

Model Number
481A03

ICP® SENSOR SIGNAL CONDITIONER

Revision: L
ECN #: 24334

ELECTRICAL

	UNITS	VALUE		
Channels		16		
Display:		Open/Short Overload		
LED (red) - Bias				
LED (yellow)				
Sensor Excitation	V/mA	24 ±1/3-20		
Fixed Gain:		x1 (unity)		
Accuracy (at 500 Hz)	%	±1		
Linearity (10-50 kHz)	%	±1		
Frequency Response (gain x 1) (-5%)	Hz	0.5-100,000 [5]		
Spectral Noise (typical):	gain	x1	x10	x100 [5][10]
1 Hz	µV√Hz	3.0	20.0	200
10 Hz	µV√Hz	1.5	1.5	10
100 Hz	µV√Hz	1.0	1.0	8.0
1 kHz	µV√Hz	1.0	1.0	6.0
10 kHz	µV√Hz	1.0	1.0	6.0
Broadband Noise 1 Hz-10 kHz (typical)	µV	100	125	650 [10]
Spectral Noise (typical):	Gain x100	filter cutoff (-3dB) Hz	10	100 995 10.7k [4]
1 Hz	µV√Hz	750	125	65.5 101
10 Hz	µV√Hz	225	50.0	15.0 12.5
100 Hz	µV√Hz	35.0	70.0	15.0 9.00
1 kHz	µV√Hz	7.00	8.50	17.0 7.80
10 kHz	µV√Hz	0.50	0.90	1.50 7.20
Broadband Noise 1 Hz-10 kHz (maximum)	mV	4.00		[3]
Output Range (w/5 kΩ load minimum)	V/mA	10/2.0		
Overload Threshold	Vpk	10 ±0.2		
Output DC Offset (maximum)	mV	50		
Output Impedance	ohms	50 (maximum)		
Channel Isolation (minimum)	dB	72		
Power Requirements:	VAC	100-240		
Maximum	A	0.6		
Frequency	Hz	47-63		

ENVIRONMENTAL

Operating Temperature:	°F	32 to 120
	°C	0 to 50
Relative Humidity (maximum)	%	85

PHYSICAL

Connectors - Signal:		
Input (rear)	D-sub-50	1
Output (rear)	D-sub-37	1
Input (rear)	BNC	16
Output (front)	BNC	16
Connector - Power		IEC 320
Size (H x W x D):	in	3.5 x 19.0 x 16.25
	[mm]	[88.8 x 483 x 413]
Weight (maximum)	lb [kg]	15.0 [6.82]

NOTES:

- [1] Frequencies - 10 Hz, 100 Hz, 1,000 Hz and 10 kHz - tested at final calibration.
- [2] RS-485 interface uses proprietary interconnect of PCB equipment only.
- [3] Filter cutoffs 21.4k, 17.1k, 14.3k channel isolation 66 dB (minimum).
- [4] Gain x1 - Filter cutoff set to 995Hz - 28.0, 16.0, 14.1, 16.8, 1.40, Broadband 525. Gain x10 - Filter cutoff set to 995Hz - 30.0, 9.60, 8.20, 7.10, 3.20, Broadband 540.
- [5] Filter disabled, Option 157 included, serial greater than 132.
- [6] Filter disabled (157) accuracy is 1%, enabled -2%.
- [7] Option 038 included serial numbers greater than 160.
- [8] After serial number 171.
- [9] See PCB Declaration of Conformance PS024 for details.
- [10] Noise test per AT-107-2, using 401A05.

SUPPLIED ACCESSORIES:

- Model 017 Power Cable
- 009N03
- Ferrite Bead (part number 100-2973-30)
- EE-75 481A Control Software (1 CD ROM)



In the interest of constant product improvement, we reserve the right to change specifications without notice.

