SE-02/N/LCD INDICATOR

Engineering documentation

File 2014-05-30 DTR SE02-005-C18-7 GB

Contents:

1. GENERAL INFORMATION

SE-02 indicator is complete subassembly for batching systems based on strain gauge transducers. The indicator is certified by Main Office for Measurements (Test Certificate No PL CB 1).

The hermetical indicator casing is made of stainless, acid proof steel tin and is equipped with LCD display (digit height - 14mm).

SE-02 indicator may be used as a part of platform scales of B or 4B series manufactured by AXIS.

SE-02 indicator cooperates with strain gauge transducers and batching devices connected to selected indicator outputs P1÷P6.

Scale controlling program C-18 enables to program and control the indicator via RS232C or RS485 interface with specialized communication protocol.

2. CERTIFICATES

Test certificate of SE-02 indicator (No PL CB 1) was issued by Main Office for Measurements in Warsaw (Notified Body No 1440).

SE-02 indicators are of IP65 protection class, confirmed with the research carried out by The Research Laboratory of The Electrotechnology Institute in Gdańsk, accredited by Polish Centre for Accreditation.

The indicator may be used as a base for scales conforming EN 45501 Metrological aspects of non-automatic weighing instruments harmonised with the Council Directive 90/384/EEC amended with 93/68/EEC.

NACE Classification: 29.24.23.

3. COMPLETENESS

A standard set consists of:
1. SE-02 indicator
2. SE-02 indicator engineering documentation
3. Guarantee card
4. RS232C connector
5. Mounting guide (on demand)

4. KEYS AND INDICATORS

key	I/⏻	- switch-on / switch-off (standby),
key	→T←	- tare (subtract package weight from weighed mass),
key	→0←	- zeroing (when the platform is empty),
key	⎘	- result printout,
key	*Program*	- programming (program recall),
key	*0, 1, 2, .., 9, .*	- numeric keys,
key	*A, B, ... , F*	- batching devices keys,
key	*Enter*	- confirm (enter data)
key	*Clr*	- reverse the last programming operation / instant batching break
key	*Start*	- start dosing,
indicator	→0←	- zero indicator,
indicator	⏦	- result stabilisation indicator,
indicator	*NET*	- net weight indicator (indication with subtracted tare)
indicator		
indicator	*READY*	- the device is ready for weighing, batching or programming,
indicator	*END*	- batching end indicator
indicator	*MODE*	- special function active,
bar indicator		- total load indicator (graduated 0-100%)

5. TECHNICAL DESCRIPTION

5.1. Working modes

Use the indicator to dose specific portion(s) of one or more ingredients according to programmed recipe (stored in batching program). The following working modes are available:

MODE 1: Dosing basing on total weight: START-PROGRAM-ILE sequence (see chapter 7.1),
MODE 2: Batching in cycles – dosing of programmed ingredients portions, removing weighed load and next dosing (continuous work): START-PROGRAM-ENTER sequence (without total load ILE). To stop the process press CLR key (see chapter 7.2),
MODE 3: Manual dosing of specific ingredient: START-A...F sequence. To stop press CLR key (see chapter 7.3).

Dosing with total weight can be repeated several times with START-ENTER sequence (see chapter 7.1) or with the external RESTART key.

START-ENTER sequence used after cycle batching restarts batching in cycles process.

In Mode 1 and Mode 2 portions are dosed in one phase if desired load does not exceed scale weighing range. Bigger portions may be dosed in few phases (with loading and removing a load in each phase), according to given proportions of each ingredient in each stage.

To program the indicator use the keypad. Enter weight value of each ingredient for successive batching devices (max 6 ingredients). It is possible to enter the value of weight advance (the weight "in air") for each of batching devices. Entered weight values of each ingredient determines the proportion of the recipe, which may be stored in one of 50 memory banks.

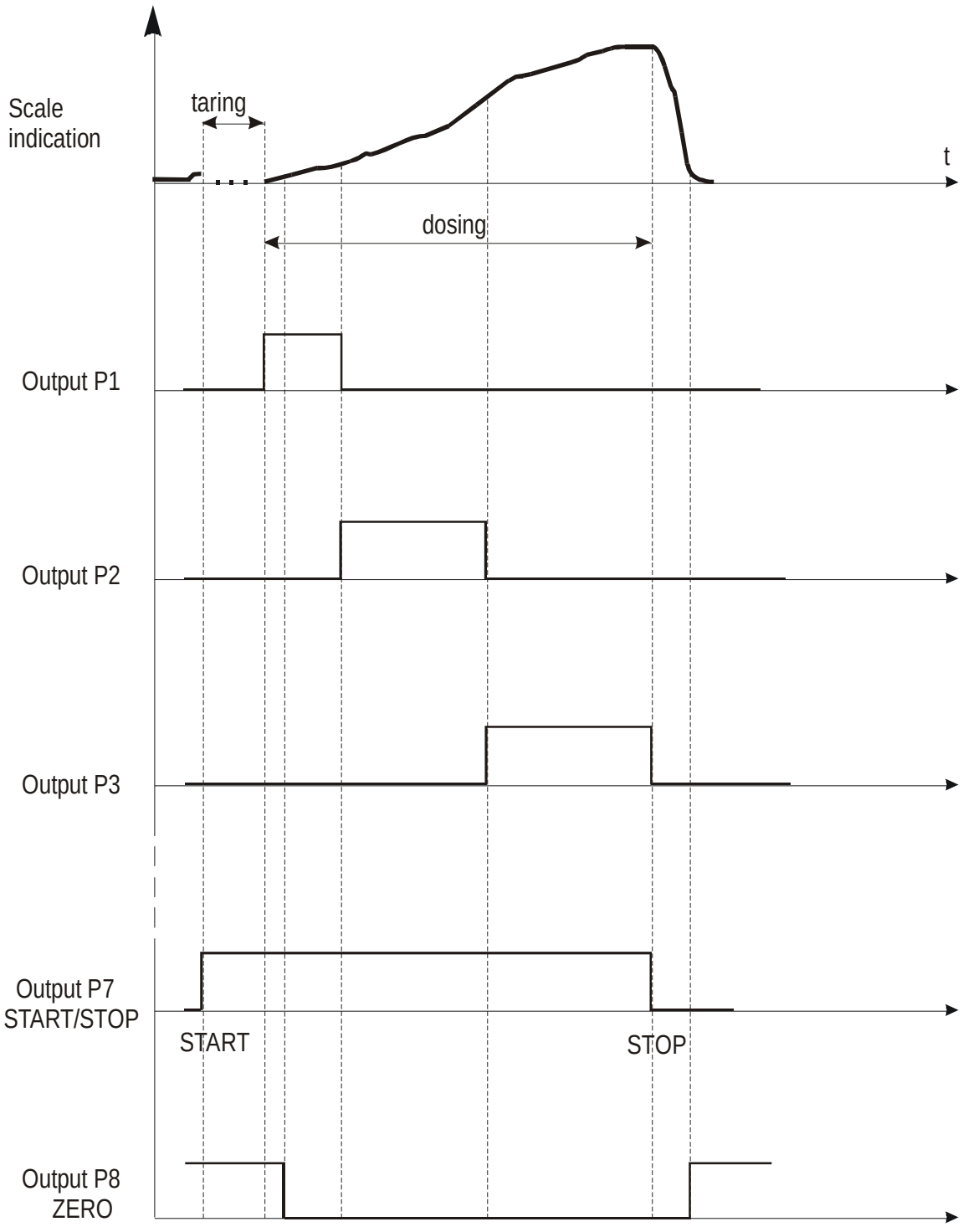
When recalling a specific program and entering the total weight of the recipe, the device dose successive ingredients according to the proportions stored in the formula. In case total weight of the recipe exceeds the scale capacity, the process is performed in few phases. In each phase the portions are dosed in programmed proportions, which does not exceed the scale weighing range.

