

Sercos connectivity: Integration of subbuses using the example of IO-Link

The vertical communication in the context of Industry 4.0 and Internet of Things (IoT) captures more and more the sensor/actuator level. Today, sensors and actuators, such as temperature probes or signal lights, are typically connected via a binary or analog link. In future, these devices will become more and more intelligent, which facilitates the implementation of decentralized automation concepts.

From a topological and functional viewpoint, the sensor/ actuator interfaces, such as AS-I or IO-Link, are to be viewed "below" the current, established fieldbuses. The integration is done by using appropriate fieldbus gateways. This approach is a significant advantage for the sensor and

actuator manufacturers, as fieldbus gateways for almost all real-time Ethernet solutions are available. Consequently they can offer a device with only one single and unified digital interface.

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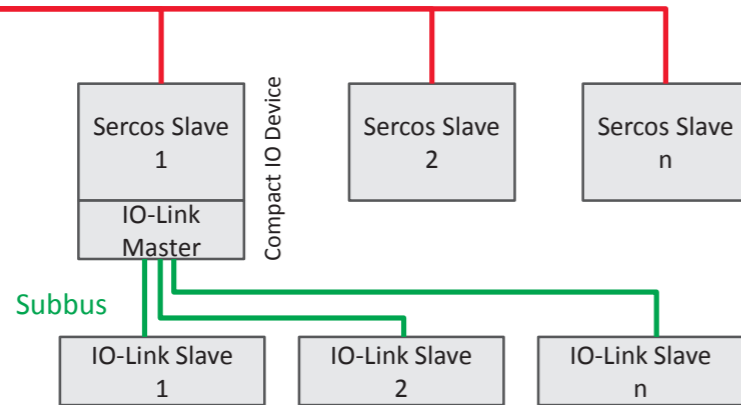


Image 1: Gateway as a stand-alone device

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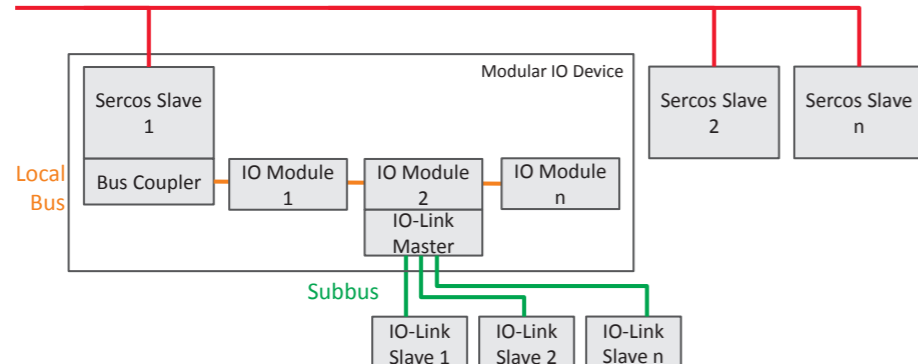


