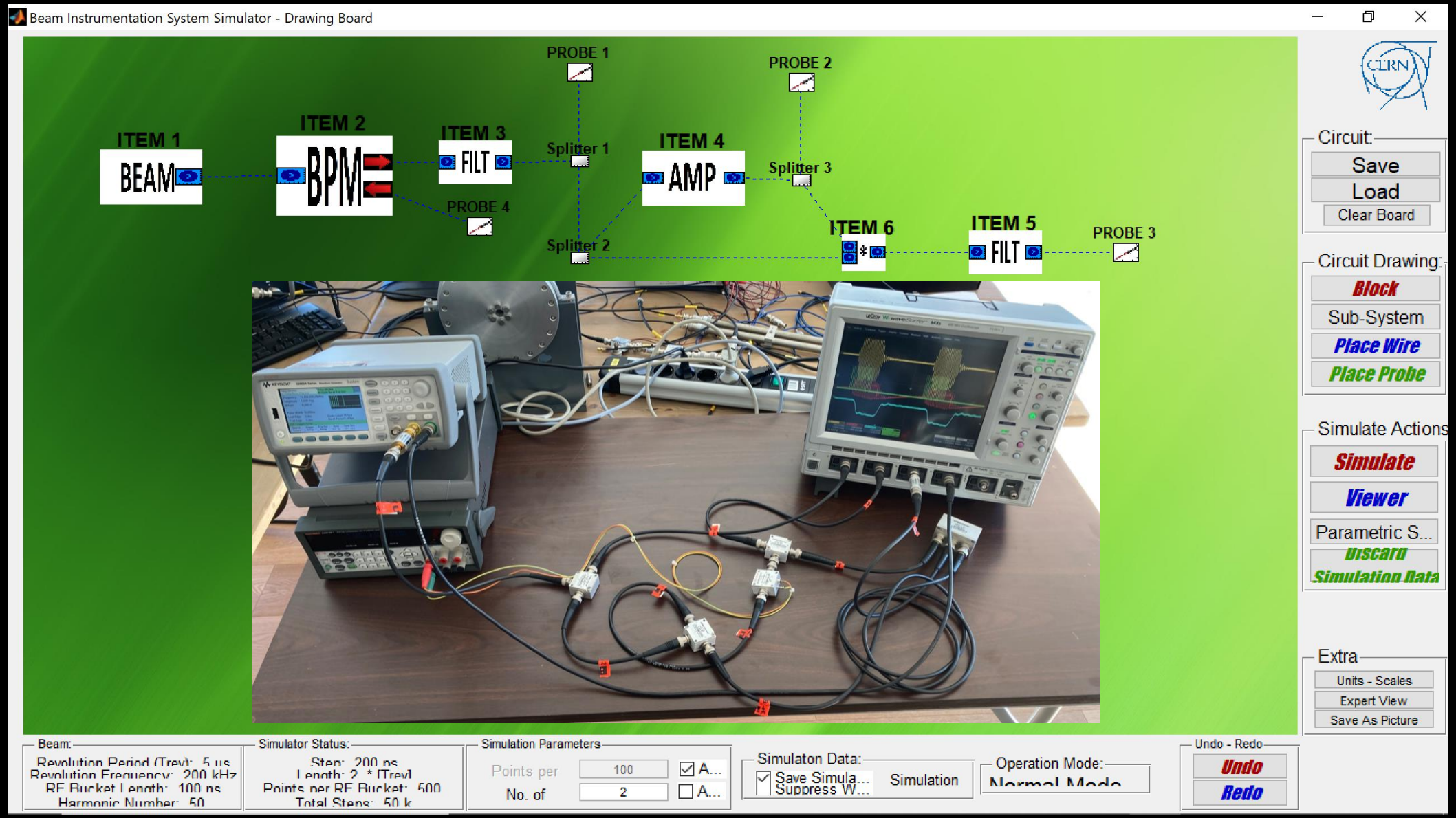
# Build your Own Homodyne



