



## PASSIVE UHF RFID STRAIN SENSOR TAG FOR DETECTING LIMB MOVEMENT

S. Merilampi<sup>1</sup>, T. Björninen<sup>2</sup>, L. Sydänheimo<sup>2</sup>, L. Ukkonen<sup>2</sup>

1. Satakunta University of Applied Sciences, Technology and Maritime Management,  
Tekniikantie 2, 28600 Pori, Finland
2. Tampere University of Technology, Department of Electronics, Rauma Research  
Unit,  
Kalliokatu 2, 26100 Rauma, Finland

Emails: [sari.merilampi@samk.fi](mailto:sari.merilampi@samk.fi), [toni.bjorninen@tut.fi](mailto:toni.bjorninen@tut.fi), [lauri.sydanheimo@tut.fi](mailto:lauri.sydanheimo@tut.fi),  
[leena.ukkonen@tut.fi](mailto:leena.ukkonen@tut.fi)

---

*Submitted: Apr. 11, 2012*

*Accepted: May 14, 2012*

*Published: June 1, 2012*

---

*Abstract- A strain sensor tag with screen printed antenna for seamless integration with clothing is examined to provide a wireless method for monitoring of human body movements. The strain response of the tag is investigated in air and on human body. While the results indicate strong antenna-body interaction, the strain response of the tag is found to be a monotonic function of the strain.*

**Index terms:** Radio frequency identification (RFID), wearable sensor, passive sensor, tag-based sensing, polymer thick films, printed electronics