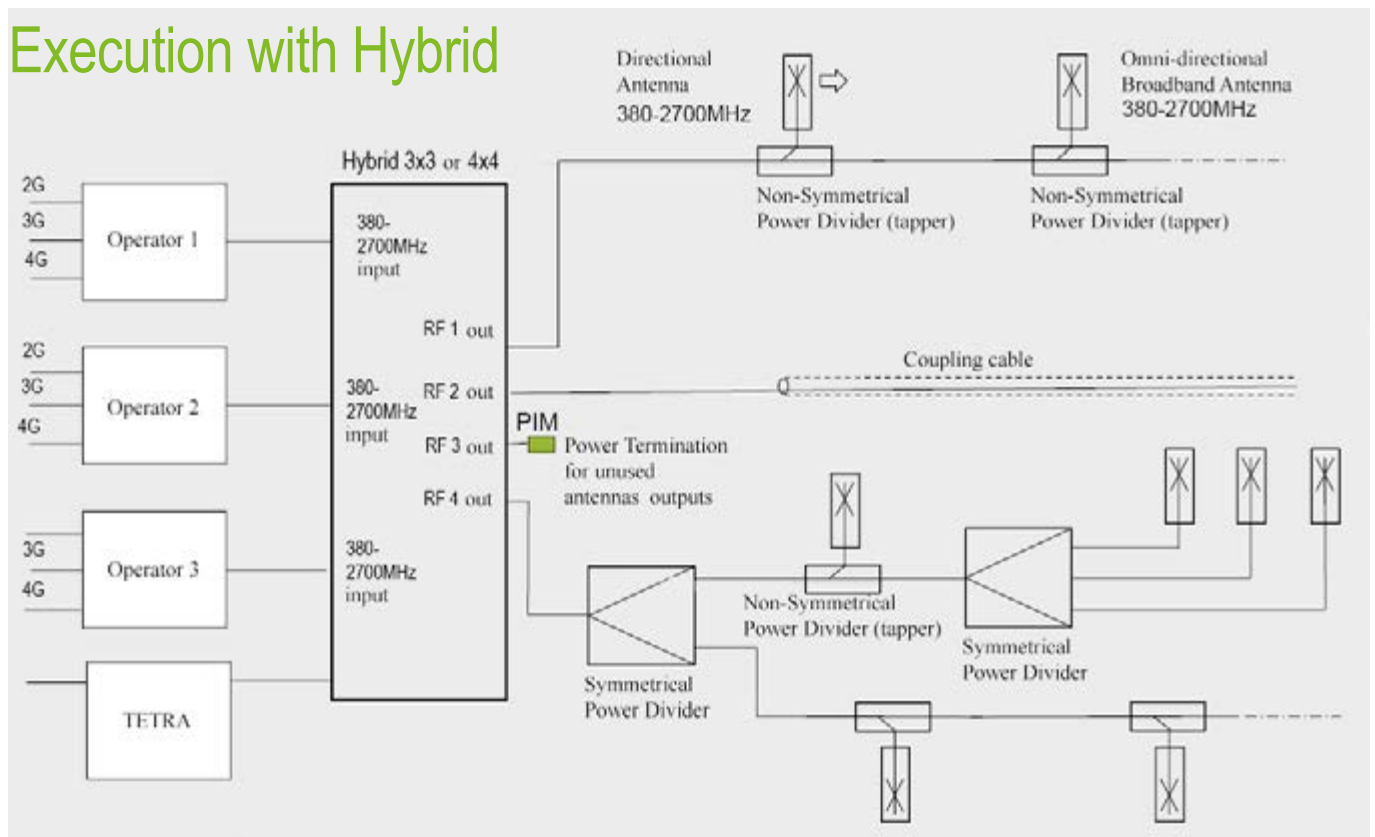


INDOOR COVERAGE ANTENNA NETWORK



System Description

Execution with Hybrid

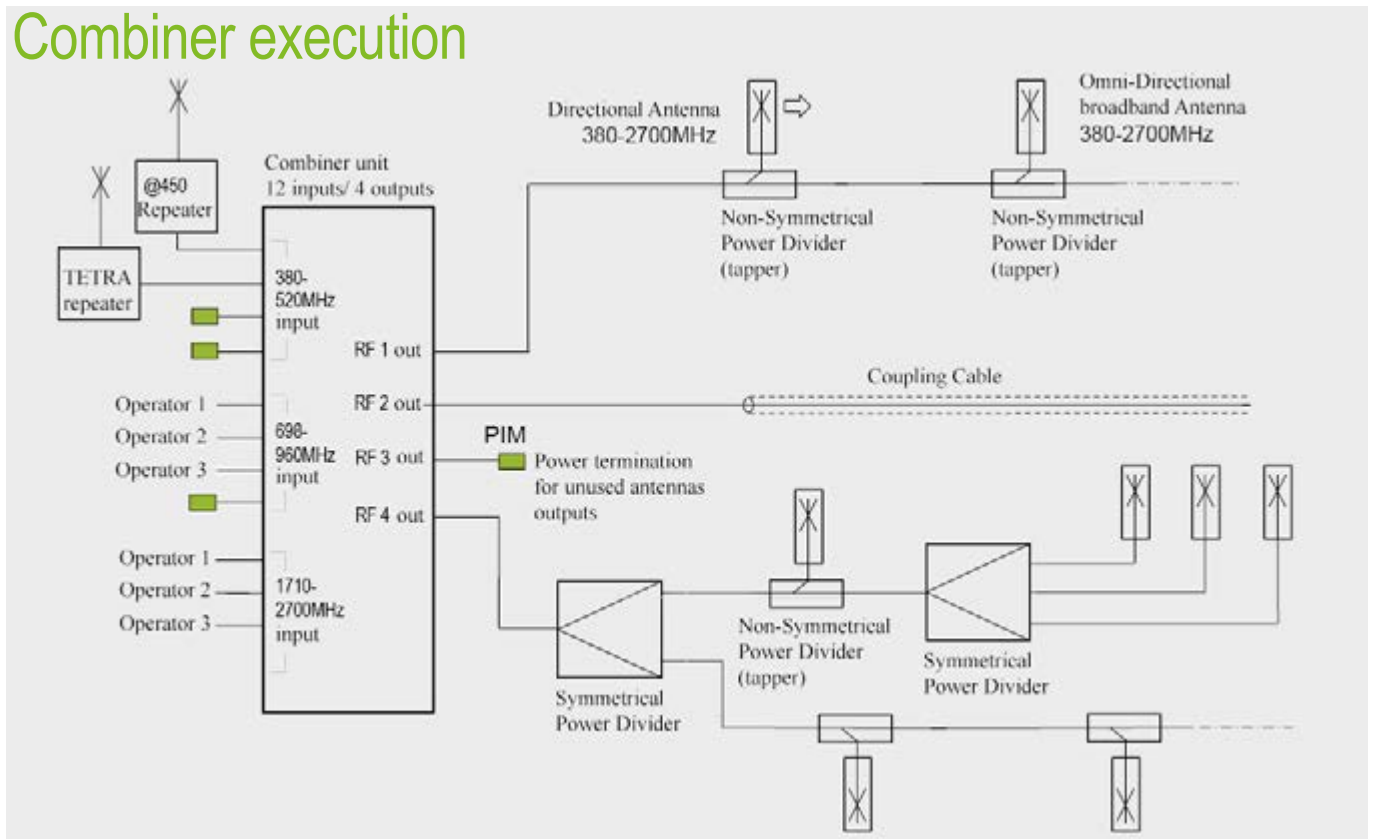


RF signal to the Indoor network is received from an active repeater or it is received from a base station. Signals of different operators, frequency ranges and services can be combined by the Combiner Box, which is assembled at the factory according to needs in the application or by connecting together set of RF components such as hybrids, diplexers, jumpers etc. Combined RF signals are transferred through distributed antenna network via corrugated feeder cables. Signal coverage can be achieved by antennas or coupling cables.

RF signal can be distributed by using of symmetrical power dividers (1:2, 1:3 or 1:4) or by non-symmetrical power dividers (tappers). The function of a divider is to distribute smaller part of the RF signal for example to the antenna, while major part of the power continues elsewhere in the distributed network.

Orbis' comprehensive product portfolio for installation of an indoor coverage antenna network consists of cables and connectors up to the power dividers and antennas. The antenna network enables for example reception of mobile signals in the underground facilities or in low-energy buildings.

Combiner execution



Connection Components

Combiner Box

Combiner Box function is to combine services from different operators and signals from different frequency ranges and to distribute them in the antenna network. Combiner unit typically has several antenna network outputs from which signal is possible to distribute for example to different floors.



Hybrids

Hybrid is combining input signals (typically 2-4 pcs) to all hybrids outputs (typically 2-4 pcs). Signals can be on different frequency ranges or on same frequency bands. Hybrids are usually used for combining different operators to the same antenna network.



Repeaters

Analog and digital RF repeaters are used to amplify the mobile signal.

