Autonomous Vs V2X

V2X/ADAS sensors provide assistance only and not active safety (where vehicles do not take any decision such as applying brake etc). As mentioned in the previous section, autonomous vehicles with current sensors will only be able to detect obstacles in line of sight, but V2X helps enhance the detection of non-line-of-sight obstacles as well.

## 1.6 Technology Overview

In this document, we will use two key words "Host vehicle" (Vehicle under test) and "Remote vehicle" (Another vehicle that might come on a collision path with the host vehicle).

As explained in previous sections, the main benefit of V2X technology is the ability of a Host vehicle to detect any remote vehicle appearing on non-line-of-sight. To achieve this goal, V2X sensor technology requires each remote vehicle to announce its own location. This will allow any host vehicle to detect if a remote vehicle is on a collision path with the Host vehicle. Unless each remote vehicle that appears from a non-line-of-sight announces its location, the host vehicle will not be able to recognize the threat from the remote vehicle.

When the host vehicle receives packets over the air, it compares its own location and path against each of the remote vehicle's path. If the host vehicle detects that it is on a collision path with one of the remote vehicles, then it provides a warning to the driver.

Infrastructure based RSU (Road Side Unit) also has an integrated GNSS device which is used to provide timing information to RSU.

### 1.6.1 On Board Unit Transmission

The Vehicle OBU (On Board Unit) transmits a Basic Safety Message (BSM) 10 times a second. This BSM consists of the location of the current vehicle (latitude, longitude, altitude and heading), which is obtained from a GNSS device such as GPS. The GNSS device can either be built as part of an OBU or be provided through a vehicle bus such as CAN.

In addition to the current location, BSM also transmits the history of past locations called "Path History". This path history consists of a maximum of 15 past locations. The computation of the past location to be added to BSM history depends on whether the vehicle travels on a straight road or a curvy road. On straight roadway, the vehicle adds path history locations every 300 meters. However, on a curvy road, the vehicle looks at two consecutive locations and adds more location points based on the sharpness of the given curvature. The actual algorithm for this is given in SAE standard. The vehicle also transmits the status of the vehicle which includes: brake status, steering wheel angle, and wiper status (as part of BSM).

### 1.6.2 Road Side Unit Transmission

The infrastructure-based RSU (Road Side Unit) also has an integrated GNSS device that is used to provide timing information to RSU. The RSU transmits the following messages:

- WSA - Wave Service Advertisement
- SPAT - Signal Phase and Timing
- MAP - Intersection geometric MAP
- TIM - Traveller Information Message
- RTCM - Real Time Correction Message for GPS correction

## 1.7 Typical V2X Device Details

A V2X device should have a minimum following components

- Application Processor
- DSRC Radio-1
- DSRC Radio-2

- GNSS Device

A V2X OBU will typically have additional interfaces such as CAN or Ethernet. A V2X RSU will typically have additional Ethernet interfaces for back-end connectivity and power.

## 1.8 Channel Details

DSRC radios can operate on one of the following channels in the range of 5.850GHz to 5.925GHz. They are numbered 172, 174, 176, 178, 180, 182 and 184.

The middle-channel (178) is called "Control Channel". This is where the RSU announces its services using a WSA broadcast. An OBU typically tunes into the Control Channel to obtain services from the RSU. The left-most channel (172) is called "Safety Channel" and is reserved for communicating safety messages including BSM. The right-most channel (184) is reserved for public safety. The remaining channels (174, 176, 180 and 182) are called "Service Channels".

One of the radios on the V2X OBU will be tuned to safety channel 172 and continuously transmits and receives BSM. The second radio on the V2X OBU will be switching between "Control Channel" and "Service Channel". The OBU spends 50ms on Control Channel and 50ms on Service Channel.

Similarly, on the RSU, one of the radios will be tuned to channel 172 to receive BSMs and forward the messages to the back-end system that is installed in the TMC (Traffic Management Center). The second radio on the RSU switches between Control Channel and Service Channel, similar to the OBU.

## 1.9 Wave Service Advertisement

The RSU transmits a special message called WSA (Wave Service Advertisement) on the control channel (178). This message provides service-channel information that the RSU offers. For example, if the RSU is installed on a toll booth, it will transmit a WSA with content "Tolling service" on channel 180. When an OBU receives this message from this RSU, it knows that the RSU offers a tolling service and tunes to channel 180 to communicate payment details to the RSU.



## Chapter 2

# Locomate Roadstar

Locomate Roadstar is a WAVE device, which adheres to DSRC standards. Locomate Roadstar utilizes Automotive grade 1Ghz Quad Core i.MX6 Freescale processor comprising of Two Hi-Power Qualcomm Atheros DSRC Radios, supported by u-Blox ADR based Multi GNSS, Sirius XM Satellite Radio and Qualcomm Atheros Bluetooth solution and a host of other interfaces to interact with generic systems.



### 2.1 Front Panel View Of Locomate Roadstar



Details of Front panel are listed below,

- Push to Power ON/OFF Switch
- Red LED Indicating System Status
- Amber-Colored GPS LED
- Blue LED on BT Status
- Green LED Indicating Status Two DSRC Radio and WLAN
- Micro USB Console and OTG Port
- Two Type A USB Ports
- MIC and Speaker 3.5mm Audio Jacks.
- Two 9 Pin DSUB Connector based CAN Ports.
- Four FAKRA Code Z based DSRC Antenna ports.

- Single SMA Bulkhead for BT.
- SMB connector for Active Sirius XM Antenna.
- Smartcard Slot

## 2.2 Back Panel View Of Locomate Roadstar



Details of Back panel are listed below,

- 12V DC IN Connector
- RJ45 Connector LAN Port, 802.3at Compliant PoE
- Type C Fare GPS Antenna port
- Type A USB Connector
- HDMI Port for optional Display
- 3 Bulkhead SMA WLAN Antenna Connector

- Factory reset & Reset Buttons.
- Optional Power connector for Automotive Application.

## 2.3 Locomate Roadstar Ports and Connections

Below figure shows the way of connecting ethernet cable to Locomate Roadstar device



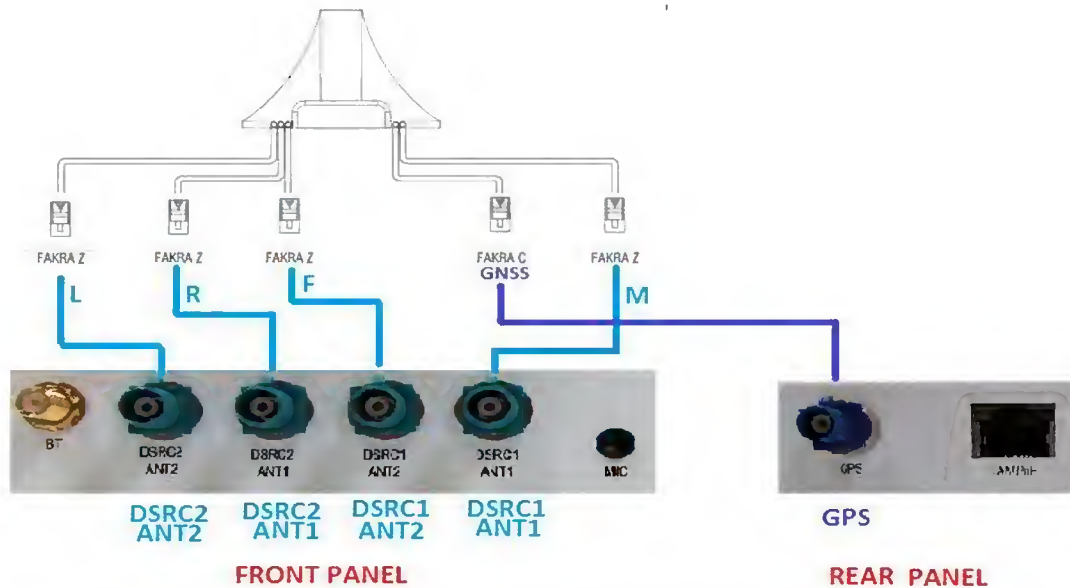
Below figure shows the way connecting the GPS to Locomate



Below figure shows the antenna connections to Locomate Roadstar



Below figure is detailed antenna cabling diagram with cable ends tagged with markings F, M, L & R.



Below figure shows the power connection to Locomate Roadstar



Set up the connections by the referring images. Accessing the device will be explained in further chapters.

## Chapter 3

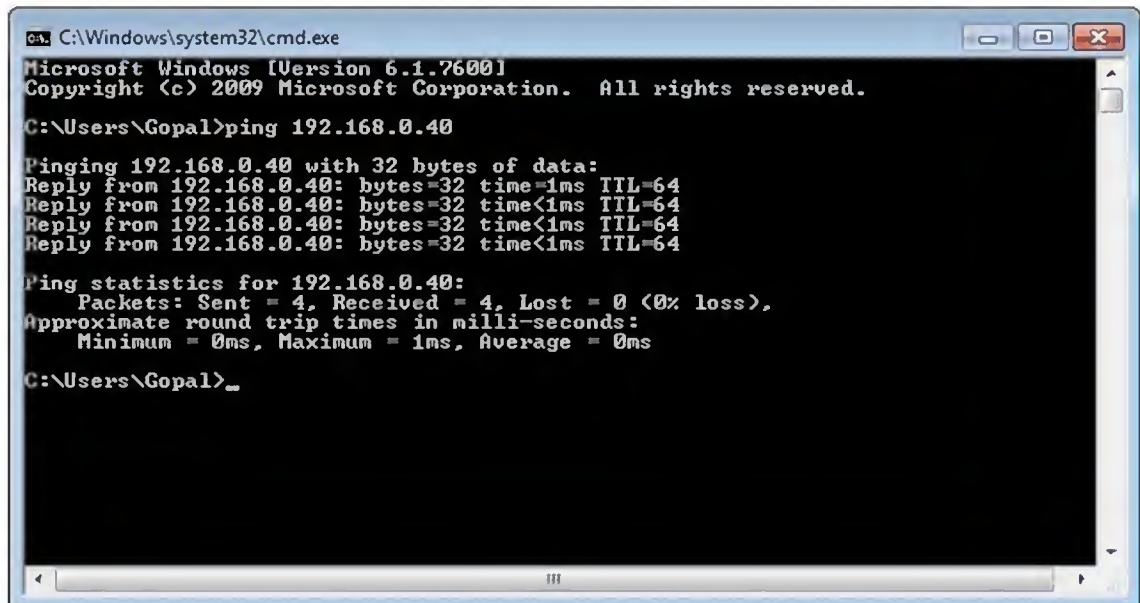
# Accessing Locomate Roadstar from the Laptop

Locomate Roadstar supports SSH remote sessions. In order to start session, make sure your computer IP address and device IP address are in the same subnet. By default Locomate Roadstar will be configured with **192.168.0.40** IP address. Try to ping to 192.168.0.40. Once Ping is success you can access the device in any of the supported remote connections. Once login to Locomate Roadstar is successful, you will land up in **Lear CLI**. We will provide detailed explanation about Lear CLI in next chapters.

### 3.1 Basic settings

- Power on Locomate Roadstar
- Make necessary IP changes on your laptop as below.
  - **On Linux machine:** If IP of Linux machine not with the prefix of "192.168.0.XX" series, add the IP to Linux machine as below,  
*sudo ifconfig eth0:1 192.168.0.56*
  - **On Windows machine:** If IP of Windows machine not with the prefix of "192.168.0.XX" series, add the IP to Windows machine statically.
- Ping to default IP 192.168.0.40, if ping is successful, Laptop is ready to communicate with Roadstar.



A screenshot of a Windows Command Prompt window. The title bar reads 'C:\Windows\system32\cmd.exe'. The window content shows the following text:

```
Microsoft Windows [Version 6.1.7600]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\Gopal>ping 192.168.0.40

Pinging 192.168.0.40 with 32 bytes of data:
Reply from 192.168.0.40: bytes=32 time=1ms TTL=64
Reply from 192.168.0.40: bytes=32 time<1ms TTL=64
Reply from 192.168.0.40: bytes=32 time<1ms TTL=64
Reply from 192.168.0.40: bytes=32 time<1ms TTL=64

Ping statistics for 192.168.0.40:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\Users\Gopal>_
```

## 3.2 Setting device password and Recovery method

Password recovery provides the facility to recover the admin password in case if it is forgotten by the user. The password recovery mechanism needs the user to answer the pre-stored questions when the user login as admin user at the very first time. Once the questions are answered, the user is provided with an option to set the new password for admin. The user is expected to provide a strong password twice to set a new password as per the guidance given below. If the user is unable to set the new password as per requirement, old or previously set password will be retained.

To recover admin password, user can login as 'recovery' user with password as 'recovery' as given below. Here, the user should answer the questions appropriately which is stored initially while setting the new password. Once the questions are answered, user can reset the admin password.

```
ssh recovery@ip_address_of_the_device with password as recovery
```

### 3.2.1 Guidance for the password Recovery:

- User is expected to provide a strong password that should involve special characters, Uppercase, lowercase letters and numbers.

- Do not use publicly available facts as responses (e.g. don't use your pet's name, etc.,) when answering the questions.
- Recommend to use different responses for the questions in different devices.

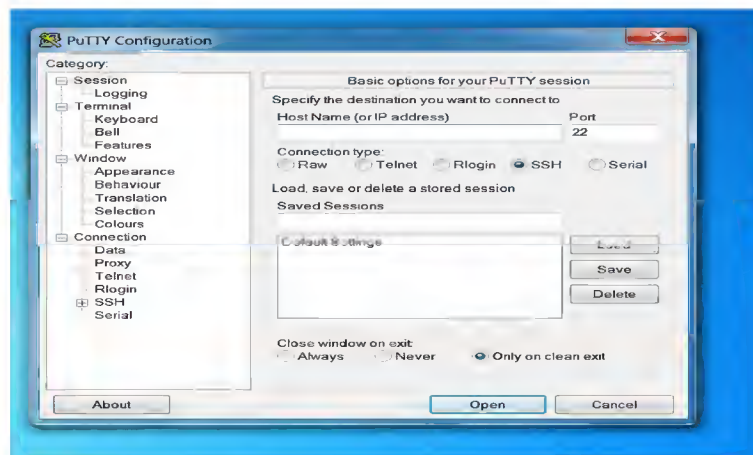
### 3.3 Connecting from Linux machine using SSH

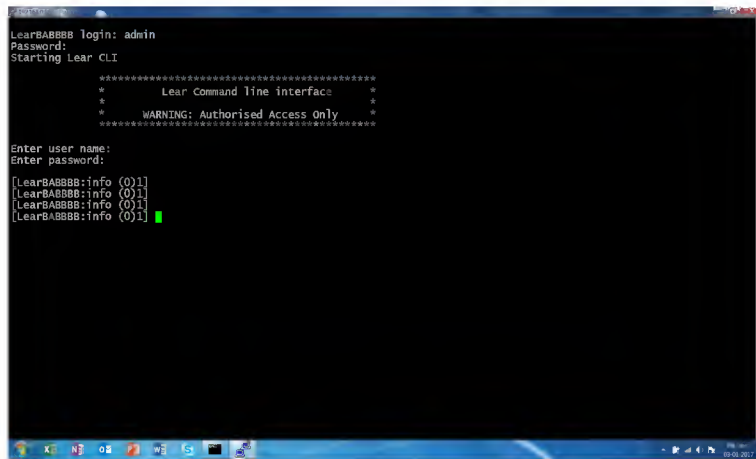
Use `ssh` command from the shell to start ssh session as below.

```
$ ssh admin@192.168.0.40  
admin@192.168.0.40's password- User@321#
```

### 3.4 Connecting from Windows machine using SSH

In Windows you can use “Putty” application to start ssh sessions with Locomate Roadstar. Select required connection type in putty application as below.





```
LearBABBB login: admin
Password:
Starting Lear CLI
*****
*      Lear Command Line interface      *
*                                     *
*      WARNING: Authorised Access Only   *
*****

Enter user name:
Enter password:
[LearBABBB:info (0)]
[LearBABBB:info (0)]
[LearBABBB:info (0)]
[LearBABBB:info (0)]
[LearBABBB:info (0)]
```

## Chapter 4

# Lear Command Line Interface

Lear CLI is a customized shell, which is built on Cisco Like Shell framework. You can configure Locomate Roadstar with “config” commands and view the configured parameters with “show” commands. There are three CLI modes on Locomate Roadstar. “Info”, “Config” and “Debug” are the three modes. Brief explanation of three modes is given below, Command reference manual explains each command in detail.

### Lear CLI control Keys

? : Provides help message of command and subcommands.

< tab >: Completes the command

## 4.1 Info mode

This is the default mode where user is placed after logging in to system. The “show” commands of “info” mode allows you to view the configured parameters of Locmate Roadstar. The “request” commands allows you perform system operations, like firmware upgrade and reboot. “copy” command allows you to copy files between Locmate Roadstar and any connected machine. “del” allows you to delete files. Use “enable” command of info mode to enter into “config” mode and “debug” command to enter into “debug” mode.

```
[lear334455:info (12)0] show application details
```

```
[lear334455:info (12)0] show application summary <application>
```

## 4.2 Config mode

In **config** mode you are allowed to configure the application, customApp, rsumode, tunnel, interface, locos, system, remote, log, time and firewall parameters.

```
[lear334455:info (12)0] enable
Moving to conf view...
[lear334455:conf (12)0]
```

**exit** command is used to exit from current mode.

```
[lear334455:conf (12)0] exit
```

### 4.3 Debug mode

**debug** provides network debugging tools like ping and traceroute. “list” command is used to list the files in required directory.

```
[lear334455:info (0)1] debug
Moving to diagnostic view...
[lear334455:debug (0)1]
```

To exit from debug mode use “exit”,

```
[lear334455:debug (12)0] exit
```

*For more information on these modes, please refer command reference manual introduction section.*

## Chapter 5

# Default configurations of the Locomate Roadstar OBU

```
[Lear121210:info (0)0] show all
```

```
----- SYSTEM -----
Product ID           =>    LOCOMATE-300-ASD
System Name          =>    Lear121210
Country              =>    unitedstates-public-safety (842)
MAC address          =>    00:26:ad:12:12:10
DB version           =>    0.13
RFS version          =>    v0.0.20-0-g8cbc5e9
SDK version          =>    v16.3.QA_09.01
Kernel version       =>    3.10.17-arada-LC3-00009-g8cbc5e9+
system uptime        =>    0 day(s) 0 hour(s) 6 min(s) 15 sec
dsrbackendseparation =>    enabled
Number of bridges    =>    2
brwifi interfaces    =>    wifi0vap0
Configured no of cores =>    25
```

```
No external media connected!
```

```
----- LOG -----
Syslog (remote) status =>    disabled

Time based syslog      =>    disabled
Syslog Rotatetime      =>    0000
Syslog File Size       =>    64kb
Syslog File count      =>    2
```

```
----- APPLICATION -----
app_name               =>    bsm
```

CHAPTER 5. DEFAULT CONFIGURATIONS OF THE LOCOMATE ROADSTAR OBU

```
app_status          =>          enabled
wme_arg             =>          psid\ 32\ service\ csr\ schan\ 172\ slot\ either
wsm_arg             =>          security\ unsecured\ verifybypass\ disable\ txchan\
 172\ datarate\ 6.0\ txpower\ 23\ chload\ 0\ infoeleId\ f\ priority\ 0\ txrate\ 50\ exptime\
sae_arg             =>          vehicletype\ 1\ vehiclewidth\ 0\ vehiclelength\ 0
oth_arg             =>          txmode\ tx\ tempIdStatus\ disable\ msgCount\ 2\
  printencode\ disable\ printdecode\ disable

app_name            =>          tim
app_status          =>          disabled
wme_arg             =>          psid\ 131\ service\ csr\ schan\ 176\ slot\ slot1
wsm_arg             =>          security\ unsecured\ verifybypass\ disable\ txchan\
 178\ datarate\ 6.0\ txpower\ 23\ chload\ 0\ infoeleId\ f\ priority\ 0\ txrate\ 50\ exptime\
oth_arg             =>          txmode\ rx\ srmFolder\ /var/SRM/AML/\ printencode\
  disable\ printdecode\ disable

app_name            =>          spat
app_status          =>          disabled
wme_arg             =>          psid\ 130\ service\ csr\ schan\ 172\ slot\ either
wsm_arg             =>          security\ unsecured\ verifybypass\ disable\ txchan\
 172\ datarate\ 6.0\ txpower\ 23\ chload\ 0\ infoeleId\ f\ priority\ 0\ txrate\ 50\ exptime\
oth_arg             =>          txmode\ rx\ tempIdStatus\ disable\ msgCount\ 2\
  printencode\ disable\ printdecode\ disable

app_name            =>          map
app_status          =>          disabled
wme_arg             =>          psid\ 130\ service\ csr\ schan\ 172\ slot\ either
wsm_arg             =>          security\ unsecured\ verifybypass\ disable\ txchan\
 172\ datarate\ 6.0\ txpower\ 23\ chload\ 0\ infoeleId\ f\ priority\ 0\ txrate\ 50\ exptime\
oth_arg             =>          txmode\ rx\ srmFolder\ /var/SRM/MAP/\ printencode\
  disable\ printdecode\ disable

app_name            =>          ipservice
app_status          =>          enabled
wme_arg             =>          psid\ 270549118\ service\ usr\ usrReq\ auto\
wsatype\ any\ psc\ ipv6\ schan\ 176\ srcMac\ ff\:ff\:ff\:ff\:ff\:ff\ advertifier\ USDOT\
  linkquality\ 0\ immaccess\ 0
wsm_arg             =>          security\ unsecured\ verifybypass\ enable\ txchan\
 178\ datarate\ 6.0\ txpower\ 23\ chload\ 0\ infoeleId\ f\ priority\ 0\ txrate\ 50\
  exptime\ 0
oth_arg             =>          txmode\ none\ printencode\ disable\ printdecode\
```

CHAPTER 5. DEFAULT CONFIGURATIONS OF THE LOCOMATE ROADSTAR ~~OPEN~~

```
disable

app_name          =>      egoprocess
app_status        =>      enabled
wme_arg           =>      psid\ 32\ service\ csr\ schan\ 172\ slot\ either
wsm_arg           =>      security\ unsecured\ verifybypass\ disable\ txchan\
172\ datarate\ 6.0\ txpower\ 23\ chload\ 0\ infoeleId\ f\ priority\ 0\ txrate\ 50\
exptime\ 0
oth_arg           =>      txmode\ rx\ printencode\ disable\ printdecode\
disable

app_name          =>      pvd
app_status        =>      disabled
wme_arg           =>      psid\ 132\ service\ usr\ usrReq\ auto\ wsatype\
any\ psc\ probe\ schan\ 176\ srcMac\ ff\:ff\:ff\:ff\:ff\:ff\ adentifier\ USDOT\
linkquality\ 0\ immaccess\ 0
wsm_arg           =>      security\ unsecured\ verifybypass\ enable\ txchan\
176\ datarate\ 6.0\ txpower\ 23\ chload\ 0\ infoeleId\ f\ priority\ 0\ txrate\ 50\
exptime\ 0
sae_arg           =>      vehicletype\ 1\ vehiclewidth\ 0\ vehiclelength\ 0
oth_arg           =>      txmode\ trrx\ printencode\ disable\ printdecode\
disable\ configFile\ /var/PVD/pvdOptions.conf

app_name          =>      pdm
app_status        =>      disabled
wme_arg           =>
wsm_arg           =>
oth_arg           =>

-----
----- TUNNEL -----
Status            =>      disabled
-----

----- IPv4 -----
IPV4 Address      =>      172.20.1.65
IPV4 Netmask      =>      255.255.255.0
IPV4 Gateway      =>      172.20.1.5
Primary DNS       =>      172.20.1.4
Secondary DNS     =>      0.0.0.0
```



CHAPTER 5. DEFAULT CONFIGURATIONS OF THE LOCOMATE ROADSTAR ~~022~~

IPV4 DHCP client => enabled

----- IPv6 -----

brtrunk IPV6 Address => fe80::ccf3:7dff:fec0:cfda/64

brtrunk IPV6 Network Prefix =>

brtrunk IPV6 Gateway =>

brwifi IPV6 Address => fe80::226:adff:fe12:1211/64

brwifi IPV6 Network Prefix =>

brwifi IPV6 Gateway =>

-----

----- AP Params -----

channel => 36

password => Shared#321Le@r

ssid => Lear051580-11ac

-----

----- REMOTE -----

SSH daemon => enabled

Telnet daemon => enabled

SNMP daemon => disabled

-----

----- TIME -----

Current time is => Wed Oct 18 05:48:34 GMT 2017

Current timezone status => iceland (110)

Daylight time saving status => enabled

GPS status => enabled

Time update interval =>

-----

----- LOCOS -----

MAC Address Randomization => enabled

LCM Deamon status => enabled

LCM logging status => enabled

LOCOS deployment => default

-----

CHAPTER 5. DEFAULT CONFIGURATIONS OF THE LOCOMATE ROADSTAR ~~023~~

```
----- BLUETOOTH -----  
hci0:  Type: BR/EDR  Bus: USB  
      BD Address: 00:3C:7F:F0:F0:0A  ACL MTU: 1022:8  SCO MTU: 183:5  
      UP RUNNING  
      RX bytes:547 acl:0 sco:0 events:27 errors:0  
      TX bytes:384 acl:0 sco:0 commands:27 errors:0
```

```
-----  
----- FIREWALL -----  
:INPUT ACCEPT [0:0]  
:OUTPUT ACCEPT [0:0]  
-----
```

```
----- OFFLOAD -----  
appName          =>    offload  
Status           =>    enabled  
psid             =>    50  
user Request Type =>    1  
wsaType          =>    4  
PSC              =>    offload  
Service Channel  =>    176  
Adevertizer identifier =>    LEAR  
RemoteUserName   =>    None  
RemoteDestDir    =>    /tmp  
LocalSrcDir      =>    /var/storage  
RetryCount       =>    3  
-----
```

```
----- Safety Apps -----  
fcwAdvisoryTriggerTTC    => 10 second  
fcwImminentTriggerTTC   => 5 second  
bswRVTimeToReachEV      => 5 second  
icwAdvisoryEVTimeToIntersection => 10 second  
icwAdvisoryEVRVTimeGap  => 4 second  
icwImminentEVTimeToIntersection => 5 second  
icwImminentEVRVTimeGap  => 2 second  
icwMinimumMergingAngle  => 15 degree  
imaAdvisoryEVTimeToIntersection => 20 second  
imarVTimeToReachImpactArea => 10 second
```

CHAPTER 5. DEFAULT CONFIGURATIONS OF THE LOCOMATE ROADSTAR ~~024~~

ltaRVTimeToCrossEV	=> 10 second
smvaEVSpeedThresholdWrtrRVSpeed	=> 10 mile/hour
rlvMinSpeedLimit	=> 5 meter/second
dnpwRVTimeToCrossEV	=> 12 second
dnpwRadialDistanceToAheadRV	=> 20 meter
laneWidth	=> 4 meter
elevationNoiseThreshold	=> 3 meter
rvFilter	=> disabled
zoneLimit:ahead	=> 13 second
zoneLimit:farAhead	=> 20 second
zoneLimit:behind	=> 4 second
zoneLimit:farBehind	=> 12 second
zoneLimit:referenceSpeed	=> 5 meter/second

-----

[Lear121210:info (0)0]

## Chapter 6

# Configuration of Locomate Roadstar OBU

Locomate Roadstar OBU supports V2V and V2I communication by transmitting and receiving standard messages like BSM, SPAT, MAP and TIM. OBU comes with a set of safety applications which will provide driver warnings based on the status of current vehicle position and other vehicles approaching. Below we will explain configuration of safety application. Also, command reference manual provide detailed explanation of the configuration parameters.

### 6.1 BSM Application

The basic safety message is used to exchange safety data regarding vehicle state. Typically BSM is transmitted 10 times per second. The content of BSM includes GPS co-ordinates and CAN data of the vehicle. Based on the remote vehicle's data, possible threats and hazards are identified by safety algorithms. The outcome of safety algorithms will be displayed on HMI.

#### 6.1.1 General syntax for BSM configuration

The general syntax for the BSM application is as follows,

```
config application <update/enable/disable> bsm <wmeConfig/wsmConfig/otherConfig>
<PARAMETERS>
```

#### 6.1.2 Example configuration of BSM application

In order to configure any application, check whether the application is enabled. Application configuration can be done only when they are in disabled state. Following command illustrates sample configuration command to configure BSM.

- Entering config mode

```
[LearBABBBB:info (1)0] enable
Moving to conf view..
```

- Disabling BSM

```
[LearBABBBB:conf (2)0] config application disable bsm
Application bsm is disabled
```

- Configure WME parameters

```
[LearBABBBB:conf (2)0] config application update bsm wmeConfig psid 32 channel
schan 172 timeslot either
```

*Updated application bsm:bsmWmeArg:psid 32 csr schan 172 slot either*

- Configure WSM parameters

```
[LearBABBBB:conf (2)0] config application update bsm wsmConfig security
unsecured verifybypass enable txchan 172 datarate 6.0 txpower 23 chload 0
infoelementindicator 15 userpriority 0 repeatrate 50 expirytime 0
```

*Updated application bsm:bsmWsmArg:security unsecure verifybypass enable txchan 172
datarate 6.0 txpower 23 chload 0 infoeleId f priority 0 txrate 50 expirytime 0*

- Configure Other parameters

```
[LearBABBBB:conf (2)0] config application update bsm otherConfig
remoteforwardip 127.0.0.1 remoteforwardport 13006 remotedataforward
wsm_payload logtype remote forwarddirection tx txrxmode tx tempidrandstatus
disable msgcount 2 printencode disable printdecode disable
```

*Updated application bsm:bsmOthArg:remoteforwardip 127.0.0.1 remoteforwardport
13006 remotedataforward wsm\_payload logtype remote forwarddirection tx txrxmode tx
tempidrandstatus disable msgcount 2 printencode disable printdecode disable*

- Configure sae parameters

```
[LearBABBBB:conf (2)0] config application update bsm saeConfig vehicletype 4
vehiclewidth 1.9 vehiclelength 4.65 vehicleheight 1
```

*Updated application bsm:bsmSaeArg:saeConfig saeConfig vehicletype 4 vehiclewidth 1.9
vehiclelength 4.65 vehicleheight 1*

- Enable the application

```
[LearBABBBB:conf (2)0] config application enable bsm
Application bsm is enabled
```

- Exiting from config mode

```
[LearBABBBB:conf (1)0] exit
Leaving conf mode...
```

### 6.1.3 Verification of BSM application

- After configuring the BSM application, the updated parameters can be viewed by entering the following command.

```
[LearBABBBB:info (0)1] show application details
```

In that we can observe the reflected parameters in BSM configuration.

**Note:** Make sure txrxmode in bsm should be "tx". So please check the txrxmode in otherconfig section. If it is not "tx" configure the txrxmode to "tx" and enable the application.

- Once application is enabled it should run on the device. we can view by entering the following command.

```
[LearBABBBB:info (0)1] show system procs
```

- Check the BSM transmission status by,

```
[LearBABBBB:info (0)1] show application summary bsm
*****bsm summary*****
TX                =>      1588
TX Drop(.3)       =>      0
TX Error(.2)      =>      0
TX Error(ASN)     =>      0
*****
```

## 6.2 Egoprocess Application

Egoprocess application used to receive BSM, SPAT, MAP and TIM messages. All the received messages will be decoded and updated in LDM (Local Dynamic Map) database.

- Received message :

**BSM** : Provides the current GPS and CAN data of Host vehicle and Remote vehicle.

**SPAT** : The Signal Phase and Timing message is used to convey the current status of one or more signalized intersections. Along with the MAP data message (which describes a full geometric layout of an intersection) the receiver of this message can determine the state of the signal phase and when the next expected phase will occur. SPAT message is transmitted by Road Side Unit. On OBU SPAT application will be configured to receive the SPAT messages. Based on the current GPS co-ordinates and received SPAT data relevant signal status will be calculated and displayed on HMI.

**MAP** : The MapData message is used to convey one or more intersection lane geometry. The map message content includes such items as complex intersection descriptions, road segment descriptions, high speed curve outlines (used in curve safety messages), and segments of roadway (used in some safety applications). OBU will be configured to receive MAP messages transmitted from RSU. Received MAP message will be processed with vehicle's GPS co-ordinates. The outcome of calculation provides information about the lane on which vehicle is travelling.

**TIM** : Traveller Information Message consists of standard ITIS codes, which will be configured by the traffic controller and broadcast by the RSU. Received ITIS codes will be processed for relevancy and displayed in the HMI.

### 6.2.1 General syntax for Egoprocess configuration

The general syntax for the Egoprocess application is as follows,

```
config application <update/enable/disable> Egoprocess <wmeConfig/wsmConfig/otherConfig>
<PARAMETERS>
```

### 6.2.2 Example configuration of Egoprocess Application

- Entering config mode

```
[LearBABBBB:info (1)0] enable
Moving to conf view..
```

- Disable egoprocess application before configuring

```
[LearBABBBB:conf (2)0] config application disable egoprocess
Application egoprocess is disabled
```

- Configure WME parameters

```
[LearBABBBB:conf (0)0] config application update egoprocess wmeConfig psid 32
channel schan 172 timeslot either
```

*Updated application egoprocess:egoprocessWmeArg:psid 32 csr schan 172 slot either*

- Configure WSM parameters

```
[LearBABBBB:conf (0)0] config application update egoprocess wsmConfig security
unsecured verifybypass enable txchan 172 datarate 6.0 txpower 23 chload 0
infoelementindicator 15 userpriority 0 repeatrate 50 expirytime 0
```

*Updated application egoprocess:egoprocessWsmArg:security unsecured verifybypass enable txchan 172 datarate 6.0 txpower 23 chload 0 infoeleId f priority 0 txrate 50 expirytime 0*

- Configure Other config parameters

```
[LearBABBBB:conf (0)0] config application update egoprocess otherConfig
remoteforwardip 127.0.0.1 remoteforwardport 13006 remotedataforward wsm_payload
logtype remote forwarddirection rx txrxmode rx configFile /var/EGOPROCESS/
dn_itis_distance.conf printencode disable printdecode disable
```

*Updated application egoprocess:egoprocessOthArg:remoteforwardip 127.0.0.1 remoteforwardport 13006 remotedataforward wsm\_payload logtype remote forwarddirection rx txrxmode rx configFile /var/EGOPROCESS/dn\_itis\_distance.conf printencode disable printdecode disable*

- Enable egoprocess application

```
[LearBABBBB:conf (2)0] config application enable egoprocess
Application egoprocess is enabled
```

- Exiting from config mode

```
[LearBABBBB:conf (1)0] exit
Leaving conf mode...
```



### 6.2.3 Verification of Egoprocess application

- After configuring the egoprocess application, the updated parameters can be viewed by entering the following command.

```
[LearBABBBB:info (0)1] show application details
```

In that we can observe the reflected parameters in egoprocess configuration.

**Note:** Make sure txrxmode in egoprocess should be "rx". So please check the txrxmode in otherconfig section. If it is not "rx" configure the txrxmode to "rx" and enable the application.

- Once application is enabled it should run on the device. we can view by entering the following command.

```
[LearBABBBB:info (0)1] show system procs
```

- To see the summary of egoprocess by,

```
[LearBABBBB:info (0)1] show application summary egoprocess
```

```
*****egoprocess summary*****
```

```
BSM
```

```
RX => 9041186
```

```
RX ERROR (.2) => 5
```

```
RX ERROR (ASN) => 310
```

```
RSSI(last rx pkt) => 79
```

```
MAP
```

```
RX => 498473
```

```
RX ERROR (.2) => 0
```

```
RX ERROR (ASN) => 122
```

```
RSSI(last rx pkt) => 117
```

```
SPAT
```

```
RX => 0
```

```
RX ERROR (.2) => 0
```

```
RX ERROR (ASN) => 0
```

```
RSSI(last rx pkt) => 0
```

```
TIM
```

```
RX => 1720149
```

```

RX ERROR (.2)      =>      0
RX ERROR (ASN)    =>      68932
RSSI(last rx pkt) =>      78
*****
[LearBABBBB:info (0)1]

```

## 6.3 IPservice Application

IPservice application on OBU receives service advertisements provided by RSU. Service advertisement contains routing information and backend server IP address. Once OBU moves into RSU's range, OBU joins with RSU using IPservice application and gets IP connectivity.

### 6.3.1 General syntax for IPservice configuration

The general syntax for the IPservice application is as follows,

```

config application <update/enable/disable> IPservice <wmeConfig/wsmConfig/otherConfig>
<PARAMETERS>

```

### 6.3.2 Example configuration of IPservice application

- Entering config mode

```

[LearBABBBB:info (1)0] enable
Moving to conf view..

```

- Disable IPservice if it is enable

```

[LearBABBBB:conf (2)0] config application disable ipservice
Application ipservice is disabled

```

- Configure WME parameters

```

[LearBABBBB:conf (2)0] config application update ipservice wmeConfig psid 270549118 user
schan 176 userreqtype auto wsatype any psc scms srcmac ff:ff:ff:ff:ff:ff
advIdentifier USDOT linkquality 0 immaccess 0

```

*Updated application ipservice:ipserviceWmeArg:psid 270549118 csr schan 176 userreq-type auto wsatype any psc scms srcmac ff:ff:ff:ff:ff:ff adentifier USDOT linkquality 0 immaccess 0*

- Configure WSM parameters

```
[LearBABBBB:conf (2)0]config application update ipservice wsmConfig security
unsecured verifybypass disable txchan 178 datarate 6.0 txpower 23 chload 0
infoelementindicator 1 userpriority 0 repestrate 50 expirytime 0
```

*Updated application ipservice:ipserviceWsmArg:security unsecure verifybypass disable txchan 178 datarate 6.0 txpower 23 chload 0 infoeleId 1 priority 0 txrate 50 expirytime 0*

- Configure other config parameters

```
[LearBABBBB:conf (2)0] config application update ipservice otherConfig txrxmode
none printencode disable printdecode disable
```

*Updated application ipservice:ipserviceOthArg:txmode none printencode disable printdecode disable*

- Enable IPservice application

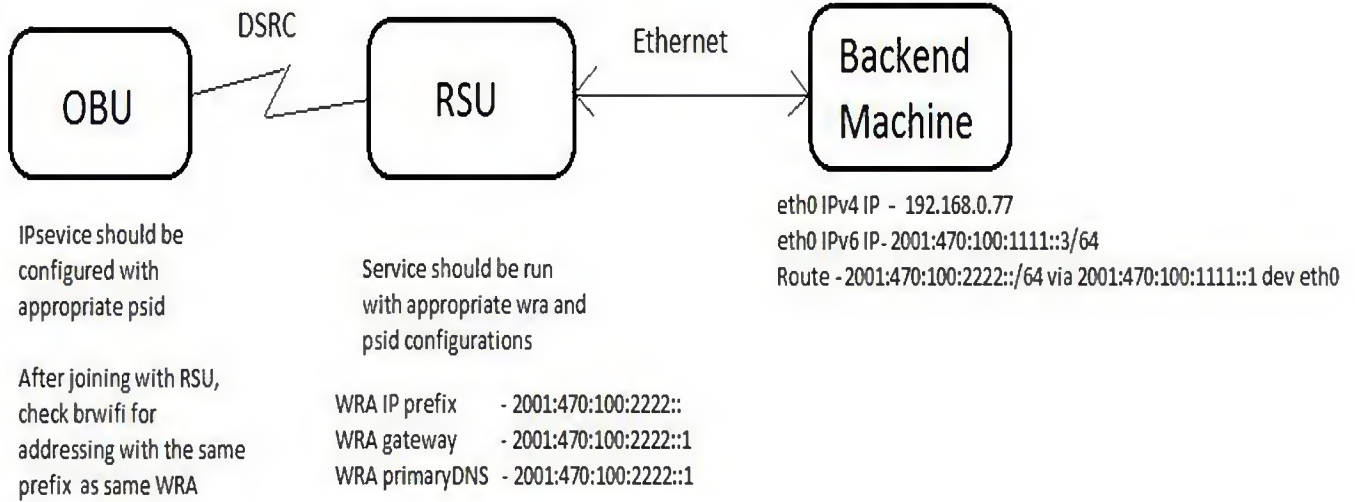
```
[LearBABBBB:conf (2)0] config application enable ipservice
Application ipservice is enabled
```

- Exiting from config mode

```
[LearBABBBB:conf (1)0] exit
Leaving conf mode...
```

### 6.3.3 General setup diagram for IPservice

Below diagram is the general setup diagram for IPservice.



