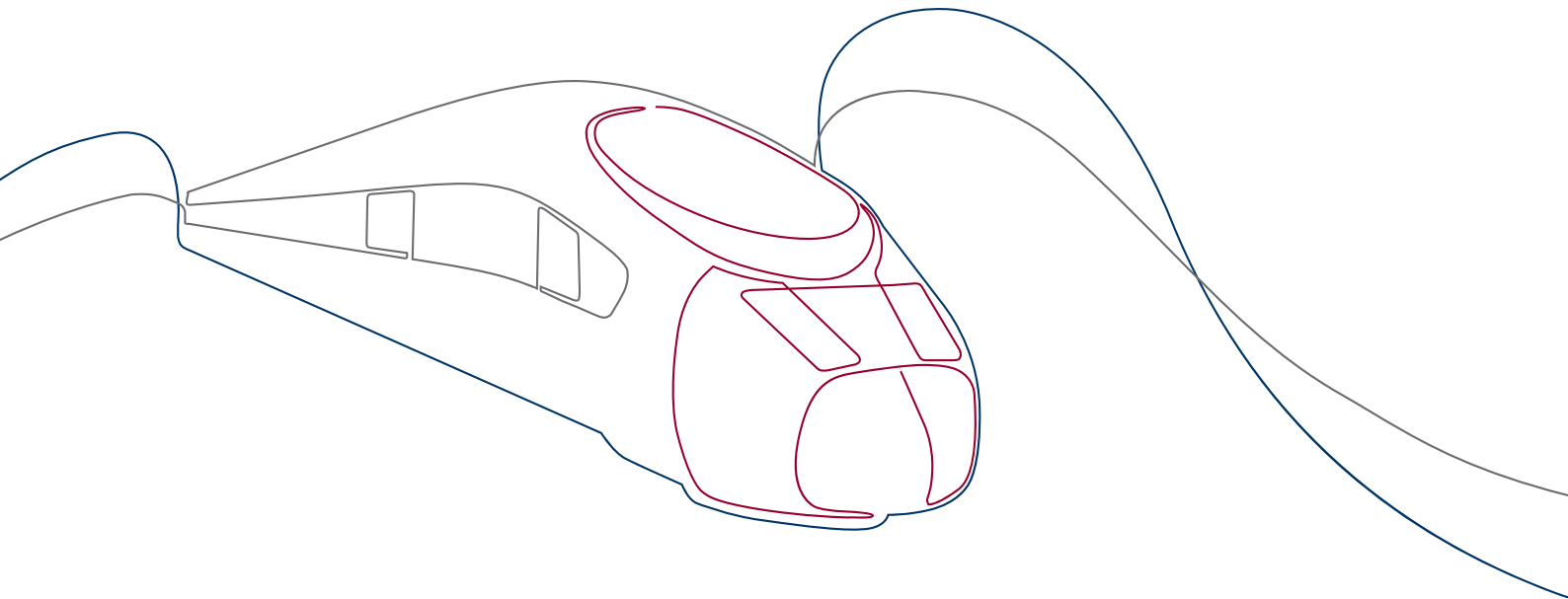


ETHERNET UPGRADE SOLUTIONS



Commitment to quality: We supply this product in accordance with our tested and certified quality standard



IATF 16949
Quality management standard
for the automotive industry



DIN EN 15085 CL1
International welding
certification for railway
vehicles

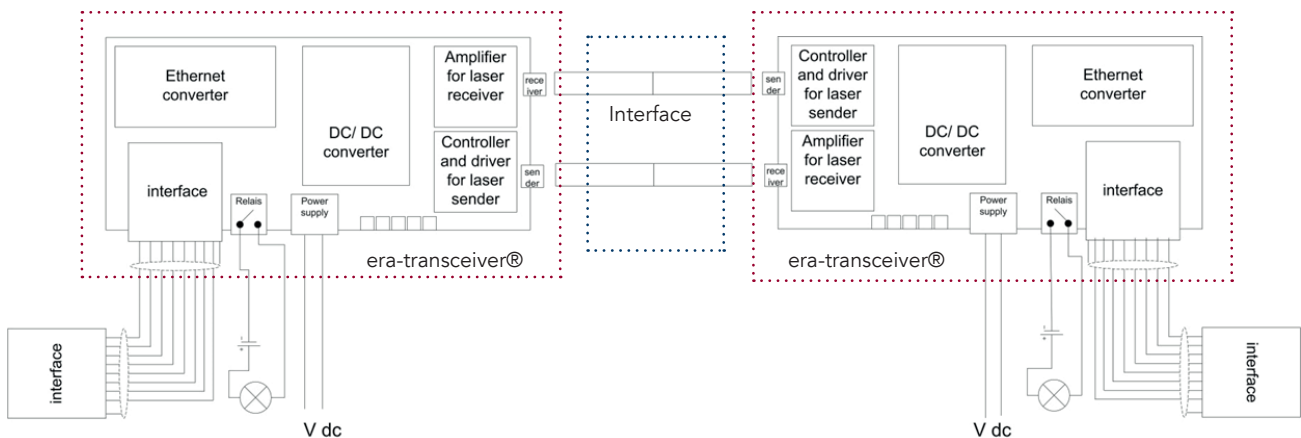


**IRIS Certification™ based
on ISO/TS 22163:2017**
Quality management
standard for the railway
industry

era-transceiver® – DATA PULSES WITH NO WEAR

The *era-transceiver®* is a unique contactless system for high-speed data transmission with full galvanic isolation, which means that no mechanical wear is caused on the contact itself. As a result, you benefit from a longer service life and cost savings throughout the entire product life cycle.

