

An Open-Source Hardware-In-The-Loop Virtualization System for Cybersecurity Studies of SCADA Systems *

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Abstract.

Industrial control systems are targeted by cyberattacks since Stuxnet in 2010 and attacks have increased in the past years wtr. interconnection with IT systems. Due to their contact with the real world, industrial systems must be protected and engineers must be trained accordingly. In this paper, we present a scalable physical process virtualization platform for cybersecurity study of SCADA systems. Our virtualization platform includes electronic interfaces and a software physical processes simulator, directly connected with the input/output cards of industrial control system hardware. Our system is entirely open source including electronic card schematics, printed circuit boards, embedded software and physical process simulation software and provides a reasonable real-time performance.

Keywords:

Hardware in the loop simulation, Cybersecurity, SCADA.