



Temperature Transmitter T01-CAN  
with SAE J1939 Interface

72507

# Manual


## T01-CAN

### Temperature Transmitter with SAE J1939 Interface

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# 1 History

Version	Date	Name	Change
1.00r0	16.04.15	Ma. Schreiber	Document created

## 2 General

The temperature transmitter T01-CAN measures the physical quantity temperature. The range is -40...150°C for the medium. The measured value is transmitted on the CAN-Bus with the SAE J1939 protocol. The transmitter takes about 107 samples per second, does filtering and converts the raw value into the output format.

The CAN2.0B interface is able to run up to a speed of 1 Mbit/sec.

The device supports Diagnostic Message 1 (DM1, PGN 0xFECA, active diagnostic trouble codes, automatically send every second), Diagnostic Message 2 (DM2, PGN 0xFECA, previously active diagnostic trouble codes) and Diagnostic Message 3 (DM3, PGN 0xFECC, diagnostic data clear/reset for previously active DTCs). Also the T01-CAN SAE J1939 firmware supports static node addressing as well as dynamically address claiming.

Furthermore the device can easily configured with a configuration vector (PGN 0xEF00) by the customer if needed. An example dbc-file with a default configuration to use with "Vector CANdb++ Editor" is available on request.

## 3 CAN Interface

The device includes a Full CAN controller specified to CAN 2.0B. The physical layer of the 2-wire interface is specified according to ISO 11898. The wires are protected against short-circuit. By adjusting the rise times and fall times of the CAN signals, the noise emission is minimized to meet the EMC requirements. The bus termination resistor is *not* included in the device.


## 4 T01-CAN Specification

### 4.1 Supply Voltage +U<sub>s</sub>

Supply voltage:	9...36 VDC, protected against reverse polarity
Current consumption at U <sub>s</sub> = 24 VDC:	I < 50 mA typical, I <sub>MAX</sub> < 100 mA

### 4.2 CAN Interface

Physical layer:	2-wire interface, 5 V level according to ISO 11898 Protected against short-circuit
Bitrate:	250 kbit/sec (max. 1 Mbit/sec possible)
Signal rise time:	Bit rate < 125 kbit/sec 12 V/μsec (without bus) Bit rate ≥ 125 kbit/sec >24 V/μsec (without bus)
Bus termination:	External
Protocol:	SAE J1939

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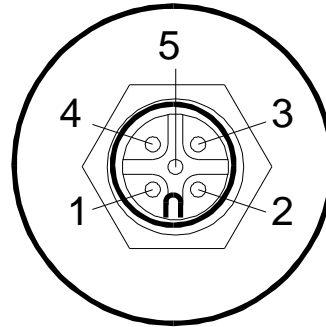
### 4.3 Environment

EMC:	noise emission	according to EN 50 081-2
	noise immunity	according to EN 50 082-2
Operating temperature:	-40...+125°C	
Media temperature:	-40...+150°C	

### 4.4 Connector Pin Assignment (CiA DR303-1)

The pin connection for the used 5 pole M12 connector is shown below (fig.: connector front view).

PIN	Assignment
1	CAN shield, PE
2	+U <sub>B</sub> , +24VDC
3	GND, 0V
4	CAN <sub>H</sub> , CAN+
5	CAN <sub>L</sub> , CAN-




## 5 SAE J1939 communication

### 5.1 Introduction

The Society of Automotive Engineers (SAE) developed the 1939 standard to be the preferred CAN for equipment used in industries ranging from agriculture, construction, and fire/rescue to forestry, materials handling as well as on and off-highway vehicles. It is a high-level protocol that defines how communication between nodes (modules) occurs on the bus. The 1939 network is a specific communication system, supporting specific sets of applications and a specific industry, rather than being generalized.

Any electronic control unit (ECU) using J1939 is permitted to transmit a message on the network when the bus is idle. Every message includes a 29-bit identifier, which defines the message priority, what data is contained within the 8-byte data array that follows the identifier, and which ECU sent the message.

