

WEIGHT INDICATOR

VI704



USER MANUAL

Application) P35702 Rev.0.5



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MAIN CHARACTERISTIC

The application P35702 VI704 performs the functions of weight indicator, compliant with metrological standard EN45501:2015 as per test certificate issued by the notified body according to Directive 2014/31/EU. The metrological characteristics are indicated in the certificate and described in this manual. Optionally the instrument can be configured in the factory for a legal (non-homologated) non-metric one.

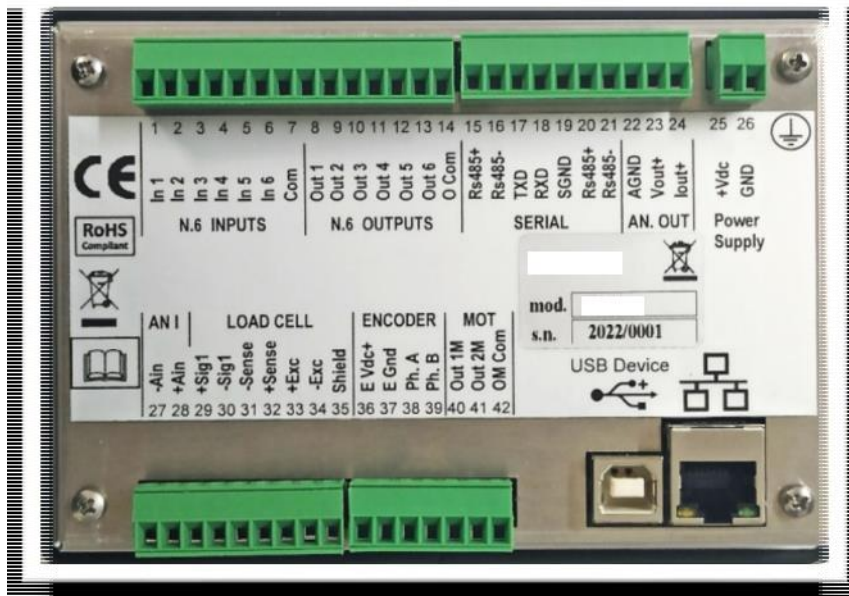
The values of 6 programmable points control the respective logical outputs.

Different communication protocols are selectable for the 3 standard serial ports and for the Ethernet port.

Optional fiscal memory is supported for weighing and serial protocols; the consultation of the stored data is carried out directly from touch screen.

The optional analog output transmits the current weight. A hardware diagnostic function is available.

STANDARD AND OPTIONAL FEATURES



In the standard version are available, in addition to the input for load cells, 6 logical outputs and 6 logical inputs, 3 serial communication ports (2 Rs485 and 1 Rs232), the Ethernet port and the USB Device port.

The following resources are optional, must be specified at order time and are factory configured

- Fiscal statement
- Analog output (V or mA)
- Fieldbus (Profibus/DP, profinet, Ethernet/IP, ethercat, canopen)
- Legal nonmetric operation (not approved).

SYMBOLGY

Below are the symbols used in the manual to draw the reader's attention: *Attenzione!* Questa operazione deve



be performed by specialized personnel.

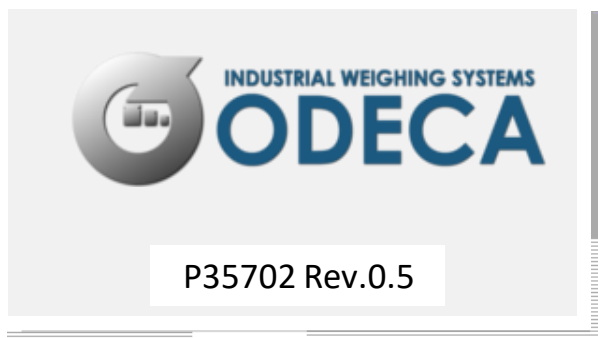


Pay particular attention to the following indications.



Additional information.

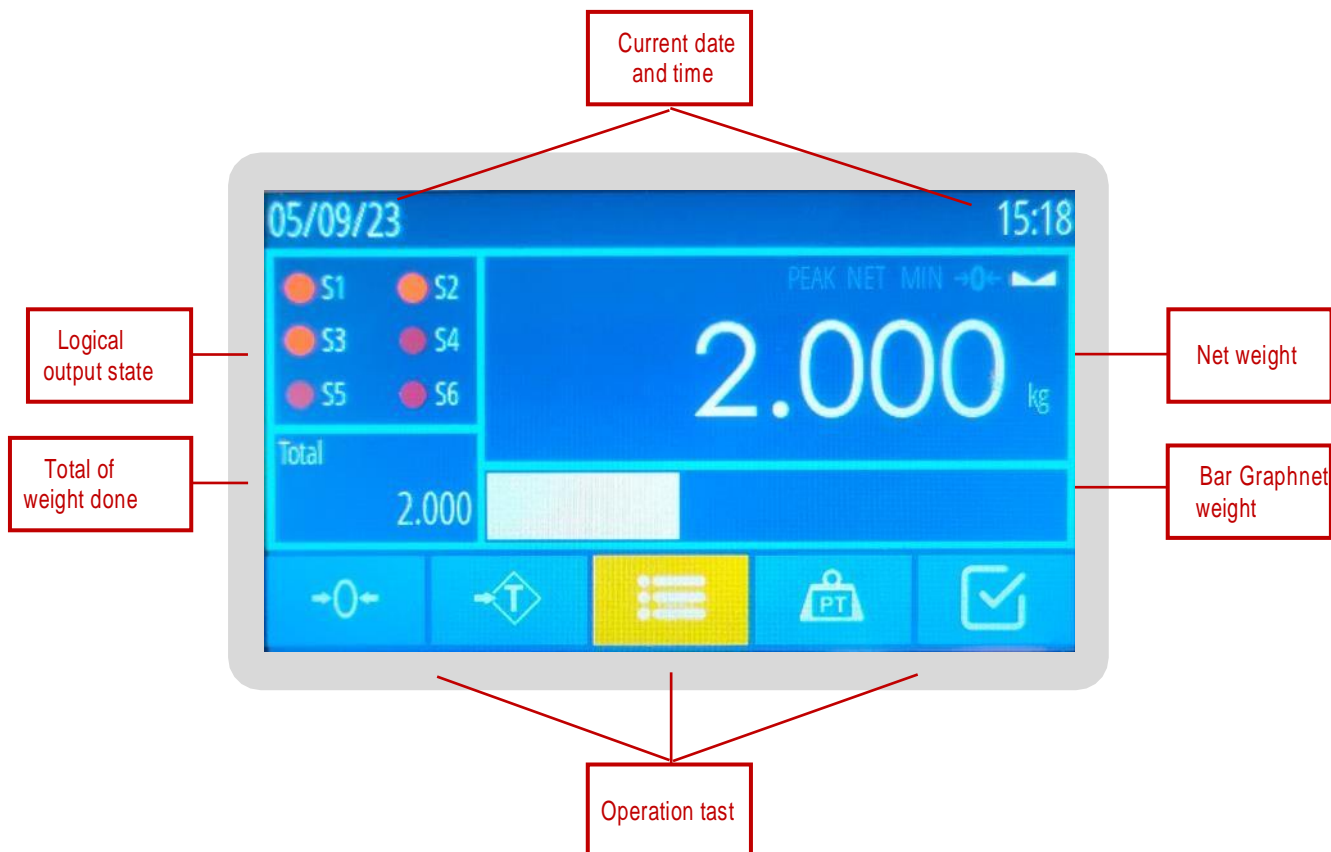
ON DISPLAY INDICATION



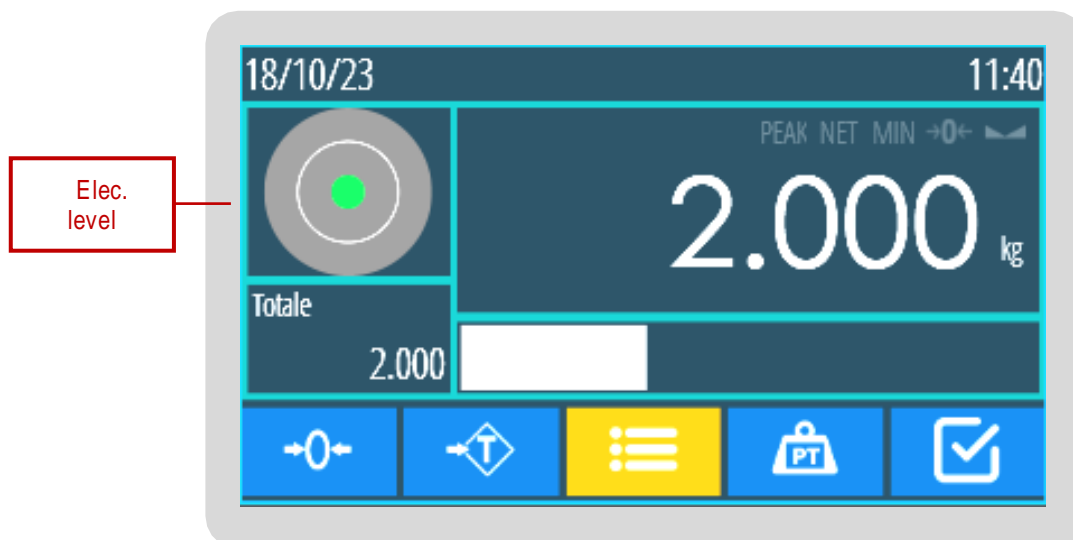
SWITCHED ON

The programmed application firmware code and the version thereof are shown temporarily when switched on.

It is important to communicate this data in case of request for assistance or repair.



Only in the case of configured electronic level (see [communication port setup menu](#)) in place of Status of the logical outputs is displayed on the electronic level.



