

# Compact BTS gateway for ISDB-T<sub>B</sub> networks

The R&S®AVG050 is a compact and versatile ISDB-T BTS gateway for ISDB-T<sub>B</sub>, a transmission standard mainly used in Latin America. The gateway is equipped with an integrated satellite receiver and remultiplexer, making it ideal for use between the local encoding/multiplexing center and the transmitter.

## Comprehensive functions

The R&S®AVG050 ISDB-T BTS gateway (Fig. 1) has an integrated satellite receiver and DVB-S / DVB-S2 demodulator for receiving and processing national programs. Local content is usually fed in in standard-definition (SD) format. It is generated in a local headend and can be fed to the R&S®AVG050 as a transport stream over IP or ASI (Fig. 2). The gateway multiplexes the satellite-fed or locally fed content to a new transport stream and generates a broadcast transport stream (BTS) with the appropriate modulation parameters for the transmitter and the corresponding signaling information (PSI/SI) for the receivers.

The gateway has two common interface (CI) slots for conditional access modules (CAM) used to decrypt the DVB-S / DVB-S2 signals and therefore supports two different encryption methods at the same time. The R&S®AVG050 can also decrypt two signals scrambled according to the basic interoperable scrambling system (BISS) standard (BISS-1 and BISS-E).

A clearly organized, intuitive user interface is provided for configuration and monitoring. All automatic monitoring commands and key device settings can also be remotely executed via an SNMP interface.

## The R&S®AVG050 is also available as a pure satellite receiver

More and more infrastructures for transmitter networks and closed user groups such as business, hospital and hotel TV use IP-based solutions. Since these applications often do not require any decoding in the receiver, the R&S®AVG050 is also available as a pure demodulator without remultiplexing function. The R&S®AVG050 DVB satellite receiver model features two integrated DVB-S / DVB-S2 demodulators for receiving two transponders. A built-in BISS descrambler and two CI slots are provided for DVB-compatible decryption. After the incoming transport streams are decrypted, the DVB satellite receiver outputs them as IP or ASI signals.

## Key features of the R&S®AVG050 DVB satellite receiver:

- Two DVB-S / DVB-S2 receivers with two CI slots
- Integrated BISS descrambling
- ASI and IP outputs
- Configuration and monitoring via SNMP
- Compact: only one height unit and ½ rack width

Fig. 1: The R&S®AVG050 ISDB-T BTS gateway multiplexes satellite transport streams and locally fed components to a new BTS.



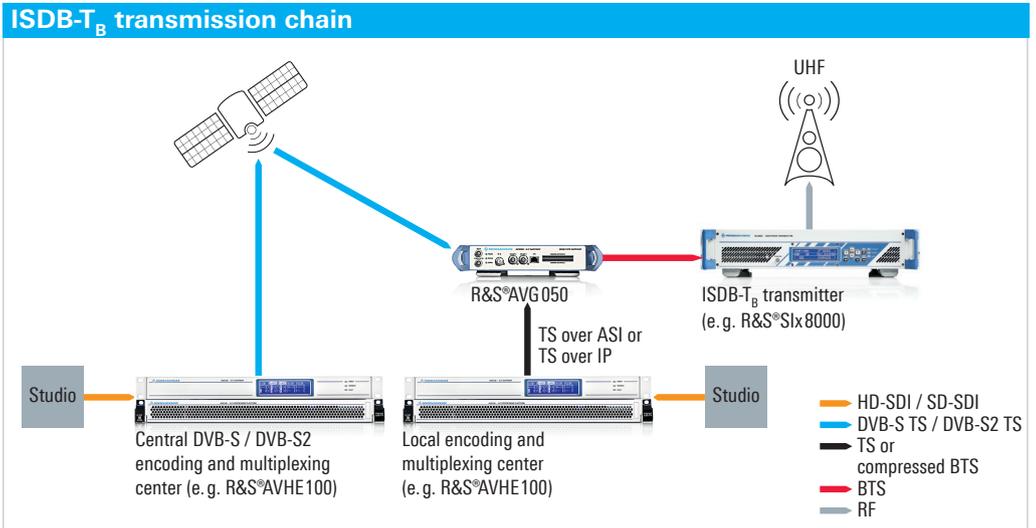


Fig. 2: The central encoding and multiplexing center transmits the transport streams via satellite to the different transmitter sites. The R&S®AVG050 uses the satellite-fed and local programs to generate a new BTS for the transmitter.

### Summary

The R&S®AVG050 ISDB-T BTS gateway expands the product range for the Latin American market. In addition to transmitters and T&M solutions for ISDB-T<sub>B</sub>, the portfolio now includes the appropriate BTS gateway with integrated satellite receiver. The gateway is very compact, yet offers

comprehensive functions. Since it is only half the width of a 19" rack, two gateways can be placed next to each other in one height unit. In addition to space savings, it also offers the advantage of low power consumption.

Claudia Görig; Denis Hagemeyer

### Typical topology of ISDB-T<sub>B</sub> transmitter networks

The ISDB-T<sub>B</sub> transmission standard for digital broadcasting is a modification of the Japanese ISDB-T standard. It mainly differs from ISDB-T by using H.264/MPEG-4 AVC instead of MPEG-2 for video coding and MPEG-4 AAC instead of MPEG-2 AAC for audio coding. It is also used to transmit data services.

In ISDB-T<sub>B</sub> networks, national programs are usually transmitted to the transmitter site via satellite (DVB-S / DVB-S2). The distances are often so large that the transmission of data streams via optical fiber or microwave links is too costly, and some countries do not have the necessary infrastructure.

Since satellite-fed signals can be received nationwide using common set-top boxes, the programs are transmitted in encrypted form and only available to pay TV end users in the respective transmitter region. These satellite streams have to be decrypted at the transmitter site and subsequently remultiplexed to a new BTS. It is possible to add regional programs during this process. CAMs inserted in the satellite receiver's CI slots are usually used for the decryption. After decryption, the newly generated BTS is fed to the transmitter.

Unlike DVB-S / DVB-S2 transport streams, the newly generated BTS has a fixed data rate of 32.508 Mbit/s and a defined frame structure for transmitting up to three layers (A, B, C) with different modulation and error protection. Depending on the selected transmission parameters, the BTS contains 30 % to 50 % null packets as placeholders. In addition to SD and HD programs for stationary reception, the BTS can contain 1seg programs for mobile reception at low data rates. It is common practice in Latin America to transmit three programs per ISDB-T<sub>B</sub> frequency: one HD program, 1seg program with the same content and an additional SD program.