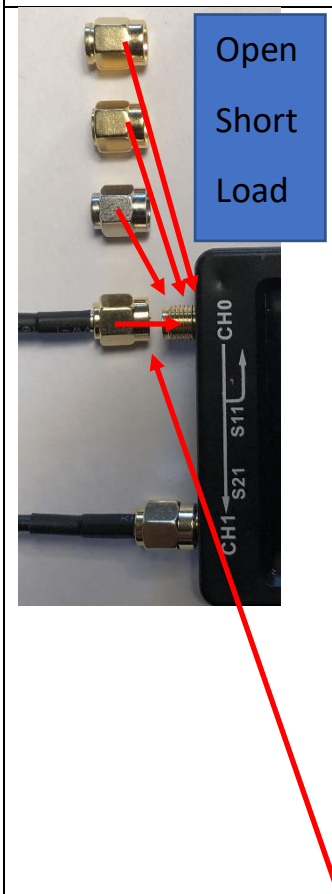
Male and female calibration of NanoVNA-H

The NanoVNA-H in the giftbox purchased from Alibama.com contained the new low loss SMA female female adaptor which show extreme low loss. This new SMA female female will be delivered to all NanoVNA-H deliveries from end of October 2019.
These data here given for calibration is derived from this new calibration kit, where the SMA male open, male short and male load adaptors are identical to what has been delivered previously, only the SMA female female adaptor differs.
The load resistances marked with red color are mine values but just use 50 ohm for your kit if you have no means for accurate 4 point measurements of your load.
Please be observant of the sign for delays whether it is positive or negative
NOTE: The entered delay data in the NanoVNA-Saver is always one way offset delay.
The Two way reflection delay are for other type of software not using one way offset delay.

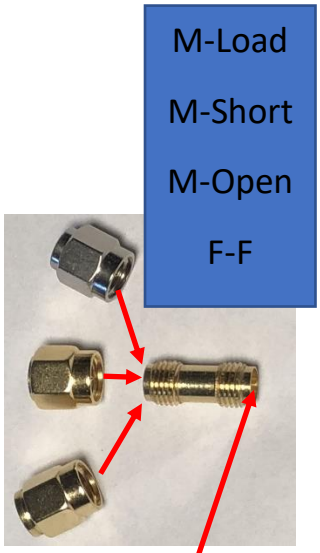
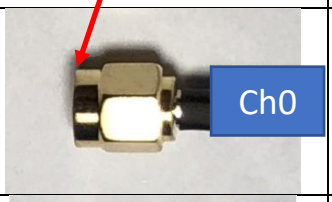
During thru calibration where the test cable from Ch1 is connected to Ch0 directly no Thru delay used thus set to 0 ps.

Male calibration at CH0	Calibration adaptors	50KHz to 500MHz Calibration	50KHz to 900/1500MHz Calibration
	**No open adaptor used**	**One way offset delay +0.98ps Two way reflection delay -1.86ps**	**One way Offset delay +.0.98ps Two way reflection delay -1.86ps**
	Male Open adaptor	**One way offset delay +2.15ps Two way reflection delay -4.3ps**	**One way offset delay +1.62ps Two way reflection delay -3.24ps**
	Male Short adaptor	**One way offset delay +0.176ps Two way reflection delay -0.352ps**	**One way offset delay +0.035ps Two way reflection delay -0.07ps**
	Male Load adaptor No Shunt Capacitor	**R=49.846 ohm One way offset delay - 6.43ps Two way reflection delay +12.86ps L= -267pH**	**R=49.846 ohm One way offset delay +4.514ps Two way reflection delay -9.027ps L= -297.5pH**
	Male Load adaptor No Series Inductor	**R=49.846 ohm One way offset delay - 9.133ps Two way reflection delay +18.226ps C= 107.5fF**	**R=49.846 ohm One way offset delay +1.534ps Two way reflection delay -3.068ps C= 119.37fF**
	Thru delay	**0 ps**	**0 ps**

SPECIAL NOTICE: The NanoVNA-saver requires some special setting which is shown in the screen copies added. The reason is that then open setting cannot accept a delay without a C0 value and the Load only accept L values
NanoVNA-saver allows delay for the female female adaptor to be subtracted, such that the correct calibration planes for the two SMA male adaptors of the two test cables are correctly established.

