FD2-PDS
Longevity Qualification and Stability Test Workshop

Jun 7, 2023

SoF Laser Diode Testing

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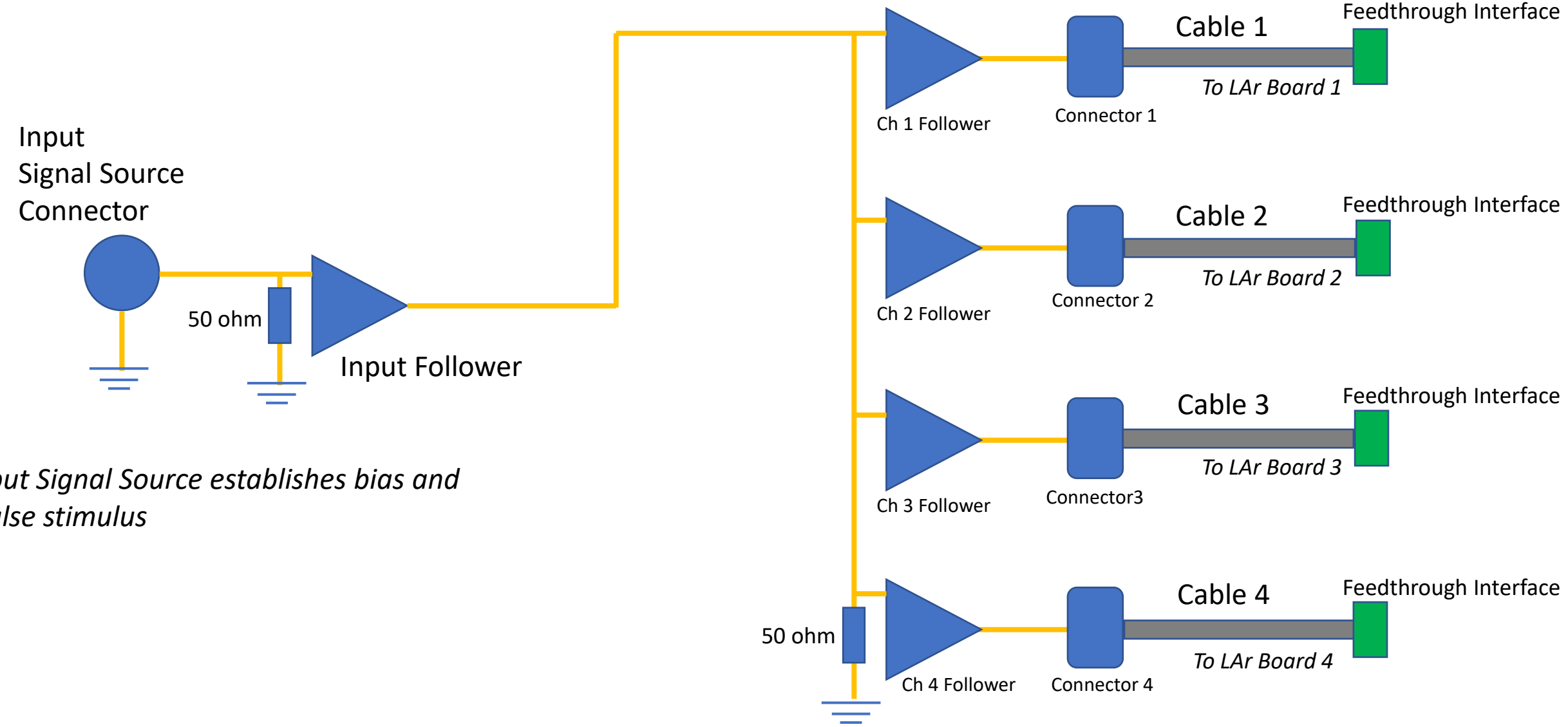
Fermilab

