COMBINERS

Amphenol Private Networks

PRO-PHY85-4DI

4-Channel Hybrid Combiner

- The PRO-PHY series of hybrid combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All hybrid combiners are suitable for 19” rack mounting.
- Dual isolators fitted as standard.

DESCRIPTION

- A range of racks and cabinets are available.
- Option: Maximum input power of 35 W (PRO-PHY…4DI-35) or 100 W (PRO-PHY…4DI-100).
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE		PRODUCT NO.
PRO-PHY85-4DI-35	210001256	
PRO-PHY85-4DI-100	210000529	

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-PHY85-4DI-...
TX FREQUENCY	66 - 88 MHz
MAX. INPUT POWER	35/100 W
TX-TX SPACING, Δ TX	< 3 MHz
TYP. INSERTION LOSS	7.2 dB
TX-TX ISOLATION	> 90 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	N-female
DIMENSIONS (L x W x H)	483 x 133 x 400/500 mm
WEIGHT	Approx. 9.5/14.1 kg

PRO-PHY85-3SI

3-Channel Hybrid Combiner

- The PRO-PHY series of hybrid combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All hybrid combiners are suitable for 19” rack mounting.
- Single isolators fitted as standard.

Description

- A range of racks and cabinets are available.
- Option: Maximum input power of 35 W (PRO-PHY…3SI-35) or 100 W (PRO-PHY…3SI-100).
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-PHY85-3SI-35	210000561
PRO-PHY85-3SI-100	210001253

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-PHY85-3SI-...
TX FREQUENCY	66 - 88 MHz
MAX. INPUT POWER	35/100 W
TX-TX SPACING, Δ TX	< 3 MHz
TYP. INSERTION LOSS	5.5 dB
TX-TX ISOLATION	> 65 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	N-female
DIMENSIONS (L x W x H)	483 x 89 x 400/500 mm
WEIGHT	Approx. 6.3/9.8 kg

PRO-PHY900-2SI-35

2-Channel Hybrid Combiners

- The PRO-PHY series of hybrid combiners have been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All hybrid combiners are suitable for 19” rack mounting.
- Single isolators fitted as standard.

- A range of racks and cabinets are available (see Accessories).
- Option: Maximum input power of 35 W.
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-PHY900-2SI-35	210001187

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-PHY900-2SI-35
TX FREQUENCY	800 - 960 MHz
MAX. INPUT POWER	35 W
TX-TX SPACING, Δ TX	< 20 MHz
TYP. INSERTION LOSS	3.6 dB
TX-TX ISOLATION	> 60 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	N-female
DIMENSIONS (L x W x H)	483 x 89 x 300 mm
WEIGHT	4.6 kg

PRO-PHY85-4SI

4-Channel Hybrid Combiner

- The PRO-PHY series of hybrid combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All hybrid combiners are suitable for 19” rack mounting.
- Single isolators fitted as standard.

DESCRIPTION

- A range of racks and cabinets are available.
- Option: Maximum input power of 35 W (PRO-PHY...4SI-35) or 100 W (PRO-PHY...4SI-100).
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE		PRODUCT NO.
PRO-PHY85-4SI-35	210000866	
PRO-PHY85-4SI-100	210001255	

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-PHY85-4SI-...
TX FREQUENCY	66 - 88 MHz
MAX. INPUT POWER	35/100 W
TX-TX SPACING, Δ TX	< 3 MHz
TYP. INSERTION LOSS	6.6 dB
TX-TX ISOLATION	> 65 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	N-female
DIMENSIONS (L x W x H)	483 x 133 x 400/500 mm
WEIGHT	Approx. 7.4/11.9 kg

PRO-PHY85-3DI

3-Channel Hybrid Combiner

- The PRO-PHY series of hybrid combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All hybrid combiners are suitable for 19” rack mounting.
- Dual isolators fitted as standard.

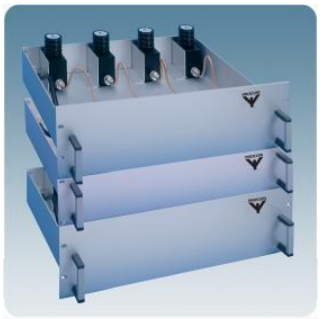
- A range of racks and cabinets are available.
- Option: Maximum input power of 35 W (PRO-PHY…3DI-35) or 100 W (PRO-PHY…3DI-100).
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-PHY85-3DI-35	210001254
PRO-PHY85-3DI-100	210000820

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-PHY85-3DI-...
TX FREQUENCY	66 - 88 MHz
MAX. INPUT POWER	35/100 W
TX-TX SPACING, Δ TX	< 3 MHz
TYP. INSERTION LOSS	6.1 dB
TX-TX ISOLATION	> 90 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	N-female
DIMENSIONS (L x W x H)	483 x 89 x 400/500 mm
WEIGHT	Approx. 7.9/11.4 kg



PRO-PHY85-8SI

8-Channel Hybrid Combiner

- The PRO-PHY series of hybrid combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All hybrid combiners are suitable for 19” rack mounting.
- Single isolators fitted as standard.

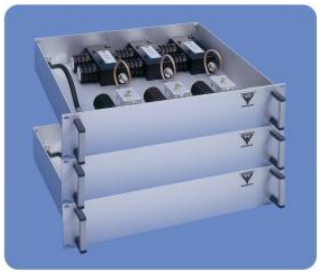
- A range of racks and cabinets are available.
- Option: Maximum input power of 35 W (PRO-PHY...-8SI-35) or 100 W (PRO-PHY...-8SI-100).
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-PHY85-8SI-35	210001134
PRO-PHY85-8SI-100	210001135

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-PHY85-8SI-...
TX FREQUENCY	66 - 88 MHz
MAX. INPUT POWER	35/100 W
TX-TX SPACING, Δ TX	< 3 MHz
TYP. INSERTION LOSS	11.1 dB
TX-TX ISOLATION	> 65 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	N-female
DIMENSIONS (W x H x D)	19" x 8 HU x 400 mm (483 x 356 x 400 mm)
WEIGHT	Approx. 30 kg



PRO-PHY85-6DI-100

6-Channel Hybrid Combiner for 100 W

- The PRO-PHY series of hybrid combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All hybrid combiners are suitable for 19” rack mounting.
- Dual isolators fitted as standard.

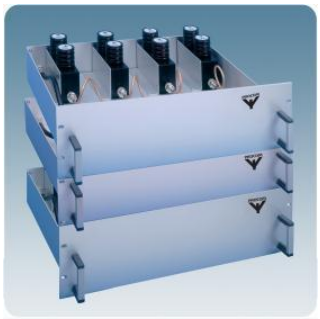
- Maximum input power of 100 W.
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-PHY85-6DI-100	210001265

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-PHY85-6DI-100
TX FREQUENCY	66 - 88 MHz
MAX. INPUT POWER	100 W
TX-TX SPACING, Δ TX	< 3 MHz
TYP. INSERTION LOSS	9.2 dB
TX-TX ISOLATION	> 90 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	N-female
DIMENSIONS (H x W x L) (H x W x L) Alternative	6HU x 483 x 500 mm (267 x 483 x 500 mm) 8HU x 483 x 400 mm (356 x 483 x 500 mm)
WEIGHT	Approx. 26 kg



PRO-PHY85-8DI

8-Channel Hybrid Combiner

- The PRO-PHY series of hybrid combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All hybrid combiners are suitable for 19” rack mounting.
- Dual isolators fitted as standard.

- A range of racks and cabinets are available.
- Option: Maximum input power of 35 W (PRO-PHY...-8DI-35) or 100 W (PRO-PHY...-8DI-100).
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-PHY85-8DI-35	210001136
PRO-PHY85-8DI-100	210001137

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-PHY85-8DI-...
TX FREQUENCY	66 - 88 MHz
MAX. INPUT POWER	35/100 W
TX-TX SPACING, Δ TX	< 3 MHz
TYP. INSERTION LOSS	11.5 dB
TX-TX ISOLATION	> 90 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	N-female
DIMENSIONS (W x H x D)	19" x 8 HU x 400 mm (483 x 356 x 400 mm)
WEIGHT	Approx. 35 kg

PRO-PHY85-3

3-Channel Hybrid Combiner for 85 MHz Transmitters

- Combining three transmitters or receivers on the same antenna.
- Better utilization of good antenna position.
- Three antennas on the same transmitter or receiver.

- The only combining option with very small TX-TX frequency spacing.
- 60 W load supplied (other loads or no load as option).

ORDERING DESIGNATIONS

TPYE	FREQ. RANGE	PRODUCT NO.
PRO-PHY85-3-1	67 - 71 MHz	210000785
PRO-PHY85-3-2	70 - 74 MHz	210000736
PRO-PHY85-3-3	73 - 77 MHz	210000549
PRO-PHY85-3-4	76 - 80 MHz	210000703
PRO-PHY85-3-5	79 - 83 MHz	210000737
PRO-PHY85-3-6	82 - 86 MHz	210000693
PRO-PHY85-3-7	85 - 89 MHz	210000694

SPECIFICATIONS

ELECTRICAL	
FILTER TYPE	Hybrid Junction
FREQUENCY	68 - 88 MHz (see table)
MAX. INPUT POWER	75 W per channel (max. 150 W with larger load)
INSERTION LOSS	< 5.2 dB ± 0.3 dB @ 2 MHz BW < 5.4 dB ± 0.3 dB @ 4 MHz BW
ISOLATION TX 1-TX 2 (*see note)	> 26 dB @ 2 MHz BW > 25 dB @ 4 MHz BW
IMPEDANCE	Nom. 50 Ω
LOAD (**see note)	30 W load fitted (other ratings available)
SWR	< 1.5 with all other ports terminated with 50 Ω
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	N-female (other types available)

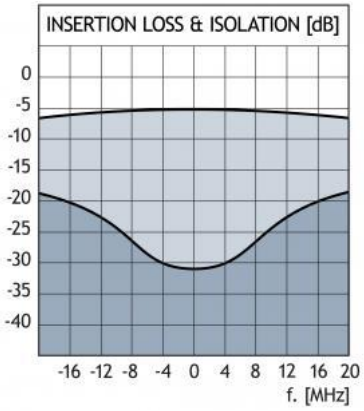
DIMENSIONS (L x W x H)	400 x 89(incl. conn.) x 42 mm (excl. loads)
WEIGHT	Approx. 1300 g (excl. load)

* The isolation between the TX ports is directly dependent on the terminating SWR on the antenna port. With an antenna load SWR = 1.5, the isolation between the two TX ports will be reduced to 20 dB @ 5 MHz bandwidth.

** The SWR of the load´s should be < 1.1! Each load should be able to dissipate 2/3 of the input power.

E.g.: With 50 W input, each load should be able to dissipate 50 W x 2/3 = 33 W.

RESPONSE CURVE



PRO-PHY85-2SI

2-Channel Hybrid Combiner

- The PRO-PHY series of hybrid combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All hybrid combiners are suitable for 19” rack mounting.
- Single isolators fitted as standard.

- A range of racks and cabinets are available.
- Option: Maximum input power of 35 W (PRO-PHY…2SI-35) or 100 W (PRO-PHY…2SI-100).
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-PHY85-2SI-35	210000924
PRO-PHY85-2SI-100	210001073

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-PHY85-2SI-...
TX FREQUENCY	66 - 88 MHz
MAX. INPUT POWER	35/100 W
TX-TX SPACING, Δ TX	< 3 MHz
TYP. INSERTION LOSS	3.6 dB
TX-TX ISOLATION	> 65 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	N-female
DIMENSIONS (L x W x H)	483 x 89 x 400 mm
WEIGHT	Approx. 4.7/5.8 kg

PRO-PHY85-2DI

2-Channel Hybrid Combiner

- The PRO-PHY series of hybrid combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All hybrid combiners are suitable for 19” rack mounting.
- Dual isolators fitted as standard.

- A range of racks and cabinets are available.
- Option: Maximum input power of 35 W (PRO-PHY…2DI-35) or 100 W (PRO-PHY…2DI-100).
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-PHY85-2DI-35	210000844
PRO-PHY85-2DI-100	210000519

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-PHY85-2DI-...
TX FREQUENCY	66 - 88 MHz
MAX. INPUT POWER	35/100 W
TX-TX SPACING, Δ TX	< 3 MHz
TYP. INSERTION LOSS	4.2 dB
TX-TX ISOLATION	> 90 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	N-female
DIMENSIONS (L x W x H)	483 x 89 x 400 mm
WEIGHT	Approx. 5.8/6.9 kg

PRO-PHY85-2

2-Channel Hybrid Ring Combiner for 85 MHz Transmitters

- Combining two transmitters or receivers on the same antenna.
- Better utilization of good antenna position.
- Two antennas on the same transmitter or receiver.

- Combining two signal generators.
- The only combining option with very small TX-TX frequency spacing.
- 60 W load supplied (other loads or no load as option).

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.	FREQUENCY
PRO-PHY85-2-1	210000539	68 - 72 MHz
PRO-PHY85-2-2	210000653	71 - 75 MHz
PRO-PHY85-2-3	210000550	74 - 78 MHz
PRO-PHY85-2-4	210000589	77 - 81 MHz
PRO-PHY85-2-5	210000588	80 - 84 MHz
PRO-PHY85-2-6	210000541	83 - 87 MHz

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-PHY85-2-...
FILTER TYPE	Hybrid Ring Junction
FREQUENCY	66 - 88 MHz (see table)
MAX. INPUT POWER	50 W per channel (max. 150 W with larger load)
INSERTION LOSS	< 3.4 dB @ 2 MHz BW < 3.7 dB @ 4 MHz BW
ISOLATION TX 1-TX 2 (*see note)	> 35 dB @ 2 MHz BW > 30 dB @ 4 MHz BW
IMPEDANCE	Nom. 50 Ω
LOAD (**see note)	60 W load fitted (other ratings available)
SWR	< 1.5 with all other ports terminated with 50
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	N-female (other types as option)
DIMENSIONS (L x W x H)	216 x 89 (incl. conn.) x 42 mm (excl. load)

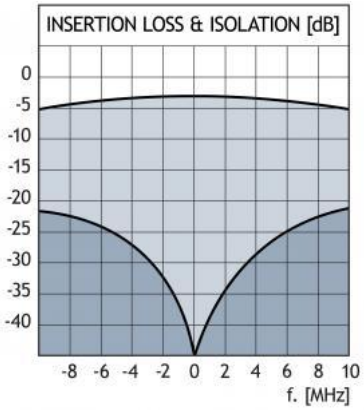
WEIGHT	Approx. 700 g (excl. load)

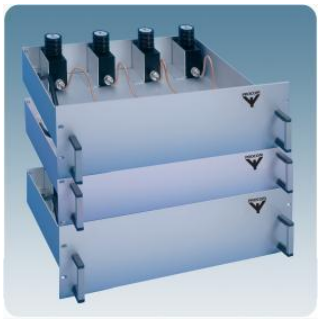
*The isolation between the TX ports is directly dependent on the terminating SWR on the antenna port. With an antenna load SWR = 1.5, the isolation between the two TX ports will be reduced to 20 dB @ 5 MHz bandwidth.

**The SWR of the load's should be < 1.1! The load should be able to dissipate 1/2 of the total input power.

E.g.: With 50 W input in total for the two channels, the load should be able to dissipate 50 W x 1/2 = 25 W.

LOSS & ISOLATION





PRO-PHY450-8SI

8-Channel Hybrid Combiner

- The PRO-PHY series of hybrid combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All hybrid combiners are suitable for 19” rack mounting.
- Single isolators fitted as standard.

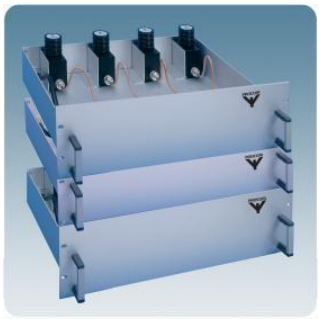
- A range of racks and cabinets are available.
- Option: Maximum input power of 35 W (PRO-PHY...-8SI-35) or 100 W (PRO-PHY...-8SI-100).
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-PHY450-8SI-35	210001213
PRO-PHY450-8SI-100	210001214

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-PHY450-8SI-...
TX FREQUENCY	380 - 470 MHz
MAX. INPUT POWER	35/100 W
TX-TX SPACING, Δ TX	< 11 MHz
TYP. INSERTION LOSS	11.1 dB
TX-TX ISOLATION	> 65 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	N-female
DIMENSIONS (W x H x D)	19" x 8 HU x 400 mm (483 x 356 x 400 mm)
WEIGHT	Approx. 30 kg



PRO-PHY450-8DI

8-Channel Hybrid Combiner

- The PRO-PHY series of hybrid combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All hybrid combiners are suitable for 19” rack mounting.
- Dual isolators fitted as standard.

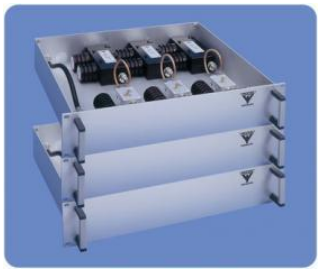
- A range of racks and cabinets are available.
- Option: Maximum input power of 35 W (PRO-PHY…-8DI-35) or 100 W (PRO-PHY…-8DI-100).
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-PHY450-8DI-35	210000898
PRO-PHY450-8DI-100	210000899

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-PHY450-8DI-…
TX FREQUENCY	380 - 470 MHz
MAX. INPUT POWER	35/100 W
TX-TX SPACING, Δ TX	< 11 MHz
TYP. INSERTION LOSS	11.6 dB
TX-TX ISOLATION	> 95 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
CONNECTORS	N-female
DIMENSIONS (W x H x D)	19" x 8 HU x 400 mm (483 x 356 x 400 mm)
WEIGHT	Approx. 33 kg
ENVIRONMENTAL	
TEMP. RANGE	–30° C → +60° C



PRO-PHY450-6DI-100

6-Channel Hybrid Combiner for 100 W

- The PRO-PHY series of hybrid combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All hybrid combiners are suitable for 19” rack mounting.

- Dual isolators fitted as standard.
- Maximum input power of 100 W.
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-PHY450-6DI-100	210000901

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-PHY450-6DI-100
TX FREQUENCY	380 - 470 MHz
MAX. INPUT POWER	100 W
TX-TX SPACING, Δ TX	< 11 MHz
TYP. INSERTION LOSS	9.1 dB
TX-TX ISOLATION	> 90 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	N-female
DIMENSIONS (H x W x L) (H x W x L) Alternative	6HU x 483 x 500 mm (267 x 483 x 500 mm) 8HU x 483 x 400 mm (356 x 483 x 500 mm)
WEIGHT	Approx. 25 kg

PRO-PHY450-5SI3

5-Channel Compact Hybrid Combiners with single or duel isolators

- The compact 5-channel hybrid combiner has been designed to help where a physical small size is of great importance. Also the insertion loss is equal and low for all five channels.
- The hybrid is used where 5 TX-channels, with very little (or no) frequency spacing, are combined into one antenna.
- The hybrid combiner is for 19” rack mounting.

- Dual isolators are fitted as standard.
- Options: Maximum input of 50 or 100 W.
- Please specify the frequencies for each TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-PHY450-5DI3-35	210000716
PRO-PHY450-5SI3-35	210000710

SPECIFICATIONS

ELECTRICAL		
MODEL	PRO-PHY450-5DI3-35	PRO-PHY450-5SI3-35
TX FREQUENCY	380 - 470 MHz	380 - 470 MHz
MAX. INPUT POWER	35 W / 100 W	35 W / 100 W
TX-TX SPACING, Δ TX	0 < TX < 20 MHz	0 < TX < 20 MHz
TYP. INSERTION LOSS	9 dB	8.6 dB
TX-TX ISOLATION	≥ 90 dB	≥ 70 dB
IMPEDANCE	Nom. 50 Ω	Nom. 50 Ω
SWR	≤ 1.5	≤ 1.5
MECHANICAL		
TEMP. RANGE	–30° C → +60° C	–30° C → +60° C
CONNECTORS	N-female	N-female
DIMENSIONS (L x W x H) 35 W	483 x 133 x 400 mm	483 x 133 x 400 mm
WEIGHT 35 W	Approx. 11 kg	Approx. 10.5 kg
DIMENSIONS (L x W x H) 100 W	483 x 133 x 500 mm	483 x 133 x 500 mm
WEIGHT 100 W	Approx. 15 kg	Approx. 14 kg

PRO-PHY450-5

5-Channel Hybrid Combiner for 450 MHz Transmitters

- Combining five transmitters or receivers on the same antenna.
- Better utilisation of good antenna position.
- Five antennas on the same transmitter or receiver.

- The only combining option with very small TX-TX frequency spacing.
- 60 W loads included (other loads or no loads as option).

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.	FREQ. RANGE
PRO-PHY450-5-1	210001383	380 - 400 MHz
PRO-PHY450-5-2	210001384	390 - 410 MHz
PRO-PHY450-5-3	210001385	400 - 420 MHz
PRO-PHY450-5-4	210001386	410 - 430 MHz
PRO-PHY450-5-5	210001387	420 - 440 MHz
PRO-PHY450-5-6	210001388	430 - 450 MHz
PRO-PHY450-5-7	210001389	440 - 460 MHz
PRO-PHY450-5-8	210001390	450 - 470 MHz
PRO-PHY450-5-9	210001391	460 - 480 MHz

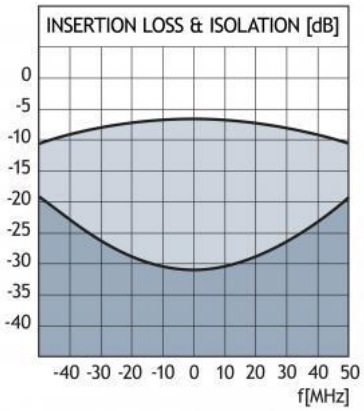
SPECIFICATIONS

ELECTRICAL	
FILTER TYPE	Hybrid Junction
FREQUENCY	380 - 480 MHz (see table)
MAX. INPUT POWER	65 W per channel (max. 150 W with larger load)
INSERTION LOSS	< 7.5 dB ± 0.3 dB @ 11 MHz BW < 7.8 dB ± 0.3 dB @ 22 MHz BW
ISOLATION TX 1-TX 2 (*see note)	> 30 dB @ 11 MHz BW > 28 dB @ 22 MHz BW
MPEDANCE	Nom. 50 Ω
LOAD	30 W load fitted (other ratings available)
SWR	< 1.5 with all other ports terminated with 50 Ω
MECHANICAL	
TEMP. RANGE	-30° C → +60° C

CONNECTORS	N-female (other types as option)
DIMENSIONS (L x W x H)	510 x 89 (incl. conn.) x 42 mm (excl. load)
WEIGHT	Approx. 1625 g (excl. load)

*The isolation between the TX ports is directly dependent on the terminating SWR on the antenna port. With an antenna load SWR = 1.5, the isolation between the two TX ports will be reduced to 20 dB @ 5 MHz bandwidth.
**The SWR of the load's should be < 1.1! Each load should be able to dissipate 4/5 of the input power.
E.g.: With 50 W input, each load should be able to dissipate 50 W x 4/5 = 40 W.

TYPICAL RESPONSE CURVE



PRO-PHY450-4SI

4-Channel Hybrid Combiner

- The PRO-PHY series of hybrid combiners ha been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All hybrid combiners are suitable for 19” rack mounting.
- Single isolators fitted as standard.

- A range of racks and cabinets are available.
- Option: Maximum input power of 35 W (PRO-PHY…4SI-35) or 100 W (PRO-PHY…4SI-100).
- Please specify the frequencies for TX when ordering.

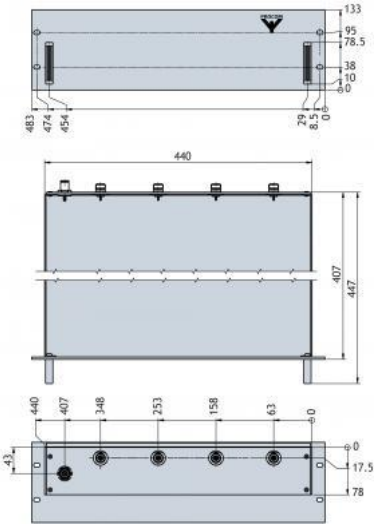
ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-PHY450-4SI-35	210000521
PRO-PHY450-4SI-100	210000551

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-PHY450-4SI-...
TX FREQUENCY	380 - 470 MHz
MAX. INPUT POWER	35/100 W
TX-TX SPACING, Δ TX	< 20 MHz
TYP. INSERTION LOSS	< 7.2 dB (Typ. 7.0 dB)
TX-TX ISOLATION	> 70 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	N-female
DIMENSIONS (L x W x H)	483 x 133 x 400/500 mm 19.02 x 5.24 x 15.75/19.69 in.
WEIGHT	Approx. 7.3/11.8 kg / 16.09/26.01 lb.

MOUNTING DETAILS


133
95
78.5
38
10
0
483
474
454
29
8.5
0
440
407
447
440
407
348
253
158
63
0
43
0
17.5
78

PRO-PHY450-4DI

4-Channel Hybrid Combiner

- The PRO-PHY series of hybrid combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All hybrid combiners are suitable for 19” rack mounting.
- Dual isolators fitted as standard.

- A range of racks and cabinets are available.
- Option: Maximum input power of 35 W (PRO-PHY…4DI-35) or 100 W (PRO-PHY…4DI-100).
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-PHY450-4DI-35	210000592
PRO-PHY450-4DI-100	210000560

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-PHY450-4DI-...
TX FREQUENCY	380 - 470 MHz
MAX. INPUT POWER	35/100 W
TX-TX SPACING, Δ TX	< 20 MHz
TYP. INSERTION LOSS	<7.5 dB (Typ. 7.3 dB)
TX-TX ISOLATION	> 100 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	N-female
DIMENSIONS (L x W x H)	483 x 133 x 400/500 mm 19.02 x 5.24 x 15.75/19.69 in.
WEIGHT	Approx. 9.4/14.0 kg / 20.72/30.86 lb.

PRO-PHY450-4/380-410/SWR

4-Channel Hybrid Ring Combiner including antenna tuner for TETRA Communication Radios

- Combiner for parallel operation of four TETRA transceivers on one common antenna where highest possible decoupling (isolation) is necessary.
- Network can be adjusted for optimization of isolation.
- High isolation achievable: Up to -50 dB at the centre frequency (dependant on the SWR of the connected antenna).

- Max. power 50 W per channel.
- Very small ripple on the connectors over the total frequency range.

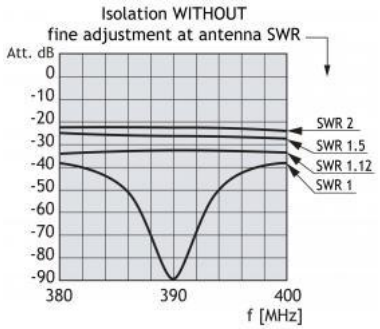
ORDERING DESIGNATIONS

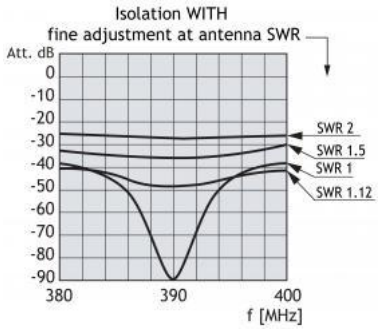
TYPE	PRODUCT NO.
PRO-PHY450-4/380-410/SWR	210000944

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-PHY450-4/380-410/SWR
FILTER TYPE	Hybrid Ring Junction
FREQUENCY	380 - 410 MHz
MAX. INPUT POWER	50 W per channel (max. 150 W with larger load)
NOMINAL DIVIDER LOSS	6.0 dB
TOTAL LOSS INCL. SPLITTER LOSS /COUPLER LOSS	< 6.9 dB
IMPEDANCE	Nom. 50 Ω
INPUT SWR	< 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTOR TYPE	N-female (Others on request)
DIMENSIONS (L x W x H)	420 x 182 (incl. connector) x 42 mm
WEIGHT	1900 g

ISOLATION RESPONSE


Isolation WITHOUT
fine adjustment at antenna SWR
Att. dB
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
380
390
400
f [MHz]
SWR 2
SWR 1.5
SWR 1.12
SWR 1


Isolation WITH
fine adjustment at antenna SWR
Att. dB
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
380
390
400
f [MHz]
SWR 2
SWR 1.5
SWR 1
SWR 1.12

PRO-PHY450-4

4-Channel Hybrid Combiner for 450 MHz Transmitters

- Combining four transmitters or receivers on the same antenna.
- Better utilisation of good antenna position.
- Four antennas on the same transmitter or receiver.

- The only combining option with very small TX-TX frequency spacing.
- 60 W load supplied (other loads or no load as option).

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.	FREQ. RANGE
PRO-PHY450-4-TETRA	210001667	380 - 400 MHz
PRO-PHY450-4-1	210000880	400 - 405 MHz
PRO-PHY450-4-2	210000712	404 - 409 MHz
PRO-PHY450-4-3	210000698	408 - 413 MHz
PRO-PHY450-4-4	210000735	412 - 417 MHz
PRO-PHY450-4-5	210000577	416 - 421 MHz
PRO-PHY450-4-6	210000582	420 - 425 MHz
PRO-PHY450-4-7	210000644	424 - 429 MHz
PRO-PHY450-4-8	210000586	428 - 433 MHz
PRO-PHY450-4-9	210000809	432 - 437 MHz
PRO-PHY450-4-10	210000715	436 - 441 MHz
PRO-PHY450-4-11	210000834	440 - 445 MHz
PRO-PHY450-4-12	210000833	444 - 449 MHz
PRO-PHY450-4-13	210000713	448 - 453 MHz
PRO-PHY450-4-14	210000581	452 - 457 MHz
PRO-PHY450-4-15	210000665	456 - 461 MHz
PRO-PHY450-4-16	210000610	458 - 463 MHz
PRO-PHY450-4-17	210000584	462 - 467 MHz
PRO-PHY450-4-18	210000643	466 - 471 MHz
PRO-PHY450-4-19	210000891	470 - 475 MHz

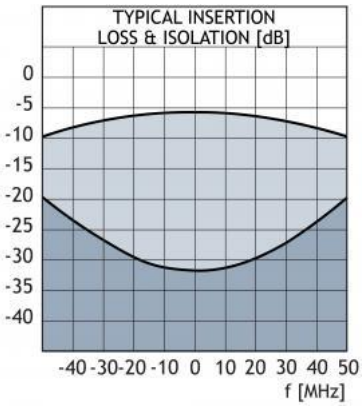
SPECIFICATIONS

ELECTRICAL	
FILTER TYPE	Hybrid Junction

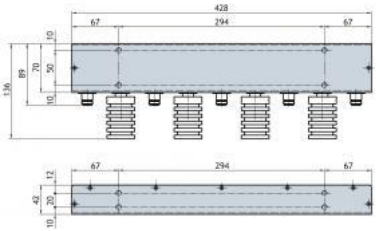
FREQUENCY	380 - 475 MHz (see table)
MAX. INPUT POWER	65 W per channel (max. 150 W with larger load)
INSERTION LOSS	< 6.3 dB ± 0.3 dB @ 11 MHz BW < 6.6 dB ± 0.3 dB @ 22 MHz BW
ISOLATION TX 1-TX 2 (*see note)	> 32 dB @ 11 MHz BW > 28 dB @ 22 MHz BW
IMPEDANCE	Nom. 50 Ω
LOAD	30 W load fitted (other ratings available)
SWR	< 1.5 with all other ports terminated with 50 Ω
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	N-female (other types as option)
DIMENSIONS (L x W x H)	420 x 89 (incl. conn.) x 42 mm
WEIGHT	Approx. 1330 g (excl. load)

*The isolation between the TX ports is directly dependent on the terminating SWR on the antenna port. With an antenna load SWR = 1.5, the isolation between the two TX ports will be reduced to 20 dB @ 5 MHz bandwidth.
**The SWR of the loads should be < 1.1! Each load should be able to dissipate 3/4 of the input power.
E.g.: With 50 W input, each load should be able to dissipate
50 W x 3/4 = 37 W.

ISOLATION & RESPONSE



MOUNTING DETAILS



PRO-PHY450-3SI

3-Channel Hybrid Combiner

- The PRO-PHY series of hybrid combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All hybrid combiners are suitable for 19” rack mounting.
- Single isolators fitted as standard.

