

CAN Protocol (Chassis)

Reset				
Sender	Receiver	CAN ID	DLC	Period[ms]
Controller	Motor driver	0x0505XX00 XX: driver id, can be 1 or 2 or 3	8	/
data	function	data type	description	
byte[0]	/	uint8	Fixed value 0x55	
byte[1]	/	uint8	Fixed value 0x55	
byte[2]	/	uint8	Fixed value 0x55	
byte[3]	/	uint8	Fixed value 0x55	
byte[4]	/	uint8	Fixed value 0x55	
byte[5]	/	uint8	Fixed value 0x55	
byte[6]	/	uint8	Fixed value 0x55	
byte[7]	/	uint8	Fixed value 0x55	
Driver mode switch				
Sender	Receiver	CAN ID	DLC	Period[ms]
Controller	Motor driver	0x0505XX01 XX: driver ID. Can be 1 or 2 or 3	8	/
data	function	data type	description	

byte[0]	mode	uint8	2-open loop mode 3-velocity loop mode 4-position velocity loop mode 5-current loop mode 6-velocity current loop mode 7-position velocity current loop mode Note: typically the velocity current loop mode should be used. If you want to switch mode, you need to send reset first
byte[1]	/	uint8	Fixed value 0x55
byte[2]	/	uint8	Fixed value 0x55
byte[3]	/	uint8	Fixed value 0x55
byte[4]	/	uint8	Fixed value 0x55
byte[5]	/	uint8	Fixed value 0x55
byte[6]	/	uint8	Fixed value 0x55
byte[7]	/	uint8	Fixed value 0x55

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Open loop mode control

Sender	Receiver	CAN ID	DLC	Period[ms]
Controller	Motor driver	0x0505XX02 XX: driver ID. Can be 1 or 2 or 3	8	10ms
data	function	data type	description	
byte[0]	pwm_duty [15:8]	int16	range [-3000,3000]	
byte[1]	pwm_duty [7:0]			
byte[2]	/	uint8	Fixed value 0x55	
byte[3]	/	uint8	Fixed value 0x55	
byte[4]	/	uint8	Fixed value 0x55	
byte[5]	/	uint8	Fixed value 0x55	
byte[6]	/	uint8	Fixed value 0x55	
byte[7]	/	uint8	Fixed value 0x55	

Velocity mode control

Sender	Receiver	CAN ID	DLC	Period[ms]
Controller	Motor driver	0x0505XX03 XX: driver ID. Can be 1 or 2 or 3	8	10ms
data	function	data type	description	
byte[0]	pwm_duty [15:8]	int16	range [-3000,3000]	
byte[1]	pwm_duty [7:0]			
byte[2]	velocity [15:8]			
byte[3]	velocity [7:0]	int16	unit: rpm, range [-500,500]	
byte[4]	/	uint8	Fixed value 0x55	
byte[5]	/	uint8	Fixed value 0x55	
byte[6]	/	uint8	Fixed value 0x55	
byte[7]	/	uint8	Fixed value 0x55	

Position velocity mode control

Sender	Receiver	CAN ID	DLC	Period[ms]
Controller	Motor driver	0x0505XX04 XX: driver ID. Can be 1 or 2 or 3	8	10ms
data	function	data type	description	
byte[0]	pwm_duty [15:8]	int16	range [-3000,3000]	
byte[1]	pwm_duty [8:0]			
byte[2]	velocity [15:8]			
byte[3]	velocity [8:0]	int16	unit: rpm, range [-500,500]	
byte[4]	position[31:24]	int32	range [-4096,4096]	
byte[5]	position[23:16]			
byte[6]	position[15:8]			
byte[7]	position[7:0]			

Current loop mode control

Sender	Receiver	CAN ID	DLC	Period[ms]
Controller	Motor driver	0x0505XX05 XX: driver ID. Can be 1 or 2 or 3	8	10ms
data	function	data type	description	
byte[0]	current [15:8]	int16	unit: 10mA, range [-7000,7000]	
byte[1]	current [7:0]			
byte[2]	/	uint8	Fixed value 0x55	
byte[3]	/	uint8	Fixed value 0x55	
byte[4]	/	uint8	Fixed value 0x55	
byte[5]	/	uint8	Fixed value 0x55	
byte[6]	/	uint8	Fixed value 0x55	
byte[7]	/	uint8	Fixed value 0x55	

