

E-Bus Transmission Systems

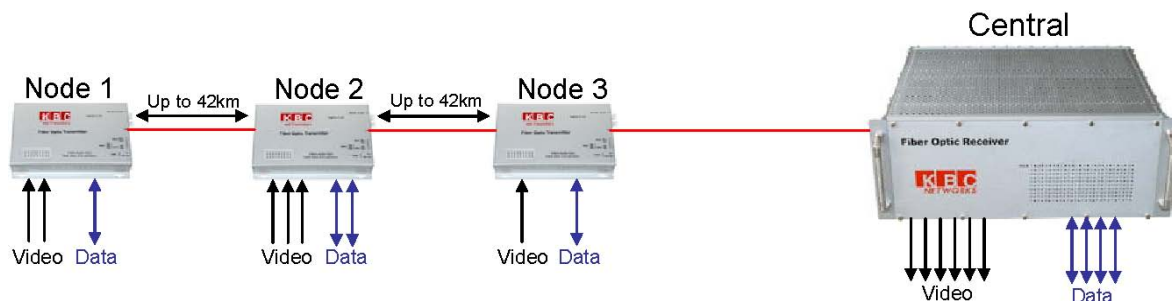
Introduction

When looking to link a number of camera locations together with a single fiber, the solution can often be very expensive due to the technology being used. It may be that the system employs a telecom backbone technology to integrate multiple, compressed, digitally encoded video signals, or it could be that uncompressed video signals are linked together on different optical wavelengths using Coarse Wavelength Division Multiplexing (CWDM) technologies. Whatever the technology, if you only have to pick up small numbers of video signals at a number of locations, the solution is very expensive on a per camera basis.

KBC Networks E-Bus modules are designed to offer a competitive, low-cost solution for CCTV optical bus systems where low numbers of video need to be attached at individual locations. E-Bus can accommodate up to 10 video and 20 data signals in a single fiber and will allow a maximum of 10 node locations to be connected. The system uses Time Division Multiplexing (TDM) to integrate signals at the same optical wavelength and then Wavelength Division Multiplexing (WDM) to put “upstream” and “downstream” signals on the same single optical fiber.

Configuration

At a node location anything from 1 up to 4 video signals can be attached plus up to 2 data channels. All video signals and data signals in the bus will be presented at the head end as individual connections. For example, if the system has three node locations (shown above) and at node one there are 2 video and 1 data interface, node



two has 3 video and 2 data connections and node three has 1 video and 1 data interface, then the head end unit would comprise of 6 video and 4 data connections. As the maximum number of video signals in a bus is 10, the maximum number of nodes that a single bus can have is also 10. However if a node position has more than 1 video input, then the number of nodes in the bus will drop accordingly.

E-Bus uses 8 bit digitally encoded transmission to put up to 10 video streams at a single wavelength. 10 bit digital encoding is available if required but due to the increase in serial bit rate, the maximum number of video signals in a 10 bit bus is reduced to 4.

Optical Budget

Each E-Bus module has a 15dB optical budget. As the fiber is connected to each module in the bus this equates to a 15dB budget between each attached unit or between nodes. For singlemode this provides distances up to 45Km between attached stations and 1Km for multimode systems. The reduced distance for multimode is due to the effective electrical bandwidth of the E-Bus system and the effect this has on multimode transmission due to modal dispersion.

Physical

Depending on the complexity and location of the E-Bus module, units are available either in wall mount, 1U or 2U 19" tray with integral PSU or a 4U chassis card. Head end units would tend to be in the 19" tray configurations due to the complexity.

E-Bus & ASFOM

E-Bus can also be used with the KBC ASFOM range to build much larger bus systems. In the drawing below, E-Bus is used as a feeder system to ASFOM which then carries the E-Bus video and data, along with locally connected ASFOM signals, on a CWDM bus system to the central point. By utilizing E-Bus and ASFOM the bandwidth of the fiber is used to its full potential and the commercial objectives of the project can be met.

Example E-Bus coupled with ASFOM 1 fiber bus solution

