# E301 - TORQSENSE™ Rayleigh Wave Torque Transducer Display Module

## Contents



April 2005

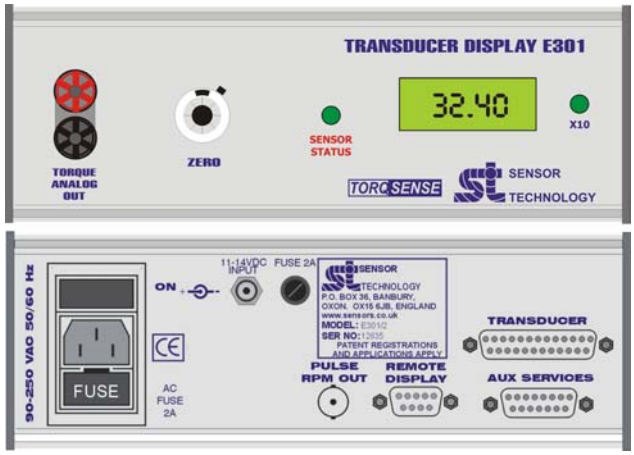
# TORQSENSE Transducer Display Interface [E301/2]

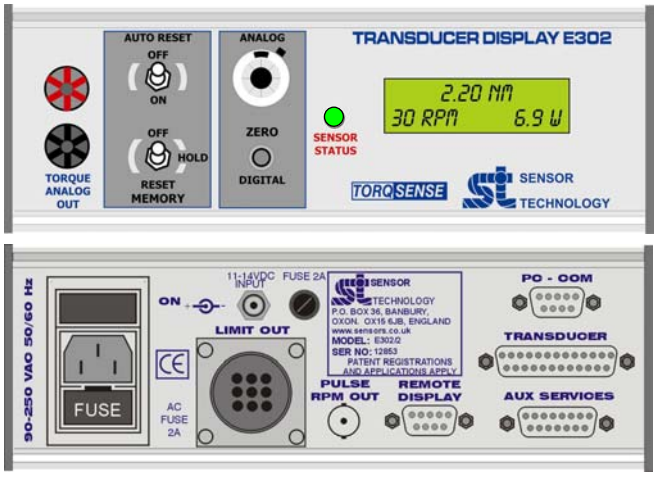
TSE2103R
Rev 6

The E300 Range of Transducer Display Interfaces are compatible with any of the TorqSense E300 RWT1 Transducers.

## Common Features

- Automatically detects the full-scale range of any E300 RWT1 transducer.
- The display is automatically programmed to read the full scale of the transducer.
- Continuous self-auditing (sensor status is indicated on a front panel LED or remotely available).
- ±5v analog output for Torque FSD.
- 90-250V ac operation or 12 v dc





A typical E-302 Transducer Display unit. Front panel varies depending on model. See over page for sizes.

## Additional Features for E302

- Operates independently or under control from remote PC.
- Operates with TorqView 2 to give
  - Advanced display modes (see TorqView 2 data sheet).
- 2 external analog input channels.
- Peak readings can be displayed and reset manually or automatically.
- Speed and power displayed (transducers require Optical RPM pickoff to be fitted).
- Options menu to allow user to:
  - Set torque limits.
  - Average torque & speed readings.
  - Adjust speed output full scale setting.
  - Set instrument display to feature other options (e.g. analogue inputs).
  - Fast record facility.

