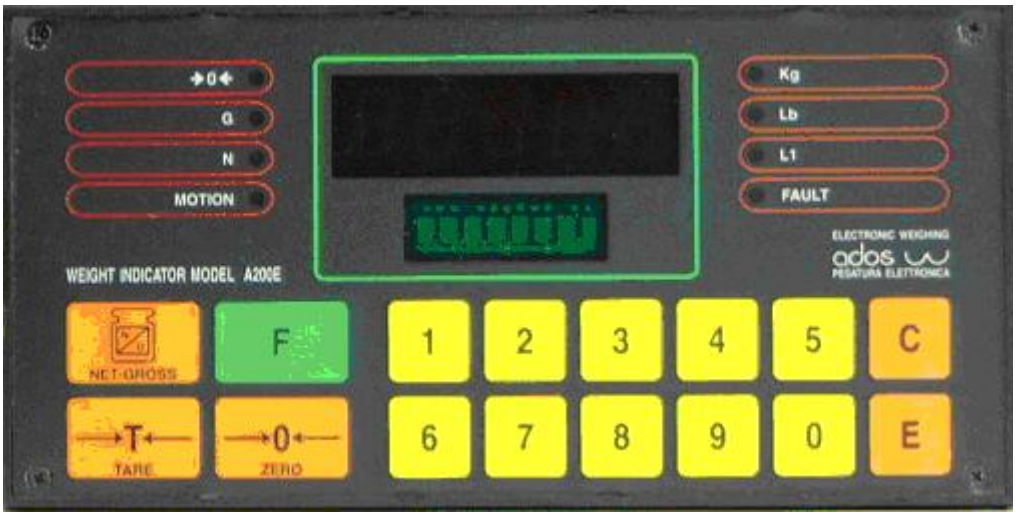
ELECTRONIC WEIGHING
ados
PESATURA ELETTRONICA

INSTRUCTION MANUAL

A200E



SW Release 1.53c

Rev.	Subject of the revision	Date	Prepared	Checked	Approved
9	Change of Modbus registers table	06/06/05	Paulitti G.	Laserra C.	
8	Update to Software revision 1.53	08/03/04	Omodeo S.		
7	Update to Software revision 1.52	25/11/02	Golinelli G.	Paulitti G.	
6	Update to Software revision 1.51	23/01/01	Golinelli G.	Paulitti G.	
5	Update to Software revision 1.42	23/03/00	Golinelli G.	Paulitti G.	
4	Update to Software revision 1.41	15-10-99	Golinelli G.	Paulitti G.	
3	Update to Software release 1.40	10-10-98	Golinelli G.	Paulitti G.	
2	Update to Software release 1.20	22-01-97	Golinelli G.	Paulitti G.	
0	Issue	30/11/95	Golinelli G.	Paulitti G.	

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1. INTRODUCTION

1.1 General

The A200E instrument is a microprocessor based weight amplifier and indicator.

When fitted with SW release 1.53b it can be configured to handle setpoint or simple batch control.
In set point mode the 3+8 relay operation is based on simple threshold.
In batch mode the unit can handle the charge of up to 3 components (double speed) and the discahrge of one component (dual speed).

In set point mode the unit has added the load peak function (gross weight)
It was designed to connected to a maximum of 8 load cells (350 Ω bridge), connected in parallel.
The keyboard can be used to carry out all the programming, configuration and calibration functions.
A series of display messages guides the operator through all the phases.
A series of options sets up the instrument for the main functions related to electronic weighing.

1.2 Versions/options

A 2 0 0 E X X S

Type of power supply (1-2-3-4-5)
Version with analog output 4-20 mA (A) - 0-10V (V)
Version set up for management: Threshold (S) Batch (D)

Code	Power supply
1	115 Vac
2	230 Vac*
3	24 Vac
4	24 Vdc
5	12 Vdc

* Versione standard - * Standard version

SAMPLE ORDER
A200E wired for 230 Vac operation and set up with analog output 4-20 mA option and batch:
A 2 0 0 E 2 A D

1.3 Documentation

This technical manual is relevant to the threshold version of the instrument.

The manual relevant to the Batch version of the instrument is **352-MTA200E4**.
The manual relevant to the continuos belt weighing version is **553-MTA200BE**.
The manual relevant to the L:I.W. weighing version is **554-MTA200LE**.

1.4 Equipment marking description

A200E is marked with symbols compliant with European Standard EN61010-1 (April 1993).

SYMBOL	DESCRIPTION
~	Alternating current
	Protective conductor terminal
	Earth (ground) terminal
	Caution (refer to accompanying documents)
	Caution, risk of electric shock

1.5 Technical data

Power supply	230 Vac 50/60 Hz (standard version)-15%.+10% (see 1.2 for others power supply versions)
Consumption	10VA (15 VA MAX.)
Fuse	230 Vac: 125 mAT 120 Vac: 250 mA T
Operating temperature	from - 10 °C to + 40 °C
Storage temperature	from - 40 °C to + 70 °C
Relative humidity	95% non-condensing
Load cell power supply	8 Vdc (short-circuit proof)
Maximum current	190 mA (8 x 350 Ω load cells in parallel)
Electric connection	4 wires (standard), 6 wires with sense on request
Analog signal	0.5 - 2.5mV/V
Resolution	0.8 μV/Grad
Conversion speed	55 conversion/sec
Graduation	1000-2000-4000-5000-10000
Resolution	1-2-5-10-20-50
Off scale limit (UL/OL)	20% of full scale load
Display	Primary: five (5) digits LED Auxiliary: eight (8) alphanumeric characters
Polarity	sign -
Keyboard	sixteen (16) keys in matrix 8x2
Status indicators	eight (8) LED indicators
Decimal point	user defined: 0 - 0.0 - 0.00 - 0.000 - 0.0000
Zero tracking	user defined (0.5 - 1 - 2 - 5 - 10 div/s)
AZM aperture	user defined (OFF - 1.9% - 100% of F.S.)
Motion band	user defined (OFF - 0.5 - 1 - 2 - 5- 10- 20 div)
Serial outputs	main output RS232 or RS485 Half-duplex, aux output RS232, Tx only
Digital inputs	three (3) optoinsulated digital inputs (12/24 dc)
Digital outputs	three (3) base relay outputs and eight (8) extra
Contact rating	0.5 A @ 24 Vdc
Housing	Anodized aluminum construction for assembly on board front panel (Standard DIN 43700)
Dimensions	96 x 192 x 140
Drilling	91 x 188
Weight	1.5 Kg
Mounting	Front panel mounting with two holding brackets mounted on the sides of the enclosure
Analog output 0-10V (option)	Voltage output 0-10V, 16 bit resolution, min. 10 KΩ optoinsulated 1000 V
Analog output 4-20 mA (option)	Current output 4-20 mA, 16 bit resolution, 500 Ω max. optoinsulated 1000 V

2. INSTRUMENT OPERATIONS

2.1 Turning on the instrument

When the instrument is turned on, the primary display indicates the following:

–	–	–	–	–

and the auxiliary display indicates the following, at intervals of about two seconds:

A	D	O	S		S	r	L

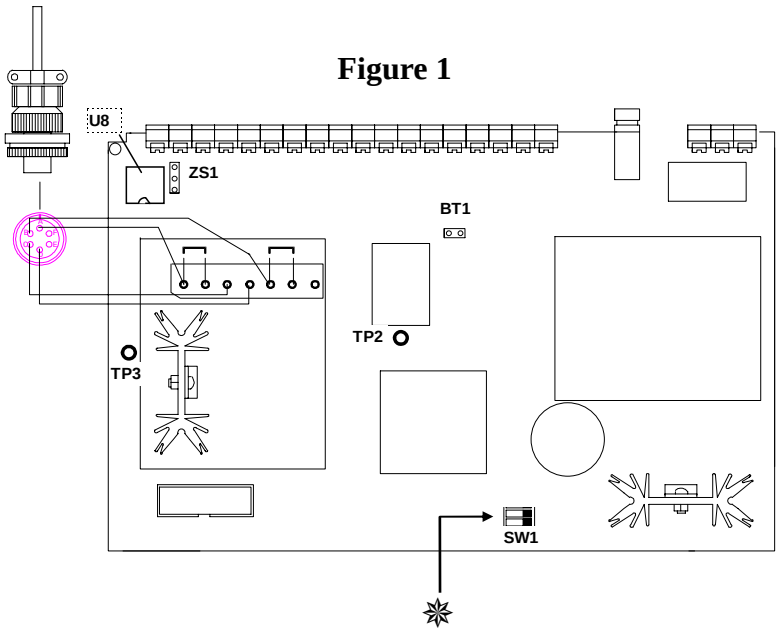
	A	2	0	0	E		

R	e	v	1	.	5	3	b

(Revision of the installed software)

After this phase, the instrument is immediately operative.

Figure 1



2.1.1 Load cell signal averaging

Starting with SW rev 1.50 a new load cell signal averaging method have been introduced (FIR filters). This method is based upon Digital Signal Processing (DSP) methodologies and is useful when the load cell signal has a large amount of harmonics (due for instance to mixers, agitators or similar).

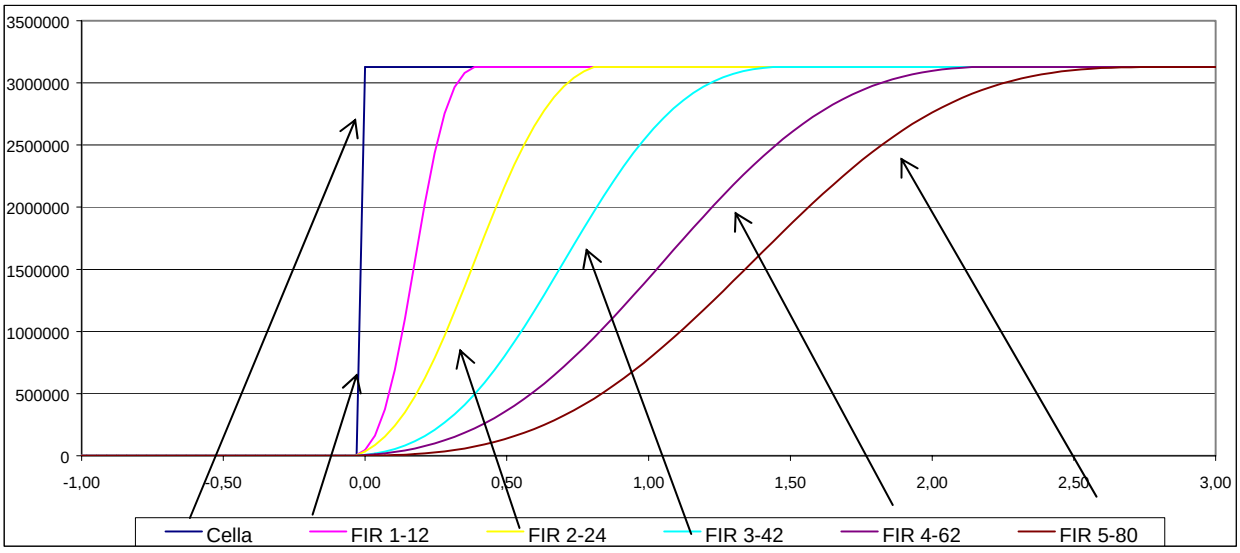
In configuration phase user can select one of three classic (mobile average) and five DSP filters.

First type of filter has a fester response time but are less efficient against disturbance and can be used when fast changing loads have to be detected.

Second type of filter are very efficient against noise and disturbances (having a higher filter effect) but have of course a higher response time.

In both cases higher filter coefficient corresponds to higher filtering effect and higher response time.

As example the following graphic shows the answer to a step changing load signal as function of different filters.
As can be noticed FIR 1 has a response time of about 0.2 seconds and FIR 5 has a response time of about 2.5 second.



