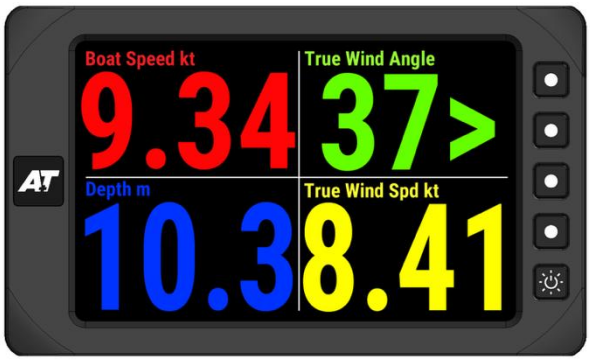

HFD5 & QBD7 Product User Guide

V0.04

Software version 1.19

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The A+T HFD5 and QBD7 are high specification full colour 5” and 7” displays. With very high contrast, and toughened anti-glare glass, they provide superb viewability under the harshest conditions.

Supplied as either an Ethernet-based unit for use with an A+T ATP processor, or CANbus (NMEA2000 compatible) for systems such as B&G, Exocet, FaRo or Raymarine.

QBD7 Bezels are available with or without buttons.

Specifications:

	HFD5	QBD7
Input voltage	10-40 Vdc	10-40 Vdc
Power consumption	@ max brightness 2.35W	@ max brightness 9.4W
NMEA2000	4 LEN	1 LEN
Weight	610g	1kg
Environmental	IP68, tested @ 1m >24hr	IP68, tested @ 1m >24hr
Operating temperature	-10 to +70 °C	-10 to +70 °C
Display resolution	800 x 480 Transflective	800 x 480 Transmissive
Backlighting	Reflected ambient +180cd/m²	1400cd/m²
Wi-Fi Access point IP	172.16.40.1	172.16.39.1

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Functionality

- Display of any data available on the instrument databus.
- Up to 8 fully custom layout pages are available that can be scrolled through via push button
- Pages may be set to switch based on a race timer and sailing modes
- Configuration and setup are via display buttons or web-server
  - CANbus displays have built-in WiFi to access the web-server from any WiFi-enabled device.
  - Ethernet displays are accessed from an ATP processor web-server.

Setup and configuration

The web-server has several functions:

- Customise display pages
- Manage lighting, including fine tuning lighting to match other displays
- Save and reload display configurations
- Upload firmware updates and system diagnostics

Connecting to the display web-server

CANbus displays

The CANbus display WiFi is always on and has an internal DHCP server.

You will require the device **serial number**. It may be accessed at:

1. On startup on the display
2. The product sticker on the rear of the display
3. Button bezel: **Menu > This Display > About Device**

Connect your computer to the display WiFi at:

WiFi SSID:	[display serial number]
WiFi Password:	instruments (**HFD5 ONLY**)
WiFi Password:	fairlylarge (**QBD7 ONLY**)

Once connected:

- Open your web browser and enter the URL which is the serial number with the suffix '**.local**'. For example:
  - Serial number: ABCDEGF123
  - URL: ABCDEGF123.local
- Alternatively use the IP address:
  - HFD5 172.16.40.1
  - QBD7 172.16.39.1

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You may connect CANbus displays to your vessels WiFi so that it may be accessed over the vessels WiFi network.

- In the webserver select **Menu > Diagnostics > WiFi** and enter the SSID and Password of your vessel network.
- You may then access the display webserver at the display URL from any device on the vessel network.

Ethernet displays

Access the display webserver from your ATP web-server **Menu > Display**

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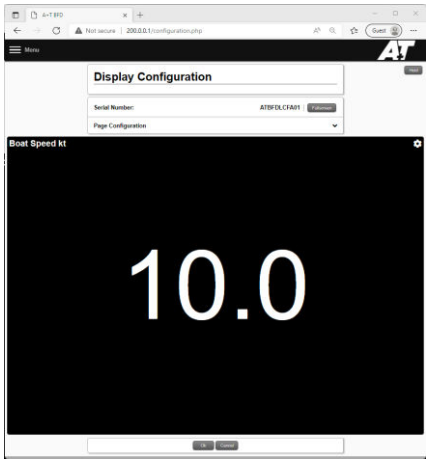
Web-server setup and configuration

Logging in to the webserver will reveal the Display Configuration page. On this page you may:

