ENGINEERING
TOMORROW

PLUS+1 GUIDE
Advanced CAN

Objectives

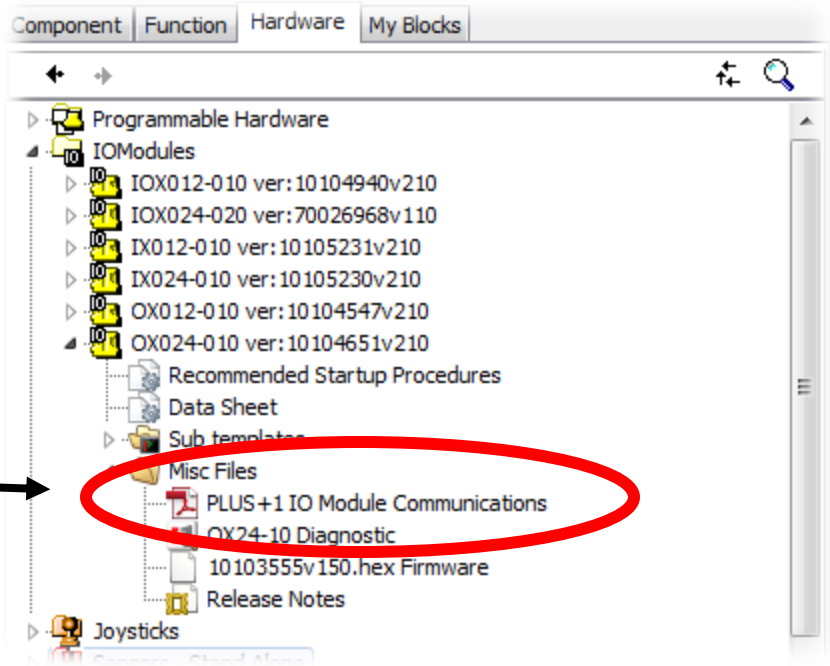
- Experience with “Transmit CAN” and “Receive CAN” components
- Experience masking data to get the message you want
- Demo of how to use H1/S90 compliance block when using IO Modules

ENGINEERING
TOMORROW

Masking CAN messages

Masking: What are we looking for?

- Our illustrative example will be getting the actual PWM duty cycle of the output on an IO Module.
- This is needed as an input by some PLUS+1 Compliance Blocks, but not currently transmitted by the IO Module
- Question: Where would we find the message format that has to be sent to the IO Module to request this information????
- Answer: In the PLUS+1 IO Modules Communication document



Masking: What are we looking for?

- Need to send a message to:
  - Tell the IO Module to start sending information and with what frequency:
    - SubCmd 12 - Configure Timing
      - SubIdentifier 96 – Multifunction Out Status
    - Note: Pin affected by the command is designated by “channel”
      - First pin of certain type designated channel 0, second is channel 1, and so on

Masking: Getting the details

- Initiator message we send once:

Configure Timing (SUBCMD 12)

CMD CAN B 0	SUBCMD CAN B 1	Data 0 CAN B 2	Data 1 CAN B 3	Data 2 CAN B 4	Data 3 CAN B 5	Data 4 CAN B 6	Data 5 CAN B 7	Timeout
0xFF	0x0C	Sub-identifier*	Channel†	Time‡ (LSB)	Time‡ (MSB)	——	——	None

†If the message being enabled or disabled has a "channel" value associated with it, please enter the value here.

*Identifies the communication message gets a new timing value.

‡New timing value, which can be the new cycle or the new timeout value, depending on the message.

- Status message we receive back regularly

Multifunction Out Status (SUBCMD 96)

CMD CAN B 0	Data 0 CAN B 1	Data 1 CAN B 2	Data 2 CAN B 3	Data 3 CAN B 4	Data 4 CAN B 5	Data 5 CAN B 6	Data 6 CAN B 7
0x60	Channel*	Value† (LSB)	Value† (MSB)	ActPWM‡ (LSB)	ActPWM‡ (MSB)	Status§	——

*Indicates the channel.

†Actual measured feedback value in 0.1 mA.

