FATZER®
BRUGG

NEW!
INTEGRA DATA

There's more in it than meets the eye...

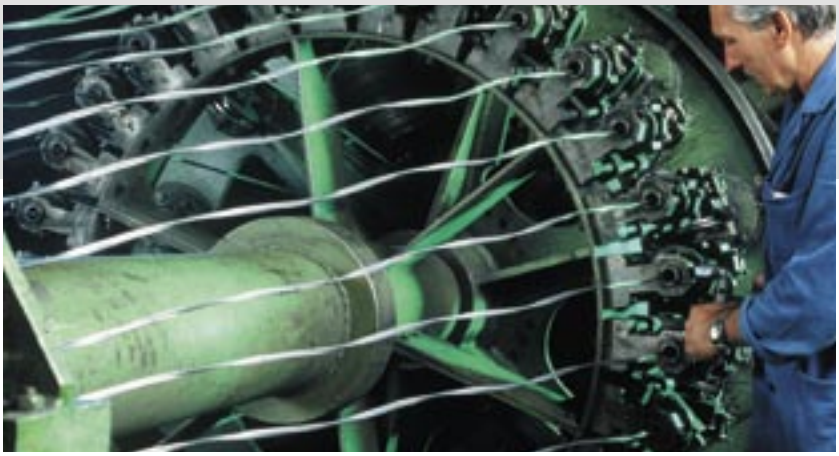
INTEGRA and INTEGRA DATA

Lock-coil wire rope. Also available with integrated conductors or fiber-optics.

INTEGRA and INTEGRA DATA wire rope: their inner values clearly distinguish them from the rest.

Our full or half-lock coil wire ropes enjoy an excellent reputation worldwide – for three reasons: firstly, we not only deliver them in conventional design, but also with «twisted» lock wires; secondly, we only use profile wires with the tightest shape tolerances and with high gauge accuracy; thirdly, we have developed a technology with which we can integrate electrical conductors or fiber-optics into the core of the wire rope.

Twisted wire ropes are torque-relieved. And safer...



With the profile wires preformed (twisted) to their subsequent helical orientation in the rope bond, before stranding, an end product is obtained that is absolutely free from torquing. The wire rope can therefore be pulled in without risk – and without any demanding and complicated rope guidance – and the risk of a damaging change to the wire rope's geometry is thereby reduced to a minimum. And there is also an additional safety aspect: in the – unlikely – case of eventual wire breakage, would the ends of the wire remain within the wire rope bond, and would not protrude dangerously.

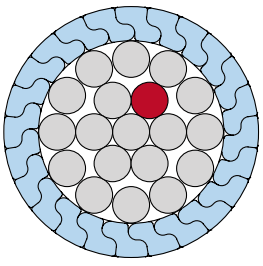
Features of INTEGRA and INTEGRA DATA wire rope:

- interior voids filled with conserving lubricant
- torque-relieved in the twisted version
- fast and safe rope-pull
- reliable signal and data transmission

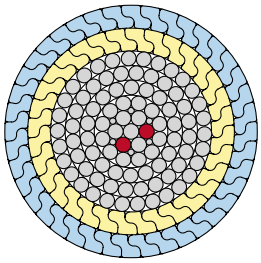
Where INTEGRA and INTEGRA DATA wire rope provide a good service:

Full and half-locked wire ropes find use in an extremely wide range of applications: they have proved themselves as track ropes in passenger and material ropeways, and as hoist and guide ropes in mine hoists. They have also shown themselves to be a good choice in a special field: in many wire rope structures, they take on a supporting role, in the truest sense of the word. Why? Because full lock coil wire ropes can be made corrosion-resistant with appropriate measures (special coating of the wires, filling with conserving agents).

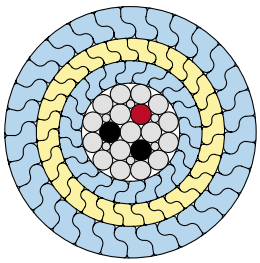
INTEGRA wire rope for passenger ropeways...