With each dosing the indicator sends START/STOP signal, which can be used for automatic portion reception.

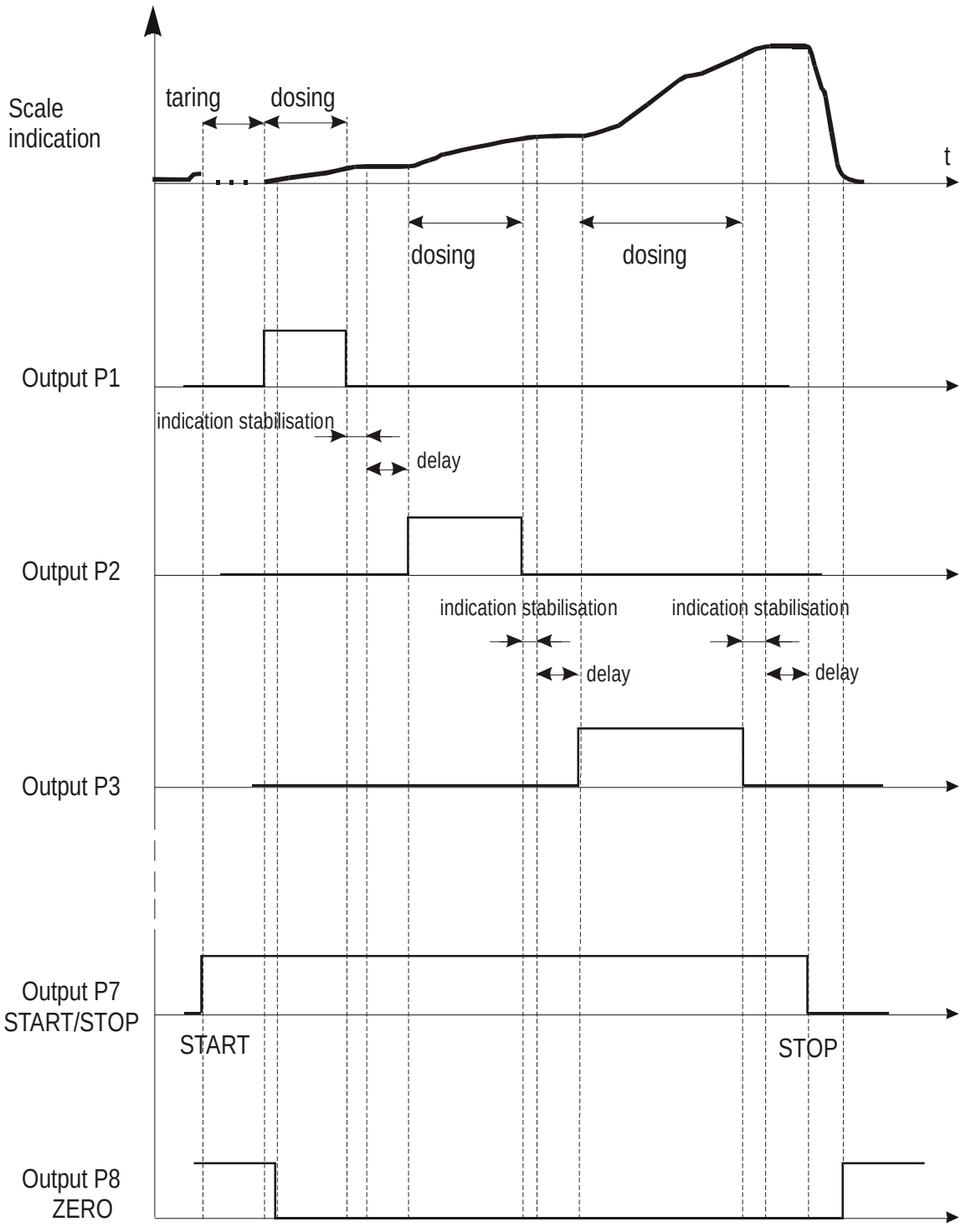
5.2. Weighing options

The dosing process may be performed according to the three different options, determined with Stb function (see chapter 8.5):
- quick option – with registration of estimated ingredients weight values,
- slow option – with registration of accurate ingredients weight values after result stabilization,
- slow option with delay - with registration of accurate ingredients weight values after result stabilization and additional measurement delay.

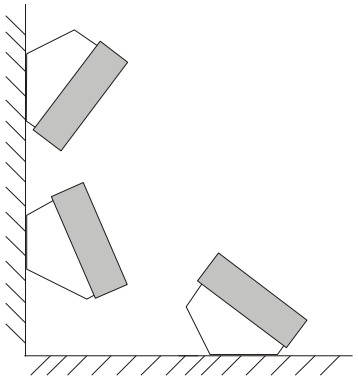
Time chart for fast option:



Time chart for slow option (slow with delay):



5.3. Technical data

Parameter	
Protection class	IP65
Max verification units number	3000
Accuracy class	III
Sensors power supply	5V AC 25Hz
Readability (d)	1, 2, 5, 10, 20 (g, dg, kg)
Verification unit (e)	any
Working temperature	-10÷40^{o}C
Tare range	full
Max sensor number	6 pcs
Input voltage ranges	2,4÷9,5mV (option 10mV) 4,8÷19mV (option 20mV) 9,6÷38mV (option 40mV) 19,2÷72mV (option 80mV)
Transoptor output load capacity	100mA / 24V DC
Power supply	230V, 50Hz, 6VA
Casing	Stainless, acid proof steel tin
Dimensions	238x182x77mm
Mounting	
Fixing	2 holes ϕ5, spacing 203mm
Weight	2,3kg

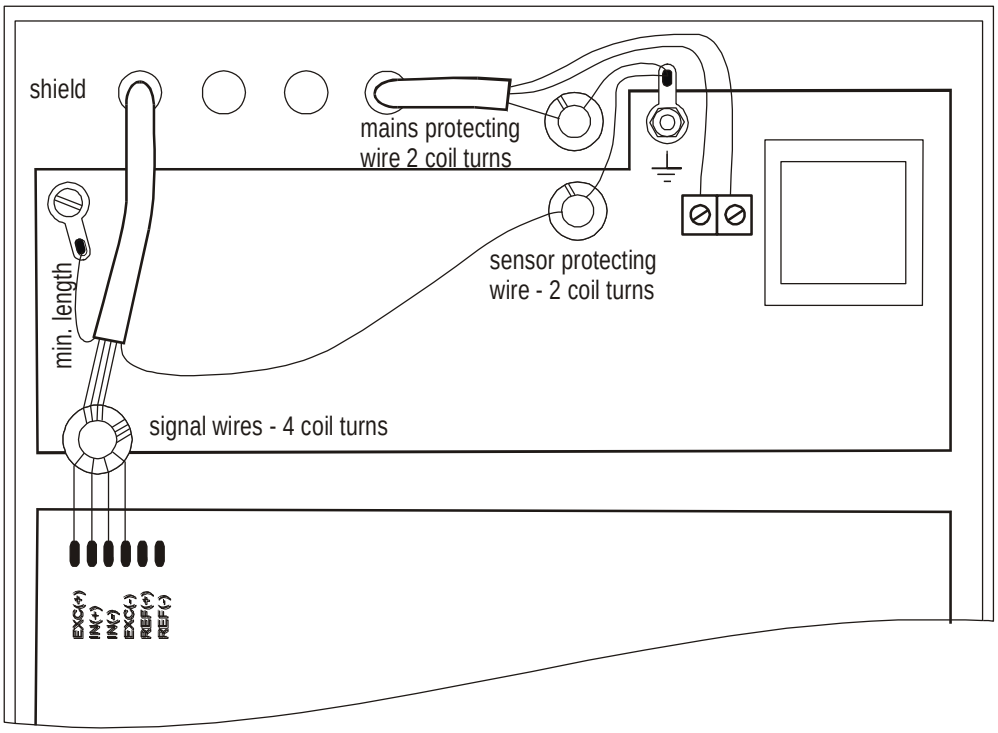
Metrologic parameters are placed on the firm plate.

