OPERATOR'S MANUAL

Norbar Torque Tools

CE

Analogue Board (AnB) Module

Part Number 34502 | Issue 1 | Original Instructions (English)

CONTENTS

INTRODUCTION

The Analogue Board Module offers the convenience to plug in more than 2 transducers into the T-Box™ 2. It also offers the advantage of being able to place the transducer at a distance to your T-Box™ 2 with no detrimental effects on the measurement signal.

Analogue Board Module part numbers covered by this manual:

Parts Included	Part Number	Quantity
T-Box™ 2 AnB Module	43543	1
Power Supply Adapter (15V 50W)	39979	1
Micro USB Cable	39905	1
Operators Manual	34502	1

Accessories Available	Part Number
AnB Module to 10-way lead, for Norbar Rotary Transducers	60216.200
AnB 6-way lead, for Norbar Static & Annular Transducers	60217.200
AnB Module to no connector (for non-Norbar Transducers)	60223.200
Extensive range of Torque Transducers	Contact Norbar
Serial Data Lead Kit	60248

NOTE: **The suffix after the lead part number indicates the length of the lead in cm, thus XXXXX.200 = 2 metres. If Transducer leads are required of a non-standard length, the new suffix must be added to the part number when ordering (to the nearest metre).**

BEFORE USE

Please read the T-Box™ 2 operators manual (34474) in conjunction with this manual. The most up to date version of the T-Box™ 2 operators manual can be found here:
https://www.norbar.com/Media/Manuals

