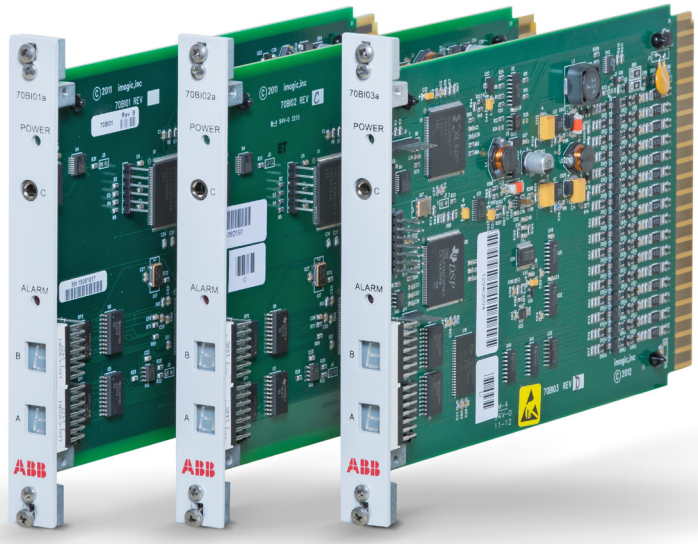
TECHNICAL DATA SHEET

Procontrol P13 I/O Modules

Input Modules for Digital Values
70BI01a, 70BI02a, 70BI03a and 70BI04a



The Procontrol P13 system features a comprehensive range of I/O modules for analog, digital and pulse based input and output signals. The new family of digital input modules comprises modules for acquisition of voltage or proximity sensor input signals and optional contact supervision as typically required for process control. All existing digital input modules of the classic Procontrol P13 portfolio can be seamlessly replaced by the new module family.

The core of the P13 digital input modules is the custom local bus UART and digital signal processing engine. Using the front panel configuration port and the P13 Configurator software, the modules can be monitored and configured for different applications.

The new family of digital input modules covers all typical applications in process control and power generation specifically: From acquiring binary signals in the control room and over short distances to field contacts over longer distances (and with higher contact voltage) to supervised contacts with additional status information for each input channel.

A major step forward compared to the classic P13 output input modules is the possibility to use the full local bus address range with every module (except 70BI03a). In addition, each input channel can be monitored directly from the P13 Configurator for easy application verification after modifications or upgrades.

Feature Highlights

- Comprehensive family of digital input modules for all power generation applications
- Flexible configuration possibilities for one-to-one replacements, retrofits and extensions
- Complete parametrization and configuration in software with the P13 Configurator tool; no need to set code switches and jumpers manually
- Support for disabling of input channel via configuration tool
- Monitoring of state of individual inputs on card level with the P13 Configurator tool
- All modules (except 70BI03a) can use the complete local bus address range (normal and special)
- New 16 channel input module with contact supervision for challenging retrofits with tight rack space constraints
- State-of-the-art technology (DSP/FPGA-based) for low maintenance and outmost durability
- Configuration cables are available with serial (DB9) or USB plug

Technical Data

		70BI01a	70BI02a	70BI03a	70BI04a
Description		Digital input, 24Vdc or proximity switches, 16x/8x	Digital input, 24/48Vdc, 16x/8x	Digital input, 24/48Vdc, contact supervision, 16x	Digital input, 24/48Vdc, contact supervision, 5x
Predecessor Module(s)		70EB01	70EB02		70EB03
I/O Interface					
No. of Channels		16 (8)		16	5
Input Types		24Vdc	48Vdc (24Vdc)	48Vdc (24Vdc)	48Vdc (24Vdc)
Input Characteristics		Resistance: 15kΩ to 'Z' ground	Resistance: 9kΩ to -24V	Resistance: 5.4kΩ to -24V 57.7kΩ to 'Z' ground	Resistance: 6.8kΩ to -29V 136kΩ to 'Z' ground
Connection Types		2-wire logic signal 2, 3, 4-wire binary proximity sensors	Single throw or double throw contacts		Single throw or double throw contacts 2-wire logic signal
Logic '0' Level		-30Vdc to +3Vdc	-24Vdc to 0Vdc	Contact Open -12Vdc to 0Vdc	Min. voltage across open contact 44V
Logic '1' Level		+11.2Vdc to +30Vdc	+2Vdc to +30Vdc	Contact Closed 0Vdc to 12Vdc	Min. Current through closed contact 5mA
Data Update Rate		50µs		2.5mS	2.5mS
Input Response		22Hz		28Hz	117Hz
Module Specific Data			48Vdc wetting for dry-contact devices	Monitored contact closure inputs requiring 2.2kΩ in series and 5.1kΩ in parallel with the contact.	Monitored contact closure inputs requiring either an external 4.7kΩ or connecting to the internal 4.7kΩ in parallel with the contact.
Local Bus Interface					
Channel Addressing (on local bus)		1 address, normal/special range		3 addresses (1 Data, 2 Status), normal range only	1 address, normal/ special range
Output Format (Data)		16bit Binary Word			
Output Format (Status)				Two 16bit Binary Words (High/Low)	Status integrated in normal channel data word
Update Rate for all Channels (on local bus)		1 local bus cycle			
Configuration and Maintenance					
Configuration Interface		Front panel RS232 (custom phone jack)			
Configuration Memory		EEPROM (onboard)			
Simulation Functions		none			
Fault Detection, Annunciation and Behavior					
Fault Conditions		Communications error, voltage source disruptions, over current conditions			
Fault Annunciation					
	Visual	Master module ALARM LED			
	I/O	SME1 Digital alarm output (+24Vdc)			
	Local Bus			Two Binary Status words (including Contact closed, Contact open, Open loop, Short Circuit, Over range)	Status integrated in normal channel data word (including Contact closed, Contact open, Open loop, Short Circuit, Ambivalence)
Fault Behavior		Input set to "0"		Input set to "0" or "Last known good value"	Input set to "0"
Electrical Characteristics					
Power Supply		via P13 rack			
Min Operating Voltage		+19.5Vdc			
Max Operating Voltage		+30Vdc			
Power Consumption		2.1W typical 5.3W max			
Max. Input Voltage		50V			
Current Draw					

Technical Data

		70BI01a	70BI02a	70BI03a	70BI04a
	Idle mode (all inputs in '0'-state)	< 30mA	140mA in mode 'wetting voltage supply internal' 63mA drawn from bus power US if in mode 'wetting voltage supply external' plus 43mA drawn from pin 95 (external power supply)	~125mA	
	Per input in '1'-state	~ 1.4mA	5mA through a closed contact	6mA (5mA minimum) through a closed contact	
	Per connected proximity sensor	~ 15mA			
Alarm Output Load		3mA			
Fault Output Capacity		<= 10mA (Protected against voltage back feed from other modules and against short circuit damage on load side.)			
Internal Wetting Supply Capacity		At least 250mA at no less than supply voltage minus 4Vdc			
Other Module Specific Data					
			-24Vdc internally generated and regulated.	Short circuit protection between channels. -24Vdc internally generated and regulated. Wire open, wire shorted and voltage over-range detected on each channel.	
Ambient Conditions and General Properties					
Operating Temperature		0 – 60°C			
Relative Humidity		0 – 95%			
Certifications		CE		CE, IEC 61508:2010 & IEC 61511:2004 (up to SIL3)	CE
Dimensions		P13 Standard module (3.5E, 1T)			

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