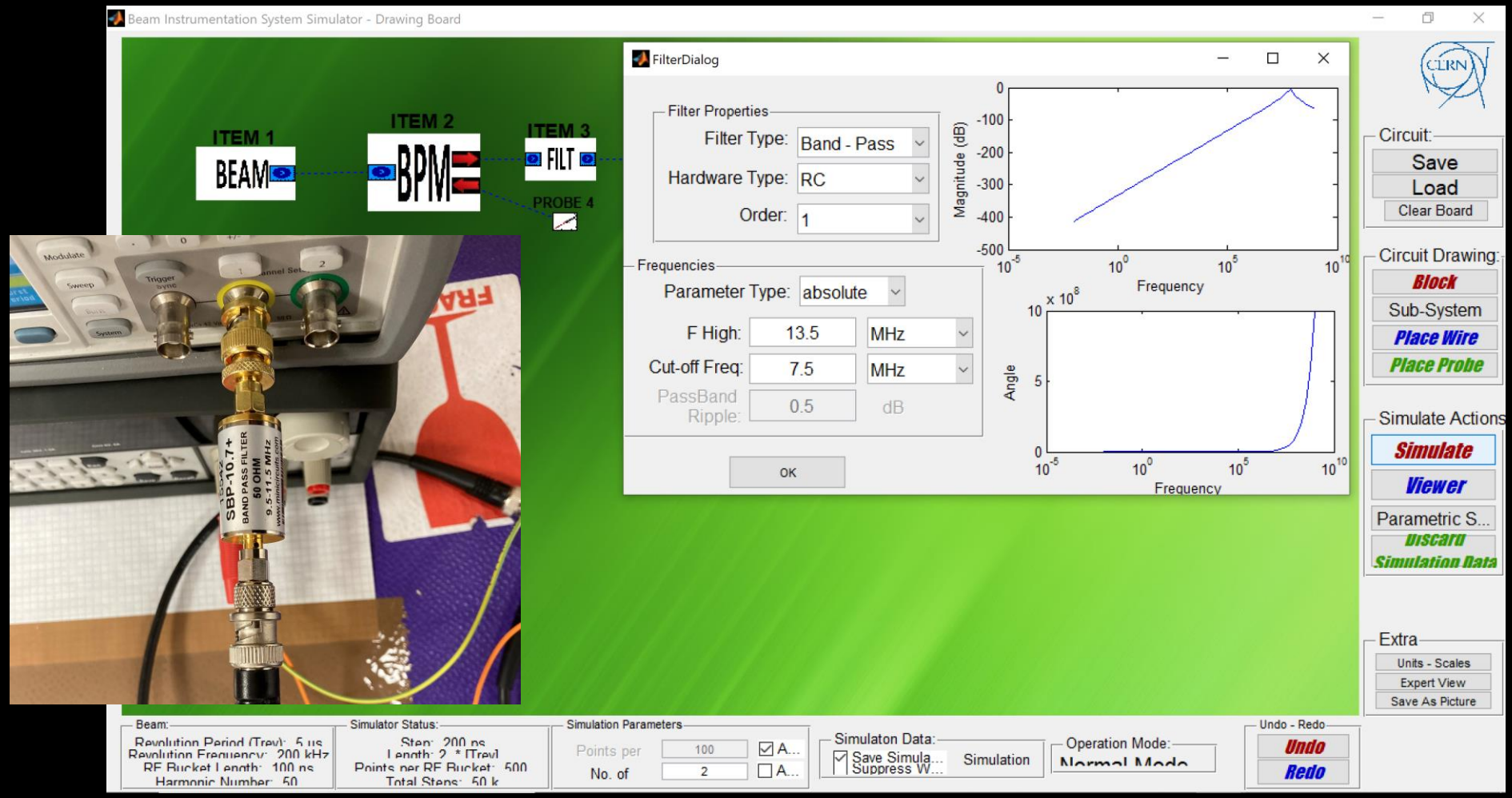
# Homodyne Experiment – the Beam/BPM signal





