



User manual

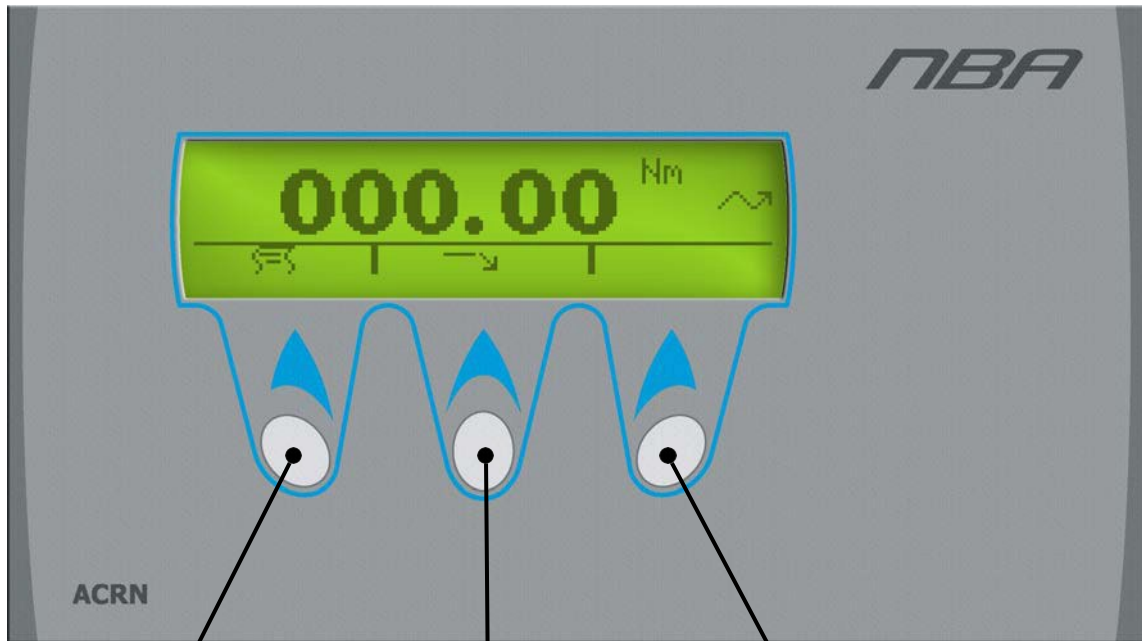
**NBA**

ORIGINAL MANUAL v3.0

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I. Quick reference guide



**Short press:**  
Print  
**Long press:**  
Footer editing

**Short press:**  
Clear peak value  
**Long press:**  
Tare

**Short press:**  
No function  
**Long press:**  
Display sensor characteristics

**3Tch sets**  
**Short press:**  
User configuration  
**Long press:**  
General configuration

*This page can be displayed on the workstation.*

## II. General characteristics

The **NBA** is a torque measuring device controlled by a microcontroller card, allowing for customized configuration of its operation via simple keyboard commands.

The box has only three keys, which have different functions depending on the application. A pictogram at the bottom of the display opposite the key indicates its function.

All data is stored in non-volatile memory. According to the manufacturer, the retention period is 30 years. A test cycle is performed each time the device is powered up.

## III. Start-up

The **NBA** must be powered by 220V. Plug it into the socket provided for this purpose at the rear of the box. Turn on the device.

If the central button is held down while the power is turned on, the program version number is displayed. This makes it easy to track any customizations or modifications made to your box. Releasing the button resumes the normal program.


When the program is launched, the **NBA** checks the calibration frequency (12 months–*Standard*).


If the period has been exceeded, the following screen is displayed:



Pressing the "**Ent**" button puts the box in measurement mode. The customer is responsible for requesting calibration from **ACRN**.


#### IV. Use

Depending on your choice, the **NBA** was delivered with a V-clamp or a 4-pin plate. Position the sample to be measured, and if necessary, reset the display by pressing the  key.

The sensor tare is calculated when the power is turned on. In the event of drift, it can be reset by pressing and holding (2 seconds) the button .

During the prolonged press, Tch becomes .

Perform your test (screwing or unscrewing). The display shows the value in the selected unit.

