

Fiber Optical Converter - 21-216 Secure Series G.703 Codir - IEEE C37.94



Technical manual

About this manual

About the contents of this manual

The information in this document may be changed at any time without notice.

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Version and revision history.

Revision history for product:

Revision R1.

Product released for serial production. 2018-01-31.

Revision history for this document.

Revision AK0.

2018-01-30, LaJo, document created.

Revision R1.

2018-02-02, OsLi, Product released for serial production.

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Author.

Created by Lars Jonsson.

Last saved by Oscar Lindberg.

General description

Functional

The 21-216, Fiber Optical Converter G.703 Codir – IEEE C37.94 is intended to extend distance and galvanic isolate the teleprotection equipment for substations connection to multiplexers.

IEEE C37.94

The standard “IEEE C37.94-2002, IEEE Standard for N times 64 Kilobit per Second Optical Fiber Interfaces between Teleprotection and Multiplexer Equipment” describes a fiberoptic intra-substation communication links between teleprotection equipment and multiplexers.

G.703 Codirectional interface - Codir

The standard “G.703 64kbit/s codirectional interface” describes a galvanic interface commonly used by teleprotection equipment for connection to multiplexers.

Features

Fiber optic and data transfer protocol

Data speed 2048kbps

Optical data

Wavelength 850nm

Fiber optical connector LC

Optical System budget 13dB with multimode fiber,
(62.5/125 μ m)

9dB with multimode fiber,
(50/125 μ m)

Typical distance 2km (6dB system margin for 62.5/125
and 3dB margin for 50/125).

Power Supply

DC input: 36-75VDC

AC input: 85-264 VAC, 50-60 Hz, \pm 20%,
or 120-370 VDC.

AC-connector IEC 320, 3pin, locking.

Power consumption

<5 W,

Optional second removable power supply available.

Dimensions and Weight

Height 44 mm

Width 222 mm (without rack mount brackets).

Depth 228 mm (from front to back, connectors excluded).

Weight 1,4 kg

The unit is intended to be mounted in a 19" rack. For a single unit mount in 19" rack, a Single Mounting Bracket is available.

Two units can also be mounted side-by-side using a Double Mounting Bracket Kit.

By adjusting, the rack mount brackets, the unit can also be mounted on a wall or similar.

Environmental conditions

Operating temperature -25 to +55 °C

Storage temperature -40 to +85 °C

Relative humidity operating 5 to 95 %

Relative humidity storage 5 to 95 % non condensing.

Unpacking.

Check that all packing material has no damage. If damages are discovered on packing material, contact your shipping company, before unpacking.

The delivered product consists of several parts. Check that all parts are present according to list, and have no damage.

Product 21-216 consists of:

