

# Fiber Noise Canceller (FNC)

Standalone controller for optical fiber noise cancellation

## Overview

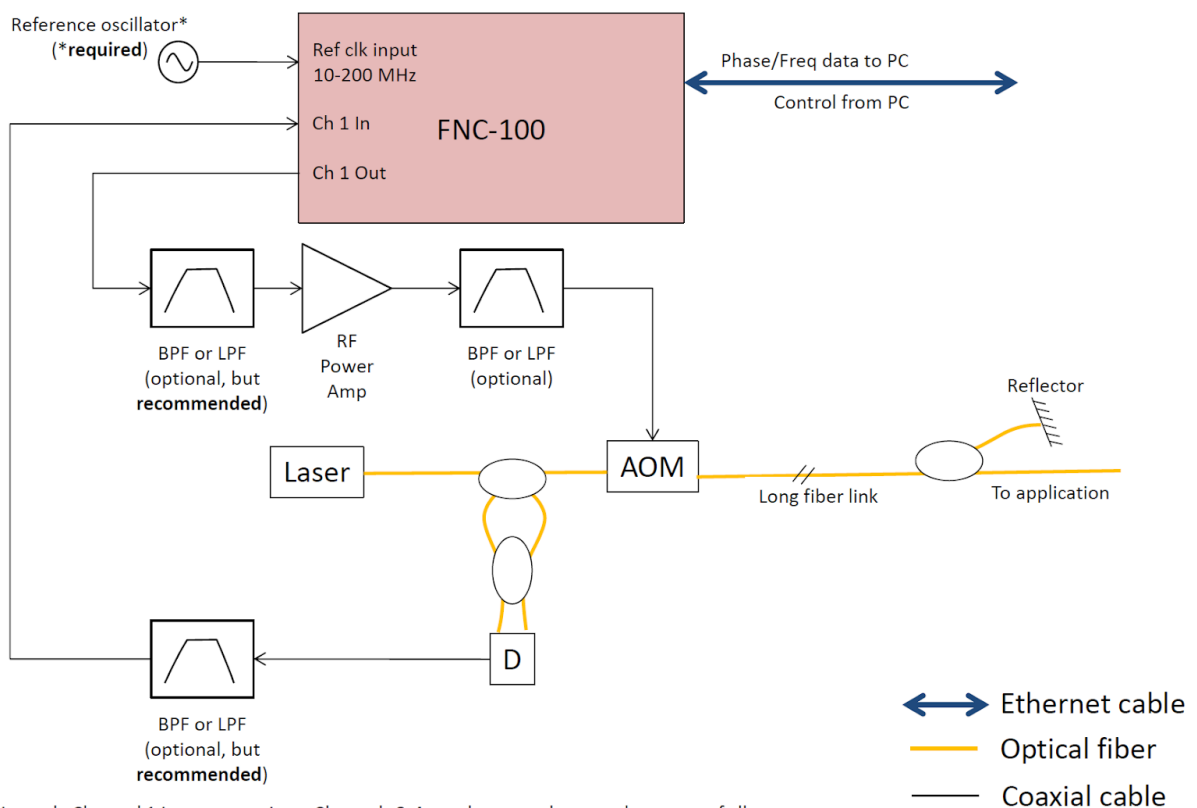
Waxwing Instrument's Fiber Noise Canceller (FNC) is a standalone controller intended for applications requiring remote frequency stabilized light sources.

In a typical application, a very stable laser will be located in building A and sent out to building B over a long optical fiber. The FNC, along with minimal electro-optic components, can be installed at site A to cancel any phase fluctuations arising from the long optical fiber.

## Features

- Small footprint
- Four independent channels
- Low-noise electronics
- Frequency counters
- FPGA-based processing
- Open-source, python-based GUI
- Ethernet connection to PC
- \*\*Requires a reference oscillator (10-200 MHz)

## Block diagram – Typical application



Showing only Channel 1 interconnections, Channels 2-4 are the same, but use the same ref clk

## Front and back views

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## Specifications

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- Four input channels:
  - 15 MHz to 1 GHz input bandwidth
  - Up to 10 MHz instantaneous bandwidth around user-selected center frequencies in the 15 MHz-1 GHz range
  - 1 Hz frequency counts with no dead time, triangular averaging
  - 100 Hz phase samples with no dead time
  - Better than 1 mHz frequency resolution at 1 sec
- Four output channels:
  - 10 MHz to 450 MHz output bandwidth
  - >-10 dBm RF output power; to be amplified and filtered before sending to an acousto-optic modulator
  - >10 kHz of closed-loop bandwidth
- PC software for diagnostics, monitoring & continuous logging