

# Antennas and mains supply are all the R&S®MLx low-power TV transmitter needs

TV transmitter networks are supposed to provide gap-free coverage, even in areas such as valleys or shadow zones between high-rise buildings. Gaps in coverage are usually filled by a large number of low-power transmitters, requiring a rather complex infrastructure and an investment that is difficult to calculate. The new R&S®MLx low-power transmitter avoids these potential cost traps because it can make do with only minimal infrastructure.

## Complex transmitter infrastructures drive hidden costs up

Terrestrial broadcasting networks are normally set up for large area coverage with a combination of high-power and medium-power transmitters (> 600 W). The network operators then use low-power transmitters (< 10 W) to close coverage gaps, for instance in valleys, urban canyons or tunnels. A suitable infrastructure for operating low-power transmitters

includes protective housing (a building or an outdoor cabinet), cooling system, power supply, transport stream feed, network infrastructure for monitoring, GPS signals, as well as transmit antennas and, if necessary, receive antennas (Fig. 1). These infrastructure requirements should not be underestimated, for complete coverage usually calls for a large number of transmitter sites and a level of investment that is hard to calculate.

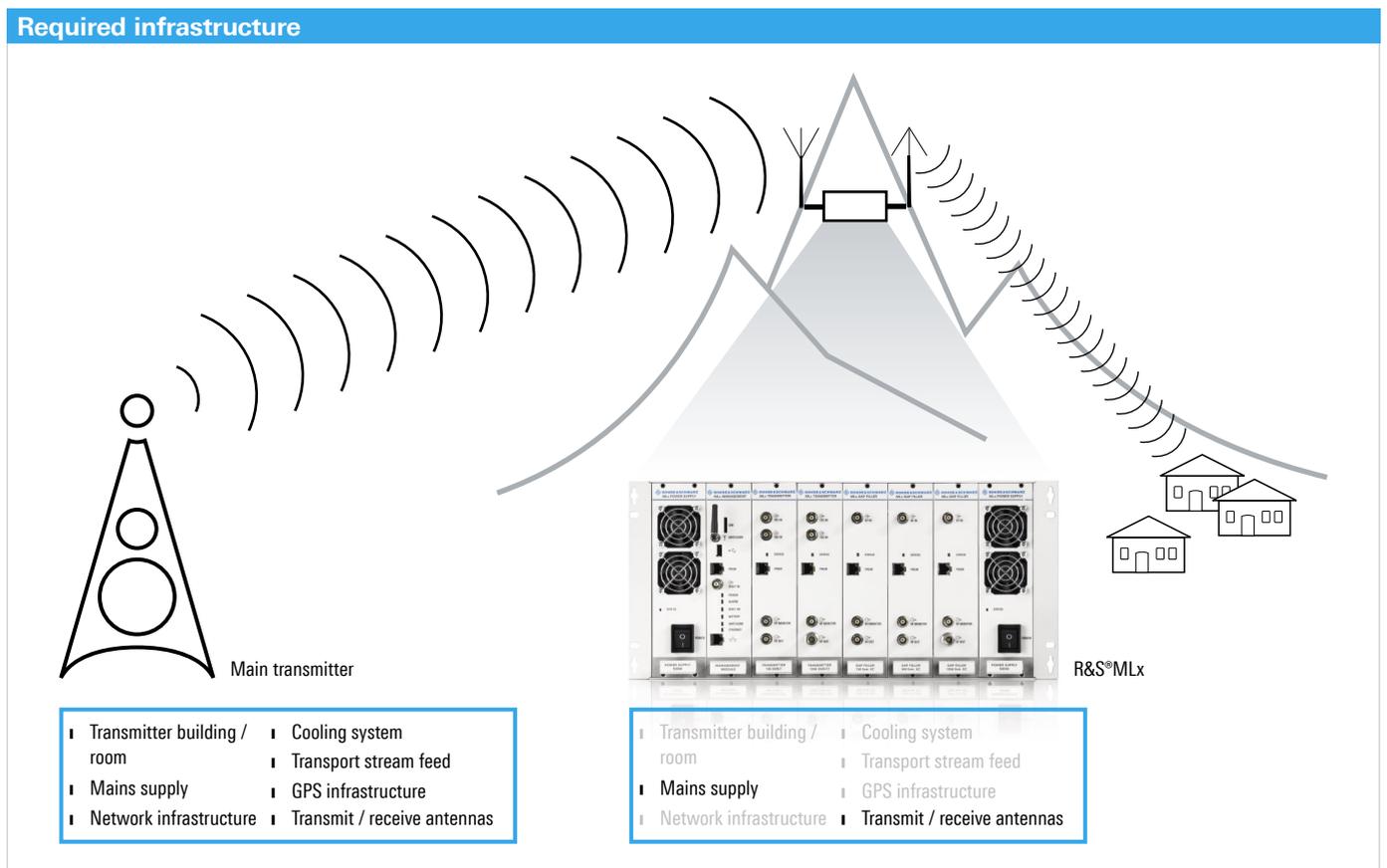


Fig. 1 The required budget for filling gaps in TV network coverage is kept within reasonable limits by using low-power transmitters that make minimal demands on infrastructure.

