

RESEARCH RING NOVEL, MOBILE, WEARABLE DEVICE FOR EDA, PULSE, ECG, TEMP



RESRING-PACK



RESRING-ECG-ADAPT



RESRING-LEAD



RESRING-PACK The Research Ring allows researchers to acquire high-quality biometric data from a study participant's finger via a compact and mobile wearable device. Data for a wide range of biometric signals can be collected and displayed with the Senstream app—formally available only for iOS and iPadOS—and is automatically saved to the cloud for easy review. The Research Ring's compact, unintrusive design eliminates the need for straps, bands, and adhesive electrode attachments while allowing research participants to perform activities naturally, even forgetting they are taking part in a data gathering activity.

RESRING-ECG-ADAPT includes a Research Ring and ECG adapter kit that adds a snap post to the ring base. Use with the RESRING-LEAD for long-term continuous ECG monitoring.

RESRING-LEAD This lead connects to the ring and runs up the arm to a disposable electrode mounted above the clavicle to provide a continuous ECG signal. Continuous lab-grade data makes the ring suitable for HRV analysis studies. The ring can also record ECG without a lead in brief intervals if the gold electrode on the back is touched to bare skin on the opposite side of the body while the user is seated and relaxed.



The Research Ring records a wide range of signals

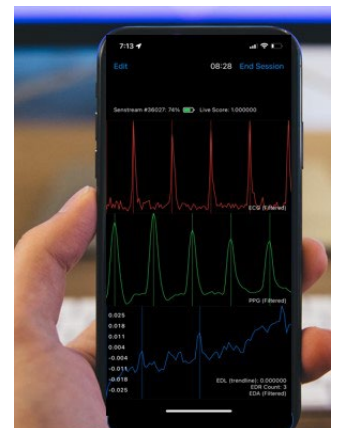
Recorded data includes the following signals and derived signals:

- Electrodermal activity (EDA)
- Photoplethysmography (PPG)
- Electrocardiogram (ECG)
 - RESRING-PACK is designed for brief ECG recordings while the user is seated and relaxed. It is not meant for continuous or long-term monitoring. To use it, the Ring must be worn and the gold electrode on the back must touch bare skin on the opposite side of the body.
 - For long-term continuous ECG monitoring, use the RESRING-ECG-ADAPT and RESRING-LEAD
- Temperature
- Accelerometry *
- Derived signals (EDRindex, EDRamp, EDL, ΔEDL, HR, HRV, RSA)

Evolving to Meet User Needs

Based on customer feedback, the Senstream app and firmware bring a wealth of enhanced features that support critical researcher needs, including the following:

Improved Data Control and Safety Features	<ul style="list-style-type: none"> • User-defined storage choices for session data (GDPR support)
Greater Session Utility	<ul style="list-style-type: none"> • Visual/audible session start signal • In-session time-stamp markers
Added Data Channels	<ul style="list-style-type: none"> • X,Y,Z accelerometer data exposed *
Enhanced Trust and Stability	<ul style="list-style-type: none"> • Greater app background session stability • Ring auto rejoin • Improved chart accuracy



Potential Applications

The Research Ring can provide valuable, high-quality data for a wide range of research applications, including the following:

- Psychophysiology
- General health tracking
- Mental health and wellness
- Lifestyle — stress, sleep, etc.
- Longevity and aging
- Media and communications
- Consumer insights
- User experience and ergonomics

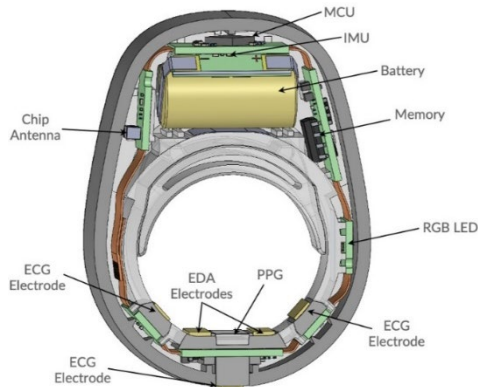
Each Pack Includes

- Research ring(s)
- Eight (8) sizing shims per ring
- Magnetic charger cable (one per ring)
- QR code for Research Ring app (iOS & iPadOS only)
- One year of Senstream Cloud (charts.senstream.com)

AcqKnowledge Integration **

- AcqKnowledge Ring Software ([ACK100W-RNG](#))

SYSTEM SPECIFICATIONS:



Ring component cross section

Charger Cable



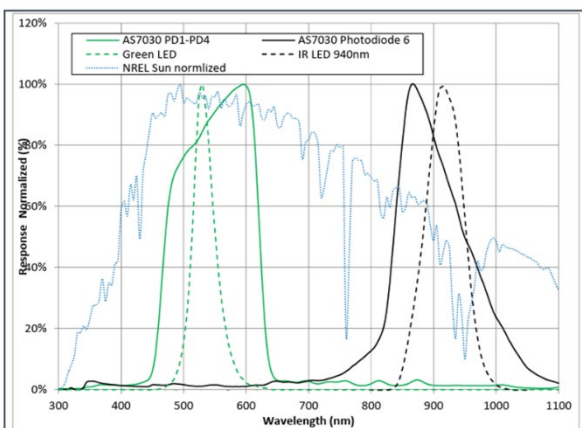
Shims



Ring charger and sizing shims

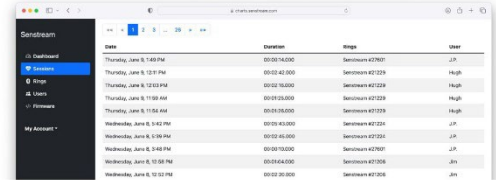
Spectrum of LED/Photodiode

Photodiode Sensitivity (solid green and black) and LED Emission Spectrum (dotted green and dotted black)



