emSFP gateway

(coaxial front end)

User guide

v0.6

Product: **emSFP gateway family**

May 19th, 2016

Table of contents

1. Introduction

This installation & configuration quick user guide provides the installations for the Embrionix SDI to IP coaxial gateway SFP+ (emSFP). These gateway modules are hot-swappable devices that plug into a 10GE MSA SFP slot; 10GE (2022-6) signal is received/transmitted on host interface.

Figure 1. SDI to IP coaxial gateway

2. Overview

The SFP+ (emSFP) modules are hot-pluggable I/O devices that plug into sockets (SFP/SFP+).

3. Required tools

ESD-preventive wrist strap

4. Installing SFP+ modules

Step 1 Attach an ESD-preventive wrist strap to your wrist and to the ESD ground connector or a bare metal surface on your chassis.

Step 2 Remove the SFP transceiver module from its protective packaging.

Step 3 Position the SDI to IP coaxial gateway SFP+ in front of the empty cage.

Step 4 Insert the SFP+ like the following pictures.

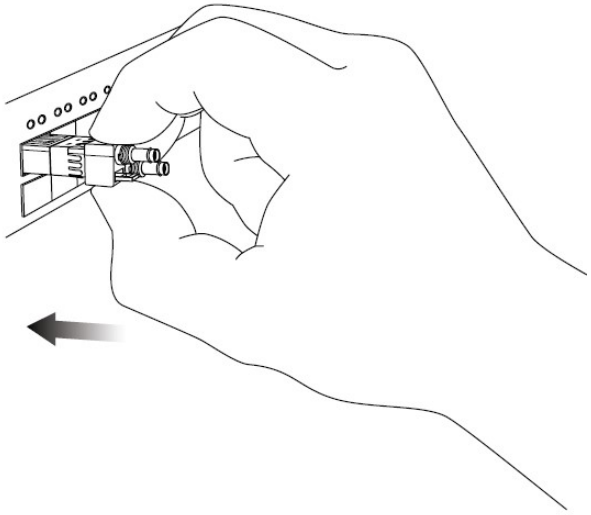


Figure 2. SDI to IP coaxial gateway insertion

Note Ensure the ejector is at rest position before inserting the SFP+ in the cage.

Step 5 Press the SFP+ until you feel the connector latch into place.

Step 6 Verify the SFP+ is seated and latched properly by grasping the SFP+ and try to remove it without releasing the latch.

5. Removing SFP+ modules

Note The SFP and SFP+ are static sensitive devices. It is recommended to use an ESD wrist strap or similar grounding device when handling the modules.

Step 1 Attach an ESD-preventive wrist strap to your wrist and to the ESD ground connector or a bare metal surface on your chassis.

Step 2 Release and remove the transceiver module from the socket connector, as shown in next figure (Step 2a) push the ejector gently in a slightly upward direction until the transceiver

disengages from the socket connector, and then pull the SFP transceiver module straight out (Step 2b).

