SERVICE MANUAL

WEIGHING SCALE
SERIES S300F, S300L

July 2020

Version 1.0

1. INTRODUCTION

The scale handles the weight according to data stored in a memory table during the calibration.

When setting up the balance, you should specify a number of parameters described below.

When re-calibrating, it is enough to take a point at zero and one or two points with a load.

At initial setup, it is convenient to load default data, which can then be changed according to the type and scope of the scale.

The balance uses 2 or 3 calibration points - one for unloaded position (zero point) and one or two for load (load points). It is mandatory to use zero and second load point, first load point is not mandatory, but must be set to 0 if not used.
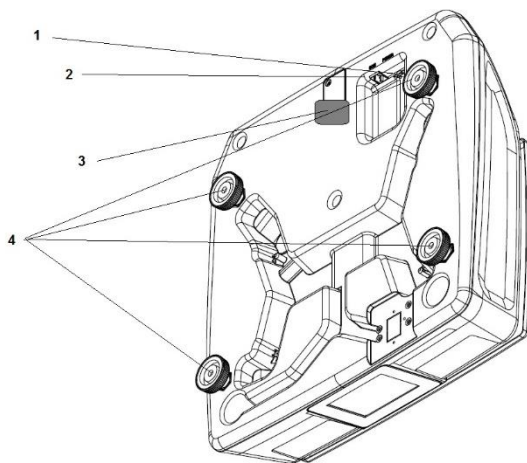
2. View from below
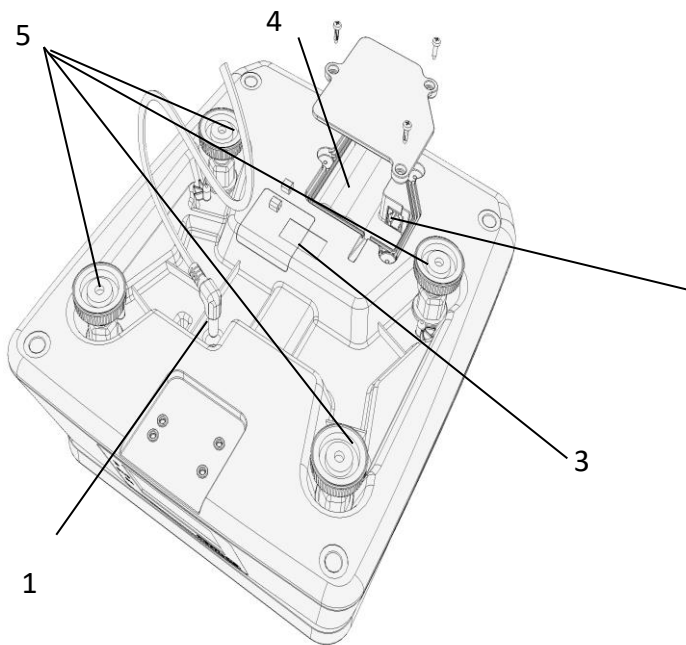
1.	Power supply connection
2.	RS232 interface connection
3.	Calibration seal
4.	Battery compartment
5.	Adjustable feet

Table 2.1 – View from below S300

Fig. 2.1 – View from below S300

1.	Power supply connection
2.	RS232 interface connection
3.	Calibration seal
4.	Adjustable feet

Table 2.26 – View from below S300-M

Fig. 2.2 – View from below S300-M
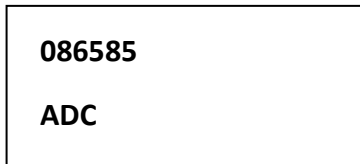
3. ENTER CALIBRATION MODE

Before you enter calibration, the jumper switch should be activated to allow parameter change.

1. Remove the calibration cover to access the calibration switch.
2. Press the calibration switch (jumper) while scale is operating.
   Scale display will show a brief message "Jumper On"
3. When Jumper ON, the scale will show high resolution x10 weighing with icon "x", and G-value compensation will not be active
4. Scale is ready for calibration

4.1 QUICK CALIBRATION

Quick calibration mode allows only scale re-calibration and G-value adjustment.