6. PREPARATIONS

1. To build a scale basing on SE-02 indicator contact authorised manufacturer service point or use Installation Guide delivered with the indicator.
2. The manufacturer gives a full guaranty for SE-02 indictor only when the indicator was mounted by AXIS Sp. z o.o. In other cases the guaranty obligation is taken over by the final contractor of the weighing device.

Before connecting the sensors to the indicator unplug the device from the mains to avoid damaging the indicator!

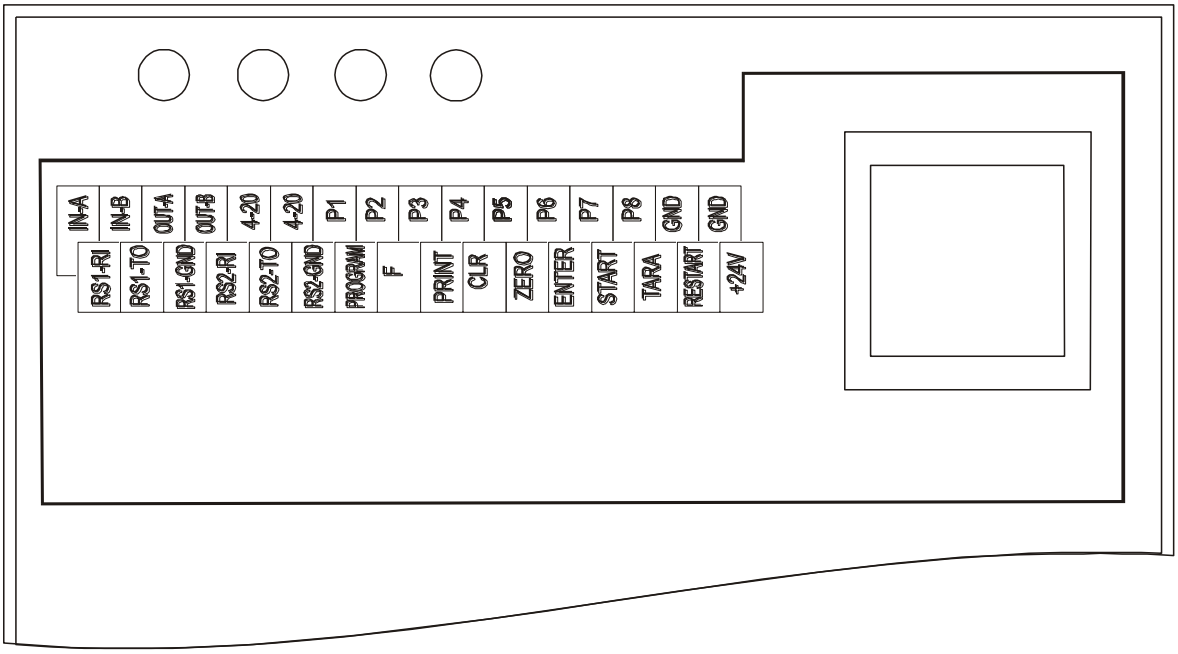
To comply CE marking requirements, for connecting the wires use filtering cores delivered with the indicator, appropriate for signal type: sensor(s) wires – ϕ20mm core, protecting wires - ϕ16mm (see the diagram below). The cores should be placed within 30mm from the place of its connection.



All devices should be powered from the same line (phase) 230V.

To feed the scale use only mains socket with ground contact.

3. Slip the external devices wires through the hermetical bushing and connect the wires to the connecting strip placed on the feeder board.



Note:
The signals connected as standard are: RS1 (-RI, -TO, -GND), P1-P8 and GND. The other signal wires are delivered according to the ordered additional equipment.

Abbreviations:

Abbreviation	Description
RS1 - RI, TO and GND	Main RS232C interface (e.g. for a computer)
RS2 - RI, TO and GND	Additional RS232C interface (e.g. for a printer)
PROGRAM, F, ⮆, CLR, ZERO, ENTER, START, TARA, RESTART	External keys input
+24V	External transoptor powering voltage input
IN-A,IN-B,OUT-A,OUT-B	RS485 interface
4-20	Analog output 4-20mA (optional 0-10V or 0-20mA)
P1-P8 and GND	Transoptor transmitter output

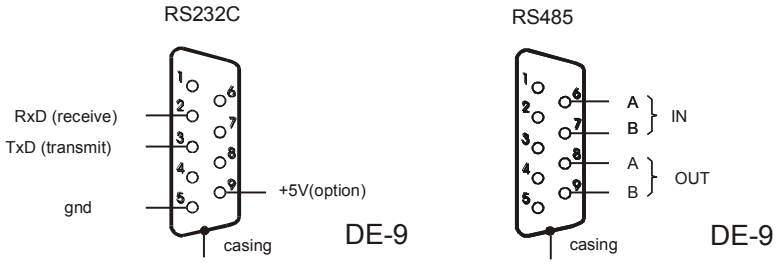
Markers and wire colours:

Marker	Signal	Wire colour*
	Control output:	
1	P1 (A)	green
2	P2 (B)	white
3	P3 (C)	brown
4	P4 (D)	yellow
5	P5 (E	red
6	P6 (F)	blue
7	P7 (START/STOP)	pink
8	P8 (ZERO)	violet
0	GND (external mass, transoptor emitters)	black
	External keys input:	
11	+24V (external feeder voltage)	blue-red
12	RESTART	green-brown
13	CLR	grey-yellow
14	$T/_{ON}$	white-green
15	⮕	grey
16	ZERO	
17	OFF	
18	F	
19	PROGRAM	
20	ENTER	
21		

* Wire colours may change.

Notes:

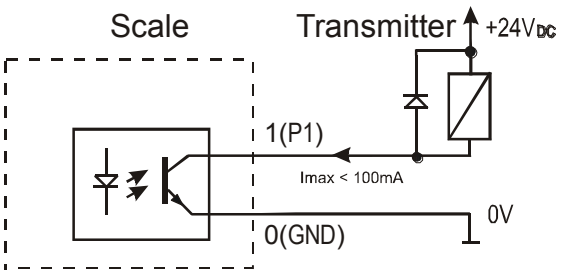
1. Basic interface for communication with external devices is RS1 interface (RS232C-I). The second RS232C interface RS-2 (RS232C-II) requires special program version.
2. Communication interfaces description (standard):



To connect the scale to the computer use RS232C connector delivered with the indicator.