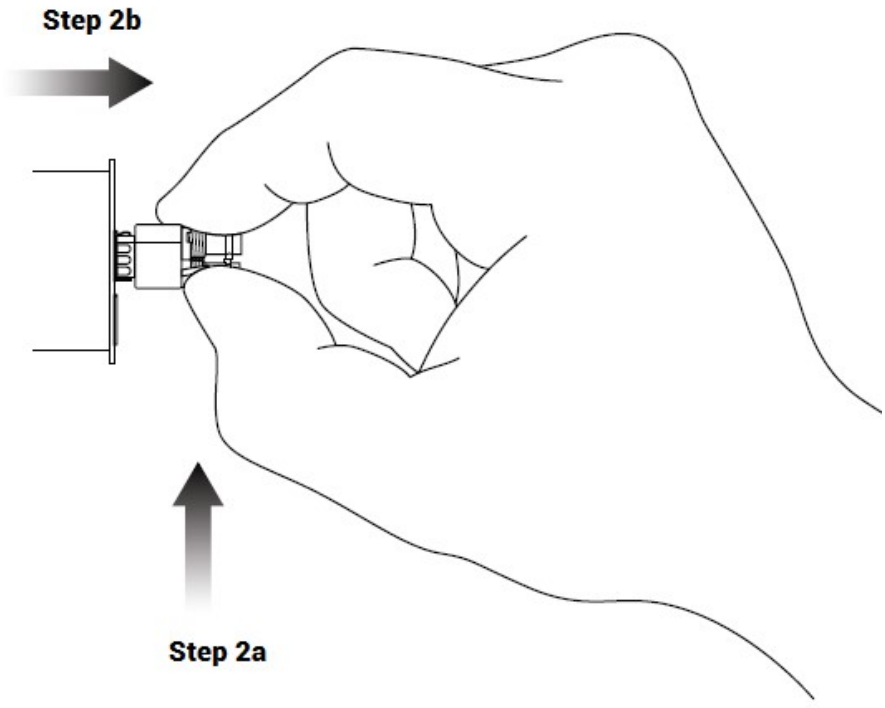


Figure 3. SDI to IP coaxial gateway extraction

6. Connecting SDI signals to the SDI to IP gateway

Step 1 Ensure that the SFP+ is seated and latched properly.

Step 2 Connect the HD-BNC by pushing the HD-BNC inside the connector (Step 2a), and then turn (clockwise) the HD-BNC to lock the cable (Step 2b) as shown in the next figure.

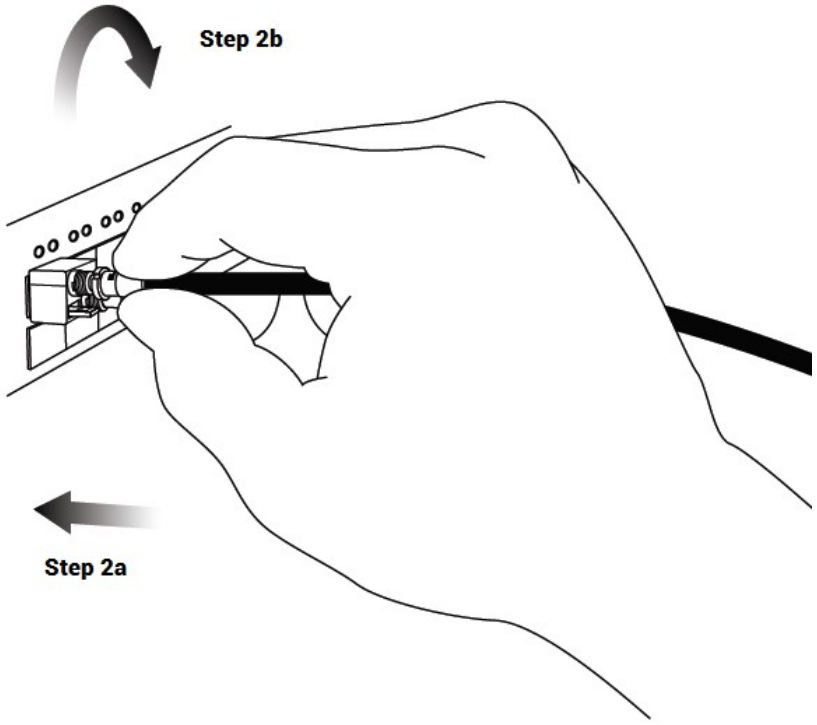


Figure 4. Connecting SDI signals

Note Supported SDI format as of publication of this manual : 1080p50/59/60, 1080i50/59/60, 720p50/59/60, 525i59, 625i50. Other rates have not been tested yet.

7. Configuring the SDI to IP gateway by the 10GE network

Note Steps described below are an **example** of a possible connection and tool to use to configure the *Gateway SFP*. One may have other solution to connect an application to send JSON commands to the *Gateway SFP* on the 10GE link.

Step 1 Insert the *Gateway SFP* into the 10GE host.