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## 5.2 Supported PGNs and SPNs

### 5.2.1 PGNs/SPNs of SAE J1939

A table with supported PGNs/SPNs of the device can be found at Appendix A.

### 5.2.2 Proprietary PGNs/SPNs

The PDU2 PGNs in the range of 65280...65535 can be freely used for manufacturer defined SPNs with a proprietary SLOTS.

For example, the following default STW-specific PGN/SPN was defined:

PGN	SPN	TTR [ms]	Data Position	Slot	Description
65280	2551	1000	1-2	STWtr01	General purpose

PGN: Parameter Group Number  
 SPN: Suspect Parameter Number  
 TRR: Transmission Repetition Rate

#### Hint:

The following settings will be used with PGNs of STW in general:

- default priority = 6
- data page = 0
- extended data page = 0


## 5.3 Definitions

### 5.3.1 PGN

The PGN (Parameter Group Number) uniquely identifies the Parameter Group (PG) that is being transmitted in the message. The Parameter Group Number (PGN) is a part of the 29-bit identifier sent with every message.

### 5.3.2 SPN

Each parameter used in the J1939 network is described by the standard. A Suspect Parameter Number (SPN) is a number that has been assigned by SAE committee to a specific parameter. Each SPN has the following detailed information associated with it: data length (in bytes); data type; resolution, offset; range; and a tag (label) for reference. SPNs that share common characteristics will be grouped into a Parameter Group (PG) and will be transmitted to the network using the same PGN.

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## 5.4 Overview of the SLOTS for temperature sensors

SLOT is the acronym for Scaling, Limit, Offset and Transfer function. The following SAE SLOTS are supported by the device.

SlotName	Slot Type	Scaling	Range	Offset	Length
SAEtp01	Temperature	1 °C/bit	-40...210 °C	-40 °C	1 byte
SAEtp02	Temperature	0.03125 °C/bit	-273...1734.96875 °C	-273 °C	2 bytes
SAEtp04	Temperature	1/128 °C/bit	-273...228.9921875 °C	-273 °C	2 bytes

Additionally, the scaling, limit and offset can be completely free configured by using a customer specific PGN. Only the data length is limited to 1, 2 or 4 bytes.

For example, a default STW-specific SLOT was defined, which perfectly fits the complete T01-CAN media temperature operational range:

SlotName	Slot Type	Scaling	Range	Offset	Length
STWtp01	Temperature	0.003 °C/bit	-40...150 °C	-40 °C	2 byte

