USB Load Cell

Computer Connection Communication Manual

A&D

A&D Company, Ltd.

1. Overview

A USB load cell is a load cell calibrated with the physical quantity of force. By connecting it to a computer by USB cable, you can easily perform measurement. This manual explains the connection of this product to a computer and communication between them.

2. Software for the Measurement

By using the "WinCT-DLC" software for measurement, measurement data can easily be confirmed on a computer. "WinCT-DLC" can be downloaded from the A&D homepage.

3. Specifications

A/D conversion rate		100 times/s
Digital filter		Select from None, 0.7, 1.0, 1.4, 2.0, 2.8, 4.0, 5.6, 8.0, 11.0 Hz (Default value: 1.0 Hz)
Communications standard		Conformed with USB Ver. 2.0　(Full Speed)
Communication settings	Baud rate	38400 bps
	Character bit length	8 bits
	Parity	Even
	Stop bit length	1 bit
	Terminator	CR LF
	Code	ASCII

4. Connecting to the Computer

The procedure to connect this product to a computer is also described in the "USB Connection Instructions" on the A&D homepage. Please refer to it along with this manual.

4.1. Operation Procedure

1) Connect a USB cable to a computer.
2) Select the Device Manager on the computer.
3) Click the "Ports (COM & LPT)".
4) Confirm the COM Port number displayed. The numerical value indicated by x in "USB Serial Port (COM x)" indicates the COM Port number. If multiple load cells are simultaneously connected to the computer without confirming the COM Port number, COM Port identification becomes difficult. Confirm the COM Port number one by one beforehand when connecting.

4.2. If the Driver Cannot Be Installed Successfully

By connecting the load cell to the computer, the driver installation is automatically installed over a period of a few minutes, and then the COM port number is displayed. If the COM port number is not refreshed even after some time has passed, that may indicate a failure in installing the driver. If such an error occurs, refer to the website of Future Technology Devices International. Ltd. to install the driver.

4.3. Changing the Communication Latency Timer

This product is capable of sampling at a rate of 100 times/s (10ms period). When the communication latency timer is set above 10ms, a communication delay may occur. To avoid this, set the communication latency timer as follows. The system may be unstable depending on the PC environment. In that case, change the setting to the previous one.

1) As is done in "0.
2)
3) Operation Procedure", select the "USB Serial Port (COM x)" in the "Device Manager" and open the "Properties".

4) Select the "Port Settings" tab and then select the "Advanced".

5) Set the Latency Timer (msec) in the "BM Options" under 10 (recommended value is 3).

5. Commands List

5.1. Reading Commands

Items	Host side transmission command	Load cell side response command
Floating point type measurement value reading	RFMV\<CR>\<LF>	RFMV<u>XXXXXXXX</u>\<CR>\<LF> (<u>XXXXXXXX</u> is the floating point type measurement value (HEX)) Response example: When measurement value is 100N RFMV<u>42C80000</u>\<CR>\<LF> (<u>42C80000</u> = 100 (Decimal digit))
Floating point type measurement value sequential reading	RCFM\<CR>\<LF>	RCFM<u>XXXXXXXX</u>\<CR>\<LF> (<u>XXXXXXXX</u> is the floating point type measurement value (HEX)) - Keep outputting until the sequential reading stops or the power is turned off. - Only the stop sequential reading command can be received while outputting. - Output rate is confirmed by the number of output updates. Response example: When measurement value is 100N RCFM<u>42C80000</u>\<CR>\<LF> (<u>42C80000 </u>= 100 (Decimal digit))
Floating point type section peak reading	RFPK\<CR>\<LF>	RFPK<u>XXXXXXXX</u>\<CR>\<LF> (<u>XXXXXXXX</u> is the floating point type section peak value (HEX)) *1 Response example: When section peak value is 100N RFPK<u>42C80000</u>\<CR>\<LF> (<u>42C80000 </u>= 100 (Decimal digit))
Floating point type section bottom reading	RFBT\<CR>\<LF>	RFBT<u>XXXXXXXX</u> \<CR>\<LF> (<u>XXXXXXXX</u> is the floating point type section bottom value (HEX)) *2 Response example: When section bottom value is 100N RFBT<u>42C80000</u>\<CR>\<LF> (<u>42C80000</u> = 100(Decimal digit))
Fixed point type measurement value reading	RLMV\<CR>\<LF>	US,<u>XXXXXXXX</u>□□N\<CR>\<LF> (<u>XXXXXXXX</u> is the fixed point type measurement value (DEC), and □ is a space (0x20)) Response example: *3 When measurement value is 100N US,<u>+0100.000</u>□□N\<CR>\<LF>

