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# SECTION 1 - INTRODUCTION

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## OVERVIEW

There are four versions of the Digital Slave Output (DSO) module; this instruction discusses the IMDSO04. The difference between this version and the IMDSO01/02/03 is in the output circuitry and switching capabilities. Refer to Product Instruction I-E96-310 for information on the IMDSO01/02/03.

The Digital Slave Output module (IMDSO04) outputs sixteen digital signals from the Infi 90 system to control a process. It is an interface between the process and the Infi 90 Process Management System. The signals provide digital switching (ON or OFF) for field devices. Master modules perform the control functions; slave modules provide the I/O.

This manual explains the purpose, operation and maintenance of the slave module. It addresses handling precautions and installation procedures. Figure 1-1 illustrates the Infi 90 communication levels and the position of the Digital Slave Output (DSO) module within these levels.

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## INTENDED USER

System engineers and technicians should read this manual before installing and operating the DSO module. A module **SHOULD NOT** be put into operation until this instruction is read and understood. You can refer to the Table of Contents to find specific information after the module is operating.

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## MODULE DESCRIPTION

The DSO consists of a single printed circuit board (PCB) that occupies one slot in a Module Mounting Unit (MMU). It outputs sixteen separate digital signals through solid state circuits on the PCB. Twelve outputs are isolated from each other; the remaining two pairs share common positive output lines.

Two captive screws on the faceplate secure the module to the MMU. A front panel LED indicates the module operating status. Sixteen front panel LEDs (group A and group B) display the module output states (ON or OFF).

The slave module has three connection points for external signals and power (P1, P2 and P3). P1 connects to logic power (+5 VDC) that drives the module circuits (refer to Table 5-2). P2 connects it to the slave expander bus to communicate with a master module (refer to Table 5-3). The digital signals are output through connector P3 using a cable connected to a

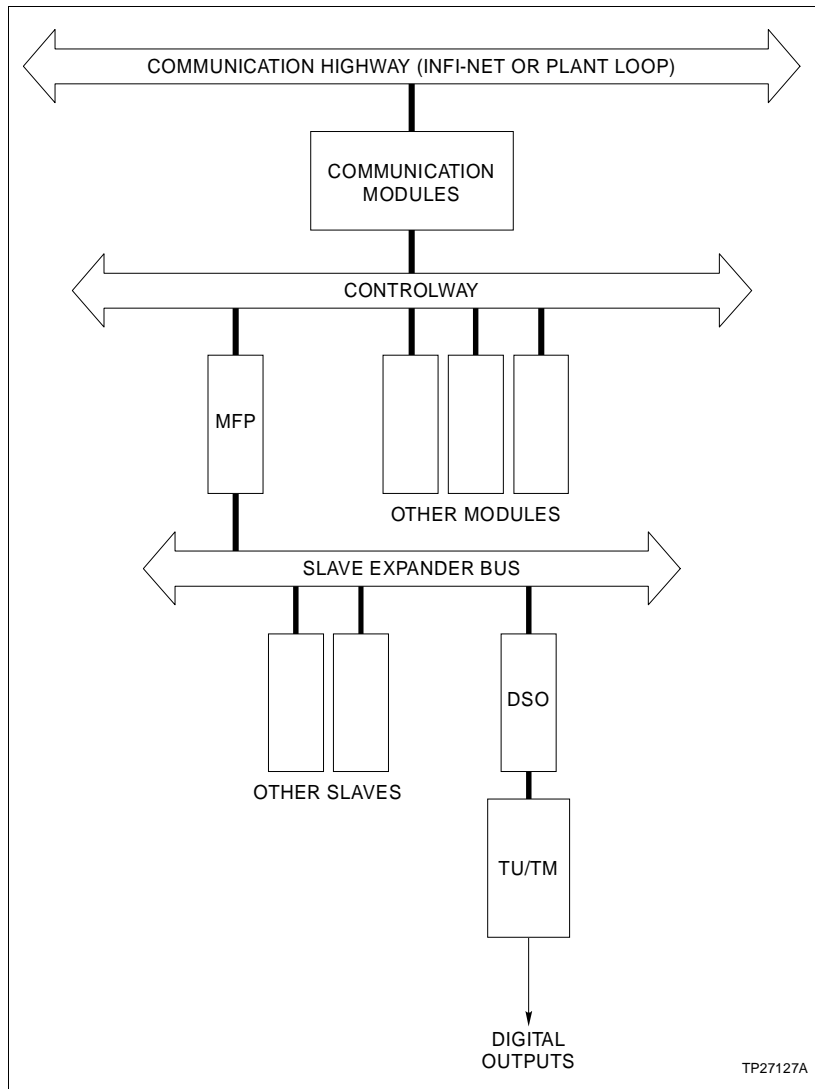


Figure 1-1. Infi 90 Communication Levels

Termination Unit (TU) or Termination Module (TM) (refer to Table 5-4). The terminal blocks (physical connection points) for field wiring are on the TU/TM.

## FEATURES

The modular design of the DSO, as with all Infi 90 modules, allows for flexibility when you are creating a process management strategy. It outputs sixteen separate digital signals to the process. Open collector transistors in the output circuits can sink up to 250 mA to a 24 VDC load.

The front panel LEDs provide a visual indication of the module status to aid in system test and diagnosis. You can remove or install a DSO module without powering the system down.

