Temperature (NTC) Sensor Data Sheet

SPECIFICATIONS
> Range: 0-50ºC
> Type: NTC thermistor
> Diameter: 2.04mm
> Response Time (Air): 15 seconds
> Response Time (Water): 2 seconds

FEATURES
> Medical-grade PVC insulation
> Fast response
> Pre-conditioned analog output
> High signal-to-noise ratio
> Ready-to-use form factor

APPLICATIONS
> Life sciences studies
> Biomedical research
> Human-Computer Interaction
> Robotics & Cybernetics
> Physiology studies
> Psychophysiology
> Biomechanics
> Ergonomics

GENERAL DESCRIPTION
Our high performance NTC sensors have been specifically developed for biomedical applications, and are meant to be used on a range of temperatures suitable for body sensing. These sensors produce a robust, stable, and accurate output with low tolerance values. The geometry and rapid response are also of added value for even the most demanding applications.

Fig. 1. Integrated miniaturized sensor + cable assembly providing unrivaled usability.

Fig. 2. Example TMP data (acquired with biosignalsplux).

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TRANSFER FUNCTION

\[
NTC(V) = \frac{ADC \cdot VCC}{2^n}
\]

\[
NTC(\Omega) = \frac{1 \times 10^4 \cdot NTC(V)}{VCC - NTC(V)}
\]

\[
TMP(\degree K) = \frac{1}{a_0 + a_1 \ln(NTC(\Omega)) + a_2 [\ln(NTC(\Omega))]^2}
\]

\[
TMP(\degree C) = TMP(\degree K) - 273,15
\]

\[VCC = 3V \text{ (operating voltage)}\]
\[a_0 = 1,12764514 \times 10^{-3}\]
\[a_1 = 2,34282709 \times 10^{-4}\]
\[a_2 = 8,77303013 \times 10^{-8}\]

\[NTV \ (V) \ - \ NTC \ output \ in \ Volt \ (V)\]
\[NTC \ (\Omega) \ - \ NTC \ resistance \ in \ Ohm \ (\Omega)\]
\[TMP(\degree K) \ - \ Temperature \ value \ in \ Kelvin \ (\degree K)\]
\[TMP(\degree C) \ - \ Temperature \ value \ in \ Celsius \ (\degree C)\]
\[ADC \ - \ Value \ sampled \ from \ the \ channel\]
\[n \ - \ Number \ of \ bits \ of \ the \ channel\]

ORDERING GUIDE

<table>
<thead>
<tr>
<th>Reference</th>
<th>Package Description</th>
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<tbody>
<tr>
<td>SENSPro-TMP</td>
<td>Temperature sensor for peripheral body temperature measurement with standard physical characteristics and random sleeve color.</td>
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</table>

\(^{1}\) The number of bits for each channel depends on the resolution of the Analog-to-Digital Converter (ADC); in biosignalsplux the default is 16-bit resolution \((n = 16)\), although 12-bit \((n = 12)\) and 8-bit \((n = 8)\) may also be found.