

**Date:** 26.06.2019

**Attendees:** Furkan Tokgöz, Mesut Uğur

**Location:** Electrical Machines Laboratory

**Target:** V1.3 Gate Driver Board (#1)

**Test type:** Parallel Connected Inverter tests with RL load

**Aims before the test:**

1. To observe and record the DC bus of parallel connected modules with and without interleaving
2. To observe and record the DC bus currents of parallel connected modules (circulating current) with and without interleaving

**Conditions:** 22 Ohm  $R_{on}$ , 2 Ohm  $R_{off}$ . 300V VDC. RL Load. 40kHz fsw. 0.9 power factor. Sinusoidal PWM with 0.9 modulation index.

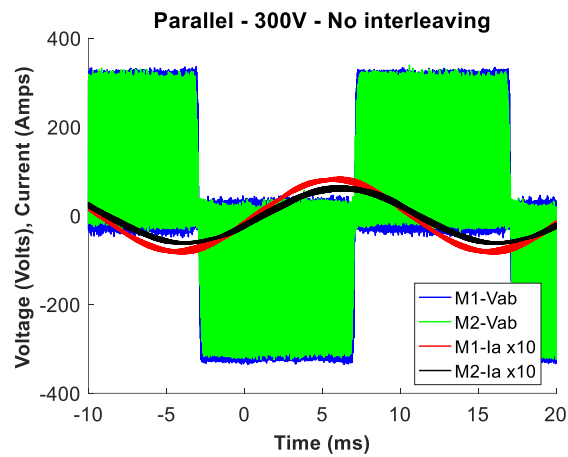
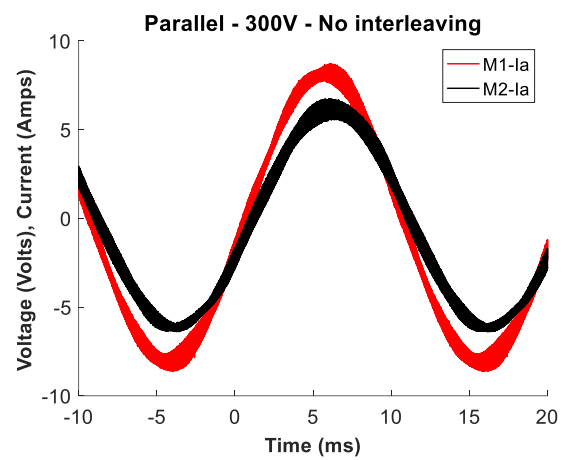
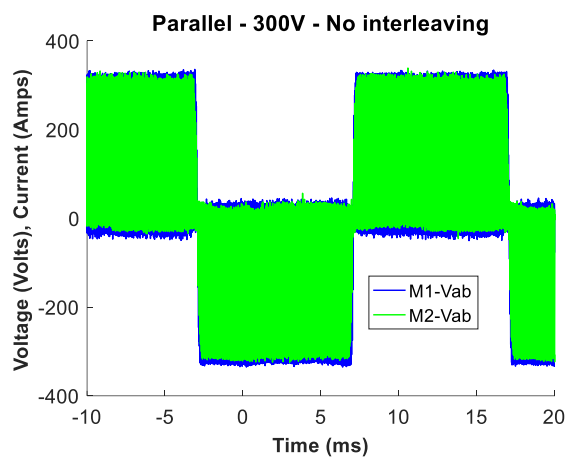
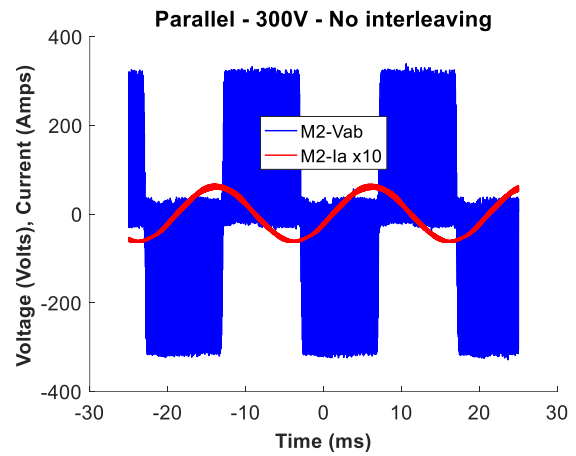
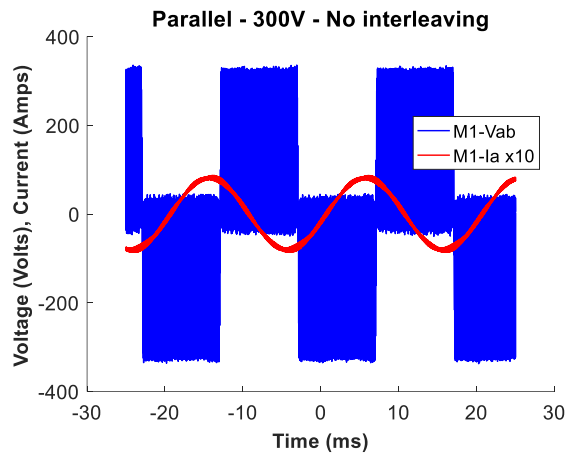
**Steps:**