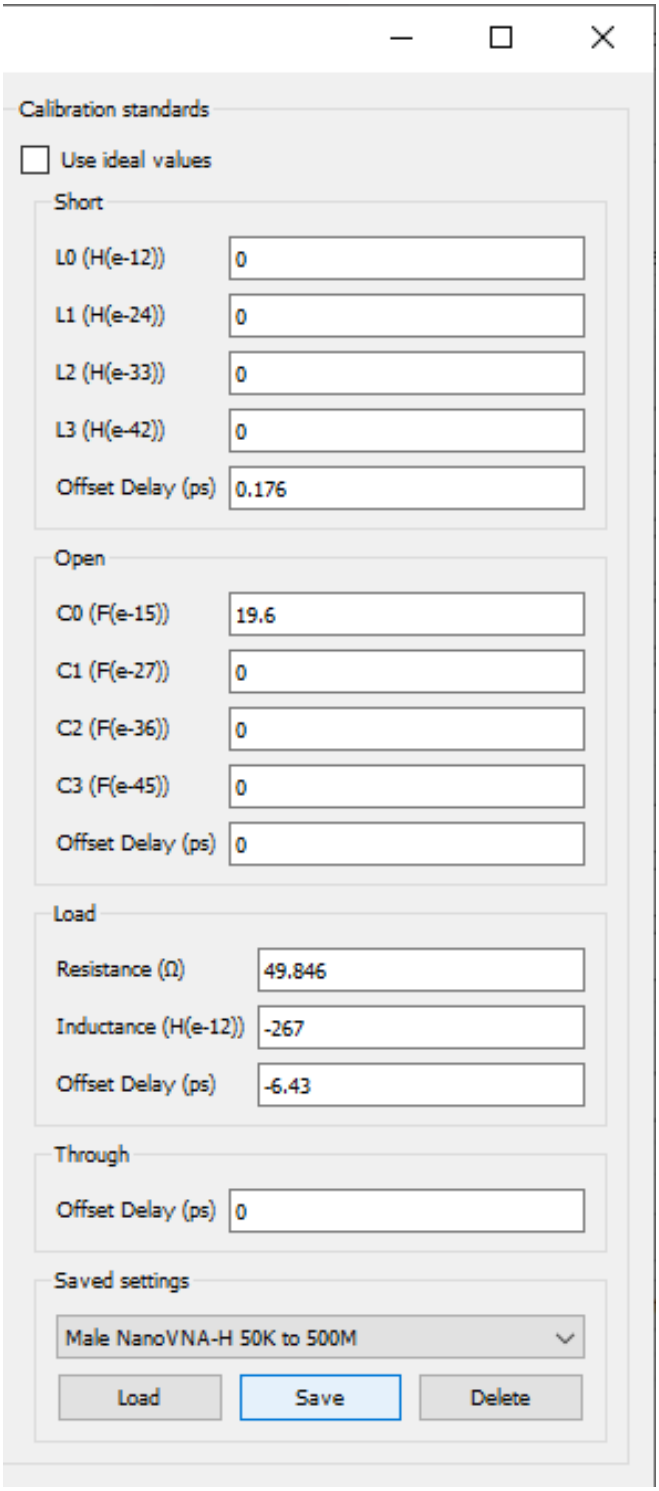
On the next page is the data given for calibration using the SMA female female adaptor terminated with the SMA male calibration adaptor. It is essential to use this method when Ch0 and Ch1 fitted with the SMA male male test cables. If the delay of the thru adaptor 50.7ps cannot be subtracted use ELECTRICAL DELAY

Please note: These data will only provide correct calibration when using the new low loss SMA female female adaptor. The thru delay for the previously delivered SMA female female adaptor is 65ps as earlier measured
However if used anyway reflection loss and transmission loss will have small errors. For transmission loss about 0.4dB at 900MHz whereas the new SMA female female adaptor has 0.02dB loss at 900MHz