3. P1-P8 outputs are transoptor outputs with open collector with load capacity 100mA/24V DC and are used to connect batching devices. The outputs enable to connect the transmitter inputs directly or through MS8K/P board delivered separately or with ST 8K/P control box (8 transmitters, separate power supply).

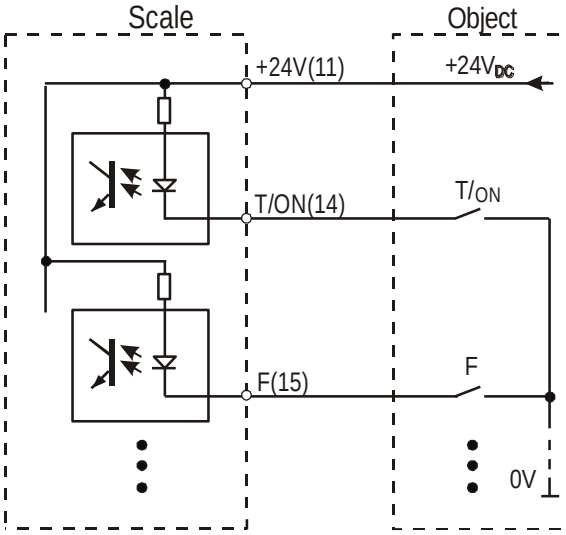
Direct transmitter – Control Output connection diagram:



The outputs are adapted for direct connection of RM96P transmitter with DC24V input voltage and AC250V 8A output. The transmitter coil should be protected (shunt) with a diode, e.g. 1N4148.

4. The external keys input enables to put (double) selected keys in a control box or at the controller stand. The external keys require external 24V DC voltage supply for galvanic separation of the automatics units. AXIS offers a control box ST 8K/P equipped with its own feeder, transmitters and connectors for direct external keys connection.

   External keys connection diagram:



7. GENERAL RULES

1. After switching-on the power, the scale proceeds with self-tests and zeroing the scale. During start-up the scale should not be loaded (does not apply to tank scales, where scales are not zeroed after start-up).
2. Before each measurement make sure that zero indicator is displayed. If zero indicator does not displayed or "----" communicate appears, press →0← key and wait until zero indication and zero indicator appears.
3. The scale is equipped with a tare equal to its range. To tare the scale press →T← key. Storing a tare value does not extend measuring range, but only subtracts it from a load placed on a pan. If the scale is not loaded →T← key does not operate – to zero the scale press →0← key.
4. Weighing result should be read when the indicator "◣ ◢" lights, which signalises stabilisation of a result.
5. Weighed sample should be placed in the centre of the platform.

Do not drop weighed objects on the platform!

Do not overload the scale more then 20% of maximum load (Max).

6. Protect the scale against dust, aggressive dusts and liquids. To clean it is advised to wash the scale with water and dry it afterwards.
7. Each indicator may be equipped on demand with a set of special functions: constant tare, total weight and many more.

In further part of this instruction SE-02 indicator operating is described as a part of a complete scale.

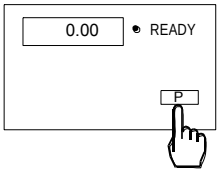
8. PROGRAMMING

Each batching program consists of the following data:

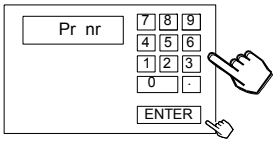
- The symbol of the main feeder - **A**,
- Weight of dosed portion **MAX**, e.g. Max=10kg
- Advance **O**: the symbol of the supportive feeder – **B** and advance value (the main feeder should be stopped before the weight in the container reaches MAX value as some material is still in the air /the advance value/), e.g. O=0.5kg (but not more than 50%*MAX).
- Emptying device symbol – **C** and **MIN** value, below which the current cycle is finished and the new cycle can be started.

Programming actions sequence is presented on the pictures on the following pages. The comments beside the drawing are just informative and are not necessary for correct programming according to the pictures.

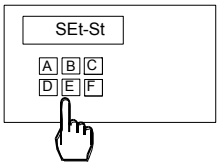
PROGRAMMING



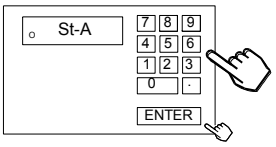
Press PROGRAM key to start programming sequence (if READY indicator does not light press ENTER key or CLR and ENTER keys). If CODE_P communicate appears (see chapter 10.12) enter the security code and press ENTER key.



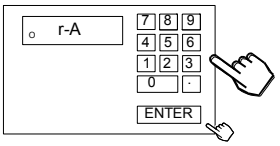
Enter the program number and accept it with ENTER key, e.g. press "1" and ENTER keys



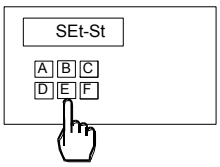
Choose batching device to be used as first, e.g. A.



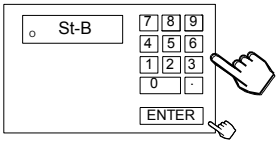
Enter the weight of the first ingredient and press ENTER key to accept, e.g. 100kg.



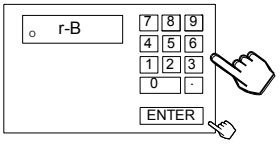
Enter the advance value for the first device, e.g. 1kg. The batching device is closed when the first ingredient weight reaches 99kg. Presuming that 1kg of the material is still in the air, the total weight will reach 100kg when the whole material will fall on the platform.



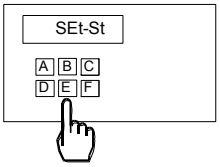
Choose another batching device, e.g. B.



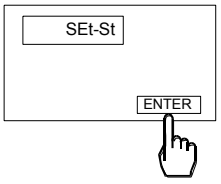
Enter the weight of the next ingredient as before, e.g. 50kg.



Enter the advance value for the next ingredient as for the first one.



Repeat the operations for all of the ingredients (Max number of ingredients is 6). Remember to program the ingredients according to dosing sequence.



To finish the programming press ENTER key. The program is now stored in the memory ("- -" communicate).

After programming it is possible to WEIGH, DOSE or PROGRAM other batching programs. All the programs are stored in the memory until other program is not stored in the same memory bank.

Note:
CLR key used during programming enables to correct wrong values in the current program.
Double pressing CLR key enables to leave the program.
Error communicates:

Err-P - incorrect program number (the number 0 or higher than 50)
Err-A..F - the batching device is entered twice

To print the program values follow the sequence below:
- press PROGRAM key – „Pr nr" communicate appears, READY indicator stops to light
- enter the program number with the numeric keys and press ENTER – "SET St" communicate appears
- press ⎙ key – PRINT communicate appears and the balance prints the program sequence and values

Printout example:

PROGRAM-NR: xx

RECIPE: ADVANCE:

INGREDIENT 1: xx ADVANCE 1: xx
INGREDIENT 2: xx ADVANCE 2: xx
...
DEVICE: A B ...

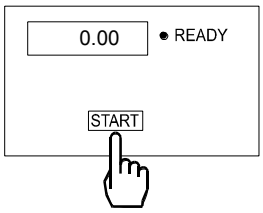
The first batching device symbol and ingredient weight appear on the display. To display consecutive programmed values press ENTER key several times. The advance values are displayed with "o" sign at the left of the display.

