STW Technic, LP

STW CoDeSys v3 Library for IQ-S Output Modules

V2.0.0.1
Hardware: v2616 or later
Firmware: 34044-564-0111.hex or later for part 100000767

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Welcome to the STW IQS I/O Module library!

The purpose of this library is to provide easy handling of CANbus communication between an STW ESX-3XL/-3XM and an STW IQ-S Output Module.

The user will instance and execute a series of structures, functions, and function blocks for each IQ-S Output Module in the CAN network.

Here is an overview.

--------------- User Data ---------------

All user data for each IQ-S Output Module will be written to/from the CANbus via a series of structures, which can be found within the **Structures** directory. The user should declare an instance (most likely globally scoped) of each structure as needed to store IQ-S data.

--- Received data (from the IQ-S Output Module) ---

T_IQS_Q_STATUS - All received data is stored into this single structure, which is composed of the following sub-structures.

t_Software_Node_Status : T_IQS_Q_PGN_STATUS_1
- Software and Hardware Version information, Fault Codes, User ID, and Status information

t_Config_Output_Status : T_IQS_Q_PGN_STATUS_2
- Output configuration jumper states, Output A/B channel statuses, Power Buss statuses, Configuration Save counter

t_Controller_Info : T_IQS_Q_PGN_STATUS_3
- Hardware configuration, Battery Voltage, Module Temperature

t_Output_Feedback_1 : T_IQS_Q_PGN_STATUS_4
- Current feedback for output ports 2 and 4

t_Output_Feedback_2 : T_IQS_Q_PGN_STATUS_5
- Current feedback for output ports 5-8

t_Output_Feedback_3 : T_IQS_Q_PGN_STATUS_6
- Current feedback for outputs 1A, 1B, 3A, and 3B

T_IQS_Q_CONFIG - All configuration data for the module is stored in this structure, which is composed of the following sub-structures.

       t_Output_Cfg_1 : T_IQS_Q_PGN_OUTPUT_CONFIG_1
- General module configuration, global output and input configuration

       t_Output_Cfg_2 : T_IQS_Q_PGN_OUTPUT_CONFIG_2
- Individual output configuration for ports 1-7

       t_Output_Cfg_3 : T_IQS_Q_PGN_OUTPUT_CONFIG_3
- Individual output configuration for port 8
- PI control configuration values for port 2

       t_Output_Cfg_4 : T_IQS_Q_PGN_OUTPUT_CONFIG_4
- PI control configuration values for ports 4-6

       t_Output_Cfg_5 : T_IQS_Q_PGN_OUTPUT_CONFIG_5
- PI control configuration values for ports 7-8

       t_Output_Cfg_6 : T_IQS_Q_PGN_OUTPUT_CONFIG_6
- Amperage range configuration values for ports 1A, 2A, and 3A

T_IQS_Q_OUTPUT_CONTROL – All control data for Digital and PWM output control is stored in this structure, which is composed of the following sub-structures.

       t_Digital_Control : T_IQS_Q_PGN_CONTROL_1
- All digital output controls

       t_PWM_Control_1 : T_IQS_C_PGN_CONTROL_2
- PWM control for output ports 1-4

       t_PWM_Control_2 : T_IQS_C_PGN_CONTROL_3
- PWM control for output ports 5-8

Functions can be found within the ***Initialization_Functions*** directory.

F_IQS_Q_Build_Defaults

- **opt_IQS_Q_Config** - Pointer to user's instance of **T_IQS_Q_CONFIG** for this module

- Return -

- **C_NO_ERR** - Function executed correctly
- **C_NOACT** - Invalid pointer, defaults not loaded

- Usage -

> This function is optional, but it is recommended to run this once during an initialization routine. The function populates the user's instance of **T_IQS_Q_CONFIG** with a baseline configuration. This includes the following:
>
> - Enables cyclic transmission of status messages **T_IQS_Q_PGN_STATUS_2**, **T_IQS_Q_PGN_STATUS_3**, **T_IQS_Q_PGN_STATUS_4**, **T_IQS_Q_PGN_STATUS_5,** and **T_IQS_Q_PGN_STATUS_6**
> - Disables global output configuration override (MODE1)
> - Configuring Outputs 1A, 1B, 3A, and 3B as type On/Off (Digital)
> - Configuring Outputs 2, 4, 5, 6, 7, and 8 as type Percent (PWM)
> - Configuring PI control parameters for outputs 2, 4, 5, 6, 7, and 8 to the default values of Kp=100 and Ki=100
> - Configuring Amp ranges 1A, 2A, and 3A to 10.0A
>
> It is important to note that parameters are not sent individually to the Module via CAN, they are always sent in groups, so it is important to have all parameters defined before sending any of them. This function only sets the configuration values; it does not send the configuration messages to the module. This must be done separately.