ON DISPLAY INDICATION

The graphic bar refers to the weight displayed with respect to the full scale of the weighing system. When the following conditions are met, the following messages appear instead of the weight:

Condition	Visualization
Initial reset not yet made	— — — (central dashes)
Gross weight less than 9 sub-zero divisions (ONLY metric operation)	_____ (low dashes)
Gross weight greater than 9 divisions of maximum capacity	^^^^^^^
Load cell signal acquisition error or internal fault.	O—L
Resolution x10 of the weight (top right display in red)	X10

If metric operation is configured, in case of access to the calibration menu (via password or physical jumper) at the top of the display is displayed the inscription “**SIGILLI RIMOSI**” in red.







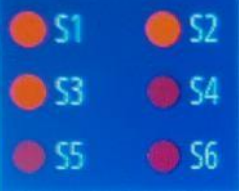

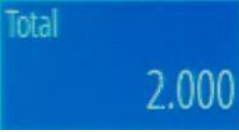
If calibration of the weight is not made (factory configuration) in the upper part of the display is displayed the inscription “**PESO NON CALIBRATO**” in red.

TOUCHSCREEN BLOCK LEVEL

Using the appropriate parameters in the setup menu, it is possible to determine the touchscreen lock level and the menu pas-sword.

Protection level	Description
FREE	Free access to main screen functions and setup menu.
LOW	Free access to the main screen functions, but the pas-sword (if scheduled) is required to access the setup menu. Only in case of non-active metric operation (factory configuration), the pas-sword is required to access the calibration menu.
HIGH	Access to the main screen features is blocked. The password is required (if scheduled) to access the setup menu. Only in case of metric operation not active (factory configuration), the password is required to access the calibration menu.

TOUCH SCREEN COMMAND

	<p>SEMI-AUTOMATIC ZERO</p> <p>This corrects small zero displacements of the balance.</p> <p>Semi-automatic zero control is not possible under the following conditions:</p> <ul style="list-style-type: none"> • Unstable weight (weight no stabilizes within 3 sec.) • Gross weight greater (positive or negative) than 2% of full scale, compared to the original zero calibration.
	<p>AUTO TARE</p> <p>This operation zeroes the net weight and inserts the tare present on the balance. Self-closing tare control is not possible under the following conditions:</p> <ul style="list-style-type: none"> • Unstable weight (weight no stabilizes within 3 sec.). • Negative gross weight. • Gross weight greater than full scale-1 division.
	<p>TARE ERASE</p> <p>This button is displayed only in the case of a self-closing or predetermined tare.</p>
	<p><u>ACCESS TO THE MAIN MANU</u></p>
	<p>PREDETERMINED TARE</p> <p>This operation allows you to enter a tare typed on touchscreen.</p> <p>The inclusion of the predetermined tare is not possible under the following conditions:</p> <ul style="list-style-type: none"> • Self-closing tare is in.
	<p>WEIGHING</p> <p>With this operation, the current weight is sent to the peripherals configured according to the selected protocols. If the optional fiscal memory is configured, the weight is associated with a code, and the weighing is recorded.</p>
	<p><u>ACCESS TO THE THRESHOLDS PROGRAMMING MENU</u></p>
	<p>SWITCH NET WEIGHT/PEAK DISPLAY</p> <p>Press on the weight dial on the instrument's main screen to move the weight display. At each pressure the displayed weight switches between the following values:</p> <ul style="list-style-type: none"> • Net - the net weight is displayed in the weight dial. • Peak - the calculated peak value is displayed in the weight quadrant (selection only available when the peak function is enabled, using the appropriate parameter in the instrument setup menu).
	<p>According to the duration of pressure the following functions are performed:</p> <ul style="list-style-type: none"> • Print receipt (short press) - In case of printer protocol enabled, comes performed the printing of the total value of the stored weighings. • Total reset (prolonged pressure, 2 seconds) - The total value of the stored weighings is cancelled. Before performing the reset operation, a confirmation is always required, via a special screen. If the printer protocol is enabled, the total value of the stored weighings is printed.

WEIGHING STORAGE AND AGGREGATION

Weighing can be done by manual control from touchscreen, external input, or by serial line or fieldbus. The control determines the net weight totalization and the transmission or printing of the data on a serious line, according to the communication ports setting. The net weight is also stored in a memory register readable on demand by fieldbus. In METRICO mode, if the alibi memory is configured, the transaction is recorded. The conditions for weighing are:

- Stable weight (or stabilized within 3 seconds of control)
- Since the last totalisation, the weight has varied by at least 20 divisions (delta weight).
- Gross weight equal to or greater than the minimum weight (20 divisions) and less than the maximum capacity.
- Not zero net weight.
- In case of METRIC operation, the net weight and gross weight must be positive.
- If the electronic level is configured, the weighing system must be "in bubble".

NOTE: The external input of the command can be kept closed for automatic weighing.

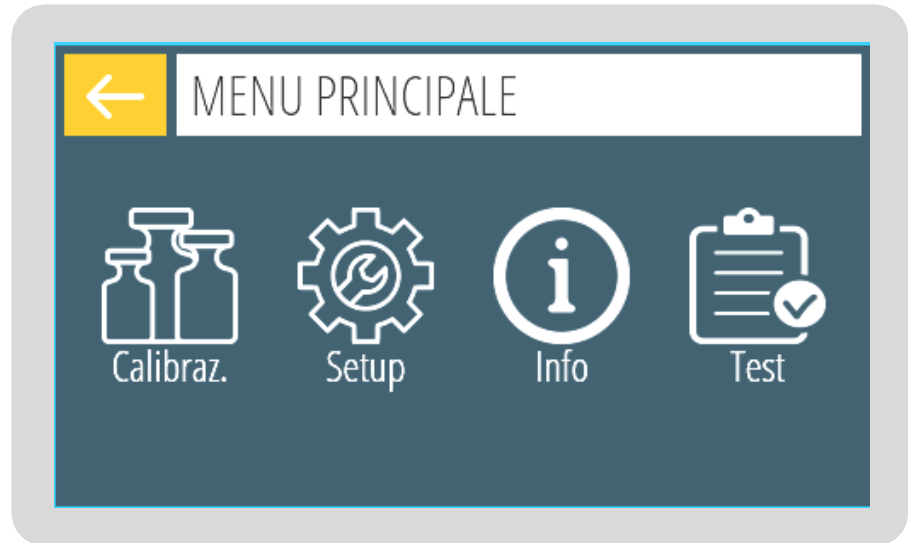
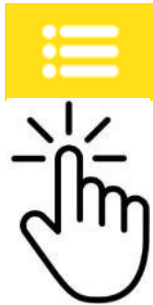
PEAK







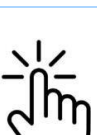

In addition to the display, the peak value can be use in the following functions

<i>Function</i>	<i>Description</i>
LOGICAL OUTPUT	Thresholds can be configured to have the peak value as reference (see configuration procedure operating logical outputs).
SERIAL PORT	The peak value can be transmitted through the protocols Continuos, Automatic, Slave e Modbus .
ANALOGIC OUTPUT	The value of the analog output can be referred to the peak value (see analogue output configuration procedure).

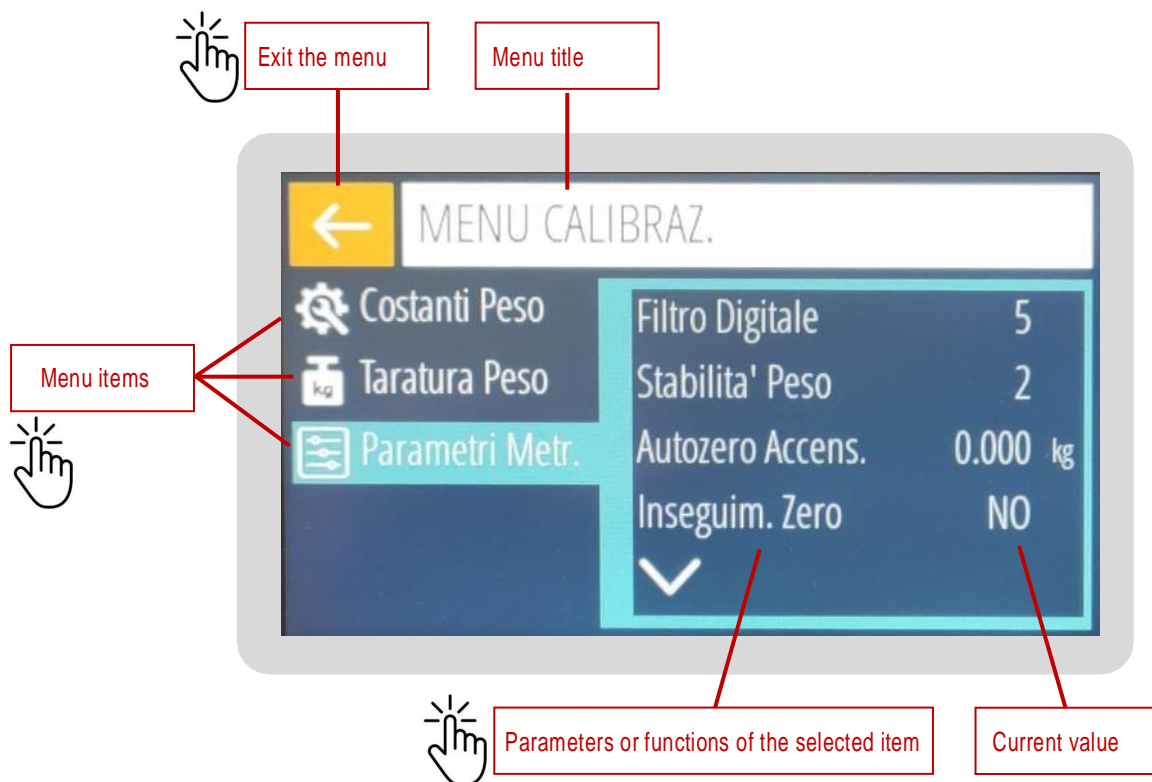
The peak value is calculated at the same frequency as the weight acquisition and is referred to the net weight or gross weight value depending on the selection in the parameter "**Abilit. Picco**" in the menu "**Modo Funz.**"

MAIN MENU



 	Access to the metrological menu for weight calibration and related parameters. Access to the calibraion menu is protected and reserved for authorized personnel.
 	Access to the setup menu to select serial port operation, input / output, and other hardware resources
 	Access to info menu for consultation of hardware and software features and the metrological access and fiscal memory.
 	Access to test menu for test procedures of the instrument hardware.