## 5.5 References

ISO11783-3 Data Link Layer

J1939-71



## Appendix A: Supported SAE J1939 PGNs/SPNs

PGN	SPN	TTR [ms]	Data Position	Slot	SPN Name
61495	6313	100	2	SAEtp01	Engine Turbocharger Compressor Blowoff Actuator 1 Temperature
61649	7090	100	2	SAEtp01	Engine Cylinder Head Bypass Actuator 1 Temperature
64548	7574	1000	2	SAEtp01	Aftertreatment 2 Diesel Exhaust Fluid Tank Temperature 2
64549	7572	1000	2	SAEtp01	Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature 2
64550	7529	1000	1	SAEtp01	Aftertreatment 2 Diesel Exhaust Fluid Controller Temperature
64550	7535	1000	2	SAEtp01	Aftertreatment 2 Diesel Exhaust Fluid Controller 2 Temperature
64551	5480	1000	1	SAEtp01	Aftertreatment 1 Diesel Exhaust Fluid Controller 1 Temperature
64551	7528	1000	2	SAEtp01	Aftertreatment 1 Diesel Exhaust Fluid Controller 2 Temperature
64557	7514	500	5	SAEtp01	Engine Fuel 2 Injector Metering Rail 1 Temperature 2
64571	7059	1000	1	SAEtp01	Engine End Bearing 17 Temperature
64571	7060	1000	2	SAEtp01	Engine End Bearing 18 Temperature
64571	7061	1000	3	SAEtp01	Engine End Bearing 19 Temperature
64571	7062	1000	4	SAEtp01	Engine End Bearing 20 Temperature
64572	7051	1000	1	SAEtp01	Engine End Bearing 9 Temperature
64572	7052	1000	2	SAEtp01	Engine End Bearing 10 Temperature
64572	7053	1000	3	SAEtp01	Engine End Bearing 11 Temperature
64572	7054	1000	4	SAEtp01	Engine End Bearing 12 Temperature
64572	7055	1000	5	SAEtp01	Engine End Bearing 13 Temperature
64572	7056	1000	6	SAEtp01	Engine End Bearing 14 Temperature
64572	7057	1000	7	SAEtp01	Engine End Bearing 15 Temperature
64572	7058	1000	8	SAEtp01	Engine End Bearing 16 Temperature
64573	7043	1000	1	SAEtp01	Engine End Bearing 1 Temperature
64573	7044	1000	2	SAEtp01	Engine End Bearing 2 Temperature
64573	7045	1000	3	SAEtp01	Engine End Bearing 3 Temperature
64573	7046	1000	4	SAEtp01	Engine End Bearing 4 Temperature
64573	7047	1000	5	SAEtp01	Engine End Bearing 5 Temperature
64573	7048	1000	6	SAEtp01	Engine End Bearing 6 Temperature
64573	7049	1000	7	SAEtp01	Engine End Bearing 7 Temperature
64573	7050	1000	8	SAEtp01	Engine End Bearing 8 Temperature
64577	7023	500	5	SAEtp01	Engine Fuel 2 Injector Metering Rail 1 Temperature
64577	7024	500	6	SAEtp01	Engine Fuel 2 Injector Metering Rail 2 Temperature
64579	6984	on request	7	SAEtp01	Over Temperature
64590	7460	500	3	SAEtp01	Aftertreatment 1 Diesel Exhaust Fluid Doser 2 Temperature
64651	6780	200	3-4	SAEtp02	Aftertreatment 1 Particulate Sensor Temperature
64655	6610	100	2	SAEtp01	Engine Fuel Vaporizer 1 Discharge Temperature
64655	6815	100	3	SAEtp01	Gaseous Fuel Accumulator Temperature





