

Dongbu Robot HerkuleX (DRS-0101, DRS-0201) Library for

Arduino –ver 0.1(2012.11.08)

(1) Constants

- LED constants

HERKULEX_LED_RED	- RED LED
HERKULEX_LED_GREEN	- GREEN LED
HERKULEX_LED_BLUE	- BLUE LED

* See. HerkuleX Manual p48

- Servo status constants

HERKULEX_STATUS_OK	- OK
HERKULEX_ERROR_INPUT_VOLTAGE	- Input voltage error
HERKULEX_ERROR_POS_LIMIT	- Position limit error
HERKULEX_ERROR_TEMPERATURE_LIMIT	- Temperature limit error
HERKULEX_ERROR_INVALID_PKT	- Invalid packet error
HERKULEX_ERROR_OVERLOAD	- Overload error
HERKULEX_ERROR_DRIVER_FAULT	- Driver error
HERKULEX_ERROR_EEPREG_DISTORT	- EEP register error

* For more detail error status and meaning, See. HerkuleX Manual p39

- Broadcast ID

HERKULEX_BROADCAST_ID	- 0xFE(254)
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* All servo listen to packet when you set up motor ID as 0xFE.

(2) Functions

- Begin

void begin(**long** baudrate, **uint8_t** rx, **uint8_t** tx);

void beginSerial(**long** baudrate);

void beginSerial1(**long** baudrate);

void beginSerial2(**long** baudrate);

void beginSerial3(**long** baudrate);

- Torque ON, OFF

void torqueOn(**uint8_t** id);

void torqueOff(uint8_t id);

- Turn speed control

void turn(uint8_t id, int16_t pwmValue, uint8_t playtime = 0x30, uint8_t led = 0x00);
int16_t **getTurnSpeed**(uint8_t id);

- Position control

void movePos(uint8_t id, uint16_t pos, uint8_t playtime = 0x30, uint8_t led = 0x00);
uint16_t **getPos**(uint8_t id);

- Position control by angle

void moveAngle(uint8_t id, **float** angle, uint8_t playtime = 0x30, uint8_t led = 0x00);
float **getAngle**(uint8_t id);

- Status check and error clear

void clear(uint8_t id);
byte **getStatus**(uint8_t id);

(3) Functions detail

void begin(long baudrate, uint8_t rx, uint8_t tx);	
Desc	Begin HerkuleX Servo control using SoftwareSerial library All Arduino boards are available with this function Arduino Uno is only available with SoftwareSerial
Param	* baudrate - 57600(recommended) * rx - Arduino board RX (HerkuleX servo TX) * tx - Arduino board TX (HerkuleX servo RX)
Usage	HerkuleX.begin(57600);

void beginSerial(long baudrate);	
Desc	Begin HerkuleX Servo control using Serial All Arduino boards are available with this function BUT, usually Serial pins are being used for communicating with PC. You might rarely use this function.
Param	* baudrate – baudrate
Usage	HerkuleX.beginSerial(115200);

void beginSerial1(long baudrate); void beginSerial2(long baudrate); void beginSerial3(long baudrate);	
Desc	Begin HerkuleX Servo control using Serial1, Serial2, and Serial3 This function is available with Arduino Mega and Due (chips based on ATmega1280 and 2560)
Param	* baudrate – 115200(recommended)
Usage	HerkuleX.beginSerial1(115200); HerkuleX.beginSerial2(115200); HerkuleX.beginSerial3(115200);

void torqueOn(uint8_t id);	
Desc	Torque on HerkuleX Servo by ID Servo will move with “Torque On” If you set 0xFE to this parameter, All servos torque on
Param	* id – HerkuleX Servo ID (0~253 Broadcast ID 254)
Usage	HerkuleX.torqueOn(253);

void torqueOff(uint8_t id);	
Desc	Torque off HerkuleX Servo by ID Servo will not move with “Torque Off” If you set 0xFE to this parameter, All servos torque off
Param	* id – HerkuleX Servo ID (0~253 Broadcast ID 254)
Usage	HerkuleX.torqueOff(253);

