S7-300 Setup with the ABR

Note: The ABR is PROFINET compatible but not PROFINET certified.

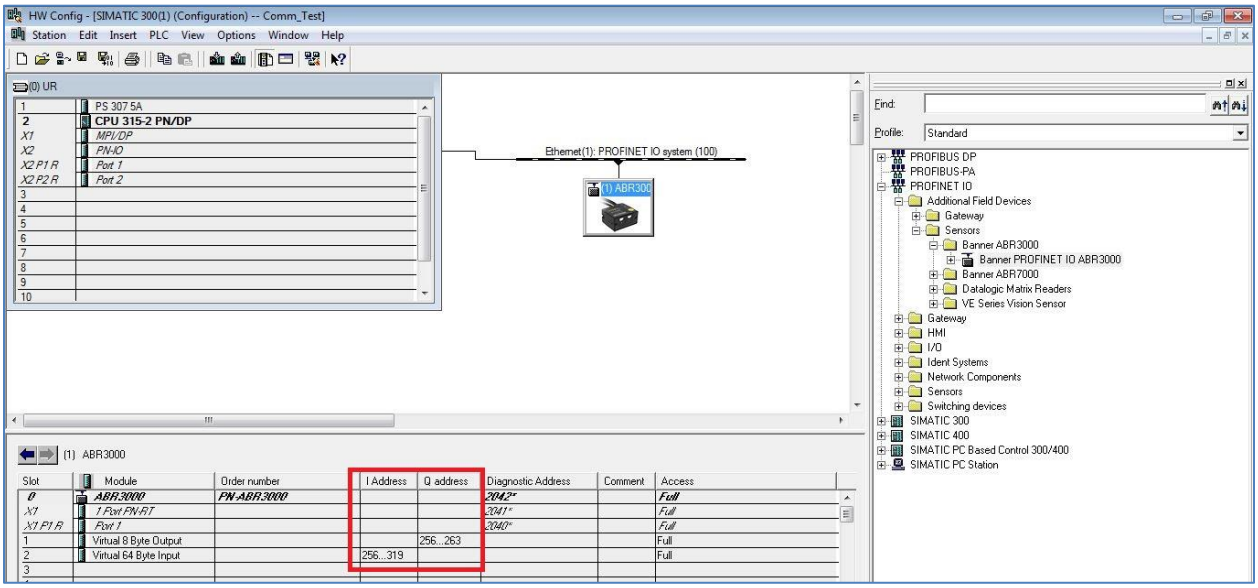
The CPU315-2 PN/DP PROFINET IO-Controller has a very small memory size allocated for data coming to and from PROFINET devices, by default the size is only 128 bytes each.

For some reason, when connecting the ABR device to the PROFINET configuration, the PLC chooses 256 as the starting byte location for both input and output. This is well beyond the allocated range of input/output memory that the PLC has set aside.

