

User's Manual

Bluetooth Digital Indicator 1/10000

Type : SSI-650

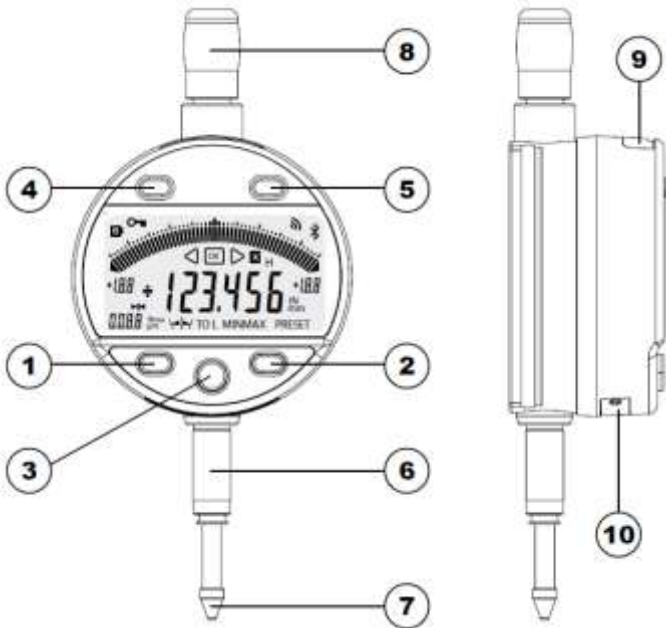
Features

- Resolution : 0.0001mm
- Protection : IP54
- Wireless Communication : Bluetooth



Q-143-1-J ver1.2

Description



- ① MODE button
- ② SET button
- ③ “Favorite” button
- ④ < button
- ⑤ > button
- ⑥ Clamping shaft Ø8 or 3/8”
- ⑦ Contact point Ø2 / M2.5 or 4-48-UNF
- ⑧ Lifting cap
- ⑨ Slot for Proximity cable
- ⑩ Slot for battery or Power cable



- ⑪ Low battery
- ⑫ + / - Indicator
- ⑬ Keypad lock
- ⑭ 7-digit display
- ⑮ Hold measured value
- ⑯ Send data
- ⑰ Measurement units (mm / INCH)
- ⑱ Preset mode
- ⑲ Analogue scale
- ⑳ Lower limit exceeded
- ㉑ Upper limit exceeded
- ㉒ Tolerance mode
- ㉓ Analogue scale lower limit
- ㉔ Analogue scale upper limit
- ㉕ Unit and value of analogue scale
- ㉖ Tolerance mode
- ㉗ MIN/MAX/DELTA mode
- ㉘ Multiplier
- ㉙ Bluetooth connection
- ㉚ Symmetrical tolerances

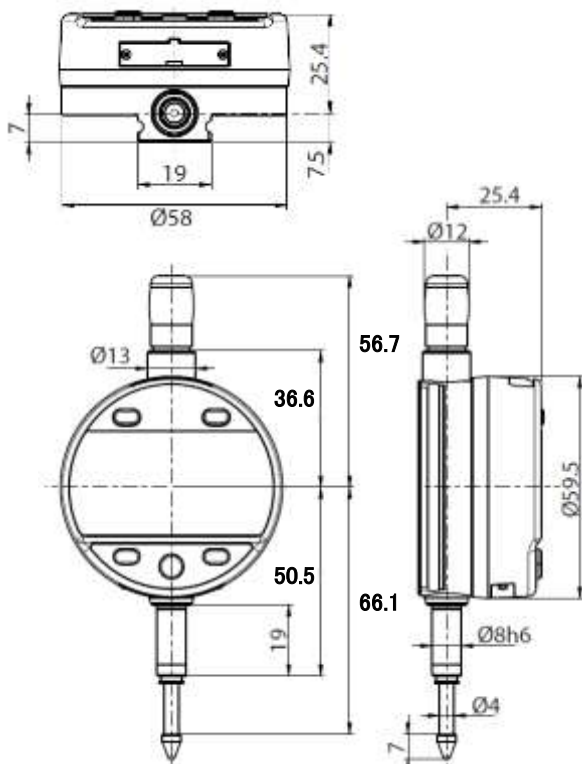
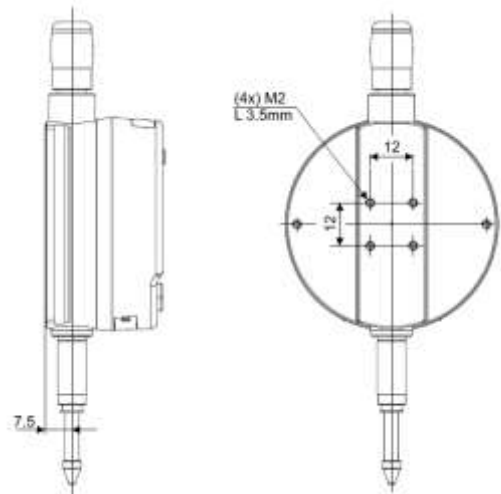