Items	Host side transmission command	Load cell side response command
Fixed point type measurement value sequential reading	RCLM<CR><LF>	US,XXXXXXXX□□N<CR><LF> (XXXXXXXX is the fixed point type measurement value (DEC), and □ is a space (0x20)) - Keep outputting until the sequential reading stops or the power is turned off. - Only the stop sequential reading command can be received while outputting. - Output rate is confirmed by the number of output updates. Response example: *3 When measurement value is 100N US,+0100.000□□N<CR><LF>
Fixed point type section peak reading	RLPK<CR><LF>	US,XXXXXXXX□□N<CR><LF> (XXXXXXXX is the fixed point type section peak value (DEC), and □ is a space (0x20)) *1 Response example: *3 When section peak value is 100N US,+0100.000□□N<CR><LF>
Fixed point type section bottom reading	RLBT<CR><LF>	US,XXXXXXXX□□N<CR><LF> (XXXXXXXX is the fixed point type section bottom value (DEC), and □ is a space (0x20)) *2 Response example: *3 When section bottom value is 100N US,+0100.000□□N<CR><LF>

Digital filter setting reading	RDGF<CR><LF>	RDGFXX<CR><LF>
		(XX is the setting value of the digital filter)
		- Relationship between setting value and cutoff frequency
		    Setting value: cutoff frequency
		    00: None
		    01: 11.0 Hz
		    02: 8.0 Hz
		    03: 5.6 Hz
		    04: 4.0 Hz
		    05: 2.8 Hz
		    06: 2.0 Hz
		    07: 1.4 Hz
		    08: 1.0 Hz (Default value)
		    09: 0.7 Hz
		Response example:
		When setting value is 1.0 Hz
		RDGF08<CR><LF>

Number of output updates setting reading	RSMR<CR><LF>	RSMRXX<CR><LF>
		(XX is the setting value of the number of output updates)
		- Relationship between setting value and number of output updates
		    Setting value: Number of output updates
		    01: 1 time/s
		    02: 10 times/s (Default value)
		    03: 50 times/s
		    04: 100 times/s
		Response example:
		When setting value is 10 times/s
		RSMR02<CR><LF>

Items	Host side transmission command	Load cell side response command
Model name reading	RMOD<CR><LF>	RMODXXXXXXXXXXXXXXX<CR><LF> (XXXXXXXXXXXXXXX is the model name) Response example: Model name is LCCU21N100 RMODLCCU21N100□□□□□<CR><LF> □ is a space (0x20)
Rated capacity reading	RRAC<CR><LF>	RRACXXXXXX<CR><LF> (XXXXXX is the rated capacity) Response example: Rated capacity is 100N RRAC000100<CR><LF>
Serial number reading	RSER<CR><LF>	RSERXXXXXXXXX<CR><LF> (XXXXXXXXX is the serial number) Response example: Serial number is 6A7300000 RSER6A7300000<CR><LF>
Software version reading	RVER<CR><LF>	RVERXXX<CR><LF> (XXX is the software version) Response example: Software version is 100 RVER100<CR><LF>