F_IQS_Q_Init_CAN_Objects

- Inputs -

- **ou16_Channel** - CANbus channel
- **ou8_Module_SA** – IQ-S module source address
- **opu32_RX_Handle** - Pointer to user's instance of an RX CAN object Handle (**UDINT**)
- **opu32_TX_Handle** - Pointer to user's instance of an TX CAN object Handle (**UDINT**)

- Return -

- **C_NO_ERR** - Function executed correctly
- **C_RANGE** - **ou16_Channel** or **ou8_Module_SA** range error, objects not initialized
- **C_NOACT** - Invalid **opu32_RX_Handle** or **opu32_TX_Handle** pointer, objects not initialized
- **C_DEFAULT** - CAN Object or Filter initialization error

- Usage -

This function is optional, but it is recommended to run this once during an initialization routine. Alternatively, the user can manually create the necessary CAN objects via the project's Devices window.

The function allocates and configures a Transmit CAN object and a Receive CAN object on CANbus **ou16_Channel** for communication with IQ-S Module **ou8_Module_SA**. The function then configures the necessary receive filter for managing IQ-S messages. The function returns Handles for the created RX and TX objects, which the user will later pass to the transmit and receive function blocks.

--------------- CAN Message Handling ---------------

Function Blocks can be found within the **CAN_Handling** directory

--- Receiving Data ---

FB_IQS_Q_Receive

- Inputs -

- **ou32_RX_Handle** - Handle of the CAN RX object receiving the messages, generated by **F_IQS_Q_Init_CAN_Objects** or by the user

- Outputs -

- **ot_IQS_Q_Status** - All status message data, stored as **T_IQS_Q_STATUS**
- **os16_Status** – Function and Function Block execution status:
  - **C_NO_ERR** - Normal execution
  - **C_DEFAULT** - Peer-to-peer message rejected with incorrect destination address
  - **C_RANGE** - CAN object handle **ou32_RX_Handle** not valid
  - **C_NOACT** - Incorrect decoding function selected
  - **C_CONFIG** - CAN object at **ou32_RX_Handle** is not type **X_CAN_OBJ_TYPE_RX**

- Usage -

The user should call this function block cyclically. The FB will process all data within the RX object buffer and populate the appropriate sub-structures within **ot_IQS_Q_Status** as the data is decoded. The function block will also manage message timeouts and will report this data within each sub-structure.

FB_IQS_Q_Output_Config_1_Transmit

- Inputs -

- **ou8_Module_SA** - IQS module source address, range 16#E0..16#EF. Global Constants **IQS_Q_MODULE_SA_00 - IQS_Q_MODULE_SA_15** are provided for convenience.
- **ou8_Own_SA** - STW Controller source address, range 16#D1. Global Constant **IQS_Q_MASTER_SA** is provided for convenience.
- **ot_Output_Config** - Configuration data, stored as **T_IQS_Q_PGN_OUTPUT_CONFIG_1**
- **ou32_TX_Handle** - Handle of the CAN TX object transmitting the messages, generated by **F_IQS_Q_Init_CAN_Objects** or by the user

- Outputs -

- **os16_Status** - Function Block execution status:
  - **C_NO_ERR** - Normal execution
  - **C_WARN** - **ou8_Own_SA** range error, message sent but module may not react
  - **C_RANGE** - **ou8_Module_SA** range error, message not sent
  - **C_DEFAULT** - Encoding or transmission error

- Usage -

The user should call this function block as needed to transmit Output Configuration 1 variables, as seen within the **T_IQS_Q_CONFIG** structure as **t_Output_Cfg_1 : T_IQS_Q_PGN_OUTPUT_CONFIG_1**. The CAN message will be transmitted once per execution of the function block.