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## INSTRUCTION CONTENT

This manual consists of eight sections. **Introduction** is an overview of the DSO module: Features, description and specifications. **Description and Operation** explains the module operation and output circuitry. **Installation** describes precautions to observe when handling DSO modules, and setup procedures required before module operation. This section discusses switch settings and installation procedures. **Operating Procedures** explains the front panel indicators and start-up of the slave module. **Troubleshooting** describes the error indications and corrective actions to take. **Maintenance** has a maintenance schedule for the slave module. **Repair/Replacement Procedures** details the procedures to replace a slave module. **Support Services** provides replacement part ordering information. It explains other areas of support that Bailey Controls provides.

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## HOW TO USE THIS MANUAL

Read this manual through in sequence. It is important to become familiar with the entire contents of this manual before using the DSO module. The manual is organized in sections to enable you to find specific information quickly.

1. Read and do the steps in **Section 3**.
2. Read **Section 4** before powering up the module.
3. Refer to **Section 5** if a problem occurs.
4. Refer to **Section 6** for scheduled maintenance requirements.
5. Use **Section 8** when ordering replacement parts.

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## REFERENCE DOCUMENTS

Document Number	Document
I-E96-201	Multi-Function Processor (IMMFP01)
I-E96-202	Multi-Function Processor (IMMFP02)
I-E96-209	Logic Master Module (IMLMM02)
I-E93-911	Termination Unit Manual
I-E96-100	Operator Interface Station
I-E93-916	Engineering Work Station
I-E92-501-2	Configuration and Tuning Terminal
I-E93-900-20	Function Code Application Manual

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**GLOSSARY OF TERMS AND ABBREVIATIONS**

Term	Definition
<b>CTT</b>	Configuration and Tuning Terminal; hand held module that provides a local means for system configuration, tuning and diagnostics.
<b>Configuration</b>	A control strategy with function blocks.
<b>Controlway</b>	A redundant peer-to-peer communication path for point data transfer between intelligent modules within a process control unit.
<b>Digital</b>	A discrete signal having only two states: on or off.
<b>Dipshunt</b>	Dual in-line package with shorting bars.
<b>Dipswitch</b>	A dual in-line package that contains single pole switches.
<b>EWS</b>	Engineering Work Station; an integrated hardware and software personal computer system for configuring and monitoring Infi 90 modules.
<b>Function Code</b>	An algorithm which defines specific functions. These functions are linked together to form the control strategy.
<b>LED</b>	Light Emitting Diode; the module front panel indicator that shows status and error messages.
<b>LSB</b>	Least Significant Bit; the bit of a binary number that carries the least numerical weight.
<b>Latch Register</b>	A temporary storage buffer that latches onto a piece of data until instructed to move it elsewhere.
<b>Master Module</b>	One of a series of controller modules designed to direct field processes through a slave module. The multi-function processor is an example.
<b>MFP</b>	Multi-Function Processor Module; a multiple-loop controller with data acquisition and information processing capabilities.
<b>MMU</b>	Module Mounting Unit (IEMMU01/02); a card cage that provides electrical and communication support for Infi 90 modules.
<b>MSB</b>	Most Significant Bit; the bit of a binary number that carries the most numerical weight.
<b>OIS</b>	Operator Interface Station; integrated operator console with data acquisition and reporting capabilities. It provides a window into the process for flexible control and monitoring.
<b>PCU</b>	Process Control Unit; rack type industrial cabinet that contains master, slave and communication modules, and their communication paths.
<b>Slave Expander Bus</b>	Parallel address/data bus between the master module and the slave.
<b>TM</b>	Termination Module; provides input/output connection between plant equipment and the Infi 90 process modules. The termination module slides into a slot in the termination mounting unit.
<b>TU</b>	Termination Unit; provides input/output connection between plant equipment and the Infi 90 process modules. The termination unit is a flat circuit board for panel mounting.

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**SPECIFICATIONS**

<b>Power Requirements</b>	
<b>Voltage</b>	+5 VDC ( $\pm 5\%$ )
<b>Current Consumption</b>	135 mA (typical) 200 mA (maximum)
<b>Dissipation</b> (logic only)	750 mW (typical) 1.2 W (maximum)
<b>Outputs</b>	
<b>Load Voltage</b>	24 VDC
<b>Load Current</b> (maximum)	250 mA
<b>Off Leakage Current</b> (maximum)	10 $\mu$ A @ 70°C (158°F)
<b>On Voltage Drop</b> (maximum)	2.4 V @ 70°C (158°F)
<b>Current Consumption</b>	150 mA (typical), 250 mA (maximum)
<b>Isolation</b>	
300 V rms between output and logic circuitry and output to output. CSA approved for 300 V isolation.	
<b>Surge Withstanding Capability</b>	
Meets ANSI/IEEE C37.90A-1974 "Guide for Surge Withstanding Capability Test".	
<b>Mounting</b>	
Occupies one slot in a standard Infi 90 module mounting unit.	
<b>Environmental</b>	
<b>Ambient Temperature</b>	0° to 70°C (32° to 158°F)
<b>Relative Humidity</b>	0 to 95% up to 55°C (131°F) (non-condensing) 0 to 45% at 70°C (158°F) (non-condensing)
<b>Atmospheric Pressure</b>	Sea level to 3 km (1.86 miles)
<b>Air Quality</b>	Non-corrosive
<b>Certification</b>	
CSA certified as process control equipment in an ordinary (non-hazardous) location .	

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

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**NOMENCLATURE**

The following modules and equipment can be used with a DSO:

<b>Nomenclature</b>	<b>Hardware</b>
IMMFP01/02	Multi-Function Processor Module
IMLMM02	Logic Master Module
NIDI01	Termination Module, Digital Inputs
NTDI02	Termination Unit, Digital Inputs
NKTM01	Cable, Termination Module
NKTU02	Cable, Termination Module
NKTU01	Cable, Termination Unit