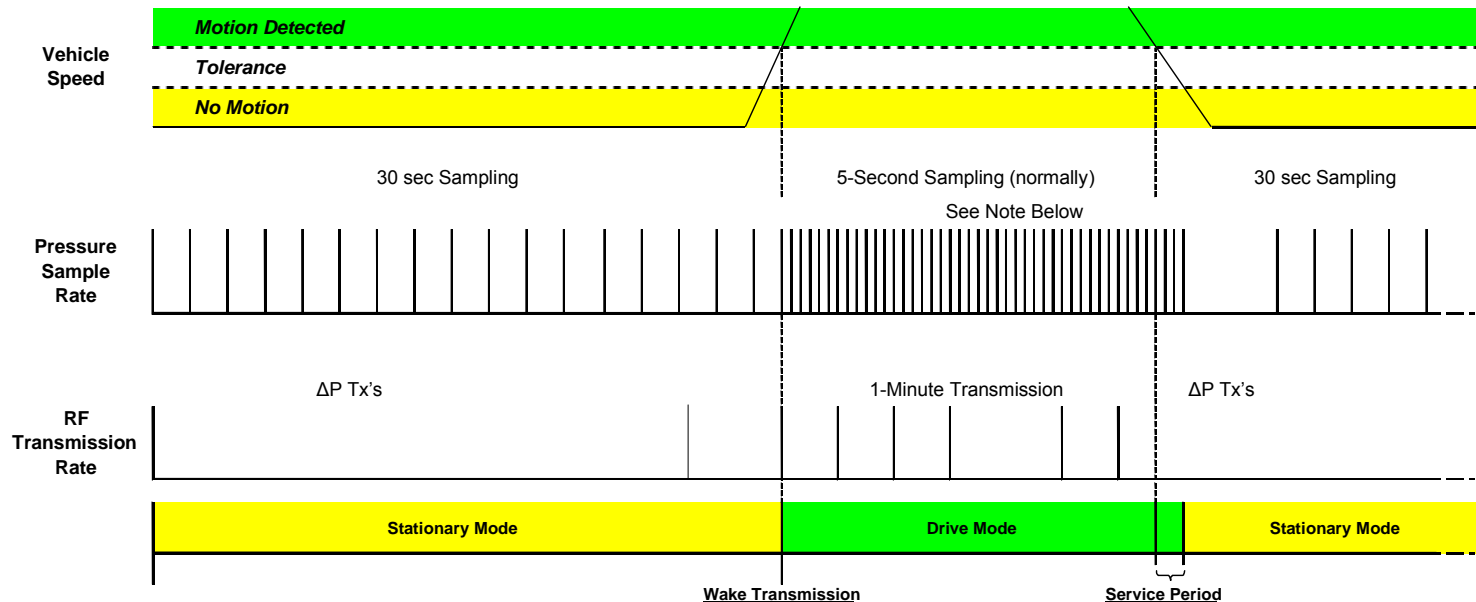


Emergency Modes	Consumer Use Modes	Manufacturing & Service Modes	Mode of Operation	Explanation	Frequency of Transmission
	X		Drive mode	Transmitter in normal operation - wheel is rotating and roll switch is closed	8 words every 60 seconds
		X	Learn Mode	Transmits 40 words after LF transponder activation or when sensor exits Off mode due to Roll switch closure	40 words for 1 transmission, < 5secs
		X	Factory Mode	Transmitter is in Factory mode for the next 16 or fewer Roll Switch closures after a Learn activation. The Wheel has to be rotating (roll switch closed). Meets 15.231(e) requirements.	8 words every 30 seconds.
X	X		Stationary Mode	Transmitter enters mode after Factory Mode or Drive Mode - Wheel is not rotating - Vehicle is stopped. Pursuant to Section 15.231(a)(4), alarm conditions apply	DP transmissions only (see Fast Measure Mode)
	X		Wake Mode	Transmit 8 words when sensor transitions from Stationary mode to Drive mode due to Roll switch closure	8 words for 1 transmission
		X	Off Mode	Transmit 8 words when sensor transitions to Off mode	8 words for 1 transmission
		X	Nissan Special Mode	Factory/Service use only	8 words every 30 seconds
X			Fast Measure Mode	Pursuant to Section 15.231(a)(4), alarm conditions apply	8 words every DP could be every 1 second
		X	ID Response Mode	When LF interrogated by the Dealer. 15.231(a) applies.	40 words for 1 transmission, < 5secs



Driving: Sample pressure every 5 seconds and transmit every 60 seconds normally. However if a pressure change of more than 1psi detected then transmitter will sample and transmit every second until pressure stabilises for 10 secs.(assumes 0-63.75psi range sensor). See flowchart

Stationary: Refer to section 3.2.