- A range of racks and cabinets are available.
- Option: Maximum input power of 35 W (PRO-PHY…3SI-35) or 100 W (PRO-PHY…3SI-100).
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-PHY450-3SI-35	210000573
PRO-PHY450-3SI-100	210000936

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-PHY450-3SI-...
TX FREQUENCY	380 - 470 MHz
MAX. INPUT POWER	35/100 W
TX-TX SPACING, Δ TX	< 20 MHz
TYP. INSERTION LOSS	5.5 dB
TX-TX ISOLATION	> 70 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	N-female
DIMENSIONS (L x W x H)	483 x 89 x 400/500 mm
WEIGHT	Approx. 6.2/9.7 kg

PRO-PHY450-3DI

3-Channel Hybrid Combiner

- The PRO-PHY series of hybrid combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All hybrid combiners are suitable for 19” rack mounting.
- Dual isolators fitted as standard.

- A range of racks and cabinets are available.
- Option: Maximum input power of 35 W (PRO-PHY…3DI-35) or 100 W (PRO-PHY…3DI-100).
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-PHY450-3DI-35	210000709
PRO-PHY450-3DI-100	210000594

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-PHY450-3DI-...
TX FREQUENCY	380 - 470 MHz
MAX. INPUT POWER	35/100 W
TX-TX SPACING, Δ TX	< 20 MHz
TYP. INSERTION LOSS	5.9 dB
TX-TX ISOLATION	> 100 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	N-female
DIMENSIONS (L x W x H)	483 x 89 x 400/500 mm
WEIGHT	Approx. 7.8/11.3 kg

PRO-PHY450-3/380-410/SWR

3-Channel Hybrid Ring Combiner for TETRA Communication Radios

- Combiner for parallel operation of three TETRA transceivers on one common antenna where highest possible decoupling (isolation) is necessary.
- Network can be adjusted for optimization of isolation.

- High isolation achievable: Up to -50 dB at the centre frequency (dependent on the SWR of the connected antenna).
- Max. power 50 W per channel.
- Very small ripple on the connectors over the total frequency range.

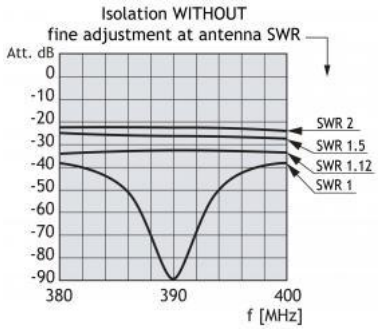
ORDERING DESIGNATIONS

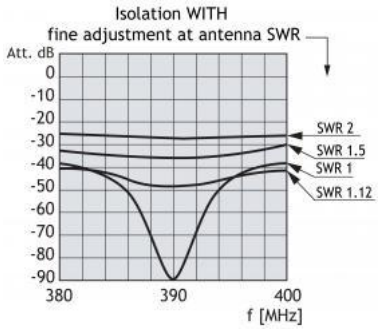
TYPE	PRODUCT NO.
PRO-PHY450-3/380-410/SWR	210000885

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-PHY450-3/380-410/SWR
FILTER TYPE	Hybrid Ring Junction
FREQUENCY	380 - 410 MHz
MAX. INPUT POWER	50 W per channel (max. 150 W with larger load)
NOMINAL DIVIDER LOSS	4.7 dB
TOTAL LOSS INCL. SPLITTER LOSS /COUPLER LOSS	< 5.5 dB
IMPEDANCE	Nom. 50 Ω
INPUT SWR	< 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTOR TYPE	N-female (Others on request)
DIMENSIONS (L x W x H)	400 x 182 (incl. connector) x 42 mm
WEIGHT	1500 g

ISOLATION RESPONSE


Isolation WITHOUT
fine adjustment at antenna SWR
Att. dB
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
380
390
400
f [MHz]
SWR 2
SWR 1.5
SWR 1.12
SWR 1


Isolation WITH
fine adjustment at antenna SWR
Att. dB
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
380
390
400
f [MHz]
SWR 2
SWR 1.5
SWR 1
SWR 1.12

PRO-PHY450-3

3-Channel Hybrid Combiner for 450 MHz Transmitters

- Combining three transmitters or receivers on the same antenna.
- Better utilisation of good antenna position.
- Three antennas on the same transmitter or receiver.

- The only combining option with very small TX-TX frequency spacing.
- 60 W load supplied (other loads or no load as option).

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.	FREQ. RANGE
PRO-PHY450-3-1	210000540	395 - 410 MHz
PRO-PHY450-3-2	210000595	405 - 420 MHz
PRO-PHY450-3-3	210000557	415 - 430 MHz
PRO-PHY450-3-4	210000654	425 - 440 MHz
PRO-PHY450-3-5	210000733	435 - 450 MHz
PRO-PHY450-3-6	210000621	445 - 460 MHz
PRO-PHY450-3-7	210000575	455 - 470 MHz
PRO-PHY450-3-8	210000576	465 - 480 MHz

SPECIFICATIONS

ELECTRICAL	
FILTER TYPE	Hybrid Junction
FREQUENCY	380 - 475 MHz (see table)
MAX. INPUT POWER	75 W per channel (max. 150 W with larger load)
INSERTION LOSS	< 5.3 dB ± 0.3 dB @ 11 MHz BW < 5.5 dB ± 0.3 dB @ 22 MHz BW
ISOLATION TX 1-TX 2 (*see note)	> 26 dB @ 11 MHz BW > 25 dB @ 22 MHz BW
IMPEDANCE	Nom. 50 Ω
LOAD	30 W load fitted (other ratings available)
SWR	< 1.5 with all other ports terminated with 50 Ω
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	N-female (other types as option)

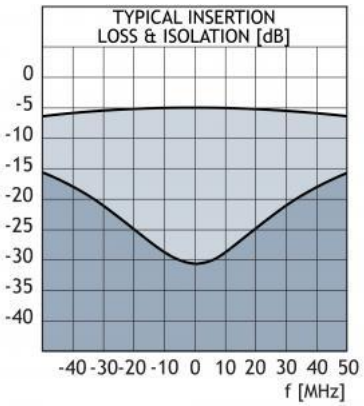
DIMENSIONS (L x W x H)	400 x 89 (incl. conn.) x 42 mm (excl. load)
WEIGHT	Approx. 1300 g (excl. load)

*The isolation between the TX ports is directly dependent on the terminating SWR on the antenna port. With an antenna load SWR = 1.5, the isolation between the two TX ports will be reduced to 20 dB @ 5 MHz bandwidth.

**The SWR of the load's should be < 1.1! Each load should be able to dissipate 2/3 of the input power.

E.g.: With 50 W input, each load should be able to dissipate 50 W x 2/3 = 33 W.

TYPICAL RESPONCE CURVE



PRO-PHY450-2SI

2-Channel Hybrid Combiner

- The PRO-PHY series of hybrid combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All hybrid combiners are suitable for 19” rack mounting.
- Single isolators fitted as standard.

- A range of racks and cabinets are available.
- Option: Maximum input power of 35 W (PRO-PHY…2SI-35) or 100 W (PRO-PHY…2SI-100).
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-PHY450-2SI-35	210000526
PRO-PHY450-2SI-100	210000935

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-PHY450-2SI-...
TX FREQUENCY	380 - 475 MHz
MAX. INPUT POWER	35/100 W
TX-TX SPACING, Δ TX	< 20 MHz
TYP. INSERTION LOSS	3.6 dB
TX-TX ISOLATION	> 70 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	N-female
DIMENSIONS (L x W x H)	483 x 89 x 400 mm
WEIGHT	Approx. 4.6/5.7 kg

PRO-PHY450-2DI

2-Channel Hybrid Combiner

- The PRO-PHY series of hybrid combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All hybrid combiners are suitable for 19” rack mounting.
- Dual isolators fitted as standard.

- A range of racks and cabinets are available.
- Option: Maximum input power of 35 W (PRO-PHY…2DI-35) or 100 W (PRO-PHY…2DI-100).
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-PHY450-2DI-35	210000609
PRO-PHY450-2DI-100	210000562

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-PHY450-2DI-...
TX FREQUENCY	380 - 475 MHz
MAX. INPUT POWER	35/100 W
TX-TX SPACING, Δ TX	< 20 MHz
TYP. INSERTION LOSS	4.1 dB
TX-TX ISOLATION	> 100 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	N-female
DIMENSIONS (L x W x H)	483 x 89 x 400 mm
WEIGHT	Approx. 5.7/6.8 kg

PRO-PHY450-2/380-410/SWR

2-Channel Hybrid Ring Combiner for TETRA Communication Radios

- Combiner for coupling of two TETRA transceivers on one common antenna.
- SWR adjustment network for optimization of SWR in the frequency range of 380 to 410 MHz.
- High isolation achievable: Up to -50 dB in the centre frequency (dependant on the SWR of the connected antenna).

- For parallel operation of two two-way communication radios (transceivers) where highest possible decoupling (isolation) is necessary. Via the adjustment network the SWR of the antenna and consequently the isolation between the ports of the combiner can be clearly improved.
- The adjustment of the SWR adjustment network takes place via built-in variable capacitors.
- Max. power 2 x 50 W.
- Very small ripple on the connectors over the total frequency range.

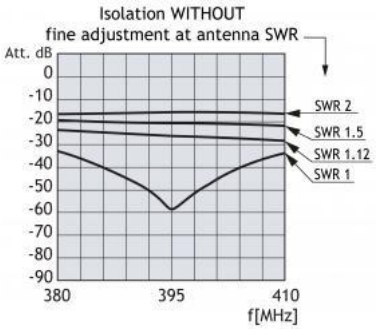
ORDERING DESIGNATIONS

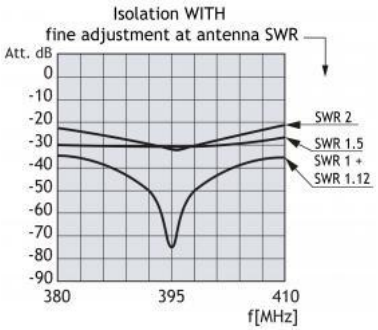
TYPE	PRODUCT NO.
PRO-PHY450-2/380-410/SWR	210000889

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-PHY450-2/380-410/SWR
FILTER TYPE	Hybrid Ring Junction
FREQUENCY	380 - 410 MHz
MAX. INPUT POWER	50 W per channel (max. 150 W with larger load)
NOMINAL DIVIDER LOSS	3.0 dB
TOTAL LOSS INCL. SPLITTER LOSS /COUPLER LOSS	< 3.5 dB
IMPEDANCE	Nom. 50 Ω
INPUT SWR	< 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTOR TYPE	N-female (Others on request)
DIMENSIONS (L x W x H)	210 x 182 (incl. connector) x 42 mm
WEIGHT	785 g

ISOLATION RESPONSE


Isolation WITHOUT
fine adjustment at antenna SWR
Att. dB
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
380
395
410
f[MHz]
SWR 2
SWR 1.5
SWR 1.12
SWR 1


Isolation WITH
fine adjustment at antenna SWR
Att. dB
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
380
395
410
f[MHz]
SWR 2
SWR 1.5
SWR 1 +
SWR 1.12

PRO-PHY450-2

2-Channel Hybrid Ring Combiner for 450 MHz Transmitters

- Combining two transmitters or receivers on the same antenna.
- Better utilization of good antenna position.
- Two antennas on the same transmitter or receiver.

- Combining two signal generators.
- The only combining option with very small TX-TX frequency spacing.
- 60 W load supplied (other loads or no load as option).

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.	FREQ. RANGE
PRO-PHY450-2-TETRA	210001126	380 - 400 MHz
PRO-PHY450-2-1	210000580	400 - 420 MHz
PRO-PHY450-2-2	210000546	415 - 435 MHz
PRO-PHY450-2-3	210000579	430 - 450 MHz
PRO-PHY450-2-4	210000542	445 - 465 MHz
PRO-PHY450-2-5	210000570	460 - 480 MHz

SPECIFICATIONS

ELECTRICAL	
FILTER TYPE	Hybrid Ring Junction
FREQUENCY	380 - 475 MHz (see table)
MAX. INPUT POWER	50 W per channel (max. 150 W with larger load)
INSERTION LOSS	< 3.4 dB @ 10 MHz BW < 3.7 dB @ 20 MHz BW
ISOLATION TX 1-TX 2 (*see note)	> 35 dB @ 10 MHz BW > 30 dB @ 20 MHz BW
IMPEDANCE	Nom. 50 Ω
LOAD (**see note)	30 W load fitted (other ratings available)
SWR	< 1.5 with all other ports terminated with 50 Ω
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	N-female (other types as option)
DIMENSIONS (L x W x H)	216 x 89 (incl. conn.) x 42 mm (excl. load)

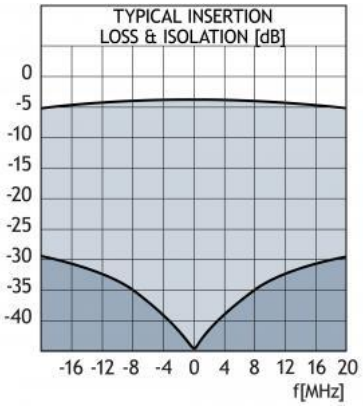
WEIGHT	Approx. 700 g (excl. load)

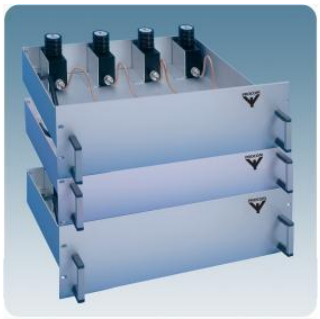
*The isolation between the TX ports is directly dependent on the terminating SWR on the antenna port. With an antenna load SWR = 1.5, the isolation between the two TX ports will be reduced to 20 dB @ 5 MHz bandwidth.

**The SWR of the loads should be < 1.1! The load should be able to dissipate 1/2 of the total input power.

E.g.: With 50 W input in total for the two channels, the load should be able to dissipate 50 W x 1/2 = 25 W.

RESPONSE CURVE





PRO-PHY150-8SI

8-Channel Hybrid Combiner

- The PRO-PHY series of hybrid combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All hybrid combiners are suitable for 19” rack mounting.
- Single isolators fitted as standard.

- A range of racks and cabinets are available.
- Option: Maximum input power of 35 W (PRO-PHY...-8SI-35) or 100 W (PRO-PHY...-8SI-100).
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-PHY150-8SI-35	210001211
PRO-PHY150-8SI-100	210001212

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-PHY150-8SI-...
TX FREQUENCY	136 - 175 MHz
MAX. INPUT POWER	35/100 W
TX-TX SPACING, Δ TX	< 7 MHz
TYP. INSERTION LOSS	11.1 dB
TX-TX ISOLATION	> 65 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	N-female
DIMENSIONS (W x H x D)	19" x 8 HU x 400 mm (483 x 356 x 400 mm)
WEIGHT	Approx. 30 kg

PRO-PHY150-6SI3

6-Channel Hybrid Combiner for 35, 50 or 75 W

- The PRO-PHY series of hybrid combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All hybrid combiners are suitable for 19” rack mounting.
- Single isolators fitted as standard.

DESCRIPTION

- Maximum input power of 35, 50 or 75 W.
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-PHY150-6SI3-35	210001717
PRO-PHY150-6SI3-50	210002369
PRO-PHY150-6SI3-75	210002370

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-PHY150-6SI3-...
TX FREQUENCY	136 - 175 MHz
MAX. INPUT POWER	35 / 50 / 75 W
TX-TX SPACING, Δ TX	< 7 MHz
TYP. INSERTION LOSS	8.5 dB
TX-TX ISOLATION	> 70 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	N-female
DIMENSIONS (H x W x L)	3HU x 483 x 400 mm (35 W) 3HU x 483 x 500 mm (50 W) 3HU x 483 x 600 mm (75 W)
WEIGHT	Approx. 10, 12, 15 kg

PRO-PHY150-5SI3

5-Channel Hybrid Combiner with single isolator

- The PRO-PHY series of hybrid combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All hybrid combiners are suitable for 19” rack mounting.

- Single isolators fitted as standard.
- A range of racks and cabinets are available.
- Option: Maximum input power of 35 W (PRO-PHY150-5SI3-35) or 100 W (PRO-PHY150-5SI3-100).

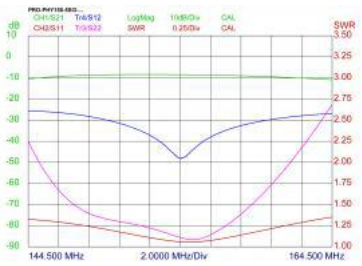
ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-PHY150-5SI3-35	210000916
PRO-PHY150-5SI3-100	210000917

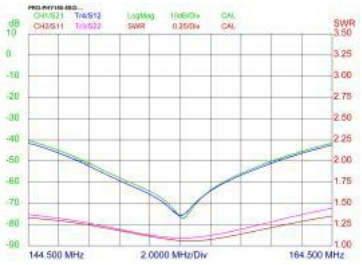
SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-PHY150-5SI3-...
TX FREQUENCY	136 - 175 MHz
MAX. INPUT POWER	35/100 W
TX-TX SPACING, Δ TX	< 7 MHz
TYP. INSERTION LOSS	8.6 dB
TX-TX ISOLATION	> 70 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	N-female
DIMENSIONS (L x W x H)	400/500 x 483 x 133 mm
WEIGHT	Approx. 7.3/11.8 kg

TYPICAL RESPONSE CURVES No 1.



TYPICAL RESPONSE CURVES No 2.



PRO-PHY150-5DI3

5-Channel Hybrid Combiner with dual isolator

- The PRO-PHY series of hybrid combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All hybrid combiners are suitable for 19” rack mounting.

- Dual isolators fitted as standard.
- A range of racks and cabinets are available.
- Option: Maximum input power of 35 W (PRO-PHY150-5DI3-35) or 100 W (PRO-PHY150-5DI3-100).

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-PHY150-5DI3-35	210000918
PRO-PHY150-5DI3-100	210000919

Please specify the frequencies for TX when ordering.

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-PHY150-5DI3-...
TX FREQUENCY	136 - 175 MHz
MAX. INPUT POWER	35/100 W
TX-TX SPACING, Δ TX	< 7 MHz
TYP. INSERTION LOSS	9 dB
TX-TX ISOLATION	> 100 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	N-female
DIMENSIONS (L x W x H)	400/500 x 483 x 133 mm / 15.75/19.69 x 19.02 x 5.24 in.
WEIGHT	Approx. 9.4/14.0 kg / 20.72/30.86 lb.

PRO-PHY150-5

5-Channel Hybrid Combiner for 150 MHz Transmitters

- Combining five transmitters or receivers on the same antenna.
- Better utilization of good antenna position.
- Five antennas on the same transmitter or receiver.

- The only combining option with very small TX-TX frequency spacing.
- 60 W load supplied (other loads or no load as option).

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.	FREQ. RANGE
PRO-PHY150-5-1	210001231	136 - 141 MHz
PRO-PHY150-5-2	210001232	140 - 145 MHz
PRO-PHY150-5-3	210001233	144 - 149 MHz
PRO-PHY150-5-4	210001234	148 - 153 MHz
PRO-PHY150-5-5	210001235	152 - 157 MHz
PRO-PHY150-5-6	210001236	156 - 161 MHz
PRO-PHY150-5-7	210001129	160 - 165 MHz
PRO-PHY150-5-8	210001131	164 - 169 MHz
PRO-PHY150-5-9	210001237	168 - 173 MHz
PRO-PHY150-5-10	210001238	172 - 175 MHz

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-PHY150-5
FILTER TYPE	Hybrid Junction
FREQUENCY	136 - 175 MHz (see table)
MAX. INPUT POWER	75 W per channel (max. 150 W with larger load)
INSERTION LOSS	< 8.2 dB ± 0.5 dB @ 8 MHz BW < 8.3 dB ± 0.5 dB @ 16 MHz BW
ISOLATION TX 1-TX 2 (*see note)	> 32 dB @ 8 MHz BW > 27 dB @ 16 MHz BW
IMPEDANCE	Nom. 50 Ω
LOAD (**see note)	30 W load fitted (other ratings available)
SWR	< 1.5 with all other ports terminated with 50 Ω

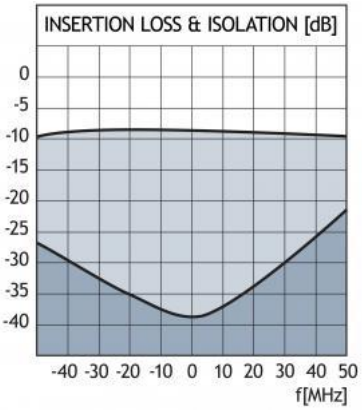
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	N-female (other types as option)
DIMENSIONS (L x W x H)	420 x 89 (incl. conn.) x 42 mm (excl. load)
WEIGHT	Approx. 1600 g (excl. load)

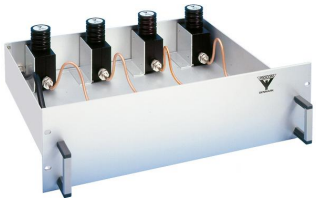
*The isolation between the TX ports is directly dependent on the terminating SWR on the antenna port. With an antenna load SWR = 1.5, the isolation between the two TX ports will be reduced to 20 dB @ 5 MHz bandwidth.

**The SWR of the load's should be < 1.1! Each load should be able to dissipate 4/5 of the input power.

E.g.: With 50 W input, each load should be able to dissipate 50 W x 4/5 = 40 W.

TYPICAL RESPONSE CURVE





PRO-PHY150-4SI

4-Channel Hybrid Combiner

- The PRO-PHY series of hybrid combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All hybrid combiners are suitable for 19” rack mounting.
- Single isolators fitted as standard.

- A range of racks and cabinets are available.
- Option: Maximum input power of 35 W (PRO-PHY…4SI-35) or 100 W (PRO-PHY…4SI-100).
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-PHY150-4SI-35	210000569
PRO-PHY150-4SI-100	210000934

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-PHY150-4SI-...
TX FREQUENCY	136 - 175 MHz
MAX. INPUT POWER	35/100 W
TX-TX SPACING, Δ TX	< 7 MHz
TYP. INSERTION LOSS	6.6 dB
TX-TX ISOLATION	> 70 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	N-female
DIMENSIONS (L x W x H)	300/400 x 483 x 89 mm
WEIGHT	Approx. 7.3/11.8 kg

PRO-PHY150-4DI

4-Channel Hybrid Combiner

- The PRO-PHY series of hybrid combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All hybrid combiners are suitable for 19” rack mounting.
- Dual isolators fitted as standard.

- A range of racks and cabinets are available.
- Option: Maximum input power of 35 W (PRO-PHY…4DI-35) or 100 W (PRO-PHY…4DI-100).
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-PHY150-4DI-35	210000565
PRO-PHY150-4DI-100	210000534

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-PHY150-4DI-...
TX FREQUENCY	136 - 175 MHz
MAX. INPUT POWER	35/100 W
TX-TX SPACING, Δ TX	< 7 MHz
TYP. INSERTION LOSS	6.9 dB
TX-TX ISOLATION	> 100 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	N-female
DIMENSIONS (L x W x H)	400/500 x 483 x 89 mm
WEIGHT	Approx. 9.4/14.0 kg

PRO-PHY150-4

4-Channel Hybrid Combiner for 150 MHz Transmitters

- Combining four transmitters or receivers on the same antenna.
- Better utilization of good antenna position.
- Four antennas on the same transmitter or receiver.

- The only combining option with very small TX-TX frequency spacing.
- 60 W load supplied (other loads or no load as option).

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.	FREQUENCY
PRO-PHY150-4-3	210000632	130 - 160 MHz
PRO-PHY150-4-5	210000672	140 - 170 MHz
PRO-PHY150-4-8	210000558	150 - 180 MHz

SPECIFICATIONS

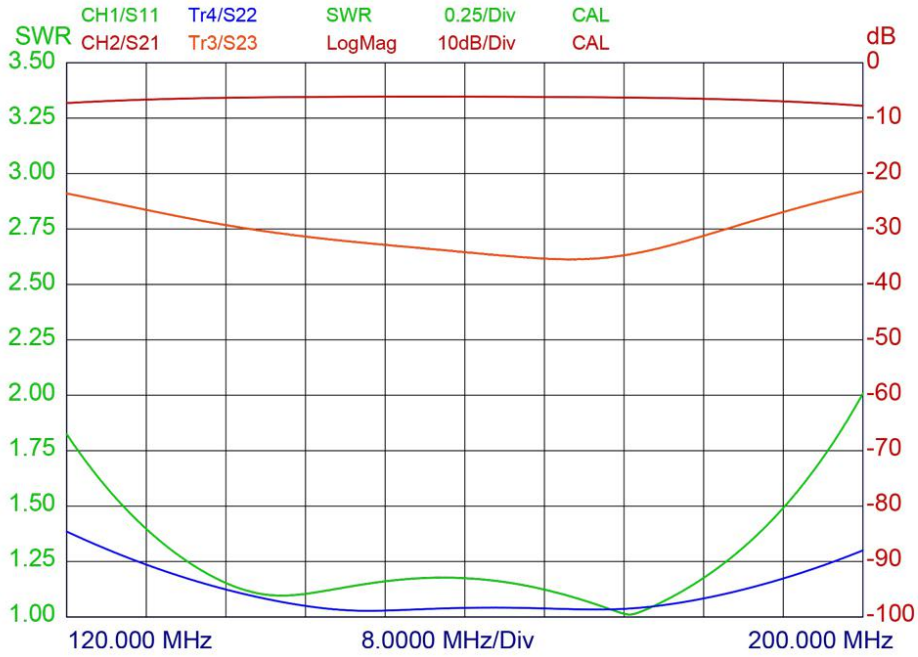
ELECTRICAL	
FILTER TYPE	Hybrid Junction
FREQUENCY	136 - 175 MHz (see table)
MAX. INPUT POWER	65 W per channel (max. 150 W with larger load)
INSERTION LOSS	< 6.3 dB ± 0.3 dB
ISOLATION TX 1-TX 2 (*see note)	> 30 dB
IMPEDANCE	Nom. 50 Ω
LOAD (**see note)	30 W load fitted (other ratings available)
SWR	< 1.5 with all other ports terminated with 50 Ω
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	N-female (other types as option)
DIMENSIONS (L x W x H)	420 x 89 (incl. conn.) x 42 mm (excl. load)
WEIGHT	Approx. 1330 g (excl. load)

*The isolation between the TX ports is directly dependent on the terminating SWR on the antenna port. With an antenna load SWR = 1.5, the isolation between the two TX ports will be reduced to 20 dB @ 5 MHz bandwidth.

**The SWR of the loads should be < 1.1! Each load should be able to dissipate 3/4 of the input power.

E.g.: With 50 W input, each load should be able to dissipate 50 W x 3/4 = 37 W.

TYPICAL RESPONSE CURVE



PRO-PHY150-3SI

3-Channel Hybrid Combiner

- The PRO-PHY series of hybrid combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All hybrid combiners are suitable for 19” rack mounting.
- Single isolators fitted as standard.

- A range of racks and cabinets are available.
- Option: Maximum input power of 35 W (PRO-PHY…3SI-35) or 100 W (PRO-PHY…3SI-100).
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-PHY150-3SI-35	210000564
PRO-PHY150-3SI-100	210000932

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-PHY150-3SI-...
TX FREQUENCY	136 - 175 MHz
MAX. INPUT POWER	35/100 W
TX-TX SPACING, Δ TX	< 7 MHz
TYP. INSERTION LOSS	5.5 dB
TX-TX ISOLATION	> 70 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	N-female
DIMENSIONS (L x W x H)	400/500 x 483 x 89 mm
WEIGHT	Approx. 6.2/9.7 kg

PRO-PHY150-3DI

3-Channel Hybrid Combiner

- The PRO-PHY series of hybrid combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All hybrid combiners are suitable for 19” rack mounting.
- Dual isolators fitted as standard.

- A range of racks and cabinets are available.
- Option: Maximum input power of 35 W (PRO-PHY…3DI-35) or 100 W (PRO-PHY…3DI-100).
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-PHY150-3DI-35	210000704
PRO-PHY150-3DI-100	210000933

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-PHY150-3DI-...
TX FREQUENCY	136 - 175 MHz
MAX. INPUT POWER	35/100 W
TX-TX SPACING, Δ TX	< 7 MHz
TYP. INSERTION LOSS	5.8 dB
TX-TX ISOLATION	> 100 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	N-female
DIMENSIONS (L x W x H)	400/500 x 483 x 89 mm
WEIGHT	Approx. 7.8/11.3 kg

PRO-PHY150-3

3-Channel Hybrid Combiner for 150 MHz Transmitters

- Combining three transmitters or receivers on the same antenna.
- Better utilization of good antenna position.
- Three antennas on the same transmitter or receiver.

- The only combining option with very small TX-TX frequency spacing.
- 60 W load supplied (other loads or no load as option).

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.	FREQUENCY
PRO-PHY150-3-1	210001225	130 - 142 MHz
PRO-PHY150-3-2	210000639	138 - 150 MHz
PRO-PHY150-3-3	210000611	146 - 158 MHz
PRO-PHY150-3-4	210000547	154 - 166 MHz
PRO-PHY150-3-5	210000583	162 - 174 MHz
PRO-PHY150-3-6	210000793	170 - 182 MHz

SPECIFICATIONS

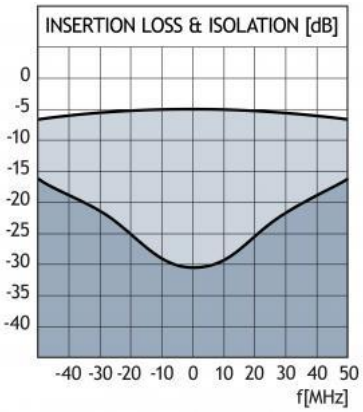
ELECTRICAL	
FILTER TYPE	Hybrid Junction
FREQUENCY	136 - 175 MHz (see table)
MAX. INPUT POWER	75 W per channel (max. 150 W with larger load)
INSERTION LOSS	< 5.2 dB ± 0.3 dB @ 8 MHz BW < 5.4 dB ± 0.3 dB @ 16 MHz BW
ISOLATION TX 1-TX 2 (*see note)	> 26 dB @ 8 MHz BW > 25 dB @ 16 MHz BW
IMPEDANCE	Nom. 50 Ω
LOAD (**see note)	30 W load fitted (other ratings available)
SWR	< 1.5 with all other ports terminated with 50 Ω
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	N-female (other types as option)
DIMENSIONS (L x W x H)	400 x 89 (incl. conn.) x 42 mm (excl. loads)
WEIGHT	Approx. 1300 g (excl. load)

*The isolation between the TX ports is directly dependent on the terminating SWR on the antenna port. With an antenna load SWR = 1.5, the isolation between the two TX ports will be reduced to 20 dB @ 5 MHz bandwidth.

**The SWR of the load's should be < 1.1! Each load should be able to dissipate 2/3 of the input power.

E.g.: With 50 W input, each load should be able to dissipate 50 W x 2/3 = 33 W.

TYPICAL RESPONCE CURVE



PRO-PHY150-2SI

2-Channel Hybrid Combiner

- The PRO-PHY series of hybrid combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All hybrid combiners are suitable for 19” rack mounting.
- Single isolators fitted as standard.

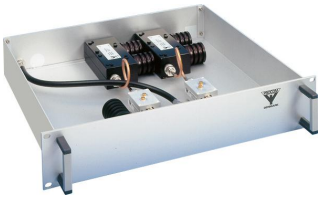
- A range of racks and cabinets are available.
- Option: Maximum input power of 35 W (PRO-PHY…2SI-35) or 100 W (PRO-PHY…2SI-100).
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-PHY150-2SI-35	210000528
PRO-PHY150-2SI-100	210000915

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-PHY150-2SI-...
TX FREQUENCY	136 - 175 MHz
MAX. INPUT POWER	35/100 W
TX-TX SPACING, Δ TX	< 7 MHz
TYP. INSERTION LOSS	3.5 dB
TX-TX ISOLATION	> 70 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	N-female
DIMENSIONS (L x W x H)	400 x 483 x 89 mm
WEIGHT	Approx. 4.6/5.7 kg



PRO-PHY 700-2DI-...

2-Channel Hybrid Combiner

- The PRO-PHY series of hybrid combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All hybrid combiners are suitable for 19” rack mounting.
- Dual isolators fitted as standard.