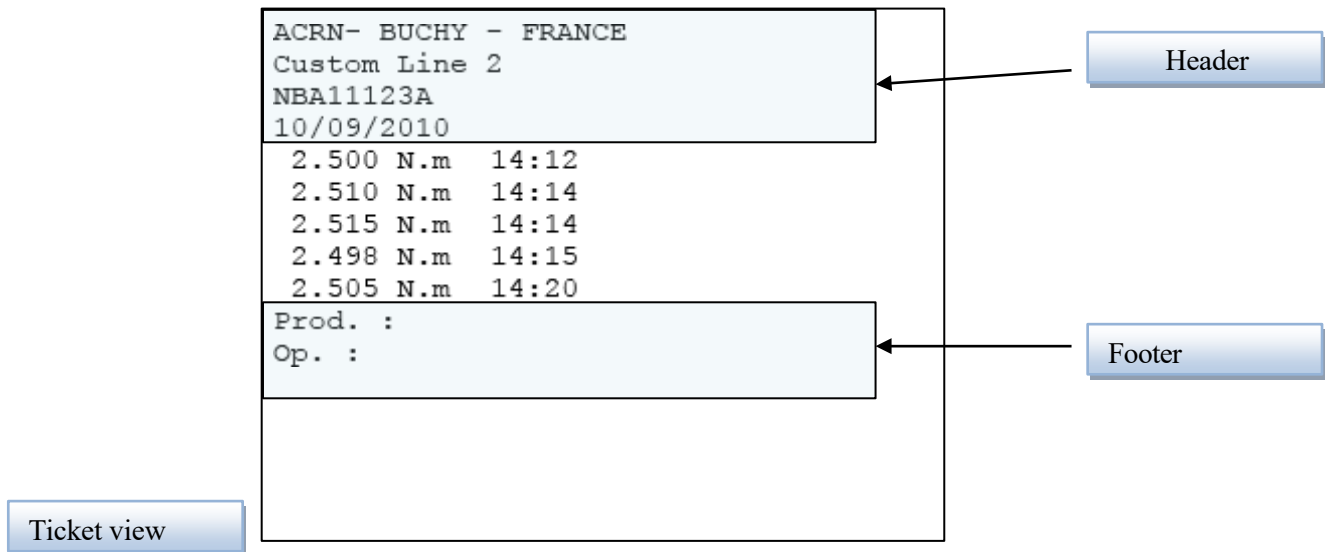
The value is output to a terminal (printer, PC, etc.) using the  button. Depending on the configuration, there are many different types of output:


- Only the value.
- The value and the unit.
- The date at the beginning of the ticket and the time of the reading at the end of the value.
- Editing of the "Custom line" customer line(s) in the header, before the

date. All these configurations can be adjusted according to the user's choice.

Only the value	Value and unit	Time-stamped
<pre>3.000 3.000 3.000</pre>	<pre>3.000 N.m 3.000 N.m 3.000 N.m</pre>	<pre>20/06/2008 3.000 N.m 12:40 3.000 N.m 12:40 3.000 N.m 12:40</pre>
Complete edition	CL1 only	Only CL2
<pre>ACRN - BUCHY - FRANCE Custom line 2 20/06/2008 3.000 N.m 12:40 3.000 N.m 12:40 3.000 N.m 12:40 1.316 N.m 12:41 1.316 N.m 12:41 0.150 N.m 12:41 0.301 N.m 12:41 3.000 N.m 12:41 300.000 N.cm 12:41 30.590 Kgf.cm 12:41 26.560 lb.in 12:41</pre>	<pre>ACRN - BUCHY - FRANCE 20/06/2008 3.000 N.m 12:40 3.000 N.m 12:40 3.000 N.m 12:40 1.316 N.m 12:41 1.316 N.m 12:41 0.150 N.m 12:41 0.301 N.m 12:41 3.000 N.m 12:41 300.000 N.cm 12:41 30.590 Kgf.cm 12:41 26.560 lb.in 12:41</pre>	<pre>Custom line 2 20/06/2008 3.000 N.m 12:40 3.000 N.m 12:40 3.000 N.m 12:40 1.316 N.m 12:41 1.316 N.m 12:41 0.150 N.m 12:41 0.301 N.m 12:41 3.000 N.m 12:41 300.000 N.cm 12:41 30.590 Kgf.cm 12:41 26.560 lb.in 12:41</pre>

Pressing the key briefly  prints the value on the ticket



At the end of the test campaign, pressing and holding the  button prints the footer, and the header will be printed again during the next measurement.