- **u8_Ctrl_Mode_Reset** - Enables Controller Mode Output Reset
- **u8_Enable_Status2_Msg** - Enables the constant transmission of message **T_IQS_Q_PGN_STATUS_2**, Configuration and Output Status
- **u8_Enable_Status3_Msg** - Enables the constant transmission of message **T_IQS_Q_PGN_STATUS_3**, Controller Information
- **u8_Enable_Amp_Msg** - Enables the constant transmission of messages:
  - **T_IQS_Q_PGN_STATUS_4**, Output Amperage Feedback OUT 2, 4
  - **T_IQS_Q_PGN_STATUS_5**, Output Amperage Feedback OUT 5-8
  - **T_IQS_Q_PGN_STATUS_6**, Output Amperage Feedback OUT 1A, 1B, 3A, 3B
- **u8_Enable_24VDC** - Enables the low and over voltage fault limits for 24 vdc system
- **u8_Save_Config** - Saves the configuration to the module (otherwise changes only valid until a power cycle occurs), set to 1 to write configuration to module
- **u16_FREQ1_Hz** - Sets the configuration of the frequency for all channels (30-1140 Hz)
- **u8_MODE1** - Sets the configuration of ALL the outputs, overrides Command 53 and 54. (0=NOT USED, 1=ON/OFF, 2=Data 0-4000, 3= Percent 0-100.0%(0-1000))
- **u8_ID1** - User defined byte for configuration ID, this will be transmitted in the STAT message.

FB_IQS_Q_Output_Config_2_Transmit

- **ou8_Module_SA** - IQS module source address, range 16#E0..16#EF. Global Constants **IQS_Q_MODULE_SA_00 - IQS_Q_MODULE_SA_15** are provided for convenience.
- **ou8_Own_SA** - STW Controller source address, range 16#D1. Global Constant **IQS_Q_MASTER_SA** is provided for convenience.
- **ot_Output_Config** - Configuration data, stored as **T_IQS_Q_PGN_OUTPUT_CONFIG_2**
- **ou32_TX_Handle** - Handle of the CAN TX object transmitting the messages, generated by **F_IQS_Q_Init_CAN_Objects** or by the user

- **os16_Status** - Function Block execution status:
  - **C_NO_ERR** - Normal execution
  - **C_WARN** - **ou8_Own_SA** range error, message sent but module may not react
  - **C_RANGE** - **ou8_Module_SA** range error, message not sent
  - **C_DEFAULT** - Encoding or transmission error

The user should call this function block as needed to transmit Output Configuration 2 variables, as seen within the **T_IQS_Q_CONFIG** structure as **t_Output_Cfg_2 : T_IQS_Q_PGN_OUTPUT_CONFIG_2**. The CAN message will be transmitted once per execution of the function block.

- **u8_Mode_1A** - Mode 0x0=disabled, 0x1=On/Off
- **u8_Mode_1B** - Mode 0x0=disabled, 0x1=On/Off
- **u8_Mode_2AB** - Mode 0x0=disabled, 0x1=On/Off, 0x2=Data(0-4000), 0x3=Percent(0-1000 = 0-100.0%), 0x4=Amps(0-4000 = 0-4.000 amps)
- **u8_Mode_3A** - Mode 0x0=disabled, 0x1=On/Off
- **u8_Mode_3B** - Mode 0x0=disabled, 0x1=On/Off
- **u8_Mode_4AB** - Mode 0x0=disabled, 0x1=On/Off, 0x2=Data(0-4000), 0x3=Percent(0-1000 = 0-100.0%), 0x4=Amps(0-4000 = 0-4.000 amps)
- **u8_Mode_5AB** - Mode 0x0=disabled, 0x1=On/Off, 0x2=Data(0-4000), 0x3=Percent(0-1000 = 0-100.0%), 0x4=Amps(0-4000 = 0-4.000 amps)
- **u8_Mode_6AB** - Mode 0x0=disabled, 0x1=On/Off, 0x2=Data(0-4000), 0x3=Percent(0-1000 = 0-100.0%), 0x4=Amps(0-4000 = 0-4.000 amps)
- **u8_Mode_7AB** - Mode 0x0=disabled, 0x1=On/Off, 0x2=Data(0-4000), 0x3=Percent(0-1000 = 0-100.0%), 0x4=Amps(0-4000 = 0-4.000 amps)

