

## 12. Entwurf hybrider Systeme mit Hyperbonds

Hybrid =

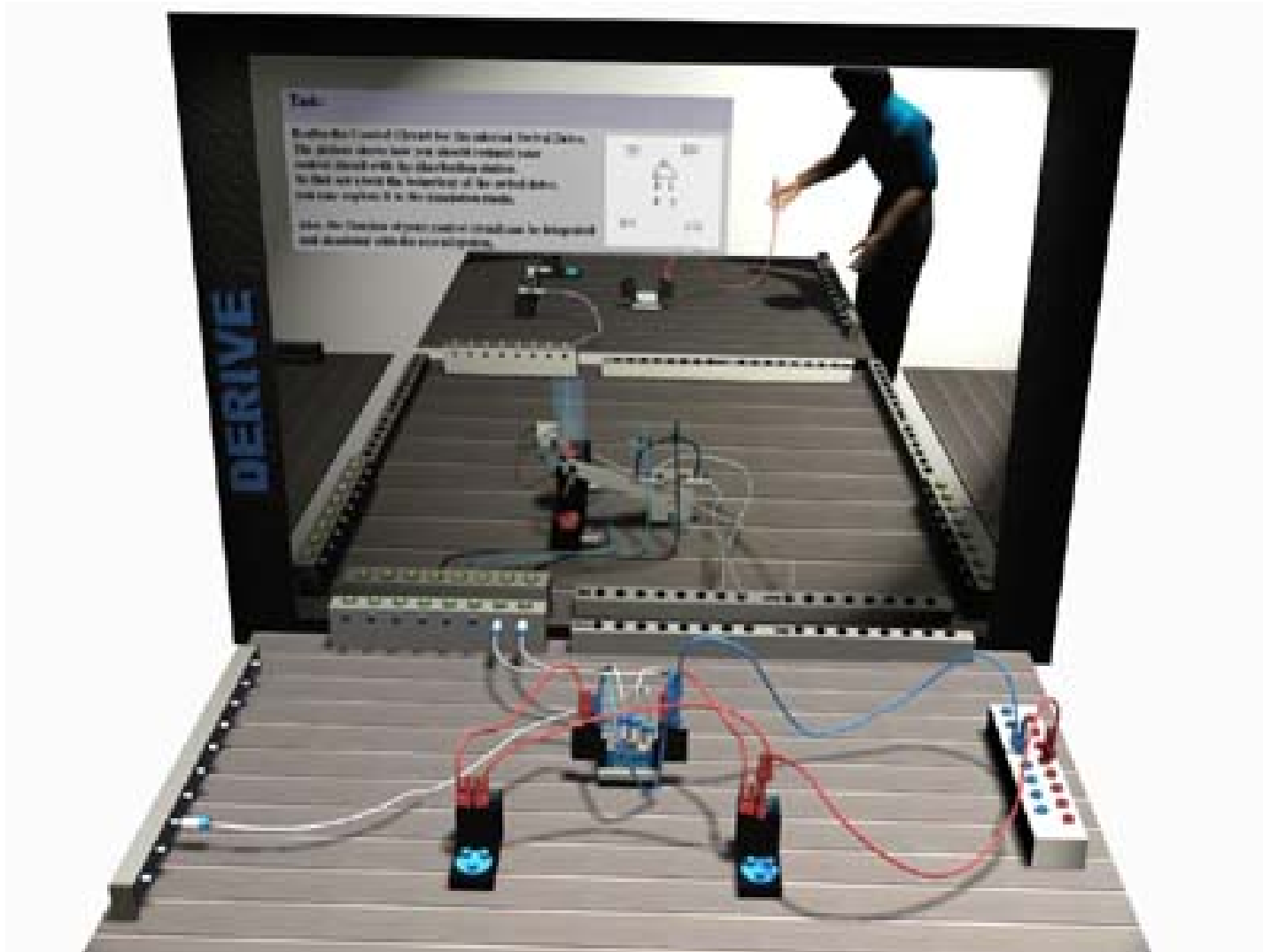
analog/digital

real/virtuell

Energie/Signal

Physik/Information

# HyperBond-Anwendungen



# HyperBonds

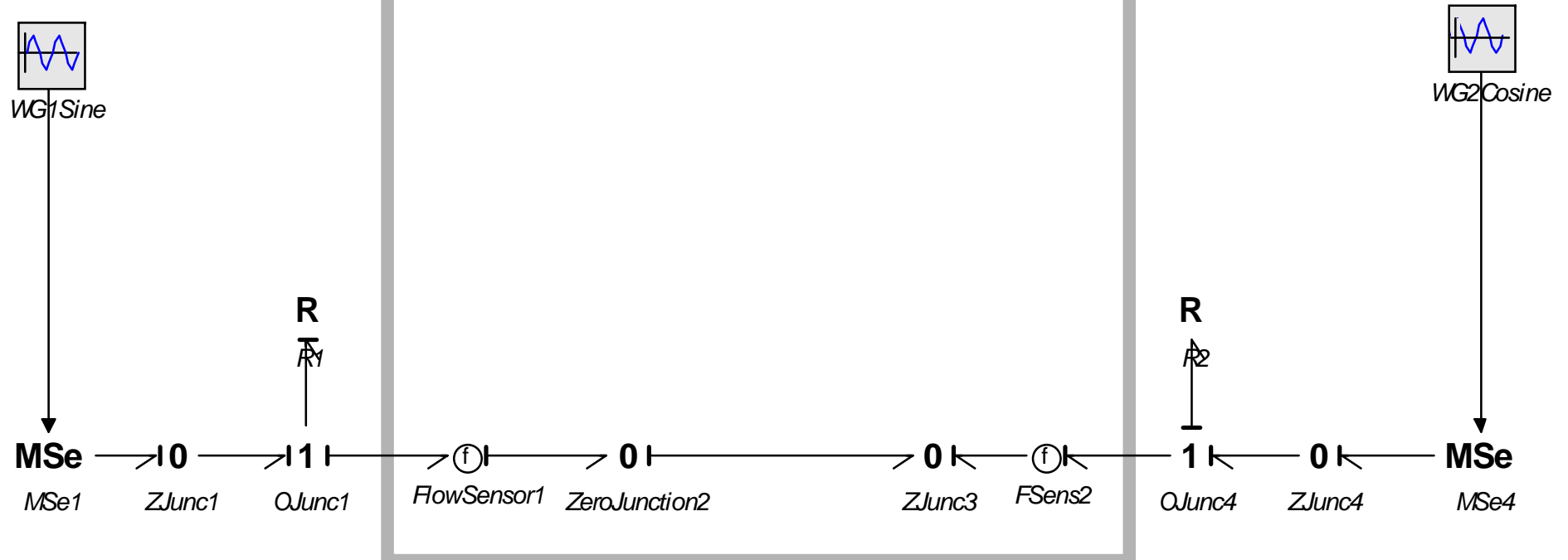
Ein Hyperbond ist ein universelles, bidirektionales Interface zwischen Energie- und Informationsebene.

Es stellt einen stetigen Energiefluss in und aus einem energetischen System

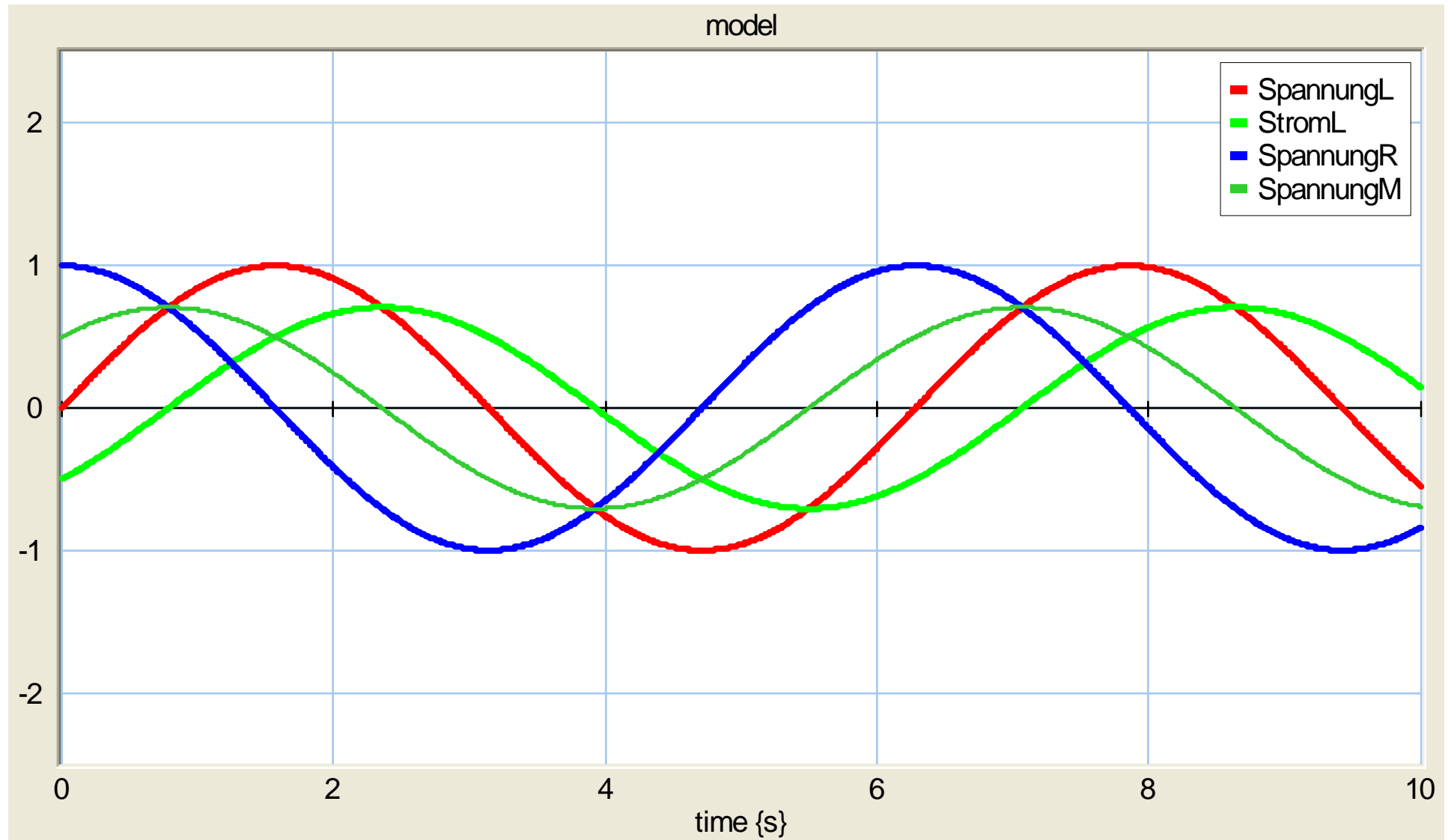
in Abhängigkeit vom verbundenen Informationssystem sicher.