## V. Overview of device functions

**The** NBA's digital card can be easily programmed by accessing menus with several submenus:

These menus are divided into two groups (General Configuration Menu and User Menu):

### General configuration menu.

- [Configuration Use.](#)
- [Ticket configuration.](#)
- [RS232 Configuration.](#)
- [Modification of "customer lines" \(Custom line\).](#)
- [Modifying date/time.](#)
- [Winter time/summer time changeover.](#)
- [Keypad code.](#)
- [Display contrast adjustment.](#)

### User configuration menu.



- [Unit of measurement.](#)
- [Measurement mode.](#)
- [Sensor status.](#)

**The general menu** can be **accessed** by pressing the 3 buttons simultaneously when turning on the device or by pressing and holding (5 seconds) during normal operation of the device.

**The user menu** can also be accessed by pressing the three buttons simultaneously for a short time during normal operation of the device.

The **NBA** then displays the following screen:



By pressing the keys  or , you can access the various functions mentioned above.

The function itself is accessed by pressing **Ent**.

After 5 seconds without keyboard input, the **NBA** returns to normal operating mode.

## VI. General configuration menu programming

*(Press all 3 keys simultaneously when turning on the device or press and hold (5 seconds) during normal operation of the device)*

### Mnu-G.1 – Configuration Use.

This menu allows you to manage the general configuration of

**the NBA.** In the general menu, go to the "Conf. Use" menu.

- Confirm with **Ent**.

The following screen is then displayed.



The selected option number is displayed in reverse video (*here, No. 1*).

Use the **Sel.** key to select the different options.

Move to the next option using the **Suiv.** key and proceed in the same way.

1 - The "##. to ##.000" option allows you to select the display accuracy. (Number of digits)

2 - The "f/1 to f/8" option allows you to choose the type of acquisition filter to use for measurement.

3 - The "TARE ON/OFF" option allows you to choose whether or not the unit performs an auto-zero of the sensor when powered up.

4 – Language selection.

## Mnu-G.2 – Print ticket configuration.

There are five options on the ticket that can be printed or not. In the main menu,

go to the "**Ticket Settings**" menu.

- Confirm by pressing **Ent**.

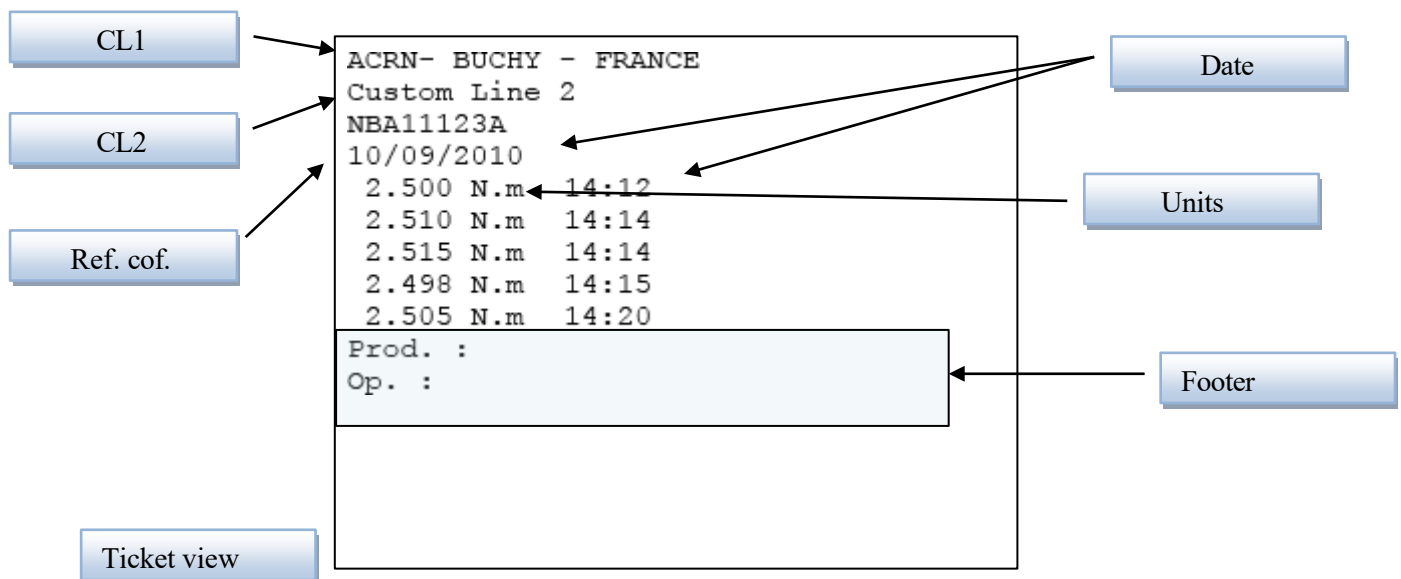
The following screen is then displayed.