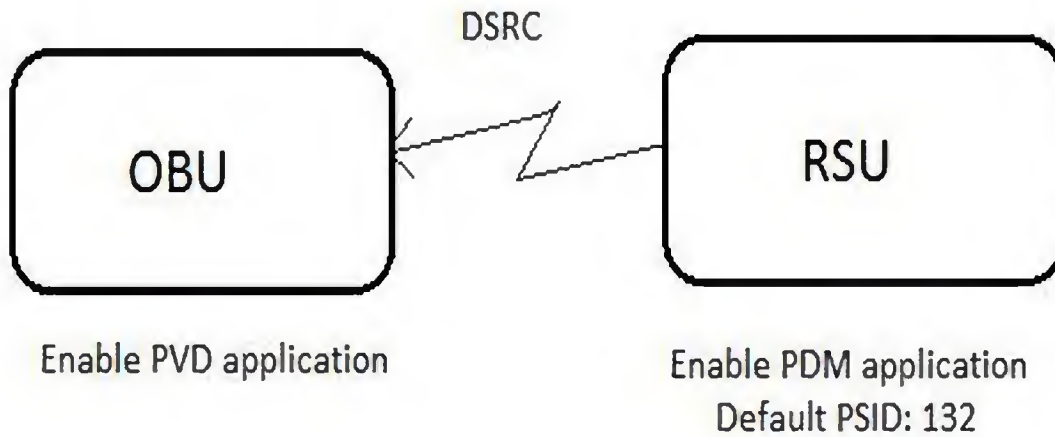
## 6.4 PVD Application

PVD stands for Probe Vehicle Data application. The probe vehicle message is used to exchange status about a vehicle with other (typically RSU) DSRC devices to allow the collection of information about typical vehicle travelling behaviours along a segment of road. In typical use the reporting vehicle has collected one or more snapshots which it will send to receiving RSUs along with information (the vector) about the point in time and space when the snapshot event occurred. Because any sequence of snapshots is related within a limited range of time and space, some data compression is used in the message to reduce redundant information.

By default, PVD application is not enabled. When user enables PVD application, OBU uses a built-in configuration.

### 6.4.1 General syntax for PVD

The general syntax for the PVD application is as follows,



```
config application <update/enable/disable> pvd <wmeConfig/wsmConfig/otherConfig>
<PARAMETERS>
```

### 6.4.2 General setup for PVD

Setup diagram for PVD application is shown below,

### 6.4.3 Example configuration of pvd application

- Entering config mode

```
[LearBABBBB:info (1)0] enable
Moving to conf view..
```

- Disable pvd

```
[LearBABBBB:conf (1)0] config application disable pvd
Application pvd is disabled
[LearBABBBB:conf (1)0]
```

- Configuring WME parameters

```
[LearBABBBB:conf (1)0] config application update pvd wmeConfig psid
132 user schan 176 userreqtype auto wsatype any psc 1 srcmac
ff:ff:ff:ff:ff:ff advidentifier USDOT linkquality 0 immaccess 0
```

*Updated application pvd:pvdWmeArg:psid 132 service usr schan 176 usrReq auto wsatype any psc 1 srcmac ff:ff:ff:ff:ff:ff advidentifier USDOT linkquality 0 immaccess 0*

- Configuring the WSM parameters

```
[LearBABBBB:conf (1)0] config application update pvd wsmConfig security
unsecured verifybypass disable txchan 176 datarate 6.0 txpower 23 chload 0
infoelementindicator f userpriority 0 repeatrate 50 expirytime 0
```

*Updated application pvd:pvdWsmArg:security unsecured verifybypass disable slot either txchan 176 datarate 6.0 txpower 23 chload 0 infoeId f priority 0 txrate 50 exptime 0*

- Configuring Other parameters

```
[LearBABBBB:conf (1)0] config application update pvd otherConfig txrxmode
txrx printencode disable printdecode disable configFile /var/PVD/pvdOptions.conf
```

*Updated application pvd:pvdOthArg:txrxmode txrx configFile /var/PVD/pvdOptions.conf printencode disable printdecode disable*

- Configuring Sae options

```
[LearBABBBB:conf (1)0] config application update pvd saeConfig vehicletype 1
vehiclewidth 0 vehiclelength 0
```

*Updated application pvd:pvdSaeArg:vehicletype 1 vehiclewidth 0 vehiclelength 0*

#### 6.4.4 Verification PVD application

- After configuring the PVD application, the updated parameters can be viewed by entering the following command.

```
[LearBABBBB:info (0)1] show application details
```

In that we can observe the reflected parameters in PVD configuration.

- Once application is enabled it should run on the device. we can view by the entering the following command.

```
[LearBABBBB:info (0)1] show system procs
```

- To see the PVD is transmitting or receiving the packets properly or not, we can check that by entering the following command.

```
[Lear121210:info (0)0] show application summary pvd
*****pvd summary*****
TX                =>      45
TX Drop(.3)       =>      0
TX Error(.2)      =>      0
TX Error(ASN)     =>      0
RX                =>      38
RX Error(ASN)     =>      0
RX Error(.2)      =>      0
*****
[Lear121210:info (0)0]
```

- If TX count is increasing means, pvd is transmitting packets. If RX count is increasing means, pvd is receiving the packets.

## 6.5 DistressNotification application

This application lets the user/driver of vehicle to send a may-day signal to the nearest service provider (RSU - Road Side Unit) and ask for help in case of vehicle break down or accident. It basically works by sending a high priority TIM message with host vehicle's location info to the nearest RSU. If a RSU is not available in the vicinity of distressed vehicle, the TIM message is broadcast to nearby OBUs which again try to send the TIM to RSU. Below are the parameters configuration for distressNotification application.

### 6.5.1 General syntax for DN application

The general syntax for the DN application is as follows,

```
config locos distressNotification <PARAMETERS>
```

### 6.5.2 Setup for DN application

**NOTE:** Distress Vehicle(DV), Relay Vehicle(RV) should be run on the same time. So that user can observe the distress notification alert on the HMI.

Below are the steps to setup the DN application.

#### HMI Setting:

- Install Lear HMI apk on HMI device.
- Go to setting->Application and select Wi-Fi option.
- Go to tab setting Connect HMI device with ASD/OBU board
- The ASD Board is protected with WPA/WPA2 security and the password to connect to the board is *Shared#321Le@r*
- In IP setting, select option static and enter IP address 192.168.10.150

#### ON ASD/OBU board:

1. Prepare LC3 OBU/ASD for Distress vehicle
  - Make sure device configure with current gps time
  - configuration application for HMI and Distress notification to generate event logs (driver alert and DN message)

#### DN Message:

```
[LearBABBBB:info (0)1] enable
[LearBABBBB:conf (0)1] config locos distressNotification logtype remote
[LearBABBBB:conf (0)1] config locos distressNotification forwardip 127.0.0.1
[LearBABBBB:conf (0)1] config locos distressNotification forwardport 13006
[LearBABBBB:conf (0)1] config locos distressNotification forwarddirection txrx
[LearBABBBB:conf (0)1] exit
```

#### Driver Alert:

```
[LearBABBBB:info (0)1] enable
[LearBABBBB:conf (0)1] config locos hmi settings logtype remote
[LearBABBBB:conf (0)1] config locos hmi settings loginterfaceip 127.0.0.1
```



```
[LearBABBBB:conf (0)1] config locos hmi settings loginterfaceport 13006
[LearBABBBB:conf (0)1] config locos hmi settings logging enable
[LearBABBBB:conf (0)1] exit
```

- Place file dn\_itis\_distance.conf in var/EGOPROCESS folder of the board
  - \* By default, ITIS code 513 and 532 and applicable distance of 5 miles is added to the file
- After configuring the ITIS code and distance in config file, user need to configure this file name in Egoprocess application

```
[LearBABBBB:info (0)1] enable
[LearBABBBB:conf (0)1] config application disable egoprocess
[LearBABBBB:conf (0)1] config application update egoprocess otherconfig
configFile /var/EGOPROCESS/dn_itis_distance.conf txrxmode rx
[LearBABBBB:conf (0)1] config application enable egoprocess
[LearBABBBB:conf (0)1] exit
```

- Connect board to HMI device1 (For connection procedure please refer HMI section).

## 2. Prepare LC3 OBU/ASD for relay vehicle1

- Make sure device configure with current gps time
- configuration application for HMI and Distress notification to generate event logs (driver alert and DN message)

### DN Message:

```
[LearBABBBB:info (0)1] enable
[LearBABBBB:conf (0)1] config locos distressNotification logtype remote
[LearBABBBB:conf (0)1] config locos distressNotification forwardip 127.0.0.1
[LearBABBBB:conf (0)1] config locos distressNotification forwardport 13006
[LearBABBBB:conf (0)1] config locos distressNotification forwarddirection txrx
[LearBABBBB:conf (0)1] exit
```

### Driver Alert:

```
[LearBABBBB:info (0)1] enable
[LearBABBBB:conf (0)1] config locos hmi settings logtype remote
[LearBABBBB:conf (0)1] config locos hmi settings loginterfaceip 127.0.0.1
[LearBABBBB:conf (0)1] config locos hmi settings loginterfaceport 13006
```

```
[LearBABBBB:conf (0)1] config locos hmi settings logging enable
[LearBABBBB:conf (0)1] exit
```

- Place file dn\_itis\_distance.conf in “/var/EGOPROCESS” folder of the board
  - \* By default, ITIS code 513 and 532 and applicable distance of 5 miles is added to the file
- After configuring the ITIS code and distance in config file, user need to configure this file name in Egoprocess application

```
[LearBABBBB:info (0)1] enable
[LearBABBBB:conf (0)1] config application disable egoprocess
[LearBABBBB:conf (0)1] config application update egoprocess otherconfig
configFile /var/EGOPROCESS/dn_itis_distance.conf txrxmode rx
[LearBABBBB:conf (0)1] config application enable egoprocess
[LearBABBBB:conf (0)1] exit
```

- Connect board to HMI device2 (For connection procedure please refer HMI section).dnm

### 3. Prepare another LC3 OBU/ASD for relay vehicle2

- Make sure device configure with current gps time
- configuration application for HMI and Distress notification to generate event logs (driver alert and DN message)

#### DN Message:

```
[LearBABBBB:info (0)1] enable
[LearBABBBB:conf (0)1] config locos distressNotification logtype remote
[LearBABBBB:conf (0)1] config locos distressNotification forwardip 127.0.0.1
[LearBABBBB:conf (0)1] config locos distressNotification forwardport 13006
[LearBABBBB:conf (0)1] config locos distressNotification forwarddirection txrx
[LearBABBBB:conf (0)1] exit
```

#### Driver Alert:

```
[LearBABBBB:info (0)1] enable
[LearBABBBB:conf (0)1] config locos hmi settings logtype remote
[LearBABBBB:conf (0)1] config locos hmi settings loginterfaceip 127.0.0.1
[LearBABBBB:conf (0)1] config locos hmi settings loginterfaceport 13006
[LearBABBBB:conf (0)1] config locos hmi settings logging enable
[LearBABBBB:conf (0)1] exit
```

- Place file `dn_itis_distance.conf` in “`/var/EGOPROCESS`” folder of the board
  - \* By default, ITIS code 513 and 532 and applicable distance of 5 miles is added to the file
- After configuring the ITIS code and distance in config file, user need to configure this file name in Egoproccess application
 

```
[LearBABBBB:info (0)1] enable
[LearBABBBB:conf (0)1] Config application disable egoproccess
[LearBABBBB:conf (0)1] Config application update egoproccess otherconfig
configFile /var/EGOPROCESS/dn_itis_distance.conf txrxmode rx
[LearBABBBB:conf (0)1] Config application enable egoproccess
[LearBABBBB:conf (0)1] exit
```
- Connect board to HMI device3
- Prepare RSU that is ready to receive DN logs through offload service from distress vehicle or relay vehicles.
- Prepare HMI device that will communicate to OBU devices to see safety or DN message.

### 6.5.3 Test procedure for DN application

#### Initialized Test Procedure

- Prepare backend system that will receive DN message from RSU via offload service
- RSUs are operational and transmitting WSA packets with PSID 50 (default PSID for offload service)
- Reboot all the OBUs before test.
- OBUs distress vehicles and relay vehicles are ready with event log configuration  
And `dnlog` file which will be offloaded to RSU is present by default in OBU board and will be updated at the time of DNM(Distress Notification Message) generation
- HMI device is ready to communicate with vehicle system device (OBU/ASD) via Wi-Fi or Bluetooth
- Conducted Safety Inspection of the test area like weather, road condition, obstructions or interference and confirmed ready for test

**Distress Vehicle Test**

- Distress vehicle is ready to generate DNM via HMI or CAN simulator
- Distress vehicle will collect all the log related to if it is user initiated through HMI or generated by CAN simulator
- Proper message with related icon should be displayed on HMI that is connected to distress vehicle
- DN packets should be broadcast continuously until we stop it using HMI or power off the device
- DN packet file will be created with unique packet id in distress vehicle folder `/var/eventlog/dnMsg.csv`
- When RSU is in vicinity, DN log file will be moved to `/var/storage/dnMsg/dnMsg.csv` and then it will be offloaded.

**Relay vehicle 1 Test**

- Relay vehicle is ready to test
- Relay vehicle OBU/ASD will receive DN packets from DV and verify it. Then it will show distressed message with icon on HMI connected to it if it is going towards DV.
- Relay vehicle will collect the log related to DNM packets it received from DV
- DN packets received by RV will be present in folder `/var/eventlog/dnMsg.csv`
- RV will decide whether to process packets or not.
- RV will not broadcast DN packets if it going towards DV and will start DN broadcasting as it cross DV till 10min or 5 miles which is first.
- RV will be silent and stopped DNM broadcasting after 10min or 5miles
- When RSU is in vicinity, DN log file will be moved to `/var/storage/dnMsg/dnMsg.csv` and then it will be offloaded.

**Relay Vehicle 2 Test**

- Relay vehicle (RV2) is ready to test
- RV2 will receive DNM packets from another Relay vehicle

- RV2 will alert the driver once it received DN packets from any RV
- RV2 will broadcast DN packets it received until 10min or 5mile
- RV2 will collect all the logs and offload DN packet to RSU, once Joined.

### RSU Test

- Once RSU receives DN packets from Distress vehicle or Relay vehicle, RSU should transmit DNM packets log to backend system.

**Note:** for bench test, can use 'NMEA' files for distress vehicle and relay vehicles.

#### 6.5.4 DN configuration file

The DN configuration file `dn_itis_distance.conf` is as below.

```
# [INTEGER] itisDistanceCount
# number of itis codes and their applicable distance
itisDistanceCount=2
# [INTEGER] itisCode
# ITIS code value
itisCode=513
# [FLOAT] distance
# distance value for the itis code
# unit meters
distance=8046.72
# [INTEGER] itisCode
# ITIS code value
itisCode=532
# [FLOAT] distance
# distance value for the itis code
# unit meters
distance=8046.72
```

## 6.6 Configuring CAN

### 6.6.1 Configuration

In order for the CAN module to send data over it's API it needs to be able to decode messages from the CAN bus. In practice this is generally done by specifying messages in the DBC format.

Once a valid DBC/Meta file is created (later in this chapter), one can configure the board using the CLI as follows.

The following example assumes a CAN cable has been connected to the CAN1 port of the device and that the bitrate for said bus is 500,000.

```
[LearBABBBB:info (0)1] enable
  Moving to conf view...
[LearBABBBB:conf (0)1] config locos can interface can0
[LearBABBBB:conf (0)1] config locos can status enable
[LearBABBBB:conf (0)1] config locos can bitrate 500000
[LearBABBBB:conf (0)1] config locos can dbcFile /var/path/to/database.dbc
[LearBABBBB:conf (0)1] config locos can metaFile /var/path/to/metafile.meta
```

### 6.6.2 DBC Files

The following is an example block in a DBC file:

```
BO_ 533 VEH_DYN: 7 Vector__XXX
  SG_ VEH_SPEED : 7|16@0+ (0.0078125,0) [0|511] "km/h" LEAR__XXX
  SG_ ABS_PRSNT : 50|1@0+ (1,0) [0|0] "" LEAR__XXX
  SG_ ESP_PRSNT : 51|1@0+ (1,0) [0|0] "" LEAR__XXX
  SG_ ESP_AVL : 55|1@0+ (1,0) [0|0] "" LEAR__XXX
```

Each block will have a header as described below:

- **BO\_** Required by the file format
- **533** The CAN ID in decimal
- **VEH\_SPEED** The label for this CAN ID
- **7** Number of bytes sent in this message ( 0-8 )

Each entry in a block will have fields described as below:

- **SG\_** Required by the file format
- **VEH\_SPEED** Label for this field
- **7** Start position
- **16** Size in bits
- **0** Endianness (1 is little endian, 0 is big endian)
- **0.0078125** Scale to divide the parsed value by
- **0** Offset to be added after scaled
- **0** Min value
- **511** Max value
- **Km/h** Unit
- **LEAR\_\_XXX** Required by the file format ('LEAR' can be changed to anything)

### 6.6.3 Meta Files

As described previously, the Meta-file links the DBC file (Section 6.6.2) and the VehicleData struct

Each entry in a meta file will have the following format:

[META ID] [CAN ID] [SG Label]

Given the DBC file example in Section 6.6.2, below is an example of how to relate the *VEH\_SPEED* entry to the *uiSpeed* field of the *vehicleData* struct.

1 533 VEH\_SPEED

META ID	FIELD	UNITS
1	SPEED	km/h
2	SPEED	Mph
3	SPEED	m/s
4	STEERING_WHEEL_ANGLE	degree
5	LATITUDE_ACCELERATION	m/s <sup>2</sup>
6	LONGITUDE_ACCELERATION	m/s <sup>2</sup>
7	VERTICAL_ACCELERATION	m/s <sup>2</sup>
8	YAW_RATE	degrees/s
11	THROTTLE_POSITION	%
12	TRANSMISSION	0:N 1:P 2:D 3:R
18	BRAKE_SYSTEM_STATUS_leftFront	0:inactive 1:active
19	BRAKE_SYSTEM_STATUS_leftRear	0:inactive 1:active
20	BRAKE_SYSTEM_STATUS_rightFront	0:inactive 1:active
21	BRAKE_SYSTEM_STATUS_rightRear	0:inactive 1:active
23	BRAKE_SYSTEM_STATUS_avail	0:unavail 1:available
40	LIGHTS_lowbeamOn	0:inactive 1:active
41	LIGHTS_highbeamOn	0:inactive 1:active
42	LIGHTS_leftTurnOn	0:inactive 1:active
43	LIGHTS_rightTurnOn	0:inactive 1:active
44	LIGHTS_hazardOn	0:inactive 1:active
45	LIGHTS_lightsAuto	0:inactive 1:active
46	LIGHTS_runningLights	0:inactive 1:active
47	LIGHTS_fogLight	0:inactive 1:active
48	LIGHTS_parkingLight	0:inactive 1:active
93	HARD_BRAKING_EVENT	0:inactive 1:active
94	DISABLED_VEHICLE_EVENT	0:inactive 1:active
95	AIR_BAG_DEPLOYMENT_EVENT	0:inactive 1:active
96	TIRE_FLAT_EVENT	0:inactive 1:active
102	EVENT_FLAGS	SAE format



## 6.7 Event logging

Event log module is implemented as a daemon application logmonitor. The logmonitor application will be started immediately after OBU gets the GPS fix. Applications which have to log events will connect to logmonitor using a UDP socket. Events which are received by logmonitor will be written to respective event log file. The maximum size of each log file be 100KB.

### 6.7.1 Configuration and Verification of logmonitor

By default, logmonitor application will be started upon every boot up. Verify whether "logmonitor" process is running by using the following command,

```
[Lear052790:info (2)0] show system procs
```

Event log files will be created in "/var/eventlog" directory. Any event log file which reaches threshold will be moved to respective offload directory. Offload directory for event logging is /var/storage/. Every event type will have its own directory for event log files in /var/storage/. The "send" order and "purge" order files is as follows.

LogFolder name	Purge order	Send order	MaxLogFileSize
wlan_capture	1	10	20MB
bsmLogDuringEvent	2	9	100KB
bsmTx	3	8	100KB
rxMsg	4	6	100KB
upgrades	5	4	100KB
scms	6	7	100KB
systemLog	7	5	100KB
environmentMsg	8	2	100KB
dnMsg	9	1	100KB
driverAlert	10	3	100KB

### 6.7.2 Configuring Applications to Generate Event Logs

The events in Locomate Roadstar OBU are "bsmTx, driverAlert, dnMsg, Upgrades".

**bsmTx:** For bsmTx, we need to configure the bsm application as shown below,

```
[LearBABBBB:info (0)1] enable
[LearBABBBB:conf (0)1] config application disable bsm
[LearBABBBB:conf (0)1] config application update bsm otherConfig remoteforwardip
```

```
127.0.0.1 remotedataforward wsm_payload remoteforwardport 13006 logtype remote
forwarddirection tx txrxmode tx
[LearBABBBB:conf (0)1] config application enable bsm
[LearBABBBB:conf (0)1] exit
```

**Driver Alert:** For driver alert we need to configure hmi parameters as shown below,

```
[LearBABBBB:info (0)1] enable
[LearBABBBB:conf (0)1] config locos hmi settings logtype remote
[LearBABBBB:conf (0)1] config locos hmi settings loginterfaceip 127.0.0.1
[LearBABBBB:conf (0)1] config locos hmi settings loginterfaceport 13006
[LearBABBBB:conf (0)1] config locos hmi settings logging enable
[LearBABBBB:conf (0)1] exit
```

**Dn Msg:** For Dn msg, following configuration should be needed,

```
[LearBABBBB:info (0)1] enable
[LearBABBBB:conf (0)1] config locos distressNotification logtype remote
[LearBABBBB:conf (0)1] config locos distressNotification forwardip 127.0.0.1
[LearBABBBB:conf (0)1] config locos distressNotification forwardport 13006
[LearBABBBB:conf (0)1] config locos distressNotification forwarddirection txrx
[LearBABBBB:conf (0)1] exit
```

**Upgrades:** For upgrades,

```
[LearBABBBB:info (0)1] Request firmware upgrade
```

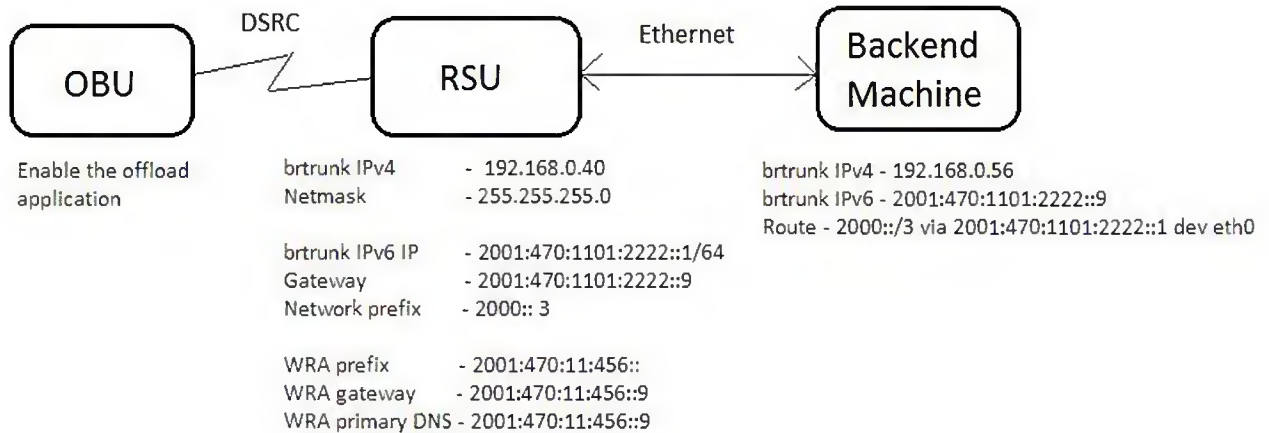
**Note:** Messages are based on firmware\_upgrade\_type [types: file,scp,etc]

## 6.8 Offload application of Locomate Roadstar OBU

Offload application on OBU/ASD will offload the files present in configured directory to backend machine. For that we need to run the offload application.

### 6.8.1 Setup diagram for ASDoffload

The setup diagram for ASDoffload is as shown below,



### 6.8.2 RSU configuration for offload

Steps to configure the ASD offload as below.

1. Configure the RSU device brtrunk address as follows

```
[Lear121210:info (0)1] enable
[Lear121210:conf (0)1] config interface brtrunk ipv6 ip 2001:470:1101:2222::1 64
[Lear121210:conf (0)1] config interface brtrunk ipv6 networkprefix 2000:: 3
[Lear121210:conf (0)1] config interface brtrunk ipv6 gateway 2001:470:1101:2222::9
[Lear121210:conf (0)1] exit
```

Reboot the device to apply the above changes.

```
[Lear121210:info (0)1] request system reboot
```

To see the updated brtrunk address enter the following command.

```
[Lear121210:info (0)1] show interface brtrunk ipv6
```

2. On backend machine Configure the IP address with root privilege.

```
ip a a 2001:470:1101:2222::9/64 dev eth0
```

And create a routing advertisement to backend machine as below,

```
ip r a 2000::/3 via 2001:470:1101:2222::1 dev eth0
```

After configuration, check the interface by pinging from RSU to backend machine IPv6 address vice versa.

```
[Lear121210:info (0)0] debug
Moving to diagnostic view...
[Lear121210:debug (0)0] ping ipv6 <Backend configured IPv6 address>
```

3. Configure WRA parameters

**WRA configuration through Clish:** WRA can be configure through Clish as below.

```
[Lear121210:info (0)1] enable
[Lear121210:conf (0)1] config locos wraconf wraiprefix 2001:470:11:456::
[Lear121210:conf (0)1] config locos wraconf wraprefixlen 64
[Lear121210:conf (0)1] config locos wraconf wradefaultgw 2001:470:11:456::9
[Lear121210:conf (0)1] config locos wraconf wraprimarydns 2001:470:11:456::9
[Lear121210:conf (0)1] exit
```

After configuring updated parameters we can see by

```
[Lear121210:info (0)1] show locos wraconf
WRA configuration details
IP Prefix of WRA           =>      2001:470:11:456::
Prefix Length of WRA      =>      64
Default Gateway of WRA    =>      2001:470:11:456::9
Primary DNS of WRA        =>      2001:470:11:456::9
```

After WRA configuration reboot the device.

```
[Lear121210:info (0)1] request system reboot
```

4. Configuring WSA parameters

- WSA can be configure through IPservice. Below are the Clish commands for WSA configuration.

```
[LearBABBBB:info (1)0] enable
[LearBABBBB:conf (1)0] config application disable ipservice
[LearBABBBB:conf (1)0] config application update ipservice wmeConfig psid 50 user
schan 176 userreqtype auto wsatype any psc scms adventifier USDOT linkquality 0
inmaccess 0
[LearBABBBB:conf (1)0] config application disable ipservice
```

- Once this IPservice application is configured, you should be able to see the ipservice application by entering following command.

```
[Lear121210:info (1)1] show system procs
```

- After this configuration work the RSU was rebooted using the RSU CLI command

```
[Lear334455:info (25)0] request system reboot
```

- To observe whether the packet transmission is happening or not by entering

```
[Lear121210:info (1)1] show application summary wsatx
```

After giving this command you can observe the tx count. That count show the number of packet transmission.

5. The above steps are makes the RSU setup to get the packets from ASD and transmit to backend machine. Now we will setup the ASD device to transmit the packets to RSU and connectivity.

### 6.8.3 ASD configuration for offload

1. In ASD device, packets can be transmit through offload application. For that we need to configure the offload service, refer the below example configuration section.
2. To see the configured offload parameters by,

```
[LearBABBBB:info (0)1] show locos offload
```

3. After configuring the offload “offload\_asd” application should run on the device. Verify this by entering,

```
[LearBABBBB:info (1)1] show system procs
```

4. To check whether ASD is join with RSU or not by observe the following print in syslog.

```
[LearBABBBB:info (0)1] show log syslog -100
```

In this we can see the print like “setdefaultgw: user joined IP service– 2001:0470:0011:0456:0000:0000:0000:0009”

Communication between ASD and RSU happen through brwifi. So to check interface in ASD by,

```
[LearBABBBB:info (0)1] show interface brwifi ipv6
```

Here we can observe the prefix value of IPv6.

5. After joining ASD to RSU, the connectivity between ASD and backend should happen. Verify the connectivity from ASD to backend machine Ip as follows.

```
[LearBABBBB:info (0)1] debug
```

```
Moving to diagnostic view...
```

```
[LearBABBBB:debug (0)1] ping ipv6 2001:470:1101:2222::9
```

6. Secure copy functionality is needed when files are transmitted from ASD to backend machine. Follow the steps given below to obtain a secure connection to backend system.

- Generate ssh-key,

```
[LearBABBBB:info (0)0] config system sshkeygen
```

- Login ASD device in another window with ssh session to see the generated key. Issue command below, Copy output to your clipboard, it should be a single line without any new line character,

```
[LearBABBBB:info (0)0] show system sshpublickey
```

- Append the generated ssh public key to “~/.ssh/authorized\_keys” of backend machine. If ssh directory does not exist in your Ubuntu machine, login as normal user (not root), and issue the following commands

```
mkdir -p ~/.ssh
```

```
chmod 0700 ~/.ssh
```

```
vi ~/.ssh/authorized_keys (then paste your clipboard. Again, make sure it is single line with-out and new line character)
```

```
chmod 0600 ~/.ssh/authorized_keys
```

**NOTE:**After these steps, you should be able to do a password-less scp from Roadstar OBU to your Ubuntu machine (offload uses this feature). To verify , please do below optional steps.

```
copy scp file <filename with path> remote <username@machine ip:Dest path>
Note: Please replace <filename with path>, <username> and <machine ip>
```

3. After issuing above command your file should be automatically copied to your Ubuntu machine without a password prompt. If it prompts for password, that means the above setup is was not done properly and offload won't work unless you are able to do password-less scp

7. Now enable the ethernet logging interface1 and interface2 for packet capturing.

```
[LearBABBBB:info (0)1] enable
Moving to conf view...
[LearBABBBB:conf (1)1] config locos logging interface1 status enable
[LearBABBBB:conf (1)1] config locos logging interface2 status enable
[LearBABBBB:conf (1)1] exit
```

8. After enabling the logging, the transmitted and received packets from OBU will be stored in the packets will be generated in “/var/storage/wlan\_capture”. If size is more than 100KB, packets are removed.
9. By default, logmonitor application is run in the RSU device. So in “/var/storage/”, directories are created with the name of “bsmLogDuringEvent, bsmTx, dnMsg, driverAlert, environmentMsg, rxMsg, scms, systemLog and upgrades”.
10. While running logmonitor, files are updated at “/tmp/eventlog/”. Once it reaches to MaxLogFileSize(100KB), the packet is copied to corresponding directory in “/var/storage/”.
11. Files are offload in a particular order. Refer Event handling section for offload order table.
12. Once if it reaches threshold3 value that we configure in the offload, the pcap files will be forwarded to backend machine. You can see those packets at configured destdir.

#### 6.8.4 Purge functionality on ASDoffload

1. Inorder to observe the purge functionality make sure backend connectivity should fail. Remove the interface between ASD and backend machine. (Remove Ethernet cable or remove IP connection)
2. By default purge functionality is enable. If connectivity to backend machine is exist, the packets transfer to backend machine. If connectivity fails then only purge functionality comes to picture.

3. Once “/var/storage” partition size reaches to threshold3 range, files are purged according to their order until partition size decreases upto threshold1 range. Once size reaches to that range, then only new packets will come to source directory.
  - To verify this, check the syslog prints. Also observe the source directory.

```
[LearBABBBB:info (0)0] show log syslog -100
[LearBABBBB:info (0)0] debug
[LearBABBBB:debug (0)0] list <source directory path>
```

- Check the purge functionality with out user join. For this configure different psid in offload configuration. Make sure asd\_offload should not join with any services. Then observe the purge functionality as per above.

### 6.8.5 Example Configuration of offload application

Application Configuration and start offload application,

```
[LearBABBBB:info (0)1] enable
[LearBABBBB:conf (0)1] config locos offload status disable
[LearBABBBB:conf (0)1] config locos offload update wmeconfig appname asdOffload
[LearBABBBB:conf (0)1] config locos offload update wmeconfig psid 50
[LearBABBBB:conf (0)1] config locos offload update wmeconfig userRequestType 1
[LearBABBBB:conf (0)1] config locos offload update wmeconfig serviceChannel 176
[LearBABBBB:conf (0)1] config locos offload update wmeconfig wsaType 4
[LearBABBBB:conf (0)1] config locos offload update wmeconfig psc offload

[LearBABBBB:conf (0)1] config locos offload update Optconfig RemoteUserName
back_end_machine_name
[LearBABBBB:conf (0)1] config locos offload update Optconfig RemoteDestDir /tmp
[LearBABBBB:conf (0)1] config locos offload update Optconfig LocalSrcDir /var/storage
[LearBABBBB:conf (0)1] config locos offload update Optconfig threshold1 30
[LearBABBBB:conf (0)1] config locos offload update Optconfig threshold2 50
[LearBABBBB:conf (0)1] config locos offload update Optconfig threshold3 70
[LearBABBBB:conf (0)1] config locos offload update Optconfig retrycount 3
[LearBABBBB:conf (0)1] config locos offload update Optconfig retryinterval 5
[LearBABBBB:conf (0)1] config locos offload status enable
```

[Note : back\_end\_machine\_name is the username to access backend machine/server]



## 6.9 LDM And SafetyApp

### 6.9.1 Configuration steps for LDM and SafetyApps

LDM and SafetyApp can be configured through Lear CLI. Below are the details of LDM and SafetyApp configuration.

- Enter "show locos safetyApps" in info prompt. It will show the default parameter values for safetyApp as shown below.

```
[Lear051580:info (10)0] show locos safetyApps
fcwAdvisoryTriggerTTC           =>      10 second
fcwImminentTriggerTTC          =>      5 second
bswRVTimeToReachEV              =>      5 second
icwAdvisoryEVTimeToIntersection =>     10 second
icwAdvisoryEVRVTimeGap          =>      4 second
icwImminentEVTimeToIntersection =>     5 second
icwImminentEVRVTimeGap          =>      2 second
icwMinimumMergingAngle          =>     15 degree
imaAdvisoryEVTimeToIntersection =>     20 second
imaRVTimeToReachImpactArea      =>     10 second
ltaRVTimeToCrossEV              =>     10 second
smvaEVSpeedThresholdWrtRVSpeed  =>    10 mile/hour
rlvMinSpeedLimit                =>      5 meter/second
dnpwRVTimeToCrossEV             =>     12 second
dnpwRadialDistanceToAheadRV     =>     20 meter
laneWidth                       =>      4 meter
elevationNoiseThreshold         =>      3 meter
rvFilter                         =>    disabled
zoneLimit:ahead                 =>     13 second
zoneLimit:farAhead              =>     20 second
zoneLimit:behind                =>      4 second
zoneLimit:farBehind             =>     12 second
zoneLimit:referenceSpeed         =>      5 meter/second
```

- Help About LDM and SafetyApp Configuration
  1. Go to the config prompt on the Lear CLI
  2. Type "config locos safetyApps ?"
  3. This will display following list

```
[Lear051580:info (10)0] enable
Moving to conf view...
[Lear051580:conf (10)0] config locos safetyApps
  fcw                FCW Configuration Parameters
  bsw                BSW Configuration Parameters
  zoneLimit          Zone Limit Configuration Parameters
  icw                ICW Configuration Parameters
  ima                IMA Configuration Parameters
  lta                LTA Configuration Parameters
  smva              SMVA Configuration Parameters
  rlv                RLV Configuration Parameters
  dnpw              DNPW Configuration Parameters
  laneWidth          Lane Width in meter
  rvFilter            Enable/Disable RV filter
  elevationNoiseThreshold Elevation noise threshold in meters.
```

- Getting Help About Configuration Parameters For A Safety Event

1. Go to the config prompt on the Lear CLI
2. Type "config locos safetyApps <event\_name> ?"
3. This will display the help about the configuration parameters of event "event\_name"
4. For example, to get the help about all FCW related configuration parameters type "config locos safetyApps fcw ?"

```
[Lear051580:info (10)0] enable
Moving to conf view...
[Lear051580:conf (10)0] config locos safetyApps fcw
  advisoryTriggerTTC Advisory threshold time-to-collision for FCW in second
  imminentTriggerTTC Imminent threshold time-to-collision for FCW in second
```

- Changing The Value Of A Config Parameter

1. Go to the config prompt on the Lear CLI
2. Type "config locos safetyApps <event\_name> <config parameter name> <config parameter value>"
3. For example, to set the value of config parameter fcwAdvisoryTriggerTTC to 29.5, execute "config locos safetyApps fcw advisoryTriggerTTC 29.5" on Lear CLI config prompt

```
[Lear051580:info (10)0] enable
Moving to conf view...
[Lear051580:conf (10)0] config locos safetyApps fcw advisoryTriggerTTC 29.5
```

4. After setting the value of any configuration parameter, LDM will restart automatically. The newly configured value should reflect when a user types "show locos safetyApps" on the info prompt of Lear CLI

```
[Lear051580:info (10)0] show locos safetyApps
fcwAdvisoryTriggerTTC           =>      29.5 second
fcwImminentTriggerTTC          =>       5 second
bswRVTimeToReachEV              =>       5 second
icwAdvisoryEVTimeToIntersection =>      10 second
icwAdvisoryEVRVTimeGap          =>       4 second
icwImminentEVTimeToIntersection =>       5 second
icwImminentEVRVTimeGap         =>       2 second
icwMinimumMergingAngle         =>      15 degree
imaAdvisoryEVTimeToIntersection =>      20 second
imaRVTimeToReachImpactArea     =>      10 second
ltaRVTimeToCrossEV             =>      10 second
smvaEVSpeedThresholdWrtRVSpeed =>     10 mile/hour
rlvMinSpeedLimit               =>       5 meter/second
dnpwRVTimeToCrossEV           =>      12 second
dnpwRadialDistanceToAheadRV    =>      20 meter
laneWidth                      =>       4 meter
elevationNoiseThreshold        =>       3 meter
rvFilter                       =>      disabled
zoneLimit:ahead                =>      13 second
zoneLimit:farAhead             =>      20 second
zoneLimit:behind               =>       4 second
zoneLimit:farBehind            =>      12 second
zoneLimit:referenceSpeed       =>       5 meter/second
```

### 6.9.2 LDM And SafetyApp Configuration Parameters

Below is the list of all the configuration parameters currently in use in safetyApps.

1. FCW
  - a. **fcwAdvisoryTriggerTTC** - Threshold TTC for generating advisory FCW. If the actual TTC is less than this value and RV is ahead of EV in the same lane then advisory FCW is generated.
  - b. **fcwImminentTriggerTTC** - Threshold TTC for generating imminent FCW. If the calculated TTC is less than this value and RV is ahead of EV in the same lane then imminent TTC is generated

## 2. BSW

- a. **bswRVTimeToReachEV** - Threshold time for generating BSW. If RV is behind EV and in adjacent lane and RV's time to overtake EV is less than this value then BSW will get generated.

## 3. ICW

- a. **icwAdvisoryEVTimeToIntersection** - Threshold time in seconds. If time required by EV to cross the intersection point is less than this threshold then further checks for advisory ICW are done.
- b. **icwAdvisoryEVRVTimeGap** - Threshold time in seconds. This is the difference of "Time required by EV to reach the Intersection point" and "Time required by RV to reach the Intersection point". Advisory ICW gets generated if the difference is less than the set threshold and condition in point #a above is satisfied.
- c. **icwImminentEVTimeToIntersection** - Threshold time in seconds. If time required by EV to cross the intersection point is less than this threshold then further checks for imminent ICW are done.
- d. **icwImminentEVRVTimeGap** - Threshold time in seconds. This is the difference of "Time required by EV to reach the Intersection point" and "Time required by RV to reach the Intersection point". Imminent ICW gets generated if the difference is less than the set threshold and condition in point #c above is satisfied.
- e. **icwMinimumMergingAngle** - Angle in degrees. Minimum merging angle of EV and RV tracks to check for ICW. If EV and RV tracks are merging at an angle less than this then ICW event will not be checked. The range for this parameter is [10, 45].

## 4. IMA

- a. **imaAdvisoryEVTimeToIntersection** - Threshold time in seconds. If time required by EV to cross the intersection point is less than this threshold then further checks for IMA are done.
- b. **imaRVTimeToReachImpactArea** - Threshold time in seconds. If time required by RV to reach the impact area is less than this threshold then IMA is issued provided the condition in #a above is satisfied.

**Impact Area** - This is a rectangle around the collision point. This is considered as a threat area. If EV and RV both are inside this area at any given

point of time then this is considered as an “incident” which should be avoided. The purpose of IMA application is to avoid this incident.

#### 5. LTA

- a. **ltaRVTimeToCrossEV** - Threshold time in seconds. If RV is classified as oncoming left and its time to cross EV is less then this set threshold then LTA is issued.

#### 6. RLV

- a. **rlvMinSpeedLimit** - Speed in meters/second. This is used in the scenario when EV is stopped and signal turns from red to green. In this case RLV is not issued until EV attain this minimum speed.