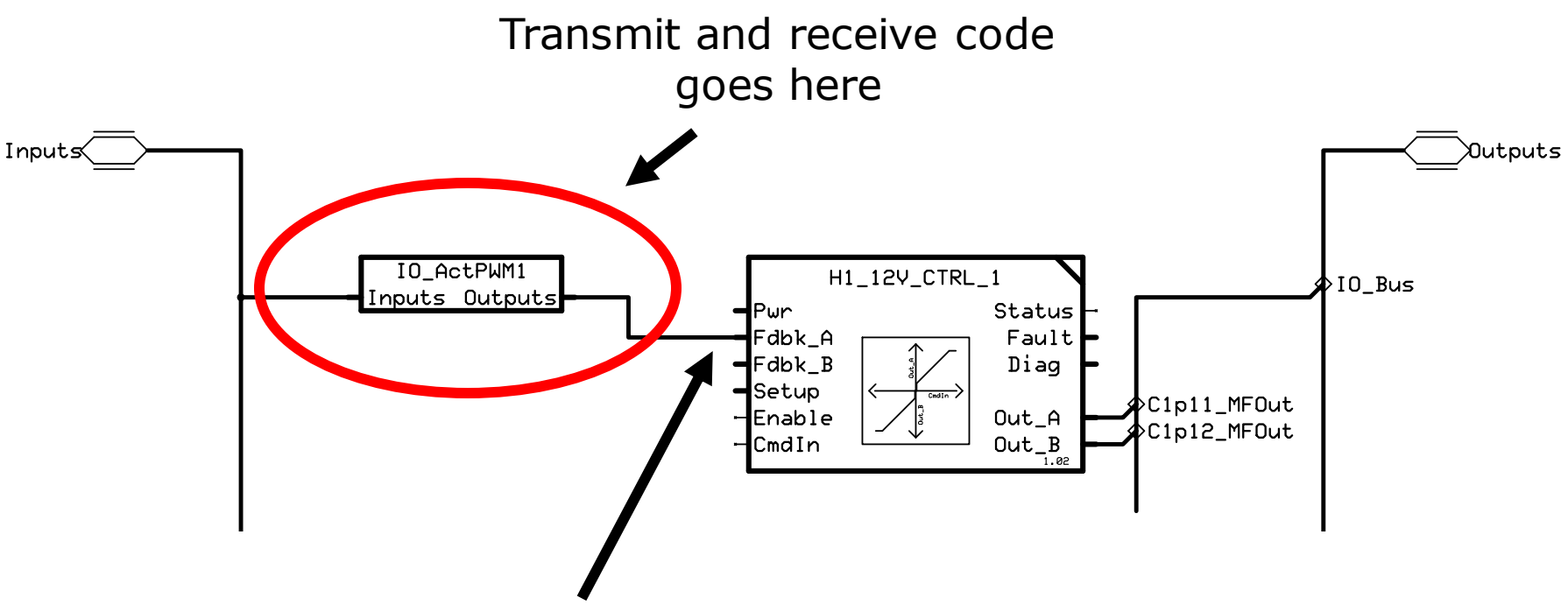
‡PWM duty cycle.

§Status of the output.

