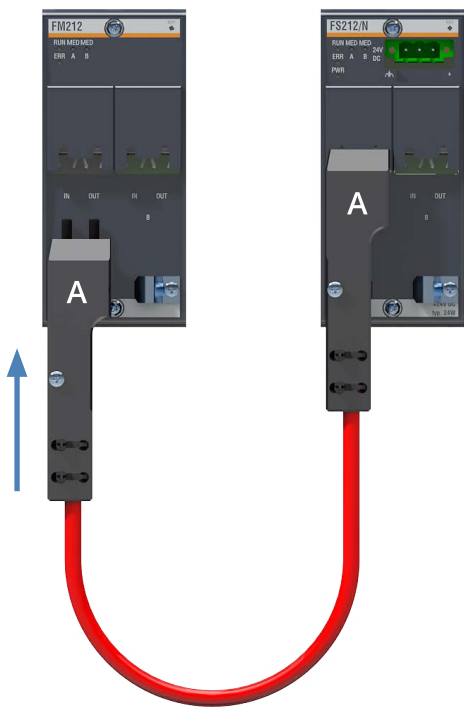




Glass Fiber Cable (HCS/PCF)

The fiber optic cables are used to connect the FM211, FM212, FS211, FS211/N and FS212 and FS212/N FASTBUS modules, enabling the connection of remote substations over large distances with a minimum signal delay. HCS (hard cladded silica) is also known as PCF (polymer cladded fiber).

- Distances of up to 150 m with HCS cables or 180 m with special HCS cables between two stations
- Minimum signal delay



Item	Item no.	Description
K-LWLH1 2.0 m AA	00010762-07	HCS Cable 2.0m duplex 200µm HCS Fiber; Fx21x Fastbus; port side AA
K-LWLH1 10.0 m AA	00010762-04	HCS Cable 10.0m duplex 200µm HCS Fiber; Fx21x Fastbus; port side AA
K-LWLH1 15.0 m AA	00010762-06	HCS Cable 15.0m duplex 200µm HCS Fiber; Fx21x Fastbus; port side AA
K-LWLH1 90.0 m AA	00010762-01	HCS Cable 90.0m duplex 200µm HCS Fiber; Fx21x Fastbus; port side AA
K-LWLH1 95.0 m AA	00010762-00	HCS Cable 95.0m duplex 200µm HCS Fiber; Fx21x Fastbus; port side AA
K-LWLH1 100.0 m AA	00010762-03	HCS Cable 100.0m duplex 200µm HCS Fiber; Fx21x Fastbus; port side AA
K-LWLH1 120,0m AA	00010762-02	Kabel 120,0m LWL duplex 200µm HCS Fiber; für Fx21x Fastbus; Anschluss AA

Required material and equipment

Item	Item no.	Description
LWLH connector	00010949-00	Pin for HCS-Cable Type Simplex per piece
LWLH-Fiber optic cable housing ZA	00011105-00	Casing LWL-HCS for left site (metal casing with screws)
LWLH-Fiber optic cable housing ZB	00011622-00	Casing LWL-HCS for right site (metal casing with screws)
LWLH-WKZ-SET	00010952-00	Tool set for LWLH with cutter, Skinning tool, Crimpgripper, Diamond cutter
LWLH/-Cap	00011188-00	Protection cap for LWL-metal connector

