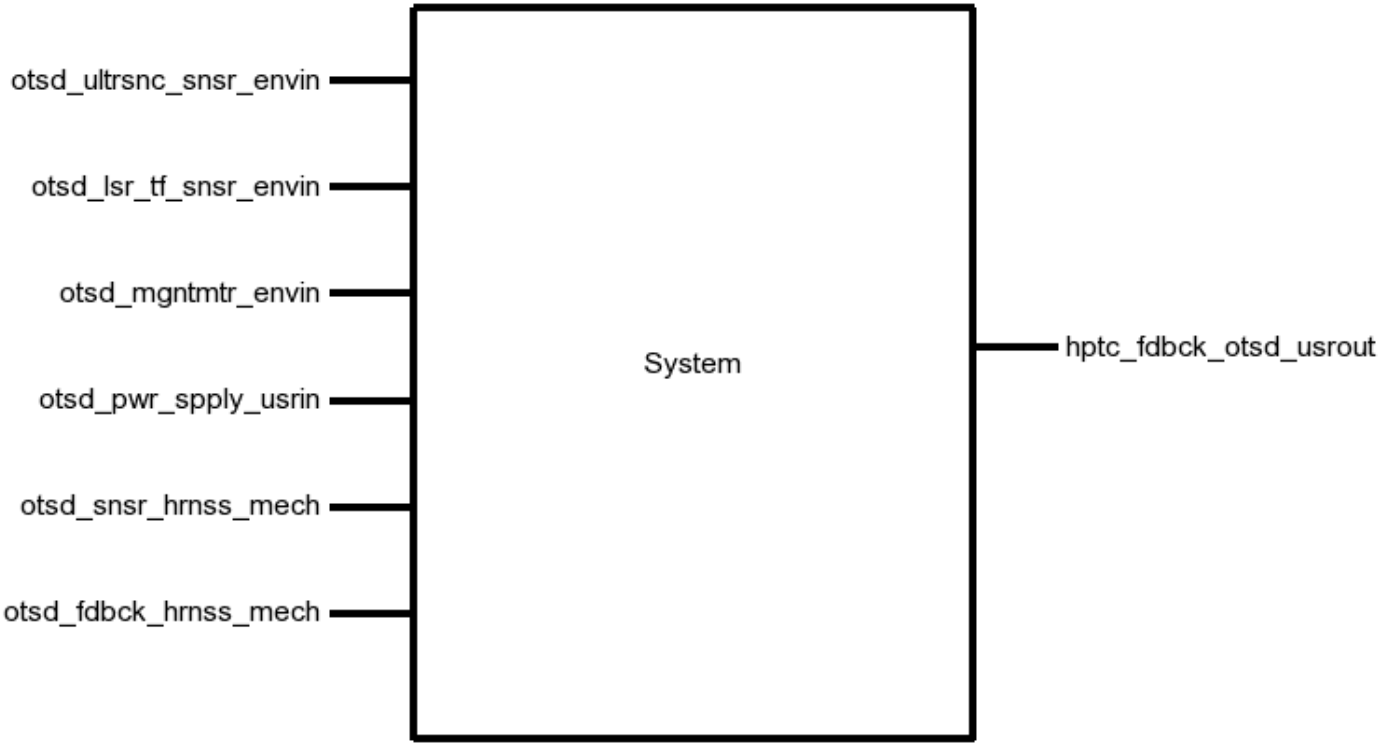