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Drawn	BLS	5/23/06	Spec No.	8388
Engineer	CPH	5/23/06		
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Approved	RNV	5/23/06		

UNITS

VALUE

012 - Calibration Signal: External Input or Internal Oscillator with Amplitude Control

External Input Amplitude Range	V rms	±1.0 (maximum)	
External Input Frequency Limits	Hz	0.5-100,000	[5]
External Input Buffer Gain Accuracy	%	1	
Internal Oscillator Frequency	Hz	100 (±2%)	
Internal Oscillator Amplitude	V pk	1 (maximum)	
Internal Oscillator Amplitude Steps	V	0.01	
Internal Oscillator Amplitude Steps Front Panel	V	0.05 (Option 103)	
Internal Oscillator Amplitude Accuracy	%	3	

020 - Programmable Overload Threshold Level

Threshold Maximum	V	10
Steps	V	1
Accuracy	%	2

037 - Programmable Fine Gain

Gain Accuracy	%	1
Linearity	minimum/maximum	0.1/200
Gain Limits:		0.1
Steps	kHz	90
Frequency Response (gain 0.1 – 99.9) (-2%/ -5%/ -10%)	kHz	20/65/90
(gain 100 - 200) (-2%/ -5%/ -10%)	kHz	20/60/80
Noise (spectral):	gain	x1 x10 x100
Typical	μV/√Hz	3.0 20.0 200
1 Hz	μV/√Hz	1.5 1.5 10
10 Hz	μV/√Hz	1.0 1.0 8.0
100 Hz	μV/√Hz	1.0 1.0 6.0
1 kHz	μV/√Hz	1.0 1.0 6.0
10 kHz	μV/√Hz	1.0 1.0 6.0
Broadband Noise 1 Hz-10 kHz (typical)	μV	100 125 650

038 - Expanded Programmable Fine Gain

[7]

Gain Accuracy	%	1
Linearity	%	1
Gain Limits:	minimum/maximum	0.0025/200
Steps	0.0025 - 9.9975	0.0025
	10.00 - 99.975	0.025
	100.0 - 200.00	0.25

NOTES:

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- [5] Filter disabled, Option 157 included, serial greater than 132.
- [6] Filter disabled (157) accuracy is 1%, enabled -2%.
- [7] Option 038 included serial numbers greater than 160.
- [8] After serial number 171.
- [9] See PCB Declaration of Conformance PS024 for details.
- [10] Noise test per AT-107-2, using 401A05.

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Drawn	BLS	5/23/06	Spec No.	8388
Engineer	CPH	5/23/06		
Sales	JJM	5/23/06	Sheet 2 of 3	
Approved	RJV	5/27/06		

	UNITS	VALUE			
Frequency Response (gain 0.0025 – 99.975) (-2%/ -5%/ -10%)	kHz	20/65/90			
(gain 100 - 200) (-2%/ -5%/ -10%)	kHz	20/60/80			[8]
Noise (spectral): Typical	gain	x1	x10	x100	[10]
1 Hz	μV√Hz	3.0	20.0	200	
10 Hz	μV√Hz	1.5	1.5	10	
100 Hz	μV√Hz	1.0	1.0	8.0	
1 kHz	μV√Hz	1.0	1.0	6.0	
10 kHz	μV√Hz	1.0	1.0	6.0	
Broadband Noise 1 Hz-10 kHz (typical)	μV	100	125	650	

057 - Programmable Low Pass Filter (Elliptic)
157 - Programmable Low Pass Filter (Elliptic) with Enable/Disable

Order of Filter		8			
Pass Band Ripple	dB	1			
Pass Band Accuracy	%	2			
Cutoff Frequency Accuracy	%	5			[1]
Stop Band Attenuation (minimum)	dB	70			
List of Cutoff Frequencies (fc): >5% apart	kHz	21.4	17.1	14.3	[3]
		12.2	10.7	9.51	
		8.56	7.78	7.13	
		6.58	6.11	5.71	
		5.35	4.75	4.51	
		4.28	4.08	3.89	
		2 thru 3.72k			
Roll Off	dB	>65 at 1.5 Times fc			

080 - 16 BNC Inputs Rear Panel

101- Digital Control with RS-232/RS-485 Interface

Connectors	D-sub-9	2			
Baud Rate	bits/sec	9,600			
Start, Data, Stop, Parity		1, 8, 1, No			
Handshaking		RTS/CTS			
RS-485 Devices In System		16			[2]
Cable Length (maximum): RS-232	ft	50			
Cable Length (maximum): RS-485 *	ft	200			
Supplied Accessories	cable	009N03			

102 – Memory Default

103 - Front Panel Control/Display

Keypad		4			
Reset		1			
Display (dot matrix)	row/column	2/16			

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Approved	RJV	5/23/06	
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