1. Parallel connected inverters are tested at 300V without interleaving and line-to-line voltage and line current waveforms are recorded (standard current probes). Unbalance is observed.
2. Parallel connected inverters are tested at 200V without interleaving and;
  - a. line-to-line voltage and line current waveforms are recorded (standard current probes).
  - b. DC bus voltage is recorded.
  - c. DC bus currents are recorded (standard current probes).
  - d. DC bus currents are recorded (shunt resistors).
3. Part 2 is repeated with interleaving at 200V.

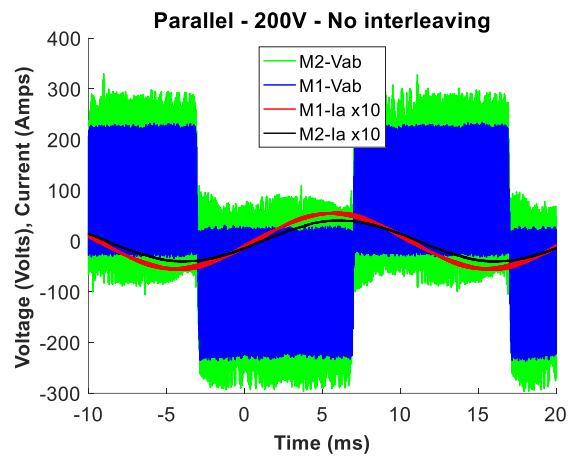
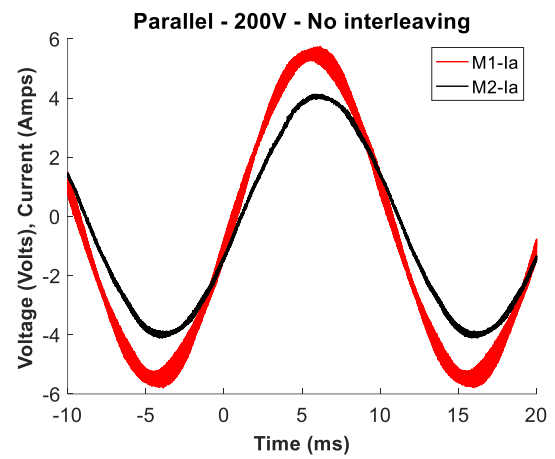
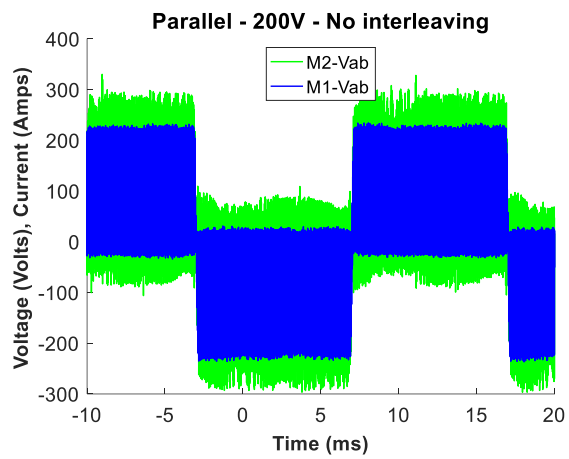
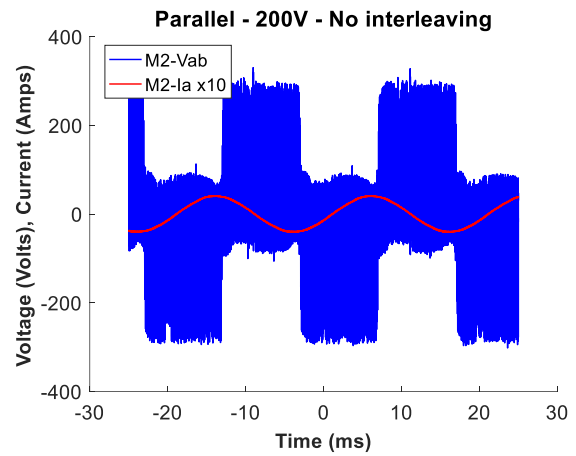
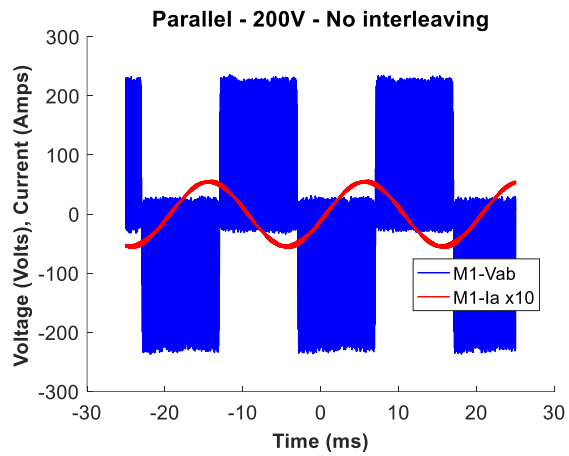
**Next time:** Series connection test will be repeated with higher voltage.