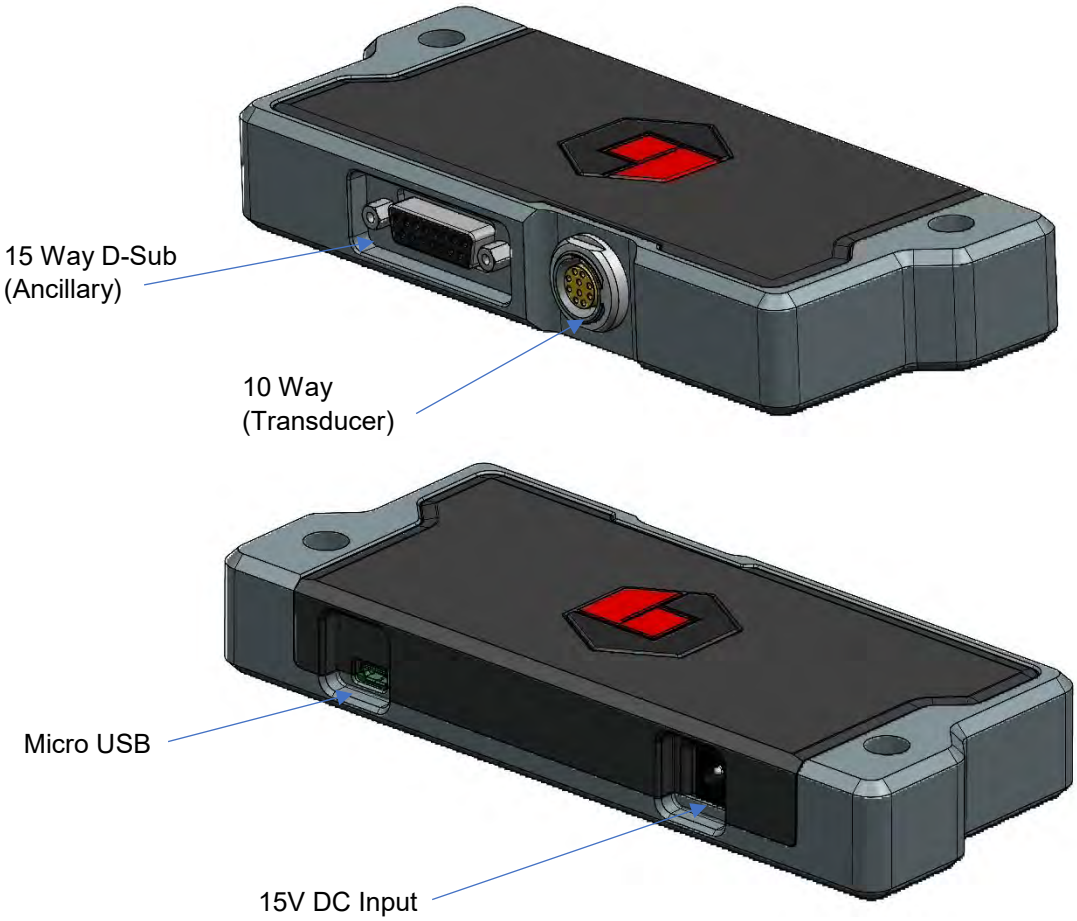
Updates

For the latest version of the T-Box™ 2 software please visit here:
https://www.norbar.com/Downloads/Software-Download/T-Box-2

Preparation

WARNING: **IF THE EQUIPMENT IS USED IN A MANNER NOT SPECIFIED BY THE MANUFACTURER, THE PROTECTION PROVIDED BY THE EQUIPMENT MAY BE IMPAIRED**

Assembly and Connections



T-Box™ 2

OPERATION

Connecting a Module

To connect an external AnB module, first ensure that the T-Box™ 2 is either turned off, or idle (both screens sat on the main menu).

Next simply plug the power chord into the module, then connect the USB cable to the T-Box™ 2. If the T-Box™ 2 was off, you can now turn it on.

For the next steps, see Configuring Ports below:

NOTE: External AnB modules are USB devices, so they are compatible with USB hubs, if you need to use a hub to gain additional USB ports (for instance, to connect an AnB module along with an external keyboard and mouse). Make sure the hub is a good quality, modern version with at least USB 2.0 support. Beware of poor-quality cables or poor-quality hubs that could cause reliability issues.

NOTE: Because they are USB devices, you could also use USB extension cables with external AnB modules, facilitating connecting T-Box™ 2 to transducers that are quite some distance away, for instance in another room.

NOTE: The external AnB module does not rely on the USB bus for power, however, other devices on the bus might. If using a non-powered USB hub (a USB hub without an external power supply), be mindful of overloading the hub and causing problems.

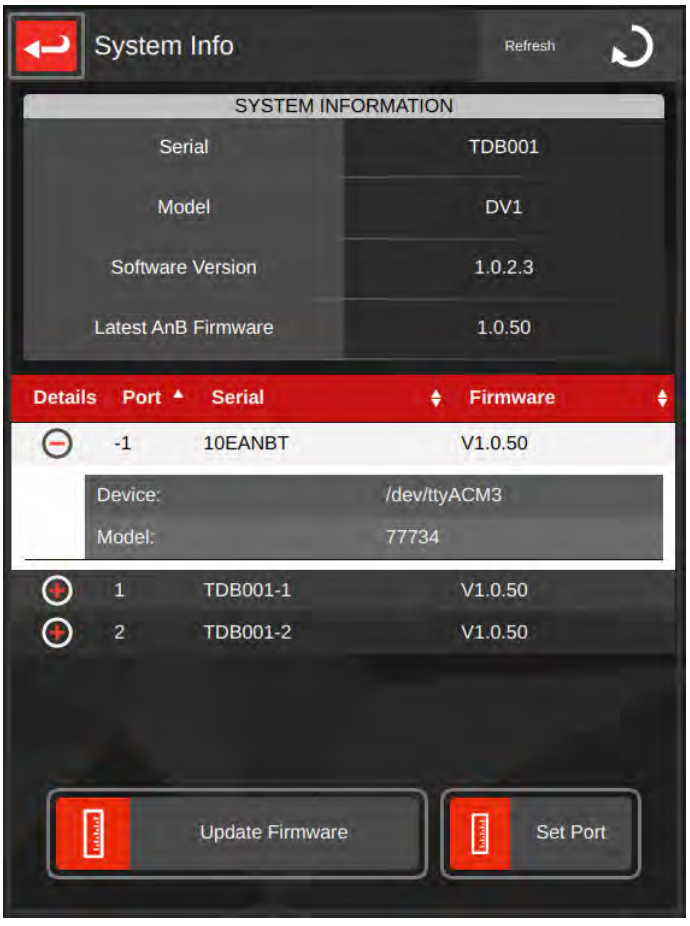
NOTE: You can connect multiple external AnB modules to the T-Box™ 2, if you require. The limit is how many available ports there are to be assigned.

