Version:	SENT II interface for UAD
QSG_09_002	QUICK START GUIDE
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SENT interface for UAD

1. Function:

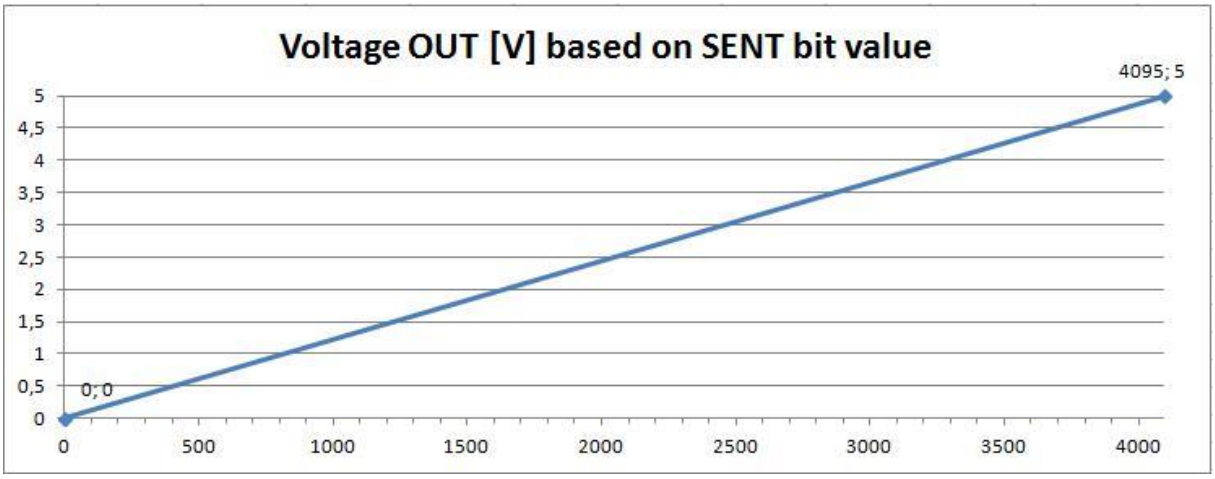
SENT converter translates SENT position signal to voltage analog signal. Voltage analog signal can be used together with UAD unit (Ultimate Actuator Drivebox) and actuators that use SENT sensor type. The work then is the same as with actuator equipped by common voltage position signal.

SENT frame:

SENT SAE J2716 frame defines two so called fast channel signals. Each carry 12bit value (values 0...4095).
SENT converter converts SIGNAL 1 bit value to analog voltage in default configuration.
Signal 2 is ignored in current version of converter.
So called slow channel information is ignored too in current version of converter.

Transfer function:

Function SENT bit to voltage is defined in graph.



Voltage range 0...5V is used to maximize the signal resolution. Another transfer functions can be offered based on customer request.

2. Power supply:

Power connector is located at side of the box:

Connector type:

Small voltage Barrel Plug d=1,3mm.

Reference Farnell: Newark Part No.: 08WX2562.

Adapter to 5.5/2.1mm plug (size of UAD power connector) is supplied with our converter too.

Supply Voltage: 10-15 VDC.

Supply Current: 50mA standalone. 80mA max. with connected Actuator

Reccomendation , warning:

Reccomendation:

It is strongly reccomended to use the same power supply line as for UAD unit.

Warning:

If different power supply is used, please make sure i tis galvanically isolated from mains ground. Otherwise ground loop will be made with UAD unit's power supply and common mode noise pick-up will happen.This may disturb operation of both devices and may cause device damage in some case.