## Results:

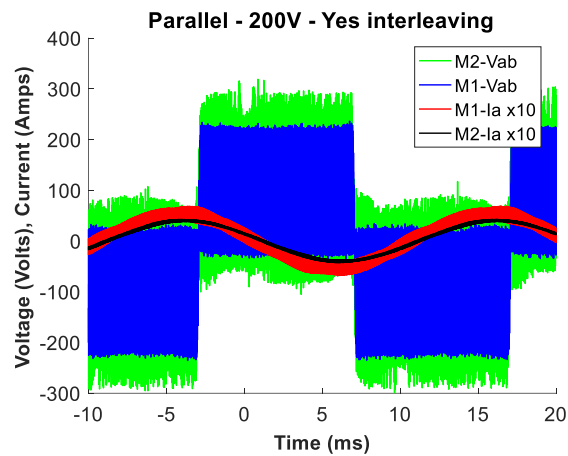
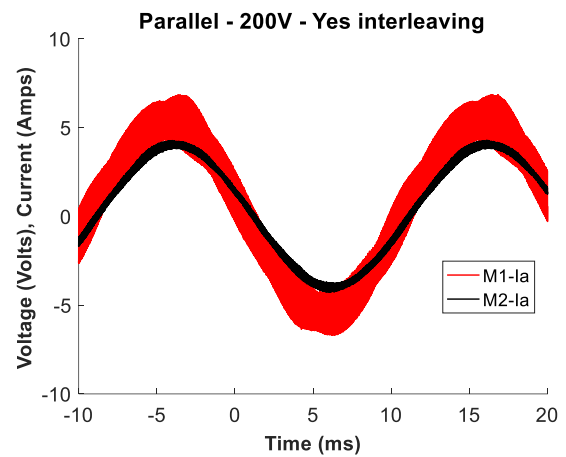
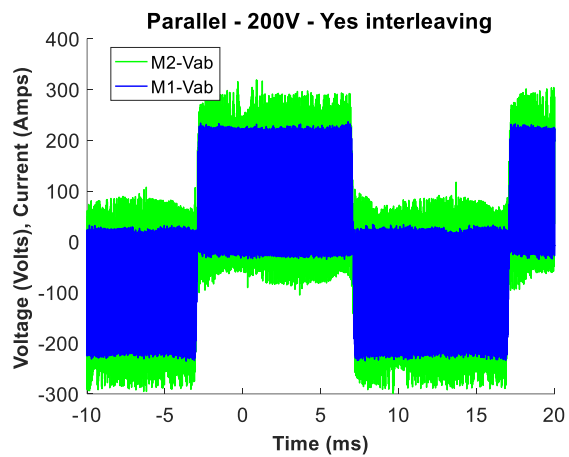
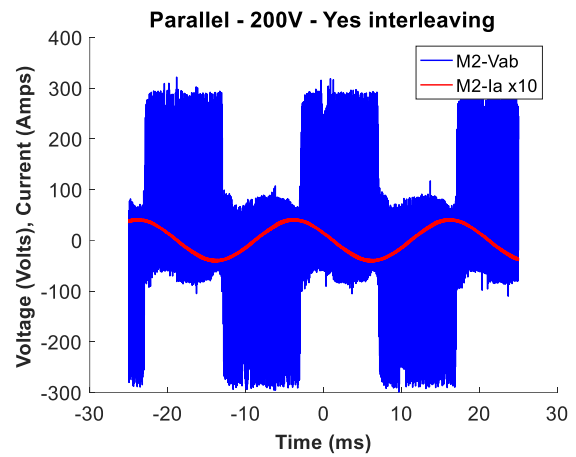
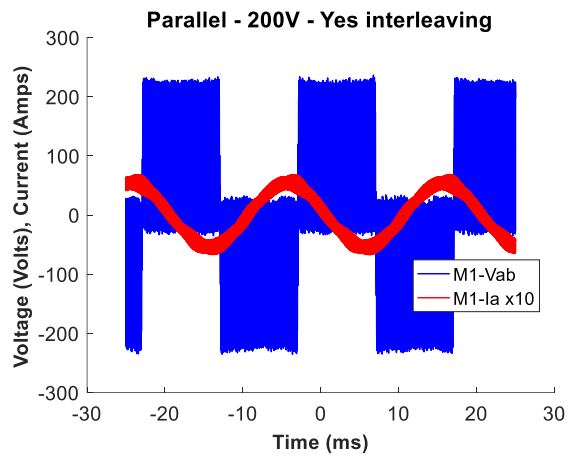
### 1. 300V Test – AC waveforms – No interleaving



