Digital Yacht
NMEA 2000 Components

New! Popular NMEA 2000 cabling and accessories
PLUS! A clear and simple guide to the basics of
building an NMEA 2000 network

January 2022

Introduction

Dear Partner

We have expanded our range of NMEA 2000 cabling and accessories to compliment our existing starter kit.

The starter kit provides the basics for a 3 device network including terminators, power cable and a 1m drop cable to connect a device. This should be an accessory used for every new NMEA 2000 installation.

Remember also, all Digital Yacht NMEA 2000 products are supplied with an integrated 1m NMEA 2000 cable.

The new products include 1m, 3m and 6m cables which can be interconnected for custom lengths or extensions as well as 1 way and 4 way "T" pieces allowing more devices to connect to the network.

These universal, certified cables use top quality shielded cable and waterproof metal connectors for the most reliable connections yet are competitively priced.

We've also produced this attached guide (included in this presentation) which helps explain how NMEA 2000 products interconnect and will be useful for DIY installers too.

For advanced installers and dealers, we also offer NavDoctor – a portable NMEA 2000 diagnostics device plus a full range of NMEA 0183/2000/USB gateways. Pricing for these components is available in our latest 2022 pricelist and on our websites.

The Digital Yacht Team

Universal – works with any system
Guaranteed Reliability – Certified, top quality cabling and metal connectors
Starter kit – One part number to get network up and running in a simple one box solution
Easily expandable – Full range of cables and connectors

Starter Kit

Item/Part Number	Description
ZDIGN2KIT **UPC: 081159830670**	Basic NMEA 2000 starter kit required for every new NMEA 2000 installation.
	Comprises: Males and female terminators, fused 12V power cable, 1m drop cable and 4 way connection block for connecting power and 3 devices (plus terminators)

Cabling

Item/Part Number	Description
ZDIGN21M **UPC:703791696338**	1m drop/backbone cable (M-F)
ZDIGN23M **UPC:703791696345**	3m drop/backbone cable (M-F)
ZDIGN26M **UPC:703791696352**	6m drop/backbone cable (M-F)
	Note cables can be interlinked for custom lengths or extensions

T Pieces For System Expansion

Item/Part Number	Description
ZDIGN21W **UPC:703791696369**	1 device extension block (T Piece)
ZDIGN26W **UPC:703791696376**	4 device extension block (4 way T Piece)
	Note T pieces can be interlinked with cables or joined directly to make multi way blocks in areas like nav stations or centre consoles when there may be many devices

NMEA 2000 Guide

Who should read this?

Anyone who is new to NMEA 2000 and wants to quickly understand the key issues in building an NMEA 2000 network

What is NMEA 2000?

- NMEA 2000 is the marine version of the CAN networks found in every modern car

- NMEA 2000 allows marine electronic devices from different manufacturers to talk to each other

- NMEA 2000 is a standard set of data messages, protocols and connectors that all NMEA 2000 devices must use*

* Note – Some manufacturers have created their own "flavours" of NMEA 2000 with different connectors and cabling; Raymarine's "SeaTalkNG" and Simrad's "SimNet" are two examples and both need proprietary adaptor cables to connect to standard NMEA 2000 networks

Connecting NMEA 2000 Devices

AIT2000 Transponder
with NMEA 2000

Rear of Modern MFD
with NMEA 2000

You cannot just plug two NMEA2000
devices together, there must be
an NMEA 2000 network

- Each device has an NMEA 2000 interface that must be powered from the network

- Some smaller low power devices, like sensors are also powered from the network

- There is a small cost in setting up the network, but future expansion is very easy

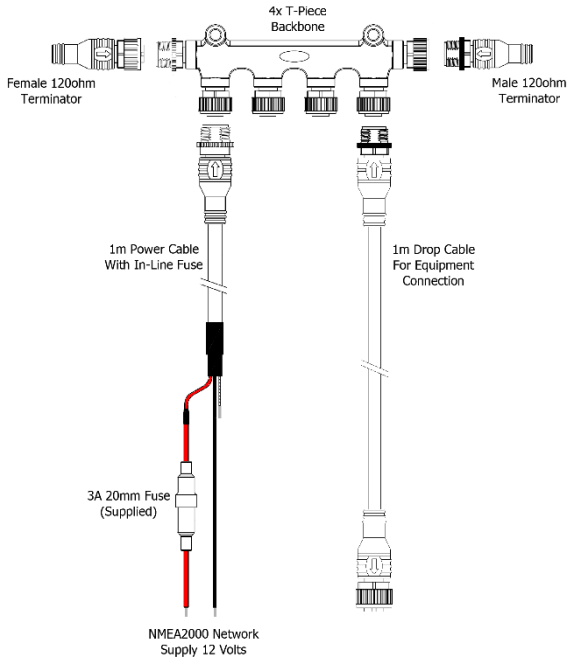- An NMEA 2000 Starter Kit is a cost effective way to build a small, expandable network

NMEA 2000 Starter Kit

Kit contents….