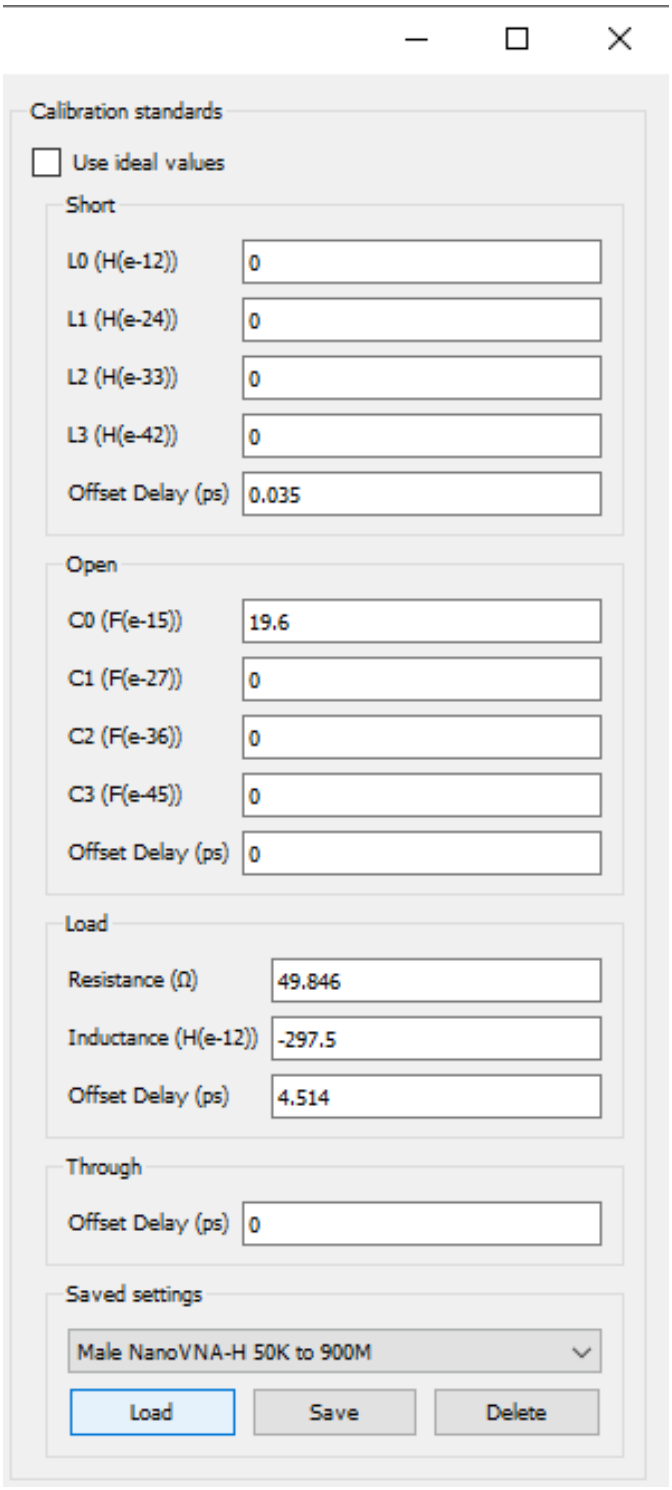
Female Calibration at SMA male adaptor	Calibration adaptors	50KHz to 500MHz Calibration	50KHz to 900/1500MHz Calibration
	**No male open adaptor used**	**One way offset delay 50.3ps Two way reflection delay -100.6ps**	**One way offset delay 50.51ps Two way reflection delay -101.02ps**
	Female Open adaptor	**One way offset delay 50.86ps Two way reflection delay -101.72ps**	**One way offset delay 51.13ps Two way reflection delay -102.23ps**
	Female Short adaptor	**One way offset delay 51.28ps Two way reflection delay -102.55ps**	**One way offset delay 51.16ps Two way reflection delay -102.32ps**
	Female Load adaptor No Shunt Capacitor	**R=49.854 ohm One way offset delay +3.945ps Two way reflection delay -7.89ps L=-171pH**	**R=49.854 ohm One way offset delay +61.59ps Two way reflection delay -123.18ps L=-205pH**
	Female Load adaptor No Series Inductor	**R=49.854 ohm One way offset delay +37.244ps Two way reflection delay -75.488ps C=68.5fF**	**R=49.854 ohm One way offset delay +59.54ps Two way reflection delay -119.08ps C=82.27ps**
	**SMA male male test cable or SMA male male adaptor connected to Ch0** 		
	**Thru delay**	**50.7ps**	**50.7ps**

