

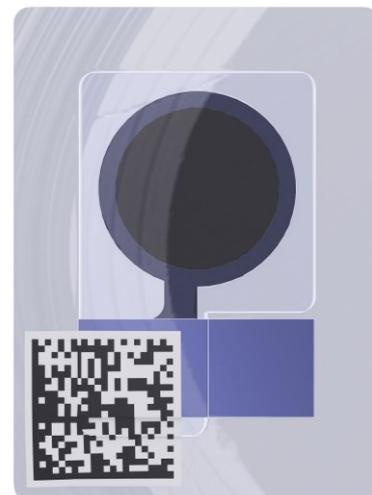
# Datasheet (preliminary)

## SMD foil sodium electrode Na01



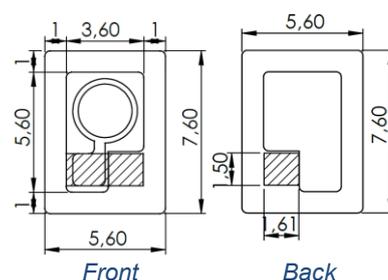
The SMD foil sodium electrode Na01 is designed for electrochemical, potentiometric determination of Na<sup>+</sup> in liquid or moist samples **when combined with a second, reference electrode.**

The readings are taken by measuring the open circuit potential/voltage between both electrodes via high resistivity voltage measurement electronics (see example circuit below). Potential (E) and Na<sup>+</sup> concentration have a linear relationship in the operating range of 100 µMol to 1 M. The sodium concentration of an unknown analyte solution can be calculated using the pre-determined slope and an offset E<sub>0</sub> value, which could be determined by measuring the potential in a calibration solution of known Na<sup>+</sup> concentration. Once used, the sensor must be kept hydrated for further application and not allowed to dry out.



Technical Data	
Dimensions	L x W in mm
Whole sensor foil	7.6 x 5.6
Connection pad	1.5 x 1.61
Potential response (at 20°C)	49.1 ± 4.0 mV / log(c[Na <sup>+</sup> ])
Set-up time (time till stable output)	< 1 min
Response time (t <sub>90</sub> )	< 30 sec
Lifetime (in use)	~ 3 days
Measuring environment	
Operating pH range	100 µMol – 1 Mol
Samples	Diverse*

\*must be sufficient moisture for contact to be maintained between both electrodes

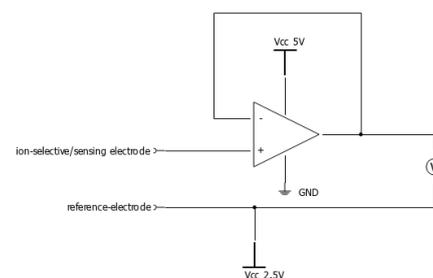


TRL 7



MRL 7

All mechanical dimensions are valid at 25 °C ambient temperature, if not differently indicated. All data except the mechanical dimensions only have information purposes and are not to be understood as assured characteristics. Technical changes without previous announcement as well as mistakes reserved. Load with extreme values during a longer period can affect the reliability. Typing errors and mistakes reserved. Product specifications are subject to change without notice.



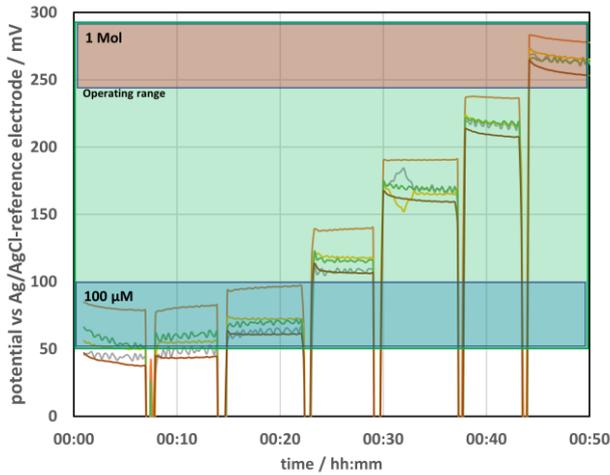
Schematic example for a measuring circuit including an operational amplifier as voltage follower

