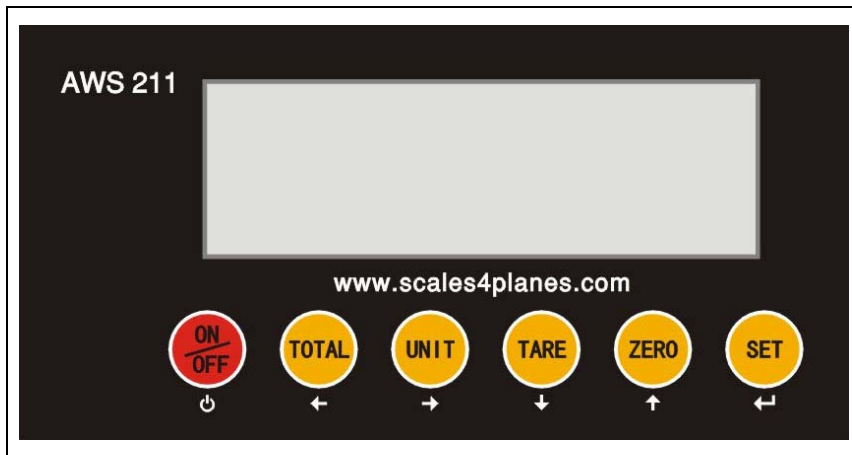# Scales4planes

AWS 211
Aircraft Scale

USER MANUAL

 Safety Instructions

For safe operation please follow the safety instructions.

WARNING
Adjusting Calibration of the indicator is prohibited by Non-licensed staff.

WARNING
Scale is not waterproof and will be damaged if it gets wet.

ATTENTION OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC SENSITIVE DEVICES	WARNING
	The indicator uses static sensitive equipment, cut off the power during electrical connections, internal components touched by hand is prohibited.

Index

1. Specifications

This weighing indicator is designed for weighing aircraft.

1.1 Main function

Weighing function:

Zero, tare, G.W, N.W, accumulation.

lb/kg conversion. Overload reminder.

Options:

Pinter

RS232/RS485 serial

1.2 Technical parameter

Accuracy class	6000 e	
Resolution	display: 30, 000	ADC: 2,000,000
Sensitivity (internal)	0. 3 μV /d	
Input voltage	-30~30mV DC	
Excitation circuit	5 VDC, 4 wire connection,	
	Maximum connect 4 load cell of 350 Ω	
AC power	AC100~250V	
Operation temperature	- 10 °C ~ + 40 °C	
Operation humidity	≤90%RH	
Storage temperature	- 40 °C ~ + 70 °C	

1.4 Battery instructions

1. When you use the internal battery for the first time，you should charge the battery fully, to prevent low voltage
2. When the "battery" bar graph is low, recharge is needed.
3. The graph changes during charging
4. Charge overnight for full charge.
5. Battery will still be consumed at slow rate when scale is off.
6. In order to keep the battery in best using condition, it is best that you fully recharge the battery every month, or remove connection from PCB to prevent power consumption.

# 2.Installation and calibration

2.1 Power supply connection

The indicator is powered by an AC adapter,. The battery is not required, but makes usage easier by eliminating excess cables.

