Sherborne **Sensors**

.... the first choice in precision

PRODUCT CATALOGUE

Global leaders in sensor design and manufacture for load, acceleration and inclination

Sherborne Sensors is a specialist sensor and instrumentation manufacturer that provides solutions for test and measurement, industrial, manufacturing, R&D, aerospace and defense applications globally.

www.sherbornesensors.com

Sherborne Sensors specialise in:

- High precision inclinometers, accelerometers & load cells
- Remote monitoring, Realtime, High Precision and Harsh environment applications
- Strain Gauge Load Technology, Servo and MEMS based Inclinometer and Accelerometers.
- Custom designed sensors and systems for specific applications

Certified System
SAI GLOBAL
AS9100
Aerospace

CE

UKAS QUALITY MANAGEMENT 001

NOVA METRIX

Overview

About Sherborne Sensors

Sherborne Sensors is an ISO9001 and AS9100C certified global leader in the design, development, manufacture and supply of high precision inclinometers, accelerometers, load cells, instrumentation and accessories for test and measurement, industrial, manufacturing, R&D, aerospace and defence applications globally.

The Company maintains a manufacturing and sales office in the UK, and a sales and stocking facility in North America, with representation globally. The core technologies used in our products are industry standards that have been continually improved upon over several decades to expand the capabilities, performance and reliability of each sensor product.

Applications

Remote Monitoring Applications

All-weather radio telemetry systems designed to provide high accuracy remote angle measurement data for applications including transportation, shipping, continuous monitoring, installation & commissioning and manufacturing

Realtime & High Precision Measurement Applications

Extremely sensitive, rugged transducers deigned to provide horizontal angle or vertical deviation measurements with virtually infinite resolution for test & measurement, R&D, industrial, process control, OEM and manufacturing applications.

Harsh Environment Applications

IP67 Hermetically sealed devices for use in challenging agricultural, automotive, industrial, chemical, testing and manufacturing environments.

Product Range

Inclinometers
Inclinometers are available with specifications to support very high accuracy and precision applications. Ranges vary from +/-1 degree to +/-90 degrees. A variety of form factors, connection styles, materials of construction, output formats, and application specific devices are available in single, dual, and tri-axial configurations, using both conventional servo mechanical and MEMS technologies.

Accelerometers
Accelerometers are available in ranges from +/- 0.1g up to several hundred g. Both conventional servo mechanical and MEMS technologies are available in single, dual, and tri-axial configurations. Optional electronics, enclosures for multiple sensors, materials of construction and a range of IP ratings are available.

