

## 2. TPM Operations

The function of the TPM is to detect tire pressures and, upon detection of pressure irregularity, to issue warnings to the driver. The wireless transmission is event driven, that is, it occurs only when there was something happen: (1) initial health transmission when the car speed reached 15mph and, thereby, turned on the sensor/transmitter power switch and, (2) when the tire pressures were not in the range specified (during monitoring). There is no continuous wireless transmission, which is unnecessary and also battery draining. There is minimal information to be transmitted; a 6-byte fixed length signal is sufficient.

The transmission signal has the following format:

<u>Bytes 1, 2 and 3:</u> Sensor ID code	<u>Byte 4:</u> Pressure status code	<u>Byte 5:</u> Sensor health code	<u>Byte 6:</u> Checksum code
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The TPM is designed to be used on a full range of automobiles, which would have very different requirements on operating tire pressures. Thus, TPM handles abnormal pressure warning in two stages. In the sensor unit, pressure readings are compared against predefined pressure thresholds that were applicable to most vehicle tires. If the readings went outside of the thresholds for several consecutive cycles, a signal with a pressure status code will be transmitted (once) to the receiver. Later, if the readings went back to normal for a while, a signal with another pressure status code will be transmitted (once). Upon receiving the signals, the receiver will look up the tire pressure requirements (set by the user) and interpret the pressure status code, and then will determine whether to issue a warning (or turn it off) for this particular vehicle. We use recognition code (i.e., status code) here because it can convey (after interpretation) much more useful information than a mere pressure reading, and we only need one byte for it.

Our status code is not a simplistic Good/Bad warning code. Nonetheless it is still a recognition code enclosed in a very short and fixed length signal. We believe that recognition codes should not be narrowly interpreted to consist of only 2 or 3 states, such as an On/Off warning code. Therefore we believe our transmission codes should not be put into the data category.

Users are generally not interested in technical details and therefore we will not attempt to describe the signal transmission protocol in the User's Guide. Simply by saying the sensor transmitted tire pressures to the receiver would actually help the user to easier and better understand this product.