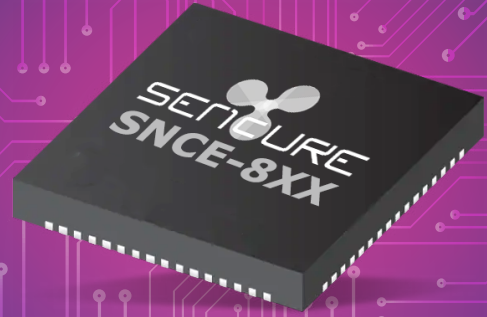


# SNCE-800 IC Series

Our SNCE 800 series integrated circuit revolutionizes biosensor development.

The SNCE-8xx IC is a chip that has been designed to measure electrophysiological activity with exceptional signal quality and low power consumption. It features 8 high-quality biopotential input channels, as well as bio-impedance measurement capabilities (in cascade up to 32 input channels). The chip also has integrated patient safety features, which makes it easier to comply with IEC 60601-1 standards while maintaining high signal quality. This chip has been specifically designed for use in wearables and diagnostic applications, both in hospitals and for remote monitoring. The SNCE-800 IC series simplifies the development of measurement devices and can significantly reduce time-to-market.



## Applications



Health Monitoring  
Devices



Disposable Medical  
Patches



Health Tracking

## Key Features

- 8 unipolar ExG / bipolar input channels and in cascade up to 32 inputs
- Integrated 24-bit simultaneous sampling ADC for each channel
- 2 and 4 point bio-impedance
- Configurable data output rate up to 16k sps
- Defibrillation proof, pace-detection supported
- Lead-off detection, low power lead-on detection
- Continuous electrode impedance measurement
- Designed for compliance with 60601-1, 60601-1-2 and 60601-2-25

