# **FS2000**

DIGITAL INDICATOR WITH GRAPHIC DISPLAY/TOUCH PANEL (SD CARD SLOT & HIGH SAMPLING RATE)



## The best solution for OK/NOK judgment of press fitting and caulking application !! High responsiveness of 5kHz to fully utilize the performance of Super Cell !! A fluctuation of force is shown as a waveform!!

- Two-dimensional OK/NOK judgement can be performed with a load cell and displacement sensor.
- 25000 times/sec high-speed processing
- Analog monitor output
- Voltage output is proportionate to the input signal making the recording on recorder convenient. Approx. 2V per 1mV/V strain gauge input
- Variety of interfaces USB / DeviceNet / CC-Link / EtherNet/IP
- 4.3-inch color LCD module & touch panel
- Operation can be effortlessly performed by a direct touch on the touch panel.
- I/O Input: Plus common / Minus common selectable. I/O Output: Sink type / Source type selectable.
- RoHS-compliant product

#### Visualize high-speed force fluctuation

High responsiveness of analogue bandwidth 5kHz (sampling 25kHz)

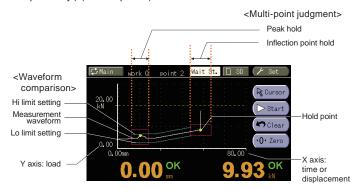
#### Comparison & hold function by waveform display

#### Waveform comparison

This function compares the actual measurement waveform against the setup High/Low limit waveforms and will give out an NOK judgment when any of the point exceeded the preset High/Low limit waveforms.

#### Multi-point judgment

OK/NOK judgment can be performed on multi points in one process. (e.g. The start point and end point of press fitting can be judged respectively.) (Max. 5 points)



#### Improved usability

4.3 inch wide display provides excellent visibility. Main display configuration can be selected to keep it as simple as possible by eliminating unnecessary information.



OK judgment

#### Saved measured data (waveform) on the SD card can be displayed afterwards

Measured data and set values can be saved in the SD card. Data can be converted to CSV format easily for editing with Microsoft Excel.



#### Trend display is helpful for preventive mainte

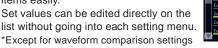
Trend of the zero-point shift and hold values can be monitored to find any irregularities for preventing breakdown of machines.

In addition, the master settings can be registered so that operator can compare with the current settings to see if there are any differences.

Trend display

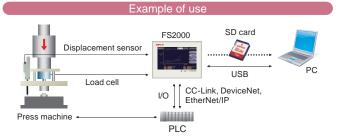
#### Changed setting items are highlighted!

Master and current set values are listed up for checking the changed setting items easily.





