DSI™ Telemetry Devices

Continuous, Real-Time *In Vivo*
Physiologic Monitoring Solutions

Physiologic signals measured include:

- Pressures: arterial, left ventricular, ocular, bladder, intra-cranial
- Biopotentials: ECG, EMG, EEG, EOG
- Blood glucose
- Respiration
- Temperature: core and localized with thermistor
- Activity
- Sympathetic nerve activity

DSI™
An Affiliate of Harvard Bioscience, Inc.

Implants for Extra-Small and Small Animals

Your proven physiological research partner for more than 40 years. DSI telemetry features the smallest size and broadest choice of implants for mice and rats.

NEW SoHo™ System

DSI's New Evolution of Preclinical Implants

Transform your studies with an advanced implantable telemetry system designed to break free from traditional constraints with the quality you trust. The SoHo telemetry system empowers you to design and execute studies on your terms with extended transmission range, a simplified design, and support for social housing.

Model	Pressure	Biopotential	Respiratory Rate^	Temperature	Activity	Continuous Glucose	Warranted Battery Life (Months)	Implant Weight (g)	Implant Volume (cc)	Minimum Animal Weight (g)*
SoHo-X00				2	1		3.5 Months (Continuous)	2.6 g	1.5 cc	25 g (IP) 17 g (Sub Q)
SoHo-X01		1		2	1		1 Month* (Continuous)			
SoHo-X02		2		2	1					
SoHo-S00				2	1		12 Months (Continuous)	6.0 g	4.2 cc	175 g
SoHo-S01		1		2	1		4.5 Months (Continuous)			
SoHo-S02		2		2	1					

Extra-Small Implants for use with mice and other similarly sized animals.

Model	Pressure	Biopotential	Respiratory Rate^	Temperature	Activity	Continuous Glucose	Warranted Battery Life (Months)	Implant Weight (g)	Implant Volume (cc)	Minimum Animal Weight (g)*
New! SoHo-X00				1	1		3**	2.2	1.2	19
HD-X11	1	1	1	1	1		1	2.2	1.4	19
HD-X10	1		1	1	1		1.5	2.2	1.4	19
HD-X02		2		1	1		1.5	2.2	1.7	19
HD-XG°				1	1	1	1.5	2.2	1.4	19
PA-C10	1		1		1		1.5	1.4	1.1	17
ETA-F10		1		1	1		2	1.6	1.1	17
TA-F10				1	1		6	1.6	1.1	17

* All minimum animal weights assume subcutaneous implantation. Intraperitoneal implantation would require a larger animal.

° Sensor often functions for 6-8 weeks; warranty is 4 weeks.

^ Implants can derive respiratory rate from pleural pressure or blood pressure.

** Battery life can be greatly extended by scheduling data acquisitions.

Small Implants for use with rats, guinea-pigs, ferrets, marmosets and others.

Model	Pressure	Biopotential	Respiratory Rate^	Temperature	Activity	Continuous Glucose	Warranted Battery Life (Months)	Implant Weight (g)	Implant Volume (cc)
HD-S21	2	1	1	1	1		2	8	5.9
HD-S20	2		1	1	1		2	8	5.9
HD-S11-F0/F2**	1	1	1	1	1		2(FO)/3(F2)	8	5.9
HD-S1-F0/F2**	1		1	1	1		2(FO)/3(F2)	8	5.9
HD-S10	1		1	1	1		5	4.4	3.1
HD-S02		2	1	1	1		5	4.7	3.3
HD-XG°				1	1	1	1.5	2.2	1.4
F50-EEE		3	1		1		2	11.5	5.5
CTA-F40		1	1	1	1		6	8	4.2
F40-TT				2	1		4	7.5	3.5
TA-F40*				1	1		12	7.25	3.5
F50-W-F2 (records sympathetic nerve activity)					1		2	12	5.5

** Available in two frequencies: 455 kHz (F0) and 18 MHz (F2). Pair housing capable.

° Sensor often functions for 6-8 weeks; warranty is 4 weeks.

* Available with an external thermistor probe if desired.

^ Implants can derive respiratory rate from pleural pressure, blood pressure or diaphragmatic EMG.

Implants for Medium and Large Animals

The trusted partner for drug discovery, safety pharmacology, toxicology and infectious disease research. Designed with social housing in mind, PhysioTel™ Digital implants have a 3-5 m transmission distance. Species commonly monitored include, but are not limited to, non-human primates, dogs, rabbits, and swine.

Model	Pressure	Biopotential	Respiratory Rate^	Temperature	Activity	Warranted Battery Life	Implant Weight (g)	Implant Volume (cc)
M00				1	1	100 Days	13.7	11
M01		1	1	1	1	40 Days	13.7	11
M10	1		1	1	1	55 Days	13.7	11
M11	1	1	1	1	1	35 Days	13.7	11
L03		3	1	1	1	90 Days	56	29
L04		4	1	1	1	95 Days	56	29
L11	1	1	1	1	1	105 Days	56	29
L11R^#	1	1	1	1	1	125 Days	49	33
L21	2	1	1	1	1	84 Days	56	29

^ L11R provides respiratory volume and respiratory rate via respiratory impedance.

LV capable version of L11R has a 110 day battery life.

PhysioTel Digital

L series: Designed for chronic physiologic monitoring research in colony animals. Implants are used in safety pharmacology studies to address core battery requirements in cardiovascular (CV), neuroscience, and respiratory applications. Core CV measurements include systemic pressure and ECG and include LV pressure as a secondary measurement.

M series: The smaller size of the M series allows PhysioTel Digital technology to be expanded into a broader range and size of species including rabbits and ferrets. Primary applications for M series are toxicology and biological defense, discovery, and metabolism studies.

External Telemetry

Less invasive telemetry by offering jacketed solutions for animals.

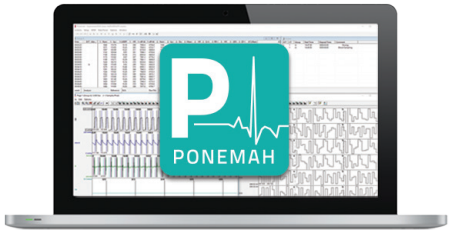
Species	Device	ECG Vectors	ECG Vectors with Respiratory Impedance Plethysmography (RIP)	Blood Pressure Add-on*	Temperature	Activity	Battery
Large Animals	JET-EA-BP	1	NA	Yes	No	Yes	Rechargeable 27-hr life
	JET-3ETA-BP	7	1	Yes	Yes	Yes	
	JET-5ETA-BP	9	7	Yes	Yes	Yes	
Small Animals	Etisense BLE Emitter	1	1	No	No	Yes	12-hr life

*PA-C10-TOX is available for less invasive blood pressure measurement

DSI Ponemah™ Software

Trusted by scientists globally, Ponemah powers DSI telemetry for real-time analysis of freely interacting animals. Acquire, analyze and report diverse physiological data - from cardiovascular to respiratory endpoints - to gain new research insights.

- Real-time analysis with visual validation.
- Customizable searches quickly locate patterns.
- Toggle between time-averaged or beat-beat data.
- Centralized user and study data management.
- Tools for FDA submission, alerts to improve animal welfare.



PhysioCath Telemetry Catheters

DSI pressure-sensing implants use a solid-state sensor coupled to a proprietary and biocompatible catheter to acquire high-fidelity signals.

DSI Services

Streamline your research by leveraging expertise you can rely on. Our Scientific Services teams can assist you with making better informed decisions, achieving greater surgical success, summarizing study data, executing preclinical in vivo studies, and meeting GLP validation requirements.

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