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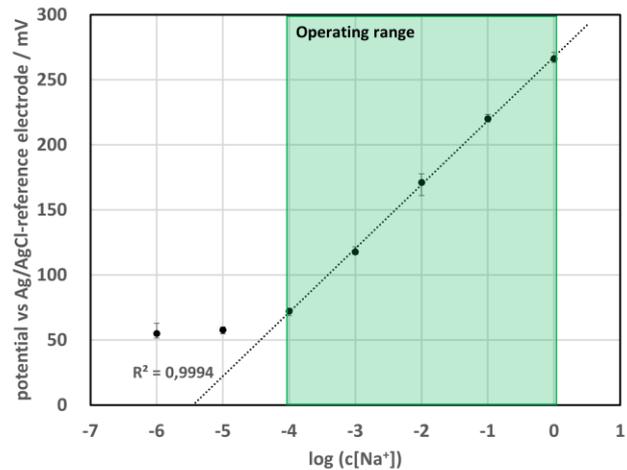
## SMD foil sodium electrode Na01



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Example output readings for different NaCl solutions



Potential dependency for different Na+ concentrations and linear approximation in the range of 100 μM to 1 M



## Technology Readiness Level

TRL 0	TRL 1	TRL 2	TRL 3	TRL 4	TRL 5	TRL 6	TRL 7	TRL 8	TRL 9	
Idea unproven concept no testing has been performed.	Problem Solving Core principles are explored and observed but no experimental proof available.	Concept Generation Concept & application have been explored.		Proof of concept Prototype Testing done on core mechanisms and function	Rough Working-Prototype Tested in intended environment	Prototype Field Trials Tested in intended environment close to expected performance	Pre-Production Prototype Operating in operational environment at precommercial scale.	First Production Runs Manufacturing issues solved.	Full Commercial-Production Technology available for consumers.	
	<ul style="list-style-type: none"> <li>Concepts identified</li> <li>Research carried out and refined</li> <li>Technology development</li> <li>Identify material concerns</li> </ul>			<ul style="list-style-type: none"> <li>Early indications of materials identified</li> <li>Manufacturing feasibility determined</li> <li>Manufacturing processes identified</li> </ul>	<ul style="list-style-type: none"> <li>Characteristics identified</li> <li>Early supply chain assessment</li> </ul>	<ul style="list-style-type: none"> <li>Initial trade studies</li> <li>Quality thresholds established</li> </ul>	<ul style="list-style-type: none"> <li>Assessed supply chain</li> <li>BOM in development</li> <li>Materials being tested</li> <li>Demonstrate supply chain BOM Draft</li> </ul>	<ul style="list-style-type: none"> <li>Establish multiple sources</li> <li>Pilot line builds validated</li> <li>Materials proven Quality characteristics validated</li> <li>BOM finalised</li> </ul>	<ul style="list-style-type: none"> <li>Continous process improvements</li> <li>Materials in control</li> <li>Quality validated with LRIP articles</li> <li>Make/buy supports</li> </ul>	<ul style="list-style-type: none"> <li>Monitor and manage all key characteristics at a Six Sigma level</li> </ul>
<b>LEVEL EXIT CRITERIA</b>										
	Prior Consultancy Knowledge As a consultancy, having worked on successful solutions for many industries, the first 3 manufacturing readiness levels are tackled and kept in mind by our early sage product-development stages.		Small Scale Prototype Crude prototypes to test technology	Refine Manufacturing Strategy Identification of enabling technologies and components.	Prototype Development Manufacturing processes have been defined but requires design for manufacturing	Design for Manufacturing Manufacturing detailing is underway.	Pilot Line Demonstration Manufacturing processes are proved	Manufacturing Production Getting the quality, costs and performance on target.	Manufacturing Management Applied Six Sigma to the production	
	MRL 1	MRL 2	MRL 3	MRL 4	MRL 5	MRL 6	MRL 7	MRL 8	MRL 9	MRL 10



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## Manufacturing Readiness Level