9. DOSING - OPERATIONS

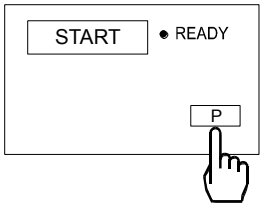
9.1. Dosing

The dosing operation proceeds according to the program stored in the scale memory (see chapter PROGRAMMING).
If the READY indicator does not light press ENTER key.

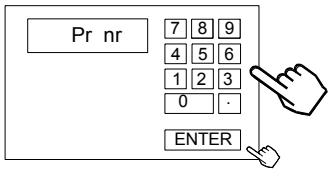
DOSING



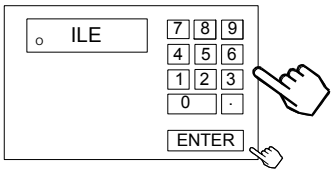
Press START key to start dosing (if READY indicator does not light press ENTER key or CLR and ENTER keys).



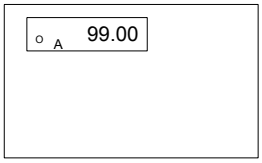
Press PROGRAM key.



When Pr nr communicate is displayed enter the program number and press ENTER key.



Press ENTER key to start dosing the programmed values or enter the total weight of the recipe and press ENTER key.
It is possible to weigh portion of total weight bigger than the scale capacity (multi-phase dosing).

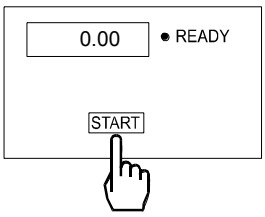


Dosing process is started with auto tare. The value on the display is the current weight of the portion.

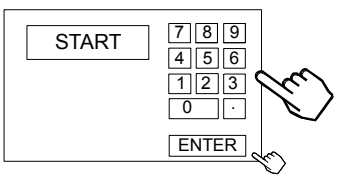
When dosing is finished END indicator lights.
The dosing process may be stopped immediately be pressing CLR key.

REPEATED DOSING

According to previously used program



To use the same program in several cycles, it is not necessary to enter its number each time. Simply press START key and the device starts dosing according to previously used program.

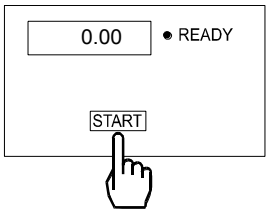


Enter total weight of the portion and press ENTER key.

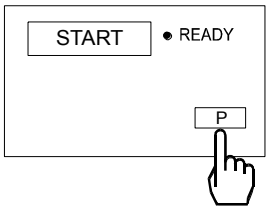
9.2. Dosing in cycles

When the current dosing cycles is finished, the scale waits until the platform is empty and after weighing result stabilisation automatically starts the next dosing cycle.

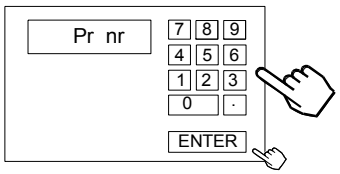
DOSING IN CYCLES



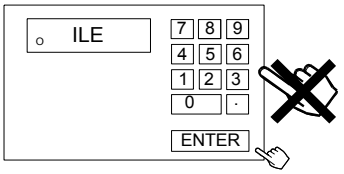
Press START key to start dosing (if READY indicator does not light press ENTER key or CLR and ENTER keys).



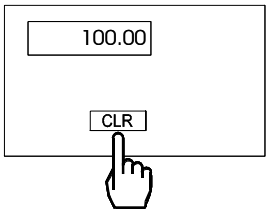
Press PROGRAM key.



Enter the program number and press ENTER key.



Press ENTER key (without entering total weight). The dosing process is performed according to the values stored in the memory for the specific program.

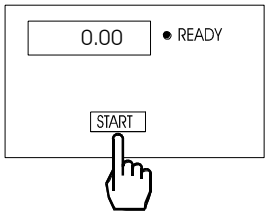


To stop dosing press CLR key.

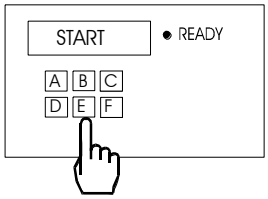
9.3. Manual dosing

The pictures below show how to use manual dosing of a single ingredient.

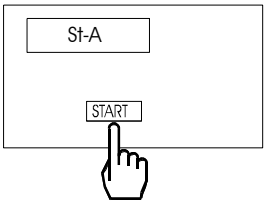
SINGLE INGREDIENT MANUAL DOSING



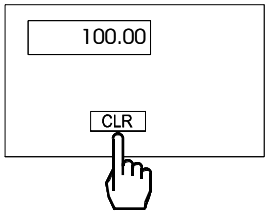
Press START key to start dosing (if READY indicator does not light press ENTER key or CLR and ENTER keys).



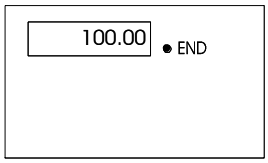
Choose batching device, e.g. A.



The scale starts dosing. The value on the display is a current weight of the ingredient.



To stop dosing press CLR key.



The next manual dosing process is started with the ENTER key – END indicator disappear and READY indicator starts to light.

9.4. Dosing results printout

Printer transmission parameters –4800 bps; 8 bits; 1 bit start, no parity.

Kafka (Mefka) printer internal switches settings:

SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	SW-7	SW-8
on	off	on	off	Off	on	on	off

To print dosing results press ⮆ key, signalised with PRINT communicate on the display.
The printing is not possible during dosing.
If the dosing was not finished, the printout consist of the results of the previous dosing process or zero values.

Printout sample:

Date: rrrr.mm.dd Time: gg:mm

NR: current nr

COMPANY: ...
PRODUCT: ...

PROGRAM-NR: ...
RECIPE: ADVANCE:

INGREDIENT 1: xx ADVANCE 1: xx
INGREDIENT 2: xx ADVANCE 2: xx
...
PROGRAMMED TOTAL WEIGH: ...

DOSING RESULTS

INGREDIENT 1 WEIGH: ...
INGREDIENT 2 WEIGH: ...
...
TOTAL WEIGHT: ...

SIGNATURE:

_____

The printing is not possible before the current dosing process is not finished – after pressing ⮆ key, " ---- " communicate appears.
To clear the current report number please contact an authorised service point.

10. SPECIAL FUNCTIONS

Beside standard set of special functions like constant tare, start-up zero and weighing options, scales may be equipped with other special functions on demand. To recall the list of special functions press **START** and **→T←** keys when the scale is not performing dosing process. The functions are displayed with "F" letter, successive number and the abbreviation of the function name, e.g. "F3-tot".

10.1. Constant tare (tAr)

This function enables weighing with the constant tare value (e.g. container weight), previously stored in the memory. When taring before each dosing cycle, the scale subtracts the constant tare value from the weighing result.

Operations sequence:

1. Press **START** key and then **→T←** key,
2. When "F..-TAR" is displayed press **ENTER** key.
3. The following options appear:
   - "F..- 0" – disables function and returns to normal weighing,
   - "F..- 1" – activates the function with previously stored tare value,
   - "F..- 2" – use the weight from the pan as the constant tare value,
   - "F..- 3" – enter the tare value from the numeric keypad.
4. To store the constant tare value press **ENTER** key.