FB_IQS_Q_Output_Config_3_Transmit

- **ou8_Module_SA** - IQS module source address, range 16#E0..16#EF. Global Constants **IQS_Q_MODULE_SA_00 - IQS_Q_MODULE_SA_15** are provided for convenience.
- **ou8_Own_SA** - STW Controller source address, range 16#D1. Global Constant **IQS_Q_MASTER_SA** is provided for convenience.
- **ot_Output_Config** - Configuration data, stored as **T_IQS_Q_PGN_OUTPUT_CONFIG_3**
- **ou32_TX_Handle** - Handle of the CAN TX object transmitting the messages, generated by **F_IQS_Q_Init_CAN_Objects** or by the user

- **os16_Status** - Function Block execution status:
  - **C_NO_ERR** - Normal execution
  - **C_WARN** - **ou8_Own_SA** range error, message sent but module may not react
  - **C_RANGE** - **ou8_Module_SA** range error, message not sent
  - **C_DEFAULT** - Encoding or transmission error

The user should call this function block as needed to transmit Output Configuration 3 variables, as seen within the **T_IQS_Q_CONFIG** structure as **t_Output_Cfg_3 : T_IQS_Q_PGN_OUTPUT_CONFIG_3**. The CAN message will be transmitted once per execution of the function block.

- **u8_Mode_8AB** - Mode 0x0=disabled, 0x1=On/Off, 0x2=Data(0-4000), 0x3=Percent(0-1000 = 0-100.0%), 0x4=Amps(0-4000 = 0-4.000 amps)
- **u8_Port2_Kp** - Port 2 proportional setpoint (0-250 = 0-2.50, >250=0) default 100
- **u8_Port2_Ki** - Port 2 integral setpoint (0-250 = 0-2.50, >250=0) default 100

FB_IQS_Q_Output_Config_4_Transmit

- **ou8_Module_SA** - IQS module source address, range 16#E0..16#EF. Global Constants **IQS_Q_MODULE_SA_00 - IQS_Q_MODULE_SA_15** are provided for convenience.
- **ou8_Own_SA** - STW Controller source address, range 16#D1. Global Constant **IQS_Q_MASTER_SA** is provided for convenience.
- **ot_Output_Config** - Configuration data, stored as **T_IQS_Q_PGN_OUTPUT_CONFIG_4**
- **ou32_TX_Handle** - Handle of the CAN TX object transmitting the messages, generated by **F_IQS_Q_Init_CAN_Objects** or by the user

- **os16_Status** - Function Block execution status:
  - **C_NO_ERR** - Normal execution
  - **C_WARN** - **ou8_Own_SA** range error, message sent but module may not react
  - **C_RANGE** - **ou8_Module_SA** range error, message not sent
  - **C_DEFAULT** - Encoding or transmission error

The user should call this function block as needed to transmit Output Configuration 4 variables, as seen within the **T_IQS_Q_CONFIG** structure as **t_Output_Cfg_4 : T_IQS_Q_PGN_OUTPUT_CONFIG_4**. The CAN message will be transmitted once per execution of the function block.

- **u8_Port4_Kp** - Port 4 proportional setpoint (0-250 = 0-2.50, >250=0) default 100
- **u8_Port4_Ki** - Port 4 integral setpoint (0-250 = 0-2.50, >250=0) default 100
- **u8_Port5_Kp** - Port 5 proportional setpoint (0-250 = 0-2.50, >250=0) default 100
- **u8_Port5_Ki** - Port 5 integral setpoint (0-250 = 0-2.50, >250=0) default 100
- **u8_Port6_Kp** - Port 6 proportional setpoint (0-250 = 0-2.50, >250=0) default 100
- **u8_Port6_Ki** - Port 6 integral setpoint (0-250 = 0-2.50, >250=0) default 100

FB_IQS_Q_Output_Config_5_Transmit

- **ou8_Module_SA** - IQS module source address, range 16#E0..16#EF. Global Constants **IQS_Q_MODULE_SA_00 - IQS_Q_MODULE_SA_15** are provided for convenience.
- **ou8_Own_SA** - STW Controller source address, range 16#D1. Global Constant **IQS_Q_MASTER_SA** is provided for convenience.
- **ot_Output_Config** - Configuration data, stored as **T_IQS_Q_PGN_OUTPUT_CONFIG_5**
- **ou32_TX_Handle** - Handle of the CAN TX object transmitting the messages, generated by **F_IQS_Q_Init_CAN_Objects** or by the user

- **os16_Status** - Function Block execution status:
  - **C_NO_ERR** - Normal execution
  - **C_WARN** - **ou8_Own_SA** range error, message sent but module may not react
  - **C_RANGE** - **ou8_Module_SA** range error, message not sent
  - **C_DEFAULT** - Encoding or transmission error

The user should call this function block as needed to transmit Output Configuration 5 variables, as seen within the **T_IQS_Q_CONFIG** structure as **t_Output_Cfg_5 : T_IQS_Q_PGN_OUTPUT_CONFIG_5**. The CAN message will be transmitted once per execution of the function block.