- A range of racks and cabinets are available.
- Option: Maximum input power of
  35 W (PRO-PHY 700-2DI-35) or
  100 W (PRO-PHY 700-2DI-100).
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-PHY 700-2DI-35	Contact for availability
PRO-PHY 700-2DI-100	Contact for availability

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-PHY 700-2DI-...
TX FREQUENCY	690 - 960 MHz
MAX. INPUT POWER	35/100 W
TX-TX SPACING, Δ TX	< 15 MHz
TYP. INSERTION LOSS	4.1 dB
TX-TX ISOLATION	> 75 dB (Typ. > 100 dB @ 25°)
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–10° C → +60° C
CONNECTORS	N-female
DIMENSIONS (L x W x H)	400 x 483 x 89 mm
WEIGHT	Approx. 5.7/6.8 kg

PRO-PHY150-2

2-Channel Hybrid Ring Combiner for 150 MHz Transmitters

- Combining two transmitters or receivers on the same antenna.
- Better utilization of good antenna position.
- Two antennas on the same transmitter or receiver.

- Combining two signal generators.
- The only combining option with very small TX-TX frequency spacing.
- 30 W load supplied (other loads or no load as option).

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.	FREQUENCY
PRO-PHY150-2-1	210000538	136 - 142 MHz
PRO-PHY150-2-2	210000878	140 - 146 MHz
PRO-PHY150-2-3	210000590	144 - 150 MHz
PRO-PHY150-2-4	210000544	148 - 154 MHz
PRO-PHY150-2-5	210000571	152 - 158 MHz
PRO-PHY150-2-6	210000572	156 - 162 MHz
PRO-PHY150-2-7	210000537	160 - 166 MHz
PRO-PHY150-2-8	210000545	164 - 170 MHz
PRO-PHY150-2-9	210000548	168 - 174 MHz
PRO-PHY150-2-10	210000629	172 - 178 MHz

SPECIFICATIONS

ELECTRICAL	
FILTER TYPE	Hybrid Ring Junction
FREQUENCY	136 - 175 MHz (see table)
MAX. INPUT POWER	50 W per channel (max. 150 W with larger load)
INSERTION LOSS	< 3.3 dB @ 3 MHz BW < 3.5 dB @ 6 MHz BW
ISOLATION TX 1-TX 2 (*see note)	> 35 dB @ 3 MHz BW > 30 dB @ 6 MHz BW
IMPEDANCE	Nom. 50 Ω
LOAD (**see note)	30 W load fitted (other ratings available)
SWR	< 1.5 with all other ports terminated with 50
MECHANICAL	

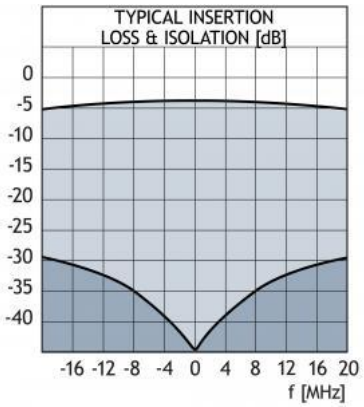
TEMP. RANGE	–30° C → +60° C
CONNECTORS	N-female (other types as option)
DIMENSIONS (L x W x H)	216 x 89 (incl. conn.) x 42 mm (excl. load)
WEIGHT	Approx. 700 g (excl. load)

*The isolation between the TX ports is directly dependent on the terminating SWR on the antenna port. With an antenna load SWR = 1.5, the isolation between the two TX ports will be reduced to 20 dB @ 3 MHz bandwidth.

**The SWR of the load's should be < 1.1! The load should be able to dissipate 1/2 of the total input power.

E.g.: With 50 W input in total for the two channels, the load should be able to dissipate 50 W x 1/2 = 25 W.

TYPICAL RESPONCE CURVE



PRO-ISO-PHY-TETRA-ELW

Two TMO TETRA Mobile-Station and one DMO TETRA Mobile Station

- The PRO-ISO-PHY-TETRA-ELW combiner provides the possibillity of connecting up to two TMO TETRA radios into one common antenna.
- ETSI compliant connection of two digital radios.

Replaced by PRO-ISO-PHY-TETRA-S-ELW

DESCRIPTION

- The PRO-ISO-PHY-TETRA-ELW supports Direct Mode Operation (DMO), giving one TETRA mobile radio the ability to communicate in direct mode.
- The PRO-ISO-PHY-TETRA-ELW is the successor to the PRO-MIX-PHY-TETRA-ELW-N-2RXI.
- The PRO-ISO-PHY-TETRA-ELW has improved isolation between the ports - more than 60 dB - and lower insertion loss.
- The use of high-quality system components such as highly selective helical duplex filters and high-performance isolators provides high isolation and secure communication.
- Built-in high-pass filter, for attenuating interference from 150 - 174 MHz and 74 - 87.5 MHz bands.
- The smallest and most compact design on the market.
- Suitable for both stationary and mobile use.
- Also available in tray for 19" rack mounting.
- Vibration and shock tested in accordance with EN-60068**.

**Tested in accordance with:
Random test: EN 60068-2-64, test specification: EN 300 019-2-5 V3.0.0.
Shock test: EN 60068-2-27, test specification: EN 300 019-2-5 V3.0.0.
Bump test: EN 60068-2-29, test specification: EN 300 019-2-5 V3.0.0.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-ISO-PHY-TETRA-ELW-N(f)	Replaced by PRO-ISO-PHY-TETRA-S-ELW

Compatible DMO-modes

The PRO-ISO-PHY-TETRA-ELW is compatible with the following DMO modes in 406 - 410 MHz band:

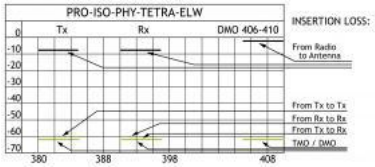
- DM-MS
- DM-REP (1A)

SPECIFICATIONS

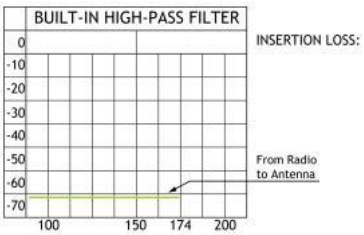
ELECTRICAL	
MODEL	PRO-ISO-PHY-TETRA-ELW
TYPE	TETRA combiner
TX/RX FREQUENCY	TX: 380 – 385 MHz RX: 390 – 395 MHz
DMO FREQUENCY *	406 - 410 MHz

INSERTION LOSS TX-ANT.	< 8.0 dB (Typ. 6.5 - 8.0 dB)
INSERTION LOSS RX-ANT.	< 8.0 dB (Typ. 6.5 - 8.0 dB)
INSERTION LOSS DMO-ANT	< 2.5 dB (Typ. 2.4 dB)
ISOLATION TRX →TRX	TX - TX: > 60 dB (380 – 385 MHz) RX - RX: > 60 dB (390 – 395 MHz) TX - RX / RX - TX: > 60 dB
ISOLATION DMO-TMO	> 60 dB
MAX. POWER	25 W / station
SWR	< 1.5
GROUP DELAY VARIATION	TX-ANT. : < 120 nsec. RX-ANT. : < 150 nsec.
MECHANICAL	
CONNECTOR TYPE	N-female
COLOUR	Black
DIMENSIONS (L x W x H)	190 (excl. conn.) x 240 x 65 mm / 7.48 (excl. conn.) x 9.45 x 2.56 in.
WEIGHT	Approx. 3700 g / 8.16 lb.
ENVIRONMENTAL	
IP-GRADE	IP-62

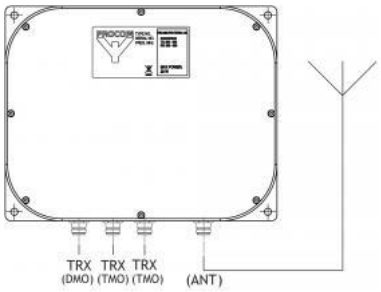
TYPICAL ATTENUATION VALUES



The built-in high-pass filter attenuates large signal interference and harmonic from radiosystems below 174 MHz.



CONNECTION DIAGRAM


TRX
(DMO)
TRX
(TMO)
TRX
(TMO)
(ANT)

PRO-ISO-PHY-TETRA-8

Eight-TETRA-Station Combiner

- The PRO-ISO-PHY-TETRA-8 combiner provides the possibillity of connecting up to eight TETRA radios into one common antenna.
- ETSI compliant connection of eight digital radios.

Replaced by
PRO-ISO-PHY-TETRA-S8

DESCRIPTION

- The PRO-ISO-PHY-TETRA-8 has improved isolation between the ports - more than 60 dB - and low insertion loss.
- The use of high-quality system components such as highly selective helical duplex filters and high-performance isolators provides high isolation and secure communication.
- The smallest and most compact design on the market.
- Suitable for both stationary and mobile use.
- Also available in tray for 19" rack mounting.
- Vibration and shock tested in accordance with EN-60068 **.
- Jumper cables included.

** Tested in accordance with:
Random test: EN 60068-2-64, test specification: EN 300 019-2-5 V3.0.0.
Shock test: EN 60068-2-27, test specification: EN 300 019-2-5 V3.0.0.
Bump test: EN 60068-2-29, test specification: EN 300 019-2-5 V3.0.0.

ORDERING DESIGNATIONS

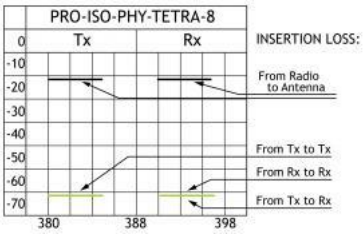
TYPE	TX MHZ	RX MHZ	PRODUCT NO.
PRO-ISO-PHY-385/390-8-N(f)	380 - 385	390 - 395	**Replaced by** PRO-ISO-PHY-TETRA-S8
PRO-ISO-PHY-385/390-8-TR-B-N(f)	380 - 385	390 - 395	
PRO-ISO-PHY-385/390-8-TR-F-N(f)	380 - 385	390 - 395	
PRO-ISO-PHY-415/420-8-N(f)	410 - 415	420 - 425	
PRO-ISO-PHY-415/420-8-TR-B-N(f)	410 - 415	420 - 425	
PRO-ISO-PHY-415/420-8-TR-F-N(f)	410 - 415	420 - 425	

SPECIFICATIONS

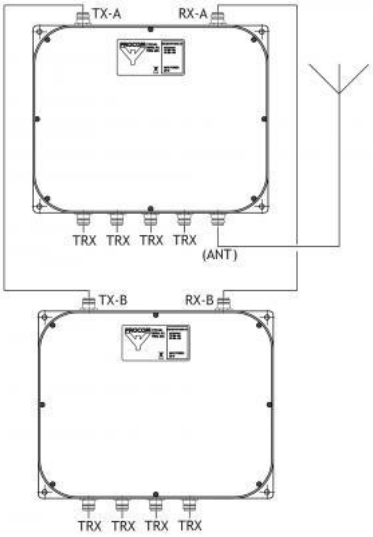
ELECTRICAL	
MODEL	PRO-ISO-PHY-TETRA-8
TYPE	TETRA combiner
TX/RX FREQUENCY	TX: 380 – 385 MHz RX: 390 – 395 MHz or TX: 410 - 415 MHz

	RX: 420 - 425 MHz
INSERTION LOSS TX-ANT.	Typ. -11.5 to -13 dB
INSERTION LOSS RX-ANT.	Typ. -11.5 to -13 dB
ISOLATION TRX → TRX	TX - TX: > 60 dB (380 – 385 MHz & 410 - 415 MHz) RX - RX: > 60 dB (390 – 395 MHz & 420 - 425 MHz) TX - RX / RX - TX: > 60 dB
SWR	< 1.5
MAX. POWER	25 W / station
GROUP DELAY VARIATION	TX-ANT. < 120 nsec. RX-ANT. < 150 nsec.
MECHANICAL	
CONNECTOR TYPE	N-female
COLOUR	Black
DIMENSIONS (W x H x D)	19" x 2 x 2 HU x 240 mm (excl. conn.) (483 x 176 x 240 mm) / (7.02 x 6.93 x 9.45 in.)
WEIGHT	Approx. 12.6 kg / 27.78 lb.
ENVIRONMENTAL	
IP RATING	IP 62

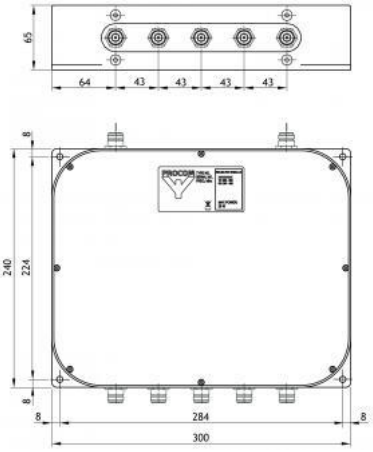
TYPICAL ATTENUATION VALUES



CONNECTION DIAGRAM



MOUNTING DETAILS



PRO-ISO-PHY-TETRA-6

Six-TETRA-Station Combiner

- The PRO-ISO-PHY-TETRA-6 combiner provides the possibillity of connecting up to six TETRA radios into one common antenna.
- ETSI compliant connection of six digital radios.

Replaced by
PRO-ISO-PHY-TETRA-S6

DESCRIPTION

- The PRO-ISO-PHY-TETRA-6 has improved isolation between the ports - more than 60 dB - and low insertion loss.
- The use of high-quality system components such as highly selective helical duplex filters and high-performance isolators provides high isolation and secure communication.
- The smallest and most compact design on the market.
- Suitable for both stationary and mobile use.
- Also available in tray for 19" rack mounting.
- Jumper cables included.

ORDERING DESIGNATIONS

TYPE	TX MHZ	RX MHZ	PRODUCT NO.
PRO-ISO-PHY-385/390-6-N(f)	380 - 385	390 - 395	**Replaced by** PRO-ISO-PHY-TETRA-S6
PRO-ISO-PHY-385/390-6-TR-B-N(f)	380 - 385	390 - 395	
PRO-ISO-PHY-385/390-6-TR-F-N(f)	380 - 385	390 - 395	

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-ISO-PHY-TETRA-6
TYPE	TETRA combiner
TX/RX FREQUENCY	TX: 380 – 385 MHz RX: 390 – 395 MHz
INSERTION LOSS TX-ANT.	Typ. -11.5 to -13 dB
INSERTION LOSS RX-ANT.	Typ. -11.5 to -13 dB
ISOLATION TRX → TRX	TX - TX: > 60 dB (380 – 385 MHz) RX - RX: > 60 dB (390 – 395 MHz) TX - RX / RX - TX: > 60 dB
SWR	< 1.5
MAX. POWER	25 W/station
GROUP DELAY VARIATION	TX-ANT. < 120 nsec.

	RX-ANT. < 150 nsec.
MECHANICAL	
CONNECTOR TYPE	N-female
COLOUR	Black
DIMENSIONS (W x H xD)	19" x 2 x 2 HU x 240 mm (excl. conn.) (483 x 176 x 240 mm)
WEIGHT	Approx. 11400 g / 25.14 lb.
ENVIRONMENTAL	
IP-GRADE	IP-62

PRO-ISO-PHY-TETRA-4

Four-TETRA-Station Combiner

- The PRO-ISO-PHY-TETRA-4 combiner provides the possibillity of connecting up to four TETRA radios into one common antenna.
- The PRO-ISO-PHY-TETRA-4 models are available in the frequency range 380 - 420 MHz

Replaced by
PRO-ISO-PHY-TETRA-S4

DESCRIPTION

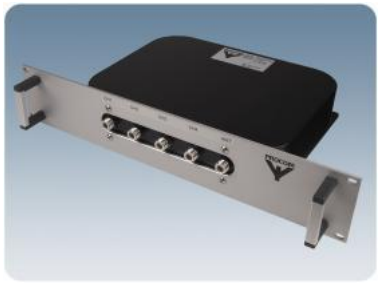
- ETSI compliant connection of four digital radios.
- The PRO-ISO-PHY-TETRA-4 is the successor to the PRO-MIX-PHY-TETRA-N-4RXI.
- The PRO-ISO-PHY-TETRA-4 has improved isolation between the ports - more than 60 dB - and lower insertion loss.
- The use of high-quality system components such as highly selective helical duplex filters and high-performance isolators provides high isolation and secure communication.
- The smallest and most compact design on the market.
- Suitable for both stationary and mobile use.
- Also available in tray for 19" rack mounting.
- Vibration and shock tested in accordance with EN-60068**.

**Tested in accordance with:
Random test: EN 60068-2-64, test specification: EN 300 019-2-5 V3.0.0.
Shock test: EN 60068-2-27, test specification: EN 300 019-2-5 V3.0.0.
Bump test: EN 60068-2-29, test specification: EN 300 019-2-5 V3.0.0.

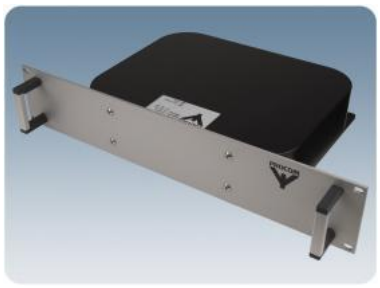
ORDERING DESIGNATIONS

TYPE	TX MHz	RX MHz	PRODUCT NO.
PRO-ISO-PHY-385/390-4-N(f)	380 - 385	390 - 395	**Replaced by** PRO-ISO-PHY-TETRA-S4
PRO-ISO-PHY-385/390-4-TR-F-N(f)	380 - 385	390 - 395	
PRO-ISO-PHY-385/390-4-TR-B-N(f)	380 - 385	390 - 395	
PRO-ISO-PHY-415/420-4-N(f)	410 - 415	420 - 425	
PRO-ISO-PHY-415/420-4-TR-F-N(f)	410 - 415	420 - 425	
PRO-ISO-PHY-415/420-4-TR-B-N(f)	410 - 415	420 - 425	
ACCESSORIES			
19" Front plate with connectors in front			
19" Front plate with connectors in back			

PRO-ISO-PHY-TETRA-4-TR-F-N(f)



PRO-ISO-PHY-TETRA-4-TR-B-N(f)

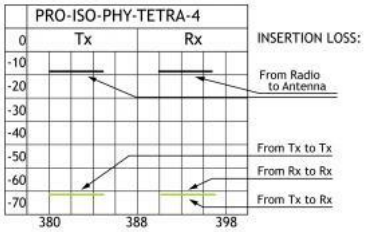


SPECIFICATIONS

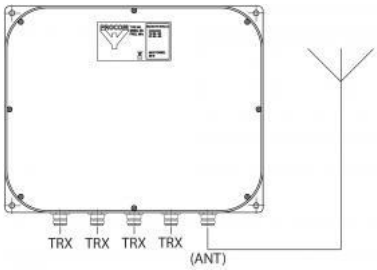
ELECTRICAL	
MODEL	PRO-ISO-PHY-TETRA-4
TYPE	TETRA combiner
TX/RX FREQUENCY	TX: 380 – 385 MHz RX: 390 – 395 MHz or TX: 410 - 415 MHz RX: 420 - 425 MHz
INSERTION LOSS TX-ANT.	< 9.7 Typ. 8.5 to 9.5 dB
INSERTION LOSS RX-ANT.	< 9.7 Typ. 8.5 to 9.5 dB
ISOLATION TRX → TRX	TX - TX: > 60 dB (380 – 385 MHz & 410 - 415 MHz) RX - RX: > 60 dB (390 – 395 MHz & 420 - 425 MHz) TX - RX / RX - TX: > 60 dB
SWR	< 1.5
MAX. POWER	25 W/station
GROUP DELAY VARIATION	TX-ANT. < 120 nsec. RX-ANT. < 150 nsec.
MECHANICAL	
CONNECTOR TYPE	N-female
COLOUR	Black
DIMENSIONS (L x W x H)	300 (excl. conn.) x 240 x 65 mm / 11.81 (excl. conn.) x 9.45 x 2.56 in.
WEIGHT	Approx. 6300 g / 13.89 lb.

ENVIRONMENTAL	
IP-GRADE	IP-62

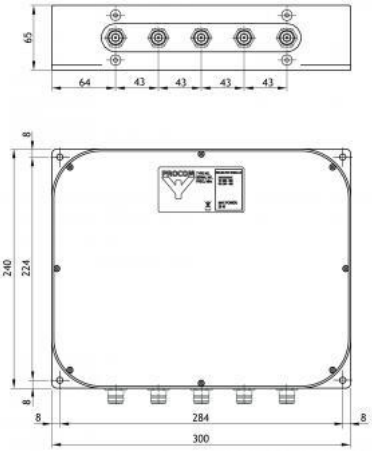
TYPICAL ATTENUATION VALUES



CONNECTION DIAGRAM



MOUNTING DETAILS



PRO-ISO-PHY-TETRA-3

Three-TETRA-Station Combiner

- The PRO-ISO-PHY-TETRA-3 combiner provides the possibillity of connecting up to three TETRA radios into one common antenna.
- The PRO-ISO-PHY-TETRA-3 models are available in the frequency range 380 - 420 MHz.

Replaced by
PRO-ISO-PHY-TETRA-S3

DESCRIPTION

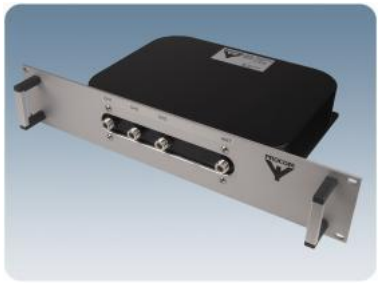
- ETSI compliant connection of four digital radios.
- The PRO-ISO-PHY-TETRA-3 has improved isolation between the ports - more than 60 dB - and low insertion loss.
- The use of high-quality system components such as highly selective helical duplex filters and high-performance isolators provides high isolation and secure communication.
- The smallest and most compact design on the market.
- Suitable for both stationary and mobile use.
- Also available in tray for 19" rack mounting.
- Vibration and shock tested in accordance with EN-60068**.

**Tested in accordance with:
Random test: EN 60068-2-64, test specification: EN 300 019-2-5 V3.0.0.
Shock test: EN 60068-2-27, test specification: EN 300 019-2-5 V3.0.0.
Bump test: EN 60068-2-29, test specification: EN 300 019-2-5 V3.0.0.

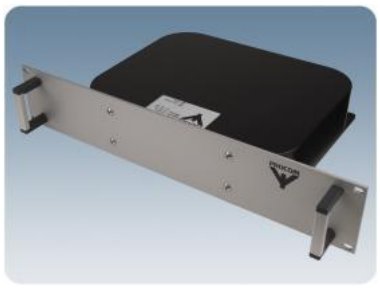
ORDERING DESIGNATIONS

TYPE	TX MHZ	RX MHZ	PRODUCT NO.
PRO-ISO-PHY-385/390-3-N(f)	380 - 385	390 - 395	**Replaced by** PRO-ISO-PHY-TETRA-S3
PRO-ISO-PHY-385/390-3-TR-F-N(f)	380 - 385	390 - 395	
PRO-ISO-PHY-385/390-3-TR-B-N(f)	380 - 385	390 - 395	
PRO-ISO-PHY-415/420-3-N(f)	410 - 415	420 - 425	
PRO-ISO-PHY-415/420-3-TR-F-N(f)	410 - 415	420 - 425	
PRO-ISO-PHY-415/420-3-TR-B-N(f)	410 - 415	420 - 425	
ACCESSORIES			
19" Front plate with connectors in front			
19" Front plate with connectors in back			

PRO-ISO-PHY-TETRA-3-TR-F-N(f)



PRO-ISO-PHY-TETRA-3-TR-B-N(f)

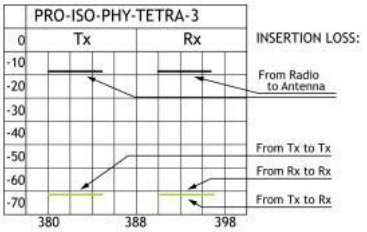


SPECIFICATIONS

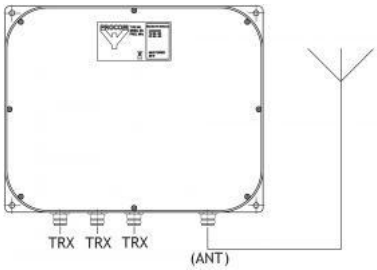
ELECTRICAL	
MODEL	PRO-ISO-PHY-TETRA-3
TYPE	TETRA combiner
TX/RX FREQUENCY	TX: 380 – 385 MHz RX: 390 – 395 MHz or TX: 410 - 415 MHz RX: 420 - 425 MHz
INSERTION LOSS TX-ANT.	< 9.7 Typ. 8.5 to 9.5 dB
INSERTION LOSS RX-ANT.	< 9.7 Typ. 8.5 to 9.5 dB
ISOLATION TRX → TRX	TX - TX: > 60 dB (380 – 385 MHz & 410 - 415 MHz) RX - RX: > 60 dB (390 – 395 MHz & 420 - 425 MHz) TX - RX / RX - TX: > 60 dB
SWR	< 1.5
MAX. POWER	25 W/station
GROUP DELAY VARIATION	TX-ANT. < 120 nsec. RX-ANT. < 150 nsec.
MECHANICAL	
CONNECTOR TYPE	N-female
COLOUR	Black
DIMENSIONS (L x W x H)	300 (excl. conn.) x 240 x 65 mm / 11.81 (excl. conn.) x 9.45 x 2.56 in.
WEIGHT	Approx. 5700 g / 12.57 lb.

ENVIRONMENTAL	
IP-GRADE	IP-62

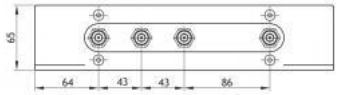
TYPICAL ATTENUATION VALUES

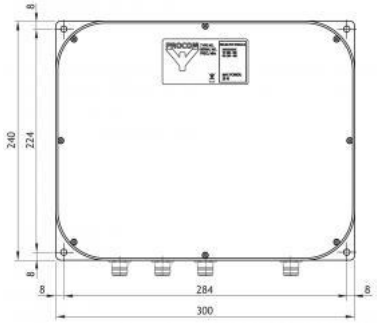


CONNECTION DIAGRAM



MOUNTING DETAILS





PRO-ISO-PHY-TETRA-2

Two-TETRA-Station Combiner

- The PRO-ISO-PHY-TETRA-2 combiner provides the possibillity of connecting up to two TETRA radios into one common antenna.
- The PRO-ISO-PHY-TETRA-2 models are available in the frequency range 380 - 420 MHz.

Replaced by PRO-ISO-PHY-TETRA-S2

DESCRIPTION

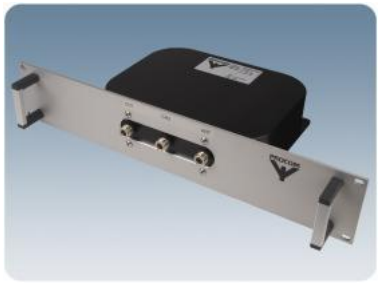
- ETSI compliant connection of two digital radios.
- The PRO-ISO-PHY-TETRA-2 is the successor to the PRO-MIX-PHY-TETRA-N-2RXI.
- The PRO-ISO-PHY-TETRA-2 has improved isolation between the ports - more than 60 dB - and lower insertion loss.
- The use of high-quality system components such as highly selective helical duplex filters and high-performance isolators provides high isolation and secure communication.
- The smallest and most compact design on the market.
- Suitable for both stationary and mobile use.
- Also available in tray for 19" rack mounting.
- Vibration and shock tested in accordance with EN-60068**.

**Tested in accordance with:
Random test: EN 60068-2-64, test specification: EN 300 019-2-5 V3.0.0.
Shock test: EN 60068-2-27, test specification: EN 300 019-2-5 V3.0.0.
Bump test: EN 60068-2-29, test specification: EN 300 019-2-5 V3.0.0.

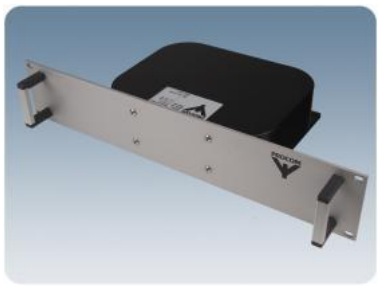
ORDERING DESIGNATIONS

TYPE	TX MHZ	RX MHZ	PRODUCT NO.
PRO-ISO-PHY-385/390-2-N(f)	380 - 385	390 - 395	Replaced by PRO-ISO-PHY-TETRA-S2
PRO-ISO-PHY-385/390-2-TR-F-N(f)	380 - 385	390 - 395	
PRO-ISO-PHY-385/390-2-TR-B-N(f)	380 - 385	390 - 395	
PRO-ISO-PHY-415/420-2-N(f)	410 - 415	420 - 425	
PRO-ISO-PHY-415/420-2-TR-F-N(f)	410 - 415	420 - 425	
RO-ISO-PHY-415/420-2-TR-B-N(f)	410 - 415	420 - 425	
ACCESSORIES			
19" Front plate with connectors in front			
19" Front plate with connectors in back			

PRO-ISO-PHY-TETRA-2-TR-F-N(f)



PRO-ISO-PHY-TETRA-2-TR-B-N(f)

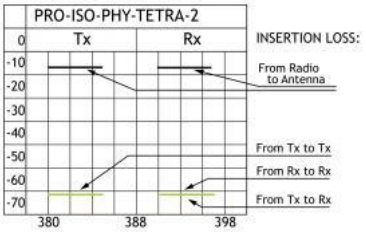


SPECIFICATIONS

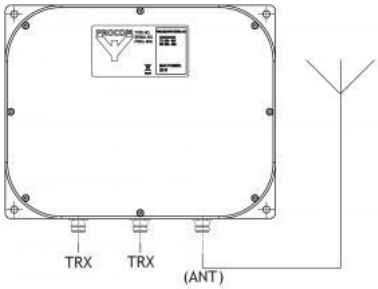
ELECTRICAL	
MODEL	PRO-ISO-PHY-TETRA-2
TYPE	TETRA combiner
TX/RX FREQUENCY	TX: 380 – 385 MHz RX: 390 – 395 MHz or TX: 410 - 415 MHz RX: 420 - 425 MHz
INSERTION LOSS TX-ANT.	< 6.2 dB (Typ. 4.8 to 6.0 dB)
INSERTION LOSS RX-ANT.	< 6.2 dB (Typ. 4.8 to 6.0 dB)
ISOLATION TRX → TRX	TX - TX: > 60 dB (380 – 385 MHz & 410 - 415 MHz) RX - RX: > 60 dB (390 – 395 MHz & 420 - 425 MHz) TX - RX / RX - TX: > 60 dB
SWR	< 1.5
MAX. POWER	25 W/station
GROUP DELAY VARIATION	TX-ANT. < 120 nsec. RX-ANT. < 150 nsec.
MECHANICAL	
CONNECTOR TYPE	N-female
COLOUR	Black
DIMENSIONS (L x W x H)	190 (excl. conn.) x 240 x 65 mm / 7.48 (excl. conn.) x 9.45 x 2.56 in.
WEIGHT	Approx. 3500 g / 7.72 lb.

ENVIRONMENTAL	
IP-GRADE	IP-62

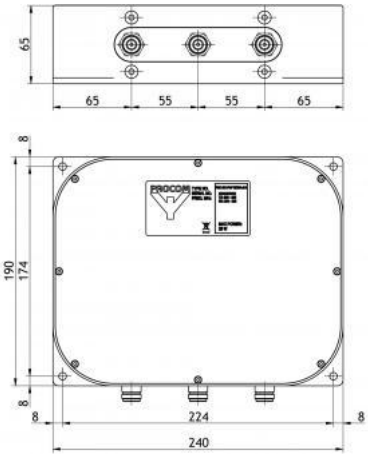
TYPICAL ATTENUATION VALUES



CONNECTION DIAGRAM



MOUNTING DETAILS



DCB 890-2300-7/16

DC-block for 890 - 2300 MHz

- DC-block for 890 - 2300 MHz.
- DC tap connected to a 3-pole DIN connector.

Description

- Don’t exceed 24 volts.
- The DIN connector has internal overvoltage protection.
- 2 models available: DC tab on male or female connector.