2.2 Connection of load cell and indicator

The indicator can connect with 4 load cell of 350Ω maximum. Use either 4 wire or 6 wire load cell cable.
There are two methods connection between load cell and indicator
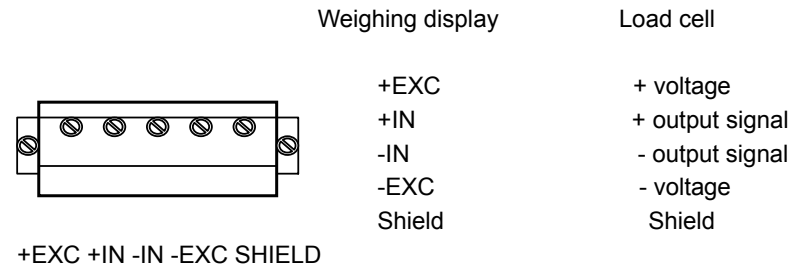
A. quick disconnect, as below:
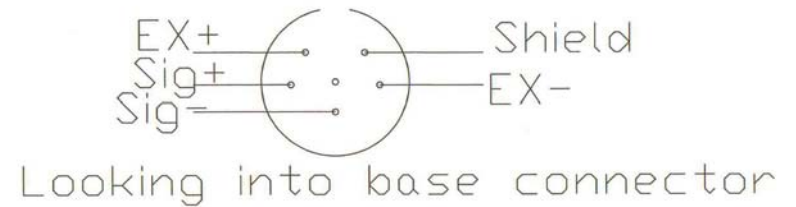
B. Terminal trip connection (inner connection)
1. The excitation voltage for the load cell is 5VDC, the largest output current 120mA, maximum of (4) 350Ω load cells;
2. Load cell (or the signal cable for the junction box) is connected with 5 position terminal trip (J5) on the circuit-board of weighing indicator.
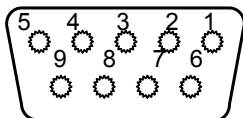3. Open Weighing indicator bottom cover, insert signal cable to the terminal trip(J5),   and make sure the screw is fixed tightly, the connection as below:

Weighing display	Load cell
+EXC	+ voltage
+IN	+ output signal
-IN	- output signal
-EXC	- voltage
Shield	Shield

+EXC +IN -IN -EXC SHIELD

2.3 Optional Communication interface (if Purchased)

RS232 : DB9 Pin or 3 Pin

DB9 definition

Pin function and definition as bellows:

DB9 joint	Definition	Function
2	TXD	Sending data
3	RXD	Receiving data
5	GND	Ground interface

Note: if RS485, The connection pin is 2 and 5 pin.

3 Pin definition
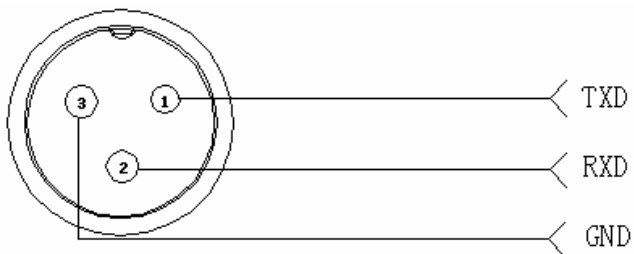
3. Basic operation

Keys function

keys	Key name	Key function
	Power on/off	Press continuously for 2 seconds to power on or power off

	Accumulation	1. Used on special applications if optional RS232 output is purchased
	Unit	Covert between LB and KG
	Tare	At G.W mode, get the tare weight. At N.W mode, clear the tare, get the G.W
	Zero	Zeros the weight on the scale within a selectable range.
	Set	Used during Configuration

3.2
Power on & off

Press Continuously for 2 seconds to power on or power off. After power is on the indicator show"000000-999999". After self-test. Scale will go to the weighing mode.

3.3 Zero operation

1. Initial zero setting

When the indicator first powers up, if the weight on the scale is within the initial zero tolerance, the indicator will show zero automatically.

2. Manually Zero setting

When the scales are stable, and not negative, you can zero the weight

within tolerance by pressing key.

3.4 Tare operation

Press "TARE" key, the gross weight is tared, indicator shows the Net weight, the "Net" "tared" status light is on. At tare mode, Press" TARE" key, clear the tare weight, the indicator will show the gross weight.

3.5 Accumulation operation

At Zero mode, load weight till stable, Press go to accumulation

mode, "Total" light on, display" n 001", and then display loaded weight; unload the weight , back to zero, load the second weight again till stable. Press display"n002" then display the second loaded weight. Repeat it agin and

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again, maximum 999 times.