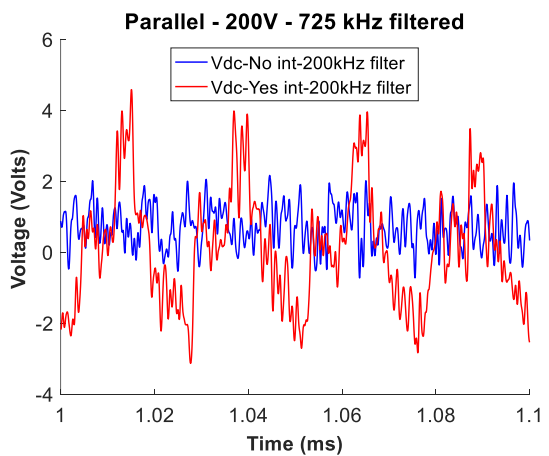
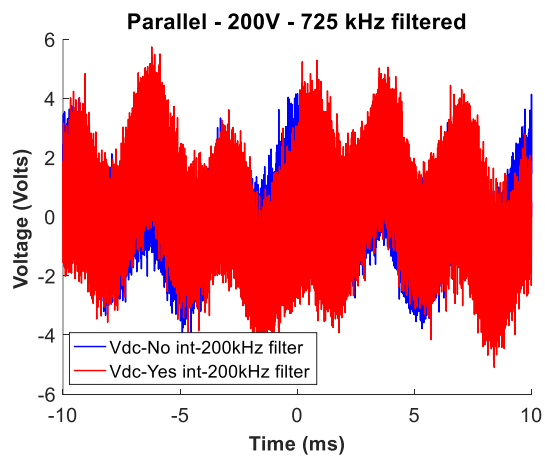
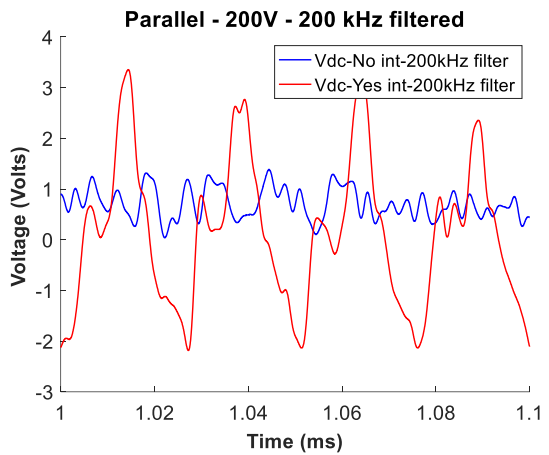
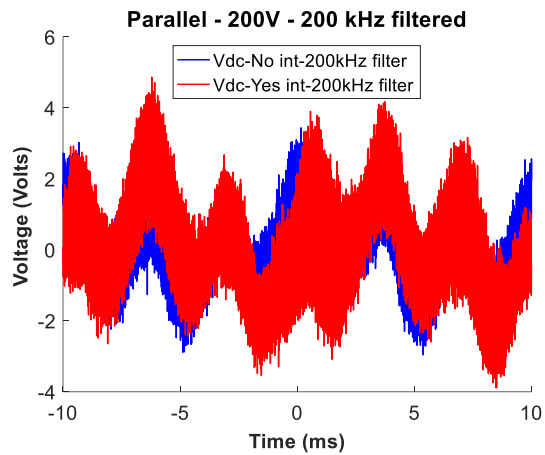
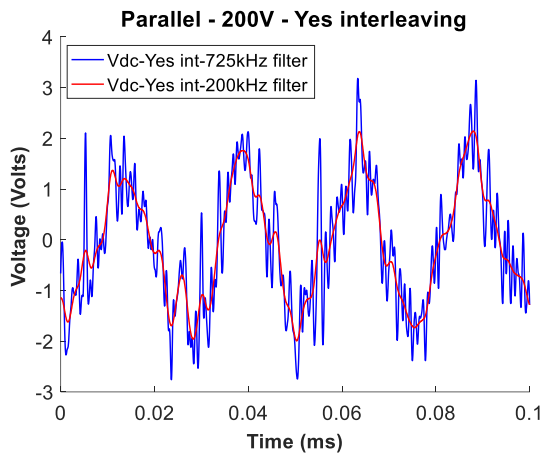