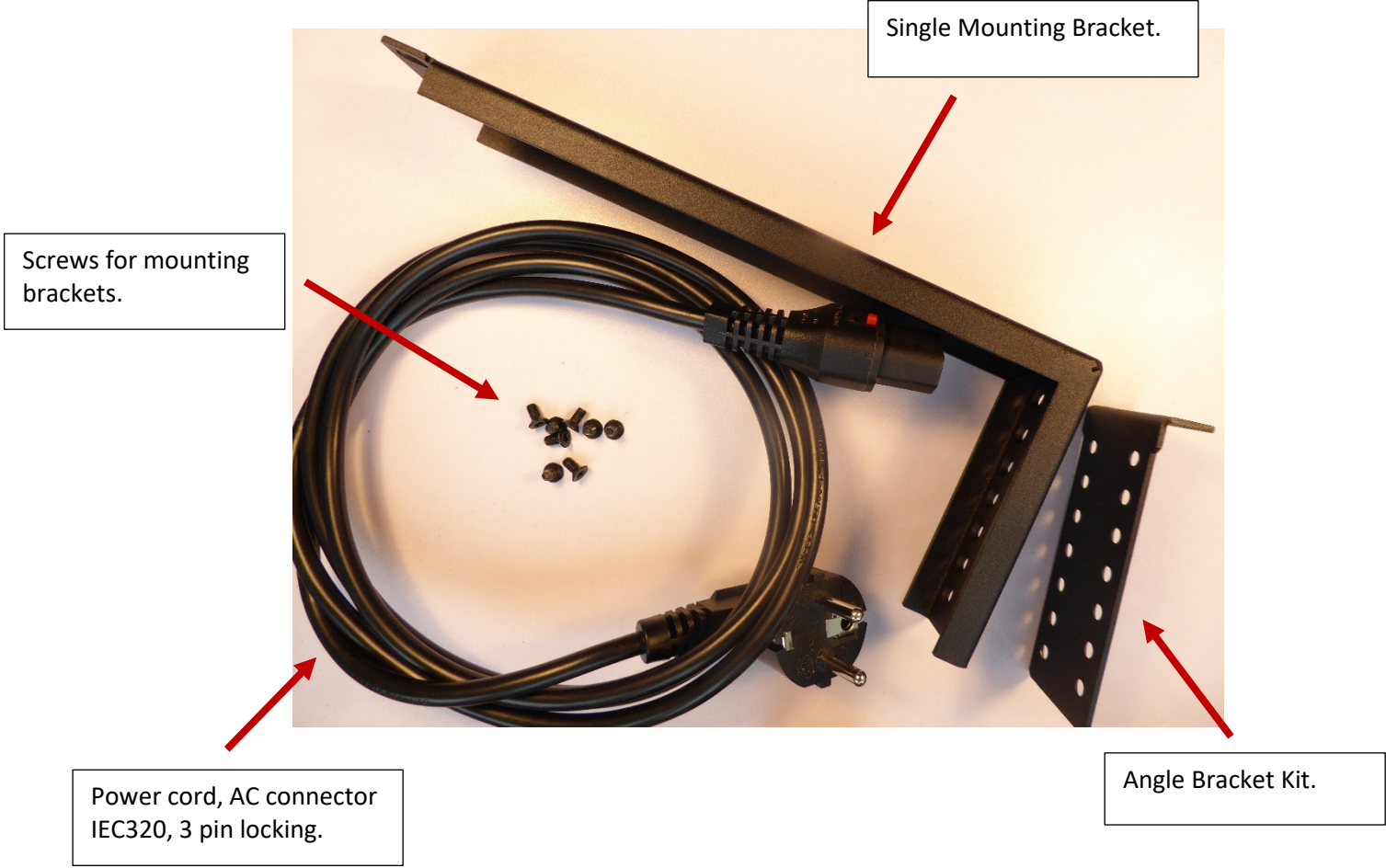
	Quantity	Part number	Description
1	1	21-216	Fiberoptic G.703 Codir – IEEE C37.94 converter <i>(Part number includes all parts in this list).</i>
		60-00-7264	Fiberoptic G.703 Codir – IEEE C37.94 converter - DC
		60-00-7265	Fiberoptic G.703 Codir – IEEE C37.94 converter - AC
2	1	60-00-7268	Single Mounting Bracket
3	2	60-00-7270	Angle Bracket Kit Incl 8 screws (50-65-3118).
4	1	50-65-6585	Power cord, AC connector IEC320, 3 pin locking
5	4	50-65-5030	Rubber feet
6	1	90-20-0125	This manual - Technical Manual 21-216 ½19" Secure Series Revision 1
Accessories			
7	2	60-00-7269	Double Mounting Brackets Incl 12 screws.
8	1	60-00-7389	AC/DC Slim Power Module
9	1	60-00-7363	DC/DC Slim Power Module 19"
10	1	60-00-7271	Din Rail mounting kit