Das HyperBond Prinzip gilt für alle Energieflussformen.

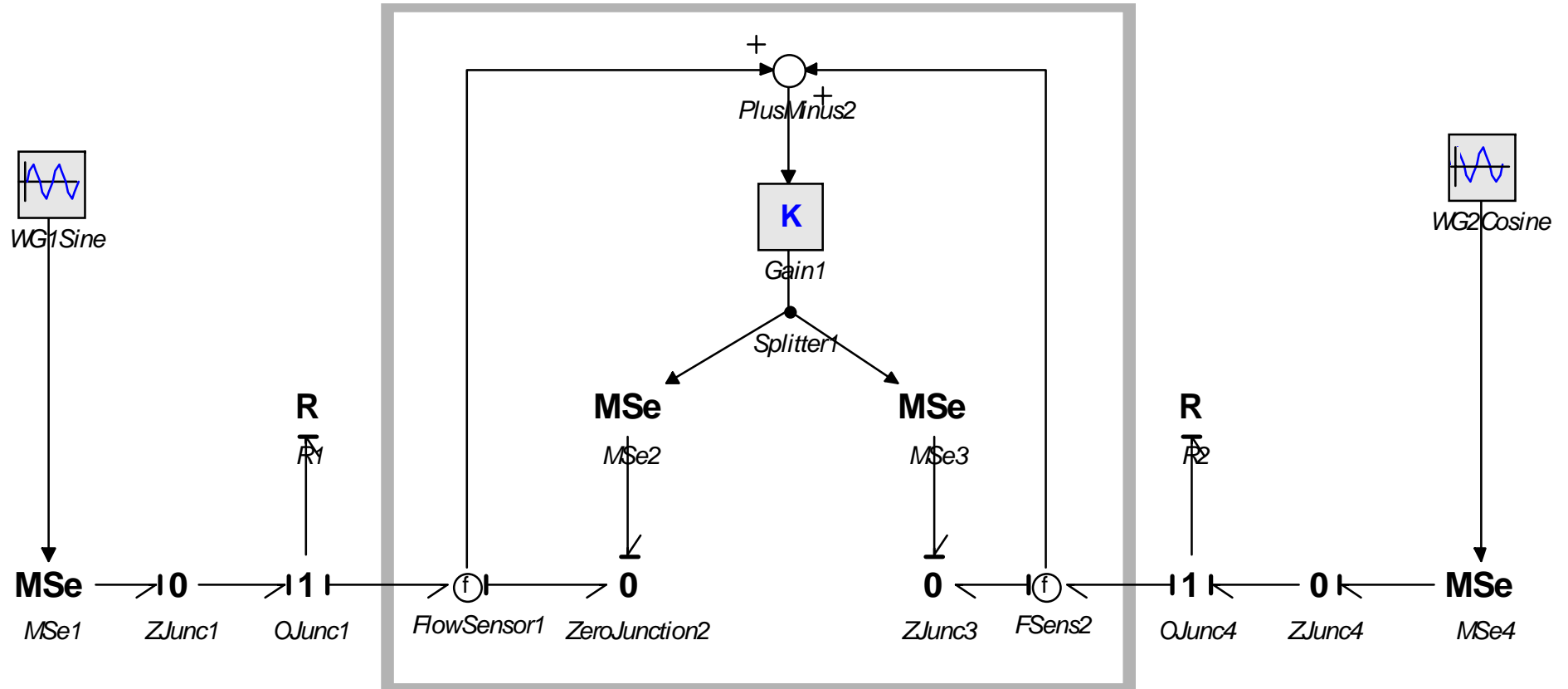
# HyperBondLeerR\_R



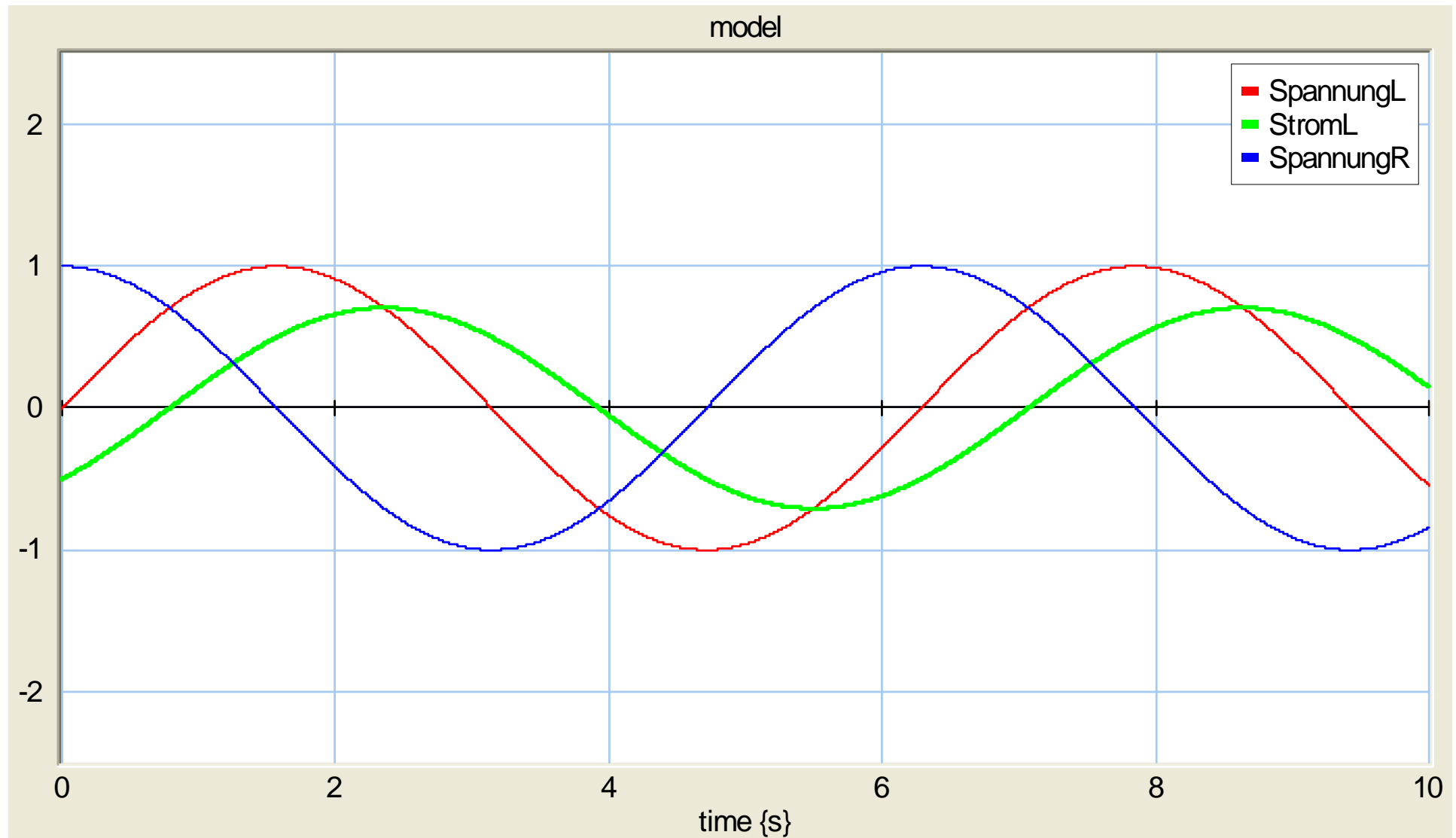
# VerhaltenLeerR-R



# HyperbondAnalogR

