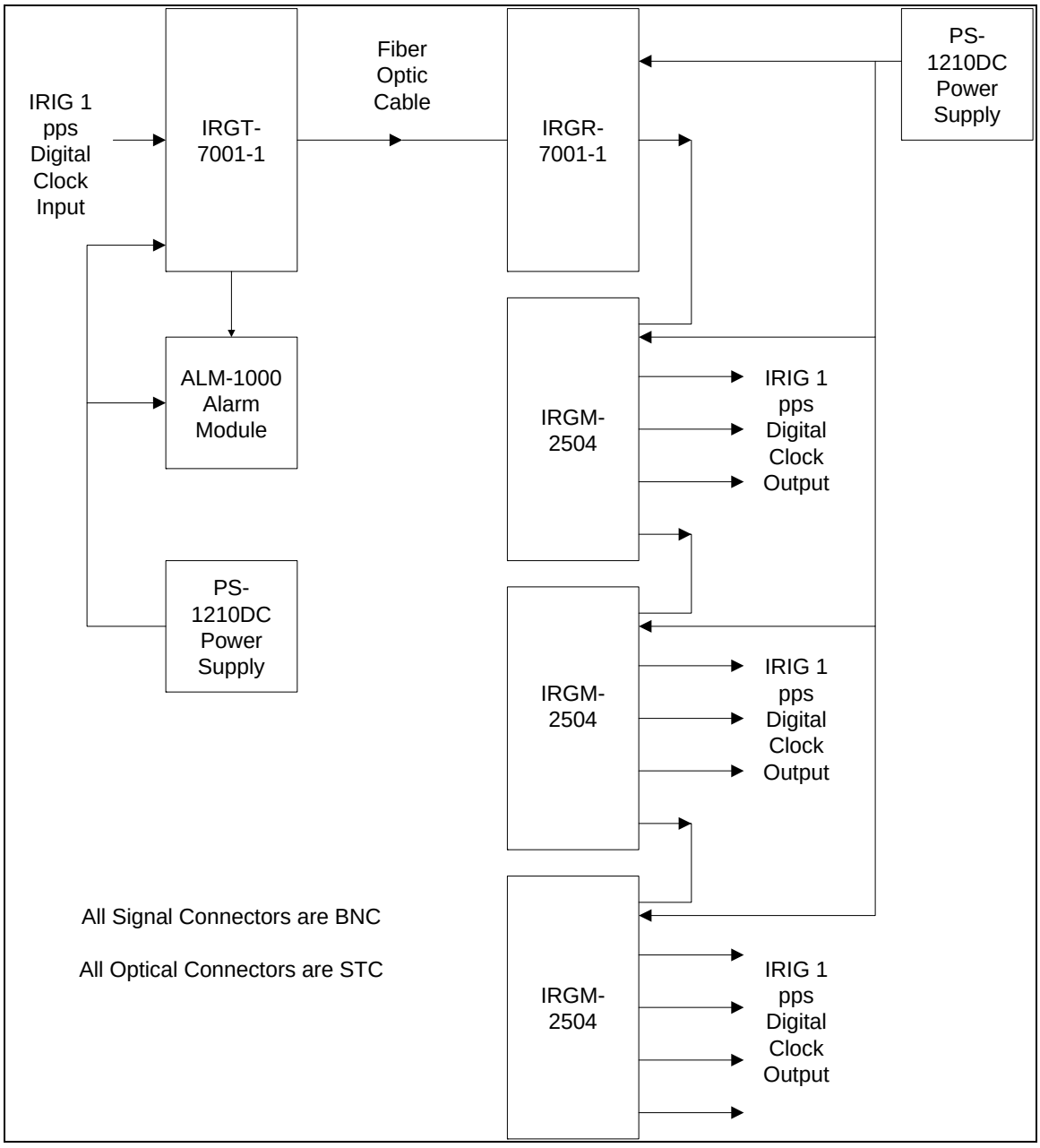
Configuring a Simple 1 PPS Distribution System

When precision 1 PPS signal (from a GPS receiver for example) needs to be distributed to multiple locations the use of fiber optic transmission techniques can assure high quality noise-free signals at each individual location without the problems normally encountered with copper cable. Since the fiber optic interconnecting cable in such a system is virtually immune to electrical interference, it can be routed wherever convenient without regard the proximity of electrical noise producers. In addition, costs need not necessarily be a detriment especially where high quality performance is critical. Figure 1 shows a typical distribution system.

The drawing below shows a complete system using relatively inexpensive components. Each component will deliver high quality PPS signals over distances of a mile or two between units with multimode optical fiber or tens of miles between units with single-mode optical fiber. The system will also operate from –35 to +75°C thereby allowing it to be used both indoors and outdoors.

In operation a PPS signal from a GPS receiver or other source is connected to a DC coupled fiber optic transmitter. This device produces an optical output which is then routed to a DC coupled fiber optic receiver. Here the optical signal is detected and an electrical output provided. The output is then connected to several distribution amplifiers where it is broken out into as many locations as required.

The drawing employs three ***Luxlink***® Units. The IRGT-7001-1 is a fiber optic transmitter that converts the PPS signal into a light pulse which is applied to a fiber optic cable. The light signal is then received by an IRGR-7001-1 fiber optic receiver where it is converted back into a PPS electrical signal. This signal is then applied to several IRGM-2504 DC coupled distribution amplifier where is then routed as desired. The PPS output signal will be nearly identical to the original signal with rise times as fast as 10 nanoseconds. In fact the only variation will be due to a time delay of a few microseconds due to the electronic circuitry and length of the fiber optic cable.



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