



User Manual
Wiring Instructions
EtherCAT

Hilscher Gesellschaft für Systemautomation mbH

www.hilscher.com

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1 Introduction

1.1 About the User Manual

This user manual provides the wiring instructions for EtherCAT.

1.1.1 List of Revisions

Index	Date	Chapter	Revisions
1	2012-11-05	All	created

Table 1: List of Revisions

1.1.2 Conventions in this Manual

Notes are marked as follows:

Notes



Important: <important note>



Note: <note>



<note, where to find further information>

1.2 Legal Notes

1.2.1 Copyright

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1.2.6 Registered Trademarks

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All other mentioned trademarks are property of their respective legal owners.

2 Wiring Instructions EtherCAT

2.1 General Notes on Wiring in EtherCAT

- Use shielded Ethernet cables that meet the requirements of at least category 5 (Cat 5) according to EN 50173 or ISO/IEC 11801.
- Do not use **hubs** in an EtherCAT network.
- Use **switches** only between EtherCAT master and first EtherCAT slave device (100 MBit/s, Full Duplex).
- The cable length between two EtherCAT devices must not exceed 100 meter.

2.2 Standard Wiring (Without Redundancy)

Standard wiring in EtherCAT connects channel 0 (also known as Port 0 or Main Port) of the master device to the IN Port of the first slave device. The OUT Port of the first slave device is connected to the IN Port of the next slave device, and so forth. The OUT Port of the last slave device and channel 1 of the master device remain unused.

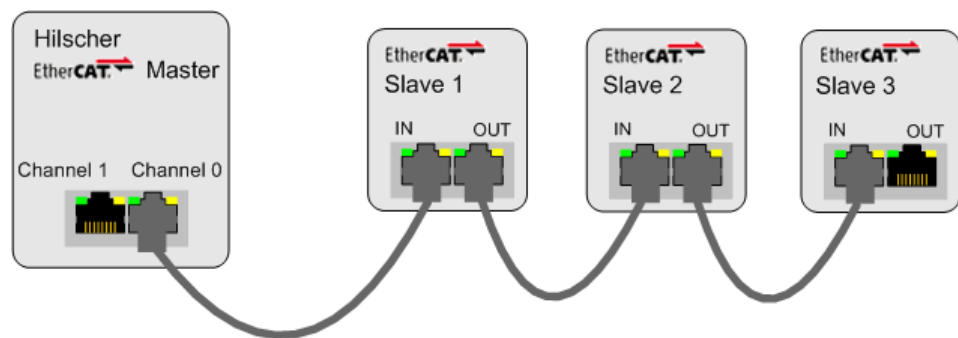


Figure 1: Standard Wiring in EtherCAT Network

2.3 Redundant Wiring

EtherCAT master firmware version $\geq 2.5.x.x$ supports redundant wiring. In redundant wiring, the OUT Port of the last slave device is connected to channel 1 (Port 1) of the master device in addition to the standard wiring, thus creating a “ring topology” with the master channel 1 serving as “redundancy port”.

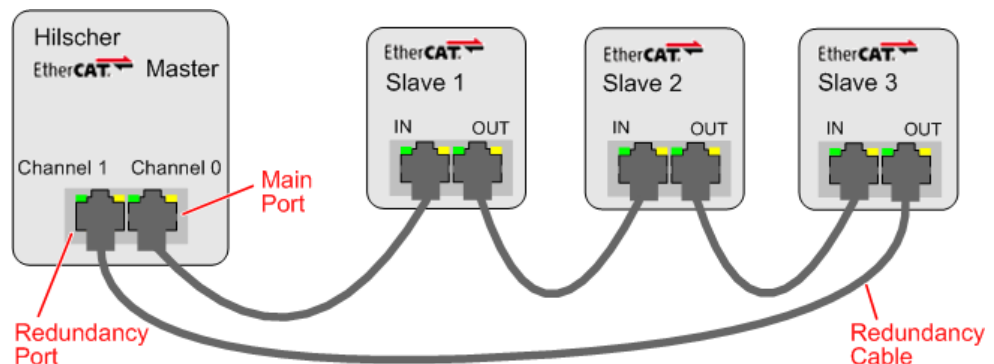


Figure 2: Redundant Wiring in EtherCAT Network

In case of an interrupted cable connection between two EtherCAT slaves or in case of a defective slave device, the redundant cable maintains communication between the master and the other slaves, which otherwise would be cut-off from the bus.