- The Generator will mimmick the Beam and single port output of a BPM (CH1 and CH2 giving the same output)
- Have a look at this by connecting CH 2 of the generator to CH 4 of the oscilloscope

# Homodyne Experiment – the Bandpass Filter

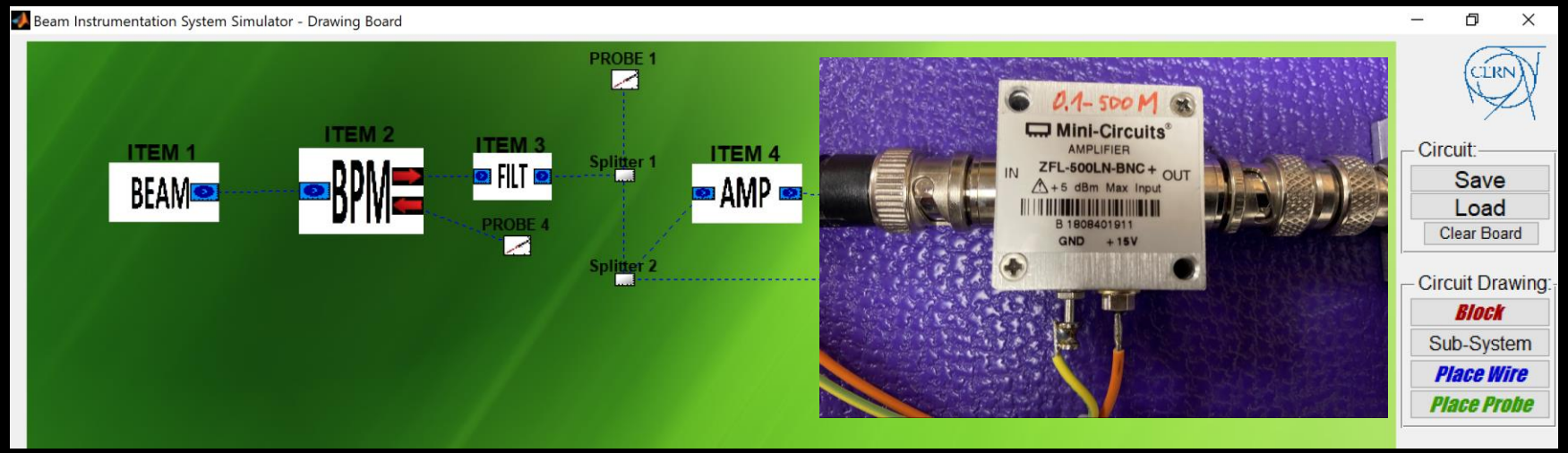






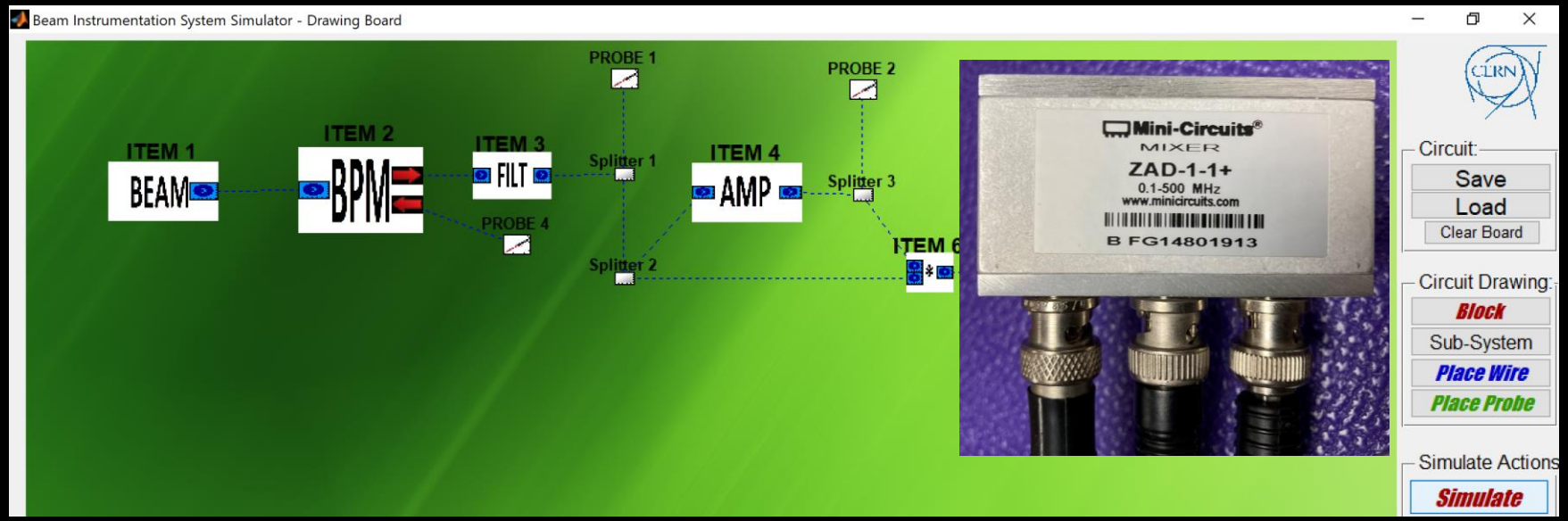
- The ringing bandpass filter is centred on the repetition frequency of the beam
- Have a look at this by connecting the filter to the generator and to CH1 of the oscilloscope

