R&S® OSP Open Switch and Control Unit

Modular platform for RF switch and control tasks

The new R&S® OSP modular platform makes RF switch and control tasks fast and easy. The expandable base unit and optional modules open up a wide range of applications, from simple RF switch functions to the RF wiring of complex EMC systems.

Versatile addition to product portfolio

The new, favorably priced R&S® OSP switch and control platform for switching signal paths between the DUT and the test equipment allows automated and thus cost-efficient measurements. This is especially advantageous in the case of complex test sequences in R&D, conformance and performance testing as well as automated production. The compact test sets made possible by the platform contain few additional external components and cables and are the prerequisite for reliable and reproducible measurements.

Compact and modular

The instruments of the R&S® OSP platform are accommodated in a 19" cabinet of only two height units. The R&S® OSP 120 base unit (FIG 1) with its internal CPU control provides, together with the instrument software, convenient and intuitive operation via the Ethernet interface. A manually operable model featuring a display and control pad is in the pipeline.

The CAN-bus-controlled R&S® OSP 150 extension unit is the perfect addition for complex switching tasks, remote switching and later expansions (FIG 2).

Versatile modules for a wide range of tasks

Module slots on the rear panel of the R&S® OSP (FIGs 3 and 4) allow the instrument to be configured for the application at hand by means of different RF changeover relays and input/output modules. For example:

- Modules with six coaxial changeover relays (SPDT) or two coaxial multi-position relays (SP6T) for the frequency range from DC to 18 GHz
- The universal digital I/O module with 16 inputs and 16 outputs (open drain) for querying external states and controlling other external devices and relays

Additional modules featuring coaxial relays from DC to 40 GHz, solid-state relays as well as relay driver modules for RF power relays and multiplexer modules are in the pipeline.

Easy system integration via Ethernet interface

The Ethernet interface of the R&S® OSP 120 allows the instrument to be quickly connected to a measuring instrument, a laptop or a control computer of a test system or integrated into the Ethernet networks of test systems or companies. The remote-control capability of the R&S® OSP and the versatile RF modules make the platform ideal especially for recurring RF switch and control tasks, from simple RF switch functions to the RF wiring of complex systems such as EMC systems (see application examples on page 30).
Remote control via a LAN

The R&S® OSP 120 is remote-controlled via a supplied operating program or from application programs. For control via an external application program, a VXI-11-compatible software interface and a VISA library based on it are available. It is thus possible to directly control the R&S® OSP from the C, LabWindows/CVI, VXI P&P and IVI programming languages by using the SCPI command set. For users of LabView (National Instruments), there is also a virtual instrument available for easy integration.

User-friendly operating program

The program for setting the switch and control platform features intuitive operation. Its plug-and-play functionality supports the user by automatically detecting the current configuration and the connected extension units. The current configuration is visible in the left-hand window of the R&S® OSP operating program (FIG 5). The individual switch states of the modules are graphically displayed and can be switched by a simple click of the mouse on the icon.

In addition, each relay and each digital input / output can be activated or deactivated for path control. The switch states defined in this way can be used to quickly switch over the switch states taken into account in the path. This procedure makes it possible to independently switch relay groups that are typical, for example, in EMC systems.
Cascadable for complex switching tasks

For complex switching tasks or later expansions, several R&S® OSP150 extension units can be connected to a base unit (FIG 6). The units are controlled via the CAN bus. This low-emission bus ensures that the circuits carry signals only during the control processes. Remote switching is thus possible even in EMC-critical areas.

Together with a converter from CAN bus to fiber-optic links (FOL), the R&S® OSP150 extension unit can be used for remote switching tasks in shielded chambers (FIG 7).

Application examples

Multiplexing between DUTs
RF testing of multiple printed panels requires, for example, multiplexing the RF signals to the individual DUTs. FIG 8 shows a schematic diagram of a test system for aligning and calibrating the transmit and receive sections of RF modules. The coaxial changeover relays of the R&S® OSP-B101 module are used to multiplex the antenna paths and to switch over between the signal generator and the spectrum analyzer (transmit and receive paths).

Signal-path switching in EMC test systems
In EMC test systems, e.g. for automatic testing of electromagnetic immunity, path switchover according to the measurement task and the frequency bands is necessary with each scan (FIG 9). In addition, to determine the net power, the monitor outputs (forward and reverse power) of the corresponding amplifiers must be switched. Automating such tasks by means of the R&S® OSP RF switch and control platform and suitable EMC software, e.g. R&S® EMC32, ensures cost-efficient, error-free and optimized measurements. Plus, the software can automatically generate the required test reports.

Summary

The R&S® OSP modular switch and control platform is suitable for a wide variety of RF switching tasks and is thus an all-purpose addition to the Rohde & Schwarz range of products.

Gert Heuer; Bernhard Rohowsky; Stefan Bauer

More information, flyers and data sheets at www.rohde-schwarz.com (search term: OSP)
FIG 6  Extending the R&S®OSP 120 base unit with the R&S®OSP 150.

FIG 7  Remote operation of the R&S®OSP 150.

FIG 8  RF test of multiple printed panels.

FIG 9  Configuration of an EMC test system.