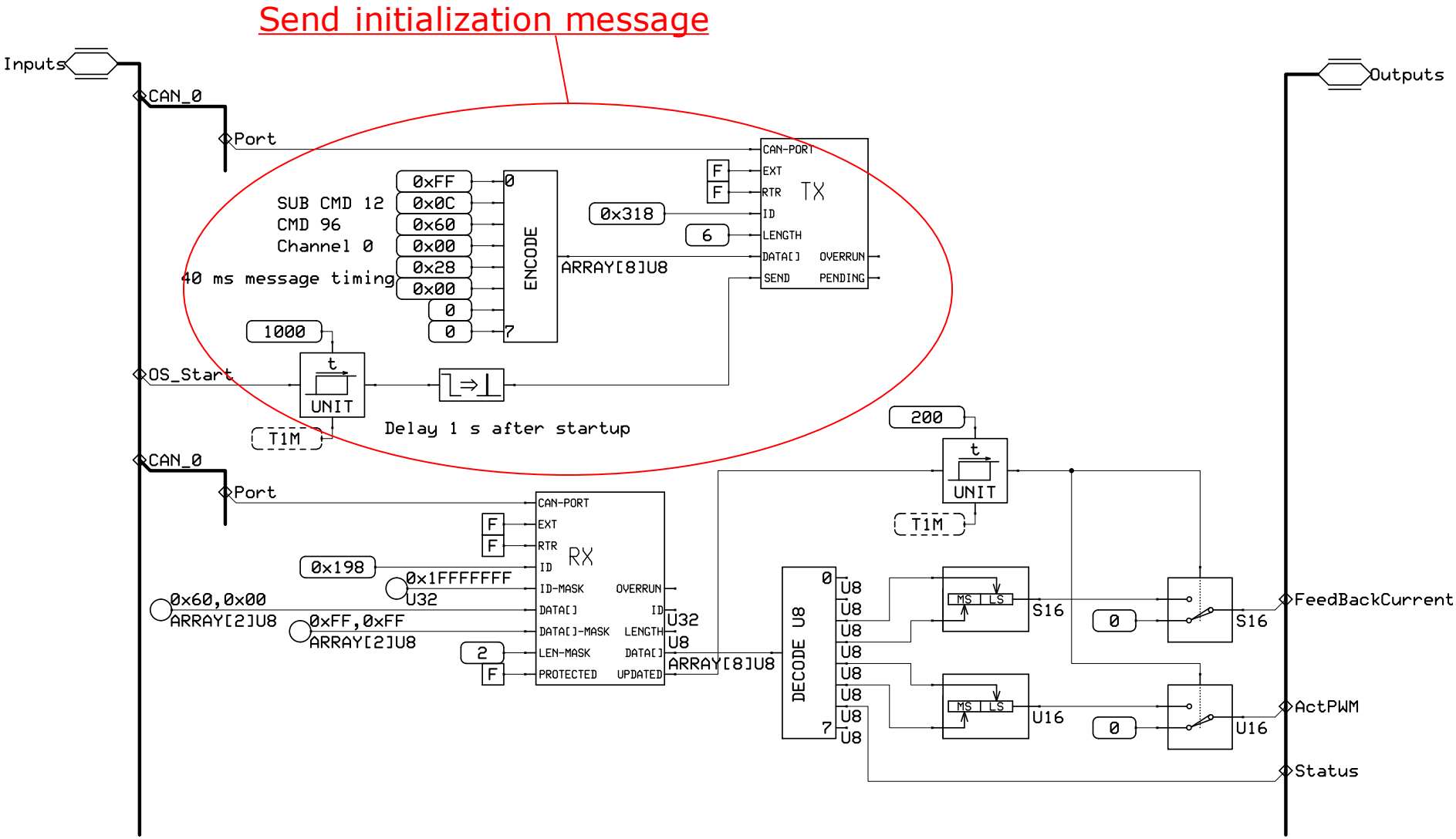
Identifier Table

N1	Tx ID	Rx ID
0	0x180	0x300
1	0x188	0x308
2	0x190	0x310
3	0x198	0x318
4	0x1A0	0x320
5	0x1A8	0x328
6	0x1B0	0x330
7	0x1B8	0x338
8	0x1C0	0x340
9	0x1C8	0x348
10	0x1D0	0x350
11	0x1D8	0x358
12	0x1E0	0x360
13	0x1E8	0x368
14	0x1F0	0x370
15	0x1F8	0x378