3. Controls:

Main Display: LCD 2x8 characters

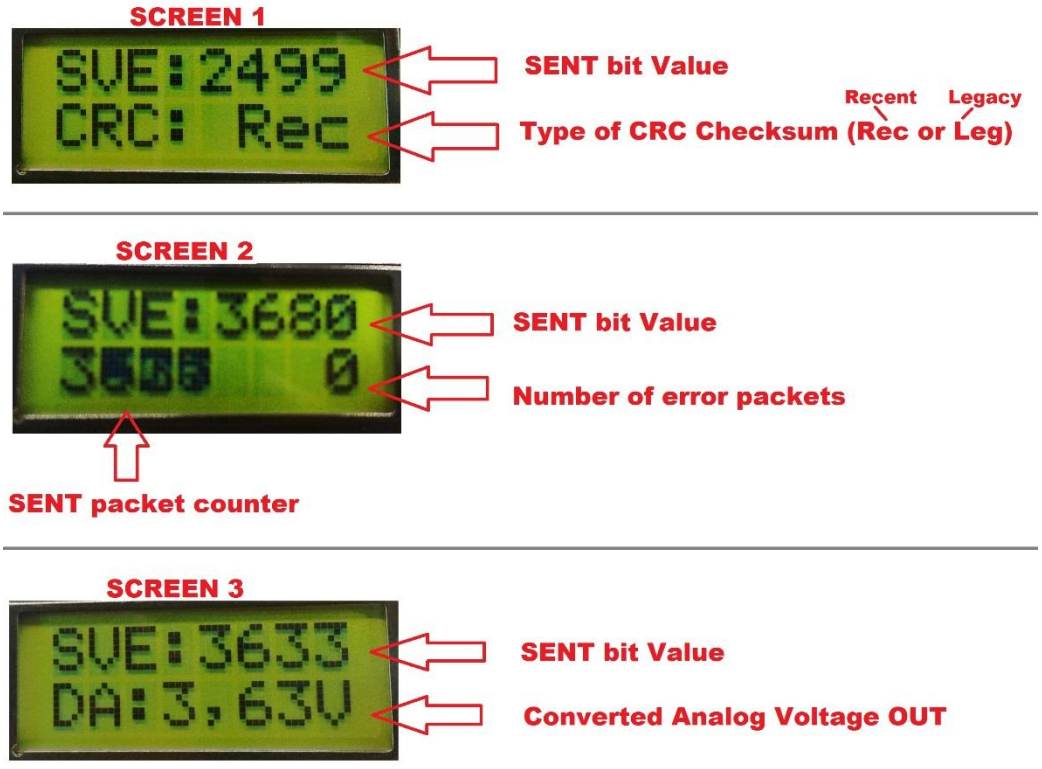
Push Button: pushing the button rotates between 3 different display screens.

Screen 1: Basic SENT type screen
Show SENT bit value and Show type of CRC checksum used by the connected sensor which sending SENT signal.
- Leg: Legacy checksum from older norm SAE J2716 2008. Still active option.
- Rec: Recent checksum type defined in norm SAE J2716 2010. Better alternative.

Screen 2: Diagnostic and troubleshooting screen.
Show SENT bit value, Show SENT packet counter and Show number of error packets.
- Packet counter is good indicator that SENT signal is alive and sending packets.
- Error packets number increase by 1 with every new packet with wrong CRC checksum

Screen 3: Conversion screen
Show SENT bit value and actual value of converted analog voltage OUT
- Converted voltage OUT will always be with reference of real Vcc at the time
- Converted voltage OUT shown is only 2 digits of precision. It is just limit of display size.

Screens contents is shown on following picture.



Examples of all screens for diferent situations about SENT signal are shown on three pictures below:

SENT signal Inconsistent - CRC errors

Screen 1

Feedback 4500bit (artificial)
CRC type Legacy

Screen 2

Feedback 4500bit (artificial)
Counter running 442 errors and increasing

Screen 3

Feedback 4500bit (artificial)
Analog Voltage OUT 4.50V

SENT signal missing

Screen 1

Feedback 0bit
No signal

Screen 2

Feedback 0bit
Counter NOT running 0 errors

Screen 3

Feedback 0bit
Analog Voltage OUT 5.00V

SENT signal OK

Screen 1

Feedback 2499bit
Checksum type: Recent

Screen 2

Feedback 3680bit
Counter running 0 errors

Screen 3

Feedback 3633bit
Analog Voltage OUT 3.63V

4. Connections:

USB connector:

On side of the box there is also mini USB connector. This is used only for manufacturer in current version of converter. Please do not use this.

Input / Output banana sockets and plugs:

Female banana sockets **(side of SENT actuator)**	**Male banana plugs** **(side of UAD unit)**
RED: Sensor Vcc OUT (5V DC / 30mA)	RED: Sensor Vcc IN
YELLOW: Sensor SENT IN (TTL 5V)	WHITE: Converted sensor Analog OUT (0 - 5V /5mA)
BLACK: Sensor GND	BLACK: Sensor GND
BLUE: MOTOR M+ OUT	BLUE: Motor M+ IN
GREEN: MOTOR M- OUT	GREEN: Motor M- IN

Motor M+ and Motor M-:

This connections is only bypass thru converter for actuator DC motor function.