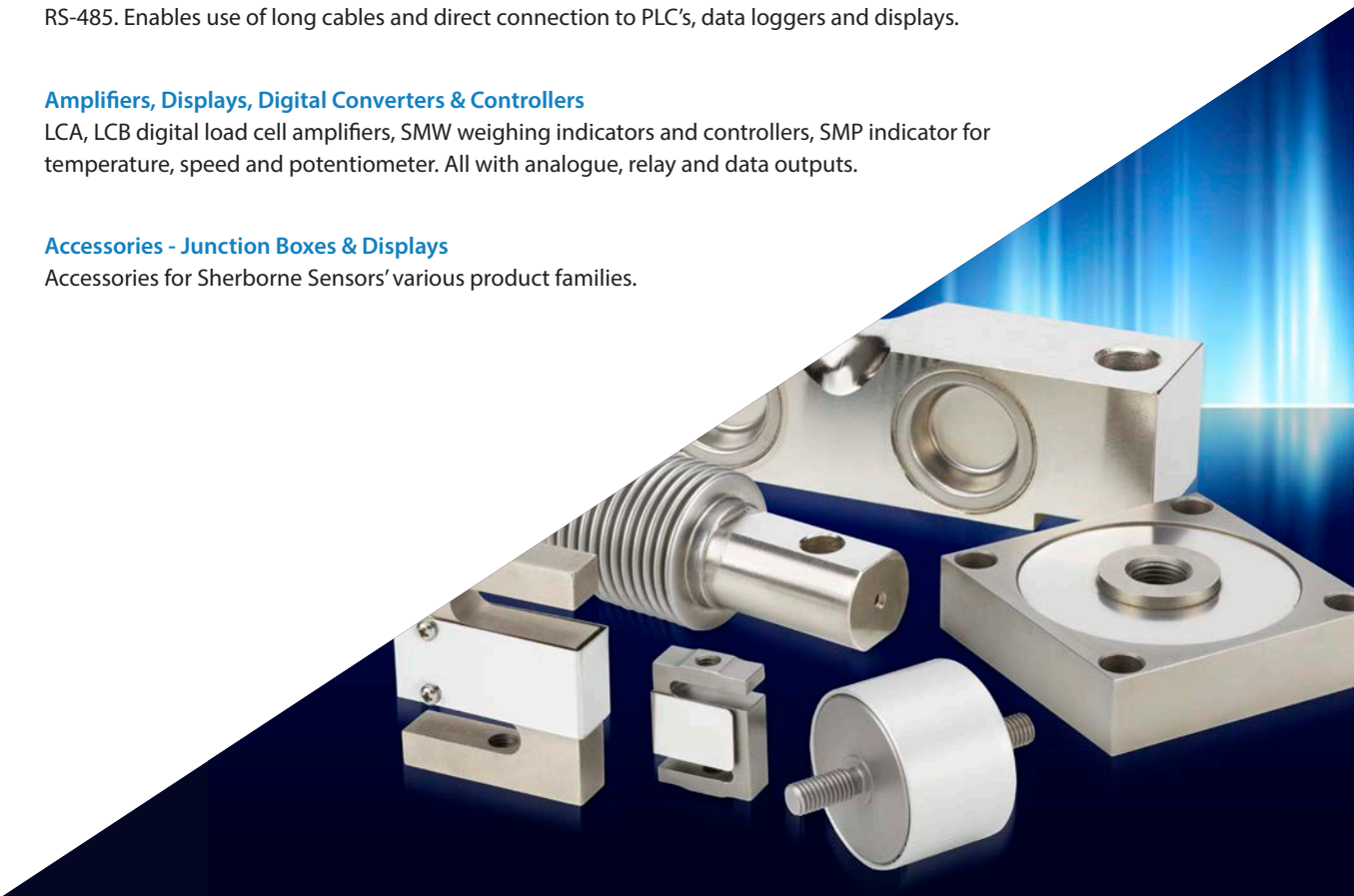
Load Cells
Sherborne Sensors load cells are available in ranges from 0.07 lb to over 132 klb. All products are high performance systems using advanced strain gage technologies.

WTS- Wireless Telemetry System
Wirelessly transmits a wide range of sensor outputs from Sherborne Sensors Load Cells, Inclinometers and Accelerometers up to 200 m (650 ft), or further using range extender (WTS-AR) and receive using a range of base stations, handhelds, displays and other outputs. Excellent battery life of up to 5 years and high accuracy measurement.

ILSC – In Line Signal Conditioners
A range of in line signal conditioners converting a standard load cell output into 0-10V, 4-20mA, RS-485. Enables use of long cables and direct connection to PLC's, data loggers and displays.

Amplifiers, Displays, Digital Converters & Controllers
LCA, LCB digital load cell amplifiers, SMW weighing indicators and controllers, SMP indicator for temperature, speed and potentiometer. All with analogue, relay and data outputs.

Accessories - Junction Boxes & Displays
Accessories for Sherborne Sensors' various product families.



High Precision Inclinometers

Inclinometers are available with specifications to support very high accuracy and precision applications. Operational ranges vary from +/-1 degree to +/-90 degrees. A variety of form factors, connection styles, materials of construction, output formats, and application specific devices are available in single and dual axis configurations, using both conventional servo mechanical and MEMS technologies. Certain products are now offered with total error band specifications.

Typical applications include: Antenna Positioning; Munition Fire Control Systems; Rail Line Maintenance and Repair; Steel Casting; Wind Tunnels and Oil and Gas Drilling.