Configuring Ports

Every AnB module, whether internal or external, needs a port designation. The two ports already inside the T-Box™ 2 are permanently assigned port 1 & 2. When connecting new external AnB modules, you will need to select a port yourself.

To do this, head to the Settings > System Info screen. If you connected the external AnB module while the T-Box™ 2 was off, you should see three AnB modules listed instead of the usual two. Otherwise, press the Refresh button in the upper right corner of the window to detect the newly connected AnB. You should see the new AnB module has “-1” listed as a port designation, indicating it needs to be set.

Select the module and press the new “Set Port” button at the bottom right of the screen. You will then be offered a list of port numbers to choose from.



It doesn't matter what number you choose, but probably, it would be logical to select port "3", if this is your first external AnB module, considering the two internal ports are 1 & 2. If you add more, you can use up more of the numbers.

NOTE: **You can change port numbers as often as you wish; just select the AnB module and use the Set Port button again.**

NOTE: **You cannot change port numbers for the internal AnB modules (ports 1 & 2).**

NOTE: **You cannot pick port numbers that are actively in use by any external AnB module; they will appear greyed out in the port list. If you want to reassign a port number that is already assigned to a connected AnB module, disconnect the AnB module first by following the disconnection procedure. (So, to reassign port 3 to another AnB module, disconnect the module assigned to port 3 first). Alternatively, temporarily pick a different port number for it if one is spare, to free up the port number you want to reassign.**

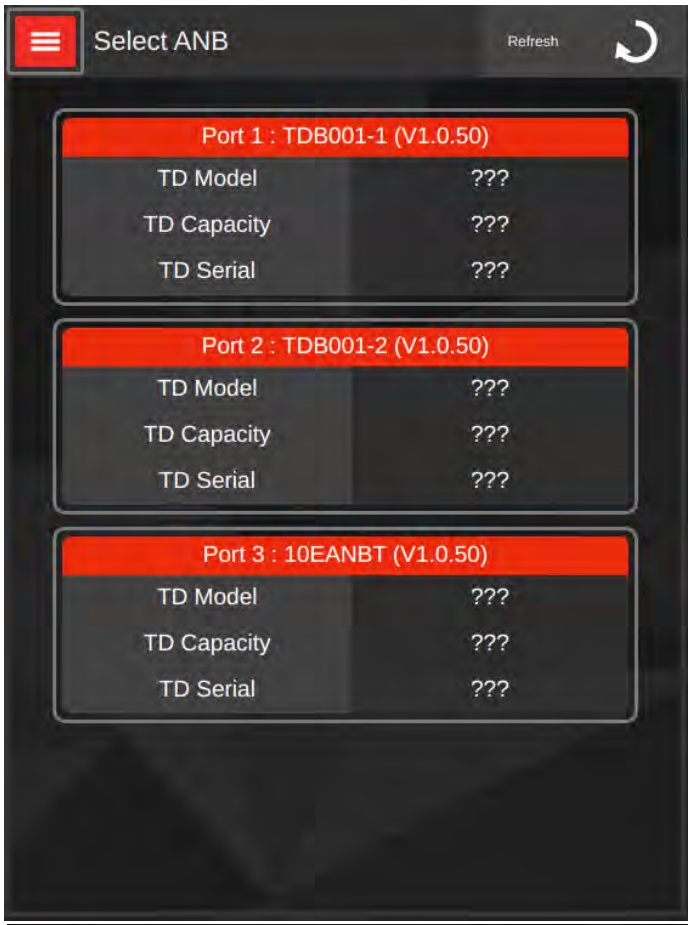
NOTE: **You cannot pick the same port number for more than one external AnB module at a time. If you already had port 3 assigned to one module, then it will be deassigned from that one before assignment to the new one. The UI will warn you this is happening. When you next connect the original AnB module, it will have no port and you will need to select one.**

NOTE: **You should not be using any AnB module when setting ports (no graphing or measuring tasks active; the other screen should be sat at the main menu).**