- At that point, there should be a link established for the *Gateway* SFP (status led on the 10GE host).

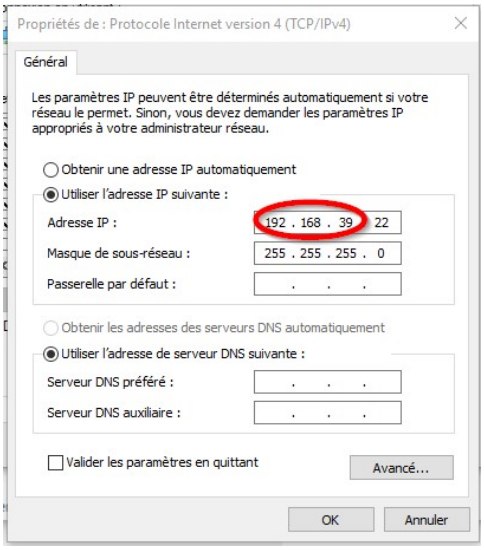
Note *Gateway SFP* (encapsulator and decapsulator) can take up to **10sec** to establish the link on cold boot.

Step 2 Insert an 1GE copper (RJ45) SFP into the 10GE/1GE equipment.

Step 3 Connect a 1GE-enabled PC to the 1GE RJ45 SFP.

- At that point, there should be a link established between the PC and the RJ45 SFP (status led on the switch).

Step 4 Configure the PC's Lan Adapter to be on the same subnet as the *Gateway SFP*



Step 5 Using Windows Command Prompt, ping your *Gateway SFP*.

- **Encap :** 192.168.39.215
- **Decap :** 192.168.39.216

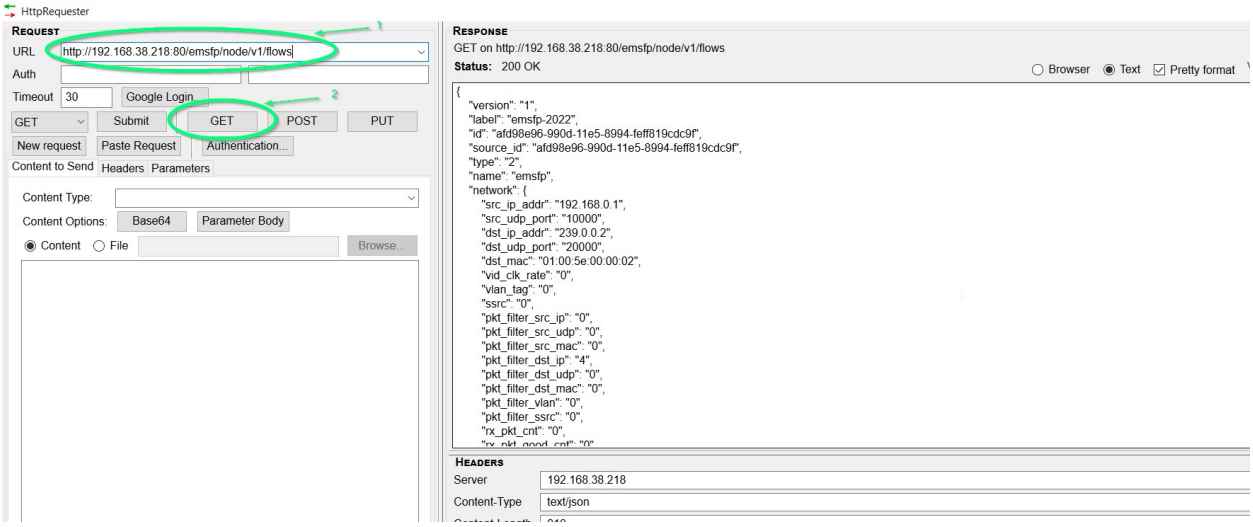
Note Depending on the 10GE equipment configuration, it may have traffic contention between 10GE/2022-6 traffic and 1GE/management traffic (for API access). For first tests, we recommend to have only management traffic in the 10GE equipment.