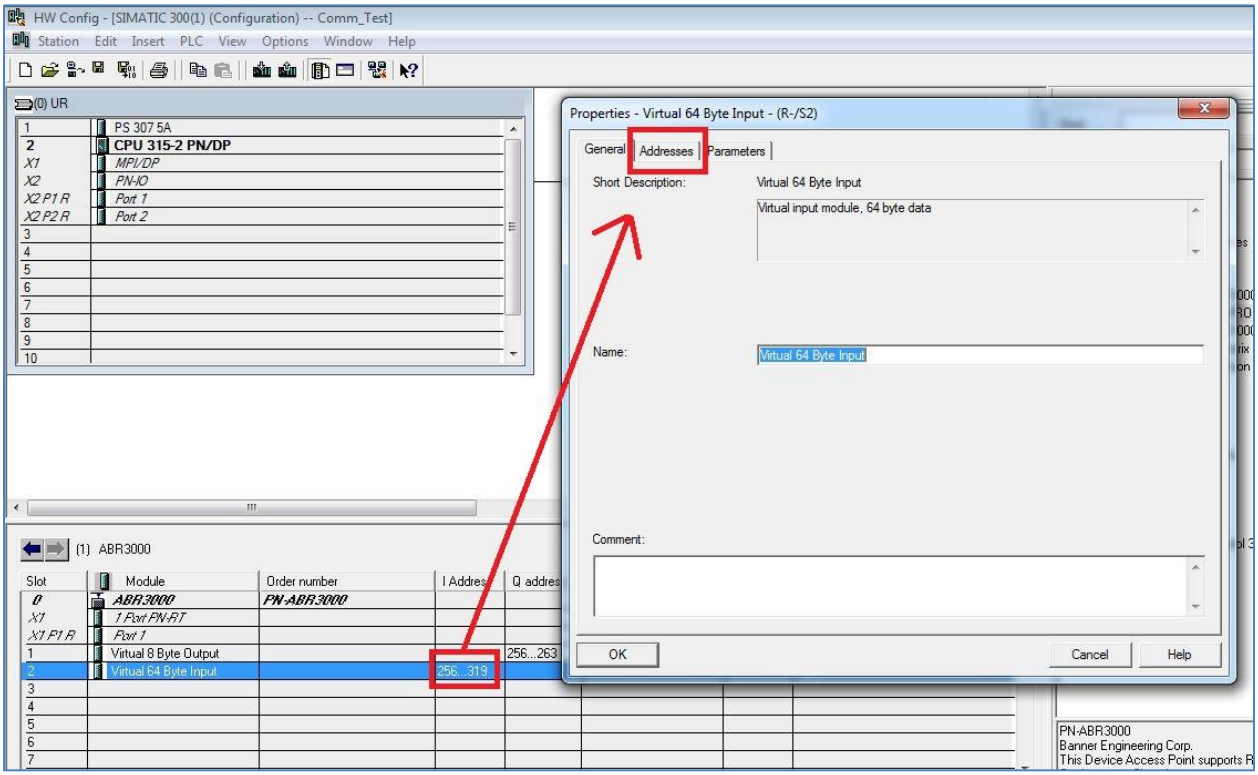
There are two ways to fix this problem: select a user-defined address for the ABR connection that is within the default 128 byte area, or change the size of the input/output area. For this CPU, the maximum size is 2048 bytes.

User-defined Addressing

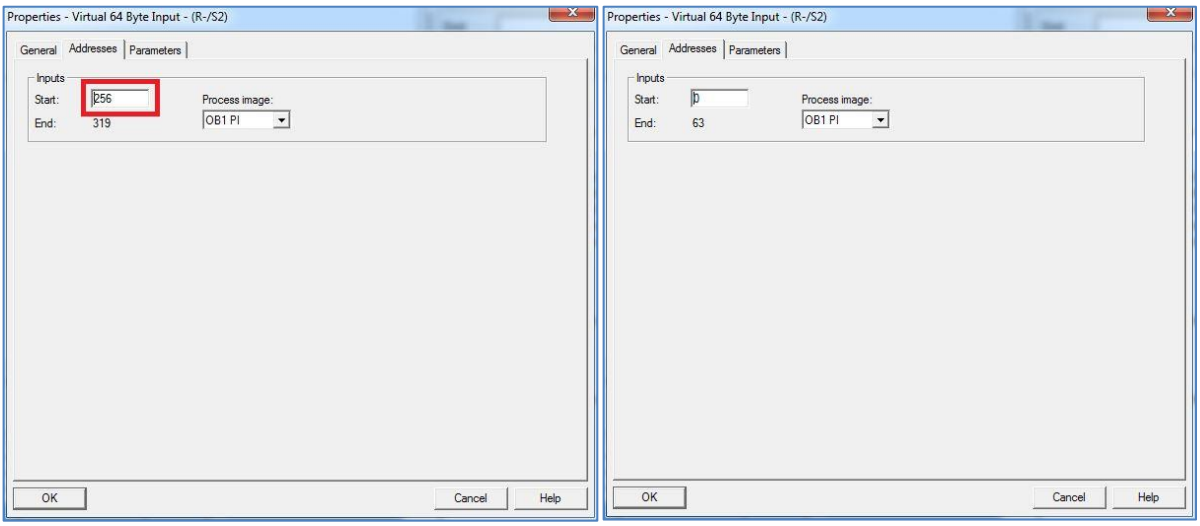
In the image below we see the initial problem. The PLC has decided to give the ABR input and output addresses starting at byte 256. This will not work in a default PLC (whose input and output memory allocation is only 128 bytes).



