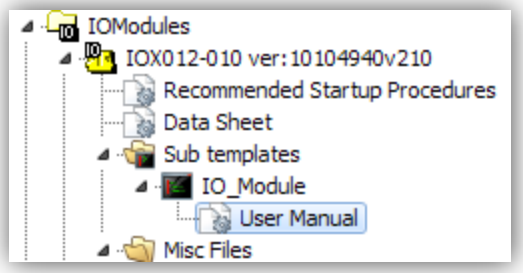
ENGINEERING
TOMORROW

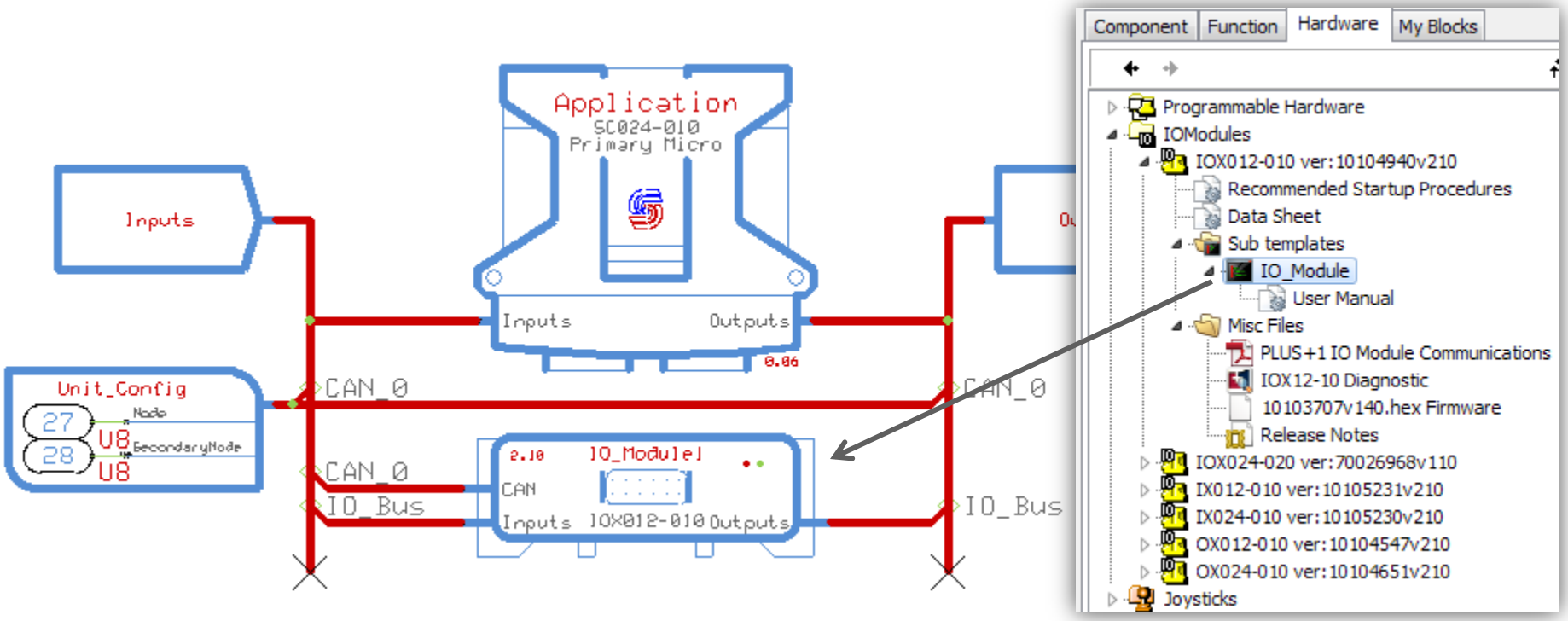
I/O-modules

I/O-modules

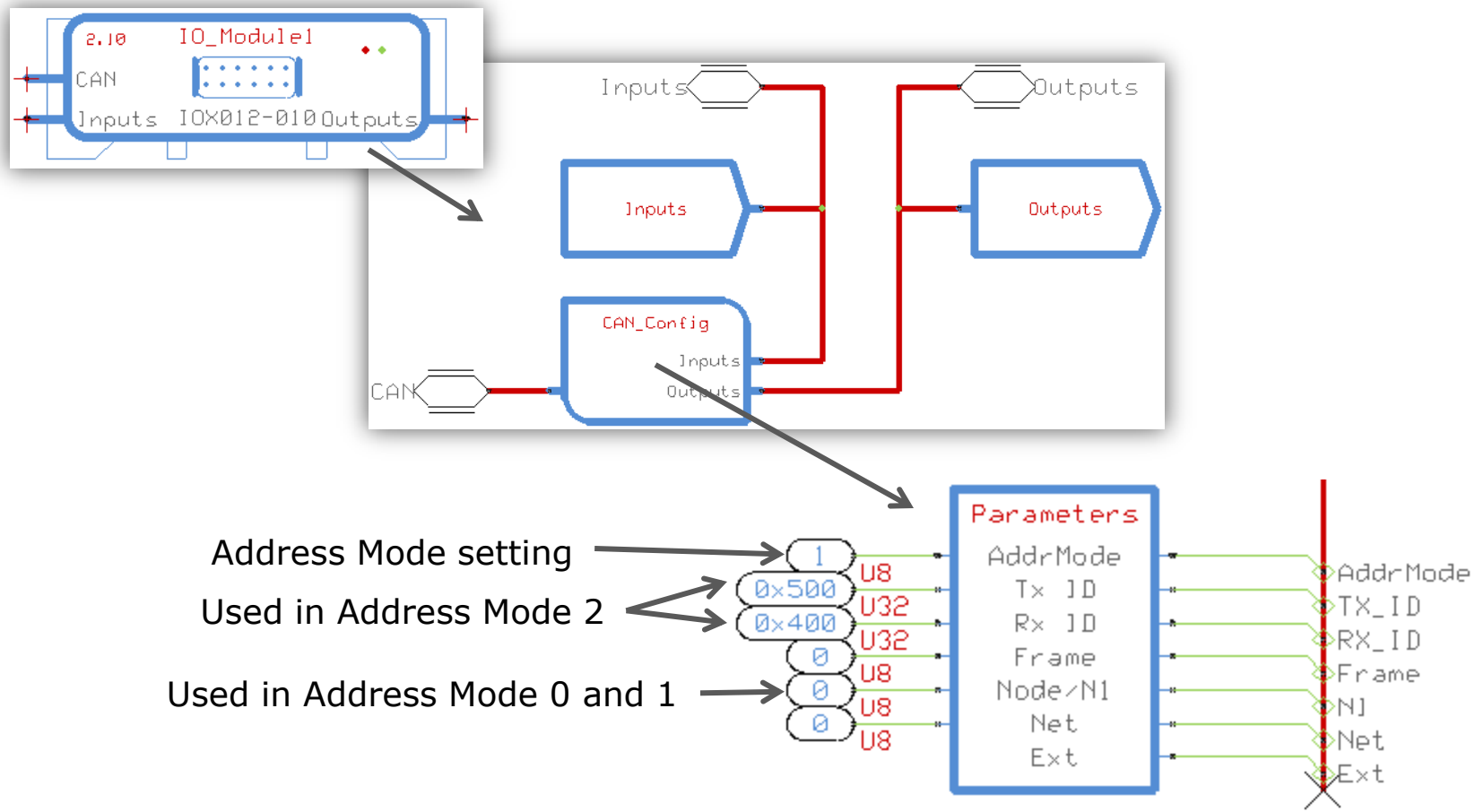
- I/O-modules provide additional inputs and outputs for a controller
- The controller reads inputs and controls outputs in the I/O-module through CAN-messages
  - One CAN-ID from controller and one from I/O-module (= CAN-ID pair)
- For detailed information regarding I/O-modules please see User Manual in HWD