void turn (uint8_t id, int16_t pwmValue, uint8_t playtime = 0x30, uint8_t led = 0x00);	
Desc	Infinite turn HerkuleX Servo by pwmValue
Param	<p>* id – HerkuleX Servo ID (0~253 Broadcast ID 254)</p> <p>* pwmValue – turn speed (-1023 ~ 1023)</p> <p>- value CW(Clock Wise)</p> <p>+ value CCW(Counter Clock Wise)</p> <p>* playtime – Time that servo reaches the turn speed</p> <p>Actual time is playtime multiplied by 11.2ms</p> <p>1: 11.2ms, 2: 22.4ms ... 10: 112ms</p> <p>You do not specify this parameter, playtime will be 0x30 (16*3*11.2ms = 537.6ms)</p> <p>* led – LED Control</p> <p>You do not specify this parameter, No led turn on.</p>
Usage	HerkuleX.turn(253, 500, 10, HERKULEX_LED_BLUE); HerkuleX.turn(254, -500, 10, HERKULEX_LED_RED HERKULEX_LED_GREEN); HerkuleX.turn(1, -300)

int16_t getTurnSpeed (uint8_t id);	
Desc	Get current turn speed from a servo
Param	* id – HerkuleX Servo ID (0~253)
Usage	HerkuleX.getTurnSpeed(253);
Return	Current turn speed

void movePos(uint8_t id, uint16_t pos, uint8_t playtime = 0x30, uint8_t led = 0x00);	
Desc	ove HerkuleX servo to target position
Param	<ul style="list-style-type: none"> * id – HerkuleX Servo ID (0~253 Broadcast ID 254) * pos – Target position (0~1023 Zero point(Center):512) * playtime – Time that servo reaches the target position Actual time is playtime multiplied by 11.2ms 1: 11.2ms, 2: 22.4ms ... 10: 112ms You do not specify this parameter, playtime will be 0x30 (16*3*11.2ms = 537.6ms) * led – LED Contorl You do not specify this parameter, No led turn on.
Usage	HerkuleX.movePos(253, 235, 50, HERKULEX_LED_BLUE); HerkuleX.movePos (254, 768, 100, HERKULEX_LED_RED HERKULEX_LED_GREEN); HerkuleX.movePos(1, 512)

int16_t getPos(uint8_t id);	
Desc	Get current position from a servo
Param	* id – HerkuleX Servo ID (0~253)
Usage	HerkuleX.getPos(253);
Return	Current position

void moveAngle (uint8_t id, float angle, uint8_t playtime = 0x30, uint8_t led = 0x00);	
Desc	Move HerkuleX Servo by angle
Param	<p>* id – HerkuleX Servo ID (0~253 Broadcast ID 254)</p> <p>* angle – Target angle (-166.7~166.7degree 0:Center) NOTICE – Not Radian The value of target angle is float type.</p> <p>* playtime – Time that servo reaches the target angle Actual time is playtime multiplied by 11.2ms 1: 11.2ms, 2: 22.4ms ... 10: 112ms You do not specify this parameter, playtime will be 0x30 (16*3*11.2ms = 537.6ms)</p> <p>* led – LED Contorl You do not specify this parameter, No led turn on.</p>
Usage	HerkuleX.moveAngle(253, -130.5, 50, HERKULEX_LED_BLUE); HerkuleX.moveAngle (254, 130.5, 100, HERKULEX_LED_RED HERKULEX_LED_GREEN); HerkuleX.moveAngle(1, 69.7)

float getAngle (uint8_t id);	
Desc	Get current angle from a servo
Param	* id – HerkuleX Servo ID (0~253)
Usage	HerkuleX.getAngle(253);
Return	Current servo angle (degree – NOT radian)

void clear (uint8_t id);	
Desc	Get rid of HerkuleX Servo error status -> When a servo is in error status, red LED will blink
Param	* id – HerkuleX Servo ID (0~253 Broadcast ID : 254)
Usage	HerkuleX.clear(253); HerkuleX.clear(254);

byte getStatus (uint8_t id);	
Desc	Get current HerkuleX Servo status
Param	* id – HerkuleX Servo ID (0~253)
Usage	HerkuleX.getStatus(253);
Return	Current servo status from a servo static byte HERKULEX_STATUS_OK = 0x00; static byte HERKULEX_ERROR_INPUT_VOLTAGE = 0x01; static byte HERKULEX_ERROR_POS_LIMIT = 0x02; static byte HERKULEX_ERROR_TEMPERATURE_LIMIT = 0x04; static byte HERKULEX_ERROR_INVALID_PKT = 0x08; static byte HERKULEX_ERROR_OVERLOAD = 0x10; static byte HERKULEX_ERROR_DRIVER_FAULT = 0x20; static byte HERKULEX_ERROR_EEPREG_DISTORT = 0x40;