	LSOC/P	LSW	DSIC	WTS	T935	LSI	Accustar
							
Description	Servo Rugged Industry Standard	Servo Rugged Industry Standard	Digital Output Rugged Servo	Wireless Advanced Tilt System	Servo Rugged Small Form Factor Voltage Output	Gravity Referenced	Solid State Single Axis
Range (°)	±1 to ±90	±1 to ±90	±5 to ±60	±5 to ±60	±1 to ±90	±3 to ±90	±60
Full Range Output	±5Vdc	±5Vdc	RS485 ASCII	Angle	±5Vdc	±5	60mV / deg
Supply Voltage (Vdc)	±12 to ±18	±12 to ±18	+9 to +18 or +18 to +36	Integral Battery	±12 to ±18	±12 to ±18	±5 to ± 30
Resolution	0.1 to 4.0 arc-second	0.1 to 4.0 arc-second	0.001°	0.003° to 0.006°	0.1 to 4.0 arc-second	0.2 to 4.0 arc-second	0.05°
Thermal Zero Shift (% FRO/°C)	0.003 - 0.05	0.003 - 0.05	Accuracy of 0.08 degrees or better across entire compensated temperature range	0.007	0.003 - 0.05	0.003 - 0.03	0.01
Thermal Sensitivity (% reading/°C)	0.006 - 0.04	0.006 - 0.04		0.007	0.006 - 0.05	0.006 - 0.03	0.01
Non-linearity (%FRO max)	0.02 - 0.05	0.02 - 0.05		0.05	0.02 - 0.08	0.02 - 0.05	0.05
-3dB Frequency (Hz)	10 to 55	10 to 55	20 Max	5	10 to 55	15 to 55	2
Operating Tempera- ture Range (°C)	-18 to +70	-18 to +70	-40 to +80	-20 to +60	-18 to +70	-18 to +70	-40 to +80
Mechanical Shock Limit (g) half sine	1,500	1,500	1,000	1,000	1,500	500	
Connection	Connector or solder pin	Connector or solder pin	Connector	Wireless	Solder Pin	Solder Pin	Flying lead
Features	Single or Dual Axis ±5Vdc or 4-20mA output options fluid filled	Single or Dual Axis ±5Vdc or 4-20mA output options fluid filled	Single or dual axis defined total error dynamic filter fluid filled	Remote on/off no communication license battery & display options	Single or dual axis stainless steel housing fluid filled	Servo with ±5Vdc output & 2 supply options	single ended or analog output
Options	Mating connectors power supplies indicator displays	Mating connectors power supplies indicator displays	Mating connectors baseplate	Alkaline and rechargeable Li-ion batteries display and base stations	Wire harnesses power supplies indicator displays	Power supplies & indicator displays	
Integrated System Solution Available	Yes	Yes	Yes	No	Yes	Yes	

"We have tried working with several other inclinometer manufacturers over the last few years, and could never find a company that cared to make the effort to truly understand our business, and the demands placed on us by our customers. Based on their initial proposal, we worked with Sherborne Sensors extensively to determine the most appropriate sensor for our application. I can't say enough about how pleased we are to have them as a valued supplier."

Rob Olenoski, Vice President, International Cybernetics Corporation.

Accelerometers

Accelerometers are available in ranges from +/- 0.1g up to several hundred g, with a focus on accuracy, reliability, frequency response, and repeatability across the product line. Both conventional servo mechanical and MEMS technologies are available in single, dual, and tri-axial configurations.

Optional electronics, enclosures for multiple sensors, materials of construction and a range of IP ratings are available. Typical applications include: Flight Control; Structural Health Monitoring; Crash Recorders and Rail Car Motion Control.