*1   About the section peak value

This is the maximum value of A/D converter sampling at a section between receiving the prior and next section peak reading commands. (The first time when turning the power on, a section from turning on the power to receiving the section peak reading command)

Example) Section peak reading

(Dotted lines: A/D converter sampling)
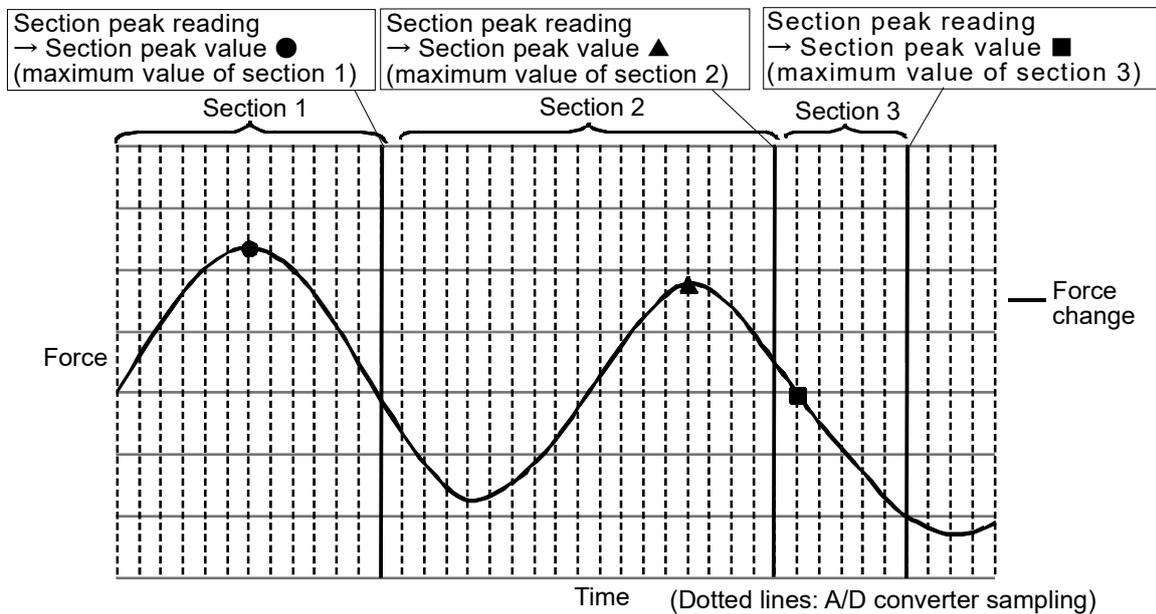
*2 About the section bottom value

This is the minimum value of A/D converter sampling at a section between receiving the prior and next section bottom reading commands. (The first time when turning the power on, a section from turning on the power to receiving the section bottom reading command)

