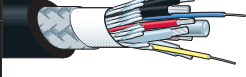



### Hybrid Fiber-optic Camera Cables (SMPTE ST 311)

Type	Model	Sales Units (m)	Nom. O.D. (mm)	Weight kg/100m	Outer Jacket	Overall Shield	Tension Tolerance (N)	Strength Member O.D. (mm)	Min. Bend Radius	Temp. Range (deg C)	Channel Unit		
											Fiber	Aux. (Power)	Signal (Control)
 <b>L-2SM9N</b> Jacket color : black	 <b>LF-2SM9N</b>	Call	9.2	12.0	Abrasion-resistance PVC	9/24/0.10TA 91%	700	2.6	6 x Nom. O.D.	-40 to +75	2 x SM 9/125 (low-water-peak) Unit O.D. 0.9 mm	4 x 20 AWG 21 / 0.18TA Unit O.D. 1.7 mm	2 x 25 AWG 7 / 0.18TA Unit O.D. 1.2 mm
	<b>LF-2SM9</b>				Smooth PVC								
	<b>LF-2SM16</b>	Double PVC											

#### LF-2SM9N

- For general use.
- Abrasion-resistance Jacket enhance the adaptability to all studio and outside broadcast applications.
- Cost effective

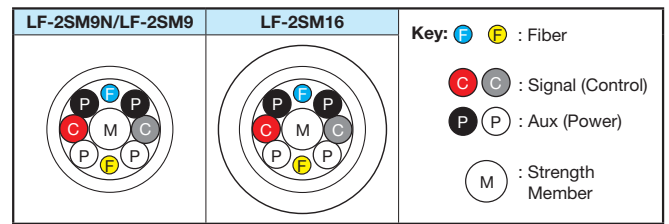
#### LF-2SM9

- For fixed installation.
- Smooth PVC Jacket brings stress-free cabling.





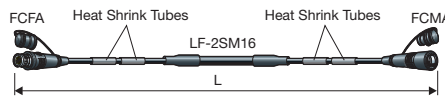
#### LF-2SM16

- For studio use.
- O.D. 16mm Double Jacket prevents the cable from being jammed under a camera pedestal dolly.

#### Cross Section



#### ■ Cable Assemblies

Type	Model	Length (m)
 Jacket color : black	 <b>FCC10N</b>	10
	<b>FCC20N</b>	20
	<b>FCC25N</b>	25
	<b>FCC35N</b>	35
	 <b>FCC50N</b>	50
	 <b>FCC100N</b>	100
	<b>FCC150N</b>	150
 Jacket color : black	<b>FCC200N</b>	200
	<b>FCC30A-WJ</b>	30
	<b>FCC50A-WJ</b>	50
	<b>FCC100A-WJ</b>	100

- Standard and widely-used models.
- Heat shrink tubes help in labeling.
- FCC\*\*A-WJ prevents the cable from being jammed under a camera pedestal dolly by its O.D. 16mm double jacket.
- 7-color connector rings included.

\* TAJIMI compatible type (Canare OC series) is also available. Please contact us for more information.



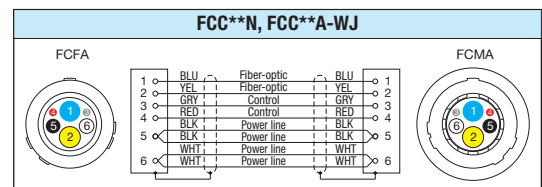
FCFA



FCMA




Color Rings



Wiring Diagram

## Slim Hybrid Fiber-optic Camera Cable

Type	Model	Sales Units (m)	Nom. O.D. (mm)	Weight kg/100m	Outer Jacket	Overall Shield	Tension Tolerance (N)	Strength Member O.D. (mm)	Min. Bend Radius	Temp. Range (deg C)	Channel Unit		
											Fiber	Aux. (Power)	Signal (Control)
 Jacket color : black	<b>LF-2SM7N</b>	Call	7.1	7.3	Abrasion-resistance PVC	8/24/0.10TA 91%	300	1.4	6 x Nom. O.D.	-40 to +75	2 x SM 9/125 (low-water-peak) Unit O.D. 0.9 mm	2 x 20 AWG 21 / 0.18TA Unit O.D. 1.7 mm	2 x 25 AWG 7 / 0.18A Unit O.D. 1.2 mm

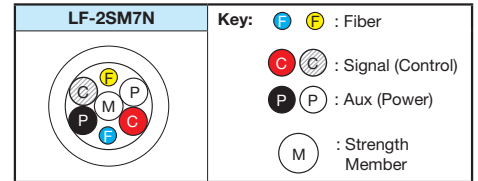
### LF-2SM7N

- O.D. 7 mm of slim profile and approx. 40% lighter than LF-2SM9N.
- Best fit for mobile applications.
- The power transmission distance is approx. twice as long as the previous model LF-2SM7R.