Step 6 Start **Firefox HTTP Requester** (free Mozilla Firefox plugin – **WINDOWS platform**).

See emSFP Devices *IP gateway REST API Userguide.pdf* document for the complete description of readable/writeable information AND for HTTP requester use.

Step 7 Get 2022-6 configuration from the *Gateway SFP*

1. Specify your *Gateway SFP* address (or hostname if DHCP is available in your system : **emsfp-a0-xx-xx**, where the xx-xx are the last digits of the *SFP* MAC address found on the label).
2. Press *GET* button
    - ➢ Command answer will be displayed on the right.

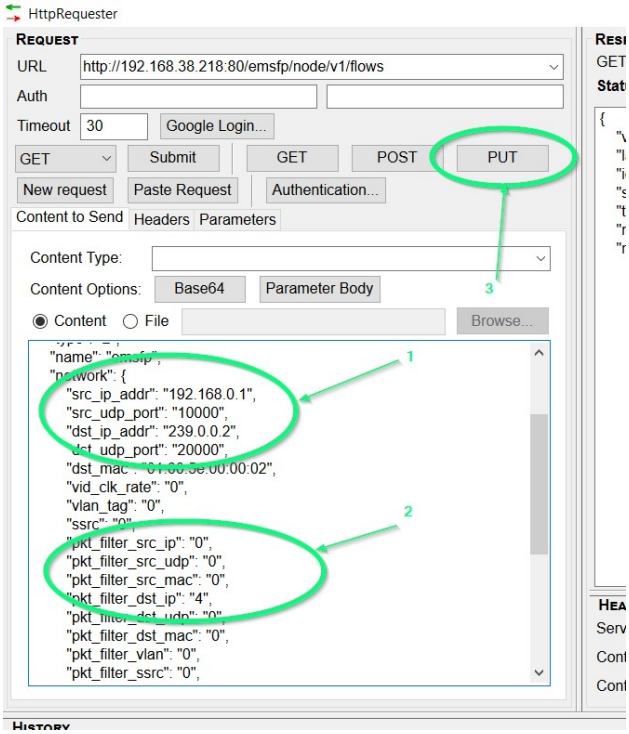


Step 8 Change 2022-6 configuration of the *Gateway SFP*

1. Specify your *Gateway SFP* address (or hostname: emsfp-a0-xx-xx, where the xx-xx are the last digits of the *SFP* MAC address found on the label).
2. Press *GET* button
    - ➢ Command answer will be displayed on the right.
3. Copy the **complete** answer displayed in *Response* text box (right side) to the left side text box *Content to send*.
4. Edit the desired values.
5. Press *PUT* button

Note Shown below is information for decap; encap is a bit different – there is no *pkt_filter_xyz* parameter to manage (item 2 in image below).

Note Configuration showed below for 2022-6 traffic is used to build / retrieve the packets so both encap and decap should have the same content based on the decap's *pkt_filter_xyz* setting. Shown below is **destination IP address filtering**.



8. Using the emSFP gateway

Note emSFP gateways have to be configured (as described in section 7) according to the network where they are used in order to work properly. Make sure to set network parameters for both, control and data path, as expected by the network.

Note emSFP gateways are 10GbE only devices, so they have to be used in 10GbE capable equipment.

8.1. Supported SDI formats

- SMPTE 259M – 525i/625i
- SMPTE 292M – 720p/1080i, 50/59.94/60Hz
- SMPTE 424M – 1080p, 50/59.94/60Hz

8.2. Expected behaviour

- Automatic SDI format detection within 30sec (expect a hit in SDI image on switch)
- Source and destination switching support (expect a hit in SDI image on switch)
- Network configurations kept in non-volatile memory
- Supports *ping* and *ARP* requests

