

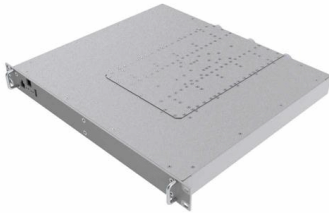


Filters & Combiners

DATA SHEET

Low Loss Combiner

LLC-1900-IN



- Combines Multiple Technologies onto a Single Feed Line
- Low Loss Combining
- Combining for Multiple Technologies (GSM/UMTS, UMTS/UMTS, UMTS/LTE, CDMA/LTE, etc.)
- Minimal or No Guard Band
- High Reliability Design
- High Power Handling
- Cascadable for higher levels of combining
- Excellent Filter Response
- Occupies only 1U of Rack Space
- Built-In Software
- Control via Ethernet TCP/IP
- DC/AISG Pass-Thru
- Critical & Non-Critical Alarm Status LED's

Overview

CCI's Remote Tunable Narrow Guard Band Filter-Combiner (LLC) combines multiple PCS Band signals onto a single feeder without the insertion loss normally associated with passive combiners. This new highly compact model requires little or no guard band depending on the technologies being combined thus maximizing the usage of allocated spectrum.

A precisely matched filter which is wide enough for a UMTS or three CDMA channels allows the carrier to be positioned anywhere in the PCS band and provides high rejection of unwanted spurious emissions and noise. Transmit paths are fully isolated to prevent interference and intermodulation products. Note that any technology (including GSM/UMTS, UMTS/UMTS, LTE/UMTS, LTE/LTE, CDMA/LTE) can be combined when utilizing this LLC. Multiple units can also be cascaded for deployment of additional channels.

When not tuning, no power is required, effectively becoming a purely passive low loss filter combiner. The LLC can be controlled locally or remotely via TCP/IP or Ethernet requiring only a web browser for simple access.

All software is resident internally; no extra software or controller is required. Note that the Bandpass port "only" passes Tx signals, but the Bandstop port is fully duplexed and passes Tx/Rx signals. The unit is housed in a single rack-mounted 19" by 1U assembly and can be cascaded for further feeder line reduction.



Filters & Combiners

SPECIFICATIONS

Low Loss Combiner

LLC-1900-IN

Electrical

RF Parameters	Ports	Frequency(MHz)	Specification
Return Loss	Bandstop TX/RX	1850 - 1990	18 dB min.
	Bandpass TX Only	1930 - 1990	18 dB min.
	ANT	1850 - 1990	18 dB min.
Insertion Loss	Bandstop TX/RX to ANT	1850 to (fc - 2.5) (fc + 2.5) to 1990	0.15 dB typ. 0.15 dB typ.
	Bandpass TX Only to ANT	(fc - 2.5) to (fc + 2.5)	0.6 dB typ.
	Isolation	Bandstop TX/RX to	1930 to (fc - 2.5)
Bandpass TX Only		(fc - 2.5) to (fc + 2.5)	25 dB min., 30 dB typ.
		(fc + 2.5) to 1990	35 dB min., 40 dB typ.
Tuning Range	Any 5 MHz segment (center frequency - fc) in 1930 - 1990 MHz		

General Characteristics	
Impedance	50 ohms
Guard Band:	
GSM/UMTS Combining	500 kHz each side of Bandpass required
UMTS/UMTS Combining	"0" Guard Band required
UMTS/LTE Combining	"0" Guard Band required for 5 MHz or greater LTE carrier
CDMA/LTE Combining	"0" Guard Band required for 5 MHz or greater LTE carrier
Group Delay variation	50 nS typ.
Continuous Average Power	500 W max. (all ports)
Peak Envelope Power	2 kW max. (all ports)
IMD	< -110 dBm (-153 dBc) typical (2 x +43 dBm tones) all bands
DC Pass Current/AISG Pass (BS port to ANT port)	3A/AISG signal (2.176 Mhz) per AISG 2.0

