Q.uick Start Guide: Inter-Module Connectivity (Peer to Peer) – How to Enable Communications between Measurement I/O Modules

Purpose: The measurement modules are physically connected to each other via the base, which shares the communications lines (UARTs) and the power lines. The variables from the modules are all buffered inside the controller, but it is also possible to communicate between measurement modules up to 24 MBaud (the speed of the UART configured by the controller).
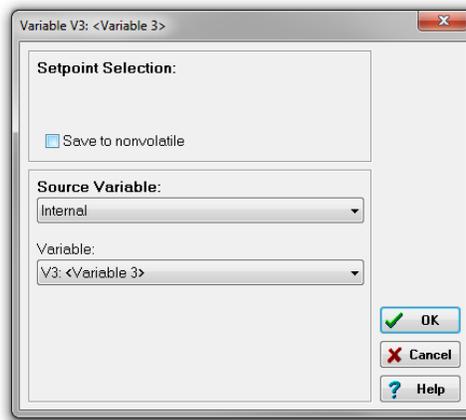
Each module writes its variable information into the assigned time slots, ensuring maximum deterministic data transfer. The Q.series modules can then be configured to read this time slot data directly from other Q.series modules.

Procedure:

1. Open the desired module in ICP100.

2. Add a virtual variable to the module, specifically a Setpoint.


3. Double-click the cell under the Additionals column. This will bring up the window below:

4. The source variable for a Setpoint can be either Internal, External, or a Constant. Internal meaning another variable within the same measurement module. External means a variable on a module connected to the same UART. Constant means a known fixed value can be applied.

5. For the purpose of this document, we will select External so we can communicate with a measurement module on the same system.
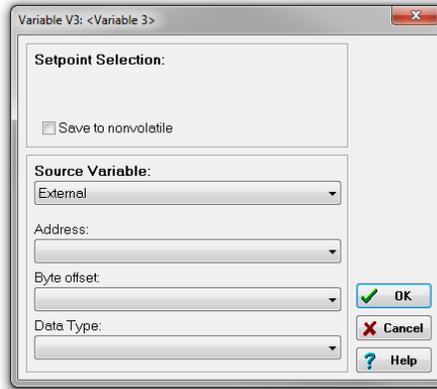
6. Notice that the Address, Byte offset, and Data Type drop down options appear when External is selected.

7. Address: refers to the address of the External module. For example, our system consists of a Q.gate, an A101, and an A104, where the A101 is address 1 and A104 is address 2. If we are configuring a Setpoint inside the A101 and want to use a variable inside the A104, we would select an Address of 2.

8. Byte offset: refers to the location of the desired variable within its respective module. For example, the A104 module has 8 x TC channels configured, we would use the following Byte offset to obtain the desired variable:

Variable inside A104	Byte offset
Variable 1	0
Variable 2	4
Variable 3	8
Variable 4	12
Variable 5	16
Variable 6	20
Variable 7	24
Variable 8	28

9. Data Type: all data measured by the Q.series modules are floating point (single).

10. Make sure to confirm the settings by clicking OK. Save the module and update the project to the controller.

Contact us today if you have any further questions!