

ZC-601W Instruction Manual



Rev.2

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1 For safe use

Before using this product, please read this instruction manual carefully to ensure correct use.

 Warning	Indicates a potentially hazardous situation which, if ignored and mishandled, could result in death or serious injury.
 Attention	This symbol indicates a potentially hazardous situation which, if ignored and mishandled, could result in personal injury or property damage only.

Warning

● If any of the following occurs, disconnect the connector immediately and contact your dealer or Adrec. If the product is used as it is, it may cause fire, electric shock, accident or malfunction.

- If smoke, strange smells or noises are coming from the product
- If any foreign object such as a piece of metal or water gets inside the product or in a crevice
- If the product stops working or the case is damaged due to dropping the product, etc.

Do not disassemble or modify the product.

Doing so may cause accidents or malfunctions.

● Do not use the product in a humid place or a place where it may be exposed to water droplets.
Doing so may cause fire, electric shock, or malfunction.

● Do not use the product in an environment where condensation occurs.
Doing so may cause fire, electric shock, or malfunction.

● Do not drop pieces of metal or spill water or other liquids inside the product or into any crevices.
Doing so may cause fire, electric shock, or malfunction.

● Do not connect or disconnect cables with wet hands.
Doing so may cause electric shock.

Attention

● Do not use this product in any environment other than the operating environment described in the instruction manual.

- Perform a start-up inspection and check the settings before using the product.
- Do not stand on this product or place heavy objects on it.
- Do not strike, drop, or otherwise subject this product to shock.
- Do not place the product on an unstable surface.
- Be sure to perform daily and periodic inspections.

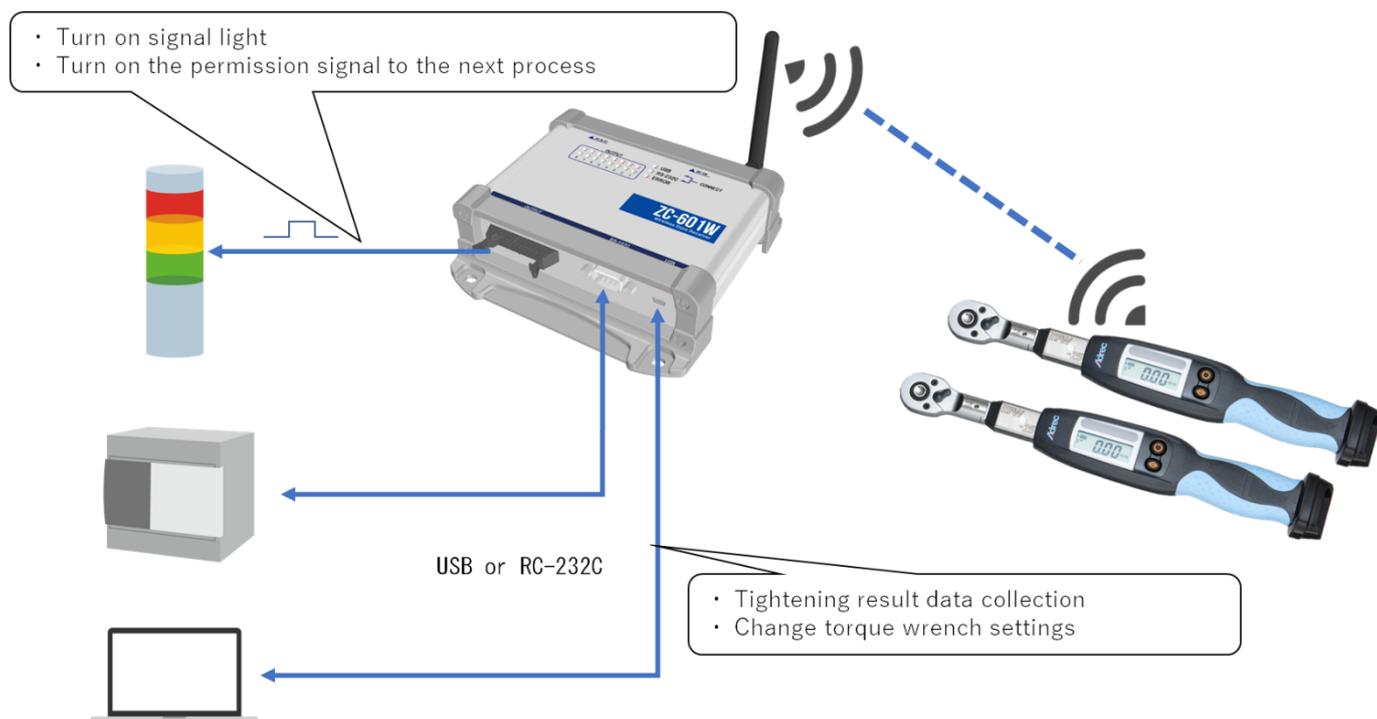
2 Outline

This product is a wireless transmitter/ receiver that enables wireless connection with Adrec wireless torque wrenches. This product can communicate with PLCs and other devices with serial communication functions to acquire tightening history and change torque wrench settings.

The communication port can be USB or RS-232C (switched by DIP switch).

In addition to communication, the tightening result (normal or over) can be output as an ON/OFF signal externally via an external output.

NET software for PCs can also be used by switching the settings.



