

High-Capacity Weigh Modules

AD-4212F

Series



Heavy Materials, Precise Results

AND
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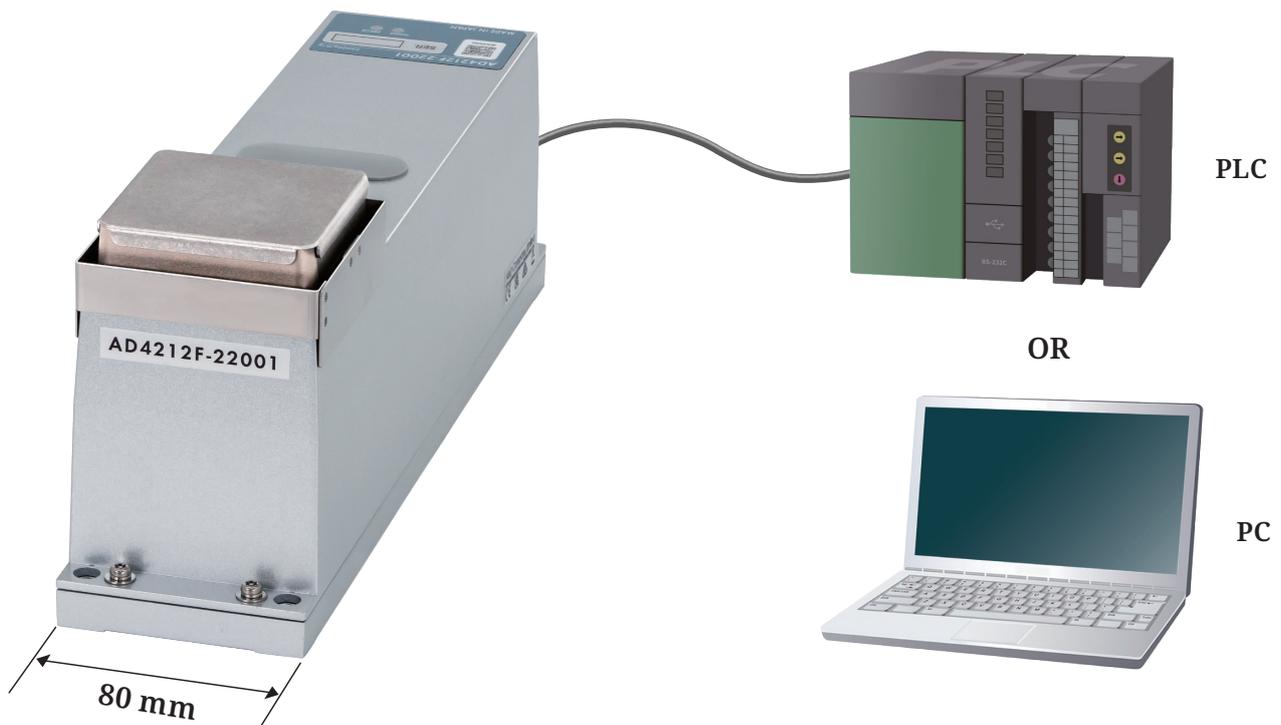
Meet A&D's Latest Solutions for In-Line Weighing With Increased Capacities

The AD-4212F series of high-capacity weigh modules are superbly built for installation in automated systems to weigh heavy materials or materials with heavy jigs/containers, such as those increasingly in demand for electronic vehicle battery manufacturing. With A&D's cutting-edge technologies and software, these weigh modules also greatly expand the scope of your design and make your work easier.

Adaptability in installation

Compact size and space-saving with an integrated A/D converter

The width of 80 mm is ideal to use built-in or for alignment in a system with limited space. Furthermore, the AD-4212F series outputs digital weighing data directly to a PLC or PC*1 without requiring a separate display unit for A/D conversion, which substantially saves space needed for installation.

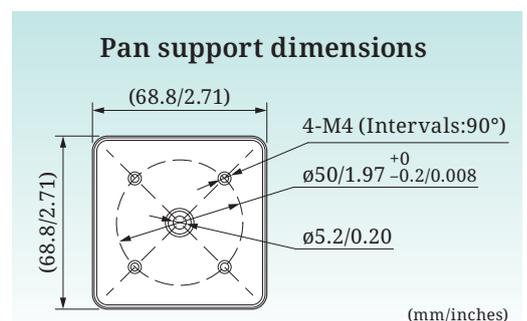


*1 An RS-232C/USB converter, such as AX-USB-9P (sold separately), is required for a PC that has no RS-232C interface.