10.2. Aggregated weight (tot) - optional

This function enables to calculate the aggregated weight of series of measurements greater than scale capacity. It is possible to print the report after the series of weighing is finished.

Operations sequence:

1. Press **START** key and then **→T←** key,
2. When "F..-tot" is displayed press **ENTER** key.
5. The following options appear:
   - "F..-P" - report printout without clearing the adding register,
   - "F..-0" - report printout and clearing the adding register,
   - "F..-1" - activates the function with printing the weighing report,
   - "F..-2" - activates the function with printing the weighing report and displaying the results on the display,
3. Press **ENTER** key when F..-2 is displayed.
4. Make at least one dosing cycle.
5. To display the aggregated weight press **START** key and then **→T←** key.
6. When "F..-tot" is displayed press **ENTER** key.
7. When "F..-P" option is displayed press **ENTER** key.
8. The scale prints the weighing report as presented below:

```
        AGGREGATED DOSING WEIGH
-------------------------------------------------------
 Date:  rrrr.mm.dd      Time.  gg:mm

 DOSING SYSLES NUMBER:  ...
 INGREDIENT A WEIGHT:  ...
 INGREDIENT B WEIGHT:  ...
   ...
 INGREDIENT F WEIGHT:  ...
 -----------------------------------------------------
 AGGREGATED WEIGHT:  ...
 ***************************************
```

- The scale displays also “TOTAL” indicator and aggregated weight value,
- Press ENTER key second time to display the number of measurements (“n” indicator is lit).
- Press ENTER third time to display the average value of dosed portions (“=” indicator is lit).
- To leave the function press ENTER for the fourth time. To leave the function before displaying the weighing results press CLR key.
- After printing the weighing report the summing register is cleared.
- If the current dosing process was not finished, the scale prints the weighing results of the last completed dosing cycle.

To deactivate the function and to clear the summing register press **ENTER** key and then **→T←** key. Then choose ”F..-tot” function and “F..-0” option with **ENTER** key. The scale prints the communicate informing about clearing the register and its status before clearing.

Note:
Maximum number of measurements is 99 999. Maximum total load is 99 999 000d.
The weighing unit of the aggregated value from the register (total) is the same as the weighing unit stated on the keypad or is 1000 times greater (signalised with “u” indicator at the left of the display).
If the registered value is too big to be displayed, “E” communicate appears on the display.
If the number of series is too high to be displayed, “Err1”communicate appears on the display.

10.3. Date and time setting (dAt) – optional

Use this function to set the internal scale clock. The clock is used at printouts of weighing results.

Operation sequence:
1. Press **START** key and then **→T←** key,
2. When ”F..-dAt” is displayed press **ENTER** key.
3. Set the current date and time in according to the given sequence: day, month **(dd.mm),** year **(rrrr)** and time **(hh.mm)**.

10.4. Start-up zero setting (ZEr)

After each start-up the scale controls if the zero value does not differ more than 10% from the primary zero value stored in EEPROM memory. In case the value is incorrect the scale displays “Err-b” communicate.
This function enables to change the initial weight of the scale (e.g. container weight) to ensure proper scale operating.

1. Press **START** key and then **→T←** key,
2. Choose ” F..-ZEr” function and then “F..-1” option with **ENTER** key.
3. Press **→0←** key and wait until " - - " communicate disappears. The scale should display the zero indication.

10.5. Weighing mode selection (Stb)

Use this function to choose from accessible dosing modes: quick, slow and slow with delay. In quick option each ingredient is dosed directly after batching the previous one. In slow mode after dosing each ingredient the scale waits for weighing result stabilisation for accurate measurement. In slow option with delay the scale waits for specified amount of time before measuring the next ingredient.
The slow option is signalised with “o” indicator at the left of the display.

Operation sequence:
1. Press **START** key and then **→T←** key,
2. When ”F..-Stb” is displayed press **ENTER** key.
3. The following options appear:
   - "F..-0" – quick mode
   - "F..-1" – slow mode (with stabilisation)
   - "F..-2" – slow mode with result stabilisation and time delay.
4. When choosing „F..-2” option, “SET-t” command appear – the scale wait for entering time delay value (in seconds).

10.6. Tare delay setting (OtA) - optional

This function enables to enter tare delay between unloading the platform and starting next dosing cycle. This option is very helpful when dosing very viscid liquids.

Operation sequence:
1. Press **START** key and then **→T←** key,
2. When ”F..-OtA” is displayed press **ENTER** key.
3. When „Set” command appear enter the tare delay value (in seconds) with numeric keys and press **ENTER** to confirm.

10.7. Zero threshold value setting (PRG) - optional

This function allows entering the threshold value, below which the platform is treated as empty (ZERO signal appears on the control output).

Operation sequence:
1. Press **START** key and then **→T←** key,
2. When ”F..-PrG” is displayed press **ENTER** key.
3. When „Set” command appear enter the zero threshold value (in weighing units) with numeric keys and press **ENTER** to confirm.

10.8. Continuous transmission (Snd)- optional

This function activates continuous transmission of weighing results via RS interface.

Operation sequence:
1. Press **START** key and then **→T←** key,
2. When ”F..-Snd” is displayed press **ENTER** key.
3. Choose desired option using **ENTER** key:
   - "F..-0" – standard transmission
   - "F..-1" – continuous transmission.

10.9. Recipe clearing (E32)- optional

This function allows deleting chosen recipe from the memory.

Operation sequence:
1. Press **START** key and then **→T←** key,
2. When ”F..-E32” is displayed press **ENTER** key.
3. Choose "F..-1" options with **ENTER** key.
4. When „Pr nr” command appears use the numeric keys to enter the program number to be deleted and press **ENTER** to confirm.

10.10. Company name and product name (nAZ)- optional

Use this function to store company and product name used in printing weighing reports.

Operation sequence:
1. Press **START** key and then **→T←** key,
2. When ”F..-nAZ” is displayed press **ENTER** key.
3. Choose "F..-1" options with **ENTER** key.
4. Choose "nAZ-FI" and press **ENTER k**ey.
5. At the left side of the display the scale present successive letter positions. Enter the company name with 16 consecutive ASCII codes using the numeric keys and press ENTER key to accept each letter. The company name will be printed at all printed reports.

To enter the space press ENTER without the letter code. To leave blank space for manual company name writing, enter 255 code at the first position and accept it with ENTER key.

6. Repeat points 1÷3.
7. Choose "nAZ-rE" with **ENTER** key.
8. When ”nr Pr” command appears enter desired program number and press **ENTER** key.
9. Enter the recipe name with 16 consecutive ASCII codes using the numeric keys and press ENTER key to accept each letter.

ASCII code table:

Sign	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
Code	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86

Sign	W	X	Y	Z	-	a	b	c	d	e	f	g	h	i	j	k	l	m	n
Code	87	88	89	90	45	97	98	99	100	101	102	103	104	105	106	107	108	109	110

Sign	o	p	q	r	s	t	u	v	w	x	y	z	**blank space**
Code	111	112	113	114	115	116	117	118	119	120	121	122	**32**

10.11. LCD display backlight setting (FOL) - optional

This function is mounted in scales equipped with optional LCD display backlight, which enables to read weighing results in places with not enough light.

Operation sequence:
1. Press **START** key and then **→T←** key,
2. When ”F..-FOL” is displayed press **ENTER** key.
3. The following options appear:
   - "F..-0" - backlight disabled
   - "F..-1" - continuous backlight
   - "F..-2" - display backlight used for non-zero indications only.
4. Choose appropriate option with **ENTER** key.