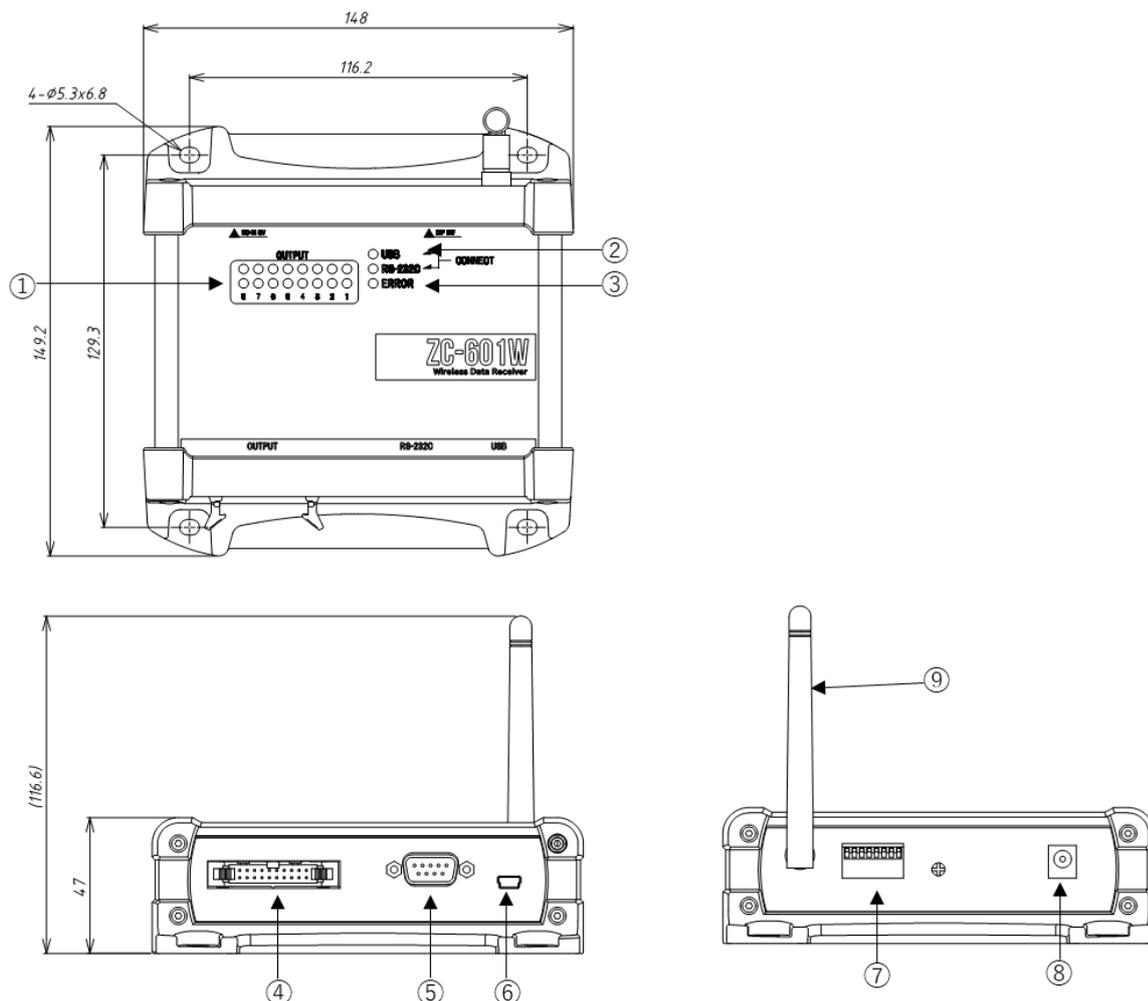
3 Specifications

Name of the product		Wireless Receiver
Model		ZC-601W
Wireless communication	Compliant Standards	IEEE802.15.4
	Frequency band	2.4GHz band
	Number of Channels	16 (Channels 11-26)
	Maximum number of connections	99 units Supported by torque wrench ID setting
	Communication distance	Visibility: approx. 60 to 100 m (varies depending on the environment)
	Antenna	Dipole antenna
USB port	Interface	USB 2.0/1.1
	Connector Shape	USB Mini-B
Serial port	Interface	RS-232C compliant
	Connector Shape	D-Sub 9-pin (male)
Output port	Number of output points	OK signal/8 points, NG signal/8 points
	Output format	Transistor/Sink Output
	Insulation method	Photocoupler Isolation
	Rated load voltage	DC5-24V
	Maximum load current	0.2A/1 point*, 1A/1 common
	Response Time	Less than 1 ms
	Surge killer	Zener diode
	Connector Shape	MIL standard compliant (MIL-C-83503) 20-pin header
Power (button on TV, etc.)	Main unit power supply	DC5V 0.2A or less
	Included AC adapter	AC100-240V, 50/60Hz
Externals		W148 x H47 x D110mm *Excluding antenna
Operating environment		0 to 50°C, no condensation
Mass		Approx. 400g *Excluding accessories
Accessory		USB cable 1 pc AC adapter 1 pc

*Output time:50ms

4 Explanation of each part

4.1 Appearance



① Measured value judgment result indicator LED

When tightening is completed, the LED with the number corresponding to the wireless ID of the torque wrench lights up.

The green LED lights up when the tightening value is normal, and the red LED lights up when the tightening value is abnormal.

② Connection port status indicator LED

The LEDs of the ports set by the DIP switches blink.

When the connection with the external device is completed, the LED switches to lit.

③ Error indicator LED

Lights up when there is an abnormality in communication, etc.

When lit, all operations are stopped.

To clear the error, turn the power back on.

- ④ Connector for external output
Used to connect OK/NG signals of measured values to external devices such as PLCs.

- ⑤ Serial communication connector (D-sub 9-pin)
Connect when communicating with external devices such as PLCs.

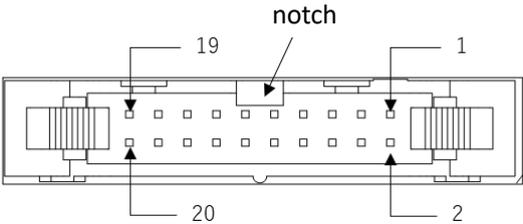
- ⑥ USB communication connector (USB Mini-B)
Connect when communicating with a PC or other device via USB.

- ⑦ Setup change switch
Used to change receiver settings.

- ⑧ Power supply plug
Connect the supplied AC adapter.

- ⑨ Antenna
Antenna for wireless communication with a torque wrench.
Adjust the position for better communication sensitivity.

4.2 External output

Pin-out	Pin number	Signal name	Details
	1	ID1 OK	WirelessID1 OK signal
	2	ID1 NG	WirelessID1 NG signal
	3	ID2 OK	WirelessID2 OK signal
	4	ID2 NG	WirelessID2 NG signal
	5	ID3 OK	WirelessID3 OK signal
	6	ID3 NG	WirelessID3 NG signal
	7	ID4 OK	WirelessID4 OK signal
	8	ID4 NG	WirelessID4 NG signal
	9	ID5 OK	WirelessID5 OK signal
	10	ID5 NG	WirelessID5 NG signal
	11	ID6 OK	WirelessID6 OK signal
	12	ID6 NG	WirelessID6 NG signal
	13	ID7 OK	WirelessID7 OK signal
	14	ID7 NG	WirelessID7 NG signal
	16	ID8 NG	WirelessID8 NG signal
	17	-	
	18	-	
	19	COM	Common
	20	COM	

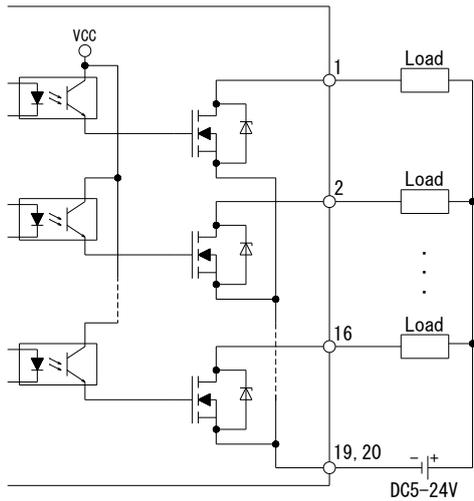
Recommended Socket

HIF3A-20D-2.54R (Hirose Electric)

HIF3BA-20D-2.54R (Hirose Electric)

HIF3BA-20D02.54C (Hirose Electric)

Connection Diagram



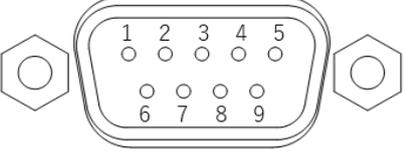
*When connecting an inductive load such as a relay, connect a diode in parallel with the load.