Diagram for rear fixings



★Installing and replacing the battery



1. Operating features of the instrument

① Button

The instrument has two operating modes: basic functions (direct access) and advanced functions. In addition to the configuration functions, available access to the MIN, MAX and DELTA mode, or display of tolerances (see chaps. 3 and 4)

② Button

The <favorite> button gives direct access to the function used most often (see chap. 9).

③ Button

Sets a Preset value, resets the MIN/MAX mode, verifies a selection, and controls switching off the instrument. By default, SIS mode enables automatic switch-off with no loss of origin (see chap. 11).

④ Button

With the «Left and Right» buttons, the user may change the extent of the analogue scale as well as enter the values of the nominal dimension and tolerance limits. (see chap. 6.2)

⑤ Serial communication (Bluetooth/RS232/USB)

It is possible to activate or de-activate certain functions of the instrument via serial communication (see chap. 13).


Data transmission parameters are 4800bps, 7bits, even parity, and 2 stop bits.

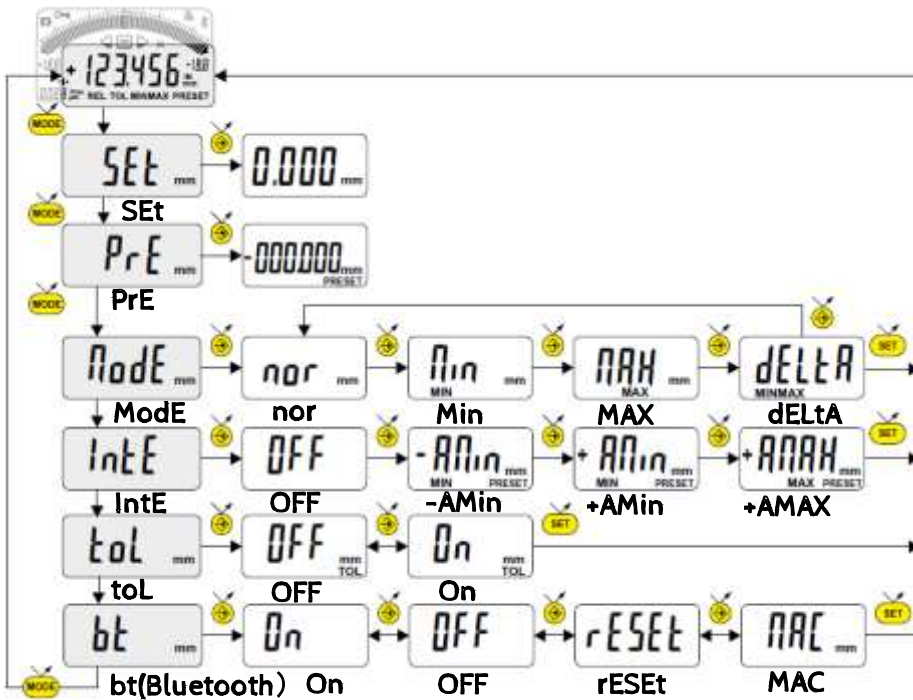
2. Start

Press any button.

For a Bluetooth connection (see chap. 5).