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64689	6214	100	1	SAEtp01	Engine Ignition Control Module 1 Temperature
64689	6215	100	2	SAEtp01	Engine Ignition Control Module 2 Temperature
64705	5938	1000	2	SAEtp01	Transmission Oil Transmission Cooler Outlet Temperature
64708	5864	500	1-2	SAEtp02	Aftertreatment 2 SCR Intermediate Temperature
64709	5862	500	1-2	SAEtp02	Aftertreatment 1 SCR Intermediate Temperature
64713	5783	100	1	SAEtp01	Engine Throttle Valve 1 Temperature
64713	5784	100	2	SAEtp01	Engine Throttle Valve 2 Temperature
64713	5785	100	3	SAEtp01	Engine Fuel Valve 1 Temperature
64713	5786	100	4	SAEtp01	Engine Fuel Valve 2 Temperature
64713	5787	100	5	SAEtp01	Engine Turbocharger Wastegate Actuator 2 Temperature
64713	7314	100	6	SAEtp01	Engine Fuel Rack Fuel Supply Temperature
64714	5775	100	2	SAEtp01	Engine Exhaust Gas Recirculation 2 Actuator 1 Temperature
64714	5779	100	5	SAEtp01	Engine Exhaust Gas Recirculation 2 Actuator 2 Temperature
64715	5765	100	2	SAEtp01	Engine Exhaust Gas Recirculation 1 Actuator 1 Temperature
64715	5769	100	5	SAEtp01	Engine Exhaust Gas Recirculation 1 Actuator 2 Temperature
64736	5501	100	1-2	SAEtp02	Aftertreatment 1 Diesel Particulate Filter Intake Temperature Set Point
64738	5561	1000	3	SAEtp01	Supplemental Fan Controller ECU Temperature
64740	5540	30000	7-8	SAEtp02	Engine Fuel Temperature (High Resolution)
64741	5536	30000	7-8	SAEtp02	Hydraulic Oil Temperature (High Resolution)
64749	5315	500	1-2	SAEtp02	Aftertreatment 2 Warm Up Diesel Oxidation Catalyst Intake Temperature
64749	5316	500	3-4	SAEtp02	Aftertreatment 2 Warm Up Diesel Oxidation Catalyst Outlet Temperature
64753	5788	100	6	SAEtp01	Engine Turbocharger Wastegate Actuator 1 Temperature
64753	5790	100	8	SAEtp01	Engine Exhaust Pressure Actuator 1 Temperature
64755	5791	100	5	SAEtp01	Engine Turbocharger Compressor Bypass Actuator 1 Temperature
64755	5792	100	6	SAEtp01	Engine Turbocharger Compressor Bypass Actuator 2 Temperature
64756	5289	1000	1-2	SAEtp02	Engine Charge Air Cooler 2 Intake Temperature
64756	5290	1000	3-4	SAEtp02	Engine Charge Air Cooler 2 Outlet Temperature
64756	5291	1000	5-6	SAEtp02	Engine Charge Air Cooler 2 Ambient Air Temperature
64757	5286	1000	1-2	SAEtp02	Engine Charge Air Cooler 2 Precooler Intake Temperature
64757	5287	1000	3-4	SAEtp02	Engine Charge Air Cooler 2 Precooler Outlet Temperature
64758	5283	1000	1-2	SAEtp02	Engine Charge Air Cooler 1 Intake Temperature
64758	5284	1000	3-4	SAEtp02	Engine Charge Air Cooler 1 Ambient Air Temperature
64759	5280	1000	1-2	SAEtp02	Engine Charge Air Cooler 1 Precooler Intake Temperature
64759	5281	1000	3-4	SAEtp02	Engine Charge Air Cooler 1 Precooler Outlet Temperature
64766	5258	on request	1-2	SAEtp02	Engine Exhaust Gas Recirculation 2 Cooler Intake Temperature
64767	5255	1000	1-2	SAEtp02	Engine Exhaust Gas Recirculation 2 Temperature
64767	5256	1000	3-4	SAEtp02	Engine Exhaust Gas Recirculation 2 Mixer Intake Temperature
64769	5148	500	4	SAEtp01	Low Voltage Disconnect Temperature
64776	5925	30000	7-8	SAEtp02	Engine Oil Temperature 3