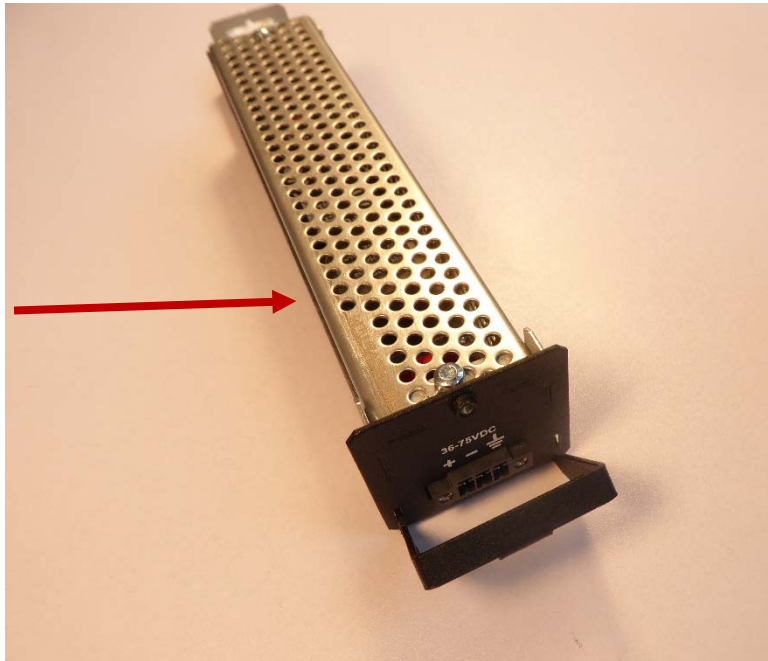
21-216, (Part number 60-00-7264 DC, 60-00-7265 AC)



21-216, (Part number 60-00-7264 DC)



Optional, extra removable Slim Power Module. AC or DC.