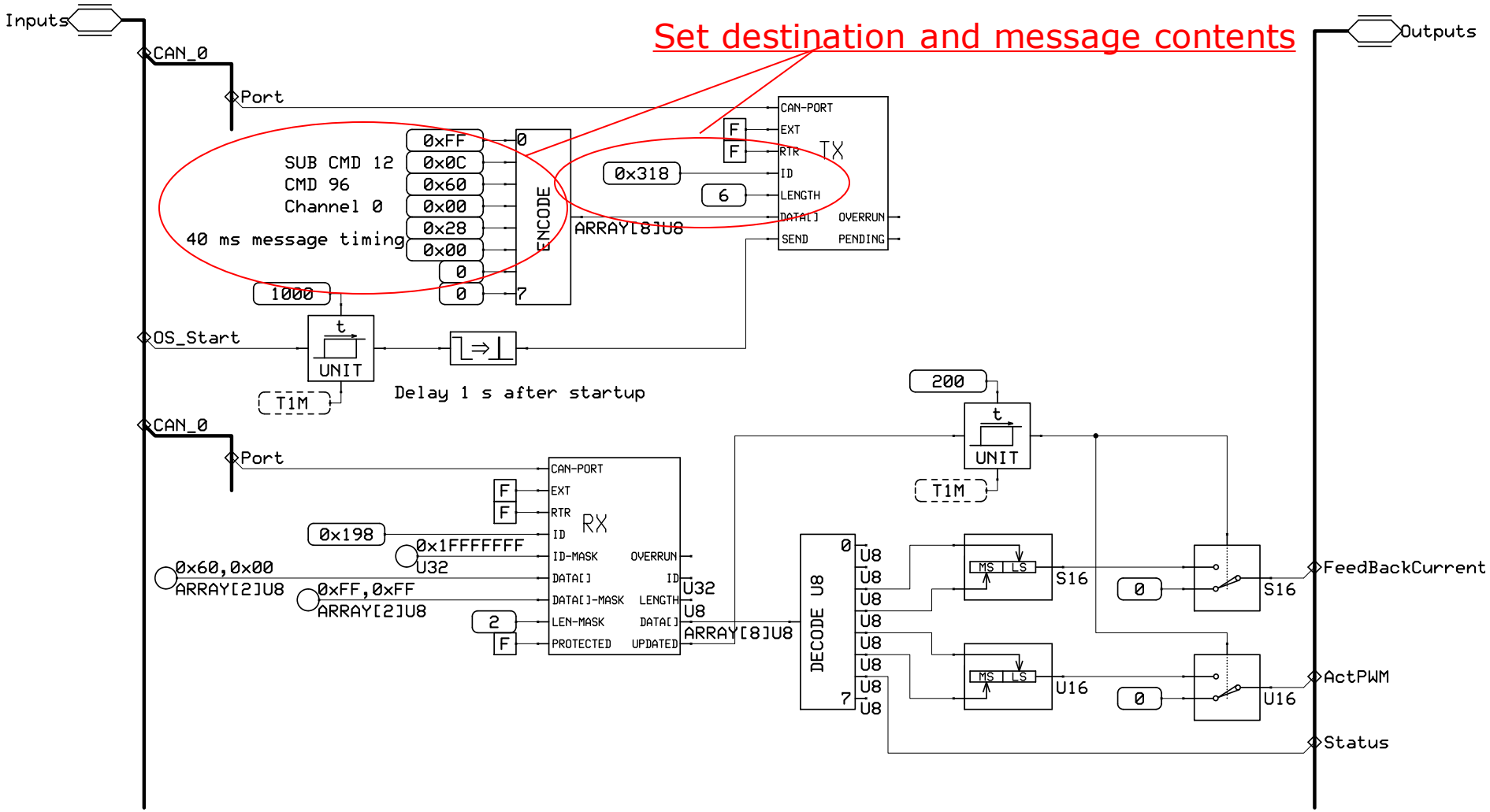
Application



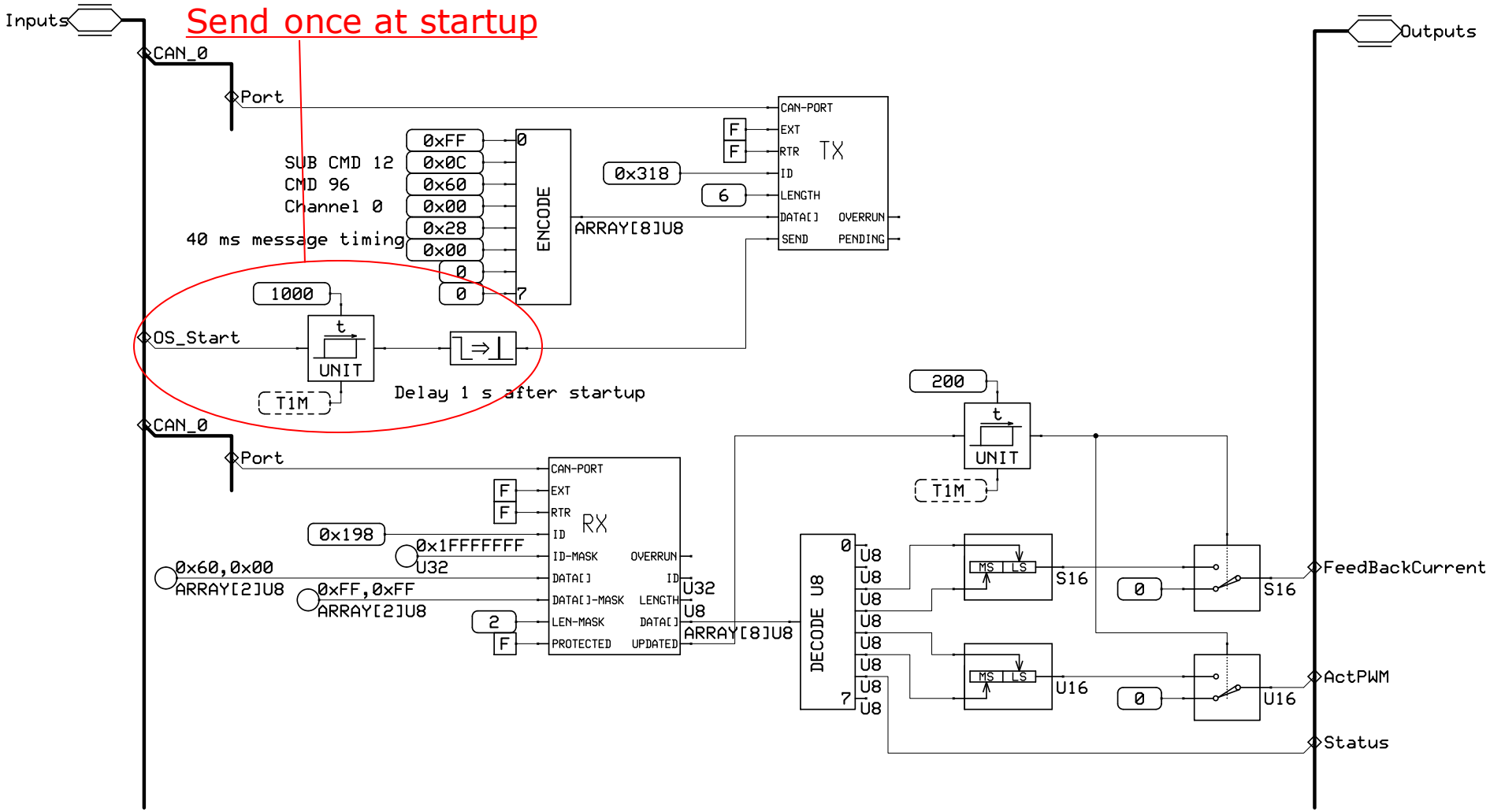
OX_ActPWM page



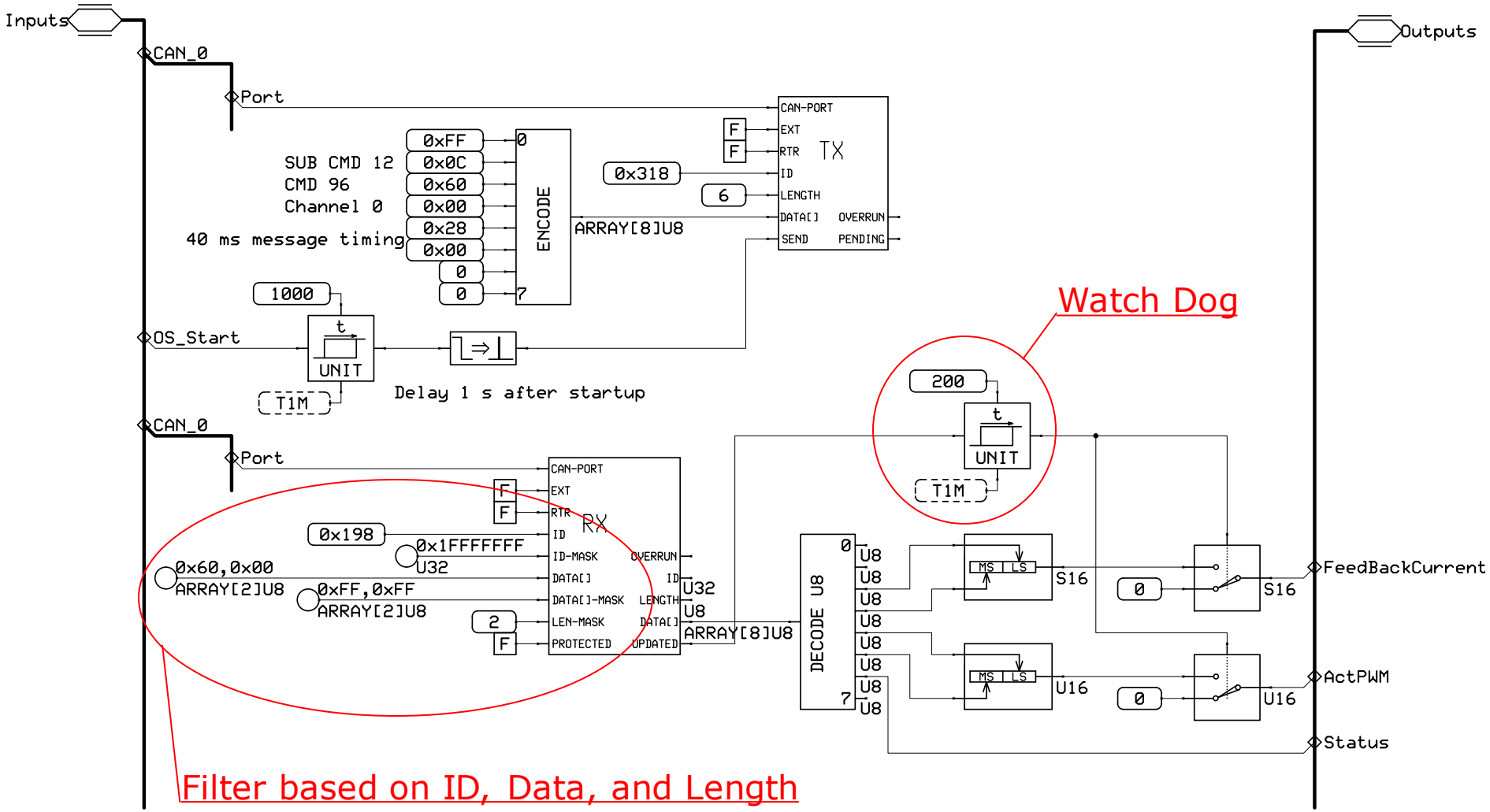
OX_ActPWM page



OX_ActPWM page



OX_ActPWM page



ENGINEERING
TOMORROW

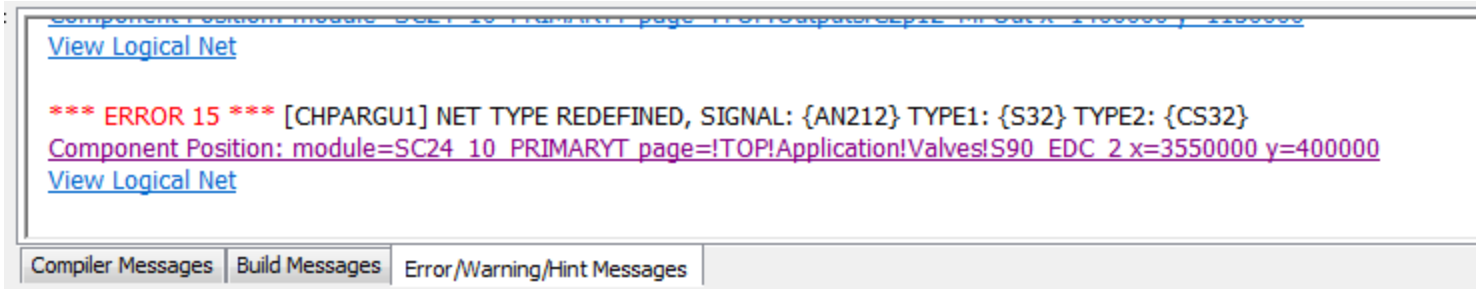
Hands-On Exercise