1	CL1+CL2	Unit. ON	4
2	Date ON	Pied page	5
3	Ref. ON		
Sel. Suiv. Fin			

As with Mnu-G.1, select the various options.

5 – If option No. 5 is disabled, the footer will not be printed.

Once you have finished, return to the main menu by pressing the **Fin** key.



### Mnu-G.3 – RS232 configuration.

This menu allows you to configure the RS232 serial connection to a printer or PC. In

the general menu, go to the "**RS232 Config.**" menu.

- Confirm with **Ent**.

The following screen is then displayed.



As with Mnu-G.1, select the various options.

1 – Transmission speed **4800Bd** or **9600Bd**.

2 – End-of-line character option **CR** or **CR/LF**.

3 - The "**SL: 01 to 10**" option allows you to edit line breaks at the end of the ticket in order to clear it above the cut.

4 – This option allows you to choose the function of the left key.  
The selected mode can be **IMP** and the key icon is changed:



*IMP*

Or **IMP OFF** and the key icon is empty.

Once finished, return to the main menu using the key **Fin**.



## Mnu-G.4 – Changes to "Custom line" on the keyboard.

The two "custom lines" can be modified on the keyboard by the user using the following procedure:

Select the "**Modify Customer Lines**" function.

- Confirm with **Ent**.

You are now in CL1 modification mode:

- Using the keys " " or ", " you can modify each character directly.
- Confirm by pressing **Ent**.
- Continue until the 24<sup>th</sup> character.

You then move on to modifying **CL2**.

- Proceed in the same way.

**Note:** Editing the header is reset when the device is turned on or when the date is changed if the device remains on continuously, as well as for any modification of Mnu-G.4.

## Mnu-G.5 - Date/Time Setting.

With Mnu-G.5, you can change the date and time. Select the

"**Date/Time Setting**" menu.

- Confirm by clicking "**Ent**."

Proceed as usual for modification.

**Note:** Editing the header is reset when the device is turned on or when the date is changed if the device remains on continuously, as well as for any access to Mnu-G5.

## Mnu-G.6 – Winter/Summer time changeover.

Mnu-G.6 simplifies the changeover between winter and summer time. The

options are as follows.

- Winter time
- Summer time (+1h)

Select the "**Summer Time**" menu

- Confirm by clicking "**Ent**."

Proceed as usual for the modification.

## Mnu-G.7 – Keypad lock code.

Mnu-G.7 allows you to set a keypad lock code to prevent operators from modifying the stored settings.

This number ranges from 0 to 99.

**Note:** Code 0 disables the keypad lock function.

If you forget the code, please contact **ACRN** for instructions on how to proceed.

Select the "**Keypad code**" menu

- Confirm with **Ent**.

Using the keys  or  to change the code (from 0 to 99).

- Confirm by pressing **Ent**.

## Mnu-G.8 – Adjusting the display contrast.

Depending on the temperature or ambient light, the display may be more or less visible. With this menu, the contrast can be adjusted.

Select the "**LCD Contrast**" menu

- Confirm with **Ent**.

By pressing the keys  or , you can change the contrast in real time.

- Confirm with **Ent**.

(Depending on the general configuration, you may need to enter the unlock code.)

### Mnu-U.1 – Select the unit of measurement.

We will choose the **NBA** work unit.

Access the "user menu" as seen previously, by pressing the 3 keys. By pressing to go

to the "Units" 

- Confirm with **Ent**.

By pressing the keys  or , you can access the different units.

- Confirm by pressing **Ent**.

- Confirm a second time by pressing **Ent** to return to the measurement.

The main screen will then display the measurement in the selected unit.

*Measurement in Nm*

For example:



*Symbol displayed*

### Mnu-U.2 – Programming the measurement mode.

This menu is used to select the device's operating mode.

We can work in several modes.

- Tracking mode: the display returns to 0 when the torque is released.
- Stored (the display stores the value) \_\_\_\_\_
- Stored from a certain value (trigger) \_\_\_\_\_
- Reset of the value after 2 seconds. \_\_\_\_\_
- Reset value after 5 seconds. \_\_\_\_\_



Access the "user menu,"

Select the "**Measurement Mode**" menu

- Confirm with **Ent**.