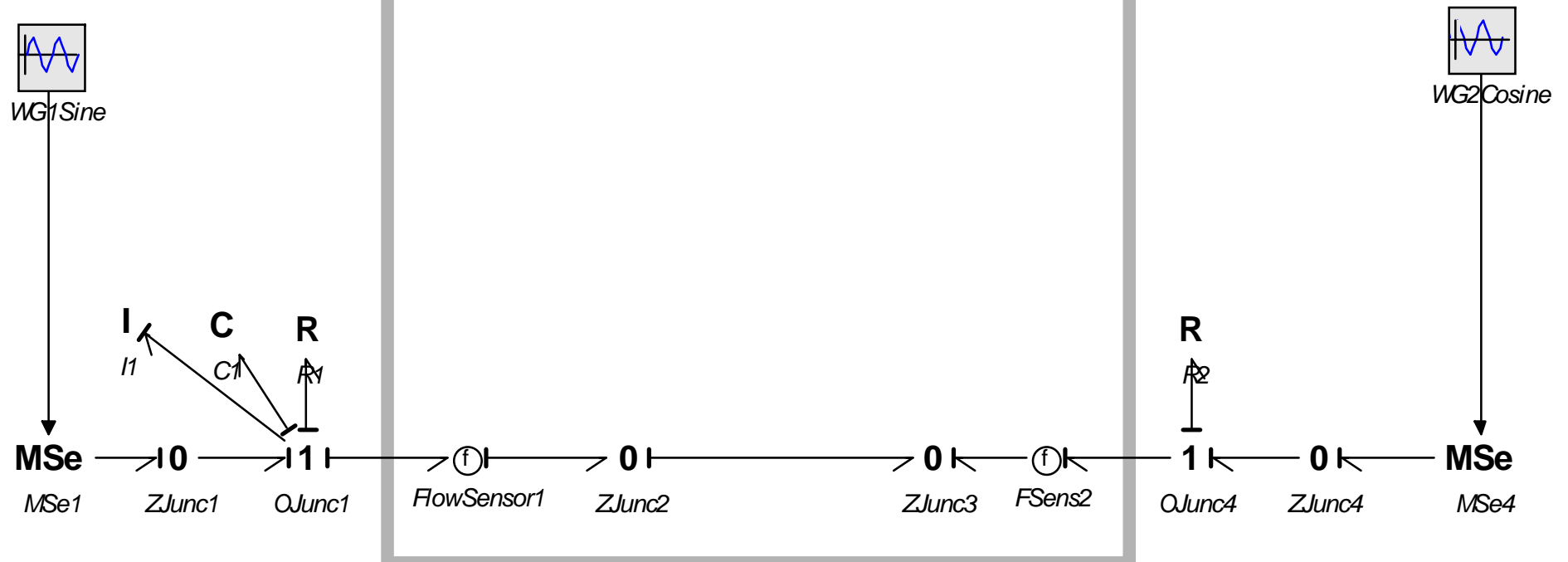


# HyperbondAnalogR Verhalten



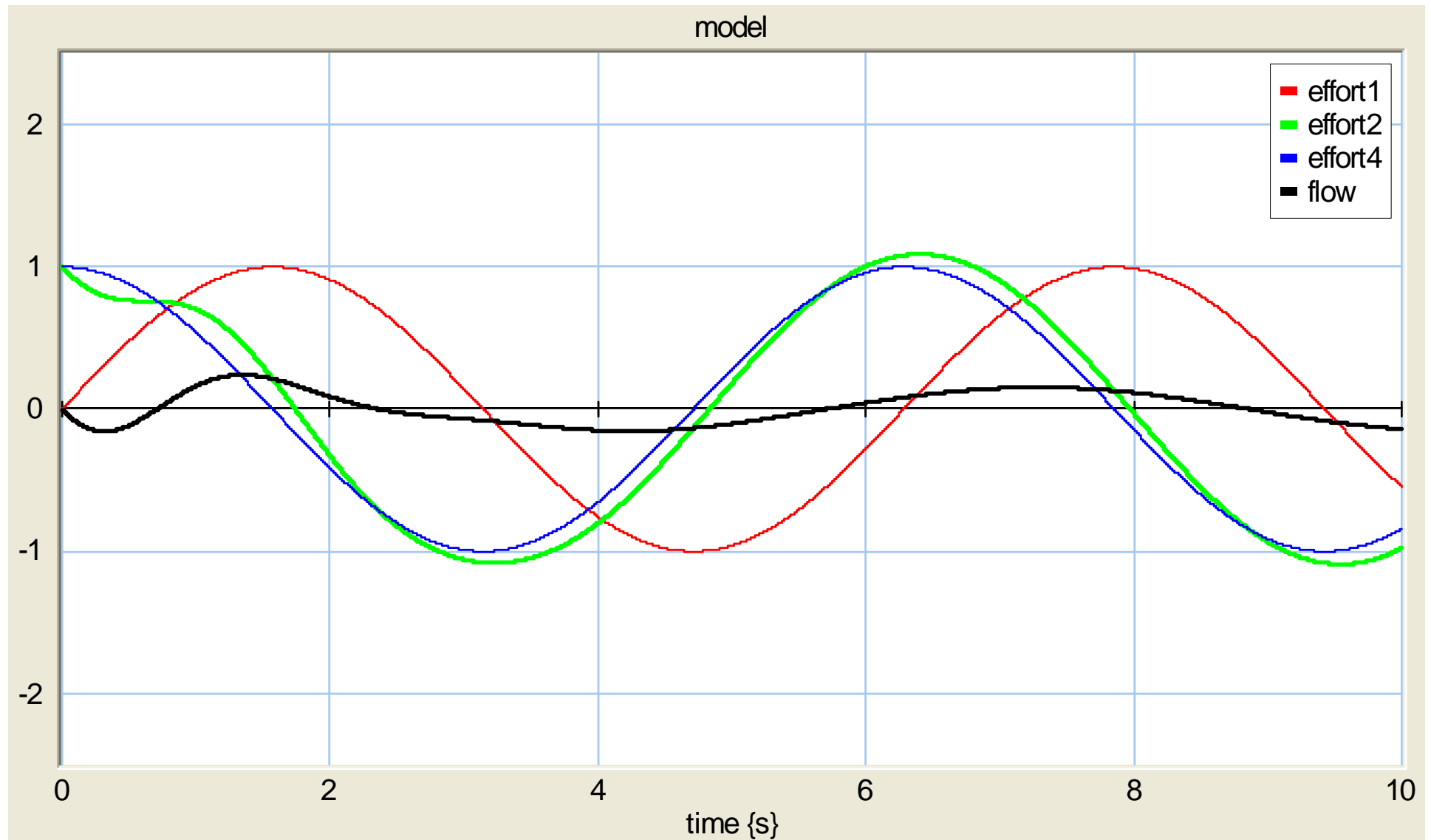
# HyperBondLeerCIR\_R

Theoretical Behaviour

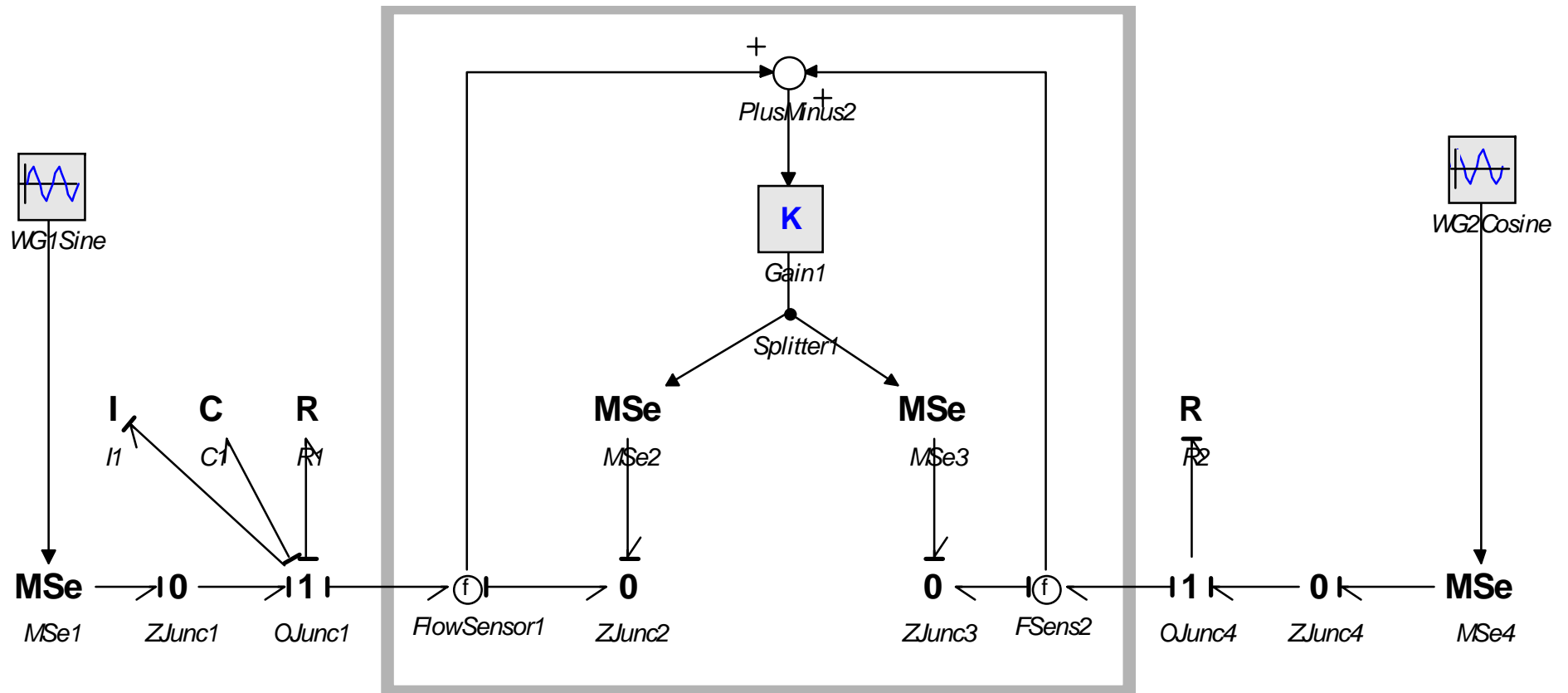