10.12. Security code setting (Cod-P) - optional

Use this function to set the security code (6 digit) protecting against unauthorised access to recipe programming.

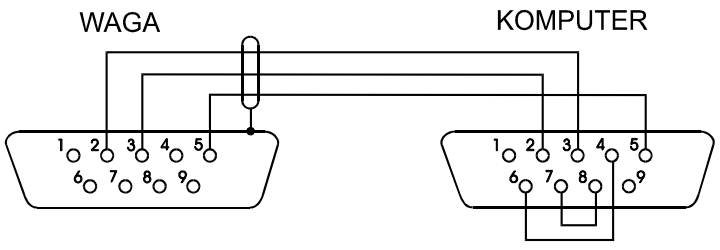
Operation sequence:
1. Press **START** key and then **→T←** key,
2. When ”F..-Cod-P” is displayed press **ENTER** key.
5. When „Set-c1” command appears use the numeric keys to enter the current security code (the default code is 1234) and press **ENTER** to confirm.
3. When „Set-c2” command appears use the numeric keys to enter the new security code and press **ENTER** to confirm.

11. SERIAL PORTS

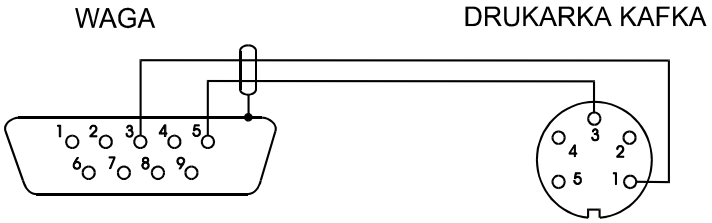
The scale can be equipped with two serial ports, RS232C or RS485.

The main interface marked as RS..-I allows bi-directional data transmission and may be used to connect any external device: a computer, a printer or a label printer.
The additional serial port marked as RS..-II allows unidirectional transmission and can be used to send data to additional display (not equipped with a keyboard). The additional interface can be used for continuous transmission of weighing results.
To use both interfaces the scale requires special program, which depend on type of an external device.

Connecting cable WK-1 *(scale – computer / 9-pin):*



Connecting cable WD-1 *(scale – Kafka printer):*



12. MAINTENANCE AND TROUBLESHOOTING

1. The scale should be kept clean.
2. Take care that no dirt gets between the casing and the pan. If found any, remove the pan (lift it up), remove dirt and then replace the pan.
3. In case of improper operation caused by short-lasting power supply decay, unplug the scale from the mains and then plug it again after few seconds (or switch the power off and on with the power switch if installed).
4. If the scale is switched on with empty pan and “Err-b” communicate appears, the load cell has been mechanically damaged – please contact our nearest service.
5. It is forbidden to make any repairs by unauthorised persons.
6. To repair the scale, please contact our nearest service.

13. PLC OR COMPUTER COOPERATION PROTOCOL DESCRIPTION

The commands send by a computer or ST01 begin with “S”
Scale response send to a computer or ST01 begin with “M”

STX is the number 02 H (HEX)
ETX CR LF is the number 03 H (HEX)
Servicing the scale with the computer is not yet possible.

Programming

STX 0 6 CR LF	- open the channel for scale number 6 (can be omitted if the number is = 00)
M 0 6 CR LF	- confirmation – the channel for scale number 6 opened
S P 1 2 CR LF	- recipe programming – program nr e.g. 12
M P CR LF	- program saved in the memory and previous settings cleared
S A 1 2 3 4 5 . 6 CR LF	- controller A and threshold value
M A CR LF	- confirmation: controller A and threshold value saved
S a 1 2 3 4 5 . 6 CR LF	- advance of the controller A
M a CR LF	- confirmation: advance saved
...	
...	
S F 1 2 3 4 5 . 6 CR LF	- controller and threshold value
M F CR LF	- confirmation: controller F and threshold value saved
S f 1 2 3 4 5 . 6 CR LF	- advance of the controller F
M f CR LF	- confirmation: advance saved
S X CR LF	- finish recipe programming
M X CR LF	- confirmation: data saved in EEPROM memory

S g 0 0 ABCDEFGHIJKLMNOP CR LF	- company name FIRMA programming – 16 signs of the name
M g 0 0 CR LF	- saved
S g 0 1 ABCDEFGHIJKLMNOP CR LF	- recipe name RECEPTURA 1 – 16 signs of the name
M g 0 1 CR LF	- saved
...	
...	
S g 30 ABCDEFGHIJKLMNOP CR LF	- recipe name RECEPTURA 30 – 16 signs of the name
M g 30 CR LF	- saved
ETX CR LF	- release the channel (can be omitted if the module nr = 00)
M Q CR LF	- the command cannot be executed

Dosing

- starting dosing

STX 0 6 CR LF	- open the channel for scale number 6 (can be omitted if the number is = 00)
M 0 6 CR LF	- confirmation – the channel for scale number 6 opened
S G 1 2 CR LF	- start program nr e.g. 12
S G 0 0 CR LF	- start the same program
M G A CR LF	- start controller A
…	
…	
M G F CR LF	- start controller F
ETX CR LF	- release the channel (can be omitted if the module nr = 00)

- entering ILE value

STX 0 6 CR LF	- open the channel for scale number 6 (can be omitted if the number is = 00)
M 0 6 CR LF	- confirmation – the channel for scale number 6 opened
S V 0 0 0 0 0 0 0 CR LF	- continuous work
S V 1 2 3 4 5 . 6 CR LF	- ILE value setting
M V CR LF	- conformation: ILE value saved
ETX CR LF	- release the channel (can be omitted if the module nr = 00)

- controller inquiry

STX 0 6 CR LF	- open the channel for scale number 6 (can be omitted if the number is = 00)
M 0 6 CR LF	- confirmation – the channel for scale number 6 opened
S G ? ? CR LF	- which controller is active?
M G A CR LF	- controller A operating
...	
...	
M G F CR LF	- controller F operating
M G 0 CR LF	- all controllers idle
ETX CR LF	- release the channel (can be omitted if the module nr = 00)

- finish dosing

STX 0 6 CR LF	- open the channel for scale number 6 (can be omitted if the number is = 00)
M 0 6 CR LF	- confirmation – the channel for scale number 6 opened
S O CR LF	- END indicator status?
M O 0 CR LF	- switched-off
M O 1 CR LF	- lit
ETX CR LF	- release the channel (can be omitted if the module nr = 00)
M E r H CR LF	- aggregated weight to big for the type of scale
M Q CR LF	- the command cannot be executed

Controller continuous operation

STX 0 6 CR LF	- open the channel for scale number 6 (can be omitted if the number is = 00)
M 0 6 CR LF	- confirmation – the channel for scale number 6 opened
S H A CR LF	- switch the controller A , B , C , D , E , F on for continuous operating
MH A CR LF	- start controller A
...	
...	
MH F CR LF	- start controller F
ETX CR LF	- release the channel (can be omitted if the module nr = 00)
M Q CR LF	- the command cannot be executed

Final report printout

STX 0 6 CR LF	- open the channel for scale number 6 (can be omitted if the number is = 00)
M 0 6 CR LF	- confirmation – the channel for scale number 6 opened

