

TPMS-CR-A	
TPMS Car Receiver	
Ref: TPMS-CR-A	
SN: U#####	Software version: v#.##

Texys sensors are designed for data recording. If the user wants to include this sensor in a close loop system or active control, he must assume all responsibility.

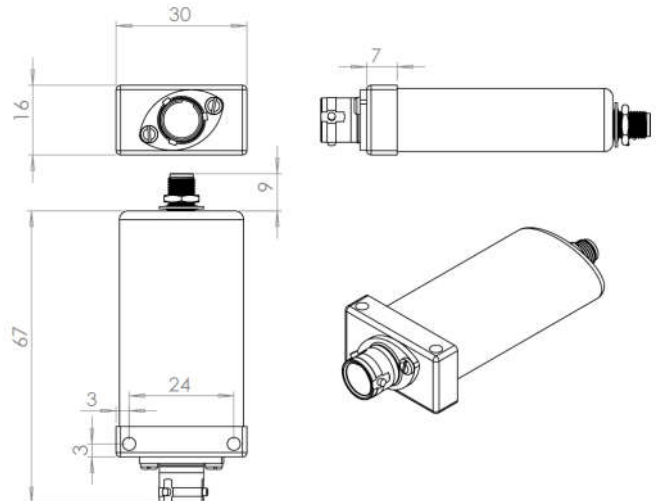
CAN bus features		
CAN type	2.0A or 2.0B	
CAN bus termination	Not connected	
Parameters	See table below	
Baud rate	250 K to 1M	bps
RF features		
RF Frequency	433MHz	
Receiver Sensitivity	-112 dBm	
Common features		
Supply Voltage	6 to 16	V
Max supply Current (with 12V supply)	45	mA
Dimensions	67x30x16	mm
Material	PR752	
Weight (without antenna)	20	g
Protection	IP64	
Vibration test	20Gpp 5'	
Shock	500	G
Operating Temp	-20 to +85	°C
Storage Temp	-20 to +85	°C

Setup parameters		
CAN type	2.0A 2.0B	-
CAN baudrate	1 M	bps
Diagnostic frame ID	0x7F0	
Corner frame ID	FL: 0x3F0	FR: 0x3F5
	RL: 0x3FA	RR: 0x3FF
Car ID	00	-

Connector: 8STA00406PN

Mating connector: 8STA60406SN

Pin	Function
1	Supply
2	0 V
3	CAN Low
4	CAN High
5	Reserved, do not connect
6	Reserved, do not connect



CAN data output

1. Diagnostic frame

This frame is sent every second continuously even if no slave is connected.

Fixed frame (default Frame ID: 0x07F0)

CAN ID	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
0x07F0	Time counter	Car ID	CAN status ⁽¹⁾	CAN Tx error counter	CAN Rx error counter	Not used	Receiver diagnostic address ⁽²⁾	Receiver diagnostic value ⁽²⁾
	1 bit/second	-	-	1 error/bit	1 error/bit	-	Raw value	Raw value

(1): Can status byte definition:

CAN status								
Bit	7	6	5	4	3	2	1	0
Name	Rx0OVFL	Rx1OVFL	TXBO	TXBP	RXBP	TXWARN	RXWARN	EWARN
Description	1 if an overflow occurred on Rx buffer 0	1 if an overflow occurred on Rx buffer 1	1 if transmitter bus is off (TX errors >255)	1 if transmitter bus is passive (TX errors >127)	1 if receiver bus is passive (RX errors >127)	1 if transmitter reach warning threshold (TX errors >95)	1 if receiver reach warning threshold (RX errors >95)	1 if TXWARN or RXWARN is set

If the CAN communication is not effective during the flag occurrence, the flag status is memorized until the communication is OK in order to see the flag occurrence on the CAN bus at least one time.