Maximum load current

Output time	50ms	0.2A / 1 point
	500ms	0.1A / 1 point
Common	1A / 1 common	

4.3 Serial port

4.3.1 Pin Assignment

Pin-out	Pin number	Signal name	ZC-601W	Destination device
	1	N.C.		—
	2	TXD		→
	3	RXD		←
	4	N.C.		—
	5	GND		↔
	6	N.C.		—
	7	N.C.		—
	8	N.C.		—
	9	N.C.		—

The serial port connector on the ZC-601W uses a 9-pin D-Sub (male).

The connector of the cable to be connected to ZC-601W should be 9-pin D-Sub (female), screwed (#4-40).

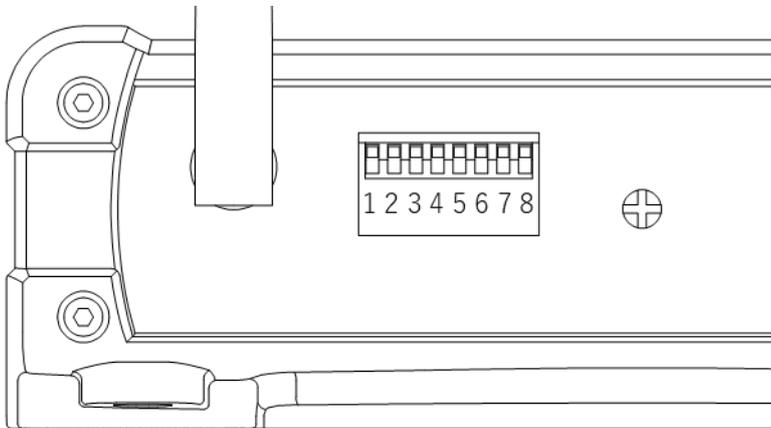
4.3.2 Communication Specifications

Item	Content
Baud rate	115,200bps
Parity	None
Data length	8bit
Stop bit	1bit
Flow control	None

5 Settings

Communication port selection, communication method, and other settings are made using the dip switches on the rear panel.

5.1 Settings

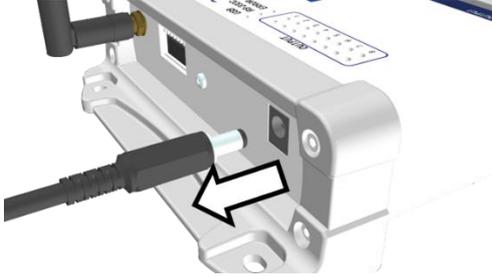


SW	Content	Settings	Detail
1	Port selection	OFF : USB port	Switches the connection method with external devices.
		ON : RS-232C port	
2	Communication method	OFF : ZC-601W	Select OFF (ZC-601W) when using the communication format described in this article.
		ON : ZC-101W	Select ON (ZC-101W) when using standard software or class libraries.
3	Measured value format	OFF : normal	Select ON when using ZC-501W communication format. It does not function when SW2 is ON (ZC-101W).
		ON : ZC-501W	
4	Output time	OFF : 500ms	Switch the ON time of the measured value judgment result display LED and external output.
		ON : 50ms	
5	BCC	OFF : BCC added	Select whether or not BCC is added after ETX in the communication format. Communication method: ZC-601W method only
		ON : No BCC	
6	unused	OFF : —	Reserved (fixed to OFF)
		ON : —	
7	unused	OFF : —	Reserved (fixed to OFF)
		ON : —	
8	unused	OFF : —	Reserved (fixed to OFF)
		ON : —	

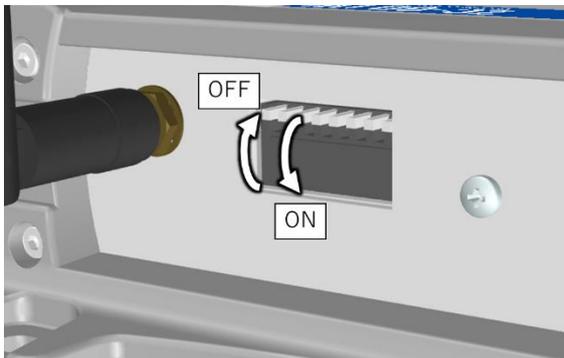
5.2 Setup procedure

To change the setting, follow the procedure below.

- ① Turn off the ZC-601W (unplug the AC adapter).

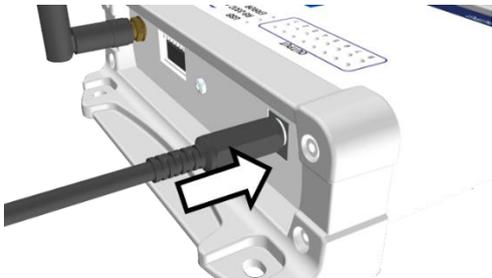


- ② Switch DIP switches.



*Please use your finger or the tip of a ballpoint pen, etc., to switch the switch.

- ③ Turn on the ZC-601W (plug in the AC adapter).



6 Communication

This section explains how to send and receive data via serial communication with ZC-601W.

There are two types of communication: the "ZC-601W method" and the "ZC-101W method," and the explanation of communication in this paper is for the "ZC-601W method" only.

*The "ZC-101W method" should be used when using the standard PC software "Adrec.NET" or when replacing the ZC-101W from the environment in which it is used.

ZC-601W method	Data is exchanged using ASCII codes. Communication is simplified because the ZC 601W performs the complex processing.
ZC-101W method	Binary data is used for communication. This is the method used in the ZC-101W receiver. Complex processing is required for communication.

6.1 Data communication

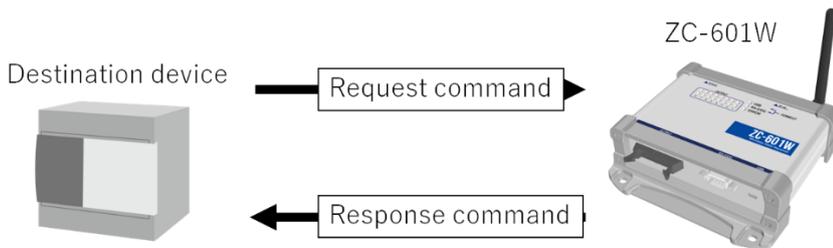
There are two ways to communicate data with ZC-601W: send/receive and receive only.

The method of communication changes with each command.

6.1.1 Send and Receive

This is done by reading and writing set values and switching modes.

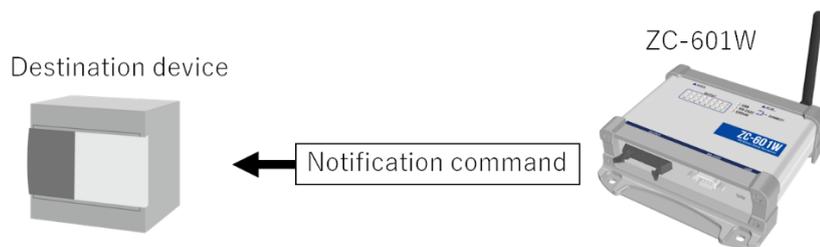
When it receives a request command from a destination device such as a PLC, it sends back a corresponding response command to the destination device.