3. Basic functions

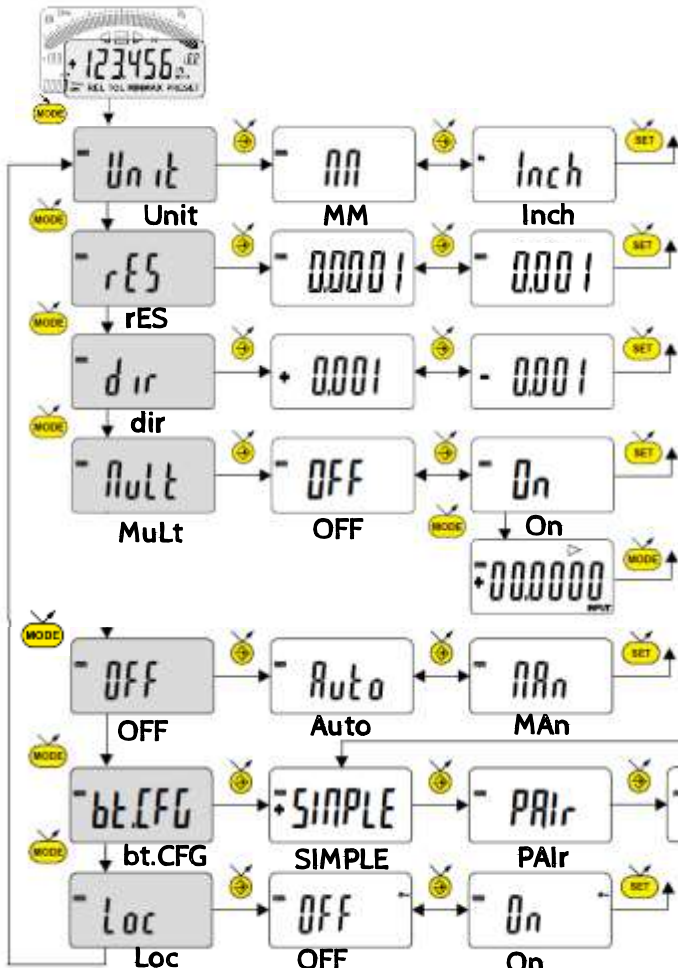
Each short press on  gives direct access to the basic functions :






- Normal mode : Zero reset
- Min (Max) mode : Preset on the measured min (max) value
- Inputting a Preset value (see chap. 7)
- Assign NORMAL/MIN/MAX/DELTA mode (see chap. 5)
- 2 points measurement (Dynamic preset) (see chapter 11)
- Tolerance display (inputting tolerance limits, see chap. 6)
- Bluetooth ON/OFF
- Reset Pairing mode
- Display the MAC add.

4. Advanced functions

Prolonged pressure (>2s) on  gives access to the advanced functions. Then, each short press on  accesses the required function:



- Assign measurement unit(mm/inch)
- Assign resolution (0.0001mm/0.001mm)
- Assign measurement direction (+/-)
- Assign multiplier mode OFF/ON
- Assign the multiplier value
 next digit  0~9  Save Mult.
- Activates/deactivates the automatic switch-off Auto(Automatic):Activates/Man:(Manual)De-activates
- Assign Bluetooth profile(Config.) SIMPLE/Pair/HID
- Assign Button lock mode(OFF/ON)
 Lock mode lock and .
 To unlock, Press for 5 sec.

5. Work in MINIMUM, MAXIMUM and DELTA mode :

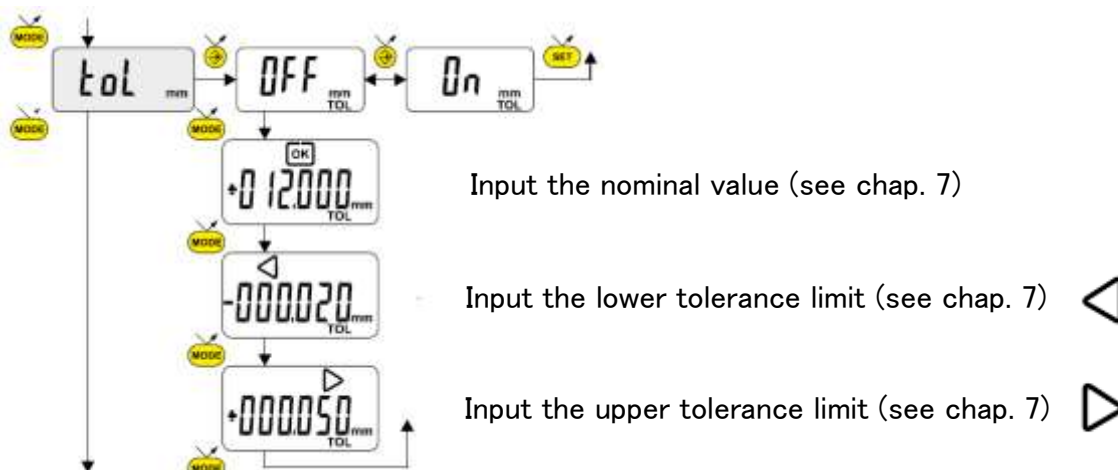
In this operating mode, the digital display stores the MIN, MAX or DELTA value. On the other hand, the analogue scale always indicates the current measured value.