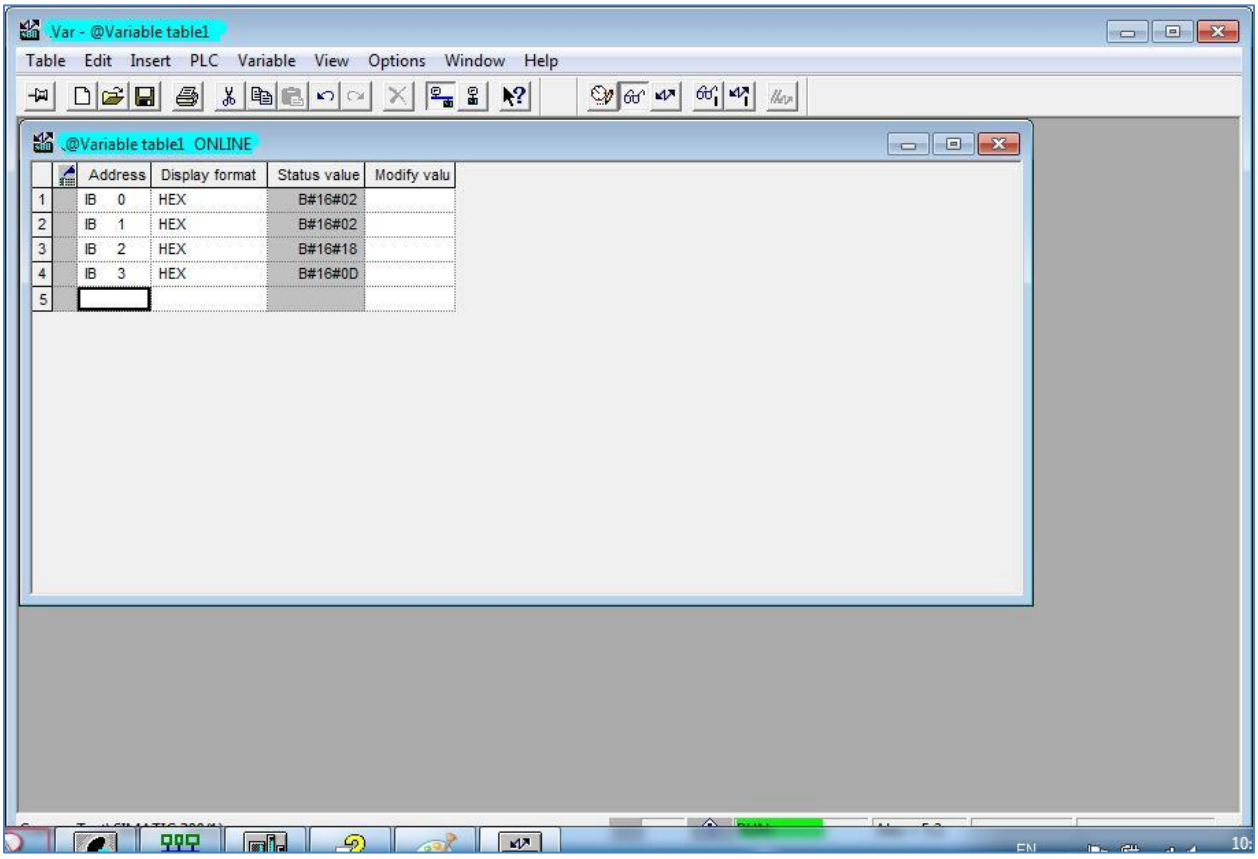
We can make use of “User-defined Addressing” and change the starting memory location for the ABR by hand. Click on the “I Address” table entry, then click “Addresses”.



As we can see, the default value the PLC gave the ABR is 256 (at left). The ABR needs 64 bytes of space for its Virtual Input Module. Choose a starting number between 0 and 64 to make the full ABR memory table fit into the PLC's default 128 byte allocation.