6.1.2 Receive only

This is done with measured values, etc.

Automatically sends notification commands from the torque wrench to the destination device.

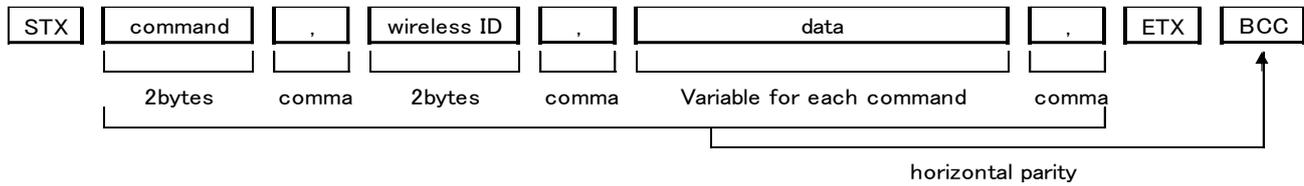


6.2 Communication Format

6.2.1 Basic Format

ZC-601W sends and receives commands based on the following format.

In addition to the command and wireless ID, [,] (comma) is placed between the delimiters of each item in the data.



STX	start code(02h)
command	request, notify command
wireless ID	Wireless ID number of the torque wrench that sends and receives commands Setting range : 1~99
data	Changed by command
ETX	Exit code (03h)
BCC	Exclusive OR (horizontal parity) from STX to before ETX

6.2.2 Character code

All use ASCII codes except BCC.

6.2.3 Type, unit

If "type" and "unit" are at the beginning of the data section, set or identify them according to the following.

Item	detail
Type	Maximum measurable value of torque wrench (model). Refer to the attached table.
Unit	Units displayed on the torque wrench (normal : 0) 0 : N · m 1 : lbg · in 2 : kgf · cm / kgf · m

Corresponding torque wrench by type			
Type	Corresponding wrench (Maximum measured value)	Type	Corresponding wrench (Maximum measured value)
0	0.15N · m	A	200N · m
1	0.3N · m	B	300N · m
2	0.5N · m	C	400N · m
3	1.5N · m	D	600N · m
4	3N · m	E	850N · m
5	5N · m	F	1000N · m
6	10N · m	G	150N · m
7	25N · m		
8	50N · m		
9	100N · m		

6.2.4 Numerical values

Data of 2 bytes or more numerical values, excluding torque and angle, are subject to the following conditions.

(1) Readout and notification

- Alignment: Right justified
- Blank space processing : Space filling

(2) Writing

- Alignment: Right justified
- Whitespace processing: 0 or space filling

6.2.5 Torque and snag torque value

(1) Readout and notification

The data of torque values in the data readout and notification commands are subject to the following conditions.

- Data : Signed 6-byte data
- Plus sign(CW) : First byte is a space ()
- Minus sign (CCW) : First byte is minus (-)
- Decimal point position : Refer to the attached table "Decimal point position by type".
- Spacing processing : Fill in spaces *When there is a margin between a sign and a numerical value.

Decimal point position by type

Type	Corresponding wrench (Maximum measured value)	decimal point position (N·m)	Type	Corresponding wrench (Maximum measured value)	decimal point position (N·m)
0	0.15N·m	□□. □□□	A	200N·m	□□□□. □
1	0.3N·m	□□. □□□	B	300N·m	□□□□. □
2	0.5N·m	□□. □□□	C	400N·m	□□□□. □
3	1.5N·m	□□. □□□	D	600N·m	□□□□. □
4	3N·m	□□. □□□	E	850N·m	□□□□. □
5	5N·m	□□. □□□	F	1000N·m	□□□□□□
6	10N·m	□□□. □□	G	150N·m	□□□□. □
7	25N·m	□□□. □□			
8	50N·m	□□□. □□			
9	100N·m	□□□□. □			

Example

type	Torque value	data
6(10N·m)	5N·m	5. 00
	-5N·m	- 5. 00
A(200N·m)	40.5N·m	40. 5
	120N·m	120. 0
	-40.5N·m	- 40. 5
	-120N·m	- 120. 0

(2) Writing

When writing torque values, make settings under the following conditions.

- Data : Signed 6-byte data
- Upper and lower limits : Lower limit torque < Upper limit torque
- Positive code (CW) : First 1 byte [+] or [] or [0]
- Negative sign (CCW) : First 1 byte [-].
- Decimal point position : Any position is acceptable. However, if it exceeds the decimal point position for each type (refer to "6.2.5 Torque and snag torque value (1) Readout and notification"), it is rounded down.

Example

Type	Torque value	Write data	Reflected data
6(10N·m)	5N·m	┐┐5. 00	┐┐5. 00
		+┐5. 00	+┐5. 00
		005. 00	005. 00
	7.15N·m	┐┐7. 15	┐┐7. 15
		┐7. 150	┐┐7. 15
A(200N·m)	120N·m	┐120. 0	┐120. 0
	80.56N·m	┐80. 56	┐┐80. 5
	120N·m	-┐┐120	-120. 0

6.2.6 Angle

(1) Readout and notification

Data for angle values for data readout and notification are subject to the following conditions.

- Data: Unsigned 6-byte data (fixed to one decimal place)
- Alignment: Right justified
- Blank space processing: Space filling

Example

Angle value	Data
10.0°	┐┐10. 0
1000.0°	1 000. 0

(2) Writing

When writing angles, please set the following conditions.

- Data : Unsigned 6-byte data
- HI/LO limit : Lower limit angle < Upper limit angle
- Maximum setting value : 6000.0 deg.
- Alignment : Right justified
- Whitespace processing : 0 or space filling
- Decimal point position : Any position is acceptable. However, if the number exceeds one decimal place (refer to "6.2.5 Torque and snag torque value (1) Readout and notification"), it is rounded down.

Example

Angle value	Write data	Reflected data
10.5°	┐┐10. 5	┐┐10. 5
1000.0°	1 000. 0	1 000. 0
10.55°	┐10. 55	┐┐10. 5
100°	┐┐100	┐1000

6.2.7 Response code

In send/receive communication, data containing a response code is sent as a result of sending a command.

For commands that include data such as setting readout, there is no response code.

However, if communication fails or other abnormalities occur, a response code is sent.

Response code	Content	Detail
F0	Completed successfully	Requested command successfully processed.
F1	BCC error	BCC values are different.
F2	Wireless ID is not activated	Torque wrench not powered or wireless channel is different.
F3	Response timeout	Due to the bad radio wave condition, it was not possible to send and receive data normally.
F4	Command receive timeout	The format of the send command was incorrect.
F5	Settings cannot be changed	Attempting to change the settings while tightening data remains. *Operation and date/time settings can be changed.
F6	Command not applicable	There are no applicable commands.
F7	Abnormal set value	The contents of the data part are incorrect.
F8	Wrench type mismatch	Wrench types are different.
F9	Torque wrench response error	Wrench type or measuring mode are different.