- A short press on **SET** resets the MIN/MAX stored value (CLEAR)
- A long press (>2s) on **SET** assigns the Preset value to the position of current measurement.

6. Inputting (or modifying) tolerance limits

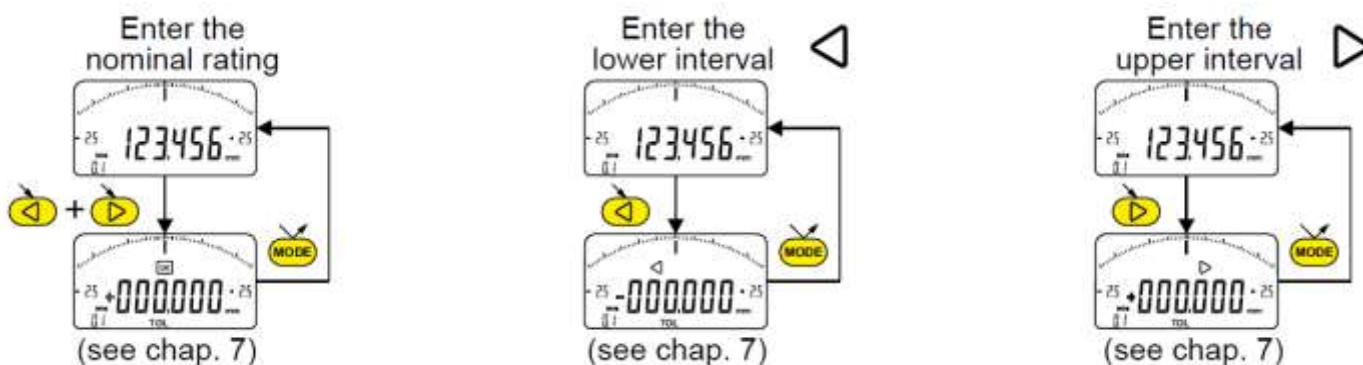
The tolerance limits are defined by introducing lower and upper intervals, compared to the nominal rating. Two methods are available :

6.1 Using the TOL mode



6.2 Use of the buttons ◀ and ▶ :

It is also possible to enter or modify the nominal value or the tolerance limits by prolongedly pressing (>2s) the ◀ and / or ▶ button :

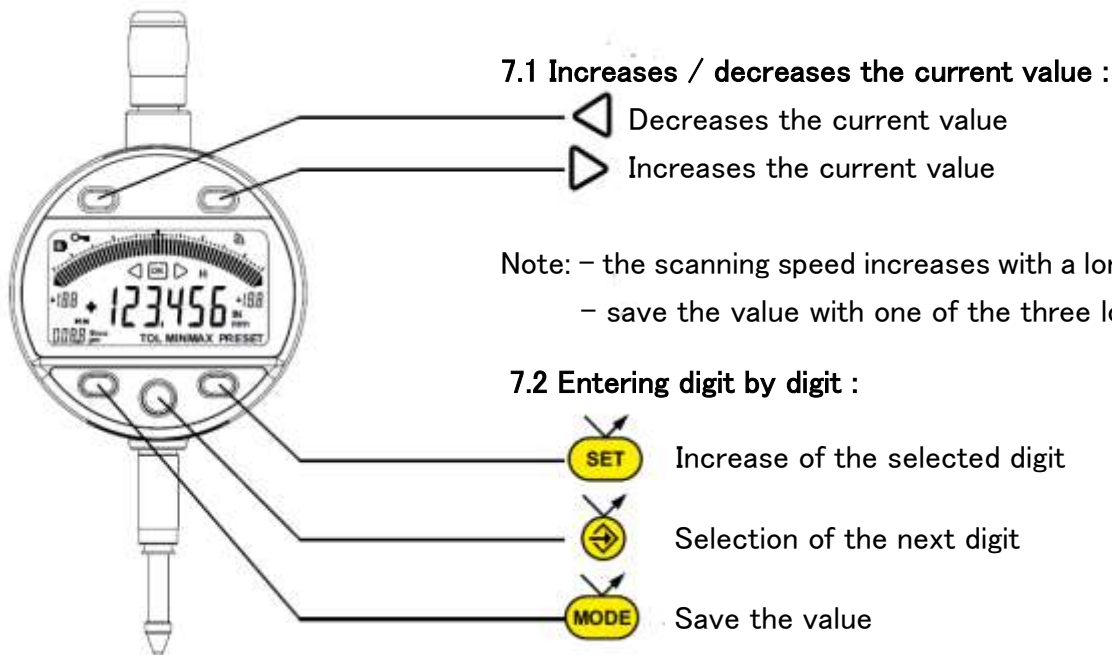


Note :