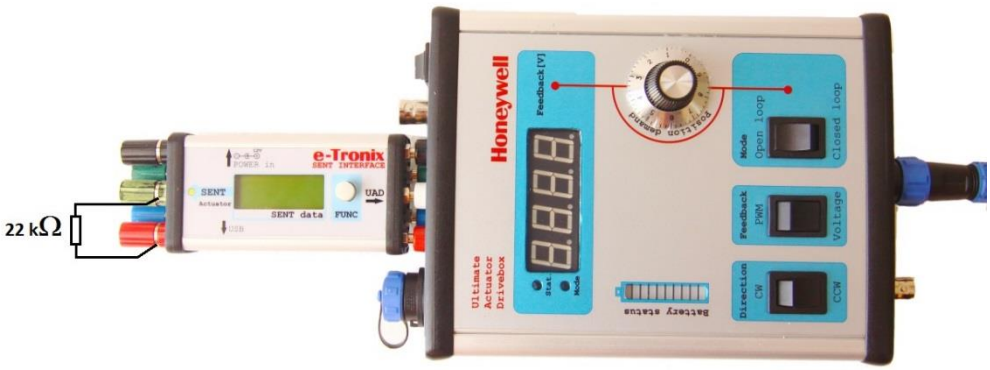
Sensor SENT IN:

Protection:

- Reverse voltage protection up to 50mA current draw
- Overvoltage up to 10mA current sink

This input have NO internal PULL UP resitor acc. SAE J2716

Note: If your sensor require pull up resistance, please connect by 22kΩ resistor Yellow and Red banana socket. That is Sensor Vcc OUT to Sensor SENT IN by 22kΩ. See illustration.



Converted sensor analog OUT:

- Range: 0 - 5V DC/ 5mA.
- Resolution: 16bit DAC
- DAC Reference: UAD unit Sensor Vcc Input.
- DAC accuracy: < +/- 1mV
- Default Conversion:
  - SENT → Analog OUT 0-4096 [bit]~0-4.096 [V]. See Transfer Function graph.
  - NO SENT signal = 5V
  - SENT CRC error = 4.5V
  - Other Configurations upon demand.

Reccomendation , warning:

- Do not use supply voltage outside range +10 to +15V DC
- Do not allow at SENT IN voltage outside TTL range. That is range 0 - 5V DC referenced to GND.
- Do not connect any voltage supply to the Analog OUT.
- Do not short out or load more than 5mA the Analog OUT.

Troubleshooting:

- If sensor SENT signal is OK, then Screen 1 show the bit value.
- If sensor SENT signal is fully missing then
- If sensor SENT has incorrect Checksum (refer to SENT SAE J2716 for details about possible reasons) then

5. SENT converter use with UAD unit

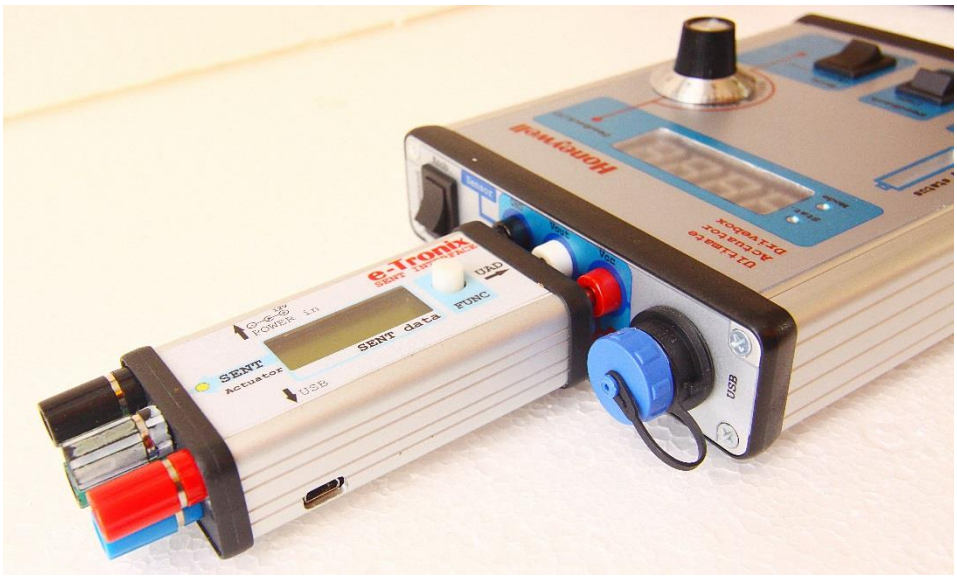
Connection

1. Slide in the converter to UAD unit banana sockets. Use push force and swinging from side to side.
2. UAD should be configured for Voltage feedback actuator
3. Connect SENT actuator to the banana sockets of converter.
4. Connect power connector to the UAD unit and converter and turn on power.

Disconnection

1. Turn off power. Disconnect power connectors.
2. Disconnect actuator from converter
3. Slide out converter from UAD unit banana sockets. Use pull force and slight swinging from side to side.

See pictures about how to connect converter to UAD:



6. compatibility

The converter implemented the SAE J2716, 2010 standard and shall be compatible with any SENT devices.
However, the converter was tested only with limited number of devices that were available during manufacturer's development. In case of issues, please contact manufacturer.