1 lock layer
nominal-ø 16 - 45 mm

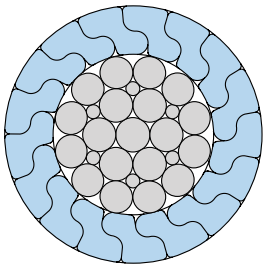


2 lock layers
nominal-ø 28 - 90 mm

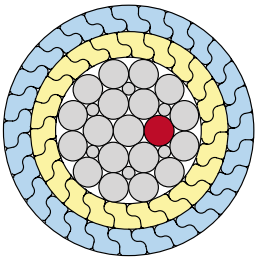


3 and more lock layers
nominal-ø 50 - 91 mm

...and for material transportation installations



1 lock layer
nominal-ø 22 - 44 mm



2 lock layers
nominal-ø 36 - 64 mm

The figures show examples of the integration of low-voltage cables and fiber-optic cables in the rope core. Number and configuration of the cables are individually tailored to the needs of the customer.

INTEGRA DATA

In INTEGRA DATA wire ropes, one or more of the core wires are replaced with fiber-optic bundles.

Low-voltage analog cable

Wire ropes that can transmit data? INTEGRA DATA!

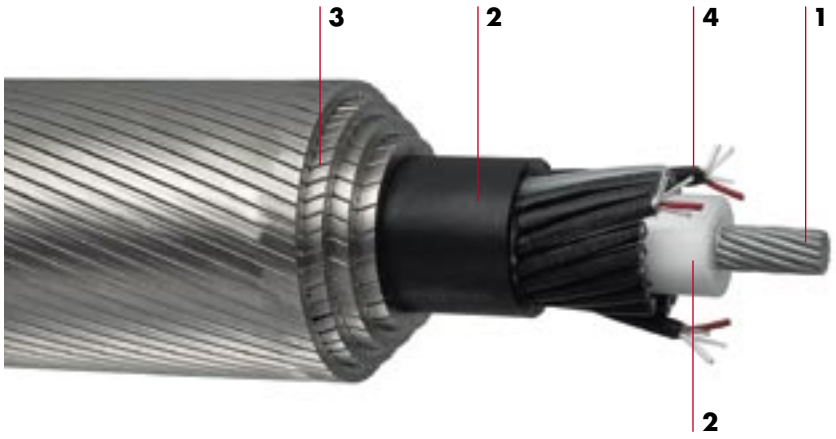
Even mountain ropeways are part of the ongoing telecommunications and information technology revolution, not least because today's technologies are creating the kind of opportunities that no modern business can afford to be without: multiple telephone lines, fax, internet connections, access to central data servers, printers, video intercom systems, TV in various locations, image, audio and video data feeds into the worldwide web...

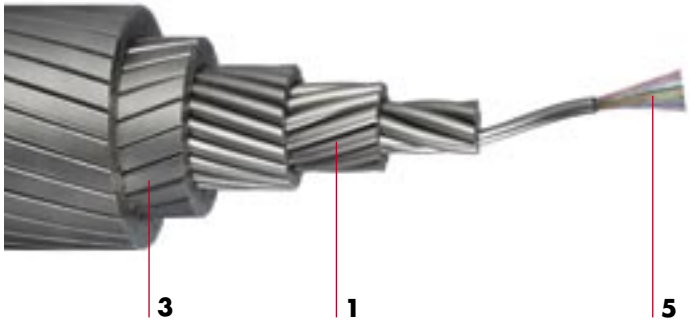
Data communication without (technical) limits.

Until recently, providing high-performance, efficient data links between mountain top and valley meant installing costly additional infrastructure. Anticipating the IT requirements of ropeway operators, Fatzer integrated fiber-optic cables in the core of INTEGRA track ropes for the first time in 2003. These fiber-optic cables were made specially for the job in stainless steel cores by our sister company «Brugg Cables».

Intensive development work was still needed, however, to guarantee perfect, error-free transmission of digital and analog data despite the mechanical forces experienced in the rope core. This work delivered an elegant solution, with compelling technical and commercial benefits: INTEGRA DATA wire ropes effectively include an integrated data highway that can carry unlimited amounts of information reliably.