- It is also possible to display the tolerance limits when the instrument is operating in MIN, MAX or DELTA mode.
- If no tolerance limits have been defined by the user, the instrument will only display the tolerance limit indicators but will not turn on the indicator lights (red - green - yellow).
- In case of measuring internal ratings, you can cross the indicators (red and yellow) by reversing the order of entering the tolerance intervals (upper interval < lower interval).

7. Entering a numeric value

To enter or modify a numeric value (Preset, nominal ratings, tolerance intervals or multiplication factor), you can proceed in two ways :



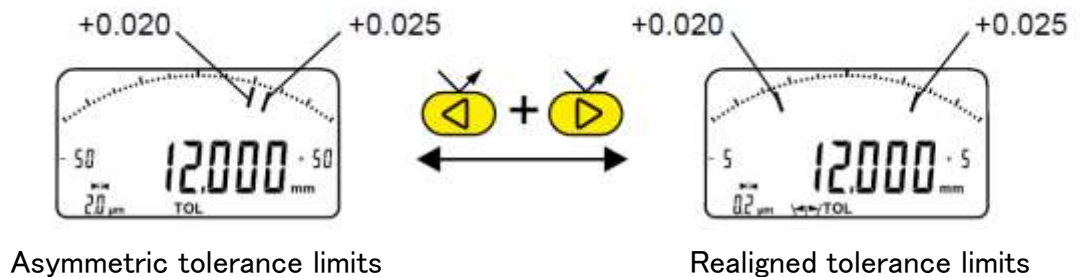
8. Scale the analog display

The user may change the analogue display's scale value by shortly pressing or .

8.1 Centering function of the analogue scale

When the tolerance limits are asymmetric with respect to the nominal ratings, it is possible to realign them to the analogue scale, by a short simultaneous press on and .

Example: 12.000 ^{+0.025}_{+0.020}



9. Operation via Bluetooth









9.1. HID mode(External Key board mode)

- ①Set HID mode by Advanced function.
- ②Set BT On mode by Advanced function.
- ③Reset Bluetooth mode by Basic function.
- ④Pairing connection the instrument to the PC.
(Instrument name : S_Dial Work HID)
- ⑤Send the measured data by the DATA button.

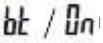
9.2. Pair mode

- ①Set Pair mode by Advanced function.
- ②Set BT On mode by Advanced function.
- ③Reset Bluetooth mode by Basic function.
- ④Pairing connection the instrument to the PC.
(Instrument name : SY289)
- ⑤Send the measured data by the DATA button.

9.3. Bluetooth configuration

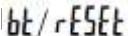
Display status	Operating mode
 off	Bluetooth disconnected
 blinkinng	Bluetooth advertising
 on	Bluetooth connected
	reset : clear pairing information
	MAC : display the MAC address
	Simple : profile without pairing
	Pair : paired and secured profile
	HID : virtual keyboard

9.4. Bluetooth Connection :

- 1° Activate Bluetooth compatible software and hardware (Master: PC, Display Unit).
- 2° Start the instrument. By default the Bluetooth® module is active and the instrument is available for connection (advertising mode).
- 3° If no connection is established during the advertisement period reactivate the Bluetooth® module using the  menu.
- 4° Instrument is ready to communicate (connected mode.)

9.5. Only with paired profile:


Pairing with master is automatically done at first connection.