8.3. Default configuration

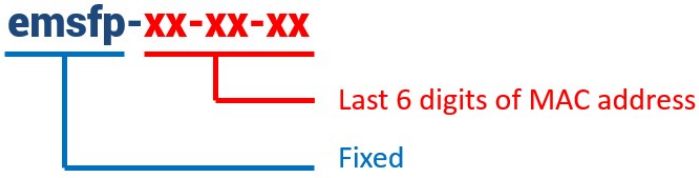
- self (*management*) configuration :
    - **encap IP address** : 192.168.39.215
    - **decap IP address** : 192.168.39.216
    - **both** :
        - MAC : *as shown on top sticker*
        - subnet mask : 255.255.255.0
        - gateway : 192.168.39.2

        - port : 80
        - DHCP : enable
- flow (data path) configuration :
    - **encap**
        - source IP address / port : 192.168.0.1:10000
        - destination IP address / port : 239.0.1.2:20000
    - **decap**
        - source IP address / port : 192.168.0.1:10000
        - destination IP address / port : 239.0.1.2:20000
        - channel selection packets filter : destination IP = 239.0.1.2

9. Updating the emSFP gateway (by the internal webpage)

Note Communication with the emSFP is only feasible if the network is properly configured and the computer used to communicate is in the same IP subnet (as shown in previous section).

The *Gateway SFP* possesses a webpage to ease update over the network. This intelligent SFP+ is DHCP ready, if a DHCP exist, the SFP+ will request an IP address and will request an HOSTNAME in the network. The HOSTNAME is composed like this:

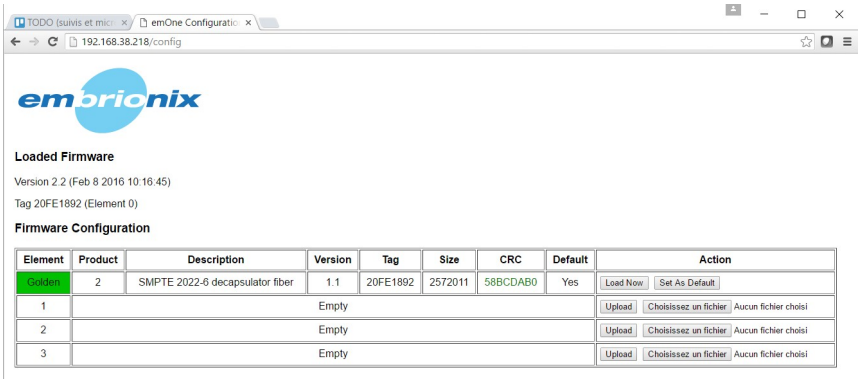


As example an SFP+ gateway with a MAC finishing by 0a-01-dd will have an hostname: emSFP-0a-01-dd

Step 1 Ensure that the link is established between the PC and the *Gateway SFP* (see steps 1 to 7 in previous section).

Step 2 Using Google Chrome on Windows, access the *Gateway SFP* webpage

Type **http://HOSTNAME (or IP address)/config**.



Step 3 Upload and run a new code

Please refer to the image above.

To upload a new code:

1- Choose an empty element and click on “Choose File” (button naming is browser dependent).

2- Browse to and select the provided **.img** file.

3- Click on “Upload”. The upload and verification process will take about 30 seconds.

If no empty element is available to upload a new code, you can free one by clicking on “Clear” and wait until the element is cleared (about 40 seconds).

If the upload process was successful, CRC value will be shown in green for that particular element. If not, it will be shown in red. In the unlikely later case, click on “Clear” and then repeat above steps.

To run a new or existing code:

1- Click on “Set As Default” to select this code as default when inserting or power cycling the emSFP.

2- Click on “Load Now” and wait until the page reloads.

3- Running image is the one marked in green (element number background, 0 on the above image).

Under some circumstances (slow switch port bring-up time, slow DHCP server response time), the loading will take more time and the page will not reload by itself. **Allow some more time and refresh the page manually, up to 1 minute.**

Note Do not remove the emSFP while uploading a new code or clearing an element.