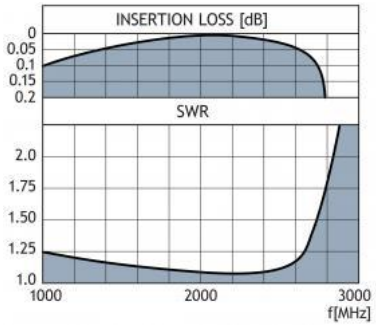
ORDERING DESIGNATIONS

TYPE		PRODUCT NO.
DCB 890-2300-7/16		210001184
DCB 890-2300-7/16-F(D)-M Male connector		210001188
DCB 890-2300-7/16-F-M (D) Female connector		210001189

SPECIFICATIONS

ELECTRICAL	
MODEL	DCB 890-2300-7/16-F(D)-M or DCB 890-2300-7/16-F-M (D)
FREQUENCY	890 - 2300 MHz
MAX. INPUT POWER	250 W
INSERTION LOSS	< 0.1 dB
MAX. VOLTAGE AT DIN-CONNECTOR	24 V
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.25
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	7/16 DIN-female / 7/16 DIN-male
DIMENSIONS (L x W x H)	80 x 43 x 55 mm
WEIGHT	Approx. 300 g

TYPICAL RESPONCE CURVE


INSERTION LOSS [dB]
0
0.05
0.1
0.15
0.2
SWR
2.0
1.75
1.50
1.25
1.0
1000
2000
3000
f[MHz]

DCB 1G-3G-SMA

DC-block for 1-3 GHz

- DC-block for 1-3 GHz.

Description

- DC tap.

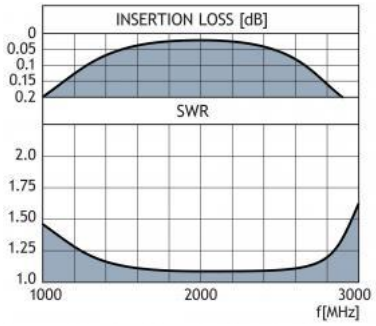
ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
DCB 1G-3G-SMA	210000496

SPECIFICATIONS

ELECTRICAL	
MODEL	DCB 1G-3G-SMA
FREQUENCY	1 - 3 GHz
MAX. INPUT POWER	25 W
INSERTION LOSS	< 0.1 dB (1300 - 2700 MHz)
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.25 (1300 - 2700 MHz)
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	SMA-female / SMA-female
DIMENSIONS (L x W x H)	45 x 35 x 15 mm
WEIGHT	Approx. 150 g

TYPICAL RESPONCE CURVE


INSERTION LOSS [dB]
0
0.05
0.1
0.15
0.2
SWR
2.0
1.75
1.50
1.25
1.0
1000
2000
3000
f[MHz]

PRO-BCU 130

Balanced Combiner Solution

- PRO-BCU 130 for upgrading site with an extra channel.
- Add an ekstra channel directly on-site without any re-tuning of the installed system.

Description

- Balanced structure with two identical filters and two 3 dB hubrid couplers.
- Suitable for 19” rack mounting.
- Expandable in the field.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-BCU 130	

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-BCU 130
TX FREQUENCY	112 - 137 MHz
MAX. INPUT POWER	150 W
TX-TX SPACING, Δ_{TX}	> 75 kHz
TX-TX ISOLATION	> 75 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
FREQ. STABILITY	Approx. 0.8 ppm/° C
CONNECTORS	N-female
DIMENSIONS (W x H x D)	19" x 10 HU x 765 (483 x 443 x 765 mm)
WEIGHT	Approx. 14.8 kg

PRO-BBPHY 4/2-20-.. dB-N

Broad Band Power Divider / Combiner

- Two antennas connected to the same transmitter or receiver.
- Broad band power splitter for radio systems.

Description

- Combining two transmitters on the same antenna.
  Note: The power splitter has to be mounted on an extra heat sink when used as a combiner. Max. 15 W per TX.
- Combining two signal generators.
- 30 W load built-in.

ORDERING DESIGNATIONS

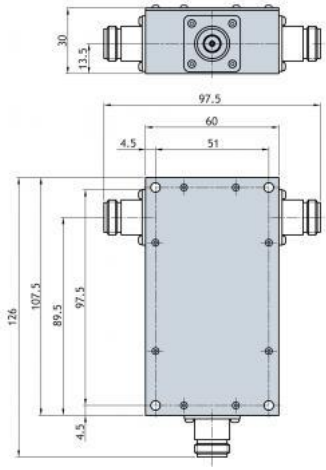
TYPE	PRODUCT NO.
PRO-BBMPHY 4/2-20-3 dB-N	210000291
PRO-BBMPHY 4/2-20-6 dB-N	210001240
PRO-BBMPHY 4/2-20-10 dB-N	210000289
PRO-BBMPHY 4/2-20-20 dB-N	210001241

SPECIFICATIONS

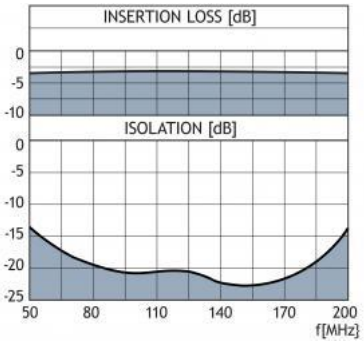
ELECTRICAL				
MODEL	PRO-BBPHY 4/2-20-.. dB-N			
	3 dB	6 dB	10 dB	20 dB
TYPE	Cascaded Wilkinson-hybrid			
FREQUENCY	70 - 175 MHz			
MAX. INPUT POWER	30 W when used as a power splitter - 15 W per channel when used as a hybrid combiner. Note: Extra cooling necessary when used as a hybrid combiner			
INSERTION LOSS	< 3.8 dB typ. < 3.4 dB	??	< 10 dB ±1.5 dB typ. < 10 dB ±1 dB	??
ISOLATION TX_1 , TX_2	> 16 dB 70 - 175 MHz, typ. > 20.5 dB	??	> 17 dB 70 - 175 MHz, typ. > 19 dB	??
PHASE TX_1 , TX_2	0°			
IMPEDANCE	Nom. 50 Ω			
LOAD	30 W load built-in			
SWR	< 1.5 all other ports terminated with 50 Ω (typically < 1.4)			

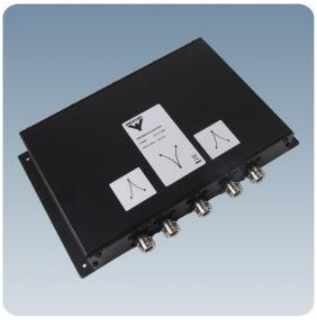
MECHANICAL			
TEMP. RANGE	–30° C → +60° C		
CONNECTOR TYPE	N-female (other types available)		
DIMENSIONS (L x W x H)	126 (incl. conn.) x 97.5 (incl. conn.) x 30.3 mm		
WEIGHT	Approx. 400 g		

MOUNTING DETAIL



TYPICAL RESPONCE CURVE for 3 dB





PRO-BBPHY 4/146-470-20-N

Broad Band Power Divider 1:4

- Four antennas connected to the same transmitter or receiver.
- Broad band power splitter for radio systems.

Description

- Combining four transmitters on the same antenna.
  Note: The power splitter has to be mounted on an extra heat sink when used as a combiner. Max. 15 W per TX.
- Built-in 30 W load.

ORDERING DESIGNATION

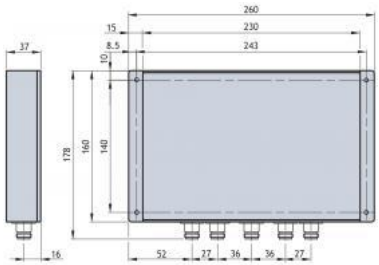
TYPE NO.	PRODUCT NO.
PRO-BBPHY 4/146-470-20-N	210000470

SPECIFICATIONS

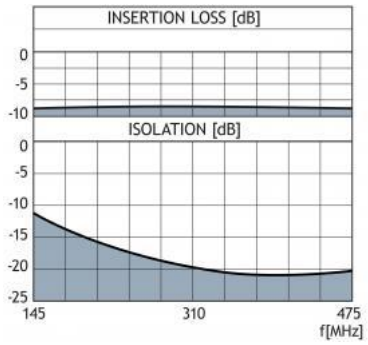
ELECTRICAL	
MODEL	PRO-BBPHY 4/146-470-20-N
TYPE	Cascaded Wilkinson multisection hybrids
FREQUENCY	146 - 470 MHz
MAX. INPUT POWER	30 W when used as a power splitter - 15 W per channel when used as a hybrid combiner. Note: Extra cooling necessary when used as a hybrid combiner
INSERTION LOSS	< 8.5 dB
ISOLATION	> 11 dB, 146 - 220 MHz, > 18 dB, 220 - 470 MHz
IMPEDANCE	Nom. 50 Ω
LOAD	Built-in 30 W load
SWR	< 1.5 all other ports terminated with 50 Ω
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTOR TYPE	N-female (other types available)
DIMENSIONS (L x W x H)	260 x 178 (incl. conn.) x 37 mm
WEIGHT	Approx. 800 g

MOUNTING	ø4 mm (four holes)

MOUNTING DETAILS



TYPICAL RESPONSE CURVE



PRO-BBPHY 2/70-20-6 dB-N

Broad Band Unsymmetrical Power Divider 1:4

- Used where unsymmetrical splitting of the signal is required.
- Two antennas connected to the same transmitter or receiver where 25% of the signal either comes from or is transmitted to one of the antennas.

Description

- Broad band power splitter for radio systems. Max. 30 W.
- 30 W load built-in.

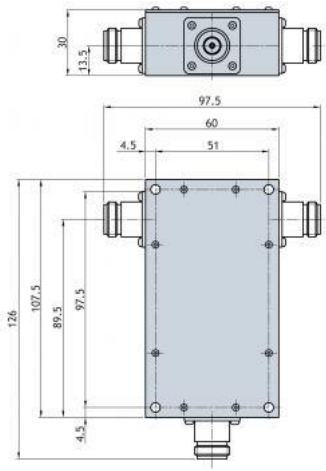
ORDERING DESIGNATION

TYPE NO.	PRODUCT NO.
PRO-BBPHY 2/70-20-6 dB-N	210000468

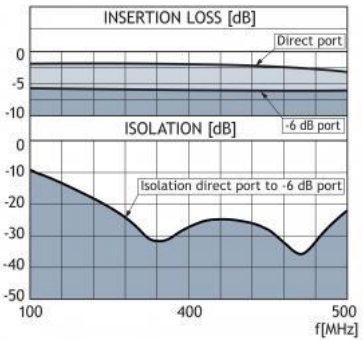
SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-BBPHY 2/70-20-6 dB-N
TYPE	Cascaded Wilkinson-hybrid
FREQUENCY	146 - 470 MHz
MAX. INPUT POWER	30 W when used as a power splitter
INSERTION LOSS	Main port: Typically < 2.2 dB, max. 3.2 dB -6 dB port: 6 dB±0.5 dB (typically 6 dB±0.3 dB)
ISOLATION	> 14 dB, 146 - 470 MHz, typically > 20 dB
IMPEDANCE	Nom. 50 Ω
LOAD	30 W load built-in
SWR High power & input port	< 1.5 (typically ≤ 1.3 dB) all other ports terminated with 50 Ω
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTOR TYPE	N-female (other types available)
DIMENSIONS (L x W x H)	126 (incl. conn.) x 97.5 (incl. conn.) x 30.3 mm
WEIGHT	Approx. 400 g

MOUNTING DETAILS



TYPICAL RESPONSE CURVE



PRO-BBPHY 2/70-20-3 dB-N

Broad Band Power Divider 1:2

- Two antennas connected to the same transmitter or receiver.
- Broad band power splitter for radio systems.

Description

- Combining two transmitters on the same antenna.
  Note: The power splitter has to be mounted on an extra heat sink when used as a combiner. Max. 15 W per TX.
- Combining two signal generators.
- 30 W load built-in.

ORDERING DESIGNATION

TYPE NO.	PRODUCT NO.
PRO-BBPHY 2/70-20-3 dB-N	210000282

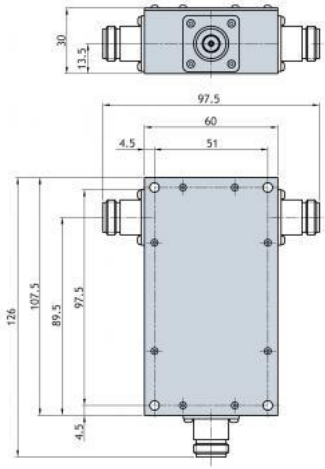
SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-BBPHY 2/70-20-3 dB-N
TYPE	Cascaded Wilkinson-hybrid
FREQUENCY	146 - 470 MHz
MAX. INPUT POWER	30 W when used as a power splitter - 15 W per channel when used as a hybrid combiner. Note: Extra cooling necessary when used as a hybrid combiner
INSERTION LOSS	< 4.5 dB
ISOLATION TX_1 , TX_2	> 11 dB, 146-470 MHz, typically > 17 dB
PHASE TX_1 , TX_2	0°
IMPEDANCE	Nom. 50 Ω
LOAD	30 W load built-in
SWR	< 1.5 all other ports terminated with 50 Ω
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTOR TYPE	N-female (other types available)
DIMENSIONS (L x W x H)	126 (incl. conn.) x 97.5 (incl. conn.) x 30.3 mm

WEIGHT	Approx. 400 g

TYPICAL RESPONSE CURVE

MOUNTING DETAILS



RPD 145-470/800-1000-10-N

Couplers

- Coupler with 8 - 14 dB coupling covering the 2 m, 70 cm, GSM and GPS bands.

DESCRIPTION

- Very broad-banded performance.

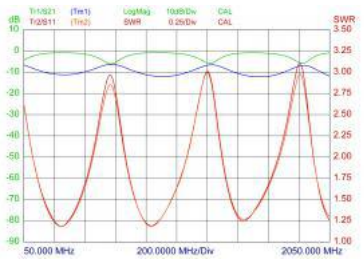
ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
RPD 145-470/800-1000-10-N	210001193

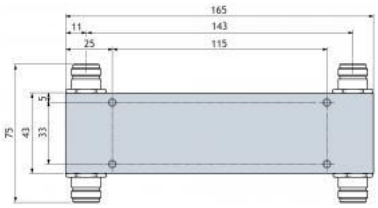
SPECIFICATIONS

ELECTRICAL	
MODEL	RPD 145-470/800-1000-10-N
FREQUENCY RANGE	2 m and 70 cm: 145 - 470 MHz GSM: 800 - 1000 MHz GPS: 1575 MHz
COUPLING	8 - 14 dB
MAX. INPUT POWER	50 W
TOTAL LOSS	
IMPEDANCE	Nom. 50 Ω
INPUT SWR	≤2.0
COMPLIANCE	RoHS, IP65
MECHANICAL	
CONNECTORS	N-female
DIMENSIONS (L x W x H)	165 x 75 x 23 mm
WEIGHT	Approx. 375 g
MOUNTING	M4 mm (4 holes)
ENVIRONMENTAL	
TEMP. RANGE	-30° C → +60° C

TYPICAL RESPONSE CURVE



MOUNTING DETAILS



RH 1800/...

Hybrid Ring Combiner for 1800 MHz Cellular BAse Station Transmitters

- The RH 1800/... is a hybrid ring combiner providing the possibility of operating two transmitters with very little or no frequency separation on the same antenna.
- The combiner forms part of the combining systems of cellular 1800 MHz base stations where multiple transmitters must be connected to a common antenna.

DESCRIPTION

- The RH 1800/... provides easy expandability as several devices can be mounted in a row as shown on the figure below.
- Materials used are aludine-treated aluminium, silvered brass and teflon. The combiners are supplied with a coating of black, 2-component polyurethane.
- The RH 1800/... is as standard provided with 7/16” connectors. Combiners with other connector types may be quoted on request.

ORDERING DESIGNATIONS

TYPE NO.	PRODUCT NO.
RH 1800/...	210001251

SPECIFICATIONS

ELECTRICAL	
FILTER TYPE	Hybrid Ring Junction
FREQUENCY	1800 MHz cellular bands
MAX. INPUT POWER	200 W
INSERTION LOSS	Nom.: 3.01 dB Typ.: 3.05 dB
ISOLATION $TX_1 \rightarrow TX_2$	35 dB at $SWR_{ANT} \leq 1.1$ 20 dB at $SWR_{ANT} \leq 1.5$
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.25 with all other ports terminated
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	7/16''
LENGTH	ø120 mm excl. connectors 162 mm incl. connectors
WIDTH	29 mm
HEIGTH	137 mm incl. connectors
WEIGHT	Approx. 2.2 kg

MODE OF OPERATION

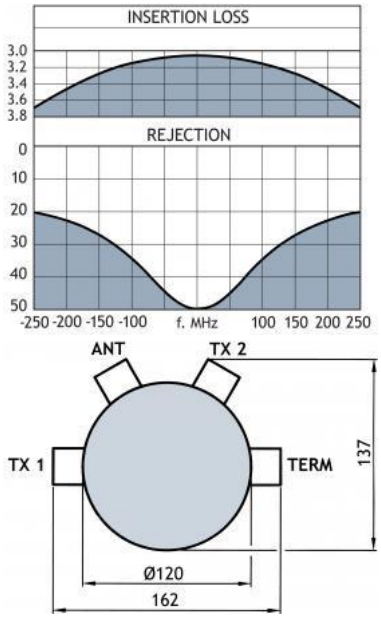
In the combiner the transmitting signals arrive 180° out of phase at each others ports.This results in an isolation of more than 30 dB from one transmitter to the other, which highly reduces the possibility of formation of intermodulation products.

Normally, isolators provided with second-harmonic filters are inserted in each branch between the transmitters and the combiner in order to increase the isolation between the transmitters further, and to prevent intermodulation caused by outside interfering signals entering the transmitter output stages from the antenna port.

The inherent insertion loss of the combiner from each TX-port to the antenna is 3 dB, which is inevitable when operating with very little or no channel spacing. Half of the power of each TX is fed to the fourth port where a suitably dimensioned 50 Ω load termination must be connected. This termination is not supplied and it should have a VSWR not exceeding 1:1.1.

The isolation between the TX-ports is highly dependent on the VSWR on the antenna port. At an antenna standing-waveratio of 1.5 the isolation will be reduced to 20 dB (please, see the low curve).

TYPICAL RESPONSE CURVE



PRO-PHY85-4

4-Channel Hybrid Combiner for 85 MHz Transmitters

- Combining four transmitters or receivers on the same antenna.
- Better utilization of good antenna position.

DESCRIPTION

- Four antennas on the same transmitter or receiver.
- The only combining option with very small TX-TX frequency spacing.
- 60 W load supplied (other loads or no load as option).

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.	FREQUENCY
PRO-PHY85-4-1	210000783	68 - 73 MHz
PRO-PHY85-4-2	210000784	72 - 77 MHz
PRO-PHY85-4-3	210000627	76 - 81 MHz
PRO-PHY85-4-4	210000567	80 - 85 MHz
PRO-PHY85-4-5	210000568	84 - 88 MHz

SPECIFICATIONS

ELECTRICAL	
FILTER TYPE	Hybrid Junction
FREQUENCY	68 - 88 MHz (see table)
MAX. INPUT POWER	65 W per channel (max. 150 W with larger load)
INSERTION LOSS	< 6.2 dB ± 0.3 dB @ 4 MHz BW < 6.3 dB ± 0.3 dB @ 8 MHz BW
ISOLATION TX_1-TX_2 (*see note)	> 31 dB @ 4 MHz BW > 29 dB @ 8 MHz BW
IMPEDANCE	Nom. 50 Ω
LOAD (**see note)	30 W load fitted (other ratings available)
SWR	< 1.5 with all other ports terminated with 50 Ω
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	N-female (other types available)
DIMENSIONS (L x W x H)	420 x 89 (incl. conn.) x 42 mm (excl. loads)
WEIGHT	Approx. 1400 g (excl. load)

*The isolation between the TX ports is directly dependent on the terminating SWR on the antenna port. With an antenna load SWR = 1.5, the isolation between the two TX ports will be reduced to 20 dB @ 5 MHz bandwidth.

**The SWR of the load's should be < 1.1! Each load should be able to dissipate 3/4 of the input power.

E.g.: With 50 W input, each load should be able to dissipate 50 W x 3/4 = 37 W.

CURVES

PRO-PHY-500-3400-4

Ultra Wideband 4-way combiner supporting GSM, DCS1800, PCS1900, UMTS, WiFi 2.4, 4G LTE (2600) and WIMAX

- Combiner for coupling of four transceivers on one common antenna.
- For parallel operation of four two-way communication radios (transceivers) where highest possible decoupling (isolation) is necessary.

DESCRIPTION

- Max. transmitter power 4 x 5 W.
- Also usable as equal power divider for max. 20 W.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-PHY 500-3400-4-SMA	210002139

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-PHY 500-3400-4-SMA(f)
FREQUENCY	500 - 3400 MHz
MAX. INPUT POWER	1 x 20 W if used as divider 4 x 5 W if used as coupler
NOMINAL DIVIDER LOSS	6.0 dB
TOTAL LOSS INCL. SPLITTER LOSS /COUPLER LOSS	≤ 9.2 dB
ISOLATION	Port Tx/Rx to Tx/Rx> 18 dB (typ> 20 dB)
IMPEDANCE	Nom. 50 Ω
SWR	
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTOR TYPE	SMA-connectors
DIMENSIONS (L x W x H)	133 x 93.6 x 19.2 / 5.2 x 3.7 x 0.76 (including connectors)
WEIGHT	Approx. 400 g / 0.88 lb.
MOUNTING	ø3 mm t(four holes)

MOUNTING DETAILS

PRO-PHY 380-520-3 dB-N XS

Hybrid Coupler 100 W

- 100 W Hybrid Coupler with 3 dB coupling covering the 380 - 520 MHz band.

DESCRIPTION

- Excellent high power performance.
- Very low insertion loss over the entire frequency range.

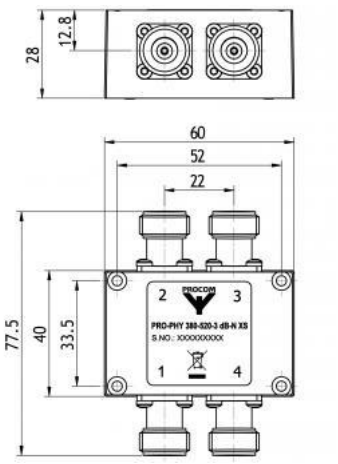
ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-PHY 380-520-3 dB-N XS	210001845

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-PHY 380-520-3 dB-N XS
FREQUENCY RANGE	380 - 520 MHz
INSERTION LOSS Port 1 to 2 or port 1 to 3	 < 3.3 ± 0.5 dB
ISOLATION Port 1 to 4 or port 2 to 3	 > 20 dB
IMPEDANCE	Nom. 50 Ω
SWR ON ALL PORTS	≤ 1.3
COMPLIANCE	RoHS, IP64
MECHANICAL	
TEMP. RANGE	-30° C → +60° C
CONNECTORS	N-female
DIMENSIONS (L x W x H)	59 x 40 x 28 mm
WEIGHT	Approx. 180 g

MOUNTING DETAILS



TYPICAL GAIN AND SWR CURVES

PHY-TETRA-4-FME-...

TETRA combiner with SWR adaption/adjustment network

- Combiner for coupling of four TETRA mobile transceivers on one common antenna.
- Factory-adjusted to either 380 - 410 MHz or 400 - 430 MHz.
- Compact dimensions – especially suitable for mobile applications.
- FME-connectors for direct connection of FME-cable without extra adapter.

DESCRIPTION

- For parallel operation of four two-way communication radios (transceivers) where highest possible decoupling (isolation) is necessary.
- Integrated SWR adjustment network for optimization of isolation in the frequency range of 380 - 410 MHz or 400 - 430 MHz. Via the adjustment network the effective SWR of the antenna can be optimized and consequently the isolation between the ports of the combiner clearly improved.
- High isolation obtainable: Up to 60 dB (Dependent on the SWR of the connected antenna).
- The adjustment of the SWR adjustment network takes place via built-in variable capacitors.
- Max. TETRA transmitter power 4 x 5 W.
- Also usable as equal power divider for max. 20 W.
- Very small ripple over the total frequency range.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PHY-TETRA-4-FME-380-410	210002057
PHY-TETRA-4-FME-400-430	210002058

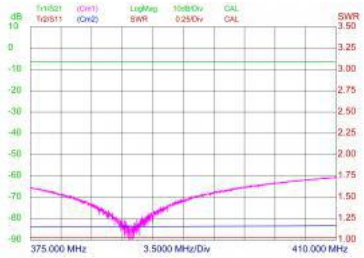
SPECIFICATIONS

ELECTRICAL	
MODEL	PHY-TETRA-4-FME-...
FREQUENCY	380 - 410 MHz or 400 - 430 MHz
MAX. INPUT POWER (TETRA)	1 x 20 W if used as divider 4 x 5 W if used as coupler -
NOMINAL DIVIDER LOSS	6.0 dB
TOTAL LOSS INCL. SPLITTER LOSS /COUPLER LOSS	≤ 7.0 dB
IMPEDANCE	Nom. 50 Ω
SWR	
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTOR TYPE	FME-connectors
DIMENSIONS (L x W x H)	56.7 x 100 (including bottom plate and connectors) x 22 mm / 2.23 x 3.94 (including bottom plate and connectors) x 0.87 in.

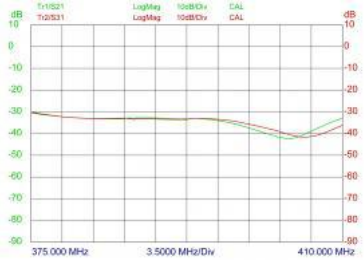
WEIGHT	Approx. 140 g / 0.31 lb.
MOUNTING	ø4 mm (two holes)

MOUNTING DETAILS

TYPICAL RESPONSE CURVE SWR 1



TYPICAL RESPONSE CURVE ANTENNA MU 1-Z/s (with 1.5 m cable)



TYPICAL RESPONSE CURVE ANTENNA MU 3-BZ/TETRA/l (with 1.5 m cable)

PHY-TETRA-2-FME-...

TETRA combiner with SWR adaption/adjustment network

- Combiner for coupling of two TETRA mobile transceivers on one common antenna.
- Factory-adjusted to either 380 - 410 MHz or 400 - 430 MHz.
- Compact dimensions – especially suitable for mobile applications.
- FME-connectors for direct connection of FME-cable without extra adapter.

DESCRIPTION

- For parallel operation of two two-way communication radios (transceivers) where highest possible decoupling (isolation) is necessary.
- Integrated SWR adjustment network for optimization of isolation in the frequency range of 380 - 410 MHz or 400 - 430 MHz. Via the adjustment network the effective SWR of the antenna can be optimized and consequently the isolation between the ports of the combiner clearly improved.
- High isolation obtainable: Up to 60 dB (Dependent on the SWR of the connected antenna).
- The adjustment of the SWR adjustment network takes place via built-in variable capacitors.
- Max. TETRA transmitter power 2 x 10 W.
- Also usable as equal power divider for max. 20 W.
- Very small ripple over the total frequency range.

ORDERING DESIGNATIONS

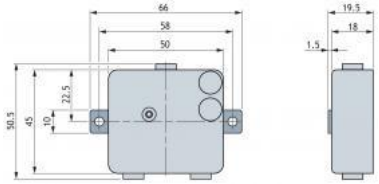
TYPE	PRODUCT NO.
PHY-TETRA-2-FME-380-410	210001836
PHY-TETRA-2-FME-400-430	210001837

SPECIFICATIONS

ELECTRICAL	
MODEL	PHY-TETRA-2-FME-...
FREQUENCY	380 - 410 MHz or 400 - 430 MHz
MAX. INPUT POWER (TETRA)	1 x 20 W if used as divider 2 x 10 W if used as coupler - if more than 2 x 5 W, mounting on metal plate is recommended!
NOMINAL DIVIDER LOSS	3.0 dB
TOTAL LOSS INCL. SPLITTER LOSS /COUPLER LOSS	≤ 3.5 dB
IMPEDANCE	Nom. 50 Ω
SWR	< 1.25
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTOR TYPE	FME-connectors
DIMENSIONS (L x W x H)	50.5 x 66 (including bottom plate

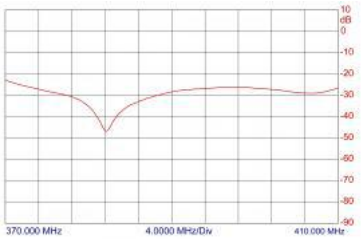
	and connectors) x 19.5 mm / 1.99 x 2.59 (including bottom plate and connectors) x 0.77 in.
WEIGHT	Approx. 360 g / 0.79 lb.
MOUNTING	ø4 mm (two holes)

MOUNTING DETAILS

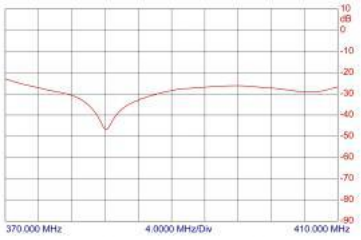


TYPICAL RESPONSE CURVE SWR 1

TYPICAL RESPONSE CURVE ANTENNA MU 1-Z/s (with 1.5 m cable)



TYPICAL RESPONSE CURVE ANTENNA MU 3-BZ/TETRA/l (with 1.5 m cable)



PRO-AREL1-12V

Alarm box used for detecting high SWR in antenna systems.

- PRO-AREL1-12V is an alarm box used for detecting high SWR in antenna systems. The PRO-AREL1-12V is connected to a power monitor, e.g. PRO-PM2-2/70 25W, and this will enable you to adjust the power monitor so that the PRO-AREL1-12V gives an alarm signal at e.g. SWR 2:1 at a certain frequency/power.

DESCRIPTION

- The alarm drives a latched relay and a light-emitting diode and that mode is active until the reset button is pressed.
- It is possible to connect an external alarm such as light, loudspeaker etc. (max. 1 A, NC or NO on a contact rail).

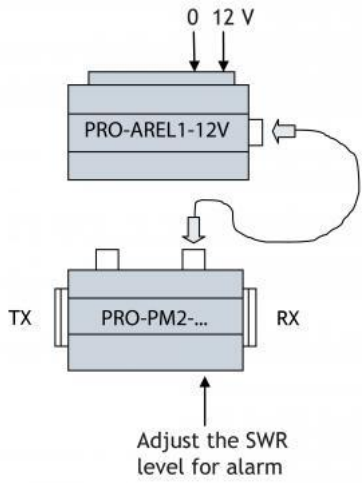
ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-AREL1-12V	210001186

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-AREL1-12V
TYPE	Alarm box
POWER	11 - 14 V
CURRENT	10 mA
CURRENT WITH ALARM	30 mA
RELAY CONTACT	NC/NO AC-DC 1A
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	Screw terminal and Phono connector
DIMENSIONS (L x W x H)	50 x 41 x 20 mm/ 1.97 x 1.61 x 0.79 in.
WEIGHT	Approx. 110 g/ 0.24 lb.

FUNCTIONAL DIAGRAM



1. Connect PRO-AREL1-12V to PRO-PM2-... to REV ANT and connect 12 V to PRO-AREL1-12V.
2. Adjust the trimming potentiometer on PRO-PM2-... to minimum (anti-clockwise).
3. Connect a load to the PRO-PM2-... corresponding to the SWR required, e.g. 25 Ω SWR 2:1.
4. Connect the signal of the required frequency and power to PRO-PM2-....
5. If the alarm is lighting, press RESET. If the alarm does not stop, adjust the trimming potentiometer on the PRO-PM2-2/70 to minimum and press RESET.
6. Slowly adjust the trimming potentiometer on the PRO-PM2-... clockwise until the alarm starts.

PRO-BBPHY 2/70-20-10 dB-N

Broad Band Unsymmetrical Power Divider 1:10

- Used where unsymmetrical splitting of the signal is required.
- Two antennas connected to the same transmitter or receiver where 10% of the signal either comes from or is transmitted to one of the antennas.

DESCRIPTION

- Broad band power splitter for radio systems. Max. 30 W.
- 30 W load built-in.