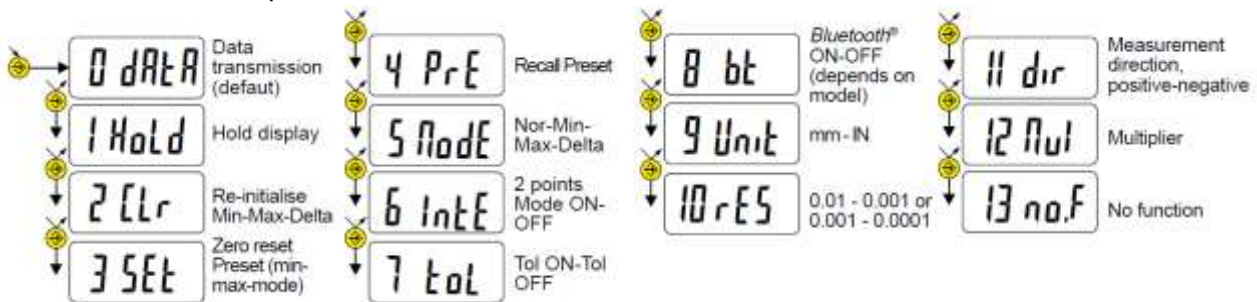
To connect the instrument to a new master (new pairing), pairing information on the instrument must be cleared using the  menu.




9.6. Bluetooth Specifications:

Items	Specification
Frequency band	2.4GHz
Modulation	GFSK
Max output power	Class3(1mW)
Range	≤15m(open space), 1-5m(industrial environment)
Version	Bluetooth4.*

10. Favorite key

The «favorite» key gives direct access to a predefined function, and can be configured according to the needs of the user. In order to assign a function to the «favorite» key, give a prolonged press on , and then select the required function :




Validation of selection: By a prolonged press on  or a short press on  or .

Note : – A function can also be assigned via RS232 using the command <FCT + Function No.> (FCT 0..9 A..F) example : Toggle unit = <FCT7>, multiplication factor = <FCTA>.


11. Adjustment and use of IntE dynamic measuring mode

Certain applications need to adjust the instrument to the MIN (or MAX) measured value. In this case, proceed as follows :

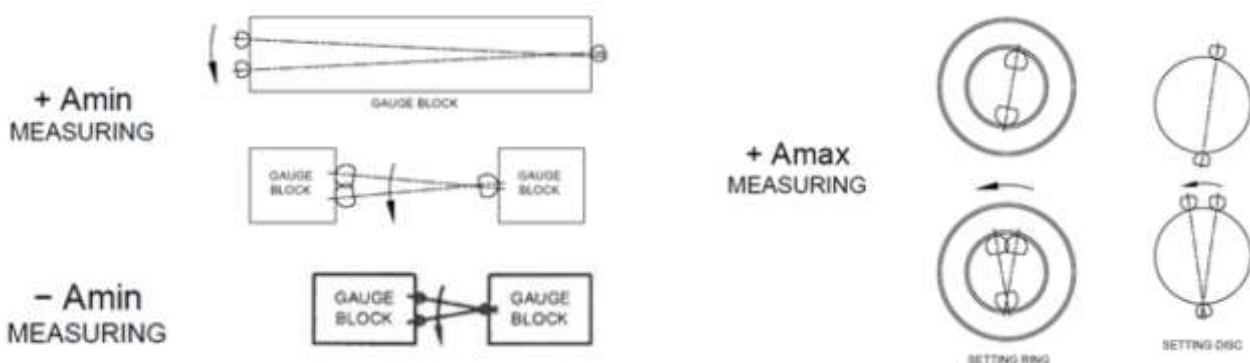
11.1 Adjustment of the instrument

- Enter a Preset value corresponding to the actual size of the standard (see chap. 3)
- In the IntE menu, select the mode –AMIN (automatic selection of DIR– and mode MIN) or +AMIN (automatic selection of DIR+ and mode MIN) or +AMAX (automatic selection of DIR+ and mode MAX) depending on application
- Make a standard measurement (going through the turnaround point)
- Adjust the instrument by selecting the SEt mode and pressing on the button  (see chap. 3)
- The instrument is adjusted and ready to measure.

11.2 Measure

- Make the measurements going through the turnaround point. The digital display stores and displays the MIN (or MAX) measured value.
- Before each new measurement, reset the measured value by a short press on .

Examples :



12. Switching off

The dial gauge goes automatically into stand-by if not used for 10 minutes, unless automatic switch-off mode has been turned off (see Chap. 4, advanced functions).

Stand-by mode can be forced by a prolonged press (> 2 sec) on



In stand-by mode, the value of the origin is retained by the sensor (SIS mode), and the instrument automatically restarts with any movement of the measurement probe, RS command, *Bluetooth*[®] request or press on button.