# Homodyne Experiment – the Amplifier



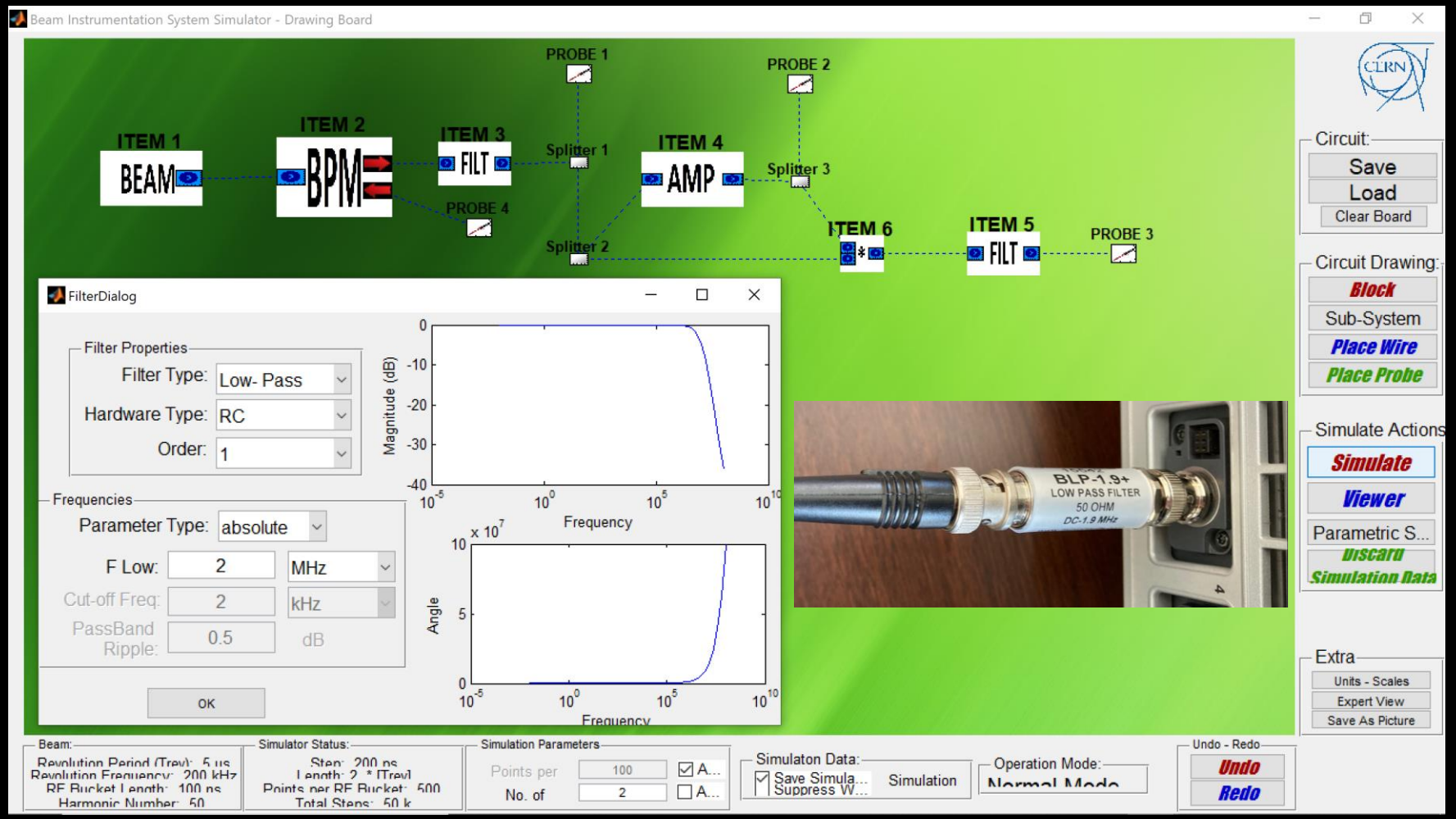

- Create your square mixing frequency by adding the amplifier which is driven into saturation
- To view both the amplifier input and the amplifier output, connect a splitter to the filter out put with one branch going directly to CH1 of the oscilloscope and one branch going to the amplifier
- The output of the amplifier can then be connected to CH2 of the oscilloscope

