

## PURPOSE

This publication covers the Isolation Transducer (IT) used within ECS2100 and DECS-2100 excitation control systems. The IT is identified by part number 9410116100.

The IT provides a highly isolated version of the input signal in a form convenient for reception by the module using the signal. The output of the Isolation Transducer is a pulsed, fiber-optic light signal with a frequency proportional to the input voltage. The Isolation Transducer has two isolated sections, each electrically isolated from the other and with the output electrically isolated from the input. The Isolation Transducer is specifically targeted at pairs of signals associated with the power portions of a generator or excitation control system. The Bridge Control Module, Firing Control Interface Module (ECS2100 systems), and ECM-2 Excitation Control Module (DECS-2100 systems) are modules capable of receiving isolated signals from the IT.

## SAFETY

As with all electrical equipment, appropriate safety measures should be taken whenever dealing with the excitation equipment. High voltage is present within the excitation cubicles; their magnitudes depend upon the particular system. Opening the sources, e.g., disconnect device 41, does not completely disconnect the high voltages. As long as the machine is still physically connected to the system, there is a possibility that a safety hazard exists.

Every precaution must be taken when working at the excitation control switchgear to ensure that all high voltages are isolated and avoided by test personnel. In addition to the machine terminal voltage (460 Vac or greater) at the excitation transformer, there may be other sources of power entering the cubicles. Examples are the user-supplied 125/250 Vdc and/or 120/240 Vac that feed certain devices. You should assume that all connections are live and dangerous until proven otherwise and avoid all body contact with any of these voltages.

## SPECIFICATIONS

### Power Supply

Input Voltage: +24 Vdc, ±10%  
Nom. Input Current: 0.25 Adc

### Environment

Temperature Range: -20 to 50°C (-4 to 122°F)  
Relative Humidity: 0 to 95%, non-condensing

EAC Mark (Eurasian Conformity)

- TP TC 004/2011
- TP TC 020/2011

## OPERATION AND APPLICATION

The Isolation Transducer has two isolated, voltage-controlled oscillator (VCO) channels. Each channel creates an output frequency which is proportional to the input voltage for that channel. The transfer function for each channel is:

$$F_{out} = 750kHz + 250kHz \times \frac{V_{in}}{V_{range}}$$

The accuracy of the transducer frequency is ±4kHz = ±1.6% of full scale. No adjustment is provided within the Isolation Transducer. If necessary, adjustments may be made digitally within the user's program. Each of the modules that use the IT for input operates on the basis of a user program viewable as a block diagram using the BESTCOMSPro application. The user program provides adjustment for each specific input and is compatible with both ECS2100 and DECS-2100 excitation systems.

Due to the free running characteristic of the VCOs, the average accuracy of the digital data is very good. The incoming frequency is counted over a known fixed time interval. Since the VCO is free running, any pulse that is missed during one interval will still fall within the next interval. Thus quantization errors are averaged out.

The advantage of VCO translation is that the isolation is provided by non-conducting, optical fiber.

## INSTALLATION

The IT is typically supplied as part of an excitation control system and is delivered with the module(s) mounted and wired within the equipment. If replacement becomes necessary, carefully label and document each of the IT connections so that the replacement module can be connected properly.

See Figure 1 for the location of the IT connectors and jumpers.