4.1 To access calibration mode hold **CHG** key for 3 sec.

4.2 Once in calibration mode, display will show ADC reading
   You can load the scale to the is the load cell reading is active and stable
   This parameter is accessible without Jumper and is use to check load cell and ADC performance

```
086585

ADC
```

4.3 In calibration mode use the **MENU** or ⏻ to go through calibration parameters.

4.4 Press **MENU** to go to parameter **ADC-0-**, scale calibration Zero.

```
086585

ADC-0-
```
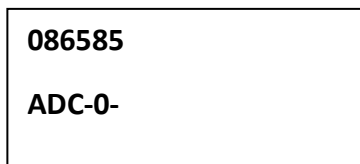
4.5 Take calibration Zero by holding **>0<**

```
Get -0-

Calib
```
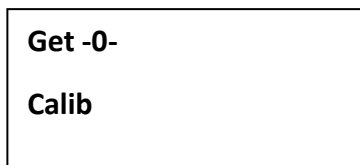
4.6 Press **MENU** to go to the next calibration parameter **uCal-1**, this is the first weight calibration weight point. If you wish to make a single point calibration set uCal-1 to 00000.0

4.7 Enter first calibration point.
   In the example we will calibrate first point with 2kg. Enter 00002.0 using the numeric keyboard.

```
00002.0

uCAL-1
```
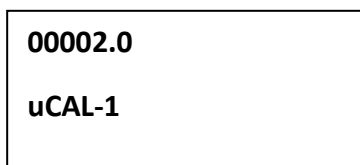
4.8 Press **MENU** to go to the calibration of the first calibration point **CAL-1 / Delta2.**

```
009472

CAL1/DELTA1
```

4.9 Place the calibration test weight in the middle of the scale pan. In our Example 2kg.

If you use single point calibration skip this step by pressing **MENU**

4.10 To take the calibration press **>T<**.
Message GET-1 CALIB will appear to confirm the calibration
this is the first weight calibration weight point. If you wish to make a single point calibration set uCal-1 to 00000.0

```
GET-1

CALIB
```

4.11 Press **MENU** to go the second calibration parameter **uCal-2.**
Enter second calibration point.
In the example we will calibrate second point with 5kg. Enter 00005.0 using the numeric keyboard.

```
00005.0

uCAL-2
```

4.12 Press **MENU** to go to the calibration of the second calibration point **CAL-2 / Delta2.**

```
023680

CAL2/DELTA2
```

4.13 Place the calibration test weight in the middle of the scale pan. In our Example 5kg.

4.14 To take the calibration press **>T<**.
Message GET-2 CALIB will appear to confirm the calibration

```
GET-2

CALIB
```

4.15 Press **MENU** to go to the **Gravity setting parameters**.

The scale has built in function for gravity compensation in cases where the place of calibration differs from place of use.

Parameter **GrAv-1** is the G-value for the place of calibration, where parameter **GrAv-2** is the G-value of the place of use. In cases where the G-value of calibration is same as G-value of use. Parameter **GrAv-2** should be set to 0.

4.16   **GrAv-1** parameter is set by default to g=9.8053 as factory G-value

You can change the value by the numeric keyboard if needed. And confirm by   MENU

```
098053

GrAv-1
```

4.17   **GrAv-2** parameter is g-value for the place of use.

If gravity compensation is not necessary parameter should be set to **0** or you should enter the g-value for the place of use and confirm it by   MENU

```
000000

GrAv-2
```

4.18   After Calibtaiton is done, hold   MENU   until message **WEIGHT SAVE** appear.

```
WEIGHT

SAVE
```

Press   [power button icon]   to save the calibration

4.19   Scale will restart automatically and new calibration will be saved.

5. SERVICE MENU

To enter service settings from menu

Hold **MENU** until display shows **SETUP**

Confirm with ⏻ and choose menu SYSTEM as shows blow

Scrow to main setup menus » MENU **» ARTICL »** MENU **» FUNCS »** MENU **» PRINT »** MENU **»**

INTERF » MENU **» SYSTEM»** ⏻

SYSTEM menu has the following sub menus:

- ➢ **PARAMS – Scale general parameters (jumper protected)**
- ➢ **DEAFAUL LOAD – Default factory stetting Reset**
- ➢ **SYST-2 – LCD display brightness adjustment**
- ➢ **CALIB POINT – Detailed calibration menu (jumper protected)**
- ➢ **CALIB CPARAM – Advance Calibration parameter for Certification purposes (jumper protected)**
- ➢ **SYS SPEED – System speed parameters**

6. DETAILED CALIBRATION (CALIB POINT)

Calibration menu navigation:

The numeric filed can be changed by the numeric keys or arrows UP an RIGHT.

