ITD

USER MANUAL

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1. INTRODUCTION

The Isolated Timing Distributor (ITD) is designed to distribute IRIG-B signals and/or Pulses for use in synchronizing industrial control and SCADA equipment. The ITD is ideally suited to distribution of signals to multiple racks due to the isolation between all interfaces.

Each input and output of the ITD is isolated from earth and every other output, so that attached wiring can feed out to operating areas in different earth potential zones without compromising the overall site earthing security. In addition, isolation and transient suppression devices protect the internal electronics from longitudinal and transient voltages.

The ITD is supplied complete with all hardware required for installation, including rack-mount kit and connectors.

Figure 1 – Isolated Timing Distributer front panel

The front panel of the ITD features two LED indicators which indicate the current status of the unit.

1. The **PWR LED** is illuminated when power is on
2. The **SIG LED** flashes in sync with data transmission.

2. BACK PANEL

ITD back panels are shown in Figure 2 & Figure 3. The only difference between fiber and other interfaces is the type of connector used. An ST fiber connector is used for fiber outputs and a 2 pin, 5.08 mm connector for all other outputs.

Figure 2 – Rear panel of ITD, configured with four TTL outputs

Figure 3 – Rear panel of ITD, configured with four fiber outputs

Modular Inputs

There are two input types that the ITD can be configured with. They are:

Output Type	Features
TTL	TTL (5 V, 2 mA), 4-pin 5.08 mm connector.
Fiber	ST fiber connector, compatible with 50/125 µm, 62.5/125 µm and 100/140 µm glass fiber.

Table 1 – ITD Available Input Modules

P2: Input Connector (4-pin [5.08 mm] or ST Fiber)

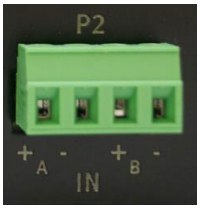

Figure 4 – 4-pin input connector

Figure 5 – Fiber input connector

The 4-pin connector is divided into 2 halves with the input on section 'A' and a 120 Ω termination on section 'B'. The polarity of the inputs is indicated by the '+' and '-' symbols on the back panel. TTL inputs are galvanically isolated from power, logic and outputs.

TTL inputs use a resistor to limit the current to 2 mA at 5 V with an input range of 5 – 12 V. In order to terminate the input, simply place a shorting link between the two pins of 'B'.

Note that only the last unit on the signal line should be terminated.

Modular Outputs

Output Type	Features
TTL	TTL (5 V, 2 mA), 4-pin 5.08 mm connector.
Fiber	ST fiber connector, compatible with 50/125 µm, 62.5/125 µm and 100/140 µm glass fiber.

Table 2 – ITD Available Output Modules

P3 – P6: Output Connectors (2-pin [5.08 mm] or ST fiber)

Figure 6 – 2-pin output connector

Figure 7 – Fiber output connector

The polarity of the outputs is indicated by the '+' and '-' symbols on the back panel. TTL outputs are capable of driving 150 mA at 5 V and are galvanically isolated from power, logic, inputs and other outputs.

Power Supply Options

There are three different power supply options available for the ITD: low, medium or high voltage. Each of the power supplies feature a similar maximum output rating of 4 W, but have different isolation levels as detailed below. All three supplies are available as an orderable option.

Power Supply	Features	
Low	14 – 36 Vdc	Maximum 5 W, 2 kV Isolation
Medium	20 – 75 Vdc	Maximum 5 W, 2 kV Isolation
AM IRIG-B	90 – 300 Vdc	Maximum 5 W, 3.75 kV Isolation

Table 3 – ITD Available Power Supplies Modules

P1: Power Supply Connectors (2-pin [5.08 mm, screw lock])

Power is applied to the unit via a 2 pin, 5.08 mm, screw lock connector. Maximum steady state power consumption is 4 W, and surge protection is provided. A mating connector is supplied that is suitable for wiring up to 1.5 mm^2. The power supply has an internal fuse rated at 2 A, 300 Vac/dc in the positive supply, to protect the unit.

NOTE: The Power supply has polarity protection built in to prevent damage.

The power supply inputs are isolated from earth so that any earthing system is acceptable (PEN, positive earth, negative earth or non-earthed low voltage supply).

The input voltage range is marked on the option label that is attached to the ITD.

