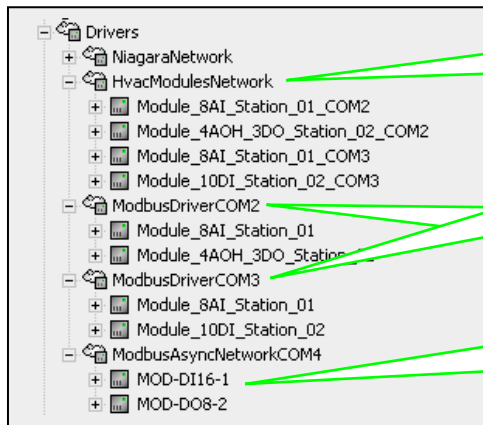


## EN-22: Modbus networks, ports and licenses

- The Vykon HVAC modules are Modbus devices and they conform to the Modbus recommendations. It is sometimes necessary to mix Vykon HVAC modules with other Modbus devices to provide other functions or data for the station. This can be done as long as certain points are considered. This engineering note discusses some of the issues around Modbus communications of Vykon HVAC.
- Communications to the Vykon HVAC modules is made via the standard NiagaraAX Framework® Modbus driver. The driver properties are exposed in the JACE station 'Drivers' folder and it is possible to have other, non-Vykon HVAC Modbus devices configured and working alongside the Vykon HVAC modules. The non-Vykon HVAC devices and their points, will of course need to be manually added and configured in the Modbus driver because these are outside of the Vykon HVAC auto-configuration. However mixing of Vykon HVAC modules and non-Vykon HVAC Modbus devices on the same COM port is not recommended because the Vykon HVAC Modbus driver settings are optimised to operate with the Vykon HVAC modules. You may get degradation in communications performance if you alter the settings of the Vykon HVAC module's COM port driver to accommodate the non-Vykon HVAC devices.
- An optional RS485 adapter card which occupies one of the two communications slots in the JACE can be added and this will provide another two communications ports, each of which can be used as an independently configurable Modbus network. Alternatively these networks may be used for Vykon HVAC devices. An example of this is shown here:



**Note:**  
The HvacModulesNetwork contains all the Vykon HVAC modules

**Note:**  
Up to 15 Vykon HVAC modules (address numbers 1 thro' 15) can be added to each COM port

**Note:**  
It is recommended that all Non-Vykon HVAC Modbus devices are be added to their own COM port driver network

- The maximum number of Modbus devices that can be configured across all the Modbus networks is controlled by the license of the JACE and this applies to the Vykon HVAC modules as well as any other Modbus device(s) connected. However, because of the way a Vykon HVAC station operates, each Vykon HVAC module is equivalent to two Modbus devices. The Jace controller product which has a 3 module license for example will enable up to three Vykon HVAC modules but to do this it is actually licensed for six Modbus devices.
- The Modbus specification (v1.02 Data Link Layer) defines that a maximum of 247 slave devices can be connected to the master via the same serial bus. However, in practice, the physical limitations of the line driver in each device lowers this to 32 before a repeater must be added. This assumes that each device is considered as a 'Full-load' ('Full-load', 'half-load' and 'quarter-load' refer to the electrical load that each device puts on the serial bus and it is possible to connect more devices without a repeater if the devices are half or quarter-loads). The line drivers in the JACE and the Vykon HVAC modules must nevertheless, be regarded as 'Full-load'.

