For more information, call 800-622-7711
or visit occfiber.com.

OPTICAL CABLE CORPORATION

CELLULAR DISTRIBUTION SYSTEM®

Overview:

OCC's patent-pending Cellular Distribution System® (CDS) is a signal booster system designed to provide a simple solution for eliminating in-building cellular dead zones. The CDS kit improves localized cellular coverage within a building that experiences low signal strength where service provider coverage is acceptable at a nearby outdoor location. The CDS solution applies structured cabling concepts to support wireless communications within a building, using newly installed coaxial cable to distribute wireless signals. This is accomplished using a unique Distributed Antenna Technology. Four antennas are cabled to the rack mount CDS panel, creating signal pathways to an external omnidirectional antenna for signals that otherwise would experience heavy propagation losses. Materials that cause such losses include external metal siding, concrete and rebar, which seriously inhibit cellular propagation inside your building. These materials are bypassed using the easy-to-install CDS Installation Kit, making the cell phone coverage inside your building as good as the coverage you get outside. Each kit includes all the components required, with easy-to-follow explicit instructions for fast installation to improve your indoor cellular service.

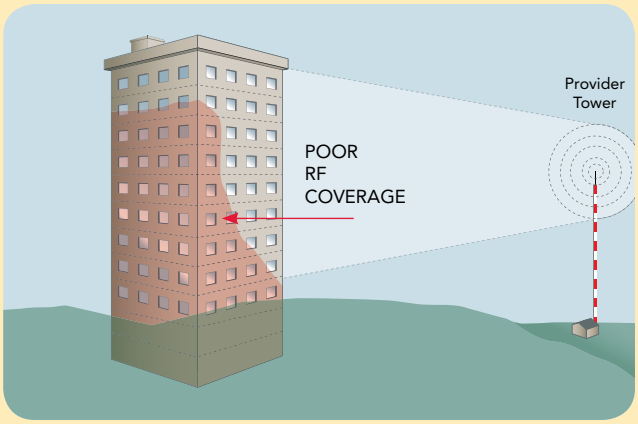
Applications:

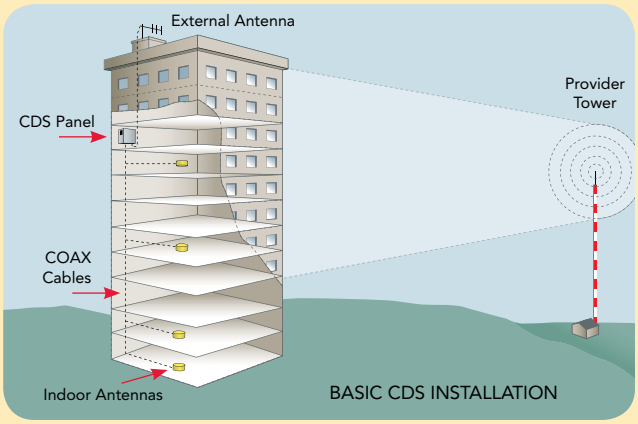
Ideal for building applications where cellular service is readily available at an external location outside the building, yet coverage is poor when the mobile user enters the facility. Typical structures that may benefit from the CDS system are buildings with metal walls or heavy rebar, underground or basement locations.

Active Hardware Specifications:

- Gain 65 dBMax Output Power up to 3 watts
- Max RF
  + 30 dBm / + 30 dBm
- Noise Figure
  3 dB nominal
- Flatness
  ± 2.5 dB
- Isolation > 90 dB
- Power Requirements 120 V AC 3/6 A max
  (Single/Dual Band System)
- Connectors N-Female 50 ohms

