# DANISENSE

# DSSIU-6-1U

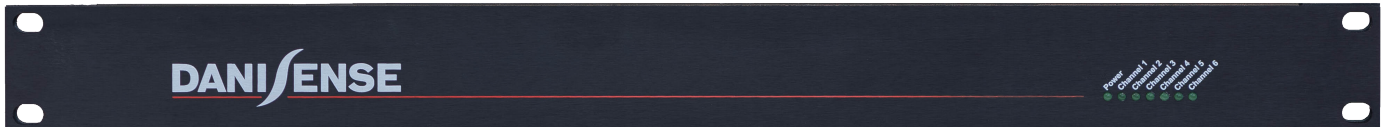**Fully configurable dedicated 6-channel system interface unit for ultra-stable, high precision fluxgate technology DS series current transducers.**

**Powers up to 6 x DS50 to DS2000 at the same time.**
**Supports calibration windings and has 6 slots for optional voltage output modules VOM (1V or 10V)**



## Features

- Compact 19" rack mount 1U height
- Current transducers' output signals (current or voltage) available via 4mm banana plugs
- Individual or serial access to calibration windings of all 6 transducers via 4mm banana plugs
- 15-pin DSUB connector provides access to isolated status signals of each transducer and power
- 6 slots for voltage output modules (VOM)
- Front LEDs indication of normal operation for each transducer and power LED for DSSIU-6-1U
- Forced cooling ensuring stable temperatures for VOM
- Universal autorange (100-240V AC 50/60Hz) AC input voltage or 120–370V DC input voltage.

## Options:

- Ultra-stable 1V or 10V voltage output modules VOM for conversion of transducer's output current to a voltage

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## Specifications

| Parameter | Symbol | Unit | Min | Typ. | Max | Comment |
|---|---|---|---|---|---|---|
| **Mains input** | | | | | | |
| AC input voltage | $V_{AC}$ | $V_{rms}$ | 85 | | 264 | Autoranging |
| AC nominal current | $I_{AC}$ | $I_{rms}$ | | | 2.1A @ 110V<br>1.1A @ 220V | Full scale operation with 6 DS2000 and 3000A primary |
| Frequency | f | Hz | 47 | | 63 | Autoranging |
| | | | | | | |
| **Transducer output port** | | | | | | |
| Supply voltage | $U_{cc}$ | | ±14.75 | | ±15.75 | x6 channels |
| Ripple | | $mV_{rms}$ | | | 15 | |
| | | | | | | |
| **Environment and Mechanical** | | | | | | |
| Ambient operating temperature range | $T_a$ | ºC | 5 | | 45 | |
| Storage temperature range | | ºC | -20 | | 85 | |
| Relative humidity | | % | 20 | | 80 | |
| Mass | | Kg | | 5.2 | | |
| Size (W x H x D) | | mm | | | | 483 x 44 x 271 |
| | | | | | | |
| **Status Port (Isolated output)** | | | | | | |
| Collector-Emitter current | | mA | | | 100 | |
| Collector-Emitter Voltage off | | V | | | 100 | |
| reverse collector emitter voltage, off | | V | | | 0.3 | |
| Collector-Emitter voltage, on | | V | | | 1.2 | @100mA |
| Isolation to chassis | | v | | | 300 | |
| | | | | | | |
| **Voltage output - 10V version** | | | | | | |
| Offset error<br>- Initial<br>- Versus temperature | | | | | Offset error<br>- 6 ppm<br>- 0.2 ppm/K | Add error from transducer |
| Ratio error<br>- Initial<br>- Versus temperature<br>- Versus time | | | | | Ratio error<br>- 5 ppm<br>- 1.5 ppm/K<br>- 20 ppm/month | Add error from transducer |
| Linearity error<br>- VOM1333-10<br>- VOM0400-10 | | | | | Linearity error<br>- 8 ppm<br>- 3 ppm | |
| | | | | | | |
| **Voltage output - 1V version** | | | | | | |
| Offset error<br>- Initial<br>- Versus temperature<br>- Versus time | | | | | Offset error<br>- 0 ppm<br>- 0 ppm/K<br>- 0 ppm/month | Add error from transducer |
| Ratio error<br>- Initial<br>- Versus temperature<br>- Versus time | | | | | Ratio error<br>- 5 ppm<br>- 1 ppm/K<br>- 20 ppm/month | Add error from transducer |
| Linearity error<br>- VOM1333-1<br>- VOM0400-1 | | | | | Linearity error<br>- 6 ppm<br>- 2 ppm | |

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## Channel configuration

Each channel does have 5 connectors.

- Transducer (DSUB9) for connection to the transducer
- YELLOW Calibration + (4mm Banana) the positive connection for the calibration current
- YELLOW Calibration - (4mm Banana) the negative connection for the calibration current
- RED + (4mm Banana) is positive output from the measured current or voltage
- BLACK - (4mm Banana) is negative output from the measured current or voltage

## Current output configuration

If no voltage options have been purchased, the DSSIU-6 will send the secondary current to the RED and BLACK 4mm banana jacks.

RED being connected to pin 6 on the transducer.

BLACK being connected to pin 1 on the transducer.