ORDERING DESIGNATION

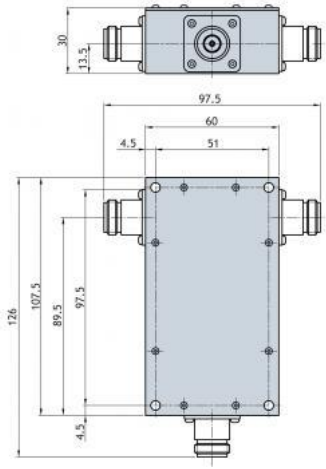
TYPE NO.	PRODUCT NO.
PRO-BBPHY 2/70-20-10 dB-N	210000281

SPECIFICATION

ELECTRICAL	
MODEL	PRO-BBPHY 2/70-20-10 dB-N
TYPE	Cascaded Wilkinson-hybrid
FREQUENCY	146 - 470 MHz
MAX. INPUT POWER	30 W when used as a power splitter
INSERTION LOSS	High power port: < 3.2 dB typically 2.4 dB Low power port: -10 dB±1 dB (typically -10 dB±0.6 dB)
ISOLATION Low to high power port	> 14 dB (typically > 17 dB)
IMPEDANCE	Nom. 50 Ω
LOAD	30 W load built-in
SWR High power & input port	< 1.5 (typically ≤ 1.3 dB) all other ports terminated with 50 Ω
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTOR TYPE	N-female (other types available)
DIMENSIONS (L x W x H)	126 (incl. conn.) x 97.5 (incl. conn.) x 30.3 mm
WEIGHT	Approx. 400 g

TYPICAL RESPONSE CURVE

MOUNTING DETAILS



PRO-BBMPHY-74-175-3 dB-100W

Broad Band Power Divider / Combiner

- Two antennas connected to the same transmitter or receiver.
- Broad band power splitter for radio systems.

DESCRIPTION

- Combining of two transmitters on the same antenna.
- Note: The power splitter has a built-in heat sink.
  Max. 40 W per TX.
- 100 W load built-in.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-BBMPHY-74-175-3 dB-100W	210000286

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-BBMPHY-74-175-3 dB-100W
TYPE	Cascaded Wilkinson-hybrid
FREQUENCY	74 - 175 MHz
MAX. INPUT POWER	100 W when used as a power splitter - 40 W per channel when used as a hybrid combiner. Note: Gets hot when used as a hybrid combiner. (Up to approx. 80° C)
INSERTION LOSS	< 3.6 dB
ISOLATION TX_1 , TX_2	> 20 dB
PHASE TX_1 , TX_2	0°
IMPEDANCE	Nom. 50 Ω
LOAD	100 W load built-in
SWR	< 1.5 with all other ports terminated with 50 Ω
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTOR TYPE	N-female (other types available)
DIMENSIONS (L x W x H)	196 (incl. conn.) x 128 x 70 mm
WEIGHT	Approx. 1.3 kg

TYPICAL RESPONSE CURVE

PRO-BBMPHY-450-2-N

Broad Band Power Divider / Combiner

- Two antennas connected to the same transmitter or receiver.
- Broad band power splitter for radio systems.

DESCRIPTION

- Combining two transmitters on the same antenna.
  Note: The power splitter has to be mounted on an extra heat sink when used as a combiner. Max. 15 W per TX.
- Combining two signal generators.
- 30 W load built-in.

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-BBMPHY-450-2-N
TYPE	Cascaded Wilkinson-hybrid
FREQUENCY	430 - 470 MHz (other frequencies on request)
MAX. INPUT POWER	30 W when used as a power splitter - 15 W per channel when used as a hybrid combiner. Note: Extra cooling necessary when used as a hybrid combiner
BANDWIDTH	30 MHz min. Can be extended.
INSERTION LOSS	< 3.6 dB, typically < 3.4 dB
ISOLATION TX_1 , TX_2	> 20 dB, typically > 23 dB
PHASE TX_1 , TX_2	0°
IMPEDANCE	Nom. 50 Ω
LOAD	30 W load built-in
SWR	< 1.5 (typically < 1.35)
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTOR TYPE	N-female (other types available)
DIMENSIONS (L x W x H)	130 (incl. conn.) x 152 x 35 mm
WEIGHT	Approx. 400 g

TYPICAL RESPONSE CURVE

PRO-BBMPHY-200-2-N

Broad Band Power Divider / Combiner

- Two antennas connected to the same transmitter or receiver.
- Broad band power divider for radio systems.

DESCRIPTION

- Combining two transmitters on the same antenna.
  Note: The power divider has to be mounted on an extra heat sink when used as a combiner. Max. 10 W per TX.
- Combining two signal generators.
- 20 W load built-in.

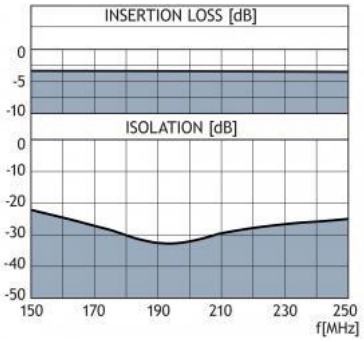
ORDERING DESIGNATION

TYPE	PRODUCT NO.
PRO-BBMPHY-200-2-N	210001111

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-BBMPHY-200-2-N
TYPE	Cascaded Wilkinson-hybrid
FREQUENCY	175 - 225 MHz
MAX. INPUT POWER	20 W when used as a power divider. 10 W per channel when used as a hybrid combiner. Note: Extra cooling necessary when used as a hybrid combiner
INSERTION LOSS	< 0.6 dB, typically < 0.5 dB
ISOLATION TX_1 , TX_2	> 24 dB, typically > 26 dB
PHASE TX_1 , TX_2	0°
IMPEDANCE	Nom. 50 Ω
LOAD	30 W load built-in
SWR	< 1.6 all other ports terminated with 50 Ω
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTOR TYPE	N-female (other types available)
DIMENSIONS (L x W x H)	130 (incl. conn.) x 152 x 35 mm

TYPICAL RESPONSE CURVE



PRO-BBMPHY-150-2-N

Broad Band Power Divider / Combiner

- Two antennas connected to the same transmitter or receiver.
- Broad band power divider for radio systems.

DESCRIPTION

- Combining two transmitters on the same antenna.
- Note: The power divider has to be mounted on an extra heat sink when used as a combiner. Max. 15 W per TX.
- Combining two signal generators.
- 30 W load built-in.

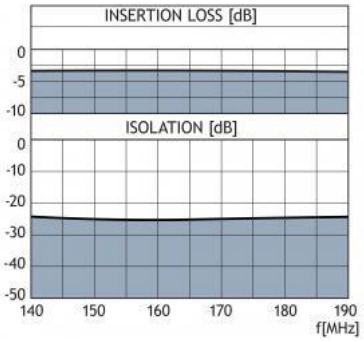
ORDER DESIGNATIONS

TYPE	PRODUCT NO.
PRO-BBMPHY-150-2-N	210000287

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-BBMPHY-150-2-N
TYPE	Cascaded Wilkinson-hybrid
FREQUENCY	144 - 175 MHz
MAX. INPUT POWER	30 W when used as a power divider. 15 W per channel when used as a hybrid combiner. Note: Extra cooling necessary when used as a hybrid combiner
INSERTION LOSS	< 3.6 dB, typically < 3.4 dB
ISOLATION TX_1 , TX_2	> 24 dB, typically > 26 dB
PHASE TX_1 , TX_2	0°
IMPEDANCE	Nom. 50 Ω
LOAD	30 W load built-in
SWR	< 1.6 all other ports terminated with 50 Ω
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTOR TYPE	N-female (other types available)
DIMENSIONS (L x W x H)	130 (incl. conn.) x 152 x 35 mm
WEIGHT	Approx. 400 g

TYPICAL RESPONCE CURVE



PRO-2REL-1PM-12V-...-TNC

Relay

DESCRIPTION

- The PRO-2RE-1PM-12V-...-TNC is a relay box that can be used in simplex systems to avoid a simultaneous transmission on two channels.
- When transmitting on one channel, the other channel changes to the LOAD port to make sure that the system is secured against a simultaneous transmission on two channels.
- PRO-2RE-1PM-12V-...-TNC units can be interconnected via a data cable for mutual control (1 unit pr. channel).
- PRO-2RE-1PM-12V-...-TNC has one terminal for LED that goes high (12 V) when Tx is transmitting.

ORDERING DESIGNATIONS

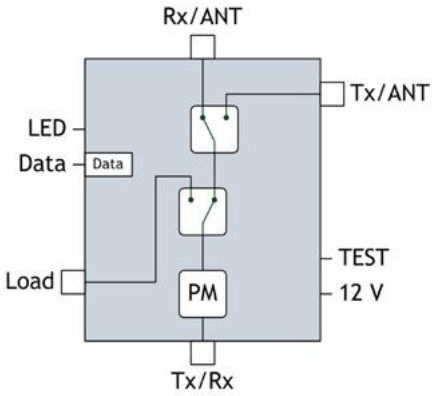
TYPE	PRODUCT NO.	FREQUENCY RANGE
PRO-2REL-1PM-12V-L-TNC	210001814	68 - 175 MHz
PRO-2REL-1PM-12V-H-TNC	210001448	300 - 470 MHz
PRO-2REL-1PM-12V-L-TNC/N	210002378	68 - 175 MHz

ELECTRICAL	
MODEL	PRO-2REL-1PM-12V-...-TNC
TYPE	Relay
FREQUENCY RANGE	68 - 175 MHz or 300 - 470 MHz
SUPPLY VOLTAGE DC	11.5 V to 15 V
CURRENT	200 mA
POWER OPERATIONS RANGE	Min. 2 W Max. 40 W
INSERTION LOSS	< 0.5 dB
ISOLATION	>50 dB
SWR	< 1.5
SHIFT TIME	< 5 ms
OPERATIONS	10^7
MECHANICAL	
CONNECTORS	TNC
DIMENSIONS (L x W x H)	90 x 77 x 28 mm/ 3.54 x 3.03 x 1.10 in. (incl. connectors)
WEIGHT	Approx. 150 g/ 0.33 lb.
MOUNTING	ø3.2 mm / ø0.13 in. (4 holes)

MOUNTING DETAILS

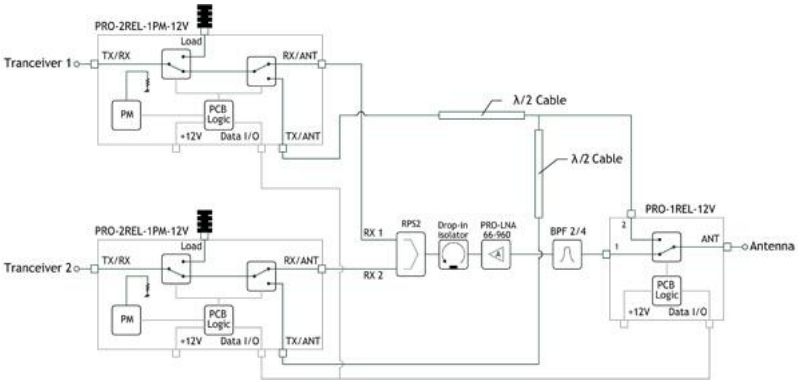
{start_next_col}

FUNCTIONAL DIAGRAM

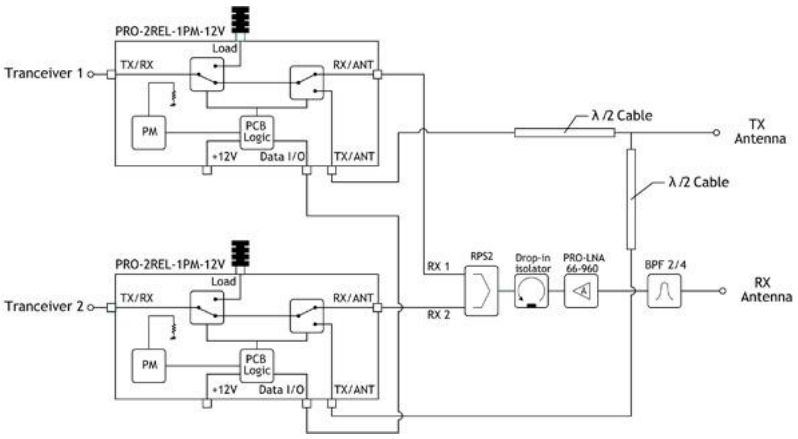


{start_next_col}

Application Example 1.
2 channel simplex combiner with one ant



Application Example 2.
2 channel simplex combiner with two ant TX and RX



PRO-RPS-4-N

4-Channel RX Power Splitter

- Low power, compact 4-channel power splitter/combiner.
- The splitter covers the frequency range from 50–1000 MHz.

DESCRIPTION

- Almost no ripple in loss and isolation over the entire frequency range.

ORDERING DESIGNATIONS

TYPE NO.	PRODUCT NO.
PRO-RPS-4-N	210000593

SPECIFICATIONS

ELECTRICAL	
FREQUENCY RANGE	50-1000 MHz
MAX INPUT POWER	2 W
INSERTION LOSS (above 6 dB)	< 1.5 dB
ISOLATION OUTPUT TO OUTPUT	> 20 dB
IMPEDANCE	Nom. 50 Ω
SWR	< 1.3
MECHANICAL	
TEMP. RANGE	-30° C → +60° C
CONNECTORS	N-female
DIMENSIONS (L x W x H)	89 x 39 x 29 mm
WEIGHT	Approx. 200 g

INSERTION LOSS & ISOLATION

PRO-RPS-4-GPS-N

4-channel RX Power Splitter

- Passive receiver power splitter.
- Large frequency range. 1500 MHz to 1650 MHz.
- High isolation between outputs. > 20 dB.

DESCRIPTION

- To be used where RF-signals, special GPS-signals shall be divided or combined:
  - more receivers connected to the same coaxial cable
  - more GPS-antennas on the same coaxial cable
  - spectrum analyzer and GPS-receiver on the same coaxial cable.
- N-female on all ports. (Other connector types on request).
- DC-pass on all ports. (Other possibilities on request).

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-RPS-4-GPS-N	210000664

SPECIFICATIONS

ELECTRICAL	
FREQUENCY RANGE	1500-1650 MHz
INSERTION LOSS [S12]	6.5 dB ± 0.5 dB
ISOLATION OUTPUT TO OUTPUT	Min. 20 dB typ. ≥ 25 dB
INPUT SWR	Max. 1.5 typ. < 1.3
OUTPUT SWR	Max. 1.5 typ. < 1.3
POWER HANDLING	Max. 0.5 W each port
DC-PASS	Yes - all ports
MECHANICAL	
TEMP. RANGE	-30° C → +60° C
CONNECTORS	N-female
DIMENSIONS (L x W x H)	138 (incl. conn.) x 152 (incl. flanges) x 35 mm
WEIGHT	280 g

INSERTION LOSS & ISOLATION

PRO-RPS-2-N

2-Channel RX Power Splitter

- Low power, compact 2-channel power splitter/combiner.
- The splitter covers the frequency range from 50 – 1000 MHz.

DESCRIPTION

- Almost no ripple in loss and isolation over the entire frequency range.

ORDERING DESIGNATIONS

TYPE NO.	PRODUCT NO.
PRO-RPS-2-N	210000599

SPECIFICATIONS

ELECTRICAL	
FREQUENCY RANGE	50-1000 MHz
MAX INPUT POWER	2 W
INSERTION LOSS (above 3 dB)	< 1.2 dB
ISOLATION OUTPUT TO OUTPUT	> 20 dB
IMPEDANCE	Nom. 50 Ω
SWR	< 1.3
MECHANICAL	
TEMP. RANGE	-30° C → +60° C
CONNECTORS	N-female
DIMENSIONS (L x W x H)	89 x 39 x 29 mm
WEIGHT	Approx. 150 g

INSERTION LOSS & ISOLATION

PRO-RPS-2-GPS-N

2-Channel RX Power Splitter

- Passive receiver power splitter.
- Large frequency range: 1500 MHz to 1650 MHz.
- High isolation between outputs: > 20 dB.

DESCRIPTION

- To be used where RF-signals, especially GPS-signals, are to be divided or combined:
  1.more receivers connected to the same coaxial cable
  2.more GPS-antennas on the same coaxial cable
  3.spectrum analyzer and GPS-receiver on the same coaxial cable.
- N-female on all ports. (Other connector types on request).
- Several DC-pass options available (see ordering designations).

ORDERING DESIGNATIONS

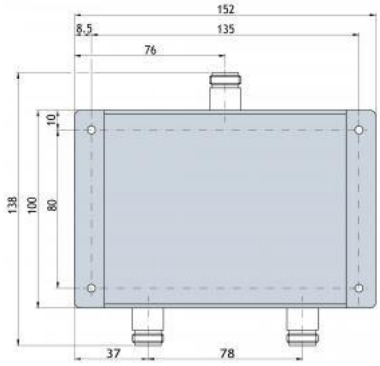
TYPE	DC PASS	PRODUCT NO.
PRO-RPS-2-GPS-N	DC pass between all ports	210000765
PRO-RPS-2-GPS-N-0DC	No DC pass	210002074
PRO-RPS-2-GPS-N-1DC	DC pass between RX port 1 and ANT port	210001852
PRO-RPS-2-GPS-N-2DC	DC pass from RX port 1 to ANT port and from RX port 2 to ANT port, but NOT from RX port 1 to RX port 2	210002143

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-RPS-2-GPS-N
FREQUENCY RANGE	1500 - 1650 MHz
INSERTION LOSS [S12]	3.5 dB ± 0.5 dB
ISOLATION OUTPUT TO OUTPUT	Min. 20 dB typ. ≥ 25 dB
INPUT SWR	Max. 1.5 typ. < 1.3
OUTPUT SWR	Max. 1.5 typ. < 1.3
POWER HANDLING	Max. 0.5 W each port
MECHANICAL	
TEMP. RANGE	-30° C → +60° C
CONNECTORS	N-female
DIMENSIONS (L x W x H)	138 (incl. conn.) x 152 (incl. flanges) x 35 mm
WEIGHT	280 g

MOUNTING	ø4 mm (4 holes)

MOUNTING DETAILS



TYPICAL RESPONSE CURVE

PRO-PS4-DC-2.5G-N

4-Channel equal Power Splitter

- Compact 4-channel resistive power splitter/combiner.
- Covers the frequency range from 0 – 2500 MHz.

DESCRIPTION

- Almost no ripple in loss over the entire frequency range.

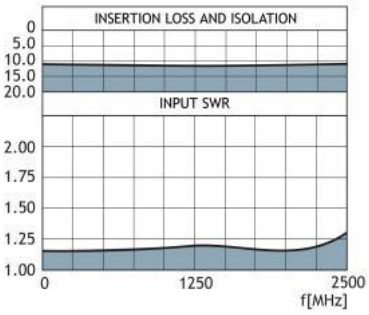
ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-PS4-DC-2.5G-N	210001173

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-PS4-DC-2.5G-N
FREQUENCY RANGE	0 - 2500 MHz
MAX INPUT POWER	10 W
INSERTION LOSS AND ISOLATION	Typ. 12.5 dB ±1 dB
IMPEDANCE	Nom. 50 Ω
INPUT SWR	< 1.5
MECHANICAL	
TEMP. RANGE	-30° C → +60° C
CONNECTORS	N-female
DIMENSIONS (L x W x H)	89 x 39 x 29 mm
WEIGHT	Approx. 200 g

TYPICAL RESPONCE CURVE


INSERTION LOSS AND ISOLATION
0
5.0
10.0
15.0
20.0
INPUT SWR
2.00
1.75
1.50
1.25
1.00
0
1250
2500
f[MHz]

PRO-PS2-DC-2.5G-N

2-Channel equal Power Splitter

- Compact 2-channel resistive power splitter/combiner.
- Covers the frequency range from 0 – 2500 MHz.

DESCRIPTION

- Almost no ripple in loss over the entire frequency range.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-PS2-DC-2.5G-N	210001172

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-PS2-DC-2.5G-N
FREQUENCY RANGE	0 - 2500 MHz
MAX INPUT POWER	10 W
INSERTION LOSS AND ISOLATION	Typ. 7 dB ±1 dB
IMPEDANCE	Nom. 50 Ω
INPUT SWR	< 1.5
MECHANICAL	
TEMP. RANGE	-30° C → +60° C
CONNECTORS	N-female
DIMENSIONS (L x W x H)	89 x 39 x 29 mm
WEIGHT	Approx. 150 g

TYPICAL REPONCE CURVE

PRO-PRL 15W-7/16

Coaxial wideband load

- 15 W load capacity at maximum operating temperature.
- Low SWR up to 3 GHz.

DESCRIPTION

- Wide temperature range.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-PRL 15W-7/16	200002308

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-PRL 15W-7/16
FREQUENCY RANGE	0 - 2 GHz
MAX. INPUT POWER	25 W @ 25°C
IMPEDANCE	Nom. 50 Ω
SWR	< 1.3
MECHANICAL	
TEMP. RANGE	-30°C → +60°C
CONNECTORS	7/16 DIN-male
DIMENSIONS	ø34.5 X 62.25 mm
WEIGHT	Approx. 150 g
COMPLIANCE	RoHs, IP65

PRO-PHY 380-520-3 dB-...

100 W 3 dB Coupler (90° Hybrid)

- Hybrid Coupler with 3 dB coupling covering the 380 - 520 MHz band.
- Excellent high-power performance - 100 W.
- Very low insertion loss over the entire frequency range.

DESCRIPTION

3 dB 90° Hybrid Couplers also known as quadrature hybrids are a passive four port device that can be used in many different modes depending on the application. It can be used as a splitter, combiner or injection of a signal into a signal path.

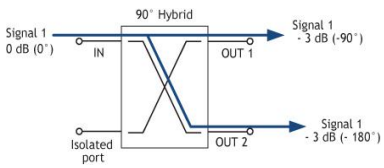
{start_next_col}

BLOCK DIAGRAM

{start_next_col}

DIFFERENT MODES OF THE 3 dB HYBRID COUPLER

Coupler splitter mode: divides the signal into two equal components with a 90° phase difference that can be used to split signals from tower top amplifiers to the base station receivers.



Coupler combiner mode 1: If the same signals is applied at the input ports with a 90° phase difference the signals adds up on one port.

Coupler combiner mode 2: Combining two non-coherent signals that are available at both ports.

{start_next_col}

COMMON APPLICATIONS OF 3 dB 90° HYBRID COUPLERS

- Combining two transmitters with very narrow spacing to one common antenna or to a DAS network.
- Combining two carrier inputs to one or two antennas or leaky feeder/radiating cables.
- Splitting signals from tower mounted amplifiers to base station receivers.

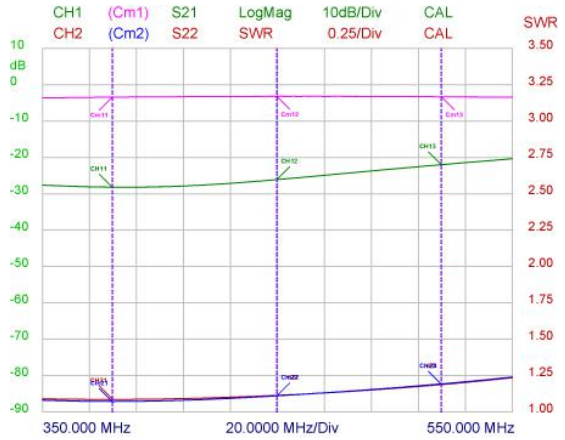
ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-PHY 380-520-3 dB-7/16	200002312
PRO-PHY 380-520-3 dB-N	200002373

SPECIFICATIONS

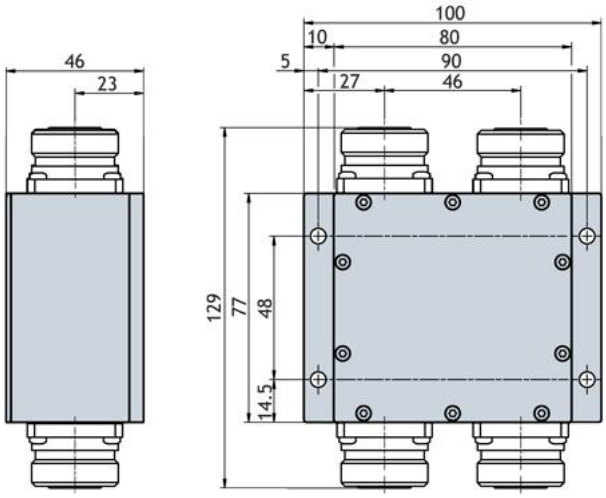
ELECTRICAL	
MODEL	PRO-PHY 380-520-3 dB-...
FREQUENCY RANGE	380 - 520 MHz
INSERTION LOSS	
Port 1 to 2 or port 1 to 3	< 3.3 ± 0.5 dB
ISOLATION	
Port 1 to 4 or port 2 to 3	> 20 dB
IMPEDANCE	Nom. 50 Ω
MAX. INPUT POWER	100 W
SWR ON ALL PORTS	≤1.5
COMPLIANCE	RoHS, IP67
IP RATING	IP67
MECHANICAL	
TEMP. RANGE	-30° C → +60° C
CONNECTORS	DIN 7/16-female or N-female
DIMENSIONS (L x W x H)	129 x 100 x 46 mm / 5.08 x 3.94 x 1.81 in. (incl. connectors and flanges)
WEIGHT	Approx. 865 g / 1.91 lb.
MOUNTING	ø5.2 mm / ø0.20 in. (4 holes)

TYPICAL COUPLING, ISOLATION AND SWR CURVES



{start_next_col}

MOUNTING DETAILS



PRO-PHY 380-2700-3 dB-...

200 W 3 dB Coupler (90° Hybrid)

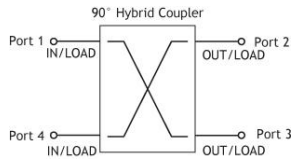
- Hybrid Coupler with 3 dB coupling covering the 380 - 2700 MHz band.
- Excellent high-power performance - 200 W.
- Low insertion loss over the entire frequency range.

DESCRIPTION

3 dB 90° Hybrid Couplers also known as quadrature hybrids are a passive four port device that can be used in many different modes depending on the application. It can be used as a splitter, combiner or injection of a signal into a signal path.

{start_next_col}

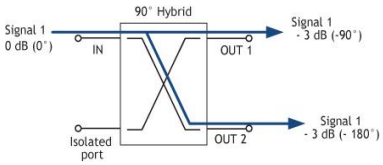
BLOCK DIAGRAM



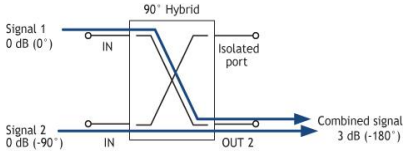
{start_next_col}

DIFFERENT MODES OF THE 3 dB HYBRID COUPLER

Coupler splitter mode: divides the signal into two equal components with a 90° phase difference that can be used to split signals from tower top amplifiers to the base station receivers.



Coupler combiner mode 1: If the same signals is applied at the input ports with a 90° phase difference the signals adds up on one port.



{start_next_col}

Coupler combiner mode 2: Combining two non-coherent signals that are available at both ports.

{start_next_col}

COMMON APPLICATIONS OF 3 dB 90° HYBRID COUPLERS

- Combining two transmitters with very narrow spacing to one common antenna or to a DAS network.

- Combining two carrier inputs to one or two antennas or leaky feeder/radiating cables.
- Splitting signals from tower mounted amplifiers to base station receivers.

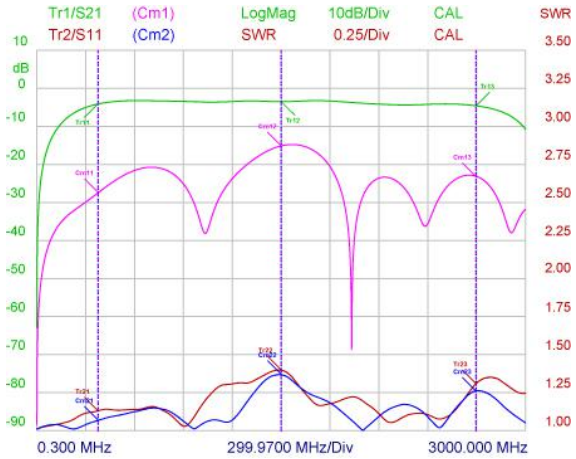
ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-PHY 380-2700-3 dB-N(f)	200002403
PRO-PHY 380-2700-3 dB-7/16(f)	200002408

SPECIFICATIONS

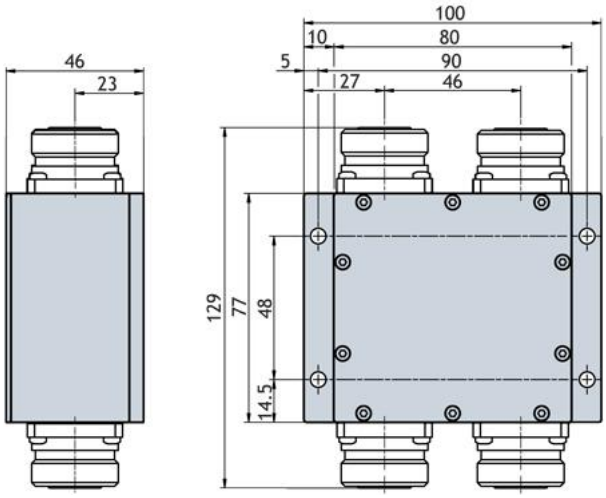
ELECTRICAL	
MODEL	PRO-PHY 380-2700-3 dB
FREQUENCY RANGE	380 - 2700 MHz
INSERTION LOSS	
Port 1 to 2 or port 1 to 3	< 3.5 ± 1 dB
ISOLATION	
Port 1 to 4 or port 2 to 3	
	380 - 960 MHz : > 20 dB
	960 - 2100 MHz : > 15 dB
	2100 - 2700 MHz : > 20 dB
IMPEDANCE	Nom. 50 Ω
MAX. INPUT POWER	200 W (composite)
SWR ON ALL PORTS	≤ 1.5
PIM	< 130 dBc @ 2 x 43 dBm
COMPLIANCE	RoHS
IP RATING	IP67
MECHANICAL	
TEMP. RANGE	-30° C → +60° C
CONNECTORS	DIN 7/16-female or N-female
DIMENSIONS (L x W x H)	129 x 100 x 46 mm / 5.08 x 3.94 x 1.81 in. (incl. connectors and flanges)
WEIGHT	Approx. 865 g / 1.91 lb.
MOUNTING	ø5.2 mm / ø0.20 in. (4 holes)

TYPICAL COUPLING, ISOLATION AND SWR CURVES



{start_next_col}

MOUNTING DETAILS



PRO-PDI2-40-1G-... dB-2.5W-N

Power Divider

- 2.5 W unequal power divider.

DESCRIPTION

- The divider covers the frequency range from 40 - 1000 MHz.
- Very little ripple on divider output over the entire frequency range.

ORDERING DESIGNATIONS

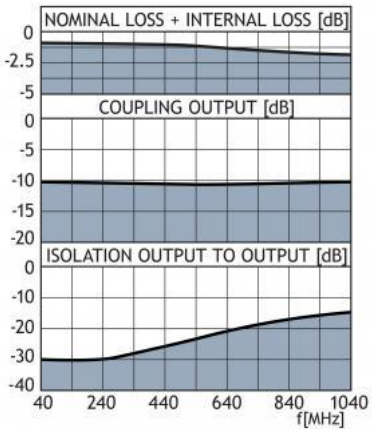
TYPE		PRODUCT NO.
PRO-PDI2-40-1G(2G)-N, 2.5..	6 dB	210001060
PRO-PDI2-40-1G(2G)-N, 2.5..	10 dB	210000437
PRO-PDI2-40-1G(2G)-N, 2.5..	15 dB	210001020
PRO-PDI2-40-1G(2G)-N, 2.5..	20 dB	210000994

SPECIFICATIONS

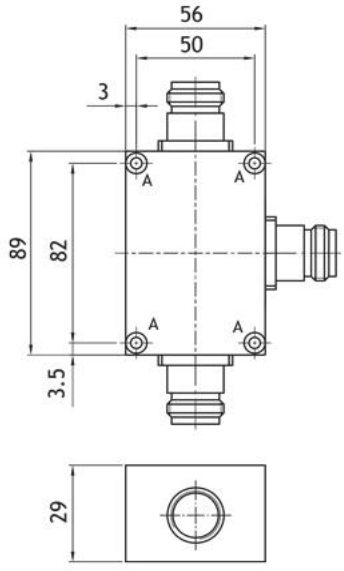
ELECTRICAL						
MODEL		PRO-PDI2-40-1G-... dB-2.5W-N				
		6 dB	10 dB	15 dB	20 dB	
FREQUENCY RANGE		40 - 1000 MHz			40 MHz - 2 GHz	
MAX. INPUT POWER		2.5 W (3 W)				
NOMINAL DIVIDER LOSS		1.25 dB	0.45 dB	0.45 dB	0.4 dB	
TOTAL LOSS INCL. NOMINAL LOSS	@ 40 MHz	≤ 2.3 dB	≤ 1.4 dB	≤ 1.4 dB	≤ 0.9 dB	
	@ 1000 MHz	≤ 2.75 dB	≤ 2.2 dB	≤ 2.2 dB	≤ 1.1 dB @ 2G < 1.4	
ISOLATION OUTPUT TO OUTPUT		> 10 dB	> 12 dB	> 16 dB	> 18 dB	
DIVIDER OUTPUT (dB)		-6.5 - 0.5 + 1	-10 ± 0.5	- 15 ± 0.5	- 20 ± 1	
IMPEDANCE		Nom. 50 Ω				
INPUT SWR		< 1.5			< 1.5 @ 2G < 2	
MECHANICAL						
TEMP. RANGE		-30°C → +60°C				

CONNECTORS	N-female	
DIMENSIONS	89 x 56 x 29 mm (incl. connectors)	
WEIGHT	Approx. 145 g	

TYPICAL RESPONSE CURVE



MOUNTING DETAILS



A = ø3.2/ø6 countersunk (4 pcs.)