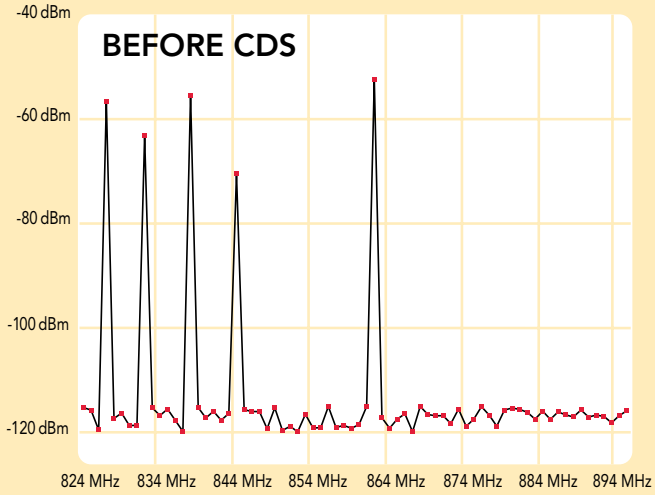
CELLULAR DISTRIBUTION SYSTEM®

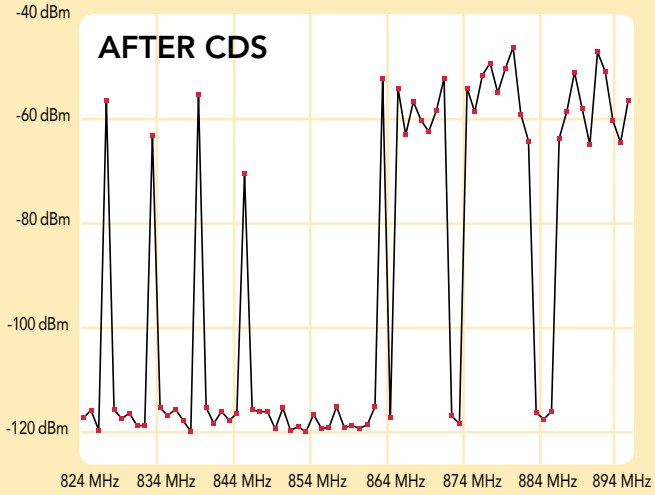




Coverage Areas:

- Coverage is highly dependent on the signal strength at the single external antenna location of each provider.
- Open space installations: ~60,000 sq feet per panel coverage established.
- Office space installations: ~30,000 sq feet.
- Open space coverage is easier to obtain than closed and walled space.
- Materials such as metal and reinforced concrete reduce effective range.
- The longer the coaxial cable-run to both the external and internal antennas, the less coverage range.
- With 100' of LMR from the panel to the internal antennas, approximately 100' of functional range will occur dependent on the signal strength at the external antenna location.
- Antenna placement in the facility is key to successful deployment.





Performance Graphs:

Site survey for provider strength is a gauge for the effectiveness a CDS system will have for a specific building. The graphs above illustrate the effectiveness of CDS in providing a signal pathway between an internal location of a mixed office/manufacturing building and the outside. In the second plot, the RF traffic from the tower can be seen to be approximately -75 dBm of power after the installation of a CDS unit, whereas prior to the installation as seen in the first plot, the power level was below the 110 dBm measurement threshold.