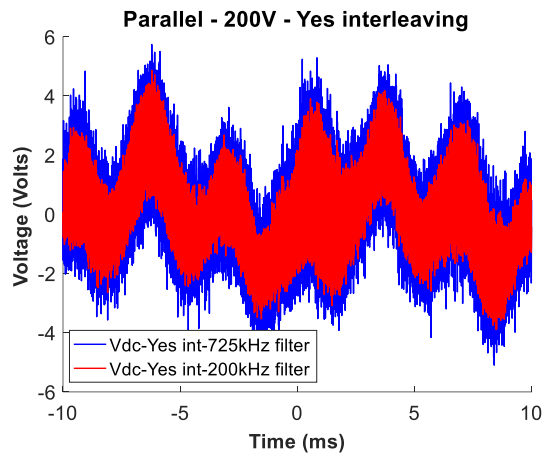
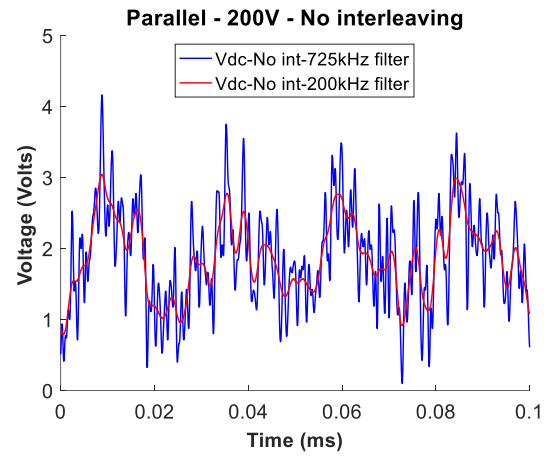
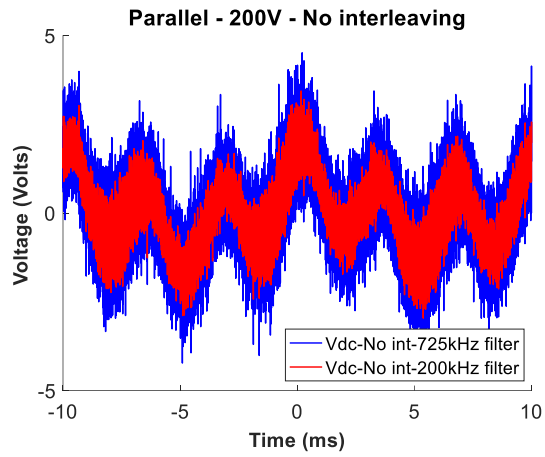
## 2. 200V Test – AC waveforms – No interleaving