2.2 Display indication

2.2.1 Primary display

Under normal operating condition the display shows the value of weight, using the following criteria:

- leading zeroes will presented as blank
- if the value is greater then 99999 only the 5 less significant digit are displayed and the display will blink to indicate that there is another digit, which value is 1, not displayed (please note that during configuration is not possible to set any combination of graduation and resolution which leads to results higher than 199999)
- the polarity “minus” (in case of negative values) is indicated in the leftmost digit
- if the negative value is composed of five digits (for example -32420), the leftmost digit will show alternatively the “minus” and the fifth digit value.
- if the negative value is composed of six digits only the 5 less significant digit are displayed and the display will blink to indicate that there is another digit, which value is 1, not displayed. The leftmost digit will show alternatively the “minus” and the fifth digit value.

Indication limits are the following:

lower limit: - 20% of full scale
higher limit: 120% of full scale

if the weight is under the lower limit the following will be displayed:

–	–	U	L	–

if the weight is over the upper limit (or if the load cell signal is higher than 20 mV the following will be displayed:

–	–	O	L	–

2.2.2 Auxiliary display

Under normal operating conditions and with the instrument in GROSS, the auxiliary display indicates the current time, in the format hours-minutes-seconds:

0	9	:	1	1	:	5	5

Press **0** on the display to indicate the current date, in the format day-month-year, for two seconds:

1	5	-	0	5	-	9	6

Under normal operating conditions and with the instrument in NET, the auxiliary display shows the value of the TARE with two alternating messages:

T	A	R	E		1		
			1	2	3	.	4

In the configuration and calibration phase, the auxiliary display is used to guide the operator in carrying out the functions.
In batch mode the display shows the batch status.

2.3 Tare operations

Up to four tare values can be defined to handle the net value of material on balance.

At power on the unit operates with tara value #1.

Operator programmed tare values are maintained in non volatile memory and are available even after a loss of power.
Automatically acquired tare values are value are lost at power down.

2.3.1 Tare selection

The procedure to select the operating tare is the following:
- set the unit in GROSS
- press the T key. The instrument shows the operating tare.
- press the T key to switch among tavailable tare
- press the E key to confirm the selected tare. The instrument goes back to operatiion in NET.
- press the C key to abort the operation

2.3.2 Manual tare data entry

The procedure to change the value of the operating tare is the following:
- set the unit in GROSS
- press the T key. The instrument shows the operating tare.
- press the T key to switch among tavailable tare
- change the Tare value using numeric keys, F key or N/G key (as explained in chapter “Configuration”)
- press the E key to confirm changes to the selected tare. The instrument goes back to operatiion in NET.

press the C key to abort the operation

Manually entered tare values are maintained in non volatile memory

2.3.3 Auto tare

Pressing the T key when the unit is in NET the value of the Gross weight of the load on balance is acquired as the actual tare.

2.4 Peak handling

The unit continuously check the actual GROSS load value against the acquired peak load value and if the actual value is higher the peak load value will be updated.

Peak load value is showed on auxiliary display.

2.4.1 Peak load value indication

Pressing the key **9** the unit shows the value of the peak load acquired.
The value is updated continuously in case of load value increase.

2.4.2 Peak value printout

The A200 can be programmed to print the peak load value on a 24 column printer.

Printing is sent on the primary serial line if it is programmed as “DE” and can be initiated pressing the “**E**” on keyboard or by closure of an external input programmed as “PRINT”.

Printout format is as follows:

```
18-11-99 11:09
Peak:     5678 Kg
----------------------
```

Date and time

Peak load value

Separator

2.4.3 Peak reset

Peak value can be reset by:
- by closure of an external input programmed as “RESET”.
- by serial line with ADOS protocol (“m” command)
- by Modbus protocol (E Coil)
- Using the keyboard

To reset the peak value from keyboard the operator must press the **>0<** key.
The unit will prompt for confirmation:

		0	**K**		**?**	**?**	

blinking

And the operator can confirm pressing the “**E**” key.

2.5 LED status indicators

The indications provided by the signal LED's located on the front panel of the instrument are explained below:

→0←

The LED is on when the value of the weight is 0 and is stable within 1/4 of a division.
The indication is available under gross weight and net weight conditions.

G

The LED is on when the instrument displays the gross weight.
Under this condition the **T** key is not operative.

N

The LED is on when the instrument displays the net weight (gross weight minus the tare).
Pressing the **T** key in NET the instrument copies the current value of the gross weight into the tare value, thus clearing the value of the net weight.

MOTION

The LED is on when the measurement is moving with a gradient that is greater than what is set in the configuration.

KG

The LED is on to signal that the weight indication is in kilograms.

LB

This signal is currently not used. Lamp is always OFF.

L1

This signal is currently not used. Lamp is always OFF.

FAULT

The LED is ON to indicate that the instrument need to be calibrated (Zero or Span or both).
The LED is BLINK to indicate errors in confguration parameters.

2.6 Key functions

ZERO
Press this key (with the instrument in the Gross mode and the weight stable) to clear the divisions indicated on the display within the limits set by the configuration of the “AZM limit” parameter.

G/N
Press this key to toggle between the Gross and Net condition.

T
Press this key (with the instrument in NET mode and the weight stable) the instrument will copy the current value of the gross weight into the tare value, thus clearing the net weight value. Press this key (with the instrument in the GROSS mode) the instrument shows the actual tare value.

F
Press this key to enter the configuration modality.

E
Press this key to perform a print request on the primary serial port. The request takes effect only if the serial port is configured for “print on request”.

1-2-3-4-5-6-7-8-9
If the unit is configured for SET POINT operation, pressing these keys the operator can edit the values of thresholds 1 to 9 without passing from the configuration mode.
Note: if the serial line is active, the status flag still reports the “configuration” indication.

1-2-3-4
If the unit is configured for NET operation, pressing these keys the operator can edit the values of parameters relevant to charge components 1,2 and 3 or to discharge component without passing from the configuration mode.
Note: if the serial line is active, the status flag still reports the “configuration” indication.

6
If the unit is configured for NET operation, pressing these keys the operator will enter the production totalizer display

5-7-8
If the unit is configured for NET operation these keys have no meaning.

0
Date display. Press this key (with the unit in GROSS) to display the current date, expressed in day-month-year, for 2 seconds.

2.7 Switch

The instrument is equipped with a DIP switch bank having the following functions:

Position	Function	Normal State
SW1-1	Initialization of configuration parameter memory Can be used as an alternative to the normal init procedure. See “Initialization” paragraph for operation details.	OFF
SW1-2	Not used	OFF

2.8 Self diagnostic

A200E has a number of built-in self diagnostic features intended to improve the overall operating safety.

Generally speaking, when a fault condition is detected, the instrument is driven to a safety condition deenergizing alarm relays.

Display indications are provided to help in fault finding.

2.8.1 Configuration memory integrity check

Check is carried out at power on.
If the configuration memory is found defective, the power on sequence will not be completed, all relays are driven to alarm condition (deenergized), the analog output is cleared and the serial line is deactivated.

A forced reconfiguration to default is then performed and the primary display shows the following message:

	I	N	I	T

Blinking

The transmitter stays in this condition as long as a key is pressed by operator to acknowledge the situation.
The instrument must be reconfigured and recalibrated.

2.8.2 Configuration parameter integrity check

Check is carried out every operating cycle.

If a configuration parameter is found defective, the message "**ER XX**" will be reported on display for half a second every two seconds, where **XX** is the code of the wrong parameter, according to the following table:

CODE	Meaning	Effect on transmitter	Resolution
ER 01	Error in the CALIBRATION parameters	The ZERO funcion is disabled, relays are deenergized and analog output is forced to error condition.	Instrument must be recalibrated
ER 02	Error in the DIVIS and SENS parameters	The ZERO funcion is disabled, relays are deenergized and analog output is forced to error condition.	Verify and reconfigure defective parameters
ER 03	Error in the DP, AVER, MOTION, AZM, Z TRK parameters	The ZERO funcion is disabled..	Verify and reconfigure defective parameters
ER 04	Error in the Analog output parameters	The analog output is zeroed	Verify and reconfigure defective parameters
ER 05	Error in BAUD - SER P - AD485 parameters	Transmitter stays in operation. Probably malfunctions on serial line operation.	Verify and reconfigure defective parameters
ER 06	Error in the IN1 - IN2 - IN3 parameters	No effect.	Verify and reconfigure defective parameters
ER 07	Error in the RELAY parameters	Relays are deenergized.	Verify and reconfigure defective parameters
ER 08	Error in the BATCH parameters	Relays are deenergized.	Verify and reconfigure defective parameters
ER 09	Error in the TARE parameters	The ZERO funcion is disabled, relays are deenergized..	Verify and reconfigure defective parameters

2.9 Digital input

Unit is equipped with three user programmable digital inputs. Inputs are driven by voltage free contacts.

Each input can be configured in one of the following functions:

OFF
Input is non used.

ZERO
The closure of the input contact can clear the value of gross weight if the value is lower than the the value defined as “MAX AZM”.
Command is accepted both in GROSS or NET and also if the load value is non stable (MOTION is On).

GROSS/NET
On closure of the input contact the instruments switches the GROSS / NET status.

TARE
On closure of the input contact the actual value of Gross weight is acquired as Tare value.
Command is accepted both in GROSS or NET and also if the load value is non stable (MOTION On).

START CHARGE / CHARGE ALARM ACKNOWLEDGE
This function is effective only if the unit is operating in BATCH MODE.
If the batch is not started the closure of the contact will start the load of the first component.
If the batch is in progress and there are alarms (out of zero, time out or aout of tolerance) or the unit is paused, the closure of the contact will resume the batch sequence.
If the batch is in progress and there are no alarms the closure of the contact will have no effect.

START DISCHARGE / DISCHARGE ALARM ACKNOWLEDGE
This function is effective only if the unit is operating in BATCH MODE.
If the unload is not started the closure of the contact will start the product unload.
If the unload is in progress and there are alarms (out of zero, time out or aout of tolerance) or the unit is paused, the closure of the contact will resume the batch sequence.
If the batch is in progress and there are no alarms the closure of the contact will have no effect.

PAUSE / ABORT
This function is effective only if the unit is operating in BATCH MODE.
If the load or unload sequence is not started the closure of the contact will have no effect.
If the load or unload sequence is in progress the closure of the contact will force the unit to PAUSE deenergizing the output relays.
If the batch is paused closure of the contact will ABORT the batch sequence.

PRINT
If the primary serial line is configured for “Print on demand” the closing of input contact will generate a printout.

RESET PEAK VALUE
The closing of input contact will generate a peak reset

PRINT PEAK VALUE
If the primary serial line is configured for “Print on demand” the closing of input contact will generate a printout of the peak value.

WEIGHT ACQUISITION
This mode is active only if the instrument is configured to work in threshold mode, the input closing allows to acquire the gross weight value (if weight is stable or anyhow within 2,5 seconds from contact closing). The value of acquired gross weight is stored in the MODBUS 10 and 11 register

2.10 Output relay operation

The instrument can be programmed to drive the output relays in two difefrent ways:
- SET POINT MODE: relays are operated based upon the actual value of load on balance and the programmed operating mode of each relay.
- BATCH MODE: relays are driven by unit to perform an automatic load or unload sequence or one or mora components with one oer two speeds.

2.10.1 Relay operation in Set point mode

The base instrument is equipped with three relays that can be configured as required. The instrument can be expanded with eight additional relays that also can be configured as required.

A voltage-free normally open (NO) contact is available for each relay.

The action of the relay depends on the weight condition (gross or net) defined in the configuration phase independently from what is indicated on the display. Therefore, the user can switch the display selection as required without accidentally enabling the thresholds.

The relay returns to “normal” conditions when the weight value drops below the value calculated as the sum of the threshold value and the programmed dead band value.

Each relay can be configured to operate in one of the following modes:

Off
The relay is permanently disabled.

Closing on Gross
The relay is de-energized (and the output contact opened) for all the gross weight values lower than the threshold set in the configuration. The relay is energized (and the output contact closed) for all the gross weight values greater than or equal to the threshold set in the configuration.