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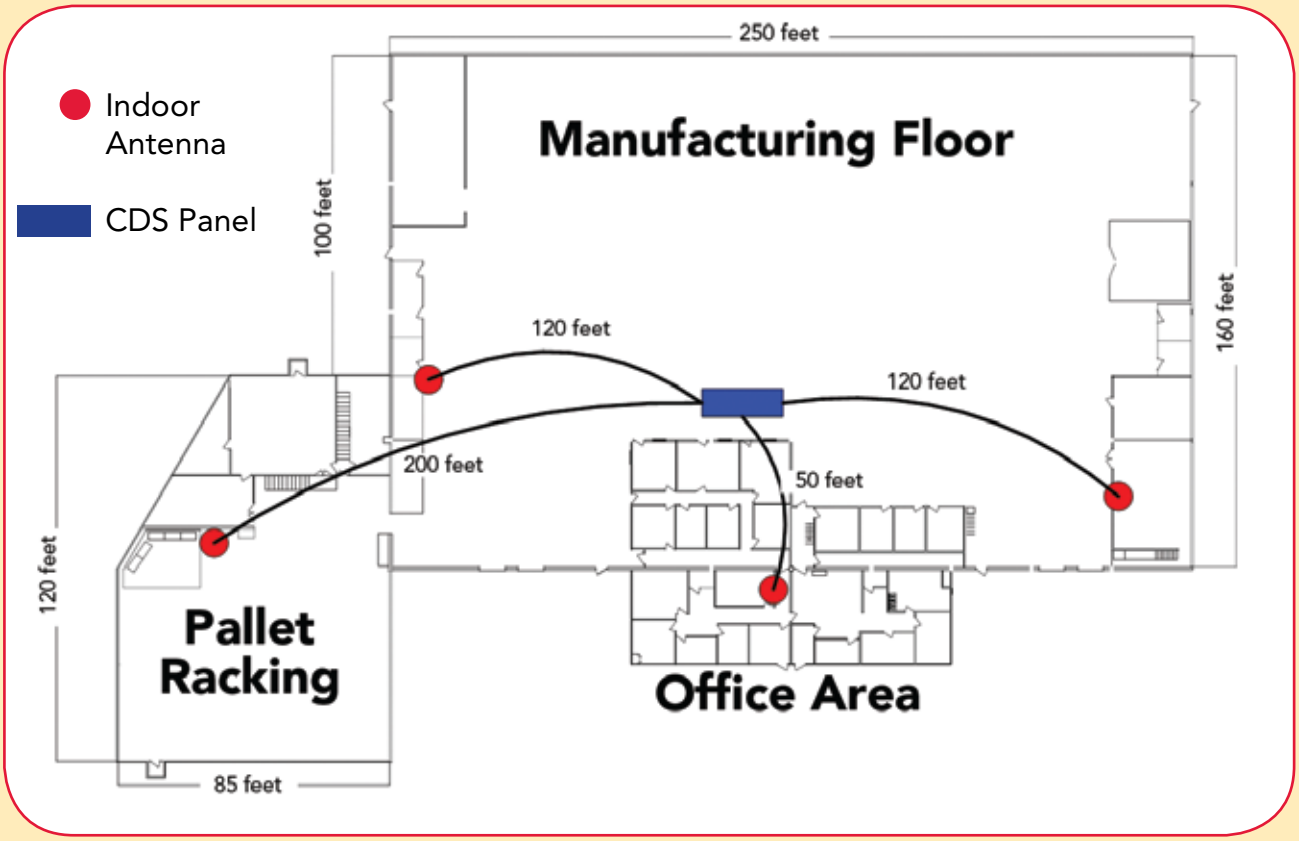
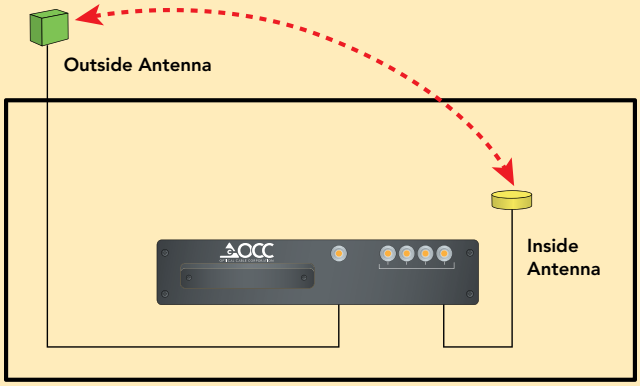




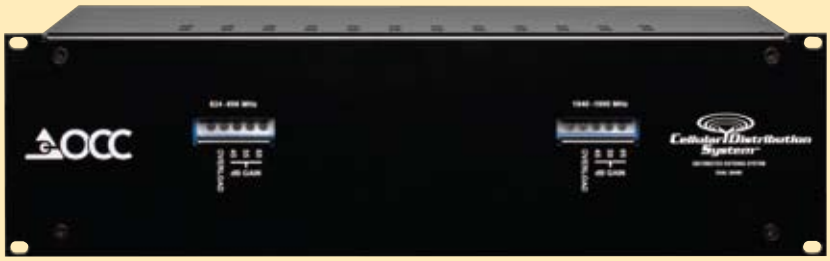
TESTING ANTENNA TO ANTENNA ISOLATION

Electrical isolation between the external antenna and the internal antennas should be at least -85 dB.

Installation Considerations:

- Location of the external donor antenna should be as high as possible, with cellular provider power levels as high as locally available.
- Cable lengths should be kept to a minimum for all segments. Increased cable length results in less range from the internal antennas.
- Low loss cable should be used. If long cable runs in excess of the recommended 140 feet from the external antenna and greater than 100 feet from the panel to the internal antennas are used, the lowest loss cable available should be considered for the install.
- An omnidirectional antenna should be used to achieve maximum external coverage for multiple bands. However, a high-gain antenna can be used for a single-band provider.
- For optimal cellular coverage, system specifications should be matched to the frequency range used by your provider.
- Internal antennas should be mounted in high locations whereby a line of sight to the antenna is probable, such as the center of open spaces and at the center of corridor junctions.