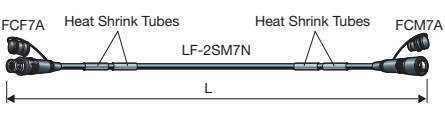
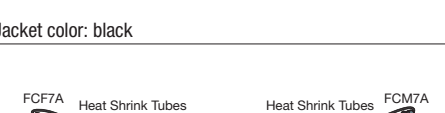
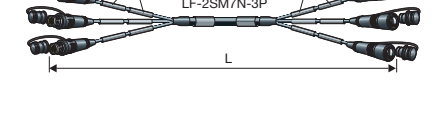
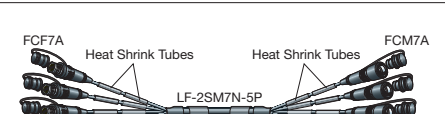
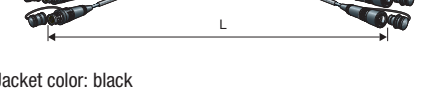
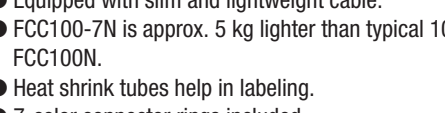
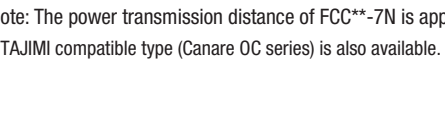



Note: The power transmission distance is shorter than typical HFO camera cables (approx. 50% of LF-2SM9N). Please contact us for more information.

\*Multichannel cables, LF-2SM7N-3P and LF-2SM7N-5P, are also available.

### Cross Section



### Cable Assemblies

Type	Model	Length (m)
	<b>FCC10-7N</b>	10
	<b>FCC20-7N</b>	20
	<b>FCC30-7N</b>	30
	<b>FCC50-7N</b>	50
	<b>FCC100-7N</b>	100
	<b>F3-FCC10-7N</b>	10
	<b>F3-FCC20-7N</b>	20
	<b>F3-FCC30-7N</b>	30
	<b>F3-FCC50-7N</b>	50
	<b>F3-FCC100-7N</b>	100
	<b>F5-FCC10-7N</b>	10
	<b>F5-FCC20-7N</b>	20
	<b>F5-FCC30-7N</b>	30
	<b>F5-FCC50-7N</b>	50
	<b>F5-FCC100-7N</b>	100

- Equipped with slim and lightweight cable.
- FCC100-7N is approx. 5 kg lighter than typical 100m HFO camera cable as FCC100N.
- Heat shrink tubes help in labeling.
- 7-color connector rings included.

Note: The power transmission distance of FCC\*\*-7N is approx. half of that of the FCC\*\*N.

\*TAJIMI compatible type (Canare OC series) is also available. Please contact us for more information.



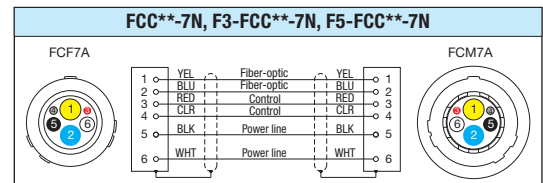
FCF7A



FCM7A



Color Rings



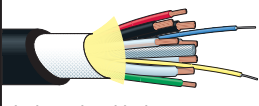
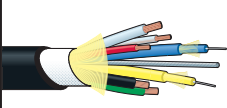
FCC\*\*-7N



F5-FCC10-7N

### Tough & Flexible HFO Camera Cable

Thermoplastic polyurethane type jacket offers amazing flexibility and superior mechanical properties; Crush Resistance, Impact Resistance and Cyclic Flexing exceed that of MIL.

