WinCT-AD4212C　Ver1.13　Addition to Manual

A&D Company, Limited 16.07.29　Ver1.01

1. Overview

This manual is for users who wish to adjust the response settings of the AD-4212C Electronic Balance beyond the standard settings.

You can make minor alterations to the response settings of the AD-4212C Series by changing the internal memory. To make changes to the memory the Windows PC application, WinCT-AD4212C (Ver1.13), and a RS232C connection to the PC are required.

2. Filter Setting

The AD4212C series has two methods of altering settings, Standard Setting and User Setting. Below is a description of each method.

2-1. Standard Setting

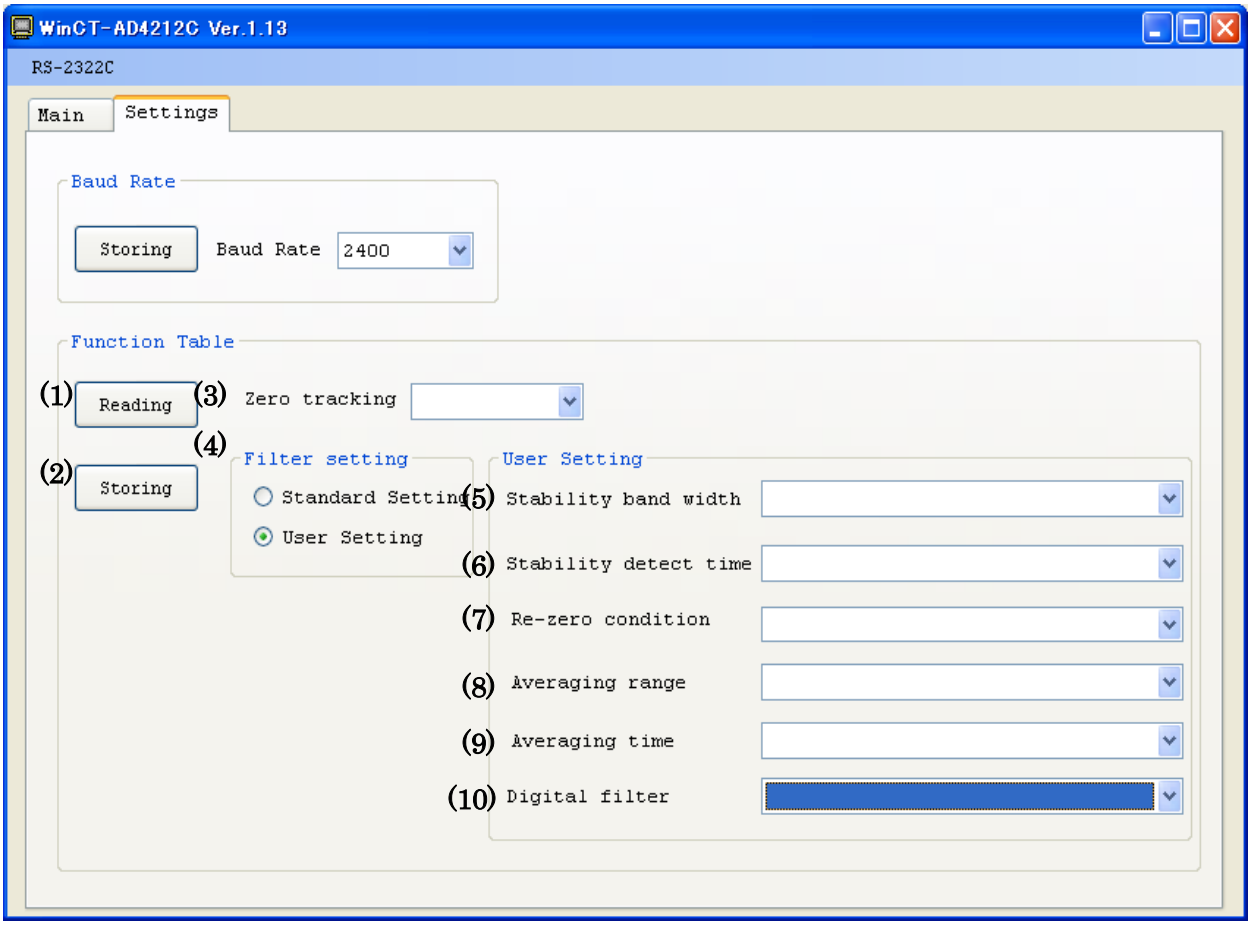
Standard Setting has three modes: FAST, MID, and SLOW.