Example) Section bottom reading

(Dotted lines: A/D converter sampling)
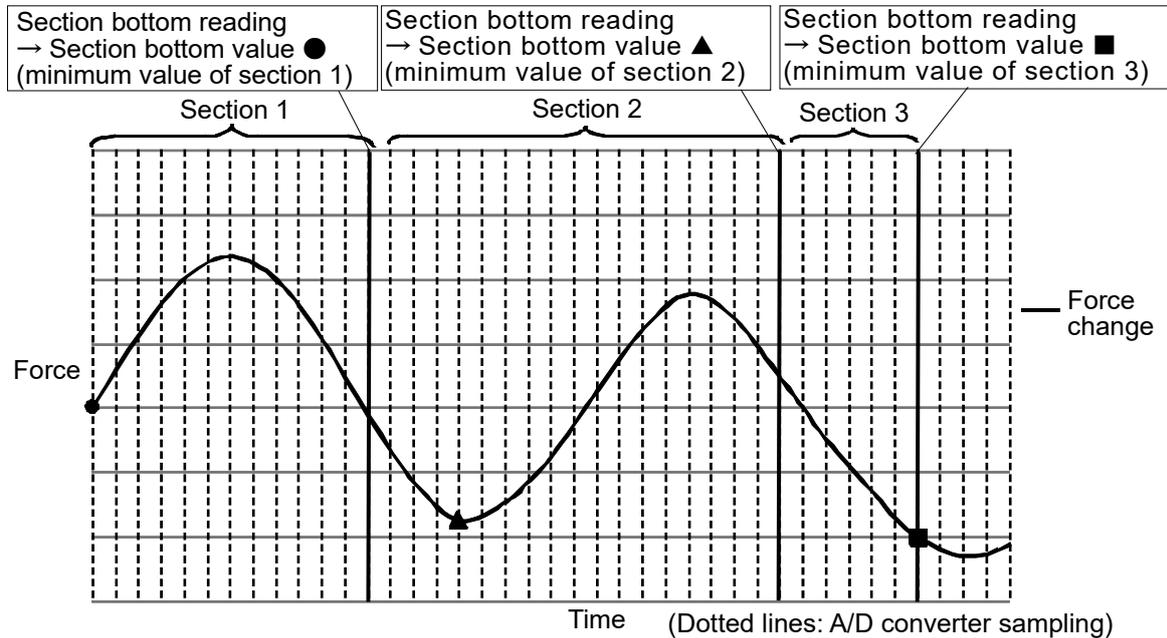
*3 Response of the fixed point type reading

The number of digits after the decimal point is different depending on the rated capacity.

Rated capacity		The number of digits after the decimal point	Response example (□ = space)
1 or greater	Less than 10	5	US,+01.00000□kN<CR><LF> US,+09.80665□□N<CR><LF>
10 or greater	Less than 100	4	US,+001.0000□kN<CR><LF> US,+098.0665□□N<CR><LF>
100 or greater	Less than 1000	3	US,+0001.000□kN<CR><LF> US,+0980.665□□N<CR><LF>
1000 or greater	Less than 10000	2	US,+00001.00□kN<CR><LF> US,+09806.65□□N<CR><LF>
10000 or greater	Less than 100000	1	US,+000001.0□kN<CR><LF> US,+098066.5□□N<CR><LF>

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5.2.　Setting Commands

Items	Host side transmission command	Load cell side response command
Digital filter setting	SDGF<u>XX</u><CR><LF> (Write a setting value in <u>XX</u>) - Relationship between setting value and cutoff frequency 　　Setting value: cutoff frequency 　　00: None 　　01: 11.0 Hz 　　02: 8.0 Hz 　　03: 5.6 Hz 　　04: 4.0 Hz 　　05: 2.8 Hz 　　06: 2.0 Hz 　　07: 1.4 Hz 　　08: 1.0 Hz (Default value) 　　09: 0.7 Hz Transmission example: When setting value is 1.0 Hz 　SDGF<u>08</u><CR><LF>	SDGF<u>XX</u><CR><LF> (<u>XX</u> is the setting value)
Number of output updates setting	SSMR<u>XX</u><CR><LF> (Write a setting value in <u>XX</u>) - Relationship between setting value and number of output updates 　　Setting value: number of output updates 　　01: 1 time/s 　　02: 10 times/s (Default value) 　　03: 50 times/s 　　04: 100 times/s Transmission example: When setting value is 10 times/s SSMR<u>02</u><CR><LF>	SSMR<u>XX</u><CR><LF> (<u>XX</u> is the setting value)
Stop sequential reading (For stopping the output of floating point type measurement value sequential reading or fixed point type measurement value sequential reading)	STOP<CR><LF>	STOP<CR><LF>

5.3.　Response When Command Error Occurs

Items	Load cell side response command
Format error	? <CR><LF>
Setting value error	V <CR><LF>

6.　LED Display

Orange………TX (sending),　　　　　Yellow………RX (receiving),　　　　　Blue………Power (power supply)

AND

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