Closing on Net upon Loading
The relay is de-energized (and the output contact opened) for all the gross net values lower than the threshold set in the configuration. The relay is energized (and the output contact closed) for all the net weight values greater than or equal to the threshold set in the configuration.

Closing on Net upon Unloading
The relay is de-energized (and the output contact opened) for all the negative net weight values lower than (in terms of absolute value) the threshold set in the configuration. The relay is energized (and the output contact closed) for all the negative net weight values greater than or equal to (in terms of absolute value) the threshold set in the configuration.
Example: if the threshold set is 1250, the relay is de-energized for positive values and for the negative values from -1 to -1249. The relay is energized for values ranging between -1250 and -F.S.

Opening on Gross
The relay is energized (and the output contact closed) for all the gross weight values lower than the threshold set in the configuration. The relay is de-energized (and the output contact opened) for all the gross weight values greater than or equal to the threshold set in the configuration.

Opening on Net upon Loading
The relay is energized (and the output contact closed) for all the net weight values lower than the threshold set in the configuration. The relay is de-energized (and the output contact opened) for all the net weight values greater than or equal to the threshold set in the configuration.

Opening on Net upon Unloading
The relay is energized (and the output contact closed) for all the net negative weight values lower than (in terms of absolute value) the threshold set in the configuration. The relay is de-energized (and the output contact opened) for all the net negative weight values greater than or equal to less (in terms of absolute value) the threshold set in the configuration.
Example: if the threshold set is 1250, the relay is energized for positive new values and for all the negative values from -1 to -1249. The relay is de-energized for values ranging between -1250 and -F.S.

2.10.2 Relay operation in Batch mode

In Batch mode the outputs on the main board are used to provide general information relative to the Batch status. Each relay can pbe programmed as follow:

Batch in Progress
The relay is excited (and its contact closed) for the entire Batch cycle, from the moment at which the cycle start is enabled to its conclusion.

End Cycle
The relay is excited (and its contact closed) at the end of the Batch cycle (either normal or due to Abort) and is maintained until the balance returns to within the Zero band (in case of load batch) or until a new START comamnd (in case of unload batch).

Fault
The relay is excited (and its contact closed) to signal a fault condition. The command is removed when the alam is acknowledge.

Acquired weight
The relè is xcited for 2,5 seconds under control of weight acquisition .

The outputs on the expansion board are used to control the component load or unload and are:

Relay 4 Loading of component 1 - Fast
Relay 5 Loading of component 1 - Slow
Relay 6 Loading of component 2 - Fast
Relay 7 Loading of component 2 - Slow
Relay 8 Loading of component 3 - Fast
Relay 9 Loading of component 3 - Slow
Relay 10 Unloading - Fast
Relay 11 Unloading - Slow

2.11 Batch mode

The instrument can automatically load 1, 2 or 3 components (double speed) and unload one component (dual speed) based on used defined data.

Each component is defined by the following parameters:

- **Set** This is the weight of the component to dose.
- **Slowdown** This is the weight value to be dosed in “slow” mode.
- **Fly** This is the weight value for the component “in fly”.
- **Tolerance** This is the allowable tolerance value on the weight of the dosed component.

Common batch parameters are:

- **Stabilisation time** This is the wait time between the de-activation of the component command and the dosed weight control.
- **Wait time** This is the wait time before switching to the next component.
- **Maximum Load** This is the maximum allowable material on balance.
- **Zero Band** This is the value of load on balance to consider the balance empty.

2.11.1 Load batch cycle

The Batch cycle control performed by the instrument is structured into operating steps which are described in the following table.

PHASE	FUNCTION
0	Batch is not activated and the instrument is waiting for the START command. The instrument continuosly verifies if the value of gross load on balance is in the ZERO band and eventually resets the "end of cycle" relay. START is accepted only if all the following conditions have been verified: ⇒ the instrument is in operating mode (not in configuration, calibration test or clock set) and in "idle " condition (no batch cycle in progress) ⇒ at least 1 component has a set value reather than zero (if not the alarm relay is activated and a blinking message "**NO SET**" is displayed) ⇒ The sum of set values and the actual gross value il lower then the "Maximum Load" value (if not the alarm relay is activated and a blinking message "**OVERLOAD**" is displayed) If all the conditions are satisfied the instrument goes to phase 1.
1	The instrument verifies if the balance is in the ZERO band (the ZERO band is also valid for negative weights). If the weight is out of the Zero band ⇒ a blinking message " **EMPTY ?**" is displayed ⇒ the Alarm relay is energized The instrument than waits for ACKor ABORT comamnd. If the gross weight is within the zero band or the off band was accepted (with the ACK command), the Alarm output is de-activated and the instrument goes to phase 2.
2	This is the Batch cycle start phase. ⇒ The step counter is cleared ⇒ The "Batch in Progress" output is set ⇒ The "End Batch" output is reset (if present) ⇒ The "Alarm" output is reset (if present) ⇒ The heading of the Batch report is printed ⇒ The instrument is placed in "Net" and the Tare is performed ⇒ The message "**C 1234**" is displayed, where 1234 is the set value The instrument goes to phase 3.
3	This is the "Fast" Batch phase. ⇒ The "fast" output is energized. Upon reaching a net weight value equal to the [set minus slowdown minus fly]

	the instrument goes to phase 4 (“Slow” phase). The Batch operation can be suspended by closing the PAUSE/ABORT input contact: all the component command outputs are de-activated and a blinking message “**PAUSED**” is displayed. The Batch operation can be started again closing the ACK input contact or can be permanently interrupted closing the PAUSE/ABORT input contact. In this case the instrument clears the “Batch in Progress” and “Batch in Alarm” status, de-activates the relative outputs and goes to phase 0 (Batch de-activated).
4	This is the “Slow” Batch phase. ⇒ The “fast” output is deenergized. ⇒ The “slow” output is energized. Upon reaching a net weight value equal to the [set minus fly] the instrument goes to phase 5 (Stabilization phase). The Batch operation can be suspended by closing the PAUSE/ABORT input contact: all the component command outputs are de-activated and a blinking message “**PAUSED**” is displayed. The Batch operation can be started again closing the ACK input contact or can be permanently interrupted closing the PAUSE/ABORT input contact. In this case the instrument clears the “Batch in Progress” and “Batch in Alarm” status, de-activates the relative outputs and goes to phase 0 (Batch de-activated).
5	This is the weight stabilisation phase and is used to recover the fly of the product. If defined in configuration, the instrument activates a wait timer whose value can be checked on the aux display: **STB 0008** When the time expires the dosed weight is checked: ⇒ if the weight is less than the [set minus fly] value, the “Slow” or “Fast” phase is re-activated (it depends on whether or not the slowdown is present) ⇒ if the weight is in tolerance, the systems goes to phase 7 (end component control) ⇒ if the weight is out of tolerance, the system goes to phase 6 (component out of tolerance control) When the stabilisation time expires, if the weight is not stable, the system goes to phase 7 (component out of tolerance control).
6	This is the out of tolerance control phase. A blinking message “**ACK TOLL**” is displayed. The “Batch in Alarm” output is activated and the status of the ACK and PAUSE/ABORT input is checked:

	⇒ if the operator closes the ACK input, the instrument de-activates the “Batch in Alarm” output and goes to phase 7 (end component control) ⇒ if the operator closes the PAUSE/ABORT input, the instrument de-activates the “Batch in Alarm” output and goes to phase 8 (end cycle control)
7	This is the End Component control phase. The instrument performs the following operations: ⇒ prints the value of dosed component ⇒ activates the wait timer between one component and the next one ⇒ when the wait timer expires places the system in the NET status and calculates the TARE **The material eventually loaded during the wait time can be seen in the printed report as difference beetwen the sum of loaded components and the valued of total dosed material.** If the formula is not completed, it then returns to phase 3 (start new component) or goes to phase 8 (end cycle control).
8	This is the End Cycle control phase. ⇒ The Batch in Progress status and relative output are cleared. ⇒ The End Batch status and relative output are activated. Instrument goes to phase 0

2.11.2 Unload batch cycle

The unload cycle control performed by the instrument is structured into operating steps which are described in the following table.

PHASE	FUNCTION
0	Batch is not activated and the instrument is waiting for the START command. The instrument continuosly verifies if the value of gross load on balance is in the ZERO band and eventually resets the “end of cycle” relay. START is accepted only if all the following conditions have been verified: ⇒ the instrument is in operating mode (not in configuration, calibration test or clock set) and in “idle “ condition (no batch cycle in progress) ⇒ the value of set 4 is greather than 0 If all the conditions are satisfied the instrument goes to phase 1.
1	This is the “Fast” unload phase. ⇒ The “fast” output is energized. Upon reaching a net weight value equal to the [set minus slowdown minus fly] the instrument goes to phase 2 (“Slow” phase). The Batch operation can be suspended by closing the PAUSE/ABORT input contact: all the component command outputs are de-activated and a blinking message “**PAUSED**” is displayed. The Batch operation can be started again closing the ACK input contact or can be permanently interrupted closing the PAUSE/ABORT input contact. In this case the instrument clears the “Batch in Progress” and “Batch in Alarm” status, de-activates the relative outputs and goes to phase 0 (Batch de-activated).
2	This is the “Slow” unload phase. ⇒ The “fast” output is deenergized. ⇒ The “slow” output is energized. Upon reaching a net weight value equal to the [set minus fly] the instrument goes to phase 5 (Stabilization phase). The Batch operation can be suspended by closing the PAUSE/ABORT input contact: all the component command outputs are de-activated and a blinking message “**PAUSED**” is displayed. The Batch operation can be started again closing the ACK input contact or can be permanently interrupted closing the PAUSE/ABORT input contact. In this case the

	instrument clears the “Batch in Progress” and “Batch in Alarm” status, de-activates the relative outputs and goes to phase 0 (Batch de-activated).
3	This is the weight stabilisation phase and is used to recover the fly of the product. If defined in configuration, the instrument activates a wait timer whose value can be checked on the aux display: **STB 0008** When the time expires the dosed weight is checked: ⇒ if the weight is less than the [set minus fly] value, the “Slow” or “Fast” phase is re-activated (it depends on whether or not the slowdown is present) ⇒ if the weight is in tolerance, the systems goes to phase 5 (end component control) ⇒ if the weight is out of tolerance, the system goes to phase 4 (component out of tolerance control)
4	This is the out of tolerance control phase. A blinking message “**ACK TOLL**” is displayed. The “Batch in Alarm” output is activated and the status of the ACK and PAUSE/ABORT input is checked: ⇒ if the operator closes the ACK input, the instrument de-activates the “Batch in Alarm” output and goes to phase 7 (end component control) ⇒ if the operator closes the PAUSE/ABORT input, the instrument de-activates the “Batch in Alarm” output and goes to phase 8 (end cycle control)
7	This is the End Component control phase. The instrument performs the following operations: ⇒ prints the value of unloaded meterial ⇒ activates the wait timer between one component and the next one ⇒ when the wait timer expires places the system in the NET status and calculates the TARE Instrument goes to phase 0

2.12 Dosed material totalizer

The instrument maintains a material totalizerfor each product (loaded or unloaded) and for the total production.
At the end of each component phase (regular or aborted) the weight of the component dosed is added to the component totalizer.
At the end of batch phase (regular or aborted) the weight of the material dosed is added to the product totalizer.

The totalizers are:
Product 1 first load component
Product 2 second load component
Product 3 third load component
Product S unload component
Product T total dosad material

The totalized value is maintained in “division” (whith a capacity of 4 billion divisions) and the presentation is made respecting the sensitivity and position of the decimal point defined in configuration. The value is converted over 7 digits (10 million).

It is also possible to reduce the scale of the display of the totalized value by a programmable factor (1,10,100,1000,10000) in order to present very large numbers or to eliminate the decimals which in the accumulated total lose their meaning.
The scale factor is applied only during the data presentation phase, for which it can be varied at any time without changing the contents of the totalizer.