- **u8_Port7_Kp** - Port 7 proportional setpoint (0-100 = 0-100%) default 50
- **u8_Port7_Ki** - Port 7 integral setpoint (0-100 = 0-100%) default 20
- **u8_Port8_Kp** - Port 8 proportional setpoint (0-100 = 0-100%) default 50
- **u8_Port8_Ki** - Port 8 integral setpoint (0-100 = 0-100%) default 20

FB_IQS_Q_Output_Config_6_Transmit

- **ou8_Module_SA** - IQS module source address, range 16#E0..16#EF. Global Constants **IQS_Q_MODULE_SA_00 - IQS_Q_MODULE_SA_15** are provided for convenience.
- **ou8_Own_SA** - STW Controller source address, range 16#D1. Global Constant **IQS_Q_MASTER_SA** is provided for convenience.
- **ot_Output_Config** - Configuration data, stored as **T_IQS_Q_PGN_OUTPUT_CONFIG_6**
- **ou32_TX_Handle** - Handle of the CAN TX object transmitting the messages, generated by **F_IQS_Q_Init_CAN_Objects** or by the user

- **os16_Status** - Function Block execution status:
  - **C_NO_ERR** - Normal execution
  - **C_WARN** - **ou8_Own_SA** range error, message sent but module may not react
  - **C_RANGE** - **ou8_Module_SA** range error, message not sent
  - **C_DEFAULT** - Encoding or transmission error

The user should call this function block as needed to transmit Output Configuration 6 variables, as seen within the **T_IQS_Q_CONFIG** structure as **t_Output_Cfg_6 : T_IQS_Q_PGN_OUTPUT_CONFIG_6**. The CAN message will be transmitted once per execution of the function block.

- **u8_Output_1A_Amp_Range** - Port 1A amp range (0-100 = 0-10.0A) default 100
- **u8_Output_2A_Amp_Range** - Port 2A amp range (0-100 = 0-10.0A) default 100
- **u8_Output_3A_Amp_Range** - Port 3A amp range (0-100 = 0-10.0A) default 100

FB_IQS_Q_Control_1_Transmit

- **oq_Enable** - Enable transmission of control message
- **ou8_Module_SA** - IQS module source address, range 16#E0..16#EF. Global Constants **IQS_Q_MODULE_SA_00 - IQS_Q_MODULE_SA_15** are provided for convenience.
- **ou8_Own_SA** - STW Controller source address, range 16#D1. Global Constant **IQS_Q_MASTER_SA** is provided for convenience.
- **ot_Control** - Output control data, stored as **T_IQS_Q_PGN_CONTROL_1**
- **ou32_TX_Handle** - Handle of the CAN TX object transmitting the messages, generated by **F_IQS_Q_Init_CAN_Objects** or by the user

- **os16_Status** - Function Block execution status:
  - **C_NO_ERR** - Normal execution
  - **C_WARN** - **ou8_Own_SA** range error, message sent but module may not react
  - **C_RANGE** - **ou8_Module_SA** range error, message not sent
  - **C_DEFAULT** - Encoding or transmission error

The user should call this function block cyclically. The function block maintains an internal timer while the **oq_Enable** input is **TRUE**. When the timer expires, the message is sent and the timer resets and begins again.

The message contents are defined within the **T_IQS_Q_OUTPUT_CONTROL** structure as **t_Digital_Control : T_IQS_Q_PGN_CONTROL_1**.

