Huber+Suhner CLIK! Splitter Boxes 1x2 and 1x4

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Huber+Suhner CLICK!
Perfect solution to distribute the full satellite signal to a multitude of receivers

Even Simpler to Use Than Regular RF Splitters

Digital TV signal distribution is more and more often based on fiber optics. Among the most important advantages of such solutions are: extremely low signal losses in fiber optic cables and wide frequency bandwidth. The latter feature makes it possible to distribute the whole Ku-Band in one band without the need to select polarization or low/high sub-band. There are already LNBs with optical output available on the market, as well as complementary optic to RF converters (re-modulators) - see the many reports on this subject in previous TELE-satellite issues. Fiber optic cables have been in use for many years now. The last components you must use to build a fiber optic satellite TV signal distribution network are optical splitter. And this test report is just about them.

The function of an optical fiber splitter is analogous to a familiar RF splitter. Most of them direct part of the incoming signal to the "tap" output where the terminal device is connected and the other part to the "trunk" output to which the remaining part of the cable network is connected. There are also splitters that divide evenly the input into two, four or more outputs. Depending on the network structure and the splitter position in the network, we need splitters with different split ratios. Huber+Suhner have various models in their portfolio. For this report, we have received optical splitters with the following split ratios: a four output model (1x4) with 25%-25%-25%-25% ratio, and a number of two output models (1x2) with the following ratios: 50%-50%, 30%-70%, 20%-80% and 10%-90%.

Apart from the splitters, Huber+Suhner offered us a selection of their excellent fiber optic cables and connectors, so that we were able to build a small network using only their components. All components were perfectly finished off and the splitters were clearly labeled. You will not have any doubt how to hook them up. In contrast to the RF stuff with F type connectors, you do not have to hurt your fingertips when connecting everything together in fiber optic installations. Just a delicate push, you hear a click and a fiber optic cable is connected to a splitter. Now you may guess why Huber+Suhner branded their new system CLIK!

TELE-satellite readers more familiar with insertion losses expressed in decibels rather than the signal power percentage description of the splitter outputs may at first feel slightly uncomfortable. But take it easy. One corresponds precisely to the other. We can easily convert original percentage values to familiar "tap loss" and trunk "loss figures" in decibels - see the table.

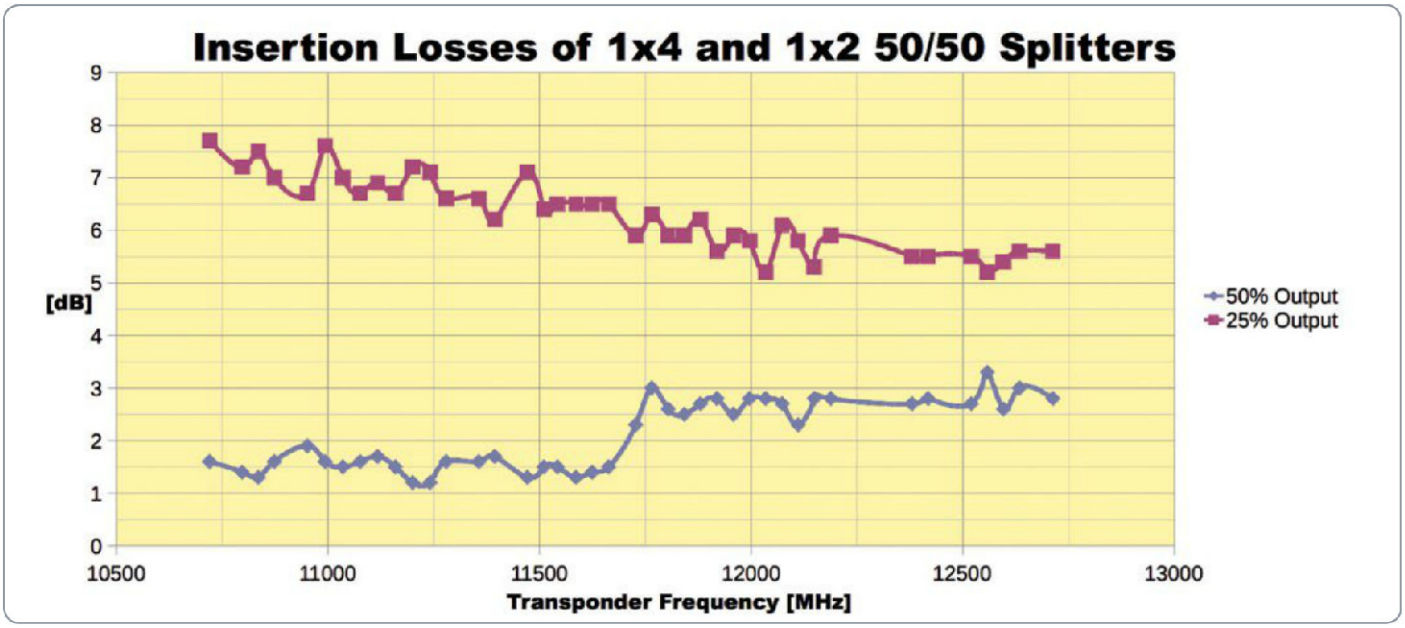
We spent some time wondering what to measure to make our test results as practical for our readers as possible. We decided to measure rather the RF signal that will be fed to the receiver IF input than optical signal before and after a fiber optic splitter. In this way, you have a good idea what you can expect from