## Advantages



Unparalleled signal quality



Ultra-low power consumption



Innovative patient safety strategy



Reduce size and product complexity

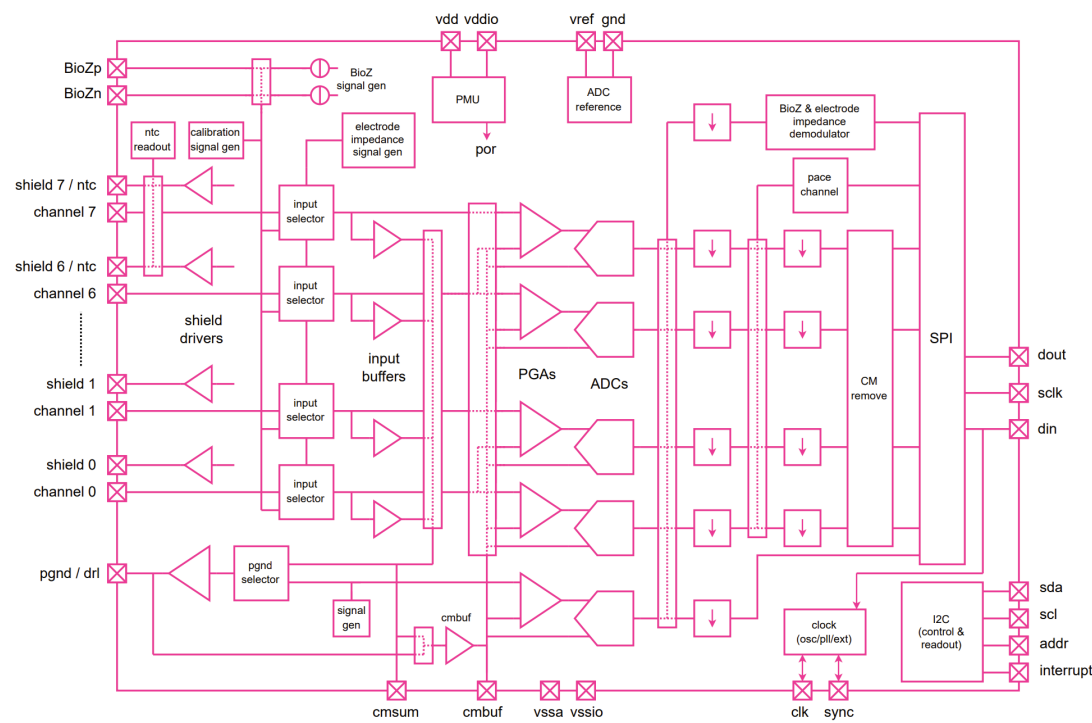
# Technical Specifications

ExG	Condition	Min. / Max.
Input voltage range	Differential (between 2 channels)	400 mV <sub>pp</sub>
	Common	100 - 2100 mV
Data output rate		500 - 16k sps
Input bandwidth		= 0.3 * DOR
Input impedance	DM	10 GΩ 5 pF
	CM	100 GΩ 1 pF
Input bias current	@ 25 - 45°C	< 10 pA
Common mode rejection	@ 50 / 60Hz	120 dB
Noise	0.1 - 10Hz	1.0 μV <sub>pp</sub>
	0.1 - 100Hz	330 nV <sub>RMS</sub>
	0.1 - 300Hz	550 nV <sub>RMS</sub>
Resolution		24 bit
DRL output voltage	Common	1.1 V
	Differential	1500 mV <sub>pp</sub>

Bio-impedance	Condition	Min. / Max.
Impedance resolution		20 mΩ
Injected current		8 - 64 μA
Measuring frequency		32k - 64k sps
Data output rate		100 S/s
General		
External supply voltage	High performance mode	2.8 - 4.3 V
	Low supply voltage mode	2.3 - 3.3 V
Current consumption	ExG, per channel	75 μA
	BioZ	50 μA
Idle consumption	Lead-on detection only	10 μA
ESD Protection (with external resistor)	Contact discharge	8 kV
	Air discharge	15 kV

The values in the tables above are estimates.  
Specifications are preliminary and subject to change.

