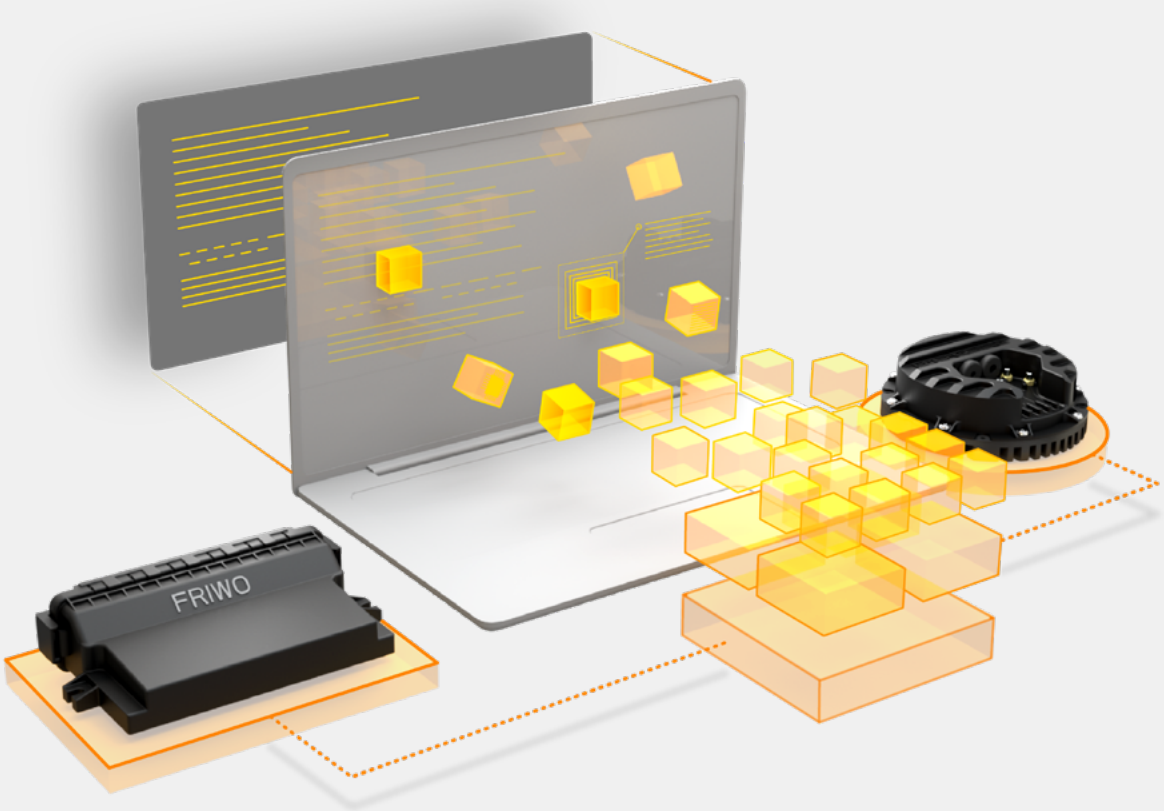
FRIWO | SDK

SOFTWARE DEVELOPMENT KIT

End-to-end Development Environment Setup Solution

MODULE DESCRIPTION



MODULE: DESIRED TORQUE (TRQ_DES)

This module is the first stage of torque calculation. It utilizes the mapped input signals of throttle and brake and calculates the torque request which is desired by the driver. In the easiest case, this can be done by simply adding the signals up in order to get a resulting torque, depending on the operation mode. For special driving maneuvers, e.g. hill assistance, additional motor related information such as the rotor speed can be used to prioritize either the throttle or the brake input.

Additionally, different maximum torque gradients could be represented for each ride mode, which evoke the driver's feeling to be more comfy or rather sporty in acceleration. After the desired torque has been calculated, the output of this module is directly handed over to the torque limitation (TRQ_LIM) and torque strategy (TRQ_STR) modules until the torque will finally be generated by the current controllers.

INPORTS

Signal	Datatype	Min	Max	Unit	Description
APP_Throttle_Signal_Channel	Float32	0	5	–	Selection of input channel which will be used as throttle input: 0 = not selected / off 1 = AIN1 2 = AIN2 3 = PWM@DIN2 4 = CAN-Bus 5 = USB (default)
APP_Brake_Signal_Channel	Float32	0	7	–	Selection of input channel which will be used as brake input: 0 = not selected / off 1 = AIN1 2 = AIN2 3 = PWM@DIN2 4 = CAN-Bus 5 = USB (default) 6 = DIN1 7 = DIN2
APP_Reverse_Gear_Signal_Channel	Float32	0	4	–	Selection of input channel which will be used as reverse gear input: 0 = not selected / off 1 = DIN1 2 = DIN2 3 = CAN-Bus 4 = USB (default)
AIN1_Throttle	Float32	0	100	%	Mapped relative torque request from Analog Interface 1
AIN2_Throttle	Float32	0	100	%	Mapped relative torque request from Analog Interface 2
CAN_EXT_Reverse_Gear	Float32	0	1		Reverse gear selection from CAN-Bus
CAN_EXT_Torque_Request	Float32	0	100	%	Relative torque request from CAN-Bus
DIN_DIN1_Signal	Float32	0	1	–	Relative torque request from DIN1
DIN_DIN2_Signal	Float32	0	1	–	Relative torque request from DIN2
PWMI_Throttle	Float32	0	100	%	Relative torque request from PWM-Input
MO_Rotor_Speed	Float32	–2400	2400	1/s	Actual mechanical rotor speed
APP_Disp_Ride_Mode	Float32	0	3	–	Selected ride-mode from APP-Interface
SM_Trq_Control_status	Float32	0	1	–	Status of torque-control: 0 = Torque-control deactivated (Powerstage disabled) 1 = Torque-control activated (Powerstage and Current Controller enabled)

OUTPORTS

Signal	Datatype	Min	Max	Unit	Description
TRQ_DES_Driver_Throttle	Float32	0	100	%	Throttle signal used for desired driver torque calculation after channel selection through APP_Throttle_Signal_Channel. **Cross connections:** This signal is compared against the SM_C_TRQ_Enable_Treshold parameter to control initial system startup as well as system restart when an error occurs. In both cases the following condition must hold to enable system startup/restart: TRQ_DES_Driver_Throttle <= SM_C_TRQ_Enable_Treshold This signal is also used for Throttle Preactivation Check if SM_C_Check_Throttle_Enable is set to true.
TRQ_DES_Driver_Brake	Float32	0	100	%	Brake signal used for desired driver torque calculation after channel selection through APP_Brake_Signal_Channel. **Cross connections:** This signals is also used for Brake Preactivation Check if SM_C_Check_Brake_Enable is set to true.
TRQ_DES_Driver_Reverse_Gear	Float32	0	1	–	Signal which shows if reverse gear is selected: 0 = Forward gear selected 1 = Reverse gear selected **Cross connections:** This signal is also used in the modules Analog_Interface_AIN1 and TRQ_STR to select between different throttle/ current mappings.
TRQ_DES_Trq_Req_Rel	Float32	–100	100	%	Final desired driver torque. This signal serves as input for the following torque limitation (TRQ_LIM) module.

Feedback

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