

ACS-005K

Antenna Control System, VHF/UHF, TX/RX coupler/switch, 30–430 MHz
Control Systems, Couplers and Diplexers



Application

The antenna coupler is intended for use with 9 transceivers plus 4 additional receivers together with three (4, or 5) antennas. The system has separate paths for VHF (L-VHF + VHF) and UHF. It is possible to transmit or receive on all channels at the same time. The transmit insertion loss depends on the number of active transmitters. Low noise amplifiers are used in the receive paths.

When used with five antennas simultaneous transmission and reception is possible. With only three antennas all reception in that band (VHF or UHF), will be disabled when one or more transmitters are active. It is possible to give priority to one transmitter on each band. L-VHF operation is independent from the other bands. For fail-safe operation one transmitter on each band is connected directly to the antenna in case of power failure. An external switch can be engaged to prevent a specific VHF transmitter from accidental transmission.

See reverse page for a closer functional description.



Electrical Specifications

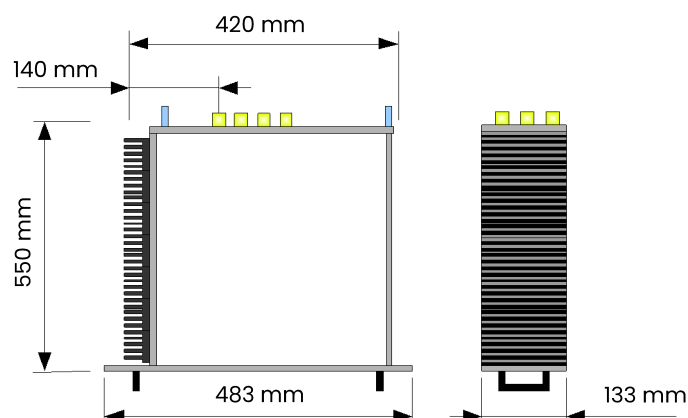
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| Frequency Range | 30–90 MHz, 1 TRX + 5 RX 118–174 MHz, 4 TRX + 2 RX 225–430 MHz, 4 TRX + 2 RX |
| Nominal Impedance | 50 ohm |
| TX Signal Path Power Rating Loss Phase Integrity Switching Speed TRX1 Blocking | 60 W, each transmitter < 2 dB (one transmitter), or < 8 dB < 10° (< 20 mm) < 100 µs, 20 ms for L-VHF > 70 dB |
| RX Signal Path Gain P –1dB, out IP3, out Noise Figure Isolation, out Max. inp. Power Isolation, TX/RX | 0..4 dB > 14 dBm > 30 dBm < 4 dB > 20 dB 30 dBm continuous >45 dB between UHF TX to VHF RX and v.v. |
| Power Supply | 18–32V @ <2A, galvanic isolation |
| Connectors RF Power Blocking Control | N female is standard, others on request Amphenol 62GB series, others on request BNC female |

Mechanical Specifications

| | |
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| Size | 3U, 19", 550 mm depth (ex. handles and connectors) |
| Temperature Range Operational Storage | – 25°C to + 55°C – 40°C to + 70°C |



Height: 3U =
0.133 m
(1U = 44.45 mm)



System Description

Common for VHF and UHF:

During reception, the transceivers (TRX1 ..) receive their signals from the LNA via the Automatic TR switches. The LNA may be connected to a separate RX antenna for duplex operation, or to a common TX/RX antenna via the SP6T PIN switch (simplex only). Two additional RX ports are available.

A transceiver in TX mode is detected by the Automatic TR switch that issue signals (PTT) to the Control Logic to enable a direct signal path to the antenna.

If more than one transceiver is in TX mode, the control logic will make the SP6T connect the antenna to the 4:1 combiner and issue signals to the Automatic TR switch to connect to the 4:1 combiner by using the Auxiliary TX output.

By nature this action will introduce a loss of 6 dB for each of the signals in the internal 50ohm terminations.

One of the transceivers may be configured for priority in TX mode. The TX signal is routed to the antenna, independent of the mode any other transceiver. These are instead connected to the 50 Ω dummy load through the 4:1 combiner and the SP6T.

The switches are implemented using PIN diode technology for fast switching speed and low insertion loss.

Relays on one input and the antenna port implements the fail-safe function.

When duplex operation is necessary and optional RX antenna can be fitted. The LNA is then configured the receive its signal from this instead of from the SP6T switch.