Warm Signal Distribution Board



Input Signal Source establishes bias and pulse stimulus

Warm Signal Distribution Board

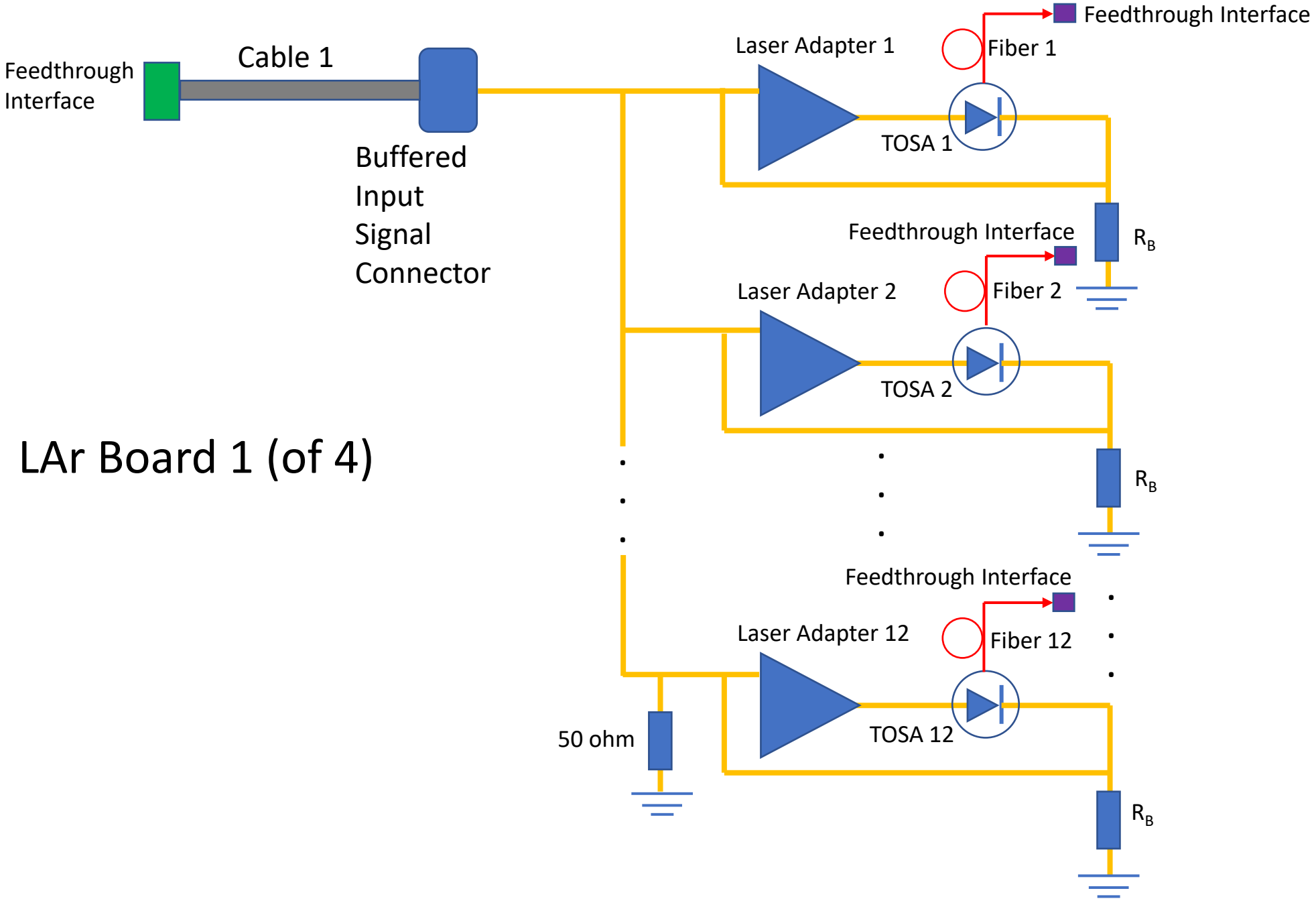
The signal source will provide DC Bias control and pulse stimulus to the four LAr boards in the dewar.

The input follower provides a single point to point interface to the signal generator
and buffers the signal to the four Channel Followers.

Four electrical output cables must penetrate the feedthrough interface.

These four electrical cables feed +5V power, ground, and voltage (offset and stimulus) to complementary boards in the dewar.

LAr Board 1 (of 4)



LAr Boards (four in total)

Each of the four LAr boards provides a common DC Bias control and pulse stimulus to 12 TOSAs.

Four LAr boards requires a total of 48 TOSAs to test.