#### 7. DNPW

- b. **dnpwRadialDistanceToAheadRV** - hreshold radial distance in meters. If radial distance from EV to RV1 (which is in the same lane and ahead of EV) is less then this threshold then further checks done on DNPW.
- b. **rvTimeToCrossEV** - Time in seconds. DNPW is generated when there is a chance of front collision with RV2 (which is oncoming and in adjacent lane to EV) while overtaking RV1 (which is in the same lane and ahead of EV). DNPW is generated when RV2 is less then rvTimeToCrossEV seconds away from EV. **This parameter is for future use. Not in use in SafetyApp as of now.**

### 6.9.3 Config Parameters Independent Of Any Event

- a. **laneWidth** - Lane width in meters
- b. **smvaEVSpeedThresholdWrtRVSpeed** - Speed in miles/hour. This is the minimum relative speed of EV with respect to RV above which RV is classified as slow moving.
- c. **enableRVFilter** - Enable/disable RV filter  
**RVFilter** - In heavy traffic conditions, there are many vehicles in the vicinity of EV which are not potential threats and need not be processed fully. These RVs can be ignored after partial processing. This is the variable to enable the functionality of filtering RVs at different stages of processing. **This parameter is for future use. Not in use in SafetyApp as of now.**

- c. **elevationNoiseThreshold** - Threshold noise in meters. If elevation difference between EV and RV tracks is less than elevationNoiseThreshold value then this elevation difference will be ignored.

**Example:** If EV and RV tracks are on the same lane in 2-D but the elevation difference between the tracks is 3 meters and if configured value of elevationNoiseThreshold is 5 meters then the elevation difference in EV and RV tracks will be ignored and RV will be classified in the same lane. But if the configured value of elevationNoiseThreshold is 2 meters then RV will not be classified in the same lane and it will not be shown on HMI. **This parameter is strictly for debugging purpose. Not to be changed by customer in any situation.**

#### 6.9.4 Zone Limit Parameters (**Not in use in SafetyApp as of now**)

- a. **zoneLimit:ahead** - Time in seconds. If this parameter is multiplied by EV speed then this value gives the limit for the 'ahead zone' for the EV
- b. **zoneLimit:farAhead** - Time in seconds. If this parameter is multiplied by EV speed then this value gives the limit for the 'far ahead zone' for the EV
- c. **zoneLimit:behind** - Time in seconds. If this parameter is multiplied by EV speed then this value gives the limit for the 'behind zone' for the EV
- d. **zoneLimit:farBehind** - Time in seconds. If this parameter is multiplied by EV speed then this value gives the limit for the 'far behind zone' for the EV
- e. **zoneLimit:referenceSpeed** - This the minimum speed of EV which will be used to define the above specified zones. If actual EV speed is below this value then this value will be used to define the ahead and behind zones for EV

#### 6.10 Configuring DeploymentId (*Optional configuration*)

Deploymentid needs to be configured to get deployment specific events. Below is the configuration command for deploymentid.

```
[LearBABBBB:info (0)1] enable
[LearBABBBB:conf (0)1] config log deploymentid default
[LearBABBBB:conf (0)1] exit
```

**NOTE:** The deploymentid will be communicated by LEAR which is customer specific.

## 6.11 Over the Air Service Guide

### 6.11.1 OTA service on RSU :

- 1 Upgrade RSU with latest firmware.
- 2 Go to config mode and set brtrunk IPV4 address,

```
config interface brtrunk ipv4 ip 192.168.0.110 255.255.255.0
```

- 3 Add a global Ipv6 address to brtrunk interface of RSU. Also IPV6 default gateway should be configured according to VM's eth0 global IPV6 address.

```
config interface brtrunk ipv6 ip 2001:470:11:22::2 64
config interface brtrunk ipv6 gateway 2001:470:11:22::1
config interface brtrunk ipv6 networkprefix 2000:: 3
```

- 4 Disable the running default provider application with below mentioned snmp command.

```
snmpset -t 15 192.168.0.110 RSU-MIB::rsuWsaStatus.1 = 6
```

- 5 Configure routing information in WRA, below mentioned are the commands,

*Note : In order to configure WRA and WSA, you can follow either SNMP or CLISH commands.*

#### CLISH commands

```
config locos wraconf wradefaultgw 2001:470:100:2222::1
config locos wraconf wraprimarydns 2001:470:100:2222::1
config locos wraconf wraipprefix 2001:470:100:2222::
config locos wraconf wraprefixlen 64
```

#### SNMP commands

```

snmpset -t 15 192.168.0.110 RSU-MIB::rsuWraIpPrefix.0 x "20010470010022220000000000000000"
snmpset -t 15 192.168.0.110 RSU-MIB::rsuWraIpPrefixLength.0 x "40"
snmpset -t 15 192.168.0.110 RSU-MIB::rsuWraGateway.0 x "20010470010022220000000000000000"

snmpset -t 15 192.168.0.110
                RSU-MIB::rsuWraPrimaryDns.0 x "20010470010022220000000000000001"

```

note:- above command is single command.

- 6 Host a ota service by configuring WSA using below commands. This will start a provider application, which transmits OTA service advertisements

```

snmpset -t 15 15 192.168.0.110 RSU-MIB::rsuWsaStatus.1 = 4 rsuWsaPsid.1 x "00000034"
                rsuWsaPriority.1 = 1 rsuWsaProviderContext.1 = "Lear"
                rsuWsaIpAddress.1 x "20010470001100220000000000000001" rsuWsaPort.1 = 16092
                rsuWsaChannel.1 = 176

```

note:- above command is single command.

- 7 reboot the board.

### 6.11.2 Configurations to join OTA service on ASD/OBU :

- 1 Upgrade OBU/ASD with latest firmware.
- 2 Configure ota user application,

```

config locos ota update wmeconfig appname ota
config locos ota update wmeconfig psid 52
config locos ota update wmeconfig userRequestType 1
config locos ota update wmeconfig serviceChannel 176
config locos ota update wmeconfig psc LearCorporationTestProviderServi
config locos ota update wmeconfig wsaType any
config locos ota update wmeconfig advertiserIdentifier LEAR
config locos ota status enable

```

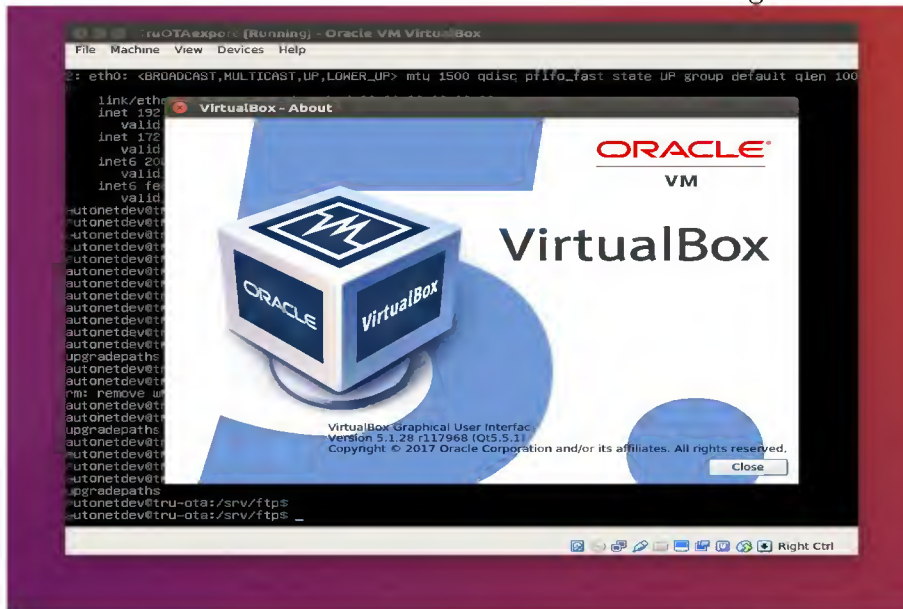
- 3 reboot the board.



### 6.11.3 Setting up OTA server on backend linux machine

*Note : All our setup is done on Ubuntu 16.04 64 bit machine* OTA server's virtual machine image will be provided by Lear Corporation. When this document was created, the image file name was "OTAexport1.ova", Contact Lear for the latest image.

- 1 Install Oracle virtual box 5 on ubuntu machine. Refer below image for virtual box

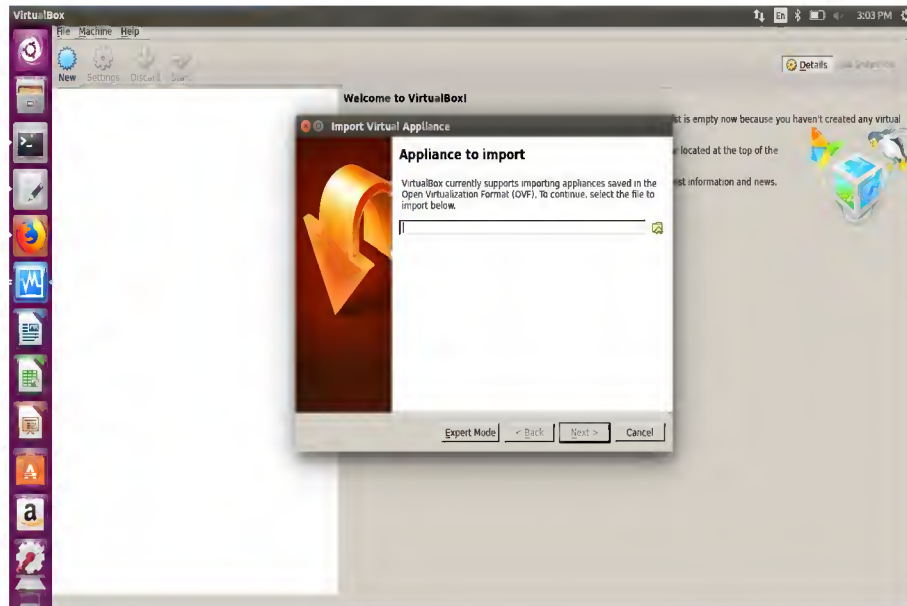
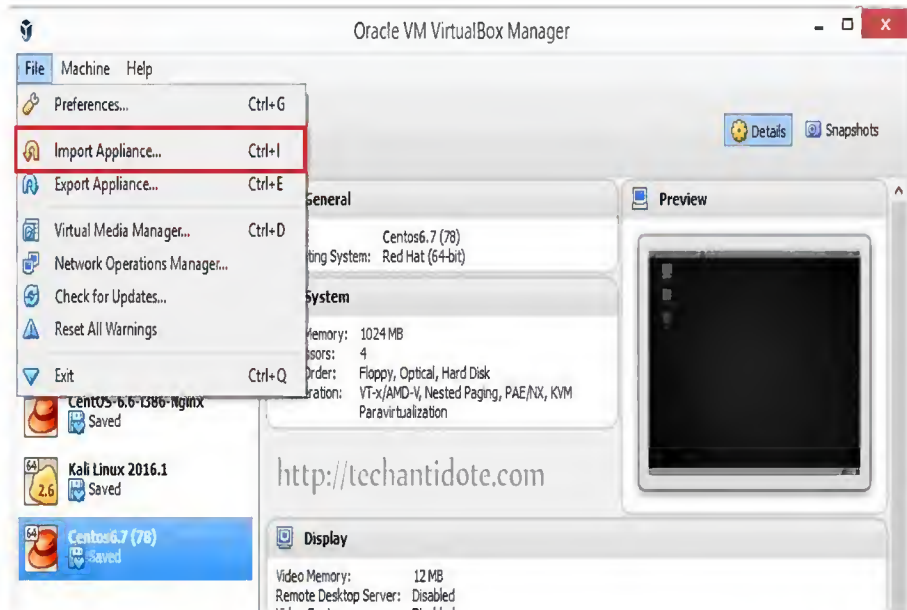


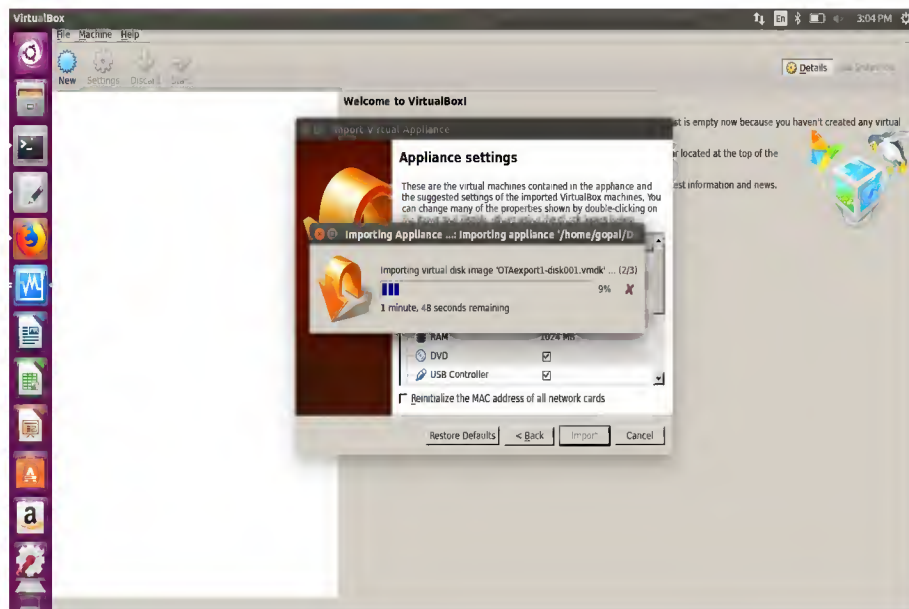
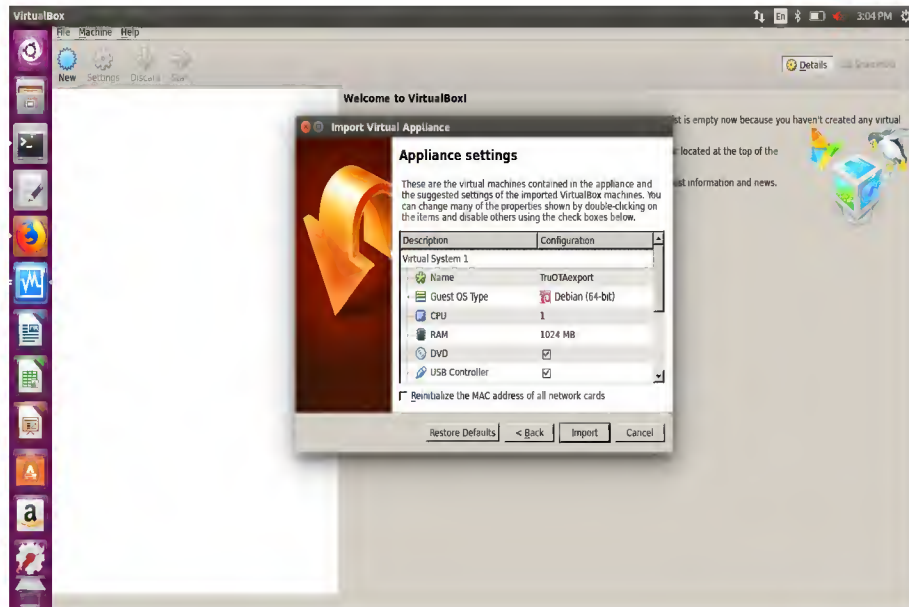
details.

- 2 Run virtual box as super user.

```
sudo virtualbox
```

- 3 import the OTAexport1.ova image on virtual box. Refer the below image,

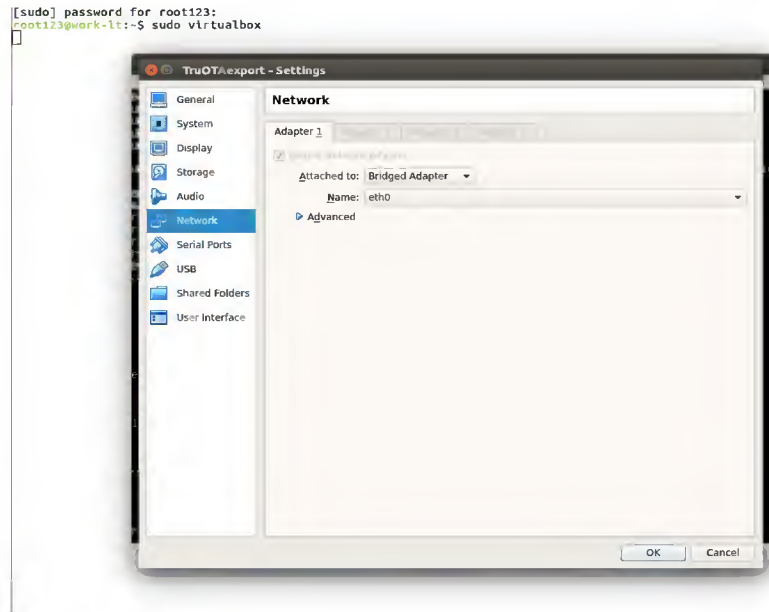




Note: Disable USB if there is any error while doing import  
Settings -> USB -> Disable USB

- 4 Network setting for this virtual machine should be as mentioned below,  
Adapter 1 :

Attached to : Bridged Adapter  
Name : eth0



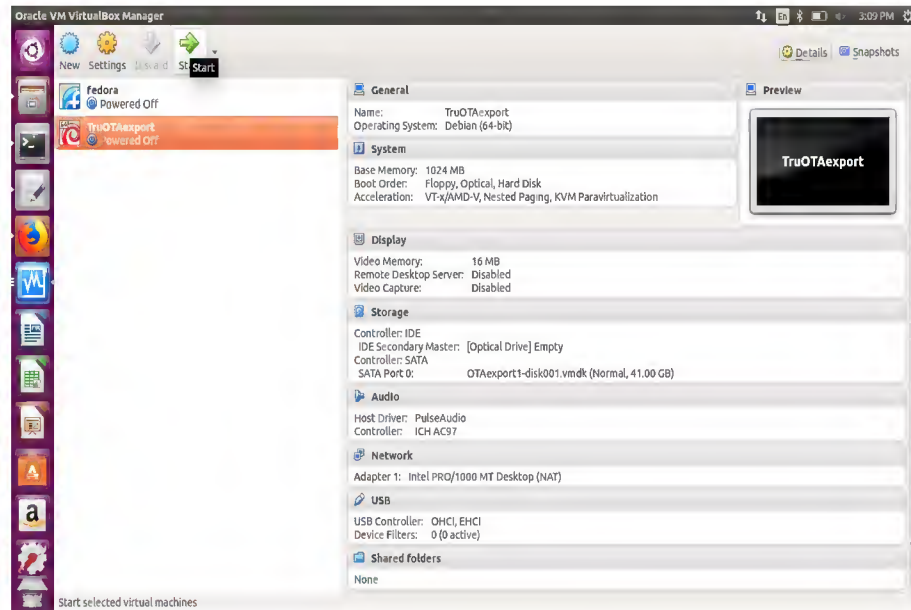
5 Set IPV4 address for eth0 interface (In backend linux machine)

```
sudo ifconfig eth0 192.168.0.150
```

#### 6.11.4 OTA server configurations (which is running in Virtual Machine)

servercomm is a server application which will be running by default. Setup the OTA server environment by executing below mentioned steps in the virtual machine console,

1 start OTA server, Refer the below image.



2 Remove all files in /srv/ftp

```
rm -rf /srv/ftp/*
```

3 Create or edit "/srv/ftp/upgradepaths" file with "from" and "to" software version information. Content of this file should of this format,

**From\_version To\_version**

example :

```
v16.3.QA_11.04 v16.3.QA_11.05
v16.3.QA_11.05 v16.3.PR11
```

4 To Show Ip address of eth0 interface,  
ip a

5 Remove existing Ipv4 address of eth0 interface,

```
sudo ip a d 169.254.6.71/16 dev eth0
```

6 Add new Ipv4 and Ipv6 address for eth0 interface,

```
sudo ip a a 192.168.0.100/24 dev eth0
```

```
sudo ip -6 a a 2001:470:11:22::1/64 dev eth0
```

*Note : Ignore any warnings displayed*

7 Add RSU brtrunk ipv6 address as a default gateway,

```
sudo ip -6 r a default via 2001:470:11:22::2 dev eth0
```

*Note : Ignore any warnings displayed*

8 create a softlink,

```
sudo rm -r /var/uploads/  
sudo mkdir -p /var/uploads  
sudo ln -s /srv/ftp/ /var/uploads/packages
```

### 6.11.5 Creating firmware package to upload on OTA server(In Ubuntu back end machine):

OTA applications expects the firmware package in .tgz format. Contents of the .tgz file is predefined . Package should contain below mentioned files,

a Filename : \*.ara

This is the firmware image file provided by Lear Corporation. File will be with .ara extension.

b Filename : Image

Add firmware file name into this file. If you have .ara file in the same directory, you can use below command to create "Image" file.

```
ls *.ara > Image
```

c Filename : install.sh

This script will be provided by Lear corporation.

Creating .tgz file :

The package should be named as "from\_version-to\_version.tgz".  
example: If you have to create a package to upgrade device from v16.3.QA\_11.05 to v16.3.PR11, then the package name will be "v16.3.QA\_11.05-v16.3.PR11.tgz".  
In this case the directory should contain these 3 alone

1. `install.sh`
2. `Image`
3. `Firmwarefile.ara` -> This is the fw to be upgraded on OBU/ASD

```
cd directory_containing_OTA_files
tar -cvzf from_version-to_version.tgz .
```

Note:- please make sure .tgz file is created properly otherwise firmware upgrade will fail.

#### 6.11.6 Accessing OTA server database using TruManager on backend linux machine:

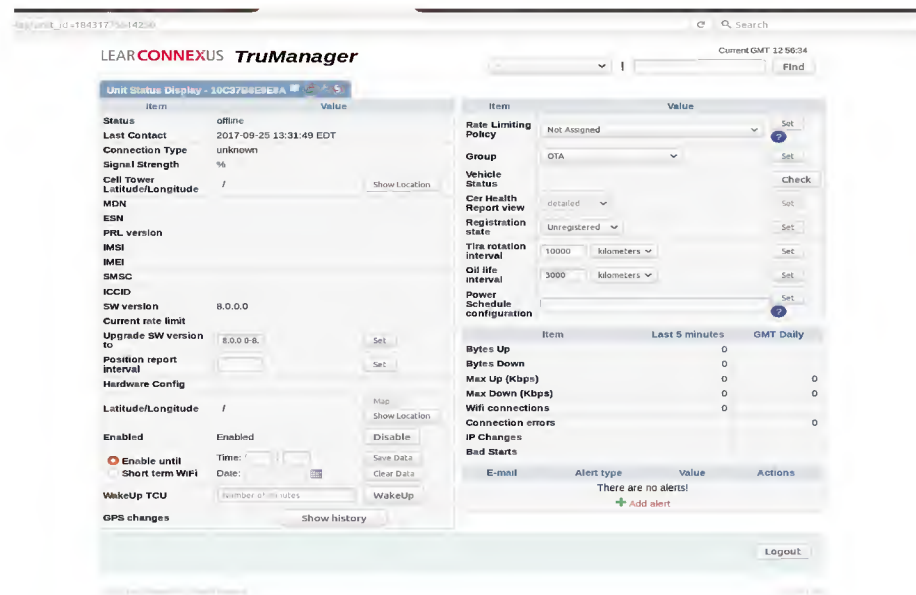
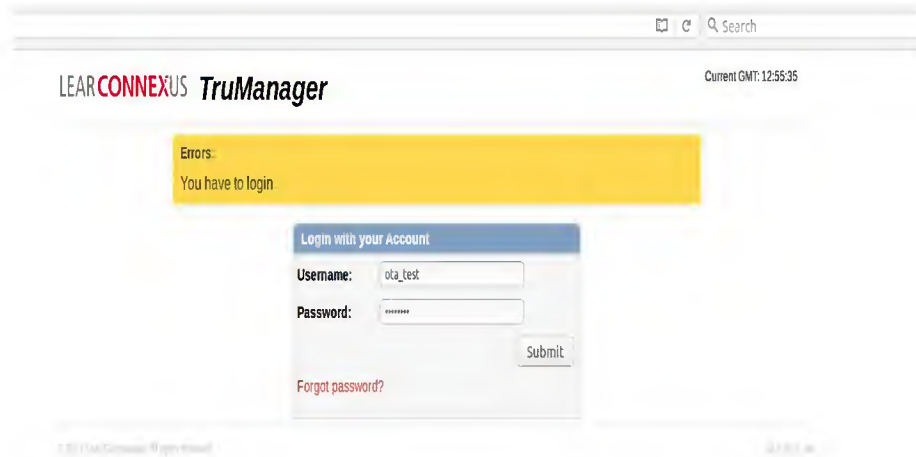
TruManager is a web interface to access OTA data base. We can upload the packages and configure unit's "to software version" on TruManager. Follow below steps to access Trumanager.

- 1 Access TRUmanger webpage, open a browser and enter below link, <http://192.168.0.100>

Note:192.168.0.100 is eth0 interface ip of OTA server running on virtual machine.

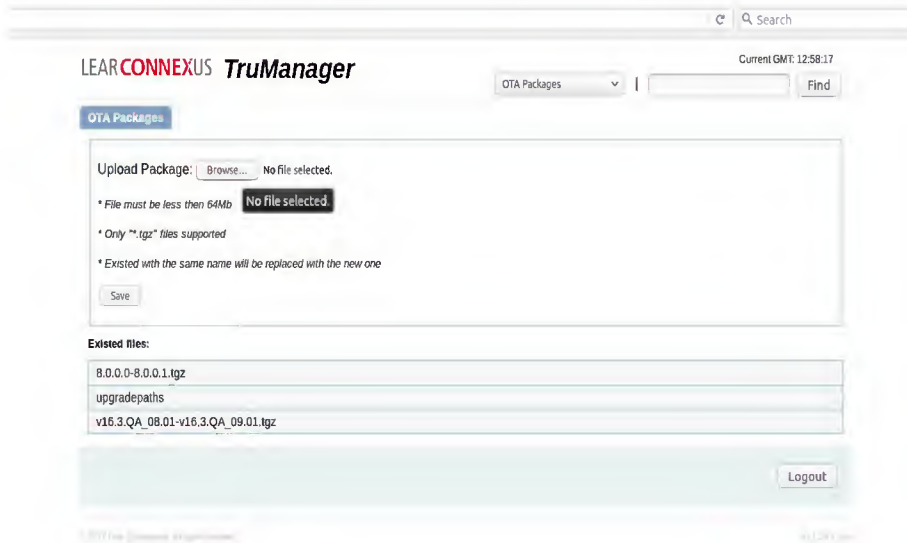
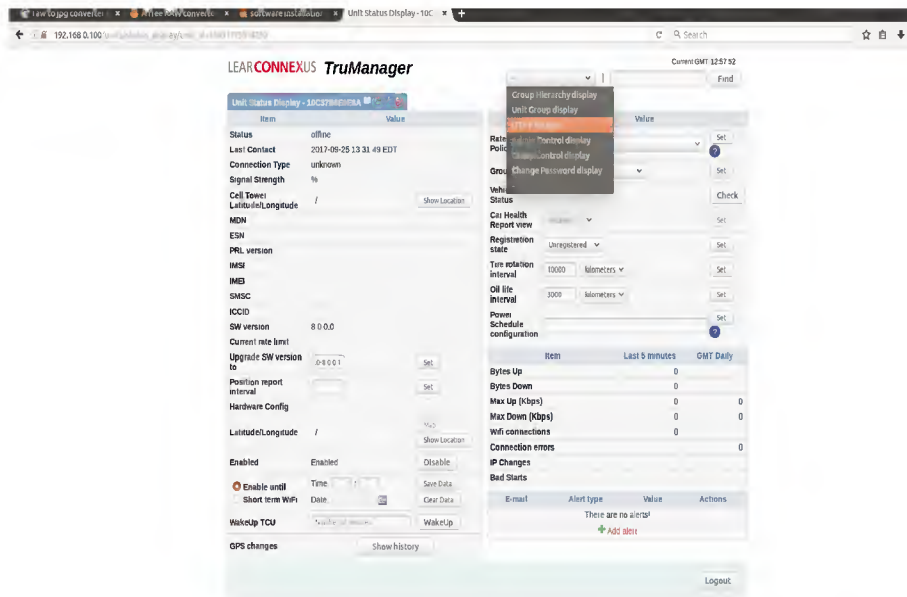
- 2 Login with below mentioned credentials,

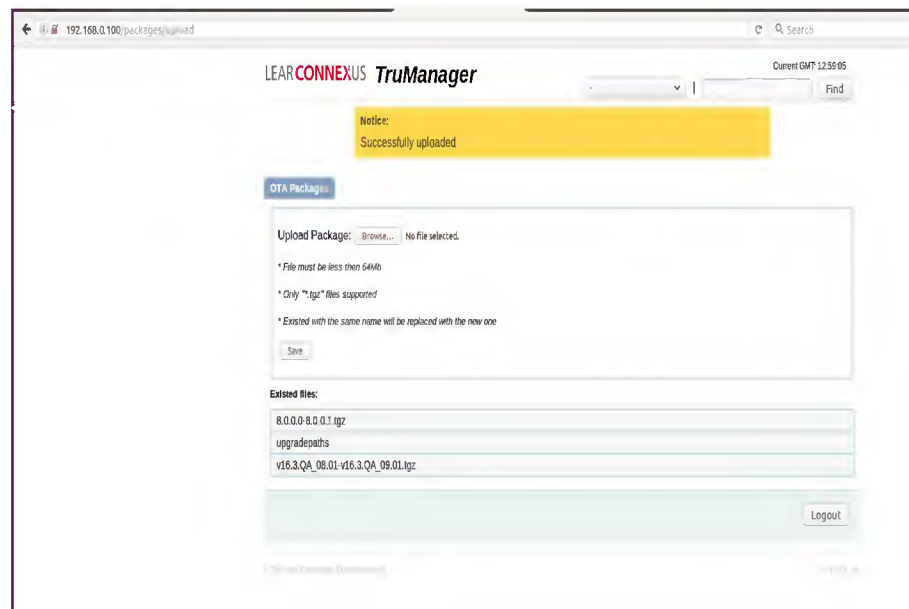
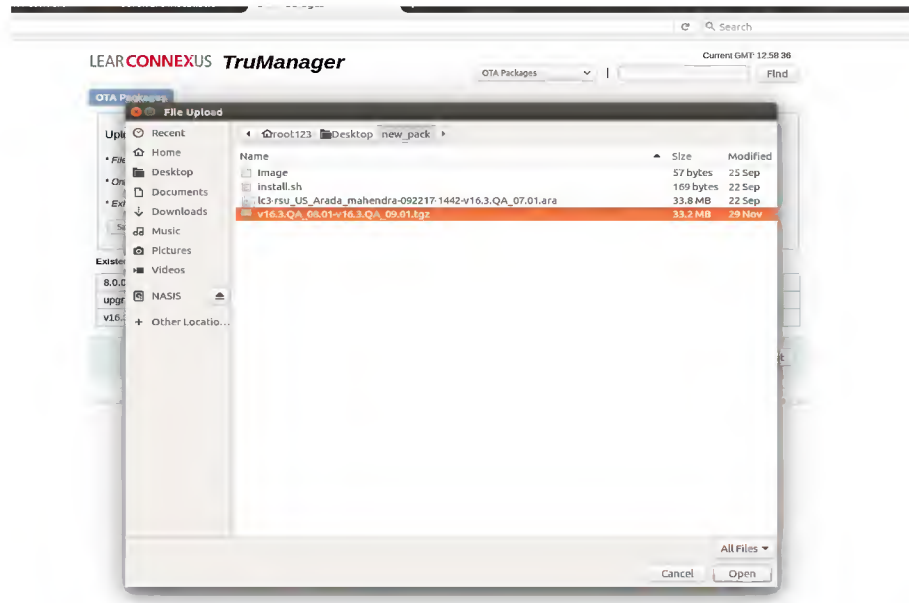
User name : ota\_test  
Passwd : Q123456q



- 3 select OTA packages section,
  - a. Browse and Upload the .tgz file.



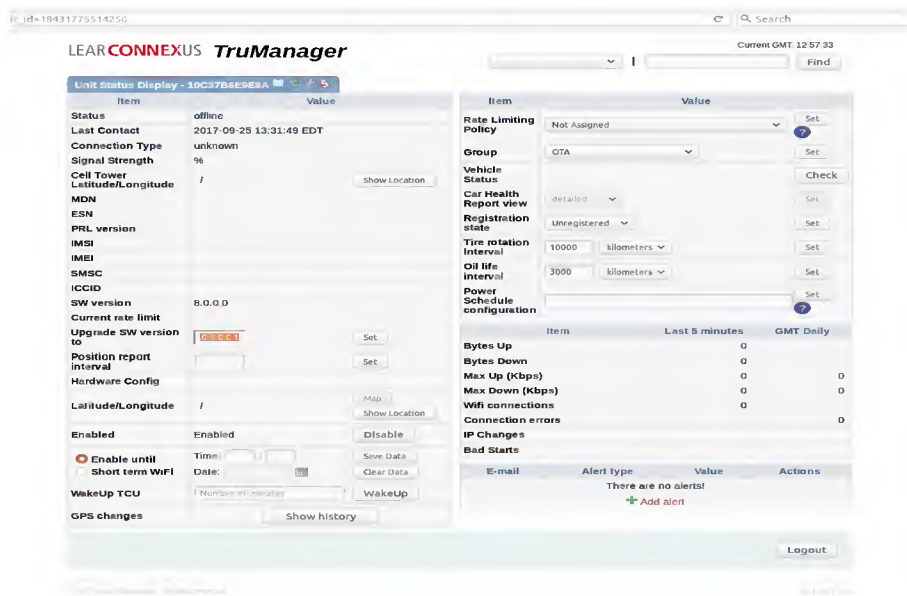




4 Find the device with hostname “10c37B6E9E8A”. You can observe unit details.

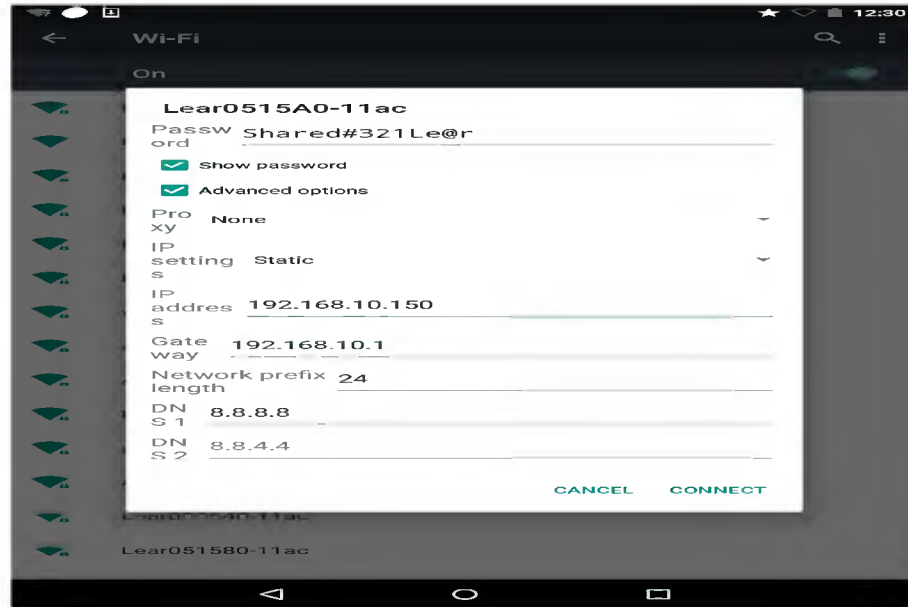


- a. Observe the "SW version", which is current version.
- b. Change the "Upgrade SW version to" section with "from\_version-to\_version" example : If you want to upgrade device from v16.3.QA\_11.05 to v16.3.PR11, then this field should contain "v16.3.QA\_11.05-v16.3.PR11"

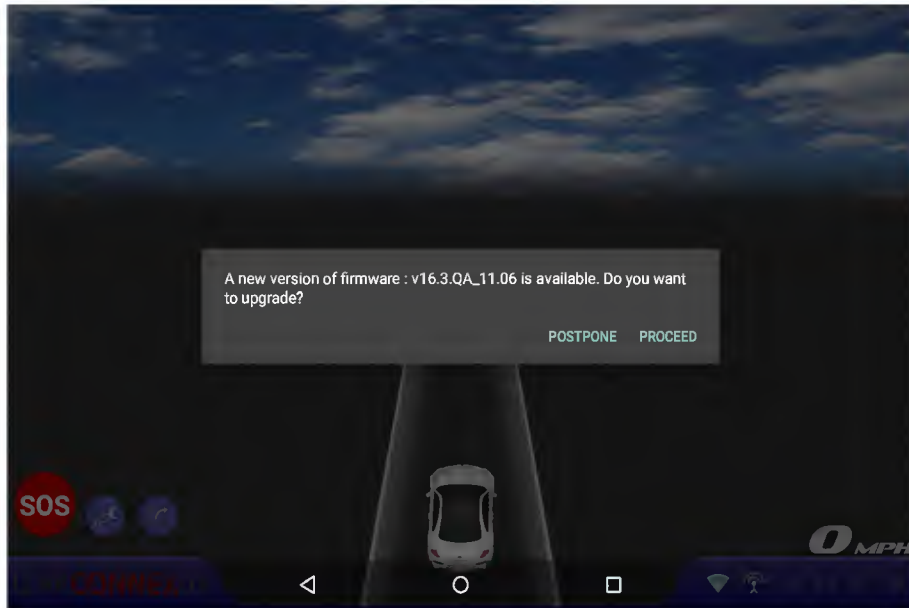


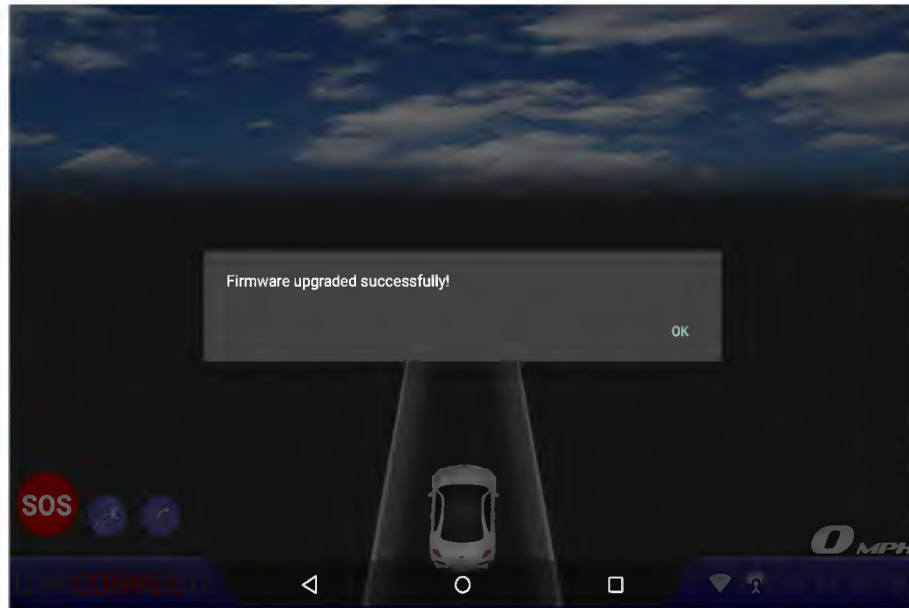
### 6.11.7 HMI Setup :

- 1 Check ath0 interface configuration on obu. SSID will be in that name by default.
- 2 Connect android device to OBU/ASD.



- 3 If upgrade is available, You will get notification on HMI to upgrade firmware, Press ok button to upgrade.





4 Check latest version after upgrade.

*Observations to be made: Wait for user join to OTA service hosted by RSU, Verify this in syslog messages. Once ota service is joined, The OTA applications will download latest softwares, if available. After complete download, ASD will send "upgrade available" notification to HMI application.*

## Chapter 7

# HMI

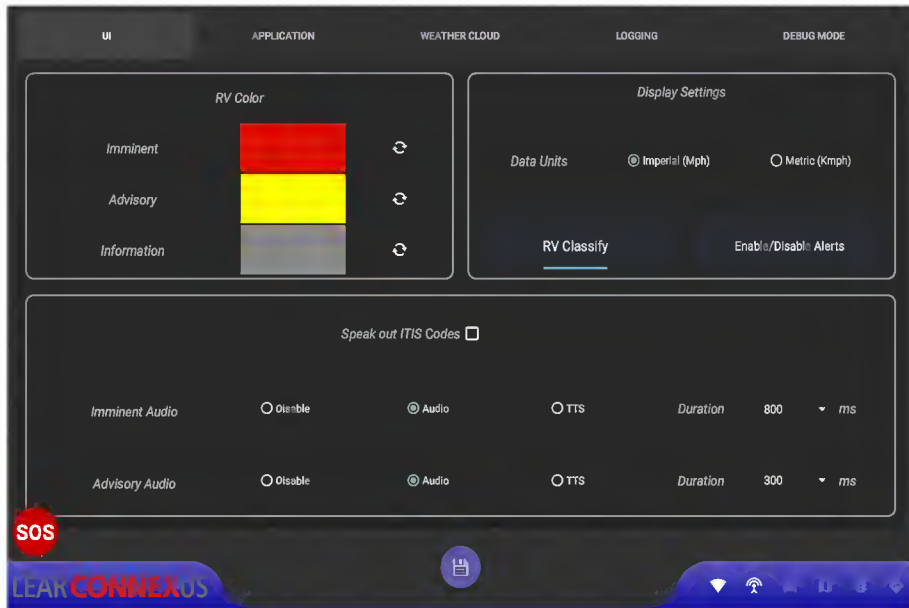
### 7.1 HMI application configuration

In order to run the HMI in the android device, follow the steps below,

1. First download the “Lear connexus HMI” android application from our support site. Once downloaded, that application(.apk) will be present in the Downloads directory of android device.
2. Install the downloaded APK.
  - If the APK installation is blocked in your android device goto,  
`settings -> security -> unknown sources`  
Enable “unknown sources” to allow APK installation
3. To enable GPU rendering,
  - Unlock the developer option in android device, goto  
`settings -> about device -> build number`  
  
Tap “Build number” 10 times. It will unlock developer options.
  - Enable GPU rendering, goto  
`Settings -> Developer options -> Force GPU rendering`  
  
Enable “Force GPU rendering”.
4. Launch the application from the app drawer. By-default app starts in wifi mode.
5. At the bottom of the application tap on “setting icon”, it will open up settings as shown in below screen shot.