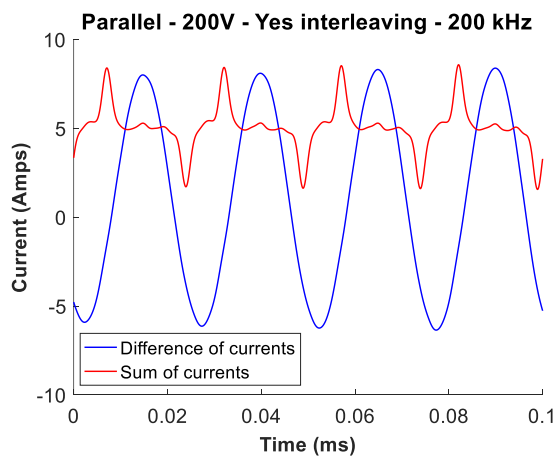
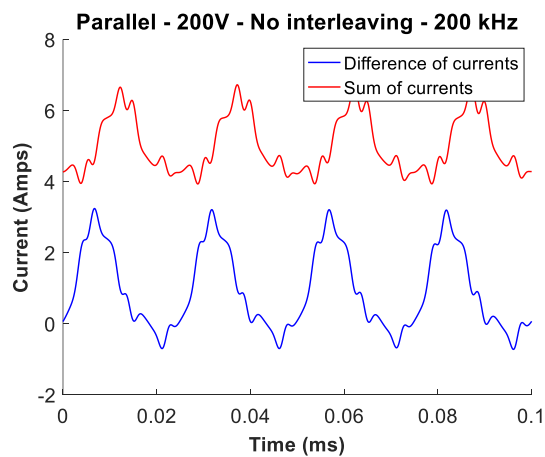
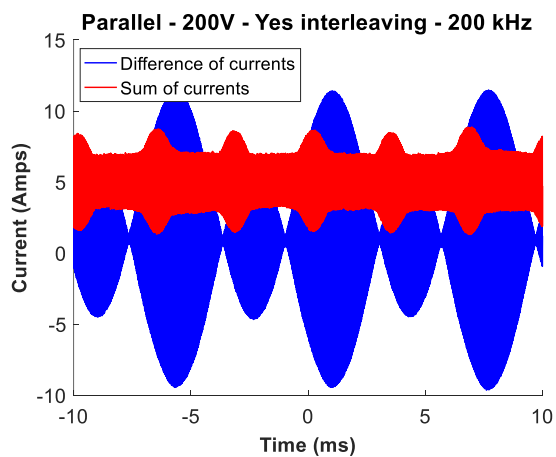
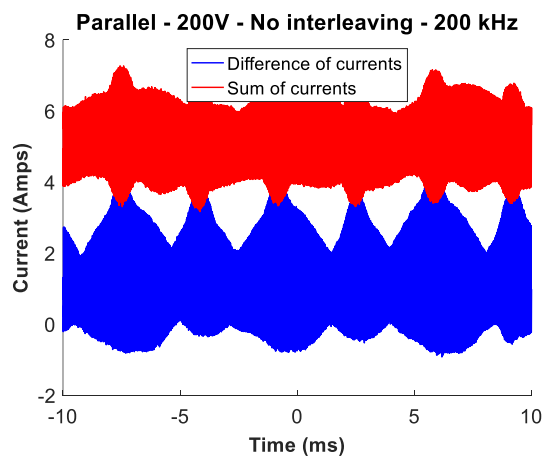
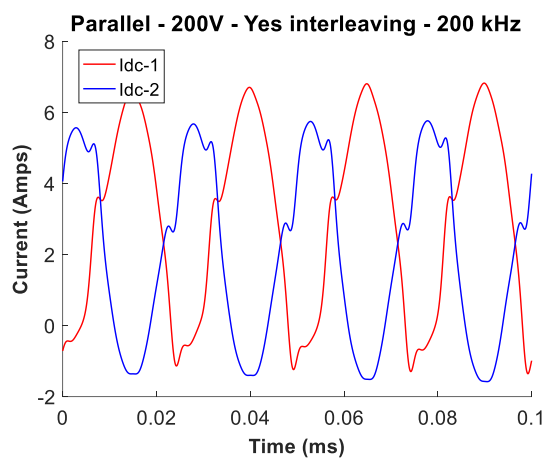