Wake: Additional transmission when motion is detected.

Delta Pressure: If a change of pressure of more than 1.25 psi is measured since last RF transmission then a Delta Pressure (Re-measure) is transmitted and the unit then transmits ever 1 sec till a steady pressure is reached.

Service Period: Service period is set to 30s

3. Modes of Operation

3.1 TPM Sensor Top Level State Diagram

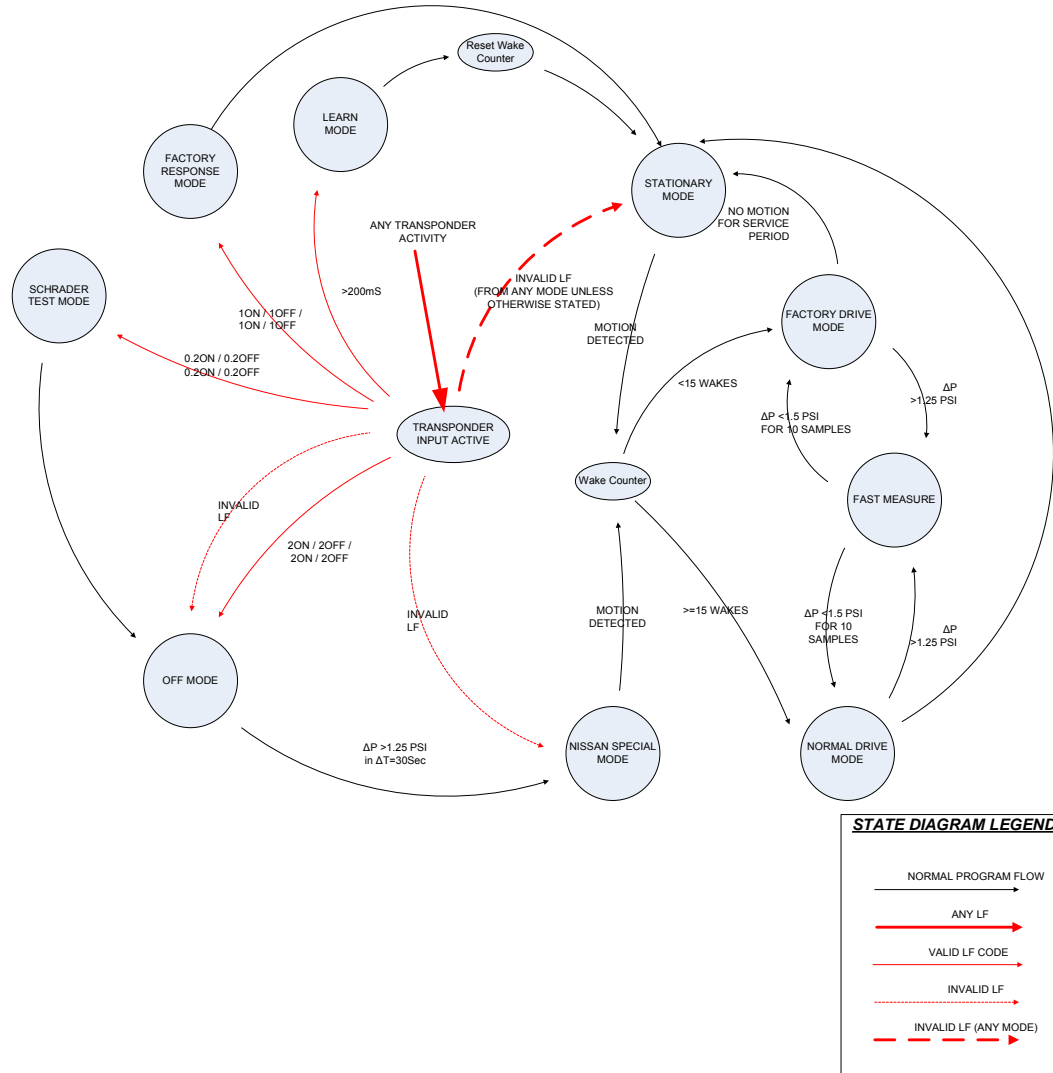


Figure 1: Top Level State Diagram

The diagram in Figure 3 shows a high level state diagram of the Nissan Gen3 TPM Sensor and how the different states or modes interact. The rest of this section is brief explanation of the function of the individual modes.