Choose FAST to prioritize response time at the expense of lower stability. Choose SLOW for a slower response time that is much stronger against disturbances.

If the three modes above do not provide the response speed or stability you require, choose User setting to fine-tune the filter adjustments.

2-2. User Setting

By choosing User Setting you can make detailed changes to the Stability band width, Stability detect time, Re-zero condition, Averaging range, Averaging time and Digital filter.



3. Function Summary

A dot ・ in the chart indicates the default setting.

(1) Reading Press the Reading button to display the current internal memory settings.

(2) Storing After selecting the desired elements press the Storing button to make changes to the internal memory of the balance.

(3) Zero tracking **Zero Tracking**

Zero tracking keeps the display at zero by tracking the zero point. When the display is fluctuating around zero, strengthening zero tracking will keep the display at zero.

This setting can be selected regardless of filter choice.

OFF	Off
Normal	Normal (Display will show zero if the fluctuation is ±1 digit within 1 second.)
Strong	Strong (Display will show zero if the fluctuation is ±1 digit within 0.5 seconds.)
Very Strong・	Very Strong (Display will show zero if the fluctuation is ±1 digit within 0.2 seconds.)

Refer to Section 7 Digit to learn more about digit.

(4) Filter setting **Filter Settings**

Standard setting・	Standard Setting mode is the factory default state. Use the MODE key to change between FAST, MID and SLOW. Refer to Section 5 Standard Setting Values to learn more about the detailed setting values for FAST, MID and SLOW for the minimum displays of each model.
User setting	User setting allows you to make detailed changes to the Stability band width, Stability detect time, Re-zero condition, Averaging range, Averaging time and Digital filter. Select User setting to enable these settings.

(5) Stability band width **Stability Band Width**

A weight is stable if it stays within a specified range (stability band width) for a specified time (stability detection time).

When stable a circle will appear on the display. This circle will disappear when the weight is unstable.

You can use this setting to change the stability band width. Choose smaller values for stricter judgments and larger values for more open judgments.

Stability band width	Description
0	±1digit
1・	±2digit
2	±3digit
3	±4digit
4	±5digit
5	±6digit
6	±7digit
7	±8digit

8	±9digit
9	±10digit

(6) Stability detect time **Stability Detection Time**

A weight is stable if it stays within a specified range (stability band width) for a specified time (stability detection time).

When stable a circle will appear on the display. This circle will disappear when the weight is unstable.

You can use this setting to change the stability detection time. Choose larger values for stricter judgments and smaller values for more open judgments.

Stability detection time	Description
0·	Default setting
1	0.1 seconds
2	0.2 seconds
3	0.3 seconds
4	0.4 seconds
5	0.5 seconds
6	0.6 seconds
7	0.7 seconds
8	0.8 seconds
9	0.9 seconds

(7) Re-zero condition **Re-zero Conditions**

The re-zero function zeros the display by saving the current point as the zero point and displaying zero. You can change the stability conditions of the re-zero function with this setting.

Re-zero conditions	Description
0	Immediately re-zero regardless of stability
1	Immediately re-zero when stable
2	Re-zero when in stable state for 0.2 seconds
3	Re-zero when in stable state for 0.3 seconds
4	Re-zero when in stable state for 0.4 seconds
5·	Re-zero when in stable state for 0.5 seconds
6	Re-zero when in stable state for 0.6 seconds
7	Re-zero when in stable state for 0.7 seconds
8	Re-zero when in stable state for 0.8 seconds
9	Re-zero when in stable state for 0.9 seconds

(8) Averaging range **Averaging Range**

Averaging begins when weight variation is within a designated range. When filling very small amounts, if the averaging range is large, the weight will not deviate from the averaging range and the response can be slow. You can reduce the averaging range to increase the response speed. On the other hand, when the averaging range is small, the measured weight can become unstable. In this case you can increase the averaging range.

Averaging range	Description		
	Model		
	300/3000	600/6000	301/3100
0·	Default setting		

1	3 digit	6 digit	30 digit
2	5 digit	10 digit	50 digit
3	10 digit	20 digit	100 digit
4	40 digit	80 digit	400 digit
5	80 digit	160 digit	800 digit
6	120 digit	240 digit	1200 digit
7	Always on		

Caution) Averaging ranges are different depending on the digital filter settings. This table shows reference values.