Type	Model	Sales Units (m)	Nom. O.D. (mm)	Weight kg/100m	Outer Jacket	Overall Shield	Tension Tolerance (N)	Strength Member O.D.	Min. Bend Radius	Temp. Range (deg C)	Channel Unit		
											Fiber	Aux. (Power)	Signal (Control)
 Jacket color : black	LF-2SM9T	Call	9.2	9.8	TPU + PVC	N/A	1500	1.8 mm + Tensile strength fiber	Equal to Nom. O.D.	-40 to +75	2 x SM 9/125 (low-water-peak) Unit O.D. 0.9 mm	4 x 20 AWG 102 / 0.08A Unit O.D. 1.75 mm	2 x 25 AWG 24 / 0.08A Unit O.D. 1.2 mm
 Jacket color : black	LF-2SM7T	Call	7.1	5.3	TPU + PVC	N/A	1000	0.63 mm + Tensile strength fiber	Equal to Nom. O.D.	-40 to +75	2 x SM 9/125 (low-water-peak) Unit O.D. 1.7 mm	2 x 23 AWG 60 / 0.08A Unit O.D. 1.4 mm	2 x 26 AWG 30 / 0.08A Unit O.D. 1.1 mm

#### LF-2SM9T

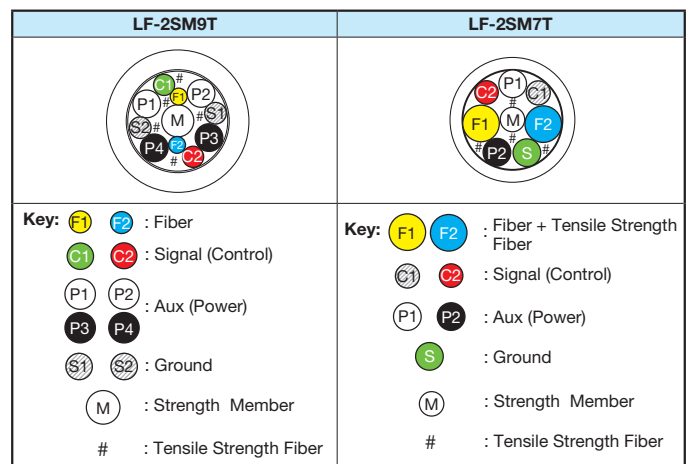
- Heavy-duty yet Flexible.
- Ideal for remote broadcast applications.
- Minimum bend radius: 9.2 mm.

#### LF-2SM7T

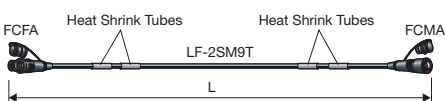
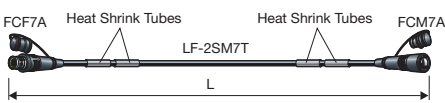
- Flexible, Slim, Lightweight, and moreover, Heavy-duty.
- Ideal for short-distance remote broadcast applications of up to 200 meters.
- O.D. 7.1 mm and weighing only 5.3 kg/100 m, it's so easy to carry around.
- Minimum bend radius: 7.1 mm.
- Fiber units include tensile strength fiber.

Note: The power supply distance of LF-2SM7T is shorter than other HFO camera cables. (approx. 30% of LF-2SM9T)  
LF-2SM7T requires a special technique during a connector assembly, so you can buy the cable assemblies shown below.  
LF-2SM7T cannot be assembled with TAJIMI type connector including Canare OC series.

#### Cross Section



#### Cable Assemblies

Type	Model	Length (m)
 Jacket color : black *Tajimi compatible type is also available.	FCC10-9T	10
	FCC20-9T	20
	FCC25-9T	25
	FCC35-9T	35
	FCC50-9T	50
	FCC100-9T	100
 Jacket color : black *Tajimi compatible type is NOT available.	FCC150-9T	150
	FCC200-9T	200
	FCC10-7T	10
	FCC20-7T	20
	FCC30-7T	30
	FCC50-7T	50
FCC100-7T	100	

- Tough & Flexible cable
- Fit for mobile applications in harsh environments.
- Heat shrink tubes help in labeling.
- 7-color connector rings included.

Note: The power transmission distance of FCC\*\*-7T is quite shorter than typical HFO camera cables.