NB: In all modes an LF signal will cause a move a transition to “TRANSPONDER INPUT ACTIVE”.

3.2 STATIONARY Mode

In normal operation and while the vehicle is not moving the TPMS Sensor will be in STATIONARY mode. In this mode sample and transmission rates are described below.

Nissan Part	Pressure Sample Rate (seconds)	Roll Sample Rate (seconds)	Normal Tx Rate (minutes)	Re-measure Tx's (enabled)
40700-1AA0A	30	10	-	Yes

Table 1: Stationary Mode

STATIONARY mode is exited when the vehicle begins to move and roll switch input is verified by the ASIC.

3.3 DRIVE Mode

DRIVE mode is the mode the TPM sensor goes to when the vehicle starts moving and motion is detected by the sensor. The activation point of the sensor is dependent on the rotational speed of the wheel and therefore varies depending on wheel and tyre configuration used. As a guideline, the wake-up speed of sensor equates to a road speed of approximately between 3 and 25KPH (2 and 16MPH). DRIVE mode is designed to increase the sample and transmission rate while the vehicle is moving.

On entry to DRIVE mode the TPM sensor will sample pressure and do a normal RF transmission with a WAKE function code (see **Error! Reference source not found.**). After the WAKE transmission the TPM sensor will transmit NORMAL function code data frames with the following sample and transmission rates:

Nissan Part	Pressure Sample Rate (seconds)	Roll Sample Rate (seconds)	Normal Tx Rate (seconds)	Re-measure Tx's (enabled)
40700-1AA0A	5	5	60	Yes

Table 2: Drive Mode

When vehicle speed has dropped below minimum vehicle speed threshold, the transmitter will remain in DRIVE mode for a period of approximately 30 seconds, known as the 'Service Period'. After the Service Period time has elapsed the TPM sensor will exit to STATIONARY Mode.

3.4 **FACTORY Mode** (A special case of **DRIVE Mode**)

A special case of **DRIVE** mode called **FACTORY** mode is available on the Nissan Gen3 sensor. The difference is an increase in the frequency of transmissions from about 60 seconds, to about 30 seconds.

Nissan Part	Pressure Sample Rate (seconds)	Roll Sample Rate (seconds)	Normal Tx Rate (seconds)	Re-measure Tx's (enabled)
40700-1AA0A	5	5	30	Yes

Table 3: Factory Mode

It is the intention of **FACTORY** mode to shorten the **LEARN** time of the TPM system in the factory assembly. **FACTORY** mode is exited after 15 **WAKE** transmissions, where one journey is defined as the sensor entering **DRIVE** mode via motion switch activation, then exiting **DRIVE** mode after the motion switch is deactivated and the service period has timed out.

NB: - The **FACTORY** mode journey counter will be reset after a **LEARN**, therefore it will take another 15 **WAKE** transmissions to exit **Factory** mode. **Factory** mode can be disabled during zener programming.

3.5 OFF Mode

This is a mode primarily used for shipping and storage of the TPMS transmitter units.

However, for Japanese customers exporting to the USA, Schrader offers the Gen 3 ASIC which permits the customer's production plant to place the transmitter in Off mode and transport vehicles to USA without violating the low power Japanese RF regulations. This scenario requires the vehicles to be 're-learned' at the dealership in USA before passing to the customer.

To enter Off mode, the 125 KHz LF transponder tool must be applied to the transmitter in using the following sequence:

Slow OFF sequence:

- 2 seconds ON,
- 2 seconds OFF,
- 2 seconds ON,
- 2 seconds OFF.

(The tolerance on the timing is +/- 0.06 seconds)

When OFF mode is entered, the RF transmitter will send a one-second block of eight frames with the OFF mode function code and then the transmitter will go off completely.