(9) Averaging time **Averaging Time**

Averaging begins when weight fluctuations are within a designated range. When the number of measurements averaged reaches the Averaging time further data will be represented as a moving average. You can change the time of the moving average with this setting.

Averaging time	Description
0·	Default setting
1	None
2	0.5 seconds
3	1.0 seconds
4	1.5 seconds
5	2.0 seconds
6	2.5 seconds
7	3.0 seconds

(10) Digital filter **Digital Filter Delay Time**

You can use this option to change the measuring speed (response) characteristics. The settings for Digital filter under User Setting are shown below. Choose a smaller value for faster response. For more stability choose a larger value.

Digital filter delay time	Description
0·	0.20 second Fast response, unstable
1	0.30 second
2	0.40 second
3	0.45 second
4	0.55 second
5	0.50 second
6	0.60 second
7	0.65 second
8	0.75 second
9	0.80 second
10	0.90 second
11	1.10 second
12	1.50 second
13	1.80 second
14	2.00 second
15	2.50 second
16	2.80 second Slow response, stable

4. Default Settings

The default settings in Section 3 Function Summary contain values for FAST, MID and SLOW response speeds from Standard settings

Example) AD-4212C-300 0.001g display in FAST mode.

Stability Detection Time 0.08 seconds
Averaging Range ~0.3g
Averaging Time 0.8 seconds

AD-4212C-300	Response	Stability Detect Time	Avg Range	Avg Time
0.001g display	FAST	0.08 seconds	~0.3g	0.8 seconds
	MID	0.16 seconds	~0.9g	0.8 seconds
	SLOW	0.32 seconds	—	0.8 seconds
0.01g display	FAST	0.08 seconds	~0.2g	0.8 seconds
	MID	0.16 seconds	~0.3g	0.8 seconds
	SLOW	0.32 seconds	~1.0g	0.8 seconds

AD-4212C-3000	Response	Stability Detect Time	Avg Range	Avg Time
0.01g display	FAST	0.08 seconds	~3.0g	0.8 seconds
	MID	0.16 seconds	~9.0g	0.8 seconds
	SLOW	0.32 seconds	—	0.8 seconds
0.1g display	FAST	0.08 seconds	~2.0g	0.8 seconds
	MID	0.16 seconds	~3.0g	0.8 seconds
	SLOW	0.32 seconds	~8.0g	0.8 seconds

AD-4212C-600	Response	Stability Detect Time	Avg Range	Avg Time
0.001g display	FAST	0.08 seconds	~0.6g	0.8 seconds
	MID	0.16 seconds	~1.8g	0.8 seconds
	SLOW	0.32 seconds	—	0.8 seconds
0.01g display	FAST	0.08 seconds	~0.4g	0.8 seconds
	MID	0.16 seconds	~0.6g	0.8 seconds
	SLOW	0.32 seconds	~2.0g	0.8 seconds

AD-4212C-6000	Response	Stability Detect Time	Avg Range	Avg Time
0.01g display	FAST	0.08 seconds	~6.0g	0.8 seconds
	MID	0.16 seconds	~18.0g	0.8 seconds
	SLOW	0.32 seconds	—	0.8 seconds
0.1g display	FAST	0.08 seconds	~4.0g	0.8 seconds
	MID	0.16 seconds	~6.0g	0.8 seconds
	SLOW	0.32 seconds	~16.0g	0.8 seconds

AD-4212C-301	Response	Stability Detect Time	Avg Range	Avg Time
0.0001g display	FAST	0.3 seconds	~1.5mg	3 seconds
	MID	0.4 seconds	~2.0mg	5 seconds
	SLOW	0.6 seconds	~3.0mg	5 seconds
0.001g display	FAST	0.08 seconds	~0.6g	0.8 seconds
	MID	0.16 seconds	~1.8g	0.8 seconds
	SLOW	0.32 seconds	—	0.8 seconds
0.01g display	FAST	0.08 seconds	~0.4g	0.8 seconds
	MID	0.16 seconds	~0.6g	0.8 seconds
	SLOW	0.32 seconds	~2.0g	0.8 seconds

AD-4212C-3100	Response	Stability Detect Time	Avg Range	Avg Time
0.001g display	FAST	0.3 seconds	~15mg	3 seconds
	MID	0.4 seconds	~20mg	5 seconds
	SLOW	0.6 seconds	~30mg	5 seconds
0.01g display	FAST	0.08 seconds	~6.0g	0.8 seconds
	MID	0.16 seconds	~18.0g	0.8 seconds
	SLOW	0.32 seconds	—	0.8 seconds
0.1g display	FAST	0.08 seconds	~4.0g	0.8 seconds
	MID	0.16 seconds	~6.0g	0.8 seconds
	SLOW	0.32 seconds	~16.0g	0.8 seconds

5. Standard Setting Values

Setting values in『FAST』、『MID』、『SLOW』for the minimum displays of each model in Standard Settings. Use for reference for user settings.