(2): Diagnostics definition:

N°	Parameter	Unit	Comments	Type
0x00	Receiver serial number	-	MSB	Unsigned int 32 bits
0x01			...	
0x02			...	
0x03			LSB	
0x04	Major SW version	-	-	Unsigned int 8 bits
0x05	Minor SW version	-	-	Unsigned int 8 bits
0x06	Lifetime counter	1 minute/bit	MSB	Unsigned int 32 bits
0x07			...	
0x08			...	
0x09			LSB	
0x0A	RF wrong CRC counter	1 message/bit	MSB	Unsigned int 16 bits
0x0B			LSB	

2. Slave data

The TPMS-CR can work with both TPMS-S and TPMS-RS sensors. TPMS-S needs 5 CAN frames per corner whereas TPMS-RS needs only 3 frames. These frames are sent with a minimum inter-frame spacing of 20ms. All data is MSB first (Motorola). Depending on CAN message format chosen by the user and slave type, CAN frame IDs are defined as the follow:

- TPMS-S-A CAN data:

Corner CAN Frame #1

ID	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
Corner CAN ID	Unsigned int 14 bits	Unsigned int 2 bits	Signed int 8 bits	Unsigned int 8 bits	Unsigned int 2 bits	Signed int 12 bits	Unsigned int 16 bits	
	Last 4 digits of TPMS SN	Frame type ⁽³⁾	RSSI	Battery voltage	Power mode ⁽⁴⁾	Slave temp.	Pressure	
	1 to 9999	0 to 3	1dBm/bit	1800mV + 10mV/bit	See below	0.1°C/bit	0.2mbarA/bit	

Corner CAN Frame #2

ID	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
Corner CAN ID+1	Unsigned int 14 bits		Unsigned int 8 bits	Unsigned int 16 bits		Unsigned int 16 bits		Unsigned int 8 bits
	Last 4 digits of TPMS SN		Start DIAG ⁽⁵⁾	RF Tx slave counter		RF Rx master counter		DIAG ⁽⁶⁾
	1 to 9999		See below	1 message/bit		1 message/bit		See below

Corner CAN Frame #3

ID	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
Corner CAN ID+2	Unsigned int 14 bits	Unsigned int 10 bits		Unsigned int 12 bits	Unsigned int 4 bits	Unsigned int 8 bits	Unsigned int 8 bits	Unsigned int 8 bits
	Last 4 digits of TPMS SN	Air humidity		Air temperature	Tyre type	Remaining battery	Parameter Address ⁽⁸⁾	Parameter Value ⁽⁸⁾
	1 to 9999	0.1%RH/bit		0.1°C/bit	See below	1%/bit	1 parameter/bit	Raw value

Corner CAN Frame #4 : Not sent in Stationary cold mode

ID	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
Corner CAN ID+3	Unsigned int 14 bits		Unsigned int 12 bits	Unsigned int 12 bits		Unsigned int 12 bits		Unsigned int 12 bits
	Last 4 digits of TPMS SN		Tyre channel 1 temp.	Tyre channel 2 temp.		Tyre channel 3 temp.		Tyre channel 4 temp.
	1 to 9999		0.1°C/bit	0.1°C/bit		0.1°C/bit		0.1°C/bit

Corner CAN Frame #5 : Not sent in Stationary cold mode

ID	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4
Corner CAN ID+4	Unsigned int 14 bits		Unsigned int 12 bits	Unsigned int 12 bits	
	Last 4 digits of TPMS SN		Tyre channel 5 temp.	Rim temp.	
	1 to 9999		0.1°C/bit	0.1°C/bit	

- TPMS-RS-A CAN data:

Corner CAN Frame #1

ID	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
Corner CAN ID	Unsigned int 14 bits	Unsigned int 2 bits	Signed int 8 bits	Unsigned int 8 bits	Unsigned int 2 bits	Signed int 12 bits	Unsigned int 16 bits	
	Last 4 digits of TPMS SN	Frame type ⁽³⁾	RSSI	Battery voltage	Power mode ⁽⁴⁾	Slave temp.	Pressure	
	1 to 9999	0 to 3	1dBm/bit	1800mV + 10mV/bit	See below	0.1°C/bit	0.2mbarA/bit	

Corner CAN Frame #2

ID	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
Corner CAN ID+1	Unsigned int 14 bits		Unsigned int 8 bits	Unsigned int 16 bits		Unsigned int 16 bits		Unsigned int 8 bits
	Last 4 digits of TPMS SN		Start DIAG ⁽⁵⁾	RF Tx slave counter		RF Rx master counter		DIAG ⁽⁶⁾
	1 to 9999		See below	1 message/bit		1 message/bit		See below