# Homodyne Experiment – the Mixer



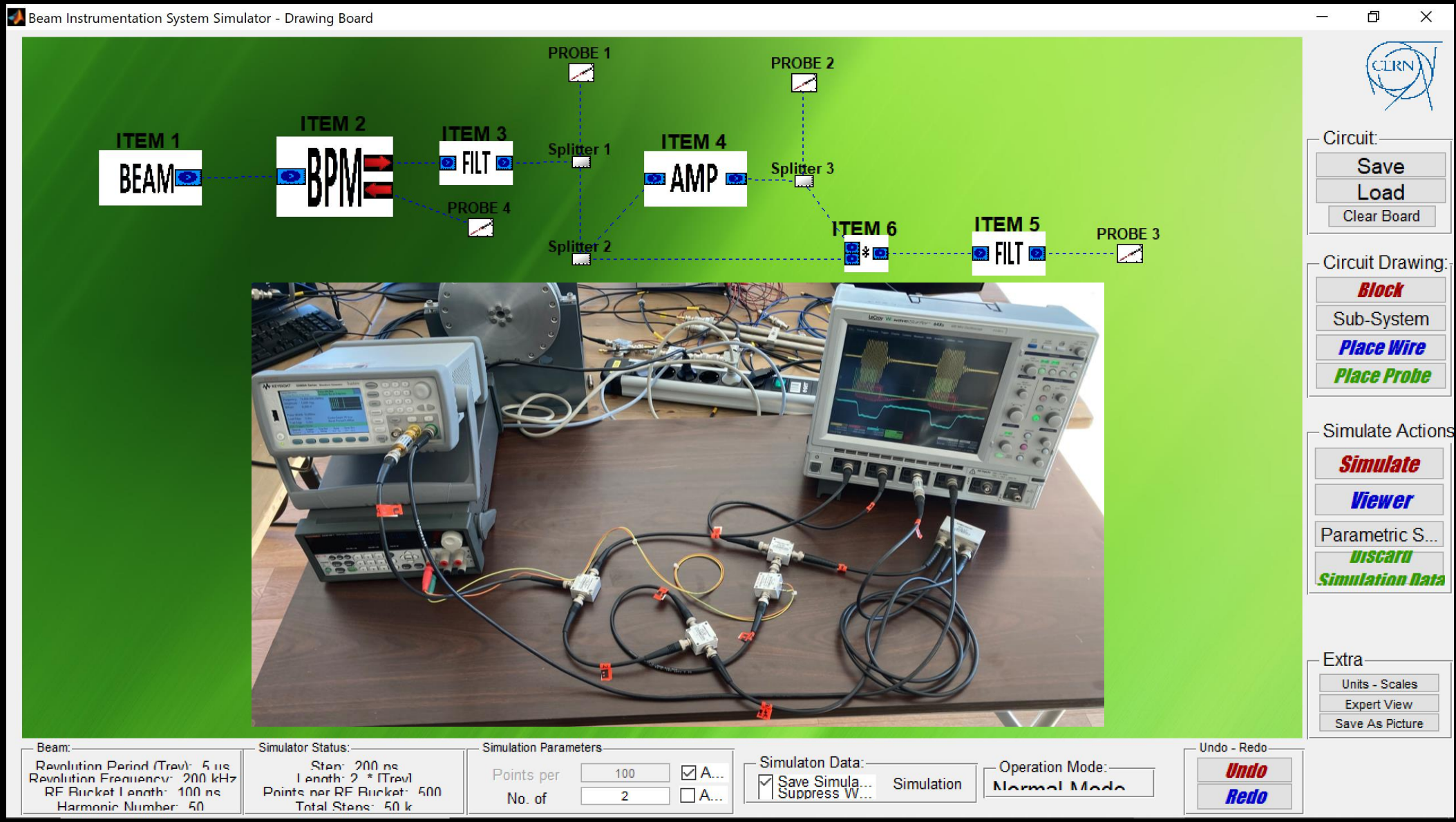

- Now split the output from the amplifier (keep viewing on CH2) and add the mixer
  - L = Local Oscillator (your square wave input) : R = RF (your signal input) : I = Intermediate frequency (your output)
- View the output from the mixer on CH3 of the oscilloscope

