Sensata Technologies NMS100 Series Serial Readout System User Guide

Contents

Sensata Technologies NMS100 Series Serial Readout System

USER MANUAL

NMS100 Series
Serial Readout

Specification

Electrical

EU Directive 73/23/EEC (Low Voltage Directive)
BS EN 55022:1998 Class B
BS EN 61326-1:2021 E1
Input to Power Supply Unit (Supplied)
100-240V (47-63Hz)
External switch-mode – Output voltage 15VDC
Input Voltage to NMS100 12-27VDC ±10%
Conforms to Low Voltage Directive

Physical

Height 104mm (4.1")
Depth 90mm (3.54")
Width 200mm (7.87")
Weight 0.5kg (1.1lb)

Invironment

Climatic Range

Storage Temperature -20°C to 70°C

Working Temperature 0°C to 55°C
Working Humidity 80% R.H. at 30°C

IP-Ingress Protection

IP40 Stand Alone, IP54 Panel Mounted

Accreditation

CE, UKCA

Disposal

At the end of its life, please dispose of the NMS100 system in a safe manner applicable to electrical goods
Do not burn.
The casework is suitable for recycling. Please consult local regulations on disposal of electrical equipment

Input and Resolution

Only Spherosyn Serial or Microsyn Serial encoders can be used with the NMS100 Serial DRO

Display Resolutions

Spherosyn/Microsyn 10μ

Serial 5μm (0.0002")
10μm (0.0005")

Microsyn 5μ Serial

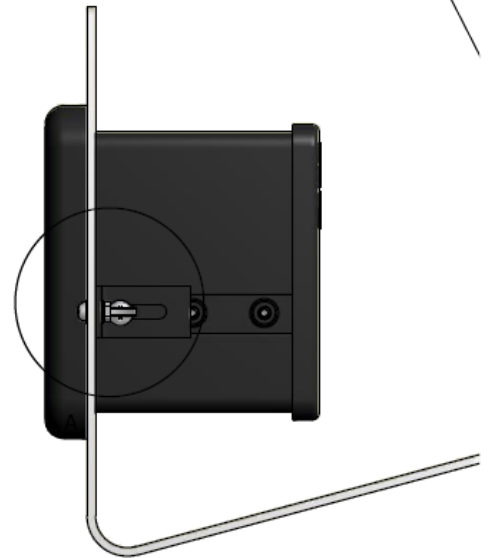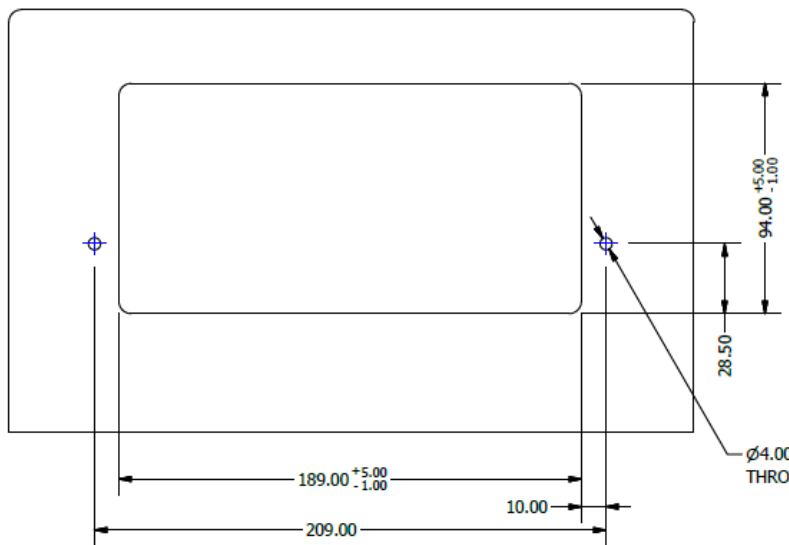1μm (0.00005"); 2μm (0.0001"); 5μm (0.0002"); 10μm (0.0005")

Newall Measurement Systems Limited reserves the right to make changes to this specification without notice

Mounting options

Standalone Mount Options

Panel Mount Option

Connection details

Important Details

The NMS100 is only compatible with Newall Spherosyn Serial and Microsyn Serial encoders. During the install it is important to ensure that:

- Secure all the cables to prevent the connectors from dropping into hazardous positions (for example the floor or coolant tray) when they are unplugged.
- Route all cables to prevent them from being caught on moving parts.
- The NMS100 is grounded to the machine, using the braided grounding lead provided, before the machine supply is turned on.

- The power has been disconnected, before the encoder(s) are connected. Do not connect this unit directly to the mains supply.

Connections

Cabinet equipotential terminal for grounding to machine

External PSU input

Encoder input connection

Auxiliary RS232 output (see page 29)
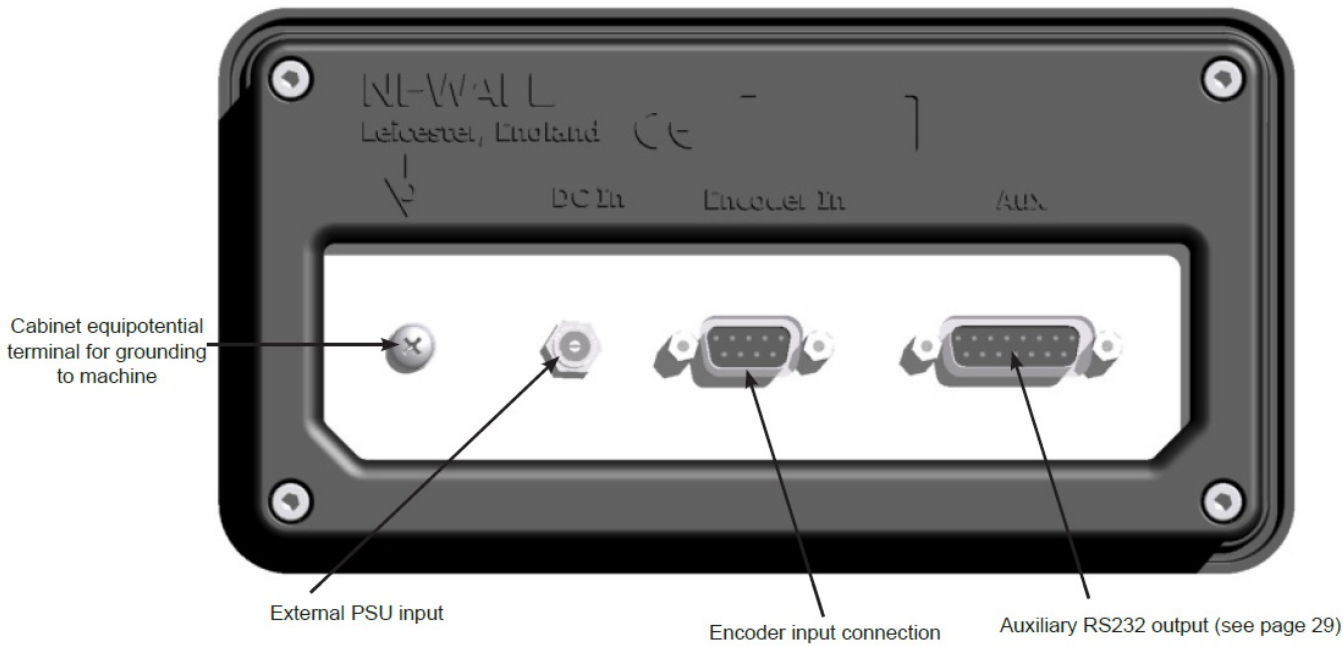
Display and keypad