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64794	4809	500	1-2	SAEtp02	Aftertreatment 1 Warm Up Diesel Oxidation Catalyst Intake Temperature
64794	4810	500	3-4	SAEtp02	Aftertreatment 1 Warm Up Diesel Oxidation Catalyst Outlet Temperature
64795	5570	1000	8	SAEtp01	Diesel Particulate Filter 2 Soot Sensor ECU Internal Temperature
64796	5569	1000	8	SAEtp01	Diesel Particulate Filter 1 Soot Sensor ECU Internal Temperature
64797	4779	on request	1-2	SAEtp02	Aftertreatment 1 Three Way Catalyst Differential Temperature
64797	4780	on request	3-4	SAEtp02	Aftertreatment 2 Three Way Catalyst Differential Temperature
64798	4777	on request	1-2	SAEtp02	Aftertreatment 1 Gas Oxidation Catalyst Differential Temperature
64798	4778	on request	3-4	SAEtp02	Aftertreatment 2 Gas Oxidation Catalyst Differential Temperature
64799	4771	500	1-2	SAEtp02	Aftertreatment 2 Diesel Oxidation Catalyst Intake Temperature
64799	4772	500	3-4	SAEtp02	Aftertreatment 2 Diesel Oxidation Catalyst Outlet Temperature
64800	4765	500	1-2	SAEtp02	Aftertreatment 1 Diesel Oxidation Catalyst Intake Temperature
64800	4766	500	3-4	SAEtp02	Aftertreatment 1 Diesel Oxidation Catalyst Outlet Temperature
64801	4759	500	1-2	SAEtp02	Aftertreatment 2 Gas Oxidation Catalyst Intake Temperature
64801	4760	500	3-4	SAEtp02	Aftertreatment 2 Gas Oxidation Catalyst Outlet Temperature
64802	4753	500	1-2	SAEtp02	Aftertreatment 1 Gas Oxidation Catalyst Intake Temperature
64802	4754	500	3-4	SAEtp02	Aftertreatment 1 Gas Oxidation Catalyst Outlet Temperature
64820	4434	1000	2	SAEtp01	Aftertreatment 2 Diesel Exhaust Fluid Quick Thaw Temperature
64821	4427	1000	2	SAEtp01	Aftertreatment 2 Diesel Exhaust Fluid Tank Temperature
64822	4420	1000	1	SAEtp01	Aftertreatment 2 Diesel Exhaust Fluid Temperature 2
64824	4413	500	1-2	SAEtp02	Aftertreatment 2 SCR Intake Temperature
64824	4415	500	4-5	SAEtp02	Aftertreatment 2 SCR Outlet Temperature
64827	4390	500	3	SAEtp01	Aftertreatment 2 Diesel Exhaust Fluid Doser 1 Temperature
64829	4368	1000	2	SAEtp01	Aftertreatment 1 Diesel Exhaust Fluid Quick Thaw Temperature
64830	4360	500	1-2	SAEtp02	Aftertreatment 1 SCR Intake Temperature
64830	4363	500	4-5	SAEtp02	Aftertreatment 1 SCR Outlet Temperature
64833	4337	500	3	SAEtp01	Aftertreatment 1 Diesel Exhaust Fluid Doser 1 Temperature
64837	4295	500	1-2	SAEtp02	Aftertreatment 2 Three Way Catalyst Intake Temperature
64837	4296	500	3-4	SAEtp02	Aftertreatment 2 Three Way Catalyst Outlet Temperature
64838	4289	500	1-2	SAEtp02	Aftertreatment 1 Three Way Catalyst Intake Temperature
64838	4290	500	3-4	SAEtp02	Aftertreatment 1 Three Way Catalyst Outlet Temperature
64849	4199	1000	2	SAEtp01	Desired Aftercooler Coolant Intake Temperature
64850	4196	1000	2	SAEtp01	Desired Engine Coolant Pump Outlet Temperature
64851	4151	500	1-2	SAEtp02	Engine Exhaust Temperature Average
64851	4153	500	3-4	SAEtp02	Engine Exhaust Bank 1 Temperature Average
64851	4152	500	5-6	SAEtp02	Engine Exhaust Bank 2 Temperature Average
64869	5456	500	6	SAEtp01	Aftertreatment 1 Hydrocarbon Doser Intake Fuel Temperature
64870	4076	1000	1	SAEtp01	Engine Coolant Temperature 2
64870	4193	1000	2	SAEtp01	Engine Coolant Pump Outlet Temperature
64870	4288	1000	4-5	SAEtp02	Engine Exhaust Valve Actuation System Oil Temperature