The next pages are how the NanoVNA-saver calibration settings for male and female calibrations are configured with an without the use of the male open calibration standard

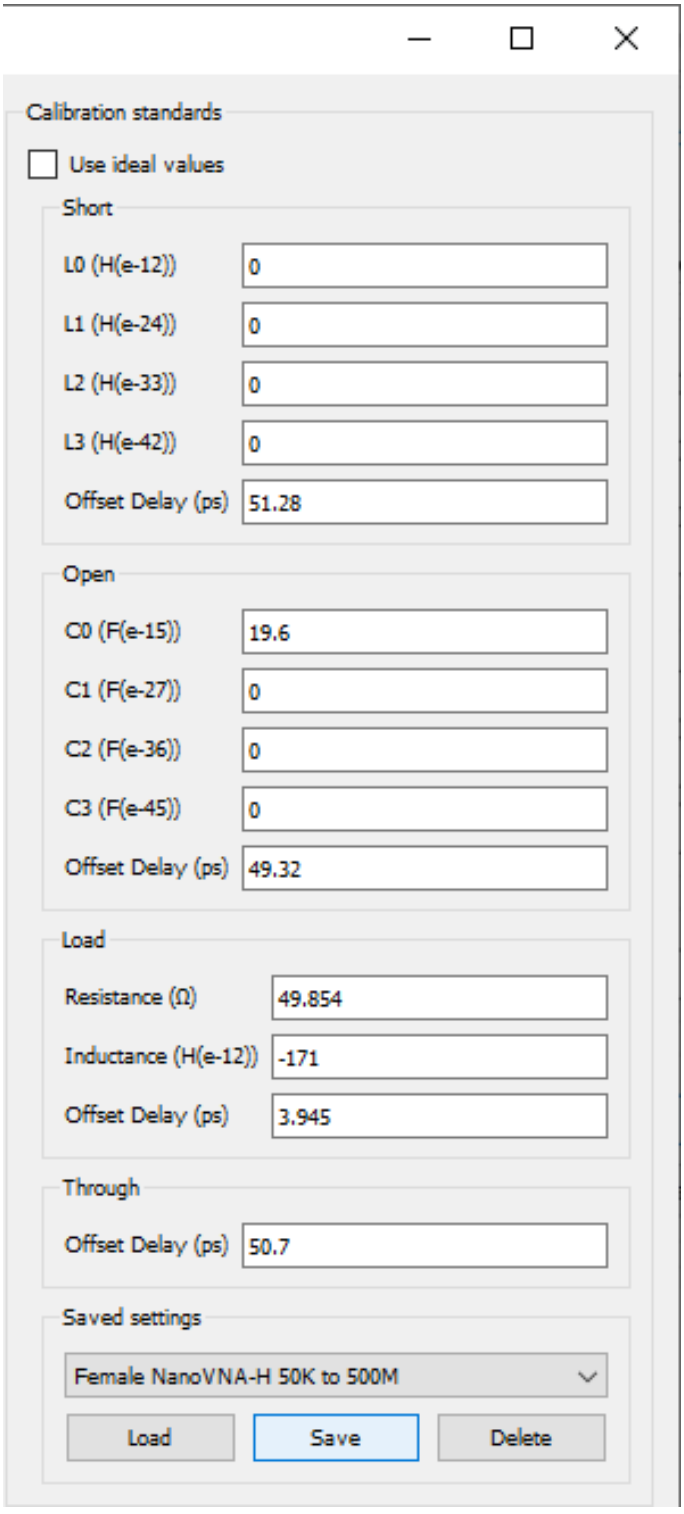
Male calibration 50K to 500M
no male open used