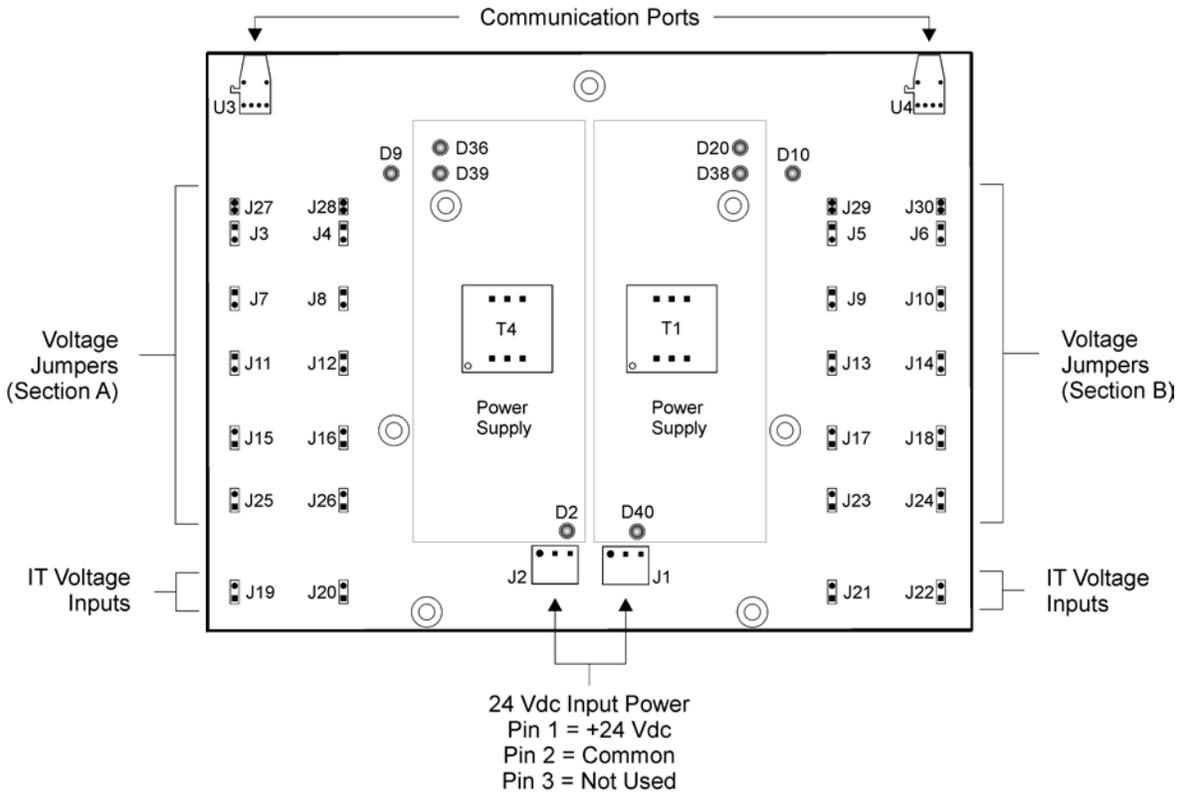
## MAINTENANCE

Equipment maintenance requires only the periodic removal of accumulated dust and inspection of connections.

**LED Indicator Legend**

|          |                     |
|----------|---------------------|
| D2, D40  | Control power       |
| D9, D10  | Over or under range |
| D20, D36 | +15 Vdc             |
| D38, D39 | -15 Vdc             |

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**Voltage Selection Jumper Legend**

| Jumper Positions, Section A |    |    |    |     |     |     |     |     |     |     |     | Max. Input | Jumper Positions, Section B |    |    |     |     |     |     |     |     |     |     |     |
|-----------------------------|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|------------|-----------------------------|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| J3                          | J4 | J7 | J8 | J11 | J12 | J15 | J16 | J25 | J26 | J27 | J28 |            | J5                          | J6 | J9 | J10 | J13 | J14 | J17 | J18 | J23 | J24 | J29 | J30 |
| [Jumper Diagram for 100 mV] |    |    |    |     |     |     |     |     |     |     |     | 100 mV     | [Jumper Diagram for 100 mV] |    |    |     |     |     |     |     |     |     |     |     |
| [Jumper Diagram for 200 mV] |    |    |    |     |     |     |     |     |     |     |     | 200 mV     | [Jumper Diagram for 200 mV] |    |    |     |     |     |     |     |     |     |     |     |
| [Jumper Diagram for 250 V]  |    |    |    |     |     |     |     |     |     |     |     | 250 V      | [Jumper Diagram for 250 V]  |    |    |     |     |     |     |     |     |     |     |     |
| [Jumper Diagram for 500 V]  |    |    |    |     |     |     |     |     |     |     |     | 500 V      | [Jumper Diagram for 500 V]  |    |    |     |     |     |     |     |     |     |     |     |
| [Jumper Diagram for 750 V]  |    |    |    |     |     |     |     |     |     |     |     | 750 V      | [Jumper Diagram for 750 V]  |    |    |     |     |     |     |     |     |     |     |     |
| [Jumper Diagram for 1000 V] |    |    |    |     |     |     |     |     |     |     |     | 1000 V     | [Jumper Diagram for 1000 V] |    |    |     |     |     |     |     |     |     |     |     |
| [Jumper Diagram for 1500 V] |    |    |    |     |     |     |     |     |     |     |     | 1500 V     | [Jumper Diagram for 1500 V] |    |    |     |     |     |     |     |     |     |     |     |
| No Jumpers Installed        |    |    |    |     |     |     |     |     |     |     |     | 2000 V     | No Jumpers Installed        |    |    |     |     |     |     |     |     |     |     |     |

**Figure 1. Isolation Transducer Block Diagram**