# Homodyne Experiment – the Low Pass Filter

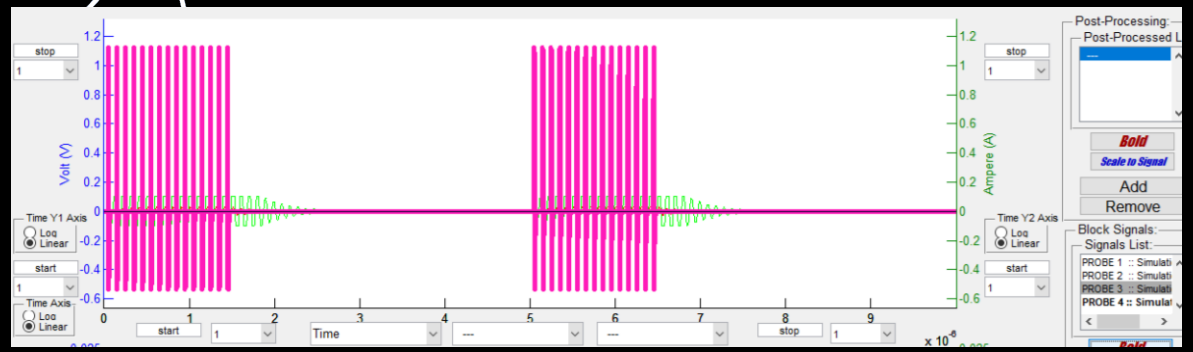



- Finally add the Low Pass filter before CH3 on the oscilloscope

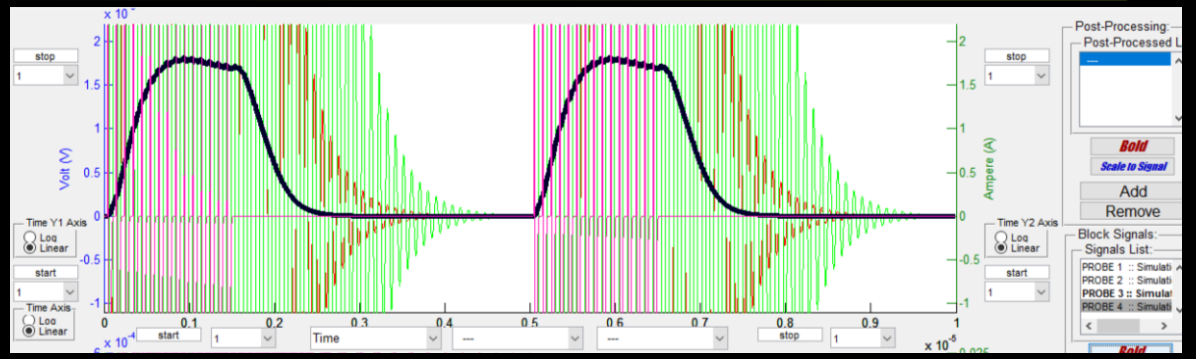
# Homodyne Experiment – the Full Circuit



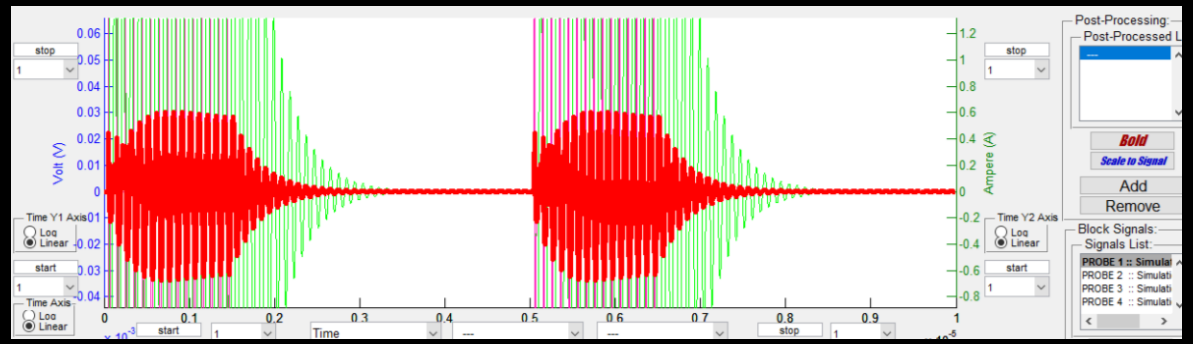