FCC\*\*-7T



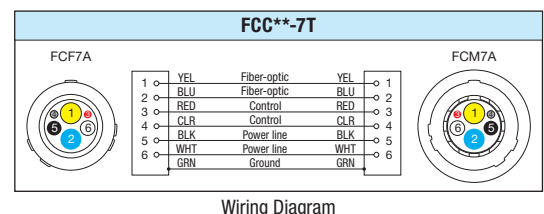
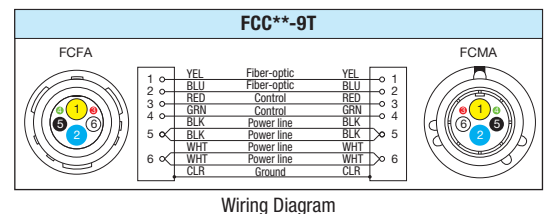
FCFA, FCF7A



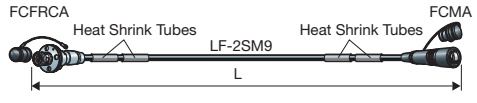
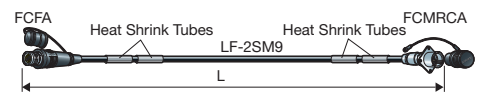
FCMA, FCM7A



Color Rings



## HFO Camera Cable Assemblies (Flanged Type)

Type	Model	Length (m)
 <p>Jacket color : black IU-FCF-SET included</p>	FCC05A-FRCM	5
	FCC10A-FRCM	10
 <p>Jacket color : black IU-FCM-SET included</p>	FCC05A-FMRC	5
	FCC10A-FMRC	10

\* TAJIMI compatible type (OC series) is also available. Please contact Canare for more information.

- HFO camera cable with the flange for panel mounting.
- SMPTE ST 304, ST 311, and ARIB BTA S-1005B compliant.
- Return loss: 45dB or greater ( $\lambda = 1.3\mu\text{m}$ ).
- Insertion loss: 0.5dB or less ( $\lambda = 1.3\mu\text{m}$ ).
- Connector body material is stainless steel.
- Color rings and insulation plates included.



Color Rings



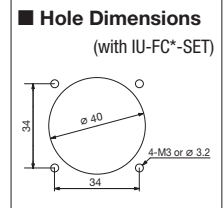
IU-FC\*-SET



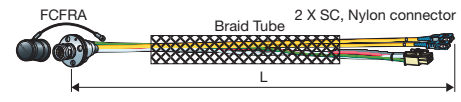
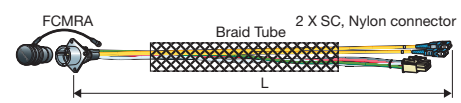
FCFRCA



FCMRCA

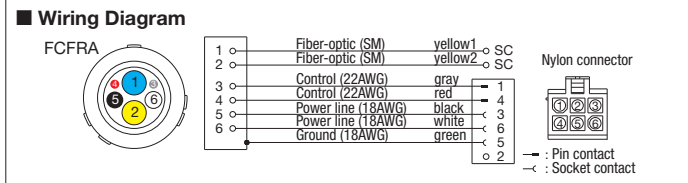


## HFO Camera Receptacle Cables

Type	Model	Length (m)
 <p>Jacket color : black IU-FCF-SET included</p>	FCS015A-FR	1.5
 <p>Jacket color : black IU-FCM-SET included</p>	FCS015A-MR	1.5

\* TAJIMI compatible type (OC series) is also available. Please contact Canare for more information.

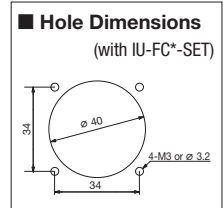
- Ideal for connecting wall terminal panels to splice enclosures, etc.
- Return loss: 45dB or greater ( $\lambda = 1.3\mu\text{m}$ ).
- Insertion loss: 0.5dB or less ( $\lambda = 1.3\mu\text{m}$ ).
- Connector body material is stainless steel.
- Insulation plates included.



FCFRA



FCMRCA



## Insulation Plate

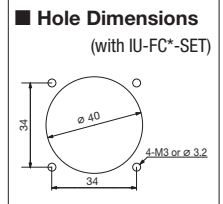
Ideal for perfect insulation between individual connector and panel.

Model	Suitable Connector
IU-FCM-SET	FCMRA, FCMRCA
IU-FCF-SET	FCFRA, FCFRCA

- Material: Bakelite (phenolic resin)
- Mounting screws included.



IU-FC\*-SET



## Extraction Tool

Extraction tool helps easy to clean Canare HFO connectors.

Model	Suitable Connector
ASPT-1	FCFA, FCF7A, FCFRA, FCFRCA

- Tool to be used to release the alignment sleeve unit when cleaning HFO connectors.

\* Use the CLETOP 2.5/2.0 (100) cleaning stick to clean fiber-optic camera connectors.