PRO-ATT ... dB-25-3

Attenuator 25 W

- This series includes 3 dB, 6 dB, 10 dB, 20 dB and 30 dB attenuators.

DESCRIPTION

- This series of attenuators has very low SWR and attenuation flatness and is especially suitable for use with:
  - Coaxial Transmission Lines
  - Power Monitors
  - Watt Meters
- The attenuators have a finish of black anodization.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-ATT 3 dB-25-3-N(f)	200001732
PRO-ATT 6 dB-25-3-N(f)	200001750
PRO-ATT 10 dB-25-3-N(f)	200001751
PRO-ATT 20 dB-25-3-N(f)	200001724
PRO-ATT 30 dB-25-3-N(f)	200001752
PRO-ATT 3 dB-25-3-7/16(f)	200002544
PRO-ATT 6 dB-25-3-7/16(f)	200002545
PRO-ATT 10 dB-25-3-7/16(f)	200002541
PRO-ATT 20 dB-25-3-7/16(f)	200002542
PRO-ATT 30 dB-25-3-7/16(f)	200002543

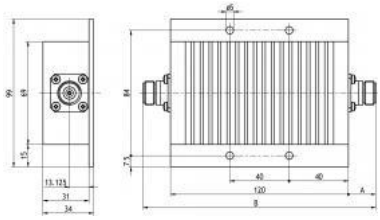
SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-ATT ... dB-25-3
FREQUENCY RANGE	DC - 3 GHz
MAX. INPUT POWER	25 W
ATTENUATION	See table below
POWER RATING REMARKS	Unrestricted airflow necessary for operating at maximum power
IMPEDANCE	Nom. 50 Ω
SWR	<1.25
MECHANICAL	
TEMP. RANGE	-35°C → +70°C

CONNECTORS	N-female or 7/16 DIN-female
DIMENSIONS (L x W x H)	120 x 100 x 34 mm / 4.72 x 3.94 x 1.35 in.
WEIGHT	Approx. 650 g / 1.43 lb.
MOUNTING	ø5 mm (4 holes)

MODEL	ATTENUATION	ATT. DEVIATION	
		DC - 2.0 GHz	2.0 - 3.0 GHz
PRO-ATT 3 dB-25-3	3 dB	+/-0.5 dB	+/-1.0 dB
PRO-ATT 6 dB-25-3	6 dB	+/-0.5 dB	+/-1.0 dB
PRO-ATT 10 dB-25-3	10 dB	+/-0.75 dB	+/-1.5 dB
PRO-ATT 20 dB-25-3	20 dB	+/-0.75 dB	+/-1.5 dB
PRO-ATT 30 dB-25-3	30 dB	+/-0.75 dB	+/-1.5 dB

MOUNTING DETAILS



DIMENSIONS

	A	B
PRO-ATT ... dB-25-3-N(f)	18.5 mm (0.73 in.)	157 mm (6.18 in.)
PRO-ATT ... dB-25-3-7/16(f)	21.5 mm (0.85 in.)	163 mm (6.42 in.)

PRO-ATT ... dB-2-3-N

Attenuator 2 W

- This 2 W series includes 3 dB, 6 dB, 10 dB, 20 dB and 30 dB attenuators.

DESCRIPTION

- This series of attenuators has very low SWR and attenuation flatness and is especially suitable for use with:
  - Coaxial Transmission Lines
  - Power Monitors
  - Watt Meters

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-ATT 3 dB-2-3-N	200002212
PRO-ATT 6 dB-2-3-N	200002213
PRO-ATT 10 dB-2-3-N	200002087
PRO-ATT 20 dB-2-3-N	200002214
PRO-ATT 30 dB-2-3-N	200002215

SPECIFICATIONS

ELECTRICAL			
FREQUENCY RANGE		DC - 3 GHz	
MAX. INPUT POWER		2 W	
ATTENUATION		See table below	
IMPEDANCE		Nom. 50 Ω	
SWR		< 1.25	
MECHANICAL			
TEMP. RANGE		-35°C → +70°C	
CONNECTORS		N-male to N-female	
DIMENSIONS		53 x 21 mm / 2.09 x 0.83 in.	
WEIGHT		Approx. 71 g / 0.16 lb.	
MODEL	ATTENUATION	ATT. DEVIATION	
		DC - 2.0 GHz	2.0 - 3.0 GHz
PRO-ATT 3 dB-2-3-N	3 dB	+/-0.2 dB	+/-0.3 dB
PRO-ATT 6 dB-2-3-N	6 dB	+/-0.2 dB	+/-0.3 dB

PRO-ATT 10 dB-2-3-N	10 dB	+/-0.2 dB	+/-0.3 dB
PRO-ATT 20 dB-2-3-N	20 dB	+/-0.2 dB	+/-0.3 dB
PRO-ATT 30 dB-2-3-N	30 dB	+/-0.5 dB	+/-1.5 dB

PRO-PDI2-0.8-2.7G-20W-N

Power Divider 20 W

- 20 W Power Divider with broadband characteristics covering the cellular service bands.

DESCRIPTION

- 20 W equal power divider.
- Very low SWR and excellent isolation over the entire frequency range.

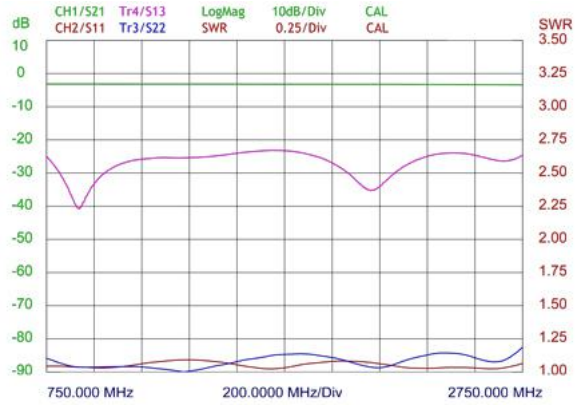
ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-PDI2-0.8-2.7G-20W-N	200001704

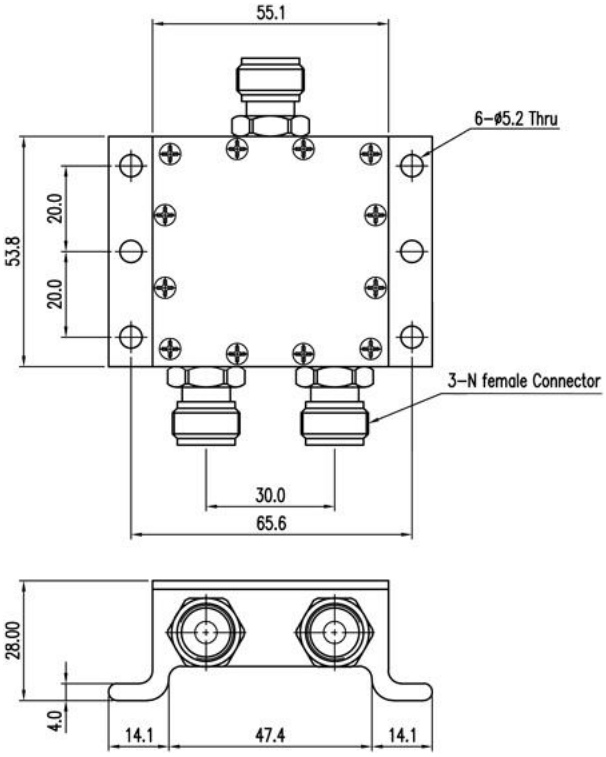
SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-PDI2-0.8-2.7G-20W-N
FREQUENCY RANGE	0.8 - 2.7 GHz
ISOLATION	> 20 dB
SWR	< 1.2
MAX. INPUT POWER	20 W
NOMINAL DIVIDER LOSS	3 dB
TOTAL LOSS INCL. NOMINAL DIVIDER LOSS	< 3.7 dB (typ. 3.5 dB)
DIVIDER OUTPUT	Equal
IMPEDANCE	Nom. 50 Ω
COMPLIANCE	RoHS, IP66
MECHANICAL	
CONNECTORS	N-female
DIMENSIONS (L x W x H)	75.6 x 90.4 x 28 mm
WEIGHT	Approx. 395 g
ENVIRONMENTAL	
TEMP. RANGE	-35° C → 60° C

TYPICAL RESPONSE CURVE



MOUNTING DETAILS



PRO-MPHY450-2-.. dB-N-...

2-Channel Hybrid Ring Power Combiner/Divider for the 450 MHz band

- Combines two transmitters or receivers on the same antenna.
- Better utilization of good antenna position.
- The only combining option with very small TX-TX frequency spacing.

DESCRIPTION

- 30 W load built-in.
- Two antennas on the same transmitter or receiver.
- Symmetrical 1:1 dividing ratio (-3 dB).
- Can be delivered with asymmetrical dividing ratio, e.g. -6 dB, -10 dB or -15 dB.
- Centre frequency to be arbitrary specified by the customer within 380 - 475 MHz.

ORDERING DESIGNATIONS

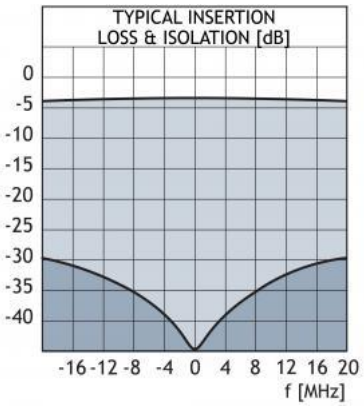
TYPE	PRODUCT NO.
PRO-MPHY450-2-3 dB-N	210000606
PRO-MPHY450-2-6 dB-N	210000728
PRO-MPHY450-2-10 dB-N	210000746
PRO-MPHY450-2-15 dB-N	210001145

SPECIFICATIONS

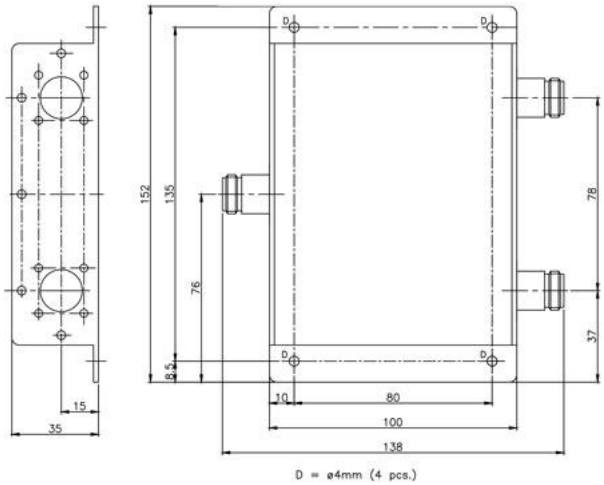
ELECTRICAL	
MODEL	PRO-MPHY450-2-.. dB-N-...
FILTER TYPE	Hybrid Ring Junction
CENTRE FREQUENCY	To be stated within 380 and 475 MHz
MAX. INPUT POWER	30 W per channel when used as a power combiner. 60 W when used as a power divider. Note: When used as a power combiner, extra cooling is necessary. At 2 x 30 W the unit requires a heatsink with R_{th} ≤3° C/W.
THROUGH LOSS	
3 dB COMBINER	< 3.4 dB @ ± 5 MHz BW
	< 3.7 dB @ ± 10 MHz BW
6 dB COMBINER	< 1.6 dB (typ. 1.5 dB)
10 dB COMBINER	< 1.2 dB (typ. 1.0 dB)
15 dB COMBINER	< 0.7 dB (typ. 0.5 dB)
ISOLATION	

3 dB COMBINER	> 35 dB @ ± 5 MHz BW
	> 30 dB @ ± 10 MHz BW
6 dB, 10 dB, 15 dB COMBINER	> 20 dB @ ± 10 MHz
IMPEDANCE	Nom. 50 Ω
SWR	< 1.5 within ± 10 MHz from centre frequncy, all other ports terminated with 50 Ω.
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	N-female (other types as option)
DIMENSIONS (L x W x H)	138 (incl. conn.) x 152 (incl. flanges) x 35 mm
WEIGHT	Approx. 350 g

TYPICAL RESPONSE CURVE



MOUNTING DETAILS



PRO-MPHY150-2-... dB

2-Channel Hybrid Ring Power Combiner/Divider for the 150 MHz band

- Combines two transmitters or receivers on the same antenna.
- Better utilization of good antenna position.
- The only combining option with very small TX-TX frequency spacing.

DESCRIPTION

- 30 W load built-in.
- Two antennas on the same transmitter or receiver.
- Symmetrical 1:1 dividing ratio (-3 dB).
- Can be delivered with asymmetrical dividing ratio, e.g. -6 dB, -10 dB, -20 dB or -30 dB.
- Centre frequency to be specified by the customer within 150 - 175 MHz.

ORDERING DESIGNATIONS

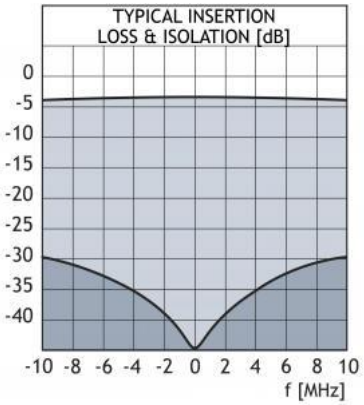
TYPE	PRODUCT NO.
PRO-MPHY150-2-3 dB-N(f)	210000514
PRO-MPHY150-2-6 dB-N(f)	210001431
PRO-MPHY150-2-10 dB-N(f)	210000624
PRO-MPHY150-2-20 dB-N(f)	210000752
PRO-MPHY150-2-30 dB-N(f)	210000725

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-MPHY150-2-.. dB
FILTER TYPE	Hybrid Ring Junction
CENTRE FREQUENCY	To be stated within 150 and 175 MHz
MAX. INPUT POWER	30 W per channel when used as a power combiner. 60 W when used as a power divider. Note: When used as a power combiner, extra cooling is necessary. At 2 x 30 W the unit requires a heatsink with R_{th} ≤3° C/W.
INSERTION LOSS	< 3.3 dB @ ± 12 MHz BW
ISOLATION	> 35 dB @ ± 6 MHz BW > 30 dB @ ± 12 MHz BW
IMPEDANCE	Nom. 50 Ω
SWR	< 1.3 within ± 10 MHz from centre frequncy, all other ports terminated with 50 Ω.
MECHANICAL	
TEMP. RANGE	–30° C → +60° C

CONNECTORS	N-female (other types as option)
DIMENSIONS (L x W x H)	138 (incl. conn.) x 152 (incl. flanges) x 35 mm
WEIGHT	Approx. 450 g

TYPICAL RESPONSE CURVE



PRO-MMU 0.8-2.5G-200W-N

Power Splitter 200 W

- 200 W equal Power Splitter with broad-band characteristic covering the cellular service bands.
- Excellent high power performance.

DESCRIPTION

- Very low SWR and IL over the entire frequency range.
- Compliant with RoHS and IP66.

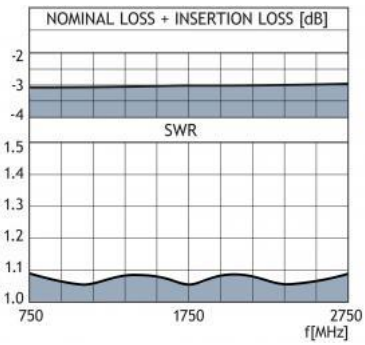
ORDERING DESIGNATIONS

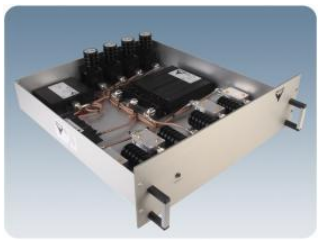
TYPE	PRODUCT NO.
PRO-MMU 0.8-2.5G-200W-N	200001718

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-MMU 0.8-2.5G-200W-N
FREQUENCY RANGE	0.8 - 2.5 GHz
WAY	2
SWR	< 1.2
MAX. INPUT POWER	200 W
NOMINAL SPLITTER LOSS	3 dB
TOTAL LOSS INCL.NOMINAL SPLITTER LOSS	< 3.5 dB
COMPLIANCE	RoHS, IP66
DIVIDER OUTPUT	Equal
IMPEDANCE	Nom. 50 Ω
MECHANICAL	
TEMP. RANGE	-35° C → +50° C
CONNECTORS	N-female
DIMENSIONS (L x W x H)	212 x 61 x 26 mm
WEIGHT	Approx. 401 g

TYPICAL RESPONSE CURVE


NOMINAL LOSS + INSERTION LOSS [dB]
-2
-3
-4
SWR
1.5
1.4
1.3
1.2
1.1
1.0
750
1750
2750
f[MHz]



PRO-COM450-HDAR-4/...

4-Channel 19

- An integrated single tray combining solution housing a 4-channel hybrid TX hybrid combiner, duplex filter, active RX multicouplers and preselector.
- Minimal rack space required - only 3 HU.

DESCRIPTION

- Compatible with digital 6.25 kHz channel spacing.
- Single TX isolators fitted as standard (dual isolators available as option).
- 4 RX ports as standard.
- Please specify TX / RX frequencies when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-COM450-HDAR-4/l	210001788
PRO-COM450-HDAR-4/h	210001855
PRO-COM450-BHDAR-4/l (With black frontplate)	210002348
PRO-COM450-BHDAR-4/h (With black frontplate)	210002349
ACCESSORIES	
ADAPTOR AC/DC 12V EU	240000040
ADAPTOR AC/DC 12V UK	240000041

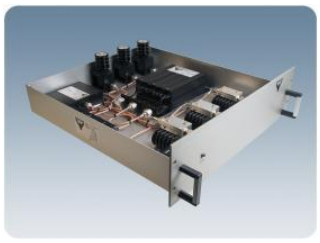
SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-COM450-HDAR-4/...
FREQUENCY RANGE	l: 340 - 400 MHz h: 406 - 470 MHz
MAX. INPUT POWER PER CH	50 W
MAX. TX-TX SPACING, Δ TX	2.0 MHz
MIN. TX-RX SPACING	5 MHz
INSERTION LOSS - TX PATH	< 8.0 dB
TX-TX ISOLATION	> 70 dB
ANT-TX ISOLATION	> 40 dB @ 25° C
RX ISOLATION IN TX BAND TX-TX spacing < 0.5 MHz	> 85 dB > 65 dB

TX-TX spacing > 0.5 MHz	
TX ISOLATION IN RX BAND RX-RX spacing < 0.5 MHz RX-RX spacing > 0.5 MHz	> 85 dB > 65 dB
RX-RX ISOLATION	> 20 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
LNA NOISE FIGURE	< 3.5 dB
GAIN - RX PATH	1 dB +/- 1 dB (factory set)
CURRENT CONSUMPTION	500 mA @ 12 VDC
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	N-female
DIMENSIONS	19" x 3 HU x 500 mm (483 x 133 x 500 mm)
WEIGHT	Approx. 7.5 kg

ADAPTOR AC/DC 12V EU

ADAPTOR AC/DC 12V UK



PRO-COM450-HDAR-3/...

3-Channel 19

- An integrated single tray combining solution housing a 3-channel hybrid TX hybrid combiner, duplex filter, active RX multicouplers and preselector.
- Minimal rack space required - only 3 HU.

DESCRIPTION

- Compatible with digital 6.25 kHz channel spacing.
- Single TX isolators fitted as standard (dual isolators available as option).
- 4 RX ports as standard.
- Please specify TX / RX frequencies when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-COM450-HDAR-3/l	210002094
PRO-COM450-HDAR-3/h	210001924
PRO-COM450-BHDAR-3/l (With black frontplate)	210002346
PRO-COM450-BHDAR-3/h (With black frontplate)	210002347
ACCESSORIES	
ADAPTOR AC/DC 12V EU	240000040
ADAPTOR AC/DC 12V UK	240000041

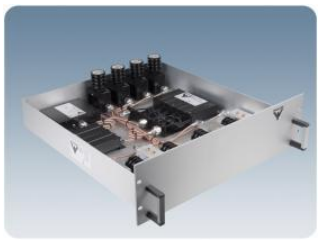
SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-COM450-HDAR-3/...
FREQUENCY RANGE	l: 340 - 400 MHz h: 406 - 470 MHz
MAX. INPUT POWER PER CH	50 W
MAX. TX-TX SPACING, Δ TX	2.0 MHz
MIN. TX-RX SPACING	5 MHz
INSERTION LOSS - TX PATH	< 7.0 dB
TX-TX ISOLATION	> 70 dB
ANT-TX ISOLATION	> 40 dB @ 25° C

RX ISOLATION IN TX BAND TX-TX spacing < 0.5 MHz TX-TX spacing > 0.5 MHz	> 85 dB > 65 dB
TX ISOLATION IN RX BAND RX-RX spacing < 0.5 MHz RX-RX spacing > 0.5 MHz	> 85 dB > 65 dB
RX-RX ISOLATION	> 20 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
LNA NOISE FIGURE	< 3.5 dB
GAIN - RX PATH	1 dB +/- 1 dB (factory set)
CURRENT CONSUMPTION	500 mA @ 12 VDC
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	N-female
DIMENSIONS	19" x 3 HU x 500 mm (483 x 133 x 500 mm)
WEIGHT	Approx. 7.0 kg

ADAPTOR AC/DC 12V EU

ADAPTOR AC/DC 12V UK



PRO-COM150-HDAR-4/...

4-Channel 19

- An integrated single tray combining solution housing a 4-channel hybrid TX hybrid combiner, duplex filter, active RX multicouplers and preselector.
- Minimal rack space required - only 3 HU.

DESCRIPTION

- Compatible with digital 6.25 kHz channel spacing.
- Single TX isolators fitted as standard (dual isolators available as option).
- 4 RX ports as standard.
- Please specify TX / RX frequencies when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-COM150-HDAR-4/l	210001857
PRO-COM150-HDAR-4/h	210001856
PRO-COM150-BHDAR-4/l (With black frontplate)	210002342
PRO-COM150-BHDAR-4/h (With black frontplate)	210002343
ACCESSORIES	
ADAPTOR AC/DC 12V EU	240000040
ADAPTOR AC/DC 12V UK	240000041

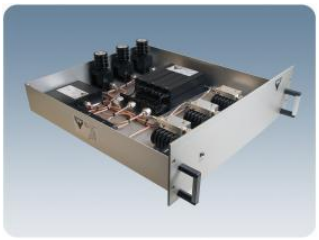
SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-COM150-HDAR-4/...
FREQUENCY RANGE	l: 136 - 156 MHz h: 152 - 175 MHz
MAX. INPUT POWER PER CH	50 W
MAX. TX-TX SPACING, Δ TX	1.5 MHz
MIN. TX-RX SPACING	4 MHz
INSERTION LOSS - TX PATH	< 8.0 dB
TX-TX ISOLATION	> 70 dB
ANT-TX ISOLATION	> 40 dB @ 25° C
RX ISOLATION IN TX TX-TX spacing < 0.5 MHz TX-TX spacing > 0.5 MHz	 > 80 dB > 60 dB

TX ISOLATION IN RX RX-RX spacing < 0.5 MHz RX-RX spacing > 0.5 MHz	 > 80 dB > 60 dB
RX-RX ISOLATION	> 20 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
LNA NOISE FIGURE	< 3.5 dB
GAIN - RX PATH	1 dB +/- 1 dB (factory set)
CURRENT CONSUMPTION	500 mA @ 12 VDC
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	N-female
DIMENSIONS	19" x 3 HU x 500 mm (483 x 133 x 500 mm)
WEIGHT	Approx. 7.5 kg

ADAPTOR AC/DC 12V EU

ADAPTOR AC/DC 12V UK



PRO-COM150-HDAR-3/...

3-Channel 19

- An integrated single tray combining solution housing a 3-channel hybrid TX hybrid combiner, duplex filter, active RX multicouplers and preselector.
- Minimal rack space required - only 3 HU.

DESCRIPTION

- Compatible with digital 6.25 kHz channel spacing.
- Single TX isolators fitted as standard (dual isolators available as option).
- 4 RX ports as standard.
- Please specify TX / RX frequencies when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-COM150-HDAR-3/l	210002050
PRO-COM150-HDAR-3/h	210002002
PRO-COM150-BHDAR-3/l (With black frontplate)	210002340
PRO-COM150-BHDAR-3/h (With black frontplate)	210002341
ACCESSORIES	
ADAPTOR AC/DC 12V EU	240000040
ADAPTOR AC/DC 12V UK	240000041

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-COM150-HDAR-3/...
FREQUENCY RANGE	l: 136 - 156 MHz h: 152 - 175 MHz
MAX. INPUT POWER PER CH	50 W
MAX. TX-TX SPACING, Δ TX	1.5 MHz
MIN. TX-RX SPACING	4 MHz
INSERTION LOSS - TX PATH	< 7.0 dB
TX-TX ISOLATION	> 70 dB
ANT-TX ISOLATION	> 40 dB @ 25° C
RX ISOLATION IN TX	> 80 dB

TX-TX spacing < 0.5 MHz TX-TX spacing > 0.5 MHz	> 60 dB
TX ISOLATION IN RX RX-RX spacing < 0.5 MHz RX-RX spacing > 0.5 MHz	> 80 dB > 60 dB
RX-RX ISOLATION	> 20 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
LNA NOISE FIGURE	< 3.5 dB
GAIN - RX PATH	1 dB +/- 1 dB (factory set)
CURRENT CONSUMPTION	500 mA @ 12 VDC

MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	N-female
DIMENSIONS	19" x 3 HU x 500 mm (483 x 133 x 500 mm)
WEIGHT	Approx. 7.0 kg

ADAPTOR AC/DC 12V EU

ADAPTOR AC/DC 12V UK

PRO-COM150-SRC-2

2-Channel VHF Simplex Relay Combiner

- The PRO-COM150-SRC-2 is an integrated single-tray solution to combine two simplex radios to one antenna.
- When transmitting on one channel, the other channel is switched to a load to make sure that the system is secured against a simultaneous transmission on two channels.
- Minimal rack space required – only 1HU
- Please specify TX / RX frequencies when ordering.

DESCRIPTION

- The PRO-COM150-SRC-2 is a 2-channel VHF simplex combiner with active relays for controlling the switching between TX and RX. The simplex combiner gives the possibility to combine two simplex radios to one antenna. In the RX path a bandpass filter, an isolator and LNA is included.
- The simplex combiner safeguards that both radio transmitters do not have access to the antenna at the same time, but the two radios are still able to listen on the RX channel simultaneously.
- The first radio that enables the transmitter will be able to transmit while the output of the other transmitter will be switch to a internal load. When the first radio that enabled the transmitter stops transmitting the other transmitter is switched to the antenna and allowed to transmit.
- If no radio is transmitting, the system is in listening mode and both radios are able to receive the signal from the antenna.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-COM150-SRC-2	210002127
ACCESSORIES	
ADAPTOR AC/DC 12V EU	240000040
ADAPTOR AC/DC 12V UK	240000041

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-COM150-SRC-2
REQUENCY RANGE	144 - 174 MHz
RX BANDWIDTH	4 MHz
INPUT POWER PER CH	Min. 3 W Max. 50 W
SWITCH TIME TX/RX/:	< 5 ms
TX/RX ISOLATION	60 dB
TX/TX ISOLATION	60 dB
IMPEDANCE	Nom. 50 Ω

SWR	≤ 1.5
LNA NOISE FIGURE	< 1.2 dB
GAIN - RX PATH	4 ±1 dB (factory set)
CURRENT CONSUMPTION	200 mA @ 12 VDC
NUMBER OF SWITCH OPERATIONS	10^7
MECHANICAL	
TEMP. RANGE	–30° C to +60° C
CONNECTORS	N-female
DIMENSIONS	19" x 1 HU x 300 mm (483 x 133 x 400 mm) 19 x 5.2 x 15.7 in.
WEIGHT	Approx. 3.9 kg

ADAPTOR AC/DC 12V EU

ADAPTOR AC/DC 12V UK

BLOCK DIAGRAM

PRO-CAV85-7

7-Channel Cavity Combiner

- The PRO-CAV series of cavity combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All cavity combiners are suitable for 19” rack mounting.

DESCRIPTION

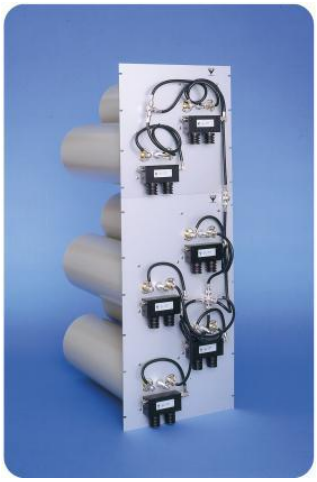
- All cavities are 250 mm dia. Dual isolators fitted as standard.
- A range of racks and cabinets are available.
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-CAV85-7	210001281

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-CAV85-7
TX FREQUENCY	66 - 88 MHz
MAX. INPUT POWER	150 W
TX-TX SPACING, Δ_{TX}	> 50 kHz
TYP. INSERTION LOSS	4.0 dB @ Δ_{TX} = 75 kHz
TX-TX ISOLATION	> 75 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
FREQ. STABILITY	Approx. 0.8 ppm/° C
CONNECTORS	N-female
DIMENSIONS (L x W x H)	19" x 34 HU x 1200 mm (483 x 1511 x 1200 mm)
WEIGHT	Approx. 77.6 kg



PRO-CAV85-6

6-Channel Cavity Combiner

- The PRO-CAV series of cavity combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All cavity combiners are suitable for 19” rack mounting.

DESCRIPTION

- All cavities are 250 mm dia. Dual isolators fitted as standard.
- A range of racks and cabinets are available.
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE NO.	PRODUCT NO.
PRO-CAV85-6	210001291

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-CAV85-6
TX FREQUENCY	66 - 88 MHz
MAX. INPUT POWER	150 W
TX-TX SPACING, Δ_{TX}	> 50 kHz
TYP. INSERTION LOSS	3.9 dB @ Δ_{TX} = 75 kHz
TX-TX ISOLATION	> 75 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
FREQ. STABILITY	Approx. 0.8 ppm/° C
CONNECTORS	N-female
DIMENSIONS (W x H x D)	19" x 30 HU x 1200 mm (483 x 1333 x 1200 mm)

WEIGHT	Approx. 65.2 kg

PRO-CAV85-5

5-Channel Cavity Combiner

- The PRO-CAV series of cavity combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All cavity combiners are suitable for 19” rack mounting.

DESCRIPTION

- All cavities are 250 mm dia. Dual isolators fitted as standard.
- A range of racks and cabinets are available.
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-CAV85-5	210001292

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-CAV85-5
TX FREQUENCY	66 - 88 MHz
MAX. INPUT POWER	150 W
TX-TX SPACING, Δ_{TX}	> 50 kHz
TYP. INSERTION LOSS	3.8 dB @ Δ_{TX} = 75 kHz
TX-TX ISOLATION	> 75 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
FREQ. STABILITY	Approx. 0.8 ppm/° C
CONNECTORS	N-female
DIMENSIONS (W x H x D)	19" x 26 HU x 1200 mm (483 x 1156 x 1200 mm)

WEIGHT	Approx. 55.1 kg

PRO-CAV85-4

4-Channel Cavity Combiner

- The PRO-CAV series of cavity combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All cavity combiners are suitable for 19” rack mounting.

DESCRIPTION

- All cavities are 250 mm dia. Dual isolators fitted as standard.
- A range of racks and cabinets are available.
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-CAV85-4	210000149

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-CAV85-4
TX FREQUENCY	66 - 88 MHz
MAX. INPUT POWER	150 W
TX-TX SPACING, Δ_{TX}	> 50 kHz
TYP. INSERTION LOSS	3.6 dB @ Δ_{TX} = 75 kHz
TX-TX ISOLATION	> 75 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
FREQ. STABILITY	Approx. 0.8 ppm/° C
CONNECTORS	N-female
DIMENSIONS (W x H x D)	19" x 19 HU x 1200 mm (483 x 845 x 1200 mm)
WEIGHT	Approx. 45 kg

PRO-CAV85-3

3-Channel Cavity Combiner

- The PRO-CAV series of cavity combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All cavity combiners are suitable for 19” rack mounting.