Corner CAN Frame #3

ID	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
Corner CAN ID+2	Unsigned int 14 bits				Unsigned int 4 bits		Unsigned int 8 bits	Unsigned int 8 bits
	Last 4 digits of TPMS SN				Tyre type ⁽⁷⁾		Parameter Address ⁽⁸⁾	Parameter Value ⁽⁸⁾
	1 to 9999				See below		1 parameter/bit	Raw value

(3): Frame type:

Value	Description
0	TPMS-S frame with infrared data
1	TPMS-S frame without infrared data (stationary cold mode)
2	TPMS-RS frame

(4): Power mode definition:

Value	Description
0	Stationary cold mode
1	Stationary hot mode
2	Moving mode
3	Transient mode

(5): Start DIAG definition:

Start DIAG								
Bit	7	6	5	4	3	2	1	0
Name	POR start	-	-	-	-	Magnet start*	LF start	HW timer start
Description	Battery change caused the reset.					The magnet detection was active on startup.	The start was caused by a remote controller (TPMS-RH).	The start was caused by the hardware timer.

*Only for TPMS-S

(6): DIAG definition:

DIAG					
Bit	4	3	2	1	0
Name	Pressure measure failed	Power failure*	Invalid setup	Accelerometer failure	Tyre thermopile failure*
Description	This bit is set if the pressure measurement or any measure required for its compensation failed.	This bit is set if an anomaly has been detected with the power stage of the sensor.	This bit is set if parameters entered in TPMS are not consistent.	This bit is set if an anomaly has been detected with the accelerometer.	This bit is set if an anomaly has been detected with the thermopile monitoring tire temperature.

*Only for TPMS-S

(7): Tyre type definition:

Value	Description
0	Unknown
1	Super soft
2	Soft
3	Medium
4	Hard
5	Wet

(8): Sensor parameters reading:

All parameters described in parameters table of TPMS-S and TPMS-RS specification are sent in Corner CAN Frame #3. Parameters are sent one at a time, byte 6 indicates which parameter address is sent and byte 7 indicates parameter value. Once the last parameter is reached, it continues in a loop with the first one.

On Car Receiver parameters

**Must be setup according to Texense's CAN protocol, or by using the Texense Smart Interface Box (tSIB®).
Contact us at info@texense.com**

CAN Parameters:

N°	Parameter	Raw values	values	Comments	
0x00	CAN type A or B (11 or 29bits ID)	0x00	CAN2.0A (standard)	default	
		0x10	CAN 2.0B (extended)		
0x01	CAN Baudrate	0x00	1 Mbps	default	
		0x01	500 Kbps		
		0x02	250 Kbps		
		0x03	125 Kbps		
0x02	Unused				
0x03					
0x04					
0x05	Fixed frame ID	if CAN2.0A: 0 to 0x7F0		MSB	Default: 0x07F0
0x06		if CAN2.0B: 0 to 0xFFFF except 0x7F1 and 0x7F3		LSB	
0x07	FL frame ID	if CAN2.0A: 1 to 0x7F0		MSB	Default: 0x03F0
0x08		if CAN2.0B: 1 to 0xFFFF except 0x7F1 and 0x7F3 Frame disabled if 0x0000		LSB	
0x09	FR frame ID	if CAN2.0A: 0 to 0x7F0		MSB	Default: 0x03F5
0x0A		if CAN2.0B: 0 to 0xFFFF except 0x7F1 and 0x7F3 Frame disabled if 0x0000		LSB	
0x0B	RL frame ID	if CAN2.0A: 0 to 0x7F0		MSB	Default: 0x03FA
0x0C		if CAN2.0B: 0 to 0xFFFF except 0x7F1 and 0x7F3 Frame disabled if 0x0000		LSB	
0x0D	RR frame ID	if CAN2.0A: 0 to 0x7F0		MSB	Default: 0x03FF
0x0E		if CAN2.0B: 0 to 0xFFFF except 0x7F1 and 0x7F3 Frame disabled if 0x0000		LSB	
0x0F	Car ID	0x00 to 0x0F		Default: 0x00	