R&S®OSP120 now even more versatile: easy setup of small RF test systems

The new R&S®OSP120 open switch and control platform offers two front module slots that facilitate cabling in the lab. Together with coaxial N relays in new modules, small RF systems can be very easily set up for test and measurement instruments with front-panel RF connectors. A new EMC module and modules with terminated semiconductor and N relays allow easy configuration of small EMS systems.

R&S®OSP120 now with front module slots
The new model of the R&S®OSP120 open switch and control platform (Fig. 1) opens up even more versatile configuration options. While the existing R&S®OSP120 and R&S®OSP130 base units and the R&S®OSP150 extension unit offer three slots on the rear for the different modules, the new model of the R&S®OSP120 additionally includes two slots on the front that can be optionally equipped with single- and double-width modules or RF feedthroughs. This is useful for small test and measurement systems in the lab, for example, when the connection lines of a matrix wired on the rear panel are to be routed forward to the device under test or the measuring instrument. Or when the R&S®OSP120 is used in racks, where the front-panel cabling can now be implemented with short RF lines.

Depending on the configuration, four to twelve SMA connectors, four N connectors or combinations thereof can be implemented (Fig. 3). When combining SMA and N connectors, the limitations with respect to the lower power rating of the SMA connectors have to be taken into account.

The RF feedthroughs between the front and rear panels of the R&S®OSP120 are implemented by combining module panels with N and SMA connectors and with the appropriate cable sets (Fig. 2).

As in the past, up to three modules or a combination of modules with a total of three control buses are supported. This makes it possible to combine an R&S®OSP-B125 triple-width module (two control buses) on the rear panel with another module on the front panel, for example.

Fig. 2  Configuration example: The R&S®OSP120 base unit with RF feedthrough with N connectors, consisting of two R&S®OSP-B012 module panels and one R&S®OSP-Z010 RF cable set.

The expansion continues: The new R&S®OSP120 model is now equipped with two additional front module slots in addition to new RF modules with N relays, new semiconductor relays and an EMS module.

The article starting on page 12 describes how to perform RSE measurements for the R&S®OSP130 base unit without bandstop filters by using the new R&S®OSP-B155 filter module.

Fig. 1  The new R&S®OSP120 base unit with two additional front module slots (here with an R&S®OSP-B131 RF switch module).
### Examples of RF feedthroughs

<table>
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<tr>
<th>Connector</th>
<th>Description</th>
<th>Modular Options</th>
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<tr>
<td>SMA to SMA</td>
<td>4 × SMA to 4 × SMA</td>
<td>2 × R&amp;S®OSP-B011, 1 × R&amp;S®OSP-Z012</td>
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<td>or (shown below)</td>
<td>12 × SMA to 12 × SMA</td>
<td>2 × R&amp;S®OSP-B011, 3 × R&amp;S®OSP-Z012</td>
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<tr>
<td>N to SMA</td>
<td>2 × 4 N to 8 × SMA</td>
<td>(1 × R&amp;S®OSP-B011, 2 × R&amp;S®OSP-B012, 2 × R&amp;S®OSP-Z011)</td>
</tr>
<tr>
<td>or (shown below)</td>
<td>4 × N to 4 × SMA</td>
<td>(1 × R&amp;S®OSP-B011, 1 × R&amp;S®OSP-B012, 1 × R&amp;S®OSP-Z011)</td>
</tr>
<tr>
<td>N to N</td>
<td>4 × N to 4 × N</td>
<td>(2 × R&amp;S®OSP-B011, 1 × R&amp;S®OSP-Z010)</td>
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**Fig. 3** Configuration examples of RF feedthroughs. Depending on the configuration, four to twelve SMA connectors, four N connectors or combinations thereof can be implemented (R&S®OSP-B011 and R&S®OSP-B012: module panels; R&S®OSP-Z010 / -Z011 / -Z012: RF cable sets).

### New modules with N relays

N connectors offer the advantage of higher electrical and mechanical power rating compared with modules with SMA connectors (Fig. 4). This is one of the reasons why N connectors are the prime choice especially when it comes to external RF connectors of measuring instruments. If possible, they are also used as output ports on power amplifiers. The new R&S®OSP-B131 and R&S®OSP-B132 options feature two and six N relays (SPDT).

### New modules with terminated relays

The R&S®OSP-B129 module extends the range of terminated coaxial relays. The module is equipped with a terminated eight-fold SP8T changeover relay and two non-terminated SPDT relays. In addition to the R&S®OSP-B107 solid-state relay (SSR) module, the portfolio now includes modules with terminated SSRs as SPDT changeover relays (R&S®OSP-B127) and SP6T multiposition relays (R&S®OSP-B128) (Fig. 5). Compared with coaxial mechanical RF relays, SSRs allow faster, wear-free changeover but generally have higher attenuation and lower power rating.

### EMS module for small EMC measurement systems

Besides the R&S®OSP-B104 relay driver module for driving external power relays in an electromagnetic susceptibility (EMS) system, the portfolio now also includes the R&S®OSP-B114 module for easy configuration of small EMS systems. It provides the following functions:
A transfer relay (DPDT) with N connectors for switching between two amplifiers and two transducers (antenna or coupling network)

An interlock circuit with an interlock loop, an output for an interlock display, a terminated SSR for separating the signal generator from the amplifier input (safety switch off if interlock loop is open) and digital inputs / outputs for further applications such as controlling antennas

Fig. 6 shows an example of system wiring for testing electromagnetic susceptibility. The combination of the amplifiers’ forward and reverse outputs with terminated SSRs of the R&S®OSP-B128 module eliminates the need for a second power sensor. Using the R&S®OSP open switch and control platform and its modules has a major advantage because a configuration can be progressively adapted and expanded into a complex system in order to meet increasing requirements. The EMS test system is controlled by the R&S®EMC32 EMC measurement software.

**Summary**
The additional front module slots of the R&S®OSP120 open switch and control platform and the new N relay modules are especially useful in lab applications where cabling has to be performed on the front of the instrument. By using special modules, e.g. the EMS module, in combination with general switch modules, an efficient setup of EMC test systems and future customer specific expansions is possible.

An overview of all available modules for the R&S®OSP open switch and control platform is included in the data sheet (www.rohde-schwarz.com, search term: OSP).

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