The *era-transceiver®* provides an ideal data transmission solution for both the initial equipping of a new vehicle and for the upgrading (Plug & Play ETHERNET, ETHERNET-UPGRADE-SOLUTION) of existing fleets and older models of railway vehicles.



Transmission principle of the era-transceiver®

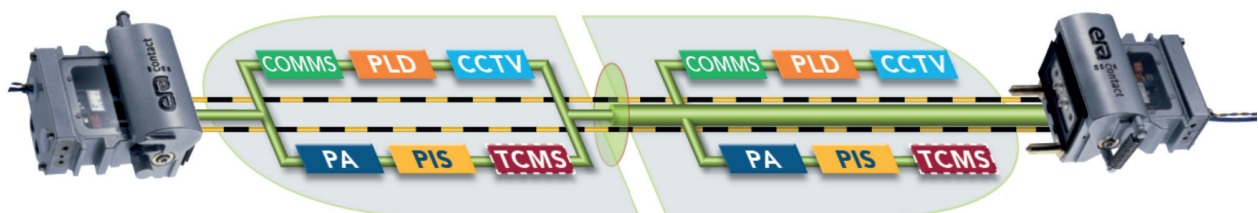
The incoming electrical Ethernet signal is converted into an optical signal. The optical signal is received on the opposite side and is converted back into an electrical signal. This involves correcting the level and timing (data clock recovery). Galvanic isolation is achieved using the interface.

Optical signals are free from EMC influence and potential shifts and are resistant to relative movements. The transmission unit operates in full-duplex mode, i.e. data is sent and received simultaneously.

era-transceiver® – PRODUCT RANGE

era-contact manufactures the 100 Mbit/s and 1000 Mbit/s versions in series production – versions up to 10 Gbit/s are available upon customer request.

Data rate	100 MBit/s	1000 MBit/s
Data interface	RJ45 (24V DL) M12 D-coded (24... 48 V DC)	M12, X-coded SC multimode
Cable requirement	min. CAT 5	min. CAT 7
Power supply	24 V DC	24 ... 48 V DC, 110 DC
General power consumption	< 5 W	< 5 W
Operating temperature range	RJ45: -25 ... +85 °C M12: -40... +35 °C	-40 ... +85 °C
Bit error rate	< 10 ⁻¹²	< 10 ⁻¹²



PA	Public Address
PIS	Passenger Information System
CCTV	Closed Circuit Television
COMM	Communications Systems
PLD	Passenger Load Determination
TCMS	Train Control Management System

SERIES SOLUTION FOR ELECTRICAL COUPLERS

The *era-transceiver*® is directly installed in automatic couplers for initial equipping. The *era-transceiver*® has already undergone field testing for series use.

The optical interface is the position where contacts are usually installed, although they are not required here. The *era-transceiver*® unit is easy to install.

era-contact always manufactures products to meet customer-specific requirements.



Series solution for electrical couplers includes:

Option 1 – era-contact electrical railway coupler with integrated *era-transceiver*®

Option 2 – *era-transceiver*® as an attachment option, i.e. the existing electrical coupler is extended. The contact carrier itself does not have to be modified. For additional options for extending the coupler, refer to: **Plug & Play ETHERNET, ETHERNET-UPGRADE-SOLUTION.**

The advantages for you:

- No additional installation space is required because the *era-transceiver*® is integrated in the contact carrier
- State of the art – no further upgrades are necessary
- Field-tested
- After-sales service

Please note: The Ethernet solution for initial equipping can only be ordered from Voith Turbo GmbH – ask specifically for the *era-transceiver*®.

era-transceiver® FIBRE-EXTENSION

The *era-transceiver® fibre-extension* is a transmission unit that can be placed wherever there is enough space, e.g. in the body.

The solution offers space for even more optical contacts even with small couplers in the original equipment.

For retrofitting existing fleets, the *era-transceiver® fibre-extension* offers the renovation advantage that existing contact holes can be used.

