

DIGITAL SWITCHING SYSTEMS

Power Management Enclosures | Standard & Custom Keypads | Interface Boards

PI π SERIES
Power Intelligence by DNA



**Marine
&
Transportation
Applications**

PI SERIES SYSTEM

"Known by the Company We Keep"

With literally thousands of installations currently in the field, DSS is the clear choice by many for their digital switching requirements. We significantly beat our competition in terms of installed units and satisfied users. Since the inception of this technology in 1999, our customer list has expanded to include some of the biggest names in the industry and we are proud to be the "Supplier of Choice" for their switching needs. Whether you choose one of our standard products or a custom system designed exclusively for you, DSS has the capability and experience to deliver a solution that will meet your needs.

The Pi Series System

DSS's Power Intelligence (PI) Series is a digital switching solution developed for the marine and transportation markets. It combines state-of-the-art digital switching technology with an attractive user-interface styling to provide designers with an extensive and exciting menu of switching solutions. The main components consist of a control switch keypad that interfaces with a Power Management Enclosure (PME). The keypad sends instructions via a simple and convenient communication interface to the PME, which processes these instructions based on the current system status. Keypads are offered in variety of standard and custom configurations and the PME is available in both electromechanical and solid-state versions. Discrete mechanical switches are also able to communicate with the PME via the "PI Series" Interface Board.

The Power Management Enclosure (PME)

The **PME** is the **intelligence** of the system. The **PME** receives switch requests from the keypad(s) and then processes these commands based on the current system status. The response to a switch request may be an activation or deactivation of a circuit, the start of a timed function, or, in systems with keyless ignition, the locking or unlocking of the system. The **PME** then sends the system status information to the keypads to turn on/off the indicator LEDs and backlights.

There are two different types of **PMEs** available in the Pi Series.

The **Electro-Mechanical PME** uses relays for load switching and thermal circuit breakers for over-current protection. Each **Electro-Mechanical PME** is capable of controlling 20-switched outputs and one constant output, which are protected by 16 circuit breakers. All 20 switched outputs can also be used as 12V sensing inputs. See the Standard PME specification chart for more detailed information. All **Electro-Mechanical PME**s are factory programmed to meet your specifications.

The **Solid-State PME** uses intelligent solid-state relays for the switching of loads and over-current protection. All mechanical components are removed. Each **Solid-State PME** is capable of controlling 16-21 switched/constant outputs. A flashing indicator at the keypad indicates a circuit fault. Simply pressing and holding the corresponding indicator resets the circuit. The **Solid State PME** can be programmed in the field or preprogrammed at the factory. The **Solid State PME** can be a drop-in replacement for the **Electro-Mechanical PME**.

Standard Functions

- Nav/anc with keypad backlighting & dimming
- Toggle
- Momentary
- Inclusive scroll
- Reverse inclusive scroll
- One-hot scroll



Optional Functions

The use of solid-state switches allows for multiple features including: Scrolling (i.e. sequential, inclusive), dimming, speed control, timers (i.e. countdown or intermittent), sensing (i.e. secondary circuit current sense or tachometer input), keyless ignition including lockouts for blower/purge and false re-starts, H-bridge/motor reversing, pass code/master code resets and many other custom features. (See table for availability by PME type)

Standard Keypads

The Pi Series standard keypad offerings allow a designer to build a semi-custom system for a minimal cost. Each standard keypad is laser etched with a customer's specified button legends, text, or company logo.

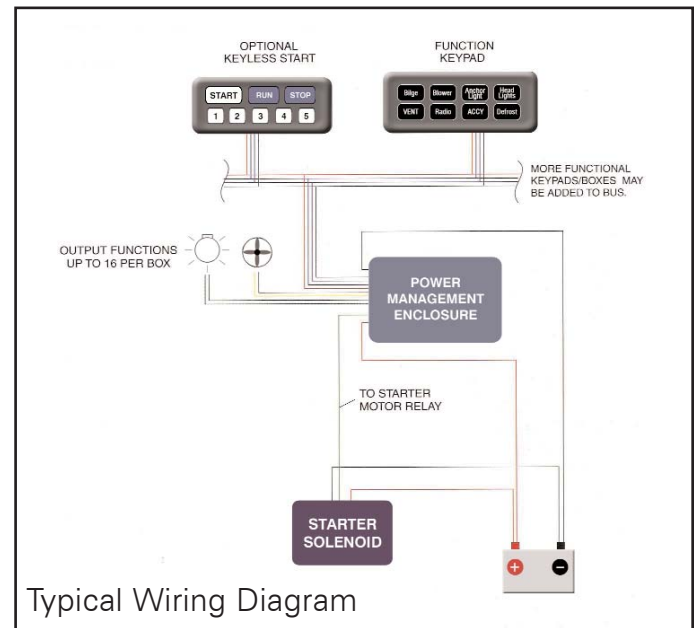
The Pi Series offers six different standard keypads in three different families. The first family consists of a four-button and an eight-button keypad. This family of keypads gives a more traditional switch appearance to the panel. There is one indicator for every button, which is on when the corresponding function is on. The keypads are also backlit for night viewing.

The second family consists of a seven-button and a ten-button keypad. This family of keypads gives a sleeker, more electronic look to the panel. The seven-button keypad has two indicators on the top button, three indicators on each of the middle four buttons and no indicators on the bottom two buttons. The ten-button keypad has three indicators for the middle eight buttons and two indicators for the buttons on each end of the keypad. The indicators are on when the corresponding function is on. These keypads are also backlit for night viewing.