List display



UNIPULSE

SENSOR	Sensor input for load	(Fixed as strain gauge input) (6-wire)		Input signal	(16) Lood (	ligital zer
INPUT		DC 2.5, 5, 10V±10% (depending on settings)		input signar		rement ei
	Excitation voltage	Output current: Within 30mA				y light up
	Signal input range	-2.0 to +2.0mV/V				/pe: Plus
	Accuracy	Non-linearity: Within 0.02%/FS ±1 digit (at 2.0mV/V input)				commor
	,	Zero drift: Within 0.1µV/°C RTI				nect a tra
		Gain drift: Within 15ppm/°C				IP output
	Low-pass filter	Selectable from 10 to 10kHz (at A/D converter speed 25000 times/sec)	INTERFACE	USB:	USB interface	n output
		Selectable from 2 to 2kHz (at A/D converter speed 5000 times/sec)			DeviceNet inter	face (ont
	A/D converter	Speed: Selectable from 25000 times/sec, 5000 times/sec			CC-Link interfa	
		Resolution: 24bit Effective Resolution: Approx. 1/30000 against 5V			EtherNet/IP inte	
	Sensor input for displace	ement (Standard: Pulse input (Line driver) Option: Pulse input (Open collector) [MLT]			ption can be inst	
	Max. input frequen		OPTION		I/O Source Boa	
	Internal count rang	-	GENERAL	Power suppl		DC2
	Adaptable rotary er		SPECIFI-	Power consi		6W
		Also capable of single-phase output	CATION	Operation co		Tem
		(A-phase input used. All pulses are counted as in the plus direction		operation of	onation	Terri
		Output stage circuit specification: Line driver (Based on RS-422)	, I I I I I I I I I I I I I I I I I I I			Hun
		Output stage circuit specification; Open collector [MLT] (built in pull-up resisto	)	Dimension		132
	Sensor input for load o	displacement (Option: Voltage input [MLT])	<u>/</u>	Weight		App
	Signal input range	-10 to +10V	ATTACHMENTS		or (with cover)	
	Input impedance	App. 1M	ATTACINETIO	Analog conr		
	Accuracy	Non-linearity: Within 0.02%/FS ±1 digit (at 10V input)		Operating to		
	Accuracy	Zero drift: Within 0.02%/PS ±P digit (at 10% input)		SD card		
		Gain drift: Within 0.01%/°C		Operation M		
	Low-pass filter	Selectable from 10 to 10kHz (at A/D converter speed 25000 times/sec)	OPTIONAL		I/O connector (v	
	Low-pass men	Selectable from 2 to 2kHz (at A/D converter speed 25000 times/sec)	ACCESSORIES		CC-Link conner	
	A/D converter	Speed: Selectable from 25000 times/sec	ACCESSORIES		Double row cor	
	A/D converter				Analog connect	
			-		DeviceNet conr	1 1 1 (with cove ector onnector fo
	Analog voltage outp				1 GByte card	IECIUI
		Load resistance 2k or more	_		2 GByte card	
DISPLAY	Display	4.3 inch TFT color LCD module			USB cable (A-n	iniB type
		Display area: 95.0 (W) ×53.9 (H) mm		0/101 0000	COD cable (// II	шир сурс
		Dot configuration: 480×272 dot	_			
	Display frequency	Fixed at 3 times/sec			<u></u>	
			_		Struc	ture c
	Multi point compariso	on mode: 16 presets (set values)			Struc	ture c
&	Multi point compariso Capable	n mode: 16 presets (set values) of judging up to 5 hold points at the same time.				
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	Input signal (16)	-			djustment / Measurement start /
				HOLD1 to 5 / I	
				-	uch panel lock / Work change
		1 21			imon selectable.
		(Minus com		£ 37	
					output type (sink type) for plus common
		and PNP ou	utput type	(source type) for	or minus common.
INTERFACE	USB: USB in	nterface			
	ODN: Device	Net interface	(option)		
	CCL: CC-Lin	nk interface (o	ption)		
	EIP: EtherN	let/IP interface	e (option)		
	(Only one option ca	an be installed	l)		
OPTION	ISC: I/O Sor	urce Board			
GENERAL	Power supply voltage	ge	DC24V(±	15%)	
SPECIFI-	Power consumption	ı	6W typ		
CATION	Operation condition	1	Temperatu	ure: Operati	on:-10 to +40°C
				Storage	e:−20 to +60°C
			Humidity:	85% RI	H or less (non-condensing)
	Dimension		132 (W) ×9	98 (H) ×110 (D)	mm (not including projections)
	Weight		Approx. 1.	.0 kg	
ATTACHMENTS	I/O connector (with	cover)1		DeviceNet	connector
	Analog connector	1		(when Dev	viceNet option is selected)1
	Operating tool	1		CC-Link co	nnector
	SD card	1		(when CC	-Link option is selected)1
	Operation Manual	1			
OPTIONAL	CN36: I/O cor	nnector (with c	cover)		
ACCESSORIES	CN71: CC-Lin	nk connector			
	CN72: Double	e row connecte	or for CC-I	Link	
	CN77: Analog	g connector			
	CND01: Device	Net connecto	r		
	SD1G: 1 GByt	ie card			
	SD2G: 2 GByt	te card			
	CA81-USB USB ca	able (A-miniB	type) 1.8	m	
		<u></u>			
		Structur	e or pr	roduct co	de
	Б	S2000			
		32000	L		
() Ctondo	and unsit	(1)	(2)	(3)	(4)
1)Standa	ira unit	0	0	0	0
②I/O out	put			<li>④Interface</li>	ce
Sign	Output type			Sign	Interface
Standard	Sink type(NPN of	outout)		Standard	USB
ISC	Source type(PN				
		. Juipui)			nal interface can be added
3Sensor	r input				
Sign	Output type			ODN	DeviceNet
Standard	Strain gauge,			CCL	CC-Link
	g go,		1	FID	EtherNet/IP

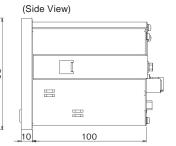
DeviceNet CC-Link EtherNet/IP

EIP

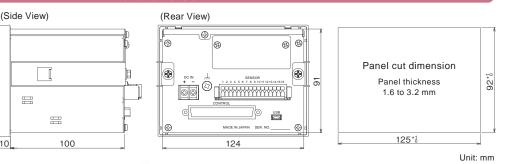
Combination table			
X axis	Y axis	Standard	MLT
Time	Strain gauge		
Line driver	Strain gauge		×
Time	Voltage (Load)	×	
Open collector	Strain gauge	×	
Open collector	Voltage (Load)	×	
Voltage (Displacement)	Strain gauge	×	

MLT Strain g		auge,		]
	Open collector,			
	Voltage (Load or displacement)			
Combinatio	on table			
X axis		Y axis	Standard	MLT
Time		Strain gauge		
Line driver		Strain gauge		×
Time		Voltage (Load)	×	
Open collec	tor	Strain gauge	×	
Open collector		(beo I) anetloV	~	

## (Front View) UNIPULSE 98 DIGATOR FS2000 132 10



### External dimension



#### Digital contact sensor ULE-50



A digital contact sensor designed for FS2000 and F381A-LDI. You can perform OK/NOK judgment with a Force vs Displacement curve.



Wide measuring range & high-accuracy Measuring range: 50mm Resolution:  $2.5 \mu$ m