	A215/220	A260	A320	A545	A640
					
Description	Servo Force Balance Industry Standard	Servo Force Balance 28Vdc Flight Applications	Servo Rugged Ultra Low Range	Advanced MEMS mV Output	Advanced MEMS Voltage Output
Range (g)	±1 to ±20	±1 to ±20	±0.1 to ±2	±2 to ±200	±1 to ±20
Full Range Output (Vdc)	±5	±5	±5 or ±10	±15mV	± 5
Supply Voltage	±15Vdc	+16 to +32	±15	+5	+6 to +32
Resolution (% FRO)	<0.0005	<0.0005	<0.0005	<0.005	<0.0005
Thermal Zero Shift (± % FRO/°C)	0.002	<0.002	0.005 to 0.03	<0.06	0.06 to 0.12
Thermal Sensitivity (± % FRO/°C)	0.02	0.02	0.006 to 0.03	0.06	0.06
Non-linearity (± %FRO max)	0.05 to 0.10	0.05 - 0.10	0.01 - 0.02	0.5	0.5
-3dB Frequency (Hz)	90 to 150	90 to 150	20 to 60	700 to 6,000	5 to 600
Operating Temperature Range (°C)	-55 to +95	-55 to +95	-18 to +70	-40 to +105	-40 to +100
Mechanical Shock (g) half Sine	100	100	1,500	1,000	200
Connection	Connector or Solder Pin	Connector	Connector or solder pin	Solder Pin	Connector or Solder Pin
Features	Miniature or standard form factor with 1g bias option	Single ended supply & 1g bias options aerospace applications	±5Vdc or 4-20mA output options fluid filled	Single, dual or tri-axial versions available	1g Bias option replacement for Schaevitz A400 series
Options	Mating connectors power supplies indicator displays	Mating connectors indicator displays low pass filters	Mating connectors power supplies indicator displays	Indicator displays	Mating connectors indicator displays

By incorporating Sherborne Sensors' custom linear servo accelerometer technology into their proprietary SHM data collection device, STRAAM's experts can say whether a structure transfers loads as designed. Michael Horodniceanu, president of New York City Metropolitan Transportation Authority Capital Construction, has tested the STRAAM service for both constant monitoring and structural analysis of fragile buildings. Notes Horodniceau, "This is a great tool that will allow us to look at buildings differently. It takes a lot of the guesswork out of it," he says. "We are very excited about continuing to use this system."

Load Cells

Sherborne Sensors load cells are available in ranges from 0.07 lb to over 132 klb. All products are high performance systems using advanced strain gauge technologies. Our load cells exhibit excellent side load and bending moment compensation, high frequency response, a variety of materials of construction, and the ability to customise form factors and ranges to optimise results to meet specific requirements. Typical applications include: Payload Validation; Flight Test Labs; Suspended Loads; Pharmaceuticals/ Tablet Manufacturing and Tank Weighing.

	SS2/3	SS5000	SS4000M	U2000	S02 'S-Type'	LP01 Low Profile	LP02 Low Profile
							
Description	Miniature, Single Point ultra-low force range	Miniature, high-level ampli-fied output	Miniature S-Type universal load cell	Miniature Pancake style. low profile, tension / compression	S-Type, General purpose, tension / compression Ideally suited for batching and filling, conveyor and hopper/tank weighing.	Low profile load cell is a pancake style, load button type load cell for applications up to 100,000 lb	Tension / compression, threaded pancake style load cell is specifically designed for applications up to 40,000 lb
Operating Range	±0.07lb or +0.13lb	60lbs to 450lbs	2.5lBs to 110lbs	562 lbs to 5.6klbs	20 lb to 44klb	2klb to 100 klb	4.5 klb to 11 klb
Operational Mode	Universal or Compression only	Universal	Universal	Universal	Universal	Compression	Universal
Recommended Excitation Voltage (VDC)	5	±10	10	10	10	10	10
Safe Overload Capacity (% range)	500	150	150	150	150	120	150
Full Range Output (mV/V)	12	±0.15	±2	2	3.0	4	2
Non-linearity (%FRO)	-	0.25	0.05	-	0.017	0.025	0.03
Combined Error (%FRO)	0.5	-	-	0.25	0.017	-	-
Compensated Temperature Range (°C)	+14 to +149	-13 to +167	+14 to +140	+32 to +140	-22 to +158	-86 to +158	-86 to +158
Thermal Zero Shift (± % FRO/°C)	±0.02	±0.02	±0.01	±0.02	±0.017	±0.005	±0.002
Thermal Sensitivity (± % Reading/°C)	±0.02	±0.02	±0.002	±0.005	±0.017	±0.005	±0.002
Electrical Connection	Integral cable	Integral cable	Integral cable	Lemo con-nector	Integral cable	Integral cable	Integral cable
Environmental Protection	IP51	IP65	IP54	IP54	IP65 / IP68	IP67	To IP68
Features	Ultra low range high frequency response	High level amplified output stainless steel construction	35mm high excellent side load and bending moment compensation	18 mm high excellent side load and bending moment compensation	High accuracy stainless steel construction	Includes mounting base	Threaded connec-tions Mounting base
Options	-	-	Rod end bearing for tension applications	Mounting base spherical load button double bridge	Rod end bearing for tension applications	-	Rod end bearing for tension applications