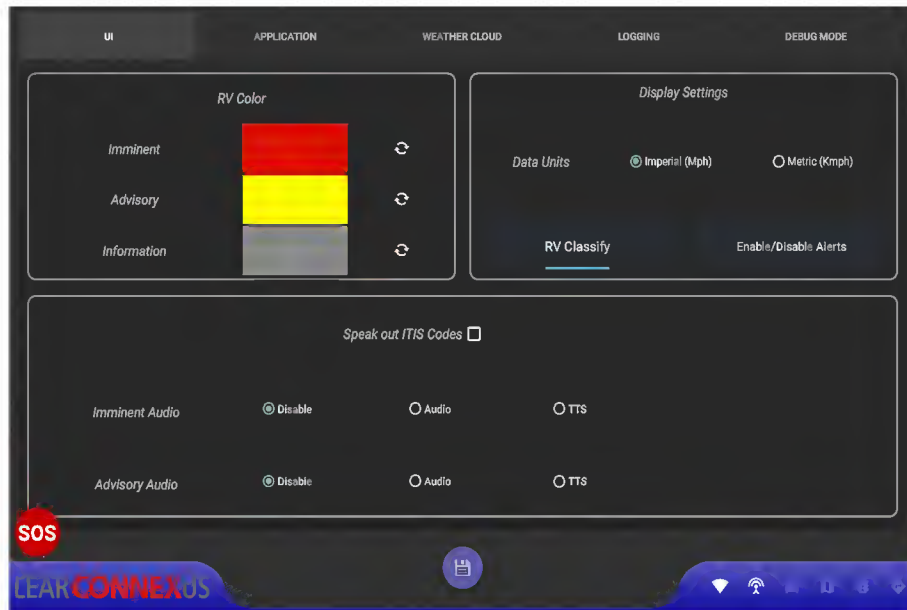


Audio enable,



Audio disable,

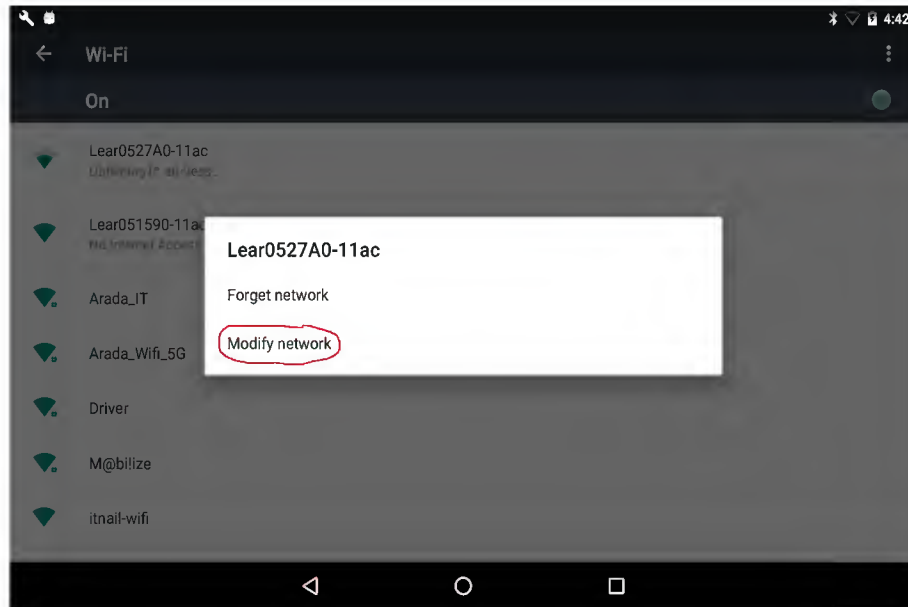




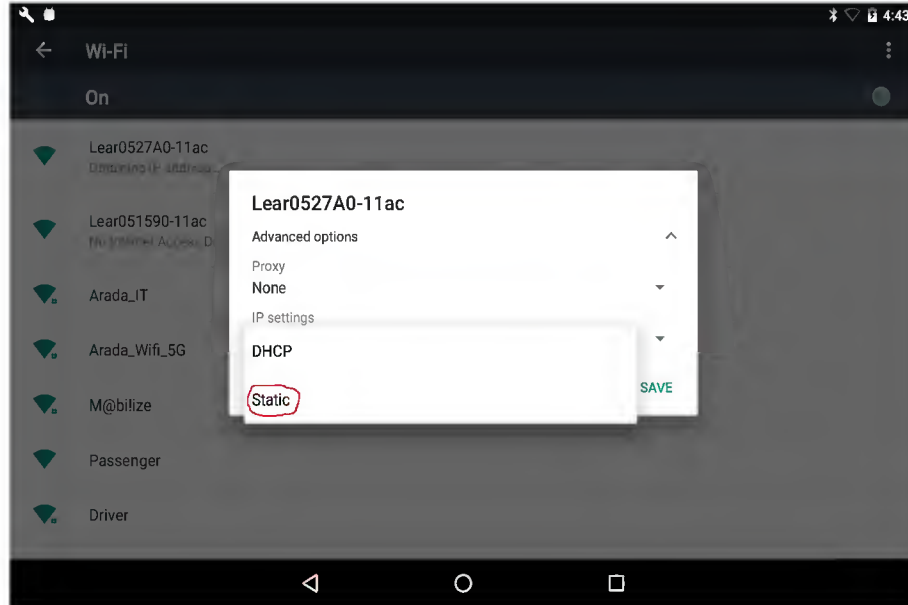
**NOTE:** Roadstar supports both wifi and bluetooth connection modes. While classic and mini2 devices only supports bluetooth.

5.1. To use Wifi as connection mode

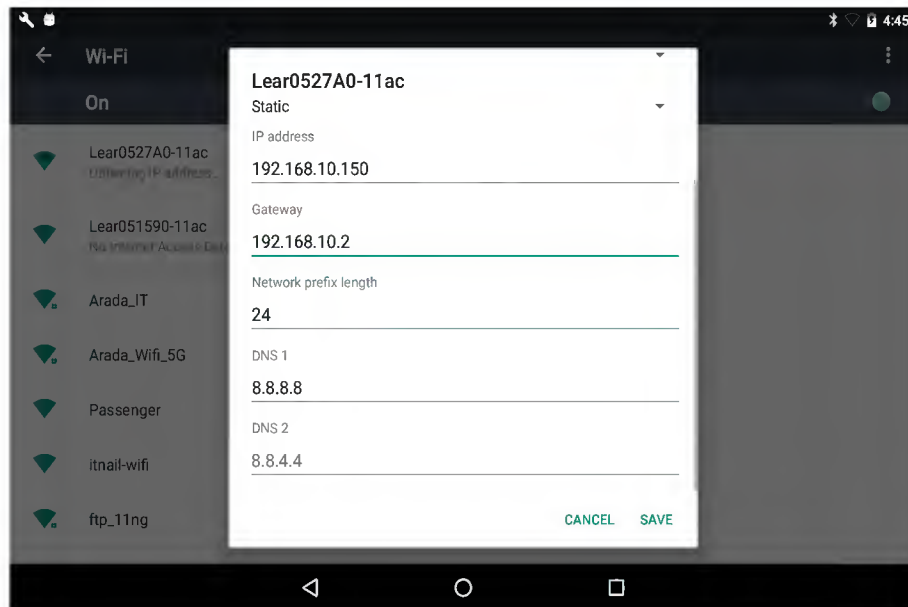
- \* In board set the connection mode as wifi as follows,  
[LearBABBBB:conf (9)0] config locos hmi settings connectionmode wifi
- \* Open settings in android device and turn on the wifi. Connect to SSID Learxxxxx-11ac.
- \* Tap and hold Learxxxxx-11ac, and select “Modify network”.



- \* In “Advance options” change “IP settings” from “DHCP” to “Static”



- \* Enter the ip address as “192.168.10.150” and gateway as “192.168.10.2”, then save it. By default roadstar is configured to send data on “192.168.10.150”.

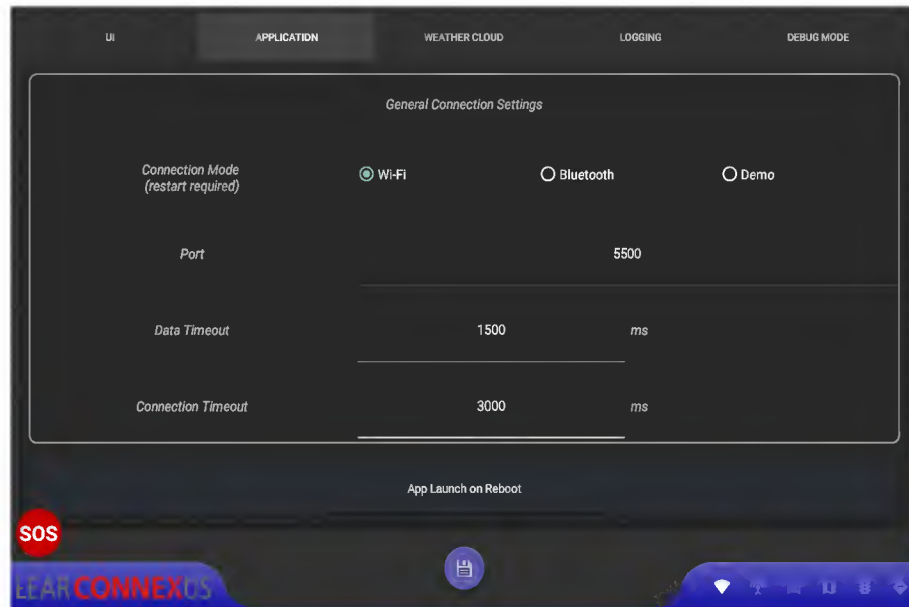


- Optional: This IP address can be configured in roadstar device as follows,  

```
[LearBABBBB:conf (9)0] config locos hmi wifi settings destinationip 192.168.10.xx
```

If the IP address is changed in the board, it has to be simultaneously be changed in the android device as well.

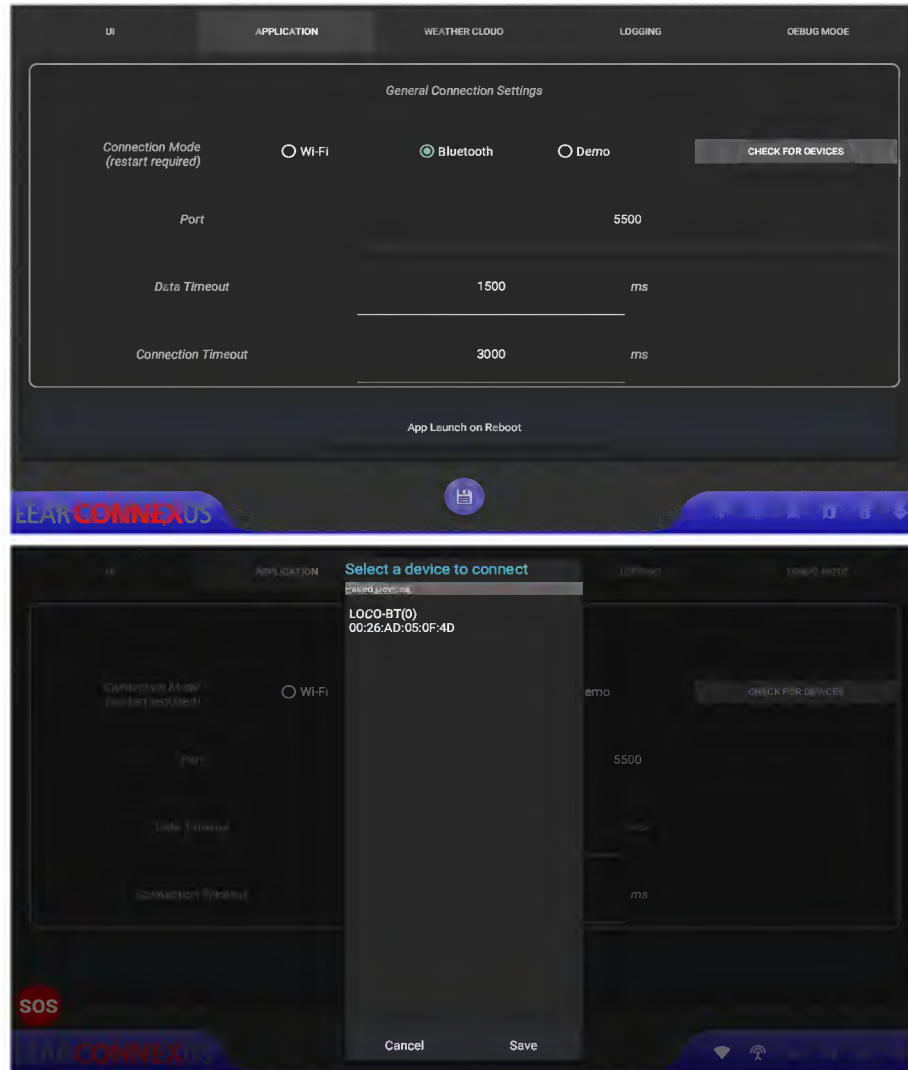
- \* After setting ip address, android device will be successfully connected to roadstar using wifi.
- \* After all these steps open the app in android device. Tap on setting icon to change settings, then set the mode to wifi mode. This requires restart of app.

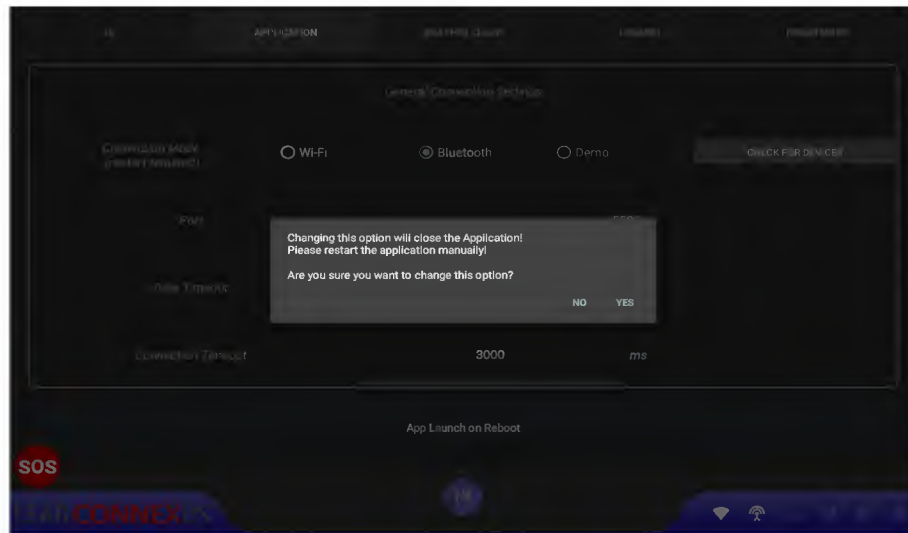


- \* After restart, connection mode will be changed to wifi and wifi symbol will be enabled on the screen.

## 5.2. To use Bluetooth as connection mode

- \* In board set the connection mode as bluetooth as follows,  
[LearBABBBB:conf (9)0] config locos hmi settings connectionmode bluetooth
- \* Change connection mode to bluetooth in android app as shown in screen shot. This requires restart of app.





- \* After restart, connection mode changed to bluetooth and bluetooth symbol enabled on the screen as shown in screen shot below.



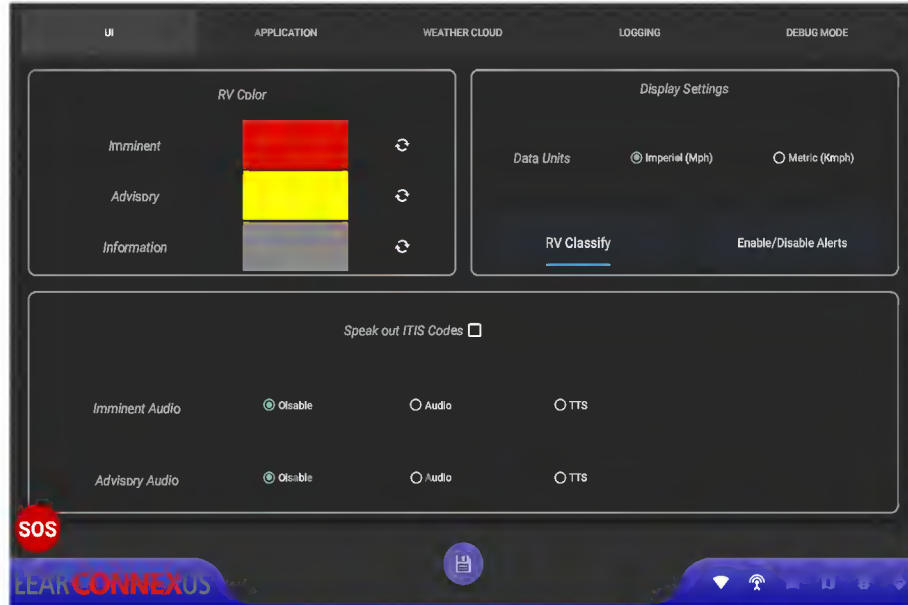
5.3 UI Settings.

\* Along with all parameters, duration of audio for alerts is configurable from settings.

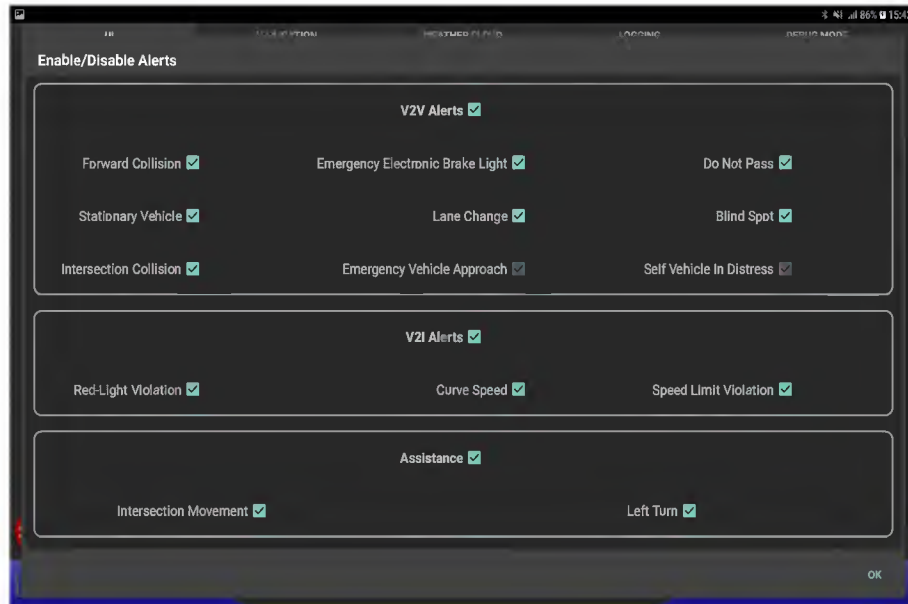
- Imminent - 100 to 4000ms
- Advisory - 100 to 2000ms



\* Disabling the audio alert



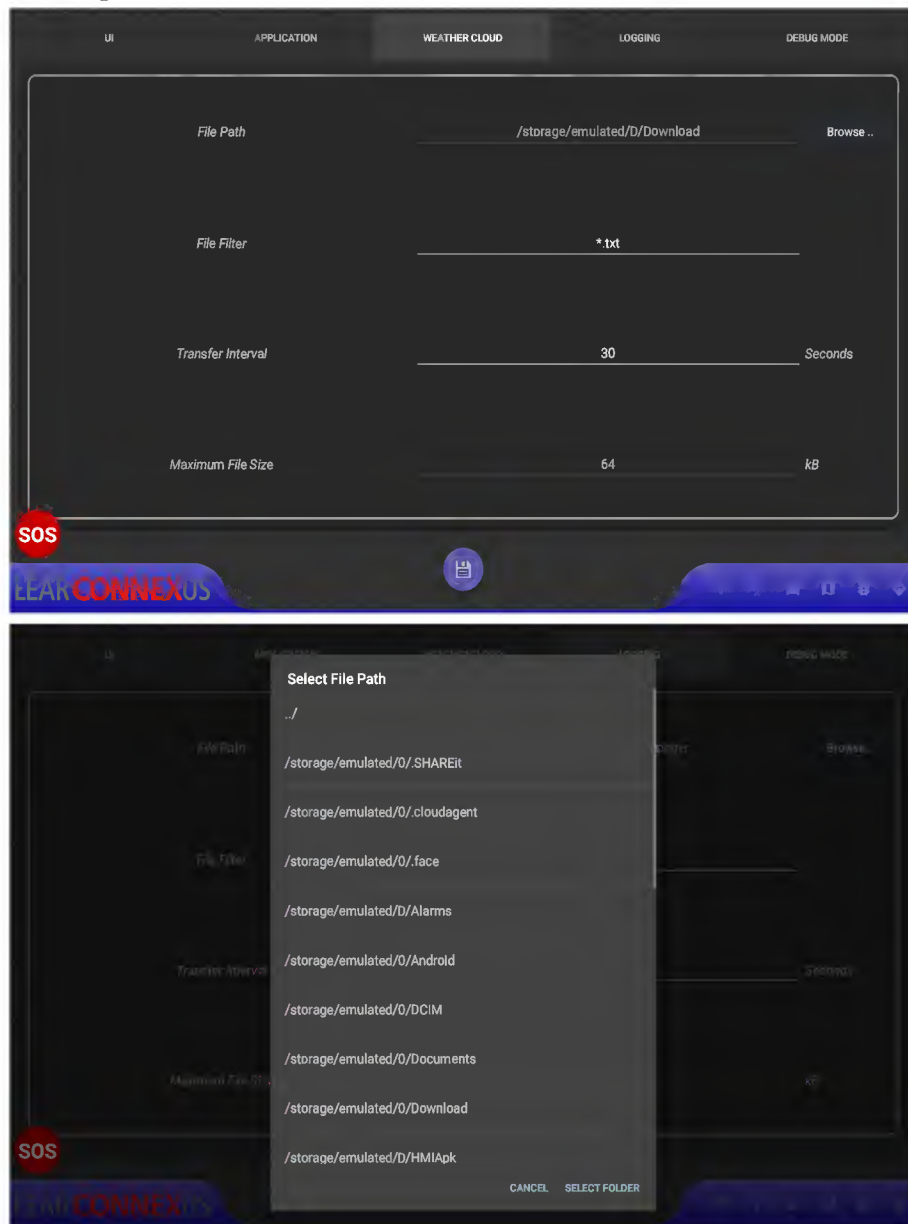
\* In UI settings, we can enable the required alerts as shown in the below screen-shots. Only the enabled alerts will be displayed in the HMI  
 Below screen-shots EVA and DN alerts are mandatory





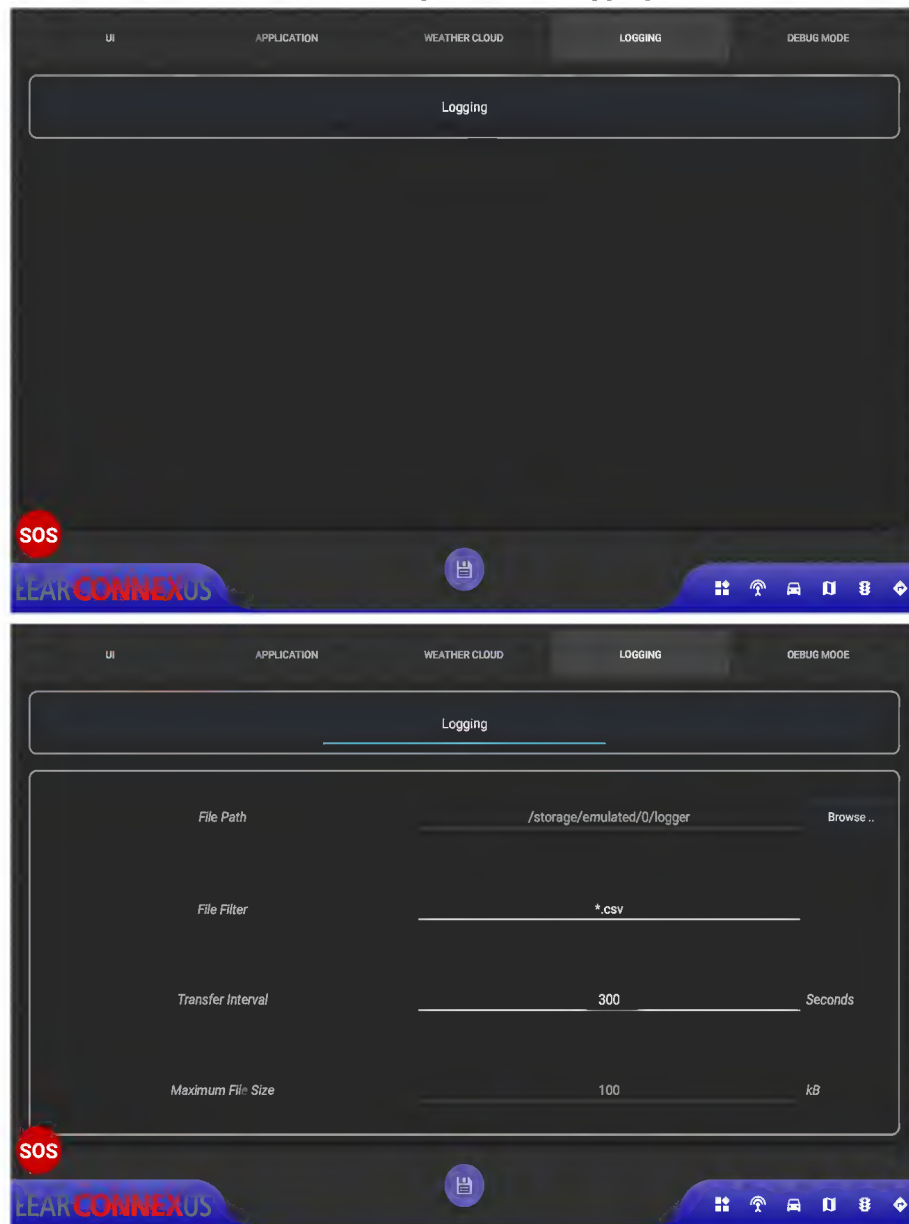
### 5.3 Configuring Weather Cloud.

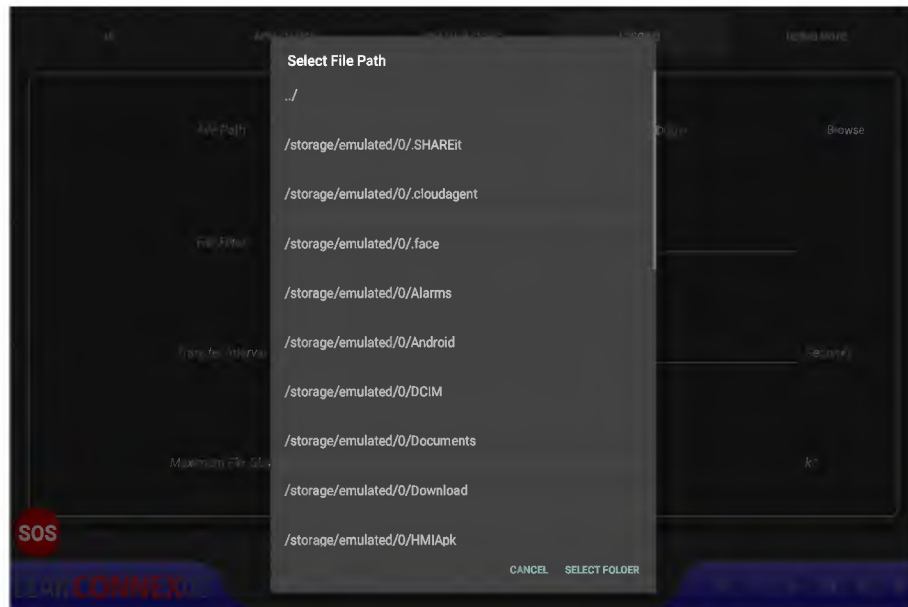
- \* In Weather Cloud, we have to give file path, file filter and transfer interval. So files are transmitted in that configured interval. Below screen-shot shows the configuration of weather cloud.



#### 5.4 Configuring logging.

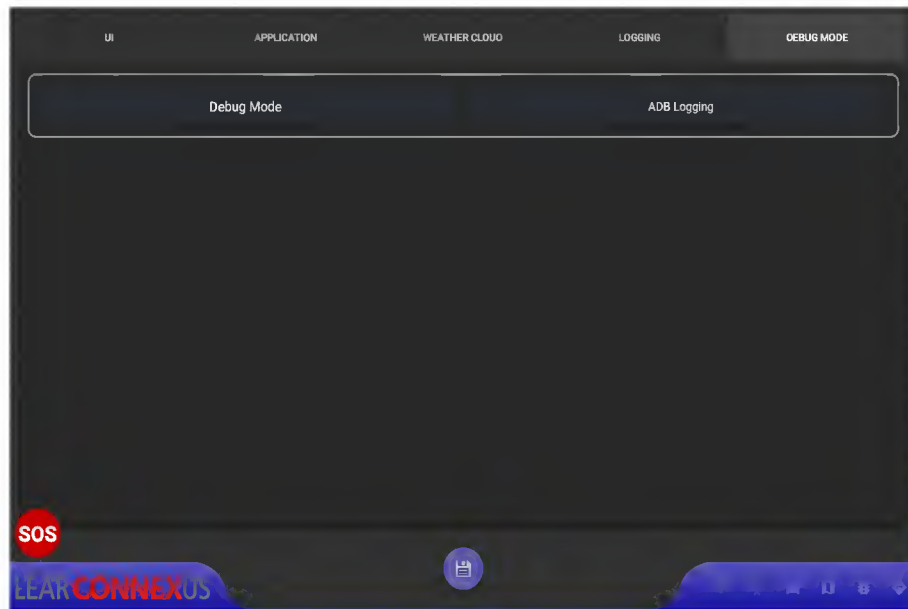
- \* In logging, we need to provide file path, file filter and transfer interval. So files are transmitted in that configured interval. By default logging is enabled. Below screen-shot shows the configuration of logging.



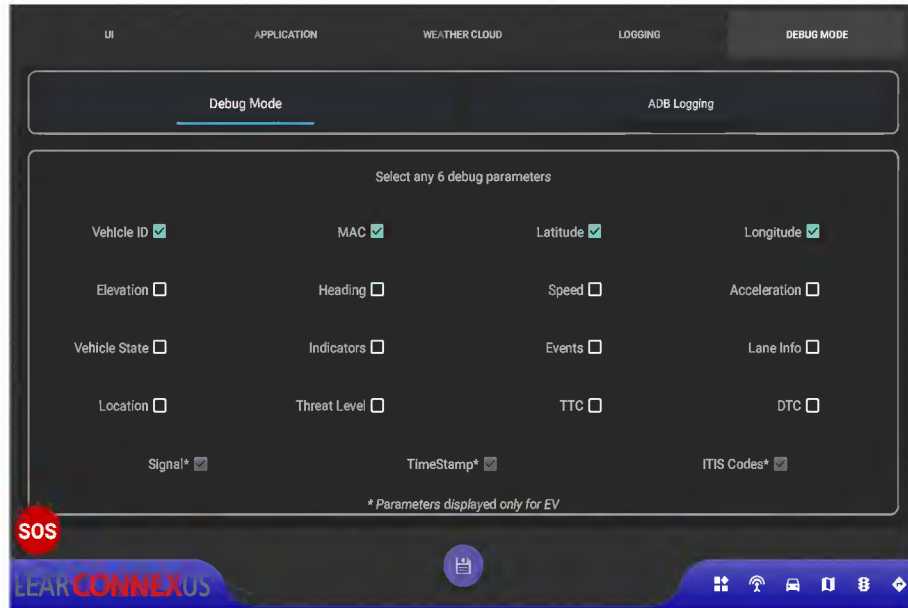


### 5.5 Debugging

- \* In debugging we can change the mode as shown in below screen-shots.



In below screen-shot under debug mode the user can select a maximum of six parameters and minimum of one parameter. These parameters will be displayed in a balloon above every RV. Parameters signal, Timestamp and ITIS codes is displayed only for EV. User cannot configure these parameters.



## 7.2 OBU Configuration Settings

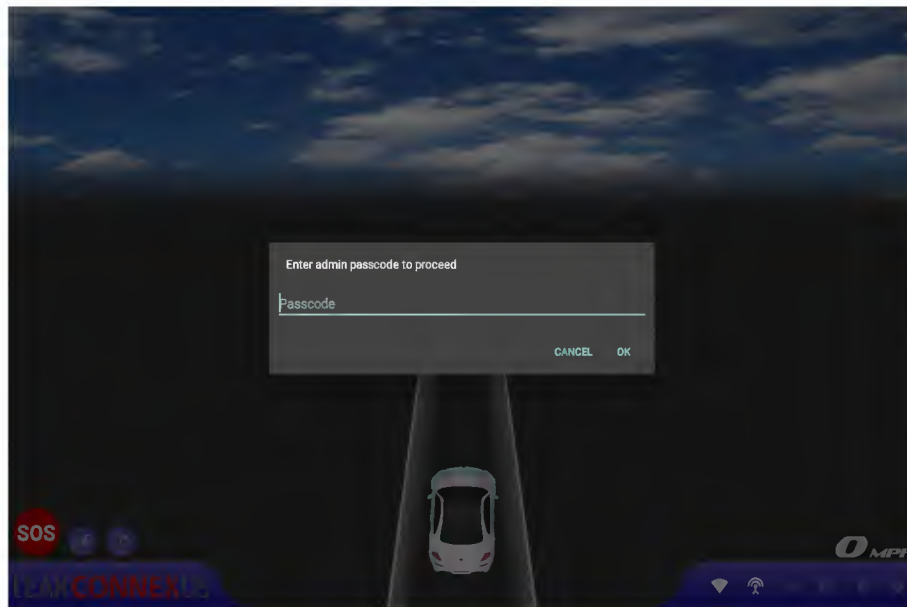
This document is solely to enable a user set OBU config settings as well as receive them from the configured OBU.

### 1. OBU Configuration:

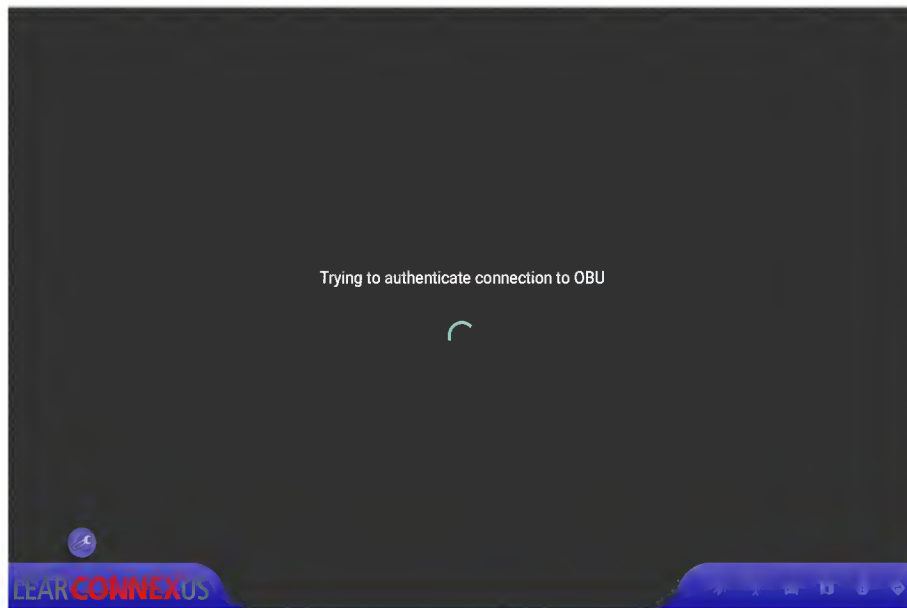
OBU configuration can be done in HMI Application settings.



Tap on the “OBU settings icon”, and enter the passcode as shown below.



After entering passcode, it connects to OBU.



If passcode is incorrect, it will show a message as as below screen-shot.



On connection time out, the below message is shown.



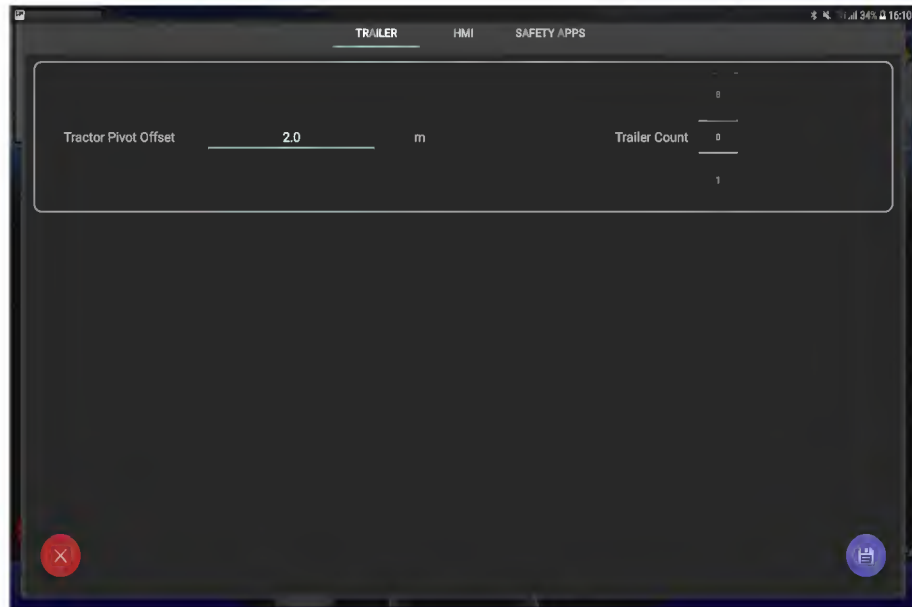
## 2. OBU Settings

The OBU settings will be fetched from the configured OBU. Currently, under OBU settings, there is provision given to the user to configure:

1. *Trailer settings.*
2. *HMI settings.*
3. *Safety apps settings.*

### \* Trailer Settings

User can set the trailer count. According to the count selected, tabs designated to each trailer will be shown. Each trailer has width, height and length as configurable parameters.

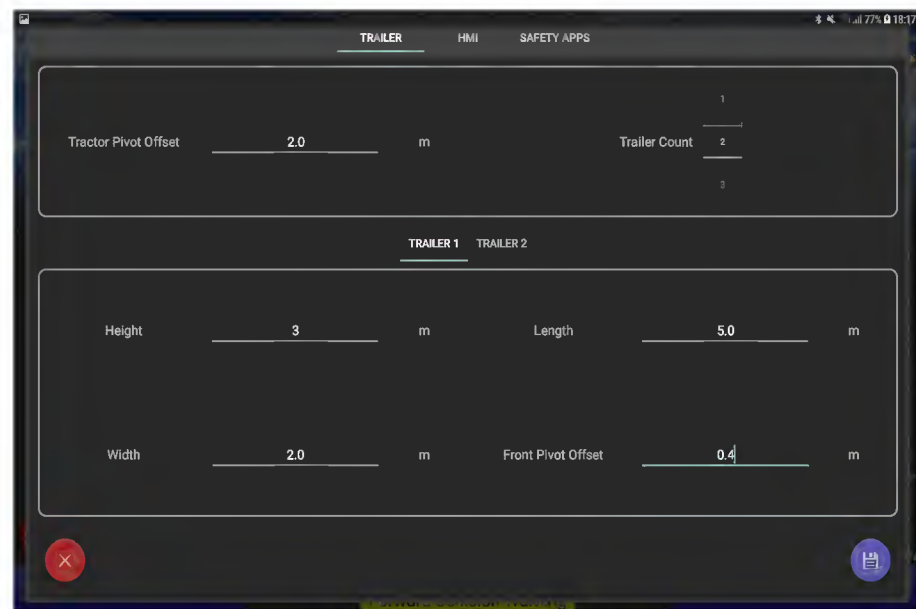




- **Trailer Height, Width and Length Settings**

User can set trailer height, width and length for each trailer. Maximum and Minimum values are defined by the Trailer data definition that is received from the OBU config.