S L CR LF - print report

M L S 0 ABCDEFGHIJKLMNOP CR LF - recipe name (if entered)

M L S 1 + 1 2 3 4 5 . 6 k g CR LF - ingredient 1 weight
...
...
M L S 6 +1 2 3 4 5 . 6 k g CR LF - ingredient 6 weight

M L S S +1 2 3 4 5 . 6 k g CR LF - aggregated weight

M L CR LF - printout end

ETX CR LF - release the channel (can be omitted if the module nr = 00)

M Q CR LF - the command cannot be executed

Program settings printout

STX 0 6 CR LF - open the channel for scale number 6 (can be omitted if the number is = 00)
M 0 6 CR LF - confirmation – the channel for scale number 6 opened

S M 0 0 CR LF - print the settings of all the programs
S M 1 2 CR LF - print the settings of the specific program e.g. no 12

M M F ABCDEFGHIJKLMNOP CR LF - company name (if entered)
M M P 0 1 CR LF - program number e.g. 1

M M N ABCDEFGHIJKLMNOP CR LF - recipe name (if entered)
M M S 1 + 1 2 3 4 5 . 6 k g CR LF - threshold 1 and threshold value
M M R 1 + 1 2 3 4 5 . 6 k g CR LF - threshold 1 advance
...
...
M M S 6 + 1 2 3 4 5 . 6 k g CR LF - threshold 6 and threshold value
M M S 6 + 1 2 3 4 5 . 6 k g CR LF - threshold 6 advance

M M S t A B C D E F CR LF - controller number and sequence

M M CR LF - printout end

ETX CR LF - release the channel (can be omitted if the module nr = 00)

M Q CR LF - the command cannot be executed

Clearing recipes and names

STX 0 6 CR LF - open the channel for scale number 6 (can be omitted if the number is = 00)
M 0 6 CR LF - confirmation – the channel for scale number 6 opened

S Y 0 0 CR LF - erase company name
M Y 0 0 CR LF - company name erased

S Y 0 1 CR LF - erase program no 01 and recipe no 01 name
M Y 0 1 CR LF - name erased
...
...
S Y 3 0 CR LF - erase program no 30 and recipe no 30 name
M Y 3 0` CR LF - erased

ETX CR LF - release the channel (can be omitted if the module nr = 00)

M Q CR LF - the command cannot be executed

Enter

STX 0 6 CR LF	- open the channel for scale number 6 (can be omitted if the number is = 00)
M 0 6 CR LF	- confirmation – the channel for scale number 6 opened
S J CR LF	- e.g. light READY indicator
M N 1 CR LF	- after READY indicator was lighted, if ENTER pressed for dosing ready status
ETX CR LF	- release the channel (can be omitted if the module nr = 00)

CLR

STX 0 6 CR LF	- open the channel for scale number 6 (can be omitted if the number is = 00)
M 0 6 CR LF	- confirmation – the channel for scale number 6 opened
S K CR LF	- stop the operation
M K CR LF	- CLR done
ETX CR LF	- release the channel (can be omitted if the module nr = 00)

READY indicator lit

STX 0 6 CR LF	- open the channel for scale number 6 (can be omitted if the number is = 00)
M 0 6 CR LF	- confirmation – the channel for scale number 6 opened
S N CR LF	- READY indicator status?
M N 0 CR LF	- switched-off
M N 1 CR LF	- lit
ETX CR LF	- release the channel (can be omitted if the module nr = 00)

END indicator lit

STX 0 6 CR LF	- open the channel for scale number 6 (can be omitted if the number is = 00)
M 0 6 CR LF	- confirmation – the channel for scale number 6 opened
S O CR LF	- END indicator status?
M O 0 CR LF	- switched-off
M O 1 CR LF	- lit
ETX CR LF	- release the channel (can be omitted if the module nr = 00)

Tare

STX 0 6 CR LF	- open the channel for scale number 6 (can be omitted if the number is = 00)
M 0 6 CR LF	- confirmation – the channel for scale number 6 opened
S T CR LF	- tare the scale if the indication is stable (switch the scale on if in STANDBY mode)
M T CR LF	- the scale tared
ETX CR LF	- release the channel (can be omitted if the module nr = 00)

Switching the scale off

STX 0 6 CR LF	- open the channel for scale number 6 (can be omitted if the number is = 00)
M 0 6 CR LF	- confirmation – the channel for scale number 6 opened
S S CR LF	- switch the scale off
S R CR LF	- the scale switched-off?
M R 0 CR LF	- the scale switched-off
M R 1 CR LF	- the scale switched-on
ETX CR LF	- release the channel (can be omitted if the module nr = 00)

Zeroing

STX 0 6 CR LF	- open the channel for scale number 6 (can be omitted if the number is = 00)
M 0 6 CR LF	- confirmation – the channel for scale number 6 opened
S Z CR LF	- zero the scale
S U CR LF	- the scale zeroed?
M U 1 CR LF (M U 0 CR LF)	- confirmation: the scale zeroed (the zero indication exceeded)
ETX CR LF	- release the channel (can be omitted if the module nr = 00)

Display indication printout

STX 0 6 CR LF	- open the channel for scale number 6 (can be omitted if the number is = 00)
M 0 6 CR LF	- confirmation – the channel for scale number 6 opened
S I CR LF	- send the current indication
stb 0 CR LF (stb 1 CR LF)	- stabilisation indicator status – unstable (stable)
- 1234.5 kg CR LF	- display status – LONG protocol
M I CR LF	- end of transmission
ETX CR LF	- release the channel (can be omitted if the module nr = 00)

Balance status

STX 0 6 CR LF	- open the channel for scale number 6 (can be omitted if the number is = 00)
M 0 6 CR LF	- confirmation – the channel for scale number 6 opened
S W CR LF	- show scale status
M W 0 CR LF	- the scale during dosing process
M W 2 CR LF	- the scale during taring (before starting dosing process)
M W 3 CR LF	- weighing mode - normal work
M Q CR LF	- the command cannot be executed
ETX CR LF	- release the channel (can be omitted if the module nr = 00)

Command cannot be executed (e.g. during dosing)

M Q CR LF

Unknown command received

M E r r CR LF

Declaration of Conformity CE

We:

AXIS Spółka z o.o. 80-125 Gdańsk, ul.Kartuska 375B

confirm with all responsibility that weighing indicators:

SE-01, SE-02 and SE-03

marked with CE mark comply with the following:

1. EN 61010-1:2004 standard Safety requirements for electrical equipment for measurement, control and laboratory use. General requirements harmonized with the directive 2006/95/WE (Low Voltage Directive),

2. EN 55022:2000 Electromagnetic compatibility (EMC) – information technology equipment – Radio disturbance characteristics - standard Limits and methods of measurement and IEC 61000-4-3 - Electromagnetic compatibility (EMC) - Part 4-3: Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test harmonized with the directive 2004/108/WE (Electromagnetic compatibility).

Additional information
- Conformity evaluation for the Council Directive 73/23/ECC and 89/336/EEC (replaced by 2006/95/WE and 2004/108/WE) was carried out by Laboratorium Badawcze Oddziału Instytutu Elektrotechniki in Gdańsk, accredited by PCA,
- Type-Approval Certificate No. PL CB 1 was issued by Główny Urząd Miar w Warszawie (Notified Body No. 1440).

Per pro Director of AXIS Sp. z o.o.:

Production Manager Jan Kończak _____ Date: 25-04-2012

Notes