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64870	5020	1000	6-7	SAEtp02	Engine Exhaust Gas Recirculation 1 Mixer Intake Temperature
64870	6209	1000	8	SAEtp01	Engine Coolant Temperature 3
64876	3834	500	3-4	SAEtp02	Aftertreatment 2 Secondary Air Temperature
64877	3831	500	3-4	SAEtp02	Aftertreatment 1 Secondary Air Temperature
64879	4750	on request	3-4	SAEtp02	Engine Exhaust Gas Recirculation 1 Cooler Intake Temperature
64917	3823	1000	2-3	SAEtp02	Transmission Torque Converter Oil Outlet Temperature
64917	5913	1000	5-6	SAEtp02	Transmission Oil Temperature 2
64919	2775	1000	1	SAEtp01	Engine Fuel Supply Temperature
64919	2776	1000	2	SAEtp01	Engine Fuel Return Temperature
64923	3515	1000	1	SAEtp01	Aftertreatment 1 Diesel Exhaust Fluid Temperature 2
64930	3468	500	5	SAEtp01	Engine Fuel Temperature 2
64943	3283	500	1-2	SAEtp02	Aftertreatment 2 Exhaust Temperature 2
64943	3284	500	3-4	SAEtp02	Aftertreatment 2 Diesel Particulate Filter Intermediate Temperature
64944	3279	500	1-2	SAEtp02	Aftertreatment 2 Exhaust Temperature 3
64944	3280	500	3-4	SAEtp02	Aftertreatment 2 Diesel Particulate Filter Outlet Temperature
64945	3275	500	1-2	SAEtp02	Aftertreatment 2 Exhaust Temperature 1
64945	3276	500	3-4	SAEtp02	Aftertreatment 2 Diesel Particulate Filter Intake Temperature
64946	3249	500	1-2	SAEtp02	Aftertreatment 1 Exhaust Temperature 2
64946	3250	500	3-4	SAEtp02	Aftertreatment 1 Diesel Particulate Filter Intermediate Temperature
64947	3245	500	1-2	SAEtp02	Aftertreatment 1 Exhaust Temperature 3
64947	3246	500	3-4	SAEtp02	Aftertreatment 1 Diesel Particulate Filter Outlet Temperature
64948	3241	500	1-2	SAEtp02	Aftertreatment 1 Exhaust Temperature 1
64948	3242	500	3-4	SAEtp02	Aftertreatment 1 Diesel Particulate Filter Intake Temperature
64979	2629	1000	1-2	SAEtp02	Engine Turbocharger 1 Compressor Outlet Temperature
64979	2799	1000	3-4	SAEtp02	Engine Turbocharger 2 Compressor Outlet Temperature
64979	2800	1000	5-6	SAEtp02	Engine Turbocharger 3 Compressor Outlet Temperature
64979	2801	1000	7-8	SAEtp02	Engine Turbocharger 4 Compressor Outlet Temperature
64981	2789	on request	1-2	SAEtp02	Engine Turbocharger 1 Calculated Turbine Intake Temperature
64981	2790	on request	3-4	SAEtp02	Engine Turbocharger 1 Calculated Turbine Outlet Temperature
64992	5581	1000	5-6	SAEtp02	Calculated Ambient Air Temperature
65031	2433	500	1-2	SAEtp02	Engine Exhaust Manifold Bank 2 Temperature 1
65031	2434	500	3-4	SAEtp02	Engine Exhaust Manifold Bank 1 Temperature 1
65031	5969	500	5-6	SAEtp02	Engine Exhaust Manifold Bank 2 Temperature 2
65031	5970	500	7-8	SAEtp02	Engine Exhaust Manifold Bank 1 Temperature 2
65104	1800	1000	1	SAEtp01	SLI Battery 1 Temperature
65104	1801	1000	2	SAEtp01	SLI Battery 2 Temperature
65104	2779	1000	3	SAEtp01	SLI Battery 3 Temperature
65104	2780	1000	4	SAEtp01	SLI Battery 4 Temperature
65110	3031	1000	2	SAEtp01	Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature