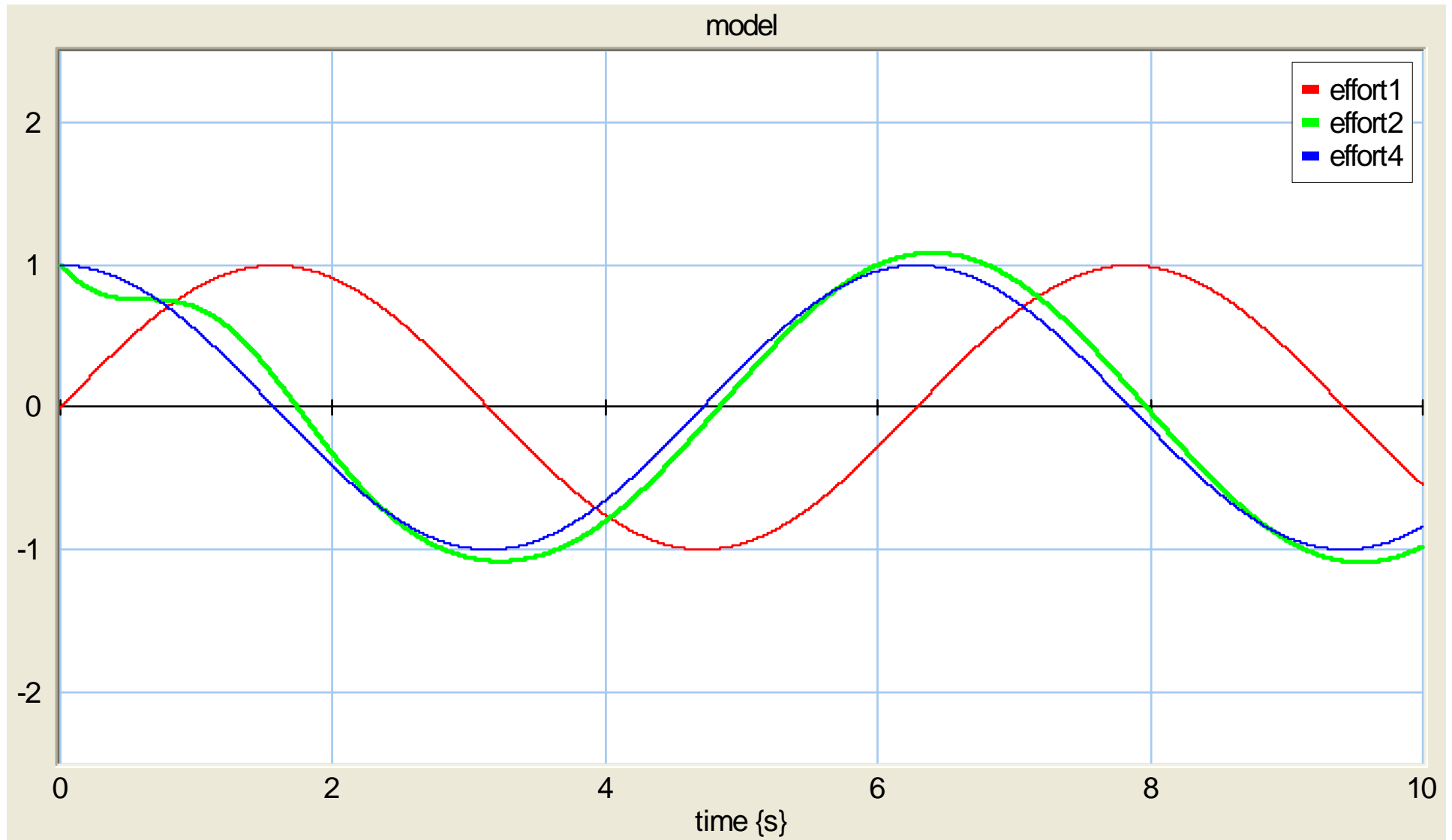
# VerhaltenCIR\_R



# HyperBondCIR\_R

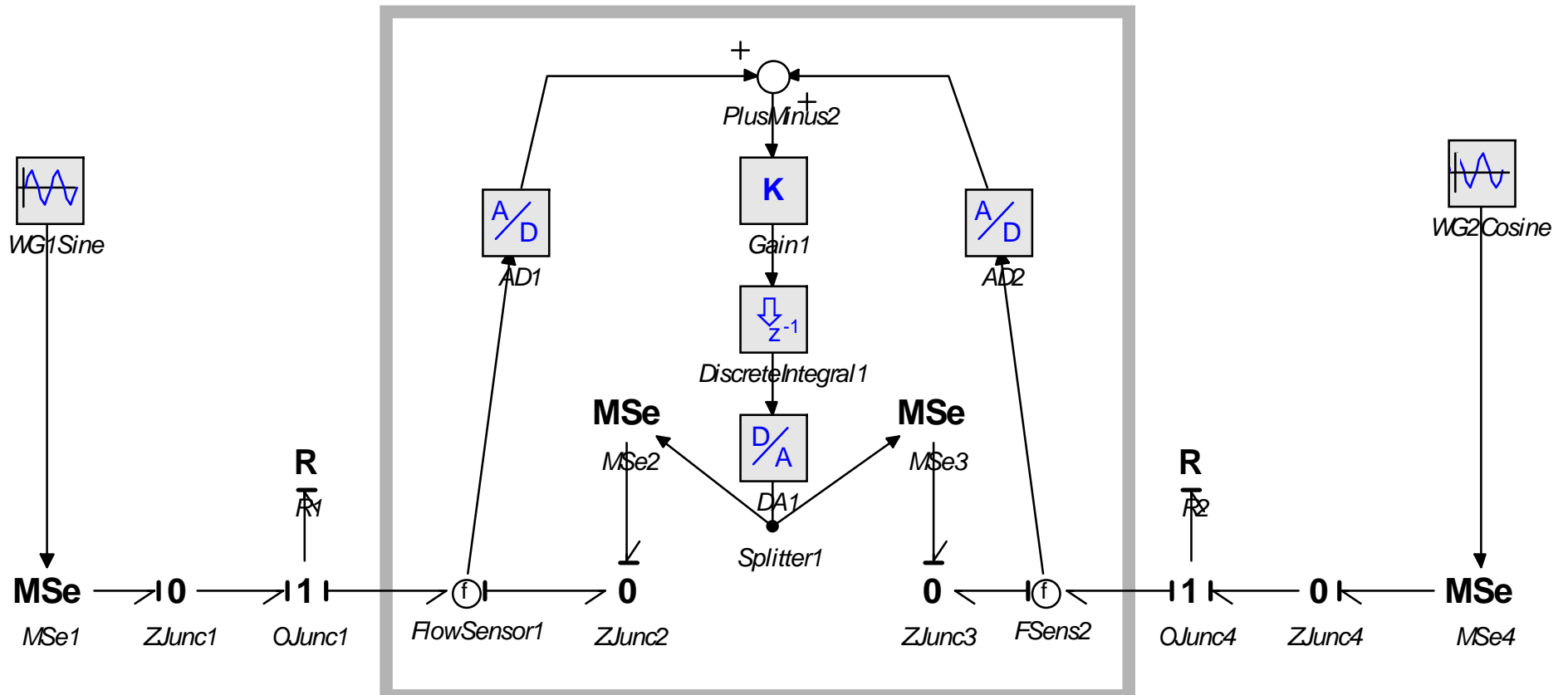


# VerhaltenHBCIR\_R

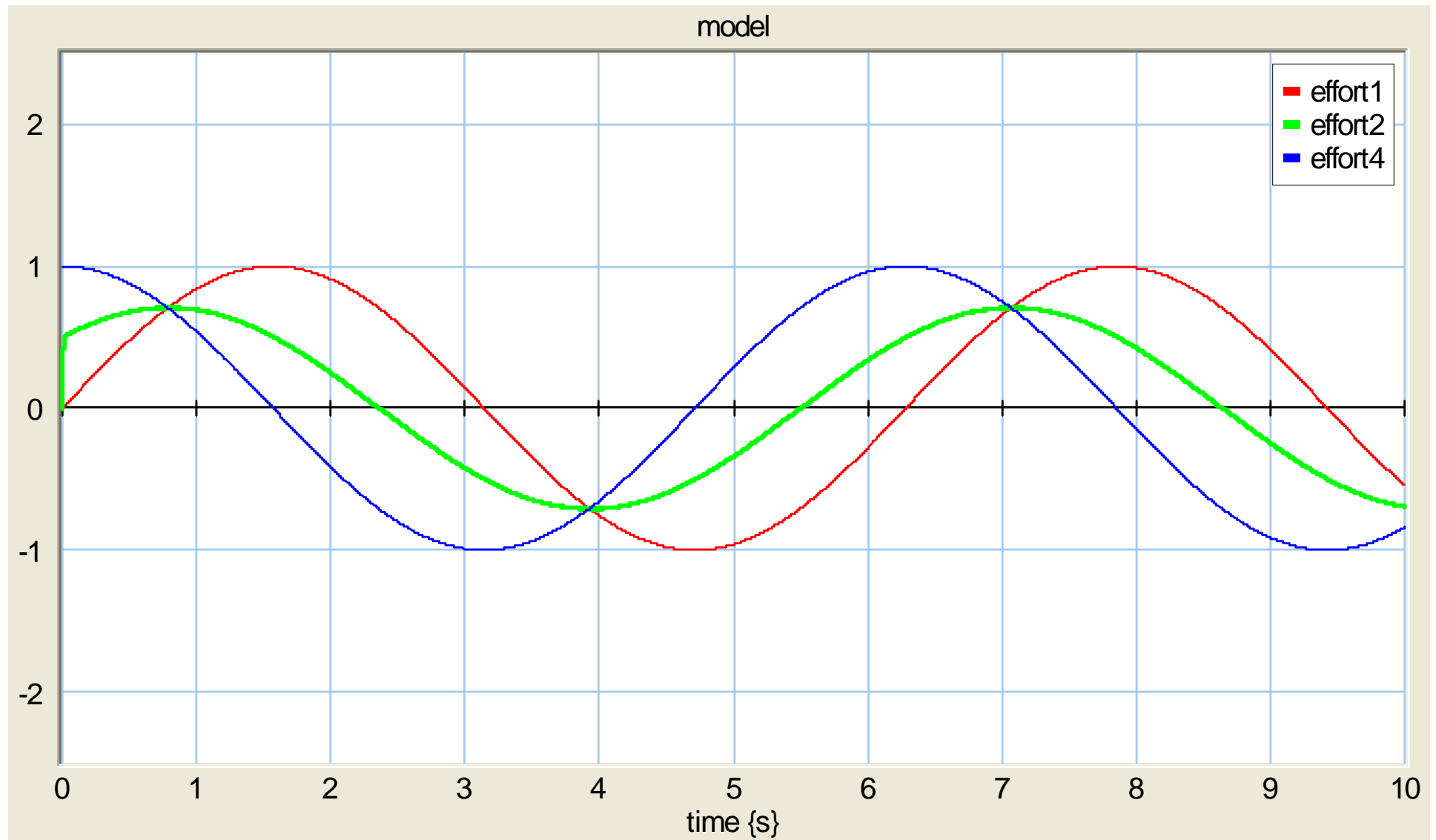


# HyperbondDiskretF

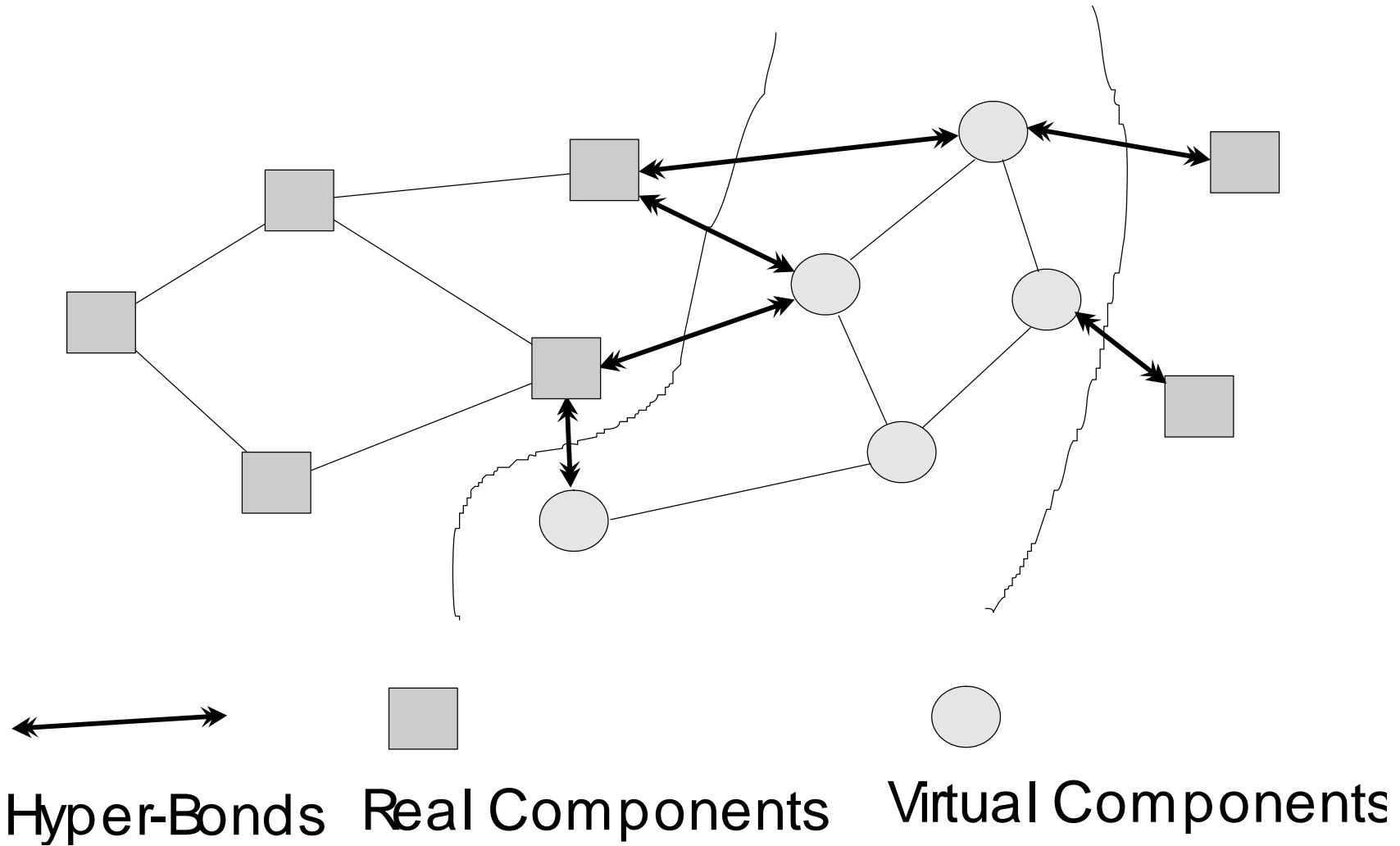