ASPT-1



Quick-release

US Patent No.7241055B2  
JP Patent No.4340186

### Hybrid Fiber-optic Camera Connector Panels

Pre-terminated HFO camera connector panel with built-in splice enclosure box provides easy and quick installation between HD camera system and terminal panel or rack. By combining the unit and frame, HFO camera connector panel enables a variety of layouts depending on the system design.

#### ■ COPS Series (SMPTE)

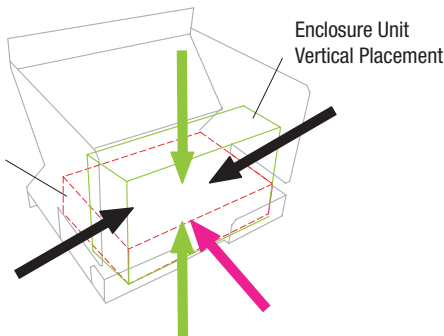
Model	Panel Size	HFO Connectors* (Assembly)
COPS-FF3A	Wall Mount Type	2x FCFRA (FCS003A-FR)
COPS-FM3A	3RU Height, W:197.6mm	2x FCMRA (FCS003A-MR)
COPS-FF2A	Wall Mount Type	2x FCFRA (FCS003A-FR)
COPS-FM2A	2RU Height, W:197.6mm	2x FCMRA (FCS003A-MR)
COPS3-FF3A	Rack Mount Type	6x FCFRA (FCS003A-FR)
COPS3-FM3A	3RU	6x FCMRA (FCS003A-MR)
COPS3-FF2A	Rack Mount Type	6x FCFRA (FCS003A-FR)
COPS3-FM2A	2RU	6x FCMRA (FCS003A-MR)

\* Each HFO connector is pre-terminated. (length: 0.3m)

\* TAJIMI compatible type (OC series) is also available. Please contact Canare for more information.

#### Key Features and Benefits

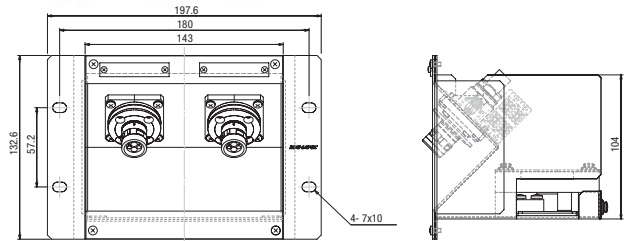
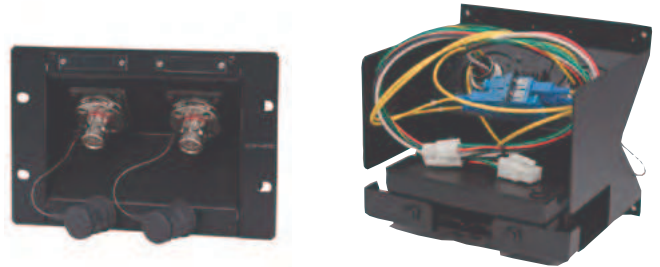
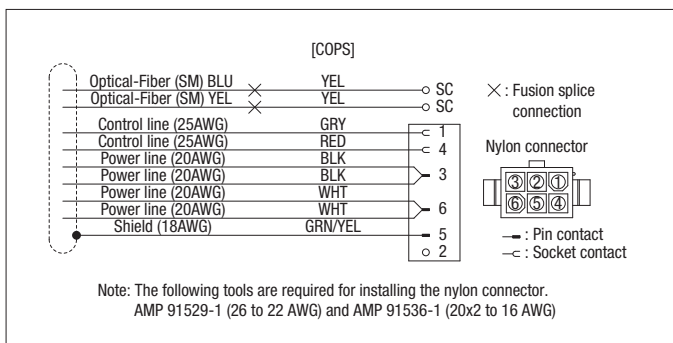
- Exclusive "5-directional Wiring"
- Convenient to build I/O interface between HD facilities and HD OB vans
- Variety of choice of 2RU/3RU and wall/rack mount
- Pre-terminated HFO connectors reduce installation time dramatically.
- Cost effective
- Lightweight aluminum chassis



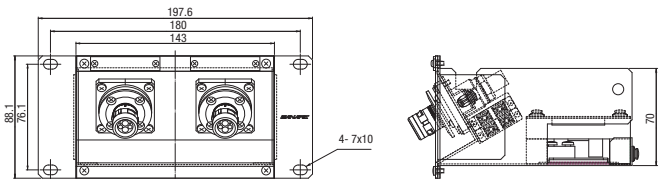
5 directions of cabling as indicated by colored arrows  
 — Vertical/Transverse placement  
 — Transverse placement  
 — Vertical placement