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65128	1638	1000	1	SAEtp01	Hydraulic Temperature
65129	1636	1000	1-2	SAEtp02	Engine Intake Manifold 1 Temperature (High Resolution)
65129	1637	1000	3-4	SAEtp02	Engine Coolant Temperature (High Resolution)
65129	2986	1000	5-6	SAEtp02	Engine Intake Valve Actuation System Oil Temperature
65129	2630	1000	7-8	SAEtp02	Engine Charge Air Cooler 1 Outlet Temperature
65133	1687	1000	1	SAEtp01	Auxiliary Heater Output Coolant Temperature
65133	1688	1000	2	SAEtp01	Auxiliary Heater Input Air Temperature
65164	441	on request	1	SAEtp01	Auxiliary Temperature 1
65164	442	on request	2	SAEtp01	Auxiliary Temperature 2
65172	1212	500	2	SAEtp01	Engine Auxiliary Coolant Temperature
65175	1184	1000	1-2	SAEtp02	Engine Turbocharger 1 Turbine Outlet Temperature
65175	1185	1000	3-4	SAEtp02	Engine Turbocharger 2 Turbine Outlet Temperature
65175	1186	1000	5-6	SAEtp02	Engine Turbocharger 3 Turbine Outlet Temperature
65175	1187	1000	7-8	SAEtp02	Engine Turbocharger 4 Turbine Outlet Temperature
65176	1180	1000	1-2	SAEtp02	Engine Turbocharger 1 Turbine Intake Temperature
65176	1181	1000	3-4	SAEtp02	Engine Turbocharger 2 Turbine Intake Temperature
65176	1182	1000	5-6	SAEtp02	Engine Turbocharger 3 Turbine Intake Temperature
65176	1183	1000	7-8	SAEtp02	Engine Turbocharger 4 Turbine Intake Temperature
65178	1172	1000	1-2	SAEtp02	Engine Turbocharger 1 Compressor Intake Temperature
65178	1173	1000	3-4	SAEtp02	Engine Turbocharger 2 Compressor Intake Temperature
65178	1174	1000	5-6	SAEtp02	Engine Turbocharger 3 Compressor Intake Temperature
65178	1175	1000	7-8	SAEtp02	Engine Turbocharger 4 Compressor Intake Temperature
65180	1165	1000	1-2	SAEtp02	Engine Main Bearing 9 Temperature
65180	1166	1000	3-4	SAEtp02	Engine Main Bearing 10 Temperature
65180	1167	1000	5-6	SAEtp02	Engine Main Bearing 11 Temperature
65180	6830	1000	7-8	SAEtp02	Engine Main Bearing 12 Temperature
65181	1161	1000	1-2	SAEtp02	Engine Main Bearing 5 Temperature
65181	1162	1000	3-4	SAEtp02	Engine Main Bearing 6 Temperature
65181	1163	1000	5-6	SAEtp02	Engine Main Bearing 7 Temperature
65181	1164	1000	7-8	SAEtp02	Engine Main Bearing 8 Temperature
65182	1157	1000	1-2	SAEtp02	Engine Main Bearing 1 Temperature
65182	1158	1000	3-4	SAEtp02	Engine Main Bearing 2 Temperature
65182	1159	1000	5-6	SAEtp02	Engine Main Bearing 3 Temperature
65182	1160	1000	7-8	SAEtp02	Engine Main Bearing 4 Temperature
65183	1153	1000	1-2	SAEtp02	Engine Exhaust Gas Port 17 Temperature
65183	1154	1000	3-4	SAEtp02	Engine Exhaust Gas Port 18 Temperature
65183	1155	1000	5-6	SAEtp02	Engine Exhaust Gas Port 19 Temperature
65183	1156	1000	7-8	SAEtp02	Engine Exhaust Gas Port 20 Temperature
65184	1149	1000	1-2	SAEtp02	Engine Exhaust Gas Port 13 Temperature