"We used Sherborne Sensors load cells to determine the clamping forces of mounting bolts during the development of our capture torque analyser system. The Sherborne load cells were accurate and robust, plus the service and support we received from Sherborne was excel-lent " - Kieron Smith, MD of MHH

Load Cells

Sherborne Sensors load cells are available in ranges from 0.07 lb to over 132 klb. All products are high performance systems using advanced strain gauge technologies. Our load cells exhibit excellent side load and bending moment compensation, high frequency response, a variety of materials of construction, and the ability to customise form factors and ranges to optimise results to meet specific requirements. Typical applications include: Payload Validation; Flight Test Labs; Suspended Loads; Pharmaceuticals/ Tablet Manufacturing and Tank Weighing.

	LP03 Low Profile	LP04 Low Profile	SB01 Shear Beam	SBD01 Double Shear Beam	B01	ADW15 Indicator	PSD Indicator
							
Description	Standard, bonded foil, strain gage load cell designed for standard low profile applications of up to 20,000 lb.	Designed for high capacity, standard applications with capacities up to 132,000 lb	The SB01 is typically used for platform weighing, vessel and tank weighing applications. Capacities range from 1klb to 55klb.	SBD01 double ended shear beam load cells is typically used for test & measurement and weighing applications of up to 75,000 lb	Heavy duty, constant moment, industrial beam load cell designed for industrial weighing and scale applications.	Digital indicator. Supplies excitation voltage and displays the output of most strain gage based load cells	Handheld 7 digit LCD display for strain gage and load cell output display
Operating Range	Up to 20klb	Up to 132klb	Up to 55klb	Up to 75 klb	Up to 11 klb	2klb to 100 klb	7 digit LCD display, 8.8mm high digits
Operational Mode	Universal	Universal	Compression	Compression	Compression	AC or DC Variants	Battery
Recommended Excitation Voltage (VDC)	5	10	10	10	10	10	5
Safe Overload Capacity (% range)	150	150	150	150	120	150	N/A
Full Range Output (mV/V)	2	2	2	3	2	0.5 to 200 mV/V	-50 to +50 mV/V
Non-linearity (%FRO)	0.1	0.1	0.0167	0.025	0.0167	-	-
Compensated Temperature Range (°F)	-86 to +158	-86 to +158	-86 to +158	-86 to +158	-86 to +158	-	-
Thermal Zero Shift (± % FRO/°C)	±0.00175	±0.05	±0.017	±0.02	±0.017	-	-
Thermal Sensitivity (± % Reading/°C)	±0.02	±0.05	±0.017	±0.02	±0.017	-	-
Electrical Connection	Integral cable	Integral cable	Integral cable	Integral cable	Integral cable	2.5mm saddle field	5 Pin Binder Socket
Environmental Protection	IP67	IP67	IP68	IP68	IP68	IP67	To IP65
Features	Industry-standard sizes and bolt patterns	-	-	-	-	Isolated inputs and outputs Auto Calibration Peak Hold Auto zero	Handheld suitable for use with strain gage based load cells with an o/p sensitivity up to 50mV/V
Options	-	-	-	Mounting base spherical load button double bridge		AC	Serial RS232 port, streaming ASCII for print, remote display and logging

WTS Wireless Telemetry Components

Sherborne Sensors Wireless Telemetry System (WTS) collects data from industrial sensors including inclinometer, accelerometer, load, pressure, torque, strain, temperature, pulse, potentiometer and 4-20 mA / 0-10V conditioned sensors. The system transmits sensor data wirelessly to handheld displays or software for display, interpretation and analysis.

