DRSP-Serial Operation Manual

(for TETRA-DS IV™)

Linux Version

Version 1.2

2012. 01.

Dongbu Robot

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Chapter 1. Drive Board DRSP-Serial Reference

Refer to below for information on Drive Board module library. Drive Board module is one of the controller boards for TETRA-DS series robot platform.

1.1 int DRSP_rs232_drv_create(const char *port, int time_out)

1.1.1 Description

Opens drive board COM Port and assigns Serial(RS-232) time out.

1.1.2 Parameters

Name	Data type	Description
port	Const char *	COM Port number
time_out	int	Serial time out (Unit: msec)

1.1.3 Return Parameters

Name	Data type	Description
Return Value	int	0: Success -1: Failure

1.2 void DRSP_rs232_drv_destroy ()

1.2.1 Description

Disconnect drive board COM Port.

1.2.2 Parameters

Name	Data type	Description
None		

1.2.3 Return Parameters

Name	Data type	Description
None		

1.3 bool DRSP_rs232_drv_module_read_encoder(int *encoder_l, int *encoder_r)

1.3.1 Description

Reads Left/Right drive motors encoder values..

1.3.2 Parameters

Name	Data type	Description
None		

1.3.3 Return Parameters

Name	Data type	Description
encoder_l	int *	Left motor encoder value
encoder_r	int *	Right motor encoder value
Return Value	int	0: Success < 0: Failure (Refer to error code table)

1.4 int DRSP_rs232_drv_module_read_bumper_emg (int *bumper_data, int *emg_data)

1.4 Description

Reads bumper and emergency stop button state value.

1.4.2 Parameters

Name	Data type	Description
None		

1.4.3. Return Parameters

Name	Data type	Description
bumper_data	int *	Bumper sensor state value bumper_data[0] : Left bumper state value bumper_data[1] : Right bumper state value 0 : Not pressed 1 : Pressed
emg_data	int *	Emergency stop button state value. 0 : Not pressed 1 : Pressed

Return Value	int	0: Success < 0: Failure(Refer to appendix)

1.5 int DRSP_rs232_drv_module_read_drive_err (unsigned char *left_wheel_err, unsigned char *right_wheel_err)

1.5.1 Description

Reads drive board state value.

1.5.2. Parameters

Name	Data type	Description
None		

1.5.3. Return Parameters

Name	Data type	Description
left_wheel_err	unsigned char *	Left motor error state value (Refer to appendix)
right_wheel_err	unsigned char *	Right motor error state value (Refer to appendix)
Return Value	int	0: Success < 0: Failure(Refer to appendix)

1.6 int DRSP_rs232_drv_module_set_servo(int mode)

1.6.1 Description

Controls drive motor Servo On/Off function.

1.6.2 Parameters

Name	Data type	Description
mode	int	0: Servo Off 1: Servo On

1.6.3 Return Parameters

Name	Data type	Description
Return Value	int	0: Success < 0: Failure (Refer to appendix)

1.7 int DRSP_rs232_drv_module_set_drive_err_reset()

1.7.1 Description

Drive motor error state reset.

1.7.2 Parameters

Name	Data type	Description
None		

1.7.3 Return Parameters

Name	Data type	Description
Return Value	int	0: Success < 0: Failure (Refer to appendix)

1.8 int DRSP_rs232_drv_moduel_set_velocity(int velocity_l, int velocity_r)

1.8.1 Description

Left/Right drive motor velocity control command.

! Caution) Motor velocity will automatically fall to 0mm/s without a new velocity control command within 1000msec from the previous control command.

1.8.2 Parameters

Name	Data type	Description
velocity_l	int	Left motor velocity command [mm/s]
velocity_r	int	Right motor velocity command[mm/s]

1.8.3 Return Parameters

Name	Data type	Description

Return Value	int	0: Success < 0: Failure (Refer to Appendix)

Chapter 2. PSV Board DRSP-RS232 Reference

Refer to below for information on PSV Board module library. PSV board controls power/sensor and it is one of the controller boards for TETRA-DS series robot platform.