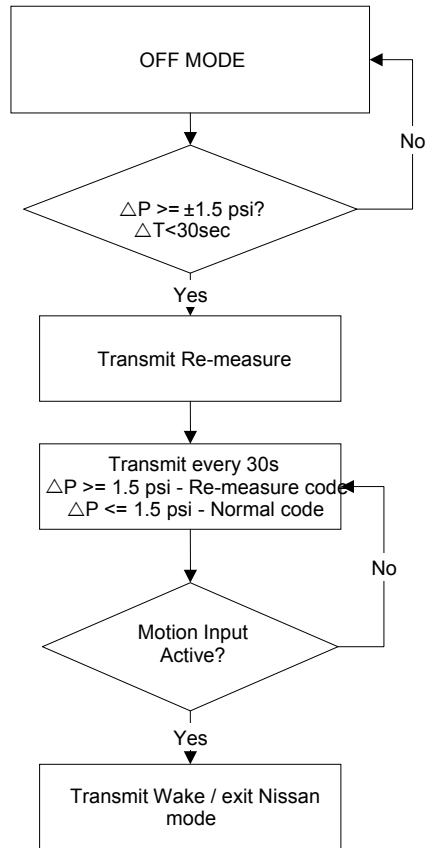
There are two methods to exit OFF mode for the Gen3 ASIC transmitter.

1. Activate the Transponder Input using a 125 kHz LF field for more than 3.5 seconds (i.e. putting the transmitter into learn mode).
2. Use Nissan Special Mode (see next section)

3.6 Nissan Special Mode

This mode allows the transmitter to come out of 'OFF' mode by a change of pressure.

The behaviour is described in the flow below:



3.7 Identification Response Mode (Dealer Use)

ID Response Mode is designed to remotely identify the TPM transmitter when it has been assembled into a wheel. It is entered after an LF field modulated in the sequence shown in **Figure 2** has been applied. After the LF has been applied and verified by the TPM Sensor, the TPM Sensor then outputs an RF sequence (RF Out).

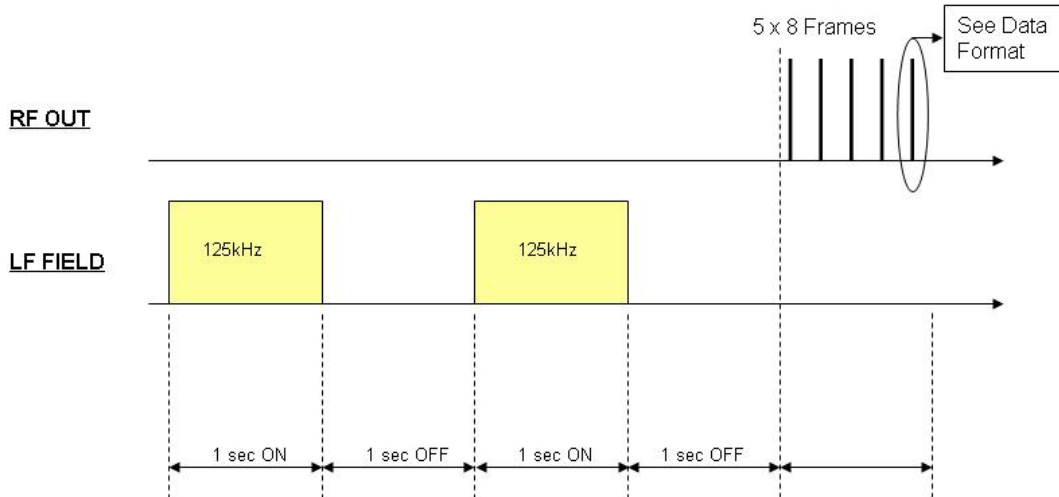


Figure 2

NB: The tolerance on the timing is +/- 0.06 seconds.

The data frame output from the TPM Sensor in ID response mode is in a slightly different format from the standard Nissan frame and is detailed in Figure 3 (Data Format). Also included is the format of the 8 bit ID code (see table below).

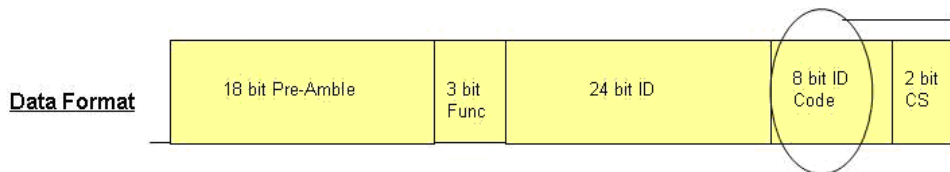


Figure 3

After the RF transmission the TPM sensor will exit ID Mode to its previous mode (eg- STATIONARY Mode).

The area code and Version code are programmed by SEL during calibration of the TPM sensor.

Nissan Part Number	Enclosure Type	Schrader Part Number	ID Code
40700-1AA0A	HSG	70503241	0000 0010