On clicking the save button, the trailer settings will be sent back to the OBU.



- \* **HMI Settings:**

HMI settings include Connection and Live map configurations.

- **Connection: WiFi and Bluetooth Configuration**

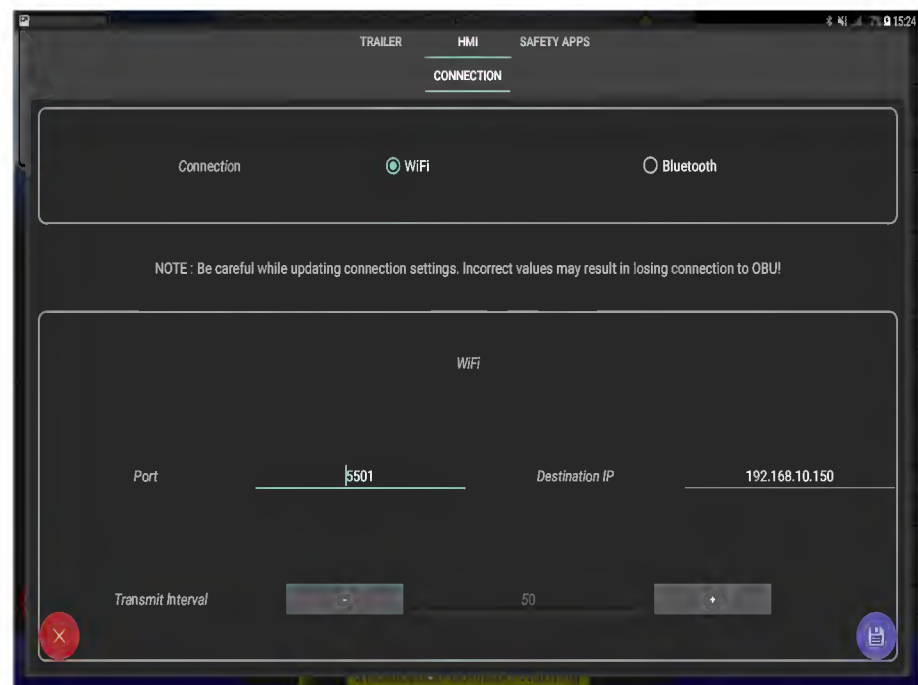
The OBU settings denote the currently set configuration – WiFi or Bluetooth. User is also allowed to change the connection according to his/her choice.

**WiFi Configuration:**

A total of 3 parameters are user configurable under WiFi:

1. *Port*
2. *Destination IP*
3. *Transmit Interval*

The maximum, minimum and interval value for transmit interval, connection timeout and data timeout are defined by the HMI data definition that is received from the OBU config.

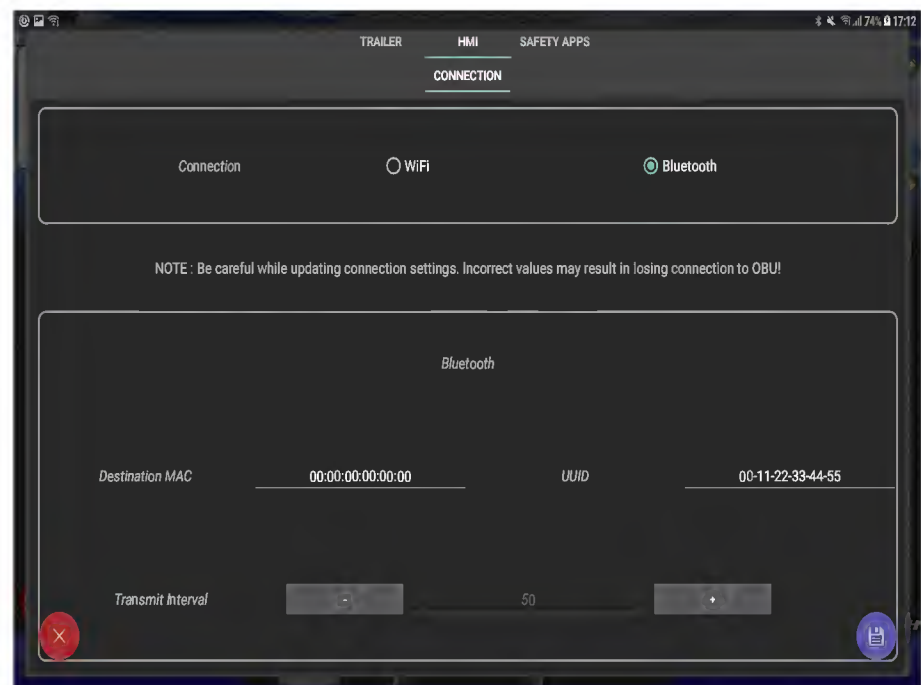


**Bluetooth Configuration:**

A total of 3 parameters are user configurable under Bluetooth:

1. *Destination MAC*
2. *UUID*
3. *Transmit Interval*

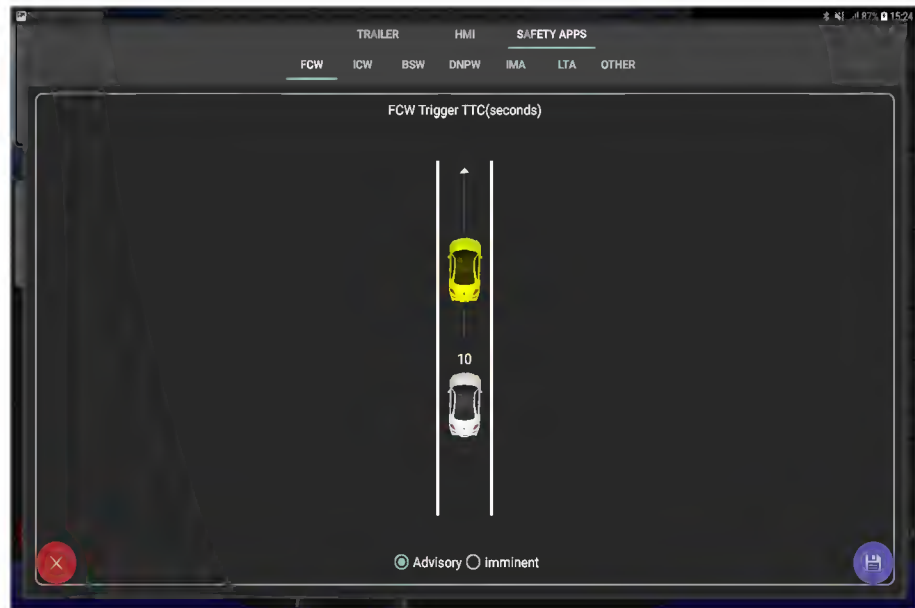
The maximum, minimum and interval value for transmit interval, connection timeout and data timeout are defined by the HMI data definition that is received from the OBU config.



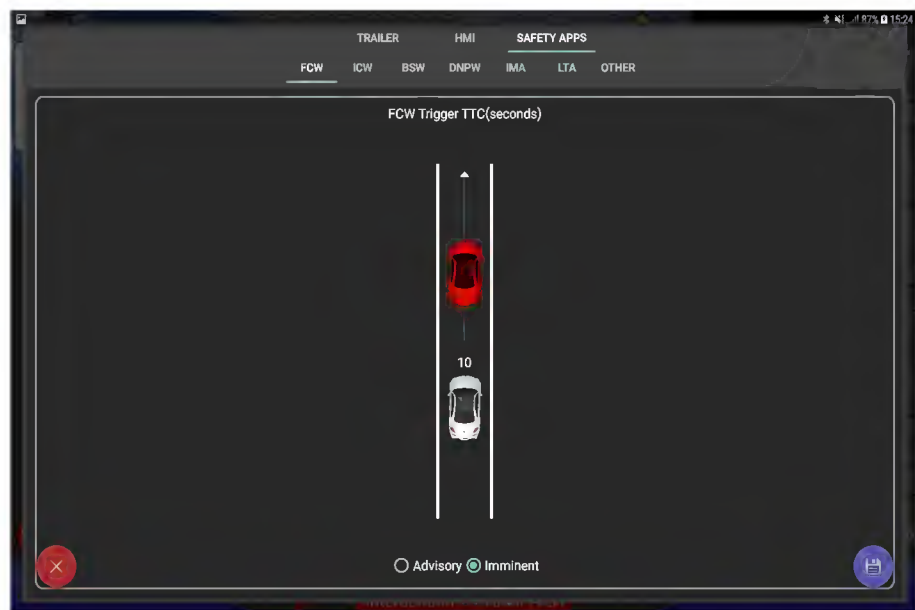
\* Safety app settings:

1. FCW setting

*For Advisory:*

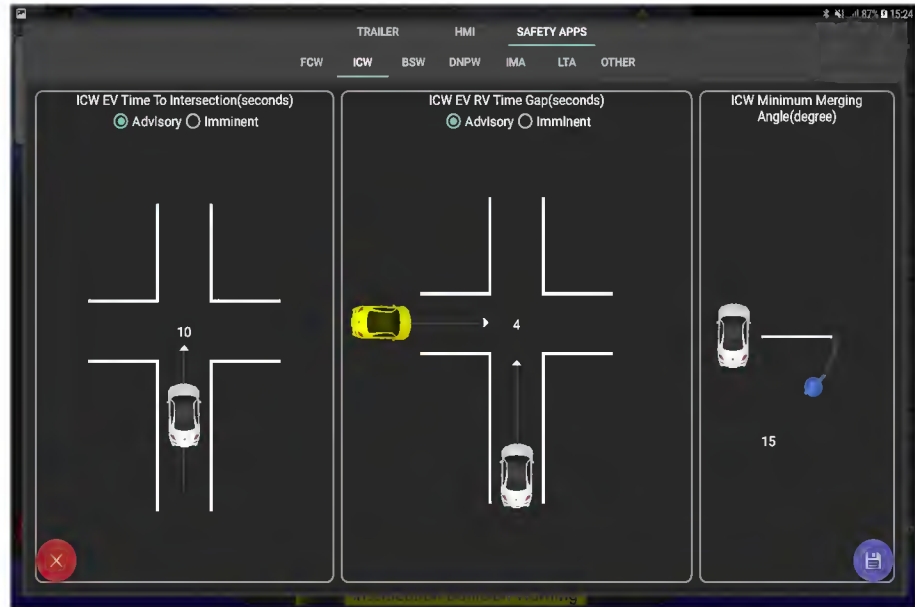


*For Imminent:*



## 2. ICW setting

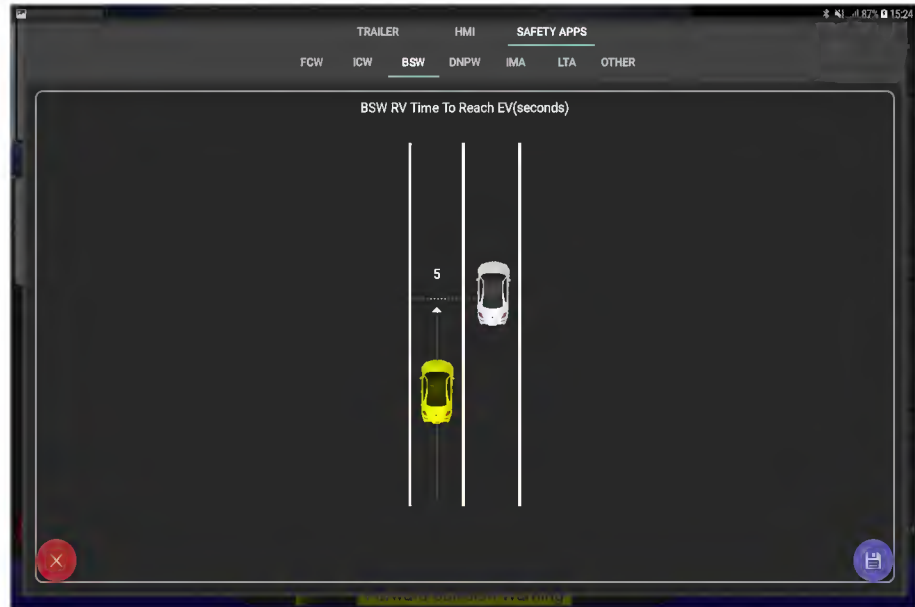
*For Advisory:*



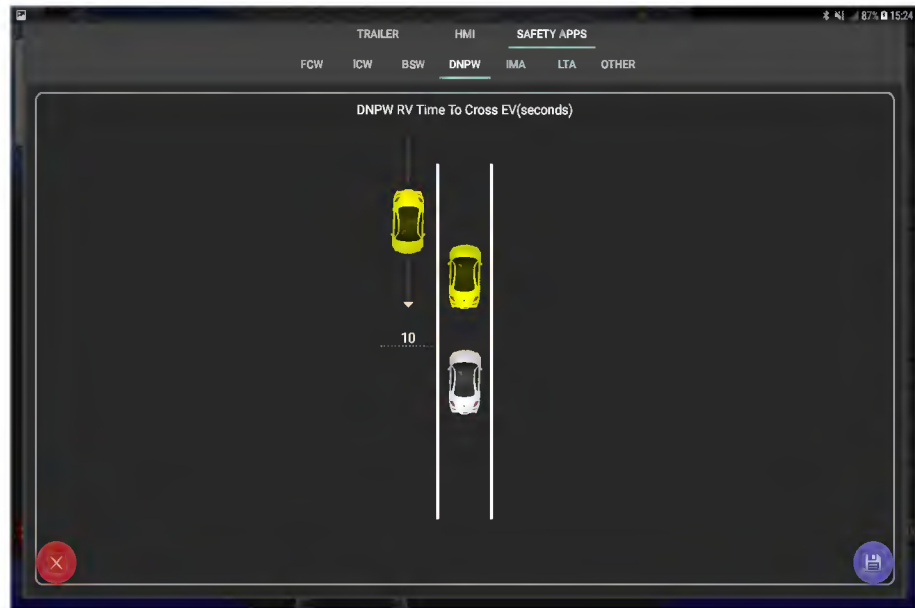
*For Imminent:*



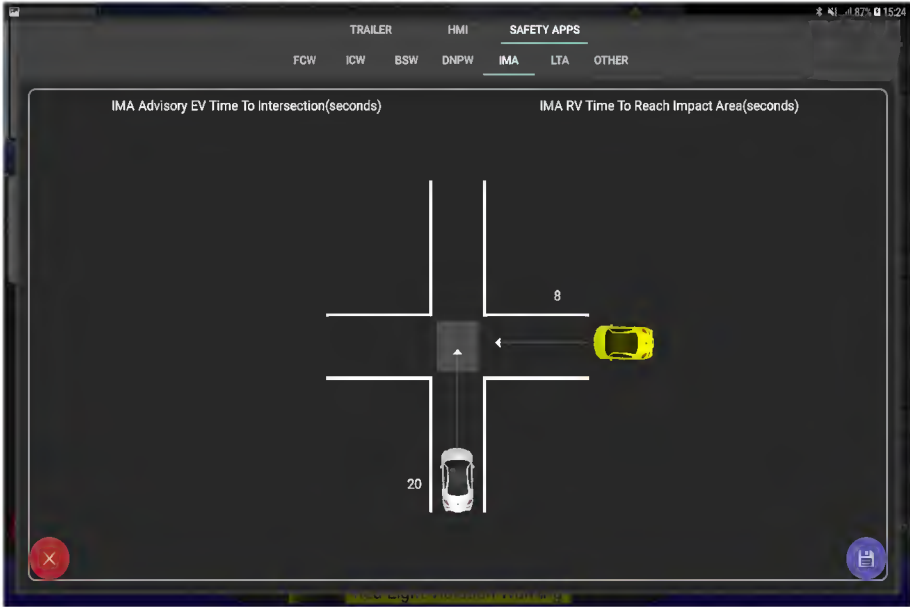
### 3. BSW setting



### 4. DNPW setting



5. IMA setting



6. LTA setting



7. OTHER setting





3. After these steps, HMI is connected to board and it can show various safety events as below

### Forward collision warning



### Intersection collision warning



Forward collision alert



Intersection collision alert



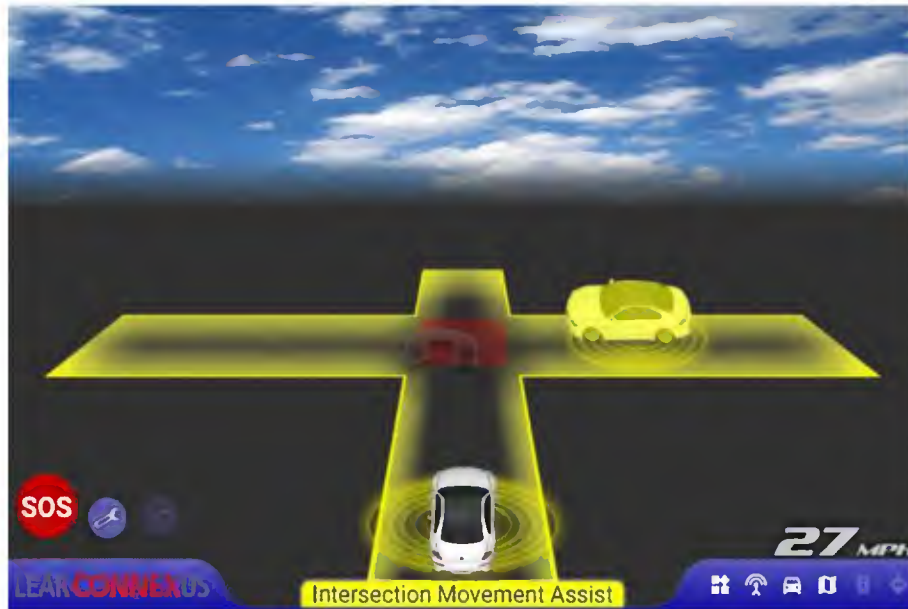
Blind spot warning



Curve speed warning



Intersection movement assist



Lane change alert



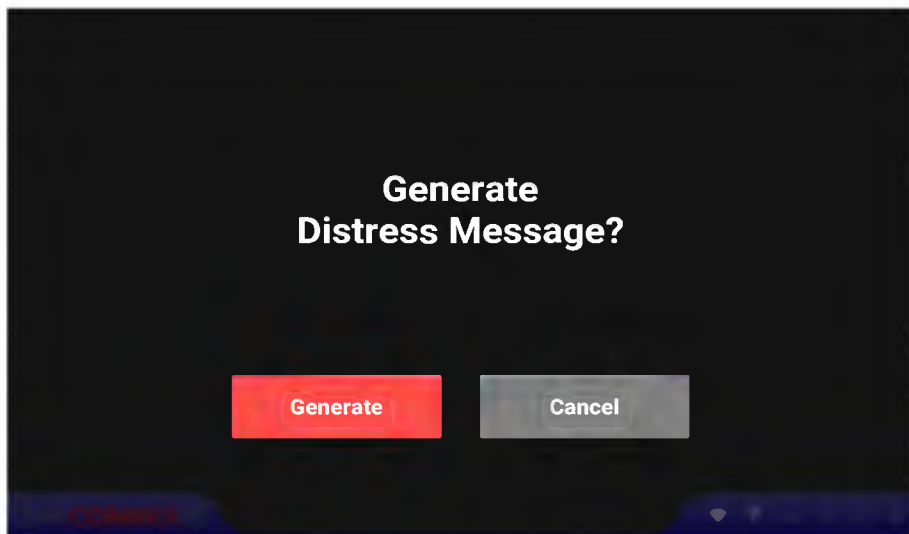
## 7.3 Distress Notification

### 7.3.1 DN message

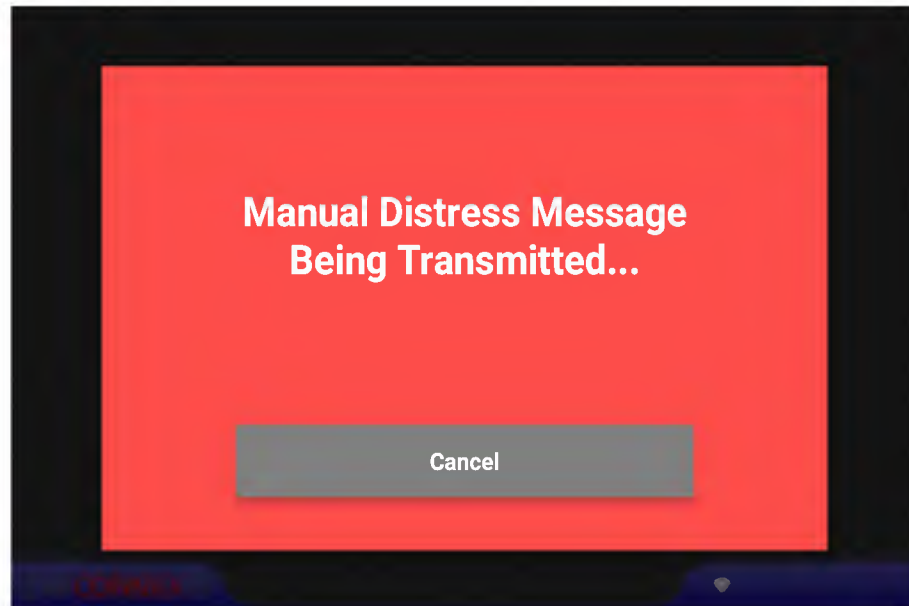
1. For DN message alert, press on the “sos” button as shown in the below screen.



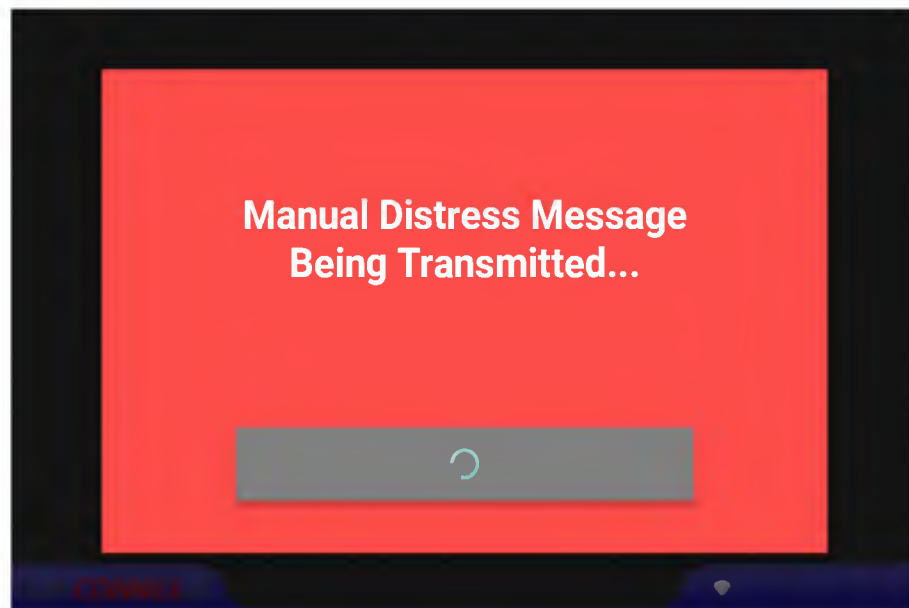
2. It will show the alert for generate DN message as below.



3. If user press on the generate option, the manual DN message is generated as shown below.

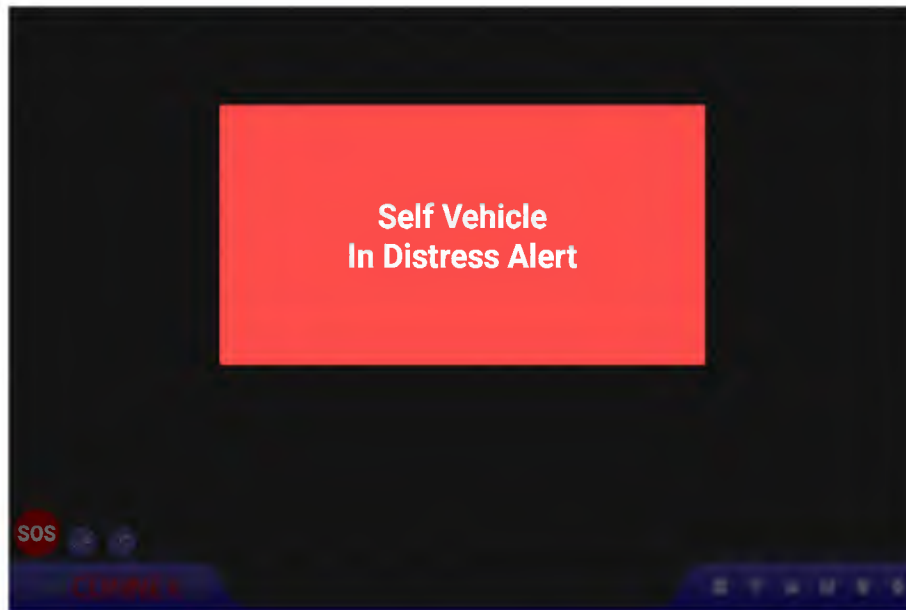


4. Once user presses the cancel button, a loading icon is displayed. Once the HMI receives the acknowledgement from the OBU the alert dismisses.



### 7.3.2 CAN generated DN

In case of CAN generated alerts like air bag deployment, the DN message is automatically generated and transmitted. On the HMI screen the message is as shown in below.



# COMMAND REFERENCE FOR LOCOMATE ROADSTAR



## Chapter 8

# Introduction

CLI is clish based

---

Welcome

### 8.1 How CLI is organised

On system boot user is presented a CLI prompt as below:

```
[lear-1c3:info (1)2]
```

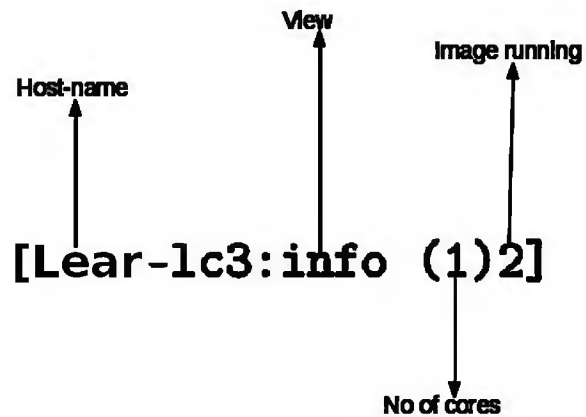


Figure 8.1: Components of CLI prompt.

1. **view:** As of now info, conf, debug views are provided.
2. **Image running:** Displays 0 for Image 0, 1 for Image 1 and 2 for recover or netboot image.

## 8.2 What is view

View is nothing but the modes that exist in the device. After login time of the device, we are in info mode. By default, we are in this info mode. We have another three modes: debug, config and request mode.

## 8.3 Context sensitive help

[?] - Display context sensitive help. This is either a list of possible command completions with summaries, or the full syntax of the current command. A subsequent repeat of this key, when a command has been resolved, will display a detailed reference.

## 8.4 Auto-completion

The following keys both perform auto-completion for the current command line. If the command prefix is not unique then the bell will ring and a subsequent repeat of the key will display possible completions.

[enter] - Auto-completes, syntax-checks then executes a command. If there is a syntax error then offending part of the command line will be highlighted and explained.

[space] - Auto-completes, or if the command is already resolved inserts a space.

## 8.5 Movement keys

[CTRL-A] - Move to the start of the line.

[CTRL-E] - Move to the end of the line.

[up] - Move to the previous command line held in history.

[down] - Move to the next command line held in history.

[left] - Move the insertion point left one character.

[right] - Move the insertion point right one character.

## 8.6 Deletion keys

[CTRL-C] - Delete and abort the current line.

[CTRL-D] - Delete the character to the right on the insertion point.

[CTRL-K] - Delete all the characters to the right of the insertion point.

[CTRL-U] - Delete the whole line.

**[backspace]** - Delete the character to the left of the insertion point.

## 8.7 Escape sequences

**!!** - Substitute the last command line.

**!N** - Substitute the Nth command line (absolute as per 'history' command)

**!-N** - Substitute the command line entered N lines before (relative)

Taken from clish webpage<sup>1</sup>.

---

<sup>1</sup><http://clish.sourceforge.net/clish-0.7.3/>

## Chapter 9

# Home menu

This is the default place where user is placed after system login, ? shows all the commands and views available here.

```
[Lear-1c3:info (1)2]
!           Comments
copy       Copy commands
debug      Move to debug view
del        Del commands
enable     Turn on privileged commands
exit       Exit from the CLI
request    Request commands
show       Show commands
```

```
[Lear-1c3:info (1)2]
```

## Chapter 10

# show system

Service and monitoring commands

---

Requires no privilege

### 10.1 show system cores

**Syntax:**

```
show system cores
```

**Description:**

Shows total number of cores present in this image instance and their file names. This file name can be used to copy the cores to any host machine for further debugging. Netboot and recovery image shows number of cores for image 0.

**Default state:**

N/A

**Privileged?:**

NO

**Added in:**

Initial

**Example log:**

```
[Learxxxxxx:info (0)0] show system cores
```

```
Number of cores => 0  
[Learxxxxxx:info (0)0]
```

---

## 10.2 show system name

### Syntax:

```
show system name
```

### Description:

Shows configured system name, this is the string which is present in the database for system hostname.

### Default state:

N/A

### Privileged?:

NO

### Added in:

Initial

### Example log:

```
[Learxxxxxx:info (0)0] show system name  
System Name => Learxxxxxx  
[Learxxxxxx:info (0)0]
```

---

### 10.3 show system region

**Syntax:**

```
show system region
```

**Description:**

Shows configured region of the device.

**Default state:**

N/A

**Privileged?:**

NO

**Added in:**

Initial

**Example log:**

```
[Learxxxxx:info (0)0] show system region  
Country      =>      unitedstates-public-safety (842)  
[Learxxxxx:info (0)0]
```

---

### 10.4 show system mac

**Syntax:**

```
show system mac
```

**Description:**

Shows the basemac of the configured device.

**Default state:**

N/A

**Privileged?:**

NO

**Added in:**

Initial

**Example log:**

```
[Learxxxxx:info (0)0] show system mac  
MAC address is => 00:11:22:33:44:55  
[Learxxxxx:info (0)0]
```

---

## 10.5 show system version

**Syntax:**

```
show system version [detail]
```

**Description:**

Shows different software versions of system components. Details are added as hidden arguments which show more about the build and firmware.

**Default state:**

N/A

**Privileged?:**

NO

**Added in:**

Initial



**Updates:**

v0.0.2 (detail argument added.)

**Example log:**

```
[Learxxxxx:info (0)0] show system version
DB version is      =>      0.3
RFS version is     =>      v0.0.7-120415-1559-IST-0-g993e0c5
SDK version is     =>      v0.0.5-18-gd3bc8bf-dirty
Kernel version is  =>      3.10.17-arada-LC3-00004-g993e0c5+
[Learxxxxx:info (0)0]
```

---

## 10.6 show system procs

**Syntax:**

```
show system procs
```

**Description:**

Shows current processes running in system.

**Default state:**

N/A

**Privileged?:**

No

**Added in:**

Initial

**Example log:**

```
[Learxxxxx:info (0)0] show system procs
S  UID  PID  PPID  VSZ  RSS  TTY  STIME  TIME  CMD
S   0   1   0  2760  668  0:0  06:03  00:00:08  init
S   0  402   1  2760  600  0:0  06:03  00:00:00  /sbin/klogd -n
```

```

S 0 417 1 2760 500 0:0 06:03 00:00:03 /sbin/syslogd -S -D -0 /var/log/messages -s 64 -b 2 -t 9999
S 0 767 1 17972 3092 0:0 06:03 00:00:00 /usr/sbin/configd
S 0 769 1 17972 3092 0:0 06:03 00:00:00 /usr/sbin/configd
S 0 788 1 3044 936 0:0 06:03 00:00:00 /sbin/udev -d
S 1003 791 1 14136 1312 0:0 06:03 00:00:00 /usr/local/bin/rhttpd 8080
S 1003 800 1 14136 1312 0:0 06:03 00:00:00 {libmicrohttpd} /usr/local/bin/rhttpd 8080
S 0 799 1 64976 3052 0:0 06:03 00:00:00 /usr/local/bin/dot3 /var/16093.conf
S 0 816 1 64976 3052 0:0 06:03 00:00:03 /usr/local/bin/dot3 /var/16093.conf
S 0 824 1 64976 3052 0:0 06:03 00:00:00 /usr/local/bin/dot3 /var/16093.conf
S 0 825 1 64976 3052 0:0 06:03 00:00:02 /usr/local/bin/dot3 /var/16093.conf
S 0 840 1 64976 3052 0:0 06:03 00:00:30 /usr/local/bin/dot3 /var/16093.conf
S 0 841 1 64976 3052 0:0 06:03 00:00:02 /usr/local/bin/dot3 /var/16093.conf
S 0 860 1 64976 3052 0:0 06:03 00:00:00 /usr/local/bin/dot3 /var/16093.conf
S 81 872 1 2584 748 0:0 06:03 00:00:02 dbus-daemon --system
S 1003 909 1 3284 1336 0:0 06:03 00:00:26 gpsd -b /dev/ttyACMO
S 0 911 1 26268 2284 0:0 06:03 00:00:01 /usr/local/bin/gpsc
S 0 919 1 26268 2284 0:0 06:03 00:00:01 /usr/local/bin/gpsc
S 0 922 1 26268 2284 0:0 06:03 00:00:06 /usr/local/bin/gpsc
S 1003 917 1 11092 592 0:0 06:03 00:00:00 /usr/local/bin/logmonitor
S 1003 921 1 11092 592 0:0 06:03 00:00:00 /usr/local/bin/logmonitor
S 1003 926 1 23032 2924 0:0 06:03 00:00:00 /usr/local/bin/ldm
R 1003 929 1 23032 2924 0:0 06:03 00:40:31 /usr/local/bin/ldm
S 1003 930 1 23032 2924 0:0 06:03 00:00:34 /usr/local/bin/ldm
S 1003 936 1 11964 1060 0:0 06:03 00:00:13 /usr/local/bin/hmi-safety
S 1003 952 1 11964 1060 0:0 06:03 00:00:00 /usr/local/bin/hmi-safety
S 0 953 1 4848 596 0:0 06:03 00:00:00 /usr/sbin/sshd -E /var/log/sshd.log
S 1003 1013 1 138m 3584 0:0 06:03 00:00:00 /usr/local/bin/dn /tmp/dn.conf /tmp/dnOpt.conf
S 1003 1032 1 138m 3584 0:0 06:03 00:00:00 /usr/local/bin/dn /tmp/dn.conf /tmp/dnOpt.conf
S 1003 1033 1 138m 3584 0:0 06:03 00:00:00 /usr/local/bin/dn /tmp/dn.conf /tmp/dnOpt.conf
S 1003 1034 1 138m 3584 0:0 06:03 00:00:00 /usr/local/bin/dn /tmp/dn.conf /tmp/dnOpt.conf
S 1003 1035 1 138m 3584 0:0 06:03 00:00:00 /usr/local/bin/dn /tmp/dn.conf /tmp/dnOpt.conf
S 1003 1036 1 138m 3584 0:0 06:03 00:00:00 /usr/local/bin/dn /tmp/dn.conf /tmp/dnOpt.conf
S 1003 1037 1 138m 3584 0:0 06:03 00:00:00 /usr/local/bin/dn /tmp/dn.conf /tmp/dnOpt.conf
S 1003 1038 1 138m 3584 0:0 06:03 00:00:00 /usr/local/bin/dn /tmp/dn.conf /tmp/dnOpt.conf
S 1003 1039 1 138m 3584 0:0 06:03 00:00:00 /usr/local/bin/dn /tmp/dn.conf /tmp/dnOpt.conf
S 1003 1040 1 138m 3584 0:0 06:03 00:00:00 /usr/local/bin/dn /tmp/dn.conf /tmp/dnOpt.conf
S 1003 1041 1 138m 3584 0:0 06:03 00:00:00 /usr/local/bin/dn /tmp/dn.conf /tmp/dnOpt.conf
S 1003 1042 1 138m 3584 0:0 06:03 00:00:00 /usr/local/bin/dn /tmp/dn.conf /tmp/dnOpt.conf
S 1003 1045 1 138m 3584 0:0 06:03 00:00:00 /usr/local/bin/dn /tmp/dn.conf /tmp/dnOpt.conf
S 1003 1063 1 138m 3584 0:0 06:03 00:00:01 /usr/local/bin/dn /tmp/dn.conf /tmp/dnOpt.conf
S 1003 1064 1 138m 3584 0:0 06:03 00:00:01 /usr/local/bin/dn /tmp/dn.conf /tmp/dnOpt.conf
S 1003 1115 1 138m 3584 0:0 06:03 00:00:00 /usr/local/bin/dn /tmp/dn.conf /tmp/dnOpt.conf
S 1003 1116 1 138m 3584 0:0 06:03 00:00:00 /usr/local/bin/dn /tmp/dn.conf /tmp/dnOpt.conf
S 1003 1057 1 113m 3572 0:0 06:03 00:00:00 /usr/local/bin/wsarx /var/wsaApp.conf /var/wsaAppOpt.conf
S 1003 1072 1 113m 3572 0:0 06:03 00:00:01 /usr/local/bin/wsarx /var/wsaApp.conf /var/wsaAppOpt.conf
S 1003 1075 1 113m 3572 0:0 06:03 00:00:00 /usr/local/bin/wsarx /var/wsaApp.conf /var/wsaAppOpt.conf
S 1003 1076 1 113m 3572 0:0 06:03 00:00:00 /usr/local/bin/wsarx /var/wsaApp.conf /var/wsaAppOpt.conf
S 1003 1077 1 113m 3572 0:0 06:03 00:00:00 /usr/local/bin/wsarx /var/wsaApp.conf /var/wsaAppOpt.conf
S 1003 1078 1 113m 3572 0:0 06:03 00:00:00 /usr/local/bin/wsarx /var/wsaApp.conf /var/wsaAppOpt.conf
S 1003 1079 1 113m 3572 0:0 06:03 00:00:00 /usr/local/bin/wsarx /var/wsaApp.conf /var/wsaAppOpt.conf
S 1003 1080 1 113m 3572 0:0 06:03 00:00:00 /usr/local/bin/wsarx /var/wsaApp.conf /var/wsaAppOpt.conf
S 1003 1081 1 113m 3572 0:0 06:03 00:00:00 /usr/local/bin/wsarx /var/wsaApp.conf /var/wsaAppOpt.conf
S 1003 1082 1 113m 3572 0:0 06:03 00:00:00 /usr/local/bin/wsarx /var/wsaApp.conf /var/wsaAppOpt.conf
S 1003 1083 1 113m 3572 0:0 06:03 00:00:00 /usr/local/bin/wsarx /var/wsaApp.conf /var/wsaAppOpt.conf
S 1003 1084 1 113m 3572 0:0 06:03 00:00:00 /usr/local/bin/wsarx /var/wsaApp.conf /var/wsaAppOpt.conf
S 1003 1085 1 113m 3572 0:0 06:03 00:00:00 /usr/local/bin/wsarx /var/wsaApp.conf /var/wsaAppOpt.conf
S 1003 1087 1 113m 3572 0:0 06:03 00:00:00 /usr/local/bin/wsarx /var/wsaApp.conf /var/wsaAppOpt.conf
S 1003 1103 1 130m 3636 0:0 06:03 00:00:00 /usr/local/bin/bsm /tmp/bsm.cfg /tmp/bsmOpt.cfg
S 1003 1119 1 130m 3636 0:0 06:03 00:00:00 /usr/local/bin/bsm /tmp/bsm.cfg /tmp/bsmOpt.cfg
S 1003 1120 1 130m 3636 0:0 06:03 00:00:00 /usr/local/bin/bsm /tmp/bsm.cfg /tmp/bsmOpt.cfg
S 1003 1121 1 130m 3636 0:0 06:03 00:00:00 /usr/local/bin/bsm /tmp/bsm.cfg /tmp/bsmOpt.cfg
S 1003 1122 1 130m 3636 0:0 06:03 00:00:00 /usr/local/bin/bsm /tmp/bsm.cfg /tmp/bsmOpt.cfg
S 1003 1123 1 130m 3636 0:0 06:03 00:00:00 /usr/local/bin/bsm /tmp/bsm.cfg /tmp/bsmOpt.cfg
S 1003 1124 1 130m 3636 0:0 06:03 00:00:00 /usr/local/bin/bsm /tmp/bsm.cfg /tmp/bsmOpt.cfg
S 1003 1125 1 130m 3636 0:0 06:03 00:00:00 /usr/local/bin/bsm /tmp/bsm.cfg /tmp/bsmOpt.cfg
S 1003 1126 1 130m 3636 0:0 06:03 00:00:00 /usr/local/bin/bsm /tmp/bsm.cfg /tmp/bsmOpt.cfg
S 1003 1127 1 130m 3636 0:0 06:03 00:00:00 /usr/local/bin/bsm /tmp/bsm.cfg /tmp/bsmOpt.cfg
S 1003 1128 1 130m 3636 0:0 06:03 00:00:00 /usr/local/bin/bsm /tmp/bsm.cfg /tmp/bsmOpt.cfg
S 1003 1129 1 130m 3636 0:0 06:03 00:00:00 /usr/local/bin/bsm /tmp/bsm.cfg /tmp/bsmOpt.cfg

```

```

S 1003 1132 1 130m 3636 0:0 06:03 00:00:01 /usr/local/bin/bsm /tmp/bsm.cfg /tmp/bsmOpt.cfg
S 1003 1133 1 130m 3636 0:0 06:03 00:00:02 /usr/local/bin/bsm /tmp/bsm.cfg /tmp/bsmOpt.cfg
S 1003 1134 1 130m 3636 0:0 06:03 00:00:01 /usr/local/bin/bsm /tmp/bsm.cfg /tmp/bsmOpt.cfg
S 1003 1168 1 130m 3636 0:0 06:03 00:00:05 /usr/local/bin/bsm /tmp/bsm.cfg /tmp/bsmOpt.cfg
S 1003 1138 1 140m 3932 0:0 06:03 00:00:00 /usr/local/bin/egoprocess /tmp/egoprocess.cfg /tmp/egoprocessOpt.cfg
S 1003 1151 1 140m 3932 0:0 06:03 00:00:00 /usr/local/bin/egoprocess /tmp/egoprocess.cfg /tmp/egoprocessOpt.cfg
S 1003 1152 1 140m 3932 0:0 06:03 00:00:00 /usr/local/bin/egoprocess /tmp/egoprocess.cfg /tmp/egoprocessOpt.cfg
S 1003 1154 1 140m 3932 0:0 06:03 00:00:00 /usr/local/bin/egoprocess /tmp/egoprocess.cfg /tmp/egoprocessOpt.cfg
S 1003 1155 1 140m 3932 0:0 06:03 00:00:00 /usr/local/bin/egoprocess /tmp/egoprocess.cfg /tmp/egoprocessOpt.cfg
S 1003 1156 1 140m 3932 0:0 06:03 00:00:00 /usr/local/bin/egoprocess /tmp/egoprocess.cfg /tmp/egoprocessOpt.cfg
S 1003 1157 1 140m 3932 0:0 06:03 00:00:00 /usr/local/bin/egoprocess /tmp/egoprocess.cfg /tmp/egoprocessOpt.cfg
S 1003 1158 1 140m 3932 0:0 06:03 00:00:00 /usr/local/bin/egoprocess /tmp/egoprocess.cfg /tmp/egoprocessOpt.cfg
S 1003 1159 1 140m 3932 0:0 06:03 00:00:00 /usr/local/bin/egoprocess /tmp/egoprocess.cfg /tmp/egoprocessOpt.cfg
S 1003 1160 1 140m 3932 0:0 06:03 00:00:00 /usr/local/bin/egoprocess /tmp/egoprocess.cfg /tmp/egoprocessOpt.cfg
S 1003 1161 1 140m 3932 0:0 06:03 00:00:00 /usr/local/bin/egoprocess /tmp/egoprocess.cfg /tmp/egoprocessOpt.cfg
S 1003 1162 1 140m 3932 0:0 06:03 00:00:00 /usr/local/bin/egoprocess /tmp/egoprocess.cfg /tmp/egoprocessOpt.cfg
S 1003 1163 1 140m 3932 0:0 06:03 00:00:05 /usr/local/bin/egoprocess /tmp/egoprocess.cfg /tmp/egoprocessOpt.cfg
S 1003 1164 1 140m 3932 0:0 06:03 00:00:31 /usr/local/bin/egoprocess /tmp/egoprocess.cfg /tmp/egoprocessOpt.cfg
S 1003 1165 1 140m 3932 0:0 06:03 00:00:09 /usr/local/bin/egoprocess /tmp/egoprocess.cfg /tmp/egoprocessOpt.cfg
S 1003 1166 1 140m 3932 0:0 06:03 00:00:09 /usr/local/bin/egoprocess /tmp/egoprocess.cfg /tmp/egoprocessOpt.cfg
S 1003 1167 1 140m 3932 0:0 06:03 00:00:08 /usr/local/bin/egoprocess /tmp/egoprocess.cfg /tmp/egoprocessOpt.cfg
S 0 4783 1 1788 540 207:17 06:40 00:00:00 /bin/arash --
S 0 4784 4783 2760 540 207:17 06:40 00:00:00 sh -c /bin/su admin -s /bin/sh -c "/usr/bin/clish -l -x /home/cli/arada-cli -
S 1003 4785 4784 2760 544 207:17 06:40 00:00:00 sh -c /usr/bin/clish -l -x /home/cli/arada-cli -f /var/.cli_history -z 143
S 1003 4786 4785 5108 3412 207:17 06:40 00:00:11 /usr/bin/clish -l -x /home/cli/arada-cli -f /var/.cli_history -z 143
S 1003 5801 4786 2760 544 207:17 06:44 00:00:00 sh -c /bin/sh /tmp/klish.fifo.1cedti
S 1003 5802 5801 3156 1032 207:17 06:44 00:00:00 /bin/sh /tmp/klish.fifo.1cedti
R 1003 5806 5802 2764 676 207:17 06:44 00:00:00 ps -w -l -T
[Learxxxxxx:info (0)0]

```

---

## 10.7 show system board

### Syntax:

```
show system board
```

### Description:

Shows the manufacturing data of the board.