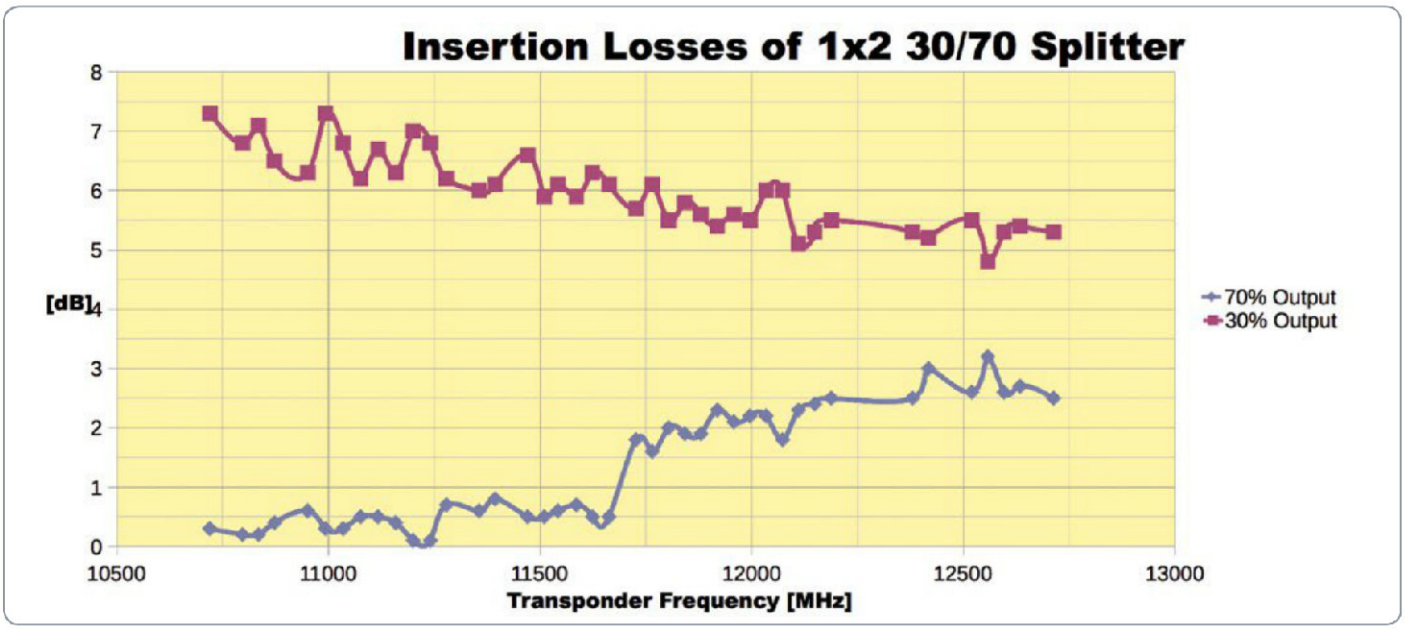
the whole system in which Huber+Suhner CLIK! Splitter Box is used. Our test system included: 90cm dish aimed at HOTBIRD satellite on 13° E, an optical LNB, optic fiber cable, optic splitter and optic-to-RF signal converter (re-modulator) that was delivering the IF signal suitable for a satellite receiver. The optical LNB generated light in the 1310 nm band. The light carrier was modulated with 0.95-5.45 GHz RF signal which was Ku-Band low and high sub bands of both polarizations stacked one over the other.