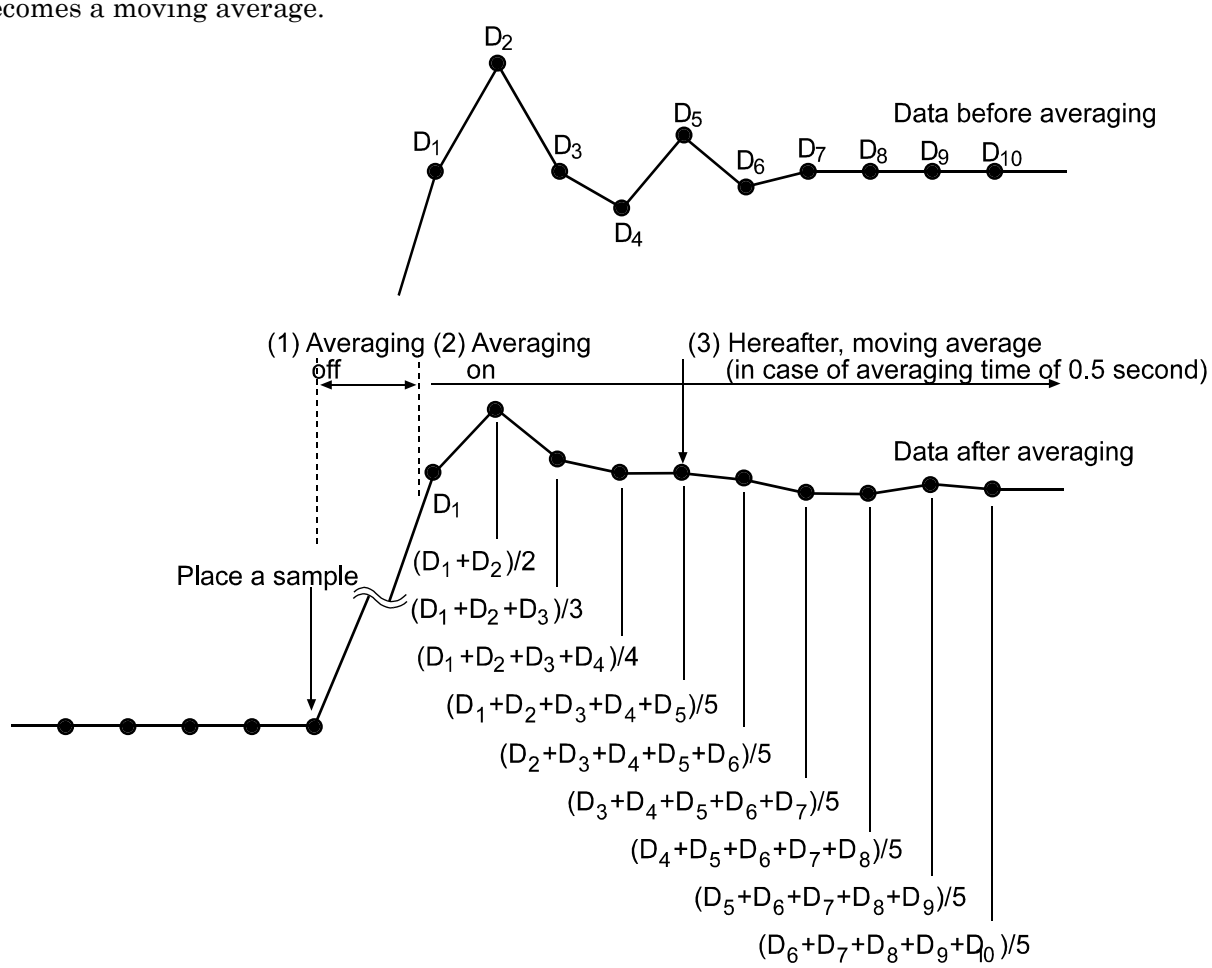
Model	Minimum Display	Response	Stability Band Width	Stability Detect Time	Rezero Conditions	Avg Range	Avg Time	Digital Filter Settings
AD-4212C-300	0.001g	FAST･	±0.002g	0.08 seconds	0.2 seconds	~0.3g	0.8 seconds	4
		MID		0.16 seconds		~0.9 g		10
		SLOW		0.32 seconds		-		13
	0.01g	FAST	±0.02g	0.08 seconds		~0.2g		0
		MID		0.16 seconds		~0.3g		4
		SLOW		0.32 seconds		~1.0g		10
AD-4212C-3000	0.01g	FAST･	±0.02g	0.08 seconds		~3.0g		4
		MID		0.16 seconds		~9.0 g		10
		SLOW		0.32 seconds		-		13
	0.1g	FAST	±0.2g	0.08 seconds		~2.0g		0
		MID		0.16 seconds		~3.0g		4
		SLOW		0.32 seconds		~8.0g		10
AD-4212C-600	0.001g	FAST･	±0.002g	0.08 seconds		~0.6g		4
		MID		0.16 seconds		~1.8 g		10
		SLOW		0.32 seconds		-		13
	0.01g	FAST	±0.02g	0.08 seconds		~0.4g		0
		MID		0.16 seconds		~0.6g		4
		SLOW		0.32 seconds		~2.0g		10
AD-4212C-6000	0.01g	FAST･	±0.02g	0.08 seconds		~6.0g		4
		MID		0.16 seconds		~18.0 g		10
		SLOW		0.32 seconds		-		13
	0.1g	FAST	±0.2g	0.08 seconds		~4.0g		0
		MID		0.16 seconds		~6.0g		4
		SLOW		0.32 seconds		~16.0g		10
AD-4212C-301	0.0001g	FAST	±0.0002g	0.3 seconds		~1.5mg	3 seconds	10
		MID･		0.4 seconds		~2.0mg	5 seconds	12
		SLOW		0.6 seconds		~3.0mg	5 seconds	14
	0.001g	FAST	±0.002g	0.08 seconds		~0.3g	0.8 seconds	4
		MID		0.16 seconds		~0.9 g		10
		SLOW		0.32 seconds		-		13
	0.01g	FAST	±0.02g	0.08 seconds		~0.2g	0.4 seconds	0
		MID		0.16 seconds		~0.3g	0.4 seconds	4
		SLOW		0.32 seconds		~1.0g	0.8 seconds	10
AD-4212C-3100	0.001g	FAST	±0.002g	0.3 seconds		~15mg	3 seconds	10
		MID･		0.4 seconds		~20mg	5 seconds	12
		SLOW		0.6 seconds		~30mg	5 seconds	14
	0.01g	FAST	±0.02g	0.08 seconds		~3g	0.8 seconds	4
		MID		0.16 seconds		~0.9 g		10
		SLOW		0.32 seconds		-		13
	0.1g	FAST	±0.2g	0.08 seconds		~2.0g	0.4 seconds	0
		MID		0.16 seconds		~3.0g	0.4 seconds	4
		SLOW		0.32 seconds		~8.0g	0.8 seconds	10