2.12.1 Totalizer display

The content of totalizers can be displayed on auxiliary display pressing key 6 (when the instrument is in “idle” condition).
Totalizer name and totalizer value are displayed aletrnate (with a 1 to 4 period):

P	r	o	d	.			1
	1	2	3	4	5	6	7

Pressing key 6 all totalizers can be displayed.
Pressing key C (or after a 1 minute time-out) will return to normal display.

Pressing key ZERO the operator can clear the value of displayed totalizer. the instrument ask for confirmation showing for 5 seconfs the message

?	?		0	K		?	?

blinking

Pressing the E key the totalizer will be cleared
Pressing the C key the request will be aborted.

2.12.2 Totalizer report

A totalizer Report can printed on primary serial line if configured for “print on request”.

To issue the print request the operator must enter the totalizer display and then press the E key.

The report has the following format:

```
11-05-96  15:22:44
Prod. 1      123.4
Prod. 2      123.4
Prod. 3      123.4
Prod. s      123.4
Prod. T      123.4
```

2.13 Batch report

Report is printed on primary serial line if configured for “print on request”.
Report fornat is different for load or unload batch.

2.13.1 Load batch report

The instrument can produce a Batch report with the following format:

```
11-05-96  15:22:44
START BATCH     282.3
Comp.   Set    Dosato
01     100.0     91.8
02     100.0     99.8
03      60.5     33.4
TOT. BATCH      133.2
11-05-96  16:22:44
```

Date and time of cycle start

dosed weight

Date and time of cycle end

The value associated to “START BATCH” indicates the weight of material on balance at batch start.

The value associated to “TOT BATCH” indicates the weight of the material dosed.

When the balance is discharged and the load value become lower than the “Zero band” value, the following message is printed:

```
11-05-96  15:22:44
EMPTY BALANCE        2.3
```

2.13.2 Unload batch report

The instrument can produce a Batch report with the following format:

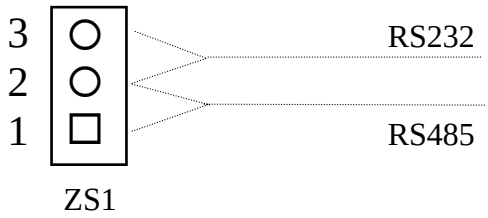
```
11-05-96  15:22:44
START BATCH     282.3
Comp.   Set    Dosato
 S     100.0     91.8
```

The value associated to “START BATCH” indicates the weight of material on balance at batch start.

2.14 SERIAL INTERFACE MANAGEMENT

2.14.1 Primary serial interface

The primary serial line is available in both the RS232 and RS485 mode.
The factory configuration is RS232 (see Figure 1).



ZS1 1-2 RS485 Mode
ZS1 2-3 RS232 Mode

If the instrument is used in the RS485 modality, an integrated circuit MAX483E must be mounted in the socket U8 (see Figure 1).

The primary serial line can be configured in one of the following operating modes:

- Bi-directional with MODBUS protocol
- Bi-directional with ADOS protocol
- Continuous transmission
- Print on request

The transmission parameters of the primary and auxiliary line are :
- 8 bit - No Parity - 1 Stop

The primary line speed can be configured as follows:
- 9600
- 4800
- 2400
- 1200

2.14.2 Multidrop networks

The instrument can control the primary serial line to operate in a multidrop network, where more than one transmitter is connected to the same host system.

The logic protocol (either ADOS proprietary or MODBUS) is half duplex master/slave and the instrument responds as a slave.

For the RS485 line connection the jumper Z8 must be positioned in 1-2.

When using ADOS protocol the point to point or multidrop connection is determined by the value of the configuration parameter “address 485”: if the parameter is 0 the connection is point to point, otherwise it is multidrop.

The modality is activated independently from the physical configuration of the board, therefore it is possible to operate with addressed frames on the physical line RS232.

The data frames are the same in both configuration, with the only addition of the address field (two characters from “01” to “32”) in reception and in transmission.

When using MODBUS protocol the connection is always multidrop.

2.14.3 Continuous modality

The instrument continuously transmits a string with the following format:

<STX><POL><WEIGHT><K/L><L/N><STATUS><CR><LF>

where:

<STX>	“Start Of Test” (Hex 02) character		
<POL>	“Blank” (Hex 20) or “-” (Hex 2D) character to indicate the polarity of the data		
< WEIGHT >	string of 7 numerical characters (Hex 30 .. 39) representing the weight shown on display and possibly with “.” (Hex 2E)		
<K/L>	“K” (Hex 4B) or “L” (Hex 4C) character to indicate the unit of measurement		
<G/N>	“G” (Hex 47) or “N” (Hex 4E) character to indicate the Gross/Net state		
<STATUS>	one of the following characters:		
	“Blank”	(Hex 20)	System under normal operating conditions
	“I”	(Hex 43)	Instrument to calibrate (invalid data)
	“C”	(Hex 43)	Instrument being configured
	“O”	(Hex 4F)	Instrument off scale
	“M”	(Hex 4D)	Moving weight
<CR>	“Carriage Return” character (Hex 0D)		
<LF>	“Line Feed” character (Hex 0A)		

2.14.4 Bi-directional modality with ADOS protocol

In this modality the instrument transmits the data only when requested by an external system.
The protocol can be used in point-to-point or multi-point connections and the selection depends on the configuration value of the RS485 address: if other than zero, the instrument controls the value of the address field in the received data and inserts the address field in the transmitted data.

The request string has the following format

<STX><ADDH><ADDL><CMD><DATA><CR><LF>
where:

<STX>	“Start Of Text” (Hex 02) character
<ADDH>	485 address character - high (Hex 30 .. 32)
<ADDL>	485 address character - low (Hex 30 .. 39)
<CMD>	Command identification character
<DATA>	Any data related to the command
<CR>	“Carriage Return” (Hex 0D) character
<LF>	“Line Feed” (Hex 0A) character

Commands from host to A200E

P (hex 50) weight request command. A string is transmitted with the same format of what is described for continuos mode. If 485 address is other than zero, the <ADDR> field is inserted after STX

p (hex 70) weight request command. A string is transmitted with the following format:
<STX><G_P><GROS_W><T_P><TARE_W><K/L><L/N><STATO><CR><LF
where:
<G_P><GROSS_W> polarity and value of the gross weight (8 char)
<T_P><TARE_W> polarity and value of the tare weight (8 char)
If 485 address is other than zero, the <ADDR> field is inserted after STX

l (hex 5C) gross weight request command. A string is transmitted with the same format of what is described for continuos mode, but always sending the value of the gross weight, independently from display selection.
If 485 address is other than zero, the <ADDR> field is inserted after STX

M (hex 4D) peak value request command. A string is transmitted with the same format of what is described for continuos mode, but with the peak value.

m (hex 6D) Peak value reset command. A string is transmitted with the same format of what is described for continuos mode, but with the peak value

Z ZERO command. The command is always accepted, even if the instrument is in Net mode or the Motion is ON. The command is effective only if the gross weight is lower then the defined AZM limit, otherwise en error message is issued

G GROSS command. The command is always accepted.

N NET command. The command is always accepted.

T Tare execution command. The command is always accepted, even if the instrument is in Net mode or the Motion is ON.

SRn request for the value of the set point “n”, with “n” between 1 and 3
The answer message has the following format:
<STX><SRnt(0001234)
where:
n is the set point number
t is the code of the relay function
0 = OFF
1 = Closing on Gross
2 = Closing on Net upon Loading
3 = Closing on Net upon Unloading
4 = Opening on Gross
5 = Opening on Net upon Loading
6 = Opening on Net upon Unloading
7 = Fault
8 = Batch Status

9 = End of cycle
10 = Batch Alarm
0001234 is the value of the set point (7 char including decimal point, if any)

SEnt(ddddddd) set value of the set point “n” to type “t” and to value “dddd”

2.14.5 Print On Request modality

If the instrument is programmed to operate in “set point” mode a weight string is transmitted like in the continuous transmission case upon closure of the external contact configured for print request or when pressing the “E” key (when the instrument is not being configured).

If the instrument is programmed to operate in “batch” mode a batch report is issued automatically according to batch status.

2.14.6 MODBUS protocol

The RTU version of MODBUS is used.

Received and transmitted frame structure

General frame structure is as follows:

ADDRESS	FUNCTION	DATA	CHECK
8 bits	8 bits	N x 8 bits	2 x 8 bits

ADDRESS 8 bit defining the slave address and ranging from 1 to 32
FUNCTION 8 bit defining the required function.
The functions supported by A200E are the following
Code 03 Read Holding Registers
Code 05 Force Single Coil
Code 06 Preset Single Register
Code 16 Preset Multiple Registers
DATA All data relevant to the specific function
CHECK CRC-16 (Cyclic Redundancy Check) frame validation

Exception responses
When A200E receives a request involving illegal functions or illegal data an exception response is generated containing address, function code, error code and checksum.
To indicate that the response is a notification of an error, the high order bit of the function code is set to “1”.

Supported error code are:

01 Illegal function. The message function received is not an allowable action for the addressed slave.
02 Illegal data address. The address referenced in the data field is not an allowable address in the address slave location
03 Illegal data value. The value referenced in the data field is not allowable in the addressed slave location

A200E supported functions

For a complete description of MODBUS available functions, please refer to detailed MODBUS documentation.

Function 03 - Read Holding Registers
Allows the host to obtain the binary value of the content of A200E registers

All registers can be transferred in a single read request.

The below example reads registers 0 through 2 from slave 01:

ADDR	FUNC	START REG HI	START ERG LOW	# OF ERG HI	# OF ERG LOW	CHECK
01	**03**	**00**	**00**	**00**	**03**	**05 CB**

Slave answer is as follows:

ADDR	FUNC	BYTE COUNT	REG 0 HI	REG 0 LOW	REG 1 HI	REG 1 LOW	REG 2 HI	REG 2 LOW	CHECK
01	03	06	00	0F	00	00	01	C0	74 B4

Value of register 0 is 15, register 1 is 0 and register 2 is 448.

Function 05 - Force Single Coil

Allows the host to force a single coil. In A200E the command is used to force ZERO, START, PAUSE or ACK command.

If the ZERO cannot be done (not enabled or weigh higher than the allowable limit) an “Illegal Data Value” exception response will be generated

The below is a valid example:

ADDR	FUNC	COIL # HI	COIL # LOW	DATA VALUE HI	DATA VALUE LOW	CHECK
01	**05**	**00**	**00**	**FF**	**00**	**8C 3A**

The normal response is to retransmit the query message:

ADDR	FUNC	COIL # HI	COIL # LOW	DATA VALUE HI	DATA VALUE LOW	CHECK
01	**05**	**00**	**00**	**FF**	**00**	**8C 3A**

Function 06 - Preset Single Register

Allows the host to modify the contents of an holding register

The below example preset register 12 of slave 01 with 54:

ADDR	FUNC	REG # HI	REG # LOW	DATA VALUE HI	DATA VALUE LOW	CHECK
01	**06**	**00**	**0C**	**00**	**36**	**C9 DF**

The normal response is to retransmit the query message:

ADDR	FUNC	REG #	REG #	DATA VALUE	DATA VALUE	CHECK

		HI	LOW	HI	LOW	
01	**06**	**00**	**0C**	**00**	**36**	**C9 DF**

NOTE:The function cannot be used to operate on double word or read only registers.

Funzione 16 - Preset Multiple Registers
Allows the host to modify the contents of more subsequent holding register

The below example preset register 12, 13 and 14 of slave 01 with 5, 0, 342:

ADDR	FUNC	STRT REG HI	STRT REG LOW	# OF REG HI	# OF REG LOW	BYTE CNT	DATA VAL. HI	DATA VAL. LOW	DATA VAL. HI	DATA VAL. LOW	DATA VAL. HI	DATA VAL. LOW	CHECK
01	**16**	**00**	**16**	**00**	**03**	**06**	**00**	**05**	**00**	**00**	**01**	**56**	**4A A4**

Teh normal response to a function 16 query is to echo the adrress, function code, starting address and number of registers to be loaded:

ADDR	FUNC	STRT REG HI	STRT REG LOW	# OF REG HI	# OF REG LOW	CHECK
01	**16**	**00**	**16**	**00**	**03**	**61 CC**

NOTE:The function cannot be used to operate on read only registers.
The first register cannot be the low side of a double word register

A200E Registers list

Register 0 is a special coded register (see details).