NAVIGATION MENU



Select the desired menu item in the left part to display its parameters in the right part.



Select the desired parameter or function in the right part to access the change of its value or run the function.
Changed values are marked in yellow.

PROGRAMMING MENU OF THE THRESHOLDS



MENU ITEM	PARAMETER	ID	DESCRIPTION	RANGE VALUE
Threshold	Threshold 1	[201]	Weight threshold connected to the logical output 1 The output is activated when the net weight is equal to or greater than the threshold value.	0÷Full scale
	Threshold 2	[203]	Weight threshold connected to the logical output 2 The output is activated when the net weight is equal to or greater than the threshold value.	0÷Full scale
	Threshold 3	[205]	Weight threshold connected to the logical output 3 The output is activated when the net weight is equal to or greater than the threshold value.	0÷Full scale
	Threshold 4	[207]	Weight threshold connected to the logical output 4 The output is activated when the net weight is equal to or greater than the threshold value.	0÷Full scale
	Threshold 5	[209]	Weight threshold connected to the logical output 5 The output is activated when the net weight is equal to or greater than the threshold value.	0÷Full scale
	Threshold 6	[211]	Weight threshold connected to the logical output 6 The output is activated when the net weight is equal to or greater than the threshold value.	0÷Full scale



The instrument controls 6 programmable weight thresholds, and enables the respective logical outputs according to the selections established in the set up phase of the operational functions, however modifiable.

For each threshold you can define:

- If compared with net weight or gross weight or peak value.
- If its output is activated with weight below the threshold, or with weight equal to or greater than the programmed value.
- If threshold control is performed with positive or negative or absolute weight values.
- If the corresponding output is activated only under stable weight or also under shifting weight conditions.

You can also program a hysteresis value for each threshold.

If the scale is exceeded or the weight is not detectable, the outputs are all deactivated (open contact).

CALIBRATION MENU



In the case of active metric operation, access to the calibration menu is protected from mechanical constraints.

To access the menu there are 2 procedures:

- Remove the physical seals and press the button on the back of the card when the instrument is already on. In this case, to access the menu you do not need the procedure of unlocking via Option code and password.
- Access the menu using the password system reserved for authorized personnel. In this case the following procedure must be followed.



subsequent accesses to the calibration menu are free and direct until the instrument is switched off, when the metrological constraint is re-established.

In this condition, the inscription is highlighted on the main dial **“SIGILLI RIMOSI”**

PROCEDURE FOR PASSWORD ACCESS

- Type the assigned OPERATOR CODE, corresponding to the password table used.
- Type the 4-digit NUMERIC PASSWORD, corresponding to the proposed 3-digit password indicated in the upper part of the display.



Each access to the calibration menu (with any of the two procedures) is recorded in the instrument memo-ria and numbered progressively, together with the OPERATOR CODE used. In the case of access with HW jumper, the registered OPERATOR CODE is 0.

The last 5 menu accesses can be found in the INFO menu.

MENU VOICE	PARAMETER	ID	DESCRIPTION	RANGE VALUE
Wweight costant	Cell load	[1003]	Total rated load cell capacity, in the unit of measurement (kg) used for weight display, in full value.	3÷999999 kg
	Average sensivity	[1005]	Average load cell sensitivity, used for automatic calibration (default 2.0000 mV/V).	0.5÷3.9999 mV/V
	Pre-load	[1006]	Cell preload (theoretical zero), used for automatic calibration expressed in the selected division value.	
	Value of the division	[1101] [1102]	Valore divisione peso. Nel caso di multirange, corrisponde al valore del campo 1. I valori dei campi 2 e 3 sono determinati automaticamente.	0.001÷50
	Full scale	[1006]	Full scale value of the weighing system expressed in the selected split value.	
	Field 1	[1012]	Weighing limit of the first field. If different from 0, determines "multirange to 2 or 3 fields" operation.	
	Field 2	[1014]	Weighing limit of the second field. If different from 0, determine the "multirange" operation in 3 fields.	
Calibration Weight	Cal. Test weight		Zero and full scale calibration procedure with sample weights. See relevant paragraph.	
	Automatic calibration		Automatic calibration function, based on the constant parameters set and the factory pre-calibration. Automatically calculate the division value at the best of 10000 divisions.	
Metr. parameters	digital filter	[1201]	Digital filter factor applied to the load cell signal. See the explanatory table.	0÷9
	Weight stability	[1203]	Indication factor of stable weight. See the explanatory table	0÷4
	Automatic zero at switch on.	[1204]	Threshold of automatic zeroing when the instrument is switched on expressed weight value. According to metrological regulations it cannot exceed 10% of full scale.	

...segue...

CALIBRATION MENU

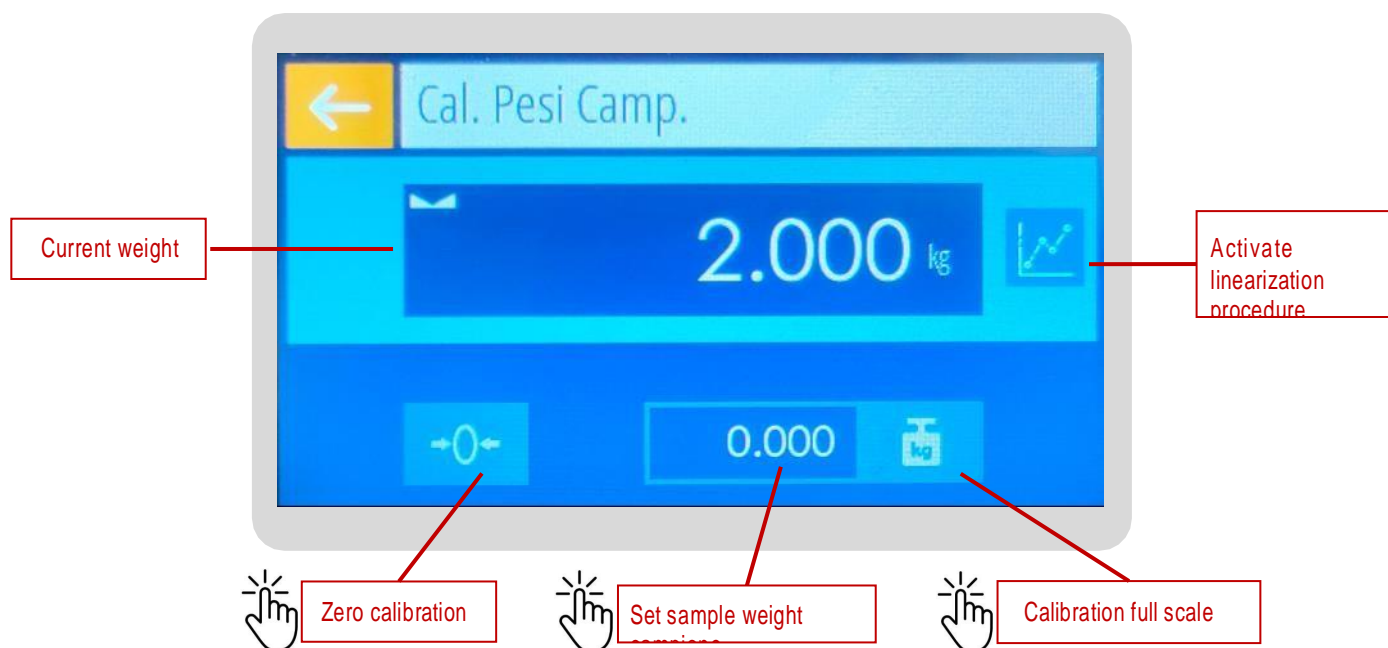
...segue...











VOCE MENU	PARAMETRO	ID	DESCRIZIONE	RANGE VALORI
Parametri menu.	Inseguim. Zero	[1206]	Numero di divisioni al secondo che sono automaticamente azzerate, per la funzione metrologica di inseguimento di zero. Secondo la normativa non può essere superiore a 0.5 d / sec.	NO, 0.5d, 1d, 2d, 3d
	G Luogo Calib.	[1108]	Accelerazione gravità del luogo dove è effettuata la calibrazione del peso. Il peso è compensato anche in funzione del parametro di accelerazione nel luogo d'uso. Se programmato a 0 la compensazione è esclusa.	0, 9.7500÷9.8500
	G Luogo Uso	[1110]	Accelerazione gravità del luogo dove è utilizzato lo strumento. Il peso è compensato anche in funzione del parametro di accelerazione nel luogo di calibrazione. Se programmato a 0 la compensazione è esclusa.	0, 9.7500÷9.8500
	Visualizz. x10		Selezione della visualizzazione del peso in decimi di divisione. Da attivare solamente in fase di test, non è ammesso l'uso metrologico. L'attivazione è indicata sul quadrante di peso.	NO÷SI
Uso metrolog.	Funzionamento		Selezione del funzionamento con vincolo metrologico oppure uso libero.	LIBERO / METRICO
	Anno Targa		Numero dell'anno di apposizione della targa metrologica. Solo se uso metrologico	00÷99
	N. Organismo		Numero dell'organismo notificato che appone i sigilli metrologici. Solo se uso metrologico	0000÷9999
	Num. Serie		Numero di serie dello strumento che è visualizzato sulla targa metrologica. Solo se uso metrologico.	000000÷999999



La selezione dal funzionamento libero a metrico è possibile solamente se è stato attivato il pulsante di accesso alla calibrazione sotto sigilli. Diversamente alla conferma della selezione, è richiesta la verifica dell'accesso tramite il sistema di password riservate al personale autorizzato, secondo la procedura descritta per [l'accesso al menu di calibrazione](#).