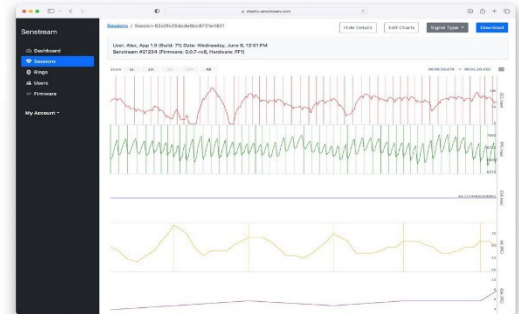
Peak wavelength for the Research Ring LED is 527 nm.
Peak wavelength of the LED/photodiode pair is 550 nm.
Only green curves apply.

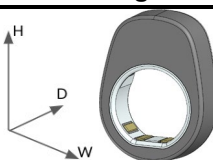
charts.senstream.com File Picker



Date	Expression	Ring	User
Thursday, June 9, 1:45 PM	00:00:16.000	Senstream 4077607	J.P.
Thursday, June 9, 12:19 PM	00:02:40.000	Senstream 4077224	High
Thursday, June 9, 12:03 PM	00:02:16.000	Senstream 4077224	High
Thursday, June 9, 11:59 AM	00:00:00.000	Senstream 4077224	High
Thursday, June 9, 11:54 AM	00:00:00.000	Senstream 4077224	High
Wednesday, June 9, 9:42 PM	00:00:45.000	Senstream 4077224	J.P.
Wednesday, June 9, 9:36 PM	00:02:45.000	Senstream 4077224	J.P.
Wednesday, June 9, 9:40 PM	00:00:10.000	Senstream 4077607	J.P.
Wednesday, June 9, 11:50 PM	00:00:04.000	Senstream 4077607	J.P.
Wednesday, June 9, 10:50 PM	00:00:00.000	Senstream 4077224	J.P.

Data Viewer



Product Name		Research Ring		
Model		-AT01		
Dimensions		in / oz	mm / grams	
Height		1.68	42.7	
Width		1.26	32.2	
Depth		0.44	11.4	
Weight		0.32	9	
Sizing				
Finger Size Range		Ring size 6-13 US (52-70 EU) with interchangeable shims		
Temperature Range				
Operating Range		0 - 45° C		
Materials		Description		
Housing material and shims		Teijin Panlite polycarbonate is certified ISO10993 for biocompatibility and rated UL94-V0		
Electrodes		Stainless Steel 430 with Nickel and Gold plating		
Sensors	Description	Metric	Max Sampling Rate***	Bandwidth
PPG	Photoplethysmography (green LED) See previous page for Spectrum of LED/Photodiode .	Heart rate - optical	400 Hz	0.33-200 Hz
EDA	Electrodermal Activity (two electrodes, single finger)	Skin conductance (µSiemens)	400 Hz	DC-20 Hz
ECG	Electrocardiogram (3 electrode)	Heart rate - electrical	800 Hz	0.33-320 Hz
Temp	Body Temperature (epidermal thermistor)	Celsius or Fahrenheit	20 Hz	0-45° C
Motion	Accelerometry*	Units of gravity	50 Hz	0-4 g
Connectivity		Description		
BLE		Bluetooth Low-Energy (Class B digital device, pursuant to part 15 of the FCC Rules)		
Firmware		Automatic firmware updates w/ Senstream app (16.6 or later, iOS & iPadOS only)		
Cloud [charts.senstream.com]		Senstream's application can automatically upload your data to our cloud application for storage analysis, downloading, or connection to other cloud solution through an API		
Battery and Power		Description		
Run time		Can exceed eight (8) hours depending on channels and sampling rates***		
Charge time		2 hours from completely depleted device		
Charge Cable		USB-A Charge cable with custom magnetic coupling (Note: USB power adaptor not included).		
Cable		RESRING-LEAD		
Length		1 meter		

* Accelerometry using the Research Ring's IMU requires Ring firmware Ver 1.2.0 and App Ver 1.1 or later.

** BIOPAC INTEGRATION: In addition to being a stand-alone research tool, the Research Ring can also be used with AcqKnowledge Ring Software (ACK100W-RNG) for in-lab applications or to import data acquired from the phone app to the cloud into AcqKnowledge. AcqKnowledge Ring Software can interface up to nine rings per computer and installation also provides a single license for Basic Scripting and Workflow drag-and-drop automation.

*** Not all sampling rates may be run concurrently. Refer to the Senstream App for defined settings.