Special weighing pan/jig

The AD-4212F series allows for the standard weighing pan to be removed so that you can design and mount a special weighing pan/jig*2 that meets your system/application requirements.

*2 The weight of the special weighing pan/jig is arbitrary within the defined range.



Assurance of productivity

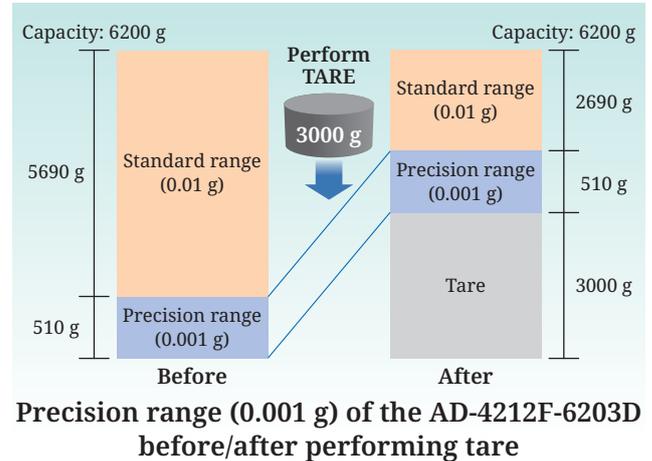
Super Hybrid Sensor (SHS) for fast stabilization and high resolution

A combination of a high-stiffness Roberval-structure spring material and an electromagnetic force restoration mechanism simultaneously accomplishes both fast stabilization and high resolution for efficient, precise weighing. Typical stabilization time is approx. **0.5 seconds** for up to 300 g excluding tare*³, which helps realize a short takt time.

*³ For the AD-4212F-10202 and AD-4212F-22001.

Smart-range function (AD-4212F-6203D)

The smart-range model (AD-4212F-6203D) always provides a readability of 0.001 g for up to 510 g even after tare has been performed for a jig/container.



Accident-proof

IP65 dust and waterproof

The IP65 construction*⁴ enables weighing of liquid or powder materials without worrying about damaging the weigh module due to accidental spillage that may be caused by actuator malfunction. Cleaning after use is also easy.

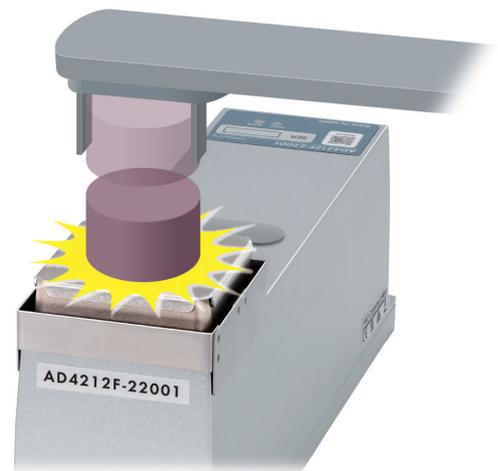
*⁴ For IP65 protection, the AC adapter input jack must be plugged all the way in and the RS-232C/485 connector must be connected to a cable (one supplied by A&D). When the weigh module is not in use, the provided rubber caps must be in place.

Impact Shock Detection (ISD)

The AD-4212F series detects impact loads applied to the weight sensor and indicates an alert according to the impact level. The impact level is displayed in five levels from 0 to 4 by the shock indicator of WinCT-AD4212F*⁵. In addition, the red LED lamp on the weigh module blinks if a Level 3 or Level 4 impact shock is detected*⁶.

By using this function and designing the system so that impact loads are not applied (automatic loading by a machine may cause more shocks to the weight sensor than expected), it is possible to mitigate variations in weighing values due to shocks and reduce the risk of eventual weight sensor failure.

For inspection after use, the AD-4212F series also logs up to 50 impacts of Level 3 and Level 4 with timestamps (data will then be overwritten in order from the weakest impact) while the power is on.



Impact alert via red LED

*⁵ Available when the weigh module is connected via RS-232C only. Details of WinCT-AD4212F are described later in this brochure.

*⁶ Level 3 means that "impacts equal to or greater than this should not be applied" and Level 4 means that "this may cause damage to the weight sensor".

Various connectivity methods

RS-232C/RS-485 output

The AD-4212F series supports both RS-232C and RS-485, and you can choose which output to use by connecting either an RS-232C or RS-485 cable (sold separately). With RS-485, it is possible to connect and send commands to up to 31 units of the AD-4212F series by means of daisy-chain connection*7.



