

### 3.6 System Expansion Planning

The DEU enables 6-way expansion of any optical port. This makes it possible to add more DRU's without having to install additional DHU's. Each DHU is equipped with six optical ports. If more than six DRU's are required by the application, a DEU may be connected to one of the optical ports at the DHU which expands that port to six ports. If still more optical ports are required, then a second DEU may be connected to the DHU or a second DEU may be connected to the first DEU. The ability to cascade DEU's in parallel or in series provides unlimited flexibility. It is physically possible to connect an unlimited number DRU's to the DHU through the installation of DEU's.

The total number of DRU's that can be served is limited by the cumulative noise effect caused by antenna combining. This number cannot be determined until the radius distance of coverage required at the DRU antenna is determined and the path loss attributed to the structure are known. The system design requires that the carrier to noise differential be greater than the customer's desired signal to noise ratio.

If it is likely that the system will be expanded in the future, locate the DHU in such a way that it can be used as a hub for an expanded system. It should be noted that a DEU can be used as an optical regenerator. A DRU may sometimes need to be located at a point that is beyond the distance limitation imposed by the optical fiber. The solution is to install a DEU at the maximum optical fiber length from the DHU. This provides an additional 500 m, 750 m, or 10 km (depending on the fiber type) of optical fiber length beyond the DEU for connecting the DRU.

### 3.7 DRU Antenna Options

Various antennas, shown in Figure 12, are available from ADC for use with the DRU. All antennas include a 6-foot (1.8 m) long 50-ohm coaxial cable (equipped with SMA male connector) for connection to the DRU. The DRU is equipped with an SMA female connector for connecting the antenna cable.

The DRU antennas are designed for unobtrusive mounting within an office environment. Each type of antenna provides a specific coverage pattern in order to accommodate the shape of the area where coverage is required. The ceiling-mount omni directional antenna is designed to mount in the center of the coverage area. The directional panel antenna is designed to mount vertically on one side of the coverage area or in the corner of the coverage area. The ceiling mount hallway antenna is designed to mount in the center of long corridors. Non-ADC antennas may also be used with the DRU to meet various application requirements, but must comply with equipment authorization for RF exposure compliance.

- ◆ **Note:** To comply with Maximum Permissible Exposure (MPE) requirements, antennas must be installed to provide at least **20 centimeters** (8 inches) of separation from all persons per FCC 47 CFR part 2.1091 and IC RSS-102, Section 2.5.2.