Weigh values (gross, net, tare and set points) are coded on two consecutive registers as 2's complement binary value.

Configuration parameters are coded as explained in "Configuration" paragraph.

Registers marked as "**R**" are read only, those marked as "**R/W**" are read-write

Register Number	Function	Type
0	Status word	**R**
1	Batch status	**R**
2	Batch timer	**R**
3	Aux relays status (from relay 4 to relay 11)	**R**
4-5	Gross weight value	**R**
6-7	Load tare value/peak value	**R**
8-9	Unload tare value (Batch version) Tare 1 (Threshold mode)	**R**
10-11	Dosed component net value(Batch version) Weight acquired (Threshold mode)	**R**
12-13	Totalizer first load component	**R**
14-15	Totalizer second load component	**R**
16-17	Totalizer third load component	**R**
18-19	Totalizer unload component	**R**
20	Graduation	**R/W**
21	Sensitivity	**R/W**
22	decimal point position	**R/W**
23	averaging coefficient	**R/W**
24	AZM limit	**R/W**
25	Motion	**R/W**
26	Zero tracking	**R/W**
27	Operating mode	**R/W**
28	Baud rate	**R/W**
29	Primary serial port	**R/W**
30	485 address	**R/W**
31	Input 1 function	**R/W**
32	Input 2 function	**R/W**
33	Input 3 function	**R/W**
34	Relay 1 function	**R/W**
35-36	Relay 1 Set point	**R/W**
37	Relay 2 function	**R/W**
38-39	Relay 2 Set point	**R/W**
40	Relay 3 function	**R/W**
41-42	Relay 3 Set point	**R/W**

43	Relay 4 function	**R/W**
44-45	Relay 4 Set point	**R/W**
46	Relay 5 function	**R/W**
47-48	Relay 5 Set point	**R/W**
49	Relay 6 function	**R/W**
50-51	Relay 6 Set point	**R/W**
52	Relay 7 function	**R/W**
53-54	Relay 7 Set point	**R/W**
55	Relay 8 function	**R/W**
56-57	Relay 8 Set point	**R/W**
58	Relay 9 function	**R/W**
59-60	Relay 9 Set point	**R/W**
61	Relay 10 function	**R/W**
62-63	Relay 10 Set point	**R/W**
64	Relay 11 function	**R/W**
65-66	Relay 11 Set point	**R/W**
67-68	Dead band	**R/W**
69	A/D mode	**R/W**
70-71	A/D zero	**R/W**
72-73	A/D span	**R/W**
74-75	Zero Band value	**R/W**
76-77	Max. load value	**R/W**
78	Stabilization time	**R/W**
79	inter component time	**R/W**
80	Totalization coefficient	**R/W**
81-82	Set component 1	**R/W**
83-84	Slow component 1	**R/W**
85-86	fly component 1	**R/W**
87-88	Tolerance component 1	**R/W**
89-90	Set component 2	**R/W**
91-92	Slow component 2	**R/W**
93-94	fly component 2	**R/W**
95-96	Tolerance component 2	**R/W**
97-98	Set component 3	**R/W**
99-100	Slow component 3	**R/W**
101-102	fly component 3	**R/W**
103-104	Tolerance component 3	**R/W**
105-106	Set unload	**R/W**
107-108	Slow unload	**R/W**
109-110	fly unload	**R/W**
111-112	Tolerance unload	**R/W**
113	Language selection (italian/english)	**R/W**
114	Keyboard disable	**R/W**

List of Coils supported by A200E

Coil Number	Function	
0	Power On Flag reset request	
1	ZERO request	
2	START/ACK (charge) request	
3	START/ACK (discharge) request	
4	PAUSE/ABORT request	
5	Totalizers reset request	
6	Totalizer component 1 reset request	
7	Totalizer component 2 reset request	
8	Totalizer component 3 reset request	
9	Totalizer unload component reset request	
10	GROSS request	
11	NET request	
12	TARE request	
13	TOTAL value reset request	
14	PEAK value reset request	
15	WEIGHT acquired request	

Status word coding

15	**14**	**13**	**12**	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**0**
POF	**F**	**S**	**Diagnostic error code**					**G/N**	**OS**	**A**	**P**	**ZB**	**R3**	**R2**	**R1**

POF	Power On Flag. Indicates a return of power supply to the transmitter. Flag is set to 1 by A200E and can be resetted to 0 by host by forcing Coil #3
F	if = 1 indicates that unit is in FAULT
S	if = 1 indicates configuration in progress
Diagnostic err code	error code (see “self diagnostic” paragraph
G/N	if = 1 indicates that unit is in NET
ZB	if = 1 indicates that load is within Zero Band
R3	if = 1 indicates that relay #3 is ON
R2	if = 1 indicates that relay #2 is ON
R1	if = 1 indicates that relay #1 is ON
OS	if = 1 indicates that unit is out of scale (UL-OL)
P	if = 1 indicates that unit is in pause
A	if = 1 indicates that unit is in alarm

Batch status coding

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Load cycle step								**Unload cycle step**							

Load cycle step
0 Non active – waiting for START
1 Component 1 fast loading
2 Component 1 slow loading
3 Component 1 fly loading and stabilization
4 Inter component waiting
5 Component 2 fast loading
6 Component 2 slow loading
7 Component 2 fly loading and stabilization
8 Inter component waiting
9 Component 3 fast loading
10 Component 3 slow loading
11 Component 3 fly loading and stabilization
12 End of batch

Unload cycle step
0 Non active – waiting for START
1 fast unloading
2 slow unloading
3 fly unloading and stabilization
4 End of batch

In case of out of tolerance or time out errors the cycle is paused and teh spep value become negative.

Register 3 coding

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
S	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**R4**	**R5**	**R6**	**R7**	**R8**	**R9**	**R10**	**R11**

R4 if = 1 indicates that relay #4 is ON
R5 if = 1 indicates that relay #5 is ON
R6 if = 1 indicates that relay #6 is ON
R7 if = 1 indicates that relay #7 is ON
R8 if = 1 indicates that relay #8 is ON
R9 if = 1 indicates that relay #9 is ON
R10 if = 1 indicates that relay #10 is ON
R11 if = 1 indicates that relay #11 is ON
S if = 1 indicates the stable weight

2.14.7 Auxiliary serial interface

The auxiliary is used to link with the remote repeaters such as RIP14, RIP51, RIP70 or with instruments for remote thresholds.

The instrument continuously transmits a string with the following format:

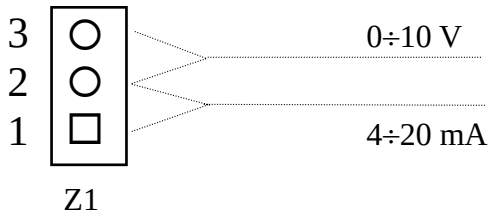
<STX><POL><WEIGHT><K/L><L/N><STATUS><CR><LF>

where:

<STX>	"Start Of Test" (Hex 02) character		
<POL>	"Blank" (Hex 20) or "-" (Hex 2D) character to indicate the polarity of the data		
< WEIGHT >	string of 7 numerical characters (Hex 30 .. 39) and possibly with "." (Hex 2E)		
<K/L>	"K" (Hex 4B) or "L" (Hex 4C) character to indicate the unit of measurement		
<G/N>	"G" (Hex 47) or "N" (Hex 4E) character to indicate the Gross/Net state		
<STATUS>	one of the following characters:		
	"Blank"	(Hex 20)	System under normal operating conditions
	"I"	(Hex 43)	Instrument to calibrate (invalid data)
	"C"	(Hex 43)	Instrument being configured
	"O"	(Hex 4F)	Instrument off scale
	"M"	(Hex 4D)	Moving weight
<CR>	"Carriage Return" character (Hex 0D)		
<LF>	"Line Feed" character (Hex 0A)		

2.15 ANALOG OUTPUT MANAGEMENT

The option board includes a 16-bit analog output that can be configured using jumper Z1 for current (4-20 mA) or voltage (0-10V) output.
The option board is factory configured for current output.



Z1 1-2 4÷20 mA Mode
Z1 2-3 0÷10 V Mode

The conversion can be associated by configuration to the value of the gross weight or the net weight to release the output signal from what is shown on the display.

The zero value and full scale value of the analog output can be associated to any two weight values.

In the “UL” condition the output signal is blocked at the start of scale (0 V or 4 mA).
In the “OL” condition the output signal is blocked at the full scale (10 V or 20 mA).

Acting from keyboard is possible the fine tuning of the analog signal corresponding to both zero and full scale.

2.15.1 Analog signal adjustment

The instruments provide a fine adjustment of the analog output (400 steps), beyond the following limits:

Reference	Lower adj. limit	Upper adj. limit	Step
0 V	-0,400 V	0,400 V	2 mV
10 V	9,600 V	10,400 V	2 mV
4 mA	3,340 mA	4,660 mA	3,3 µA
20 mA	19,340 mA	20,660 mA	3,3 µA

Zero e Full Scale adjustment can be performed during D/A Zero and D/A Full Scale configuration.
The instrument shows the number of actual adjustment steps:

D	A	Z		-	1	2	3
D	A	S		-	1	9	9

Zero adjustment
Full Scale adjustment

Pressing the ZERO button the number of adjustment step can be incremented up to 199.
Pressing the TARE button the number of adjustment step can be decremented down to -199.

3. INSTALLATION

3.1 Material receiving

Remove the instrument from its packing and check if it has been damaged during transport.

Claims for any damage must be submitted immediately and in writing to the supplier and to the carrier which delivered the goods.

The instrument should be delivered with the following :

- 1 6 pin male circular connector kit for load cell wiring
- 1 kit of removable female terminal blocks for power supply and I/O wiring
- 2 attachment brackets
- 1 copy of the instruction manual
- 2 copies of the instrument testing certificate (check that the serial no. reported in the special area on the back corresponds to what is reported on the testing sheet)

3.2 Instrument mounting

The instrument is designed for panel mounting. The cut-out dimensions are indicated in Figure 2.

Insert the instrument, hook the two attachment brackets into the special holes located on the side of the box. Then, use a screwdriver to adjust the set screws until the front frame is flush with the board.

For the necessary depth, consider the length of the instrument plus about 5 cm for the connection cables.

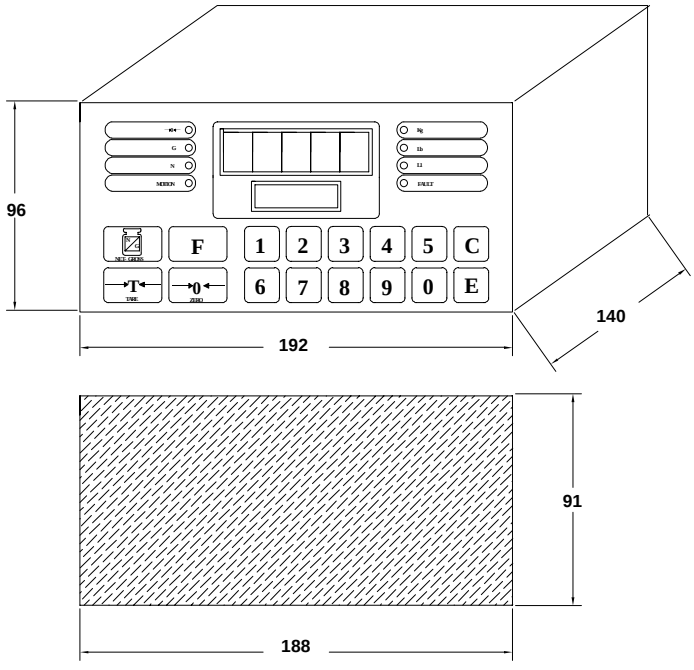


Figure 2 - A200E drilling template

3.3 Connections

All the connections to the instrument are available on the back panel of the instrument.