DESCRIPTION

- All cavities are 250 mm dia. Dual isolators fitted as standard.
- A range of racks and cabinets are available.
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-CAV85-3	210000150

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-CAV85-3
TX FREQUENCY	66 - 88 MHz
MAX. INPUT POWER	150 W
TX-TX SPACING, Δ_{TX}	> 50 kHz
TYP. INSERTION LOSS	3.1 dB @ Δ_{TX} = 75 kHz
TX-TX ISOLATION	> 75 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
FREQ. STABILITY	Approx. 0.8 ppm/° C
CONNECTORS	N-female
DIMENSIONS (W x H x D)	19" x 15 HU x 1200 mm (483 x 667 x 1200 mm)
WEIGHT	Approx. 32.6 kg

PRO-CAV85-2

2-Channel Cavity Combiner

- The PRO-CAV series of cavity combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All cavity combiners are suitable for 19” rack mounting.

DESCRIPTION

- All cavities are 250 mm dia. Dual isolators fitted as standard.
- A range of racks and cabinets are available.
- Please specify the frequencies for TX and RX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-CAV85-2	210001252

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-CAV85-2
TX FREQUENCY	66 - 88 MHz
MAX. INPUT POWER	150 W
TX-TX SPACING, Δ_{TX}	> 50 kHz
TYP. INSERTION LOSS	2.6 dB @ Δ_{TX} = 75 kHz
TX-TX ISOLATION	> 75 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
FREQ. STABILITY	Approx. 0.8 ppm/° C
CONNECTORS	N-female
DIMENSIONS (W x H x D)	19" x 11 HU x 1200 mm (483 x 489 x 1200 mm)
WEIGHT	Approx. 22.5 kg

PRO-CAV450-8

8-Channel Cavity Combiner

- The PRO-CAV series of cavity combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All cavity combiners are suitable for 19” rack mounting.

DESCRIPTION

- All cavities are 250 mm dia. Dual isolators fitted as standard.
- A range of racks and cabinets are available.
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-CAV450-8	210000212

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-CAV450-8
TX FREQUENCY	380 - 470 MHz
MAX. INPUT POWER	150 W
TX-TX SPACING, Δ_{TX}	> 250 kHz
TYP. INSERTION LOSS	3.8 dB @ Δ_{TX} = 450 kHz
TX-TX ISOLATION	> 75 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
FREQ. STABILITY	Approx. 0.8 ppm/° C
CONNECTORS	N-female
DIMENSIONS (W x H x D)	19" x 38 HU x 300 mm (483 x 1689 x 300 mm)
WEIGHT	Approx. 39.2 kg

PRO-CAV450-7

7-Channel Cavity Combiner

- The PRO-CAV series of cavity combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All cavity combiners are suitable for 19” rack mounting.

DESCRIPTION

- All cavities are 250 mm dia. Dual isolators fitted as standard.
- A range of racks and cabinets are available.
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-CAV450-7	210000419

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-CAV450-7
TX FREQUENCY	380 - 470 MHz
MAX. INPUT POWER	150 W
TX-TX SPACING, Δ_{TX}	> 250 kHz
TYP. INSERTION LOSS	3.7 dB @ Δ_{TX} = 450 kHz
TX-TX ISOLATION	> 75 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
FREQ. STABILITY	Approx. 0.8 ppm/° C
CONNECTORS	N-female
DIMENSIONS (W x H x D)	19" x 34 HU x 300 mm (483 x 1511 x 300 mm)
WEIGHT	Approx. 33.3 kg

PRO-CAV450-6

6-Channel Cavity Combiner

- The PRO-CAV series of cavity combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All cavity combiners are suitable for 19” rack mounting.

DESCRIPTION

- All cavities are 250 mm dia. Dual isolators fitted as standard.
- A range of racks and cabinets are available.
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE NO.	PRODUCT NO.
PRO-CAV450-6	210000299

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-CAV450-6
TX FREQUENCY	380 - 470 MHz
MAX. INPUT POWER	150 W
TX-TX SPACING, Δ_{TX}	> 250 kHz
TYP. INSERTION LOSS	3.6 dB @ Δ_{TX} = 450 kHz
TX-TX ISOLATION	> 75 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
FREQ. STABILITY	Approx. 0.8 ppm/° C
CONNECTORS	N-female
DIMENSIONS (W x H x D)	19" x 30 HU x 300 mm (483 x 1333 x 300 mm)
WEIGHT	Approx. 27.4 kg

PRO-CAV450-5

5-Channel Cavity Combiner

- The PRO-CAV series of cavity combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All cavity combiners are suitable for 19” rack mounting.

DESCRIPTION

- All cavities are 250 mm dia. Dual isolators fitted as standard.
- A range of racks and cabinets are available.
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-CAV450-5	210000303

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-CAV450-5
TX FREQUENCY	380 - 470 MHz
MAX. INPUT POWER	150 W
TX-TX SPACING, Δ_{TX}	> 250 kHz
TYP. INSERTION LOSS	3.5 dB @ Δ_{TX} = 450 kHz
TX-TX ISOLATION	> 75 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
FREQ. STABILITY	Approx. 0.8 ppm/° C
CONNECTORS	N-female
DIMENSIONS (W x H x D)	19" x 26 HU x 300 mm (483 x 1156 x 300 mm)
WEIGHT	Approx. 23.5 kg

PRO-CAV450-4

4-Channel Cavity

- The PRO-CAV series of cavity combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All cavity combiners are suitable for 19” rack mounting.

DESCRIPTION

- All cavities are 250 mm dia. Dual isolators fitted as standard.
- A range of racks and cabinets are available.
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-CAV450-4	210000171

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-CAV450-4
TX FREQUENCY	380 - 470 MHz
MAX. INPUT POWER	150 W
TX-TX SPACING, Δ_{TX}	> 250 kHz
TYP. INSERTION LOSS	3.3 dB @ Δ_{TX} = 450 kHz
TX-TX ISOLATION	> 75 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
FREQ. STABILITY	Approx. 0.8 ppm/° C
CONNECTORS	N-female
DIMENSIONS (L x W x H)	19" x 19 HU x 300 mm (483 x 845 x 300 mm)
WEIGHT	Approx. 19.6 kg

PRO-CAV450-3

3-Channel Cavity Combiner

- The PRO-CAV series of cavity combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All cavity combiners are suitable for 19” rack mounting.

DESCRIPTION

- All cavities are 250 mm dia. Dual isolators fitted as standard.
- A range of racks and cabinets are available.
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-CAV450-3	210000157

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-CAV450-3
TX FREQUENCY	380 - 470 MHz
MAX. INPUT POWER	150 W
TX-TX SPACING, Δ_{TX}	> 250 kHz
TYP. INSERTION LOSS	2.8 dB @ Δ_{TX} = 450 kHz
TX-TX ISOLATION	> 75 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
FREQ. STABILITY	Approx. 0.8 ppm/° C
CONNECTORS	N-female
DIMENSIONS (W x H x D)	19" x 15 HU x 300 mm (483 x 667 x 300 mm)
WEIGHT	Approx. 13.7 kg

PRO-CAV450-2

2-Channel Cavity Combiner

- The PRO-CAV series of cavity combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All cavity combiners are suitable for 19” rack mounting.

DESCRIPTION

- All cavities are 250 mm dia. Dual isolators fitted as standard.
- A range of racks and cabinets are available.
- Please specify the frequencies for TX and RX when ordering.

Ordering Designations

TYPE	PRODUCT NO.
PRO-CAV450-2	210000400

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-CAV450-2
TX FREQUENCY	380 - 475 MHz
MAX. INPUT POWER	150 W
TX-TX SPACING, Δ_{TX}	> 250 kHz
TYP. INSERTION LOSS	2.3 dB @ Δ_{TX} = 450 kHz
TX-TX ISOLATION	> 75 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
FREQ. STABILITY	Approx. 0.8 ppm/° C
CONNECTORS	N-female
DIMENSIONS (W x H x D)	19" x 11 HU x 300 mm (483 x 489 x 300 mm)
WEIGHT	Approx. 9.8 kg

PRO-CAV130-8

8-Channel Cavity Combiner

- The PRO-CAV series of cavity combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All cavity combiners are suitable for 19” rack mounting.

DESCRIPTION

- All cavities are 250 mm dia. Dual isolators fitted as standard.
- A range of racks and cabinets are available.
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-CAV130-8	210002320

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-CAV130-8
TX FREQUENCY	116 - 146 MHz
MAX. INPUT POWER	150 W
TX-TX SPACING, Δ_{TX}	> 75 kHz
TYP. INSERTION LOSS	3.7 dB @ Δ_{TX} = 150 kHz
TX-TX ISOLATION	> 75 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
FREQ. STABILITY	Approx. 0.8 ppm/° C
CONNECTORS	N-female
DIMENSIONS (W x H x D)	19" x 38 HU x 765 (483 x 1689 x 765 mm)
WEIGHT	67.4 kg

PRO-CAV150-7

7-Channel Cavity Combiner

- The PRO-CAV series of cavity combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All cavity combiners are suitable for 19” rack mounting.

DESCRIPTION

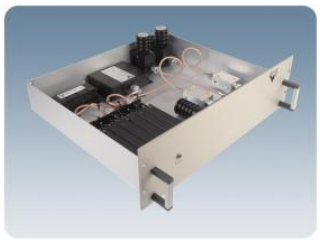
- All cavities are 250 mm dia. Dual isolators fitted as standard.
- A range of racks and cabinets are available.
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-CAV150-7	210001282

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-CAV150-7
TX FREQUENCY	136 - 175 MHz
MAX. INPUT POWER	150 W
TX-TX SPACING, Δ_{TX}	> 75 kHz
TYP. INSERTION LOSS	3.6 dB @ Δ_{TX} = 150 kHz
TX-TX ISOLATION	> 75 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
FREQ. STABILITY	Approx. 0.8 ppm/° C
CONNECTORS	N-female
DIMENSIONS (W x H x D)	19" x 34 HU x 600 (483 x 1511 x 600 mm)
WEIGHT	Approx. 43.8 kg



PRO-COM450-HDAR-2/...

2-Channel 19

- An integrated single tray combining solution housing a 2-channel hybrid TX hybrid combiner, duplex filter, active RX multicouplers and preselector.
- Minimal rack space required - only 3 HU.

DESCRIPTION

- Compatible with digital 6.25 kHz channel spacing.
- Single TX isolators fitted as standard (dual isolators available as option).
- 2 RX ports as standard (4 ports available as option).
- Please specify TX / RX frequencies when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-COM450-HDAR-2/l	210001739
PRO-COM450-HDAR-2/h	210001738
PRO-COM450-BHDAR-2/l (With black frontplate)	210002344
PRO-COM450-BHDAR-2/h (With black frontplate)	210002345
ACCESSORIES	
ADAPTOR AC/DC 12V EU	240000040
ADAPTOR AC/DC 12V UK	240000041

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-COM450-HDAR-2/...
FREQUENCY RANGE	l: 340 - 400 MHz h: 406 - 470 MHz
MAX. INPUT POWER PER CH	35 W
MAX. TX-TX SPACING, Δ TX	2.0 MHz
MIN. TX-RX SPACING	5 MHz
INSERTION LOSS - TX PATH	< 5.0 dB
TX-TX ISOLATION	> 70 dB
ANT-TX ISOLATION	> 40 dB @ 25° C

RX ISOLATION IN TX BAND TX-TX spacing < 0.5 MHz TX-TX spacing > 0.5 MHz	> 85 dB > 65 dB
TX ISOLATION IN RX BAND RX-RX spacing < 0.5 MHz RX-RX spacing > 0.5 MHz	> 85 dB > 65 dB
RX-RX ISOLATION	> 20 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
LNA NOISE FIGURE	< 3.5 dB
GAIN - RX PATH	1 dB +/- 1 dB (factory set)
CURRENT CONSUMPTION	500 mA @ 12 VDC
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	N-female
DIMENSIONS	19" x 3 HU x 400 mm (483 x 133 x 400 mm)
WEIGHT	Approx. 6.3 kg

ADAPTOR AC/DC 12V EU

ADAPTOR AC/DC 12V UK

PRO-CAV85-8

8-Channel Cavity Combiner

- The PRO-CAV series of cavity combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All cavity combiners are suitable for 19” rack mounting.

DESCRIPTION

- All cavities are 250 mm dia. Dual isolators fitted as standard.
- A range of racks and cabinets are available.
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-CAV85-8	210001209

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-CAV85-8
TX FREQUENCY	66 - 88 MHz
MAX. INPUT POWER	150 W
TX-TX SPACING, Δ_{TX}	> 50 kHz
TYP. INSERTION LOSS	4.1 dB @ Δ_{TX} = 75 kHz
TX-TX ISOLATION	> 75 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
FREQ. STABILITY	Approx. 0.8 ppm/° C
CONNECTORS	N-female
DIMENSIONS (L x W x H)	19" x 38 HU x 1200 mm (483 x 1689 x 1200 mm)
WEIGHT	Approx. 90 kg

PRO-CAV150-5

5-Channel Cavity Combiner

- The PRO-CAV series of cavity combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All cavity combiners are suitable for 19” rack mounting.

DESCRIPTION

- All cavities are 250 mm dia. Dual isolators fitted as standard.
- A range of racks and cabinets are available.
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-CAV150-5	210000297

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-CAV150-5
TX FREQUENCY	144 - 175 MHz
MAX. INPUT POWER	150 W
TX-TX SPACING, Δ_{TX}	> 75 kHz
TYP. INSERTION LOSS	3.4 dB @ Δ_{TX} = 150 kHz
TX-TX ISOLATION	> 75 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
FREQ. STABILITY	Approx. 0.8 ppm/° C
CONNECTORS	N-female
DIMENSIONS (W x H x D)	19" x 26 HU x 600 (483 x 1156 x 600 mm)
WEIGHT	Approx. 31 kg

PRO-CAV150-4

4-Channel Cavity Combiner

- The PRO-CAV series of cavity combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All cavity combiners are suitable for 19” rack mounting.

DESCRIPTION

- All cavities are 250 mm dia. Dual isolators fitted as standard.
- A range of racks and cabinets are available.
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-CAV150-4	210001547

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-CAV150-4
TX FREQUENCY	144 - 175 MHz (other frequencies on request)
MAX. INPUT POWER	150 W
TX-TX SPACING, Δ_{TX}	> 75 kHz
TYP. INSERTION LOSS	3.2 dB @ Δ_{TX} = 150 kHz
TX-TX ISOLATION	> 75 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
FREQ. STABILITY	Approx. 0.8 ppm/° C
CONNECTORS	N-female
DIMENSIONS (W x H x D)	19" x 19 HU x 600 (483 x 845 x 600 mm)

WEIGHT	Approx. 25.6 kg

PRO-CAV150-3

3-Channel Cavity Combiner

- The PRO-CAV series of cavity combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All cavity combiners are suitable for 19” rack mounting.

DESCRIPTION

- All cavities are 250 mm dia. Dual isolators fitted as standard.
- A range of racks and cabinets are available.
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-CAV150-3	210000168

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-CAV150-3
TX FREQUENCY	136 - 175 MHz
MAX. INPUT POWER	150 W
TX-TX SPACING, Δ_{TX}	> 75 kHz
TYP. INSERTION LOSS	2.7 dB @ Δ_{TX} = 150 kHz
TX-TX ISOLATION	> 75 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
FREQ. STABILITY	Approx. 0.8 ppm/° C
CONNECTORS	N-female
DIMENSIONS (L x W x H)	19" x 15 HU x 600 (483 x 667 x 600 mm)
WEIGHT	Approx. 18.2 kg

PRO-CAV150-2

2-Channel Cavity Combiner

- The PRO-CAV series of cavity combiners havsbeen designed to help identify the optimum solution for combining several transmitters into one antenna.
- All cavity combiners are suitable for 19” rack mounting.

DESCRIPTION

- All cavities are 250 mm dia. Dual isolators fitted as standard.
- A range of racks and cabinets are available.
- Please specify the frequencies for TX and RX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-CAV150-2	210000172

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-CAV150-2
TX FREQUENCY	136 - 175 MHz
MAX. INPUT POWER	150 W
TX-TX SPACING, Δ_{TX}	> 75 kHz
TYP. INSERTION LOSS	2.2 dB @ Δ_{TX} = 150 kHz
TX-TX ISOLATION	> 75 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
FREQ. STABILITY	Approx. 0.8 ppm/° C
CONNECTORS	N-female
DIMENSIONS (W x H x D)	19" x 11 HU x 600 (483 x 489 x 600 mm)
WEIGHT	Approx. 12.8 kg

PRO-PDI-2-TETRA-FME-J-...

TETRA combiner with SWR adaption/adjustment network

Replaced by PHY-TETRA-2-FME-...

- Combiner for coupling of two TETRA mobile transceivers on one common antenna.
- Factory-adjusted to either 380 to 410 MHz or 410 to 430 MHz.
- Compact dimensions – especially suitable for mobile applications.

DESCRIPTION

- FME-connectors for direct connection of FME-cable without extra adapter.
- For parallel operation of two two-way communication radios (transceivers) where highest possible decoupling (isolation) is necessary.
- Integrated SWR adjustment network for optimization of isolation in the frequency range of 380 to 410 MHz or 410 to 430 MHz. Via the adjustment network the effective SWR of the antenna can be optimized and consequently the isolation between the ports of the combiner clearly improved.
- High isolation obtainable: Up to 50 dB (Dependant on the SWR of the connected antenna).
- The adjustment of the SWR adjustment network takes place via built-in variable capacitors.
- Max. TETRA transmitter power 2 x 5 W.
- Also usable as equal or unequal power divider for max. 10 W.
- Very small ripple over the total frequency range.

ORDERING DESIGNATIONS

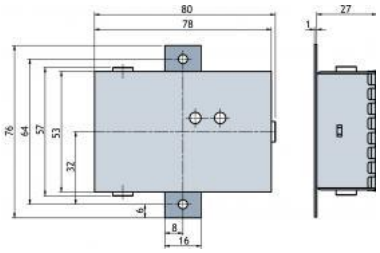
TYPE	PRODUCT NO.
PRO-PDI-2-TETRA-FME-J-380-410	Replaced by PHY-TETRA-2-FME-...
PRO-PDI-2-TETRA-FME-J-410-430	

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-PDI-2-TETRA-FME-J-...
FREQUENCY	380 - 410 MHz or 410 - 430 MHz
MAX. INPUT POWER (TETRA)	1 x 10 W if used as divider 2 x 5 W if used as coupler
NOMINAL DIVIDER LOSS	3.0 dB
TOTAL LOSS INCL. SPLITTER LOSS /COUPLER LOSS	< 3.5 dB
IMPEDANCE	Nom. 50 Ω
SWR	< 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTOR TYPE	FME-connectors
DIMENSIONS (L x W x H)	80 x 76 (inclusive of mounting plate) x 28 mm

WEIGHT	Approx. 360 g
MOUNTING	ø4 mm (two holes)

MOUNTING DETAILS



TYPICAL RESPONSE CURVE

TYPICAL RESPONSE CURVE

PRO-ISO-PHY-TETRA-S-ELW

Two TMO TETRA Mobile-Station and one DMO TETRA Mobile Station

- The PRO-ISO-PHY-TETRA-S-ELW combiner provides the possibillity of connecting two TMO and one DMO TETRA radios into one common antenna.
- ETSI and DIN-SPEC 14507-2 compliant connection of two digital radios.

DESCRIPTION

- The PRO-ISO-PHY-TETRA-S-ELW supports Direct Mode Operation (DMO), giving one TETRA mobile radio the ability to communicate in direct mode.
- The PRO-ISO-PHY-TETRA-S-ELW is the successor to the PRO-ISO-PHY-TETRA-ELW.
- The PRO-ISO-PHY-TETRA-S-ELW has improved isolation between the ports - more than 60 dB - and lower insertion loss.
- The use of high-quality system components such as highly selective helical duplex filters and high-performance isolators provides high isolation and secure communication.
- Built-in high-pass filter, for attenuating interference from 150 - 174 MHz and 74 - 87.5 MHz bands.
- The smallest and most compact design on the market.
- Suitable for both stationary and mobile use.
- Also available in tray for 19" rack mounting.
- Vibration and shock tested in accordance with EN-60068**.

**Tested in accordance with:
Random test: EN 60068-2-64, test specification: EN 300 019-2-5 V3.0.0.
Shock test: EN 60068-2-27, test specification: EN 300 019-2-5 V3.0.0.
Bump test: EN 60068-2-29, test specification: EN 300 019-2-5 V3.0.0.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-ISO-PHY-TETRA-S-ELW-N(f)	210002226
ACCESSORIES	
19" Front plate with connectors in front	210002300
19" Front plate with connectors in back	210002301

Compatible DMO-modes

The PRO-ISO-PHY-TETRA-S-ELW is compatible with the following DMO modes in 406 - 410 MHz band:

- DM-MS
- DM-REP (1A)

SPECIFICATIONS

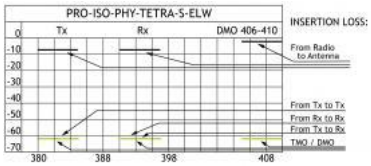
ELECTRICAL	
MODEL	PRO-ISO-PHY-TETRA-S-ELW
TYPE	TETRA combiner
TX/RX FREQUENCY	TX: 380 – 385 MHz

	RX: 390 – 395 MHz
DMO FREQUENCY *	406 - 410 MHz
INSERTION LOSS TX-ANT.	< 7 dB
INSERTION LOSS RX-ANT.	< 7 dB
INSERTION LOSS DMO-ANT	< 2 dB
ISOLATION TRX →TRX	TX - TX: > 62 dB (380 – 385 MHz) RX - RX: > 62 dB (390 – 395 MHz) TX - RX / RX - TX: > 62 dB
ISOLATION DMO-TMO	> 60 dB
MAX. POWER	25 W / station
SWR	< 1.5
GROUP DELAY VARIATION	TX-ANT. : < 120 nsec. RX-ANT. : < 150 nsec.
MECHANICAL	
CONNECTOR TYPE	N-female
COLOUR	Black
DIMENSIONS (L x W x H)	150 (excl. conn.) x 200 x 35 mm / 5.91 (excl. conn.) x 7.87 x 1.38 in.
WEIGHT	Approx. 1940 g / 4.28 lb.
ENVIRONMENTAL	
IP-GRADE	IP-62

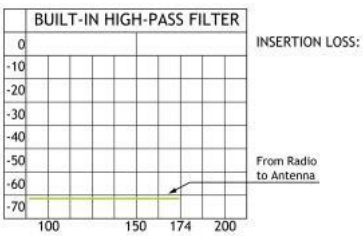
* Compatible DMO-modes

The PRO-ISO-PHY-TETRA-S-ELW is compatible with the following
DMO modes in 406 - 410 MHz band:
- DM-MS
- DM-REP (1A)

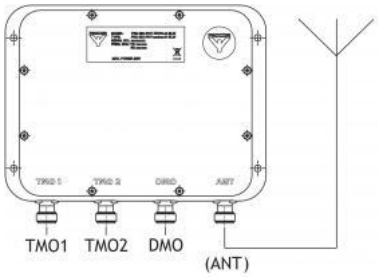
TYPICAL ATTENUATION VALUES



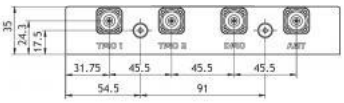
The built-in high-pass filter attenuates large signal interference and harmonic from radiosystems below 174 MHz.

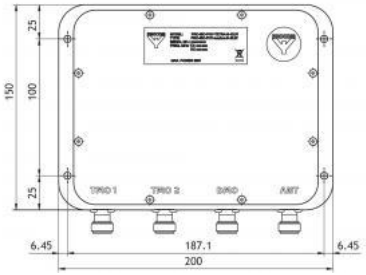


CONNECTION DIAGRAM



MOUNTING DETAILS





19" Front plate with connectors in front (210002300)

19" Front plate with connectors in back (210002301)

PRO-ISO-PHY-TETRA-S2

Two-TETRA-Station Combiner

- The PRO-ISO-PHY-TETRA-S2 combiner provides the possibillity of connecting up to two TETRA radios into one common antenna.
- The PRO-ISO-PHY-TETRA-S2 models are available in the frequency range 380 - 470 MHz (on request).
- ETSI compliant connection of two digital radios.
- The PRO-ISO-PHY-TETRA-S2 is the successor to the PRO-ISO-PHY-TETRA-2.

DESCRIPTION

- The PRO-ISO-PHY-TETRA-S2 has improved isolation between the ports - more than 62 dB - and lower insertion loss.
- The use of high-quality system components such as highly selective helical duplex filters and high-performance isolators provides high isolation and secure communication.
- The smallest and most compact design on the market.
- Suitable for both stationary and mobile use.
- Also available in tray for 19" rack mounting.
- Vibration and shock tested in accordance with EN-60068**.

**Tested in accordance with:
Random test: EN 60068-2-64, test specification: EN 300 019-2-5 V3.0.0.
Shock test: EN 60068-2-27, test specification: EN 300 019-2-5 V3.0.0.
Bump test: EN 60068-2-29, test specification: EN 300 019-2-5 V3.0.0.

ORDERING DESIGNATIONS

TYPE	TX MHz	RX MHz	PRODUCT NO.
PRO-ISO-PHY-385/390-S2-N(f)	380 - 385	390 - 395	210002227
PRO-ISO-PHY-415/420-S2-N(f)	410 - 415	420 - 425	210002242
ACCESSORIES			
19" Front plate with connectors in front			210002247
19" Front plate with connectors in back			210002248

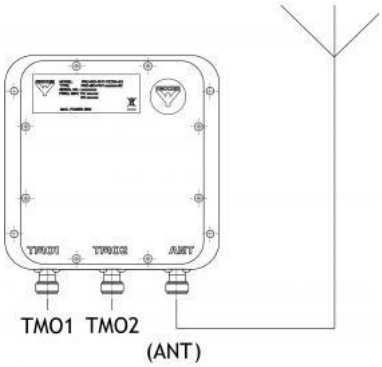
SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-ISO-PHY-TETRA-S2
TYPE	TETRA combiner
TX/RX FREQUENCY	TX: 380 – 385 MHz RX: 390 – 395 MHz or TX: 410 - 415 MHz RX: 420 - 425 MHz
INSERTION LOSS TX-ANT.	< 6.0 dB

INSERTION LOSS RX-ANT.	< 6.0 dB
ISOLATION TRX → TRX	TX - TX: > 62 dB RX - RX: > 62 dB TX - RX / RX - TX: > 62 dB
SWR	< 1.5
MAX. POWER	25 W per port
GROUP DELAY VARIATION	TX-ANT. < 120 nsec. RX-ANT. < 150 nsec.
MECHANICAL	
CONNECTOR TYPE	N-female
COLOUR	Black
DIMENSIONS (L x W x H)	150 (excl. conn.) x 150 x 35 mm / 5.91 (excl. conn.) x 5.91 x 1.38 in.
WEIGHT	Approx. 1820 g / 4.01 lb.
ENVIRONMENTAL	
IP-GRADE	IP-62

TYPICAL ATTENUATION VALUES

CONNECTION DIAGRAM



MOUNTING DETAILS

19" Front plate with connectors in front (210002247)

19" Front plate with connectors in back (210002248)

PRO-ISO-PHY-TETRA-S3

Three-TETRA-Station Combiner

- The PRO-ISO-PHY-TETRA-S3 combiner provides the possibillity of connecting up to three TETRA radios into one common antenna.
- The PRO-ISO-PHY-TETRA-S3 models are available in the frequency range 380 - 470 MHz (on request).
- ETSI compliant connection of three digital radios.
- The PRO-ISO-PHY-TETRA-S3 is the successor to the PRO-ISO-PHY-TETRA-3.

DESCRIPTION

- The PRO-ISO-PHY-TETRA-S3 has improved isolation between the ports - more than 62 dB - and lower insertion loss.
- The use of high-quality system components such as highly selective helical duplex filters and high-performance isolators provides high isolation and secure communication.
- The smallest and most compact design on the market.
- Suitable for both stationary and mobile use.
- Also available in tray for 19" rack mounting.
- Vibration and shock tested in accordance with EN-60068**.

**Tested in accordance with:
Random test: EN 60068-2-64, test specification: EN 300 019-2-5 V3.0.0.
Shock test: EN 60068-2-27, test specification: EN 300 019-2-5 V3.0.0.
Bump test: EN 60068-2-29, test specification: EN 300 019-2-5 V3.0.0.

ORDERING DESIGNATIONS

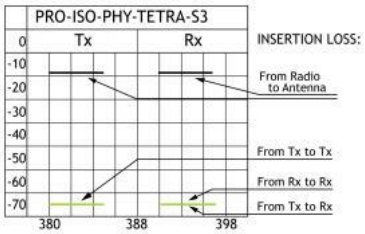
TYPE	TX MHz	RX MHz	PRODUCT NO.
PRO-ISO-PHY-385/390-S3-N(f)	380 - 385	390 - 395	210002228
PRO-ISO-PHY-415/420-S3-N(f)	410 - 415	420 - 425	210002252
ACCESSORIES			
19" Front plate with connectors in front			210002302
19" Front plate with connectors in back			210002205

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-ISO-PHY-TETRA-S3
TYPE	TETRA combiner
TX/RX FREQUENCY	TX: 380 – 385 MHz RX: 390 – 395 MHz or TX: 410 - 415 MHz RX: 420 - 425 MHz
INSERTION LOSS TX-ANT.	< 9.0 dB

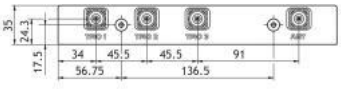
INSERTION LOSS RX-ANT.	< 9.0 dB
ISOLATION TRX → TRX	TX - TX: > 62 dB RX - RX: > 62 dB TX - RX / RX - TX: > 62 dB
SWR	< 1.5
MAX. POWER	25 W per port
GROUP DELAY VARIATION	TX-ANT. < 120 nsec. RX-ANT. < 150 nsec.
MECHANICAL	
CONNECTOR TYPE	N-female
COLOUR	Black
DIMENSIONS (L x W x H)	150 (excl. conn.) x 250 x 35 mm / 5.91 (excl. conn.) x 9.84 x 1.38 in.
WEIGHT	Approx. 2400 g / 5,29 lb.
ENVIRONMENTAL	
IP-GRADE	IP-62

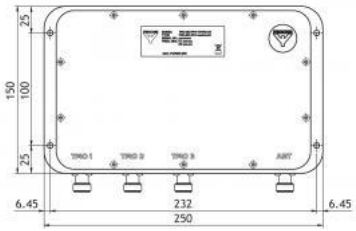
TYPICAL ATTENUATION VALUES



CONNECTION DIAGRAM

MOUNTING DETAILS





19" Front plate with connectors in front (210002302)

19" Front plate with connectors in back (210002205)

PRO-ISO-PHY-TETRA-S4

Four-TETRA-Station Combiner

- The PRO-ISO-PHY-TETRA-S4 combiner provides the possibillity of connecting up to four TETRA radios into one common antenna.
- The PRO-ISO-PHY-TETRA-S4 models are available in the frequency range 380 - 470 MHz (on request).

DESCRIPTION

- ETSI compliant connection of four digital radios.
- The PRO-ISO-PHY-TETRA-S4 is the successor to the PRO-ISO-PHY-TETRA-4.
- The PRO-ISO-PHY-TETRA-S4 has improved isolation between the ports - more than 62 dB - and lower insertion loss.
- The use of high-quality system components such as highly selective helical duplex filters and high-performance isolators provides high isolation and secure communication.
- The smallest and most compact design on the market.
- Suitable for both stationary and mobile use.
- Also available in tray for 19" rack mounting.
- Vibration and shock tested in accordance with EN-60068**.

**Tested in accordance with:
Random test: EN 60068-2-64, test specification: EN 300 019-2-5 V3.0.0.
Shock test: EN 60068-2-27, test specification: EN 300 019-2-5 V3.0.0.
Bump test: EN 60068-2-29, test specification: EN 300 019-2-5 V3.0.0.

