WORLDCAST SYSTEMS

POWERFUL PERFORMANCE CONTROL SAVINGS SERVICES


# Solution for the Best Time-Synchronized Audio Transmission

**APT's SynchroStream technology is the industry's best dynamic STL latency control for FM Single Frequency Networks with overlapping transmitter contours.**

FM Radio is still the most consumed medium across society today. The programs are local, it is free, and reception can be mobile; all excellent attributes. However, if your station cannot be received well throughout the broadcast area, this will affect your listener retention.

Synchronized transmitter arrangements today are designed and optimized with visualization software and measurement equipment that provide an excellent prediction of RF contours in the terrain.

Well-performing boosters and translators are important tools for increasing coverage, a better reception performance and better ratings, and leads to new revenue opportunities.

With modern FM transmitters and directive antenna arrays, interference induced fading effects are kept to a minimum.

However, a key factor to achieve the desired enhancements by boosters and translaters is the perfect synchronization of the program feeds and control of the modulation timing in the air.

**SynchroStream** sets new standards in terms of the precise and location-stable placement of RF transition zones in the terrain.

## SynchroStream Benefits

***What our product manager says:***
*"With SynchroStream, we provide SFN designers with a professional tool that greatly simplifies the precise synchronization of transmitter feeds. The central determination of the network target latency and the modulation timing fine-adjustment of the boosters are perfectly under your control."*

*Hartmut Foerster*

### Achieve Highest SFN Accuracy

SynchroStream has the highest accuracy for target latency determination in a Single Frequency Network. Once set in the IP Encoder, all network timing differences are compensated and the modulation of all transmitters are synchronized. The very finely adjustable GPS-based modulation timing enables accurate positioning of location-stable overlap zones in the terrain.

### Optimize the RF Reception

Make the most of your licensed RF contour without needing additional frequencies. Booster and translators are the tools of choice to cover the total region. With SynchroStream, you can place synchronized gap-filler transmitters to precisely eliminate RF-shadows in the field and optimally spot out your main contour.

### Increase your Revenue

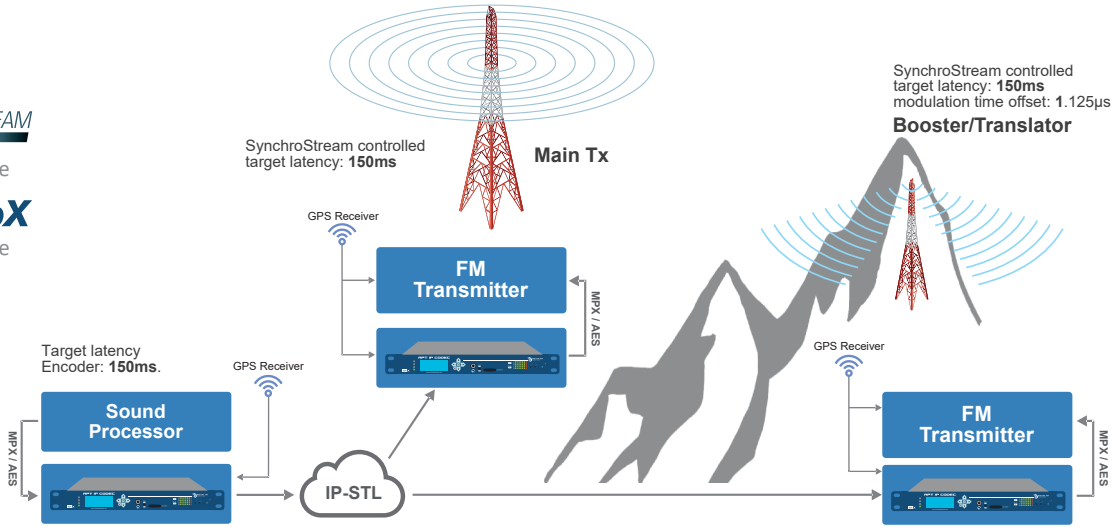
With optimal signal coverage of your total broadcast region and great reception conditions everywhere, you achieve maximum ratings. Your valuable program and the distributed advertisements generate the highest revenue.

SYNCHROSTREAM

# APT SynchroStream | perfectly aligned SFN Synchronicity

SURESTREAM compatible

APTmpX compatible




Transmission on a Single Frequency Network requires perfect compansation of IP-Link latencies and management of the modulation-timing

## STL-Latency Compensations

SynchroStream provides real-time dynamic transport delay compensation. Network jitter and re-routing effects are compensated with a single target latency setting on the IP Encoder.

IP network latency variables are eliminated in the target latency time span. With the additional integration of the NTP protocol, SynchroStream can manage time differences of up to five seconds.

## Modulation-Timing

SynchroStream manages the modulation delay from each antenna tower to the overlap area in the speed of light time domain.

This timing management takes into account the propagation time of the modulation in the air and allows the zero-delay line to be shifted in one direction or the other. SynchroStream allows time shifts with steps equal to less than 50 meters in the field; a uniquely fine granulation

# Associated **Technology**

## SynchroStream & APTmpX

Multiple analog stereo encoders in the SFN are, next to sound processors, the most unpredictable latency variables of an STL.

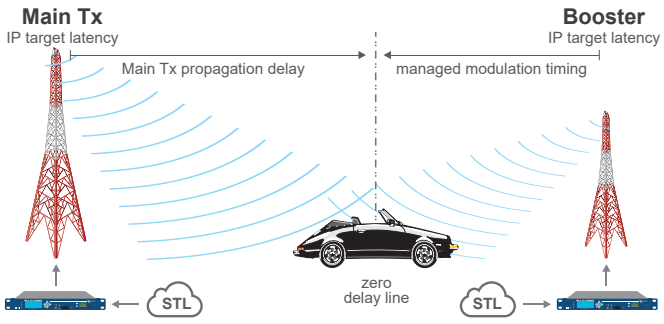
The solution is a fully digital signal path with central sound processor and a robust and predictable MPX transmission format. APT's IP codecs with SynchroStream not only feature a digital MPX-over-AES interface but also convert the MPX/composite into the bandwidth-saving APTmpX transmission format.

SynchroStream with the finest timing control and digital APTmpX with the lowest IP bandwidth requirements make the achievement of a perfect FM-SFN easier and more cost-effective than ever before.

APTmpX

APTmpX is the best MPX compression algorithm, that delivers the highest sound transparency over low-bitrate IP transmissions.

Read more and listen to: APTmpX




Highly granular modulation delay management

| APT SynchroStream Characteristics | |
|---|---|
| **SynchroStream is available as a license option for the APT IP Codec** | |
| **Time Source** | GPSDO 10MHz & 1PPS |
| **STL Latency Compensation** | up to 5 sec. in 1 ms increments |
| **Modulation Delay Offset** | up to ±50 ms in 125 ns increments (~37 m / 0.023 mi in terrain) |
| **SFN Stability** | Time alignment is maintained at ± 250 ns |
| **Associated Technologies** | SureStream (redundant streaming)<br>APTmpX composite/MPX compression format |



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