The third family of keypads offers even more flexibility to the OEM or Value-added Reseller (VAR). The Re-Legendable keypads are the same size and shape as the four and eight-button keypads described above. However, they have a pocket above each button that accepts a clear plastic insert. The inserts can be silk-screened or pad-printed with text or symbols. The inserts can be supplied pre-printed or blank. This unique keypad allows customers to customize keypads on their own production floor!

The Analog Switch Interface Board (IF-Board)

The IF-Board allows conventional analog momentary switches to be connected to other Pi Series components. This is a low-cost way to duplicate a few functions at a remote location. Each IF-Board accepts up to four analog switch inputs, is capable of driving an indicator in each switch and also supports switches with backlighting circuitry. There is an indicator above each switch connector that is illuminated when the corresponding function is ON. The fifth indicator is illuminated when the backlight circuit is ON.



Typical Wiring Diagram



PI SERIES: SPECIFICATIONS **Electromechanical PME** **Solid State Gen 1.0 & 1.8** **Solid State Gen 2.0**

Electrical	Supply voltage	12V Nominal 8-16V or 24V Nominal 16-32V			
	Standby current	10mA per PME			
	Load current	20A per output	12A per output	20A per output	
	Input current	50A max	55A max	75A max	
	Communication bus	RS-485 between keypad and PME			
Mechanical	Circuit breakers	ETA Series 1658	N/A	N/A	
	Connector	Deutsch DRC 13-40P	Deutsch DRC 13-40P-A004	Molex MX150 Series	
	Mating connector	Deutsch DRC 18-40S	Deutsch DRC 16-40S-****		
	Housing / cover	Black ABS		Anodized aluminum	
	All screws	Stainless steel, AISI 300, passivated finish			
	Power lugs	1/4-20 phosphor bronze, electroplated bright tin			
	Power lug hardware	Silicone bronze hex nuts and flat split washers			
	Information label	Opaque polyester, white background with black text			
	Warning label	Opaque white mylar with orange background and black printing			
	PC board	0.093" thick, Nema Grade FR-4, Double clad with 3oz copper			
	PC board conformal coating / epoxy	0.008 min. thickness applied to both sides of PC board	All components are encased in electronics grade epoxy		
	Environmental	Operating temperature	0° C to +70° C		
		Storage temperature	-40° C to +85° C		
		Humidity	0 to 98% (no condensation)		
		Salt spray	Per ASTM B117		
Features	Circuits	16	16/21	22	
	Size	6 x 10 x 3"	6 x 10 x 1.5"	9.2 x 11 x 3	
	Remote reset	N/A	Standard	Standard	
	System reset	N/A	N/A	Optional	
	Status indicator	N/A	N/A	Standard	
	By-pass option	N/A	N/A	Optional 4 circuits	
	Low voltage sense & lock down	N/A	N/A	Standard	
	"H" Bridge capability	N/A	2 Outputs	4 Outputs	
	Analog switching	2 Circuits	N/A	2 Circuits	
	Sense pins	Special Option	1	4	
	Tach sense pins	Special Option	0/2	2	
	PWM Features*	N/A	21 Circuits	21 Circuits	
	Circuit status monitoring	N/A	N/A	Optional	
	CANbus Compliant	Optional	Optional	Standard	
	Field re-programmable	Optional	Optional	Standard	
	External status communication on the Bus	N/A	N/A	Optional	

PI SERIES SYSTEM: Specifications of Keypads & Interface Board

Family 1



Family 2



Relegendable



IF Board



DNA Group, Inc.
 PO Box 31727
 Raleigh, NC 27622-1727
 Tel: 919-881-0889
 Fax: 919-881-0144

www.dnagroup.com

PI SERIES: SPECIFICATIONS		Standard Keypad
Electrical	Supply voltage	12-24V Nominal 8-52V
	Standby current	10-30mA per PME
	Communication bus	RS-485
	LED indicator brightness (Orange)	1500mcd
Mechanical	Connector	Deutsch DT04-4P or equivalent ¹
	Mating connector	Deutsch DT06-4S ²
	Switch life	3 million operations
	Mounting studs	#10-32 CDS-510 phosphor bronze, electroplated bright tin
	Keypad	Silicone rubber with polyurethane hardcoat
	PC board	0.062" thick, Nema Grade FR-4, Double clad with 1oz copper
	PC board conformal coating / epoxy	All components are encased in electronics grade epoxy
	Operating temperature	0° C to +70° C
	Storage temperature	-40° C to +85° C
	Humidity	0 to 98% (no condensation)
	UV protection	UBVB 400 hours
	Salt spray	Per ASTMB117

Note ¹ - For 7 & 10 position: AMP MATE-N-LOK (P/N 350780-1), or MOLEX (P/N 50-84-2042)

Note ² - For 7 & 10 position: AMP MATE-N-LOK (P/N 350779-1), or MOLEX (P/N 50-84-1045)

PI SERIES: SPECIFICATIONS		Interface Board
Electrical	Supply voltage	12V Nominal 8-16V
	Standby current	10mA per PME
	Switch indicator current	170mA per indicator (internally limited)
	Switch backlight current	170mA total, 43mA per switch backlight (internally limited)
Mechanical	Communication bus	RS-485
	Connector	Deutsch DT04-4P or equivalent
	Mating connector	Deutsch DT06-4S
	Housing	PVC, 0.050" thick
	PC board	0.062" thick, Nema Grade FR-4, Double clad with 1oz copper
	PC board conformal coating / epoxy	All components are encased in electronics grade epoxy
	Operating temperature	0° C to +70° C
	Storage temperature	-40° C to +85° C
	Humidity	0 to 98% (no condensation)
	UV protection	UBVB 400 hours
	Salt spray	Per ASTMB117