Except for the load cell, all the connections are made using pull-out terminal blocks using flexible wire 0,5...1,5 mmq.

WARNING

Any wiring must be done when the instrument is powered off

Chech carefully the value of the power supply and the power supply wiring

ANY CONNECTION ERROR VOIDS WARRANTY

The connection to the safety ground must always be done.

For load cell, analog output and serial line wiring shielded cable is recommended.

Load cell, analog output and serial line wiring must be separated from power lines

The A200 mounting panel or cabinet must be properly grounded.

A200E output relays must be used only to drive relay coils (with nominal current and voltage beyond contact rating and using dumping networks) or logic input or signaling lamps; they cannot be used to drive power actuator.

Figure 3 - A200E connection layout

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IN CASE OF PROBLEMS PLEASE REFER TO THE ADOS SERVICE ORGANIZATION

3.3.1 Wiring the instrument to the protective earthing system

Protective conductor terminal must be connected to the protective earthing system by means of flexible wire (Yellow-green on FAST-ON terminal) having a minimum section of 2,5mmq.

Protective conductor terminal can be used for the ground connection of the load cell cable shield.

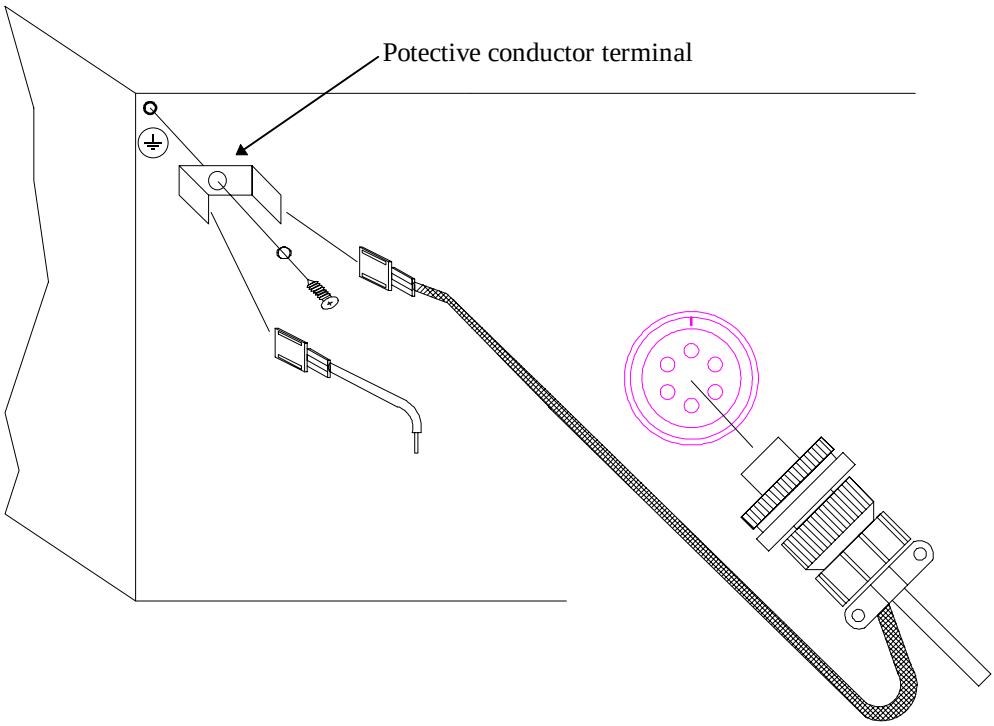


Figure 4 - A200E earthing

3.3.2 Power supply connection

Connect the power supply to terminals " 2 " and " 3 " of terminal block M1.

Terminal " 3 " must be connected to the earth.

TERMINAL BOARD	PIN	FUNCTION
M1	1	Earth
M1	2	230 Vac line
M1	3	230 Vac line

UNLESS OTHERWISE INDICATED, THE INSTRUMENT IS SUPPLIED FOR USE WITH 230 Vac POWER SUPPLY

3.3.3 Load cell connection

Connect the cable coming from the load cells or from the junction box to the circular connector located in the rear of the instrument and indicated as LC.

The load cell must be connected to the instrument with a shielded cable according to the attached table. To this regard, we recommended the use of our shielded cable (Type CS-4).
The cable shield at A200E side must be grounded. It can be wired to the protective conductor terminal
The connection must be made in accordance with the color code reported on the load cell (when using ADOS cells refer to table 167-MTSCACOC).

The A200E includes the standard connection of load cells with 4 wires. For a connection to load cells equipped with senses (therefore with a 6-wire connection), contact ADOS.

THE CONNECTION CABLE BETWEEN THE LOAD CELLS AND THE INSTRUMENT MUST FOLLOW A COMPLETELY SEPARATE LAYOUT, TO AVOID UNWANTED COUPLING THAT CAN REDUCE THE QUALITY OF MEASUREMENT.

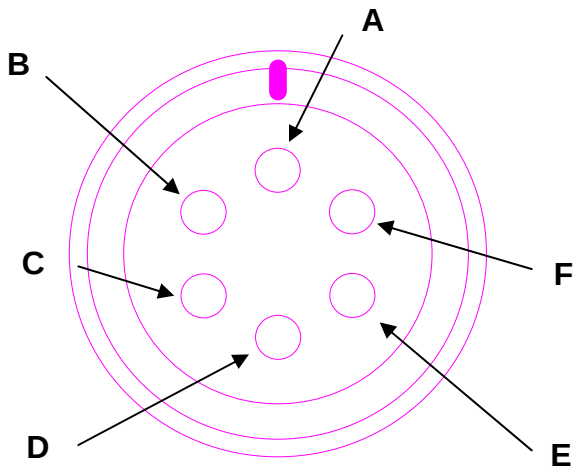


Figure 5 - A200E load cell connector

PIN	FUNCTION	ADOS COLOR CODE
A	+ POWER SUPPLY	RED
B	- POWER SUPPLY	BLACK
C	+ SIGNAL	GREEN
D	- SIGNAL	WHITE
E	N.C.	
F	N.C.	

Cable shield must be connected to a good ground reference plane.

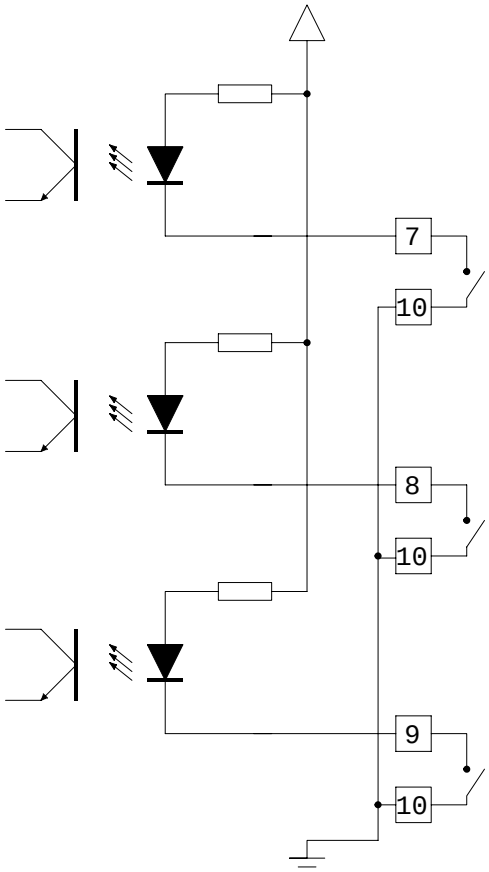
3.3.4 Digital input connection

In the base version, the instrument is supplied with (3) optoinsulated digital inputs.

The function of each input can be configured by the user. For the relative programming, refer to section 5 CONFIGURATION.

The inputs are powered by the A200E and to activate the input just use a voltage free contact to close the common pin and the relevant input pin.

Figure 1 - Typical wiring for inputs



TERMINAL BOARD	PIN	FUNCTION
M2	7	Input 1
M2	8	Input 2
M2	9	Input 3
M2	10	Common

3.3.5 Relay output connection

The A200E can control three relay outputs in the base configuration and eight additional outputs in the expanded configuration.
The outputs can be associated to digital thresholds that can be programmed as required.
Refer to “Threshold control” paragraph for the functional aspects.
Refer to “CONFIGURATION” section of the manual for the programming modalities.

As output, a normally open (NO) contact that is voltage free is available to the user for each relay.

The contact rating is 0.5A at 24 Vdc.
If contact drives relay coils or inductive loads, a shut-off circuit must be provided in parallel to the contact.

TERMINAL BOARD	PIN	FUNCTIONS
M2	1	Relay 1 - NO
M2	2	Relay 1 - C
M2	3	Relay 2 - NO
M2	4	Relay 2 - C
M2	5	Relay 3 - NO
M2	6	Relay 3 - C

TERMINAL BOARD	PIN	FUNCTIONS
M5	1	Relay 4 - NO
M5	2	Relay 4 - C
M5	3	Relay 5- NO
M5	4	Relay 5 - C
M5	5	Relay 6 - NO
M5	6	Relay 6 - C
M5	7	Relay 7 - NO
M5	8	Relay 7 - C

TERMINAL BOARD	PIN	FUNCTIONS
M6	1	Relay 8 - NO
M6	2	Relay 8 - C
M6	3	Relay 9 - NO
M6	4	Relay 9 - C
M6	5	Relay 10 - NO
M6	6	Relay 10 - C
M6	7	Relay 11 - NO
M6	8	Relay 11 - C

3.3.6 Primary serial port connection

The primary transmission line can be used in the R232 or RS485 mode (refer to section "CONFIGURATION" for the operating modalities).

Connections must be done with a shielded cable (RS232 lines) or with a twisted pair (RS 485 lines).

In the RS485 modality, put a 50 Ω resistor in parallel (where necessary) to the signal of the unit that is farthest from the HOST to correct for possible signal reflections.

TERMINAL BOARD	PIN	FUNCTIONS
M3	1	TX232 - 1
M3	3	RX232
M3	4	CTS232
M3	5	SGROUND
M3	6	RTX485+
M3	7	RTX485-
M3	8	SGROUND

3.3.7 Auxiliary serial port connection

The auxiliary transmission line can be used in the R232 mode (refer to section "CONFIGURATION" for the operating modalities).

The auxiliary line is used for connection to a repeater or for any interfacing to a printer.

Complete the connections with a shielded cable or with a twisted pair.

TERMINAL BOARD	PIN	FUNCTIONS
M3	2	TX232 - AUX
M3	8	SGROUND

3.3.8 Analog output connection (option)

The analog outputs 0-10 V and 4-20 mA are available on terminal board M4. Refer to section "CONFIGURATION" to calibrate or align values other than those set by the factory.

It is recommended to use a shielded cable and, where necessary, a layout in separate ducts to avoid reducing equipment operating capacities and the relative performances.