Understanding The Display

Axis 1

Message display

mm/inch Short cut

ABS/INC Short cut

Zero/Set Short cut
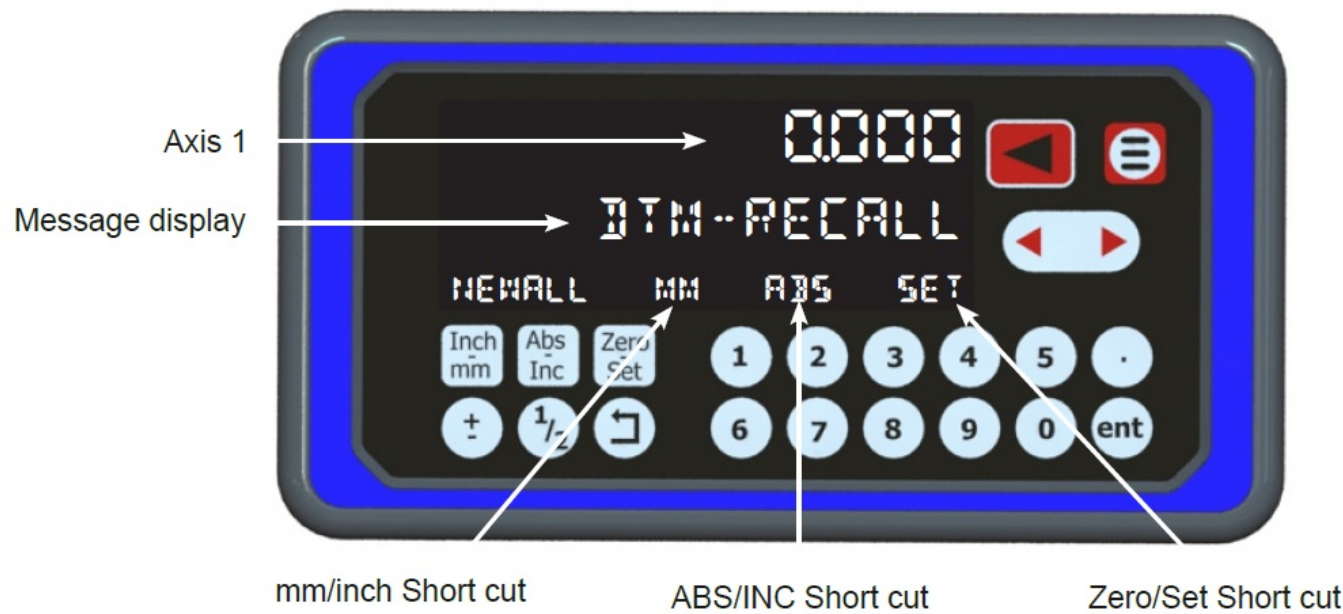
Understanding The Keypad

	Axis selection key			Zero Set	Switches between zero and axis pre-set modes
				Abs Inc	Switches between absolute and incremental modes
7 8 9				Inch mm	Switches between inch and mm display
4 5 6	Numeric keys				
1 2 3					Back / cancel key
. 0					
ent	Enter key				Menu key
◁ ▷	Navigation keys			1/2	Centre find
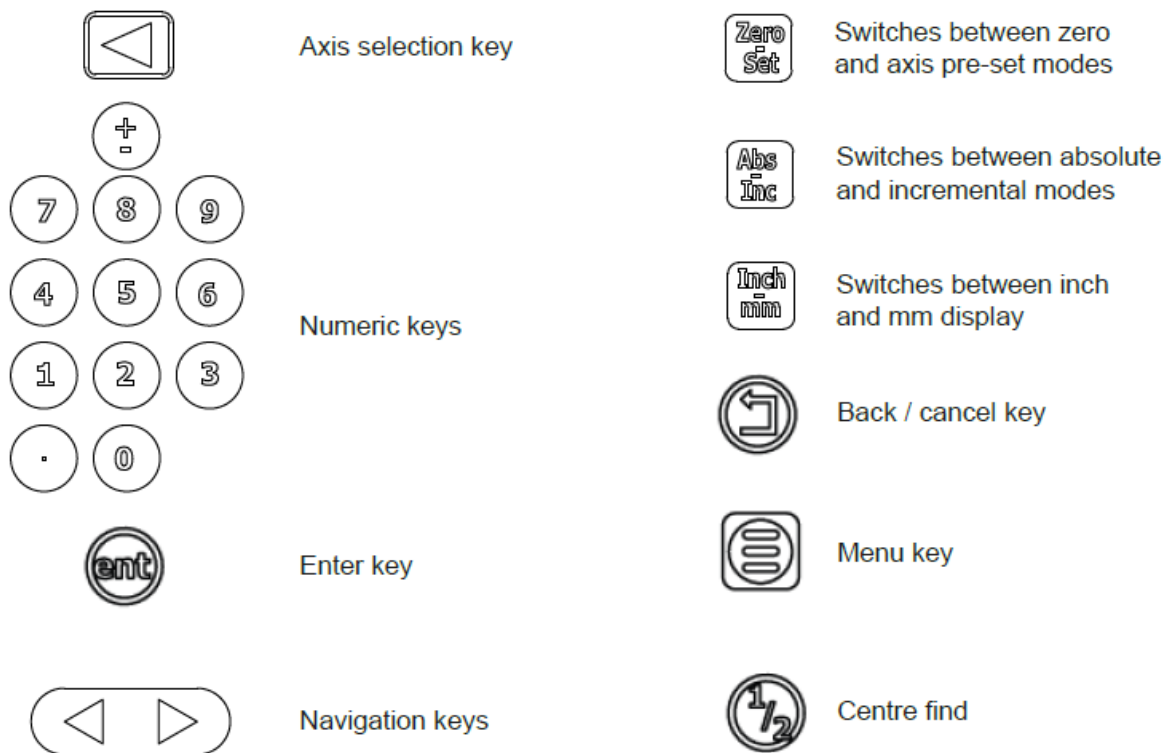
Setting up the unit