CDS DUAL BAND WIDTH SYSTEMS



CDS8N/19-50-4D | iDEN and 1840–1990 MHz Distributed Antennas System
CDS8V/19-50-4D | 824–896 MHz and 1840–1990 MHz Distributed Antennas System

iDEN & 1840-1990 MHz	824–896 & 1840–1990 MHz	FEATURES AND BENEFITS
■	■	Improves cell service in buildings where service is poor or nonexistent, and is good at a nearby outside location.
■		806–866 MHz and 1840–1990 MHz simultaneous provider band support.
	■	824–896 MHz and 1840–1990 MHz simultaneous provider band support.
■	■	Easy to install – no software configuration.
■	■	1 external low-profile dual-band omni-directional 3dBi gain antenna, 4 internal omni-directional broadband ceiling-mount dome antennas.
■	■	Utilizes low loss coaxial cable to distribute cellular provider signals throughout a building.
■	■	Requires strong cellular service provider signal at the external antenna location.
■		iDEN (800 MHz) CDMA TDMA and GSM (1900 MHz) compatible, including high-speed data and 3G internet services.
	■	CDMA, TDMA and GSM compatible, including high-speed data and 3G internet services.
■		Does not support 800 MHz iDEN and 824–896 MHz simulataneously.
	■	Does not support 800 MHz iDEN.
■	■	Complete kit – installer only needs coaxial cable.
■	■	3RU form factor.

iDEN & 1840-1990 MHz	824–896 & 1840–1990 MHz	APPLICATIONS / SUPPORT SPECIFICATIONS
■		65 dB gain for both 806–866 MHz and 1840–1990 MHz bands simultaneously.
	■	65 dB gain for both 824–896 MHz and 1840–1990 MHz bands simultaneously.
■	■	Utilizes standard 50 Ohm N connectors for all connectivity.
■	■	Automatic gain adjustment.
■	■	Maximum 3W power output.
■	■	+30 dBm RF Uplink, +30 dBm RF Downlink maximum.
■	■	FCC part 22 compliant as a low-power cellular accessory.
■	■	18 lbs panel weight, 4.75 in x 17.50 in x 8.195 in.
■	■	13.75” External Antenna Length.
■	■	Utilizes in-line coaxial gas tube for lightning surge suppression.
■	■	120 VAC power supply input.

System design and cabling support consulting services available upon request.

CDS – 1900 MHz SYSTEMS

CDS19-50-4D | 1840-1990 MHz Distributed Antennas System

1840-1990 MHz	FEATURES AND BENEFITS
■	Improves cell service in buildings where service is poor or nonexistent, and is good at a nearby outside location.
■	1840–1990 MHz provider band support.
■	Easy to install – no software configuration.
■	1 external low-profile dual-band omni-directional 3dBi gain antenna, 4 internal omni-directional broadband ceiling-mount dome antennas.
■	Utilizes low loss coaxial cable to distribute cellular provider signals throughout a building.
■	Requires cellular service provider signal at the external antenna location.
■	CDMA, TDMA and GSM compatible, including high-speed data and 3G internet services.
■	Complete kit – installer only needs coaxial cable.
■	2RU form factor.

1840-1990 MHz	APPLICATIONS / SUPPORT SPECIFICATIONS
■	65 dB gain for 1840–1990 MHz band.
■	Utilizes standard 50 Ohm N connectors for all connectivity.
■	Automatic gain adjustment.
■	Maximum 3W power output.
■	+30 dBm RF Uplink, +30 dBm RF Downlink maximum.
■	FCC part 22 compliant as a low-power cellular accessory.
■	13.75” External Antenna Length.
■	Utilizes in-line coaxial gas tube for lightning surge suppression.
■	120 VAC power supply input.

System design and cabling support consulting services available upon request.