PROCEDURE OF CALIBRATION AT SAMPLE WEIGHT



		With unloaded weighing system and stable weight, it performs zero calibration. The current weight is reset.
		Set the value of the sample weight used for background calibration.
		After loading the sample weight on the weighing system, at stable weight, it performs the full scale calibration.
		Activates the linearization procedure at sample weights. Up to 5 linearization points can be set on a positive scale. Set the sample weight value of the linearization point and confirm with the button  . To finish press the button  , you can set a number of points less than 5. Set the value to 0 to zero all subsequent linearization points and finish the procedure.

DIGITAL WEIGHT FITER

	Factor	Frequenzy of the answer	Settling Time (mS)	Freq ADC (Hz)
	0	4	250	50
	1	2	500	50
	2	1.25	800	50
	3	1	1000	50
	4	0.8	1250	50
Default value	5	0.66	1500	50
	6	0.55	1800	50
	7	0.5	2000	50
	8	0.45	2250	50
	9	0.4	2500	50

WEIGHT STABILITY FACTOR

	Factor	Window	Time
	0	Always stable	
	1	2	0.5
Default value	2	1.5	0.5
	3	1	0.75
	4	1	1

The weight is considered stable when it remains inside the indicated window for the specified time.

SETUP MENU

MENU VOICE	PARAMETER	ID	DESCRIPTION	RANGE VALUE
Mode Func.	Language	[1001]	Language selection.	Italian/English
	Peak	[1002]	Enables or disables the peak function.	Disable/Net/Gross
Com. port	Com. 1 - Rs485		Access to the port setup menu COM1 (Rs485)	
	Com. 2 - Rs232		Access to the port setup menu COM2 (Rs232)	
	Com. 3 - Rs485		Access to the port setup menu COM3 (Rs485)	
	Ethernet		Access to the port setup menu ETHERNET	
Input	Fun. Input 1	[1401]	Function associated with input 1.	Zero/Tare/EraseTar/ Erase peak/Weight
	Fun. Input 2	[1402]	Function associated with input 2.	Zero/Tare/EraseTar/ Erase peak/Weight
	Fun. Input 3	[1403]	Function associated with input 3.	Zero/Tare/EraseTar/ Erase peak/Weight
	Fun. Input 4	[1404]	Function associated with input 4.	Zero/Tare/EraseTar/Erase peak/Weight
	Fun. Input 5	[1405]	Function associated with input 5.	Zero/Tare/EraseTar/ Erase peak/Weight
	Fun. Input 6	[1406]	Function associated with input 6.	Zero/Tare/EraseTar/ Erase peak/Weight
Output	Par. Output 1		Access to the setup menu related to the output 1.	
	Par. Output 2		Access to the setup menu related to the output 2.	
	Par. Output 3		Access to the setup menu related to the output 3.	
	Par. Output 4		Access to the setup menu related to the output 4.	
	Par. Output 5		Access to the setup menu related to the output 5.	
	Par. Output 6		Access to the setup menu related to the output 6.	
Clock./ Date	Current date		Current date of the device	
	Current time		Current time of the device	
Touch Screen	Brightness		Brightness of the display.	0÷9
	Calibraz.Touch		Access to the procedure of calibration of the display	
Protec. level	Block Touchs.		Change the value of block of the touchscreen	Free/Low/High
	Password Menu		Set a password to enter in the calibration menu.	0÷99999
Analogic output	Full scale	[1501]	Weight value corresponding to the full scale of the analog output.	
	Range Output	[1504]	Selection of the output type	0-10V / 0-5V / 0-20mA / 4-20mA
	Val. in output	[1503]	Selection of the transmitted value with the analog output.	Net/Gross/Peak
	Calibration		Access to the calibration procedure of the analog output.	

OUTPUT SETUP MENU

VOICE MENU	PARAMETER	ID	DESCRIPTION	RANGE VALUE
Par. Uscita N	Ref. weight	[1411] (Output 1)	Selection of the weight value used to control the relevant threshold. The threshold can be compared with net weight, gross weight or peak. In the latter case the threshold is compared with the last acquired peak value, even when the peak function is not active.	Net/ Gross/ Peak
		[1421] (Output 2)		
		[1431] (Output 3)		
		[1441] (Output 4)		
		[1451] (Output 5)		
		[1461] (Output 6)		
	Logica Contatti	[1412] (Output 1)	Operating logic of its output (normally open or normally closed).	N. Open/ N. Close
		[1422] (Output 2)		
		[1432] (Output 3)		
		[1442] (Output 4)		
		[1452] (Output 5)		
		[1462] (Output 6)		
	Polarità Peso	[1413] (Output 1)	The relative threshold can be compared only with positive weights, only with negative weights or with both positive and negative values.	Positive/ Negative/ Bidirectional
		[1423] (Output 2)		
		[1433] (Output 3)		
		[1443] (Output 4)		
		[1453] (Output 5)		
		[1463] (Output 6)		
	Stabilità Peso	[1414] (Output 1)	Its output can also be activated when the weight is in motion or only after the weight has stabilized.	Normal/ Stable
		[1424] (Output 2)		
		[1434] (Output 3)		
		[1444] (Output 4)		
		[1454] (Output 5)		
		[1464] (Output 6)		
	Isteresi	[1415] (Output 1)	Hysteresis value in relation to the set threshold.	0÷Full scale
		[1425] (Output 2)		
		[1435] (Output 3)		
		[1445] (Output 4)		
		[1455] (Output 5)		
		[1465] (Output 6)		

COMMUNICATION PORT SETUP MENU

VOICE MENU	PARAMETER	ID	DESCRIPTION	RANGE VALUE
Com. 1/2/3 - Rs485	Baud Rate		Baud rate of the communication in bit/sec	1200÷115200
	Format Frame		Combination of parity, data bits and stop bits.	N81, N82, E72, E81, O72, O81
	Protocoll		Communication protocol selection based on the connected device	Si veda tabella
	Address Com.		Address of the instrument used in communication protocols	0÷99
	Transmitted value		Selection of the transmitted value	Net/Gross/ Peak
Ethernet	Address IP1		First byte of network IP address	0÷255
	Address IP2		Second byte of network IP address	0÷255
	Address IP3		Third byte of network IP address	0÷255
	Address IP4		Fourth byte of network IP address	0÷255
	Address Mask 1		First byte of Subnet mask	0÷255
	Address Mask 2		Second byte of Subnet mask	0÷255
	Address Mask 3		Third byte of Subnet mask	0÷255
	Address Mask 4		Fourth byte of Subnet mask	0÷255
	Gateway 1		First byte of Gateway	0÷255
	Gateway 2		Second byte of Subnet mask	0÷255
	Gateway 3		Third byte of Subnet mask	0÷255
	Gateway 4		Fourth byte of Subnet mask	0÷255
	Porta		Network port number	0÷9999
	Protocollo		Communication protocol selection based on the connected device	Si veda tabella
	Transmitted value		Selection of the transmitted value	Net/Gross/ Peak

COMMUNICATION PROTOCOLS

Selection	Protocol
NONE	No functionality on the door
<u>CONTINUE</u>	Continuous string transmission (ex. to a weight repeater)
<u>AUTO</u>	Automatic weight transmission at transaction
<u>SLAVE</u>	Bidirectional protocol in master mode / slave
<u>MODBUS</u>	Modbus RTU Protocol
<u>PRINT</u>	Transmission of a receipt upon transaction.
<u>LEVEL</u>	Electronic level connection mod. S309

CONTINUE TRANSMISSION PROTOCOL

This protocol is used for continuous transmission, usually to the repeater panel. String transmitted at a frequency of 5 Hz:

STX	<Stato>	<Peso>	ETX	<checksum>	EOT
-----	---------	--------	-----	------------	-----

<Status>: character coded as from table seguente (bit = 1 if true condition).

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0	1	1	Tare	Min weight	Stable weight	Zero center

<Weight>: field composed of 8 ASCII characters with the right justified weight value. The transmitted weight value can be the net weight, the gross weight or the peak value, according to the selection of the transmitted data in the configuration menu of the serial communication ports.

In overweight conditions the field assumes the value: "^^^^^^^".

Under underweight conditions the field assumes the value: "_____".

Conditions of error reading weight the field assumes the value: "O-L"

STX: start of text; end data string char (value ASCII 02h)

ETX: end of text; end data string char (value ASCII 03h)

EOT: end of transmission; end transmission char (valore ASCII 04h)

<checksum>: sum of string data control. Calculate by running the exclusive OR (XOR) of all characters from STX to ETX excluding the latter. The result of the XOR is broken down into 2 characters considering separately the upper 4 bits (first character) and the lower 4 bits (second character). The obtained 2 characters are then encoded ASCII. (Esempio: XOR = 5Dh; <csum> = "5Dh" so 35h e 44h).

COMMUNICATION PROTOCOLS

AUTOMATIC TRANSMISSION PROTOCOL

String automatically transmitted to the transaction:

STX	<Status>	<Net>	<ID Weight>	ETX	<checksum>	EOT
-----	----------	-------	-------------	-----	------------	-----

<Status>: character coded as following table (bit = 1 if condition true).

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0	1	1	Tara Inserita	Pesata Minima	Peso Stabile	Centro zero

<Weight>: field composed of 8 ASCII characters with the right justified weight value. The transmitted weight value can be the net weight, the gross weight or the peak value, according to the selection of the transmitted data in the configuration menu of the serial communication ports.