Based on the *era-transceiver®*-technology



era-transceiver® fibre-extension includes:

- era-transceiver®
- Fibre lines
- Already complies with the standard requirements of ETB (Electronic Equipment for Railways - Train Communication Network)
- maximum bandwidth right from the start, thus faster data transmission
- Increased security against external access and manipulation: The *era-transceiver®* fiber-extension ensures that all desired signal circuits can be transmitted over ethernet



Use of example: 20 optical contacts for 10 GBit/s ethernet transmission

Requirements for era-transceiver® fibre-extension:

- This solution requires only two fibre contacts in the electrical coupler, which take up as much room in the installation space as a regular pin contact
- The total number of optical contacts is open and depends on customer requirements and possible number of any contact positions in the respective couplers
- For refurbishment: existing boreholes

The advantages for you:

- Unlimited data transmission of fast ethernet signals
- An upgrade solution without a exchange or damaging the original coupler
- Customer-specific adaptations to the circumstances
- Fast and particularly modern upgrade of older models of railway vehicles

PLUG & PLAY ETHERNET FOR REFURBISHMENT

The *Plug & Play ETHERNET* solution can be flexibly attached to existing couplers **with their own drive**.

- Plug & Play is an upgrade solution for transmitting large quantities of data **without** affecting the original coupler.
- It can be installed at the side, top or bottom
- It is suitable for pneumatically and electrically operated couplers.



The Plug & Play ETHERNET solution includes:

- era-transceiver®
- A housing is adapted to the coupler, the attachment options in place and the installation space available:
 - At the top and bottom: One housing per coupler
 - At the side: Two housings per coupler



Requirements for Plug & Play ETHERNET:

- Sufficient installation space, which has to be calculated individually for each coupler, but at least an additional 50 mm on all sides
- Attachment options must already be available on the mechanical head, e.g. in the form of threaded holes, recommendation: M8–M12

The advantages for you:

- An upgrade solution without damaging the original coupler
- Customer-specific adaptations to the circumstances
- A simple solution as a response to the increased digital requirements in railway traffic
- Fast and particularly modern upgrade of older models of railway vehicles

ETHERNET-UPGRADE-SOLUTION FOR REFURBISHMENT

The *ETHERNET-UPGRADE-SOLUTION* is a solution for simple Ethernet upgrades in existing systems with a **swivelled** coupler. The existing electrical coupler is retained and does not have to be opened (opening is often associated with new tests of the coupler and new approvals). The solution enables both redundancy operation and the use of two transmission channels.

The additional components are attached to the left and right of the existing electrical coupler. Only one new (and longer) lid is required.

Simple installation can be performed by the operator themselves or can be commissioned by our service team.



The **ETHERNET-UPGRADE-SOLUTION** includes:

- era-transceiver®
- Housing is adapted according to the installation space
- Control arm is adapted to the new length
- A new adapted lid is fitted to protect the era-transceiver®
 - We offer a **self-opening version** for coupler without their own drive
- Optional: Installation by our service team

Requirements for **ETHERNET-UPGRADE-SOLUTION**:

- Sufficient installation space, which has to be calculated individually for each coupler, but at least an additional 50 mm on all sides
- For couplers from companies other than era-contact, the third-party product must be made available or accessible for measuring so that the customer-specific adaptations can be made.

The advantages for you:

- An upgrade solution for the transmission of large quantities of data in existing system
- Fast and particularly modern upgrade of older models of railway vehicles
- Customer-specific adaptations are possible, even for third-party products
- Independent installation is possible



HANDHELD MEASURING

The *handheld test device* makes it possible to directly check that existing electrical couplers with one or more era-transceivers® are working properly, i.e. checking the coupler itself.

Transmission rates of 100 and 1000 Mbit/s can be tested in a two-phase process: The optical interface of the era-transceiver® is tested in the initial quick check.

→ **Special characteristic:** No additional wiring is required for this test.

The optical and electrical interface of the era-transceiver® can be inspected in a second test, which requires additional wiring.



Dimensions (LxWxH):	approx. (248x103x38) mm
Weight including batteries:	540 g
Voltage range of the power supply unit:	100 to 240 V AC
Input voltage for the test device:	6 V DC
Mains plug:	Type C (European plug)
Transmission rates:	100 / 1000 MBit/s
Data interfaces:	RJ45

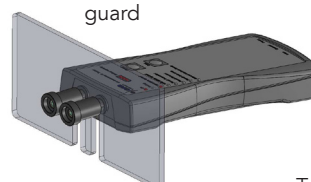
The test device incl. storage case



Battery size:	Mignon cells (type: AA)
Number of batteries:	4
Laser class:	1
Degree of protection:	IP20
Temperature range during operation:	-10 °C to 60 °C non condensing
Air humidity during operation:	0 to 90 % non condensing

There is the option to use a **contact guard** during testing as an additional safety measure.

Optional for increased protection:
Handheld test device with contact guard



Technical data subject to change.



OUR BENEFITS FOR YOU:

- Punctuality
- Consistently high quality all over the world
- Comprehensive service wherever you are in the world
- Years of expertise for your product
- International presence
- On-site engineering service – from prototyping to after-sales
- Original manufacturer
- A team just for you



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