### Default state:

N/A

### Privileged?:

NO

**Added in:**

v0.0.2

**Example log:**

```
[Learxxxxxx:info (0)0] show system board
-----
Displaying board details.
ProductID = LC3
HWVer = 0011
reginfo = 0
basemac = 001122334455
serno = 007
Manufacturing data version number =
Ethernet base Mac =
Dummy Mac 0 =
Dummy Mac 1 =
Dummy Mac 2 =
[Learxxxxxx:info (0)0]
```

---

## 10.8 show system externalmedia

**Syntax:**

```
show system externalmedia
```

**Description:**

Display externally connected media and Mount point.

**Default state:**

N/A

**Privileged?:**

No

**Added in:**

v0.0.4

**Example log:**

```
[LearBABBBB:info (0)2] show system externalmedia
usb is mounted on /tmp/usb.
-----
Filesystem      Size      Used Available Use% Mounted on
/dev/sda1       3.6G    1012.2M      2.4G   29% /tmp/usb
-----
[LearBABBBB:info (0)2]
```

---

## 10.9 show system uptime

**Syntax:**

```
show system uptime
```

**Description:**

Shows the time the system was awake for in days, hours, minutes and seconds.

**Default state:**

N/A

**Privileged?:**

No

**Added in:**

v0.0.5

**Example log:**

```
[Learxxxxxx:info (6)2] show system uptime
system uptime => 0 day(s) 2 hour(s) 17 min(s) 56 sec
[Learxxxxxx:info (6)2] show system uptime
system uptime => 0 day(s) 2 hour(s) 18 min(s) 1 sec
[Learxxxxxx:info (6)2]
```

---

## 10.10 show system corelimit

**Syntax:**

```
show system corelimit
```

**Description:**

Shows configured number of cores which can be stored at a time and after which loop will start.

**Default state:**

N/A

**Privileged?:**

No

**Added in:**

v0.0.6

**Example log:**

```
[Lear557722:info (11)0] show system corelimit  
Maximum no of cores => 15  
[Lear557722:info (11)0]
```

---

## 10.11 show system boot

**Syntax:**

```
show system boot
```

**Description:**

Shows the SDK version of images in Recovery (if running), Image 0 and Image 1. Currently running image is marked by '\*'.

**Default state:**

N/A

**Privileged?:**

No

**Added in:**

v0.0.6

**Example log:**

```
[Learxxxxxx:info (11)2] show system boot
Recovery *      =>    v0.0.5
Image 0         =>    v0.0.5
Image 1         =>    v0.0.4
```

---

## 10.12 show system dsrbackendseparation

**Syntax:**

```
show system dsrbackendseparation
```

**Description:**

Show dsrbackendseparation status and number of bridges.

**Default state:**

Enabled. (number of bridge 2)

**Privileged?:**

No.

**Added in:**

v0.0.6

**Updates:**

v0.0.7 (status enabled by default)

v0.0.20 (showing the interfaces for second bridge).

**Example log:**

```
Leaving conf mode...
[LearBABBBB:info (0)2] show system dsrbackendseparation
dsrbackendseparation =>      enabled
Number of bridges    =>      2
brwifi interfaces    =>      wifi0vap0 wifi1vap0
[LearBABBBB:info (0)2]
```

---

## 10.13 show system sshpublickey

**Syntax:**

```
show system sshpublickey
```

**Description:**

Used to get the ssh public keys. This public ssh key must be appended in host machine's `~/.ssh/authorized_keys` file.

You can also get this ssh public key using command `'copy scp var scp_key.pub remote username@host:scp_key.pub'` then append this key using this command in host machine `'cat ~/scp_key.pub » ~/.ssh/authorized_keys'`.

**Default state:**

N/A



**Privileged?:**

No

**Added in:**

v0.0.17

**Example log:**

```
[LearAABBCC:info (0)2] show system sshpublickey
```

```
-----  
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQCIDq217Rj2P5IpV3YBZT8n1/12WXkn8bYC2VNqzaLiLw117/y/xBXiop91/HXNidxXxLD1yr03DHErtd2fS5e9WaVtftHvnxSG79LQZ  
VZS5dy7R+a/rF7qhsCE08WVXmI9yNrjdFBcop1cKe67emXVafShbazbG5BtzBj2yT8Y2/ZTc0/dxddFQX7YHnv18h6fkyvR/3Jok7mF2HADYdeMHhvK2N11fLLmGyB93Xmsr+vTbc2c1B  
6H7yFw30gf9i0VBqrD8siw3fD7QjvWTS1SMVkJwnf4kpF14BDdjwK08oB3aczt2F3pb2CnN1E4C0gUSmrYTiUPRTjFwwj root@AradaAABBCC  
-----
```

```
Append this key in host machine's '~/.ssh/authorized_keys'
```

```
[LearAABBCC:info (0)2]
```

---

## Chapter 11

# Show operatemode

**Syntax:**

```
[Learxxxxxx:info (0)2] show operatemode
```

**Description:**

It shows the mode of the device that is configured.

**Default state:**

N/A

**Privileged?:**

NO

**Added in:**

Initial

**Example log:**

```
[Learxxxxxx:info (0)2] show operatemode  
operatemode      => operate
```

---

## Chapter 12

# Show interface

### 12.1 show interface <interface> ipv4

**Syntax:**

```
show interface <interface> ipv4
```

**Description:**

Command shows ipv4 settings of interface selected, interface can be selected from the options which tab completion presents. This commands lists all interfaces in devices on tab completion request.

**Default state:**

N/A

**Privileged?:**

NO

**Added in:**

Initial

**Example log:**

```
[Learxxxxxx:info (0)2] show interface brtrunk ipv4
Details for brtrunk

IPV4 Address          =>      172.20.1.244
IPV4 Netmask          =>      255.255.255.0
```

```
IPV4 Gateway           =>      172.20.1.255
Primary DNS            =>      0.0.0.0
Secondary DNS         =>      0.0.0.0
IPV4 DHCP client      =>      disable
```

---

## 12.2 show interface <interface> ipv6

### Syntax:

```
show interface <interface> ipv6
```

### Description:

Command shows ipv6 settings of interface selected, interface can be selected from the options which tab completion presents. This commands lists all interfaces in devices on tab completion request.

### Default state:

N/A

### Privileged?:

NO

### Added in:

Initial

### Example log:

```
[Learxxxxxx:info (0)2] show interface brtrunk ipv6
```

```
IPV6 Address           =>      fe80::211:22ff:fe33:4455/64
fe80::200:ff:fe00:1/64
```

```
IPV6 Netmask           => fe80::211:22ff:fe33:4455/64
fe80::200:ff:fe00:1/64
IPV6 Gateway           => fe80::211:22ff:fe33:4455/64
fe80::200:ff:fe00:1/64
Primary DNS             => 0.0.0.0
Secondary DNS           => 0.0.0.0
```

---

### 12.3 show interface <interface> route

#### Syntax:

```
show interface <interface> route
```

#### Description:

Shows route settings for selected interface.

#### Default state:

NA

#### Privileged?:

NO

#### Added in:

Initial

#### Example log:

```
[Learxxxxxx:info (0)2] show interface brtrunk route
Route for interface brtrunk => default via 172.20.1.5 dev brtrunk
```

---

## 12.4 show interface <interface> stats

**Syntax:**

```
show interface <interface> stats
```

**Description:**

Shows selected interface stats in detail.

**Default state:**

NA

**Privileged?:**

NO

**Added in:**

Initial

**Example log:**

```
[Learxxxxxx:info (0)2] show interface brtrunk stats
```

```
Stats for interface brtrunk:
```

```
collisions                =>0
multicast                  =>0
rx_bytes                   =>2971530
rx_compressed              =>0
rx_crc_errors              =>0
rx_dropped                 =>0
rx_errors                  =>0
rx_fifo_errors             =>0
rx_frame_errors            =>0
```

```
rx_length_errors      =>0
rx_missed_errors      =>0
rx_over_errors        =>0
rx_packets            =>32904
tx_aborted_errors     =>0
tx_bytes              =>754
tx_carrier_errors     =>0
tx_compressed         =>0
tx_dropped            =>0
tx_errors             =>0
tx_fifo_errors        =>0
tx_heartbeat_errors   =>0
tx_packets            =>9
tx_window_errors      =>0
```

---

## 12.5 show interface ath0 apParams

### Syntax:

```
show interface ath0 apParams
```

### Description:

Shows ath0 apParams interface. apParams works only for ath0 interface.

### Default state:

N/A

### Privileged?:

NO

### Added in:

Initial

**Example log:**

```
[Learxxxxxx:info (0)2] show interface ath0 apParams
channel          =>      36
password         =>      Shared#321Le@r
ssid             =>      Lear051580-11ac
```

---



## Chapter 13

# Show remote

### 13.1 show remote

**Syntax:**

```
show remote
```

**Description:**

Shows remote settings config area.

**Default state:**

N/A

**Privileged?:**

NO

**Added in:**

Initial

**Example log:**

```
[Learxxxxxx:info (0)2] show remote
SSH daemon          =>    enabled
SNMP daemon         =>    diabled
```

## 13.2 show remote ssh

**Syntax:**

```
show remote ssh
```

**Description:**

Shows ssh settings in remote config area.

**Default state:**

N/A

**Privileged?:**

NO

**Added in:**

Initial

**Example log:**

```
[Learxxxxxx:info (0)2] show remote ssh  
SSH daemon          =>      enabled
```

---

## 13.3 show remote snmp

**Syntax:**

```
show remote snmp
```

**Description:**

Shows snmp daemon status.

**Default state:**

N/A

**Privileged?:**

NO

**Added in:**

Initial

**Example log:**

```
[Learxxxxxx:info (0)2] show remote snmp
SNMP daemon          =>      enabled
```

---

## Chapter 14

# Show time

### 14.1 show time

**Syntax:**

```
show time
```

**Description:**

Shows time related settings of unit.

**Default state:**

N/A

**Privileged?:**

No

**Added in:**

Initial

**Example log:**

```
[Learxxxxxx:info (0)2] show time
Current time is           => Sun Jan  4 01:02:11 UTC 1970
Current timezone is      => india(110)
Daylight time saving is  => enabled
GPS is                   => enabled
```

---

## 14.2 show time timezone

**Syntax:**

```
show time timezone
```

**Description:**

Shows timezone related setting in time config area.

**Default state:**

N/A

**Privileged?:**

NO

**Added in:**

Initial

**Example log:**

```
[Learxxxxxx:info (0)2] show time timezone
Current time is           =>      Sun Jan  4 01:07:33 UTC 1970
Current timezone is      =>      110
```

---

## 14.3 show time daylight

**Syntax:**

```
show time daylight
```

**Description:**

Shows daylight settings of time config area.

**Default state:**

N/A

**Privileged?:**

NO

**Added in:**

Initial

**Example log:**

```
[Learxxxxxx:info (0)2] show time daylight
Daylight time saving is          =>    enabled
```

---

## 14.4 show time gps

**Syntax:**

```
show time gps
```

**Description:**

Shows gps related settings in time config area.

**Default state:**

N/A

**Privileged?:**

NO

**Added in:**

Initial

**Example log:**

```
[LEAR:info (2)1] show time gps
GPS is =>enabled
=== Connections ===
GPSD Server IP =>172.20.1.176
GPSD Server Port =>2947
GPSC IP =>172.20.1.20
Global GPSD =>0
=== Physical Configuration ===
Vehicle Center =>Fw: 0, Up 0
Antenna Position =>Fw: 0, Left 0, Up 0
Device Position =>Fw: 0, Left 0, Up 0
=== RSU/SNMP ===
UDP Output Address =>
UDP Output Port =>
Snmp Output Interval =>
Snmp Max Deviation =>
Snmp Ref Lat =>
Snmp Ref Lon =>
Snmp Ref Elev =>
=== OBU Advanced ===
NMEA Mode =>1
Send Frozen COG =>1
Low Pass Filter COG =>76
Low Speed COG Filter =>0
Low Pass Speed Filter =>153
Static Hold Thresh =>0
Min Positional Accuracy =>100
Gps Timeout Notif Seconds => 5
Path Prediction Cutoff Frequency => ppCutoffFreq
=== Dead Reckoning ===
GPS Ublx ADR status =>0
Auto Mount Alignment =>0
Mount Alignment (YPR) =>0, 0, 0
[LEAR:info (0)1]
```





## Chapter 15

# Show locos

### 15.1 show locos deployment

**Syntax:**

```
show locos deployment
```

**Description:**

Shows deployment details from locos config area.

**Default state:**

N/A

**Privileged?:**

NO

**Added in:**

Initial

**Example log:**

```
[Learxxxxxx:info (0)2] show locos deployment  
LOCOS deployment          =>      default
```

## 15.2 show locos bt status

**Syntax:**

```
show locos bt status
```

**Description:**

Shows bluetooth status under locos.

**Default state:**

N/A

**Privileged?:**

No

**Added in:**

v0.0.2

**Example log:**

```
[Learxxxxxx:info (4)2] show locos bt status
hci0:  Type: BR/EDR  Bus: USB
      BD Address: 00:3C:7F:F0:F0:0A  ACL MTU: 1022:8  SCO MTU: 183:5
      DOWN
      RX bytes:547 acl:0 sco:0 events:27 errors:0
      TX bytes:384 acl:0 sco:0 commands:27 errors:0
[Learxxxxxx:info (4)2]
```

---

## 15.3 show locos bt detail

**Syntax:**

```
show locos bt detail
```

**Description:**

Shows bluetooth details in paged output.

**Default state:**

N/A

**Privileged?:**

No

**Added in:**

v0.0.2

**Example log:**

```
[Learxxxxxx:info (4)2] show locos bt detail
hci0:  Type: BR/EDR  Bus: USB
      BD Address: 00:3C:7F:F0:F0:0A  ACL MTU: 1022:8  SCO MTU: 183:5
      Features page 0: 0xff 0xfe 0x0d 0xfe 0xd8 0x7f 0x7b 0x87
        <3-slot packets> <5-slot packets> <encryption> <slot offset>
        <timing accuracy> <role switch> <hold mode> <sniff mode>
        <RSSI> <channel quality> <SCO link> <HV2 packets>
        <HV3 packets> <u-law log> <A-law log> <CVSD> <power control>
        <transparent SCO> <EDR ACL 2 Mbps> <EDR ACL 3 Mbps>
        <enhanced iscan> <interlaced iscan> <interlaced pscan>
        <inquiry with RSSI> <extended SCO> <AFH cap. slave>
        <AFH class. slave> <LE support> <3-slot EDR ACL>
        <5-slot EDR ACL> <sniff subrating> <pause encryption>
        <AFH cap. master> <AFH class. master> <EDR eSCO 2 Mbps>
        <EDR eSCO 3 Mbps> <extended inquiry> <LE and BR/EDR>
        <simple pairing> <encapsulated PDU> <err. data report>
        <non-flush flag> <LSTO> <inquiry TX power> <EPC>
        <extended features>
      Features page 1: 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
      Commands: Octet 0 = 0xbf (Bit 0 1 2 3 4 5 7)
                Octet 1 = 0xff (Bit 0 1 2 3 4 5 6 7)
                Octet 2 = 0xfb (Bit 0 1 3 4 5 6 7)
                Octet 3 = 0x03 (Bit 0 1)
                Octet 4 = 0xce (Bit 1 2 3 6 7)

--More--
```

---

## 15.4 show locos safetyApps

**Syntax:**

```
show locos safetyApps
```

**Description:**

Displays the safetyApps configured values.

**Default state:**

Example below has default values for all fields.

**Privileged?:**

No

**Added in:**

v0.0.18:

**Example log:**

```
[Lear334455:info (0)1] show locos safetyApps
fcwAdvisoryTriggerTTC      => 10 second
fcwImminentTriggerTTC     => 5 second
bswRVTimeToReachEV        => 5 second
icwAdvisoryEVTimeToIntersection => 10 second
icwAdvisoryEVRVTimeGap    => 4 second
icwImminentEVTimeToIntersection => 5 second
icwImminentEVRVTimeGap    => 2 second
icwMinimumMergingAngle    => 15 degree
imaAdvisoryEVTimeToIntersection => 20 second
imaRVTimeToReachImpactArea => 10 second
ltaRVTimeToCrossEV        => 10 second
smvaEVSpeedThresholdWrtRVSpeed => 10 mile/hour
rlvMinSpeedLimit          => 5 meter/second
dnpwRVTimeToCrossEV      => 12 second
dnpwRadialDistanceToAheadRV => meter
laneWidth                 => 4 meter
elevationNoiseThreshold   => 3 meter
rvFilter                   => disabled
zoneLimit:ahead           => 13 second
zoneLimit:farAhead        => 20 second
zoneLimit:behind          => 4 second
zoneLimit:farBehind       => 12 second
zoneLimit:referenceSpeed  => 5 meter/second
```

---

## 15.5 show locos distressNotification

### Syntax:

```
show locos distressNotification
```

### Description:

Displays the status of the distressNotification.

### Default state:

Example below has default values for all fields.

### Privileged?:

No

### Added in:

v0.0.18:

### Example log:

```
[Lear334455:info (0)1] show locos distressNotification
status          => 1
appname         => dn
psid            => 16514
servicetype     => usr
securitytype    => 1
verifybypass   => 0
expirytime     => 2880
repeatrate     => 50
printencode     => 0
printdecode    => 0
logtype        => remote
forwarddirection => disabled
forwardip      => N/A
forwardport    => N/A
[Learxxxxxx:info (0)2]
```

---

## 15.6 show locos ota

### Syntax:

```
show locos ota
```

### Description:

Displays the status of the ota

### Default state:

Example below has default values for all fields.

### Privileged?:

No

### Added in:

v0.0.18:

### Example log:

```
[Lear334455:info (0)1] show locos ota
ota configuration details
app name      => ota
status       => 0
psid         => 52
userRequestType => 1
wsaType      => 4
psc         => ota
advertiserIdentifier => LEAR
serviceChannel => 176
```

---

## 15.7 show locos provider advertiserid

### Syntax:

```
show locos provider advertiserid
```

**Description:**

This command gives the advertiser ID.

**Default state:**

NONE

**Privileged?:**

No

**Added in:**

v0.0.18:

**Example log:**

```
[Lear334455:info (0)1] show locos provider advertiserid  
#advertiserIdentifier=
```

---

## 15.8 show locos can

**Syntax:**

```
show locos can
```

**Description:**

Displays the status of the CAN bus

**Default state:**

Example below has default values for all fields.

**Privileged?:**

No

**Added in:**

v0.0.18:

**Example log:**

```
[Lear334455:info (0)1] show locos can
filterIDs => 1
status => 0
server => 1
loopback => 0
listenonly => 0
decodePGN => 0
interface => can0
bitrate => 0
pidList => 0
dbcFile => 0
metaFile => 0
[Learxxxxxx:info (0)2]
```

---

## 15.9 show locos security asm

**Syntax:**

```
show locos security asm
```

**Description:**

Displays all the configurations of Lear Security Module.

**Default state:**

N/A

**Privileged?:**

No

**Added in:**

v0.0.21



**Example log:**

```
[Lear121210:info (0)2] show locos security asm
WSMP signBypass => disabled
WSA signBypass => disabled
WSMP verifyBypass => disabled
WSA verifyBypass => disabled
ASM log status =>disabled
ASM log level =>crit
ASM log file size(kb) =>976
ASM log file name =>asm.log
MAC Address Randomization =>enabled
Certificate reload time =>0
Certificate loading path =>/usb/ModelDeploymentConfigurationItems/1609Certificates/
```

---

## 15.10 show locos security lcm

**Syntax:**

```
show locos security lcm
```

**Description:**

Displays all the configurations of LCM.

**Default state:**

N/A

**Privileged?:**

No

**Added in:**

v0.0.21

**Example log:**

```
[Lear121210:info (0)2] show locos security lcm
LCM Deamon status => enabled
SCMS server address => 12.172.124.234
SCMS server port => 16092
```

```

LCM device specific ID => ARADA
LCM device name => obe
Storage Space(kb) => 20480
BootStrap Request Timeout(seconds) => 30
Batch Duration Units => 2
Batch Duration Value => 120
Super Batch Duration Units => 2
Super Batch Duration Value => 120
Certificate Request Status InquiryInterval(seconds) => 70
Certificate Request ConfirmationTimeout(seconds) => 30
DecryptionKey RequestInterval(seconds) => 5
Maximum CertificateStorageTime(seconds) => 31536000
Request CertificateTime(seconds) => 30000
Request DecryptionKey Time(seconds) => 15000
Connection Retry Interval(seconds) => 5
DecryptionKey Retry(seconds) => 3
Default timeout(seconds) => 30
LCM CRL status => enabled
LCM logging status => enabled
LCM log file name => lcm.log
LCM AdditionalInfo logging status => enabled
LCM BootstrapRequest logging status => enabled
LCM BootstrapConfirm logging status => enabled
LCM BootstrapAck logging status => enabled
LCM CertRequest logging status => enabled
LCM CertRequestConfirm logging status => enabled
LCM CertStatusRequest logging status => enabled
LCM CertStatusConfirm logging status => enabled
LCM CertStatusConfirmData logging status => disabled
LCM CertResponseAck logging status => enabled
LCM DecryptKeyRequest logging status => enabled
LCM DecryptKeyConfirm logging status => enabled
LCM DecryptKeyAck logging status => enabled
LCM SignEncryptInput logging status => enabled
LCM SignEncryptBeforeEncrypt logging status => enabled
LCM SignEncryptAfterEncrypt logging status => enabled
LCM ImportedFile logging status => disabled
[Lear121210:info (0)2]

```

## 15.11 show locos wsacnf

### Syntax:

```
show locos wraconf
```

### Description:

Displays the WRA configuration details.

### Default state:

N/A

**Privileged?:**

No

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:info (0)1] show locos wraconf
WRA configuration details
IP Prefix of WRA           => 2001:470:11:456::
Prefix Length of WRA      => 64
Default Gateway of WRA    => 2001:470:11:456::9
Primary DNS of WRA        => 2001:470:11:456::9
```

---

## 15.12 show locos offload

**Syntax:**

```
show locos offload
```

**Description:**

Used to check the configured offload parameters.

**Default state:**

N/A

**Privileged?:**

No

**Added in:**

v0.0.17

**Example log:**

```
[Lear121210:info (0)0] show locos offload
appName          =>    offload
Status           =>    enabled
psid             =>    50
user Request Type =>    1
wsaType          =>    4
PSC              =>    offload
Service Channel  =>    176
Adevertizer identifier =>    LEAR
RemoteUserName   =>    None
RemoteDestDir    =>    /tmp
LocalSrcDir      =>    /var/storage
SizeThreshold1   =>    30
SizeThreshold2   =>    50
SizeThreshold3   =>    70
RetryCount       =>    3
```

---

### 15.13 show locos rsuoffload

**Syntax:**

```
show locos offload
```

**Description:**

Used to check the configured rsuoffload parameters.

**Default state:**

N/A

**Privileged?:**

No

**Added in:**

v0.0.17

**Example log:**

```
[Lear052790:info (1)1] show locos rsuoffload
Status => enabled
Partition mountpoint => /var
keyfile => /var/scp_key
sizethreshold1 => 30
sizethreshold2 => 50
sizethreshold3 => 70
size threshold check interval => 15
offloadinterval => 20
directory1 action => added
directory1 srcpath => /var/storage
directory1 server addr => NA
directory1 server port => 0
directory1 Destination Directory => /tmp
directory1 server username => NA
directory1 retry count => 3
directory2 action => not_added
directory2 srcpath => NA
directory2 server addr => NA
directory2 server port => 0
directory2 Destination Directory => /tmp
directory2 server username => NA
directory2 retry count => 3
directory3 action => not_added
directory3 srcpath => NA
directory3 server addr => NA
directory3 server port => 0
directory3 Destination Directory => /tmp
directory3 server username => NA
directory3 retry count => 3
directory4 action => not_added
directory4 srcpath => NA
directory4 server addr => NA
directory4 server port => 0
directory4 Destination Directory => /tmp
directory4 server username => NA
directory4 retry count => 3
directory5 action => not_added
directory5 srcpath => NA
directory5 server addr => NA
directory5 server port => 0
directory5 Destination Directory => /tmp
directory5 server username => NA
directory5 retry count => 3
```

## 15.14 show locos logging

**Syntax:**

```
show locos logging
```

**Description:**

Displays the configuration of Packet Logging Module

**Default state:**

N/A

**Privileged?:**

No.

**Added in:**

v0.0.19

**Example log:**

```
[Lear050E32:info (0)2] show locos logging
Packet logging status
***** Interface1 *****
Interface logging =>disabled
LogFile Size(MB) =>
LogFile time(Hrs) =>
Direction based logging =>disabled
Interface Name =>
***** Interface2 *****
Interface logging =>disabled
LogFile Size(MB) =>
LogFile time(Hrs) =>
Direction based logging =>disabled
Interface Name =>
***** Other Config *****
Transmit log =>disabled
Receive log =>disabled
Forward PCAP =>disabled
Remote machine IP Addr =>
Remote machine port number =>
[Lear050E32:info (0)2]
```

---

## 15.15 show locos hmi

**Syntax:**

```
show locos hmi
```

**Description:**

Displays HMI related settings.

**Default state:**

N/A

**Privileged?:**

No

**Added in:**

v0.0.23

**Example log:**

```
[Lear334450:info (0)1] show locos hmi
Status                               =>    enabled
Connection mode                       =>    wifi
Wifi Destination IP                   =>    192.168.10.150
Wifi Destination Port                 =>    5500
Wifi Tx Interval                      =>    100
Wifi Connection Timeout               =>    3000
Wifi Data Timeout                     =>    1500
Bluetooth Client MAC                 =>    00\:00\:00\:00\:00\:00
Bluetooth UUID                       =>    00001101-0000-1000-8000-00805F9B34FB
Bluetooth Tx Interval                =>    100
Bluetooth Connection Timeout         =>    3000
Bluetooth Data Timeout               =>    1500
LiveMap Status                       =>    enabled
LiveMap Server IP                    =>    192.168.0.96
LiveMap Server Port                  =>    6000
LiveMap RV Update                    =>    enabled
LiveMap Path History Trail            =>    enabled
```

---

## Chapter 16

# Show log

### 16.1 show log kernel

**Syntax:**

```
show log kernel [<number of lines to display, - for lines from end>]
```

**Description:**

Shows kernel ring buffer logs.

**Default state:**

When command is given without number of lines it displays last 10 lines.

**Privileged?:**

No

**Added in:**

Initial

**Example log:**

```
[Lear-lc3:info (1)2] show log kernel -2
```

```
Going to display last 2 lines.
```

```
imx-sgtl5000 sound.24: snd_soc_register_card failed (-517)
```

```
platform sound.24: Driver imx-sgtl5000 requests probe deferral
```

```
[Lear-lc3:info (1)2]
```



## 16.2 show log syslog

### Syntax:

```
show log syslog [facility <facility name to look in log file>]
[priority <priority name to look in log file>]
[matching <string to look in log file>]
[<number of lines to display, - for lines from end>]
```

### Description:

Displays syslog default file as per command. Command works only for number of lines as of now. Manual will be updated once it is working properly.

### Default state:

Displays last 10 lines of /var/log/messages (Still not configurable).

### Privileged?:

No

### Added in:

Initial

### Example log:

```
[Lear-lc3:info (1)2] show log syslog -2

Going to display last 2 lines.
Jan  6 18:45:55 arada-lc3 authpriv.warn ....._ecdsa_host_key
Jan  6 18:45:55 arada-lc3 authpriv.info ..... available

[Lear-lc3:info (1)2]
```

---

## 16.3 show log trace

**Syntax:**

```
show log trace
```

**Description:**

Place holder for command, Not supported as of now.

**Default state:**

N/A

**Privileged?:**

N/A

**Added in:**

N/A

**Example log:**

N/A

---

## 16.4 show log status remote

**Syntax:**

```
show log status remote
```

**Description:**

Displays the status the remote syslog settings

**Default state:**

Disabled

**Privileged?:**

No

**Added in:**

v0.0.3

**Example log:**

```
[Learxxxxxx:info (0)2] show log status remote
Syslog (remote) is          =>      disable
[Learxxxxxx:info (0)2]
```

---

## 16.5 show log status local

**Syntax:**

```
show log status local
```

**Description:**

Displays the status of local syslog settings.

**Default state:**

Disabled

**Privileged?:**

No

**Added in:**

v0.0.3

**Updates:**

v0.0.6 (Updated)

**Example log:**

```
[Learxxxxxx:info (0)0] show log status local
Time based syslog      =>  disable
Syslog Rotatetime     =>  0000
Syslog File Size      =>  64kb
Syslog File count     =>  2
[Learxxxxxx:info (0)0]
```

---

## 16.6 show log lcmlog

**Syntax:**

```
show log lcmlog
show log lcmlog <no of lines>
show log lcmlog <-no of lines>
```

**Description:**

Displays the contents of lcm log file.

**Default state:**

N/A

**Privileged?:**

No

**Added in:**

v0.0.6

**Example log:**

```
[Learxxxxxx:info (0)0] show log lcmlog
Oct 6 16:55:37 : 2.5
Oct 6 16:55:37 : [BOOTSTRAP_REQ]:Sent bytes:167 to --> 12.172.124.234
Oct 6 16:55:37 : rcv:error,size=0 0
Oct 6 16:55:37 : [BOOTSTRAP_CFM]:timed out retry:1,[Err:-1]
Oct 6 16:55:37 : [BOOTSTRAP_CFM]:Max Retries Excedded [Err:-1]
Oct 6 16:55:37 : 1
```

```
Oct 6 16:55:37 : Connecting ...16092
Oct 6 16:55:37 : Connecting ...1
Oct 6 16:55:37 : Connecting ...2
Oct 6 16:55:37 : Connecting ...2.1
[Learxxxxx:info (0)0]
```

---

## Chapter 17

# Show application

### 17.1 show application details

**Syntax:**

```
show application details
```

**Description:**

Shows configured applications details.

**Default state:**

N/A

**Privileged?:**

No.

**Added in:**

v0.0.9

**Updates:**

v0.0.10 (Updated the command to show details of all apps)

v0.0.15 (added wsmppforward app support).

**Example log:**

```
[Lear050E52:info (0)1] show application details
app_name      =>      bsm
app_status    =>      enabled
wme_arg       =>      psid\ 32\ service\ csr\ schan\ 172\ slot\ either\
wsm_arg       =>      security\ unsecured\ verifybypass\ disable\ txchan\ 172\ datarate\ 6.0\ txpower\ 23\
```

```

chload\ 0\ infoeleId\ f\ priority\ 0\ txrate\ 50\ exptime\ 0
sae_arg => vehicletype\ 1\ vehiclewidth\ 0\ vehiclelength\ 0
oth_arg => txmode\ txrx\ tempIdStatus\ disable\ msgCount\ 2\ printencode\ disable\ printdecode\ disable

app_name => tim
app_status => enabled
wme_arg => psid\ 131\ service\ csr\ schan\ 172\ slot\ either
wsm_arg => security\ unsecured\ verifybypass\ disable\ txchan\ 172\ datarate\ 6.0\ txpower\ 23\
chload\ 0\ infoeleId\ f\ priority\ 0\ txrate\ 50\ exptime\ 0
oth_arg => txmode\ rx\ srmFolder\ /var/AML/\ printencode\ disable\ printdecode\ disable

app_name => spat
app_status => enabled
wme_arg => psid\ 130\ service\ csr\ schan\ 172\ slot\ either
wsm_arg => security\ unsecured\ verifybypass\ disable\ txchan\ 172\ datarate\ 6.0\ txpower\ 23\
chload\ 0\ infoeleId\ f\ priority\ 0\ txrate\ 50\ exptime\ 0
oth_arg => txmode\ rx\ tempIdStatus\ disable\ msgCount\ 2\ printencode\ disable\ printdecode\ disable

app_name => map
app_status => enabled
wme_arg => psid\ 130\ service\ csr\ schan\ 172\ slot\ either
wsm_arg => security\ unsecured\ verifybypass\ disable\ txchan\ 172\ datarate\ 6.0\ txpower\ 23\
chload\ 0\ infoeleId\ f\ priority\ 0\ txrate\ 50\ exptime\ 0
oth_arg => txmode\ rx\ srmFolder\ /var/MAP/\ printencode\ disable\ printdecode\ disable

app_name => ipservice
app_status => enabled
wme_arg => psid\ 35\ service\ psr\ wsatype\ any\ psc\ scms\ schan\ 172\ chaccess\ alternatcch\
wsarate\ 50\ wsachan\ 178\ ipservice\ disable\ port\ 0\ rcpthresh\ 0\ wsacnth\ 0\ wsacnthint\ 0\ infoeleId\ f\ signlifetime\ 0
wsm_arg => security\ unsecured\ verifybypass\ disable\ txchan\ 172\ datarate\ 6.0\ txpower\ 23\
chload\ 0\ infoeleId\ f\ priority\ 0\ txrate\ 50\ exptime\ 0
oth_arg => txmode\ rx\ printencode\ disable\ printdecode\ disable

app_name => egoprocess
app_status => enabled
wme_arg => psid\ 32\ service\ csr\ schan\ 172\ slot\ either
wsm_arg => security\ unsecured\ verifybypass\ disable\ txchan\ 172\ datarate\ 6.0\ txpower\ 23\ chload\ 0\ infoeleId\ f\
priority\ 0\ txrate\ 50\ exptime\ 0
oth_arg => txmode\ rx\ printencode\ disable\ printdecode\ disable

[Lear050E52:info (0)1]

```

---

## 17.2 show application summary

### Syntax:

```
show application summary <appname>
```

### Description:

Shows summary of packet tx/rx for given application.

Summary for ipservice and wsmppforward application will not be available.

**Default state:**

N/A

**Privileged?:**

No.

**Added in:**

v0.0.9

**Updates:**

v0.0.10 (updated command syntax)

**Example log:**

```
[Lear01BA01:info (0)0] show application summary egoprocess
*****egoprocess summary*****
TX      =>    0
TX Drop =>    0
TX Error =>   0
RX      =>  17510
*****
[Learxxxxx:info (0)0]
```

---



## Chapter 18

# Show tunnel

### 18.1 show tunnel details

#### Syntax:

```
show tunnel details
```

#### Description:

Shows configured tunnel details.

Note:- Tunnel details will be shown only when tunnel status is enabled.

#### Default state:

N/A

#### Privileged?:

No.

#### Added in:

v0.0.13

#### Example log:

```
[LearBABABA:info (0)1] show tunnel details
Status          => enabled
Name            => tun3
Remote IPv4     => 216.218.221.42
Local IPv6      => 2001\::470\baba\::1/64
IPv6 gateway    => 2001\::470\baba\::1
IPv6 Network Prefix => 2000\::/3
[LearBABABA:info (0)1]
```



## Chapter 19

# Show firewall

### 19.1 show firewall details

**Syntax:**

```
show firewall details
```

**Description:**

Displays the configured firewall rules.

**Default state:**

N/A

**Privileged?:**

NO

**Added in:**

v0.0.13

**Example log:**

```
[LearAABBCC:info (0)0] show firewall details
:INPUT ACCEPT [2676:10510098]
:OUTPUT ACCEPT [1658:358176]
-A INPUT -s 192.168.0.69/32 -j DROP
```

## Chapter 20

# Show all

### 20.1 show all

**Syntax:**

```
show all
```

**Description:**

Shows configured values for user relevant configurations.

**Default state:**

N/A

**Privileged?:**

NO

**Added in:**

v0.0.16

**Example log:**