**5-directional Wiring**  
 JP Patent No.4388540

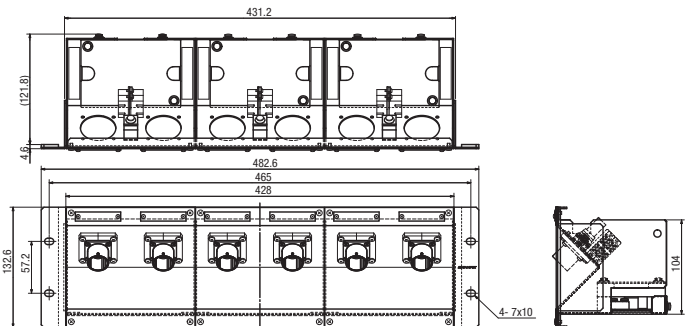
#### ■ Wiring Diagram



COPS-FF3A



COPS-FF2A



COPS3-FM3A

#### Accessories:

Fiber-optic cable w/SC connector (2m), grounding cable, nylon connector, pin contact, socket contact, tie-band, fusion splice protection sleeve, splice holder, color-coded tube, mounting screw, laser warning label.

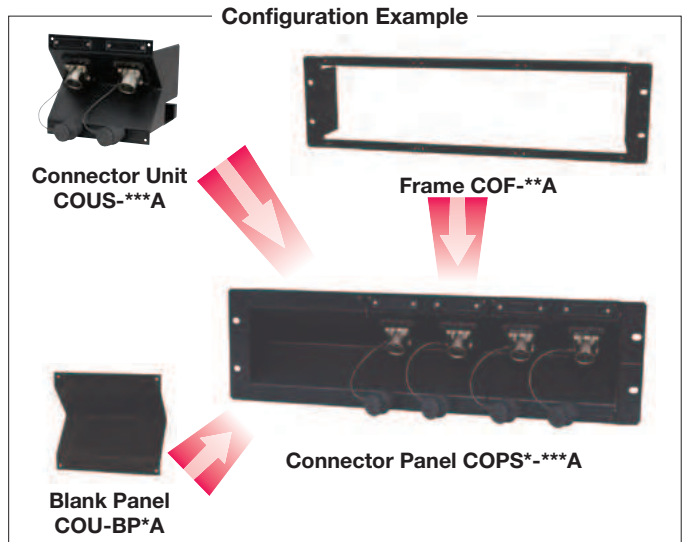
Note: Assembly tools for the nylon connectors are NOT include.

## Individual Units and Parts

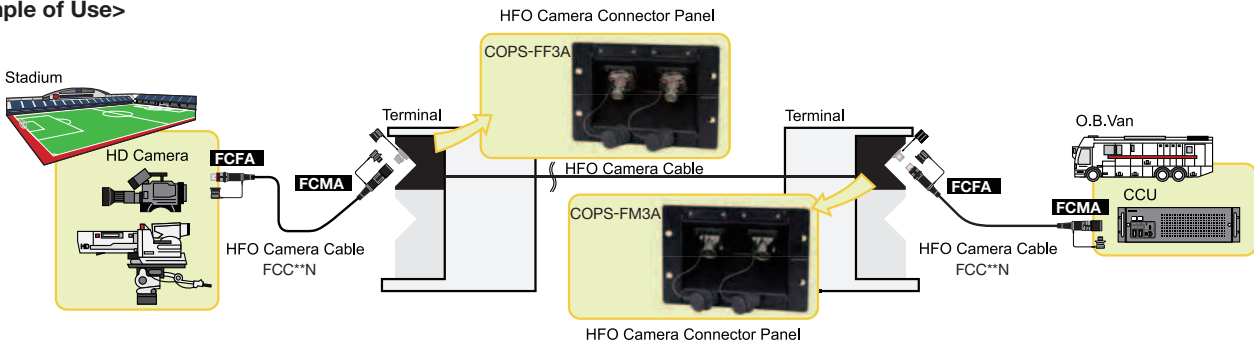
Model	Panel Height	Description
COUS-FF3A	3RU	Connector Unit w/ 2x FCFRA (FCS003A-FR)
COUS-FM3A	3RU	Connector Unit w/ 2x FCMRA (FCS003A-MR)
COUS-FF2A	2RU	Connector Unit w/ 2x FCFRA (FCS003A-FR)
COUS-FM2A	2RU	Connector Unit w/ 2x FCMRA (FCS003A-MR)
COU-BP3A	3RU	Blank Panel
COU-BP2A	2RU	Blank Panel
COF-13A	3RU	Frame for 1 Unit
COF-12A	2RU	Frame for 1 Unit
COF-33A	3RU	Frame for 3 Unit
COF-32A	2RU	Frame for 3 Unit