We tested 5 CLIK! Splitter Box models. The table below presents the insertion losses specified in manufacturer data.

You can see the results in the attached graphs. Please mind that on top of the optic splitter losses, there are losses caused by nonlinear transfer function of the optic-to-RF signal converter. Because of that, the losses for 10, 20 and 30% outputs may appear slightly higher than specified for certain frequencies. This is due to

Splitting ratio	%	2 x 50	30/70	20/80	10/90	4 x 25
Maximum Insertion loss	dB	3.8 each	6.3/2.1	8.4/1.4	12.0/0.8	7.7 each

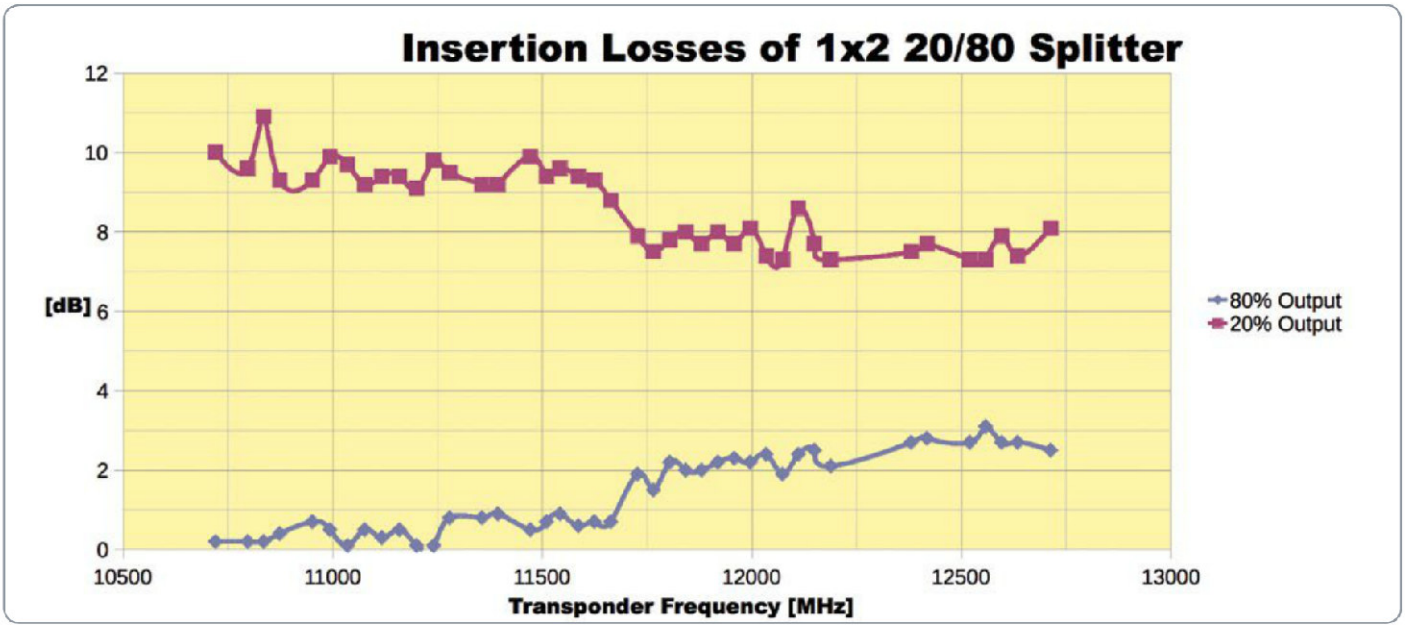


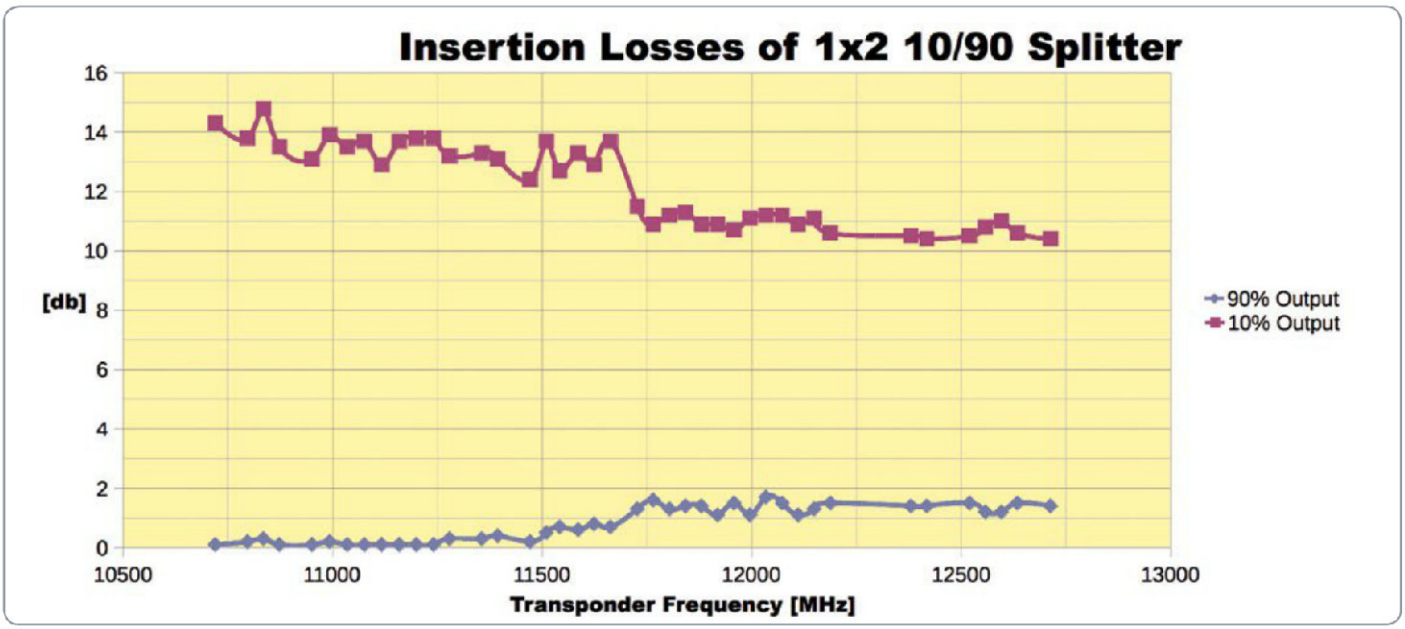


non ideal optic-to-RF conversion - not because of optic splitters imperfections.

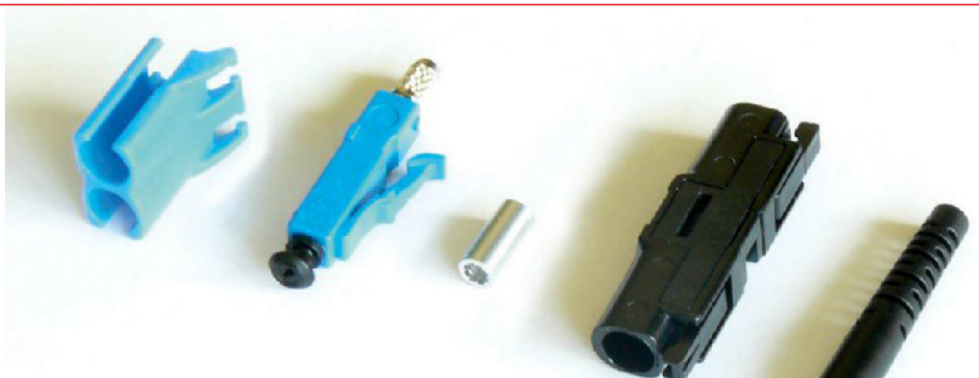
We also measured the noise performance and we are happy to inform you that in line with theory, optic fiber cable and optic splitters practically do not add any noise. No matter what output we tested: 90% or 10% MER or C/N readings were at maximum (MER was above 14 dB). This means that your receiver connected to such network would also show very high quality readings (close to 100%).

