

## **Description of operation for ION (GMX 357) IBCM RFA**

### Description of the function:

The Remote Function Actuation (RFA) subsystem is a functional subsystem designed to allow the driver to perform certain vehicle functions (locking or unlocking the doors from a remote location) without physically contacting the normal controls for these functions. More specifically to ION IBCM, the RFA controls locking/unlocking doors and trunk release

### Description of the system:

The RFA subsystem consists of two components, a vehicle mounted receiver, in the body controller module (BCM) and two customers carried transmitters (keyfobs attached to the car key)

The data link between transmitter and receiver is secure. A unique cryptographic key is used for each system. The data exchanged between transmitter and receiver are not only limited to door locking/unlocking but also they allow some diagnostic or after sale functions, such as “battery low” information or cryptographic key code learning

### Data link details:

The source of the data is the transmitter. The numerical data consists of an 18 byte message (checksum + ID + function + rolling counter + random byte + crypto keys). These data are manchester coded and then RF modulated with a carrier at 315 MHz

On the receiving side (IBCM) the same functions are performed the other way round. The receiving functions are integrated in an IC (TEMIC) which decodes the demodulated signal and send to data bytes to a micro-controller via a serial link. Interpretations of the data are performed by the micro-controller.

### Different operation modes:

The IBCM module, in key-off position, is said to be in sleep mode, with a low current consumption. Nevertheless, the RF receiver hardware is always active, ready to receive and decode RF signals. If a valid signal is received, it will wake-up the micro-processor, which will then put the IBCM in awake mode.

So despite the two operational mode of the IBCM module, the RF receiver has only one mode.