In overweight conditions the field assumes the value: "^^^^^^^".

Under underweight conditions the field assumes the value: "_____".

Conditions of error reading weight the field assumes the value: "O-L"

<ID peso>: questo campo è presente **solo in caso di memoria fiscale attivata**, composto da 6 caratteri ASCII con il codice numerico associato al peso memorizzato.

L.STX: start of text; end data string char (value ASCII 02h)

ETX: end of text; end data string char (value ASCII 03h)

EOT: end of transmission; end transmission char (valore ASCII 04h)

<checksum>: sum of string data control. Calculate by running the exclusive OR (XOR) of all characters from STX to ETX excluding the latter. The result of the XOR is broken down into 2 characters considering separately the upper 4 bits (first character) and the lower 4 bits (second character). The obtained 2 characters are then encoded ASCII. (Esempio: XOR = 5Dh; <csum> = "5Dh" so 35h e 44h).

COMMUNICATION PROTOCOLS

SLAVE PROTOCOL

Control of current weight demand

<address> "N" EOT →

Answer
VI704 ← <address> "N" <status> <weight> ETX <checksum> EOT

Last transaction request command executed

<address> "P" EOT →

Answer
VI704 ← <address> "P" <weight> <Weight Mem.> <Weight ID> ETX <checksum> EOT

Automatic tare command

<address> "A" EOT →

Answer
VI704 ← <address> "A" ACK EOT

Semi-automatic Zero command

<address> "Z" EOT →

Answer
VI704 ← <address> "Z" ACK EOT

Peak value reset command

<address> "X" EOT →

Answer
VI704 ← <address> "X" ACK EOT

Erase tare command

<address> "DT" EOT →

Answer
VI704 ← <address> "D" ACK EOT

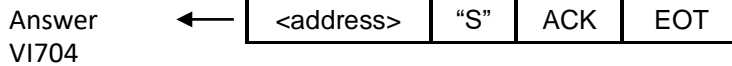
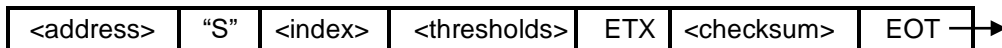
Command to request threshold value

<address> "R" <index> EOT →

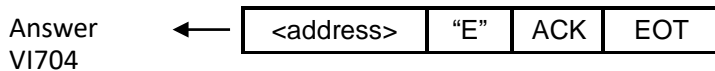
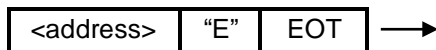
Answer
VI704 ← <address> "R" <index> <threshold> ETX <checksum> EOT

SLAVE PROTOCOL

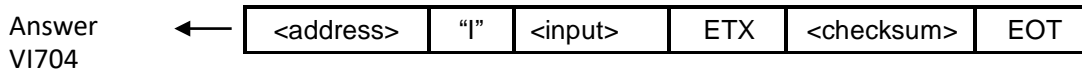
Control of threshold programming



Preset thresholds storage control



Read input state command



Dove:

<indirizzo>: instrument identifier; is the ASCII character obtained by adding 80h to the address number (es. address 1: <Ind> = 80h + 01h = 81h).

ETX: end of text; end data string char (value ASCII 03h)

EOT: end of transmission; end string char (value ASCII 04h)

ACK: Acknowledge ; correct receiving character (value ASCII 06h)

"N": char "N" value ASCII 4Eh.

"P": char "P" value ASCII 50h.

"A": char "A" value ASCII 41h.

"Z": char "Z" value ASCII 5Ah.

"X": char "X" value ASCII 58h.

"D": char "D" value ASCII 44h.

"T": char "T" value ASCII 54h.

"R": char "R" value ASCII 52h.

"S": char "S" value ASCII 53h.

"E": char "E" value ASCII 45h.

COMMUNICATION PROTOCOLS

SLAVE PROTOCOL

"I": char "I" value ASCII 94h.

<Stato>: character encoded as in the following table (bit = 1 if true condition).

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0	1	1	Inser tare	Min weight	Stable weight	Zero center

<Weight>: field composed of 8 ASCII characters with the right justified weight value. The transmitted weight value can be the net weight, the gross weight or the peak value, according to the selection of the transmitted data in the configuration menu of the serial communication ports.

In overweight conditions the field assumes the value: "^^^^^^^^".

Under underweight conditions the field assumes the value: "_____".

Conditions of error reading weight the field assumes the value: "O-L"

<Weight mem.>: field composed of 8 ASCII characters with the value of the last stored weight justified on the right.

<ID weight>: this field is present **only in case of metric operation and active fiscal memory**, consisting of 6 ASCII characters with the numeric code associated with the stored weight.

<index>: single ASCII character corresponding to threshold number (from "1" to "6").

< threshold >: field corresponding to threshold value, formatted as field <Weight>.

<Ingressi>: ASCII characters encoded as following table (bit = 1 if input enable).

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
1° char	0	0	1	1	Input 4	Input 3	Input 2	input 1
2° char	0	0	1	1	0	0	input 6	input5

<checksum>: sum of string data check. It is calculated by running the exclusive OR (XOR) of all characters from <address> to ETX excluding the latter. The result of the XOR is divided into 2 characters considering separately the upper 4 bits (first character) and the lower 4 bits (second character). The obtained 2 characters are then encoded ASCII. (Example: XOR = 5Dh; <csum> = "5Dh" so 35h e 44h).

COMMUNICATION PROTOCOLS

MODBUS RTU

The following table lists the instrument registers that can be read or programmed via protocol- lo Modbus RTU. The registers have a size of 16 bits.

- Type R - Reading logs.
- Type W - Writing registers.

Indirizzo Modbus	Holding register	Tipo	Note
0001	Status Register	R	Valore INT. (Si veda la tabella relativa)
0002	Gross weight (MSB)	R	INT Value. - Most significant Word
0003	Gross weight (LSB)	R	INT value. - Word less significant
0004	Net weight (MSB)	R	INT Value. - Most significant Word
0005	Net weight (LSB)	R	INT value. - Word less significant
0006	Peak (MSB)	R	INT Value. - Most significant Word
0007	Peak (LSB)	R	INT value. - Word less significant
0008	Digital input	R	INT value. (See relative table)
0009	Digital output	R	INT value. (See relative table)
0101	Net weight (MSB)	R	INT Value. - Most significant Word
0102	Net weight (LSB)	R	INT value. - Word less significant
0103	Weight code (MSB)	R	INT Value. - Most significant Word
0104	Weight code (LSB)	R	INT value. - Word less significant
0105	Weight total (MSB)	R	INT Value. - Most significant Word
0106	Weight (LSB)	R	INT value. - Word less significant
0201	Setpoint 1 (MSB)	R	INT Value. - Most significant Word
0202	Setpoint 1 (LSB)	R	INT value. - Word less significant
0203	Setpoint 2 (MSB)	R	INT Value. - Most significant Word
0204	Setpoint 2 (LSB)	R	INT value. - Word less significant
0205	Setpoint 3 (MSB)	R	INT Value. - Most significant Word
0206	Setpoint 3 (LSB)	R	INT value. - Word less significant
0207	Setpoint 4 (MSB)	R	INT Value. - Most significant Word
0208	Setpoint 4 (LSB)	R	INT value. - Word less significant
0209	Setpoint 5 (MSB)	R	INT Value. - Most significant Word
0210	Setpoint 5 (LSB)	R	INT value. - Word less significant
0211	Setpoint 6 (MSB)	R	INT Value. - Most significant Word
0212	Setpoint 6 (LSB)	R	INT value. - Word less significant
0501	Data Register (MSB)	W	INT Value. - Most significant Word
0502	Data Register (LSB)	W	INT value. - Word less significant
0503	Command Register	W	INT value. (See relative table)

COMMUNICATION PROTOCOLS

MODBUS RTU (segue)

Indirizzo Modbus	Holding register	Tipo	Note
1001	Language	R/W	See match in menu setup .
1002	Peak mode	R/W	See match in menu setup .
1101	(*) Weight division value	R/W	INT value. See match in calibration menu
1102	(*) Decimal number weight	R/W	INT value. See match in calibration menu
1103	(*) Total cell flow (MSB)	R/W	INT Value. - Most significant Word
1104	(*) Total cell flow (LSB)	R/W	Value INT. - Word less significant
1105	(*) Mezzi di sensibilità	R/W	Valore INT.
1106	(*) Pre-load (MSB)	R/W	INT Value. - Most significant Word
1107	(*) Pre-load (LSB)	R/W	Value INT. - Word less significant
1108	(*) Calibration spot gravity (MSB)	R/W	INT Value. - Most significant Word
1109	(*) Calibration spot gravity(LSB)	R/W	Value INT. - Word less significant
1110	(*) Usage spot gravity (MSB)	R/W	INT Value. - Most significant Word
1111	(*) Usage spot gravity (LSB)	R/W	Value INT. - Word less significant
1112	(*) Field 1 (MSB)	R/W	INT Value. - Most significant Word
1113	(*) Field 1 (LSB)	R/W	Value INT. - Word less significant
1114	(*) Field 2 (MSB)	R/W	INT Value. - Most significant Word
1115	(*) Field 2 (LSB)	R/W	Value INT. - Word less significant
1201	Digital filter	R/W	Value INT.
1301	(*) Full scale (MSB)	R/W	INT Value. - Most significant Word
1302	(*) Full scale (LSB)	R/W	Value INT. - Word less significant
1303	(*) Weight stability	R/W	Value INT.
1304	(*) Autozero when switched on (MSB)	R/W	INT Value. - Most significant Word
1305	(*) Autozero when switched on (LSB)	R/W	Value INT. - Word less significant
1306	(*) Zero tracker	R/W	Value INT.



(*) These registers can only be written when metric operation is not active (factory configuration) or in case of seals removed by [special procedure](#).