If the fuse blows, the unit should be returned for service as this is an unusual condition.

Check the identification label on the base of the unit to ensure that the correct output and voltage range has been supplied before proceeding to install.

The label on the base of ITD contains the voltage range: Do not apply power outside of this range.

Earth Stud (M4 Bolt and M4 Nut)

An M4 bolt is provided for earthing. This is located on the rear panel on the left side of the case.

The earth must be connected for regulatory compliance purposes.

Isolation & Protection

All outputs on the ITD are isolated from each other, the power supply and from earth.

Each modular output features at least 3 kV isolation from earth and has ESD suppression suitable for the interface type.

The power supply isolation varies from 2 kV for Low and Medium power supplies to 3 kV for the High power supply. In addition, a varistor protects the power supply against transverse voltages and transient suppressor diodes protect the internal electronics from longitudinal events.

Time-sensitive signaling paths use fixed delay, high speed optocoupler to keep timing delays consistent.

The TTL input (P2) has a varistor and diode clamp protection and uses resistors to limit the current to 2 mA at 5 V. The limiting voltage for the input is 18 V. The TTL outputs (P3 to P6) are each protected against damage from transverse voltage events via an auto-resetting fuse, and transient suppressor diode.

Fiber outputs and inputs use the inherent protection afforded by the fiber itself for protection.

3. INSTALLATION

Identification

Each ITD is shipped with an identification label on the base and side of the unit. The label provides details of the particular options fitted to the unit, the power supply requirement, the serial number and firmware revision.

The label indicates the type of output module: Do not apply voltages to output only interfaces and ensure that switch cards are connected appropriately.

The label contains the voltage range: Do not apply power outside of this range.

Connecting the ITD

The ITD has a five IO connectors and one power connector across the back. The connections from right to left are: power, one input (P2) and four outputs (P3 - P6). Any output connection not required may be left unterminated. The screw terminals are designed for stranded cables 0.14 – 1.5 mm^2 (25 – 16 AWG).

Mounting the Isolated Timing Distributer

The clock can be used free standing or mounted in a 19" rack. Each unit ships with a rack-mount bracket for this purpose

Figure 8 – Isolated Timing Distributer with rack-mount bracket

4. Appendix

ITD – Specifications

Physical Specifications

Performance Property		Metric
Dimensions	Width	160 mm
	Depth	155 mm
	Height	40 mm
	Weight	800 g
Inputs	1	
Outputs	4	

Input and Output Specifications

Type	Electrical	Delay
TTL Connector Mates with Voltage Burden	 MC 1,5/ 4-G-5,08 MC 1,5/ 4-ST-5,08 5 – 12 V 2.5 V switching 2 mA	≤ 80 ns
TTL Out Connector Mates With Voltage Drive	 MC 1,5/ 2-G-5,08 MC 1,5/ 2-ST-5,08 5 V 150 mA @ 4.5 V	≤ 100 ns
Fiber In (λ = 820 nm)	ST, λ=820 nm, -34 dBm sensitivity	≤ 70 ns
Fiber Out (λ = 820 nm)	ST, λ=820 nm, -19 dBm Optical Power	≤ 4 ns

Environmental Specifications

Performance Property	Metric
Operating Temperature Range	-10 ~ +65 °C

Electrical Specifications

Performance Property		Metric
Power Supply	Low Voltage	14 ~ 36 Vdc
	Medium Voltage	20 ~ 75 Vdc
	High Voltage	90 ~ 300 Vdc
Power drain		5 W max

Isolation

Performance Property	Metric
Performance Property	**Metric**
Power to IO (Low / Med power supply)	5.0 kV DC
Power to IO (High power supply)	5.0 kV DC
Power to Earth (Low / Med power supply)	2.0 kV DC
Power to Earth (High power supply)	3.0 kV DC
Input to Earth	3.5 kV AC
Output to Earth	3.0 kV DC

5. WARRANTY

For terms and conditions of Tekron's Warranty see the Web Site

http://tekron.com/about-tekron/warranty

WARNING

This product has been designed to comply with the limits for a Class A digital device pursuant to Part 15 of FCC rules. These limits are designed to provide reasonable protection against such interference when operating in a commercial environment.

Notes

The information in this manual may change without notice. The manufacturer assumes no responsibility for any errors that may appear in this manual.

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