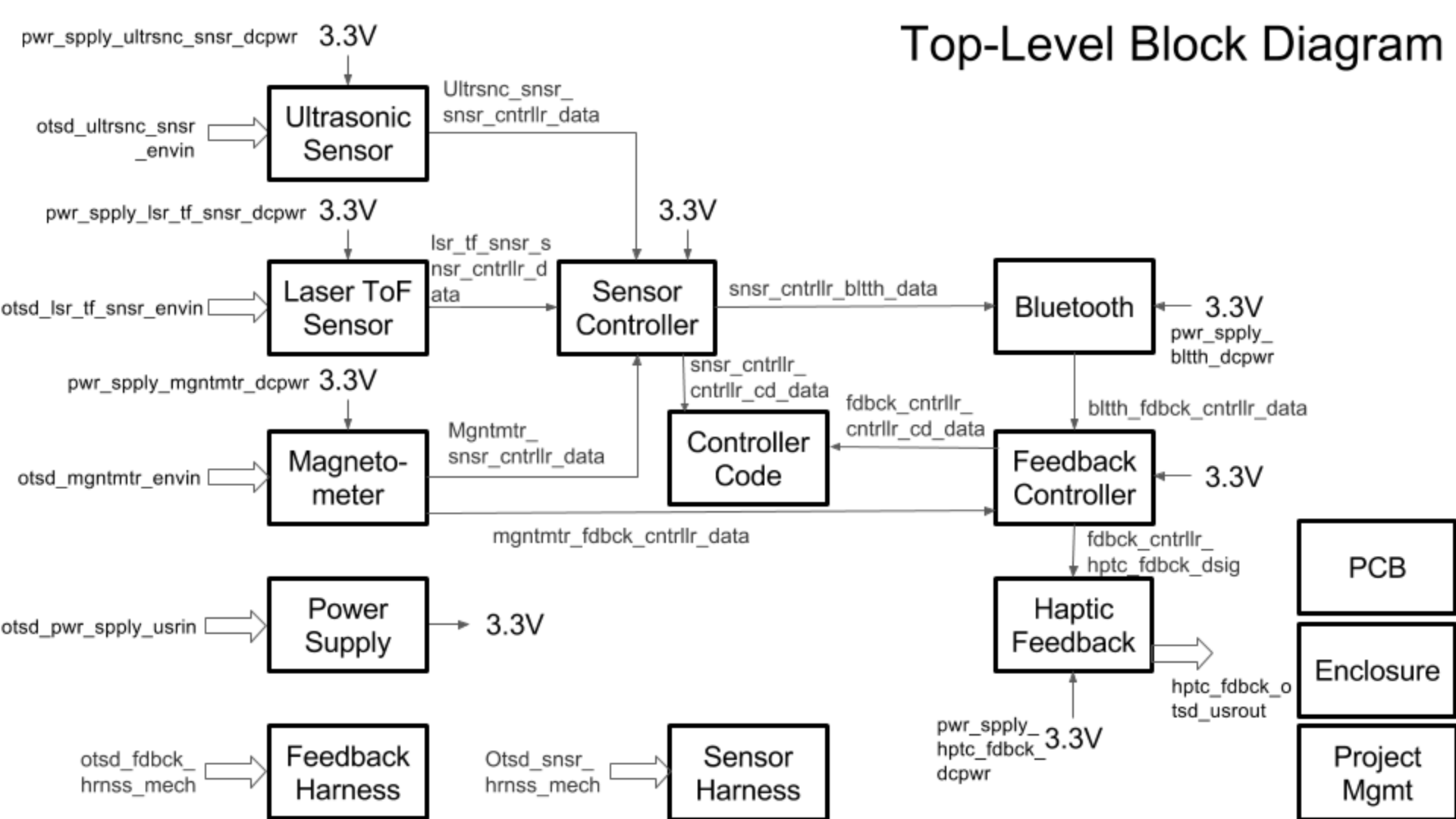