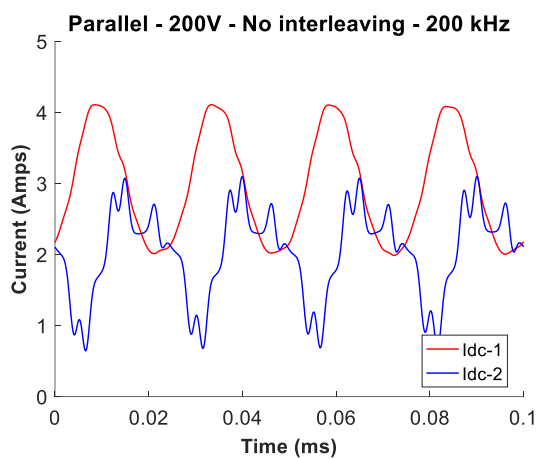
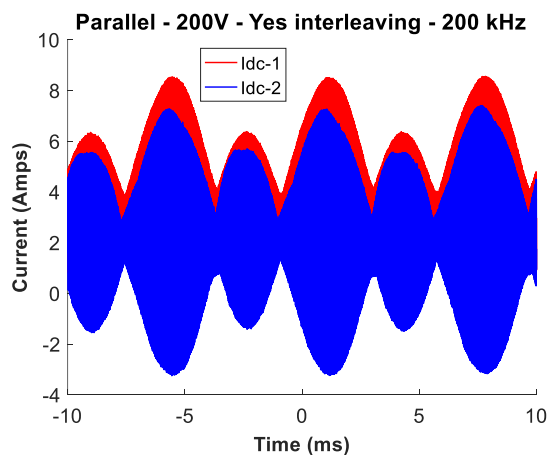
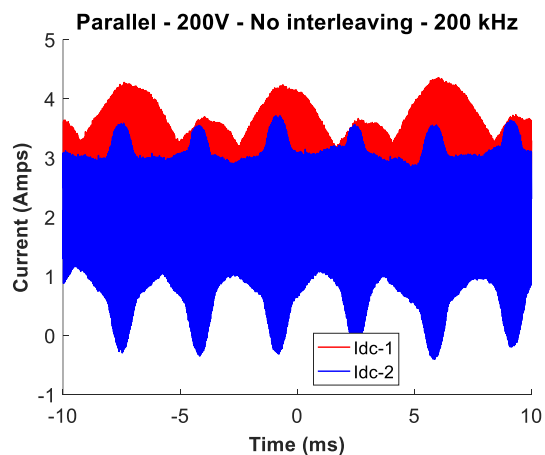
### 3. 200V Test – AC waveforms – Yes interleaving