# Display Interface Technical Data and Option Sheet

| | | E301 | E302 | Option | |
|---|---|---|---|---|---|
| **Display Interface Accuracy** | ±0.1% Digital readout | | ● | | |
| | ±0.25% Analog out | ● | ● | | |
| | | | | | |
| **Resolution** | 0.1% Digital readout | ● | ● | | |
| | 0.05% Analog out | ● | ● | | |
| **Display** | LCD (max 1999) with x10 LED indicator | ● | | | |
| | LCD 16 x 2 | | ● | | |
| **Analog Bandwidth** | 5KHz @ -3dB | ● | ● | | |
| | 10KHz @-3dB | | | | |
| | 50KHz @-3dB | | | | |
| **Local display update rate** | 10 times/sec | | ● | | |
| **Overall Size (mm)** | 220w x 290d x 100h (Aluminium enclosure) | ● | ● | | |
| **Fitted Tilt Feet** | | ● | ● | | |
| **Weight (nominal)** | 2.5Kg (5lb 10 oz) | ● | ● | | |
| **Temperature Range** | -10ºC - 50ºC | ● | ● | | |
| **Power Supply** | 90-250v AC, 50-400Hz, 20W, IEC connector. 11-14 v DC 1 A 2.1mm jack reverse polarity protected | ● | ● | 1 | - |
| | Power Input - 24v | ○ | ○ | | a |
| **Torque Analog Output** | Analog Output ±5v FSD | ● | ● | 2 | - |
| | Analog Output ±1v FSD | ○ | ○ | | a |
| | Analog Output ±10v FSD | ○ | ○ | | b |
| | Analog Output +0.5v (fsd ccw) +2.5v(zero) +4.5(fsd cw) | ○ | ○ | | c |
| | Analog Output 4-20 mA | ○ | ○ | | d |
| **Speed Analog Output** (Specify RPM FSD required) (Speed pickoff on Transducer reqd) | RPM Analog +1v for FSD | | ○ | 3 | a |
| | RPM Analog +5v for FSD | | ○ | | b |
| | RPM Analog + 10v for FSD | | ○ | | c |
| | RPM Analog 4-20 mA for FSD | | ○ | | d |
| **Power Analog Output** (Specify Power FSD required) (Speed pickoff on Transducer reqd) | Power Analog +1v for FSD | | ○ | 4 | a |
| | Power Analog +5v for FSD | | ○ | | b |
| | Power Analog + 10v for FSD | | ○ | | c |
| | Power Analog 4-20 mA for FSD | | ○ | | d |
| **Serial Output** | TORQVIEW 2 | | ○ | 5 | a |
| | RS232 | | ○ | | b |
| | Optical Fibre Transmitter for RS232 | | ○ | | c |
| | RS 422 Output 4800 baud | | ○ | | d |
| | USB Adaptor | | ○ | | e |
| **Auxiliary Inputs** | 4-20mA | | ○ | 6 | a |
| | AC RMS (50-400Hz) | | ○ | | b |
| | Dual Analog inputs + 1v | | ○ | | c |
| | Dual Analog inputs +5v | | ○ | | d |
| | Dual Analog inputs +10v | | ○ | | e |
| **External Limit Outputs** | Limit output (relay) | | ○ | 7 | a |
| | Limit output (opto) | | ○ | | b |
| | Limit output TTL/HC +5v positive logic | | ○ | | c |
| **Extended Cable Driver** | Over 10 Metres | | ○ | 8 | a |
| **Front Panel (Lanuage)** | English | ● | ● | 9 | - |
| | German | ○ | ○ | | a |
| | French | | ○ | | b |
| | Italian | | ○ | | c |

● – Standard ○ – Option available

Patents pending. US Patents: US5585571, US6237417, US6467351.

*Sensor Technology Ltd reserves the right to change specification and dimensions without notice.*
*See cover page or contact company for warranty and EMC compliance*

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# TORQSENSE Transducer Display Interface [E301] Operating Guide

## *1. Introduction*

The E301 provides a stabilised power supply and display for the E300 RWT1 torque transducer. Torque is displayed on a 3½ digit LCD display, while the RPM output (if fitted), can be accessed by the RPM out connector on the back of the instrument.

The E301 can be powered either from 96-250V, 50/ 60Hz AC mains supply, or from an 11-14V DC source. Power to the transducer is supplied from the E301.

Although the system does not require routine maintenance, we recommend that, for maximum accuracy, the equipment be recalibrated annually.

## *2. Description of Controls*


## *Front Panel*

### *2.1 "Zero Control"*

This multi-turn potentiometer is used to zero, if necessary, the torque signal output of the transducer when no torque is applied to it. A dial lock is incorporated to prevent accidental movement of the control while measurements are being made. The normal setting of this control is close to the position 5.00. If the zero is away from this position by more than ±1.00, recalibration should be carried out, as the transducer may have been overstrained. This control can also be used to bias the torque reading in either direction to correct for any residual torque present.

