

REFLECTION INDEX

<p>What is it?</p>	<p>The Digital Volume Pulse (DVP) is a waveform that can be acquired with photoplethysmography (PPG). It exhibits a characteristic inflection point which is ascribed to the superposition of the direct wave and the reflection wave. The reflection index (RI) is an index computed on the DVP. It measures the amplitude of the reflection wave relative to the direct wave amplitude [Alty 2007].</p>
<p>Why do we measure it?</p>	<p>In non-pathological condition, the large artery elastic component assure that the pulsatile component of the cardiac cycle is softened and transmitted to the peripheral circulation. With advancing age, due to arterial stiffening, reflected wave increases [Charlton 2021, Wu 2012, Liang 2019]. The reflection index quantifies the reflected wave amplitude with respect to the forward one [Elgendi 2012]. This value can be modulated by different factors such as for example arterial stiffening, reflection coefficients, properties affecting timing of waves as subject height, heart rate.</p>
<p>How can it be measured</p>	<p>The reflection index (RI) is defined as the percentage of the ratio between the reflected wave amplitude (y) and the direct wave amplitude (x). It can be expressed as percentage.</p> $RI = y/x * 100$
<p>Where is it measured?</p>	<p>Since the RI is an index computed on the DVP, it can be measured wherever a DVP can be acquired (see PPG).</p>
<p>Figure</p>	<p>Figure from a publication:</p> <p>(a) Pulse wave A where direct and reflected wave are observable. (c) First derivative of waveform A. (b) Pulse wave B where the</p>

	<p>reflected wave is not clearly detectable. (c) First derivative of waveform B. PPT = peak-to-peak time; CT = crest time.</p> <p><i>S. R. Alty, N. Angarita-Jaimes, S. C. Millasseau, and P. J. Chowienczyk, "Predicting arterial stiffness from the digital volume pulse waveform," IEEE Trans. Biomed. Eng., vol. 54, no. 12, pp. 2268–2275, 2007, doi: 10.1109/TBME.2007.897805.</i></p>
References	<p>Alty et al. 2007. DOI: 10.1109/TBME.2007.897805. Charlton et al. 2021. DOI: 10.1152/ajpheart.00392.2021 Wu et al. 2012. DOI: 10.1109/TIM.2011.2159416. Liang et al. 2019. DOI: 10.3390/jcm8010012. Elgendi et al. 2012. DOI: 10.2174/157340312801215782.</p>

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<https://vascagenet.eu/feedback-for-official-glossary-of-key-terms>

* These definitions have been downloaded from <https://vascagenet.eu/official-glossary> and were released on 1st April, 2023.