Cable recommendations ¹⁾

Item	Item no.	Manu-fac-turer	Description
Glass fiber cable ²⁾ (HCS/PCF)	84Q02300T000ZUL00	LEONI AG	I-V(ZN)YY 2K200/230 Mini breakout cable up to 150 m long, operating and storage temp. -40 to 90 °C
Glass fiber cable ²⁾ (HCS/PCF)	84Q04700T	LEONI AG	AT-V(ZN)Y11Y 2K200/230 Breakout cable up to 150 m long, operating and storage temp. -40 to 85 °C
Glass fiber cable ²⁾ (HCS/PCF)	84Q02300W	LEONI AG	I-V(ZN)YY 2K200/230 GI-PCF Mini breakout cable up to 180 m long, operating and storage temp. -20 to +70 °C, storage temp. -40 to +70 °C
Glass fiber cable ²⁾ (HCS/PCF)	84Q04700W	LEONI AG	AT-V(ZN)Y11Y 2K200/230 Breakout cable up to 180 m long, operating temp. -20 to +70 °C, storage temp. -30 to +70 °C
Glass fiber cable ²⁾ (HCS/PCF)	801733	HELUCOM	I-V(ZN)YY 2K200/230 Mini breakout cable up to 150 m long, operating and storage temp. -30 to +85 °C

1) Information without guarantee, order directly from manufacturer

2) When using the cables of other manufacturers, be aware of any different specifications, e.g. attenuation or minimum bend radius. The fiber optic single fiber must have a diameter of 2.2 mm, the HCS core 200 µm. The outer diameter of the fiber optic cable incl. sheath must not exceed ≤ 8 mm in order to be accommodated by the strain relief housing.

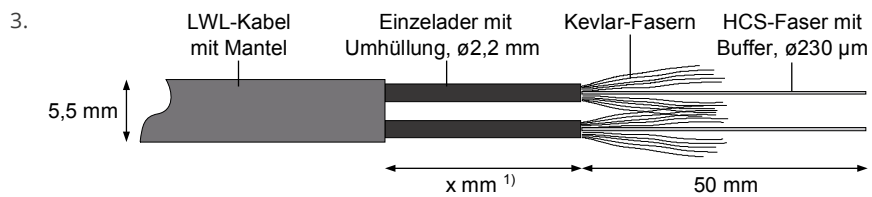
Preparing the cable

Procedure:

The HCS-fiber must not be damaged when stripping, otherwise optical reflections could result, which would seriously reduce the transmission quality.

1. Strip jacket using a stripping knife.

2.  Strip HCS-fibers. For this purpose, stripping pliers notch 1.6 has to be used.



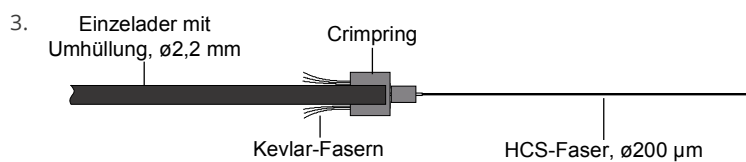
Cut off half of the Kevlar fibers (on a quantity basis) with the scissors. The length x (1)) is geared to the possibility of traction relief. The length is 55 mm for fiber optic cable casing ZA or ZB.

→ Cable is prepared.

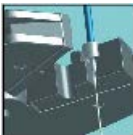
Apply crimp sleeve

Procedure:

1. Distribute the carbon fibers evenly backward over the jacket.
2. Slide the crimp sleeve onto the HCS-fiber.



Screw the crimp sleeve onto the jacket until resistance can be felt.


4.  Crimp the crimp sleeve onto the HCS-fiber. For this purpose, the forward inset of the crimping pliers has to be used.

5. Cut off protruding Kevlar fibers with the scissors.

→ Crimp sleeve is assembled.

Remove buffer

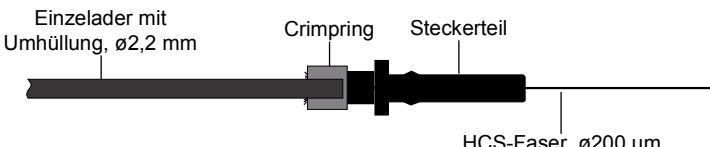
Procedure:


1.  Insert the HCS-fibers along with the crimp sleeve into the frontal aperture of the stripping tool up to the stop.
2. Squeeze both stripping tool grips.
3. Remove the buffer carefully and straightly from the HCS-fiber.
4. Check the HCS fiber for damage or dirt. Blf the fiber has been hurt, start again. If the fiber is dirty, wipe off, using a soft towel.