### *2.2 "Sensor Status" Indicator*

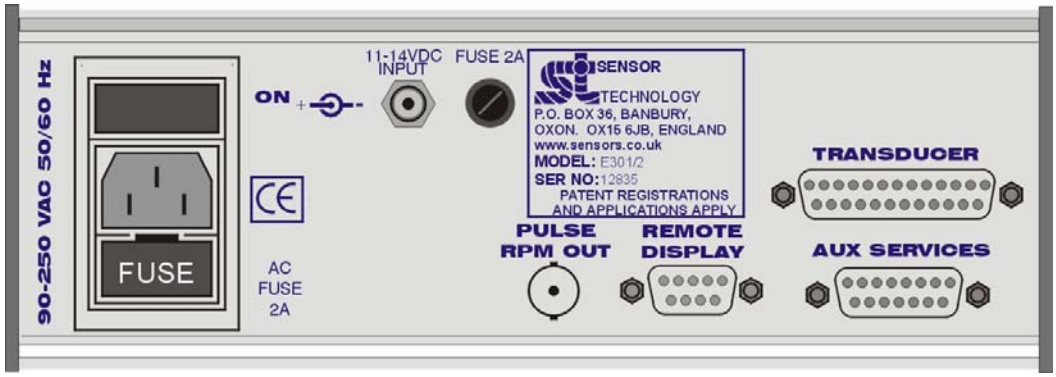
This indicator shows the status of the Transducer. A green light means that the Transducer is functioning normally, a red light means a Transducer error. The operator should check that the transducer is connected properly.

## *2.3 "Analog out" 2 x 4mm Front Panel Connector*

This connector outputs the torque reading from the E300 RWT1, giving (as standard) + Full Scale Deflection = + 5.00v* and – Full Scale Deflection = -5.00v*. The black 4mm connector is OV signal ground. This signal should not be loaded with less than 500 Ohms to maintain accuracy and is protected against accidental short circuits.

* On earlier instruments prior to Serial Number 11010. This was ±1.000v FSD.

## *Back panel*




## *2.4 Power Supply Connectors*

AC Mains power is connected and switched on/off through the combined switch/fuse/plug on the back panel of the E301.

DC power, not switched, is connected through the round socket marked 11-14VDC; the fuse for this supply is the round fuse on the right of the DC input connector.

**DO NOT CONNECT AC AND DC SUPPLIES AT THE SAME TIME**

## *2.5 Transducer Socket*

The E300 RWT1 should be connected to the 25 pin cavity 'D' socket marked "TRANSDUCER" on the rear of the E301. To ensure a good connection, the locking screws should be tightened.

## *2.6 "RPM" Socket*

This socket is connected to the rotary speed sensor of the transducer (when fitted) and allows the user to display the RPM on a Frequency Counter at the rate of 1 Hz = 1RPM. Do not load below 500 Ohms, accidental short circuit protection is provided.

## *2.7 Auxiliary Services Connector*

Signals are available through this connector for any output options, such as ±5V or ±10V FSD, fitted to the module. See Section 4 for details of options fitted and Pin Out connections (if applicable).

## *3. Operating Instructions*

Connect the E301 and the E300 RWT1 using the correct E300 RWT1 lead.

**THE SERIAL NUMBER OF THE LEAD MUST MATCH THE SERIAL NUMBER OF THE E300/RWT.**

This is important because the lead carries important calibration history and scaling information, which is reported to the E301. This ensures that the E301 displays the correct torque readings.

The E301 must be connected to either a 96-250V DC, 50/60Hz, AC mains, or an 11-14V DC source to supply power for the E301 and the transducer.

**DO NOT CONNECT AC AND DC SUPPLIES AT THE SAME TIME**

When the E301 is turned on, the Transducer reports to the E301 with the scaling information. Zero the E300/RWT using the zero control on the front panel of the E301. If the transducer range is greater than the display can show, for example, 2000Nm, the display will show 200 and the x10 indicator will be lit.

## *4. E301 Serial No 11669*

## Options Fitted & External Connection Details

### *4.1 Options Fitted*

Option 2) Torque Analog Output

Standard) Analog Output ±5v Transducer FSD where:

+5v = Clockwise Transducer FSD
0v = Zero Torque
-5v = Anticlockwise Transducer FSD

See Individual Option Sheets Attached for Detailed Specifications

| **15 Way Auxiliary Services Connector** | | | | | |
|---|---|---|---|---|---|
| Option | PIN | SERVICE | FITTED | RANGE | LEVEL |
| | 1&9 | ANALOG GND | ✓ | N/A | N/A |
| | 8&15 | DIGITAL GND | | | |
| | 2 | SPEED OUT | | | |
| | 3 | TORQUE OUT | ✓ | 0 - FSD | ±5v |
| | 4 | POWER OUT | | | |
| | 10 | ANALOGUE AUX A | | | |
| | 11 | ANALOGUE AUX B | | | |
| | 5 | LIMIT A OUT (TTL) | | | |
| | 6 | LIMIT B OUT (TTL) | | | |
| | 7 | LIMIT C OUT (TTL) | | | |
| | 12 | A (TTL) | | | |
| | 13 | B (TTL) | | | |
| | 14 | +5v OUTPUT | | | |

Mating Connector is 15Way Male “D” Series