COMMUNICATION PROTOCOLS

MODBUS RTU (segue)

Modbus address	Holding register	Type	Note
1401	Input function 1	R/W	See match in menu setup .
1402	Input function 2	R/W	See match in menu setup .
1403	Input function 3	R/W	See match in menu setup .
1404	Input function 4	R/W	See match in menu setup .
1405	Input function 5	R/W	See match in menu setup .
1406	Input function 6	R/W	See match in menu setup .
1411	Output parameters 1 - Reference weight	R/W	See match in output parameter menu .
1412	Output parameters 1 - Contact logic	R/W	See match in output parameter menu .
1413	Output parameters 1 - Weight polarity	R/W	See match in output parameter menu .
1414	Output parameters 1 - Weight stability	R/W	See match in output parameter menu .
1415	Output parameters 1 - Hysteresis	R/W	See match in output parameter menu .
1421	Output parameters 2 - Reference weight	R/W	See match in output parameter menu .
1422	Output parameters 2 - Contact logic	R/W	See match in output parameter menu .
1423	Output parameters 2 - Polarity weight	R/W	See match in output parameter menu .
1424	Output parameters 2 - Weight stability	R/W	See match in output parameter menu .
1425	Output parameters 2 - Hysteresis	R/W	See match in output parameter menu .
1431	Output parameters 3 - Reference weight	R/W	See match in output parameter menu .
1432	Output parameters 3 - Contact logic	R/W	See match in output parameter menu .
1433	Output parameters 3 - Weight polarity	R/W	See match in output parameter menu .
1434	Output parameters 3 - Weight stability	R/W	See match in output parameter menu .
1435	Output parameters 3 - Hysteresis	R/W	See match in output parameter menu .
1441	Output parameters 4 - Reference weight	R/W	See match in output parameter menu .
1442	Output parameters 4 - Contact logic	R/W	See match in output parameter menu .
1443	Output parameters 4 - Weight polarity	R/W	See match in output parameter menu .
1444	Output parameters 4 - Weight stability	R/W	See match in output parameter menu .
1445	Output parameters 4 - Hysteresis	R/W	See match in output parameter menu .
1451	Output parameters 5 - Reference weight	R/W	See match in output parameter menu .
1452	Output parameters 5 - Contact logic	R/W	See match in output parameter menu .
1453	Output parameters 5 - Weight polarity	R/W	See match in output parameter menu .
1454	Output parameters 5 - Weight stability	R/W	See match in output parameter menu .
1455	Output parameters 5 - Hysteresis	R/W	See match in output parameter menu .
1461	Output parameters 6 - Reference weight	R/W	See match in output parameter menu .
1462	Output parameters 6 - Contact logic	R/W	See match in output parameter menu .
1463	Output parameters 6 - Weight polarity	R/W	See match in output parameter menu .
1464	Output parameters 6 - Weight stability	R/W	See match in output parameter menu .
1465	Output parameters 6 - Hysteresis	R/W	See match in output parameter menu .

COMMUNICATION PROTOCOLS

MODBUS RTU (segue)

Address Modbus	Holding register	Type	Note
1501	Analog output - Full scale (MSB)	R/W	INT Value. - Most significant Word
1502	Analog output - Full scale (LSB)	R/W	INT value. - Word less significant
1503	Analog output - Output value	R/W	See correspondence in menu setup .
1504	Analog output - Range	R/W	See correspondence in menu setup .
2000	Monitor register	W	INT value. The programmed value is automatically written in the monitor register (2100).
2100	Monitor register	R	INT value.
5101	Software and version code	R	INT value. For example, the value 0201h corresponds to software code 02 and version number 01.

TABLE STATUS REGISTER

Bit	7	6	5	4	3	2	1	0
Descrizione	Weight not cal.	W. error	Overload	Underload	Tare	Min. Weight	Peso Stabile	Center Zero

Bit	15-14	13	12	11	10	9	8
Descrizione	unused bits	Campo 2	Campo 1	Zero iniziale eseguito	Setup in corso	Peso Variato	Dati da salvare
		Campo 3					

INPUT CODING TABLE

Bit	15-6	5	4	3	2	1	0
Description	unused bits	Ingresso 6	Ingresso 5	Ingresso 4	Ingresso 3	Ingresso 2	Ingresso 1

TABLE ENCODING OUTPUTS

Bit	15-6	5	4	3	2	1	0
Description	unused bits	Uscita 6	Uscita 5	Uscita 4	Uscita 3	Uscita 2	Uscita 1

TABLE COMMAND REGISTER / DATA REGISTER

Register value	FUNCTION COMMAND REGISTER	FUNCTION DATA REGISTER
0x0001	Zero semiautomatic	-
0x0002	Tare semiautomatic	-
0x0003	Peak erase	-
0x0004	(*) Zero calibration	-
0x0005	(*) Calibration by sample weight	Sample weight value
0x0006	(*) Theoric calibration	-
0x0007	Analogic output test	Percentage value, from 0 to 100.
0x0008	Finish analogic output test	-
0x0009	Command for weighing execution	-
0x000A	Data saving command in permanent memory	-



(*) These functions can only be performed in the case of non-active metric operation (factory configuration) or in the case of seals removed by [special procedure](#).

COMMUNICATION PROTOCOLS

PRINT PROTOCOL

At the time of weighing, a string of rats is transmitted which produces the following receipt on the connected printer. The weighing code is printed **only in case of metric operation and active fiscal memory**.

06/10/23	11:18
Codice	27
Peso Lordo	20.0 kg
Tara	5.0 kg
Peso Netto	15.0 kg

You can also print the total value of the weighings performed, by pressing in the corresponding quadrant of the main screen.

06/10/23	11:18
TOTALE	
Peso Netto	1735.8 kg

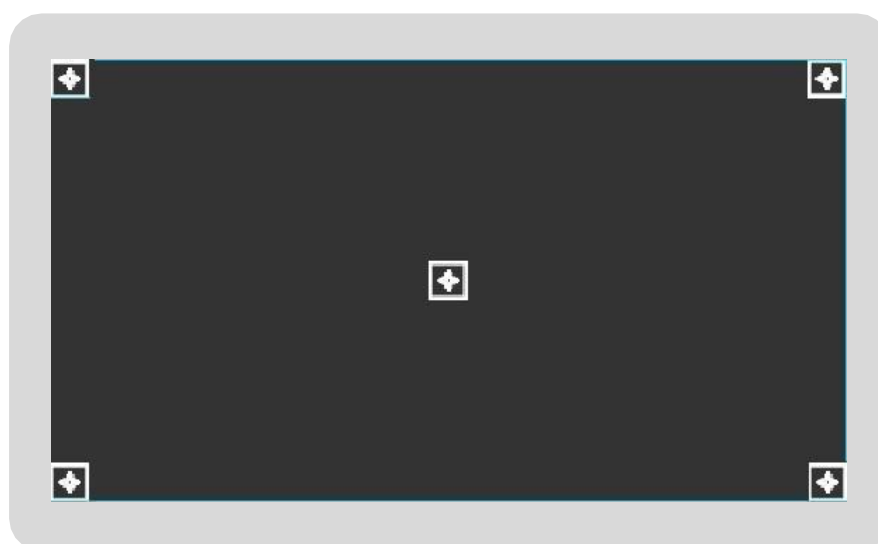
ELECTRONIC LEVEL PROTOCOL

This protocol provides the connection Rs232 or Rs485 to the model S309 with firmware P30901. The communication parameters are 38400,N,8,1. The level signal is received and updated on the display at a frequency of 5 Hz. In if not received the level indicator is not visible.

In the case of a configured electronic level, storage of the weight is allowed with a maximum inclination of 5 per thousand (about 2.8) in each direction (green indicator).

TOUCH SCREEN CALIBRATION

Touchscreen calibration is carried out at the factory. Activate this procedure only if you notice an inaccuracy of the touch point, to be verified by the relevant test procedure.

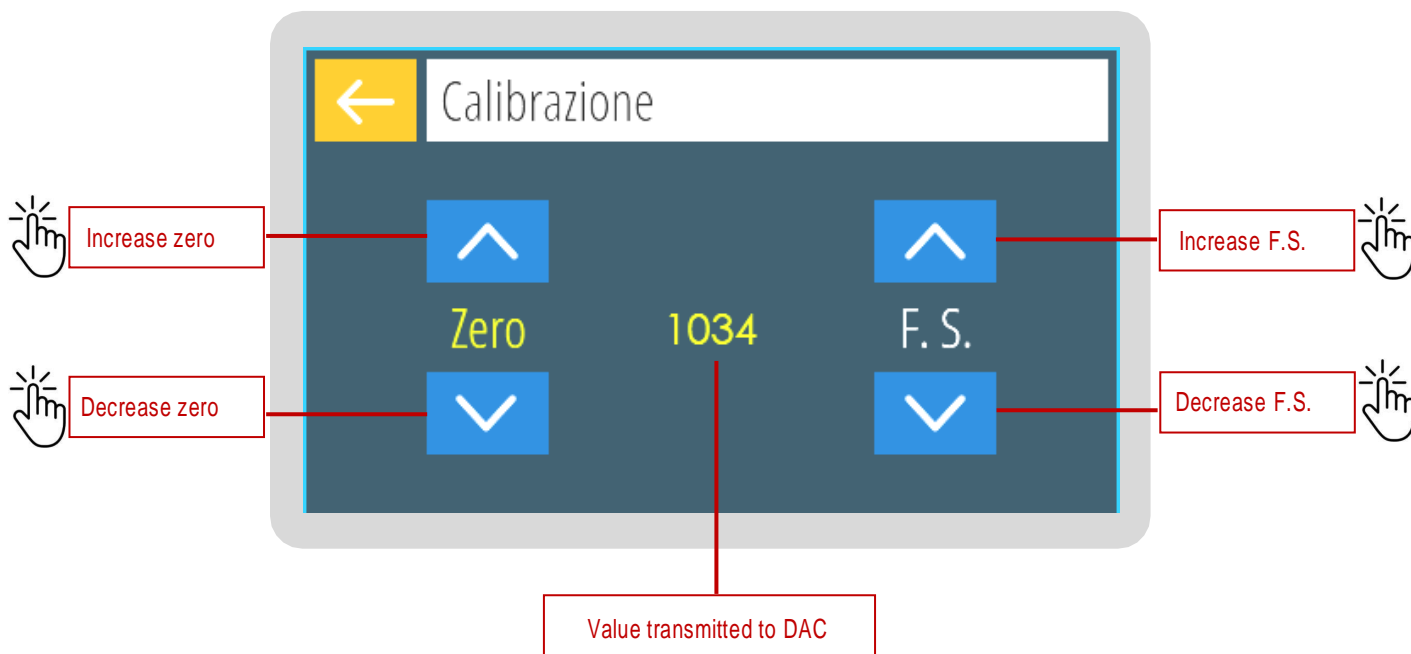


Per effettuare la calibrazione del touchscreen premere sui punti indicati, nella seguente sequenza:

- 1) Bottom left point
- 2) Central point
- 3) Top right stitch
- 4) Bottom right stitch
- 5) Top left point

CALIBRAZIONE USCITA ANALOGICA

Connect a voltmeter or ammeter to the analog output terminals, depending on the selected range, to check the value to be calibrated.



Use the 4 buttons indicated to adjust the calibration of Zero and the full scale. Press and hold the button to apply a faster change. The value indicated centrally refers to the value of zero or full scale according to the adjustment made (the related data are highlighted in yellow).



Limit values

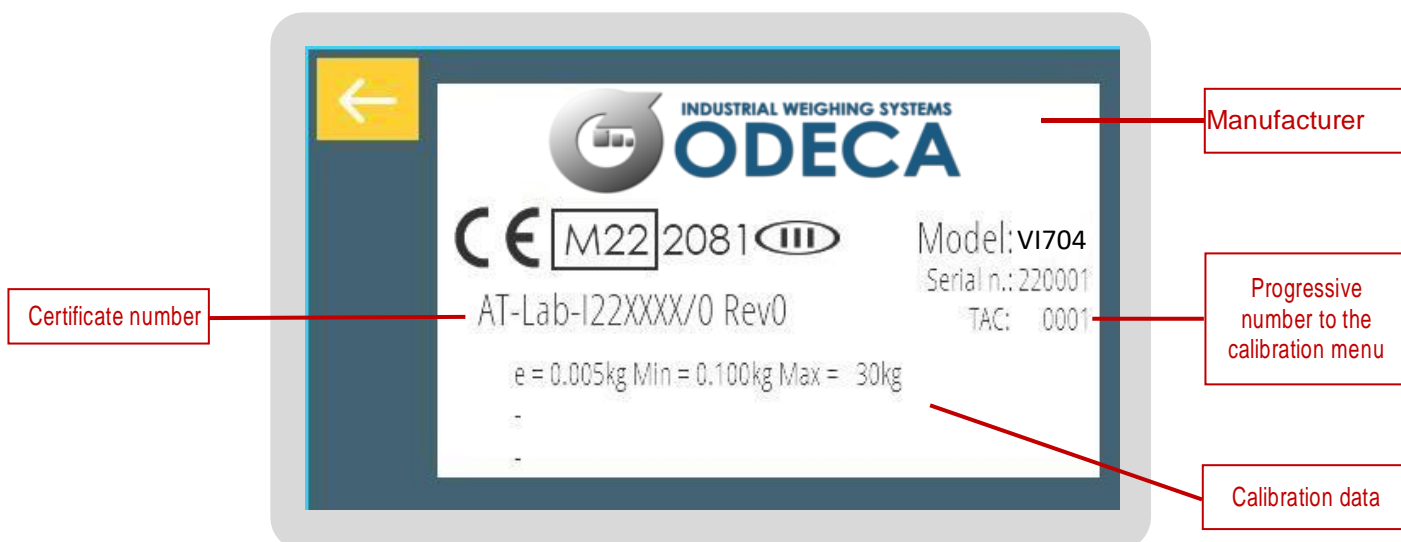
- When the weight exceeds the programmed full scale the output takes a value higher than the full scale of the analog output up to a limit value (saturation).
- When the weight is negative the output is lower than the minimum value up to a limit value (saturation).
- When the weight is not detectable, and when the instrument is switched on, the analog output assumes a minimum value lower than the nominal minimum value.

The frequency of signal refresh is that of display update. The filter applied to the analog output (being a conversion of the digital value) are those applied to the weight display.

MENU INFO

VOCE MENU	PARAMETRO	ID	DESCRIZIONE	RANGE VALORI
weighing	Metrol. plate		Access to the visualization of the metrological plate(only on metric function)	
	Cells signal		Load cell current signal in mV/V	
Software	Code SW		Visualization of the implemented software code	
	Version		Software version	
	Checksum		Sum of metrological firmware control implemented	
Hardware	Fiscal memory		Optional fiscal memory installed	NO÷YES
	SD Card		Optional SD card installed	NO÷YES
	Analogic output		Installed analog output option	NO÷YES
	Ethernet		Ethernet port installed	NO÷YES
Access to calib.	Access N.		Last access to the calibration menu. Press to display the logged-in operator.	
	Access N.		Second last access to the calibration menu. Press to display the operator that logged in.	
	Access N.		Third last access to the calibration menu. Press to display the operator that logged in.	
	Access N.		Fourth last access to the calibration menu. Press to see which operator is logged in.	
	Access N.		Fifth last access to the calibration menu. Press to display the logged-in operator.	
Fiscal memory	Cod.Mem. N		Code of the last weighing performed. Press to display the relative weight.	
	Cod.Mem. N		Code of the second last weighing performed. Press to display the relative weight.	
	Cod.Mem. N		Code of the third last weighing performed. Press to display the relative weight.	
	Search Mem.		Code associated with the weighing to be searched.	0÷959999

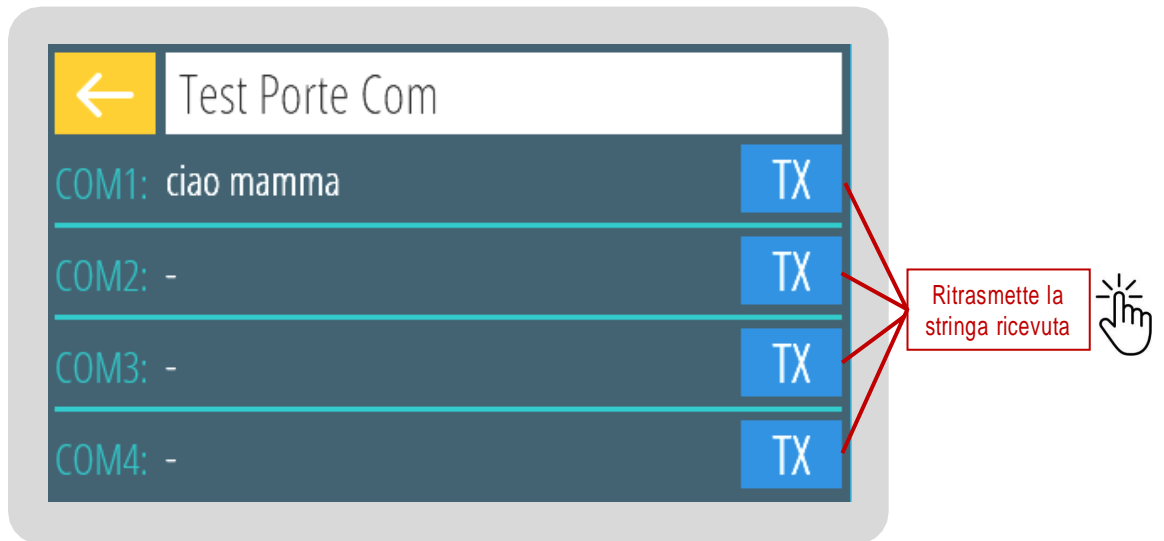
METROLOGICAL PLATE



MENU TEST

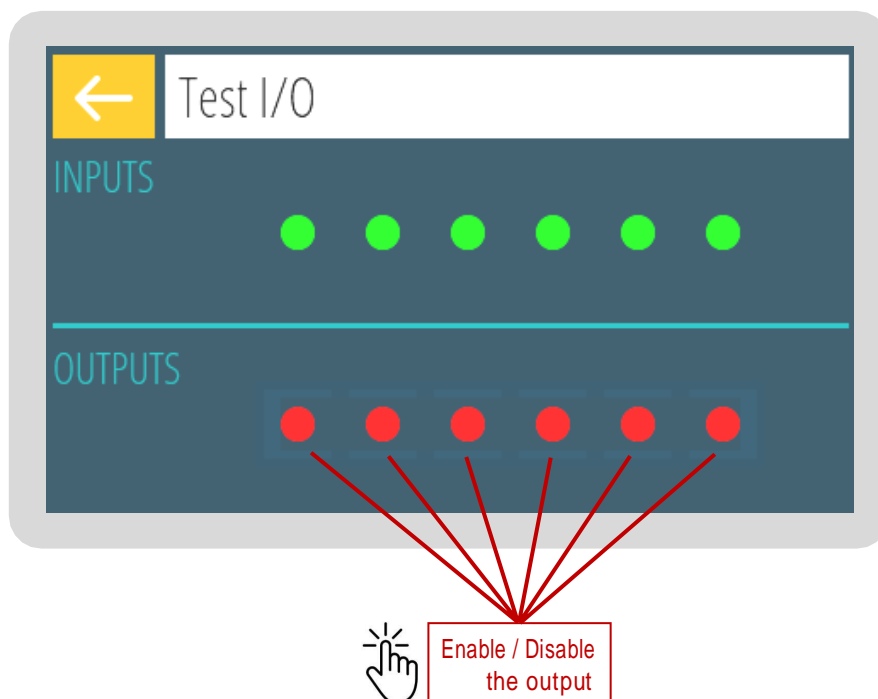
VOCE MENU	PARAMETRO	ID	DESCRIZIONE	RANGE VALORI
	Test Memoria		Procedura di test delle memoria dati	
	Test Porte Com		Accesso alla procedura di test delle porte di comunicazione	
Test Hardware	Test I/O		Accesso alla procedura di test degli ingressi e delle uscite logici	
	Test Touch		Accesso alla procedura di test del touch screen	
	Test Usc.Analog.		Accesso alla procedura di test dell'uscita analogica opzionale	