Key ⏻ *used to save the changes and go to the next parameter.*

Key >0< *used to take scale Zero*

Key >T< *use to take calibration*

Key **MENU** used to to go to next parameter and exit/save calibration

6.1 RANGE_

When changing RANGE parameter and confirming with ENTER – indicator checks if there is such table in the memory. If such table is existing it loads all parameters. If not tables is found all remaining parameters remain unchanged.

Note: In current version only table 0615 is available.

6.2 SERNUM

Scale/module serial number. It can be changed only it its 0000000.

6.3 G-KG

Parameter for main weight unit.

0 – Grams

1 – Kg

6.4 ADC___

Shows current ADC reading from ADC module.

Used to evaluate the scale condition and loading/unloading reaction.

No a parameter for change/set.

6.5 ADC-0-

Shows ADC value of calibration point ZERO.

To take calibration zero, ensure that scale is free of weight and hold ![>0<] key.

Display will shows "GET-0-/CALIB" for about 2 sec., after that it will remember the new ADC value for ZERO.

6.6 UCAL-1

Value of first calibration point in unit according to set up in section 4.3. Grams, Kg.

Pay attention to the decimal point in mode grams/kg.

If calibration will be made at single calibration point, calibration point UCAL-1 should be set to zero (000000).

6.7 DELTA1/CAL-1

Shows the calibration weight for first calibration point.

The number is shows in ADC values minus the ADC value of Zero point. Refer to section 4.5.

If first calibration point will not be used ("WCAL-1"= 000000), press ![power key] to go to next parameter.

If first calibration point will be used ("WCAL-1" > 000000), load the scale with the corresponding load set in parameter "WCAL-1". Wait for the load to get stable (3-5 sec) press and hold key ![>T<].

Display will show "GET-1/CALIB", after which the display shows the the new ADC value stored for this point.

Press ![power key] go to the next parameter.

6.8 UCAL-2

Value of the second calibration point in unit according to set up in section 4.3. Grams, Kg.

!!!Pay attention to the decimal point in mode grams/kg!!!

This calibration point in mandatory! Enter the calibration weight and press [power button icon] to go to next parameter.

6.9 DELTA2/CAL-2

Shows the calibration weight for second calibration point.

The number is shows in ADC values minus the ADC value of Zero point. Refer to section 4.5.

Load the scale with the corresponding load set in parameter "WCAL-2". Wait for the load to get stable (3-5 sec) press and hold key [>T< key icon].

Display will show "GET-1/CALIB", after which the display shows the new ADC value stored for this point.

Press [power button icon] go to the next parameter.

6.10 STB-1

Number of successive reports tracked when determining whether the balance is in a stable state.

Normal value is 5 reports.

6.11 STB-2

Allowable difference between two successive reports when determining whether the scale is in a stable state. The unit of measurement is parts of the division (see next point) of the scale.

The normal value is 0.35 parts of the division.

The parameters "STB-1" and "STB-2" influence the operation of the balance when exchanging data with other devices when printing, with automatic functions (automatic tare and auto-lock). Very small values of "STB-1" can compromise the mentioned functions, very large values - delay these functions.

Conversely, large values of "STB-2" may compromise the mentioned functions, very small values - delay these functions

6.12 UNIT-1

Value of a scale verification interval in the first interval. In this parameter you can set the value of the scale division for first range.
In the case of a single range scale, this parameter must be set to 0.
The unit should be set according to point 4.3 - in grams, Kg. Pay attention to the decimal point.

Eligible values are 1,2,5,10 and the outputs of these numbers by 10,100, 1000, etc.

6.13 CNT-1

Number of verification scales intervals for first interval. The multiplication of "CNT-1" and "UNIT-1" equals to the capacity of the first weighing range.