Exercise

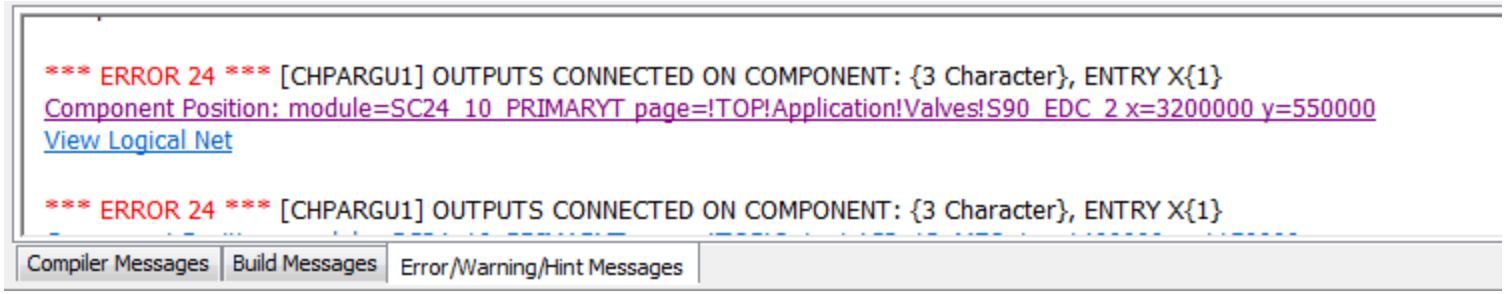
- Open Project IO_Module_PWM in Advanced CAN folder
- Use S90 EDC Compliance Block to drive outputs using IO Module
  - Add another S90 Compliance Block for IO Module output pins C1p11 & C1p12
  - Use IO_ActPWM SCS file in Advanced CAN folder