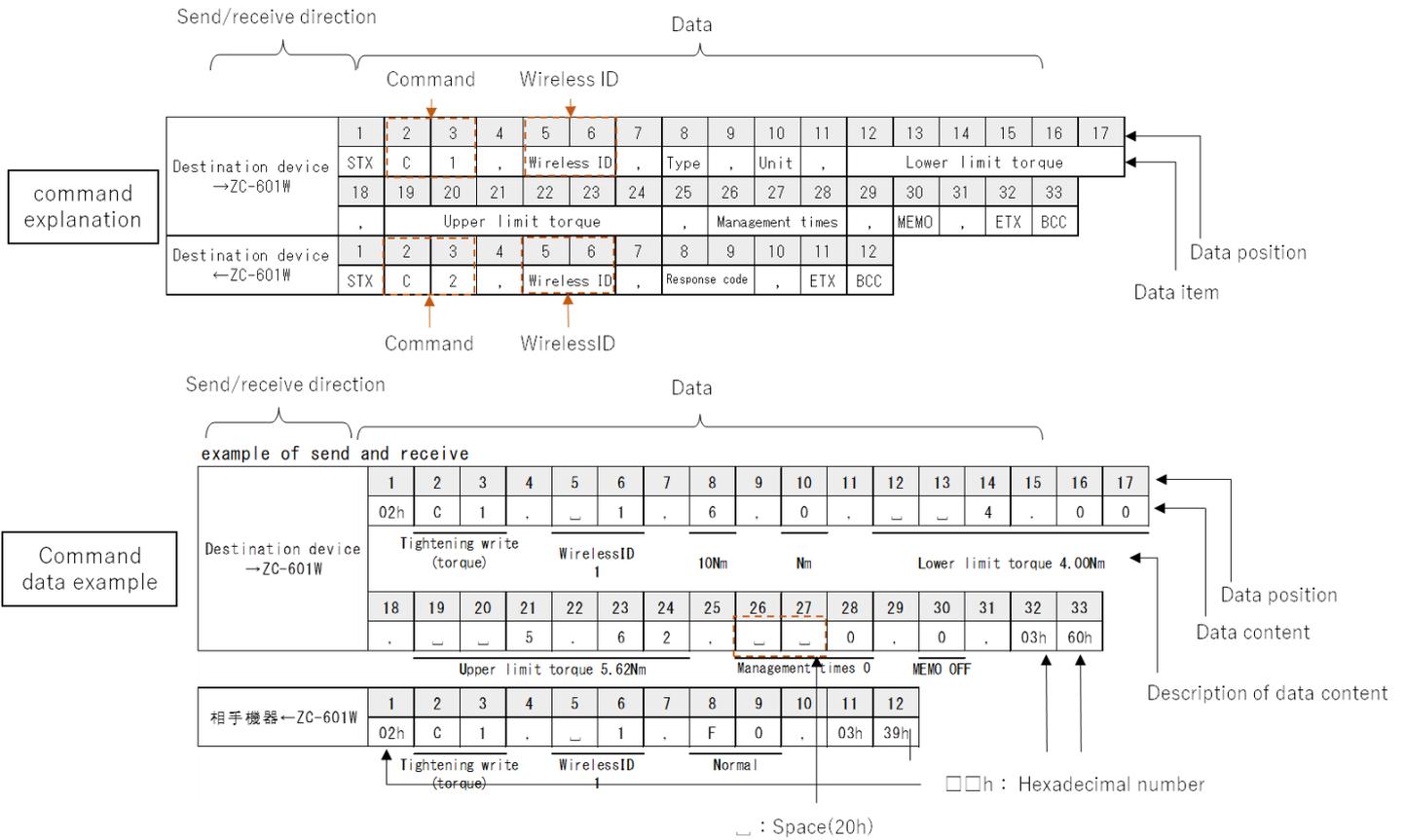
Example of send and receive

	Destination device →ZC-601W	1	2	3	4	5	6	7	8	9						
		02h	B1	1	,	┘	1	,	03h	62h						
Normal case	Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11				
		02h	B	1	,	┘	1	,	6	,	0	,				
		12	13	14	15	16	17	18	19	20	21	22	23	24	25	
		┘	┘	3	.	5	0	,	┘	1	0	.	0	0	,	
		26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
		┘	┘	0	,	0	,	┘	┘	┘	0	,	4	,	03h	47h
Abnormal case	Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12			
		02h	B	1	,	┘	1	,	F	3	,	03h	36h			

Response timeout

6.3 Commands

How to read commands



- Transmission/reception direction : Data flow

[ZC-601W]: Transmission from the other device

[ZC-601W]: Transmission from ZC-601W

- Command : Command position, Fixed to 2nd or 3rd byte
- Wireless ID : Wireless ID number to send/receive, Fixed to 5th-6th byte
- Data position : Order of data
- Data item : Data content for each data location

*Each command is explained with the BCC setting as "with BCC". If you select "without BCC," ignore the BCC item.

6.3.1 Mode switching (A1 / A2 / A3 / A4)

Mode switching is performed according to the function of the torque wrench.

(1) Measurement mode switching (A1)

This mode is used for tightening operations and setting changes.

Normally, the torque wrench is in this mode when it is started.

Destination device →ZC-601W	1	2	3	4	5	6	7	8	9	
	STX	A	2	,	wirelessID	,	ETX	BCC		
Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10
	STX	A	2	,	wirelessID	,	response code	,		

example of send and receive

Destination device →ZC-601W	1	2	3	4	5	6	7	8	9			
	02h	A	2	,	┘	2	,	03h	61h			
		command			wireless ID2							
Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12
	02h	A	2	,	┘	2	,	F	0	,	03h	3Bh
		command			wireless ID2			normal				

(2) Output mode switching

This mode is switched when reading the tightening history of the torque wrench.

*Use when MEMO mode is ON and the history is saved in the torque wrench.

*it can be used with DPW torque wrench program Ver. 2.90(0) or later.

Destination device →ZC-601W	1	2	3	4	5	6	7	8	9			
	STX	A	2	,	wireless ID	,	ETX	BCC				
Destination device← ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12
	STX	A	2	,	wireless ID	,	response code	,	ETX	BCC		

Example of send and receive

Destination device →ZC-601W	1	2	3	4	5	6	7	8	9			
	02h	A	2	,	┘	2	,	03h	61h			
		command			wireless ID2							
Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12
	02h	A	2	,	┘	2	,	F	0	,	03h	3Bh
		command			wireless ID2			normal				

(3) Online mode switching

This mode transmits the current tightening status data sequentially.

[On-line mode measured value \(E2\)](#) is continuously transmits during tightening.

Destination device →ZC-601W	1	2	3	4	5	6	7	8	9			
	STX	A	3	,	wireless ID	,	ETX	BCC				
Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12
	STX	A	3	,	wireless ID	,	response code	,	ETX	BCC		

Example of send and receive

Destination device →ZC-601W	1	2	3	4	5	6	7	8	9			
	02h	A	3	,	┘	1	,	03h	63h			
	command				wireless ID1							
Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12
	02h	A	3	,	┘	1	,	F	0	,	03h	39h
command				wireless ID1				normal				

(4) Real-time mode switching

Like the online mode, this mode sequentially transmits data on the current tightening status.