- Set the webserver to display data in full screen making your PC/tablet/phone a data display
- Control the current page cell data, colours and rules



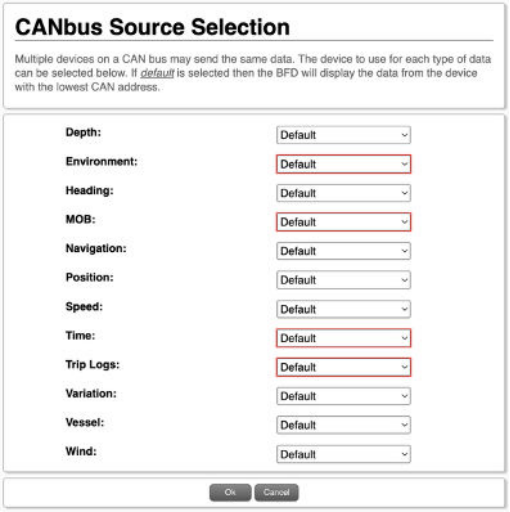
Display configuration page

- Access the **Menu** (top left of the webpage) to setup and control the display

Menu > Settings > CANbus Source

[CANbus displays only]

Sources must be configured before continuing.



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Menu > Configuration

If you edit a page that is currently displayed, the changes will be made upon clicking OK at the bottom of the page.

Serial Number: Of this device

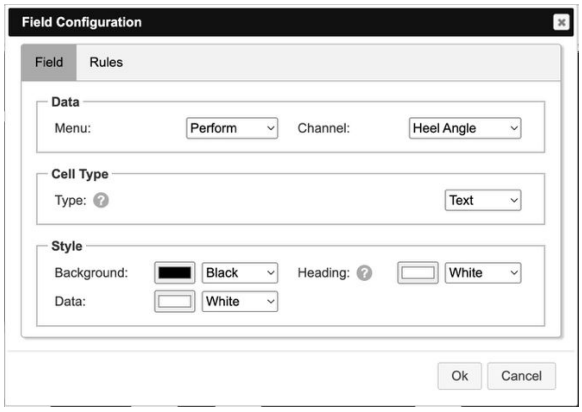
Number of Pages: Set, add or delete (1 to 8)

Page Configuration

- Select the page number that you want to view and edit
- Select the number of cells for this page
- Select the layout variant (A = rows, B = grid, C = columns)
- Edit the cell border colour (colour picker or presets)

Configuring displayed data

To configure a cell, click on the cell to reveal the Field Configuration window:



- Select the Menu and Channel to display
- Select **Cell Type** (text, analogue gauge, time series or bar graph)
- Change the colour scheme of the field with colour pickers or preset colours

  Click the **Rules** tab to set custom rules for data colours

  - You may create up to 5 Data Rules to change colour of the data, title or background using logical operators.

  For example, if you wish to set conditions to indicate colour for safe depth, caution depth, and hazardous depth:

  - Edit the first rule to display the data in **RED** when depth <5m
  - Press + to add a new rule and edit to display the data in **AMBER** when depth >5m
  - Press + to add a new rule and edit to display the data in **WHITE** when depth >10m

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Where conditions overlap, the bottom, or most recently added, rule will apply. In this example the last two rules apply for depth > 15 metres however the last rule has priority, so the depth text is **WHITE**.

Night Mode

Toggle to preset the display colours in either day or night mode.

Any changes made must be sent to the display by pressing **Ok** at the bottom of the window.

Menu > Settings > Display

- Change the display orientation
- Select the number of pages (1 to 8) to use
- Set/change the currently displayed page
- Allow/prevent this display from showing MOB or Alarms when triggered.
- Activate Alarm Relay will allow this display to trigger a connected audio or visual alarm. See wiring details for more information.
- Keyboard sensitivity: reduce to make the button pushes less sensitive (or turn off)

Menu > Settings > Lighting

Each lighting level may be tuned to match other display lighting levels, and to set the lighting behaviour to operate either with the system lighting commands or independently

Menu > Settings > Colours

Define a preset palette to re-use across the display

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Menu > Settings > Night Mode

The display can be set to an alternate colour mode when the lighting level falls below a certain threshold. This is triggered by the lighting level selected.

For example, the digit colours can be set to change from White to Red when the lighting level is set below Low-Medium.

Each page of the display may be set up for this mode. Switching to Night Mode on the Configuration page will allow setup of a night mode option.

