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## Measures and correctness criteria for determining the length of the image line of data obtained in the process of electromagnetic infiltration

### Tytuł

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## Abstract

The protection of information against electromagnetic penetration is one of the most important aspects related to the protection of information against its non-invasive acquisition. Compared to the activities of cybercriminals, the use of electromagnetic emissions in the electromagnetic infiltration process does not leave any traces of activity, and the owner of the information is not aware of its loss. The most common activities of electromagnetic eavesdropping are related to the infiltration of emission sources, graphically revealing the processing of information using both analog and digital methods. This allows for the presentation of reconstructed data in the form of images. Correct display of the acquired information requires knowledge of raster parameters such as line length and the number of lines building the reconstructed image. Due to the lack of direct access to the intercepted device, knowledge in this field does not allow for the correct determination of the aforementioned parameters, and thus, for recreating an image that would contain legible and understandable data. Additionally, incorrect values of the parameters result in failure of further processing of the obtained image, e.g., by using a coherent summation of images. Therefore, it is necessary to propose a solution that will allow not so much to roughly define the raster parameters but to estimate them precisely. Moreover, it should enable the automation of the process after the implementation of an appropriate algorithm. The article proposes an algorithm for estimating the line length of the reconstructed image. The raster parameter estimated with the use of the algorithm allows for summarizing images several dozen times with a significant improvement in the image quality and readability of the data contained in it. The image summation algorithm is very often used as one of the main image processing methods in the electromagnetic infiltration process. Incorrect raster parameters often make coherent summation useless. The proposed algorithm for estimating the line length of the reconstructed image uses three methods of determining the line length of the image for a given accuracy. At the same time, criteria were indicated that must be met to determine the correct length of the image line for the assumed accuracy of estimation. Obtained results confirmed that the proposed methods and criteria are effective in the process of electromagnetic infiltration. These methods allow us to determine the line length of reconstructed images with accuracy up to  $10^{-5}$ .

### Keywords:

electromagnetic leakage information; computer security; protection of information; TEMPEST; image processing; reveal emission; VGA; HDMI; image contrast

## Powiązane publikacje

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