\* Each HFO connector is pre-terminated. (length: 0.3m)

\* TAJIMI compatible type (OC series) is also available. Please contact Canare for more information.



## <Example of Use>



## Hybrid Fiber-optic Splice Enclosures

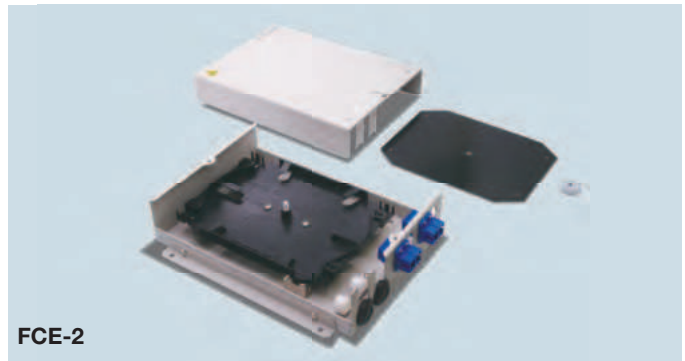
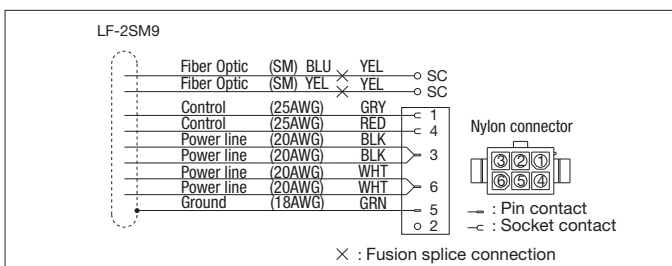
The fiber-optic splice enclosure was designed specifically for use with hybrid fiber-optic camera cables. The enclosure is used to protect fusion splice connection parts after installation.

Model	No. of cables	Fusion splice tray No.	Adapter	
			SC	Nylon connector
FCE-2	2	1	4	2
FCE-4	4	2	8	4
FCE-6	6	3	12	6

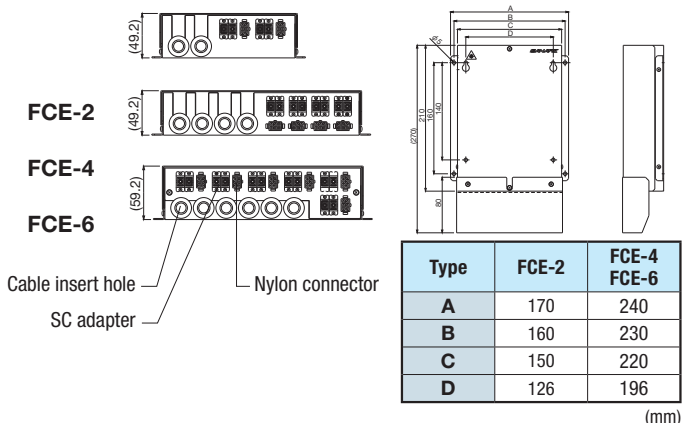
- The enclosure is designed specifically for the hybrid fiber-optic camera cable (LF-2SM9), making installation and operation very easy.
- The enclosure can be installed on walls or placed flat. Mounting bracket (connector protection cover) can be detached from the box when installing in limited space.
- The enclosure is designed with two configurations, the top-bottom split design (FCE-2, FCE-4) and the removable panel design (FCE-6). Both designs enable easy installation of cables.
- The connection with hybrid fiber-optic receptacle cable is done by use of connectors, thus enabling easy interchanging of lines after installation.
- The tension member is insulated from the chassis.

Note :  
The following tools are required for installing the nylon connector.  
AMP 91529-1 (26 to 22 AWG) and AMP 91536-1 (20x2 to 16 AWG)

## Wiring Diagram



Accessories:  
Fiber-optic cable w/SC connector (2m), splice holder, fusion splice protection sleeve, nylon connector, pin contact, socket contact, tie band, grounding cable, color-coded tube.



