TECHNICAL OVERVIEW

Taps FAQs

Fiber Taps FAQs

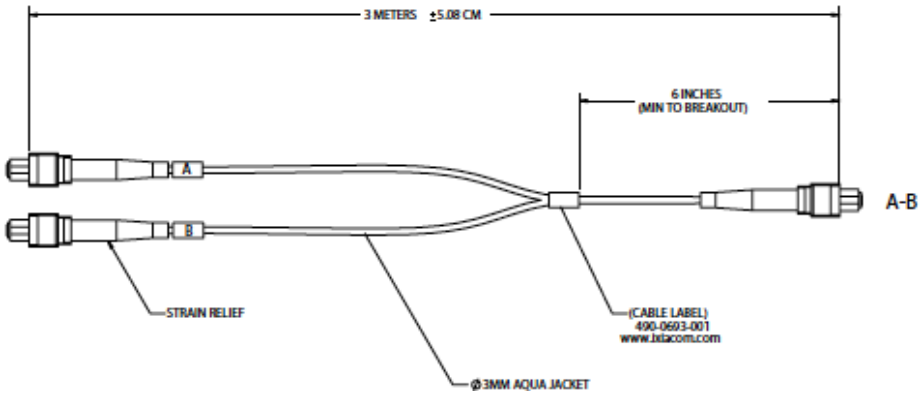
Q: What type of MTP connectors are used to connect to Ixia Flex taps?

A: The Flex taps have 'male' or 'pinned' MTP connectors, so Female 'non-pinned' MTP connectors must be used to mate with Ixia Flex taps. See also the answer to "What MTP cable type polarity is required for Multi-Mode SR10 or SR4 Flex Taps?" later in the FAQ.

Q: Do I need to buy Y cables for MTP Flex Taps?

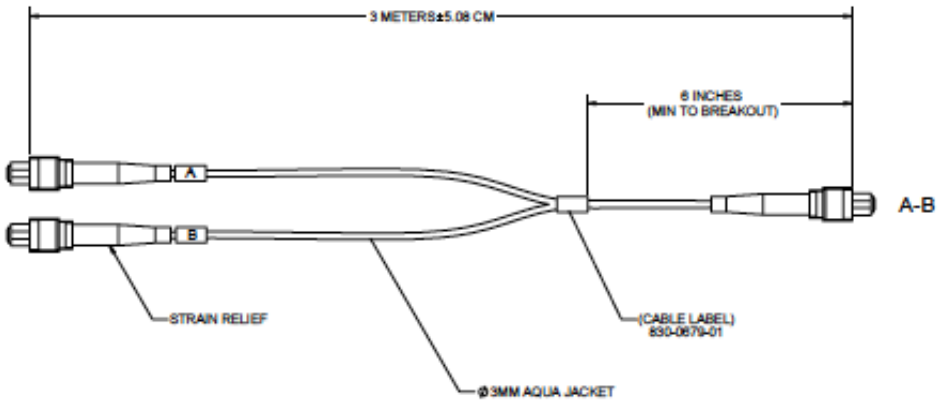
A: No. The MTP based taps include Y cables. The SR4 based taps include a Y cable with 8 fibers (4 on each leg) and is suitable for SR4 (eg. QSFP+ and QSFP28 transceivers) deployments. The SR10 based taps include a Y cable with 24 fibers (12 on each leg) and is suitable for SR10 deployments (eg. CFP transceivers). The Y cables look like the following:

SR4 MTP Flex Tap Y Cable



KEYSIGHT TECHNOLOGIES

SR10 MTP Flex Tap Y Cable



Ixia also offers a Y cable kit for the SR4 MTP tap. This contains a spare Y cable and 2 straight through cables.

Q: Can I "mix and match" Standard and Flex Tap VHD modules within the same chassis?

A: Yes. A standard Flex Tap module takes up 1/24th of the standard Rack Mount Chassis (RK-FLEX-24). The Flex Tap VHD takes up 1/12th of the chassis. However, there are internal dividers within the chassis which divide the chassis into '12 bays'. Each bay can take two standard modules or a single VHD module. If only a single standard module is deployed, a "spacer' module can be used to occupy the unused space in a bay. You can mix and match Standard modules, VHD modules and Spacer units to occupy the full chassis. Using the VHD Modules (each of which has 3 taps) gives a maximum density of 36 1/10G LC based taps in a single 19in 1U rack.

