Light Rail Camera
- an EMC-assessment

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Public safety and security is an exponentially growing market and does not only put high demands on the camera quality, but also on its flexibility. With a competitive market, companies must offer solutions over the expectations. This thesis investigates the possibility to attach a camera to a light rail for easy implementation and adaptation for a security system. This was verified with a proof of concept prototype that can transfer power, communication and attach a camera on to the light rail.

Figure 1: A light rail camera prototype.

Today when a new camera is going to be set up, an installer has to draw long cables and also mount the camera onto something. This also makes it really difficult to move the camera to a new position. What if it was possible to use an already existing infrastructure to mount the cameras on and also draw power and communication from, all to skip cable management. This could be possible with the help of light rails.

A light rail is in most cases just an extension of the electrical wall socket that is exposed. From here you can attach any lamp socket designed for that model. The lamps become easily adaptable on the rail since they are easy to move and angle. This was the featured goal of the light rail camera, movable and adaptable application for the user.

A prototype was constructed using a homeplug-adapter. These adapters are used to send internet trough the electric wires in your house, for example to get internet access on another floor without having to use a long ethernet cable. The homeplug-adapters were deconstructed and modified for its application and combined with some other electronics for it to work properly. Finally all components were placed in a 3D-printed housing combined with an attachment for the light rail.

The figure below shows an example of how the prototype was connected. A computer was connected to a base unit that was in turn connected to the light rail. A camera and the developed prototype could then be attached to the light rail in order to establish communication and power for the units.

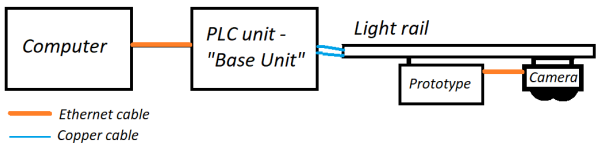

Figure 2: Example of light rail camera setup.

The light rail camera were tested for its connection reliability and showed promising results with one or more cameras connected. A theoretical maximum with the constructed prototype indicates usage up to 15 cameras for every base unit which would be necessary feature for a security network. The light rail camera was also tested for electromagnetic emissions. The results indicated that the emissions are higher than the allowed standard.

In future development of this concept the electromagnetic emissions needs to be lowered. The prototype itself should also be made smaller and less noticeable. This could be achieved by constructing the full device in-house and not use a modified homeplug-adapter.

The light rail camera could potentially be an attractive product for retail stores that has the need to adapt the security system for changes in the store layout. It could also save installation cost since it adapts to an existing infrastructure.