Check the accumulation

Press "Set "key and hold it then press "TOTAL"" key, display "n**", (it is the accumulating times) then show total weight. there are 8 digits totally. It shows the first 4 digits then the last 4 digits. For example, the first 4 digits is"0012", the last 4 digits is"34,56" It means the actual weight is "1234.56"

EXIT the accumulation function

When the indicator show the last 4 digits, Press hold it, the indicator show " clr n", it means don't clear the total Weight, Press "Set" key to exit it; if you want to clear total weight, Press "ZERO" or "TARE" key, "clrn" change to "clry" it means clear total weight ,then Press "Set" to clear the total weight and exit accumulating mode.

3.6 Print (if ordered)

If the weighing is stable, after connection with printer, press" Set" to print the weight. Note: at tare mode, print with tare. if negative weight,, can not print. Set C30 for time format.

4. Calibration and Parameter setting

4.1 Enter setting

There have two methods to enter the setting menu:

1. when the switch " CAL" is off, press the "set" hold it and then press" HOLD" enter C08-39 setting.

2. Move the jumper on the back of PCB, then press "CAL" , at the

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"SPAN" position as below. press "Set" hold it and then press "HOLD" key , enter C01-C39 setting.

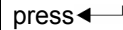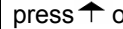The key functions in setting：

← Enter

↑ Up

↓ Down
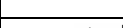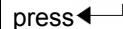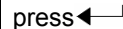
← Left

⏻ Power switch. exit setting

4.2. Step of calibration operation:

According to the second method which can enter setting menu, C01-C39

step	Method of operation	display	Remark
1		[C01]	After you enter calibration mode, it display [C01]

2	press←	[C01 1]	Weight unit option：1=kg 2=lb
3	press← press← press↑ or↓	[C02] [C02 0] [C02 2]	Set decimal digits option：0/1/2/3/4 Select decimal digit example：two decimal point：[C02 2]
4	press← press← press↑ or↓	[C03] [C03 1] [C03 5]	Set graduation option：1/2/5/10/20/50 Select required graduation example：graduation 5：[C03 5]
5	press← press← press↑ or↓/←	[C04] [0100.00] [0100.00]	Max capacity example：max weighing 100kg: [0100.00]
6	press← press← press↑ press← ○○○○○○ [0000.00]	[C05] [C05 0] [C05 1] [CAL 9]	Zero calibration Option 0=no need zero calibration 1=need zero calibration calibration zero please choose 1 and ensure scale is empty and "stable" light is on Ensure zero calibration, countdown. Till show[0.00](example for two decimal point)。
7	press← press← press↑ or↓ press←	[C06] [C06 0] [C06 1] [SPAN] [0100.00]	calibration option: 0=No need calibration 1= need calibration Load weights on scales according to max. capacity. Suggest close to the max capacity, at least 10% of max.

			capacity.
	press↑ or↓ press↵	[0080.00] [CAL 9] …… [0080.00] [CAL End]	For example: the weights is 80kg As bellows: Input the 0080.00, count down , then indicator shows 0080.00 , calibration is over. If you want to set application function parameter. Press "PRINT" if you want to exit press "TOTAL"
8	press↵ press↵ press↑ or↓	[C07] [07 0] [07 1]	Default parameters setting option:0=non-restore default parameters 1=restore default parameters Note: after the above parameters setting finish, please do not set default parameters to avoid the original setting parameters is lost.