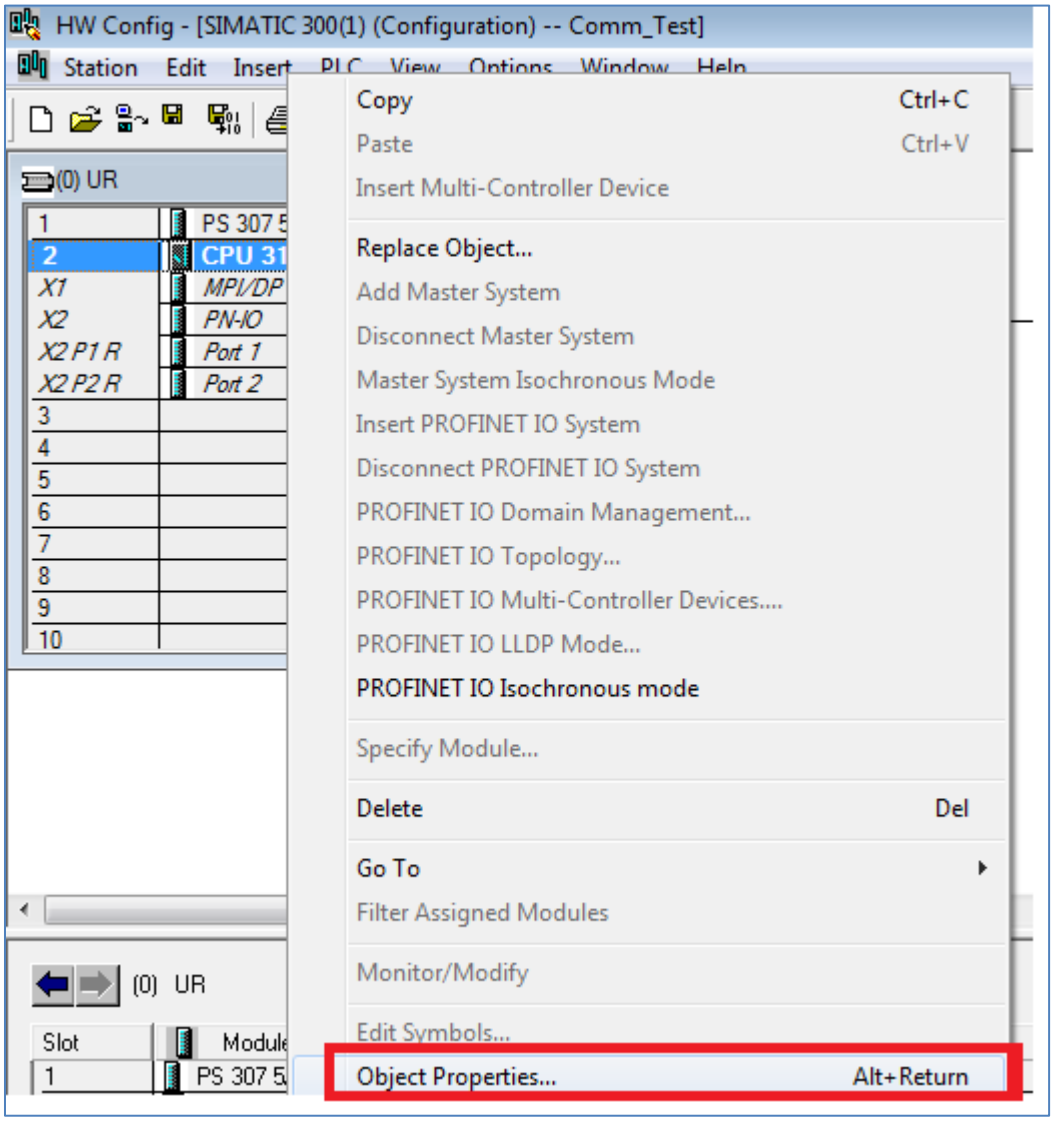


Here we see the ABR data coming into the PLC correctly.