Menu > Settings > Screensaver

The display can display a fixed image when it is not in use.

By default, this is the A+T Instruments logo, but a custom image can be uploaded.

The QBD screen resolution is 800x480. Smaller images are not scaled up; larger images are scaled down.

The background colour may be set to support smaller or transparent images. Supported formats are .PNG and .JPEG

The screensaver may be manually toggled:

- In the Web-server
- In the device display Menu
- Pressing and holding the lighting button.

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Menu > Settings > Context Switching

Each display may switch to one of four predefined pages based on a race timer or TWA.

The A+T Race Timer may be triggered by an A+T MFD, QFD7 or HFD5, or by ethernet connected Expedition Navigation Software.

You may set the TWA threshold for transitions between the TWA modes, and the prestart mode will be triggered by the Race Timer.

When context switching is enabled:

Page 1 = Upwind mode

Page 2 = Reaching mode

Page 3 = Downwind mode

Page 4 = Prestart mode

Menu > Diagnostics > Display Status

Shows the status of the device including environmental and runtime information

Menu > Diagnostics > Event Logs

View and download internal event logs for troubleshooting.

Menu > Diagnostics > CANbus [CANbus display only]

View and download CANbus logs for troubleshooting.

Menu > Diagnostics > WiFi [CANbus display only]

Connect this display to the vessels WiFi

Menu > Diagnostics > Saved Configurations

Manage saved display configurations.

May be used to restore backups in case of accidental changes, or to maintain configurations for different situations. Saved configurations can also be exported for diagnostic purposes.

Menu > Diagnostics > Software Update

Current version date, and upload of an A+T update file (*.zip)

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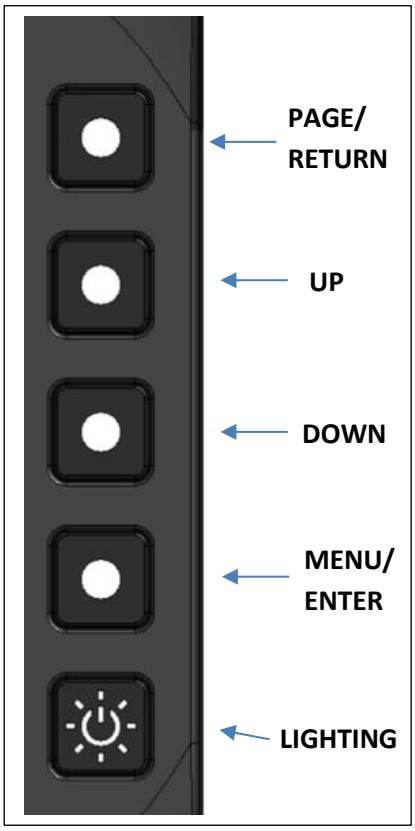
Button bezel menu



- **Page/Return**
  - Toggle through preset Pages
  - Return when in Menu
- **Up**
  - Pressing will reveal the button menu
  - Toggle clockwise through cells
  - Up in Menu items
- **Down**
  - Pressing will reveal the button menu
  - Toggle anti clockwise through cells
  - Down in Menu items
- **Up + Down** [pressed together]
  - Toggles the Keypad Lock
- **Menu/Enter**
  - Press once for the **Main Menu**
  - Press to enter selection
  - Pressed 3x will trigger the MOB alarm
- **Lighting**
  - Scrolls through preset lighting levels

To edit a cell, press **Up** or **Down** to cycle to the cell you wish to edit, and press **Enter**

Main Menu Items

- MOB
  - Set the MOB features.
  - NOTE: **3x press on Menu will trigger the A+T system MOB function**
- Timer
  - Set the Race Timer in A+T. Sync will set the running time to the nearest whole minute
- Page
  - Add new, Delete or configure current Page
- This Display
  - System settings and information about this display
- System
  - Manage Remote displays
  - View Network statistics
- Event Logs
  - Logs of all device actions for debugging and problem solving

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Installation

The HFD5 & QBD7 may be mounted in either landscape, or portrait orientation.

Landscape: When viewed from the rear the cable should exit vertically down.

Portrait: When viewed from the front, rotate the display from landscape to portrait turning 90° clockwise, with the keypad at the bottom.

DO NOT USE Acetone or any alcohol based solvent agents for cleaning. These could damage the materials of the display.

