

NMEA 2000 Standard does not allow daisy chaining for a number of reasons. Most importantly, because of potential electrical and signal properties mismatch.

First, the NMEA 2000 Standard is an industry standard built by members of the marine electronics industry. The NMEA 2000 Standard states that; “*Multiple non isolated NMEA 2000 connections, allowing the network backbone to pass thru the device are not permitted.*” Daisy chaining is where the network lines run through a product as opposed to the NMEA 2000 Standard that mandates products be connected to the network via a stub or drop. The difference being that Daisy Chaining allows the network to run through a product, while the NMEA 2000 Standard does not allow the network to be routed through a product.

Second, NMEA 2000 Certification does not regulate the internal wiring of any NMEA 2000 Certified Product. To begin implementing such a strategy, product costs would be much higher. With daisy chaining, and internal wiring unregulated, manufacturers may have a long wire or the wrong impedance of that internal wire from the NMEA 2000 connector to their PCB. A bad reflection would exacerbate two or three times through these “daisy chained” products causing a problem with the signal now propagating down the long wire (wrong impedance) from the NMEA 2000 connector, across the PCB and back out through another long wire (wrong impedance) to the other NMEA 2000 connector on the back of the product (and so on) before the signal continues down the network. The result would mean significant distortion of the signal beyond all recognition as it propagates through the daisy-chained products and onto the network.

Furthermore, passing the internal power wire through daisy-chained products has the potential for additional problems, including voltage drops. For example, if manufacturers choose a small diameter wire gauge for routing the internal power wire through their product, then significant voltage drop within the daisy-chained products might cause problems downstream on the NMEA 2000 network. (see drawing 1)

The NMEA 2000 Standard promotes a single drop line to a product eliminating a lot of the concerns and promoting a better network design. The non-daisy chained method meant that the signal never actually propagates through a product, the signal simply ends at the product.

To remain electrically equivalent, the circuit in the device would have to connect the two ports before any of the required isolation circuitry. The shield would have to pass through from one connector to the other. The DC Isolation requirement would need to allow these ports to have zero resistance between them. You can no longer remove the device while the system is operational. One of the key objectives of the NMEA 2000 Standard was to have the capability to “plug and play,” taking products on and off the network without disrupting any other products on the network. This is a huge benefit in the marine market as products are added or replaced. (see drawing 2).

Lastly, in summary, NMEA 2000 Standard includes both control and safety critical messages. NMEA 2000 was developed with safety in mind. Over the last 5 years, the NMEA 2000 Standards Committee has had this discussion twice and both times, the Committee thoughtfully and purposely discussed minimizing any kind of possible disruption to the network, thereby daisy chaining was not allowed.