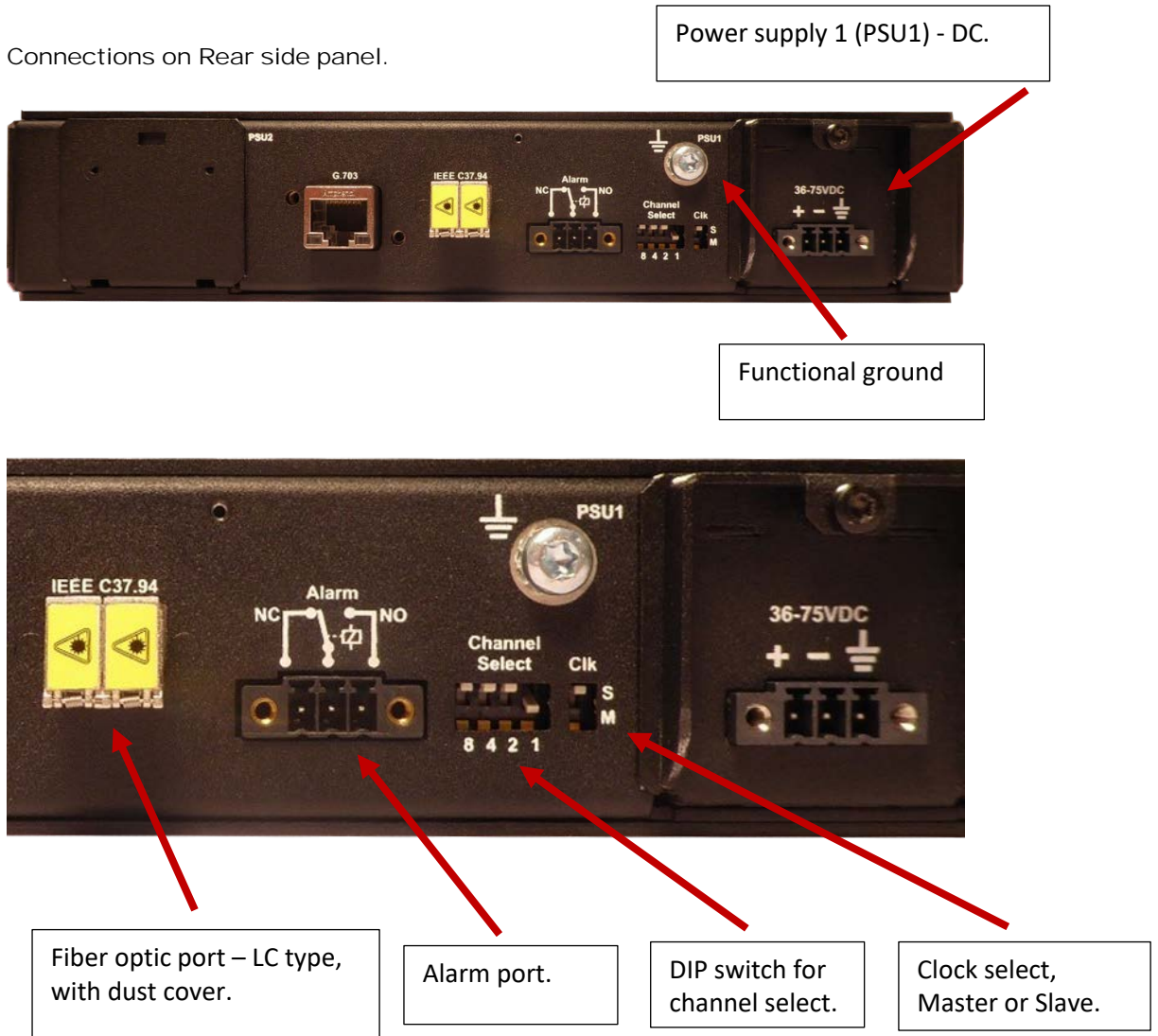


Installation.

Serial number.

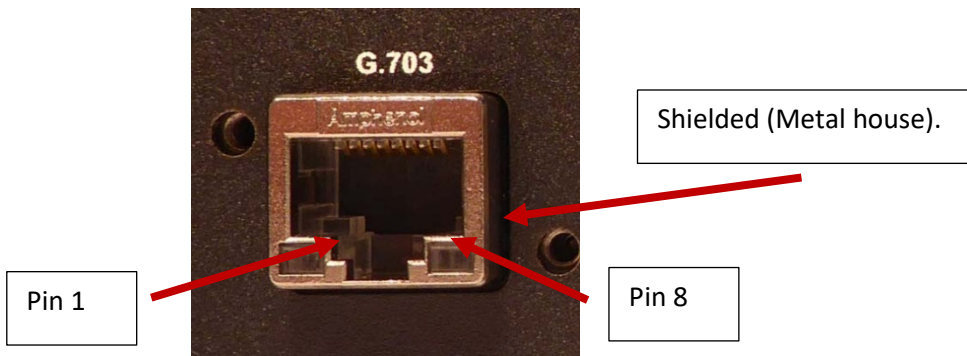
The products serial number is the best way for Fibersystem to identify the product. If the serial number is not noted on your delivery notes, please add the serial number to your own product documentation. This will be useful at future contact with Fibersystem.

Connections on Rear side panel.



Confirm that the attenuation of the fiber optic cable, including splices and patch cables, doesn't exceed the system budget. Don't forget to add a safety margin. Minimum safety margin is 3dB.

G.703 64kbit/s Codir Port.



Pinning of Codir port:

RJ45 pin	Name	Direction
1	Tx+ (TIP-out)	From 21-216 to multiplexer
2	Tx- (RING-out)	From 21-216 to multiplexer
4	Rx+ (TIP-in)	From multiplexer to 21-216
5	Rx- (RING-in)	From multiplexer to 21-216
Metalhouse	Shield	Cables shield must be connected

Use a cable with twisted pairs and a high quality shield. Only foil shielding is not enough.

Rx+ and Rx- should form one twisted pair - Tx+ and Tx- another twisted pair. A Cat5 S/FTP-cable, (Shielded/Foil Twisted Pair) used for example in Ethernet communication is a good cable. The outer shield is a braided mesh around the cable. In addition every twisted pair has a foil-shielding.

If a S/FTP patchcable for Ethernet is used, be aware that a cross-connected cable has only the pairs on pin 1-2 and 3-6 cross-connected, the two remaining pairs are not cross-connected.

Functional earth/ground.



To the left of the PSU1 power supply, a reference ground/earth screw is available. Protective ground shall be connected to the IEC 320 power supply connector.

Configuration

Start and usage.