Velocity current mode control

Sender	Receiver	CAN ID	DLC	Period[ms]
Controller	Motor driver	0x0505XX06 XX: driver ID. Can be 1 or 2 or 3	8	10ms
data	function	data type	description	
byte[0]	current [15:8]	int16	unit: 10mA, range [-7000,7000]	
byte[1]	current [7:0]			
byte[2]	velocity [15:8]	int16	unit: rpm, range [-500,500]	
byte[3]	velocity [7:0]			
byte[4]	/	uint8	Fixed value 0x55	
byte[5]	/	uint8	Fixed value 0x55	
byte[6]	/	uint8	Fixed value 0x55	
byte[7]	/	uint8	Fixed value 0x55	

Position velocity current mode control

Sender	Receiver	CAN ID	DLC	Period[ms]
Controller	Motor driver	0x0505XX07 XX: driver ID. Can be 1 or 2 or 3	8	10ms
data	function	data type	description	
byte[0]	current [15:8]	int16	unit: 10mA, range [-7000,7000]	
byte[1]	current [8:0]			
byte[2]	velocity [15:8]	int16	unit: rpm, range [-500,500]	
byte[3]	velocity [8:0]			
byte[4]	position[31:24]	int32	range [-4096,4096]	
byte[5]	position[23:16]			
byte[6]	position[15:8]			
byte[7]	position[7:0]			

Set motor acceleration or deceleration

Sender	Receiver	CAN ID	DLC	Period[ms]
Controller	Motor driver	0x0505XX30 XX: driver ID. Can be 1 or 2 or 3	8	/
data	function	data type	description	
byte[0]	open loop acc [15:8]	uint16	if you set 1000,it means that the PWM duty cycle value takes 1 second to go from 0 to 1000	
byte[1]	open loop acc [7:0]			
byte[2]	open loop dec [15:8]	uint16	if you set 1000,it means that the PWM duty cycle value takes 1 second to go from 1000 to 0	
byte[3]	open loop dec [7:0]			
byte[4]	velocity loop acc[15:8]	uint16	if you set 100,it means that the rpm value takes 10 second to go from 0	

byte[5]	velocity loop acc [7:0]		
byte[6]	velocity loop dec[15:8]	uint16	if you set 100,it means that the rpm value takes 10 second to go from 1000 rpm to 0 rpm
byte[7]	velocity loop dec [7:0]		

set velocity loopwithout current loopPID param cmd

Sender	Receiver	CAN ID	DLC	Period[ms]
Controller	Motor driver	0x0505XX40 XX: driver ID. Can be 1 or 2 or 3	8	The driver has default parameters that are sent when they need to be modified
data	function	data type	description	
byte[0]	P [31:24]	float	Proportion param	
byte[1]	P[23:16]			
byte[2]	P[15:8]			
byte[3]	P[7:0]			
byte[4]	I [31:24]	float	Integral param	
byte[5]	I[23:16]			
byte[6]	I[15:8]			
byte[7]	I[7:0]			

set position loopwithout current loopPID cmd

Sender	Receiver	CAN ID	DLC	Period[ms]
Controller	Motor driver	0x0505XX41 XX: driver ID. Can be 1 or 2 or 3	8	The driver has default parameters that are sent when they need to be modified

data	function	data type	description
byte[0]	P [31:24]	float	proportion param
byte[1]	P[23:16]		
byte[2]	P[15:8]		
byte[3]	P[7:0]		
byte[4]	D [31:24]	float	differential param
byte[5]	D[23:16]		
byte[6]	D[15:8]		
byte[7]	D[7:0]		

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set current loop PID cmd

Sender	Receiver	CAN ID	DLC	Period[ms]
Controller	Motor driver	0x0505XX42 XX: driver ID. Can be 1 or 2 or 3	8	The driver has default parameters that are sent when they need to be modified

data	function	data type	description
byte[0]	P [31:24]	float	proportion param
byte[1]	P[23:16]		
byte[2]	P[15:8]		
byte[3]	P[7:0]		
byte[4]	I [31:24]	float	Integral param
byte[5]	I[23:16]		
byte[6]	I[15:8]		
byte[7]	I[7:0]		