DO NOT OVERTIGHTEN THE FASTENINGS. Overtightening could lead to distortion of the display body and consequential loss of watertightness, or break the glass or case. This would not be covered by warranty.

Mounting Templates are supplied with the unit and are also available for download here. Check the dimensions after printing!

HFD5

www.aandtinstruments.com/downloads/HFD_MOUNTING_TEMPLATE.pdf

QBD7

www.aandtinstruments.com/downloads/QBD_MOUNTING_TEMPLATE.pdf

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Connections

The CANbus HFD5 connects directly to the CANbus using a standard M12 connector.

The QBD7s and Ethernet HFD5 are supplied with a junction box and 3 metre extension cable to connect the instrument data, and power connected from a separate source. The cable may be shortened without affecting the unit or warranty.

Custom cable lengths and the IP68 rated in-line connectors are available.

The QBD7 junction box requires a fuse protected power supply of minimum 26W per box, independent of the data bus power.

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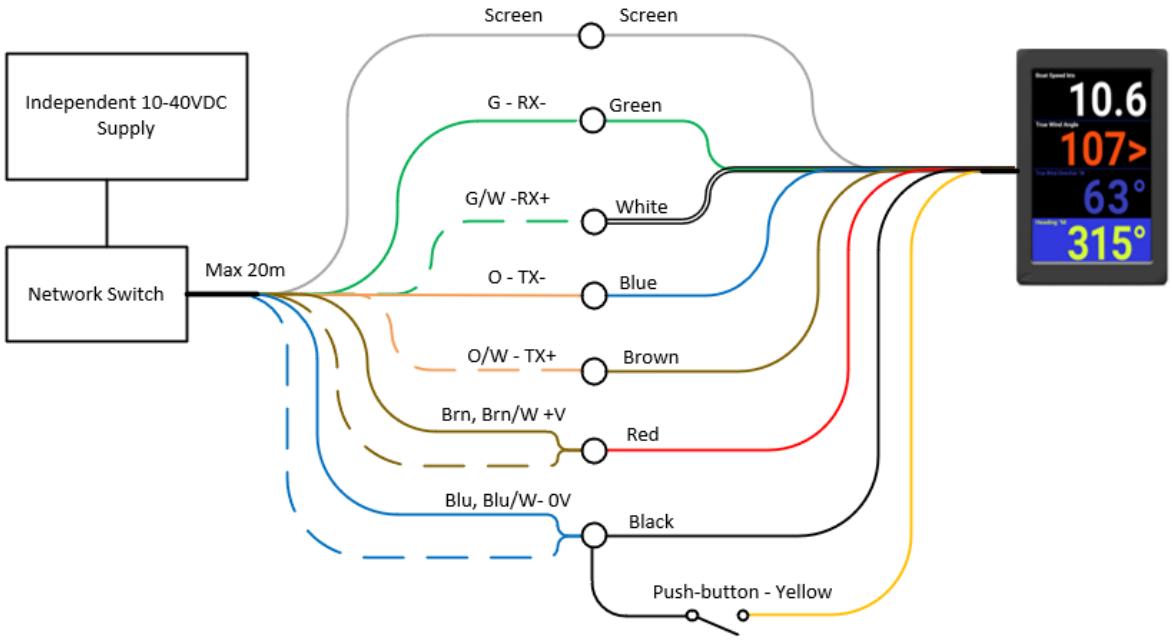
Ethernet:

The colour codes in the cable are:-

A+T	Ethernet cable	Function	Comment
Black	*Blue & Blue/White	0V	
Red	*Brown & Brown/White	+V	10-40 VDC fused supply
White	White/Green	RX+	
Green	Green	RX-	
Brown	White/Orange	TX+	
Blue	Orange	TX-	
Violet		Alarm relay	Needs accurate description
Yellow		Push-button	When contacted with 0v will step to the next page
Bare		Screen	

*The +V and 0v connections use spare wires within the ethernet cable. Twist together the Blue/Blue/White and Brown/Brown/White pair for connection to the +V and 0V terminals.