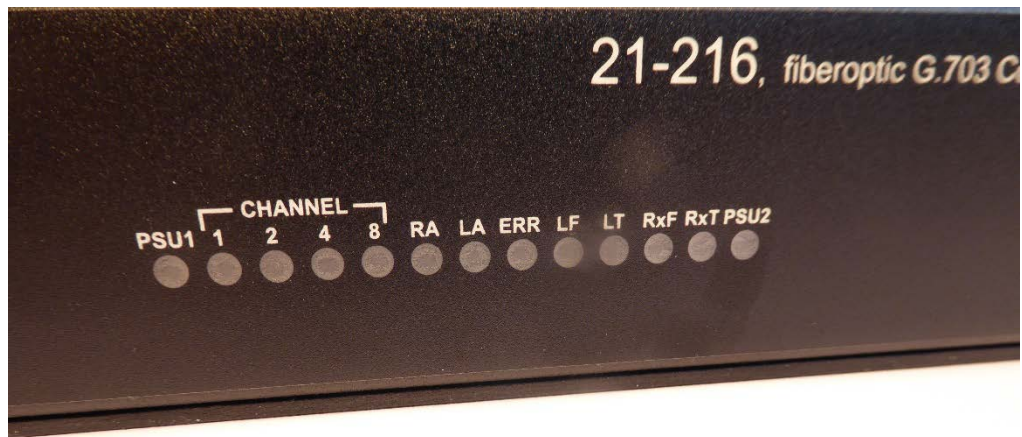
Power on.

Connect the power cord to the 21-216 and then connect to mains.

If the link doesn't work, try to cross-connect the fibers at one end.

LED-status.

There are 13 LED-indicators at the front panel.



PSU1

A green LED lit when power is connected to the unit.

CHANNEL

Four yellow LED's representing the channel chosen by DIP switch at rear panel.

The channel is "calculated" by adding the lit LED's.

For example if LED 1 and LED 2 are lit $\rightarrow 1+2=3 \rightarrow$ Channel 3 is chosen.

This means that data to/from G.703 codir-port is sent and received on the IEEE C37.94 protocol on the fiber.

The fiber protocols bits for N, named p,q,r,s in the IEEE 37.94 standard are always set to N=1, (0,0,0,1). This means that 21-216 will send 1 channel and active data will be sent on channel 3. The remaining 11 channels will have idle data - all ones. 21-216 will also accept data on channel 3.



RA

Remote Alarm. A red LED indicating that the remote unit has encountered a fault condition and has set the "Yellow Alarm bit" in the IEEE C37.94 protocol.

LA

Local Alarm. A red LED indicating that the 21-216 has encountered a fault in the received IEEE C37.94 protocol – LOS Loss Of Signal. The "Yellow Alarm bit" is set in the outgoing IEEE C37.94 protocol.

ERR

Error. A red LED indicating that the 21-216 has detected an internal error.

LF

Link Fiber. A green LED indicating that the 21-216 receives correct IEEE C37.94 frames, (no LOS).

LT

Link Twisted pair/G.703 codir. A green LED indicating that 21-216 receives G.703 codir 64kbit/s protocol.

RxF

Receives data on fiber. A green LED indicating that 21-216 receives data in IEEE C37.94 format.

RxT

Receives data on Twisted pair/G.703 codir. A green LED indicating that 21-216 receives data in G.703 codir protocol.

PSU2 (Optional second power supply)

A green LED lit when power is connected to the unit.

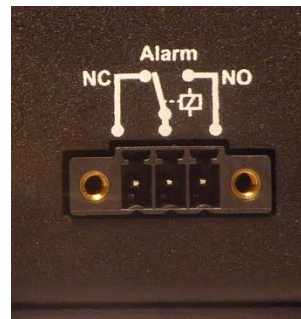
Alarm

Alarm out, is a 3-pin relay output. Normally when the G.703 link is up and the C37.04 link is up and no errors, the NC pin and the common pin (in the middle) are closed, at the same time the NO pin are open.

When G.703 link is down or C37.94 link is down or any other error is detected the relay will switch to the opposite state.

Max switching voltage 440VAC, 300VDC.

Max switching current 8 A.



Technical support

Before contacting technical support, we ask you to first read the manual once again. If you still have problems or questions, don't hesitate to contact help desk. Please gather all relevant information, including serial number, about your installation before contacting help desk.

Our technical support can be reached at:

Fibersystem AB

Gårdsfogdevägen 18A

S-168 67, Bromma

Sweden

Telephone: +46-8-564 828 80

Web: <http://www.fibersystem.com/>

E-mail addresses can be found on our web-site.

CE - mark

The product described in this manual, is designed to apply to the specifications of the EMC directive 89/336/EEC and to low voltage directive 73/23/EEC

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