



# Filters & Combiners

DATA SHEET

## 4x4 Wideband Hybrid Combiner

HYO-77-4xx



- High in-band isolation at 30 dB minimum and 32 dB typical
- Very low PIM with low insertion loss
- High power handling 500W per port and 3KW peak
- DC/AISG Input pass through on all ports
- Outdoor rated unit with included mounting bracket
- High reliability of >500K Hours MTBF and RoHS compliant

### Overview

CCI's High Power Outdoor 4x4 Hybrid Combiner is commonly used to combine multiple Base Station (BTS) resources into a Distributed Antenna System (DAS). The RF from each input port is present equally at each one of the four output ports of the 4x4 Hybrid. The Model HYO-77-4xx is a wideband device that can combine all wireless frequency bands from 698 to 2700 MHz and provides a minimum of 30 dB of port to port isolation, 32 dB typical. It has been designed to minimize PIM whilst providing maximum Isolation between ports.

#### Technical Description:

CCI's outdoor wideband 4x4 Hybrid Combiner covers the full spectrum from 698 MHz to 2700 MHz. The unit allows DC/AISG pass-through on all ports for powering Tower Mount Amplifiers. The unit is housed in an IP67 moisture proof enclosure, with IP67 moisture proof connectors suited for long-life. The combiner can be wall or pole mounted.



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## SPECIFICATIONS

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#### Electrical

RF Parameters	Ports	Frequency(MHz)	Specification
Insertion Loss	Input <sup>1</sup> to Output <sup>2</sup>	698 - 800	6.1 dB $\pm$ 0.9 dB
		800 - 2700	6.1 dB $\pm$ 0.6 dB
Coupled Output	Input <sup>1</sup> to Coupled Port <sup>3</sup>	698 - 2700	34 dB $\pm$ 10 dB
Isolation	Input Port <sup>1</sup> to Input Port <sup>1</sup>	698 - 2700	30 dB min., 32 dB typ.
Return Loss	All Ports	698- 2700	$\leq$ 25 dB min.

<sup>1</sup>Ports 1-4; <sup>2</sup>Ports 6-8; <sup>3</sup>Test Port

General Characteristics	
Impedance	50 ohms
Continuous Average Power	500 W max. (all ports)
Peak Envelope Power	3 kW max. (all ports)
Intermodulation Performance (all ports 2 x 43 dBm carriers)	<-160 dBc (-117 dBm) min., <-165 dBc (-122 dBm) typ.
DC Pass Current/AISG Pass	DC paths: Port 1 to Port 5; Port 2 to Port 7; Port 3 to Port 6; Port 4 to Port 8 (max 6.5 A per AISG 2.0)

#### Environmental

Operating Temperature	-40 °C to +70 °C
Ingress Protection	IP67
Relative Humidity	0 - 95%

#### Mechanical

Input Connectors	7-16 DIN or 4.3-10 female x 4 (Port 1 - 4)
Output Connectors	7-16 DIN or 4.3-10 female x 4 (Port 5 - 8)
Dimensions (body)(HxWxD)	350 x 100 x 55.4 mm (13.78 x 3.94 x 2.18 in.)
Dimensions (incl. brackets)(HxWxD)	350 x 230 x 65 mm (13.78 x 9.06 x 2.56 in.)
Weight with brackets	4.44 Kg (9.78 lbs)
Mounting	Pole/Wall mounting bracket

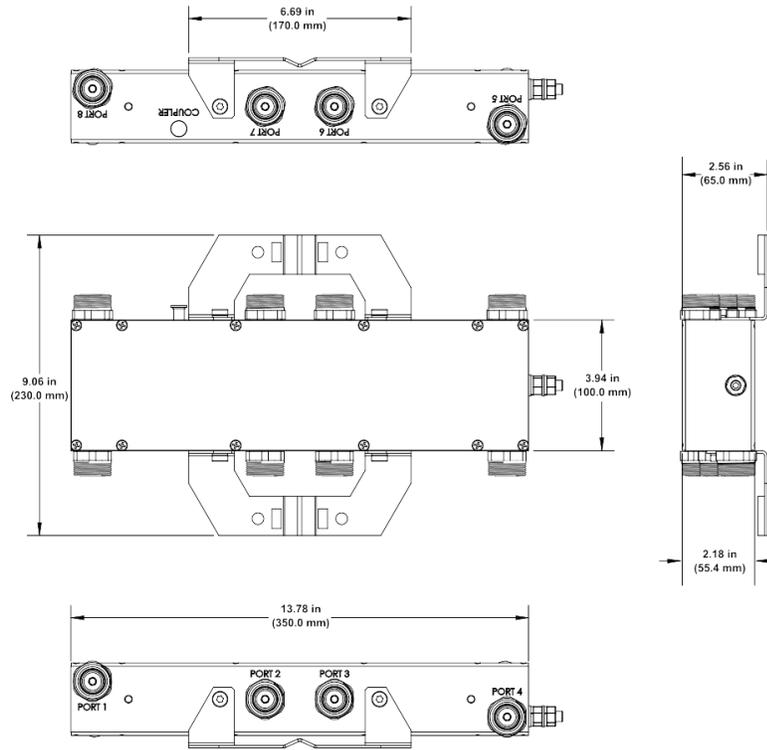


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SPECIFICATIONS

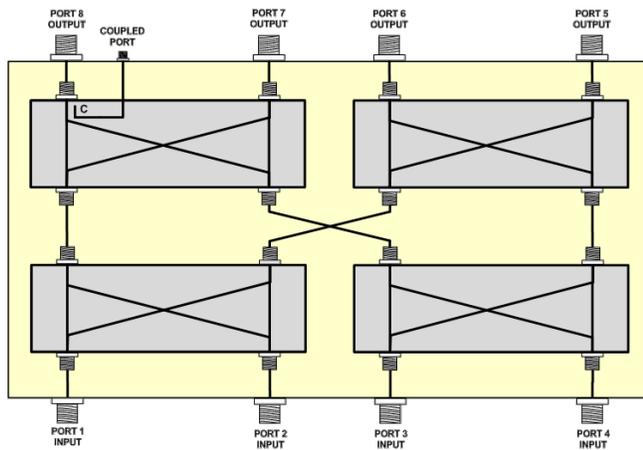
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4 x 4 Hybrid Combiner Outline Drawing

## Block Diagram



4 x 4 Hybrid Combiner Block Diagram



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## STANDARDS & CERTIFICATIONS

### 4x4 Wideband Hybrid Combiner

HYO-77-4xx

#### Parts & Accessories

- HYO-77-4F1** High Power Outdoor 4 x 4 combiner with output coupler and 7-16 Connectors
- HYO-77-4F2** High Power Outdoor 4 x 4 combiner output coupler and 4.3-10 Connectors

#### Standards & Compliance

- Safety** EN 60950-1, UL 60950-1
- Emission** EN 55022
- Immunity** EN 55024
- Environmental** IEC 60068-2-1, IEC 60068-2-2, IEC 60068-2-5, IEC 60068-2-6, IEC-60068-2-11, IEC 60068-2-14, IEC 60068-2-18, IEC 60068-2-27, IEC 60068-2-29, IEC 60068-02-30, IEC 60068-2-52, IEC 60068-2-64, GR-63-CORE 4.3.1, EN 60529 IP67 & IP68

#### Certifications

Federal Communication Commission (FCC) Part 15 Class B, CE, CSA US, ISO 9001