## Hyperbond Implementation F



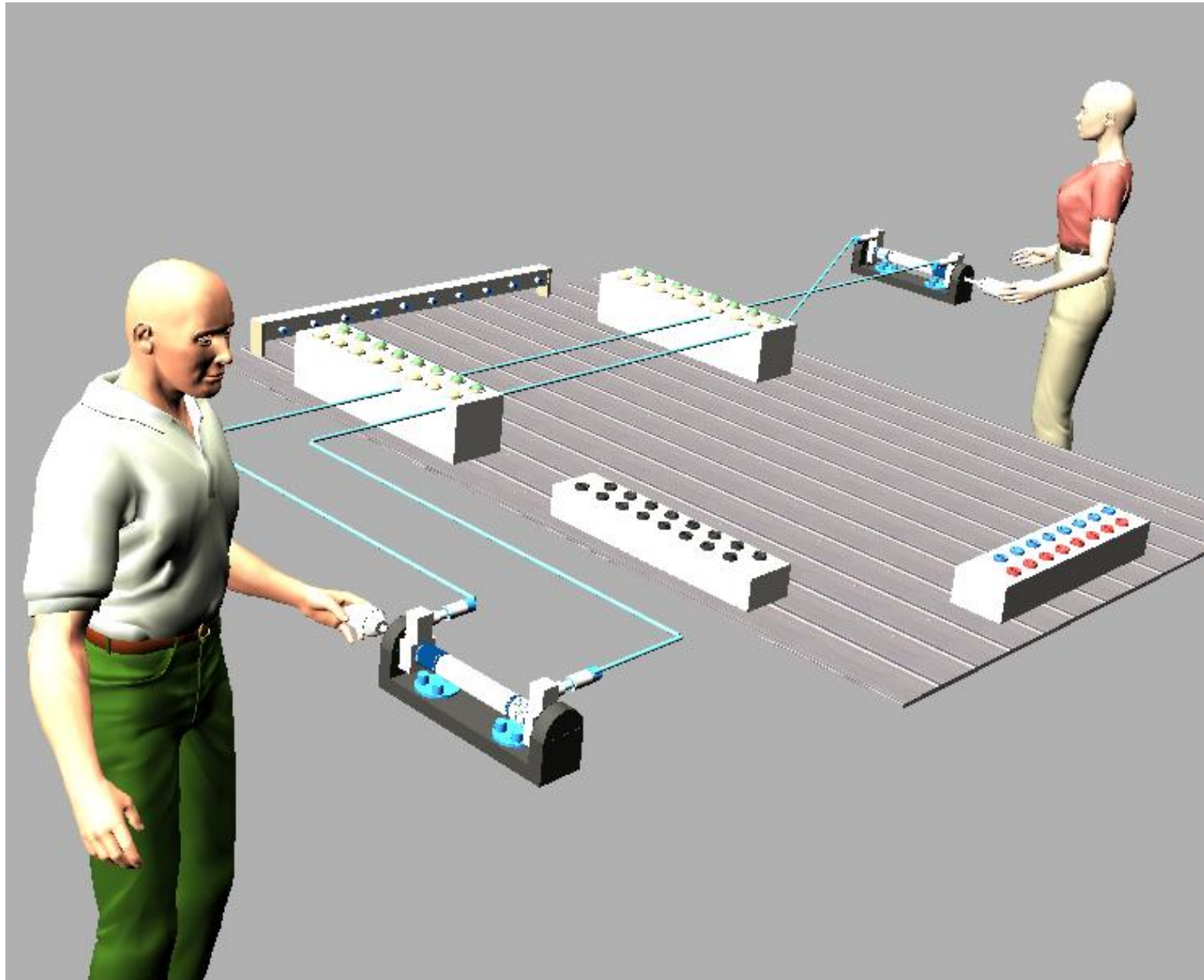
# HyperbondDiskretFVerhalten



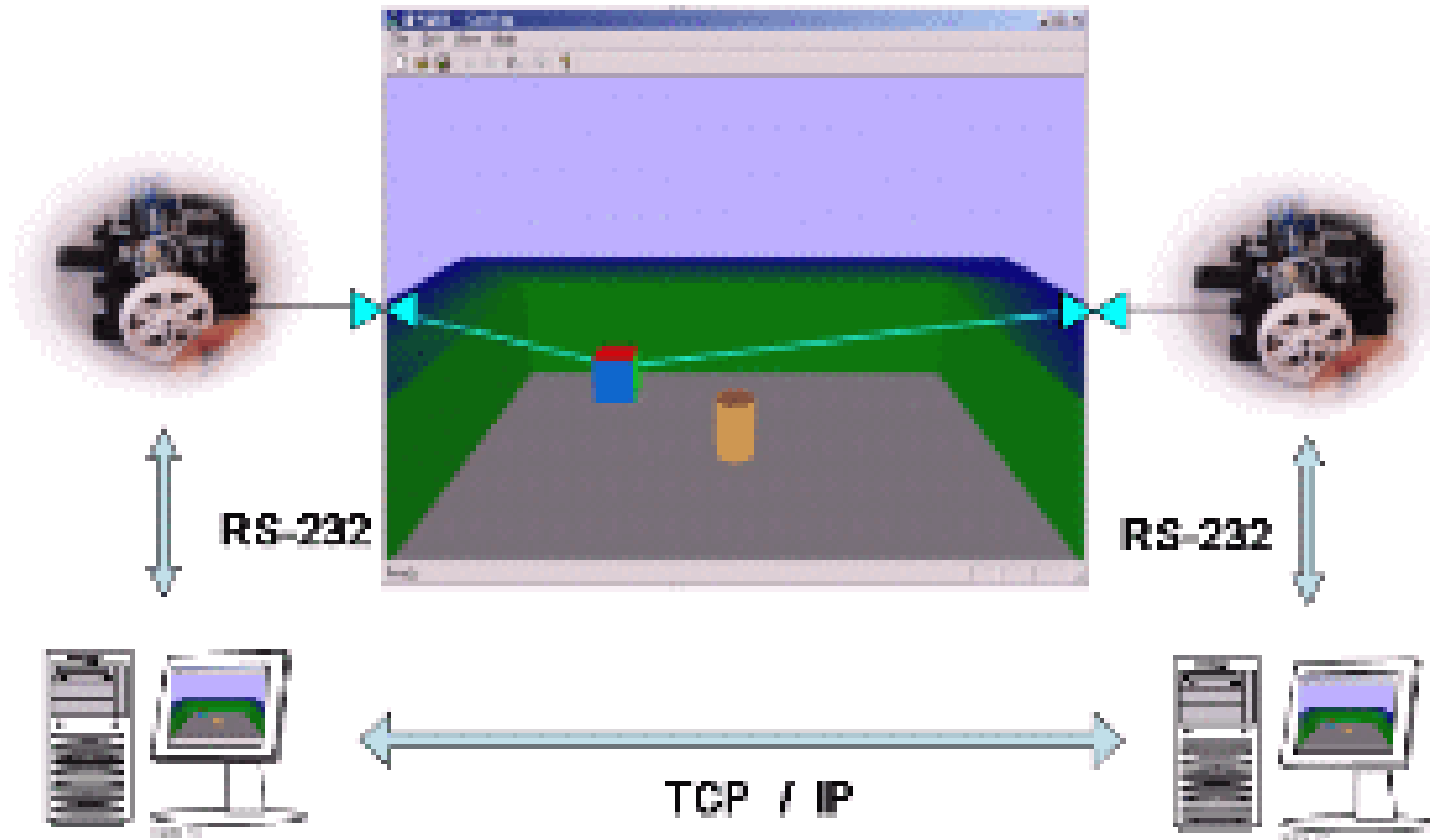
# Aufschneiden und verteilen eines Systems