For legal for trade scales"CNT-1"≤3000.

6.14 UNIT-2

Value of a scale verification interval for the second interval. In this parameter you can set the value of the scale division for second range for dual range scales or scale interval for single range scales.
The unit should be set according to point 4.3 - in grams, Kg. Pay attention to the decimal point.

Eligible values are 1,2,5,10 and the outputs of these numbers by 10,100, 1000, etc.

6.15 CNT-2

Number of verification scales intervals for second interval. The multiplication of "CNT-2" and "UNIT-2" equals to the max scale capacity.

For legal for trade scales"CNT-2"≤3000.

6.16 TRADE

If parameter is set to =1, no weight values will be sent through the interfaces is weight is below minimum.

6.17 DPOINT

Number of digits after the decimal point.

In mode Kg possible values are: 0, 1, 2, 3

In model Grams possible values are 0, 1, 2

6.18 O-LOAD

Number of verification scales intervals above the scale maximum, eligible for display.

For legal for trade versions parameter should be set to ≤ 9.

6.19 U-LOAD

Minimum number of verification scale intervals (Min) under which some functions are not allowed.

Functions are: Sending weight through interface, Auto tare, Print.

For legal for trade scales values should be 20

6.20 U1-ʀᴀɴ

Max capacity for Range 1 in kg

6.21 U2-ʀᴀɴ

Max capacity for Range 2 in kg

6.22 GRAV-1

Value of gravity coefficient for the place of calibration.

6.23 GRAV-2

Value of gravity coefficient for the place of use.

Note: If some of the parameters "GRAV-1" or "GRAV-2" is set to zero, no gravity compensation will be active.

Exit Calibration mode

To exit calibration mode hold

Hold **MENU** until display shows **WEIGHT SAVE**.

To save settings confirm with ⏻ .

Instrument will restart. Test to see if calibration changes are correct and seal the instrument.

To exit without saving the changes press >T< display shows **WEIGHT SAVE** confirm with ⏻ .

7. CALIB RAPAMETERS

7.1 TRAC-0

Scope - in parts of the division - to activate automatic zero-setting device.
Normal value is 1.50.

7.2 TOL-0

Permissible deviation / tolerance at initial reset - in percent of scale range. When the instrument is switched on, the initial reset monitors whether the measured load (relative to zero of the calibration) is less than or greater than this tolerance. If larger, it issues an error-0- message and remains in the initial reset state.

Allowed value for legal for trade scales ≤ 10%.

Secondary zeroing by key or automatic zero-setting device is limited to 4% of the range fromt he zero setting point.

7.3 NEAR-0

In parts of the verification scale interval - Determines the action of the proximity indicator to zero.

Value for legal for trade scales is 0.30

7.4 FAST

An assist parameter, indicating:

- slow operation of the ADC (0,1,2,3)
- fast operation of the ADC (10, 11, 12, 13)
- fast operation with hitting peaks (20, 21, 22, 23).

7.5 TCAL_

Measured temperature at calibration. The value is not an accurate temperature and it is used for temperature deviations and weight calculation.

7.6 GRAV-1

Value of gravity coefficient for the place of calibration.

7.7 GRAV-2

Value of gravity coefficient for the place of use.

Note: If some of the parameters "GRAV-1" or "GRAV-2" is set to zero, no gravity compensation will be active.

7.8 USEC-Z

If parameter set =1, when turning ON the instrument, the indicator will not initial zeroing and calibration Zero will be used.

Default setting: 0

7.9 NZTRAC

Activation of the automatic zero-tracking device (see section 4.20) with stable decreasing of the weight near Zero.

0 – Disabled

1 – Enabled

7.10 PZTRAC

Activation of the automatic zero-tracking with stable decreasing of the weight near Zero.

0 – Disabled

1 – Enabled

7.11 NZTRAC

Activation of the automatic zero-tracking device with stable decreasing of the weight near Zero.

0 – Disabled

1 – Enabled

7.12 GRAMS_

0 – Disabled

1 – Enabled

7.13 IFGRAM

Allows instrument to send weight to external devices according to command by external device.

0 – Disabled

1 – Enabled

7.14 NEGDSP

Display of negative weight on the display.