- **u8_OnOff_Output_1A** .. **u8_OnOff_Output_8B** - Turns the output on when in "On/Off" Mode, (not used when using any other mode)

FB_IQS_Q_Control_2_Transmit

- **oq_Enable** - Enable transmission of control message
- **ou8_Module_SA** - IQS module source address, range 16#E0..16#EF. Global Constants **IQS_Q_MODULE_SA_00 - IQS_Q_MODULE_SA_15** are provided for convenience.
- **ou8_Own_SA** - STW Controller source address, range 16#D1. Global Constant **IQS_Q_MASTER_SA** is provided for convenience.
- **ot_Control** - Output control data, stored as **T_IQS_Q_PGN_CONTROL_2**
- **ou32_TX_Handle** - Handle of the CAN TX object transmitting the messages, generated by **F_IQS_Q_Init_CAN_Objects** or by the user

- **os16_Status** - Function Block execution status:
  - **C_NO_ERR** - Normal execution
  - **C_WARN** - **ou8_Own_SA** range error, message sent but module may not react
  - **C_RANGE** - **ou8_Module_SA** range error, message not sent
  - **C_DEFAULT** - Encoding or transmission error

The user should call this function block cyclically. The function block maintains an internal timer while the **oq_Enable** input is **TRUE**. When the timer expires, the message is sent and the timer resets and begins again.

The message contents are defined within the **T_IQS_Q_OUTPUT_CONTROL** structure as **t_PWM_Control_1 : T_IQS_Q_PGN_CONTROL_2**.

- **u16_PWM_Output_1AB_Magnitude** – Port magnitude, range dependent on config
- **u8_PWM_Output_1AB_Direction** – Port direction, (00=PortA, 01=PortB, 10=Not used, 11=Not used)
- **u16_PWM_Output_2AB_Magnitude** – Port magnitude, range dependent on config
- **u8_PWM_Output_2AB_Direction** – Port direction, (00=PortA, 01=PortB, 10=Not used, 11=Not used)
- **u16_PWM_Output_3AB_Magnitude** – Port magnitude, range dependent on config
- **u8_PWM_Output_3AB_Direction** – Port direction, (00=PortA, 01=PortB, 10=Not used, 11=Not used)
- **u16_PWM_Output_4AB_Magnitude** – Port magnitude, range dependent on config
- **u8_PWM_Output_4AB_Direction** – Port direction, (00=PortA, 01=PortB, 10=Not used, 11=Not used)

FB_IQS_Q_Control_3_Transmit

- **oq_Enable** - Enable transmission of control message
- **ou8_Module_SA** - IQS module source address, range 16#E0..16#EF. Global Constants **IQS_Q_MODULE_SA_00 - IQS_Q_MODULE_SA_15** are provided for convenience.
- **ou8_Own_SA** - STW Controller source address, range 16#D1. Global Constant **IQS_Q_MASTER_SA** is provided for convenience.
- **ot_Control** - Output control data, stored as **T_IQS_Q_PGN_CONTROL_3**
- **ou32_TX_Handle** - Handle of the CAN TX object transmitting the messages, generated by **F_IQS_Q_Init_CAN_Objects** or by the user

- **os16_Status** - Function Block execution status:
  - **C_NO_ERR** - Normal execution
  - **C_WARN** - **ou8_Own_SA** range error, message sent but module may not react
  - **C_RANGE** - **ou8_Module_SA** range error, message not sent
  - **C_DEFAULT** - Encoding or transmission error

The user should call this function block cyclically. The function block maintains an internal timer while the **oq_Enable** input is **TRUE**. When the timer expires, the message is sent and the timer resets and begins again.

The message contents are defined within the **T_IQS_Q_OUTPUT_CONTROL** structure as **t_PWM_Control_2 : T_IQS_Q_PGN_CONTROL_3**.

- **u16_PWM_Output_5AB_Magnitude** – Port magnitude, range dependent on config
- **u8_PWM_Output_5AB_Direction** – Port direction, (00=PortA, 01=PortB, 10=Not used, 11=Not used)
- **u16_PWM_Output_6AB_Magnitude** – Port magnitude, range dependent on config
- **u8_PWM_Output_6AB_Direction** – Port direction, (00=PortA, 01=PortB, 10=Not used, 11=Not used)
- **u16_PWM_Output_7AB_Magnitude** – Port magnitude, range dependent on config
- **u8_PWM_Output_7AB_Direction** – Port direction, (00=PortA, 01=PortB, 10=Not used, 11=Not used)
- **u16_PWM_Output_8AB_Magnitude** – Port magnitude, range dependent on config
- **u8_PWM_Output_8AB_Direction** – Port direction, (00=PortA, 01=PortB, 10=Not used, 11=Not used)

--- Other Functions ---

The directories **RX_Functions** and **TX_Functions** contain several functions which are used by the **CAN_Handling** function blocks. It is not necessary for the user to directly access these functions.