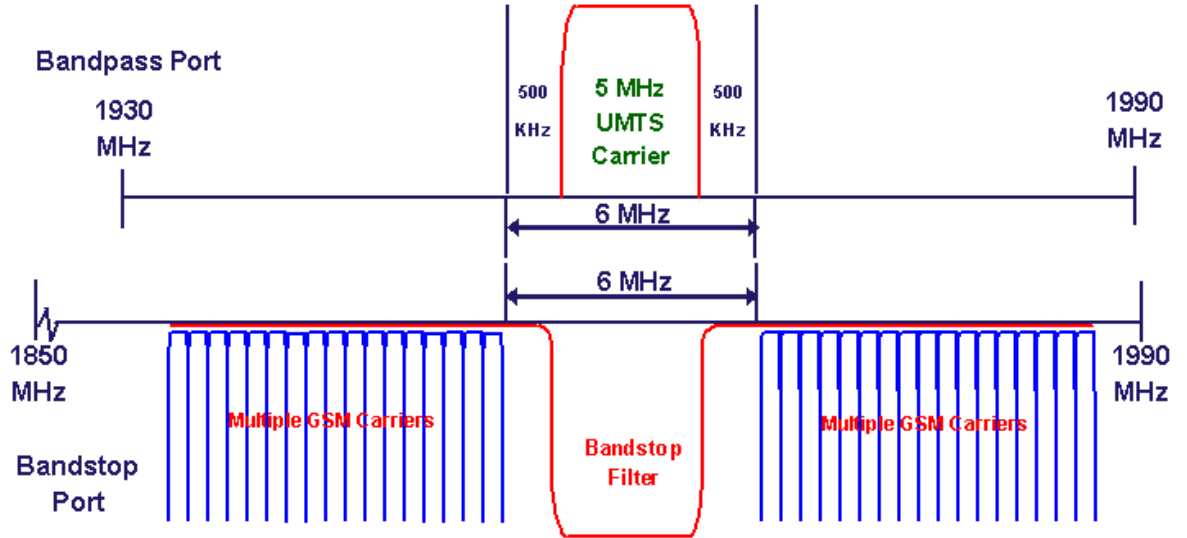


Filters & Combiners

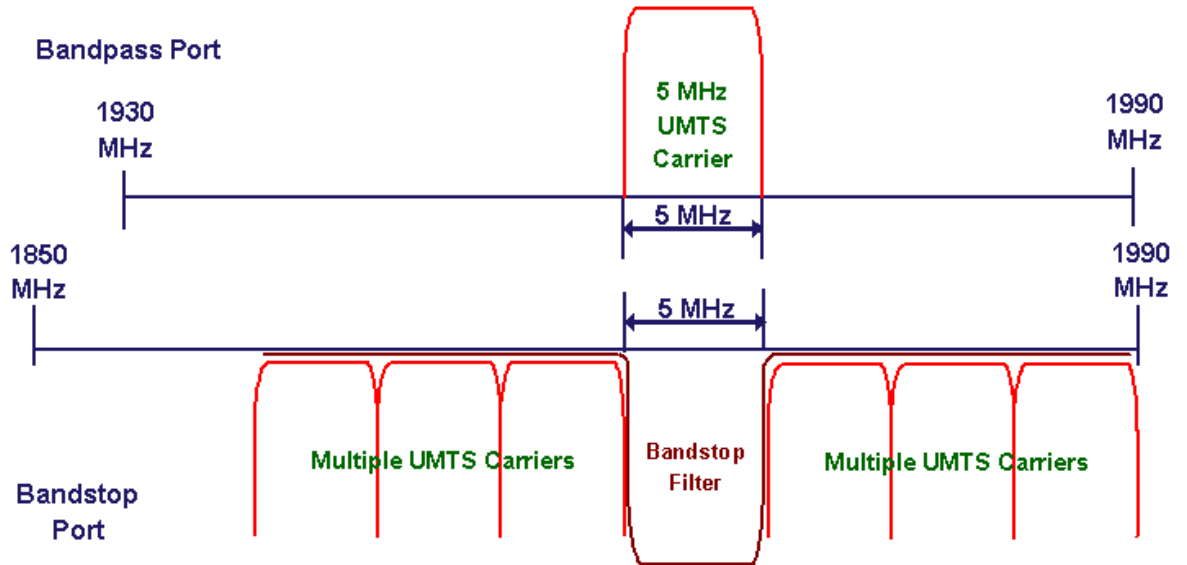
SPECIFICATIONS

Low Loss Combiner

LLC-1900-IN



GSM/UMTS Combining: 500 kHz guard band required



UMTS/UMTS Combining: "0" guard band required

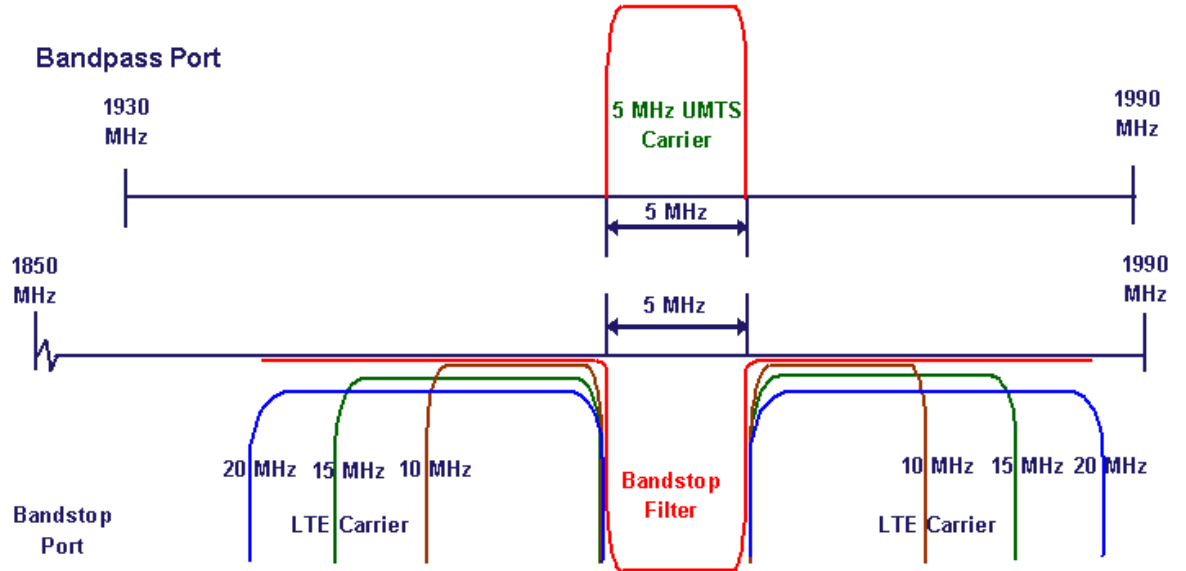


Filters & Combiners

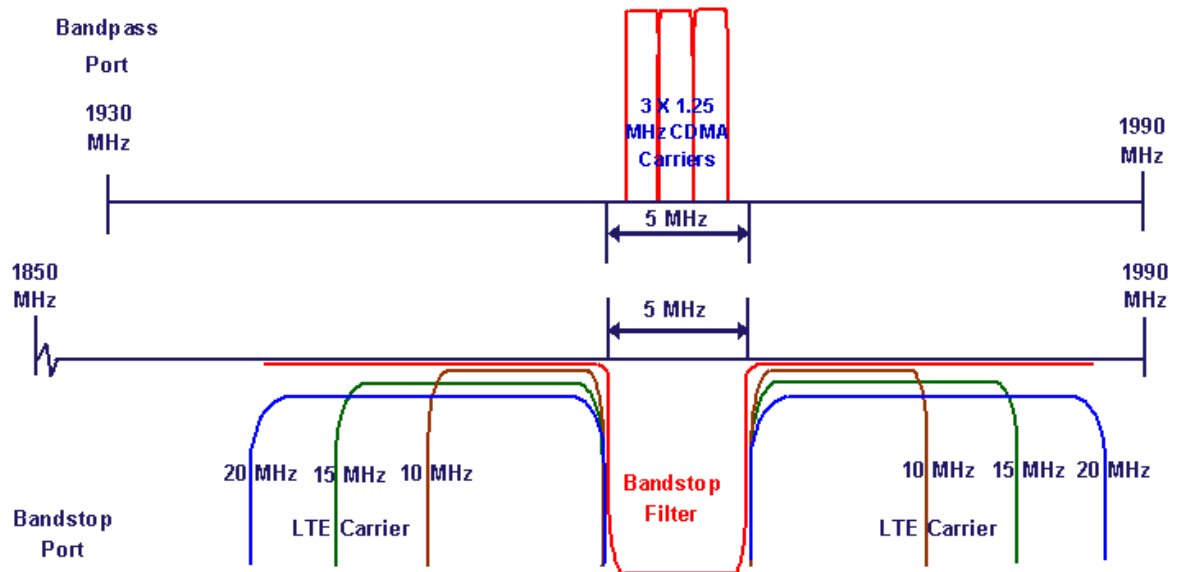
SPECIFICATIONS

Low Loss Combiner

LLC-1900-IN



UMTS/LTE Combining: "0" guard band required for 5 MHz or greater LTE carrier



CDMA/LTE Combining: "0" guard band required for 5 MHz or greater LTE carrier

Environmental

Operating Temperature 0°C to +55°C

Enclosure Indoor

