

Using Sound Pressure Sensors to Monitor the Performance of Manually Operated Circular Saws: What Parameters and to What Extent Can They Be Inferred?



FORMEC

Romania 2017

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Introduction:



Delivery of various wood products to final consumers spans a wide supply chain composed of operational processes developed in the forest, on the transportation infrastructure, in the primary timber processing facilities and in the final wood product development facilities;



To cope with market requirements and customer satisfaction, production managers are concerned with their product development processes, insurance of production quality and timing of their product release on the market;



Meanwhile, one of the current problems of the Romanian wood related industry is that related to the training level of the personnel.

Scope:

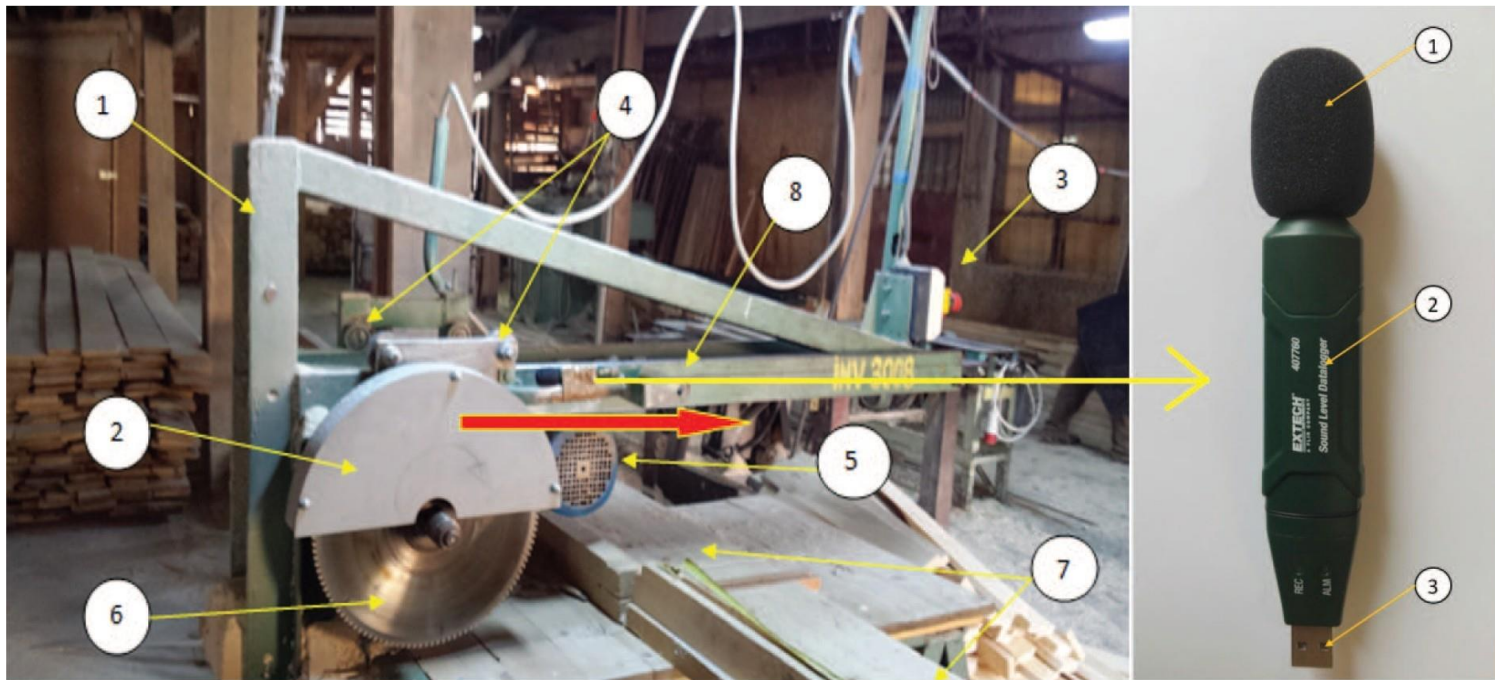


The goal of this study was to test to what extent the sensors used to measure the sound pressure level can be used to monitor and collect data for manually operated wood trimming equipment.