4.3 Application function parameters setting chart

Function	Setting Item	parameters setting and instruction
warning tone	**C08** warning tone	Options: 0 = close warning tone 1 = open warning tone
Automatic power off	**C09** Automatic power off	option：0=close auto power off 10= power off automatically if no change within 10 minute. 30= power off automatically if no change within 30 minute. 60= power off automatically if no change within 60 minute.
Power saving setting	**C10** Power saving setting	LED Version: option：0= close power saving setting 3= close display if no change within 3min. 5= close display if no change within 5 min. LCD Version: 0=Close he backlight 1= backlight when the weight change or press the keyboard 2=constant backlight
Hold function	**C11** Hold mode	option：0=close hold function 1=Peak hold /2=Data Hold Instruction: Peak-hold: it shows the max. data, mainly application for materials testing, such as tension and pulling force. Data-hold: it shows current weight value. Mainly application for animal weighing.
LB/KG conversion	**C12** LB/KG conversion	C12=0 stop LB/KG conversion C12=1 LB/KG conversion is ok
Upper/lower limit alarm	**C13** Upper limit alarm value	You can set it within the max. capacity limit
	C14 Lower limit alarm value	
Inner Code display	**C15** Check inner code	enter C15 to check the inner code

Date and time	C16 Date	Enter C16, you can set the date, from left to right: year/month/day
	C17 Time	Enter C17, you can set the time from left to right: hour/min./sec.
Communication setting	C18 Serial interface data output method	option：0= Close serial interface data output 1=Continuous sending, connect big display 2=Print method, connect printer. 3=Command request method，connect computer. 4=PC continues sending format, connect computer. 5=PC/ big display continuous sending format.
	C19 Baud rate	option： 0=1200/1=2400/2=4800/3=9600
Zero range	C20 Manually zero range	Option: 0= close manually zero setting 1=±1% max capacity 2=±2% max capacity 4=±4% max capacity 10=±10% max capacity 20=±20% max capacity 100=±100% max capacity
	C21 Initial zero range	option：0= no initial zero setting 1=±1% max capacity 2=±1% max capacity 5=±1% max capacity 10=±1% max capacity 20=±1% max capacity

Zero tracking	C22 Automatically zero tracking range	Options: 0= close zero tracking 0.5=±0.5d 1.0=±1.0d 2.0=±2.0d 3.0=±3.0d 4.0=±4.0d 5.0=±5.0d Note: 1. d = division 2. the zero tracking range can not bigger than manual zero range.
	C23 Automatically zero tracking time	Options: 0= close zero tracking time 1= 1 second 2= 2 seconds 3= 3 seconds
Overload range	C24 Overload range	option：00= close overload range 01d～99d remark：d =division
Negative display	C25 Negative display range	Option：0=-9d 10=10% max. capacity 20=20% max. capacity 50=50% max. capacity 100=100% max. capacity
Standstill time	C26 Standstill time	Option: 0= quick 1= medium 2= slow
	C27 Standstill range	Option: 1= 1d 2=2d 5=5d 10=10d D= division

Digital filter	**C28** Dynamic filter Instruction ： Dynamic filter is collecting the data filter before loaded weight stable. When loaded weight easily shaking (for example animal) , you can set this filter to make weight display more stable	option：0= close dynamic filter 1=1 digital filter strength 2=2 digital filter strength 3=3 digital filter strength 4=4 digital filter strength 5=5 digital filter strength 6=6 digital filter strength Note ：Pls setting dynamic filter strength carefully, the No. is bigger, more stable. if the loaded weight shake not too much. The setting is less than 3
	C29 Noise filter	option：0=close noise filter 1=1 digital filter strength 2=2 digital filter strength 3=3 digital filter strength
	C30 Print time and date	C30=0 yy.mm.dd C30=1 mm.dd.yy C30=2 dd.mm.yy C30=3 yy.mm.dd
Analog output setting	C31 output type	C31=0 0~5Vouput C31=1 4~20mA output
4~20mA current calibrate	C32 calibrate current	Refer to 2.5
Relay output setting	C33 Relay output	C33=0 close relay output C33=1 Open relay output function 1 C3=2 Open relay output function2 C33=3 Preserved menu

Muti communication add.	C34 Communication add.	C34= 0~99 Add. Code
Wireless communication	C35	C35=0~99 signal
Gravity of calibration location	C36	C36=9.7000~9.9999
Gravity of destination	C37	C37=9.7000~9.9999
Version No.	C38	
Preserved menu	C39	