*7 For daisy-chain connection, the AD4212F-29 optional interface is required. (It is not required if RS-485 communication is to be made with just one unit.)

Embedded terminating resistor

Owing to an embedded terminating resistor (100 Ω) which can be connected by turning on the slide switch inside the rear panel, there is no need to prepare an external terminating resistor for the termination unit when multiple units of the AD-4212F series are connected via RS-485.

Configurable data transmission rate

The data transmission rate can be set between approx. 3 times/sec and 100 times/sec*8 by changing the baud rate (when the weigh module is set to continuous output mode) depending on the system/application requirements.

*8 The default setting is approx. 13 times/sec (2400 bps). The data is always updated 100 times/sec inside the weigh module.

Diverse peripherals available to expand communication methods with PLCs

The following devices can be used for conversion between RS-232C and a different interface/output to connect the AD-4212F series to a PLC:



AD-8922A
(Remote controller)
For BCD, comparator,
or analog output*9

AD-8923-BCD/CC
(Remote controller)
For BCD (AD-8923-BCD)
or CC-Link (AD-8923-CC)

AD-8551R
(RS-232C to Modbus-
RTU converter)
For Modbus-RTU

AD-8552EIP
(RS-232C to EtherNet/IP
converter)
For EtherNet/IP

*9 One of AD-8922A optional interfaces needs to be installed.

Free dedicated software WinCT-AD4212F

Weighing data display/logging

WinCT-AD4212F displays weighing data transmitted from the AD-4212F series (multiple weighing data are displayed when multiple units are connected via RS-485). In addition, it enables logging and saving weighing data to a text file, with or without timestamps*10.



Weighing data display/logging

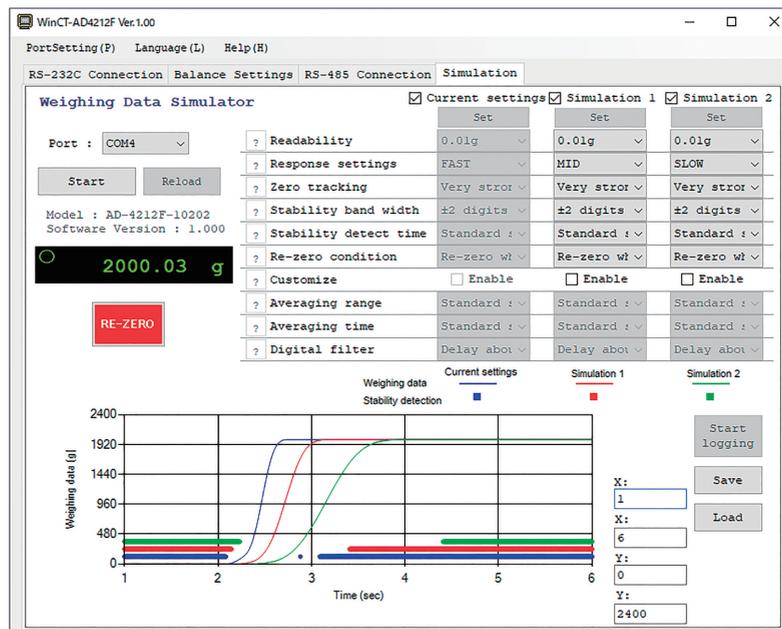
Response characteristics settings

Three preset combinations of weighing speed and stability (FAST, MID, and SLOW) are available as standard settings to choose from, depending on the levels of drafts and vibrations at the location. The slower the weighing speed, the more stable the display becomes.

To further optimize performance, WinCT-AD4212F also lets you make more detailed, customized settings for zero tracking, stability, re-zero, averaging and digital filter conditions.

Weighing Data Simulator (WDS)

The WDS function*10 visualizes (graphs) and helps compare how the response of the weigh module will vary with each setting change after one initial test load in the actual conditions of use. This greatly reduces the time and effort required to examine and adjust response characteristics settings at the time of installation.



Weighing Data Simulator (WDS)

*10 Available when the weigh module is connected via RS-232C only.

Self-check by using the Electronically Controlled Load (ECL)

ECL is A&D's patented technology of artificially generating a minute load (0.3 to 3% of the weigh module capacity) by altering the equilibrium state of the weight sensor.