# Remote Control

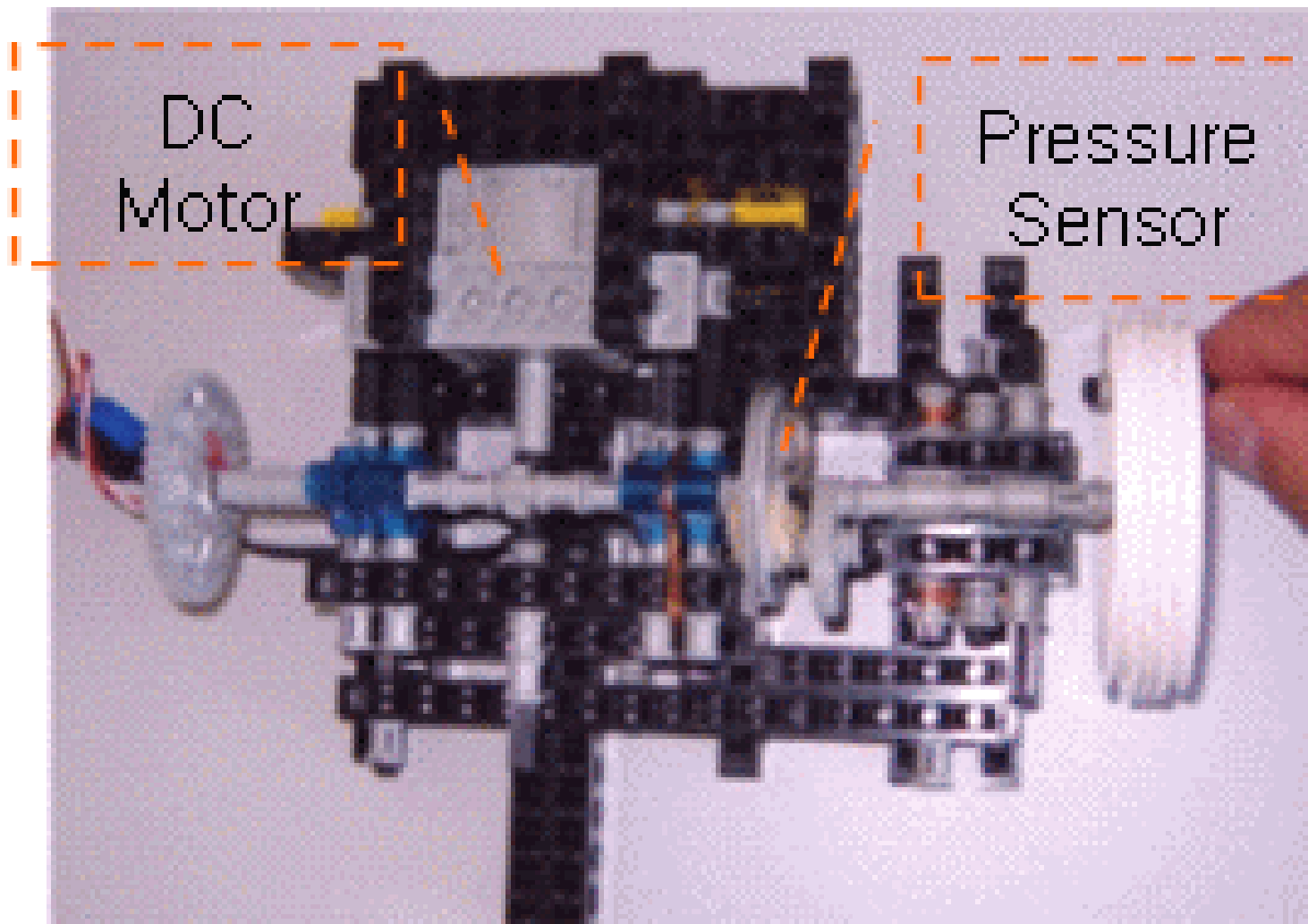


# Remote Force-Feedback

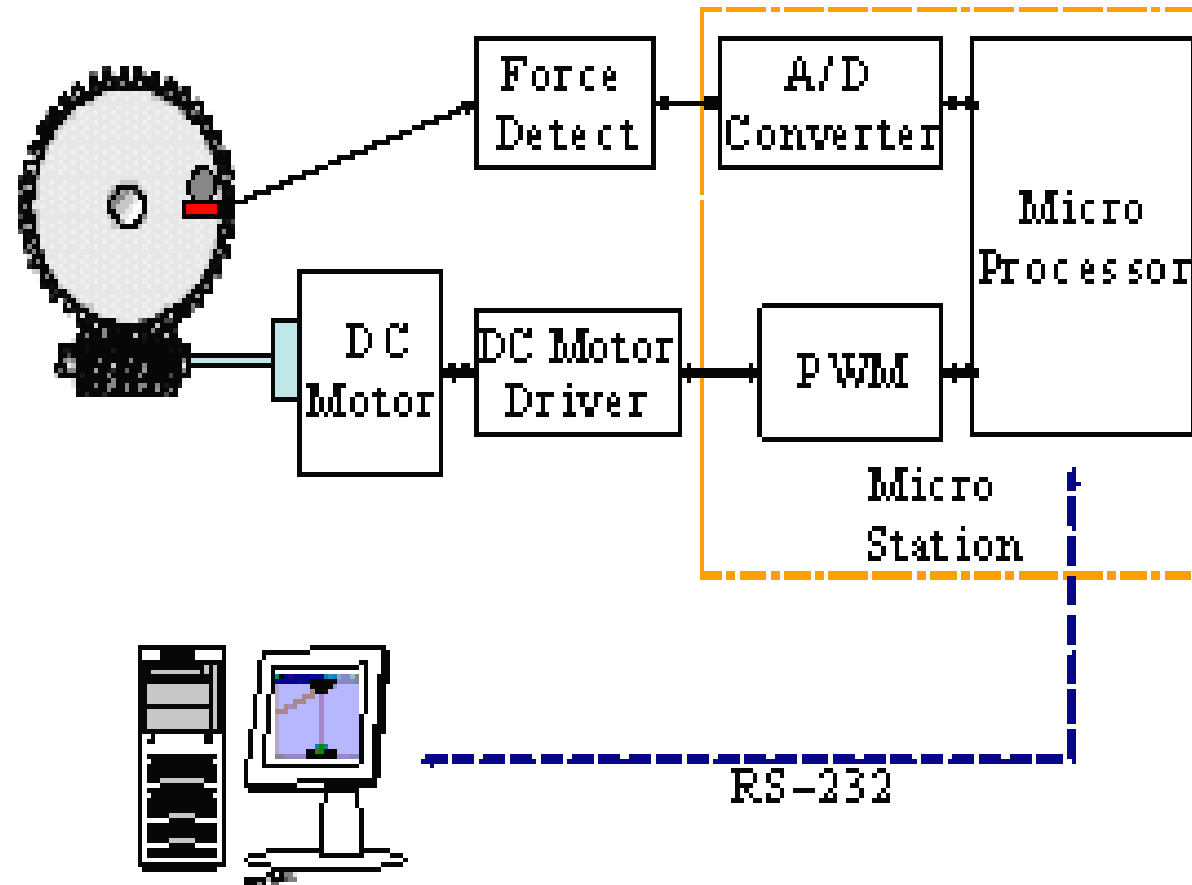




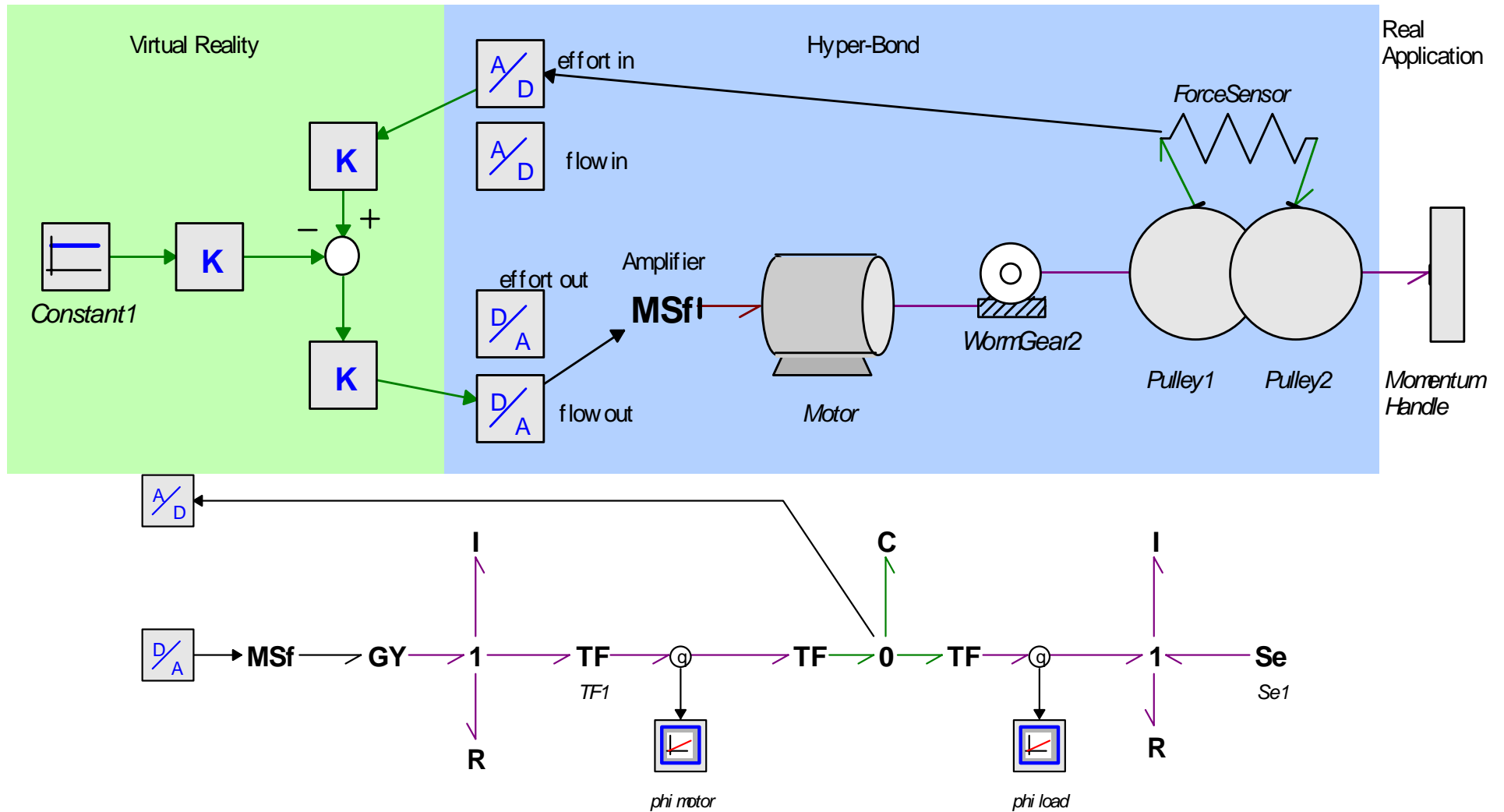
## Low-Cost Momentum Handle



