Technical Description

USB3 & PCIe Flat Ribbon Cables

for xiQ, xiC and xiX cameras

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1. USB3 – Cabling, Connectors

1.1. USB3 - FPC cable

Two types of flat ribbon USB3 cables (FFC) were introduced along with the cameras for integrations.

The initial version was a polarized custom cable (PN: CBL-MQ-FL-xxx, gold color). The camera side is laser marked "CAM" and the break-out-board/ host computer side is marked "BOB". This FFC must be connected to the camera and the computer / break-out-board or carrier-board in the correct orientation.

The newer generation of these cables (PN: CBL-USB3FLEX-xxx, white color) is NOT polarized and either end can be used for the camera or the host.

Both types of cables coexist and can be ordered in different lengths with respective part numbers:

Old (gold) PN	New (white) PN
CBL-MQ-FL-0M1	CBL-USB3FLEX-0M10
CBL-MQ-FL-0M25	CBL-USB3FLEX-0M25
	CBL-USB3FLEX-0M50

Figure 1-1, xiQ/xiC FPC cable, part numbers

Polarized cables PN: CBL-MQ-FL-xxx:
The camera and / or the computer interface can be destroyed in case of wrong cabling.

Turn power off and unlock the connector before inserting / detaching the cable to avoid any damage.

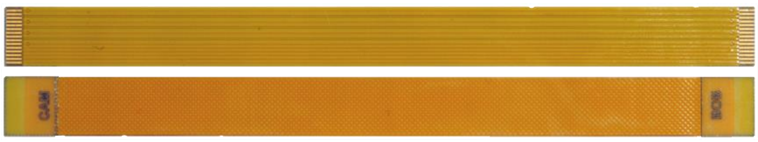

Figure 1-2, xiQ/xiC FPC cable, PN: CBL-MQ-FL-xxx

Figure 1-3, xiQ/xiC FPC cable, PN: CBL-USB3FLEX-xxx

Important note:
The EMI/EMC performance should be evaluated by customer. The customer is liable for compliance to FCC and/or any other national regulations of device(s) containing the subassembly.

1.1.1. Cable Properties

The thickness of the gold FPC (PN: CBL-MQ-FL-xxx) is 0.16mm, with a bending radius of 3.0mm.

The thickness of the white FPC (PN: CBL-USB3FLEX-xxx) is 0.38mm. The bending radius is not published by the cable vendor, but it is generally higher, and the cable is more rigid than the gold variant.

Note that both cable types can be folded for integration purposes, but the folding/flexing should not be repeated multiple times.

1.1.2. Camera side connection

The camera side of the FPC cables CBL-MQ-FL-xxx is laser marked “CAM”:

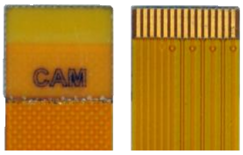

Figure 1-4, xiQ/xiC cable, PN: CBL-MQ-FL-xxx – camera side

This CAM-side of the cable must be connected to the camera:

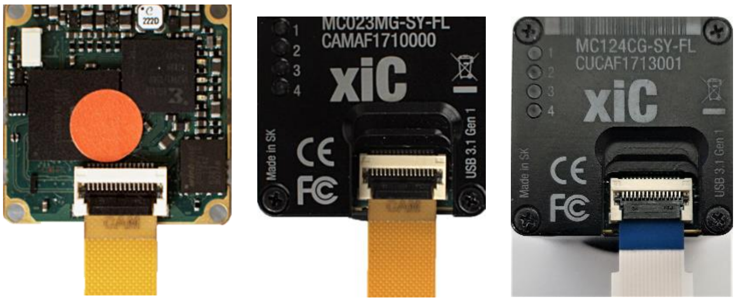

Figure 1-5, xiQ (left) and xiC (right) – camera side, correct FPC cabling

1.1.3. Break-out-board / host computer side connection

The “computer” side of the FPC- cables CBL-MQ-FL-xxx is laser marked “BOB” (break-out-board):

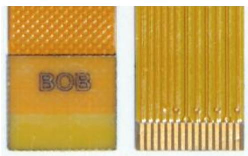

Figure 1-6, xiQ/xiC cable, PN: CBL-MQ-FL-xxx – break-out-board side

This BOB-side of the cable must be connected to the host computer / break-out-board.