Wireless Sensor Transmitter

- Wireless range up to 100 m (325 ft)
- Battery power 3 V DC
- Operating temperature -40 to +85°C
- 76 mm x 24 mm x 20 mm
- IP50 rated

Wireless Sensor Transmitter

- Wireless range up to 200 m (650 ft)
- Internal batteries (2 x AA)
- 76 mm x 59 mm x 29 mm
- Operating temperature -40 to +85°C
- Waterproof to IP65 NEMA 4

Wireless Portable Display (Single)

- WTS-HS receives data from a single wireless transmitter
- Tare functionality
- Auto 'power on / off' of remote module
- Battery powered 40 hours use
- Wireless range of up to 800 m (650 ft)
- Waterproof to IP65 NEMA 4

Wireless Portable Display (Multiple)

- WTS-HR receives data from any number of wireless transmitters displaying 1 at a time
- WTS-HA receives data from up to 12 wireless transmitters displaying 1 at a time
- Auto 'power on' and 'power off' of remote transmitter module
- Battery powered 40 hours use
- Wireless range of up to 800 m (650 ft)
- Waterproof to IP65 NEMA 4

Wireless USB Base Stations

- Base station wirelessly configures any WTS telemetry module via USB. Provides wireless data acquisition from T24 wireless transmitters
- Use WTS-BSu for wireless range of up to 100 m (325 ft) desktop or wall mount IP50 enclosure
- Use WTS-BSue for wireless range of up to 200 m (650 ft), waterproof to IP65 NEMA 4

Wireless Base Station

- Base station with USB, RS232 & RS485 interfaces up to 1000 m cable for optimum wireless coverage
- Collects data from and configures any WTS radio telemetry module using wireless
- Wide range power supply (9-32 Volts)
- Wireless range of up to 200 m (650 ft)
- Integral antenna
- Waterproof to IP65 NEMA4

Wireless Range Extender

- Extends range up to 400 m (1300 ft)
- Also used to pass the wireless signal around an obstruction such as buildings
- Internal battery or external power supply
- Waterproof to IP65 NEMA4

Wireless Modbus Gateway

- Modbus gateway Modbus RTU or ASCII interface (RS232/RS485)
- Gathers data from up to 100 wireless transmitters
- Stores data which can be requested by a Modbus system
- Wireless range of up to 200 m (650 ft)
- External power supply (9-32 Volts)
- Waterproof to IP65 NEMA 4

Configuration & Calibration Toolkit

- Free wireless telemetry software toolkit
- Enables users to select a required device
- Configures & calibrates sensors via wireless
- Logs data to a CSV file (Requires a base station to operate)

Logging & Mapping Software

- Displays and logs data from up to 100 wireless sensor transmitters
- Build a visual picture of your system and assign live readings
- Web server offers remote viewing on iPads, tablets & smart phones (Requires a base station to operate)

Wireless Range | Powerful logging, Interpretation and Analysis

- Wireless range of up to 800 m, 2,600 ft (1,600 m 5,200ft using the WTS wireless range extender WTS-AR)
- The in-built web server provides a summary view page to other computers, tablets, iPads and smart phones etc. using a standard browser
- Logging and Mapping Software provides logging of up to 100 channels as well as the ability to build visual mapping displays.
- Audible alarms can indicate under and over range as well as loss in communications, low battery and error reports.