otsd_ultrsnc_snsr_envin
otsd_lsr_tf_snsr_envin
otsd_mgntmtr_envin
otsd_pwr_spply_usrin
otsd_snsr_hrnss_mech
otsd_fdbck_hrnss_mech
System
hptc_fdbck_otsd_usrout

Top-Level Block Diagram



Name	Properties
otsd_ultrsnc_snsr_envin	• **Other:** Accuracy: 10cm • **Other:** Range: 20-500cm • **Other:** Angle: 37.5Â°
otsd_lsr_tf_snsr_envin	• **Other:** Measurement Time: 60ms • **Other:** Accuracy: 12% • **Other:** Range: 1m(white) 0.4m(black) • **Other:** Angle: 5Â°
otsd_mgntmtr_envin	• **Electromagnetic:** Minimum Magnetic Flux: -1mT • **Electromagnetic:** Magnetic Flux Resolution: 1ÂµT • **Electromagnetic:** Maximum Magnetic Flux: 1mT • **Other:** Direction Measurement Accuracy: Â±15Â°
otsd_pwr_spply_usrin	• **Timing:** Low-Power Mode Battery Life: 24h • **Timing:** Standard Mode Battery Life: 12h • **Type:** AA Batteries (4x) • **Usability:** Time to Change Batteries: <1min
otsd_snsr_hrnss_mech	• **Other:** Maximum Circumference: 60cm • **Other:** Maximum Weight: 100g • **Other:** Minimum Circumference: 50cm
otsd_fdbck_hrnss_mech	• **Other:** Minimum Circumference: 84cm • **Other:** Maximum Circumference: 110cm • **Other:** Weight: 100g
ultrsnc_snsr_snsr_cntrllr_data	• **Messages:** Object Distance • **Other:** Measurement Time: <38ms • **Other:** Pulse Voltage: 3.3V • **Protocol:** TTL
lsr_tf_snsr_snsr_cntrllr_data	• **Datarate:** 100kHz • **Messages:** Address Programming, Measurement Trigger, Measurement Read • **Other:** Measurement Time: <60ms • **Protocol:** I2C
mgntmtr_snsr_cntrllr_data	• **Datarate:** 100kHz • **Messages:** Sensor Data • **Other:** Measurement Frequency: 20Hz • **Protocol:** I2C
mgntmtr_fdbck_cntrllr_data	• **Datarate:** 100kHz • **Messages:** Sensor Data • **Other:** Measurement Frequency: 20Hz • **Protocol:** I2C
pwr_spply_ultrsnc_snsr_dcpwr	• **Inominal:** 5mA Â± 10% • **Ipeak:** 30mA

	• **Vmax:** 5.5V • **Vmin:** 3V
pwr_spply_lsr_tf_snsr_dcpwr	• **Inominal:** 35ÂµA Â± 10% per sensor (between measurements) • **Ipeak:** 30mA per sensor (during measurement) • **Vmax:** 5V • **Vmin:** 3V
pwr_spply_mgntmtr_dcpwr	• **Inominal:** 5ÂµA Â± 10% (standby) • **Ipeak:** 0.5mA (measurement) • **Vmax:** 3.6V • **Vmin:** 1.95V
pwr_spply_snsr_cntrllr_dcpwr	• **Inominal:** 35mA Â± 10% (Bluetooth Paired, with laser, bluetooth, ultrasonic) • **Inominal:** 60mA Â± 10% (Bluetooth Not Paired, with laser, Bluetooth, ultrasonic) • **Vmax:** 12V • **Vmin:** 3.4V
pwr_spply_bltth_dcpwr	• **Inominal:** 35mA Â± 10% (During Pairing) • **Inominal:** 15mA Â± 10% (after pairing) • **Vmax:** 6V • **Vmin:** 3.6V
pwr_spply_hptc_fdbck_dcpwr	• **Inominal:** 50mA Â± 20% at 100% duty cycle • **Ipeak:** 75mA (per motor) • **Vmax:** 3.3V • **Vmin:** 2.7V
pwr_spply_fdbck_cntrllr_dcpwr	• **Inominal:** 9mA Â± 10% • **Ipeak:** 20mA • **Vmax:** 5.5V • **Vmin:** 1.8V
snsr_cntrllr_cntrllr_cd_data	• **Other:** Language: Arduino • **Other:** Code Size less than 25KB • **Protocol:** Avrdude
snsr_cntrllr_bltth_data	• **Datarate:** 38400 Baud • **Other:** Name: ece34_M • **Other:** Password: group34 • **Other:** Range: >1m • **Protocol:** Serial Port Protocol • **Protocol:** 1 Stop Bit, No Parity Bits
bltth_fdbck_cntrllr_data	• **Datarate:** 38400 Baud • **Other:** Range: >1m • **Other:** Name: ece34_S • **Other:** Password: group34 • **Protocol:** 1 Stop Bit, No Parity Bits • **Protocol:** Serial Port Protocol

hptc_fdbck_otsd_usrout	• **Other:** Minimum Frequency: 1Hz • **Other:** Number of Intervals: 5 (1m each for the ultrasonic sensor, 20cm each for the laser ToF sensors.) • **Other:** Frequency Interval Step: 1Hz • **Other:** Maximum Frequency: 5Hz • **Type:** Haptic Feedback • **Usability:** 6.Usability: 9/10 users can detect the vibration frequency changing with 100% accuracy
fdbck_cntrllr_cntrllr_cd_data	• **Other:** Language: Arduino • **Other:** Code Size less than 10KB • **Protocol:** Avrdude
fdbck_cntrllr_hptc_fdbck_dsig	• **Fall Time:** <100ms • **Logic-Level:** 3.3V • **Rise Time:** <100ms