The 12 TOSAs are to be provided with 6 Laser Adapter Boards (soldered to the LAr board).

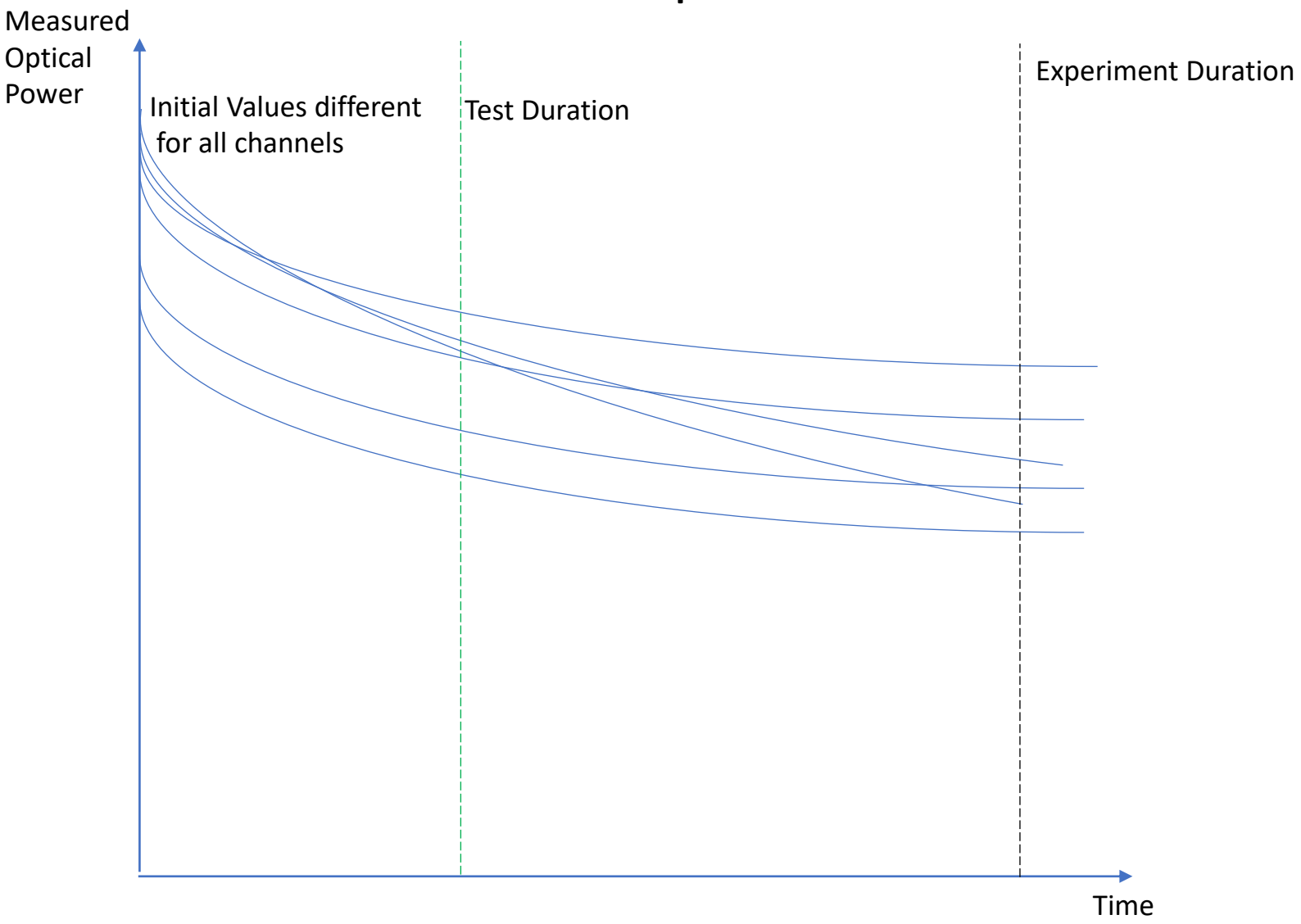
A total of 24 Laser Adapter Boards will be needed for the full 48 TOSAs.

The 48 optical fibers connected to the TOSAs will deliver optical power to a (48 channel) multichannel power meter.