Block for I/O-module communication

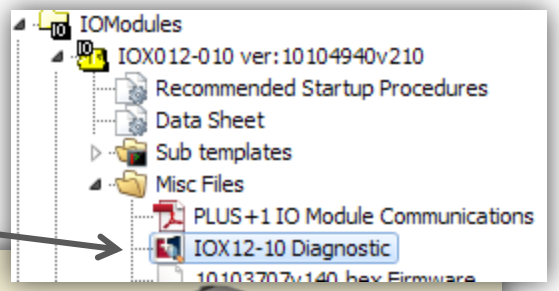


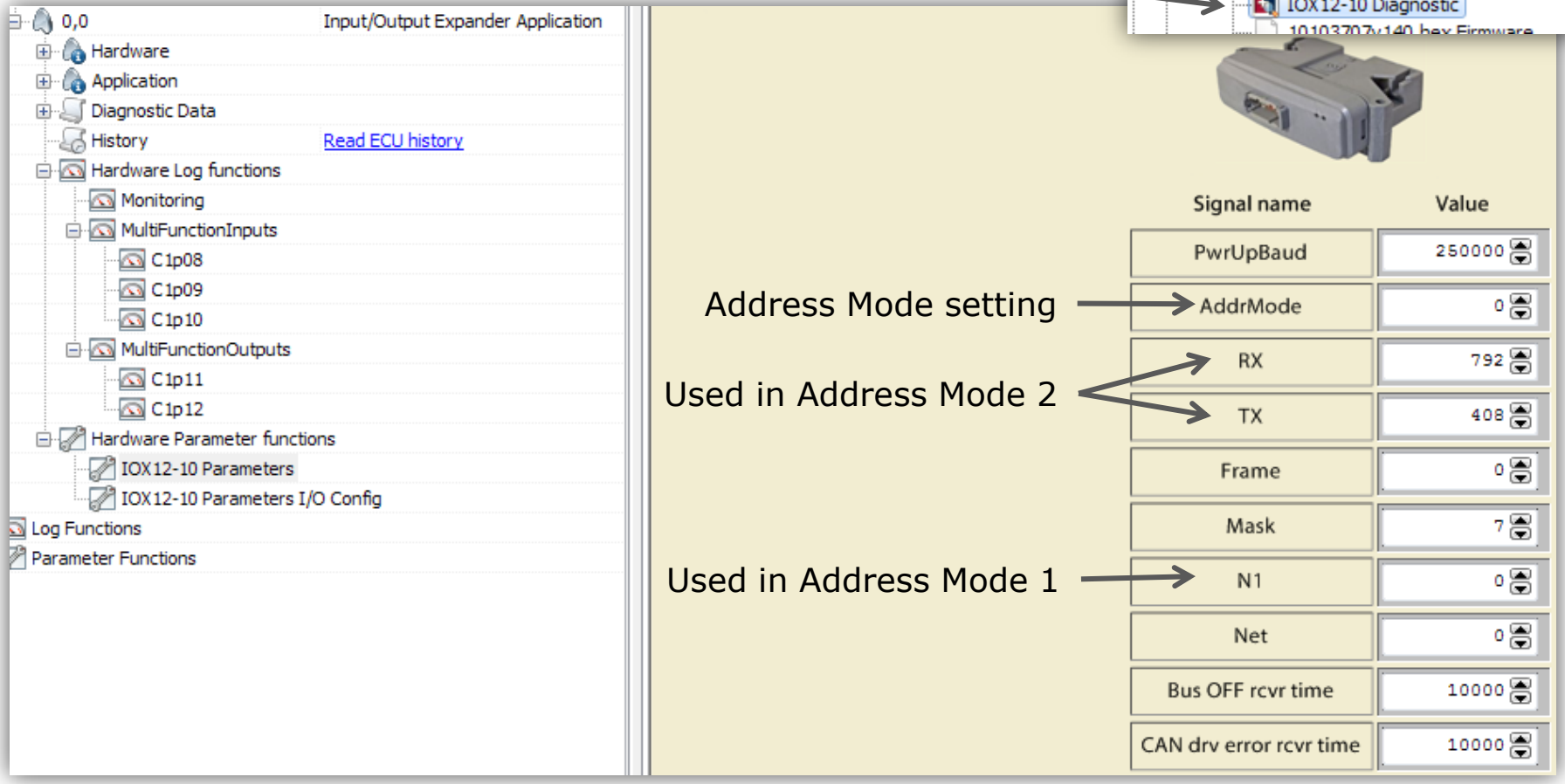
Communication setup in block



Parameters in I/O-module

- Open "IOX12-10 Diagnostic" under Misc Files





Address Modes

- Address Mode 0 – Variable Addressing
  - **CAN Shield Input** (C1p05) voltage on I/O-module selects CAN-ID pair from the Identifier Table
  - In controller: **N1** must be set so it will select the same CAN-ID pair from the Identifier Table as the I/O-module does

- Address Mode 1 – Predefined Addressing
  - Set parameter **N1** in I/O-module (via Service Tool) and **N1** in controller to the same value (selects CAN-ID pair from the Identifier Table)

- Address Mode 2 – Fixed Addressing
  - Set parameter **RX** and **TX** in I/O-module (via Service Tool) and **Rx** and **Tx** in controller so they match

Identifier Table (in User Manual)

- Tx ID and Rx ID is here seen from I/O-module
- KWP2000 Node is the I/O-modules' Service Tool ID

IO Module CAN Message Identifiers

CAN Shield Voltage [mV]	N1	KWP2000 Node	Tx ID	Rx ID