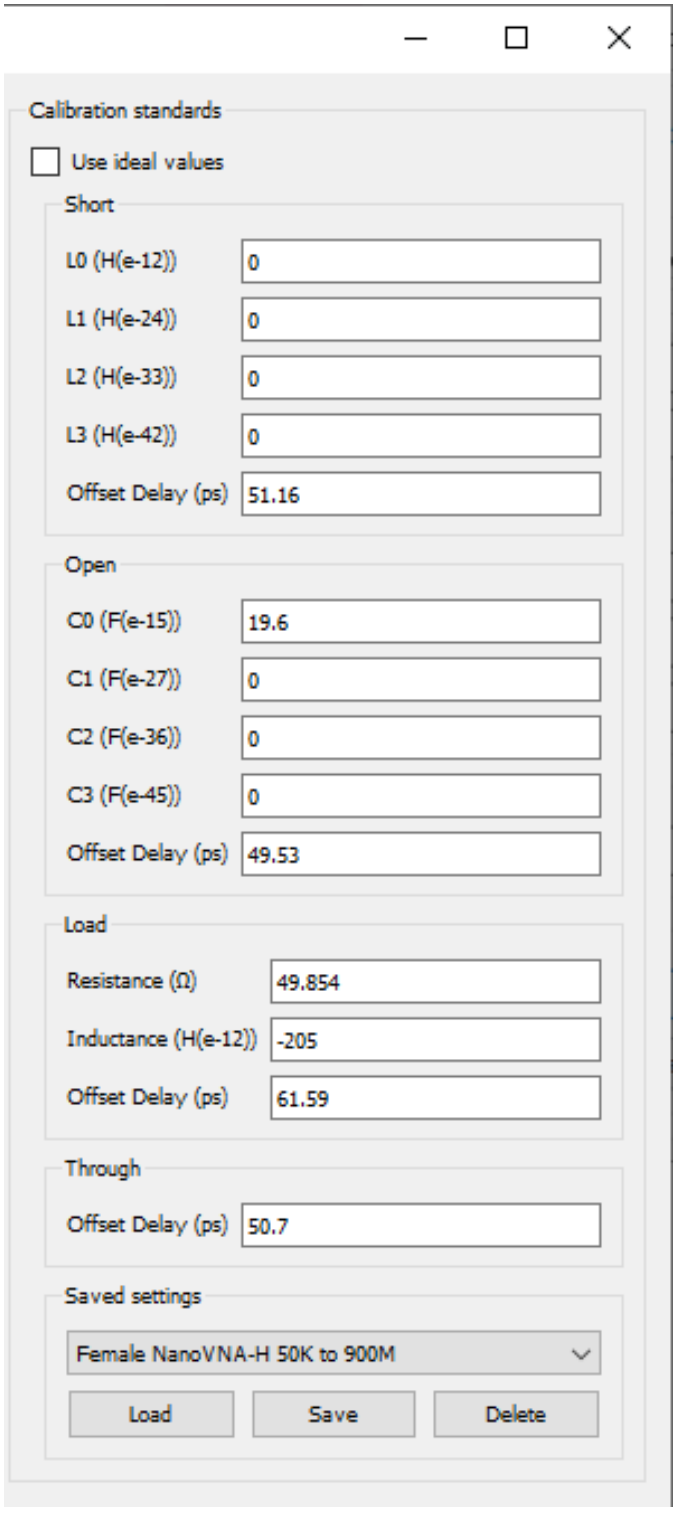
Male Calibration 50K to 900M
no male open used