[Real-time mode measured value \(E3\)](#) is continuously transmitted during tightening.

Destination device →ZC-601W	1	2	3	4	5	6	7	8	9			
	STX	A	4	,	wireless ID	,	ETX	BCC				
Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12
	STX	A	4	,	wireless ID	,	response code	,	ETX	BCC		

Example of send and receive

Destination device →ZC-601W	1	2	3	4	5	6	7	8	9			
	02h	A	4	,	┘	1	,	03h	64h			
	command				wireless ID1							
Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12
	02h	A	4	,	┘	1	,	F	0	,	03h	3Eh
command				wireless ID1				normal				

6.3.2 Setting readout (B1 / B2 / B3 / B4 / B7 / B8 / B9)

Read out the setting status of the torque wrench.

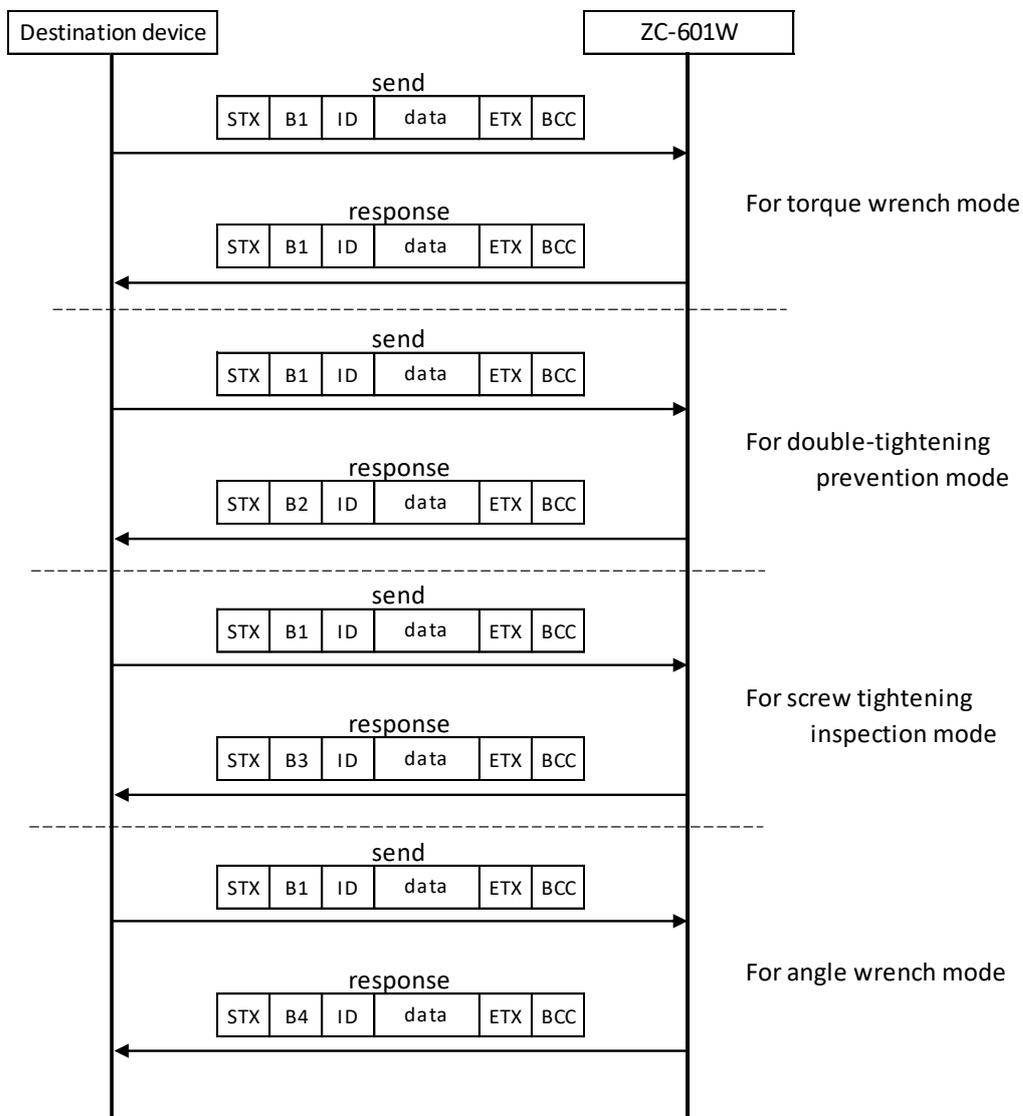
The set torque value, angle value, function status, etc. can be checked.

(1) Tightening value setting

Recall the tightening setting values (torque and angle) of the torque wrench.

Depending on the mode of the torque wrench, the response commands are B1 to B4.

Destination device →ZC-601W	1	2	3	4	5	6	7	8	9
	STX	B	1	,	wireless ID	,	ETX	BCC	



■ Torque wrench mode (B1)

This mode determines tightening by the lower and upper torque limits.

Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		
	STX	B	1	,	WirelessID	,	Type	,	Unit	,	Lower limit torque							,		
	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36		
	Upper limit torque					,	Management times					,	MEMO	,	Number of tightening records					,
	37	38	39	40																
battery		,	ETX	BCC																

Item description

Item	Description	Example
Lower limit torque	Torque value with sign	┐┐ 1. 2 5
Upper limit torque	CCW direction adds "-" to the beginning	-┐ 1. 2 5
Management times	Set management count	┐ 3 0
MEMO	MEMO mode setting status 0 : invalid 1 : valid	—
Number of tightening records	Number of tightening data recorded in the torque wrench	┐┐ 2 0
Battery	Torque wrench battery level 4(much)~1(low)	—

Example of send and receive

Destination device →ZC-601W	1	2	3	4	5	6	7	8	9
	02h	B	1	,	┐	1	,	03h	62h

Read tightening Wireless ID1

Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	02h	B	1	,	┐	1	,	6	,	0	,	┐	┐	3	.	5	0	,
	Read tightening			Wireless ID1			10Nm		Nm		Lower limit torque 3.5							
	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
	┐	1	0	.	0	0	,	┐	┐	0	,	0	,	┐	┐	┐	0	,
Upper limit torque 10.00					Management times C					MEMO:OFF			Number of tightening records 0					
37	38	39	40															
4		,	03h	57h														

Battery 4

■ Double-tightening prevention mode (B2)

In addition to the lower and upper torque limits, this mode detects whether a screw is tightened twice at the specified angle.

Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	STX	B	2	,	WirelessID		,	Type	,	Unit	,	Lower limit torque					
	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
	,	Upper limit torque				,	Specified angle				,	Interval		,			
	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49		
Management times				,	MEMO	,	Number of tightening records			,	Battery	,	ETX	BCC			

Item description

Item	Description	Example
Lower limit torque	Torque value with sign	┐┐ 1 . 2 5
Upper limit torque	CCW direction adds "-" to the beginning	-┐┐ 1 . 2 5
Specified angle	Angle value with 1 decimal place	┐┐ 3 0 . 0
Interval	Measurement state retention time when loosening by ratchet action during tightening	—
Management times	Set management count	┐ 3 0
MEMO	MEMO mode setting status 0 : invalid 1 : valid	—
Number of tightening records	Number of tightening data recorded in the torque wrench	┐┐ 2 0
Battery	Torque wrench battery level 4(much)~1(low)	—

Example of send and receive

Destination device →ZC-601W	1	2	3	4	5	6	7	8	9
	02h	B	1	,	┐	1	,	03h	62h
			Read tightening			Wireless ID1			

Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	02h	B	2	,	┐	1	,	6	,	0	,	┐	┐	3	.	5	0
				Read tightening			Wireless ID1		10Nm		Nm		Lower limit torque 3.5				
	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
	,	┐	1	0	.	0	0	,	┐	┐	┐	5	.	0	,	1	,
					Upper limit torque 10.00					Specified angle 5°					Interval 1sec		
35	36	37	38	39	40	41	42	43	44	45	46	47	48	49			
┐	┐	0	,	0	,	┐	┐	┐	0	,	4	,	03h	6Eh			
Management times 0				MEMO:OFF		Number of tightening records 0				Battery 4							

■ Screw tightening inspection mode (B3)

In addition to the lower and upper torque limits, this mode detects missed tightening by the allowable angle.

Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	STX	B	3	,	Wireless ID	,	Type	,	Unit	,	Lower limit torque						
	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
	,	Upper limit torque						,	Allowable angle						,	Interval	
	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49		
Management times				,	MEMO	,	Number of tightening records				,	battery	,	ETX	BCC		

Item description

Item	Description	Example
Lower limit torque	Torque value with sign	└└ 1. 2 5
Upper limit torque	CCW direction adds "-" to the beginning	-└└ 1. 2 5
allowable angle	Angle value with 1 decimal place	└└ 3 0. 0
Interval	Measurement state retention time when loosening by ratchet action during tightening	—
Management times	Set management count	└ 3 0
MEMO	MEMO mode setting status 0 : invalid 1 : valid	—
Number of tightening records	Number of tightening data recorded in the torque wrench	└└ 2 0
Battery	Torque wrench battery level 4(much)~1(low)	—

Example of send and receive

Destination device →ZC-601W	1	2	3	4	5	6	7	8	9
	02h	B	1	,	└	1	,	03h	62h
			Read tightening			Wireless ID1			

Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	02h	B	3	,	└	1	,	6	,	0	,	└	└	3	.	5	0
				Read tightening			Wireless ID1		10Nm		Nm		Lower limit torque 3.5				
	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
	,	└	1	0	.	0	0	,	└	└	1	0	.	0	,	1	,
						Upper limit torque 10.00			allowable angle 10°				interval 1sec				
35	36	37	38	39	40	41	42	43	44	45	46	47	48	49			
└	└	0	,	0	,	└	└	└	0	,	4	,	03h	78h			
Management times C				MEMO:OFF		Number of tightening records 0				Battery4							

■ Angle wrench mode (B4)

This mode determines tightening by the lower and upper limit angles.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
STX	B	4	,	Wireless ID		,	Type	,	Unit	,	Snug torque					
18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
,	Lower limit angle					,	Upper limit angle					,	Interval			
35	36	37	38	39	40	41	42	43	44	45	46	47	48	49		
Management times		,	MEMO		,	Number of tightening records				,	Battery	,	ETX	BCC		

Item description

Item	Description	Example
Snug torque	Torque value with sign CCW direction adds "-" to the beginning	┐┐ 1 . 2 5 -┐┐ 1 . 2 5
Lower limit angle	Angle value with 1 decimal place	┐┐ 3 0 . 0
Upper limit angle		
interval	Measurement state retention time when loosening by ratchet action during tightening	—
Management times	Set management count	┐ 3 0
MEMO	MEMO mode setting status 0 : invalid 1 : valid	—
Number of tightening records	Number of tightening data recorded in the torque wrench	┐┐ 2 0
Battery	Torque wrench battery level 4(many)~1(low)	—

Example of send and receive

Destination device →ZC-601W	1	2	3	4	5	6	7	8	9
	02h	B	1	,	┐	1	,	03h	62h

Read tightening Wireless ID1

Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	STX	B	4	,	┐	1	,	6	,	0	,	┐	┐	1	.	0	0
	Read tightening		Wireless ID1			10Nm		Nm		Snug torque 1							
	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
	,	┐	┐	9	0	.	0	,	┐	1	2	0	.	0	,	3	,
	Lower limit angle 90°					Upper limit angle 120°					Interval 3sec						
35	36	37	38	39	40	41	42	43	44	45	46	47	48	49			
┐	┐	0	,	0	,	┐	┐	┐	0	,	4	,	03h	73h			
Management times C		MEMO:OFF			Number of tightening records 0				Battery 4								

(2) Operation setting

Call up operational settings such as vibration, buzzer operation, and warning alerts.

Destination device →ZC-601W	1	2	3	4	5	6	7	8	9									
	STX	B	7	,	WirelessID	,	ETX	BCC										
Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	STX	B	7	,	WirelessID	,	type	,	unit	,	Vibration	,	lock	,	Reset	,	Buzzer	
	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
	,	Communication	,	AUTO	,	Auto off	,	advance notice1	,	advance notice2	,	advance notice3	,	advance notice4	,	advance notice5	,	sound1
	37	38	39	40	41	42	43	44	45	46	47	48	49					
	,	sound2	,	sound3	,	sound4	,	sound5	,	Battery	,	ETX	BCC					

Item description

item	description
vibration	Vibration working state 0 : invalid 1 : valid
lock	Wrench body operation lock state 0 : invalid 1 : valid
reset	Tightening control count reset state 0 : manual 1 : auto
Buzzer	Buzzer operating status 0 : OFF 1 : ON
communication	State of communication interval mode 0 : normal 1 : system
AUTO	AUTO mode status 0 : confirmation 1 : Auto
Auto off	auto off timer 0 : OFF 1 : 1hour 2 : 4hour 3 : 8hour
advance notice 1~5	advance warning1~5 0 : OFF 1 : 10% 2 : 20% 3 : 30% 4 : 40% 5 : 50% 6 : 60% 7 : 70% 8 : 80% 9 : 90%
sound 1~5	Advance warning buzzer sound1~5 ※0(Low) <-> 10(high) 0 : pattern 0 1 : pattern 1 2 : pattern 2 3 : pattern 3 4 : pattern 4 5 : pattern 5 6 : pattern 6 7 : pattern 7 8 : pattern 9 A : pattern 10 E : OFF
battery	Torque wrench battery level 4(many)~1(low)

Example of send and receive

Destination device →ZC-601W	1	2	3	4	5	6	7	8	9									
	02h	B	7	,	└	1	,	03h	64h									
			Operation read			Wireless ID1												

Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17		
	02h	B	7	,	└	1	,	6	,	0	,	1	,	1	,	0	,		
				Operation read			Wireless ID1			10Nm		Nm		vibrationON		lock valid		reset OFF	
	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34		
	1	,	1	,	1	,	0	,	2	,	4	,	6	,	8	,	0		
		buzzer ON		system		AUTO auto		auto OFF 0		advance notice1 20%		advance notice2 40%		advance notice3 60%		advance notice4 80%		advance notice5 OFF	
	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49				
	,	A	,	8	,	6	,	4	,	F	,	3	,	03h	66h				
		sound1 PT10		sound2 PT8		sound3 PT6		sound4 PT4		sound5 OFF		battery 3							

(3) Date and time setting

Call up date/time data in the torque wrench.