Apply plug

Procedure:

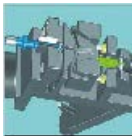
The fiber has to be clean, try and oil free in order to achieve good crimp performance.

1.  Slide the plug over the HCS-fiber and under the crimp sleeve. The plug flange has to abut the crimping pliers.

2.  Crimp the crimp sleeve onto the plug. For this purpose, the rearmost inset of the crimping pliers has to be used. → Plug is assembled.

Breaking the HCS-fiber

Procedure:

1.  Insert the connector into the breaking tool (diamond cutter) and hold it tight on the stop.
 2. Hold the breaking tool with one hand at the round handle.
 3. Press the lever down slowly with your thumb.
 4. Release the lever.
- HCS-fiber is broken..

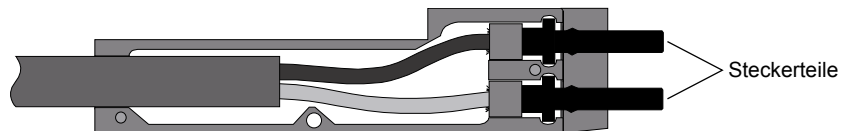
Casing assembly

Depending on the application, different housings have to be used.

The example described here shows a FAST-Bus cable with two housings of ZA type, as needed e. g. for the connection between the A channel of an FM21x to the A channel of the FS21x at the first FAST Bus slave station.

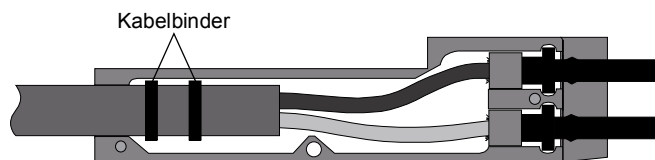
Procedure:

1.



Insert plug into the casing. The individual wires in the casing must not be tensed, otherwise the horizontal play of the single connector in the casing is inhibited.

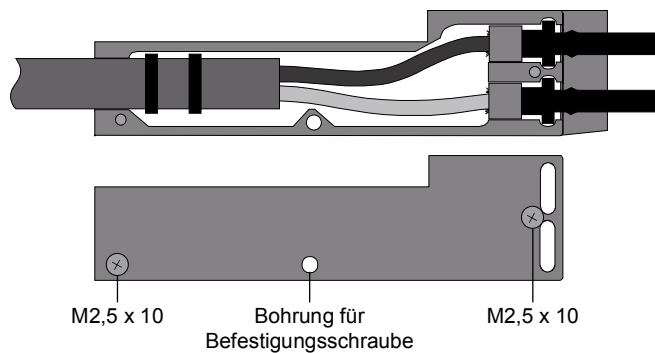
2.



Bind cable with cable tie. Fasten using both countersunk screws (M2.5 x 10). The fastening screw (M3 x 20) secures the connector's pull-off guard on the module.

NOTE: To ensure optimum enclosure of the cable sheath, position the cable tie so that the head of the cable tie is located outside of the connector housing.

3.

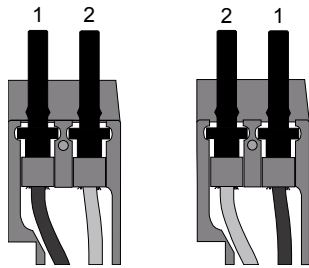


Assemble cover.

→ 1. Casing is assembled.

4. Assemble casing

This can usually be checked by different colors of the protective coatings.



Check whether the fibers are chipped.

5. 2. Assemble casing. The procedure is the same as for 1. Casing. → 2. Casing is assembled.

→ The cable is fully patched.

Mounting on the module

When attaching the housing to the module make sure that the housing is shifted upwards as far as possible. The tolerance window for the module's fiber optic cable connector is shifted as a result. If the socket is bolted tight against the lower stop and the individual wires in the socket are taut, it can happen that the individual fiber optic cable jack is easily pulled out of the module's fiber optic cable socket.