Using a proper combination of Huber+Suhner CLIK! Splitter Boxes, you can easily build a distribution network with even 36 optic outputs provided that your optic LNB generates about 7 dBm of output power what is a quite typical value. Such configuration consists of one 1x4 splitter which splits the LNB output to four optic fiber cables. On every fiber optic cable, eight 1x2 splitters are installed: four 10/90, two 20/80, one 30/70 and one 50/50. In such configuration, you get the output levels from -10.7 dBm through -13.2 dBm. This is quite a sufficient level for an optic-to-RF converter. Now, if your optic-to-RF converters are of quad types, you will be able to connect not 36 but 144 regular satellite receivers!

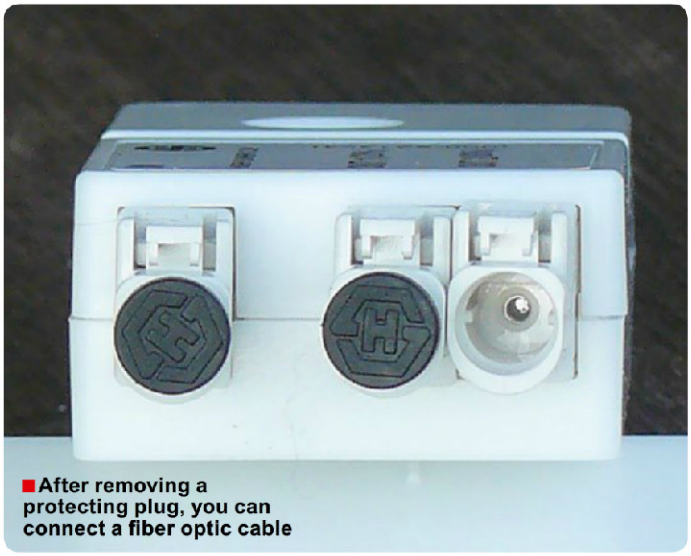




After taking our measurements, we can honestly confirm that this is not just theoretical possibility but something that can be realized in real world. Time has indeed come to focus and switch to the fiber optical world.



■ A small selection of many accesories available from Huber Suhner



■ After removing a protecting plug, you can connect a fiber optic cable

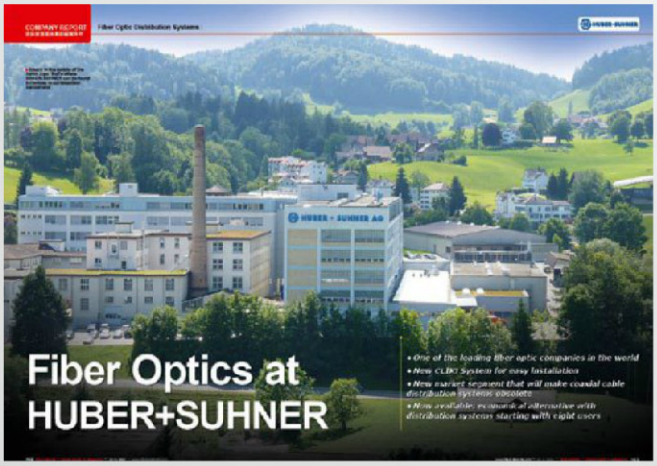
More on This Manufacturer

Read TELE-satellite's Company Report:

HUBER+SUHNER

TELE satellite Recommended

Fiber Optic Cables and Distribution, Switzerland www.hubersuhner.com



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TECHNICAL DATA

Manufacturer	HUBER+SUHNER AG, Fiber Optics Division Degersheimerstrasse 14, 9100 Herisau/Switzerland
Telephone	+41 71 353 4111
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Email	info@hubersuhner.com
Web	www.hubersuhner.com
Model	CLIK! Splitter Box
Description	Optic splitter
Operating wavelength	1310 nm and 1550 nm
Operating bandwidth	+/- 40 nm
Power handling	500 mW for 1x2 and 300 mW for 1x4 models
Operating temperature	– 40 to +85° C
Fiber type	Corning SMF-28e XB

Expert Opinion

Jacek Pawlowski
TELE-satellite
Test Center
Poland

+
- **Very good workmanship – everything fits perfectly**
- **Very easy installation**
- **Loss insertion agrees well with manufacturer specification**

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- **None**