Note It is not possible to clear or upgrade the code located in element labeled “Golden”. This ensures that the product will always have a working code to load.

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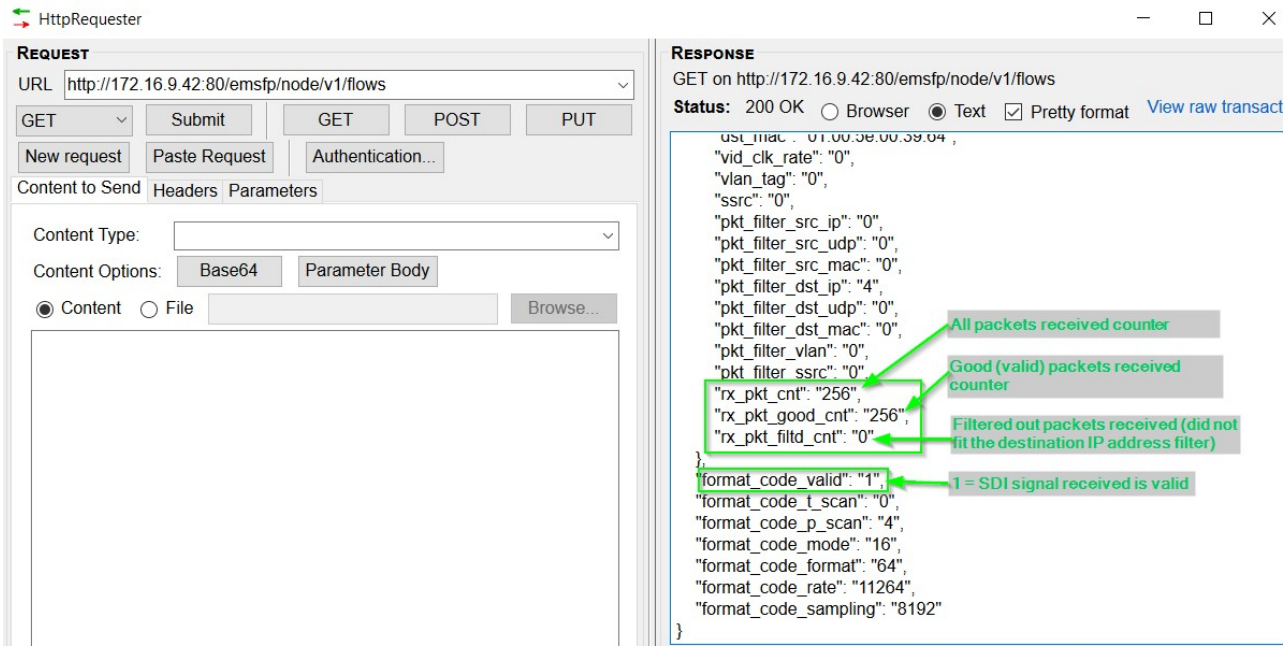
10. Troubleshooting the modules

Step 1 If the SFP is accessible for configuration but the video path is not working :

1. Make sure the *flows* configuration matches between encap and decap.
2. Make sure to disable IGMP snooping (release A106).
3. In the decap, make sure that the *packet filter* selected is well defined so data from only one encap is selected. For example, if filtering on destination IP, make sure that only one encap is sending to that specific destination IP.
4. In the decap, check for *rx_pkt_cnt, rx_pkt_good_cnt and rx_pkt_filtd_cnt.* If valid 2022-6 packets are received but do not fit the “packet filter”, you should see all counts increase. If the filter is valid, *rx_okt_filtrd_cnt* should not increment. Counters increment slowly as they are only for status report (count / 65536). Also, the video format valid indicator should be set if SDI data received is valid. *(see picture below)*



Step 2 After a live update, “loaded element” is still 0 while I did mark element 1 as default.

1. The detection of the loaded image is pretty basic, as of today. So if the new image uses the same internal firmware version than a previous one, the detection of the load will fail and select the first image with the specified ID, beginning by the top of memory.