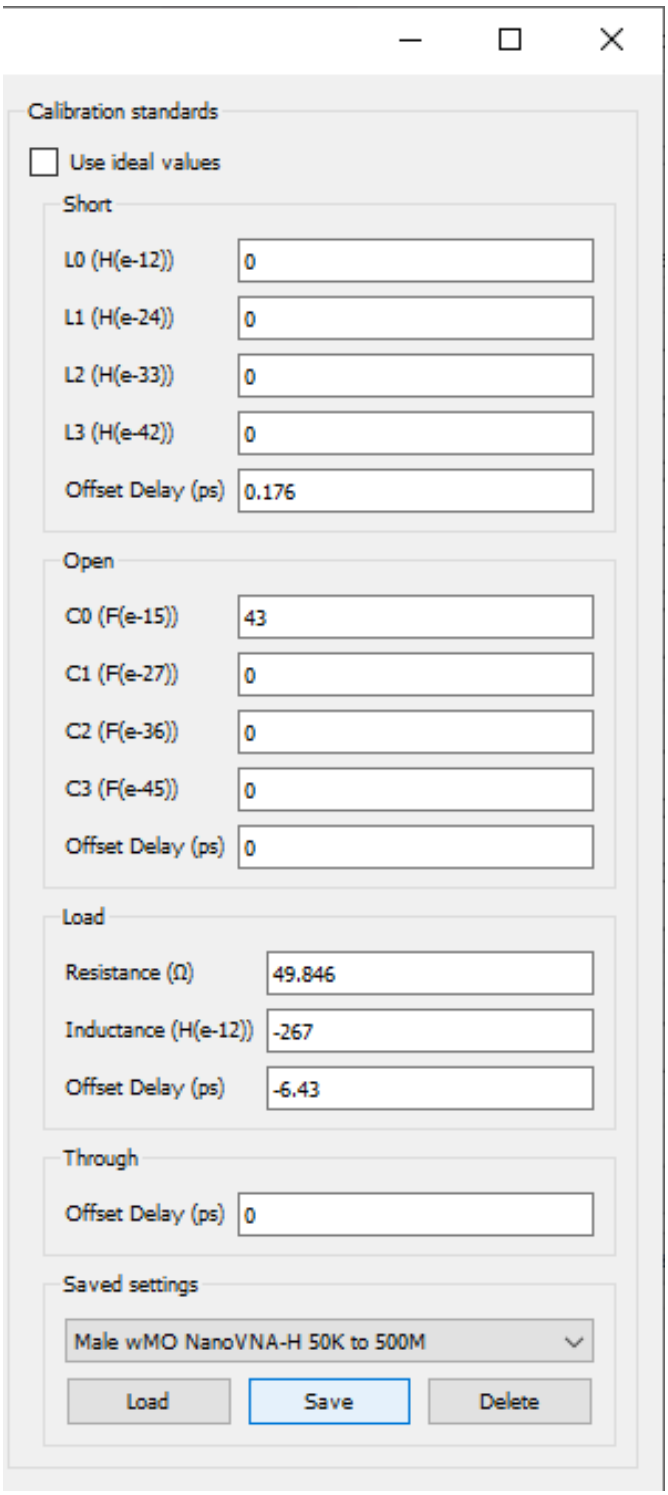
Female calibration 50K to 500M
no male open used



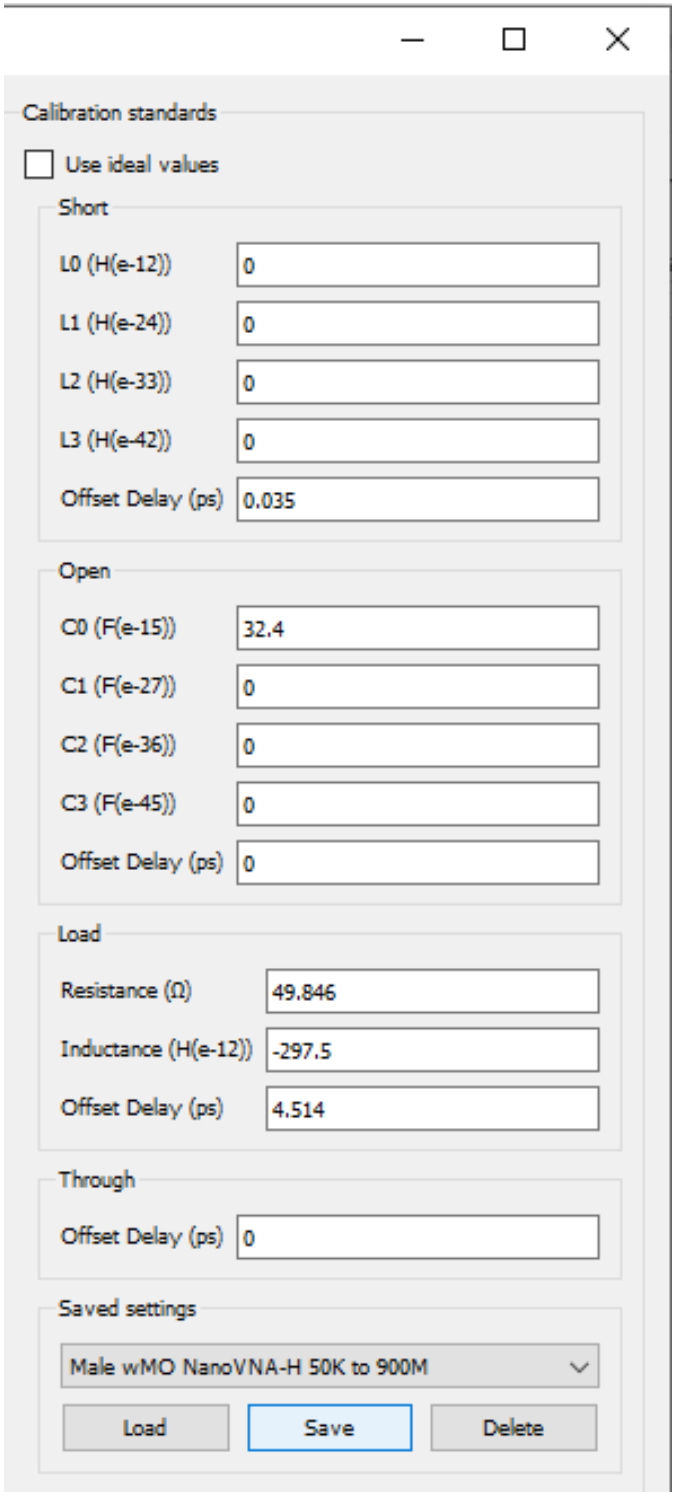
Female Calibration 50K to 900M
no male open used