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set velocity loop[with current loop]PID cmd

Sender	Receiver	CAN ID	DLC	Period[ms]
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Controller	Motor driver	0x0505XX43 XX: driver ID. Can be 1 or 2 or 3	8	The driver has default parameters that are sent when they need to be modified
data	function	data type	description	
byte[0]	P [31:24]	float	proportion param	
byte[1]	P[23:16]			
byte[2]	P[15:8]			
byte[3]	P[7:0]			
byte[4]	I [31:24]	float	Integral param	
byte[5]	I[23:16]			
byte[6]	I[15:8]			
byte[7]	I[7:0]			

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set position loopwith current loopPID cmd

Sender	Receiver	CAN ID	DLC	Period[ms]
Controller	Motor driver	0x0505XX44 XX: driver ID. Can be 1 or 2 or 3	8	The driver has default parameters that are sent when they need to be modified
data	function	data type	description	
byte[0]	P [31:24]	float	proportion param	
byte[1]	P[23:16]			
byte[2]	P[15:8]			
byte[3]	P[7:0]			
byte[4]	D [31:24]	float	differential param	
byte[5]	D[23:16]			
byte[6]	D[15:8]			
byte[7]	D[7:0]			

motor position velocity current feedback

Sender	Receiver	CAN ID	DLC	Period[ms]
Motor driver	Controller	0x0505XXB1 XX: driver ID. Can be 1 or 2 or 3	8	10ms
data	function	data type	description	
byte[0]	current [15:8]	int16	unit: 10mA	
byte[1]	current [8:0]			
byte[2]	velocity [15:8]			
byte[3]	velocity [8:0]	int16	unit: rpm	
byte[4]	position[31:24]			
byte[5]	position[23:16]			
byte[6]	position[15:8]	int32	unit: qc	
byte[7]	position[7:0]			

Driver status feedback

Sender	Receiver	CAN ID	DLC	Period[ms]
Motor driver	Controller	0x0505XXB2 XX: driver ID. Can be 1 or 2 or 3	8	100ms
data	function	data type	description	
byte[0]	pwm duty [15:8]	int16	unit: 0.01V	
byte[1]	pwm duty [8:0]			
byte[2]	voltage [15:8]			
byte[3]	voltage [8:0]	uint16		
byte[4]	MOSFET temperature	uint8	unit: °C	
byte[5]	motor temperature	uint8	unit: °C	

byte[6]	error	uint8	0-normal 1-voltage over low 2-voltage over high 3-mosfet overtemperature 4-motor overtemperature 5-motor over current 6-encoder disconnect 7-encoder feedback direction is incorrect 8-encoder leads are not secure 9- hall sensor is abnormal
byte[7]	warning	uint8	bit0-can watchdog timeout bit1-there is a gap in the Hall sensor

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vcu error feedback

Sender	Receiver	CAN ID	DLC	Period[ms]
VCU	Controller	0x011101BA	8	100ms
data	function	data type	description	
byte[0]	reverse	uint8	0	
byte[1]	reverse	uint8	0	
byte[2]	reverse	uint8	0	
byte[3]	error	uint8	bit0-Low battery warm bit1-Low battery error bit2-reverse bit3-emergency stop	
byte[4]	reverse	uint8	0	
byte[5]	reverse	uint8	0	
byte[6]	reverse	uint8	0	
byte[7]	reverse	uint8	0	

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VCU ctrl mode switch

Sender	Receiver	CAN ID	DLC	Period[ms]
VCU	Controller	0x01110111	8	/

data	function	data type	description
byte[0]	VCU mode	uint8	0-standby 1-reverse 2-VCU CAN mode 3-free mode 4-passthrough mode Note: After powering on, it is in passthrough mode by default
byte[1]	reverse	uint8	0
byte[2]	reverse	uint8	0
byte[3]	error	uint8	0
byte[4]	reverse	uint8	0
byte[5]	reverse	uint8	0
byte[6]	reverse	uint8	0
byte[7]	reverse	uint8	0

Velocity current mode example

1. Switch to velocity current mode

CAN ID: 0x05050101, Data: 06 55 55 55 55 55 55 55

2. Set target velocity to 500 rpm, current to 30000mA

CAN ID: 0x05050106, Data: 0B B8 01 F4 55 55 55 55