0 – 299	0	0	0x180	0x300
300 – 599	1	8	0x188	0x308
600 – 899	2	16	0x190	0x310
900 – 1199	3	24	0x198	0x318
1200 – 1499	4	32	0x1A0	0x320
1500 – 1799	5	40	0x1A8	0x328
1800 – 2099	6	48	0x1B0	0x330
2100 – 2399	7	56	0x1B8	0x338
2400 – 2699	8	64	0x1C0	0x340
2700 – 2999	9	72	0x1C8	0x348
3000 – 3299	10	80	0x1D0	0x350
3300 – 3599	11	88	0x1D8	0x358
3600 – 3899	12	96	0x1E0	0x360
3900 – 4199	13	104	0x1E8	0x368
4200 – 4499	14	112	0x1F0	0x370
4500 –	15	120	0x1F8	0x378

New settings

- The I/O-module will accept new settings after the power is cycled

Service Tool ID for I/O-module

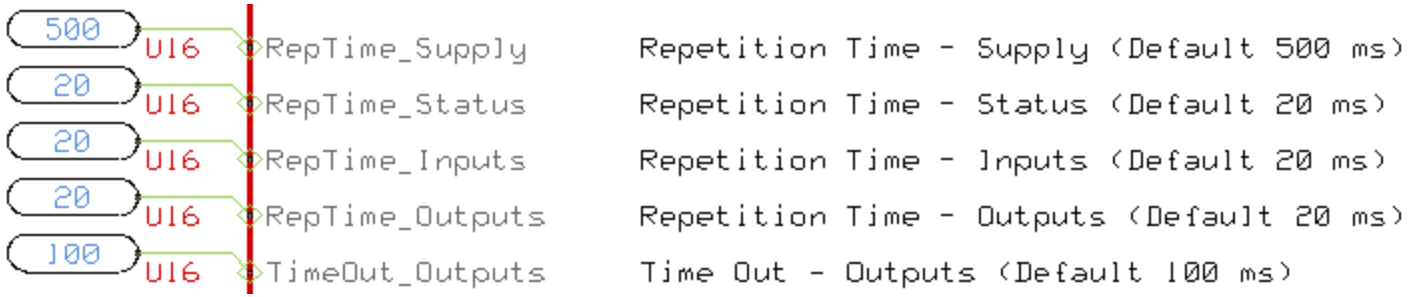
- Address Mode 0: **CAN Shield Input** (C1p05) voltage selects ID from the Identifier Table column **KWP2000 Node**
- Address Mode 1: Parameter **N1** selects ID from the Identifier Table column **KWP2000 Node**
- Address Mode 2:
  - For IX12-10 and IX24-10: Parameter **N1** selects ID from the Identifier Table column **KWP2000 Node**
  - For the other I/O-modules: The 7 Least Significant bits in parameter **TX,** in multiples of 8, determines the ID (0, 8, 16……120)