All the following make part of INTEGRA wire rope:





1) core cable
2) plastic sheathing or round-wire layer(s)
3) profile wire layer(s)
4) low-voltage cable in plastic sheathing
5) fibre-optic conductor, integrated into the steel wire core cable

INTEGRA DATA

INTEGRA DATA: totally useful.

The fiber-optic cable integrated in INTEGRA DATA track ropes brings a whole range of benefits for the operator:

- It can be used as a universal data link between top and bottom terminals
- It replaces additional signal and control cables fraught with risk
- It also replaces expensive radiated beam installations

In addition, the fiber-optic line can be leased to a third-party such as a telecom provider.

Our technology is proven.

INTEGRA DATA track ropes with integrated fiber-optic cable have been used successfully for years. The key difference from telecom cables is that the wire layers, which are laid over the integrated fiber-optic cable, protect it perfectly from the outside environment. In addition, using the track-rope link as a data line saves cleaning and maintenance work on extra ropes and cables.

Tailored perfectly to your needs...

We customize the number and type of fiber-optic cables to suit local conditions and customer requirements. Single-mode or multi-mode fibers can be used, depending on the application:

- Single-mode fibers are suitable for transmitting very large amounts of data even over long distances (10 Gbit Ethernet computer networks). They are used especially in telecommunications and for ticketing systems.
- Multi-mode fibers are ideally suited to ropeway-control applications over short distances.

Of course single-mode and multi-mode fibers can also be combined in the same tube within the INTEGRA DATA rope. For instance, we have developed a configuration containing six multi-mode fibers for control functions and ten single-mode fibers for EDP, video, radio and phone.

Fibers	Utilization
Single-mode	• Computer network 10 Gbit Ethernet • Mobile radio antenna • Cable TV • All utilizations of multi-mode
Multi-mode	• Ropeway control system • Computer network 100 Mbit Ethernet • Phone, voice over IP • Video, Video over IP • Ticketing • Payment system • Fire alarm system

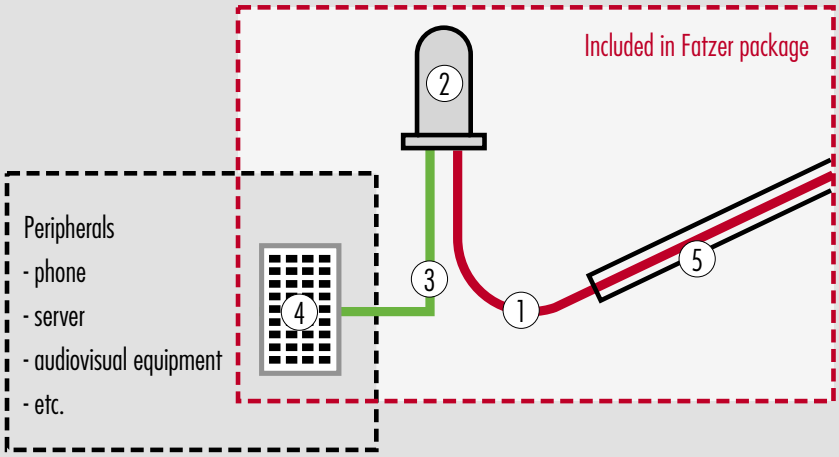
Left figure:
Access and ticketing systems can be networked via an INTEGRA DATA track rope.

Right figure:
The fiber-optic cable as leased line: an INTEGRA DATA track rope is used to connect telecom antennas to the network.

We connect what we deliver.

INTEGRA DATA ropes are supplied as a complete hardware package including connection technology comprising fiber-optic splice closures, fiber-optic connecting cables, cable terminations and connectors. In short, we provide a complete system, which also means we guarantee that the interfaces will work perfectly. So all you need to do is to specify the connector type; we then provide you with the finished system, you connect your peripherals, and you are up and running.