### Hybrid Fiber-Optic Camera Cable Checker

Canare Cable Checker allows fast, easy confirmation of HFO cables in the field. No heavy equipment to drag around. The compact design features a backlight digital display to measure optic loss/power and electrical continuity. Small and light, Canare Cable Checker helps make mobile installations smooth, secure and constant.

Kit Model	Individual Model	
	Measuring Unit	Loop-back Unit
<b>FCT-FCKIT</b>	FCT-FC	FCT-FCLB

\* TAJIMI compatible type (OC series) is also available. Please contact Canare for more information.

#### Key Features and Benefits

- Compact, hand-held design
- Measured optical loss and power in addition to electrical signals
- 2x AA, 20 hours battery life
- The kit includes a storage case, carrying cases, AA Batteries, and cleaning sticks

#### Specifications

Kit Model	FCT-FCKIT
Connector	SMPTE/ARIB (Canare FC Series)
LD	FP-LD
Wavelength	1310nm
Output Power	-2.5dBm
Sensitivity	-24 to -2dBm
Maximum Length	3.5km (Canare LF-2SM9N)
Optic Lines	Two Lines: Power and Loss
Copper Lines	Power, Control, and Shield: Connectivity
Battery/Life	2pcs of AA/ Approx. 20hours
Operating Temperature	-10 to 60°C
Dimensions	FCT-FC: 46x 46x 150mm FCT-FCLB: 46x 46x 65mm
Weight	FCT-FC: 380g FCT-FCLB: 170g
Accessories	Storage case, carrying cases, AA Batteries, and cleaning sticks

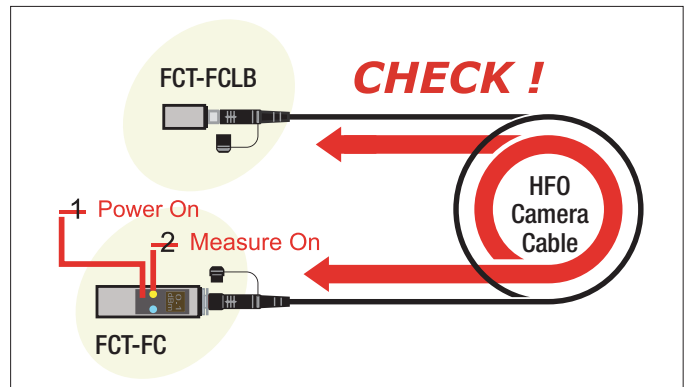
CE, FCC, FDA registered  
US Patent No.7113678  
JP Patent No.4155979



Carrying Cases



Storage Case

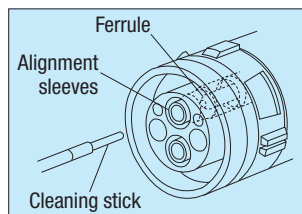


## Technical Note

### Maintaining Hybrid Fiber-Optic Camera Connectors

The connector sections to be cleaned are the key parts, including the tips and sides of ferrules, the interior walls of alignment sleeves and the interior and exterior of connector shells. Note that scratches and particles of foreign matter on the tip of the ferrule can have a disabling effect on fiber-optic transmission. The following procedures should be used when cleaning hybrid fiber-optic camera connectors.

- For Plugs, the interior surfaces of alignment sleeves and the tips of ferrules are to be cleaned with the non-alcohol treated cleaning stick using a gentle stroking action. Canare FCFA and FCFA enhance easy cleaning procedure for its innovative alignment sleeve and insulator detachable design.



US Patent: No.7241055B2, JP Patent: No.4340186

- For Jacks, it is important to clean both the tips and sides of the completely protruding ferrules with the cleaning stick.
- Both the male and female connector shells tend to attract dust and metal particles, so it is important to clean both the insides and outsides using cotton gauze or similar material.



Before cleaning



After cleaning

#### Cleaning Stick

Model: **CLETOP 2.5/2.0**

- Compact and disposable
- Allows cleaning both the tips and sides of ferrules
- Manufactured by NTT-AT



Cleaning stick  
CLETOP 2.5/2.0

#### IBC Brand Cleaner M-20

Model: **14347 CLEANER**

- Easy "one-push" cleaner
- Allows cleaning the tips of ferrules without removing alignment sleeve
- Manufactured by US Conec



IBC Brand Cleaner M-20  
14347 CLEANER