- 4 way T-Piece Backbone
- 2x Terminators
- 1m Power Cable (fused)
- 1m Drop Cable

Digital Yacht NMEA 2000 Starter Kit

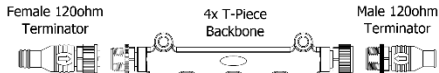Part# ZDIGN2KIT

4x T-Piece Backbone

Female 120ohm Terminator

Male 120ohm Terminator

1m Power Cable With In-Line Fuse

1m Drop Cable For Equipment Connection

3A 20mm Fuse (Supplied)

NMEA2000 Network Supply 12 Volts

AIT2000 Transponder
with NMEA 2000

Female 120ohm
Terminator

4x T-Piece
Backbone

Male 120ohm
Terminator

Rear of Modern MFD
with NMEA 2000

Integral
1m Drop Cable
For Network
Connection

1m Drop Cable
For Equipment
Connection

1m Power Cable
With In-Line Fuse

3A 20mm Fuse
(Supplied)

[Digital Yacht NMEA 2000 Starter Kit](#)

Part# ZDIGN2KIT

NMEA2000 Network
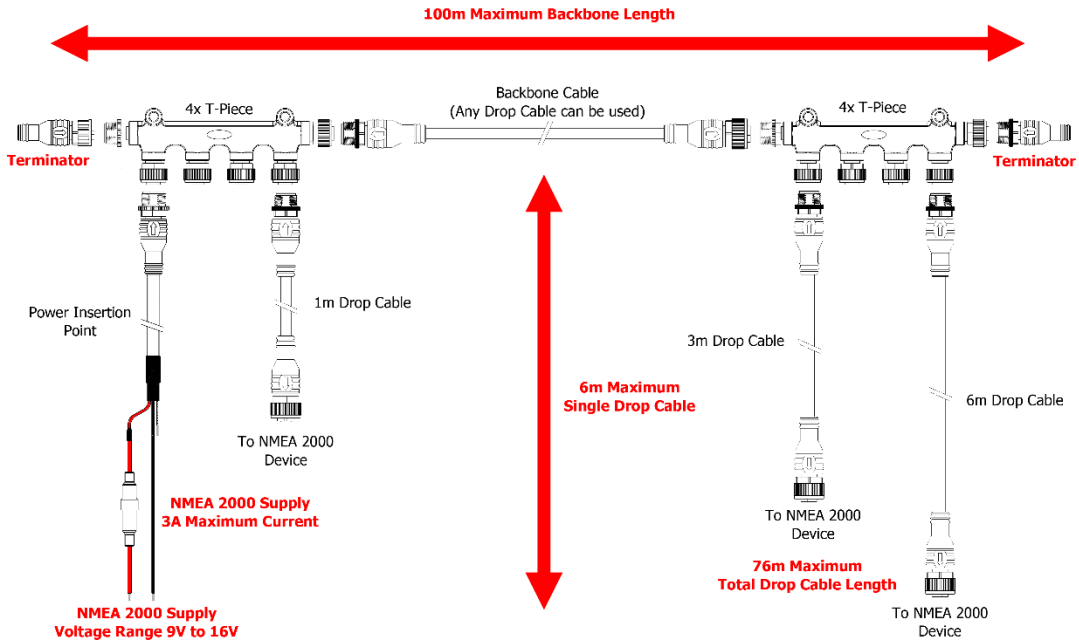Supply 12 Volts

Basic NMEA 2000 Networking Rules

1) The network must be properly terminated
2) The NMEA 2000 Supply voltage must be between 9V and 16V
3) The NMEA 2000 Supply current must be less than 3A (60 LEN)
4) Maximum number of 50 physical devices on the network
5) The NMEA 2000 backbone must be less than 100m
6) Maximum single drop cable length is 6m
7) Total length of all drop cables must be less than 76m
8) The volt drop from one end of the network to the other, must be less than 1.5V

Basic NMEA 2000 Networking Rules

100m Maximum Backbone Length

4x T-Piece

Backbone Cable
(Any Drop Cable can be used)

4x T-Piece

Terminator

Terminator

Power Insertion
Point

1m Drop Cable

3m Drop Cable

**6m Maximum
Single Drop Cable**

6m Drop Cable

To NMEA 2000
Device

**NMEA 2000 Supply
3A Maximum Current**

To NMEA 2000
Device

**76m Maximum
Total Drop Cable Length**

**NMEA 2000 Supply
Voltage Range 9V to 16V**

To NMEA 2000
Device

NMEA 2000 Network Current

- Each device on the NMEA 2000 network consumes some current

- It is very important that the total network current is known and that it is less than 3A