Lightning Protection Surge > 30 KA, 20 KA Mult, Res. Pulse < 250 uJ



Filters & Combiners

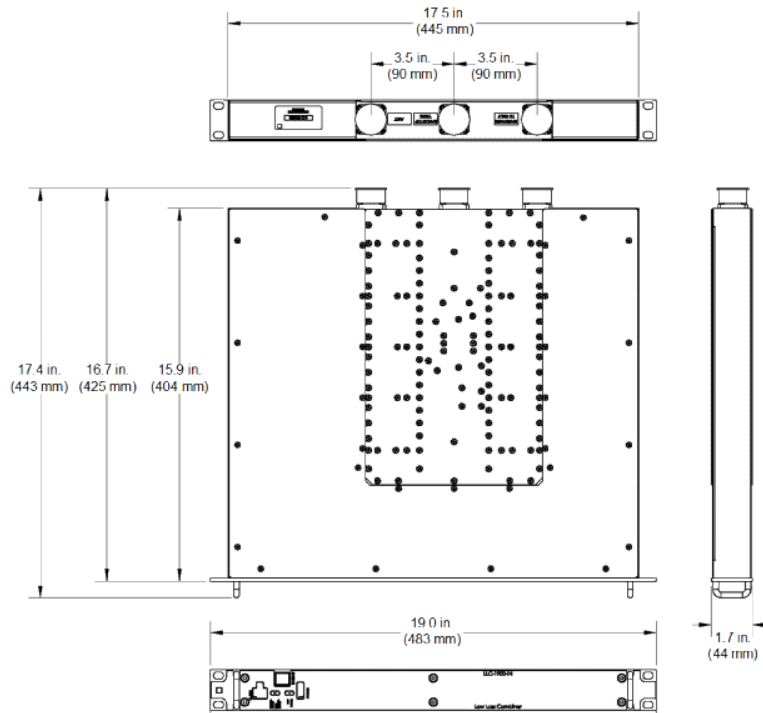
SPECIFICATIONS

Low Loss Combiner

LLC-1900-IN

Mechanical

Connectors	3 x 7-16 DIN female
Data Connection	RJ45 Ethernet
Alarm Connection	6 pin Molex connector (4.2 mm)
Power Connection	2 pin Molex connector (4.2 mm)
DC Power Requirement	2A @ +24VDC (only required when tuning)
DC Voltage	±18 to ±76 VDC
Dimensions (incl. connectors)(HxWxD)	1.75 x 19 x 16.25 in. (44.45 x 482.6 x 412.75 mm)
Dimensions (incl. connectors and handles)(HxWxD)	1.75 x 19 x 17.5 in. (44.45 x 482.6 x 444.5 mm)