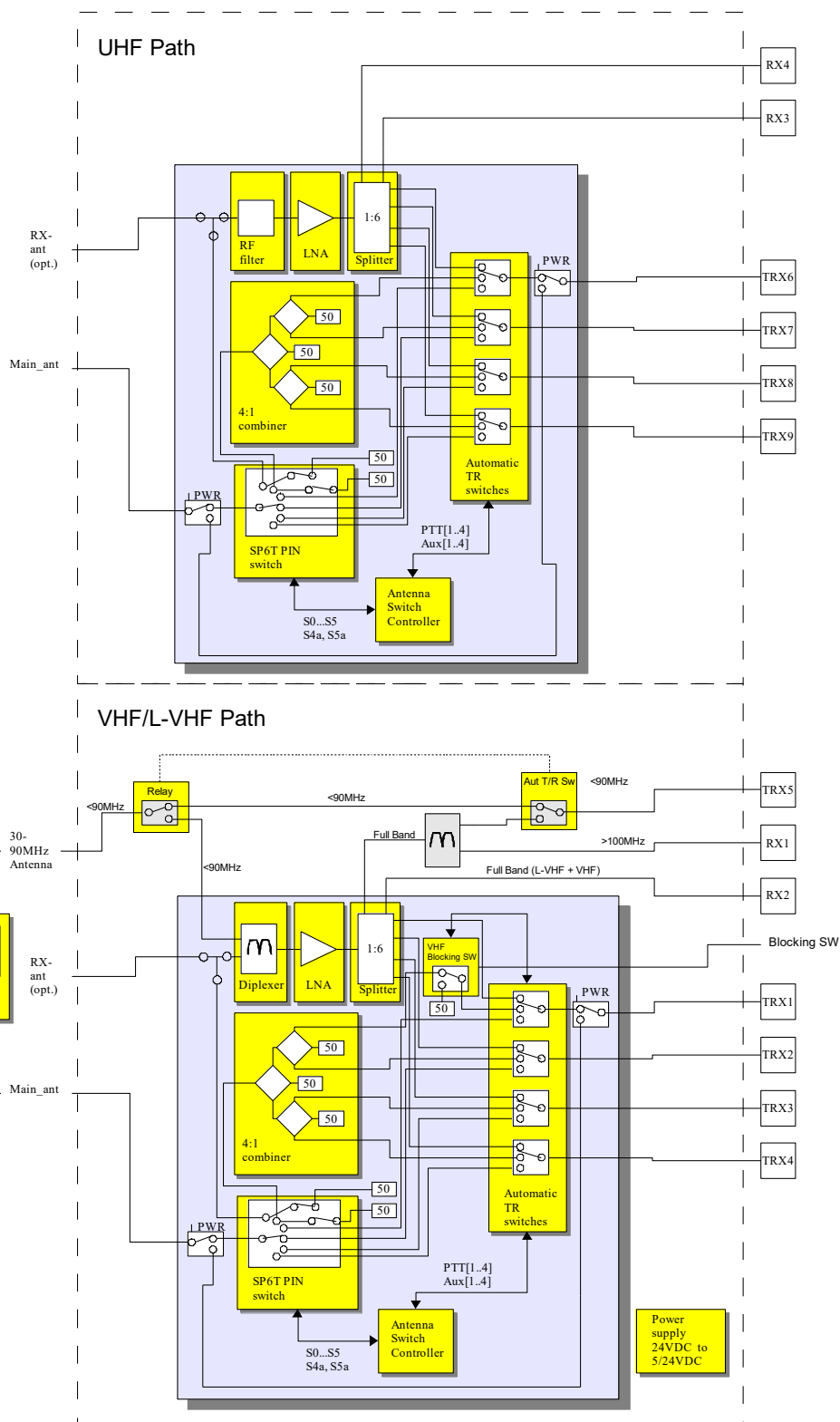
A power supply provides galvanic isolation.

VHF Path only:

The L-VHF TRX is switched directly to its antenna during transmission, but reception is through the LNA. This is necessary as L-VHF reception must be possible on different receivers.

One RX output is for > 100 MHz, while the L-VHF TRX can not receive signals > 100 MHz.

To prevent transmission when absolute radio silence is required, TRX1 can be forced to transmit into a dummy load. This can be used for the Maritime VHF TRX that may answer or transmit a DSC call without any operator influence.



September 2018

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