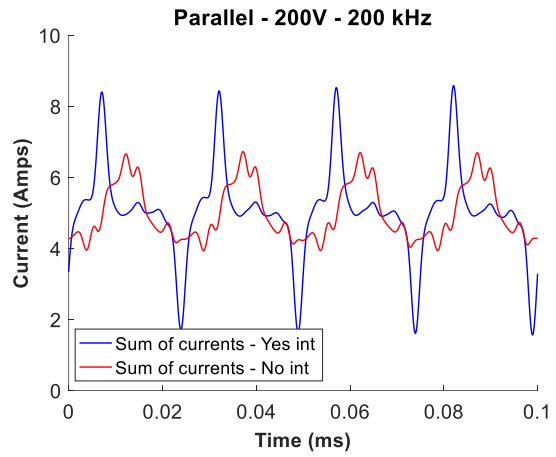
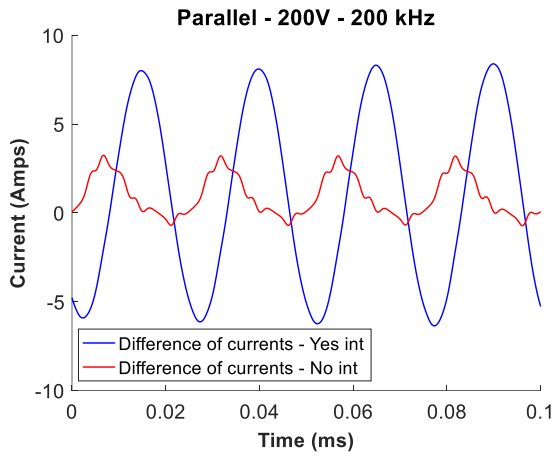
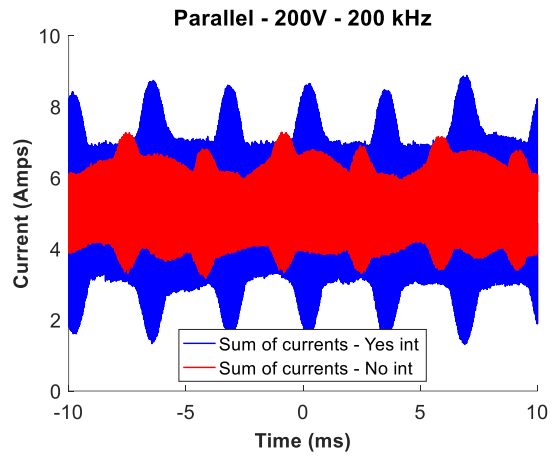
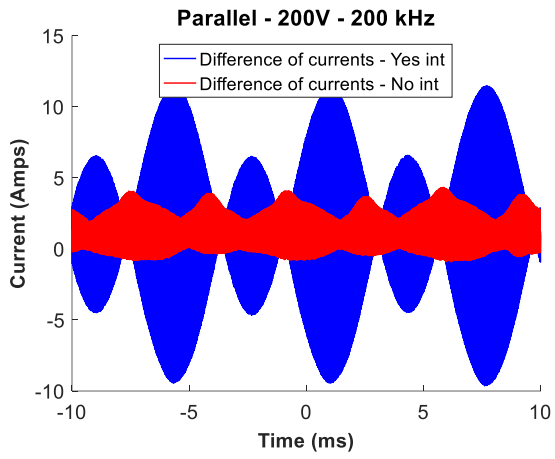


#### 4. 200V Test – DC voltage



## 5. 200V Test – DC current – Current probe





## 5. 200V Test – DC current – Shunt resistor