Navigating Setup

How to enter setup

How to enter setup

☰ ◁ ▷ `DRO SETUP` (ent) `CODE` ④ ⑧ ⑥ ②

`SETUP~LANGUAGE` → `ENG GB` ◁ →

`ENG US`	`ESPANOL`
`FRANCAIS`	`DANSK`
`DEUTSCH`	`CESKY`
`ITALIANO`	`POLSKI`

(ent)

▷

`SETUP~DISPLAY RES` → `0.005` ◁ →

`0.001`	`0.002`
`0.01`	`0.02`
`0.05`	

▷

`SETUP~DIRECTION` → `----3` ◁ → `E----`

▷

`SETUP~FEED RATE` → `MMINUTES` ◁ → `SECONDS`

▷

`SETUP~FEED RATE` → `LOWER` → `UPPER` ◁

▷

`SETUP~BRIGHTNESS` → `MID` → `HIGH` / `LOW` ◁

▷

`SETUP~BEEP` → `ON` → `OFF` ◁

▷

Setting up the unit

SETUP-LINEAR ERR COMP → 0 TEACH PROGRAM (ent)

▷

SETUP-SCALING → 1000

▷

SETUP-SLEEP → OFF 5 MINS | 10 MINS
30 MINS | 60 MINS

▷

SETUP-RESET → NO YES

[⮌] to exit setup and return to menu, or [☰] to exit setup and return to measurement display

Language Setup

This setting enables the user to choose the language that is required to be displayed in the NMS100 display.

There are 9 language settings: ENG GB English UK (**Default**)

ENG US English US   FRANCAIS French   DEUTSCH German

ITALIANO Italian   ESPANOL Spanish   DANISH Danish

CESKY Czech   POLSKI Polish

Press the axis select key [◁] next to the axis to cycle through the options

Display Resolution Setup (Linear)

The display resolution settings available for the NMS100 can not be finer than the encoder resolution. The inch/mm setting will also define the resolution that is actually displayed as per the below table:

	Display	
µm	mm	in
1	0.001	0.00005
2	0.002	0.0001
5	0.005	0.0002
10	0.01	0.0005

Press the axis select key [◁] next to the axis to cycle through the options

Direction of Travel Setup

This setting allows the user to match the NMS100 to the actual direction of travel of the axes fitted to the machine.

The two settings available for each axis are `-- -- -- --3` and `E-- -- -- --`

Press the axis select key `◁` next to the axis to cycle through the options

Example:

If the current setting is `-- -- -- --3` **and if the travel is positive from right to left, changing the**

setting to `E-- -- -- --` **will reverse the direction to measure positive from left to right**

Feed Rate Setup

`MINUTES` `◁` to change between minutes and seconds

`SETUP-FEEDRATE` Settings available are: in/minutes, in/second, mm/minutes & mm/second

`SECONDS`

`SETUP-FEEDRATE` `Inch mm` to change from inches to millimetres in conjunction with this function

Feed Rate Display Setup

The feed rate display setting can change where the feed rate is displayed on the NMS100 screen. This can be useful if the feed rate is the more useful information that is required to be displayed.
Note: The feed rate will need to be activated in the functions menu before being displayed on the NMS100 screen.

Settings available for feed rate display:

`LOWER` When the feed rate is active it will be displayed in the message display, see example below
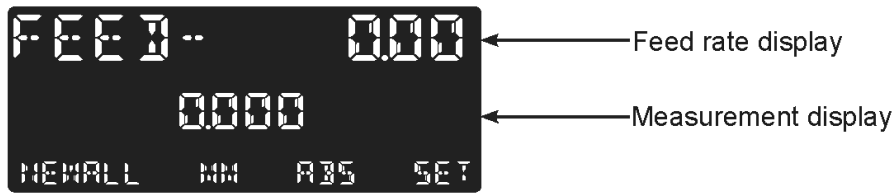
`0000` ← Measurement display

`FEED-- 000` ← Feed rate display

`NEWALL MM ABS SET`

Press the axis select key `◁` next to the axis to cycle through the options

`UPPER` When the feed rate is active it will be displayed in the number display, see example below

FEED⁻   0.00 ← Feed rate display

0.000 ← Measurement display

NEWALL   MM   ABS   SET

Press the right arrow key ▷ to accept the chosen resolution and move on to the next setting

Brightness Setup

This setting allows the user to alter the brightness of the display, this can be useful in varying ambient light conditions.

Settings available for brightness:

MID   The default brightness is medium

Press the axis select key ◁ next to the axis to cycle through the options

HIGH   Setting to high brightness increases the display brightness to its maximum

LOW   Setting to low brightness decreases the display brightness to its minimum

Press the right arrow key ▷ to accept and move on to the next setting

Beep / Tone Setup

This setting enables or disables an audible tone coming from the unit when a button is pressed.

ON ◁   The default setting is on

Press the axis select key ◁ next to the axis to cycle through the options

OFF   Once turned off no audible tone will be made

Press the right arrow key ▷ to accept and move on to the next setting

Error Compensation

The digital readout (DRO) system helps to improve productivity. It decreases the number of scrapped parts, as there is no concern about making mistakes related to counting the revolutions on the dials. The DRO system also helps to eliminate some errors related to ball-screw backlash.

The DRO system will operate to its published accuracy, provided all components are in working order and properly installed. Field calibration is not necessary.