Using a Module

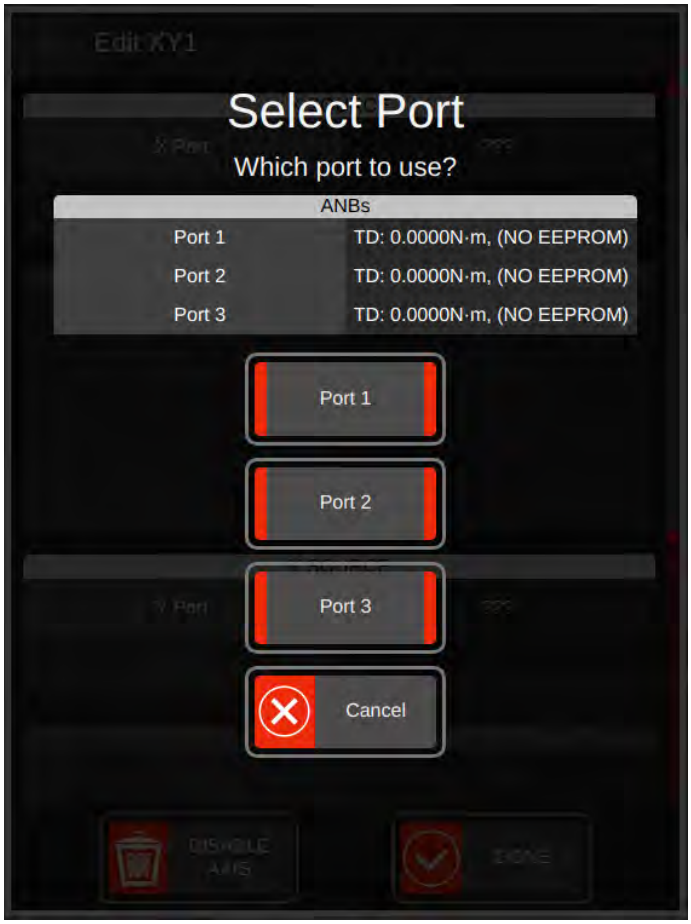
After ports are configured, the external AnB module is ready to use. You should now see three AnB modules listed in the AnB Selection screen, instead of the usual two.

Now everything is ready, you can just use the T-box™ 2 normally. The external AnB modules work exactly the same as the existing hardware in the T-Box™ 2, so you already know how to use them.



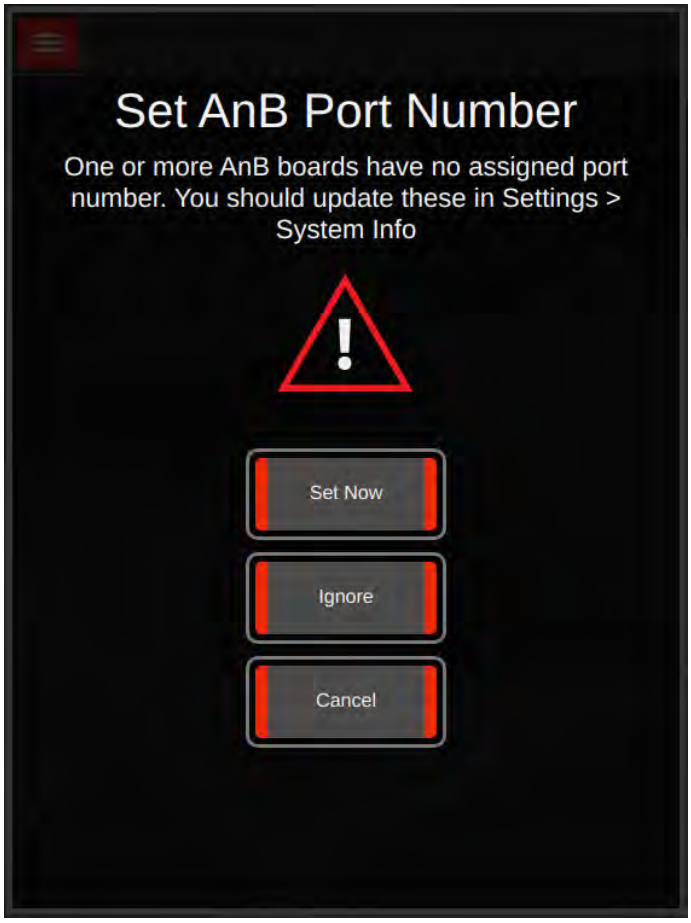
NOTE: **If you did not yet set a port number, the external module will be flashing a warning on the screen to set the port (it looks the same as when an AnB firmware update is required, and in the same way, if you select it, will open a popup message that offers to take you to the System Info screen to set the port).**

Similarly, to use external AnB modules for graphing, you should see the additional port designation appearing as an option when choosing which data source you're using for each axis.