```
[LearBABBBB:info (0)0] show all
----- SYSTEM -----
Product ID           =>      LOCOMATE-300-ASD
System Name          =>      Lear121210
Country              =>      unitedstates-public-safety (842)
MAC address          =>      00:26:ad:12:12:10
DB version           =>      0.13
```

```

RFS version           =>      v0.0.20-0-g8cbc5e9
SDK version           =>      v16.3.QA_09.01
Kernel version        =>      3.10.17-arada-LC3-00009-g8cbc5e9+
system uptime         =>      0 day(s) 0 hour(s) 6 min(s) 15 sec
dsrbackendseparation =>      enabled
Number of bridges     =>      2
brwifi interfaces     =>      wifi0vap0
Configured no of cores =>      25

```

No external media connected!

-----

----- LOG -----

```

Syslog (remote) status =>      disabled

Time based syslog     =>      disabled
Syslog Rotatetime     =>      0000
Syslog File Size      =>      64kb
Syslog File count     =>      2

```

-----

----- APPLICATION -----

```

app_name              =>      bsm
app_status            =>      enabled
wme_arg               =>      psid\ 32\ service\ csr\ schan\ 172\ slot\ either
wsm_arg               =>      security\ unsecured\ verifybypass\ disable\ txchan\
  172\ datarate\ 6.0\ txpower\ 23\ chload\ 0\ infoeleId\ f\ priority\ 0\ txrate\ 50\ exptime\
sae_arg               =>      vehicletype\ 1\ vehiclewidth\ 0\ vehiclelength\ 0
oth_arg               =>      txmode\ tx\ tempIdStatus\ disable\ msgCount\ 2\
  printencode\ disable\ printdecode\ disable

app_name              =>      tim
app_status            =>      disabled
wme_arg               =>      psid\ 131\ service\ csr\ schan\ 176\ slot\ slot1
wsm_arg               =>      security\ unsecured\ verifybypass\ disable\ txchan\
  178\ datarate\ 6.0\ txpower\ 23\ chload\ 0\ infoeleId\ f\ priority\ 0\ txrate\ 50\ exptime\
oth_arg               =>      txmode\ rx\ srmFolder\ /var/SRM/AML/\ printencode\
  disable\ printdecode\ disable

app_name              =>      spat
app_status            =>      disabled

```

```

wme_arg          =>      psid\ 130\ service\ csr\ schan\ 172\ slot\ either
wsm_arg          =>      security\ unsecured\ verifybypass\ disable\ txchan\
 172\ datarate\ 6.0\ txpower\ 23\ chload\ 0\ infoeleId\ f\ priority\ 0\ txrate\ 50\ exptime\
oth_arg          =>      txmode\ rx\ tempIdStatus\ disable\ msgCount\ 2\
  printencode\ disable\ printdecode\ disable

app_name         =>      map
app_status       =>      disabled
wme_arg          =>      psid\ 130\ service\ csr\ schan\ 172\ slot\ either
wsm_arg          =>      security\ unsecured\ verifybypass\ disable\ txchan\
 172\ datarate\ 6.0\ txpower\ 23\ chload\ 0\ infoeleId\ f\ priority\ 0\ txrate\ 50\ exptime\
oth_arg          =>      txmode\ rx\ srmFolder\ /var/SRM/MAP/\ printencode\
  disable\ printdecode\ disable

app_name         =>      ipservice
app_status       =>      enabled
wme_arg          =>      psid\ 270549118\ service\ usr\ usrReq\ auto\
wsatype\ any\ psc\ ipv6\ schan\ 176\ srcMac\ ff\:ff\:ff\:ff\:ff\:ff\ advertifier\ USDOT\
 linkquality\ 0\ immaccess\ 0
wsm_arg          =>      security\ unsecured\ verifybypass\ enable\ txchan\
 178\ datarate\ 6.0\ txpower\ 23\ chload\ 0\ infoeleId\ f\ priority\ 0\ txrate\ 50\
  exptime\ 0
oth_arg          =>      txmode\ none\ printencode\ disable\ printdecode\
  disable

app_name         =>      egoprocess
app_status       =>      enabled
wme_arg          =>      psid\ 32\ service\ csr\ schan\ 172\ slot\ either
wsm_arg          =>      security\ unsecured\ verifybypass\ disable\ txchan\
 172\ datarate\ 6.0\ txpower\ 23\ chload\ 0\ infoeleId\ f\ priority\ 0\ txrate\ 50\
  exptime\ 0
oth_arg          =>      txmode\ rx\ printencode\ disable\ printdecode\
  disable

app_name         =>      pvd
app_status       =>      disabled
wme_arg          =>      psid\ 132\ service\ usr\ usrReq\ auto\ wsatype\
any\ psc\ probe\ schan\ 176\ srcMac\ ff\:ff\:ff\:ff\:ff\:ff\ advertifier\ USDOT\
 linkquality\ 0\ immaccess\ 0
wsm_arg          =>      security\ unsecured\ verifybypass\ enable\ txchan\
 176\ datarate\ 6.0\ txpower\ 23\ chload\ 0\ infoeleId\ f\ priority\ 0\ txrate\ 50\

```

```

exptime\ 0
sae_arg          =>      vehicletype\ 1\ vehiclewidth\ 0\ vehiclelength\ 0
oth_arg          =>      txmode\ txrx\ printencode\ disable\ printdecode\
                        disable\ configFile\ /var/PVD/pvdOptions.conf

```

```

app_name         =>      pdm
app_status       =>      disabled
wme_arg          =>
wsm_arg          =>
oth_arg          =>

```

```
-----
```

```
----- TUNNEL -----
```

```
Status          =>      disabled
```

```
-----
```

```
----- IPv4 -----
```

```

IPv4 Address     =>      172.20.1.65
IPv4 Netmask     =>      255.255.255.0
IPv4 Gateway     =>      172.20.1.5
Primary DNS      =>      172.20.1.4
Secondary DNS    =>      0.0.0.0
IPv4 DHCP client =>      enabled

```

```
----- IPv6 -----
```

```

brtrunk IPv6 Address     =>      fe80::ccf3:7dff:fec0:cfda/64
brtrunk IPv6 Network Prefix =>
brtrunk IPv6 Gateway     =>

brwifi IPv6 Address     =>      fe80::226:adff:fe12:1211/64
brwifi IPv6 Network Prefix =>
brwifi IPv6 Gateway     =>

```

```
-----
```

```
----- AP Params -----
```

```

channel          =>      36
password         =>      Shared#321Le@r
ssid             =>      Lear051580-11ac

```

```
-----  
----- REMOTE -----  
SSH daemon          =>    enabled  
SNMP daemon         =>    disabled  
-----  
----- TIME -----  
Current time is     =>    Wed Oct 18 05:48:34 GMT 2017  
Current timezone status =>    iceland (110)  
Daylight time saving status =>    enabled  
GPS status          =>    enabled  
Time update interval =>  
-----  
----- LOCOS -----  
MAC Address Randomization =>    enabled  
LCM Deamon status    =>    enabled  
LCM logging status   =>    enabled  
LOCOS deployment     =>    default  
-----  
----- BLUETOOTH -----  
hci0:  Type: BR/EDR  Bus: USB  
       BD Address: 00:3C:7F:F0:F0:0A  ACL MTU: 1022:8  SCO MTU: 183:5  
       UP RUNNING  
       RX bytes:547 acl:0 sco:0 events:27 errors:0  
       TX bytes:384 acl:0 sco:0 commands:27 errors:0  
-----  
----- FIREWALL -----  
:INPUT ACCEPT [0:0]  
:OUTPUT ACCEPT [0:0]  
-----  
----- OFFLOAD -----  
appName             =>    offload  
Status              =>    enabled  
psid                =>    50
```



```

user Request Type      =>      1
wsaType                =>      4
PSC                    =>    offload
Service Channel        =>    176
Adevertizer identifier =>    LEAR
RemoteUserName         =>    None
RemoteDestDir          =>    /tmp
LocalSrcDir            =>    /var/storage
RetryCount             =>      3

```

-----

----- Safety Apps -----

```

FCW advisory TTC      =>    10 second
FCW imminent TTC     =>    5 second
BSW RV time to reach EV =>    5 second
Ahead zone limit     =>    13 second
Far Ahead zone limit =>    20 second
Behind zone limit    =>    4 second
Far Behind limit     =>    12 second
Reference speed      =>    5 meter/second
ICW advisory EV time to intersection =>    10 second
ICW advisory EVRV time gap =>    4 second
ICW imminent EV time to intersection =>    5 second
ICW imminent EVRV time gap =>    2 second
ICW minimum merging angle =>    15 degree
IMA advisory EV time to intersection =>    20 second
IMA RV time to reach impact area =>    10 second
LTA RV time to cross EV =>    10 second
SMVA EV speed threshold wrt to RV speed =>    10 mile/hour
RLV minimum speed limit =>    5 meter/second
DNPW RV time to cross EV =>    12 second
Lane width           =>    4 meter
RV filter            =>    enabled

```

-----

[LearBABBBB:info (0)0]

---

## Chapter 21

# Request commands

Administration related commands

---

Requires no privilege

### 21.1 request firmware upgrade

#### 21.1.1 request firmware upgrade scp

**Syntax:**

```
request firmware upgrade scp <path to firmware file> <IP or hostname>  
<Username> [reboot]
```

**Description:**

This command uses ssh client to get supplied file from host machine pointed by hostname or IP. There is an optional argument reboot which can reboot after upgrade when specified. Recovery or netboot image will upgrade first image and flash boot images will upgrade non used image.

**Default state:**

None

**Privileged?:**

No

**Added in:**

v0.0.13

**Example log:**

```
[Lear000031:info (1)0] request firmware upgrade scp /tftpboot/lc3-rsu_US_Arada_sathish-030216-1228-v0.0.13.ara 192.168.0.136
sathish reboot
Getting firmware file
/tftpboot/lc3-rsu_US_Arada_sathish-030216-1228-v0.0.13.ara using scp from host 192.168.0.136
sathish@192.168.0.136's password:
lc3-rsu_US_Arada_sathish-030216-1228-v0.0.13. 100% 15MB 7.6MB/s 00:02
Updating firmware...
rebooting..
```

---

**21.1.2 request firmware upgrade file****Syntax:**

```
request firmware upgrade file <path to firmware file> [reboot]
```

**Description:**

This command upgrades the locally present firmware. User need to copy the firmware file to device(/tmp) or User can have firmware file in USB to upgrade the firmware. There is an optional argument reboot which can reboot after upgrade when specified. Recovery or netboot image will upgrade first image and flash boot images will upgrade non used image.

**Default state:**

None

**Privileged?:**

No

**Added in:**

v0.0.13

**Example log:**

```
[Lear000031:info (0)1] request firmware upgrade file /tmp/lc3-rsu_US_Arada_sathish-030216-1228-v0.0.13.ara reboot
Getting firmware file lc3-rsu_US_Arada_sathish-030216-1228-v0.0.13.ara
Updating firmware...
rebooting..
```

---

### 21.1.3 request firmware check sign

**Syntax:**

```
request firmware check sign
```

**Description:****Default state:**

None

**Privileged?:****Added in:**

v0.0.13

**Example log:**

```
[Lear000031:info (0)1] request firmware check sign
```

---

### 21.1.4 request firmware check validity

**Syntax:**

```
request firmware check validity
```

**Description:****Default state:**

None

**Privileged?:**

No

**Added in:**

v0.0.13

**Example log:**

```
[Lear000031:info (0)1] request firmware check validity
```

---

## 21.2 request system

### 21.2.1 request system reboot

**Syntax:**

```
request system reboot
```

**Description:**

Requests system reboot.

**Default state:**

NA

**Privileged?:**

NO

**Added in:**

Initial

**Example log:**

No Log

---

### 21.2.2 request system shell

**Syntax:**

```
request system shell
```

**Description:**

Provides system shell.

**Default state:**

NA

**Privileged?:**

NO

**Added in:**

Initial

**Example log:**

```
[Lear-lc3:info (0)1] request system shell
Forking system Shell.
$
```

---

### 21.2.3 request system halt

**Syntax:**

```
request system halt
```

**Description:**

Halt the device.

**Default state:**

NA

**Privileged?:**

NO

**Example log:**

```
[Lear-lc3:info (0)1] request system halt
```

---

**21.2.4 request system restore****Syntax:**

```
request system restore
```

**Description:**

Restores system to default state.

**Default state:**

NA

**Privileged?:**

NO

**Added in:**

v0.0.2

**Example log:**

```
[Learxxxxxx:info (4)2] request system restore  
Restoring system
```

**21.2.5 request system snapshot****Syntax:**

```
request system snapshot
```

**Description:**

Command gives the snapshot of the device.

**Default state:**

NA

**Privileged?:**

NO

**Added in:**

v0.0.2

**Example log:**

```
[Learxxxxxx:info (4)2] request system snapshot
```

---

**21.2.6 request system logout****Syntax:**

```
request system logout
```

**Description:**

This command gives the device logout.



**Default state:**

N/A

**Privileged?:**

NO

**Added in:**

v0.0.2

**Example log:**

```
[Learxxxxxx:info (4)2] request system logout
```

---

## 21.2.7 request system cleanup

**Syntax:**

```
request system cleanup
```

**Description:**

Cleanup the device

**Default state:**

N/A

**Privileged?:**

NO

**Added in:**

v0.0.2

**Example log:**

```
[Learxxxxxx:info (4)2] request system cleanup
```

---

## Chapter 22

# Debug commands

Debugging related commands

---

Requires no privilege

Sending command "debug" on cli main view takes you to debug view, prompt changes as below:

```
[Lear-lc3:info (0)1] debug
Moving to diagnostic view...
[Lear-lc3:debug (0)1]
```

This view will house all the commands which are required to debug things on this board.

### 22.1 ping

**Syntax:**

```
ping [ip | ipv6 | arp] <destination> [source <Source interface>]
[repeat <count>] [resolve] [broadcast] [size <packet size>]
[flood] [duplicate-detect]
```

**Description:**

Ping to different hosts on network.

**Default state:**

Default ping count is 5.  
duplicate-detect option is when arp ping is done.

**Privileged?:**

NO

**Added in:**

Initial

**Example log:**

```
[Lear-lc3:debug (0)1] ping 172.20.1.68
PING 172.20.1.68 (172.20.1.68): 56 data bytes
64 bytes from 172.20.1.68: seq=0 ttl=64 time=0.788 ms
64 bytes from 172.20.1.68: seq=1 ttl=64 time=0.298 ms
64 bytes from 172.20.1.68: seq=2 ttl=64 time=0.377 ms
64 bytes from 172.20.1.68: seq=3 ttl=64 time=0.294 ms
64 bytes from 172.20.1.68: seq=4 ttl=64 time=0.277 ms

--- 172.20.1.68 ping statistics ---
5 packets transmitted, 5 packets received, 0% packet loss
round-trip min/avg/max = 0.277/0.406/0.788 ms
[Lear-lc3:debug (0)1]
```

---

## 22.2 list

**Syntax:**

```
list [<absolute path of directory whose listing is required>]
```

**Description:**

List content of the directory supplied as argument, when no argument given lists root(/)

**Default state:**

On no arguments list content of root(/).

**Privileged?:**

NO

**Added in:**

Initial

**Example log:**

```
[Lear-1c3:debug (1)2] list /tmp
/
drwxrwxrwt    4 root    root    220 Jan  6 00:22 ./
drwxrwxr-x   18 1000    input   0 Sep  9 2015 ../
-rw-r--r--    1 root    root    0 Jan  6 00:22 clish.lock
.....
lrwxrwxrwx    1 root    root    4 Jan  6 00:22 tmp -> /tmp/
[Lear-1c3:debug (1)2]
```

---

## 22.3 exit

**Syntax:**

```
exit
```

**Description:**

This command will take you out of debug mode and will change to info view.

**Default state:**

NA

**Privileged?:**

NO

**Added in:**

Initial

**Example log:**

```
[Lear-lc3:debug (0)1] exit
Leaving diagnostic mode...
[Lear-lc3:info (0)1]
```

---

## 22.4 traceroute

**Syntax:**

```
traceroute ip/ipv6 <address>
```

**Description:**

This command is used to trace out the devices which are connected to it.

**Default state:**

No

**Privileged?:**

NO

**Added in:**

Initial

**Example log:**

```
[Lear-lc3:debug (0)1] traceroute ip 172.20.1.230  
1 manne-System.arada-blr.com (172.20.1.208) 0.271 ms 0.165 ms 0.140 ms
```

---

## Chapter 23

# Copy commands

File transfer commands

---

Requires no privilege

### 23.1 copy

#### Syntax:

```
copy <scp|rcp> <core|file|var|tmp|remote> <source file>  
<file|var|tmp|remote> <destination file>
```

#### Description:

Copying file to and from this box, source for the file can be from core, normal file, persistent file (var) or remote file. Similarly destination could be similar except core file. both source and destination cannot be remote.

#### Default state:

NA

#### Privileged?:

NO

#### Added in:

Initial

#### Example log:

```
[Learxxxxxx:info (4)2] copy scp core ntp.553-0-0.11.587186.tar.gz remote ramanuj@172.20.1.68:/home/ramanuj/.
```



```
Coping from /var/cores/ntp.553-0-0.11.587186.tar.gz to ramanuj@172.20.1.68:/home/ramanuj/..
Host '172.20.1.68' is not in the trusted hosts file.
(ecdsa-sha2-nistp256 fingerprint md5 a9:de:11:4e:28:43:61:50:93:12:9e:a6:29:6b:21:92)
Do you want to continue connecting? (y/n) y
ramanuj@172.20.1.68's password:
ntp.553-0-0.11.587186.tar.gz          100% 28KB 27.6KB/s 00:00
[Learxxxxxx:info (4)2]
```

## Chapter 24

# Del commands

Deletes files and cores

---

Requires no privilege

### 24.1 del system

**Syntax:**

```
del system <cores|files> < <Tab to select file name>|all>
```

**Description:**

By using this command you can delete all or selected core files.  
Added support for deleting files from /var/ folder.

**Default state:**

NA

**Privileged?:**

NO

**Added in:**

Initial

**Updates:**

v0.0.17 (Added support for /var/ files deletion).

**Example log:**

```
[Learxxxxxx:info (2)2] del system cores  
gps.559-0-0.11.587399.tar.gz gps.561-0-0.11.587186.tar.gz  
[Learxxxxxx:info (2)2] del system cores gps.559-0-0.11.587399.tar.gz  
Deleting core file gps.559-0-0.11.587399.tar.gz  
[Learxxxxxx:info (1)2] show system cores  
We have 1 cores is system.  
gps.561-0-0.11.587186.tar.gz  
[Learxxxxxx:info (1)2]
```

---

## Chapter 25

# Config interface

Configuration commands

---

Requires privilege

Below are the commands supported in this area as of this release.

```
[Learxxxxxx:conf (0)2]
!      Comments
config config commands
exit   Go back to main menu
```

### 25.1 config interface <interface> ipv4 ip

#### Syntax:

```
config interface <interface> ipv4 ip <ipaddr> <netmask>
```

#### Description:

Configures interface ipv4 address and netmask.

#### Default state:

```
ipv4 addr 192.168.0.40
netmask 255.255.255.0
```

**Privileged?:**

Yes

**Added in:**

v0.0.4

**Example log:**

```
[Learxxxxxx:conf (0)2] config interface brtrunk ipv4 ip 192.168.0.52 255.255.255.248  
[Learxxxxxx:conf (0)2]
```

---

## 25.2 config interface <interface> ipv4 gateway

**Syntax:**

```
config interface <interface> ipv4 gateway <ip addr>
```

**Description:**

Configure interface ipv4 gateway.

**Default state:**

192.168.0.255

**Privileged?:**

Yes

**Added in:**

v0.0.4

**Example log:**

```
[Learxxxxx:conf (0)2] config interface brtrunk ipv4 gateway 192.168.0.1  
[Learxxxxx:conf (0)2]
```

---

## 25.3 config interface <interface> ipv4 dns

**Syntax:**

```
config interface <interface> ipv4 dns <primary dns server ip> <secondary dns server ip>
```

**Description:**

Configure interface dns (primary and secondary) server(s) ipv4 address.

**Default state:**

0.0.0.0

**Privileged?:**

Yes

**Added in:**

v0.0.4

**Example log:**

```
[Learxxxxx:conf (0)2] config interface brtrunk ipv4 dns 4.4.4.4 8.8.8.8  
[Learxxxxx:conf (0)2]
```

---

## 25.4 config interface <interface> ipv4 dhcp-client

### Syntax:

```
config interface brtrunk ipv4 dhcp-client <enable|disable>
```

### Description:

enable/disable interface dhcp-client status.

### Default state:

disable

### Privileged?:

Yes

### Added in:

v0.0.4

### Example log:

```
[Learxxxxx:conf (0)2] config interface brtrunk ipv4 dhcp-client disable  
Dhcp client is already disabled.  
[Learxxxxx:conf (0)2] config interface brtrunk ipv4 dhcp-client enable  
[Learxxxxx:conf (0)2]
```

---

## 25.5 config interface <interface> ipv4 route

### Syntax:

```
config interface <interface> ipv4 route <ip addr>
```

### Description:

Configure interface ipv4 route.

**Default state:**

0.0.0.0

**Privileged?:**

Yes.

**Added in:**

v0.0.4

**Example log:**

```
[Learxxxxxx:conf (0)2] config interface brtrunk ipv4 route 192.168.0.12  
[Learxxxxxx:conf (0)2]
```

---

## 25.6 config interface <interface> ipv6 ip

**Syntax:**

```
config interface <interface> ipv6 ip <ipv6 addr> <netprefix>
```

**Description:**

Configures interface ipv6 address and network prefix.

**Default state:**

NA

**Privileged?:**

Yes

**Added in:**

v0.0.4



**Example log:**

```
[Learxxxxx:conf (0)2] config interface brtrunk ipv6 ip 2001:470:1111::1 64  
[Learxxxxx:conf (0)2]
```

---

## 25.7 config interface <interface> ipv6 gateway

**Syntax:**

```
config interface <interface> ipv6 gateway <ipv6 addr>
```

**Description:**

Configure interface ipv6 gateway.

**Default state:**

NA

**Privileged?:**

Yes

**Added in:**

v0.0.4

**Example log:**

```
[Learxxxxx:conf (0)2] config interface brtrunk ipv6 gateway 200:470:1111::2  
[Learxxxxx:conf (0)2]
```

---

## 25.8 config interface <interface> ipv6 networkprefix

**Syntax:**

```
config interface <interface> ipv6 networkprefix <netprefix> <prefix length>
```

**Description:**

Configures interface ipv6 network prefix and prefix length.

**Default state:**

NA

**Privileged?:**

Yes.

**Added in:**

v0.0.4

**Example log:**

```
[Learxxxxx:conf (0)2] config interface brtrunk ipv6 networkprefix 2000:: 3  
[Learxxxxx:conf (0)2]
```

---

## 25.9 config interface ath0 apParams channel

**Syntax:**

```
config interface ath0 apParams channel <integer>
```

**Description:**

Configures interface ath0 apParam channel.

**Default state:**

NA

**Privileged?:**

Yes.

**Added in:**

v0.0.11

**Example log:**

```
[Learxxxxx:conf (0)2] config interface ath0 apParams channel 178  
[Learxxxxx:conf (0)2]
```

---

## 25.10 config interface ath0 apParams password

**Syntax:**

```
config interface ath0 apParams password <string>
```

**Description:**

Configures interface ath0 apParam password.

**Default state:**

NA

**Privileged?:**

Yes.

**Added in:**

v0.0.11

**Example log:**

```
[Learxxxxx:conf (0)2] config interface ath0 apParams password Lear@456  
[Learxxxxx:conf (0)2]
```

---

## 25.11 config interface ath0 apParams ssid

**Syntax:**

```
config interface ath0 apParams ssid <string>
```

**Description:**

Configures interface ath0 apParam ssid.

**Default state:**

NA

**Privileged?:**

Yes.

**Added in:**

v0.0.11

**Example log:**

```
[Learxxxxx:conf (0)2] config interface ath0 apParams ssid Lear051580-11ac  
[Learxxxxx:conf (0)2]
```

---

## Chapter 26

# config application

### 26.1 config application update

**Syntax:**

**Example log:**

```
config application update <bsm/tim/spat/map/ipservice/egoprocess/pdm/pvd> wmeConfig
config application update <bsm/tim/spat/map/ipservice/egoprocess/pdm/pvd> wsmConfig
config application update <bsm/tim/spat/map/ipservice/egoprocess/pdm/pvd> saeConfig
config application update <bsm/tim/spat/map/ipservice/egoprocess/pdm/pvd> otherConfig
```

**Description:**

Configures application profiles.

Application configuration is divided into 4 different type of configuration as per 2016 standard.

wmeConfig has all wme configurations for application registration like user, provider, channel service selection, psid, txchannel, mode, etc.

wsmConfig has all packet tx/rx related configurations like security, txpower, txchan datarate, etc.

saeConfig has vehiclewidth(vehicle width value in meters) , vehiclelegh(vehicle length value in meters), vehicleheight(vehicle height value in meters) configurations. saeConfig only applicable for BSM application.

otherConfig is for debug purpose and most of the parameters are not under development. Application names bsm, spat, map, tim, ipservice, egoprocess only supported.

**Default state:**

NA

**Privileged?:**

Yes.

**Added in:**

v0.0.5

**Updates:**

v0.0.7 (Updated)

v0.0.9 (fixed app names, status -&gt; enable)

v0.0.11 (added port support for spat/map)

v0.0.12 (updated the command syntax)

v0.0.15 (added wsmppforward app support)

v0.0.17 (added vehicle type and tempid randomization support)

v0.0.21 (removed vehicle type and tempid from application).

v0.0.21 (Added txrate and wsmpps config support).

**Example log:**

```
[Lear050E52:conf (0)1] config application disable bsm
[Lear050E52:conf (0)1] config application update bsm
wmeConfig wsmConfig saeConfig otherConfig
[Lear050E52:conf (0)1] config application update bsm wmeConfig psid 32
provider user channel
[Lear050E52:conf (0)1] config application update bsm wmeConfig psid 32 channel schan
172 174 176 180 182 184
[Lear050E52:conf (0)1] config application update bsm wmeConfig psid 32 channel schan 172 timeslot
slot0 slot1 either
[Lear050E52:conf (0)1] config application update bsm wmeConfig psid 32 channel schan 172 timeslot either
Updated application bsm:bsmWmeArg:psid 32 service csr schan 172 slot either

Enable the application to apply the changes
[Lear050E52:conf (0)1] config application enable bsm
```

## 26.2 config application disable

**Syntax:**

```
config application disable <bsm/tim/spat/map/ipservice/egoprocess/pdm/pvd>
```

**Description:**

Disables configured application profiles.

**Default state:**

NA

**Privileged?:**

Yes.

**Added in:**

v0.0.5

**Updates:**

v0.0.9 (disabling app require name instead of psid)

v0.0.11 (removed parameter "name", as autocomplete is supported).

v0.0.15 (added wsmppforward app support).

**Example log:**

```
[Lear050E52:conf (0)1] config application disable bsm
Application bsm is disabled
[Lear050E52:conf (0)1]
```

---

## 26.3 config application enable

**Syntax:**

```
config application enable <bsm/tim/spat/map/ipservice/egoprocess/pdm/pvd>
```

**Description:**

Enables the application.

Application name is mandatory.

Application names bsm,tim,spat,map, ipservice and egoprocess only supported.

**Default state:**

NA

**Privileged?:**

Yes

**Added in:**

v0.0.12

**Updates:**

v0.0.15 (added wsmppforward app support).

**Example log:**

```
[Lear050E52:conf (0)1] config application enable bsm  
Application bsm is enabled  
[Lear050E52:conf (0)1]
```

---



## Chapter 27

# config customApp

### 27.1 config customApp update

**Syntax:**

**Example log:**

```
config customApp update <app1/app2/app3/app4>
```

**Description:**

To configure the required application, this command is used. Here app1, app2, app3, app4 are the user defined customise applications. So user can select any type of application and configure the customApp. To configure this user need to provide the absolute path of the application and arguments for that application.

**Default state:**

NA

**Privileges?:**

Yes

**Added in:**

v0.0.14

**Example log:**

```
[LearBABBBB:conf (17)1] config customApp update app1 /var/csrTx "p 23 c 180 n 50"  
path /var/csrTx and argument p 23 c 180 n 50
```

```
Enable the application to apply the changes  
[LearBABBBB:conf (17)1]
```

## 27.2 config customApp enable

**Syntax:**

**Example log:**

```
config customApp enable <app1/app2/app3/app4>
```

**Description:**

Enables the application.

Application name is mandatory.

Application names app1, app2, app3 and app4 only supported.

**Default state:**

NA

**Privileged?:**

Yes

**Added in:**

v0.0.14

**Example log:**

```
[LearBABBBB:conf (17)1] config customApp enable app1
Application app1 is enabled
[LearBABBBB:conf (17)1]
```

---

## 27.3 config customApp disable

**Syntax:**

**Example log:**

```
config customApp disable <app1/app2/app3/app4>
```

**Description:**

Enables the application.

Application name is mandatory.

Application names app1, app2, app3 and app4 only supported.

**Default state:**

NA

**Privileged?:**

Yes

**Added in:**

v0.0.14

**Example log:**

```
[LearBABBB:conf (17)1] config customApp disable app1
Application app1 is disabled
[LearBABBB:conf (17)1]
```

---

## Chapter 28

# config operatemode

### 28.1 config operatemode

**Syntax:**

**Example log:**

```
config operatemode <operate/standby>
```

**Description:**

setting the mode of RSU

**Default state:**

NA

**Privileged?:**

Yes

**Added in:**

v0.0.14

**Example log:**

```
[LearBABBBB:conf (17)1] config operatemode operate  
[LearBABBBB:conf (17)1]
```

## Chapter 29

# config system

### 29.1 config system name

**Syntax:**

```
config system name <string>
```

**Description:**

Configures the system name.

**Default state:**

NA

**Privileged?:**

Yes

**Added in:**

v0.0.2

**Example log:**

```
[Learxxxxxx:conf (0)2] config system name Lear  
configuring system name as Lear  
md5 checksum computed  
[Learxxxxxx:conf (0)2]
```

## 29.2 config system password

**Syntax:**

```
config system password
```

**Description:**

Configures the system password.

**Default state:**

NA

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Learxxxxx:conf (0)2] config system password
changing the password for admin
Old Password :
New Password :
Retype Password :
[Learxxxxx:conf (0)2]
```

---

## 29.3 config system region

**Syntax:**

```
config system region <string>
```

**Description:**

Configures system region.

**Default state:**

Unites-states-public-safety (842)

**Privileged?:**

Yes

**Added in:**

v0.0.2

**Updates:**

0.0.3 (modified argument from unsigned integer to string.)

**Example log:**

```
[Learxxxxx:conf (0)2] config system region india
Configuring system region india
md5 checksum computed
Stopping Lear Process manager: OK
pcd: Caught fault signal.
Stopping system message bus: done
Saving random seed... done.
Stopping logging: OK
Stopping Lear utilities: OK
Applying basic configurations.
mount: mounting proc on /proc failed: Device or resource busy
mount: mounting none on /dev failed: Device or resource busy
can't run '/sbin/swapoff': No such file or directory
umount: tmpfs busy - remounted read-only
umount: can't remount tmpfs read-only
umount: devtmpfs busy - remounted read-only
The system is going down NOW!
Sent SIGTERM to all processes
Sent SIGKILL to all processes
Requesting system reboot
Restarting system.
```

---

## 29.4 config system corelimit

### Syntax:

```
config system corelimit <value in range 1-25>
```

### Description:

Configures the number of cores device will store at maximum. Oldest core(s) will be deleted automatically upon generation of new core(s) beyond the configured limit.

If cores present in system are already more than newly configured value this will be adjusted when new core is generated.

### Default state:

25 is the default and maximum value for LC3.

### Privileged?:

Yes

### Added in:

v0.0.6

### Updates:

v0.0.7 (updated corelimit value)

### Example log:

```
[Lear557722:conf (11)0] config system corelimit 15
```

---



## 29.5 config system imageswitch

**Syntax:**

```
config system imageswitch
```

**Description:**

Changes currently configured flash image to other one.

**Default state:**

NA

**Privileged?:**

Yes

**Added in:**

v0.0.6

**Example log:**

```
[Lear557722:conf (11)0] config system imageswitch  
Marked image 1 as default boot.
```

---

## 29.6 config system dsrckbackendseparation status

**Syntax:**

```
config system dsrckbackendseparation status <enable/disable>
```

**Description:**

Configures number of bridges.

If enabled separates the wired and wireless interfaces.

**Default state:**

Enabled. (number of bridge 2)

**Privileged?:**

Yes.

**Added in:**

v0.0.6

**Updates:**

v0.0.7 (status enabled by default)

v0.0.20 (updated the command syntax).

**Example log:**

```
[LearBABBBB:conf (0)2] config system dsrbackendseparation status enable
dsrbackendseparation is already enabled..!!
[LearBABBBB:conf (0)2] config system dsrbackendseparation status disable
Reboot is required.
[LearBABBBB:conf (0)2] config system dsrbackendseparation status enable
Reboot is required.
[LearBABBBB:conf (0)2]
```

---

## 29.7 config system dsrbackendseparation interfaceForWifiBridge

**Syntax:**

```
config system dsrbackendseparation interfaceForWifiBridge <interface>
```

**Description:**

Configures the interface for wifi bridge.

**Default state:**

wifivap0 wifilvap0 (both interfaces part of bridge).

**Privileged?:**

Yes.

**Added in:**

v0.0.20

**Example log:**

```
[LearBABBBB:conf (0)2] config system dsrckbackendseparation interfaceForWifiBridge wifi0vap0
wifi0vap0 is already part of bridge.
[LearBABBBB:conf (0)2] config system dsrckbackendseparation interfaceForWifiBridge wifi1vap0
Reboot is required.
[LearBABBBB:conf (0)2] config system dsrckbackendseparation interfaceForWifiBridge both
Reboot is required.
[LearBABBBB:conf (0)2]
```

---

## 29.8 config system sshkeygen

**Syntax:**

```
config system sshkeygen
```

**Description:**

Used to generate ssh keys. The generated public ssh key must be appended in host machine's `~/.ssh/authorized_keys` file.

You can get ssh public key using command `'show system sshpublickey'`. Or using command `'copy scp var scp_key.pub remote username@host:scp_key.pub'` then append this key using this command in host machine `'cat ~/scp_key.pub » ~/.ssh/authorized_keys'`.

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.17

**Example log:**

```
[LearAABBCC:conf (0)2] config system sshkeygen  
Generating key, this may take a while...  
Use 'show system sshpublickey' command to get the public ssh key.  
[LearAABBCC:conf (0)2]
```

---

## Chapter 30

# config time

### 30.1 config time daylight

**Syntax:**

```
config time daylight enable|disable
```

**Description:**

Enables/disables Daylight settings.

**Default state:**

Enable.

**Privileged?:**

Yes

**Added in:**

v0.0.2

**Example log:**

```
[Learxxxxxx:conf (0)2] config time daylight enable
Configuring daylightSaving enablemd5 checksum computed
[Learxxxxxx:conf (0)2] config time daylight disable
Configuring daylightSaving disablemd5 checksum computed
[Learxxxxxx:conf (0)2]
```

## 30.2 config time timezone

**Syntax:**

```
config time timezone <string>
```

**Description:**

Configures system time zone.

**Default state:**

iceland (110)

**Privileged?:**

Yes

**Added in:**

v0.0.2

**Updates:**

v0.0.3 (modified argument from unsigned integer to string.)

**Example log:**

```
[Learxxxxx:conf (0)2] config time timezone india  
Configuring TimeZone india
```

---

## 30.3 config time gps status

**Syntax:**

```
config time gps status enable|disable
```

**Description:**

Enables/Disables gps time syncing.

**Default state:**

Enabled

**Privileged?:**

Yes

**Added in:**

v0.0.2

**Example log:**

```
[Learxxxxxx:conf (0)2] config time gps status enable
gps status already enabled.
[Learxxxxxx:conf (0)2] config time gps status disable
Configuring gps status...
[Learxxxxxx:conf (0)2] config time gps status enable
Configuring gps status...
[Learxxxxxx:conf (0)2]
```

---

## 30.4 config time gps ntp-server

**Syntax:**

```
config time gps ntp-server < <url> | <ipv4addr> >
```

**Description:**

Configures NTP server URL.

**Default state:**

NA

**Privileged?:**

Yes

**Added in:**

v0.0.2

**Updates:**

v0.0.6 (command bifurcated to take either URL or IP to have aid in validation.)

**Example log:**

```
[Learxxxxx:conf (0)2] config time gps ntp-server time.windows.com  
[Learxxxxx:conf (0)2] config time gps ntp-server 172.20.1.100
```

---

## 30.5 config time gps gpserverip

**Syntax:**

```
config time gps gpserverip <IP address>
```

**Description:**

This command updates the GPSC server ip.  
Reboot is required for changes to take effect.

**Default value:**

127.0.0.1

**Privileged?:**

Yes

**Added in:**

v0.0.11



**Example log:**

```
[Learxxxxx:conf (0)2] config time gps gpserverip 172.20.1.69  
Reboot required
```

---

## 30.6 config time gps gpserverip

**Syntax:**

```
config time gps gpserverip <IP address>
```

**Description:**

This command updates the GPSD server ip.  
Reboot is required for changes to take effect.

**Default value:**

127.0.0.1

**Privileged?:**

Yes

**Added in:**

v0.0.11

**Example log:**

```
[Learxxxxx:conf (0)2] config time gps gpserverip 172.20.1.69  
Reboot required
```

---

## 30.7 config time gps serverport

**Syntax:**

```
config time gps serverport <port number>
```

**Description:**

This command updates the GPSD server port from range [2000-65535]. Reboot is required for changes to take effect.

**Default value:**

2947

**Privileged?:**

Yes

**Added in:**

v0.0.11

**Example log:**

```
[Learxxxxx:conf (0)2] config time gps serverport 6969  
Reboot required
```

---

## 30.8 config time gps devicePosition

**Syntax:**

```
config time gps devicePosition <X Offset> <Y Offset> <Z Offset>
```

**Description:**

This command sets the position of the LC3 Device in the vehicle. Offsets are measured in centimeters from the center of the rear axle and should be accurate to at least 0.1 meters. The dimensions x,y,z represent forward, left and up respectively relative to the vehicle.

**Default value:**

0 0 0

**Privileged?:**

Yes

**Added in:**

v0.0.23

**Example log:**

```
[Learxxxxxx:conf (2)0] config time gps devicePosition 71 0 43  
[Learxxxxxx:conf (2)0]
```

---

## 30.9 config time gps antennaPosition

**Syntax:**

```
config time gps antennaPosition <X Offset> <Y Offset> <Z Offset>
```

**Description:**

This command sets the position of the GPS antenna in the vehicle. Offsets are measured in centimeters from the center of the rear axle and should be accurate to at least 0.1 meters. The dimensions x,y,z represent forward, left and up respectively relative to the vehicle.

**Default value:**

0 0 0

**Privileged?:**

Yes

**Added in:**

v0.0.23

**Example log:**

```
[Learxxxxxx:conf (2)0] config time gps antennaPosition 173 0 102  
[Learxxxxxx:conf (2)0]
```

---

## 30.10 config time gps ublxhnrfeaturestatus

**Syntax:**

```
config time gps ublxhnrfeaturestatus <enable/disable>
```

**Description:**

This command enables/disables the High Navigation Rate ublox feature, which enables fixes of up to 20hz. With HNR disabled the interval should only be configured to 200ms, with it enabled 50ms is the shortest.

**Default value:**

enable

**Privileged?:**

Yes

**Added in:**

v0.0.24

**Example log:**

```
[Learxxxxxx:conf (2)0] config time gps ublxhrfeaturestatus disable  
Configuring Ublx HNR status... [Reboot required]  
[Learxxxxxx:conf (2)0]
```

---

## 30.11 config time gps autoMountAlign

**Syntax:**

```
config time gps autoMountAlign <enable/disable>
```

**Description:**

This command enables/disables automatic mount alignment in the ublox chip. Only useful when ADR is enabled, this feature enables alignment of the ublox sensors relative to the vehicle frame. Without autoMountAlignment ADR results may be skewed.

**Default value:**

disable

**Privileged?:**

Yes

**Added in:**

v0.0.23

**Example log:**

```
[Learxxxxxx:conf (2)0] config time gps autoMountAlign enable  
[Learxxxxxx:conf (2)0]
```

---

## 30.12 config time gps lowSpeedCOGFilter

**Syntax:**

```
config time gps lowSpeedCOGFilter <enable/disable>
```

**Description:**

This command enables/disables the low speed course over ground feature supported by the Ublox GPS hardware.

**Default value:**

disable

**Privileged?:**

Yes

**Added in:**

v0.0.23

**Example log:**

```
[Learxxxxxx:conf (2)0] config time gps lowSpeedCOGFilter enable  
[Learxxxxxx:conf (2)0]
```

---

## 30.13 config time gps sendFrozenCOG

**Syntax:**

```
config time gps sendFrozenCOG <enable/disable>
```

**Description:**

This command enables/disables the publishing of course over ground data when the COG has been frozen. The COG is sometimes frozen by various ublox features when position accuracy is poor at low speeds.