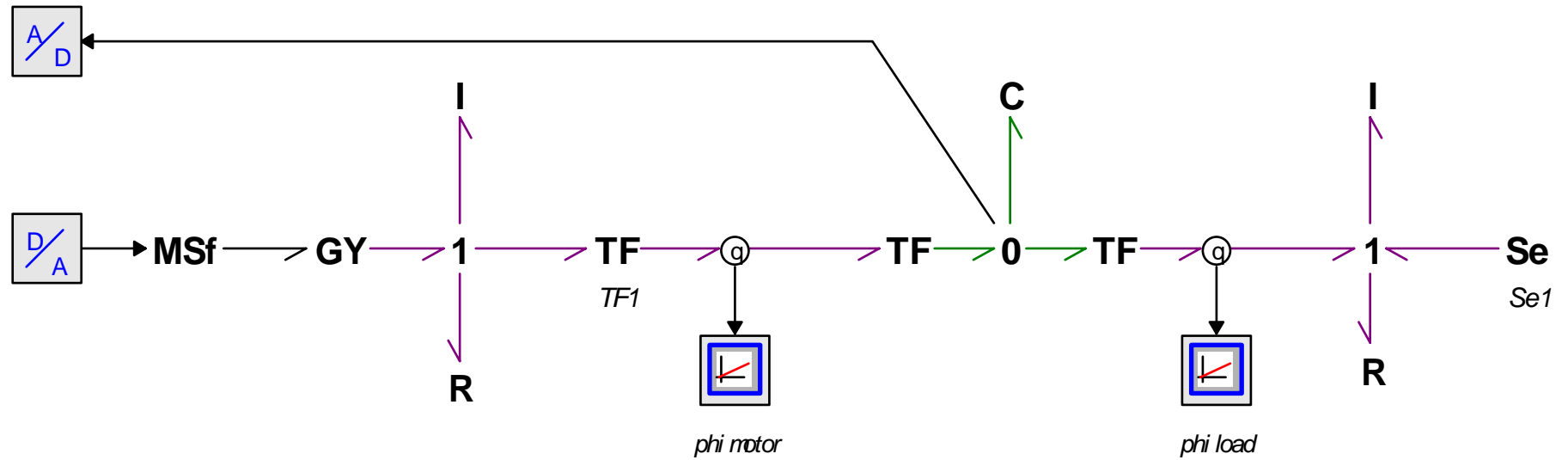
# LoMo



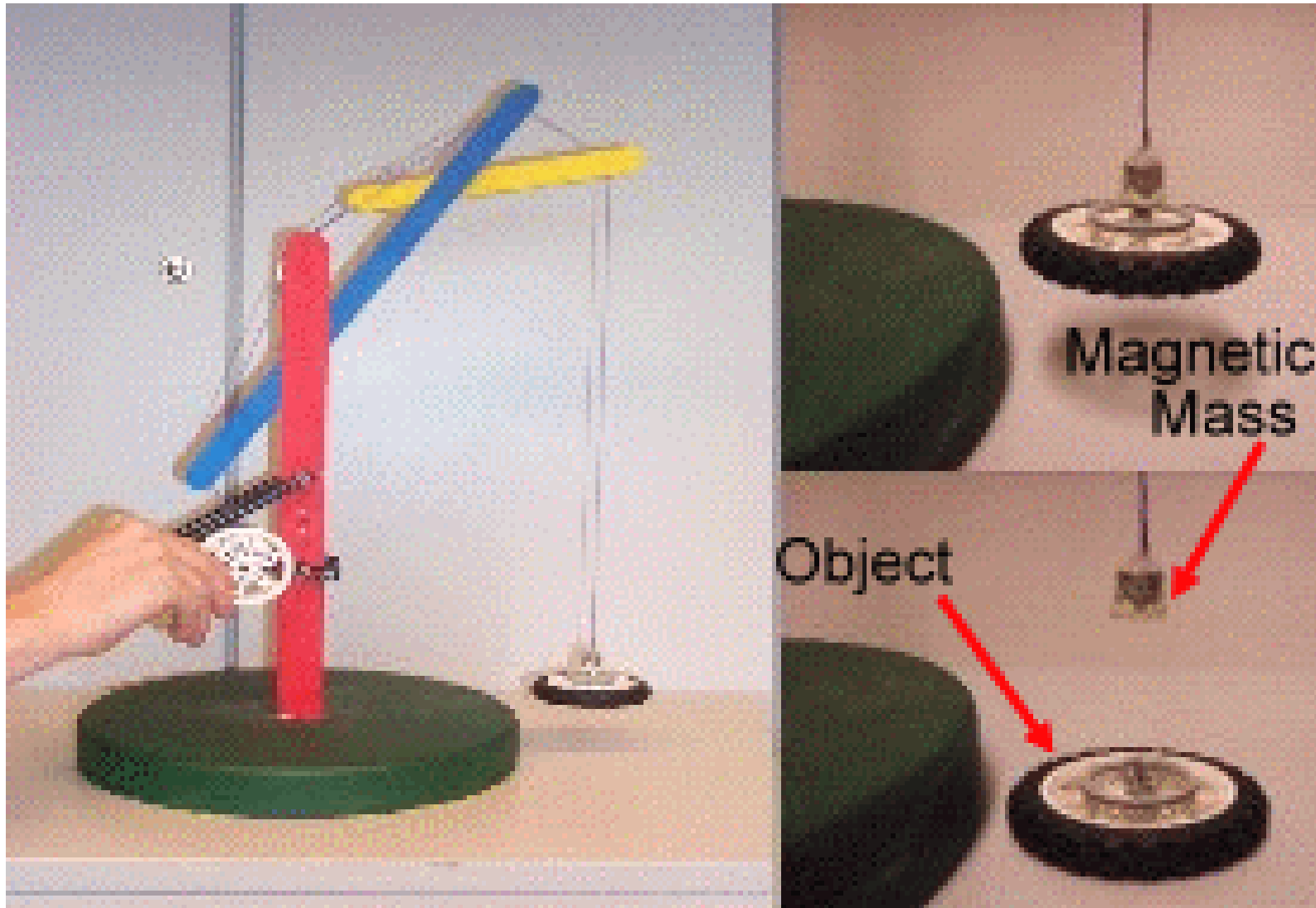
# Drehmoment Handle



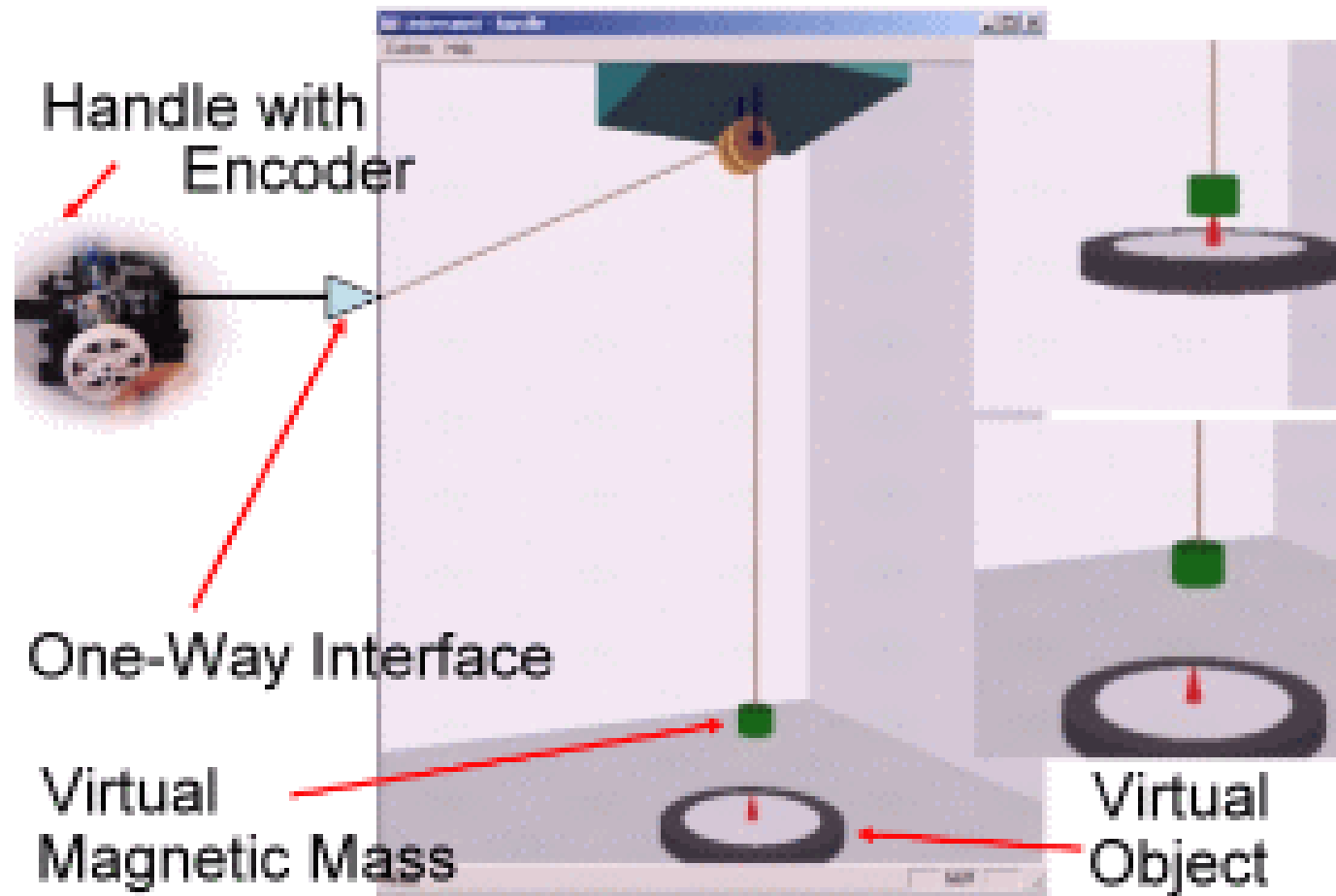
# Reality Part



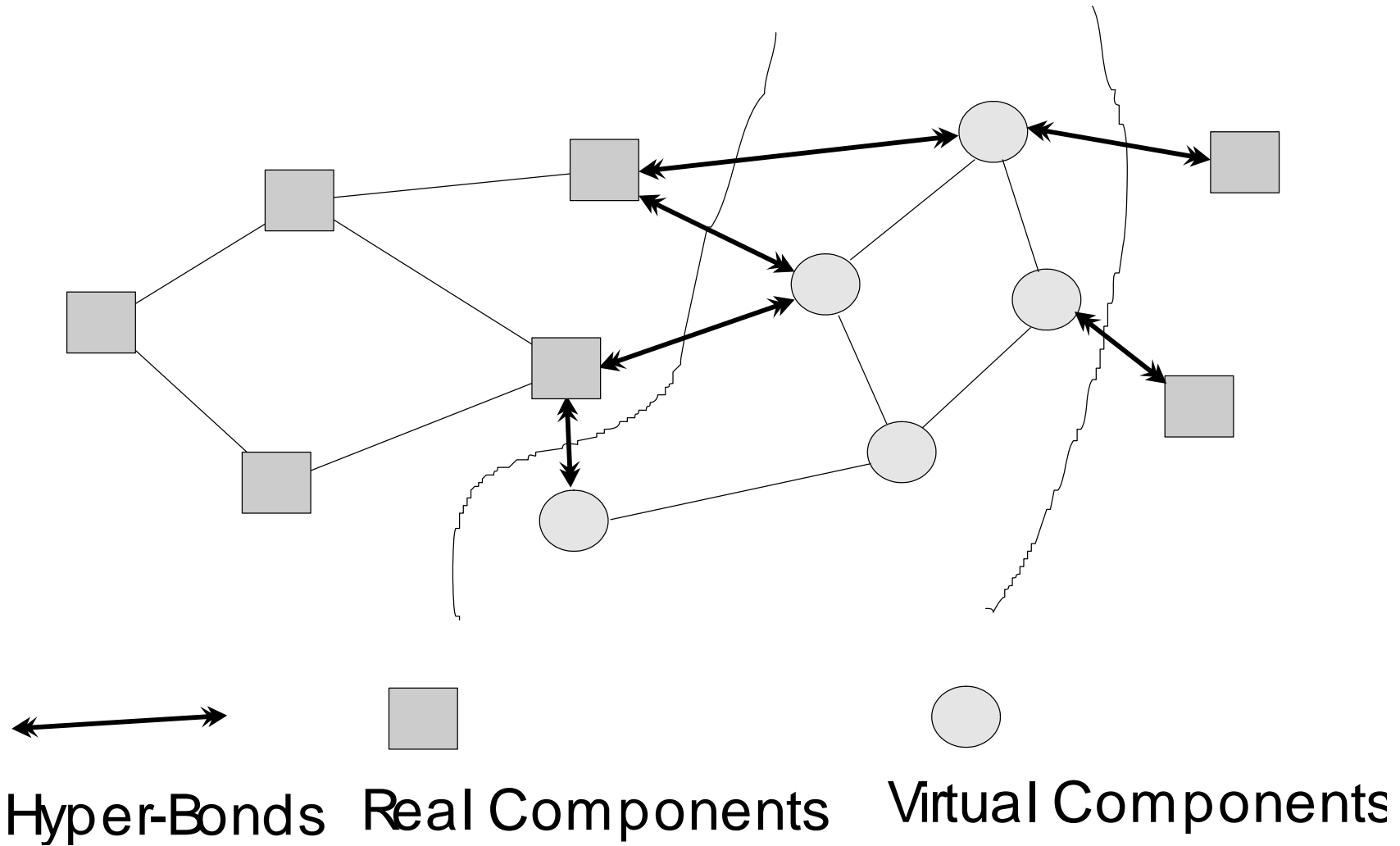
# Lifter



# LoMo Lifter



# Aufschneiden und verteilen eines Systems



# Scenario: simulation of parts of a complex System

- Coupling of complex circuits
- Integration of Cosimir Robot-Simulation