NOTE: **If you did not yet set a port number, a popup warning will occur when trying to open the Graphing screen (it looks the same as when an AnB firmware update is required, and in the same way, will take you to the System Info screen to set the port).**

NOTE: **Using Graphing screens, it is theoretically possible to simultaneously capture graph data from up to 4 different transducers at once (using 4 AnB modules, two per each screen). This will tax the T-Box™ 2 quite heavily and is not recommended at high sample rates.**



Disconnecting a Module

To disconnect an external AnB module, it's important to stop using it first. You can ensure this is the case either by returning both task windows to the main menu screen, or by turning the T-Box™ 2 off.

At this point, the module should be idle and you can unplug the AnB module's USB cable. When you next refresh the list of available AnB modules on the AnB selection screen, or use the Graphing screen, the external AnB module will no longer be present as an option.

NOTE: You should power off/disconnect any equipment attached to the external AnB module's ancillary port before disconnecting the external AnB module.

NOTE: If you remove the AnB module while it is in use, you risk rendering it inoperable until the T-Box™ 2 is restarted, and unpredictable behaviour from the user interface and the AnB module itself. This may include unpredictable behaviour of any equipment connected to the AnB ancillary port at the time. Only remove the external AnB module when it is not actively in use. If an AnB module is accidentally removed while in use, the T-Box™ 2 user interface will attempt to gracefully close any task(s) that were using it, but you will lose any unsaved data from those tasks.

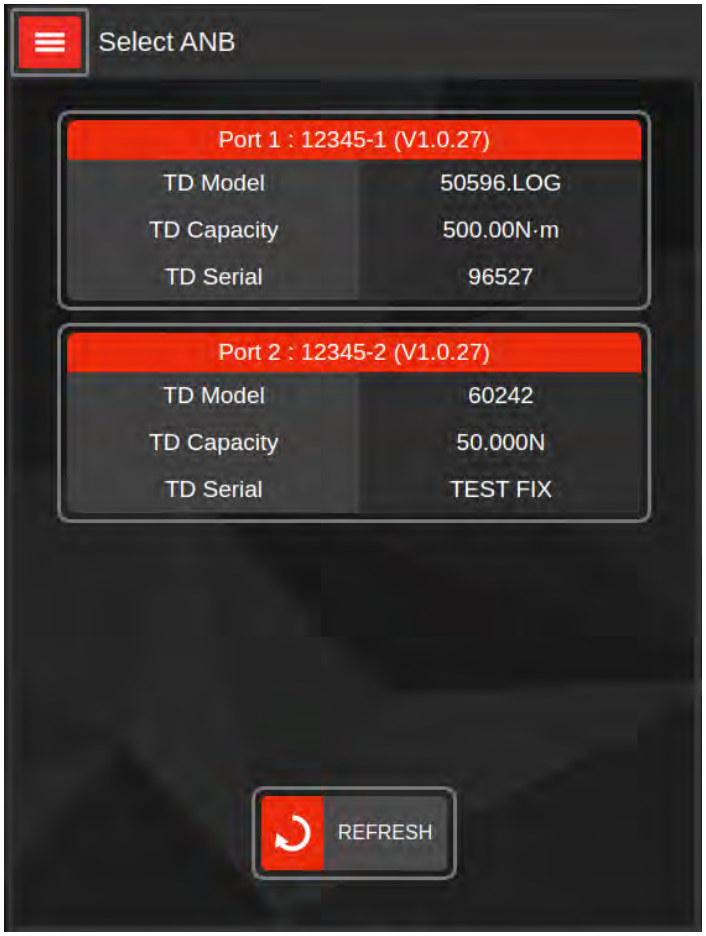
Select AnB Screen

The T-Box™ 2 contains two inbuilt AnB (analogue board) modules, allowing for simultaneous reading of two transducers.