Frequency band repeaters can be installed at the request of each operator separately. Power range between repeaters is 15-20, 27-33, 33-43 dBm. The range of Orbis repeaters includes models for both indoor as well as for outdoor use, such as apartments, offices and shopping centers.



Diplexers

Diplexer combines two different frequency band signals to one output. Respectively Triplexer combines three different frequency band signals, and Quadroplexer four different frequency band signals. Diplexer does not attenuate the signal very much, and it effectively separates different frequency bands from each other.



Power Dividers, symmetrical



Symmetrical Power Dividers distribute RF-antenna signal to two (1:2), to three (1:3) or to four (1:4) branches.

Power Dividers, Non-symmetrical



Non-symmetrical Power Dividers (tappers) distribute less power of the RF antenna signal e.g. to an antenna. Number such 4:1/6 dB indicates the power distribution in the 4:1, ie 6dB. The second number -1.0 / -7.0 indicates the pass-through attenuation of the signal (-1,0dB) and the branched signal attenuation (-7,0dB) compared to the incoming signal.

Terminations and attenuators



Terminations are used to match any unused RF interfaces to operating impedance (typically 50Ω). At the selection of a termination is important to take into consideration affecting RF power level, which may be high, because the interface can be affected by summed signals of several operators and frequencies. The power level can be adjusted with an attenuator to fit, for example, antennas requirements.

DC-blocks



DC blocks are used to separate the DC potential of e.g. different parts of the antenna network, which enables the RF signal to pass through the block mostly un-attenuated. There are two different types of blocks: a DC block, in which only the inner conductor is separated and the DC / DC block in which the inner conductor and the outer housing are separated.

Indoor Coverage Antennas

Indoor coverage antennas are used in the antenna networks as alternative to coupling (leaky) cables. Which solution is better depends on a lot from the structure of the space, as for example coupling cable is used a lot in the long tunnels. Isotropic antennas are again better to use in large open spaces. Antennas are usually omni- or multi-directional or panel directional antennas. A MIMO antenna includes two antennas inside.



"Shark fin"- shape



SISO Panel Directional



MIMO Panel Directional



OMNI-Multi-Directional

Corrugated Cables



Since the antenna signal may flow long distances through the network it is required to keep attenuation at low level. This is the reason why corrugated cables are used as trunk cable in the network. Cables are usually with diameter of 1/2", 7/8" or 1 5/8". Because cables are most often installed indoors, due to fire safety the cable must be low-smoke and halogen free (LSZH) type.

Coupling (Leaky) cables



Corrugated cable can be used as coupling cable if there are openings on the cable shielding. The shielding of a coupling cable can be also made of twisted foil and make openings on it in regular intervals.

Jumper cables



Thinner and more flexible short jumper cables are used for connecting antennas, power splitters and other components to thicker and stiffer corrugated cables. Connector alternatives are 7/16, 4.3-10 and N. The most common jumper models are immediately available from Orbis stock.

Connectors tools



CT-stripping tool

In the installation of corrugated cables special stripping tools are needed, which are available in different cable diameters.

Connectors & Adapters



Regular connector for outdoor coverage systems is 7/16 series. For indoor systems can be used N series connectors.

Newest replacement for 7/16 –smaller and with better performance 4.3-10 connectors and adapters are available as well.

Clamping accessories

Clamps for different kinds of mounting are available for feeder cables: to the wall, ceiling, roof, on cable trays or wires.



Plastic: recommended installation range 80-120 cm

Metal: recommended installation range 10-15 m for cables with plastic clamps, otherwise 80-120 cm

Spacer: Spacer is mounted between the clamp and the wall to obtain the coupling cable to operate in desired way

Fast clamps: Clamp is placed on the edge of a cable tray. Then the cable is pressed into the clamp i.e. the cable does not need to be threaded.

Read more

www.orbis.eu

Orbis Oy is a Finnish company which trades products of data transmission in Finland, Estonia, Latvia, Lithuania and Russia. Orbis holds decades of experience in radio frequency and fiber optic technologies.

The company provides solutions for fixed and wireless networks in apartment houses, public buildings, transportation, mobile networks, data centers and industry. Its imported product portfolio is complemented with Orbis' own product development and manufacturing operations such as high quality cable assemblies.

Complete Solution for indoor coverage

Orbis and its partners can offer the entire indoor coverage project:

- Coverage mapping and creating of the enhancement proposal / plan
- Network planning and preparation of the component list
- Delivery of components
(including multi-frequencies / multi-Operator networks)
- Installation
- Final testing
- Start-up
- Approvals and documentation



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