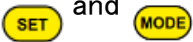
The instrument can be switched off completely for a long period of non-use, but this will necessitate a zero reset on restart (the origin will be lost) :

- Prolonged press (>4 sec) on



13. Re-initializing the instrument

The initial instrument settings can be restored at any time by a prolonged press (>4 sec) simultaneously on



until the message rESEt is displayed.

14. Connecting the instrument

The instrument can be connected to a peripheral via a Proximity (RS or USB), Power (RS or USB) cable or Bluetooth[®]. See page 3 for connecting the Power cable.

Measured values can be transmitted and the instrument driven using predefined commands (see chap. 10 for a list of the main commands).

Note : - In Tolerance mode, the tolerance limit lights remain lit only for a few seconds while the measurement stabilizes. On the other hand, they will remain lit continuously if the instrument is connected to, and powered by, the Power RS (USB) cable.

15. Maintenance

Carefully dry all mechanical parts of the instrument after contact with liquids to ensure proper operation and avoid corrosion.

Don't use aggressive products (alcohol, trichloroethylene or others) to clean plastic parts.

Don't expose the instrument to direct sunlight, heat or humidity.

16. Serial communication commands

Selection and configuration		Interrogation	
CHA+ / CHA-	Assign measurement direction CHA+:positive sense / CHA-:negative sense	CHA?	Measurement direction? Response : CHA+ / CHA-
FCT0 / FCT1 / ... / FCTA / ... / FCTF	Assign «favourite» function	FCT?	«favourite» function ? Response : FCT0~FCTF
MM / IN	Assign measurement unit MM:mm/IN:inch	UNI?	Measurement unit active? Response : MM/IN
KEY0 / KEY1	Assign Keypad Lock KEY0:Lock/KEY1:Unlock	KEY?	Keypad locked? Response : KEY0/KEY1
MUL +/-xx.xxxx	Assign the multiplier value	MUL?	Multiplier value? Response : +/-xx.xxxx
PRE +/-xxx.xxx	Assign preset value	PRE?	Preset value? Response : +/-xxx.xxx
STO1 / STO0	Assign Hold mode STO1:ON / STO0:OFF	STO?	Status of HOLD function? Response : STO1/STO0
TOL1 / TOL0	Assign Tolerance mode TOL1:ON/TOL0:OFF	TOL?	Status of Tolerance mode? Response : TOL1/TOL0
REF1 / REF2	Change active reference Two tolerance values are REF1 or REF2	REF?	Active Reference ? Response : REF1/REF2
ECO1 / ECO 0	Assign Economic mode ECO1:ON / ECO0:OFF	ECO?	Current economic mode? Response : ECO1/ECO0
INTE1 / INTE0	Assign 2 points measurement mode INTE1:ON / INTE0:OFF	INTE ?	2 points mode ? Response : INTE1/INTE0
LCAL dd.mm.yy	Modify last calibration date	LCAL?	Date of last calibration? Response : dd.mm.yyyy
NCAL dd.mm.yy	Modify next calibration date	NCAL?	Date of next calibration? Response : dd.mm.yyyy
NUM x...x (up to 20 chars)	Modify the instrument number	NUM?	Instrument number? Response : NUM x...x
MIN /MAX /DEL /NOR	Assign MIN, MAX, Delta, Normal mode MIN:Minimum/MAX:Maximum/DEL:Delta=MAX-MIN/ NOR:Normal=Current value	MOD?	Active mode (MIN, MAX, Delta or Normal)? Response : MIN/MAX/DEL/NOR
AOFF1 /AOFF0	Activates/deactivates the automatic switch-off AOFF1:Activate/AOFF0:De-activate	AOFF?	Status of the automatic switch-off Response:AOFF1/AOFF0
CFGBAR NOR / CFGBAR MAX	Assign Bargraph display CFGBAR NOR:Normal bargraph/ CFGBAR MAX:Keep Bargraph on Max value	CFGBAR?	Bargraph configuration? CFGBAR NOR/CFGBAR MAX
FACT1 / FACT2 / FACT5 / FACT10	Assign analogue scale factor FACT1:1scale=1digit/FACT2:1scale=2digits/ FACT5:1scale=5digits/FACT10:1scale=10digits	FACT?	Status of the analogue scale factor? Response : FACT1/FACT2/FACT5/FACT10
RES1 / RES2 / RES3	Change of resolution RES1:0.0001mm/RES2:0.001mm/RES3:0.01mm	RES?	Status of the current resolution? Response : RES1/RES2/RES3
TOL +/-xxx.xxx +/-yyy.yyy	Inputting current tolerance limits x:lower tolerance limit/y:upper tolerance limit	?	Current value (the displayed value)? Response : +/-zzz.zzz =>current value in the case of Tol mode =>+/-zzz.zzz =>current value <+/-xxx.xxx =>lower tolerance limit >+/-yyy.yyy =>upper tolerance limit
CLE	Reset(Clear) of MIN, MAX or Delta	SET?	Main instrument parameters? Response : CHA+/CHA-,MM/IN,X1/X2/X5, RES1/RES2/RES3,MIN/MAX/DEL/NOR, STO0/STO1,KEY0/KEY1,BAT1/BAT0
UNI1 / UNI0	Activate / de-activate UNIT command(MM/IN) UNI1:ON/UNI0:OFF	ID?	Instrument identification code? Response : SYxxx
OUT1 / OUT0	Activate / de-activate continued data transmission OUT1:ON/OUT0:OFF	BAT?	Status of Battery? Response : BAT1: OK/ BAT0: low battery
PRE ON / PRE OFF	Activate / de-activate Preset function(PRE command)	VER?	Version No. and date of firmware Response : Vx.x DD.MM.YYYY
ANA ON / ANA OFF	Activate / de-activate the analogue scale	MAC?	Bluetooth® MAC address? Response :XXX...XXX(up to 12 chars)
PRE	Recall Preset value		
SET	Zero reset		
SBY xx	xx number of minutes before stand-by		
BT1 / BT0	Activate/de-activate Bluetooth® module BT1:ON/BT0:OFF		
BTRST	Reset Bluetooth pairing information		
OFF	Switch-off (wake up using a button or RS)		
RST	Reset the instrument		
SBY	Put instrument in stand-by mode(SIS)		
FAC RST	Reset (Restores the factory parameters)		
TOL +/-nnn.nnn +/-xxx.xxx +/-yyy.yyy (In the case of SSI-650)	Inputting current tolerance limits n :nominal value / x :lower tolerance limit/y :upper tolerance limit		






