Video-over-IP module for Universal System Frame USF-212BS. USF-10IP Series converts video, audio and ancillary data between IP formats (SMPTE ST 2022-6/SMPTE ST 2110, SMPTE ST 2022-8/SMPTE ST 2110) and between IP and SDI. Two dual (USF-10IP-TRC/USF-10IP-TRC-FS) or dual (USF-10IPSDI6-FS/USF-10IPSDI12-FS) 10 GbE (SFP+) modules can be installed to support hitless operation.

### Baseband and IP Hybrid System

For an IP system, the SMPTE ST 2022-6 standard is mainly used in transmission. In a production system, SMPTE ST 2110 is the most commonly used standard. In the future, baseband and IP, as well as SMPTE ST 2022-6 and SMPTE ST 2110 may be mixed for production applications. The USF-10IP Series provides IP and baseband conversion, and supports system configurations with mixed standards.
Available Modules

**USF-10IP-TRC**

- **SMPTE ST 2022-8 ↔ SMPTE ST 2110 conversion**
  - IP format: SMPTE ST 2022-8, SMPTE ST 2110.
  - IP synchronization: PTP (SMPTE ST 2059).
  - Two dual 10 GbE (SFP+) port supports hitless operation for redundancy (SMPTE ST 2227).
  - Control: Web GUI, NMOS (IS-04/05).

  - Up to 5 USF-10IP-TRC modules can be installed into USF-212BS.

**USF-10IP-TRC-FS**

- **SMPTE ST 2022-6 ↔ SMPTE ST 2110 conversion**
  - IP format: SMPTE ST 2022-6, SMPTE ST 2110.
  - IP synchronization: PTP (SMPTE ST 2059). Equipped with frame synchronization to synchronize SMPTE ST 2022-6 sources using PTP.
  - Two dual 10 GbE (SFP+) port supports hitless operation for redundancy (SMPTE ST 2227).
  - Control: Web GUI, NMOS (IS-04/05).

  - Up to 3 USF-10IP-TRC-FS modules can be installed into USF-212BS.

**USF-10IPSDI6-FS**

- **IP ↔ SDI conversion**
  - IP format: SMPTE ST 2022-6/8, SMPTE ST 2110 (used by switching, cannot be mixed).
  - IP synchronization: PTP (SMPTE ST 2059).
  - Frame synchronizer:
    - Selectable from sync signal generated from PTP or external BB input.
  - Two 10 GbE (SFP+) port supports hitless operation for redundancy (SMPTE ST 2227).
  - Video format: 1080/59.94p, 1080/50p, 1080/59.94i, 1080/50i.
  - Conversion of up to 6 streams.
    - 3G-SDI: 3 inputs/3 outputs.
    - HD-SDI: Up to 6 inputs or 6 outputs, or 3 inputs/3 outputs.
  - Compresses 12G-SDI to 3G/1.5G-SDI and processes 4K signals by using codec module USF-106TICO-12G simultaneously with input/output signals.
  - Control: Web GUI, NMOS (IS-04/05).

  - Up to 5 USF-10IPSDI6-FS modules can be installed into USF-212BS.

**USF-10IPSDII12-FS**

- **IP ↔ SDI conversion**
  - IP format: SMPTE ST 2022-6/8, SMPTE ST 2110 (used by switching, cannot be mixed).
  - IP synchronization: PTP (SMPTE ST 2059).
  - Frame synchronizer:
    - Selectable from sync signal generated from PTP or external BB input.
  - Two 10 GbE (SFP+) port supports hitless operation for redundancy (SMPTE ST 2227).
  - Video format: 1080/59.94p, 1080/50p, 1080/59.94i, 1080/50i.
  - Conversion of up to 12 streams.
    - 3G-SDI: 3 inputs/3 outputs.
    - HD-SDI: Up to 6 inputs or 6 outputs.
    - 4K-SDI: 6 inputs/6 outputs.
  - Compresses 12G-SDI to 3G/1.5G-SDI and processes 4K signals by using codec module USF-106TICO-12G simultaneously with input/output signals.
  - Control: Web GUI, NMOS (IS-04/05).

  - Up to 5 USF-10IPSDII12-FS-FS modules can be installed into USF-212BS.
Available Frames

USF-212BS

- Hot-swappable, front-accessible power unit and module bays.
- New design combining SDI and Ethernet.
- 2 genlock inputs (black burst (BB) or tri-level sync).
- Built-in gigabit Ethernet hub for GUI-based module configuration.
- Frame operational monitoring (cooling fan and power) and module life-and-death monitoring using SNMP.

Specifications

<table>
<thead>
<tr>
<th></th>
<th>USF-10IP-TRC</th>
<th>USF-10IP-TRC-FS</th>
<th>USF-10IPSDI6-FS</th>
<th>USF-10IPSDI12-FS</th>
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</thead>
<tbody>
<tr>
<td>IP format</td>
<td>• SMPTE ST 2110</td>
<td>• SMPTE ST 2110</td>
<td>• SMPTE ST 2110</td>
<td>• SMPTE ST 2110</td>
</tr>
<tr>
<td></td>
<td>• SMPTE ST 2022-8</td>
<td>SMPTE ST 2022-6</td>
<td>SMPTE ST 2022-6/8</td>
<td>SMPTE ST 2022-6/8</td>
</tr>
<tr>
<td>IP I/F (SFP+)</td>
<td>4 ports (2 x 2)</td>
<td>4 ports (2 x 2)</td>
<td>2 ports</td>
<td>2 ports</td>
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<tr>
<td></td>
<td>ST 2110: 2 ports</td>
<td>ST 2110: 2 ports</td>
<td>ST 2022-8: 2 ports</td>
<td>ST 2022-8: 2 ports</td>
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<tr>
<td>IP synchronization</td>
<td>PTP (SMPTE ST 2059)</td>
<td>PTP (SMPTE ST 2059)</td>
<td>3G/1.5G-SDI BNCx6 (input/output switchable)</td>
<td>3G/1.5G-SDI BNCx6</td>
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<tr>
<td>Video format</td>
<td>3G: 1080/59.94p, 1080/50p</td>
<td>3G/1.5G-SDI BNCx6</td>
<td>HD: 10ch, 3G: 6ch</td>
<td>HD: 10ch, 3G: 6ch</td>
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<tr>
<td>SDI input</td>
<td>—</td>
<td>—</td>
<td>HD: 6ch, 3G: 6ch</td>
<td>HD: 12ch, 3G: 6ch</td>
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<tr>
<td>SDI output</td>
<td>—</td>
<td>—</td>
<td>3G/1.5G-SDI BNCx6</td>
<td>3G/1.5G-SDI BNCx6</td>
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<tr>
<td>Available frames</td>
<td>USF-212BS</td>
<td>USF-10IP-TRC-FS</td>
<td>USF-10IPSDI6-FS</td>
<td>USF-10IPSDI12-FS</td>
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<tr>
<td>Max. number of mountable modules</td>
<td>5</td>
<td>3</td>
<td>5</td>
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