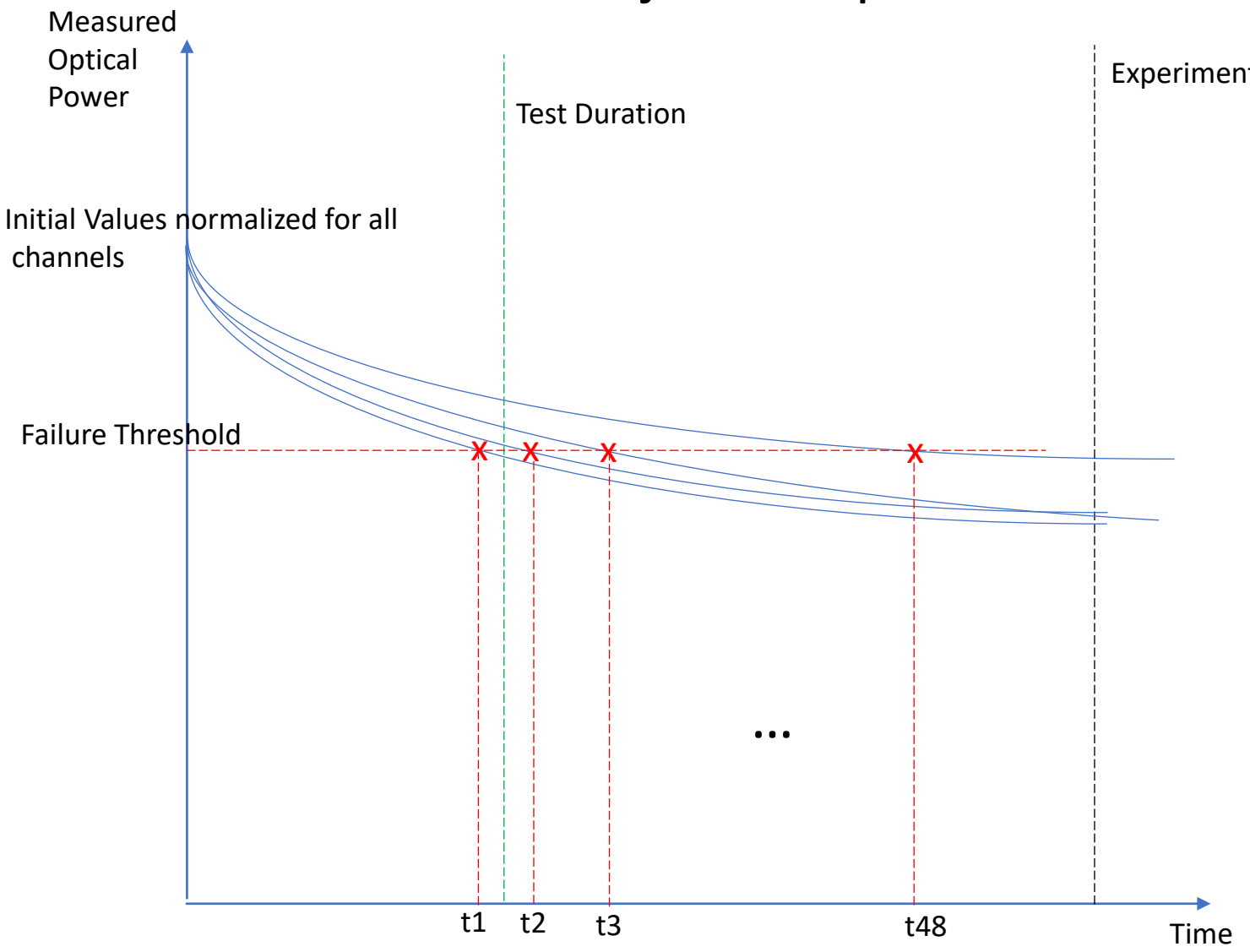
This requires the purchase of the multichannel optical power meter.

Additional lasers will also need to be purchased. A quotation for 130 of the 2.5 mm defocused lasers has been requested.

Raw Optical Power Data Collection



Adjusted Optical Power Data Analysis



"Failure" times (measured or extrapolated)

Empirical Plot of Cumulative Distribution for Failure Probability