Image 2: Modular device with an integrated gateway

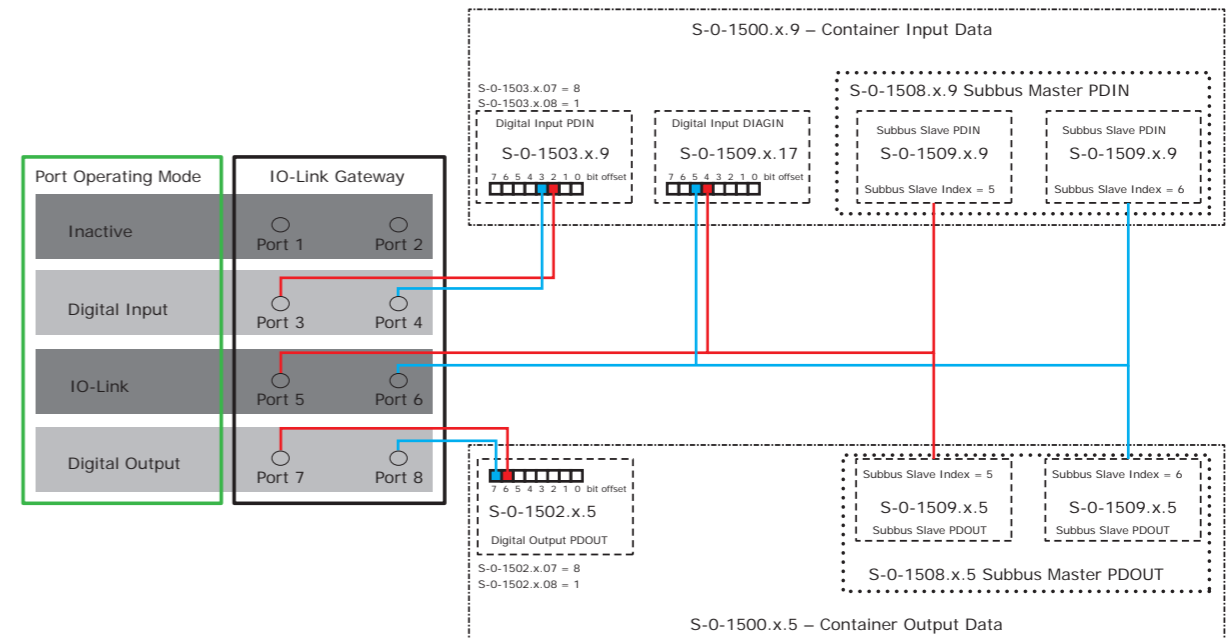


Image 3: Mapping of the cyclic data transmission

For Sercos® a generally valid specification for the integration of IO-Link into Sercos was created, which covers all necessary use cases comfortably and in a manner appropriate to the user. Major importance was placed particularly on both the diagnosis and parameterization of the IO-Link master ports in the gateway and on handling in the case of a gateway exchange.

The device with the gateway functionality can be a stand-alone device (image 1), or it can be part of a modular device (image 2).

The specification for the IO-Link integration (see image 3) contains the functionality during operation (cyclical data and acyclic data transmission, automatic parametrization in case of device replacement), the functionality during

start-up (device identification of all connected IO-Link devices, coordinated bus start-up of IO-Link with Sercos), the functionality of the configuration (port configuration of the IO-Link master ports, configuration of the IO-Link devices), the functionality in case of diagnosis (replacement value behavior in error case, diagnosis of the IO-Link devices and of the IO-Link master ports).

The two-tiered nature of the specifications makes it easy to integrate – besides IO-Link – other subbuses (image 4). When changing the subbus, the Sercos mechanisms remain identical for the user. Furthermore, the application in the control device only changes little as the data exchange with sensors and actuators is based on Sercos mechanisms, which every Sercos control today can handle.

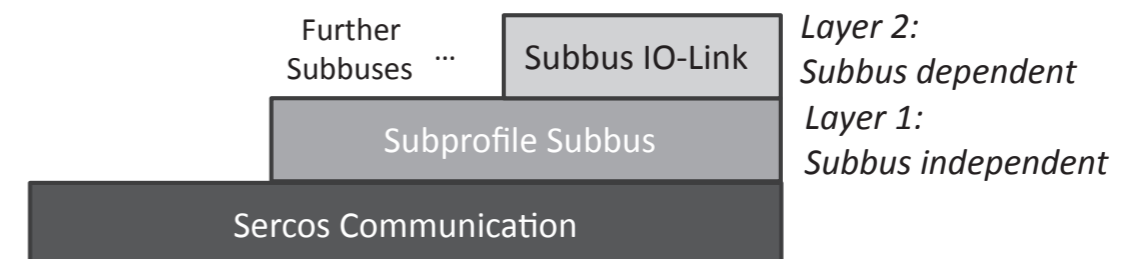


Image 4: Two-tiered subbus integration