2.1 int DRSP_rs232_sensor_module_create(const char *port, int time_out)

2.1.1 Description

Opens PSV board COM Port and assigns Serial(RS-232) time out.

2.1.2 Parameters

Name	Data type	Description
port	const char *	COM Port number
time_out	int	Serial time out (Unit: msec)

2.1.3 Return Parameters

Name	Data type	Description
Return Value	int	0: Success -1: Failure

2.2 void DRSP_rs232_sensor_module_destroy()

2.2.1 Description

Disconnects PSV board COM Port connection.

Name	Data type	Description
None		

2.2.2 Return Parameters

Name	Data type	Description
None		

2.3 int DRSP_rs232_sensor_module_read_usonic(double *data)

2.3.1 Description

Reads ultrasonic sensor value through the PSV board.

2.3.2 Parameters

Name	Data type	Description
None		

2.3.3 Return Parameters

Name	Data type	Description
data	double	Ultrasonic sensor data[단위: m] data[0] ~ data[7] Refer to 'DRSP-HAL Platform Operation Manual' for ultrasonic sensor placement information.
Return Value	int	0: Success < 0: Failure (Refer to appendix)

2.4.1 int DRSP_rs232_sensor_module_max_dist(int val)

2.4.1 Description

Assigns maximum ultrasonic sensor range through the PSV board.

Response time is directly proportional to ultrasonic sensor range (Longer the distance, longer the response time).

! Caution. Sensor data becomes unreliable when maximum ultrasonic sensor range is set farther than 3.5m.

2.4.2. Parameters

Name	Data type	Description
port	Const char *	1 : Ultrasonic sensor range limit 1.5m 2 : Ultrasonic sensor range limit 2.0m 3 : Ultrasonic sensor range limit 2.5m 4 : Ultrasonic sensor range limit 3.0m 5 : Ultrasonic sensor range limit 3.5m 6 : Ultrasonic sensor range limit 4.0m 7 : Ultrasonic sensor range limit 4.5m

		8 : Ultrasonic sensor range limit 5.0m 9 : Ultrasonic sensor range limit 5.5m

2.4.3 Return Parameters

Name	Data type	Description
Return Value	int	0: Success < 0: Failure (Refer to appendix)

2.5 int DRSP_rs232_power_module_read_power(DRSP_power_data *data)

2.5.1 Description

Reads power state value of the PSV board

2.5.2 Parameters

Name	Data type	Description
None		

2.5.3 Return Parameters

Name	Data type	Description
data	DRSP_power_data	Power status value Refer to Operation Manual for state values of different models. battery_volt : Battery voltage charge_volt : Charge voltage charge_current: Charge current consumption_current: Current consumption power_state_drive : Drive power state power_state_sensor : Sensor module power state power_state_lrf : LRF power state power_state_sbc : SBC power state power_state_gyro : GYRO power state

		power_state_stargazer : StarGazer power state power_state_lcd : LCD power state power_state_pantilt : Pan-tilt power state
Return Value	int	0: Success < 0: Failure (Refer to appendix)

2.6 int DRSP_rs232_power_module_power_control(int select, int mode)

2.6.1 Description

PSV board power control (On/Off)

2.6.2 Parameters

Name	Data type	Description
select	int	0 : drive 1 : sensors (Ultrasonic Sensor & Gyro) 2 : LRF (Laser Rangefinder) 3 : SBC (Single Board Computer) 4 : spare 5 5 : StarGazer 6 : spare 1 7 : spare 3 8 : spare 2 9 : LCD 10 : Pan-tilt 11 : spare 4
mode	int	0 : off 1 : on

2.6.3 Return Parameters

Name	Data type	Description
Return Value	int	0: Success

		< 0: Failure (Refer to appendix)

Appendix

A. 1 Error return value table

[Table 1] Error Returns

Value	Description
-1	Com Port not initialized
-10	STX error
-11	Data Receive error
-12	LRC check error