CDS (850 MHz SYSTEMS)

CDS8N-50-4D | iDEN Distributed Antenna System
CDS8V-50-4D | 824-896 MHz Distributed Antenna System

iDEN	824-896 MHz	FEATURES AND BENEFITS
■	■	Improves cell service in buildings where service is poor or nonexistent, and is good at a nearby outside location.
■		806–866 MHz provider band support.
	■	824–896 MHz provider band support.
■	■	Easy to install – no software configuration.
■	■	1 external low-profile dual-band omni-directional 3dBi gain antenna, 4 internal omni-directional broadband ceiling-mount dome antennas.
■	■	Utilizes low loss coaxial cable to distribute cellular provider signals throughout a building.
■	■	Requires cellular service provider signal at the external antenna location.
■		iDEN compatible.
	■	CDMA, TDMA and GSM compatible, including high-speed data and 3G internet services.
■	■	Complete kit – installer only needs coaxial cable.
■	■	2RU form factor.

iDEN	824-896 MHz	APPLICATIONS / SUPPORT SPECIFICATIONS
■		65 dB gain for both 806–866 MHz.
	■	65 dB gain for both 824–896 MHz.
■	■	Utilizes standard 50 Ohm N connectors for all connectivity.
■	■	Automatic gain adjustment.
■	■	Maximum 3W power output.
■	■	+30 dBm RF Uplink, +30 dBm RF Downlink maximum.
■	■	FCC part 22 compliant as a low-power cellular accessory.
■	■	13.75" External Antenna Length.
■	■	Utilizes in-line coaxial gas tube for lightning surge suppression.
■	■	120 VAC power supply input.

System design and cabling support consulting services available upon request.

CDS ORDERING INFORMATION

PART NO.	DESCRIPTION
CDS8V-50-4D**	Cellular Distribution System Kit for 824–894 MHz cellular band
CDS8N-50-4D**	Cellular Distribution System Kit for 806–866 MHz iDEN band
CDS19-50-4D**	Cellular Distribution System Kit for 1840–1990 MHz cellular band
CDS8V/19-50-4D**	Cellular Distribution System Kit for 824–895 MHz cellular band and 1840–1990 MHz cellular band
CDS8N/19-50-4D**	Cellular Distribution System Kit for 806–866 MHz iDEN band and 1840–1990 MHz cellular band
LMR400NM-XXX*	Riser 50 Ohm LMR400 coaxial cable with male "N" type connectors
LMR400NMP-XXX*	Plenum 50 Ohm LMR400 coaxial cable with male "N" type connectors
* Replace "XXX" with length of LMR 400 coaxial cable assembly	
** Each CDS Kit includes: 1 – CDS Panel 4 – Standard Single-Ceiling Mount Dome Antennas 1 – Omni-Directional Outdoor Antenna and Mounting Hardware	

Warranty:

Each CDS kit is backed by a 1-year product warranty from OCC. The products must receive normal and proper use and due care in handling. Normal wear and tear, deterioration due to aging or damage caused by environmental conditions, electromagnetic interference ("EMI") or radio frequency interference ("RFI") shall not constitute a defect or failure under this warranty. These warranties do not cover defects resulting from accidents, alteration, unauthorized repair, misuse, fire, flood, lightning strike damage, acts of God and or any diverse changes in temperature and climate not considered normal for an interior building infrastructure. All installation records must be updated to reflect any maintenance, movements, additions or changes, and such records shall be made available to OCC upon request.

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ATTENTION

This CDS product (the "System") (OCC Data Product No. CDS8V-50-4D, CDS8N-50-4D, CDS19-50-4D, CDS8V/19-50-4D, CDS8N/19-50-4D), comprised of one CDS panel, four faceplates (internal antennas), internal cabling and external antenna, has been verified as capable of compliance with Subpart B of Part 15 of the FCC's rules, provided that the System and each of its components are used for their intended purpose pursuant to the manufacturer's instructions and authorized vendor's installation and provided that no modifications of any nature are made to the System or any of its component parts. Operation of the System is subject to the following two conditions: (1) This device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of this device. The signal booster component (FCC ID No. Pwo8013sb) manufactured by Wilson Electronics, Inc., installed in the CDS panel is certified compliant with Part 22 of the FCC's rules.

The System is designed to cause no interference to lawful users of licensed frequencies, but this does not constitute a guarantee or warranty that no interference will occur.