## Blockdiagram



# Benchmark

 <b>Sencure</b>		<b>Sencure</b> SNCE-800 IC	<b>Analog Devices</b> ADAS1000	<b>Texas Instruments</b> ADS1298R	<b>Texas Instruments</b> ADS1299	<b>Maxim</b> MAX30001
EoG	# Channels (single IC)	8 unipolar/ 4 bipolar	5 unipolar	8 bipolar	8 unipolar / 8 bipolar	1 bipolar
	Cascaded ICs	Yes	Limited functionality	Yes	Yes	No
	Data output rate	500 - 16k sps	2k sps	250 - 32k sps	250 - 16k sps	125 -512 sps
	Analog Bandwidth	DC - 4800 Hz (0.3 * DOR)	DC - 450 Hz	DC - 8400 Hz (0.262 * DOR)	DC - 4193 Hz (0.262 * DOR)	0.5 - 150 Hz
	Input range (typical case)	DM: 200 mV <sub>pp</sub> / CM: 1000 mV <sub>pp</sub>	Total: 660 - 2000 mV <sub>pp</sub>	DM: 350 mV <sub>pp</sub> / CM: 500 mV <sub>pp</sub>	DM: 350 mV <sub>pp</sub> / CM: 400 mV <sub>pp</sub>	DM: 65 mV <sub>pp</sub> / CM: 1100 mV <sub>pp</sub>
	Noise (0.1 - 100 Hz)	<b>Unipolar: 330 nV<sub>rms</sub></b> <b>Bipolar: 470 nV<sub>rms</sub></b>	Unipolar: >1000 nV <sub>rms</sub> Bipolar: >1000 nV <sub>rms</sub>	Unipolar: 437 nV <sub>rms</sub> Bipolar: 618 nV <sub>rms</sub>	Unipolar: 201 nV <sub>rms</sub> Bipolar: 284 nV <sub>rms</sub>	Unipolar: N/A Bipolar: 630 nV <sub>rms</sub>
	Input resistance	DM: 10 GΩ / CM: 100 GΩ	1 GΩ	> 1 GΩ	> 1 GΩ	DM: 1.5 GΩ / CM: 45 GΩ
	Input capacitance	DM: 5 pF / CM: 1 pF	DM: 10 pF / CM: 10 pF	20 pF	20 pF	No spec
	Input bias current	-10 pA max	+/- 1 nA typ / +/- 10 nA max	+/- 200 pA max	+/- 300 pA max	+/- 100 pA typ / +/- 1nA max
	CMR @50/60 Hz	110 dB min / 120 dB typ	105 dB min / 110 dB typ	105 dB min	110 dB min / 120 dB typ	100 dB min / 115 dB typ
BioZ	Low power lead on detect	Yes	No	No	No	Yes
	Sensitivity	20 mΩ <sub>pp</sub>	20 mΩ <sub>pp</sub>	20 mΩ <sub>pp</sub>	No Bioimpedance	40 mΩ <sub>pp</sub>
	Current	8 - 128 μA <sub>pp</sub>	8 - 64 μA <sub>pp</sub>	29 μA <sub>pp</sub>	No Bioimpedance	16 - 192 μA <sub>pp</sub>
	Frequency	32k - 64k sps	46.5k - 64k sps	32k - 64k sps	No Bioimpedance	0.125k - 131.072k sps
	Electrode impedance measurement	Continuous	No	Separate mode	Separate mode	No
	Patient Safety (IEC 60601-1)	Patent pending design	Not described	Limited description	Limited description	N.A.
	Pace detect	Supported	Internal	Supported	No	Internal
	Shield driver	Yes, 1 per channel	Yes, 1 in total	No	No	No
Power	BioZ	115 μW	7600 μW	1100 μW	No Bioimpedance	136 μW / 234 μW
	ExG High Performance Mode	210 μW / channel	5400 μW / channel	1100 μW / channel	4875 μW / channel	171 μW / channel
	ExG Low Power Mode	175 μW / channel	4200 μW / channel	750 μW / channel	N/A	83.6 μW / channel
	Supply Voltages	Analog: 2.8 - 4.3 V / 2.3 - 4.3 V Interface: 1.65 - 3.6 V	Analog: 3.15 - 5.5 V Interface: 1.65 - 3.6 V	Analog: 2.7 - 5.25 V Interface: 1.65 - 3.6 V	Analog: 4.75 - 5.25 V Interface: 1.8 - 3.6 V	Analog: 1.1 - 2.0 V Interface: 1.65 - 3.6 V
	Package	QFN 48 (6 * 6 mm)	LFCSP 56 (9 * 9 mm) LQFP 64 (10 * 10 mm)	TQFP 64 (10 * 10 mm) NFBGA 64 (8 * 8 mm)	TQFP 64 (10 * 10 mm)	WPL 30 (2.9 * 2.7 mm)

[www.sencure.com](http://www.sencure.com)



## Patient Safety

From the start, the SNCE-8xx has been developed with medical regulations in mind, resulting in an innovative way of complying with IEC60601-1 for patient safety while maintaining ultra-high signal quality.

IEC 60601-1 is a standard for the safety and essential performance of medical electrical equipment, ensuring that devices are designed and manufactured in a way that minimizes the risk of harm to patients. This includes requirements for electrical, mechanical, and thermal safety.

The standard requires biosensors to be designed with sufficient insulation between the electrical circuits and the patient's body to prevent electrical shock. Sencure has implemented innovative strategies in the chip that help to comply with leakage current requirements even in fault conditions with a minimum number of external components. Using our reference designs, compliance with IEC 60601-1 will become much easier while maintaining high performance.



**Interested to learn how our  
chip can bring your products to  
the next level?**

Contact [sales@sencure.com](mailto:sales@sencure.com) to be introduced to our technical specialist