Accuracy problems with machined parts may be caused by machine error, installation inaccuracies, or a combination of both. The first step in determining the source of error is to check the DRO system. To do this compare the movement of the Newall reader head to the position reading shown on the display. A high accuracy standard, such as a laser interferometer is required. A dial indicator can be used to check short distances, but a laser provides the best results. If a dial indicator must be used, be sure it is the highest available accuracy.

To check the accuracy of the DRO system:

1. Place the target of the laser or the needle of the dial indicator directly on the Newall reader head. It is absolutely critical that the readings are taken directly from the Newall reader head. If a dial indicator must be used, be sure that the needle of the indicator is perpendicular to the reader head and not angled. If readings are taken anywhere else on the machine, machine errors may distort the results.
2. When the reader head moves, the movement registers on the laser / indicator and DRO display.
3. Set the laser / dial indicator and DRO position displays to 0.
4. Make a series of movements and compare the position readings between the laser / dial indicator and the DRO display. If the readings match within the accuracy specified, it proves that the DRO system is op-erating properly. If this is the case, proceed to the next step: evaluating the machine errors. If the readings do not match, the DRO system must be repaired before proceeding with error compensation.

To evaluate machine errors:

1. Put the laser target / dial indicator on the part of the machine where the machining is done.
2. Make a series of movements and compare the position readings between the laser / dial indicator and the DRO display. The difference between the laser / dial indicator reading and the reading on the DRO display is the machine error.
3. Plot the machine error along the entire axis of travel to determine the nature of the error. If it is a linear error, use linear error compensation. If the error is not linear, use segmented error compensation.
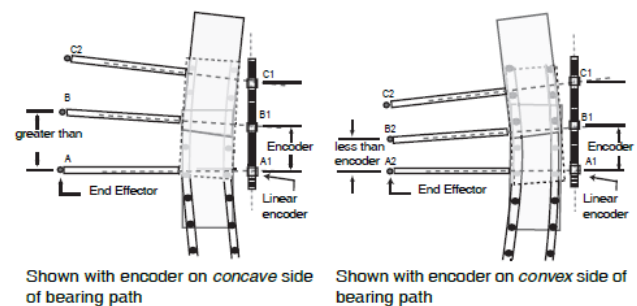
Types of Machine Error

There are many types of machine error, including pitch, roll, yaw, flatness, straightness, and Abbé error. The diagrams below demonstrate these errors.
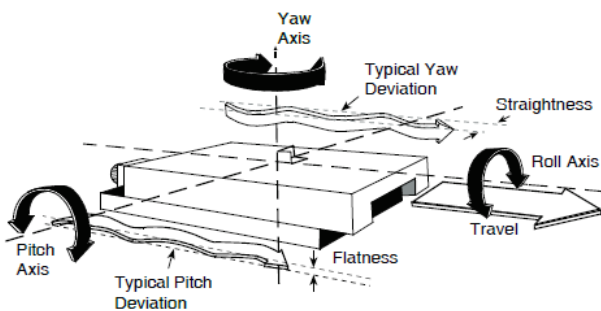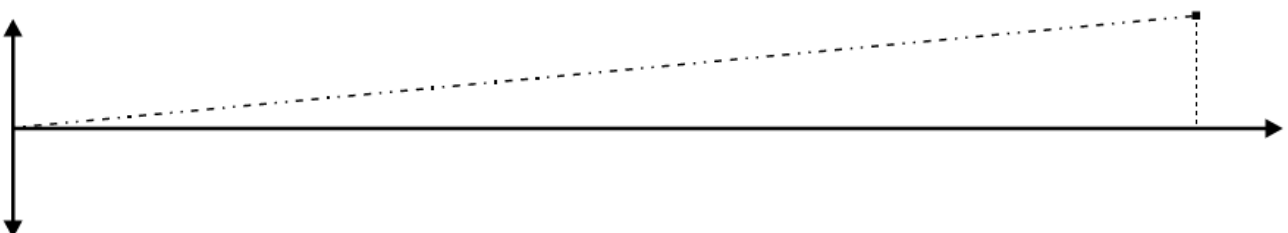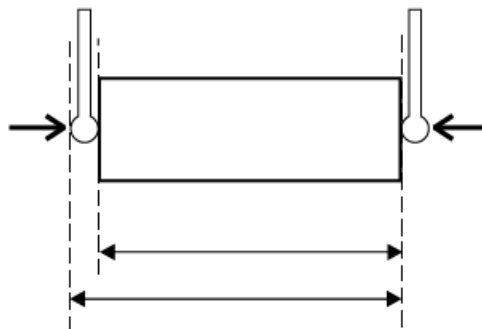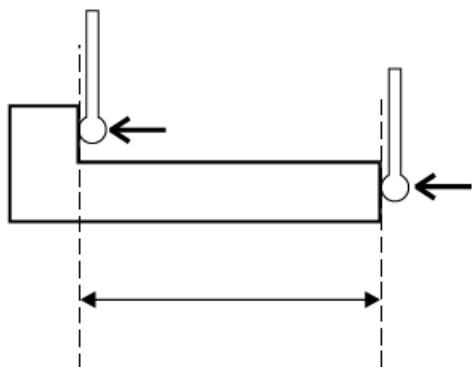

Linear Error Compensation

In this mode, a single constant correction factor is applied for each axis for all displayed measurements. Calculate the correction factor, and specify it in parts per million (ppm).

When following the procedure ensure that a stepped standard is used, and approach each edge from the same direction; or if each edge must be approached from opposite directions, then subtract the width of the tool or measuring probe from the value displayed on the NMS300.

When navigating to Linear error compensation setup the below screen will be displayed, the value will be the compensation that is currently applied, the default is 0, where no compensation is being applied.

0 Compensation value currently applied

SETUP - LINEAR

NEWALL   MM   ABS   SET

Press the axis select key ◁ next to the axis to cycle through the options

TEACH Teach mode, compares physical movement with actual measurement

PROGRAM Program mode, allows the ppm value to be entered once calculated manually

Teach Mode

TEACH

Press the (ent) key to begin the teach process

0.000 encoder position (start point)

TCH - START

Press the (ent) to accept the start point

1000.000 encoder position (end point)

TCH - END

Press the (ent) to accept the end point

TCH - MOVEMENT

enter the actual measurement using the numeric keypad

```
 1000.500
TCH··  EDITING
```

Press the (ent / ≡) to accept the actual measurement

```
 1000.500
TCH··  MOVEMENT
```

Press the (ent / ≡) to confirm the actual measurement

```
 -500
TCH··  ACCEPT
```

Program Mode

Program mode allows the linear compensation to be calculated manually and then entered as a PPM value into the NMS100 display.
The procedure to do this is shown below:

To illustrate the calculation an example is being used where the standard distance is 500.000mm and the measured distance is 500.200mm.