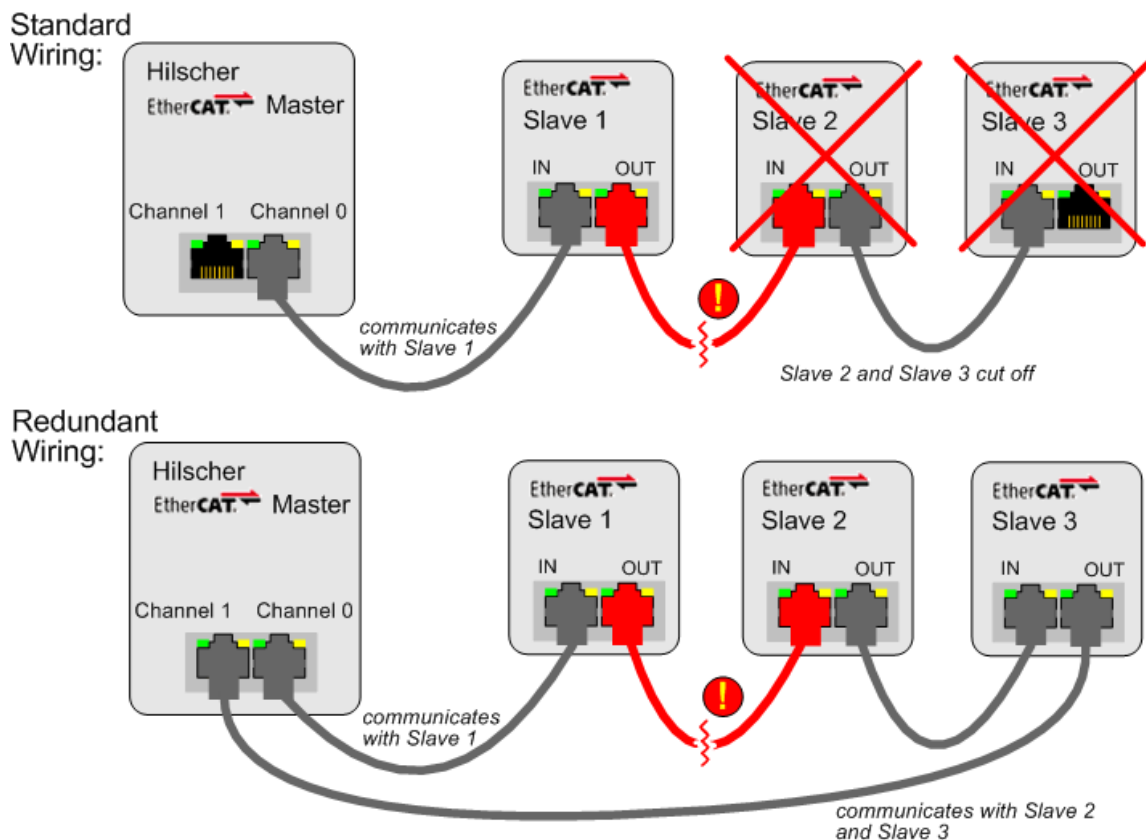


Figure 3: Cable Interrupt in Standard/Redundant Wiring in EtherCAT Network

Prerequisites for using redundant wiring in EtherCAT

- Hilscher EtherCAT master firmware is version 2.5.x.x or higher
- Redundancy function has been enabled in configuration of master



Important: Redundancy function and **Distributed Clocks** function can not be used at the same time.
Firmware version 2.5.x.x does not support Distributed Clocks at all.
Firmware version 3.0.x supports either redundancy or Distributed Clocks, but never both functions at once.

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