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65184	1150	1000	3-4	SAEtp02	Engine Exhaust Gas Port 14 Temperature
65184	1151	1000	5-6	SAEtp02	Engine Exhaust Gas Port 15 Temperature
65184	1152	1000	7-8	SAEtp02	Engine Exhaust Gas Port 16 Temperature
65185	1145	1000	1-2	SAEtp02	Engine Exhaust Gas Port 9 Temperature
65185	1146	1000	3-4	SAEtp02	Engine Exhaust Gas Port 10 Temperature
65185	1147	1000	5-6	SAEtp02	Engine Exhaust Gas Port 11 Temperature
65185	1148	1000	7-8	SAEtp02	Engine Exhaust Gas Port 12 Temperature
65186	1141	1000	1-2	SAEtp02	Engine Exhaust Gas Port 5 Temperature
65186	1142	1000	3-4	SAEtp02	Engine Exhaust Gas Port 6 Temperature
65186	1143	1000	5-6	SAEtp02	Engine Exhaust Gas Port 7 Temperature
65186	1144	1000	7-8	SAEtp02	Engine Exhaust Gas Port 8 Temperature
65187	1137	1000	1-2	SAEtp02	Engine Exhaust Gas Port 1 Temperature
65187	1138	1000	3-4	SAEtp02	Engine Exhaust Gas Port 2 Temperature
65187	1139	1000	5-6	SAEtp02	Engine Exhaust Gas Port 3 Temperature
65187	1140	1000	7-8	SAEtp02	Engine Exhaust Gas Port 4 Temperature
65188	1135	1000	1-2	SAEtp02	Engine Oil Temperature 2
65188	1136	1000	3-4	SAEtp02	Engine ECU Temperature
65188	412	1000	7-8	SAEtp02	Engine Exhaust Gas Recirculation 1 Temperature
65189	1131	1000	1	SAEtp01	Engine Intake Manifold 2 Temperature
65189	1132	1000	2	SAEtp01	Engine Intake Manifold 3 Temperature
65189	1133	1000	3	SAEtp01	Engine Intake Manifold 4 Temperature
65189	1802	1000	4	SAEtp01	Engine Intake Manifold 5 Temperature
65189	1803	1000	5	SAEtp01	Engine Intake Manifold 6 Temperature
65191	1122	1000	1	SAEtp01	Engine Alternator Bearing 1 Temperature
65191	1123	1000	2	SAEtp01	Engine Alternator Bearing 2 Temperature
65191	1124	1000	3	SAEtp01	Engine Alternator Winding 1 Temperature
65191	1125	1000	4	SAEtp01	Engine Alternator Winding 2 Temperature
65191	1126	1000	5	SAEtp01	Engine Alternator Winding 3 Temperature
65262	110	1000	1	SAEtp01	Engine Coolant Temperature
65262	174	1000	2	SAEtp01	Engine Fuel Temperature 1
65262	175	1000	3-4	SAEtp02	Engine Oil Temperature 1
65262	176	1000	5-6	SAEtp02	Engine Turbocharger Oil Temperature
65262	52	1000	7	SAEtp01	Engine Intercooler Temperature
65264	90	100	1	SAEtp01	Power Takeoff Oil Temperature
65268	242	10000	3-4	SAEtp02	Tire Temperature
65269	170	1000	2-3	SAEtp02	Cab Interior Temperature
65269	171	1000	4-5	SAEtp02	Ambient Air Temperature
65269	172	1000	6	SAEtp01	Engine Intake Air Temperature
65269	79	1000	7-8	SAEtp02	Road Surface Temperature



# Temperature Transmitter T01-CAN with SAE J1939 Interface

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65270	105	500	3	SAEtp01	Engine Intake Manifold 1 Temperature
65270	173	500	6-7	SAEtp02	Engine Exhaust Temperature
65272	177	1000	5-6	SAEtp02	Transmission Oil Temperature 1
65273	75	1000	1	SAEtp01	Steering Axle Temperature
65273	578	1000	4	SAEtp01	Drive Axle Temperature
65275	120	1000	2	SAEtp01	Hydraulic Retarder Oil Temperature
65275	5656	1000	4	SAEtp01	Retarder Coolant Outlet Temperature
65276	169	1000	5-6	SAEtp02	Cargo Ambient Temperature
65277	7020	500	6	SAEtp01	LNG Vaporizer Coolant Outlet Temperature