WinCT-AD4212F can produce the standard deviation (i.e. repeatability) calculated from 10 repeated measurements of this ECL, and thereby enable quick evaluation of performance under a given installation environment without having to take time and load/unload an actual weight, which is especially convenient when the weigh module is confined in a system.

Specifications

Models	AD-4212F-6203D	AD-4212F-10202	AD-4212F-22001
Capacity	510 g / 6200 g ^{*i}	10200 g	22000 g
Readability (d)	0.001 g / 0.01 g ^{*i}	0.01 g	0.1 g
Repeatability (standard deviation)	0.002 g / 0.01 g	0.01 g	0.1 g
Linearity	±0.02 g	±0.03 g	±0.2 g
Stabilization time ^{*ii}	d = 0.001 g : 1.3 secs	0 to 300 g : 0.5 secs	0 to 300 g : 0.5 secs
	d = 0.01 g : 1.0 sec	300 to 10200 g : 1.0 sec	300 to 22000 g : 1.0 sec
Data transmission rate	Approx. 3 times/sec to 100 times/sec (approx. 13 times/sec ^{*iii})		
I/O unit (RS-232C / RS-485)	Bi-directional, 600 to 115200 bps (2400 bps ^{*iii})		
Sensitivity drift (10 to 30 °C/50 to 86 °F)	±2 ppm/°C		±3 ppm/°C
Operating environment	5 to 40 °C/41 to 104 °F, 85 %RH or less (no condensation)		
Allowable eccentric load	1 Nm or less (with respect to the center of the weighing pan)		
Applicable weight value for sensitivity adjustment	50 g, 100 g, 200 g, 300 g, 500 g, 1000 g, 2000 g ^{*ii} , 3000 g, 4000 g, 5000 g, 6000 g	500 g, 1000 g, 2000 g, 3000 g, 4000 g, 5000 g ^{*ii} , 6000 g, 7000 g, 8000 g, 9000 g, 10000 g	1000 g, 2000 g, 5000 g, 10000 g ^{*ii} , 20000 g
Weighing pan size	70 × 70 mm		
External dimensions	80 (W) × 320 (D) × 128 (H) mm		
Net weight	Approx. 3.2 kg		
Dust and waterproof rating	IP65		
Power supply / consumption	AC adapter / approx. 30 VA		

***i** Smart range function: Automatically switches between the precision and standard ranges, and recovers the full precision range as the tare operation is performed.

***ii** Typical when the weighing speed is set to FAST and the stability band width to ±3 digits.

***iii** Factory setting

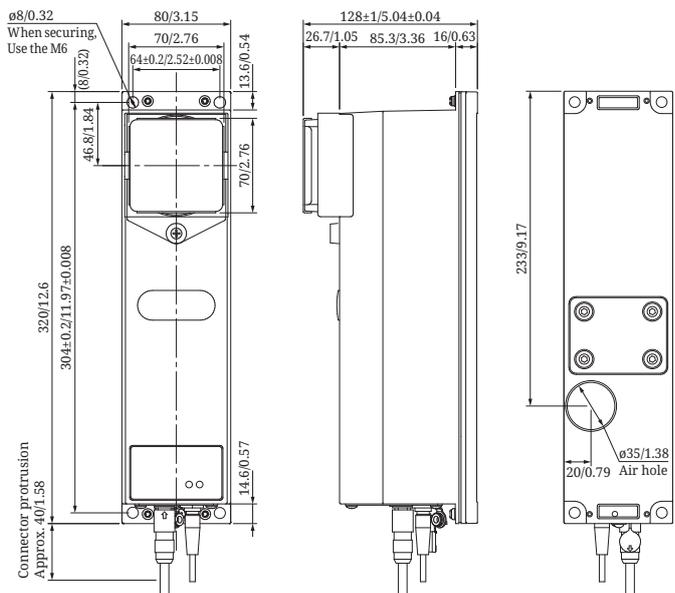
Options

AD4212F-29 RS-485 interface for daisy-chain connection

Accessories

AX-KO3590-200 RS-232C cable (2 m)
 AX-KO3590-500 RS-232C cable (5 m)
 AX-KO3590-1000 RS-232C cable (10 m)
 AX-KO7796-1000 RS-232C cable (UL-compliant) (10 m)
 AX-KO7522-500 RS-485 cable for connection with a PLC (loose-end wire) (5 m)
 AX-KO7622-200 RS-485 cable for daisy-chain connection (2 m)
 AD-1683 Static eliminator
 AX-USB-9P RS-232C/USB converter with cable

Dimensions (mm/inches)



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