True Randomness mainboard

- control 3 wheel motors, each with PID controlled speed
- thrower motor
- ball holder servo
- ball in holder detection with an IR LED and sensor

Mainboard communication

Communicate with the mainboard over USB using structs. Send and receive are the same struct but the values are not necessarily the same. Sending and receiving structs with python.

Send parameters

parameter	type	values	comment
motor1	float	-100 to 100	wheel motor speed
motor2	float	-100 to 100	wheel motor speed
motor3	float	-100 to 100	wheel motor speed
thrower	float	0 to 100	thrower speed
servo	float	-100 to 100	ball holder servo speed
ir_control	int_32	0, 1	ball holder servo behavior when ir sensor is blocked. 0 = servo is automatically stopped regardless of the servo parameter value 1 = servo continues running
p_const	float	any	wheel pid p const, a good value is 5
i_const	float	any	wheel pid i const, a good value is 0.001
d_const	float	any	wheel pid d const, a good value is 15
pid_accuracy	int_32	0, 1	wheel motor pid accuracy 0 = last measurement 1 = over last 10 measurements
delimiter	int_32	0xABCABC	always the same value

Receive parameters

parameter	type	values	comment
motor1	float	-100 to 100	measured wheel motor speed (not clamped to the input range)
motor2	float	-100 to 100	measured wheel motor speed (not clamped to the input range)
motor3	float	-100 to 100	measured wheel motor speed (not clamped to the input range)
thrower	float	0	unused
servo	float	0	unused
ir_sensor	int_32	0, 1	ir sensor status 0 = sensor is not blocked 1 = sensor is blocked
p_const	float	0	unused
i_const	float	0	unused
d_const	float	0	unused
pid_accuracy	int_32	0	unused
delimiter	int_32	0xABCABC	always the same value

Board pinout

Power and motors

connector	pin 1	pin 2
POWER	GND	Vin
MOTOR POWER	B	A

Micro match

connector	pin 1	pin 2	pin 3	pin 4
ENCODER	GND	+3.3V	A	B
SERVO	GND	+5V	PWM	
THROWER	GND		PWM	
IR DETECTOR	GND	+5V	Vo	GLout
IR LED		+5V	GLout	