5. Output format

5.1 Big display continuous sending format

Output continuous format																
STX	SWA	SWB	SWC	X	X	X	X	X	X	X	X	X	X	X	X	CR	CKS
1	2			3						4						5	6

State A			
Bits0,1,2			
0	1	2	Decimal point position
1	0	0	XXXXXX0
0	1	0	XXXXXXX
1	1	0	XXXXX. X
0	0	1	XXXX. XX
1	0	1	XXX. XXX
Bits3,4			Division
0		1	X1
1		0	X2

State B	
BitsS	function
Bits0	gross=0, net=1
Bits1	Symbol: positive =0,negative =1
Bits2	Overload(or under zero)=1
Bits3	dynamic=1
Bits4	unit：lb=0, kg=1
Bits5	Constant 1
Bits6	Constant 0

State C			
Bit2	Bit1	Bit0	unit
0	0	0	Kg or lb
0	0	1	g
0	1	0	t
Bit 3			printing=1
Bit 4			Extend display=1
Bit 5			Constant 1
Bit 6			Constant 0

5.2 Computer continuous sending format

		,			,											CR	LF

S 1   **S 2**   **S 3**   **Data**   **S 4**
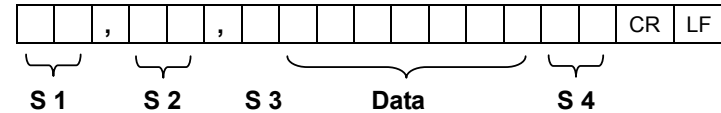
S1: weight status, ST= standstill, US= not standstill, OL= overload

S2: weight mode, GS=gross mode, NT=net mode

S3: weight of positive and negative, "+" or " –"

S4: "kg" or "lb"

Data: weight value, including decimal point

CR: carriage return

LF: line feed

5.3 Serial interface reception command：

RS232COM serial interface can receive simple ASCII command. Command word and role as follows:

Command	NAME	Function
T	TARE	Save and clear tare
Z	ZERO	Zero gross weight

P	PRINT	Print the weight
R	G.W/N.W	Read gross weight or net weight
C	Kg/lb	Kg/lb conversion
G	G.W	Check gross weight at net weight mode

R command receive data format
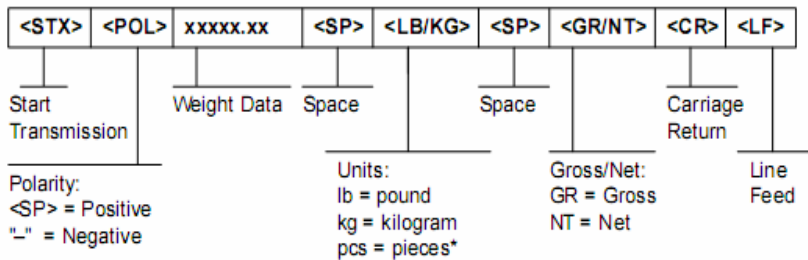
5.4 Print format

```
ID.NO.          004   （Serial No.）
Date:         XX.XX. XX   (yy.mm.dd)
Time:         XX.XX.XX   (hh.mm.ss)
GROSS            8.88kg   (gross weight)
TARE            2.88kg   （tare）
NET             6.00kg   （net weight）
```