## R&S®MLx: robust low-power transmitter with minimal requirements

The new R&S®MLx multichannel low-power transmitter (Fig. 2) was developed with special focus on modest infrastructure requirements. Its modular system design combines versatility with failsafe performance and a small footprint. The compact 5 HU, 19" subrack has a depth of only 250 mm, allowing parallel operation of any combination of up to six transmitters, gap fillers or retransmitters for DVB-T, DVB-H and DVB-T2 with output power of 1 W, 5 W and 10 W.

The compact design and easily accessible interfaces mean the R&S®MLx can be installed in a minimum of space, e.g. in outdoor cabinets where the rear panel is inaccessible. Neither a transmitter room nor a building is necessary. The system dissipates very little heat, and a combined fan and convection cooling allows operation in many regions without an air conditioning system. The integrated satellite receiver enables wireless transport stream feeding, and the built-in UMTS/3G modem makes a wired infrastructure for transmitter monitoring unnecessary (Fig. 3). The system also features a GPS receiver and advanced echo cancellation for up to +24 dB echo gain. The only on-site essentials are transmit and receive antennas and mains supply.

A key feature of the new transmitter is its high availability. The redundancy concept ensures fine-tuned backup of 1+1 to 6+1 systems. A redundant power supply unit can also be integrated to enhance availability.

## Flexibility in choosing a site

Competitor products in the 10 W power class often require a lot of space because they have a mounting depth of 450 mm or more as well as interfaces on the front and rear panels. The actual footprint of such transmitters significantly exceeds their mounting depth since the interfaces have to be accessible for maintenance work. If a product that has these disadvantages also necessitates a wired infrastructure, the number of suitable installation sites decreases significantly.

With the R&S®MLx, there is no need to make compromises of this type. Thanks to its compact design and high degree of independence from air conditioning and wired infrastructures, the R&S®MLx can be installed in outdoor cabinets, allowing virtually unlimited positioning of the transmitter system.