Ethernet Wiring: need to verify all



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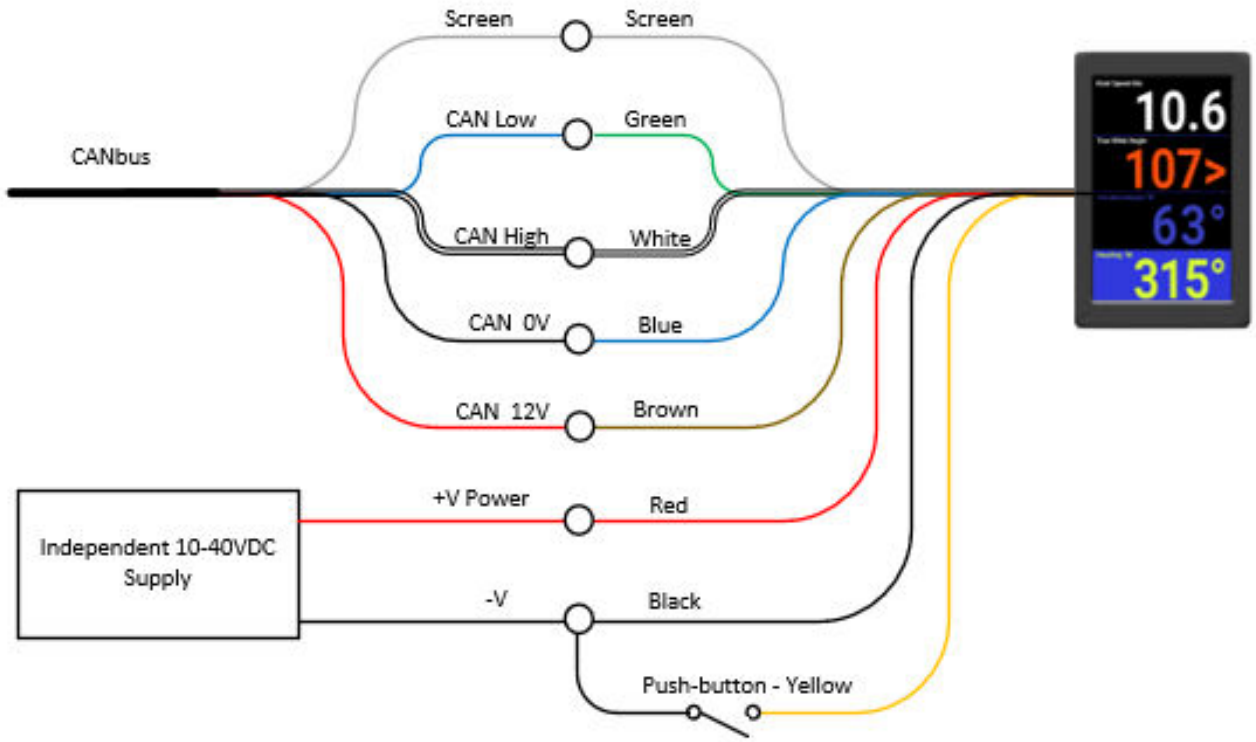
CANbus:

Contact A+T for connection requirements.

The colour codes in the cable are:-

A+T CANbus	N2K	Function	Comment
Black		0V	
Red		+ve power	10-40VDC 26W fused supply
Screen	Screen	Shield	
Brown	Red	NET S/+ve	
Blue	Black	NET C/-ve	
White	White	CAN H/NET +	
Green	Blue	CAN L/NET -	
Yellow		Push-button	When contacted with 0v will step to the next page
Violet		Alarm relay	Needs accurate description

QBD7 CANbus Wiring: check all and add alarm relay



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Warranty:

The A+T HFD5 and QBD7 are warranted against manufacturing defects for three years from the date of shipping from the factory, on a return to factory basis. Warranty is void if case is opened. An integral tamper sensor is fitted.

The expected life of the lcd backlighting is limited when run continuously at 100% brightness, therefore warranty is voided in this case. It is recommended to turn off the displays when not in use, or at least reduce the brightness to 80% or less.

The warranty specifically excludes physical damage, lightning strikes, overvoltage on supply or signal lines, and use outside the normal operating environment of a yacht.

Trademarks:

B&G and Raymarine are registered trade marks of their respective owners. Exocet is a product of Pixel sur Mer, and FaRo is a product of Faro Advanced Systems S.L. All such uses are acknowledged.

Declaration of Conformity:

A+T Instruments Ltd hereby declares that this product conforms to the requirements of Directive 2014/30/EU (Electromagnetic Compatibility). This declaration is made under the sole responsibility of A+T Instruments Ltd and confirms compliance with all applicable technical requirements.

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