5.5 PC or Big display continuous sending format

6. Maintenance

6.1 Regular error and solution

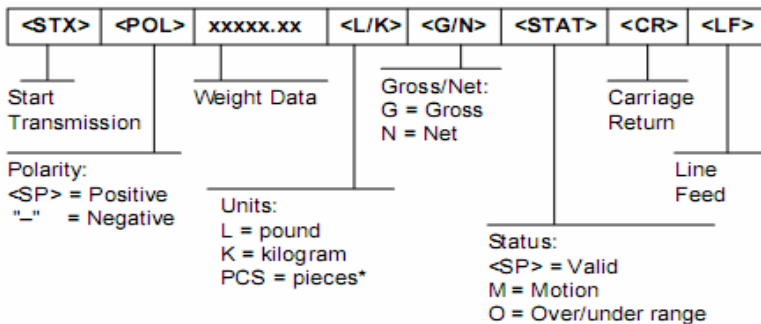| ERROR	REASON	SOLUTION
UUUUUU	1. Overload 2. wrong connection with load cell 3. load cell has quality problem.	1. reduce the weight 2. check load cell connection 3. inspection load cell. Check the input and output
nnnnnnn	1. calibration is no good 2. wrong connection 3. load cell has quality problem	1. check scale is resisted or not, foot is kept level or not. 2. check load cell connection. 3. checking load cell：check input and output resistance to judge it is good or not.
ERR1	During calibration, no input of the weights or the weight is overload	Input the correct weights
ERR2	During calibration , the weights are below the Min. required weights	The calibration weights Minimum is 10% of Max. cap. Recommend 60%-80% of Max. Cap.
ERR3	During calibration, the input signal is negative	1. check the connection is correct 2. check load cell has no problem 3. recalibration is still wrong change the PCB

ERR4	During calibration, the signal is unstable	After the platform is stable, start calibration
ERR5		Change PCB

6.2 Daily maintain

1. Protect the indicator from strong sunlight to prolong the useful life.

2. Good connection between load cell and indicator. Stay away from strong electric field, magnetic field.

3. Power off the indicator during lightning storms

4. Power off the indicator first before you plug in or unplug adapter

6.3 Restore default parameter

Go into calibration mode, Set C07=1. Press" PRINT" then press" TOTAL" to exit saving setting. All parameter will go back to default settings.

Note：Please, do not restore default parameter unless you are a licensed scale company or have not yet calibrated the scale.

Default parameter

Parameter	instruction	Default
C01	Calibration	1
C02	Decimal digits	0
C03	Resolution	1
C04	Max. capacity	10000
C05	Empty calibration	0
C06	Capacity calibration	0
C07	Restore default	0
C08	Warning tone	1
C09	Power-off automatically	0
C10	Power saving mode	0

C11	Hold function	0
C12	Prohibit kg/lb conversion	1
C13	Upper limit alarm	000000
C14	Under limit alarm	000000
C15	Inner code	
C16	Date setting	
C17	Time setting	
C18	Serial interface data output	0
C19	Serial interface Baud rate	3（9600）
C20	Zero manually	10
C21	Initial zero	10
C22	Zero tracking range	0．5
C23	Zero tracking time	1
C24	Overload range	9
C25	Negative range	10
C26	Standstill time	1
C27	Standstill range	2
C28	Dynamic filter	0
C29	Noisy filter	2
C30	Print format	0
C31	Analog signal options	1
C32	4~20mA testing	4
C33	Relay output setting	1
C34	Muti PC communication add.	0
C35	Wireless communication channel	6
C36	Calibration location gravity	9.7936
C37	Destination gravity	9.7936
C38	Version No. check	
C39	Reserved menu	

Warranty:

Limited warranty of 12 months covers only defective materials or workmanship of your new scale. Battery is considered a maintenance item and is therefore only covered for 30 days. Shipping both to and from the factory is not covered, and will be billed to you. Calibration/certification is good for 1 year under normal usage, but should be checked on annual basis. No liability is assumed for any loss incurred because of any down time caused by product failure. We suggest the purchase of three scales so that you can check accuracy of one scale compared to the other two. If there is any shipping damage please report it to the carrier immediately as you have been charged for insurance on the shipment of your new scales. We hope you enjoy the new equipment, and do appreciate your business. For Re-Certification at special pricing return your equipment annually to address below:

Weigh-Systems Inc.

3086 Coachlite lane

Springdale, Arkansas   72764

(479) 751-7225 or 751-SCALe