17. Specifications

Items	Specification
Measuring range	12.5 mm
Resolution	0.0001 mm
Measuring force	0.65~0.9 N
Indication Error	1.8 μm
Repeatability	0.5 μm
MAX. speed of travel	1.7 m/s
No. of measurements /second	Normal mode : up to 10 meas/s , MIN/MAX mode : 20 meas/s
Data output	Bluetooth/USB/RS232
Data output parameter	4800bauds,7bits,parity,2stop bits
Battery life	about 6 months(general using)
Working temperature	5~40°C
Storage temperature	-10~60°C
Weight	119g
EMC	EN61326-1
IP specification	IP54
Battery	CR2032

18. Description of Bluetooth® module:

This module is based on Nordic Semiconductor nRF8001 μ Blue Bluetooth Low Energy Platform. The nRF8001 is a single chip transceiver with an embedded baseband protocol engine, suitable for ultra-low power wireless applications conforming to the Bluetooth Low Energy Specification contained within v4.0 of the overall Bluetooth specification. The nRF8001, used in the current revision of ISP091201, is a product using a ROM for the baseband protocol engine.

19. Certification

contains bluetooth module	ISP091201D
Region	Certification
USA	FCC ID : 2AAQS-ISP091201
Canada	IC : 11306A-ISP091201
Brazil	Anatel : 0516-14-4534
Korea South	 MSIP-CRM-iNs-ISP091201
Mexico	IFT : RCPSYIS14-0655
Japan	  001-A06167
Taiwan	 CCAH18LP2040T6
EU	
India	WPC : ETA-1003/2-17-/RLO(WR)

CERTIFICATE OF CALIBRATION

We hereby certify that this product has been calibrated and found to be in accordance with the applicable NATIONAL STANDARDS and TECLOCK STANDARDS, Equipment used in this calibration has traceable accuracy to the NATIONAL LENGTH and FORCE STANDARD.



Notice for use

Be sure to conduct a routine check for this product according to the purpose of use before use. This product is precision instrument, periodically considering frequency of use, environmental conditions and method of use.

It is not guaranteed for the performance of this product, which has been repaired or disassembled by other than TECLOCK.

For appearance and other design improvement, this products subject to change without advance notice.

TECLOCK Corporation

TECLOCK SmartSolutions Corporation

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