Correction factor = error / actual x 1,000,000
Correction factor = (500.000 - 500.200) / 500.000 x 1,000,000
Correction factor = -400 PPM

To enter this value into the display:

```
 PROGRAM
```

Press the (ent / ≡) key to enter the program mode

```
PRG··   PPM
NEWALL   MM   ABS   SET
```

Enter the correction factor using the numeric keypad

```
        -400
PRG -- EDITING
NEWALL    MM    ABS    SET
```

Press the (ent) to accept the correction factor

```
        -400
PRG -- PPM
NEWALL    MM    ABS    SET
```

Press the (ent) key to exit this mode.

Scaling Setup

The scaling setup function allows a constant factor to be applied to the measurement, this can be useful for using the display for indirect measurement purposes.

```
        1.000
SETUP -- SCALING
NEWALL    MM    ABS    SET
```
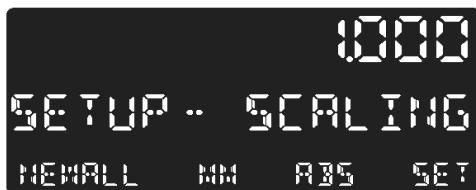
the default value is 1.000, (normal measurement)

Press the (ent / ≡) key to enter the scaling edit mode

```
SCALING -- EDIT
NEWALL    MM    ABS    SET
```

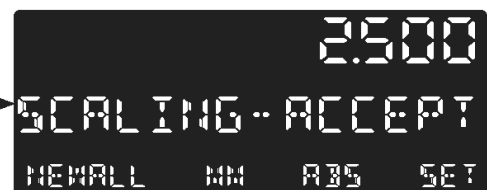enter the desired scaling factor using the numeric keypad

In the example below a factor of 2.5 is being applied

```
        2.5
SCALING -- EDIT
NEWALL    MM    ABS    SET
```

Press the (ent) key →

```
        2500
SCALING -- ACCEPT
NEWALL    MM    ABS    SET
```

Press the (ent) key to accept the scaling factor

This will now apply a 2.5 x factor to the measurement

This setting enables the user to define an automatic sleep mode after a period of time. The user either leaves the default setting at 'off' which deactivates the sleep mode, or selects a predefined value when the sleep mode is initiated after no operation of the NMS100.

To exit sleep mode, simply move an axis or press any key.

`OFF`   'off' disables the sleep function and is the default

Press the axis select key ◁ next to the axis to cycle through the options

`5 MINS` sleep function active after 5 minutes   `30 MINS` sleep function active after 30 minutes

`10 MINS` sleep function active after 10 minutes   `60 MINS` sleep function active after 60 minutes

Once the required value is entered via the numeric keypad, press ⏎ ` to accept the value

This setting enables the NMS100 to be reset to its default parameters.

WARNING:: Enabling this setting will erase any data that was previously stored in the functions and settings of the readout.

```
                    NO
SETUP - RESET
MEMALL    MM   ABS   SET
```

Press the axis select key ◁ next to the axis to cycle through the options

```
                   YES
SETUP - RESET
MEMALL    MM   ABS   SET
```

Press the ⏎ key to reset the unit

At this point the unit will go though its boot up routine as if the unit had the power switched on and off. All the settings will be at the factory default.
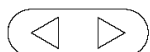
Standard functions

How to enter DRO Info

▤   ◁ ▷   **DRO INFO**   (ent)

1.00   Software Version

SN .. ..   Unit Serial Number

NEWALL   MM   ABS   SET

◁ ▷

TTL/QUAD
DRO TYPE
NEWALL   MM   ABS   SET

Digital Readout Type
(Dependant on model purchased)

↰ to exit DRO Info and return to menu, or ▤ to exit DRO Info and return to measurement display

Absolute / Incremental

Press the [Abs - Inc] key to toggle between absolute and incremental modes.
The NMS100 has a dedicated key to switch the positional displays between absolute (abs) and incremental (inc) measurements. The current display mode is indicated at the bottom of the screen as shown on the right.

Abs

[Abs - Inc]

Absolute (abs) mode has been selected

Inc

[Abs - Inc]

Incremental (inc) mode has been selected

Using incremental mode

In Incremental mode the DRO displays the position relative to the last position. This is also known as point-to-point use. In this mode set the value for each axis, or zero it to create an Incremental datum. This does not effect the machine's Absolute datum that is configured in Absolute mode.
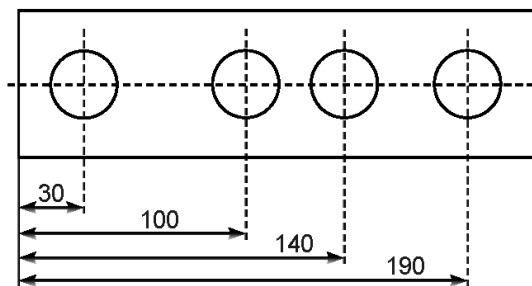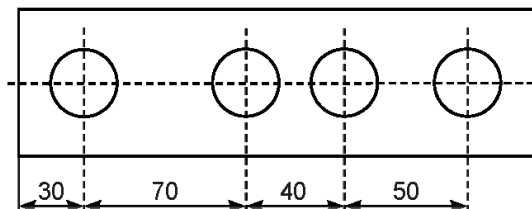
Using absolute mode

In Absolute mode the DRO displays the positions of all the axes with respect to a fixed datum. The datum is set by entering an axis position when in Absolute mode.

30   70   40   50

30   100   140   190

Inch and mm Modes

Press ⌨[Inch - mm] to toggle between Inch and mm measurement modes.