0 – Disabled

1 – Enabled

7.15 NEGUNI

Maximum weight to be displayed below ZERO in number of verification intervals (see section 4.36)

For Legal for trade scales ≤19

7.16 HWGAIN

ADC parameter.

SET by Default to 0

7.17 T-COR

Temperature compensation.

1 – Disabled

0 – Enabled

Table 1. Calibration Parameters

Number	Name	Example reading	Format for number	
0	ADC-0-	08671050	RD8.0	ADC result for non-loaded position
1	DELTA1	00420645	RD8.0	In ADC units, between Calibration Zero point and first loaded point
2	DELTA2	00841303	RD8.0	In ADC units, between Calibration Zero point and second loaded point
3	UCAL-1	00001.0	JD6.1	In 'kg' , value of first calibration weight
4	UCAL-2	00002.0	JD6.1	In 'kg' , value of second calibration weight
5	UNIT- 1	00.002	JD5.3	"e1"-in 'kg' Set to zero for single interval scale
6	CNT-1-	03000	JD5.0	Count of units in first interval. Set to zero for single interval scale.
7	UNIT-2	00.005	JD5.3	"e2"- in 'kg' for 2-interval scale "e"- in 'kg' for 1-interval scale
8	CNT-2-	03000	JD5.0	Count of units in second interval, or Count of units for singe interval scale.
9	U1-Ran			Max capacity for Range 1
10	U2-Ran			Max capacity for Range 2
11	O-LOAD	09	JD2.0	In "e2" units, allowed values for displaying. Max allowed to display weight is (CNT2+O_LOAD)*UNIT_2
12	U-LOAD	20	JD2.0	In 'e1' (or 'e') units, scale minimum.

13	STB-1-	075	JD3.0	Count of sequential readings, to set stability flag
14	STB-2-	00.40	JD4.2	Allowed difference between sequential readings to set stability flag.
15	TRAC-0	1.50	JD3.2	In 'e1' ('e') units – Zero autotrack range.
16	TRADE_	1	JD1.0	Flag 1/0 – scale is in trade mode.
17	DPOINT	3	JD1.0	Place of decimal point.
18	FILTER	02	JD2.0	ADC averaging
19	TOL-0	10	JD2.0	In % of MAX (2), allowed Zero point at reset.
20	NEAR-0	00.30	JD4.2	In 'e1' (e) units – difference to set 'nearzero' flag.
21	RANGE_	0615	JD4.0	Used to load predefined table, not used in normal weighing mode.
22	TCAL--	25	RD3.0	Temperature (Cesium) when calibration with weights is performed.
23	FAST--	00	JD2.0	ADC mode
24	ADC___	07977212	RD8.0	Default ADC reading.
25	GRAV-1	098053	JD6.0	Gravity coefficient – place of calibration
26	GRAV-2	000000	JD6.0	Gravity coefficient – place of usage. If settled to zero – no gravity compensation is used.
27	Time			Real time clock time setting
28	Date			Real time clock date setting
29	SERNUM	000012	JD6.0	Serial number of the scale.
30	UseC-Z	0	Jb1.0	Use Calibration Zero point, instead zeroing at reset.
31	PZTrac	1	Jb1.0	Allows Zero autotrack, when weight is positive.
32	NZTrac	1	Jb1.0	Allows Zero autotrack, when weight is negative.
33	Grams_	0	Jb1.0	Flag, show weight in grams, for messages.
34	IfGram	1	Jb1.0	Enable switching 'g'/'kg' by host.
35	NegDsp	1	Jb1.0	Enable negative weight show.
36	NegUni	19	JD2.0	In 'e1' units, allowed negative weight to show. NegUni=0 is equivalent to NegUni=20. NegUni=99 is equivalent to 'no limit' - to use in non-trade mode scales.
37	HwGain	00	JD2.0	Not used in this version.

38	T-cor_	0	Jb1.0	Enabled(1)Disabled(0) – temperature compensation
39	G-KG	0	Jb1.0	Main unit 0 = g 1 = kg

- **R** -Read only

- **J** - write by **J**umper

- **W** - write w/o jumper

- **D** - number

- **b** -bitflag