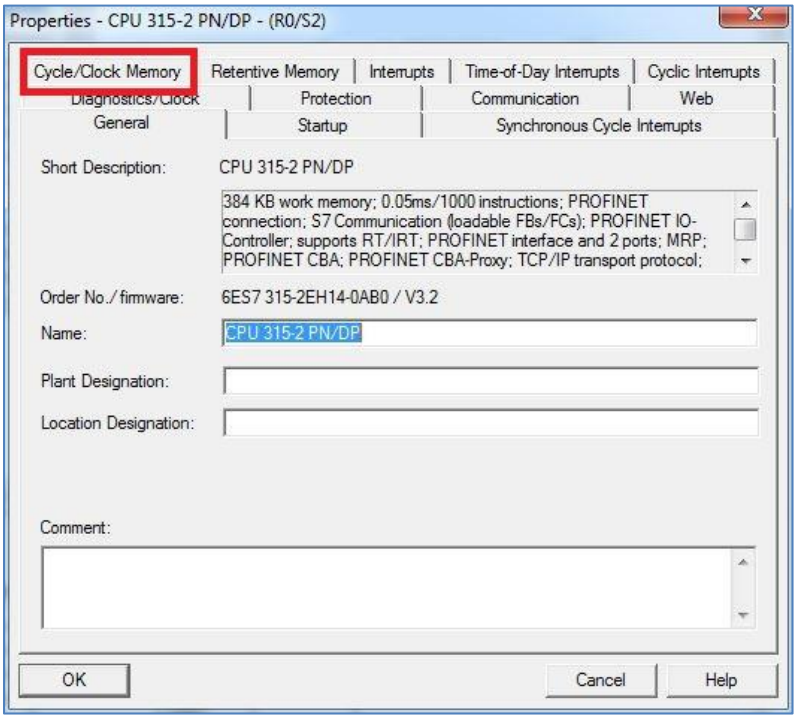


Increase the Size of the CPU Process Image Input/Output Areas

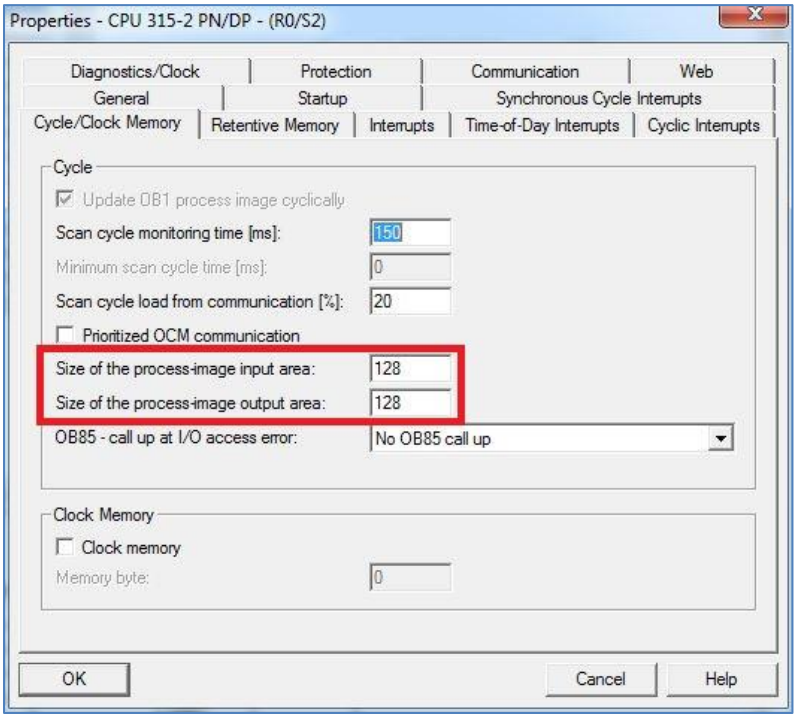
The other way to fix our problem is to increase the allocation of PLC memory that can be used by PROFINET devices. In the HW Config program, right click on the CPU, then select “Object Properties”.