COMMUNICATION PORT TEST



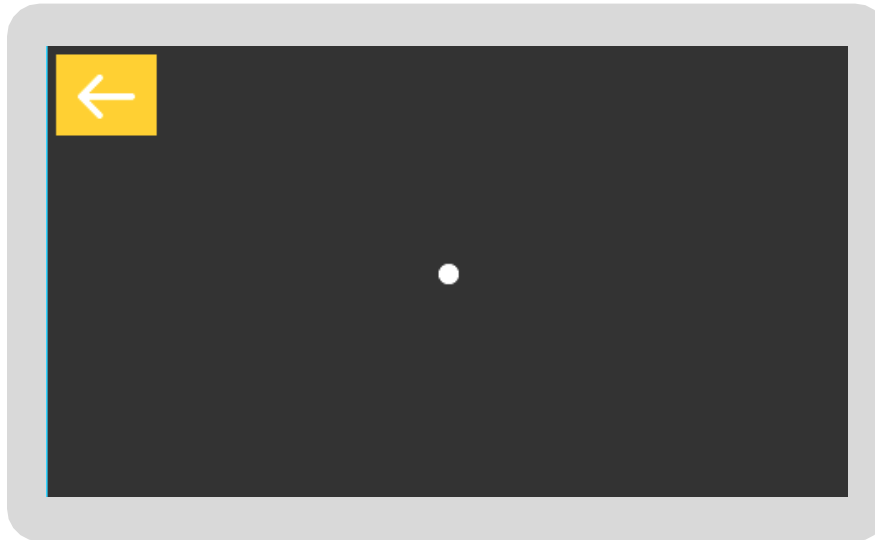
The received string is displayed in the row corresponding to the affected port. You can re-transmit once the received string using the right button.

LOGICAL INPUT OUTPUT TEST



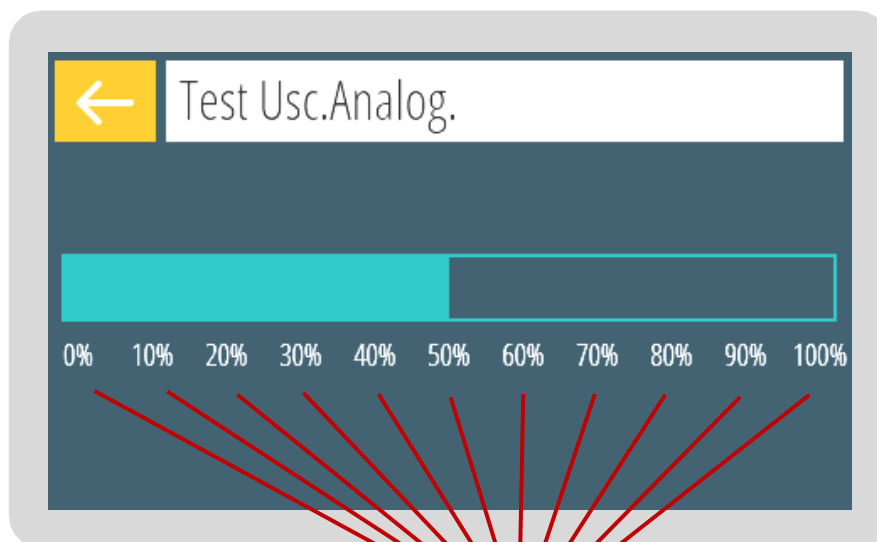
The status of the logical inputs and logical outputs is displayed. To turn the outputs on/ off, press on the indicator light. Inputs and outputs are numbered from left to right (1 ... 6).

TEST TOUCH SCREEN



Press on the touch screen. The bright spot is positioned at the touch point.

TEST USCITA ANALOGICA



Premere sulla scala per
settare il valore dell'uscita
tra lo zero e il fondo scala

With this procedure you can set the output value manually, in steps of 10% of full scale, and check the output value with a multimeter connected to the output terminals.

APPLICATION SOFTWARE UPDATE

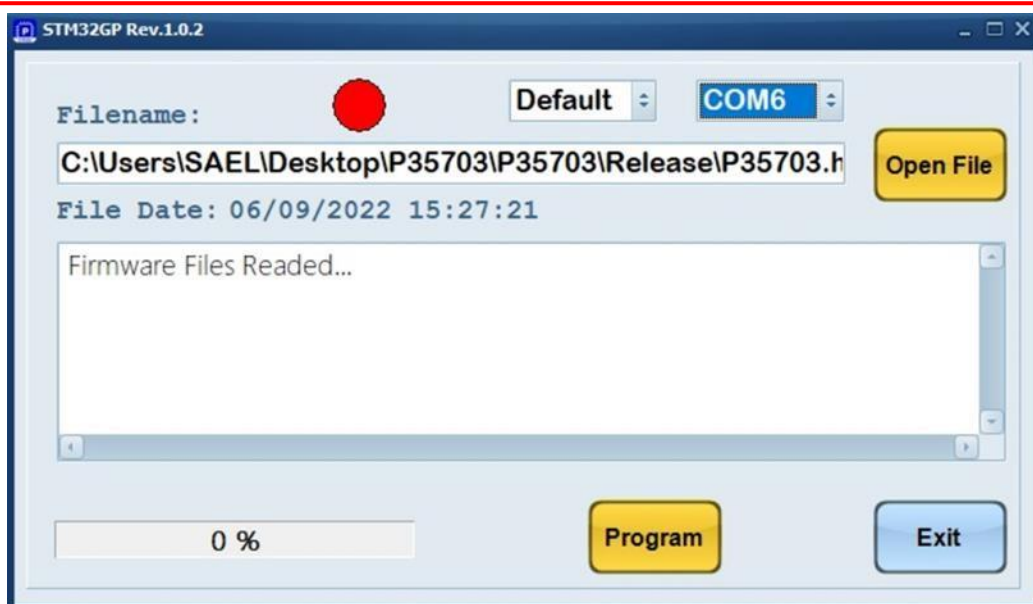
The firmware of the tool is upgradeable by connecting a Windows PC to the USB port. The STM32GP application must be installed on the PC. (PWIN143)



1) Switch on the instrument by pressing the touch in the upper left corner. The instrument displays the following screen and beeps (2 rapid sounds every 3 seconds), and displays the following screen:

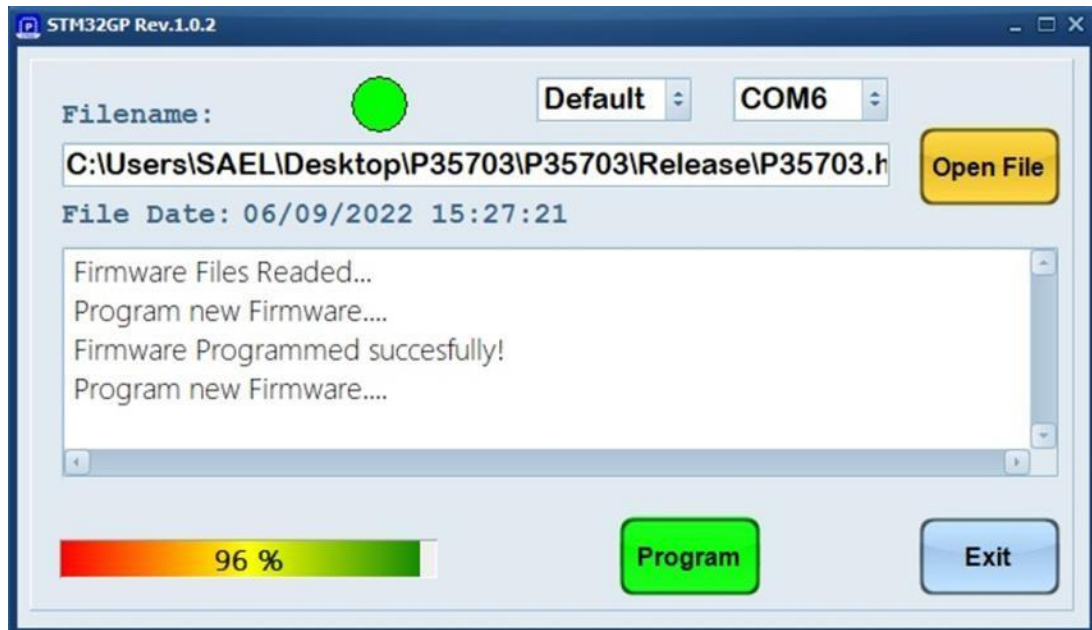


2) Connect the PC to the S357 instrument via USB cable and start the PWIN143 application. The USB connection is detected by the PC as a virtual COM port, the necessary drivers are installed automatically by the operating system. Once started, the program comes with the following screen.



APPLICATION SOFTWARE UPDATE

- 3) Select the **Default** and the virtual **COM** used by the pc.
- 4) Press the **Open File** button to select the file to program
- 5) Press the **Program** button to start programming the firmware



During programming the tool displays the following screen



Alla fine della programmazione lo strumento si arriva in automatico.