ORDERING DESIGNATIONS

TYPE	TX MHz	RX MHz	PRODUCT NO.
PRO-ISO-PHY-385/390-S4	380 - 385	390 - 395	210002202
PRO-ISO-PHY-415/420-S4	410 - 415	420 - 425	210002203
ACCESSORIES			
19" Front plate with connectors in front			210002204
19" Front plate with connectors in back			210002205

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-ISO-PHY-TETRA-S4
TYPE	TETRA combiner
TX/RX FREQUENCY	TX: 380 – 385 MHz RX: 390 – 395 MHz or TX: 410 - 415 MHz RX: 420 - 425 MHz
INSERTION LOSS TX-ANT.	< 9.0 dB
INSERTION LOSS	< 9.0 dB

RX-ANT.	
ISOLATION TRX → TRX	TX - TX: > 62 dB RX - RX: > 62 dB TX - RX / RX - TX: > 62 dB
SWR	< 1.5
MAX. POWER	25 W per port
GROUP DELAY VARIATION	TX-ANT. < 120 nsec. RX-ANT. < 150 nsec.
MECHANICAL	
CONNECTOR TYPE	N-female
COLOUR	Black
DIMENSIONS (L x W x H)	150 (excl. conn.) x 250 x 35 mm / 5.91 (excl. conn.) x 9.84 x 1,.8 in.
WEIGHT	Approx. 2400 g / 5,29 lb.
ENVIRONMENTAL	
IP-GRADE	IP-62

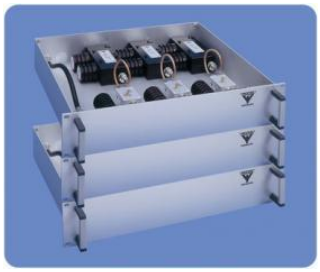
TYPICAL ATTENUATION VALUES

CONNECTION DIAGRAM

MOUNTING DETAILS

19" Front plate with connectors in front (210002204)

19" Front plate with connectors in back (210002205)



PRO-PHY 450-6SI-100

6-Channel Hybrid Combiner for 100 W

- The PRO-PHY series of hybrid combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All hybrid combiners are suitable for 19” rack mounting.

- Single isolator fitted as standard.
- Maximum input power of 100 W.
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-PHY 450-6SI-100	210001279

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-PHY 450-6SI-100
TX FREQUENCY	380 - 470 MHz
MAX. INPUT POWER	100 W
TX-TX SPACING, Δ TX	< 11 MHz
TYP. INSERTION LOSS	8.6 dB
TX-TX ISOLATION	> 70 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	N-female
DIMENSIONS (H x W x L)	6HU x 483 x 500 mm (267 x 483 x 500 mm)
WEIGHT	Approx. 22 kg

PRO-DMO/TMO-4

Preliminary data sheet, costumized

- The PRO-DMO/TMO-4 is an upgrade kit for the PRO-ISO-PHY-TETRA-4, which gives the posibility to connect four DMO/TMO radios.
- Easy setup.
- Jumper cables included.

DESCRIPTION

- Possibility to mount on top of PRO-ISO-PHY-TETRA-4 unit (same footprint) or mount the unit in front/back of the PRO-ISO-PHY-TETRA-4 unit.
- Also available in 19" rack-mountable version from factory or later for upgrade.
- The use of high-quality system components such as highly selective helical duplex filters provides high isolation between DMO and TMO mode.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-DMO/TMO-4	Contact for availability
PRO-DMO/TMO-4-TR-F	Contact for availability
PRO-DMO/TMO-4-TR-B	Contact for availability

PRO-DMO/TMO-4-TR-F

* Compatible DMO-modes

The PRO-ISO-PHY-TETRA-ELW is compatible with the following DMO modes in 406 - 410 MHz band:

- DM-MS

- DM-REP (1A)

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-DMO/TMO-4
TYPE	TETRA combiner
TMO FREQUENCY	380 – 395 MHz
DMO FREQUENCY *	406 - 410 MHz
INSERTION LOSS TMO	< 4.3 dB
INSERTION LOSS DMO-ANT	< 11 dB
ISOLATION DMO-TMO	> 60 dB
ISOLATION DMO-DMO	> 20 dB (typ. > 30 dB @ SWR 1.5)
MAX. POWER PR. CHANNEL	≤ 25 W
MAX. RETURN POWER IN ADJACENT CHANNELS	< 250 mW
SWR	< 1.5
MECHANICAL	
CONNECTOR TYPE	N-female
COLOUR	Black
DIMENSIONS (L x W x H)	300 (excl. conn.) x 240 x 40 mm / 11.81 (excl. conn.) x 9.45 x 1.57 in.
WEIGHT	Approx. 3100 g / 6.83 lb.
ENVIRONMENTAL	
IP-GRADE	IP-62

PRO-DMO/TMO-4 mounted on top of a PRO-ISO-PHY-TETRA-4-N(f)

PRO-DMO/TMO-4-TR-F mounted on top of a PRO-ISO-PHY-TETRA-4-TR-F-N(f)

PRO-CAV150-6

6-Channel Cavity Combiner

- The PRO-CAV series of cavity combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All cavity combiners are suitable for 19” rack mounting.

DESCRIPTION

- All cavities are 250 mm dia. Dual isolators fitted as standard.
- A range of racks and cabinets are available.
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-CAV150-6	210000379

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-CAV150-6
TX FREQUENCY	136 - 175 MHz
MAX. INPUT POWER	150 W
TX-TX SPACING, Δ_{TX}	> 75 kHz
TYP. INSERTION LOSS	3.5 dB @ Δ_{TX} = 150 kHz
TX-TX ISOLATION	> 75 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
FREQ. STABILITY	Approx. 0.8 ppm/° C
CONNECTORS	N-female
DIMENSIONS (W x H x D)	19" x 30 HU x 600 (483 x 1333 x 600 mm)
WEIGHT	Approx. 36.4 kg

PRO-PHY350-2

2-Channel Hybrid Ring Combiner for 350 MHz Transmitters

- Combining two transmitters or receivers on the same antenna.
- Better utilization of good antenna position.
- Two antennas on the same transmitter or receiver.

DESCRIPTION

- Combining two signal generators.
- The only combining option with very small TX-TX frequency spacing.
- 60 W load supplied (other loads or no load as option).

ORDERING DESIGNATIONS

TYPE	FREQ. RANGE	PRODUCT NO.
PRO-PHY350-2	330 - 360 MHz	210000696

SPECIFICATIONS

ELECTRICAL	
FILTER TYPE	Hybrid Ring Junction
FREQUENCY	330 - 360 MHz
MAX. INPUT POWER	50 W per channel (max. 150 W with larger load)
INSERTION LOSS	< 3.4 dB @ 10 MHz BW < 3.7 dB @ 20 MHz BW
ISOLATION TX 1-TX 2 (*see note)	> 35 dB @ 10 MHz BW > 30 dB @ 20 MHz BW
IMPEDANCE	Nom. 50 Ω
LOAD (**see note)	30 W load fitted (other ratings available)
SWR	< 1.5 with all other ports terminated with 50 Ω
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	N-female (other types as option)
DIMENSIONS (L x W x H)	216 x 89 (incl. conn.) x 42 mm (excl. load)
WEIGHT	Approx. 700 g (excl. load)

*The isolation between the TX ports is directly dependent on the terminating SWR on the antenna port. With an antenna load SWR = 1.5, the isolation between the two TX ports will be reduced to 20 dB @ 5 MHz bandwidth.
**The SWR of the loads should be < 1.1! The load should be able to dissipate 1/2 of the total input power.
E.g.: With 50 W input in total for the two channels, the load should be able to dissipate 50 W x 1/2 = 25 W.

RESPONSE CURVE

PRO-ISO-PHY-TETRA-S6

Six-TETRA-Station Combiner

- The PRO-ISO-PHY-TETRA-S6 combiner provides the possibillity of connecting up to six TETRA radios into one common antenna.
- ETSI compliant connection of six digital radios.

DESCRIPTION

- The PRO-ISO-PHY-TETRA-S6 has high isolation between the ports - more than 62 dB - and low insertion loss.
- The use of high-quality system components such as highly selective helical duplex filters and high-performance isolators provides high isolation and secure communication.
- The smallest and most compact design on the market.
- Suitable for both stationary and mobile use.
- Delivered in tray for 19" rack mounting (Unassembled).
- Jumper cables included.

ORDERING DESIGNATIONS

TYPE	TX MHZ	RX MHZ	PRODUCT NO.
PRO-ISO-PHY-385/390-S6-TR-B-N(f)	380 - 385	390 - 395	210002299
PRO-ISO-PHY-385/390-S6-TR-F-N(f)	380 - 385	390 - 395	210002356
PRO-ISO-PHY-415/420-S6-TR-B-N(f)	410 - 415	420 - 425	210002357
PRO-ISO-PHY-415/420-S6-TR-F-N(f)	410 - 415	420 - 425	210002358

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-ISO-PHY-TETRA-S6
TYPE	TETRA combiner
TX/RX FREQUENCY	TX: 380 – 385 MHz RX: 390 – 395 MHz or TX: 410 - 415 MHz RX: 420 - 425 MHz
INSERTION LOSS TX-ANT.	< 13 dB
INSERTION LOSS RX-ANT.	< 13 dB
ISOLATION TRX → TRX	TX - TX: > 62 dB RX - RX: > 62 dB TX - RX / RX - TX: > 62 dB

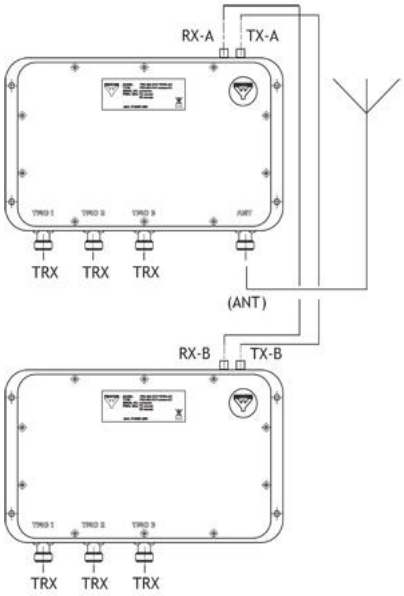
SWR	< 1.5
MAX. POWER	25 W/station
GROUP DELAY VARIATION	TX-ANT. < 120 nsec. RX-ANT. < 150 nsec.
MECHANICAL	
CONNECTOR TYPE	N-female
COLOUR	Combiner: Black Frontplate: Aluminium
DIMENSIONS (W x H xD)	19" x 2 HU x 154 mm (excl. conn.) (483 x 88 x 154 mm) /(7.02 x 3.46 x 6.06 in.)
WEIGHT	Approx. 5.3 kg / 11.68 lb.
ENVIRONMENTAL	
IP-GRADE	IP-62

Option TR-F

Option TR-B

{start_next_col}

CONNECTION DIAGRAM


RX-A
TX-A
TRX
TRX
TRX
(ANT)
RX-B
TX-B
TRX
TRX
TRX

PRO-ISO-PHY-TETRA-S8

Eight-TETRA-Station Combiner

- The PRO-ISO-PHY-TETRA-S8 combiner provides the possibillity of connecting up to eight TETRA radios into one common antenna.
- ETSI compliant connection of eight digital radios.

DESCRIPTION

- The PRO-ISO-PHY-TETRA-S8 has high isolation between the ports - more than 62 dB - and low insertion loss.
- The use of high-quality system components such as highly selective helical duplex filters and high-performance isolators provides high isolation and secure communication.
- The smallest and most compact design on the market.
- Suitable for both stationary and mobile use.
- Delivered in tray for 19" rack mounting (Unassembled).
- Vibration and shock tested in accordance with EN-60068 **.
- Jumper cables included.

** Tested in accordance with:
Random test: EN 60068-2-64, test specification: EN 300 019-2-5 V3.0.0.
Shock test: EN 60068-2-27, test specification: EN 300 019-2-5 V3.0.0.
Bump test: EN 60068-2-29, test specification: EN 300 019-2-5 V3.0.0.

ORDERING DESIGNATIONS

TYPE	TX MHZ	RX MHZ	PRODUCT NO.
PRO-ISO-PHY-385/390-S8-TR-B-N(f)	380 - 385	390 - 395	210002359
PRO-ISO-PHY-385/390-S8-TR-F-N(f)	380 - 385	390 - 395	210002360
PRO-ISO-PHY-415/420-S8-TR-B-N(f)	410 - 415	420 - 425	210002361
PRO-ISO-PHY-415/420-S8-TR-F-N(f)	410 - 415	420 - 425	210002362

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-ISO-PHY-TETRA-S8
TYPE	TETRA combiner
TX/RX FREQUENCY	TX: 380 – 385 MHz RX: 390 – 395 MHz or TX: 410 - 415 MHz RX: 420 - 425 MHz
INSERTION LOSS TX-ANT.	< 13 dB
INSERTION LOSS RX-ANT.	< 13 dB

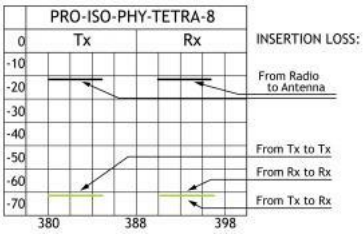
ISOLATION TRX → TRX	TX - TX: > 62 dB RX - RX: > 62 dB TX - RX / RX - TX: > 62 dB
SWR	< 1.5
MAX. POWER	25 W / station
GROUP DELAY VARIATION	TX-ANT. < 120 nsec. RX-ANT. < 150 nsec.
MECHANICAL	
CONNECTOR TYPE	N-female
COLOUR	Combiner: Black Frontplate: Aluminium
DIMENSIONS (W x H x D)	19" x 2 HU x 154 mm (excl. conn.) (483 x 88 x 154 mm) / (7.02 x 3.46 x 6.06 in.)
WEIGHT	Approx. 5.3 kg / 11.68 lb.
ENVIRONMENTAL	
IP-GRADE	IP-62

Option TR-F

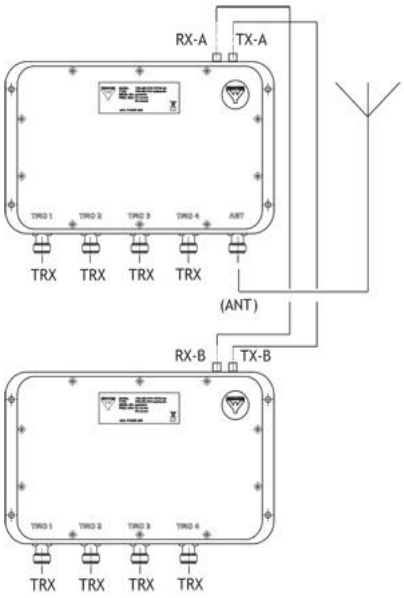
Option TR-B

{start_next_col}

TYPICAL ATTENUATION VALUES



CONNECTION DIAGRAM



PRO-CAV130-2

2-Channel Cavity Combiner

- The PRO-CAV series of cavity combiners havsbeen designed to help identify the optimum solution for combining several transmitters into one antenna.
- All cavity combiners are suitable for 19” rack mounting.

DESCRIPTION

- All cavities are 250 mm dia. Dual isolators fitted as standard.
- A range of racks and cabinets are available.
- Please specify the frequencies for TX and RX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-CAV130-2	210001459

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-CAV130-2
TX FREQUENCY	116 - 146 MHz
MAX. INPUT POWER	150 W
TX-TX SPACING, Δ_{TX}	> 75 kHz
TYP. INSERTION LOSS	2.2 dB @ Δ_{TX} = 150 kHz
TX-TX ISOLATION	> 75 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
FREQ. STABILITY	Approx. 0.8 ppm/° C
CONNECTORS	N-female
DIMENSIONS (W x H x D)	19" x 11 HU x 600 (483 x 489 x 765 mm)
WEIGHT	16.55 kg

PRO-CAV130-3

3-Channel Cavity Combiner

- The PRO-CAV series of cavity combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All cavity combiners are suitable for 19” rack mounting.

DESCRIPTION

- All cavities are 250 mm dia. Dual isolators fitted as standard.
- A range of racks and cabinets are available.
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-CAV130-3	210001412

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-CAV130-3
TX FREQUENCY	116 - 146 MHz
MAX. INPUT POWER	150 W
TX-TX SPACING, Δ_{TX}	> 75 kHz
TYP. INSERTION LOSS	2.7 dB @ Δ_{TX} = 150 kHz
TX-TX ISOLATION	> 75 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
FREQ. STABILITY	Approx. 0.8 ppm/° C
CONNECTORS	N-female
DIMENSIONS (L x W x H)	19" x 15 HU x 765 (483 x 667 x 765 mm)
WEIGHT	25 kg

PRO-CAV130-4

4-Channel Cavity Combiner

- The PRO-CAV series of cavity combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All cavity combiners are suitable for 19” rack mounting.

DESCRIPTION

- All cavities are 250 mm dia. Dual isolators fitted as standard.
- A range of racks and cabinets are available.
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-CAV130-4	210001150

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-CAV130-4
TX FREQUENCY	116 - 146 MHz
MAX. INPUT POWER	150 W
TX-TX SPACING, Δ_{TX}	> 75 kHz
TYP. INSERTION LOSS	3.2 dB @ Δ_{TX} = 150 kHz
TX-TX ISOLATION	> 75 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
FREQ. STABILITY	Approx. 0.8 ppm/° C
CONNECTORS	N-female
DIMENSIONS (W x H x D)	19" x 19 HU x 765 (483 x 845 x 765 mm)
WEIGHT	33 kg

PRO-CAV130-5

5-Channel Cavity Combiner

- The PRO-CAV series of cavity combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All cavity combiners are suitable for 19” rack mounting.

DESCRIPTION

- All cavities are 250 mm dia. Dual isolators fitted as standard.
- A range of racks and cabinets are available.
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-CAV130-5	210002317

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-CAV130-5
TX FREQUENCY	116 - 146 MHz
MAX. INPUT POWER	150 W
TX-TX SPACING, Δ_{TX}	> 75 kHz
TYP. INSERTION LOSS	3.4 dB @ Δ_{TX} = 150 kHz
TX-TX ISOLATION	> 75 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
FREQ. STABILITY	Approx. 0.8 ppm/° C
CONNECTORS	N-female
DIMENSIONS (W x H x D)	19" x 26 HU x 765 (483 x 1156 x 765 mm)

WEIGHT	42,85 kg

PRO-CAV130-6

6-Channel Cavity Combiner

- The PRO-CAV series of cavity combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All cavity combiners are suitable for 19” rack mounting.

DESCRIPTION

- All cavities are 250 mm dia. Dual isolators fitted as standard.
- A range of racks and cabinets are available.
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-CAV130-6	210002318

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-CAV130-6
TX FREQUENCY	116 - 146 MHz
MAX. INPUT POWER	150 W
TX-TX SPACING, Δ_{TX}	> 75 kHz
TYP. INSERTION LOSS	3.5 dB @ Δ_{TX} = 150 kHz
TX-TX ISOLATION	> 75 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
FREQ. STABILITY	Approx. 0.8 ppm/° C
CONNECTORS	N-female
DIMENSIONS (W x H x D)	19" x 30 HU x 765 (483 x 1333 x 765 mm)

WEIGHT	51 kg

PRO-CAV130-7

7-Channel Cavity Combiner

- The PRO-CAV series of cavity combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All cavity combiners are suitable for 19” rack mounting.

DESCRIPTION

- All cavities are 250 mm dia. Dual isolators fitted as standard.
- A range of racks and cabinets are available.
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-CAV130-7	210002319

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-CAV130-7
TX FREQUENCY	116 - 146 MHz
MAX. INPUT POWER	150 W
TX-TX SPACING, Δ_{TX}	> 75 kHz
TYP. INSERTION LOSS	3.6 dB @ Δ_{TX} = 150 kHz
TX-TX ISOLATION	> 75 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
FREQ. STABILITY	Approx. 0.8 ppm/° C
CONNECTORS	N-female
DIMENSIONS (W x H x D)	19" x 34 HU x 765

	(483 x 1511 x 765 mm)
WEIGHT	59.2 kg

PRO-CAV150-8

8-Channel Cavity Combiner

- The PRO-CAV series of cavity combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All cavity combiners are suitable for 19” rack mounting.

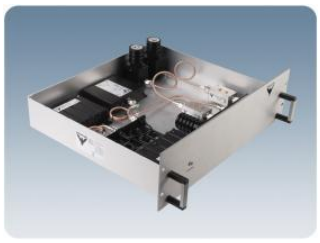
- All cavities are 250 mm dia. Dual isolators fitted as standard.
- A range of racks and cabinets are available.
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-CAV150-8	210001013

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-CAV150-8
TX FREQUENCY	136 - 175 MHz
MAX. INPUT POWER	150 W
TX-TX SPACING, Δ_{TX}	> 75 kHz
TYP. INSERTION LOSS	3.7 dB @ Δ_{TX} = 150 kHz
TX-TX ISOLATION	> 75 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
FREQ. STABILITY	Approx. 0.8 ppm/° C
CONNECTORS	N-female
DIMENSIONS (W x H x D)	19" x 38 HU x 600 (483 x 1689 x 600 mm)
WEIGHT	Approx. 51.2 kg



PRO-COM150-HDAR-2/...

2-Channel 19

- An integrated single tray combining solution housing a 2-channel hybrid TX hybrid combiner, duplex filter, active RX multicouplers and preselector.
- Minimal rack space required - only 3 HU.

DESCRIPTION

- Compatible with digital 6.25 kHz channel spacing.
- Single TX isolators fitted as standard (dual isolators available as option).
- 2 RX ports as standard (4 ports available as option).
- Please specify TX / RX frequencies when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-COM150-HDAR-2/l	210001737
PRO-COM150-HDAR-2/h	210001736
PRO-COM150-BHDAR-2/l (With black frontplate)	210002338
PRO-COM150-BHDAR-2/h (With black frontplate)	210002339
ACCESSORIES	
ADAPTOR AC/DC 12V EU	240000040
ADAPTOR AC/DC 12V UK	240000041

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-COM150-HDAR-2/...
FREQUENCY RANGE	l: 136 - 156 MHz h: 152 - 175 MHz
MAX. INPUT POWER PER CH	35 W
MAX. TX-TX SPACING, Δ TX	1.5 MHz
MIN. TX-RX SPACING	4 MHz
INSERTION LOSS - TX PATH	< 5.0 dB
TX-TX ISOLATION	> 70 dB
ANT-TX ISOLATION	> 40 dB @ 25° C
RX ISOLATION IN TX BAND TX-TX spacing < 0.5 MHz TX-TX spacing > 0.5 MHz	 > 80 dB > 60 dB

TX ISOLATION IN RX BAND RX-RX spacing < 0.5 MHz RX-RX spacing > 0.5 MHz	 > 80 dB > 60 dB
RX-RX ISOLATION	> 20 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
LNA NOISE FIGURE	< 3.5 dB
GAIN - RX PATH	1 dB +/- 1 dB (factory set)
CURRENT CONSUMPTION	500 mA @ 12 VDC
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	N-female
DIMENSIONS	19" x 3 HU x 400 mm (483 x 133 x 400 mm)
WEIGHT	Approx. 6.3 kg

ADAPTOR AC/DC 12V EU

ADAPTOR AC/DC 12V UK

PRO-ISO-PHY-435/440-S8

Eight-TETRA-Station Combiner

Customized

- The PRO-ISO-PHY-435/440-S8 combiner provides the possibillity of connecting up to eight TETRA radios into one common antenna.
- ETSI compliant connection of eight digital radios.

DESCRIPTION

- The PRO-ISO-PHY-435/440-S8 has high isolation between the ports - more than 62 dB - and low insertion loss.
- The use of high-quality system components such as highly selective helical duplex filters and high-performance isolators provides high isolation and secure communication.
- The smallest and most compact design on the market.
- Suitable for both stationary and mobile use.
- Delivered in tray for 19" rack mounting (Unassembled).
- Vibration and shock tested in accordance with EN-60068 **.
- Jumper cables included.

** Tested in accordance with:

Random test: EN 60068-2-64, test specification: EN 300 019-2-5 V3.0.0.
Shock test: EN 60068-2-27, test specification: EN 300 019-2-5 V3.0.0.
Bump test: EN 60068-2-29, test specification: EN 300 019-2-5 V3.0.0.

ORDERING DESIGNATIONS

TYPE	TX MHZ	RX MHZ	PRODUCT NO.
PRO-ISO-PHY-435/440-S8-TR-B-N(f)	430 - 435	440 - 445	Contact for availability
PRO-ISO-PHY-435/440-S8-TR-F-N(f)	430 - 435	440 - 445	Contact for availability

SPECIFICATIONS

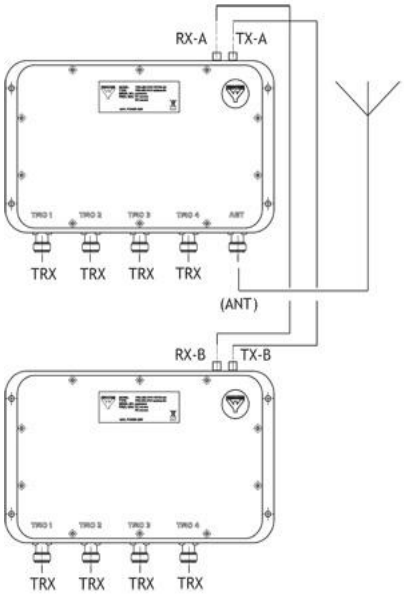
ELECTRICAL	
MODEL	PRO-ISO-PHY-435/440-S8
TYPE	TETRA combiner
TX/RX FREQUENCY	TX: 430 - 435 MHz TX: 430 - 435 MHz RX: 440 - 445 MHz
INSERTION LOSS TX-ANT.	< 13 dB
INSERTION LOSS RX-ANT.	< 13 dB
ISOLATION TRX → TRX	TX - TX: > 62 dB RX - RX: > 62 dB RX - TX: > 62 dB
SWR	< 1.5

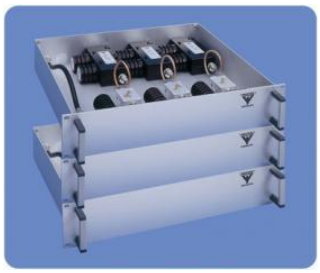
MAX. POWER	25 W / station
GROUP DELAY VARIATION	TX-ANT. < 120 nsec. RX-ANT. < 150 nsec.
MECHANICAL	
CONNECTOR TYPE	N-female
COLOUR	Combiner: BlackFrontplate: Aluminium
DIMENSIONS (W x H x D)	19" x 2 HU x 154 mm (excl. conn.) (483 x 88 x 154 mm) / (7.02 x 3.46 x 6.06 in.)
WEIGHT	Approx. 5.3 kg / 11.68 lb.
ENVIRONMENTAL	
IP-GRADE	IP62

Option TR-F

Option TR-B

CONNECTION DIAGRAM


RX-A
TX-A
TRX
TRX
TRX
TRX
(ANT)
RX-B
TX-B
TRX
TRX
TRX
TRX



PRO-PHY150-6DI-100

6-Channel Hybrid Combiner for 100 W

- The PRO-PHY series of hybrid combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All hybrid combiners are suitable for 19” rack mounting.
- Dual isolators fitted as standard.

- Maximum input power of 100 W.
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-PHY150-6DI-100	210000922

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-PHY150-6DI-100
TX FREQUENCY	136 - 175 MHz
MAX. INPUT POWER	100 W
TX-TX SPACING, Δ TX	< 7 MHz
TYP. INSERTION LOSS	9.0 dB
TX-TX ISOLATION	> 90 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	N-female
DIMENSIONS (H x W x L) (H x W x L) Alternative	6HU x 483 x 500 mm (267 x 483 x 500 mm) 8HU x 483 x 400 mm (356 x 483 x 500 mm)
WEIGHT	Approx. 25 kg

PRO-PHY150-2DI

2-Channel Hybrid Combiner

- The PRO-PHY series of hybrid combiners has been designed to help identify the optimum solution for combining several transmitters into one antenna.
- All hybrid combiners are suitable for 19” rack mounting.
- Dual isolators fitted as standard.

- A range of racks and cabinets are available.
- Option: Maximum input power of 35 W (PRO-PHY…2DI-35) or 100 W (PRO-PHY…2DI-100).
- Please specify the frequencies for TX when ordering.

ORDERING DESIGNATIONS

TYPE	PRODUCT NO.
PRO-PHY150-2DI-35	210000531
PRO-PHY150-2DI-100	210000620

SPECIFICATIONS

ELECTRICAL	
MODEL	PRO-PHY150-2DI-...
TX FREQUENCY	136 - 175 MHz
MAX. INPUT POWER	35/100 W
TX-TX SPACING, Δ TX	< 7 MHz
TYP. INSERTION LOSS	4.1 dB
TX-TX ISOLATION	> 100 dB
IMPEDANCE	Nom. 50 Ω
SWR	≤ 1.5
MECHANICAL	
TEMP. RANGE	–30° C → +60° C
CONNECTORS	N-female
DIMENSIONS (L x W x H)	400 x 483 x 89 mm
WEIGHT	Approx. 5.7/6.8 kg

PRO-PDI2-40-1G-... dB-10W-N

Power Divider

- 10 W unequal power divider.

DESCRIPTION

- The divider covers the frequency range from 40 - 1000 MHz.
- Very little ripple on divider output over the entire frequency range.

ORDERING DESIGNATIONS

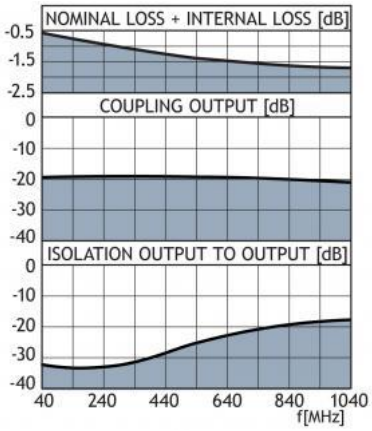
TYPE	PRODUCT NO.
PRO-PDI2-40-1G-3 dB-10W-N	210000438
PRO-PDI2-40-1G-6 dB-10W-N	210000440
PRO-PDI2-40-1G-7 dB-10W-N	210000443
PRO-PDI2-40-1G-8 dB-10W-N	210000444
PRO-PDI2-40-1G-10 dB-10W-N	210000446
PRO-PDI2-40-1G-20 dB-10W-N	210000445

SPECIFICATIONS

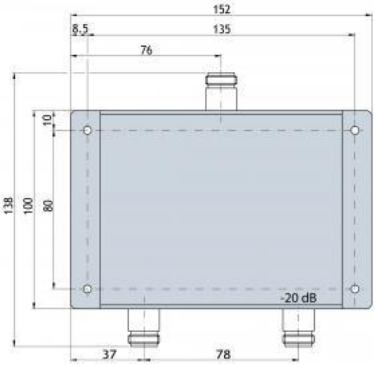
ELECTRICAL							
MODEL	PRO-PDI2-40-1G-... dB-10W-N						
	3 dB	6 dB	7 dB	8 dB	10 dB	20 dB	
FREQUENCY RANGE	40 - 1000 MHz						
MAX. INPUT POWER	10 W						
NOMINAL DIVIDER LOSS	3.0 dB	1.25 dB	0.8 dB	0.75 dB	0.45 dB	0.04 dB	
TOTAL LOSS INCL. NOMINAL LOSS	@ 40 MHz	≤ 3.7 dB	≤ 2.0 dB	≤ 2.0 dB	≤ 1.8 dB	≤ 1.8 dB	≤ 0.8 dB
	@ 1000 MHz	≤ 4.8 dB	≤ 3.75 dB	≤ 2.75 dB	≤ 2.9 dB	≤ 2.9 dB	≤ 1.7 dB
ISOLATION OUTPUT TO OUTPUT	> 17 dB	> 10 dB	> 10 dB	> 10 dB	> 12 dB	> 15 dB	
DIVIDER OUTPUT (dB)	Equal	-6.5 ± 0.5	-7.0 ± 0.5	-8.0 ± 0.5	-10.0 ± 0.5	-20 ± 1.0	
IMPEDANCE	Nom. 50 Ω						

INPUT SWR	< 1.5
MECHANICAL	
TEMP. RANGE	-30°C → +60°C
CONNECTORS	N-female
DIMENSIONS	138 (incl. connectors) x 152 (incl. flanges) x 35 mm
WEIGHT	Approx. 360 g

TYPICAL RESPONCE CURVE



MOUNTING DETAILS



PROCOM A/S

Smedetoften 12, 3600
Frederikssund, Denmark

PROCOM - Making the world smaller

PROCOM A/S
Smedetoften 12
3600 Frederikssund
Denmark