## Voltage output configuration

The DSSIU-6 is by default configured to have 6 current output channels. Each of these can from factory be configured to handle all the various transducers offered by Danisense.

| Vom version | | | VOM0400-1 | VOM0400-10 | VOM1333-1 | VOM1333-10 |
|---|---|---|---|---|---|---|
| Transducer | Ratio | Nominal(A) | Vout@Nom(V) | Vout@Nom(V) | Vout@Nom(V) | Vout@Nom(V) |
| DS50IDSA | 1/500 | 50 | 0.250 | 2.500 | 0.075 | 0.750 |
| DS200CDSA | 1/500 | 200 | 1.000 | 10.000 | 0.300 | 3.000 |
| DS200CLSA | 1/500 | 200 | 1.000 | 10.000 | 0.300 | 3.000 |
| DS200IDSA | 1/500 | 200 | 1.000 | 10.000 | 0.300 | 3.000 |
| DS300IDSA | 1/1000 | 300 | 0.750 | 7.500 | 0.225 | 2.250 |
| DS400IDSA | 1/2000 | 400 | 0.500 | 5.000 | 0.150 | 1.500 |
| DS600CLSA | 1/1500 | 600 | 1.000 | 10.000 | 0.300 | 3.000 |
| DS600IDSA | 1/1500 | 600 | 1.000 | 10.000 | 0.300 | 3.000 |
| DS600IDSM | 1/1500 | 600 | 1.000 | 10.000 | 0.300 | 3.000 |
| DS600IDSP | 1/1500 | 600 | 1.000 | 10.000 | 0.300 | 3.000 |
| DS640IDSP | 40A-640A | 40-640 | N/A | N/A | 0.750 | 7.500 |
| DS2000 | 1/1500 | 2000 | N/A | N/A | 1.000 | 10.000 |

Please see attached matrix with the various options:

If the output is configured as a voltage output it is important to ensure that the transducers are not attached to the wrong channels.

Example 1: A DS2000 is wrongly connected to a DS200 voltage output channel. The over current will burn a non recovering fuse inside the DSSIU-6 to protect the current to voltage module from damage.

Example 2: A DS200 is wrongly connected to a DS2000 voltage output channel. The DS200 does not create an overcurrent, but the output voltage will be wrong.

## Calibration winding access

Each channel gives access to the calibration winding of transducers with this feature. Currently the following transducers do support this functionality.

- DS200IDSA-C1000 - 1000 turns calibration winding (Max 200mA) - Equals a primary current of 200A
- DS200IDSA-C100 - 100 turns calibration winding (Max 100mA) - Equals a primary current of 10A
- DS600IDSA-C100 - 100 turns calibration winding (Max 100mA) - Equals a primary current of 10A
- DS2000IDLA-C100 - 100 turns calibration winding (Max 100mA) - Equals a primary current of 10A

Each transducers calibration winding can be driven either is series with the other transducers or independently with it's own power supply.

When using the DS200IDSA-C1000, it is possible to do a full scale calibration from –200A to 200A.

**Principle for calibration:**

It is important to use a stable current source. If the current source is calibrated then there is no need for an Ampere-meter on the calibration current.

Example for DS200IDSA-C1000 on channel X configured with a 1V voltage module

1. Connect transducer to channel X on DSSIU-6
2. Ensure light is on for channel X on the frontside of the DSSIU-6 - meaning the transducer is in normal operation
3. Ensure no primary current through the transducer
4. Read the voltage output from channel X - This is the offset of the transducer V(offset)
5. Connect a stable current source to the calibration winding of channel X - +100mA
6. Let the current stabilize according to current source specification
7. Measure the voltage - V(100A)
8. Change polarity of the calibration current (Either by swapping the calibration cable from + to -, or by changing the polarity directly on the current source if possible)
9. Let the current stabilize according to current source specification
10. Measure the voltage - V(-100A)

Vout(100A) theoretical is 0.5V or 5V depending on voltage module installed.
Vout(-100A) theoretical is -0.5V or -5V depending on voltage module installed.

When evaluating the transducer performance it is important to take the different uncertainties of the measurement instruments into account.

## Status port

The status port provides access to the status of the system via optical isolated pins in a DSUB15.

Overview: (Current direction is from + to -)

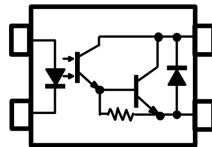| Status Port | + | - |
|---|---|---|
| Channel 1 | 1 | 9 |
| Channel 2 | 2 | 10 |
| Channel 3 | 3 | 11 |
| Channel 4 | 4 | 12 |
| Channel 5 | 5 | 13 |
| Channel 6 | 6 | 14 |
| Power | 7 | 15 |

Use a pull up resistor value which does not exceed 100mA when the pin is @ 1V.

Example:
5V supply, resistor of 1kOhm is connected between 5V and + of channel 1 (pin 1) and pin 9 is connected to 0V.
If the transducer is working correctly pin 1 and 9 are shorted with below optocoupler circuit.
The voltage on pin 1 will be around 1V and current I®=(5V-1V)/1kOhm=4mA

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## Mechanical Dimensions



270.50 mm

44.00 mm

482.60 mm