- Every NMEA 2000 certified device, must display its Load Equivalency Number or "LEN" for short

- 1 LEN = 0.05A (50mA)

- Add up the LEN values of all devices and make sure the total is less than 60 LEN which equals 3A

iKonvert
NMEA2000 Gateway
(ISO)

TECH SUPPORT
USA +1 978 277 1234
ROW +44 117 955 4474
www.digitalyachtamerica.com

Power ●
N2K ●
N0183 ●
Error ●

NMEA2000 Bus Powered LEN=1
Full Galvanic Isolation
Compass Safe Distance 1m

PART NO. ZDIGIKVT
Manufactured in the UK

Tested to comply
with FCC standards

NMEA 2000 Network Voltage Drop

- When current flows through the NMEA 2000 backbone and drop cables, a voltage drop occurs resulting in the voltage at one of the network being different to the voltage at the other end

- The longer the cables or the higher the current, the larger the voltage drop and if greater that 1.5V, then data errors can occur

- To calculate voltage drop, use the following formula…

  Volt Drop = LEN x Backbone Length x 0.006
  (above formula is valid for most common NMEA 2000 networks)

- If voltage drop > 1.5V add an additional Power Insertion point

NMEA 2000 Voltage Drop Example

Volt Drop = LEN x Backbone Length x 0.006

Volt Drop = 12 x 10 x 0.006

Volt Drop = 0.72V ✓

Less than 1.5V so OK

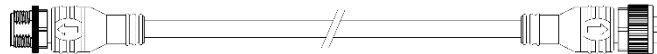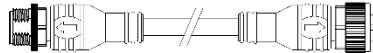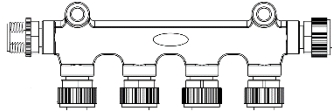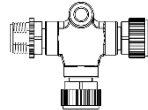**Total LEN = 6 + 4 + 2 = 12**

Backbone Length = 6 + 3 + 1 = 10m
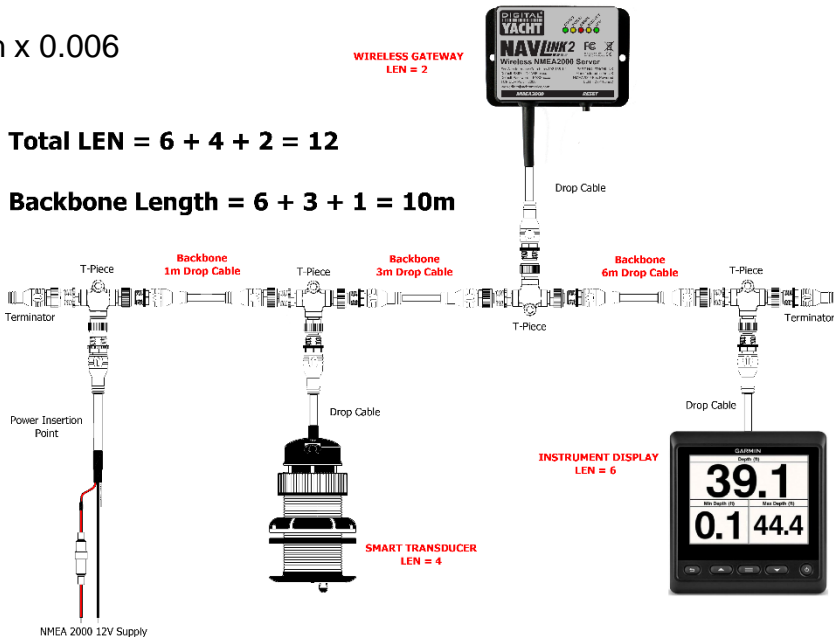
NMEA 2000 Parts

In addition to the NMEA 2000 Starter Kit, Digital Yacht also sell…

- Single T-Piece Part# ZDIGN21W

- 4 Way T-Piece Part# ZDIGN26W

- 1m Drop Cable Part# ZDIGN21M

- 3m Drop Cable Part# ZDIGN23M

- 6m Drop Cable Part# ZDIGN26M

Fault Finding an NMEA 2000 Network

- NMEA 2000 networks are very reliable and really are "Plug and Play"

- When things go wrong, it is not always easy to fault find even a small NMEA 2000 network

- Digital Yacht's NAVDoctor is the perfect NMEA 2000 fault finding and test tool

- Part# ZDIGNAVDOC