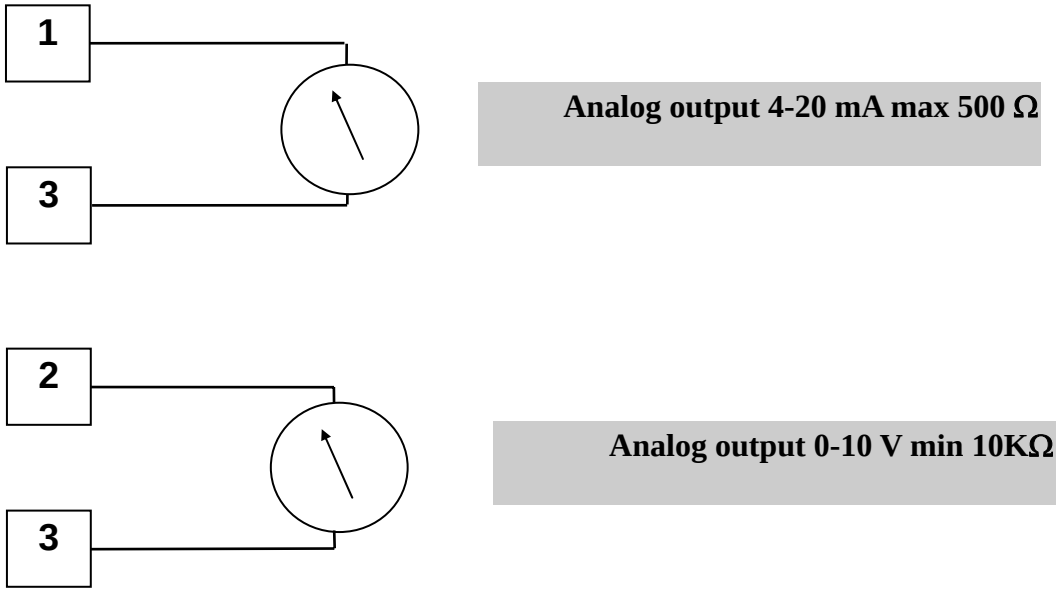


Figure 7 - A200E analog output connection

TERMINAL BOARD	PIN	FUNCTIONS
M4	1	4 ÷20 mA
M4	2	0 ÷10 V
M4	3	Common

4. MAINTENANCE

4.1 Preventive maintenance

The instrument needs no particular preventive maintenance.

For safety reason is a good practice to check periodically, by visual inspection, the connections to the protective earthling system.

4.2 Corrective maintenance

Any corrective maintenance to possible failures must be carried out at ADOS laboratories or at least by ADOS authorized personnel

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5. INSTRUMENT CONTROL

5.1 Introduction

The A200E indicator is a programmable instrument that performs a set of functions which can be adapted and/or personalized by the user to implement a variety of applications.

These functions can be modified using the configuration parameters.

Therefore, the instrument must be configured on the basis of the specific application before being used.

All the configuration parameters are maintained in non-volatile storage.
The parameter storage state is controlled when the instrument is turned on: if the result is negative the instrument is automatically re-initialized with the base configuration and must be reconfigured and re-calibrated.

During the instrument configuration process, the state of the signal LED’s remains congruent with that of the process; however, the LED’s flash to indicate to the user that it is not in normal operating condition.

The thresholds associated to the relays are controlled normally.

If the serial is active, the status flag in the transmitted message indicates that the instrument is in the configuration process.

5.2 Control function selection

The A200E includes the following control functions:

1. parameter configuration
2. weight calibration
3. clock set
4. test
5. system initialization

All the operations are guided by messages in plain text displayed on the auxiliary display.
The main display is used to display/set the value of the parameter to be modified.

To enter the instrument control modality just press the **F** key.

The instrument prepares to configure the parameters and displays the following message:

C	O	N	F	I	G	U	R

pressing the **F** key switches the control level and the following messages appear:

G	E	N		C	N	F	.
B	T	C	H		C	N	F
W	E	I	G		C	A	L
T	I	M	E		S	E	T
		T	E	S	T		
S	Y	S		I	N	I	T

pressing the **E** key confirms the selection made.

Pressing the **C** key cancels the control request and the system returns to the normal operating modality.

5.2.1 Password

The operator access to configuration, weight calibration and system initialization is controlled by means of a password.
The password value is "**45700120**".
The password value is fixed and there are no procedures to modify while in operation. The scope of the password is not intended for security but only to prevent unwanted access to system functions.

The instrument shows the following message on the auxiliary display:

P	A	S	S	W	O	R	D

and the message characters are substituted with "*****" when the operator keys in the password.

When a correct access code is fully keyed the selected function menu will appear, otherwise the instrument will go back to the function selection menu.

5.2.2 Keyboard time out

After 30 seconds of no keyboard activity the instrument automatically generates a **C** key code, so if the instrument is abandoned while in configuration or calibration it will go back to the operation menu and than to the operating status.

5.2.3 Keyboard disable function

Selecting parameter " KBD ENBL" to OFF it is possible to disable all keyboard function. To enable again the keyboard perform the follow sequence :

hold down the **C** and **E** keys at the same time while the instrument is being turned on

the instrument displays the following message :

R	E	L		K	E	Y	

Release the **C** and **E** keys.

The instrument displays the following message :

P	A	S	S	W	O	R	D

Keys the password then go to configuration and set to ON the parameter " KBD ENBL ".

5.3 Operating parameter configuration

5.3.1 Operating parameter selection

Entering the configuration from the configuration level selection menu the instrument prepares to configure the first parameter and displays the following message:

D	i	v	i	s	i	o	n

Press the **F** key to sequentially select all the configurable parameters (after reaching the last one it returns automatically to the first one).

Pressing the numeric keys directly sets the number of the parameter to be configured.

Press the **N/G** key to decrease the number of the parameter selected (after reaching the last one it returns automatically to the first one).

Press the **C** key to cancel the configuration request and return to the configuration level selection menu.

Press the **E** key to confirm the selection made and the instrument prepares to configure the parameter selected: the primary display indicates the value or the code of the parameter and the auxiliary display flashes to indicate that the instrument is prepared to accept the change to the value of the parameter.

5.3.2 Modifying the value of the operating parameters

Entering the configuration from the parameter selection menu the instrument indicates the value or the code of the parameter on the primary display.
The auxiliary display flashes to indicate that the instrument is prepared to accept the change to the value of the parameter.

Press the **F** key to increase the value of the parameter selected (after reaching the maximum it returns automatically to 0).
If the data displayed is a weight (for example a relay threshold) the increase will occur on the basis of the configured resolution.
By keeping the **F** key pressed, the increase gradient is increased automatically up to a maximum of 128 times the base value.

Press the **N/G** key to decrease the value of the parameter selected (after reaching the minimum it returns automatically to the maximum).
If the data displayed is a weight (for example a relay threshold) the decrease will occur on the basis of the configured resolution.
By keeping the **N/G** key pressed, the decrease gradient is increased automatically up to a maximum of 128 times the base value.

Pressing the numeric keys directly sets the number of the parameter to be configured.

Press the **>0<** key to clear the value of the selected parameter.

Press the **C** key to cancel the configuration request and return to the selection menu of the next parameter.

Press the **E** key to confirm the modification made.
The instrument checks if the value set is formally acceptable and displays the following message for 2 seconds:

		D	O	N	E		

and returns automatically to the selection menu of the next parameter.

If the value setting is not formally correct, the system displays the following message for 2 seconds:

	E	R	R	O	R		

and waits for new values.

5.3.3 Graduation

G	r	a	d	u	a	t	.

Parameter 01

It is possible to set the following values:
- 1000
- 2000
- 4000
- 5000 (default configuration)
- 10000

5.3.4 Resolution

R	e	s	o	l	u	t	.

Parameter 02

It is possible to set the following values:
- 1 (default configuration)
- 2
- 5
- 10
- 20
- 50

The system does not accept the following settings of resolution versus graduation (it would not be possible to present the data on the 5-digit display) :

- ♦ resolution 20 and 50 with 4000 and 5000 graduation
- ♦ resolution 10, 20 and 50 with 10000 graduation

5.3.5 Decimal point

D	e	c	.		P	n	t

Parameter 03

It is possible to set the following values:
- 0 (default configuration)
- 0.0
- 0.00
- 0.000
- 0.0000

5.3.6 Averages

A	v	e	r	a	g	e	

Parameter 04

It is possible to set the following values:
- 2
- 4
- 8 (default configuration)
- F1
- F2
- F3
- F4
- F5

5.3.7 Language selection

L	A	N	G	U	A	G	E

It is possible to set the following values:
- ITAL italian language (default configuration)
- ENGL english language

5.3.8 Opening on AZM

M	a	x		A	Z	M	

Parameter 05

This is the maximum load value that the instrument can clear (either from an external contact or from a key on the front panel).
It is possible to set the following values:
- OFF (default configuration)
- 1.9%
- 100%

5.3.9 Motion band

M	o	t	i	o	n		

Parameter 06

It is possible to set the following values:
- OFF (default configuration)
- 0.5 div/sec
- 1 div/sec
- 2 div/sec
- 5 div/sec
- 10 div/sec
- 20 div/sec

5.3.10 Zero tracking limit

Z	e	r	o		T	R	K

Parameter 07

It is possible to set the following values:
- OFF (default configuration)
- 0.5 div
- 1 div
- 2 div
- 5 div
- 10 div

5.3.11 Keyboard disable

K	B	D		E	N	B	L

It is possible to set the following values:
- ON Keyboard enable (default configuration)
- OFF Keyboard disable

5.3.12 Operating Mode

O	p	.		M	o	d	e

It is possible to set the instrument operating mode. Possible values are:
- SET P (default configuration)
- BATCH

5.3.13 Baud rate

B	a	u	d	R	a	t	e

Parameter 08

It is possible to set the following values:
- 9600 (default configuration)
- 4800
- 2400
- 1200

5.3.14 Primary serial port

P	r	i	m		S	e	r

Parameter 09

It is possible to set the following values:
- MODBUS Modbus protocol (default configuration)
- BIDIR Bi-directional
- CONT Continuous transmission
- DE Print on demand

5.3.15 Address on RS485

4	8	5		A	d	d	r

Parameter 10

- It is possible to set values ranging from 0 (default configuration) to 32

5.3.16 Digital input function

I	N	1		M	o	d	e	Parameter 12
I	N	2		M	o	d	e	Parameter 13
I	N	3		M	o	d	e	Parameter 14

It is possible to set the following values:

- OFF Off (default configuration)
- --0-- External ZERO command
- G-N External Gross-Net command
- TARE External Tare command
- STT-C Load start
- STT-U Unload start
- PAUSE Batch pause
- PRINT External print command
- P RES External peak value reset
- P PRT External peak print command
- ACP Acquire weight

5.3.17 Relay function

R		1		M	o	d	e	(Key 1)
R		2		M	o	d	e	(Key 2)
R		3		M	o	d	e	(Key 3)
R		4		M	o	d	e	(Key 4)
R		5		M	o	d	e	(Key 5)
R		6		M	o	d	e	(Key 6)
R		7		M	o	d	e	(Key 7)
R		8		M	o	d	e	(Key 8)
R		9		M	o	d	e	(Key 9)
R	1	0		M	o	d	e	
R	1	1		M	o	d	e	

It is possible to set the following values:

- OFF Off (default configuration)
- C G Closing on Gross
- C NL Closing on Net upon Loading
- C NU Closing on Net upon Unloading
- O G Opening on Gross
- O NL Opening on Net upon Loading
- O NU Opening on Net upon Unloading
- FAULT Fault indication
- CYCON Batch in progress
- ENDCY Batch complited
- ALARM Batch alarm
- ACP Weight acquired

5.3.18 Relay threshold

R		1			S	e	t
R		2			S	e	t
R		3			S	e	t
R		4			S	e	t
R		5			S	e	t
R		6			S	e	t
R		7			S	e	t
R		8			S	e	t
R		9			S	e	t
R	1	0			S	e	t
R	1	1			S	e	t

It is possible to set a value ranging from 0 (default configuration) to the full scale (given by the product of graduation by resolution).

5.3.19 Dead Band

D	e	a	d	B	a	n	d

Parameter 37

It is possible to set a value ranging from 0 (default configuration) to the 2% of full scale (given by the product of graduation by resolution).

5.3.20 D/A converter function

D	/	A		M	o	d	e

Parameter 38

It is possible to set the following values:
- Gross (default configuration)
- Net

5.3.21 D/A Zero

D	/	A		Z	e	r	o

Parameter 39

It is possible to set a value ranging from 0 (default configuration) to the full scale (given by the product of graduation by resolution).
At this configuration step is possible to adjust the Zero analog output (see “analog output management” paragraph).