with code from preceding slides to get Pin Status Feedback from IO Module pins needed by S90 Compliance Block

Common Errors

- Error 15
  - Net Type Redefined, Signal

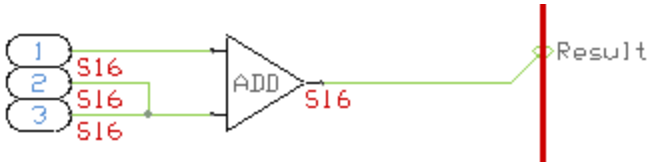


- Error 24
  - Outputs Connected On Component



Common Errors

- Outputs Connected on Component
  - Missing redundant word: MULTIPLE



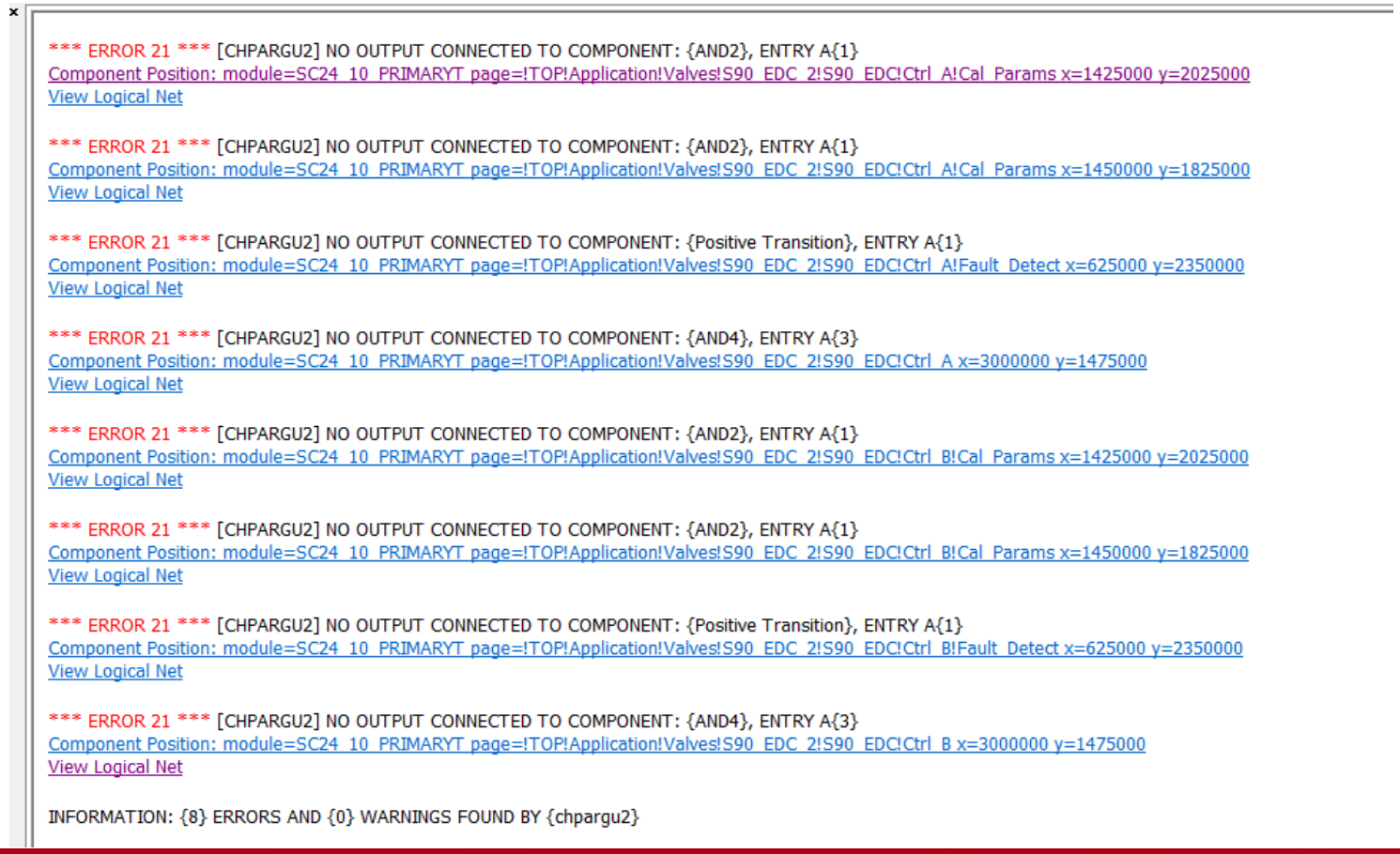
*** ERROR 24 *** [CHPARGU1] OUTPUTS CONNECTED ON COMPONENT: {3 Character}, ENTRY X{1}
Component Position: module=SC24_10_PRIMARYT page=!TOP!Application!Valves x=3025000 y=2400000
View Logical Net