Press the  or  to select the desired mode.

- Confirm with **Ent**.

### Mnu-U.3 – Sensor Status.

The sole purpose of this menu is to indicate the status of the sensor. This is useful if you suspect that the sensor may have been misused, preventing it from returning to zero in the rest position. (*Forced sensor*)

Go to the "user menu" and select the

"Sensor Status" menu.

- Confirm with **Ent**.



The offset must not exceed  $\pm 5\%$ .

- Confirm with **Ent**.

**Note:** If excessive force is applied to the sensor, it may become irreversibly deformed. In this case, a message (ZBA) is displayed continuously in measurement mode.

## VII. Programming and control via RS232 terminal

The **NBA** can also be programmed via RS232 access (*4800bd, 8b, 1stop, NoParity*):  
It also includes functions such as date and time updates.

Cde	Description
CUN0	N.m
CUN1	N.cm
CUN2	Kgf.cm
CUN3	Lb.in
CDYN	Tracking mode
CMEM	Peak Mode
CM2S	Peak Mode - Raz 2s
CM5S	Peak Mode - Reset 5s
CTE0	Tch IMP OFF
CTE1	Tch IMP ON
CTM	Manual tare
CAT	Auto tare at start-up
CEU0	Unit editing OFF
CEU1	Unit Edition ON
CEH0	Timestamp Edition OFF
CEH1	Timestamp Output ON
CCL0	CL Edition OFF
CCL1	CL1 Edition
CCL2	CL2 edition
CCL3	CL1 and CL2 Edition
CHHV	Winter Time Conference
CHET	Conf. Summer Time
CAC0	Display ##.
CAC1	Display ##.0
CAC2	Display ##.00
CAC3	Display ##.000

### Setting the time and date.

Depending on the **NBA** delivery time zone, it may be necessary to change the time. This can be done via the device's RS232 port.

The command is as follows:

ETM=hhmm followed by the ENT key

The same applies to the date:

EDT=ddmmyyyy □ /ENT/

### Programming "Custom Lines".

The **NBA** has two "custom lines" which are free text lines used for ticket editing or linking to a PC or other device.

Each line has a capacity of 25 characters.

To configure them, use the following command: *(example)*


ECL1=Company name → /ENT/ The

**NBA** responds "OK"

ECL2=Station number → /ENT/ The


**NBA** responds "OK"

### Controlling printouts.

By sending the character "M" or "m", the **NBA** returns the displayed value to the terminal in the selected format. This is identical to pressing .

By sending the character "F" or "f", the footer is edited and the ticket advanced according to the value programmed in Fct.2.

This is identical to pressing and holding .

With the uppercase or lowercase letter "Z," the peak memory is reset to zero, similar to pressing .

Other commands allow the user to read the accessible configurations.

Cde	Description	Format	Example or Original message
LCL1	Play Custom line 1	string	"Line_1 = ACRN - BUCHY - FRANCE"
LCL2	Custom line 2 reading	string	"Line_2 = Custom Line 2"
LMOD	Reading the measurement mode	string	"MOD=DYN"
LACQ	ACQ Mode	string	"ACQ=RESET"
LEDT	Edit mode	string	"EDT=MAN" or "EDT=AUT"
LUNT	Current unit	string	"UNT=0" to 3
LEU	Editing units or not	string	"EU=With" or "Without"
LVER	Software version number	string	"V1.00"
LTM	Time reading	Time=hhmn	Time=11:53 p.m.
LDT	Date reading	Date=dd/mm/yyyy	Date=05/13/2008
LEH	Timestamped or not	string	"Timestamp=On"
LHHV	Winter/summer time reading	string	"Summer time"
LECL	Custom line edition	string	"LECL=CL1"

## VIII. RS232 connector

The **NBA** has a PC-compatible RS232-V24 serial connection. (Sub D 9 Female.).

**Speed:** 4800Bd

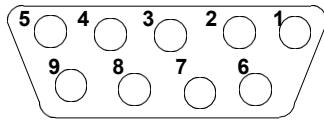
Format:

1 Start bit, 8

Data bits

1 Stop.

Pinout:



Pin no.:	Signal
1	Not used.
2	Rxd ← Receive.
3	Txd → Transmission.
4	Not used.
5	0V Ground.
6	Not used (Reserved for Mitutoyo interface).
7	Not used (Reserved for Mitutoyo Interface).
8	Not used (Reserved for Mitutoyo Interface).
9	Not used (Reserved for Mitutoyo interface).