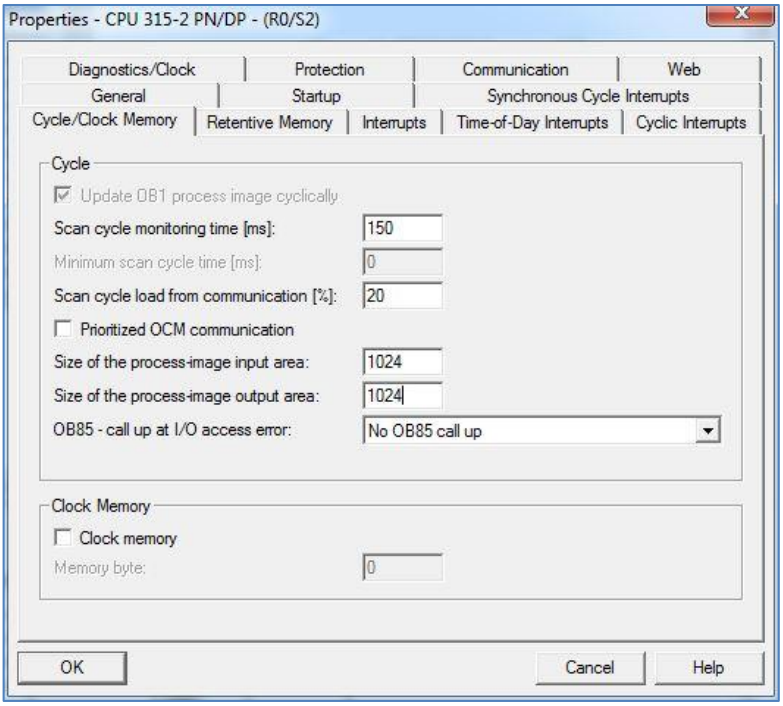
Click on the “Cycle/Clock Memory” tab.



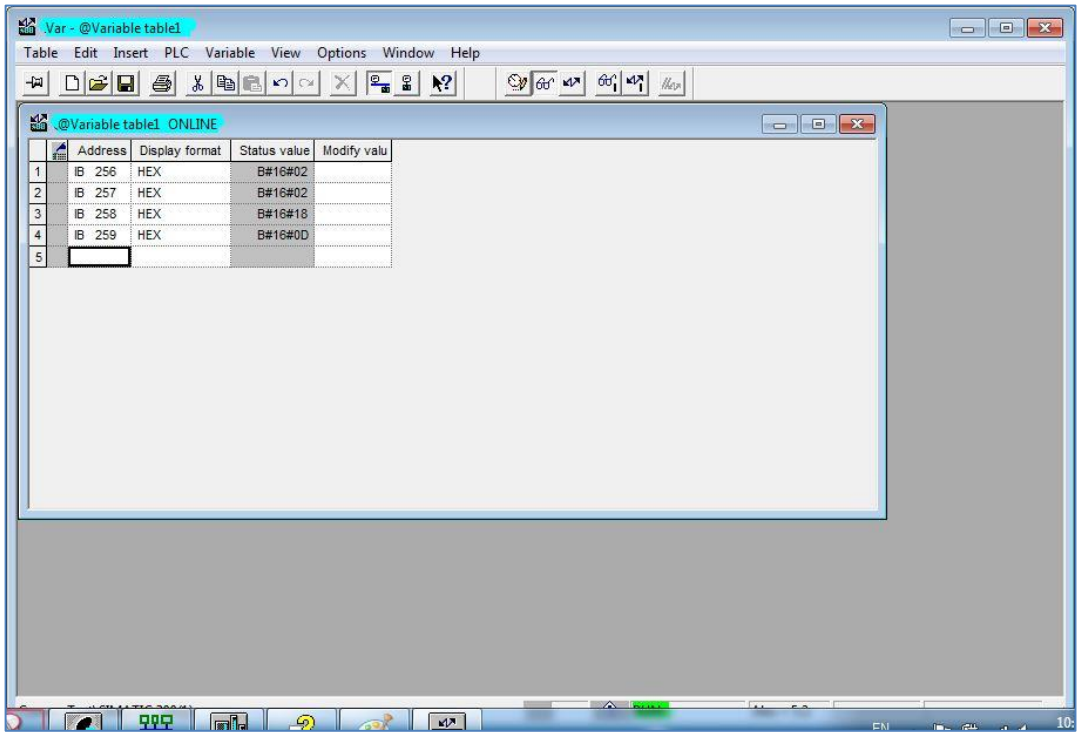
Notice that the default settings for “Size of process-image input area” and “Size of process-image output area” are both 128 bytes.



Change one or both to a higher number (maximum 2048). This will increase the PLC memory space that can be allocated to PROFINET devices.



After that change, the ABR data can now be mapped to input byte starting at 256 and we can see the data in the PLC.


Var - @Variable table1
Table Edit Insert PLC Variable View Options Window Help
@Variable table1 ONLINE
Address Display format Status value Modify valu
1 IB 256 HEX B#16#02
2 IB 257 HEX B#16#02
3 IB 258 HEX B#16#18
4 IB 259 HEX B#16#0D
5