5.3.22 D/A Full Scale

D	/	A		S	p	a	n

Parameter 40

It is possible to set a value ranging from full scale (default configuration), given by the product of graduation by resolution, to 0.
At this configuration step is possible to adjust the Full Scale analog output (see “analog output management” paragraph).

5.4 Batch parameter configuration

Common batch parameters can be accessed using configuration menu.

Component parameters can be accessed using keys 1,2,3 or 4

5.4.1 Zero band

Z	e	r	o	B	a	n	d

Is the maximum allowable load value to consider the balance empty.
It is possible to set a value ranging from 0 to 20% of full scale, given by the product of graduation by resolution.

5.4.2 Maximum balance load

M	a	x		L	o	a	d

Is the maximum allowable balance load.
It is possible to set a value ranging from 0 to full scale, given by the product of graduation by resolution.

5.4.3 Stabilization time

S	t	a	b	T	i	m	e

It is possible to set a value ranging from 0 to 60 seconds.

5.4.4 Wait time

W	a	i	t	T	i	m	e

It is possible to set a value ranging from 0 to3600 seconds.

5.4.5 Totalization coefficient

T	o	t	C	o	e	f	f

Possible values are 1-10-100-1000-10000.

5.4.6 Set point

S	e	t	P	n	t		#

It is possible to set a value ranging from 0 to maximum load minus the value of already configured set points: values giving an Over Load condition cannot be configured.

5.4.7 Slow

S	l	o	w				#

It is possible to set a value ranging from 0 Set point value - 1

5.4.8 Fly

F	l	y					#

It is possible to set a value ranging from 0 to Slow value minus 1.

5.4.9 Tolerance

T	o	l	l	e	r	.	#

It is possible to set a value ranging from 0 to Fly value minus 1.

5.5 Calibration

After a system initialization, the instrument must be calibrated before performing any weighing operation.

The calibration operation consists of two phases:
- zero calibration
- Span calibration

The two phases must be carried out at least once, otherwise the instrument does not exit the FAULT condition.
It is possible to carry out successive single calibrations, zero only or Span only.

To enter the calibration mode the user must enter the instrument control mode, and use the **F** key to select the:

W	E	I	G		C	A	L

and press the **E** key.

The instrument prepares for the zero scale calibration function and the following message is displayed:

		Z	E	R	O		

Press the **F** key to switch to Span calibration function and the following message is displayed:

F	S		1	2	3	4	5

where 12345 is the value of the weight currently on the balance.

Press the **E** key to request to start the selected calibration sequence.

Press the **C** key to cancel the calibration request and to return to the instrument control menu.

5.5.1 Zero calibration

The weighing system must be set with ZERO weight.

After selecting the modality:

		Z	E	R	O		

press the **E** key.
The instrument prepares to receive the confirmation command and flashes the message on the auxiliary display.

Press the **E** key again and the instrument starts the zero calibration procedure. The display shows the waiting time:

W	A	I	T				5

During the waiting time the load cell signal is integrated and it must stay stable.
When the wait time expires instrument performs the zero calibration and displays the following message for 2 seconds:

		D	O	N	E		

and returns automatically to the calibration menu.

5.5.2 Span calibration

The weighing system must be set with a KNOWN weight that is greater than 12.5% of the Span.
The precision of the Span calibration is greater the closer the known weight is to the full scale value.

The system is set to perform the calibration with a known weight corresponding to the value of the weight currently on the balance.
The operator can modify this setting by changing the value of the known weight directly (using the numeric keys) and by using the **F** key to increase the value on the display. The increase is performed in steps of one division or, by continuing to press the **F** key, in larger and larger steps up to a maximum of 128 graduation.

After pressing the **E** key, the instrument prepares to receive the confirmation command and flashes the following writing on the display:

F	S		1	2	3	4	5

Press the **E** key again and the instrument starts the zero calibration procedure. The display shows the waiting time:

W	A	I	T				5

During the waiting time the load cell signal is integrated and it must stay stable.
When the wait time expires instrument performs the zero calibration and displays the following message for 2 seconds:

		D	O	N	E		

and returns automatically to the calibration menu.

If the value of the known weight set is not correct, the instrument displays the following signal for two seconds:

	E	R	R	O	R		

and returns automatically to the calibration menu.

5.6 Date and time set up

This function allows the user to set or correct the date and time values.

To enter the set date and time modality, the user must enter the instrument control mode and using the **F** key select the modality:

T	I	M	E		S	E	T

and press the **E** key.

The instrument displays the time, flashing the seconds digits, to indicate that this a field can be modified.

Press the **N/G** key to move within the minutes, hours, year, month and day fields.

Press the **F** key to modify the contents of the field selected, increasing it up to the value requested. The instrument returns automatically to the base of the field on which it was operating. The changes made take effect immediately.

Press the **C** key to return to the instrument control menu.

5.7 Test

This function allows the user to verify the signal provided by load cells, to check the correct connection of the input contacts to the instrument and the relay outputs.

To enter the test modality, the user must enter the instrument control model and use the **F/INC** key to select the modality:

		T	E	S	T		

and press the **E** key.

To enter the test modality, the user must enter the instrument control model and use the **F/INC** key to select the modality:

and press the **E** key.

Press the **F/INC** or **DEC** key to scroll trough the available functions:

L	O	A	D	C	E	L	L
	1		0	4			0

5.7.1 Load cell test

Entering the load cell test function the display will indicate the load cell signal value in mV/V:

0.	1	2	3	4

Press the **F** key to return to the INPUT/OUTPUT/ANALOGIC TEST

On the main display the instrument indicates the state of the digital inputs: 0 refers to an open contact and 1 to a closed contact

0		0		0

The digit on the right corresponds to input 1, the one in the middle to input 2 and the one on the left to input 3.

On the auxiliary display the instrument shows the state of relays and analog output:

	1		0	4			0

First number (1) indicates the number of the relay that is ON on the main board; the second number (04) indicates the number of the relay that is ON on the aux board; the third number (0) represent the analog output value (in step of 10% from 0 to 9 and F for Full scale).

Press the **F1/DEC** key to sequentially and individually drive each relay of the instrument, including those mounted on the CS 522.02 expansion board (if installed).

Press the **ZERO** key to switch the analog output from 0 to Full scale.

Press the **T** key to switch the analog output from 0 to Full scale in step of 10% (1 V or 1,6 mA).

Press the **C** key to return to the main test menù

NOTE: analog output test can be done only if the instrument is calibrated

5.8 System Initialization

The instrument can be reset to the default configuration by mean of the System initialization function.

To enter the system initialization mode , the user must enter the instrument control mode and use the **F/INC** key to select the modality:

S	Y	S		I	N	I	T

and press the **E** key.
The instrument will ask for password and, if correct, the following message will be displayed:

*		I	N	I	T		*

Press the **E** key to request to start the sequence and the instrument prepares to receive the confirmation command:

O	K		I	N	I	T	?

flashing

Press the **E** key to confirm the selection made and the instrument initializes the parameters and restarts automatically.

Press the **C** key to cancel the initialization request and return to the instrument control menu.

5.8.1 Switch controlled initialization

Initialization by switch can only be performed at power-on time.
The procedure is the following:

- DIP switch SW1-1 must be ON prior to power on
- The display shows the message:

O	K		I	N	I	T	?

flashing

- if the switch is set to OFF in less than 5 seconds the initialization is carried out and the message on display changes to

*		I	N	I	T		*

flashing

  and stays in this condition as long as a key is pressed, thus proceeding with startup sequence.

- if the switch is left unchanged the instrument proceeds with normal startup sequences

6. INSTRUMENT CONFIGURATION TABLE

6.1 General parameters

Parameters												
Graduation	1000	2000	4000	5000	10000							
Resolution	1	2	5	10	20	50						
Decimal point	0	0.0	0.00	0.000	0.0000							
Averages	2	4	8	F1	F2	F3						
Language	ENGLIS	ITALIA										
Max AZM	OFF	1.9	100									
Motion	OFF	0.5	1.0	2.0	5.0	10.0	20.0					
Zero TRK	OFF	0.5	1.0	2.0	5.0	10.0						
Key. Enable	OFF	ON										
Oper. mode	SET P	BATCH										
BaudRate	9600	4800	2400	1200								
Prim. Ser.	MDBUS	BIDIR	T CONT	DE								
485 Add.	0,1..32	(0)										
Funz IN 1	OFF	--0--	G-N	TARE	STT C	STT U	PAUSA	PRINT	P RES	P PRT	ACP	
Funz IN 2	OFF	--0--	G-N	TARE	STT C	STT U	PAUSA	PRINT	P RES	P PRT	ACP	
Funz IN 3	OFF	--0--	G-N	TARE	STT C	STT U	PAUSA	PRINT	P RES	P PRT	ACP	
Funz R 1	OFF	C L	C NC	C NS	A L	A NC	A NS	FAULT	CYC	ENDCY	ALARM	ACP
Set R 1	0..F.S.	(0)										
Funz R 2	OFF	C G	C NL	C NU	O G	O NL	O NU	FAULT	CYCON	ENDCY	ALARM	ACP
Set R 2	0..F.S.	(0)										
Funz R 3	OFF	C G	C NL	C NU	O G	O NL	O NU	FAULT	CYCON	ENDCY	ALARM	ACP
Set R 3	0..F.S.	(0)										
Funz R 4	OFF	C G	C NL	C NU	O G	O NL	O NU	FAULT	CYCON	ENDCY	ALARM	ACP
Set R 4	0..F.S.	(0)										
Funz R 5	OFF	C G	C NL	C NU	O G	O NL	O NU	FAULT	CYCON	ENDCY	ALARM	ACP
Set R 5	0..F.S.	(0)										
Funz R 6	OFF	C G	C NL	C NU	O G	O NL	O NU	FAULT	CYCON	ENDCY	ALARM	ACP
Set R 6	0..F.S.	(0)										
Funz R 7	OFF	C G	C NL	C NU	O G	O NL	O NU	FAULT	CYCON	ENDCY	ALARM	ACP
Set R 7	0..F.S.	(0)										
Funz R 8	OFF	C G	C NL	C NU	O G	O NL	O NU	FAULT	CYCON	ENDCY	ALARM	ACP
Set R 8	0..F.S.	(0)										
Funz R 9	OFF	C G	C NL	C NU	O G	O NL	O NU	FAULT	CYCON	ENDCY	ALARM	ACP
Set R 9	0..F.S.	(0)										
Funz R 10	OFF	C G	C NL	C NU	O G	O NL	O NU	FAULT	CYCON	ENDCY	ALARM	ACP
Set R10	0..F.S.	(0)										
Funz R 11	OFF	C G	C NL	C NU	O G	O NL	O NU	FAULT	CYCON	ENDCY	ALARM	ACP
Set R11	0											
Dead band	0..F.S.	(0)										
D/A. Function	GROSS	NET										
D/A Zero	0..F.S.	(0)										
D/A Span	0..F.S.	(FS)	2500.0									

6.2 Batch parameters

Parameter						
ZeroBand	0..F.S.	(0)	0.5			
Mx Load	0..F.S.	(0)	2500.0			
StabTime	0..60	(0)				
Wait Time	0..3600	(0)				
Tot. Coeff	1	10	100	1000	10000	
SetPnt 1	0..Mx Load	(0)				
Slow 1	0..Set-1	(0)				
Fly 1	0..Slow-1	(0)				
Toller 1	0..Flay-1	(0)				
SetPnt 2	0..Mx Load	(0)				
Slow 2	0..Set-1	(0)				
Fly 2	0..Slow-1	(0)				
Toller 2	0..Fly-1	(0)				
SetPnt 3	0..Mx Load	(0)				
Slow 3	0..Set-1	(0)				
Fly 3	0..Slow-1	(0)				
Toller 3	0..Fly-1	(0)				
SetPnt U	0..Mx Load	(0)				
Slow U	0..Set-1	(0)				
Fly U	0..Slow-1	(0)				
Toller U	0..Fly-1	(0)				