Interfaces between customer and Fatzer AG



1) Fiber-optic cable integrated in rope 2) Fiber-optic splice closure 3) Metal-free fiber-optic connecting cable
4) Cable termination with fiber-optic connectors 5) Track rope

BFOC (ST®)

FC

LC

LSH (E-2000)

SC

Connector types for the cable termination

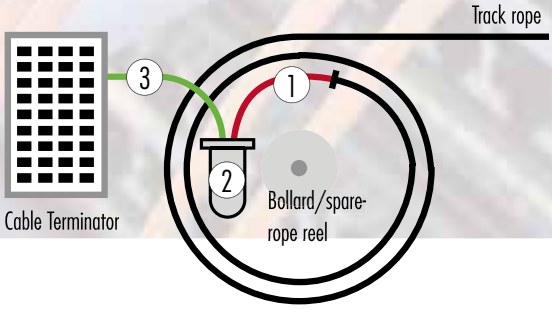
Example of a cable termination – in this case as a plug-in module in an existing connecting box

INTEGRA DATA

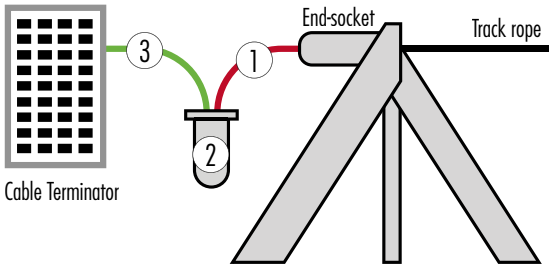
Connections that deliver what you ask...

We have put a great deal of thought into the practical details of how to connect the ends of INTEGRA DATA rope, whether anchored by bollard, end socket or tensioning rope. For instance, to connect the fiber-optic cable to the termination we use a metal-free connection cable, so that a lightning strike poses no risk.

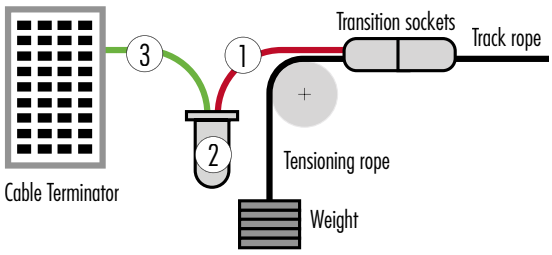
Bollard anchoring



Socket end termination



Counterweight anchoring



In the mechanical, positive-fit end connection, the outer layers of the rope are peeled away down to the core, the fiber-optic cable (1) is exposed and then spliced in the fiber-optic splice closure (2) with the metal-free fiber-optic connecting cable (3).

Cold-casting technique: proven and approved technology

We have pioneered resin casting technology in INTEGRA DATA track ropes (shown below). It simplifies on-site connecting work, provides best possible protection of the fiber-optic cable to be fed out, and is extremely efficient compared with metal casting technology. Why? Because it eliminates the trouble and risks involved in heating the rope heads and the casting metal. It goes without saying that our cold-casting technique also complies with the European Ropeway Directive 2000/9/EC.

Result: Fatzer does the whole job.

We can provide you with a complete package that covers installation of the INTEGRA DATA rope including data connections. The benefits are obvious: our procedure is a guarantee for optimum protection of the fiber-optic cable at the end of the rope and professional workmanship for all rope castings and fiber-optic splices. Of course we carry out backscatter measurements before and after splicing the optical fibers.

Detailed technical information can be called-up on web site (www.fatzer.com) or can be requested from us directly (info@fatzer.com, phone +41 71 466 81 11, fax +41 71 466 81 10). On request, we will be happy to provide you with our overall catalogue.

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People who rely on INTEGRA wire rope...

1 St.Moritz: Switzerland
2 Mayrhofen: Austria
3 Zakopane: Poland
4 Jackson Hole: USA
5 Chur: Switzerland
6 Mt. Olyphant: Jamaica
7 Hongkong: China
8 Jay Peak: USA
9 Innsbruck: Austria

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A company of the BRUGG Group

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