1.1.4. Cable pin orientation

The basic orientation of the FPC cables in the connector can be seen in the following diagram:

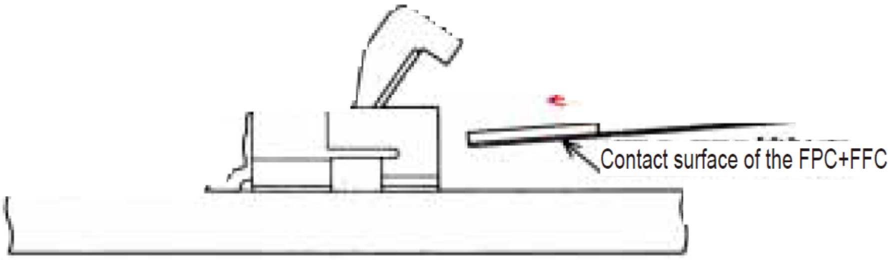

Figure 1-7, FPC-cable orientation in the connector

Make sure that the pins at the end of the cable are facing **away** from the latch of the mating connector.

1.2. Mating Connectors

The compatible mating connectors for the USB3 / IO cables are:

Molex 502231-1530

2. PCIe – Cabling, Connectors

2.1. PCIe Gen 2, 2 lanes - FPC cable

Two types of flat ribbon PCIe cables were introduced along with the cameras for integrations.

The initial version was a polarized custom cable (PN: CBL-MX-X2G2-xxx, gold color). Camera side is laser marked "CAM" and host computer / break-out-board side is marked "BOB".The FPC cable must be connected to the camera and the computer / break-out-board or carrier-board in the correct orientation.

The newer generation of these cables (PN: CBL-PCIEFLEX-X2G2-xxx, white color) is NOT polarized and either end can be used for the camera or the host.

Both types of cables coexist and can be ordered in different lengths with respective part numbers:

Old (gold) PN	New (white) PN
CBL-MX-X2G2-0M07	
CBL-MX-X2G2-0M10	CBL-PCIEFLEX-X2G2-0M10
CBL-MX-X2G2-0M25	CBL-PCIEFLEX-X2G2-0M25
CBL-MX-X2G2-0M50	CBL-PCIEFLEX-X2G2-0M50

Figure 2-1, xiX FFC, part numbers

Polarized cables PN: CBL-MX-X2G2-xxx:
The camera and / or the computer interface can be destroyed in case of wrong cabling.

Turn power off and unlock the connector before inserting / detaching the cable to avoid any damage.

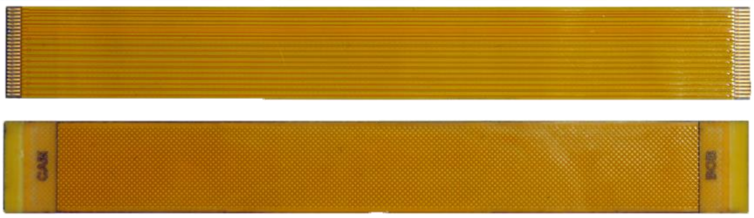

Figure 2-2, xiX X2G2 FPC cable, PN: CBL-MX-X2G2-xxx

Figure 2-3, xiX X2G2 FPC cable, PN: CBL-PCIEFLEX-X2G2-xxx

Important note:
The EMI/EMC performance should be evaluated by customer. The customer is liable for compliance to FCC and/or any other national regulations of device(s) containing the subassembly.

2.1.1. Cable Properties

The thickness of the gold FPC (PN: CBL-MX-X2G2-xxx) is 0.16mm, with a bending radius of 3.0mm.

The thickness of the white FPC (PN: CBL-PCIEFLEX-X2G2-xxx) is 0.38mm. The bending radius is not published by the cable vendor, but it is generally higher, and the cable is more rigid than the gold variant.

Note that both cable types can be folded for integration purposes, but the folding/flexing should not be repeated multiple times.