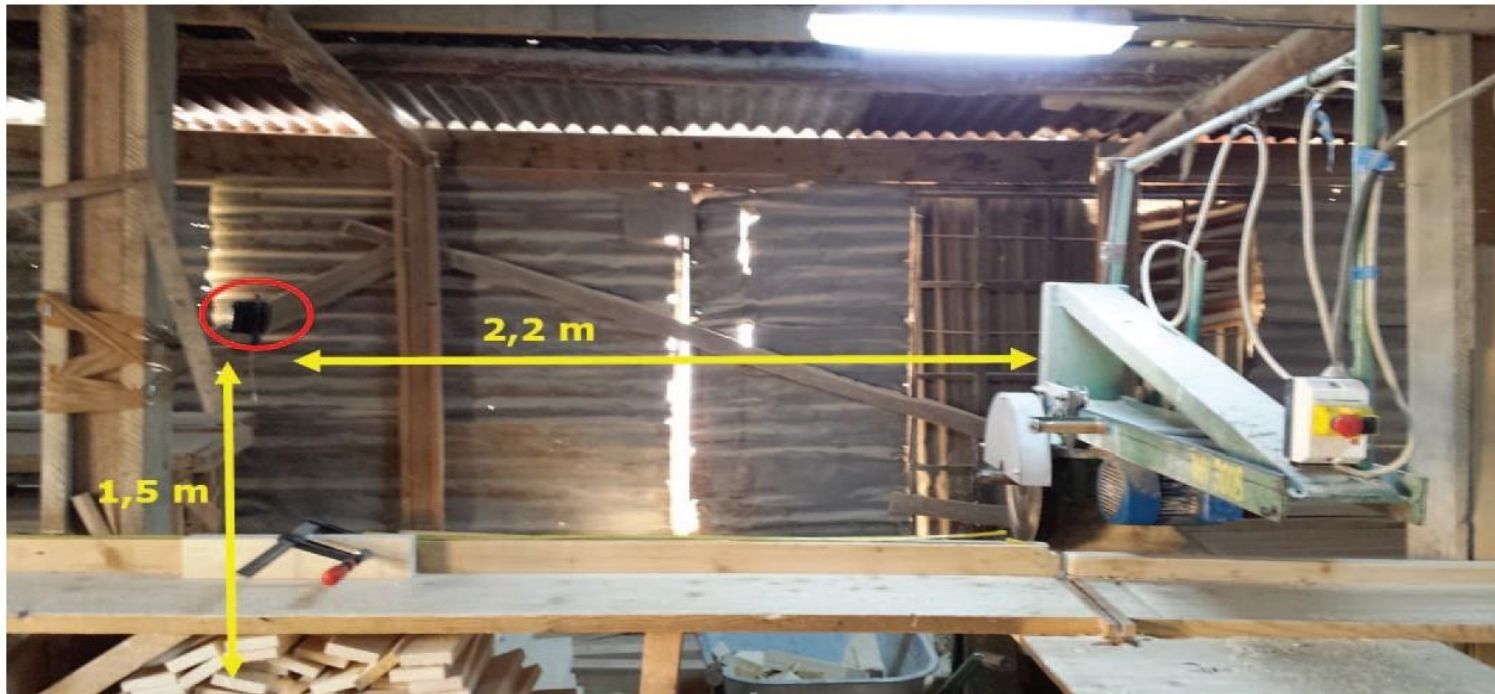
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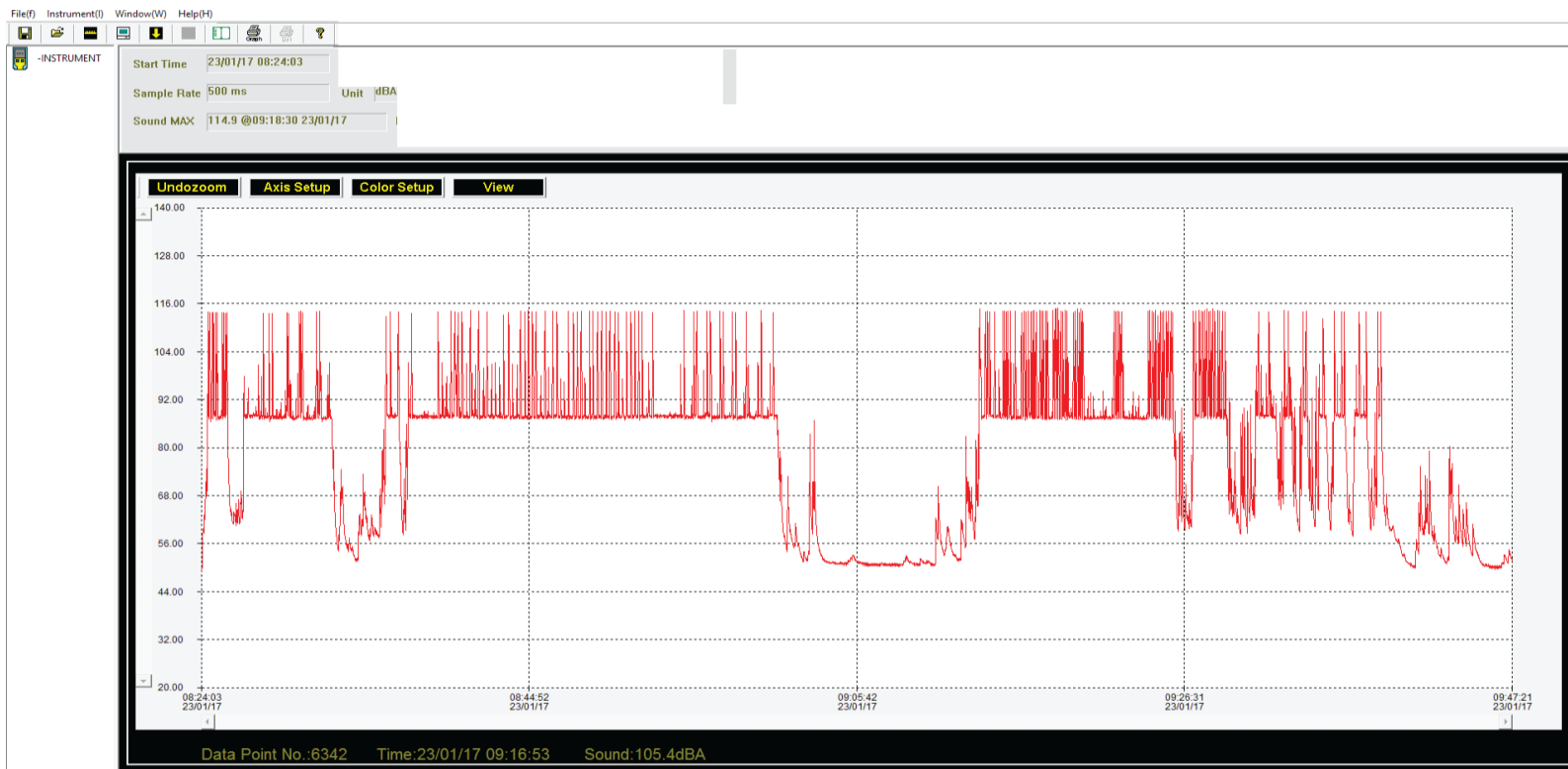
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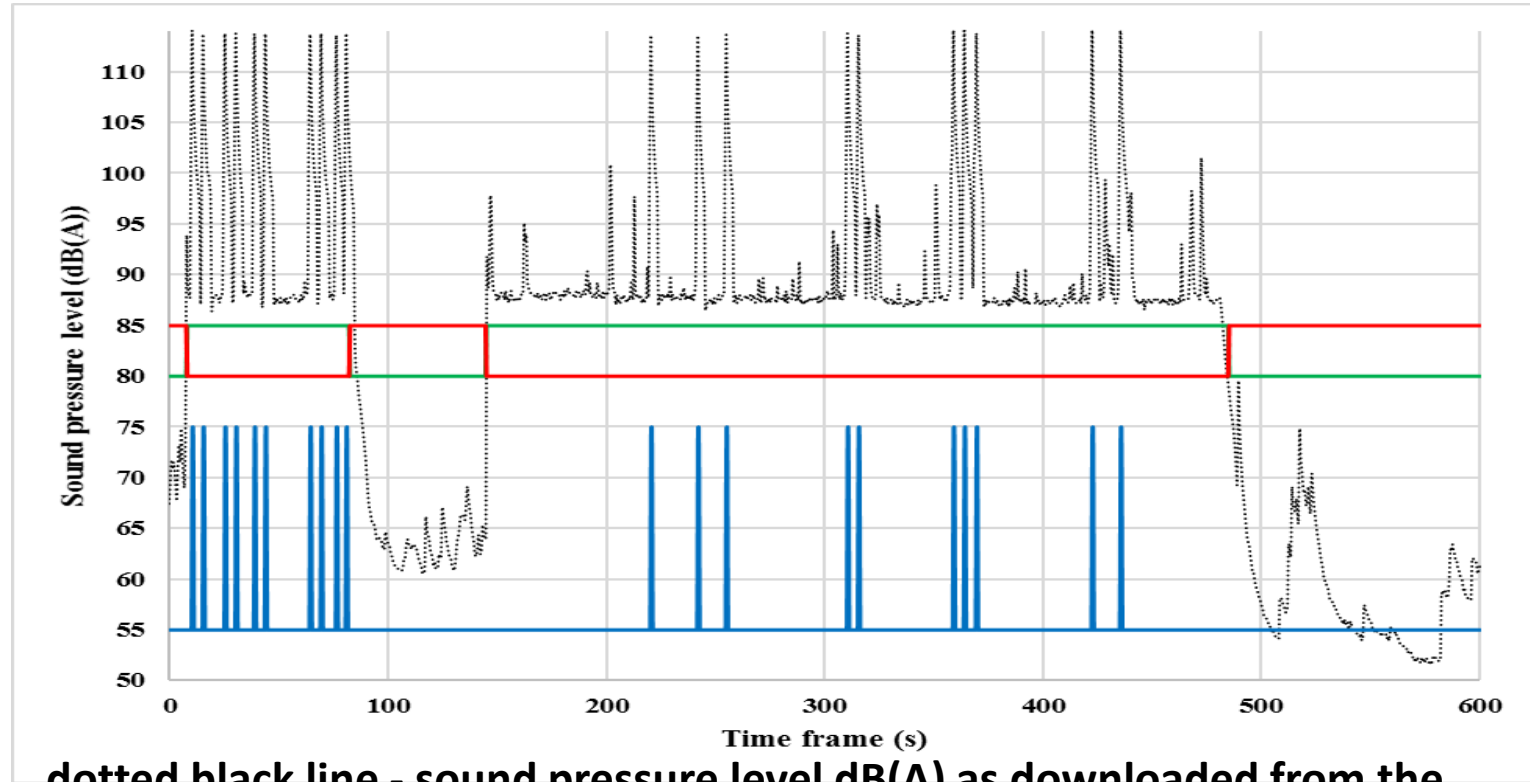


Results

Comparison of video-extracted and sensor collected data

Parameter	Extracted from video files	Extracted from sound pressure level data	Recognition accuracy [%]
Trimmed pieces	30	20	- 33.33
Running time - <i>RUN</i> (s)	414.5	413.5	-00.24
Down time - <i>STOP</i> (s)	186.0	187.0	+00.54

Results



dotted black line - sound pressure level dB(A) as downloaded from the datalogger, continuous green line - running regime; continuous red line - stopped regime, continuous blue line - number of recognized cuts

Conclusions



Following a comparative design, the results indicate a good potential to use a threshold-setting approach in monitoring the equipment, as the separation between the running and down time was possible and accurate;



Nevertheless, the extraction of effective sawing time as well as of the number of trimmed wood pieces that indicate the production, was rather difficult and inaccurate for the time being but it would be possible to infer such parameters by using higher sampling rates.

**THANK YOU FOR YOUR
ATTENTION!**



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