Q: Can the smaller Mini Chassis be mounted on the left and right hand side of a 19in rack?

A: Yes. Simply rotate the unit rack unit through 180 degrees to mount on the opposite side of a 19in cabinet. The Mini Chassis will hold up to 8 standard Flex Tap modules or 4 VHD modules. As a VHD module holds 3 individual taps you can fit 12 taps in this space.

Q: Can I use a standard Flex Tap module to tap a Cisco 40G BiDi link?

A: No. A standard Tap cannot properly pass the light traveling in opposing directions. It is necessary to use a Ixia's BiDI Flex Tap modules.

Q: Do I need a Y-Cable for the monitor ports on the Flex Tap BiDi?

A: No, because the transceiver(s) have receive capability on each simplex LC connector, you need only use a duplex LC multimode cable.

Q: How do you connect a 100G MM tap to a 100G MM interface on an Ixia NPB?

A: To connect the two devices, you must use a Y-Cable that is supplied with each Flex Tap and plug the feeds into two separate 100G transceivers. The single end of the cable plugs into the monitor port on the Flex Tap.

Q: Does the LR Flex Tap support 1310nm and 1550nm?

A: Yes, the LR Flex Tap does support both 1310nm and 1550nm wavelengths, meaning it supports LR and ER functions.

Q: What MTP cable type polarity is required for Multi-Mode SR10 or SR4 Flex Taps?

A: Ixia Flex Taps are labelled and operate as though they were Transceivers - ie. the fibers that receive light from the "Tx" side of network appliance transceivers must be fed into the "Rx" side of the taps (and vice versa).

MTP/MPO cables come in 3 different varieties. The varieties vary according to whether 12 or 24 fiber cables/connectors are used:

12 Fiber (SR4 taps):

A single row of 12 fibers is included in the MTP/MPO connectors. The polarity of these cables is defined in TIA-568.3-D.

Type A - "Straight through" cables, where pin 1 on one side of the cable is connected to pin 1 on the far side. Pin 2 on one side then goes to pin 2 etc.

Type B - "Cross Over" cables, where pin 1 on one side of the cable is connected to pin 12 on the receive side, Pin 2 on one side then goes to pin 11 etc.

Type C - "Cross Paired" cables, where adjacent fiber pairs are 'flipped' - ie fiber 1 on one side goes to 2 on the far side and vice versa. Pin 2 then goes to pin 1, and then 3 goes to 4 etc. Essentially this is like Type A, but with every two fiber pairs being swapped.

Type B cables must be used for SR4 based taps, if the tap is directly connected to the network devices by single cables. If the connectivity is via patch panels or additional cables, great care should be taken that the polarity of the signals are not modified**. If polarity is reversed on both sides of the Flex Tap then the tap will pass data on the network side, but will not act as a tap and no or very weak signals will be present on the monitor ports.**

24 Fiber (SR10 taps):

Two parallel rows of 12 fibers are included in the MTP/MPO connectors, for a total of 24 fibers. Historically there have been no consistent standards in the polarity of 24 Fiber MTP to MTP cables. In late 2016 an updated TIA standard was published (TIA-568.3-D). This added clear definitions to 24 strand MTP to MTP patch cable polarity. The following descriptions follow the latest TIA-568.3-D standard.

Type A - "Flipped" patch cables, where fibers are 'flipped'" vertically - ie. Pin 1 on one side goes to 13 on the other side and vice versa. Pin 2 goes to Pin 14 etc. For 24 stranded fiber, the 'flipping' is therefore vertical across the two rows of fibers.

Type B - "Flipped and Cross Over" patch cables, where pin 1 on one side of the cable is connected to pin 24 on the receive side, Pin 2 on one side then goes to pin 23 etc. This means that in addition to the rows being flipped vertically, they are also reversed across the rows.

Type C - "Flipped and Cross Pair" patch cables, where fibers are 'flipped'" vertically similar to Type A, but each pair of adjacent fibers are crossed - ie. pin 1 on one side goes to 14 on the other side and then pin 2 on one side goes to 13 etc.

