Video-over-IP module for Universal System Frame USF-212AS/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.

Four (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).
- **Four 10 GBE (SFP+) port supports hitless operation for redundancy (SMPTe ST 2022-7).**
- **Control**: Web GUI, NMOS (IS-04/05 In-band).

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.
- **Four 10 GBE (SFP+) port supports hitless operation for redundancy (SMPTe ST 2022-7).**
- **Control**: Web GUI, NMOS (IS-04/05 In-band).

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 2022-7).**
- **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 In-band).

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

### USF-10IPSDI12-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 2022-7).**
- **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/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 In-band).

Up to 3 USF-10IPSDI12-FS modules can be installed into USF-212BS/212BS.
Available Frames

USF-212AS/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 (preliminary)

<table>
<thead>
<tr>
<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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<tbody>
<tr>
<td><strong>IP format</strong></td>
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<tr>
<td>- SMPTE ST 2110</td>
<td>- SMPTE ST 2110</td>
<td>- SMPTE ST 2110</td>
<td>- SMPTE ST 2110</td>
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<tr>
<td>- SMPTE ST 2022-8</td>
<td>- SMPTE ST 2022-8</td>
<td>- SMPTE ST 2022-6/8</td>
<td>- SMPTE ST 2022-6/8</td>
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<tr>
<td><strong>IP I/F (SFP+)</strong></td>
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<tr>
<td><em>Hitless operation for redundancy supported (SMPTE ST 2022-7)</em></td>
<td>4 ports (2 x 2)</td>
<td>4 ports (2 x 2)</td>
<td>2 ports</td>
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<tr>
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<td>ST 2110: 2 ports</td>
<td>ST 2110: 2 ports</td>
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<td></td>
<td>ST 2022-8: 2 ports</td>
<td>ST 2022-8: 2 ports</td>
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<tr>
<td><strong>IP synchronization</strong></td>
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<tr>
<td>PTP (SMPTE ST 2059)</td>
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<tr>
<td><strong>Video format</strong></td>
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<tr>
<td>3G: 1080/59.94p, 1080/50p</td>
<td>HD: 1080/59.94i, 1080/50i</td>
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<tr>
<td><strong>SDI input</strong></td>
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<td>3G/1.5G-SDI BNCx6</td>
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<tr>
<td><strong>SDI output</strong></td>
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<tr>
<td>-</td>
<td></td>
<td>(input/output switchable)</td>
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<tr>
<td><strong>Number of simultaneous conversion lines</strong></td>
<td>HD: 11ch, 3G: 6ch</td>
<td>HD: 10ch, 3G: 6ch</td>
<td>HD: 6ch, 3G: 6ch</td>
</tr>
<tr>
<td><strong>Available frames</strong></td>
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<td>USF-212BS</td>
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<td>USF-212AS/212BS</td>
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<tr>
<td><strong>Max. number of mountable modules</strong></td>
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