The NMS100 has a dedicated key to switch the positional displays between imperial (inch) and metric (mm) measurements. The current display mode is indicated at the bottom left of the screen as shown right.

mm
[Inch - mm]

Metric (mm) mode has been selected

In
[Inch - mm]

Imperial (In) mode has been selected
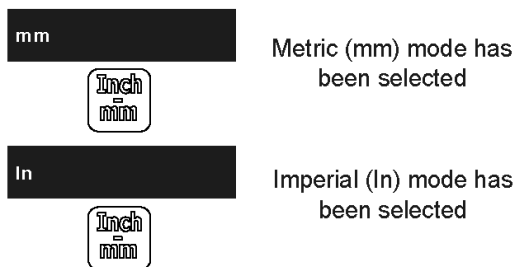
Zero and Pre-set an Axis

Press ⌨[Zero - Set] to toggle between set and zero modes.

The NMS100 has a dedicated key to switch the operation of the axis selection key between zero and set modes. The currently selected mode is indicated at the bottom right of the screen as shown.

Set
[Zero - Set]

Set mode has been selected

Zero
[Zero - Set]

Zero mode has been selected

- -
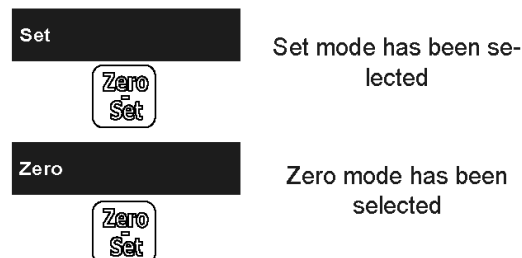
Using set mode

With the set mode selected, the select axis key prompts a numeric entry into the desired axis.
Once the correct value has been selected, it can be set into the axis by pressing the enter key. This can be seen in the example on the right.

`0.000` ◁

`0`

(±) (1) (4) (5) (·) (2) (3) (ent)

`- 145.230`

- -
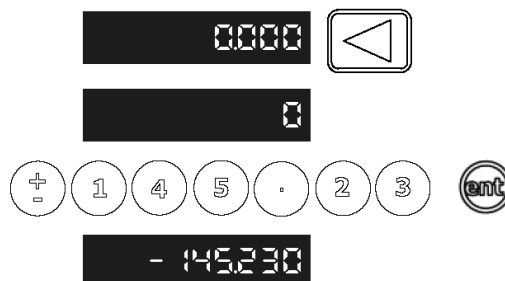
Zeroing an axis in set mode

With set mode selected, it is possible to zero an axis conveniently by holding down the axis select key for at least 3 seconds. This allows the user to zero an axis but stay in the pre-set mode. Use of this feature can be seen in the example on the right.

`- 145.230`

◁

`0.000`

- -

Using zero mode

With zero mode selected, this enables the select axis keys to zero each axis independently. This can be seen in the example on the right.

`- 145.230`

◁

`0.000`

The NMS100 stores the last 10 positions / numeric inputs, which can be accessed using the undo [↰] feature.

Example 1 - non movement

display shows   `- 145.230`   input a value   `95.520`

an incorrect figure has been accepted but the dimension shown previously is required.

press [↰] display now shows   `- 145.230`

Example 2 - movement

input a value   `5.000`   move to that point, display now shows   `0.000`

input a value   `10.000`   move to that point, display now shows   `0.000`

Press [↰] once, display now shows   `- 10.000`   this is the position of the second point

Press [↰] again, display now shows   `- 10.000`   this is the position of the starting point

Important note: the undo key is also used for returning to the previous menu structure when in the readout settings and functions.

Half Function / Centre Find

Press [¹/₂] to initiate the half function.

The NMS100 has a dedicated key to half the value on your DRO. This is achieved by pressing the half key and then selecting the axis. Example shown on the right.

[¹/₂]

`100.000` [◁]

`50.000`
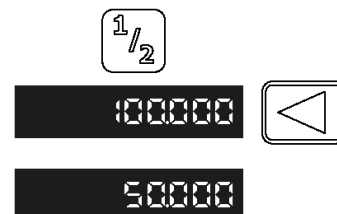
The NMS100 has multiple functions that can be accessed via the main menu

Press the menu key ☰ then the right key ▷ to navigate

to the function menu

then press the (ent) key to enter the function menu

FUNCTION MENU
NEWALL   MM   ABS   SET

OFF
ZERO APPROACH
NEWALL   MM   ABS   SET

Press the axis select key ◁ next to the axis to cycle through the options

Enable or disable the zero approach function, (the default is disabled).

Press the right arrow key ▷ to move on to the next function

OFF
FEED RATE
NEWALL   MM   ABS   SET

Press the axis select key ◁ next to the axis to cycle through the options

Enable or disable the feed rate function, (the default is disabled).

Press the right arrow key ▷ to move on to the next function

OFF
FRACTION
NEWALL   MM   ABS   SET

Press the axis select key ◁ next to the axis to cycle through the options

Enable or disable the fraction function, (the default is disabled).

Press the right arrow key ▷ to move on to the next function

OFF
SETPOINTS
NEWALL   MM   ABS   SET

Press the axis select key ◁ next to the axis to cycle through the options

Enable or disable the setpoints function, (the default is disabled).

Press the right arrow key ▷ to move on to the next function

OFF
LOGGING
NEWALL   MM   ABS   SET

Press the axis select key ◁ next to the axis to cycle through the options

Enable or disable the logging function, (the default is disabled).

Zero Approach Function

Zero approach is a visual indicator that helps the operator when approaching zero on the display. The arrows will display when the maximum value is reached, the arrows will then decrease towards the middle of the display as zero is approached. Zero is reached when the tolerance set is reached.

◄◄◄◄◄◄◄◄◄◄ ● ►►►►►►►►►► — Zero approach visual indicator

0.000 — Encoder position display

DTM-RECALL

NEWALL   MM   ABS   SET

Zero Approach Tolerance

The zero approach Tolerance setting defines the accuracy of when the visual indication is at zero. For example if the setting was 0.01mm, the visual indication will be full (at zero) when at or passed 0.01mm

Settings available for zero approach Tolerance are:

ON

ZERO APPROACH

NEWALL   MM   ABS   SET

Press the axis select key ◄ next to the axis to cycle to the next option.