The Select AnB menu is used to select one of the two AnB (transducer) ports for measurement and is opened when the user wishes to use the Measure Screen. Once selected you will be taken to the Measure Screen. The example below shows a torque transducer (500 N·m) connected to AnB port 1 and a force transducer (50 N) attached to AnB port 2.

If you wish to measure from both transducers simultaneously, use the second window to open a second Measure screen and select the other AnB for that screen.

To select a transducer just tap on it. If you remove or connect transducers, press REFRESH to update the changes on the screen.

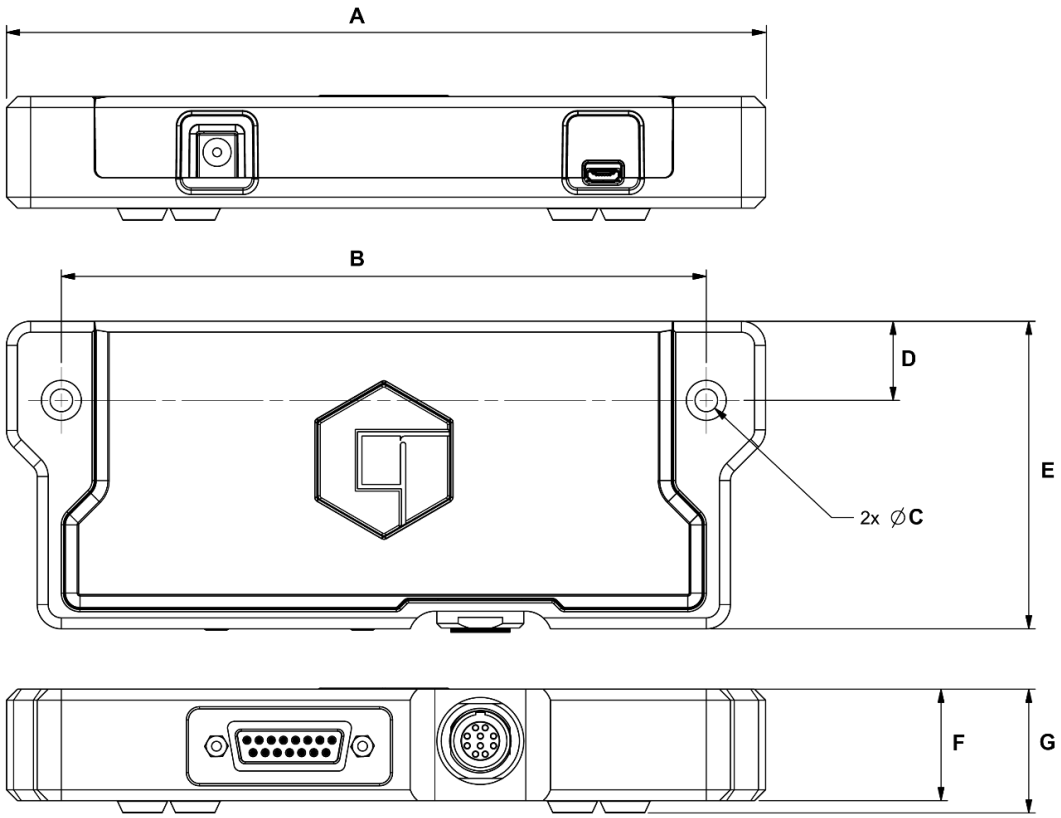


Updating the AnB Modules

1. From the Select Task screen tap Settings.
2. Now Tap System Info; the AnB modules should be listed in a table.
3. Compare each AnB firmware version with the “Latest AnB Firmware” field in the System Information panel. Outdated AnB modules will also have a yellow warning in the Firmware column stating as such.
4. Tap the AnB module to you want to update.
5. Select Update Firmware.
6. Click ‘I Understand’ on the warning screen.
7. Wait for Update to complete. Do not turn off the T-Box™ 2 or close the T-Box™ 2 UI during the update.
8. If you get an Error at the end of the update Restart the T-Box™ 2.
9. Check version Numbers of AnB module.
10. Repeat steps 3 - 7 for another AnB module.