Type A cables must be used for SR10 based taps, if the tap is directly connected to the network devices by single cables. If the connectivity is via patch panels or additional cables, great care should be taken that the polarity of the signals are not modified. **If polarity is reversed on both sides of the Flex Tap then the tap will pass data on the network side, but will not act as a tap and no or very weak signals will be present on the monitor ports.**

Note: Due to the non standard of patch cable labeling prior to TIA-568.3-D, a variety of cable polarities were available on the market. Users should always ensure that the cable polarity agrees with the above Type A definition. In the past some cable vendors did name this cable as a Type C cable, so care should be taken that the cable complies with Type A as defined in TIA-568.3-D.

Q: Do Flex Taps support asymmetric speed such as below scenario:

A: Firewall has a 10Gb interface and Switch has a 10G interface as well but Analyzer (connected to monitor port of the Flex Tap) Tool has 1Gb interface.

Q: Is this possible using Flex Tap? Hence 10G In/Out and 1Gb monitor.

A: Unfortunately, this will not work due to the passive nature of the tap and the difference between the 10G and 1G protocols (ie, what 10G TX is sending can't be comprehended by 1G RX). With 10G network links you will have 10G protocol coming out of the monitor.

Q: Can ‘active’ taps such as the 10G Fiber Agg Tap (iTap) handle the asymmetric speeds between the network side and tool side?

A: The answer here will be no as well. The monitor ports on the aggregation tap are XFP and XFP does not support the 1G protocol. This actually come up pretty often and the only solution I am aware of is to run the traffic through an Ixia NPB. Note that media conversion can occur – eg the tool can be using SX (short range) optics, whilst the network link could be LX (Long Range).

Aggregation and Regen Taps

Q: On an aggregation or regen tap, what is the difference between an Inline port and a SPAN port?

A: Inline ports can be connected directly to the network links while SPAN ports will need to be connected to a switch in the middle.

Inline ports are bidirectional and SPAN port is always unidirectional

With inline ports, you are tapping the network links directly. Fail-safe (non intrusion to network traffic even if when power is lost) is Ixia’s responsibility (Fail Open, or passive, or Ixia’s unique Virtual Zero Delay technology).

With SPAN ports, you’re tapping the network links indirectly via a switch. Fail-safe is the switch’s responsibility.

Q: When Power is lost to the copper Aggregator Tap the network connection between ports A & B still functions normally. However, when I apply power back to the Agg Tap, Ports A & B stop transmitting/Receiving data for approx. 6 seconds. This is unexpected. Monitoring ports stop working without power as you would expect.

A: When relay closure takes place at power down, both network A and B links are kept UP so there will be only packet loss during the process of relay closure (if any drops at all). On the other hand, when the unit is powered up, the PHY chip of the network ports needs to re-negotiate with link partners for proper speed (10/100/1000) and this is inherent to copper Ethernet. The time should be around or less than 2.5s for a typical link and 6 seconds is too long. Check with the network device and find out how long it takes to auto negotiate a speed on its own so to determine if it's a problem of the tap or a problem of the device to be tapped.

Copper Taps

Q: Zero Delay Tap: A packet arrives on Network port A and exits on both Network Port B and Monitor Port A. What is the latency difference between the packet leaving Network Port B and Monitor Port A?

A: The packets receive nearly the same latency traveling from Network A => Network B, as it does from Network A => Monitor A, about a 0.01 microsecond average difference (64 -1518 random byte packets).

Q: When TP-CU3 (4 copper-ports TAP) power is off, is there a hit on network traffic, and if yes, for how long?

A: Network traffic will be interrupted when power is lost on a TP-CU3.

The reason for this interruption is as follows:

When TP-CU3 is powered, the link negotiation is between the Network Switch A and TP-CU3 Net Port A. Similarly, the link negotiation is between Network Switch B and TP-CU3 Net Port B.

Upon power failure, these links between TP-CU3 Net ports and Network ports go down, causing interruption. An internal relay within the TP-CU3 is triggered creating an internal connection between TP-CU3 Net Port A and Net Port B.

This action results in a link renegotiation directly between Network Switch A and Network Switch B. Traffic will be interrupted during this link renegotiation period. The interruption period depends on the network.

This Zero Delay (ZD) Tap, contains an internal rechargeable power source (a battery), which during a power failure maintains the link between the TP-CU3-ZD Net Ports A & B and the Network Switches A & B. Hence no interruption to Network Traffic when power is turned off. Chose the Zero Delay Copper Tap of you do not want to see traffic disrupted.

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