

Fibre optic distribution system for reference signals

Pendulum Instruments offers a distribution system - DA-35 - for analogue reference signals with minimal jitter. The system is adapted to single-frequency reference signals e.g. 10 MHz (sine). The distribution is completely analogue, without the use of PLLs or other types of frequency restructuring circuits. The signal is reconstructed with the help of a steep band pass filter. Disturbances like e.g. noise and distortion, can be completely eliminated due to the filter. The steepness can be selected depending on the choice of application.

The signal/noise ratio can be almost equal (in extreme cases even better!) to the input signal by using a steep filter, even in the case where the signal is distributed several kilometres.

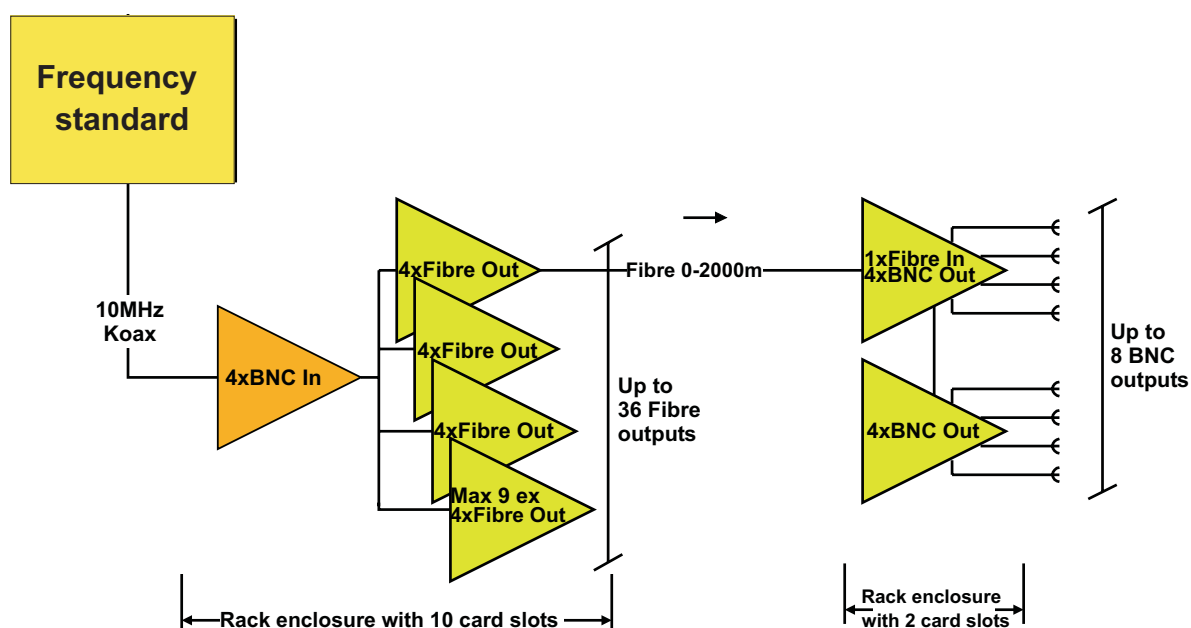
By using a fibre optic cable as the transmitting medium, a galvanic isolation is created between the transmitting element and the receiving element. The fibre is insensitive to external disturbances as e.g. crosstalk/crossinduction and ESD. The main advantage is the elimination of ground currents.

The receiving end of the system has AGC (Automatic Gain Control) which makes the installation and adjustment easy. Distances between 0-2000 m can, without changing the settings, be overbridged by the use of multimode fibre.

System structure

DA-35 is modularly constructed, with plug-in cards to a rack backplane. There are two types of rack enclosures; one with 2 card slots, the other with 10 card slots. Supply voltage and common signals are distributed via the back of the rack. All card slots are similar.

Both rack enclosures can be used either as "stand-alone" or in a rack stand.



Plug-in Boards

4 x BNC In

The card is used for feeding the analogue reference signal into the distribution system. The signal is fed via one of the BNC-contacts on the front of the card to the back of the rack enclosure. Four different frequencies can be feeded, but should be avoided, as it may cause beat frequencies. These beat frequencies may in turn, via voltage feed and crosstalk in the back plane, disturb the reference signals.

4 x Fibre Out

The card selects one of the four back plane trunk lines containing a signal. The signal is, via power control, transmitted on a fibre optic cable. There are 4 fibre outputs per card. The standard type of fibre contact is ST, but also SMA can be mounted. Other types of contacts can be offered if requested.

1 x Fibre In, 4 x BNC Out

The fibre distributed signal is received, amplified, band pass filtered, and finally distributed as an electric analogue signal. The signal is either distributed via the BNC-output of the card, to the back plane of the rack enclosure, or both. The card holds an AGC that overbridges different distances with fibre, without re-trimming the card. A diode lamp indicates whether the AGC is working within its limits. The steepness of the band pass filter is chosen depending on application. It is possible to re-trim the card to suit other frequencies.

4 x BNC Out

This card exists in several versions. One version is a card without AGC, where the amplification has to be manually set. This card is used when it is desirable to obtain the reference signal via BNC:s from the back plane. One of four signals derived from the back plane can be chosen, and the chosen signal is fed to all of the four BNC:s.

Other types of plug-in boards can be offered if requested. Contact us for further information.

Pendulum Instruments AB
www.pendulum.se