In Line Signal Conditioners (ILSC)

In Line Signal Conditioner (ILSC)

- ILSC converts a load cell to a conditioned load cell
- Outputs of 4-20 mA, 0-10 V, 0-5 V, ±10 V
- Small size – 56 x 28 mm excluding glands
- Machined from solid stainless steel
- Waterproof to IP67 NEMA 6

Digital In Line Signal Conditioner (DILSC)

- DILSC converts a load cell to a digital load cell
- Strain gauge to RS485 or CAN digital output
- Small size – 56 x 28 mm excluding glands
- Machined from solid stainless steel
- Waterproof to IP67 NEMA 6

In Line USB (DSCUSB)

- USB strain gauge interface – device appears as a virtual com port. Simple & easy to connect to your strain gauge sensor to PC
- Multiple devices can be used with one PC
- IP50 rated

Logging & Mapping Software

- Software for configuration, calibration, logging & parameter management of the DSCUSB
- Viewing of input with annunciators for integrity
- 2 point calibration by application of known weight or by load cell data

In Line Indicators and Amplifiers

LCA20 Load Cell Amplifier

- Full digital set–up using PC or keypad
- 3 x configurable digital inputs e.g. for autotare, peak hold and reset
- RS485 and RS232 digital data output for communications and printing
- Measurement speeds of 10 / 80 samples per sec
- Factory calibration in mV/V
- 5 V excitation supports up to 10 x 350 R load cells
- Fully isolated 4-20 mA and 0-10 V analogue outputs
- 6 wire input to compensate for barrier and cable losses

Active & Passive Summing Load Cell Junction

- Active summing load cell junction box sums the outputs from up to 4 x 350 - 1,000 Ohm strain gauge load cells. Individual gain adjustment provided for each channel
- Passive load cell junction box for 4 x load cells connected in parallel
- Waterproof to IP65 NEMA 4

Load Cell / Strain Gauge Indicator

- Direct strain gauge input 4.5 digit display
- 4-20 mA & 0 -10 V analogue output
- 2 relay outputs for control and alarm
- Data port RS232 / RS485
- Waterproof to IP65 NEMA 4

Tracker 220 Universal Input Indicator

- Direct strain gauge input 4.5 digit display
- Transmitter & Transducer Supplies
- Standard 1/8 DIN Panel Size
- Programmable Function Buttons and Maths Functions
- Serial Communications
- Waterproof to IP65 NEMA 4

Handheld Display (PSD)

- Handheld 7 digit LCD display with peak, trough, net,overload and shunt cal indication
- Battery life of 450 hours in power save mode
- Keys for on/off, range select, peak/valley hold, and gross/net
- Single pass calibration (direct mV/V) with dual range for values such as kg and lb

Handheld Display (PSD232)

- RS232 interface which allows connection to many interfaces including PC, data loggers, etc.
- Handheld 7 digit LCD display with peak, trough, net, overload and shunt cal indication
- Battery life of 450 hours in power save mode
- Keys for on/off, range select, peak/valley hold, and gross/net
- Single pass calibration (direct mV/V) with dual range for values such as kg and lb
- Waterproof to IP65 NEMA 4

Accessories

Sherborne Sensors offers a broad range of accessories and services to enhance the performance and capabilities of our sensor products, including:

- line voltage and battery enabled power supplies
- specialised mating connectors
- cable assemblies
- high performance digital displays and universal input indicators
- repair and calibration services for all brands of accelerometers, inclinometers and load cells

Customization

With extensive in-house engineering capabilities, Sherborne Sensors offers not only a large range of standard sensors but also unique expertise in the design, development and manufacture of specialized sensors and systems that meet specific customer application and performance requirements.

The need to customize our sensors to the specific requirements of an application to ensure they deliver improved safety and efficiency, with optimized cost and return-on-investment is often critical to project success.

Using customer driven elements of sensor design, output and performance, Sherborne Sensors will tailor a device to meet almost any application. Major cost and performance benefits may be realised by specifying a customized sensor where performance and mechanical design are optimally matched to specific application demands.

Sherborne Sensors

.... the first choice in precision

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Sherborne Sensors, a Nova Metrix company