TOLERANCE

ZERO APPROACH

NEWALL   MM   ABS   SET

Press the **ent** key to set the zero approach tolerance

0.100

ZERO APPROACH

NEWALL   MM   ABS   SET

(The number displayed will be the last set zero approach tolerance set)
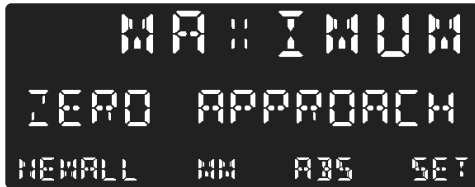
enter the desired zero approach tolerance using the numeric keypad

Press the **ent** key to accept the zero approach tolerance

```
TOLERANCE
ZERO APPROACH
NEWALL   MM   ABS   SET
```

Press the axis select key [◁] next to the axis to cycle to the next option.

```
MAXIMUM
ZERO APPROACH
NEWALL   MM   ABS   SET
```

Press the (ent) key to set the zero approach tolerance

```
1.000
ZERO APPROACH
NEWALL   MM   ABS   SET
```

(The number displayed will be the last set zero approach maximum set)

enter the desired zero approach maximum using the numeric keypad

Press the (ent) key to accept the zero approach tolerance

Feed Rate Function

This function allows the operator to display the feed rate of the encoder connected.
Note: The feed rate position on the display and the time division are defined in the setup (pages 11 and 12)

An example of the feed rate being active is shown below:

```
0.000
FEED -   0.00
NEWALL   MM   ABS   SET
```

Encoder position display

Feed rate display in mm/s

Fraction Function

This function allows the operator to display a fraction as well as the decimal position.
Note: This function only operates when the unit is set in INCH mode.

An example of the fraction function being active is shown below:

```
  0.2500
```
Encoder position display

```
0    1/4
```
Fraction display

```
NEWALL   IN   ABS   SET
```

Setpoints Function

The NMS100 can store up to 50 Setpoint positions, or machining steps into the memory. Using setpoints allows the operator to work to zero by calling up stored dimensions, instead of "working up" to drawing dimensions. This eliminates the need to constantly refer to the drawing, and reduces the possibility of scrapping parts due to misread dimensions. It also speeds up positioning because the operator focuses on working to zero.

The setpoints are stored as co-ordinates relative to the current absolute / incremental datum position. If the absolute / incremental datum position changes, the setpoints will "shift" to the new datum.

Once a repetitive sequence of co-ordinates is entered into setpoints, the co-ordinates can be recalled at any time. The positions remain in memory until altered by the operator. Simply assign any setpoint number 1 - 50 to each machining step. When machining, call up each step (setpoint) number and work to zero.

There are two ways to store Sub datums, Teach mode and program mode. See example on the next page:

To use setpoints press the menu key and then select the Function menu, navigate to setpoints with the arrow keys and then use the select axis key to navigate the setpoint options available

Teach Mode

Navigate to the setpoints function in the function menu (as described above) and then press the select axis key until the below screen is shown:

```
      TEACH
SETPOINTS
NEWALL   MM   ABS   SET
```
(ent)

Move the axis to the 1st location

```
  100.000
TEACH      -01
NEWALL   MM   ABS   SET
```
(ent)

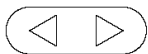◁ ▷ to move to the next set point, repeat above process for each new set point required.

↰ to return to the main setpoint menu, or press ☰ to exit to the measurement screen

Navigate to the setpoints function in the function menu (as described in the setpoints function) and then press the select axis key until the below screen is shown:

PROGRAM
SETPOINTS
NEWALL   MM   ABS   SET

(ent)

enter the dimension required via the keypad for the first set point

150.000
PROGRAM   ·· 01
NEWALL   MM   ABS   SET

(ent)

◁ ▷ to move to the next set point, repeat above process for each new set point required.

↰ to return to the main setpoint menu, or press ☰ to exit to the measurement screen

Navigate to the setpoints function in the function menu (as described in the setpoints function) and then press the select axis key until the below screen is shown:

DELETE
SETPOINTS
NEWALL   MM   ABS   SET

(ent)

YES
DELETE
NEWALL   MM   ABS   SET

To confirm the delete press (ent), to cancel the delete press ↰

Important note: this will delete all the current data in all Setpoints

Navigate to the setpoints function in the function menu (as described in the setpoints function) and then press the select axis key until the below screen is shown:

```
               USE
SETPOINTS
MEMRLL   MM   ABS   SET
```

🔙 to return to the function menu, or ☰ to exit functions and return to measurement display with setpoints active

```
     100.000
SETPOINT  -  1
MEMRLL   MM   ABS   SET
```
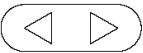
◁ ▷ tro navigate the sub datum required

To exit the setpoint use function, press the ☰ key, navigate to the function menu and then press (ent) , now navigate to the setpoint menu as below

```
               USE
SETPOINTS
MEMRLL   MM   ABS   SET
```

Press the axis select key ◁ next to the axis to cycle through the options until off is found as below

```
               OFF
SETPOINTS
MEMRLL   MM   ABS   SET
```

☰ to exit functions and return to measurement display without setpoints active
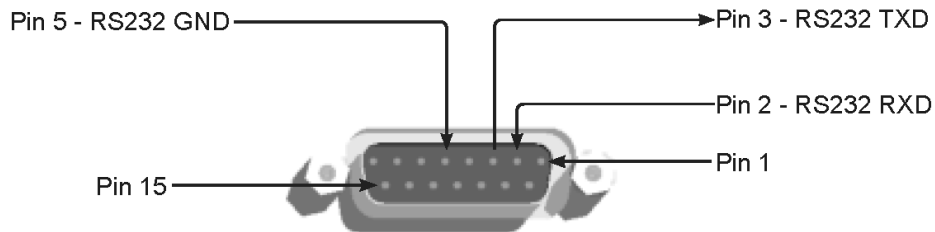
Logging Function

The NMS100 readout is capable of offering basic serial communications via a dedicated hardware RS232 compatible port, This is only used for output purposes and is how the logging function operates.

The communication parameters for the NMS 100 are: 115200 band, no parity, 1 stop bit, 8 data bit.

Logging Connection (RS232)

On the back of the NMS100 is a 15 way D female connector that is used to allow logging data to be output to another compatible RS232 device. The connections required to make this happen are detailed below:

Pin 5 - RS232 GND
Pin 3 - RS232 TXD
Pin 2 - RS232 RXD
Pin 1
Pin 15

A serial cable is available from Newall, please quote part number 307-83210 when contacting your local Newall supplier for more details.

Using the Logging Function

Navigate to the function menu and then to the logging function (see page 23), as per the screen below

Press the axis select key [◁] next to the axis to cycle to the next option.