*** ERROR 24 *** [CHPARGU1] OUTPUTS CONNECTED ON COMPONENT: {3 Character}, ENTRY X{1}
Component Position: module=SC24_10_PRIMARYT page=!TOP!Application!Valves x=3025000 y=2350000
View Logical Net

  - Two signals of type 3-Character-Constant input to Entry X1

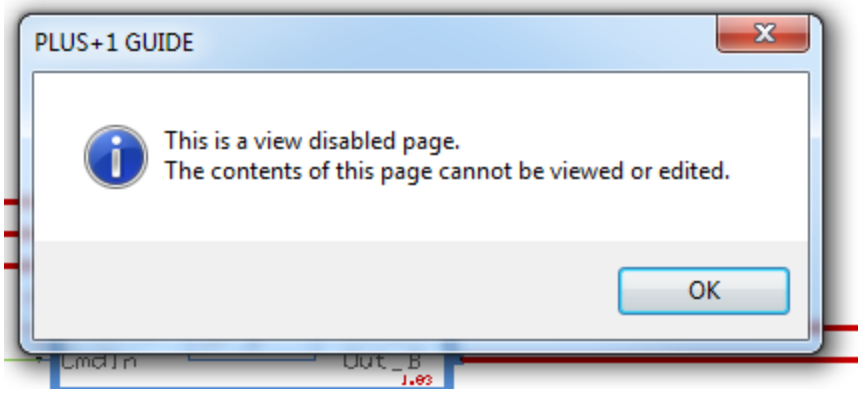
Common Errors

- Error 21
  - No Output Connected On Component



Common Errors

- View Logical Net – Sometimes not helpful if error is in disabled page, but …



Common Errors

- Error 66
  - Multi-Defined Alias

```
*** ERROR 66 *** [GLINK] MULTI DEFINED ALIAS: {S90_EDC_L_A_EE_Thld}, FILE1: {SC24_10_PRIMARYT.exr}, SIGNAL1: {_NVINT[NVBase_MAINTASK+
*** ERROR 66 *** [GLINK] MULTI DEFINED ALIAS: {S90_EDC_L_A_EE_EndCrnt}, FILE1: {SC24_10_PRIMARYT.exr}, SIGNAL1: {_NVINT[NVBase_MAINTA
*** ERROR 66 *** [GLINK] MULTI DEFINED ALIAS: {S90_EDC_L_A_EE_CalFlg}, FILE1: {SC24_10_PRIMARYT.exr}, SIGNAL1: {_NVINT[NVBase_MAINTASK
```

  - What causes it?