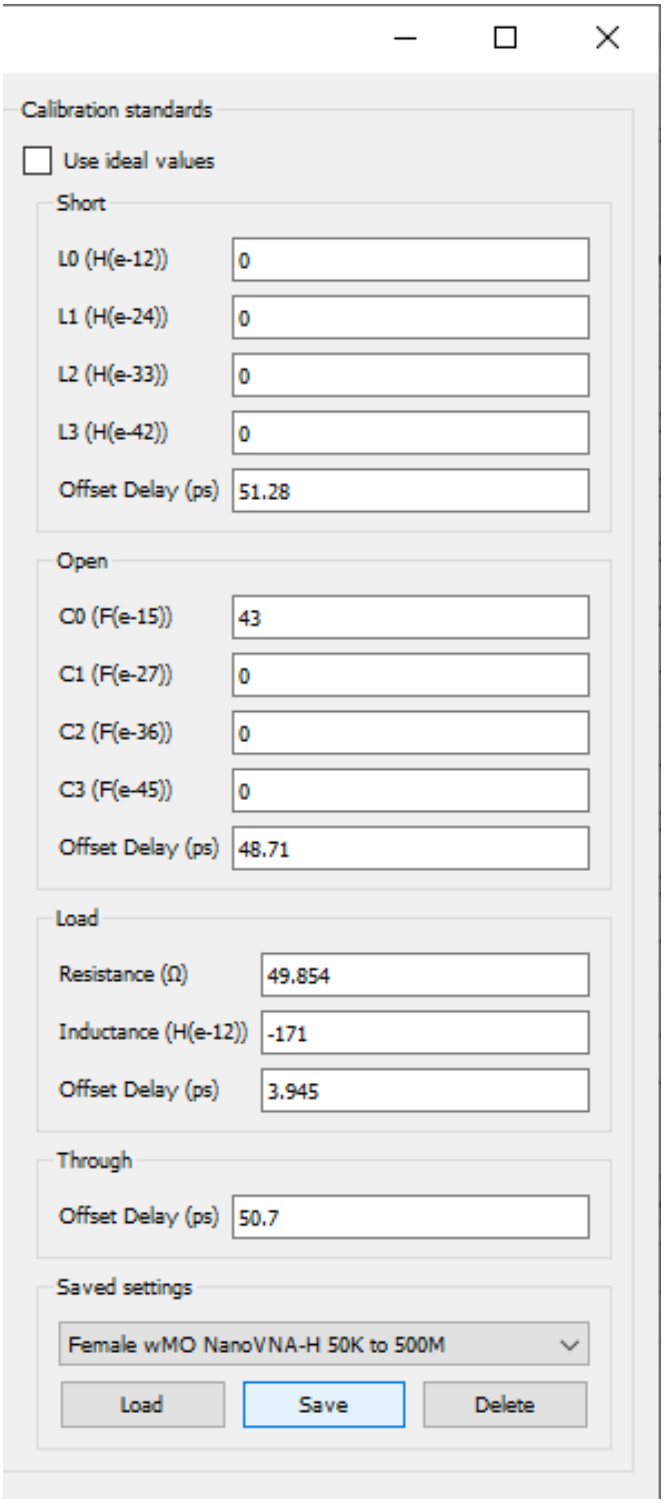
Male calibration 50K to 500M
Male open used