6. Averaging Range and Averaging Time

(1) When weight fluctuations are large (exceeding the averaging range set by "Averaging range"), the averaging process is turned off and the display value follows the fluctuations in weight.

(2) When fluctuations in weight become small, weight averaging is turned on and the weights become more stable.

(3) The number of values averaged gradually increases and when the preset amount is reached the data becomes a moving average.



For very small samples or when filling very small amounts, fluctuations in the display can be small (not exceeding averaging range set by "Averaging range") and the averaging process may not turn off. If the averaging process does not turn off when a sample is added, the balance will stay in the moving averaging state, and it will take longer to reach the final value after the sample is placed on the balance.
For this, you should change the "Averaging range" setting and make the averaging range smaller. However, use caution as a tighter averaging range may reduce the stability.

7. Digit

Digit is the smallest increment displayed by a device (minimum display)

Ex 1) When the minimum display of the AD-4212C-301 is 0.0001g, 1 digit = 0.0001g.
With one fewer display digit, the minimum display becomes 0.001g and 1 digit = 0.001g.
With two fewer display digits, the minimum display becomes 0.01g and 1 digit = 0.01g.

Ex 2) The smart range feature of the AD-4212C-301 automatically changes the minimum display when 51g or more is loaded on the balance.
For less than 51g the minimum display is 0.0001g = 1 digit
For 51g or more the minimum display is 0.001g = 1 digit