0.1 seconds between each output

Continue to Press the axis select key [◁] next to the axis to cycle through the below options.

 0.1 second between each output

 1 second between each output

 5 seconds between each output

 10 seconds between each output

 30 seconds between each output

 60 seconds between each output

 Enter key generates an output

The NMS100 comes equipped with Digifind, a feature unique to Newall digital readout products. Digifind eliminates the risk of losing position and datum Set-Up. With Digifind, precise Set-Up of a work-piece is carried out only one time.

When the NMS100 is powered on, it displays the position at power off, compensated for any movement of a Spherosyn encoder up to 0.2500" (6mm) and a Microsyn encoder up to 0.0787" (2mm) in either direction since the unit was last used. If the machine has moved beyond 0.2500" (6mm) - Spherosyn [0.0787"(2mm) - Microsyn], Digifind allows a quick means to find the datum if lost.

A mark must be made on both a stationary part and moving part of the machine. The marks must be aligned and will serve as the machine "home" position.

The mark must be indelible, and it must allow the operator to move the machine to within a 0.2500" (6 mm) - Spherosyn [0.0787" (2mm) - Microsyn] band around the mark at any time. Alternatively, use a convenient reference point on the work-piece.

To use digifind function, simply enter the function menu using ☰ , and scroll to the digifind function using ◁ ▷

Setting the reference

Scoll to digifind and press the ◁ key.

◁   DIGI-   SET REF   (ent)   DIGI-   0.000

Move your encoder to the position you want to set your reference point. and hit the (ent) key.

Finding the reference

If the reference is lost at anytime it is possible to 'find' the reference again. Position the machine to within 6mm (0.2500") band for Spherosyn and 2mm (0.0787") band for Microsyn.

◁   DIGI-   FIND REF   (ent/≡)   FD RF-   0.000

once at the reference mark, hit the (ent) key to return to the home screen.

RS232 Output Data Format

The output data for the RS232 is as follows;
The current axis data for the axes available on the system in transmitted.
The data Packet structures of 12 characters is defined as follows:
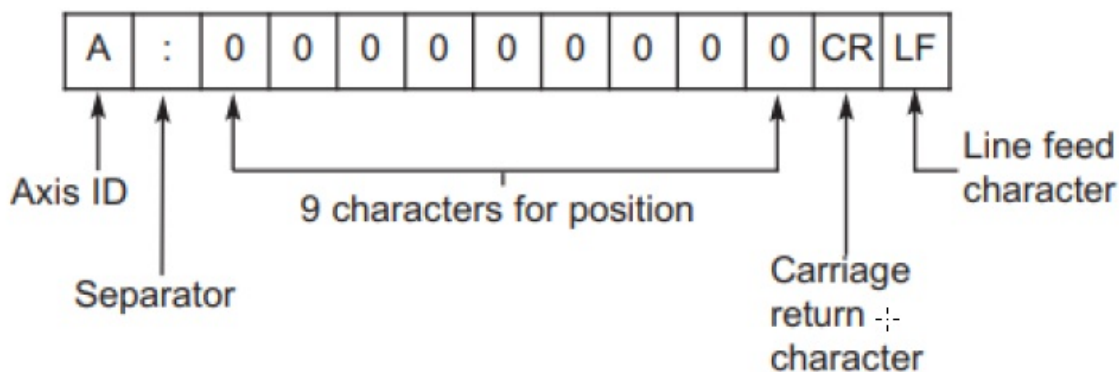
The Axes ID is the representation of the axis at the time of printing. This will be shown by the legend set for the axis at the time.

Trouble shooting guide

Symptom	Solution
The display is blank	• The NMS100 may be in sleep mode. Press any key to exit sleep mode • Check that the power supply is correctly connected to a working mains outlet • Check that the power supply cables are not damaged • Check that the power supply voltage is 15 – 24Vdc ±10%
The display works, but resets from time to time without any keys being pressed.	Either the supply voltage is too low, or the power supply or mains supply has an intermittent fau • Check that the power supply voltage is 15 – 24Vdc ±10%. • Check that all the connections are secure.
The display works, but gives erratic readings, the last digit jitters or the measurements jump to new figures unexpectedly.	There may be a poor earth (ground) connection. Both the NMS100, and the machine on which installed, must have proper earth (ground) connections. There may be a problem with the encoder.
The unit does not respond to any key presses.	Disconnect the NMS100 from its power supply, wait 15 seconds and then reconnect.
'NO Sig' / 'SIG FAIL' or '1.x' appears in the display.	This indicates that the unit is not receiving a proper signal from the encoder. • Check that the encoder connections are secure. • Check that there is no damage to the connectors or to the encoder. • Switch the NMS100 off and back on again.
Readings are incorrect.	• Check the Encoder Type to ensure it is correct. • Check the Radius / Diameter setting. The Diameter setting causes the axis to read double. • Check the Error Compensation factors. • If using the Segmented Error Compensation, verify the datum position. • Check that there is no damage to the encoder or its cable. • Check that the encoder is fixed firmly and aligned correctly, as described in the Spherosyn /Microsyn Installation manual. • Check that there is no binding on the scale. With the scale brackets slightly loosened, you sho be able to slide the scale back and forth with minimal resistance. • If a Spherosyn scale is in use, check that the scale is not bent, by removing it and rolling it on a flat surface.

If the solutions suggested above do not solve the problem, contact Newall for further instruction.

To swap encoders to trace a fault:

1. Check that the axis is set to the correct encoder types.
2. Disconnect the NMS100 power supply.
3. Disconnect the encoder from the malfunctioning axis and move to a working axis.
4. Reconnect the NMS100 power supply and turn on.

If the fault stays with the same encoder, then the encoder is at fault. If the fault does not follow with the encoder the NMS100 is at fault.
Providing the machine has not been moved more than 6.3mm (0.25") for a Spherosyn encoder or 2.5mm (0.1") for a Microsyn encoder,
switching the power off and back on again does not lose the datum position.

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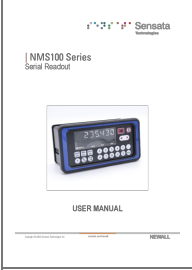**newall.com**
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Documents / Resources

Sensata Technologies NMS100 Series Serial Readout System [pdf] User Guide
NMS100 Series Serial Readout System, NMS100 Series, Serial Readout System, Readout System

References

- **User Manual**