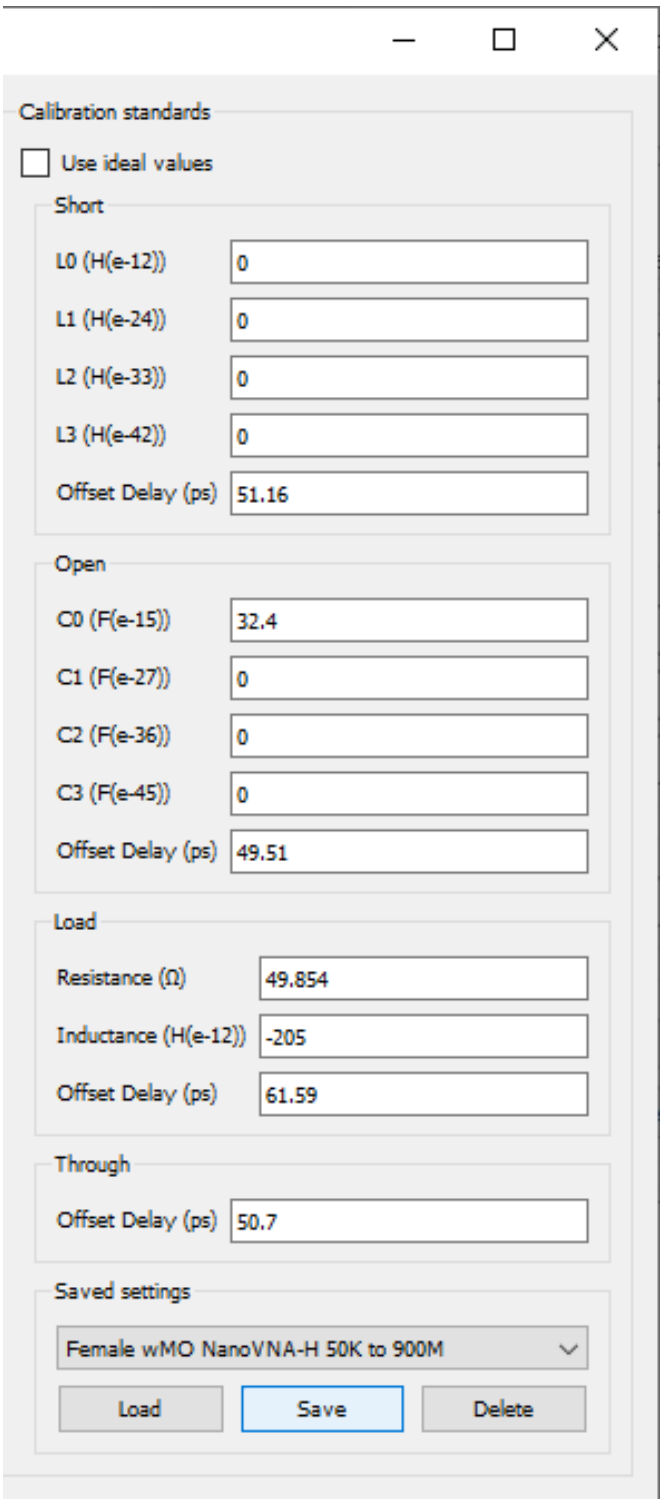
Male Calibration 50K to 900M
Male open used



Female calibration 50K to 500M
Male open used



Female Calibration 50K to 900M
Male open used



26-11-2019 Kurt Poulsen