2.1.2. Camera side connection

The camera side of the FPC cables CBL-MX-X2G2-xxx is laser marked “CAM”:

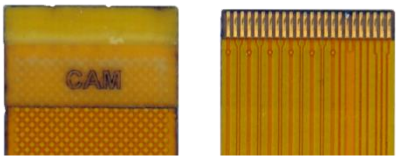

Figure 2-4, xiX X2G2 cable, PN: CBL-MX-X2G2-xxx – camera side

This CAM-side of the cable must be connected to the camera:

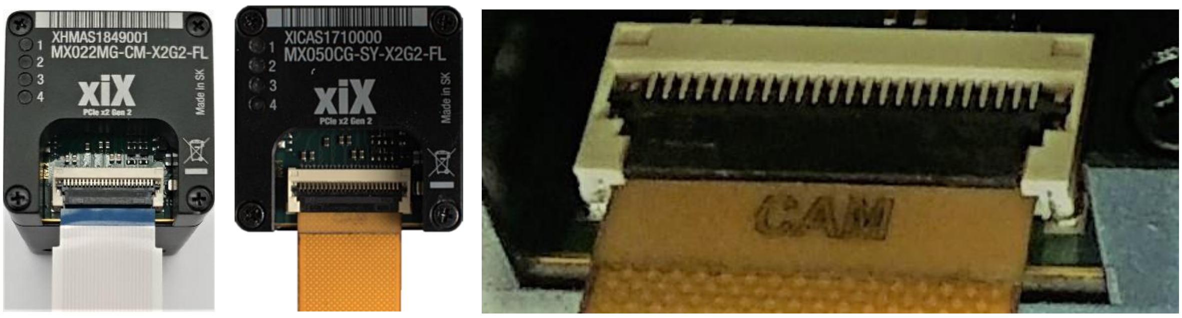

Figure 2-5, xiX X2G2 – camera side, correct FPC cabling

2.1.3. PCIe adapters / host computer side connection

The “computer” / adapter side of the FPC-cables CBL-MX-X2G2-xxx is laser marked “BOB” (break-out-board):

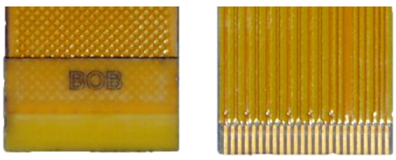

Figure 2-6, xiX X2G2 cable, PN: CBL-MX-X2G2-xxx – break-out-board side

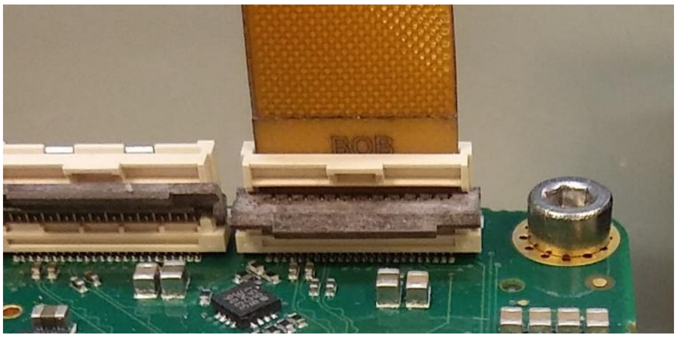

Figure 2-7, xiX X2G2 – break-out-board side, correct FPC cabling

This BOB-side of the cable must be connected to the host computer.

2.1.4. Cable pin orientation

The basic orientation of the FPC cables in the connector can be seen in the following diagram:

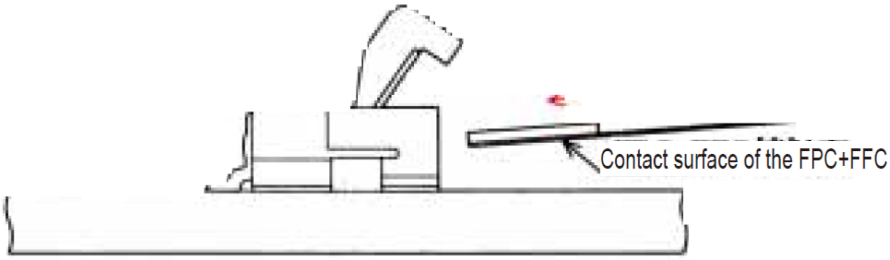

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Figure 2-8, FPC-cable orientation in the connector

Make sure that the pins at the end of the cable are facing **away** from the latch of the mating connector.

2.2. Mating Connectors

The compatible mating connectors for the PCIe / IO cables are:

Molex 502231-2430