# Homodyne Experiment – the Results



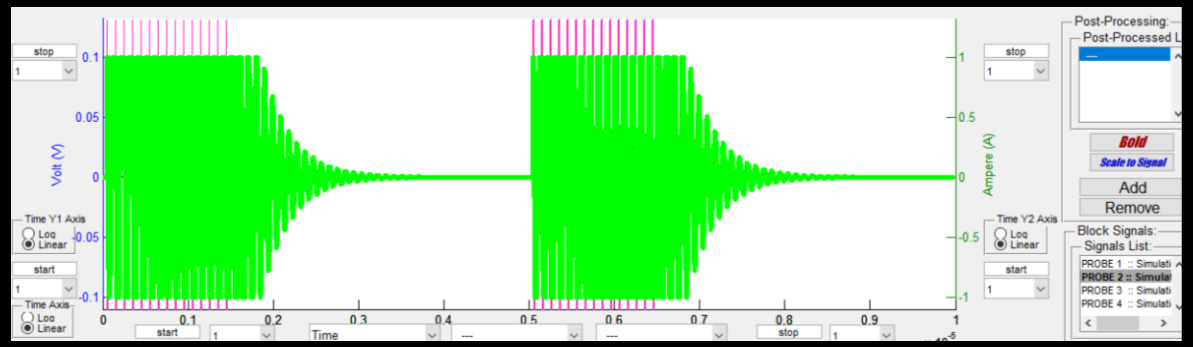

CH4 – BPM output signal




CH3 – Low Pass Filter Output




CH1 – Bandpass Filter output signal




CH2 – Amplifier output signal