SPECIFICATION – GENERAL

Part Number	Dimensions (mm)						
	A	B	ØC	D	E	F	G
43543	173	147	Ø5.2	18	70	25.4	28.2



Operating Temperature Range:	+5°C to +40°C.
Storage Temperature Range:	-20°C to +70°C.
Maximum Operating Humidity:	85% Relative Humidity @30°C.
Power Supply Adapter:	100 to 240 V A.C. at 50 - 60 Hz input. 15 V, 3.36 A D.C. output (centre positive).
Weight:	0.36 kg (AnB only, no cables or power supply)
Case Housing Materials / Finish:	Material: 6082 Aluminium Finish: Natural
Case Lid Materials / Finish:	Material: PA2200 Nylon Finish: Nickel based conductive spray paint
Environmental Protection:	IP40
Environment :	Indoor use within a light industrial environment.
Electromagnetic Compatibility: (EMC) Directive	Designed to comply with EN 61326-1
Low Voltage Directive:	Designed to comply with EN 61010-1

NOTE: Due to continuous improvement all specifications are subject to change without prior notice.

SPECIFICATION – TRANSDUCER INTERFACE

Smart Transducers

Norbar ‘SMART’ transducers store the calibration data; they are available in 4 types:

Suffix	‘SMART’ Transducer Description		
	Integral Angle Encoder?	Calibration	mV/V Figure Supplied
XXXXX.IND	No	mV/V	Yes
XXXXX.INDA	Yes	mV/V	Yes
XXXXX.LOG	No	With a T-Box™ 2 in torque units	Yes
XXXXX.LOGA	Yes	With a T-Box™ 2 in torque units	Yes

For additional accuracy SMART transducers can be factory programmed with a second-degree polynomial, so any slight errors can be reduced. These transducers are identified as ‘linearised’ on the transducer information screen.

Pin Connections

Pin No	Function
1	+ve transducer excitation.
2	-ve transducer excitation.
3	+ve transducer signal.
4	-ve transducer signal.
5	Digital 0 volts.
6	Digital +5 volts for transducer selected, digital 0 volts when not selected.
7	Rotary transducer angle input (Channel A).
8	Rotary transducer angle input (Channel B).
9	Serial clock (SMART memory).
10	Serial data (SMART memory).

Connector Type

10-way ‘Push-Pull’ style panel socket.

SPECIFICATION - ANCILLARIES

The Ancillaries connector contains inputs and outputs for connection to external equipment.

Pin Connections

Pin No	Function
1	Digital +5 V (maximum current 5 mA).
2	External PRINT / RESET Input (Active High).
3	Low Limit Torque Output.
4	Pass Limit Torque Output.
5	High Limit Torque Output.
6	Low Limit Angle Output.
7	Pass Limit Angle Output.
8	High Limit Angle Output.
9	Digital 0 V.
10	Tool Stop Output.
11	Analogue Output.
12	Analogue Output 2.5 V.
13	Analogue Output 0 V reference (Do not connect to a noisy electrical ground).
14	External Snug Trigger Input.
15	Not Used.

Connector Type

9-way male ‘D’ type connector.

Connecting Lead

A 9-way female to 9-way female null modem connecting lead is required for connection to a PC with a 9-way male connector.

MAINTENANCE

Calibration

Your instrument has been supplied with a clockwise certificate of calibration. To maintain the specified accuracy, it is recommended that the instrument is recalibrated at least once per year. Recalibration should be carried out by the supplier or by a supplier approved agent, where all the facilities to ensure the instrument is functioning at maximum accuracy are available.

Repair

Repair should be carried out by the supplier or by a supplier approved agent, where all the facilities to ensure the instrument is functioning at maximum accuracy are available.

Cleaning

Do not use abrasives or solvent-based cleaners.

Product Disposal

This symbol on the product indicates that it must not be disposed of in the general waste.

Please dispose of according to your local recycling laws and regulations.

Contact your distributor or see the Norbar website (www.norbar.com) for further recycling information.

NORBAR TORQUE TOOLS LTD

Wildmere Road, Banbury,
Oxfordshire, OX16 3JU

UNITED KINGDOM

Tel + 44 (0)1295 270333

Email enquiry@norbar.com

For the most up-to-date version of the Operator's Manual, please scan the QR code below.

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