Weight	21.0 lbs (9.53 kg)



Low Loss Combiner Outline Drawing



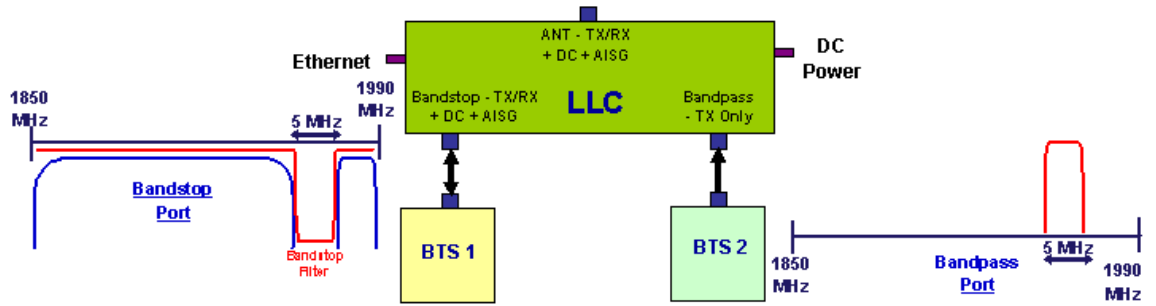
Filters & Combiners

SPECIFICATIONS

Low Loss Combiner

LLC-1900-IN

Block Diagram



Low Loss Combiner Block Diagram



Filters & Combiners

Low Loss Combiner

LLC-1900-IN

STANDARDS & CERTIFICATIONS

Parts & Accessories

LLC-1900-IN 1900 Band Narrow Guard Band Tunable LLC

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, IEC61000-4-5, GR-63-CORE 4.3.1, EN 60529 IP67, IP68

Certifications

Antenna Interface Standards Group (AISG), Federal Communication Commission (FCC) Part 15 Class B, CE, CSA US, ISO 9001