**Default value:**

enabled

**Privileged?:**

Yes

**Added in:**

v0.0.23

**Example log:**

```
[Learxxxxxx:conf (2)0] config time gps sendFrozenCOG enable  
[Learxxxxxx:conf (2)0]
```

---

## 30.14 config time gps lowPassFilterCOG

**Syntax:**

```
config time gps lowPassFilterCOG <filter value>
```

**Description:**

This command sets the filter strength for the low pass course over ground filter in the Ublox gps receiver. Range from 0 (no filter) to 255 (max filter).

**Default value:**

76

**Privileged?:**

Yes

**Added in:**

v0.0.23

**Example log:**

```
[Learxxxxx:conf (2)0] config time gps lowPassFilterCOG 123  
[Learxxxxx:conf (2)0]
```

---

## 30.15 config time gps lowPassFilterSpeed

**Syntax:**

```
config time gps lowPassFilterSpeed <filter value>
```

**Description:**

This command sets the filter strength for the low pass speed filter in the Ublox gps receiver. Range from 0 (no filter) to 255 (max filter).

**Default value:**

153

**Privileged?:**

Yes

**Added in:**

v0.0.23



**Example log:**

```
[Learxxxxxx:conf (2)0] config time gps lowPassFilterSpeed 123  
[Learxxxxxx:conf (2)0]
```

---

## 30.16 config time gps staticHoldThreshold

**Syntax:**

```
config time gps staticHoldThreshold <speed cm/s>
```

**Description:**

This command set the static hold threshold value such that if a speed is below this threshold, the position becomes fixed and the speed is set to zero by the receiver. Note that the speed should be set in units of cm/s

**Default value:**

0

**Privileged?:**

Yes

**Added in:**

v0.0.23

**Example log:**

```
[Learxxxxxx:conf (2)0] config time gps staticHoldThreshold 5  
[Learxxxxxx:conf (2)0]
```

---

## 30.17 config time gps enableGlobal

### Syntax:

```
config time gps enableGlobal <enable/disable>
```

### Description:

This command adds the -G argument when starting GPSD in the translator. This flag lets GPSD listen on all interfaces for clients, enabling gpsd access from development machines.

### Default value:

### Privileged?:

Yes

### Added in:

v0.0.23

### Example log:

```
[Learxxxxx:conf (2)0] config time gps enableGlobal enable  
Changes will take effect after reboot.  
[Learxxxxx:conf (2)0]
```

---

## 30.18 config time gps manualMountAlignment

### Syntax:

```
config time gps manualMountAlignment <yaw>
```

### Description:

Program in units of centi-degrees the Yaw, Pitch and Roll corrections for the device relative to the ideal reference frame.

**Default value:**

0 0 0

**Privileged?:**

Yes

**Added in:**

v0.0.23

**Example log:**

```
[Learxxxxx:conf (2)0] config time gps manualMountAlignment 100 200 300  
[Learxxxxx:conf (2)0]
```

---

## Chapter 31

# config locos

### 31.1 config locos deployment

**Syntax:**

```
config locos deployment <string>
```

**Description:**

Configures locos deployment value.

**Default state:**

NA

**Privileged?:**

Yes

**Added in:**

v0.0.2

**Example log:**

```
[Learxxxxxx:conf (0)2] config locos deployment usdot  
configuring deployment usdot  
  
[Learxxxxxx:conf (0)2] config locos deployment default  
configuring deployment default  
  
[Learxxxxxx:conf (0)2]
```

## 31.2 config locos bt status

### Syntax:

```
config locos bt status enable|disable
```

### Description:

Bring up/down BT device.

### Default state:

Down

### Privileged?:

Yes.

### Added in:

v0.0.2

### Example log:

```
[Learxxxxxx:conf (0)2] config locos bt status disable  
[Learxxxxxx:conf (0)2] config locos bt status enable  
Successfully brought up hci0.  
[Learxxxxxx:conf (0)2] config locos bt status disable  
[Learxxxxxx:conf (0)2]
```

---

## 31.3 config locos can bitrate

### Syntax:

```
config locos can bitrate [ 1000000 800000 500000 250000 125000 100000 50000 20000  
10000 ]
```

**Description:**

Set the bitrate of the can0 interface

**Default state:**

0 (disabled)

**Privileged?:**

Yes

**Added in:**

v0.0.19

**Example log:**

---

## 31.4 config locos can loopback

**Syntax:**

```
config locos can loopback enable/disable
```

**Description:**

Enable loopback on the can0 interface

**Default state:**

Enabled

**Privileged?:**

Yes

**Added in:**

v0.0.19

**Example log:**

---

## 31.5 config locos can listenonly

**Syntax:**

```
config locos can listenonly enable/disable
```

**Description:**

Enable listenonly on the can0 interface

**Default state:**

Enabled

**Privileged?:**

Yes

**Added in:**

v0.0.19

**Example log:**

---

## 31.6 config locos can status

**Syntax:**

```
config locos can status enable/disable
```

**Description:**

Enable or disable the can\_module

**Default state:**

disabled

**Privileged?:**

Yes

**Added in:**

v0.0.19

**Example log:**

---

## 31.7 config locos can interface

**Syntax:**

```
config locos can interface [ can0 vcan0 .. ]
```

**Description:**

Defines the CAN interface which the can\_module should listen on. vcan0 is used for testing.



**Default state:**

can0

**Privileged?:**

Yes

**Added in:**

v0.0.19

**Example log:**

---

## 31.8 config locos can filterIDs

**Syntax:**

```
config locos can filterIDs enable/disable
```

**Description:**

Filter IDs of incoming packets based on the CAN ids described in the dbc file

**Default state:**

Enabled

**Privileged?:**

Yes

**Added in:**

v0.0.19

**Example log:**

---

## 31.9 config locos can server

**Syntax:**

```
config locos can server enable/disable
```

**Description:**

Enable the server component of the can\_ module which will allow it to respond to UDP requests

**Default state:**

Enabled

**Privileged?:**

Yes

**Added in:**

v0.0.19

**Example log:**

---

## 31.10 config locos can decodePGN

**Syntax:**

```
config locos can decodePGN enable/disable
```

**Description:**

Informs the can\_module that incoming can\_ids must be treated as J1939 PGNs

**Default state:**

Disabled

**Privileged?:**

Yes

**Added in:**

v0.0.19

**Example log:**

---

## 31.11 config locos can pidList

**Syntax:**

```
config locos can pidList 1,2,3,4,5,...
```

**Description:**

A csv list of PIDs to monitor on the CAN bus. Find supported values in a shell with 'can\_module -P'

**Default state:**

0 (disabled)

**Privileged?:**

Yes

**Added in:**

v0.0.19

**Example log:**

---

## 31.12 config locos can dbcFile

**Syntax:**

```
config locos can dbcFile (file path)
```

**Description:**

The DBC file to be used by the can\_ module in order to decode messages from the CAN bus.

**Default state:**

0 (disabled)

**Privileged?:**

Yes

**Added in:**

v0.0.19

**Example log:**

```
[Lear334455:conf (4)1] config locos can dbcFile /var/testfile.dbc  
Warning: file does not currently exist. '/var/testfile.dbc'
```

---

### 31.13 config locos can metaFile

**Syntax:**

```
config locos can metaFile (file path)
```

**Description:**

The meta-file to be used by the can\_ module in order to store messages decoded from the CAN bus in the proper field.

**Default state:**

0 (disabled)

**Privileged?:**

Yes

**Added in:**

v0.0.19

**Example log:**

```
[Lear334455:conf (4)1] config locos can metaFile /var/testfile.meta  
Warning: file does not currently exist. '/var/testfile.meta'
```

---

## 31.14 config locos rsuoffload status

**Syntax:**

```
config locos rsuoffload status <disable/enable>
```

**Description:**

Disabling the offload.

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1] config locos rsuoffload status enable  
rsuoffload status disabled  
[Lear000031:conf (0)1]
```

---

## 31.15 config locos rsuoffload update partition mountpoint

**Syntax:**

```
config locos rsuoffload update partition mountpoint <path>
```

**Description:**

Setting the mount point path

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1] config locos rsuoffload update partition mountpoint /var  
[Lear000031:conf (0)1]
```

---

## 31.16 config locos rsuoffload update partition keyfile

**Syntax:**

```
config locos rsuoffload update partition keyfile <keyfile path>
```

**Description:**

Setting the keyfile path

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1]config locos rsuoffload update partition keyfile /var/scp_key  
[Lear000031:conf (0)1]
```

---

## 31.17 config locos rsuoffload update partition sizethreshold1

**Syntax:**

```
config locos rsuoffload update partition sizethreshold1 <size>
```

**Description:**

Setting the threshold size

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1]config locos rsuoffload update partition sizethreshold1 50  
[Lear000031:conf (0)1]
```

---



## 31.18 config locos rsuoffload update partition sizethreshold2

**Syntax:**

```
config locos rsuoffload update partition sizethreshold2 <size>
```

**Description:**

Setting the threshold size

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1]config locos rsuoffload update partition sizethreshold2 60  
[Lear000031:conf (0)1]
```

---

## 31.19 config locos rsuoffload update partition sizethreshold3

**Syntax:**

```
config locos rsuoffload update partition sizethreshold3 <size>
```

**Description:**

Setting the threshold size

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1]config locos rsuoffload update partition sizethreshold3 80  
[Lear000031:conf (0)1]
```

---

## 31.20 config locos rsuoffload update partition sizethresholdcheckinterval

**Syntax:**

```
config locos rsuoffload update partition sizethresholdcheckinterval <interval  
in minuets>
```

**Description:**

Setting the sizethresholdcheckinterval

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1]config locos rsuoffload update partition sizethresholdcheckinterval 15  
[Lear000031:conf (0)1]
```

---

## 31.21 config locos rsuoffload update partition offloadinterval

**Syntax:**

```
config locos rsuoffload update partition offloadinterval <integer>
```

**Description:**

Setting the interval

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1]config locos rsuoffload update partition offloadinterval 12  
[Lear000031:conf (0)1]
```

---

## 31.22 config locos rsuoffload update directory(1/2/3/4/5) action

### Syntax:

```
config locos rsuoffload update <directory1/directory2/directory3/directory4/  
directory5> action <add/delete>
```

### Description:

update directory1/directory2/directory3/directory4/directory5 action with add or delete

### Default state:

N/A

### Privileged?:

Yes

### Added in:

v0.0.16

### Example log:

```
[Lear000031:conf (0)1]config locos rsuoffload update <directory1/directory2/directory3/directory4/directory5>  
action add  
[Lear000031:conf (0)1]
```

---

## 31.23 config locos rsuoffload update directory(1/2/3/4/5) srcpath

### Syntax:

```
config locos rsuoffload update <directory1/directory2/directory3/directory4/  
directory5> srcpath <path>
```

**Description:**

update directory1/directory2/directory3/directory4/directory5 srcpath

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1]config locos rsuoffload update <directory1/directory2/directory3/directory4/directory5>  
srcpath /var/storage  
[Lear000031:conf (0)1]
```

---

## 31.24 config locos rsuoffload update directory(1/2/3/4/5) serveraddr

**Syntax:**

```
config locos rsuoffload update <directory1/directory2/directory3/directory4/  
directory5> serveraddr <address>
```

**Description:**

update directory1/directory2/directory3/directory4/directory5 server address

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1]config locos rsuoffload update directory1/directory2/directory3/directory4/directory5>  
serveraddr 2001:470:11:45::10  
[Lear000031:conf (0)1]
```

---

## 31.25 config locos rsuoffload update directory(1/2/3/4/5) serverport

**Syntax:**

```
config locos rsuoffload update <directory1/directory2/directory3/directory4/  
directory5> serverport <integer>
```

**Description:**

update directory1/directory2/directory3/directory4/directory5 server port number

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1]config locos rsuoffload update <directory1/directory2/directory3/directory4/directory5>  
serverport 23551  
[Lear000031:conf (0)1]
```

---

### 31.26 config locos rsuoffload update directory(1/2/3/4/5) destdir

**Syntax:**

```
config locos rsuoffload update <directory1/directory2/directory3/directory4/  
directory5> destdir <destination path>
```

**Description:**

update directory1/directory2/directory3/directory4/directory5 destination directory

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1]config locos rsuoffload update directory1/directory2/directory3/directory4/directory5>  
destdir /home/storage  
[Lear000031:conf (0)1]
```

---

### 31.27 config locos rsuoffload update directory(1/2/3/4/5) serverusername

**Syntax:**

```
config locos rsuoffload update <directory1/directory2/directory3/directory4/  
directory5> serverusername <string>
```

**Description:**

update directory1/directory2/directory3/directory4/directory5 serverusername

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1]config locos rsuoffload update <directory1/directory2/directory3/directory4/directory5>  
serverusername offloadserver  
[Lear000031:conf (0)1]
```

---

### 31.28 config locos rsuoffload update directory(1/2/3/4/5) retrycount

**Syntax:**

```
config locos rsuoffload update <directory1/directory2/directory3/directory4/  
directory5> retrycount <integer>
```



**Description:**

update directory1/directory2/directory3/directory4/directory5 retrycount

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1]config locos rsuoffload update <directory1/directory2/directory3/directory4/directory5> retrycount 3  
[Lear000031:conf (0)1]
```

---

## 31.29 config locos offload status

**Syntax:**

```
config locos offload status <enable/disable>
```

**Description:**

offload status enable/disable

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1] config locos offload status enable  
[Lear000031:conf (0)1]
```

---

**31.30 config locos offload update wmeconfig appname****Syntax:**

```
config locos offload update wmeconfig appname <name>
```

**Description:**

setting the name for the offload

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1]config locos offload update wmeconfig appname weathercloud
```

---

### 31.31 config locos offload update wmeconfig psid

**Syntax:**

```
config locos offload update wmeconfig psid <integer>
```

**Description:**

setting offload wme psid

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1]config locos offload update wmeconfig psid 36
```

---

### 31.32 config locos offload update wmeconfig userRequestType

**Syntax:**

```
config locos offload update wmeconfig userRequestType <integer>
```

**Description:**

setting offload user request type

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1]config locos offload update wmeconfig userRequestType 1
```

---

### 31.33 config locos offload update wmeconfig serviceChannel

**Syntax:**

```
config locos offload update wmeconfig serviceChannel <172/174/176/178/180/182/184>
```

**Description:**

setting offload service channel

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1]config locos offload update wmeconfig serviceChannel 176
```

**31.34 config locos offload update wmeconfig wsaType****Syntax:**

```
config locos offload update wmeconfig wsaType <integer>
```

**Description:**

setting offload wsatype

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1]config locos offload update wmeconfig wsaType 4
```

---

**31.35 config locos offload update wmeconfig psc****Syntax:**

```
config locos offload update wmeconfig psc offload
```

**Description:**

setting offload wmeconfig psc

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1]config locos offload update wmeconfig psc offload
```

---

### 31.36 config locos offload update Optconfig RemoteUserName

**Syntax:**

```
config locos offload update Optconfig RemoteUserName <string>
```

**Description:**

setting offload optconfig remote user name

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1]config locos offload update Optconfig RemoteUserName back end_machine_name
```

---

### 31.37 config locos offload update Optconfig RemoteDestDir

**Syntax:**

```
config locos offload update Optconfig RemoteDestDir <directory path>
```

**Description:**

setting offload optconfig remote destination directory

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1]config locos offload update Optconfig RemoteDestDir /tmp
```

---

### 31.38 config locos offload update Optconfig LocalSrcDir

**Syntax:**

```
config locos offload update Optconfig LocalSrcDir <directory path>
```

**Description:**

setting offload optconfig local source directory

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1]config locos offload update Optconfig LocalSrcDir /var/offload
```

---

### 31.39 config locos offload update Optconfig threshold1

**Syntax:**

```
config locos offload update Optconfig threshold1 <integer>
```

**Description:**

setting offload threshold1 value. Its a minimum size of partition.



**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1]config locos offload update Optconfig threshold1 30
```

---

## 31.40 config locos offload update Optconfig threshold2

**Syntax:**

```
config locos offload update Optconfig threshold2 <integer>
```

**Description:**

setting offload optconfig threshold2 value.

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1]config locos offload update Optconfig threshold2 40
```

---

**31.41 config locos offload update Optconfig threshold3****Syntax:**

```
config locos offload update Optconfig threshold3 <integer>
```

**Description:**

setting offload optconfig threshold3 value. Its maximum limit of partition.

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1]config locos offload update Optconfig threshold3 50
```

---

## 31.42 config locos offload update Optconfig retrycount

**Syntax:**

```
config locos offload update Optconfig retrycount <integer>
```

**Description:**

setting offload optconfig retry count

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1]config locos offload update Optconfig retrycount 3
```

---

## 31.43 config locos distressNotification status

**Syntax:**

```
config locos distressNotification status <enable/disable>
```

**Description:**

Starting or stopping DN application

- 

\*Default state: N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1]config locos distressNotification status enable
```

---

## 31.44 config locos distressNotification appname

**Syntax:**

```
config locos distressNotification appname <string>
```

**Description:**

appname of the DN application

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1]config locos distressNotification appname DN
```

---

**31.45 config locos distressNotification psid****Syntax:**

```
config locos distressNotification psid <Integer>
```

**Description:**

psid of the DN application

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1]config locos distressNotification psid 23
```

---

### 31.46 config locos distressNotification servicetype

**Syntax:**

```
config locos distressNotification servicetype <string>
```

**Description:**

service type to use psr/usr/csr.

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1]config locos distressNotification servicetype usr
```

---

### 31.47 config locos distressNotification security

**Syntax:**

```
config locos distressNotification security <string>
```

**Description:**

security service of the DN transmission.

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1] config locos distressNotification security encrypt
```

---

## 31.48 config locos distressNotification verifybypass

**Syntax:**

```
config locos distressNotification verifybypass <enable/disable>
```

**Description:**

verifybypass of the DN transmission.

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1] config locos distressNotification verifybypass enable
```

---

**31.49 config locos distressNotification expirytime****Syntax:**

```
config locos distressNotification expirytime <Integer>
```

**Description:**

expirytime of the DN transmission.

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1] config locos distressNotification expirytime 20
```

---



### 31.50 config locos distressNotification repeatrate

**Syntax:**

```
config locos distressNotification repeatrate <Integer>
```

**Description:**

repeatrate of the DN transmission.

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1] config locos distressNotification repeatrate 10
```

---

### 31.51 config locos distressNotification printencode

**Syntax:**

```
config locos distressNotification printencode <enable/disable>
```

**Description:**

enable or disable printencode of the DN transmission.

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1] config locos distressNotification printencode disable
```

---

## 31.52 config locos distressNotification printdecode

**Syntax:**

```
config locos distressNotification printdecode <enable/disable>
```

**Description:**

enable or disable printdecode of the DN transmission.

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1] config locos distressNotification printdecode disable
```

---

### 31.53 config locos distressNotification logtype

**Syntax:**

```
config locos distressNotification logtype <string>
```

**Description:**

where to go the packet of the DN transmission.(disable/file/remote/stdout)

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1] config locos distressNotification logtype file
```

---

### 31.54 config locos distressNotification forwarddirection

**Syntax:**

```
config locos distressNotification forwarddirection <string>
```

**Description:**

Log of Tx, Rx or both.

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1] config locos distressNotification forwarddirection Tx
```

---

### 31.55 config locos distressNotification forwardip

**Syntax:**

```
config locos distressNotification forwardip <string>
```

**Description:**

forward Ip or filename of Dn

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1] config locos distressNotification forwardip dn.txt
```

---

## 31.56 config locos distressNotification forwardport

**Syntax:**

```
config locos distressNotification forwardport <integer>
```

**Description:**

forward port number of Dn.

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1] config locos distressNotification forwardport 121
```

---

**31.57 config locos ota status****Syntax:**

```
config locos ota status <enable/disable>
```

**Description:**

Status of the OTA application

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1] config locos ota status enable  
[Lear000031:conf (0)1]
```

---

### 31.58 config locos ota wmeconfig appname

**Syntax:**

```
config locos ota wmeconfig appname <String>
```

**Description:**

Application name of the OTA

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1] config locos ota wmeconfig appname OTAApp  
[Lear000031:conf (0)1]
```

---

### 31.59 config locos ota wmeconfig psid

**Syntax:**

```
config locos ota wmeconfig psid <Integer>
```

**Description:**

Psid of the application.

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1] config locos ota wmeconfig psid 23  
[Lear000031:conf (0)1]
```

---

## 31.60 config locos ota wmeconfig wsatype

**Syntax:**

```
config locos ota wmeconfig wsatype <string>
```

**Description:**

Security of OTA packet transmission.

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16



**Example log:**

```
[Lear000031:conf (0)1] config locos ota wsatype unsecured  
[Lear000031:conf (0)1]
```

---

### 31.61 config locos ota wmeconfig userRequestType

**Syntax:**

```
config locos ota wmeconfig userRequestType <Integer>
```

**Description:**

configuring the User request type of application (auto/user)

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1] config locos ota wmeconfig userRequestType 0  
[Lear000031:conf (0)1]
```

---

## 31.62 config locos ota wmeconfig psc

**Syntax:**

```
config locos ota wmeconfig psc <string>
```

**Description:**

psc of application that maybe any string.

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1] config locos ota wmeconfig psc name  
[Lear000031:conf (0)1]
```

---

## 31.63 config locos ota wmeconfig advertiserIdentifier

**Syntax:**

```
config locos ota wmeconfig advertiserIdentifier <String>
```

**Description:**

advertiserIdentifier for OTA .

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1] config locos ota wmeconfig advertiserIdentifier oTA  
[Lear000031:conf (0)1]
```

---

## 31.64 config locos wraconf wraipprefix

**Syntax:**

```
config locos wraconf wraipprefix <IPv6 Address>
```

**Description:**

Configures the IP prefix in WRA

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1] config locos wraconf wraipprefix
A:B:C:D::E or ::A or any IPv6 Address

[Lear000031:conf (0)1] config locos wraconf wraipprefix 2001:470:11:22::
[Lear000031:conf (0)1]
```

---

## 31.65 config locos wraconf wraprefixlen

**Syntax:**

```
config locos wraconf wraprefixlen <integer>
```

**Description:**

Configures the IP prefix length in WRA

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1] config locos wraconf wraprefixlen
positive integer [0-254] Prefix Length

[Lear000031:conf (0)1] config locos wraconf wraprefixlen 64
[Lear000031:conf (0)1]
```

---

## 31.66 config locos wraconf wraefaultgw

### Syntax:

```
config locos wraconf wraefaultgw <IPv6 Address>
```

### Description:

Configures the default gateway in WRA

### Default state:

N/A

### Privileged?:

Yes

### Added in:

v0.0.16

### Example log:

```
[Lear000031:conf (0)1] config locos wraconf wraefaultgw
A:B:C:D::E or ::A or any IPv6 Address

[Lear000031:conf (0)1] config locos wraconf wraefaultgw 2001:470:11:22::2
[Lear000031:conf (0)1]
```

---

## 31.67 config locos wraconf wraprimarydns

### Syntax:

```
config locos wraconf wraprimarydns <IPv6 Address>
```

### Description:

Configures the primary DNS address in WRA

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1] config locos wraconf wrprimarydns
A:B:C:D::E or ::A or any IPv6 Address

[Lear000031:conf (0)1] config locos wraconf wrprimarydns 2001:470:11:22::2
[Lear000031:conf (0)1]
```

---

## 31.68 config locos wraconf wrasecondarydns

**Syntax:**

```
config locos wraconf wrasecondarydns <IPv6 Address>
```

**Description:**

Configures the secondary DNS address in WRA

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1] config locos wraconf wrasecondarydns
A:B:C:D::E or ::A or any IPv6 Address

[Lear000031:conf (0)1] config locos wraconf wrasecondarydns 2001:470:11:22::4
[Lear000031:conf (0)1]
```

---

## 31.69 config locos wraconf wragatewaymacaddr

**Syntax:**

```
config locos wraconf wragatewaymacaddr <IPv6 Address>
```

**Description:**

WRA IPv6 MAC address.

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.16

**Example log:**

```
[Lear000031:conf (0)1] config locos wraconf wragatewaymacaddr
A:B:C:D::E or ::A or any IPv6 Address

[Lear000031:conf (0)1] config locos wraconf wragatewaymacaddr 2001:470:11:22::2
[Lear000031:conf (0)1]
```

---

### 31.70 config locos logging interface1/interface2 status

**Syntax:**

```
config locos logging interface1/interface2 status <enable/disable>
```

**Description:**

interface status Enabling or disabling.

**Default state:**

NA

**Privileged?:**

Yes

**Added in:**

v0.0.19

**Example log:**

```
[Lear050E32:conf (0)2] config locos logging interface1/interface2
enable disable
[Lear050E32:conf (0)2] config locos logging interface1/interface2 disable
[Lear050E32:conf (0)2]
```

---

### 31.71 config locos logging interface1/interface2 logfilesize

**Syntax:**

```
config locos logging interface1/interface2 logfilesize <positive integer>
```

**Description:**

Size of the log file in MB.



**Default state:**

NA

**Privileged?:**

Yes

**Added in:**

v0.0.19

**Example log:**

```
[Lear050E32:conf (0)2] config locos logging interface1/interface2
logfilesize 10
[Lear050E32:conf (0)2]
```

---

## 31.72 config locos logging interface1/interface2 logfiletime

**Syntax:**

```
config locos logging interface1/interface2 logfiletime <positive integer>
```

**Description:**

Time of the log file in hours.

**Default state:**

NA

**Privileged?:**

Yes

**Added in:**

v0.0.19

**Example log:**

```
[Lear050E32:conf (0)2] config locos logging interface1/interface2
logfiletime 10
[Lear050E32:conf (0)2]
```

---

**31.73 config locos logging interface1/interface2 status****Syntax:**

```
config locos logging interface1/interface2 logbydirection <enable/disable>
```

**Description:**

logby direction is Enabling or disabling.

**Default state:**

NA

**Privileged?:**

Yes

**Added in:**

v0.0.19

**Example log:**

```
[Lear050E32:conf (0)2] config locos logging interface1/interface2
logbydirection disable
[Lear050E32:conf (0)2]
```

---

### 31.74 config locos logging interface1/interface2 logfiletime

**Syntax:**

```
config locos logging interface1/interface2 interfacename <string>
```

**Description:**

Name of the interface.

**Default state:**

NA

**Privileged?:**

Yes

**Added in:**

v0.0.19

**Example log:**

```
[Lear050E32:conf (0)2] config locos logging interface1/interface2
wifi0vap0
[Lear050E32:conf (0)2]
```

---

### 31.75 config locos logging otherConfig transmitlog

**Syntax:**

```
config locos logging otherConfig transmitlog <enable/disable>
```

**Description:**

Configures the status of Transmitted packets to be captured or not.

**Default state:**

NA

**Privileged?:**

Yes

**Added in:**

v0.0.19

**Example log:**

```
[Lear050E32:conf (0)2] config locos logging otherConfig transmitlog
enable disable
[Lear050E32:conf (0)2] config locos logging otherConfig transmitlog disable
[Lear050E32:conf (0)2]
```

---

## 31.76 config locos logging otherConfig receiveolog

**Syntax:**

```
config locos logging otherConfig receiveolog <enable/disable>
```

**Description:**

Configures the status of received packets to be captured or not.

**Default state:**

NA

**Privileged?:**

Yes

**Added in:**

v0.0.19

**Example log:**

```
[Lear050E32:conf (0)2] config locos logging otherConfig receiveLog
enable disable
[Lear050E32:conf (0)2] config locos logging otherConfig receiveLog disable
[Lear050E32:conf (0)2]
```

---

### 31.77 config locos logging otherConfig fwdpcapstatus

**Syntax:**

```
config locos logging otherConfig fwdpcapstatus <enable/disable>
```

**Description:**

Configures the status of forward pcap packets to forward or not.

**Default state:**

NA

**Privileged?:**

Yes

**Added in:**

v0.0.19

**Example log:**

```
[Lear050E32:conf (0)2] config locos logging otherConfig fwdpcapstatus
enable disable
[Lear050E32:conf (0)2] config locos logging otherConfig fwdpcapstatus disable
[Lear050E32:conf (0)2]
```

---

## 31.78 config locos logging otherConfig ipaddress

**Syntax:**

```
config locos logging otherConfig ipaddress <IPv6 Address>
```

**Description:**

Configures the remote machine IPv6 address to forward the packets.

**Default state:**

NA

**Privileged?:**

Yes

**Added in:**

v0.0.19

**Example log:**

```
[Lear050E32:conf (0)2] config locos logging otherConfig ipaddress  
A:B:C:D::E or ::A or any IPv6 Address  
  
[Lear050E32:conf (0)2] config locos logging otherConfig ipaddress 2001:470:11:22::3  
[Lear050E32:conf (0)2]
```

---

## 31.79 config locos logging otherConfig port

**Syntax:**

```
config locos logging otherConfig port <port number>
```

**Description:**

Configures the remote machine port number to forward the packets.

**Default state:**

NA

**Privileged?:**

Yes

**Added in:**

v0.0.19

**Example log:**

```
[Lear050E32:conf (0)2] config locos logging otherConfig port
positive integer [0-65535] Configure remote machine Port

[Lear050E32:conf (0)2] config locos logging otherConfig port 16092
[Lear050E32:conf (0)2]
```

---

## 31.80 config locos hmi settings

**Syntax:**

```
config locos hmi settings <param> <value>
```

**Description:**

To configure HMI related settings.

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.23

**Example log:**

```
[LearAABBCC:conf (0)0] config locos hmi settings connectionmode wifi
```

---

## 31.81 config locos hmi wifi settings

**Syntax:**

```
config locos hmi wifi settings <param> <value>
```

**Description:**

To configure HMI WiFi related settings.

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.23

**Example log:**

```
[LearAABBCC:conf (0)0] config locos hmi wifi settings destinationip 192.168.10.150
```

---



## 31.82 config locos hmi bluetooth settings

**Syntax:**

```
config locos hmi bluetooth settings <param> <value>
```

**Description:**

To configure HMI Bluetooth related settings.

**Default state:**

N/A

**Privileged?:**

YES

**Added in:**

v0.0.23

**Example log:**

```
[LearAABBCC:conf (0)0] config locos hmi bluetooth settings clientmac AA:BB:CC:DD:EE:FF
```

---

## 31.83 config locos hmi livemap settings

**Syntax:**

```
config locos hmi livemap settings <param> <value>
```

**Description:**

To configure HMI Livemap related settings.

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.23

**Example log:**

```
[LearAABBCC:conf (0)0] config locos hmi livemap settings severip 192.168.0.69
```

---

## Chapter 32

# config log

### 32.1 config log syslog remote

**Syntax:**

```
config log syslog remote <enable ip addr port portno>|<disable>
```

**Description:**

Configure the remote syslog server settings.

**Default state:**

Disabled

**Privileged?:**

Yes

**Added in:**

v0.0.2

**Updates:**

v0.0.6 (Added Enable / disable and moved ip and port configuration as mandatory when enable is selected.)

**Example log:**

```
[Learxxxxx:conf (0)2] config log syslog remote enable ip 172.20.1.115 port 514
stopped /sbin/syslogd (pid 1367)
sh: you need to specify whom to kill
stopped /sbin/syslogd (pid 2380)
sh: you need to specify whom to kill
```

---

## 32.2 config log syslog local syslogrotateday

**Syntax:**

```
config log syslog local syslogrotateday <Name of the day from Monday to Sunday>
```

**Description:**

Configure the syslog file rotation day .

**Default state:**

Sunday

**Privileged?:**

Yes

**Added in:**

PR11.01

**Example log:**

```
[Learxxxxx:conf (0)2] config log syslog local syslogrotateday Sunday
```

---

## 32.3 config log syslog local syslogdeleteday

**Syntax:**

```
config log syslog local syslogdeleteday <Name of the day from Monday to Sunday>
```

**Description:**

Configure the syslog file delete day. This will be effective only when `syslogdeleteage` is configured as 0

**Default state:**

Sunday

**Privileged?:**

Yes

**Added in:**

PR11.01

**Example log:**

```
[Learxxxxx:conf (0)2] config log syslog local syslogdeleteday Sunday
```

---

## 32.4 config log syslog local syslogdeleteage

**Syntax:**

```
config log syslog local syslogdeleteage <Value>
```

**Description:**

Configure the syslog file deleted after given number of day(s). If both `syslogdeleteday` and `syslogdeleteage` is configurated, `syslogdeleteage` will be considered. If `syslogdeleteage` is configured as 0, then, `syslogdeleteday` will be considered. The `syslogdeleteage` is computed from the time the board is booted.

**Default state:**

30

**Privileged?:**

Yes

**Added in:**

PR11.01

**Example log:**

```
[Learxxxxxx:conf (0)2] config log syslog local syslogdeleteage 5
```

---

## 32.5 config log syslog local syslogloglevel

**Syntax:**

```
config log syslog local syslogloglevel <String>
```

**Description:**

Configure the syslog file logging level (emerg, alert, crit, err, warning, notice, info, debug).

**Default state:**

info

**Privileged?:**

Yes

**Added in:**

PR11.01

**Example log:**

```
[Learxxxxxx:conf (0)2] config log syslog local syslogloglevel info
```

---

## 32.6 config log syslog local syslogrotatetime

### Syntax:

```
config log syslog local syslogrotatetime <value in hhmm range 0000-2359>
```

### Description:

Configure the syslog file rotation time

### Default state:

0000

### Privileged?:

Yes

### Added in:

v0.0.2

### Example log:

```
[Learxxxxx:conf (0)2] config log syslog local syslogrotatetime 1230
```

---

## Chapter 33

# config remote

### 33.1 config remote ssh

**Syntax:**

```
config remote ssh enable|disable
```

**Description:**

Enables / disables ssh server on board.

**Default state:**

Enabled.

**Privileged?:**

Yes

**Added in:**

v0.0.2

**Example log:**

```
[Learxxxxxx:conf (0)2] config remote ssh enable  
ssh status already enabled.
```

---



## 33.2 config remote snmp status

**Syntax:**

```
config remote snmp status enable|disable
```

**Description:**

Enables/disables SNMP server on board.

**Default state:**

Disable.

**Privileged?:**

Yes

**Added in:**

v0.0.2

**Example log:**

```
config remote snmp status disable
```

---

## 33.3 config remote snmp createuser

**Syntax:**

```
config remote snmp createuser username <user> authprotocol  
<SHA/MD5> authpassword <password> privprotocol <AES/DES> privpassword  
<password> access <rouser/rwuser>
```

**Description:**

User creation with SNMP.

**Default state:**

NA

**Privileged?:**

Yes

**Added in:**

v0.0.12

**Example log:**

```
config remote snmp createuser username Lear authprotocol SHA authpassword password privprotocol AES privpassword password access
rouser
```

---

## 33.4 config remote snmp deleteuser

**Syntax:**

```
config remote snmp deleteuser <user>
```

**Description:**

Deleting the existing snmp user.

**Default state:**

NA

**Privileged?:**

Yes

**Added in:**

v0.0.12

**Example log:**

```
config remote snmp deleteuser Lear
```

---

## Chapter 34

# config tunnel

### 34.1 config tunnel status

**Syntax:**

```
config tunnel status <enable|disable>
```

**Description:**

Configures the tunnel status.

**Default state:**

Disabled.

**Privileged?:**

Yes

**Added in:**

v0.0.13

**Example log:**

```
[LearBABABA:conf (0)1] config tunnel status enable  
Tunnel status is already enabled...  
[LearBABABA:conf (0)1] config tunnel status disable  
[LearBABABA:conf (0)1]
```

## 34.2 config tunnel name

### Syntax:

```
config tunnel name [sit1/tun1]
```

### Description:

Configures the tunnel name.

Note:- Name should contain sit<index> or tun<index>

### Default state:

NA.

### Privileged?:

Yes

### Added in:

v0.0.13

### Example log:

```
[LearBABABA:conf (0)1] config tunnel name
String Enter tunnel name e.g. sit1, tun1
[LearBABABA:conf (0)1] config tunnel name LearTun
Enter proper name
Allowed names => sit[if_num]|tun[if_num]
[LearBABABA:conf (0)1] config tunnel name sit2
[LearBABABA:conf (0)1] config tunnel name tun3
[LearBABABA:conf (0)1]
```

---

## 34.3 config tunnel localIpv6

### Syntax:

```
config tunnel localIpv6 <IPv6 addr> prefixLen <prefix length>
```

**Description:**

Configures the tunnel local IPv6 address.

Note:- Tunnel localIPv6 addr is client IPv6 address which is assigned by tunnel broker.

**Default state:**

NA.

**Privileged?:**

Yes

**Added in:**

v0.0.13

**Example log:**

```
[LearBABABA:conf (0)1] config tunnel localIPv6
  A:B:C:D::E or ::A or any IPv6 addr

[LearBABABA:conf (0)1] config tunnel localIPv6 2001:470:baba::1 prefixLen
  Unsigned integer IPv6 addr prefix len

[LearBABABA:conf (0)1] config tunnel localIPv6 2001:470:baba::1 prefixLen 64
[LearBABABA:conf (0)1]
```

---

## 34.4 config tunnel remoteIPv4

**Syntax:**

```
config tunnel remoteIPv4 <IPv4 addr>
```

**Description:**

Configures the tunnel remote endpoint IPv4 address.

Note:- Tunnel remoteIPv4 addr is server IPv4 address which is assigned by tunnel broker.

**Default state:**

NA.

**Privileged?:**

Yes

**Added in:**

v0.0.13

**Example log:**

```
[LearBABABA:conf (0)1] config tunnel remoteIpv4
  A.B.C.D IPv4 addr

[LearBABABA:conf (0)1] config tunnel remoteIpv4 216.218.221.42
[LearBABABA:conf (0)1]
```

---

## 34.5 config tunnel ipv6Gateway

**Syntax:**

```
config tunnel ipv6Gateway <IPv6 addr>
```

**Description:**

Configures the tunnel IPv6 gateway address.

Note:- Tunnel ipv6Gateway addr is generally server IPv6 address which is assigned by tunnel broker.

**Default state:**

NA.

**Privileged?:**

Yes

**Added in:**

v0.0.13

**Example log:**

```
[LearBABABA:conf (0)1] config tunnel ipv6Gateway
  A:B:C:D::E or ::A or any IPv6 addr
[LearBABABA:conf (0)1] config tunnel ipv6Gateway 2001:470:baba::1
[LearBABABA:conf (0)1]
```

---

## 34.6 config tunnel ipv6NetPrefix

**Syntax:**

```
config tunnel ipv6NetPrefix <IPv6 addr> prefixLen <prefix length>
```

**Description:**

Configures the tunnel IPv6 network prefix.

Note:- Tunnel ipv6NetPrefix is generally IPv6 addr subnet. e.g. 2000::/3

**Default state:**

NA.

**Privileged?:**

Yes

**Added in:**

v0.0.13

**Example log:**

```
[LearBABABA:conf (0)1] config tunnel ipv6NetPrefix
  A:B:C:D::E or ::A or any IPv6 addr
```



```
[LearBABABA:conf (0)1] config tunnel ipv6NetPrefix 2000::  
    prefixLen IPv6 prefix length  
  
[LearBABABA:conf (0)1] config tunnel ipv6NetPrefix 2000:: prefixLen 3  
[LearBABABA:conf (0)1]
```

---

## Chapter 35

# config firewall

### 35.1 config firewall rule

**Syntax:**

```
config firewall rule <block/allow> <incoming/outgoing> <ipv4/ipv6/port> [ip/all]  
<ip or port val> [optional: mask] [optional: port upper limit]
```

**Description:**

To add new firewall rule.

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.13

**Updates:**

v0.0.15 (updated the command syntax).

**Example log:**

```
[LearAABBCC:conf (0)0] config firewall rule block incoming ipv4 ip 192.168.0.50  
[LearAABBCC:conf (0)0]
```

## 35.2 config firewall reset

**Syntax:**

```
config firewall reset
```

**Description:**

To delete all firewall rules.

**Default state:**

N/A

**Privileged?:**

Yes

**Added in:**

v0.0.13

**Example log:**

```
[LearAABBCC:conf (0)0] config firewall reset  
All rules deleted.  
[LearAABBCC:conf (0)0]
```

---

# Disclaimer

## 15.105 Information to the user.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. The equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures: -Reorient or relocate the receiving antenna - Increase the separation between the equipment and the receiver. -Connect the equipment into an outlet on a circuit different from that to which the receiver is connected -Consult the dealer or an experienced radio/TV technician for help

## 15.21 Information to user.

The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. In cases where the manual is provided only in a form other than paper, such as on a computer disk or over the Internet, the information required by this section may be included in the manual in that alternative form, provided the user can reasonably be expected to have the capability to access information in that form.

**RF Exposure warning:** This device complies with FCC radiation exposure limits set forth for an uncontrolled environment. The device should be installed and operated with a minimum distance of 20cm between the radiator and your body. This device must not be collocated or operating in conjunction with any other antenna or transmitter