Red and green LED on the I/O-module

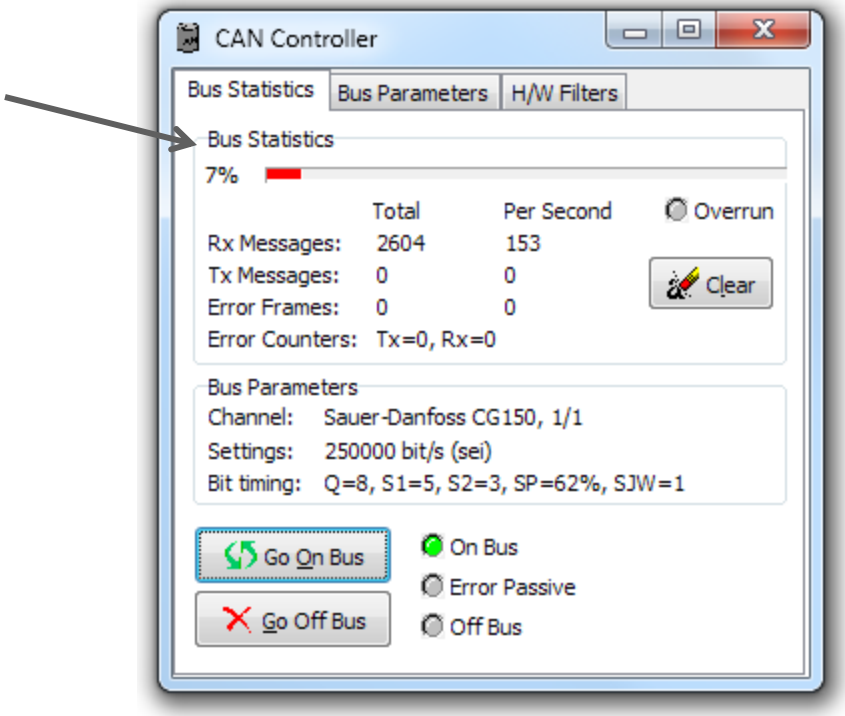
- Red LED: Indicates outgoing message traffic from the I/O-device (Tx ID)
  - The LED toggle its state with every successfully transmitted frame
  - If the device's CAN-bus goes into a *bus off* condition, then the LED will be permanently on
- Green LED: Indicates that the I/O-device is seeing incoming message traffic (Rx ID)
  - The LED toggle its state with every successfully received frame
  - If no messages are received for more than 10 seconds, then the LED starts to blink at one Hertz rate