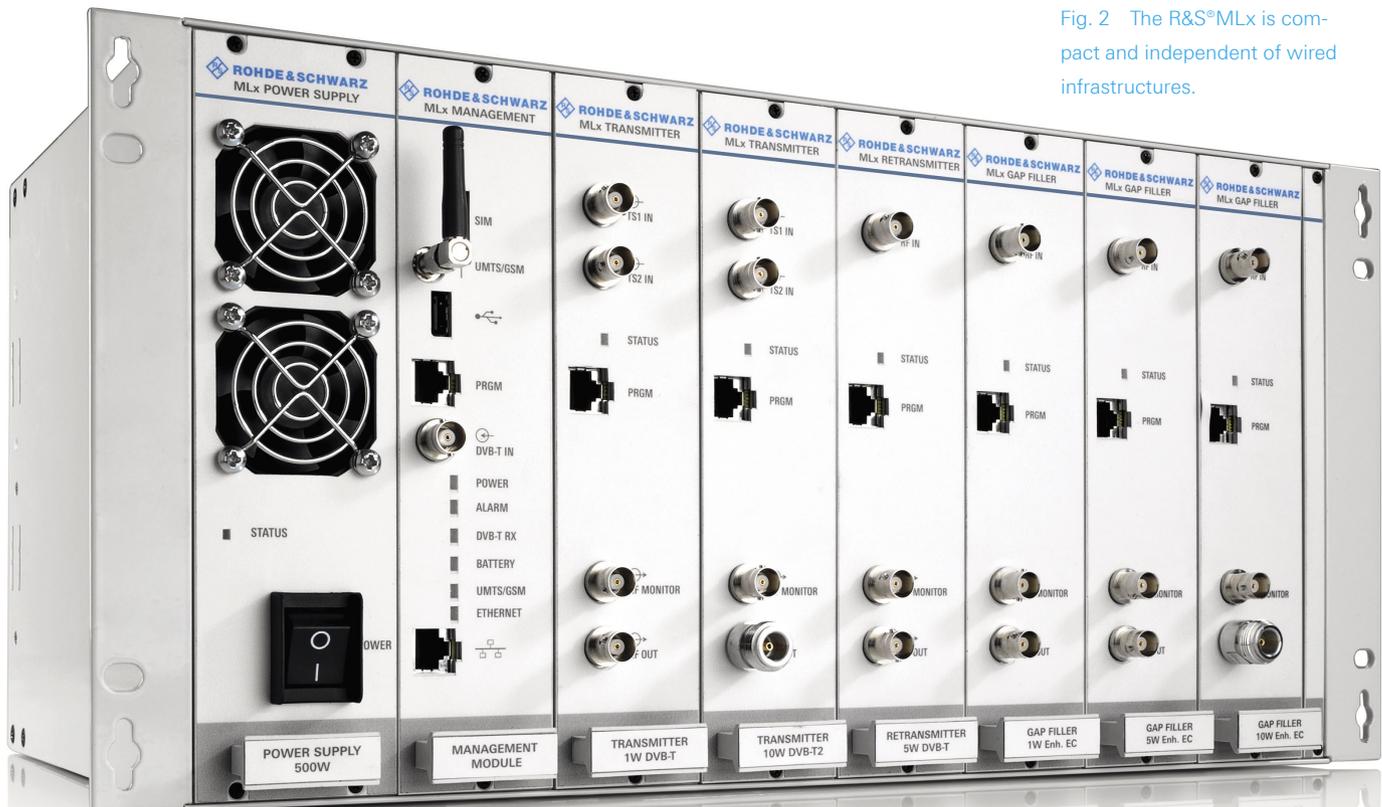


Fig. 2 The R&S®MLx is compact and independent of wired infrastructures.

The screenshot displays the 'R&S MLx Management' web interface. On the left is a navigation menu with options: Start, System, Summary >, Configuration >, and Alarms >. The main content area is titled 'R&S®MLx System Status' and features a 'System Information' table, a 'Quantity of modules: 9' section, and a detailed 'Modules' table. A 'Refresh...' button is located at the bottom left of the interface.

System Information	
Name	Demo System 01 <i>i</i> <i>g</i>
Version	02.E02.2
Date	2012-08-10 13:06:27
Temperature	40.0 °C
Battery	OK <i>✓</i>
DVB-T Receiver	4 Channels <i>i</i> <i>g</i>
Modem	3G <i>█</i> <i>█</i> <i>█</i> <i>█</i> Data: Ok VPN: Ok

**Quantity of modules: 9**

Modules	Alarms	Status	Configure
1-GPS Splitter 10MHz/1PPS	<i>✗</i>	<i>i</i>	<i>g</i>
2-GPS Splitter 10MHz/1PPS	<i>✓</i>	<i>i</i>	<i>g</i>
5-Gap Filler Enhanced EC 1W	<i>✓</i>	<i>i</i>	<i>g</i>
6-Gap Filler Enhanced EC 5W	<i>✓</i>	<i>i</i>	<i>g</i>
7-Gap Filler Enhanced EC 10W	<i>✓</i>	<i>i</i>	<i>g</i>
9-Retransmitter 5W DVB-T	<i>✓</i>	<i>i</i>	<i>g</i>
10-Transmitter 5W DVB-T2	<i>✓</i>	<i>i</i>	<i>g</i>
11-Transmitter 1W DVB-T	<i>✓</i>	<i>i</i>	<i>g</i>
20-N+1 Switch Transmitter	<i>✓</i>	<i>i</i>	<i>g</i>

Fig. 3 The R&S®MLx can be easily controlled remotely via a web browser user interface.

### Summary: a multi-application transmitter

Compact and modular, the R&S®MLx is perfect for a broad range of application scenarios in transmitter sites or outdoor cabinets, in urban environments and remote regions. The R&S®MLx is excellent for areas with urban canyons and their many shadow zones, where signal propagation conditions are complex and space is limited. A site for the transmitter can be selected with a high degree of freedom, since a wired infrastructure is not needed and unmatched echo cancellation is integrated in the system.

In remote areas, even a basic infrastructure can be absent – e.g. on a small island, where there is frequently no main transmitter, no wired signal feed and no means of monitoring. In such a scenario, the integrated satellite receiver, UMTS/3G modem and transmitter modules of the R&S®MLx provide a superior solution, which can be up and running quickly and does not require extensive additional investment.

Unlike competitor broadcast transmitters in the same power class, the R&S®MLx is optimized for minimum infrastructure requirements. It is highly flexible when it comes to site selection and can be used universally in a wide range of application scenarios.

Maurice Uhlmann

### R&S®MLx modules

- ▮ Power supply unit
- ▮ Redundant power supply unit (optional)
- ▮ Management module
- ▮ GPRS/UMTS/3G modem (optional)
- ▮ Channel modules with 1 W, 5 W or 10 W output power (up to six for each system)
- ▮ Transmitter modules for DVB-T or DVB-T2
- ▮ Retransmitter modules for DVB-T
- ▮ Gap filler modules for DVB-T / DVB-T2 / ISDB-T
- ▮ GPS receiver module
- ▮ Redundant GPS receiver module (optional)
- ▮ Satellite receiver module
- ▮ N+1 switching unit for transmitter and gap filler modules