Timing Values

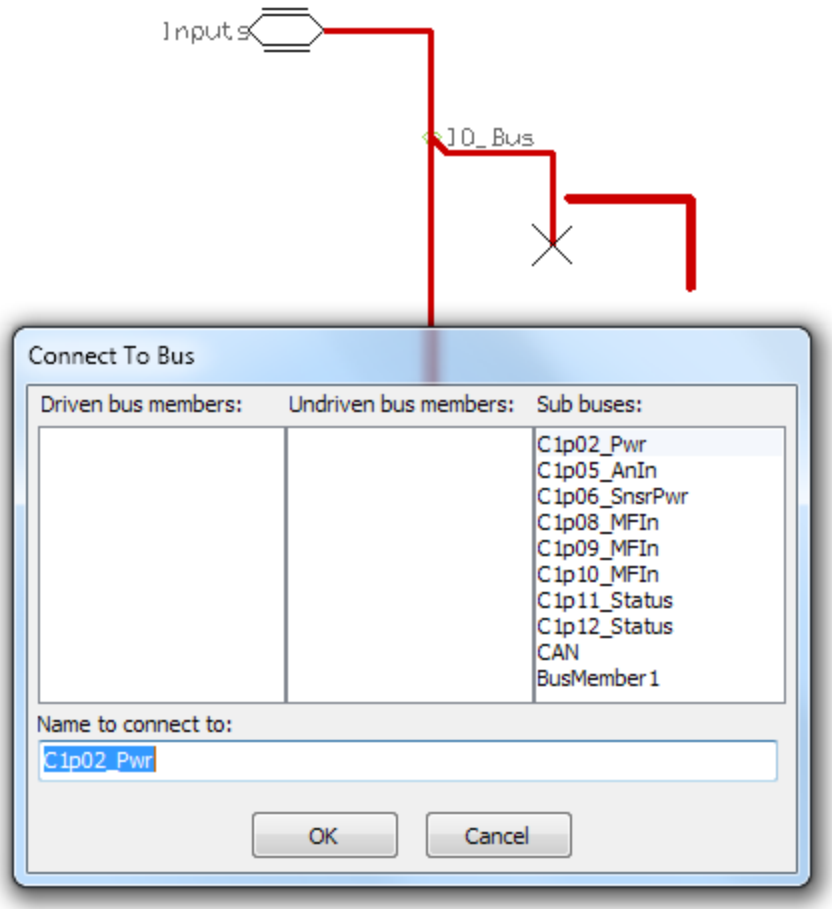
- The Bus Load can be controlled by choosing timing values wisely
- Adjust TimeOut_Outputs according to RepTime_Outputs

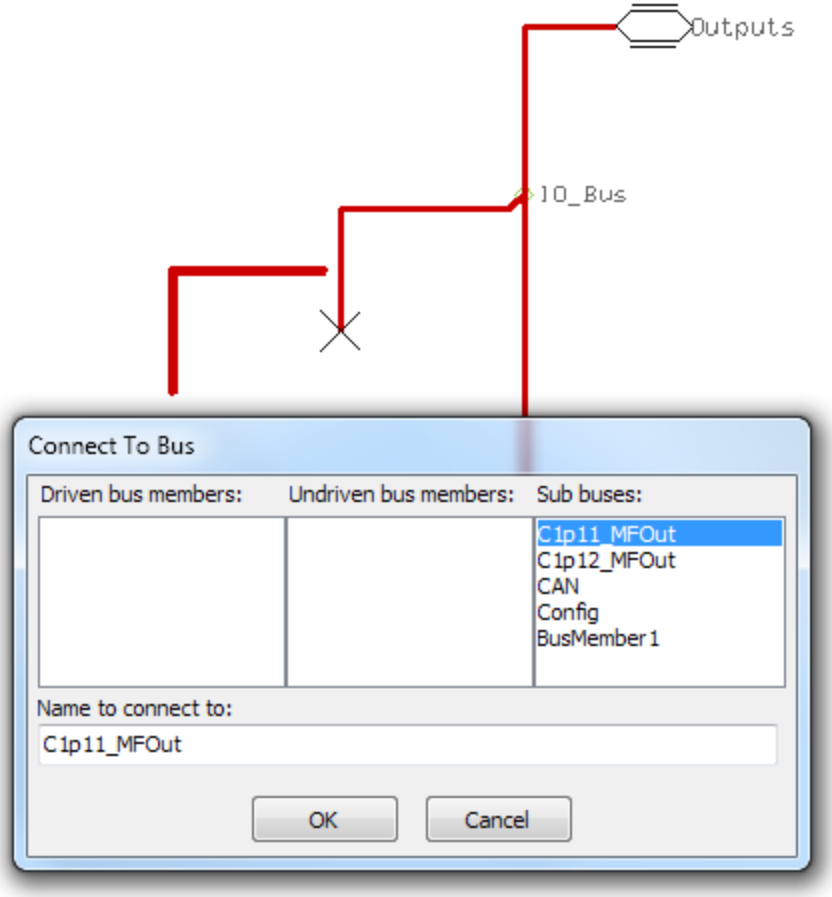


Bus load measurement in CANKing



Accessing I/O signals in the application





Adding additional expansion modules

- Create unique bus names