Destination device →ZC-601W	1	2	3	4	5	6	7	8	9									
	STX	B	8	,	WirelessID	,	ETX	BCC										
Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
	STX	B	8	,	WirelessID	,	Type	,	Unit	,	Year	/	Month	/				
	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33		
	Day		┐	Hour		:	Minutes		:	Seconds		,	Battery	,	ETX	BCC		

Item description

Item	Description
Year	Year setting Range : 0~99(yy)
Month	Month setting Range : 1~12
Day	Day setting Range : 1~31
Hour	Hour setting Range : 0~23
Minutes	Minutes setting Range : 0~59
Seconds	Seconds setting Range : 0~59

Example of send and receive

Destination device→ ZC-601W	1	2	3	4	5	6	7	8	9
	02h	B	8	,	┐	1	,	03h	6Bh
			Time readout			WirelessID1			

Destination device← ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
	02h	B	8	,	┐	1	,	6	,	0	,	2	3	/	┐	3	/	
				Time readout			WirelessID1			10Nm		Nm		23 years		March		
	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33		
	1		0	,	┐	8	:	1	2	:	2	1	,	3	,	03h	79h	
			The 10th			8 o'clock			12 minutes			21 seconds		Battery 3				

(4) Serial number

Call up the serial number of the torque wrench.

Destination device →ZC-601W	1	2	3	4	5	6	7	8	9									
	STX	B	9	,	Wireless ID		,	ETX	BCC									
Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
	STX	B	9	,	Wireless ID			Type	,	Unit	,	Serial number						
	18	19	20	21	22	23	24	25	26	27	28	29	30					
	Serial number											,	ETX	BCC				

Example of send and receive

Destination device →ZC-601W	1	2	3	4	5	6	7	8	9								
	02h	B	9	,	␣	1	,	03h	6Ah								
Serial number read					Wireless ID1												
Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	02h	B	9	,	␣	1	,	6	,	0	,	4	0	6	2	3	0
	Serial number read				Wireless ID1			10Nm		Nm							
	18	19	20	21	22	23	24	25	26	27	28	29	30				
3			␣	0	7	0	1	R	␣	␣	␣	,	03h	24h			
Serial number 4062303_0701R_␣_␣_␣																	

6.3.3.3 Setting write (C1 / C2 / C3 / C4 / C7 / C8)

(1) Tightening value write-in

Write the tightening setting values (torque and angle) of the torque wrench.

Set commands C1 to C4 depending on the mode of the torque wrench.

When setting the tightening value, do so with no tightening history. If there is a tightening history, an error will occur.

■ Torque wrench mode (C1)

This mode determines tightening by the lower and upper torque limits.

Destination device →ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
	STX	C	1	,	Wireless ID		,	Type	,	Unit	,	Lower limit torque						
	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33		
		Upper limit torque					,	Management times		,	MEMO	,	ETX	BCC				
Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12						
	STX	C	2	,	Wireless ID		,	Response code		,	ETX	BCC						

Item description

Item	Description	Example
Lower limit torque	Torque value with sign	┐┐ 1 . 2 5
Upper limit torque		┐┐ 1 . 2 5
Management times	Management count setting Setting range : 0~999	┐ 3 0
MEMO	MEMO mode setting status 0 : invalid 1 : valid	┐

Example of send and receive

Destination device →ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	02h	C	1	,	┐	1	,	6	,	0	,	┐	┐	4	.	0	0
	Tightening write (torque)			WirelessID 1			10Nm		Nm		Lower limit torque 4.00Nm						
	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	
,	┐	┐	5	.	6	2	,	┐	┐	0	,	0	,	03h	60h		
Upper limit torque 5.62Nm							Management times 0				MEMO OFF						
Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12					
	02h	C	1	,	┐	1	,	F	0	,	03h	39h					
Tightening write (torque)			WirelessID 1			Normal											

■ Double-tightening prevention mode (C2)

In addition to the lower and upper torque limits, this mode detects whether a screw is tightened twice at the specified angle.

If the angle measurement result is less than or equal to the specified angle, it is NG.

Destination device →ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
	STX	C	2	,	Wireless ID			,	Type	,	Unit	,	Lower limit torque					
	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	
	,	Upper limit torque						,	Specified angle						,			
	35	36	37	38	39	40	41	42	Interval									
Management times			,	MEMO	,	ETX	BCC											
Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12						
	STX	C	2	,	Wireless ID			,	Response code	,	ETX	BCC						

Item description

Item	Description	Example
Lower limit torque	Torque value with sign	┐┐ 1 . 2 5
Upper limit torque		┐┐ 1 . 2 5
Specified angle	Angle value with 1 decimal place Setting range : 0~6000	┐┐ 3 0 . 0
Interval	Measurement state retention time when loosening by ratchet action during tightening Setting range : 0~8 (Sec)	—
Management times	Management count setting Setting range : 0~999	┐ 3 0
MEMO	MEMO mode setting status 0 : invalid 1 : valid	—

Example of send and receive

Destination device →ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	02h	C	2	,	┐	1	,	9	,	0	,	┐	┐	3	0	.	0
	Tightening writing (Double tightening)		Wireless ID 1			100Nm		Nm		Lower limit torque 30.0Nm							
	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
	,	┐	┐	3	2	.	3	,	┐	┐	┐	5	.	0	,	2	,
	Upper limit torque 32.3Nm						Specified angle 5°						Interval 2sec				
35	36	37	38	39	40	41	42										
┐	┐	0	,	0	,	03h	51h										
Management times 0				MEMO OFF													
Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12					
	02h	C	2	,	┐	1	,	F	0	,	03h	3Ah					
Tightening writing (Double tightening)		Wireless ID 1			Normal												

■ Screw tightening inspection mode (C3)

In addition to the lower and upper torque limits, this mode detects missed tightening by the allowable angle.

If the angle measurement result is greater than the allowable angle, it is NG.

Destination device →ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17			
	STX	C	3	,	Wireless ID	,	Type	,	Unit	,	Lower limit torque									
	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34			
	,	Upper limit torque							,	Allowable angle							,			
	35	36	37	38	39	40	41	42												
Management times				,	MEMO	,	ETX	BCC												
Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12								
	STX	C	3	,	Wireless ID	,	Response code	,	ETX	BCC										

Interval

Item description

Item	Description	Example
Lower limit torque	Torque value with sign	┐┐ 1 . 2 5
Upper limit torque		┐┐ 1 . 2 5
Allowable angle	Angle value with 1 decimal place Setting range : 0~6000	┐┐ 3 0 . 0
Interval	Measurement state retention time when loosening by ratchet action during tightening Setting range : 0~8 (秒)	—
Management times	Management count setting Setting range : 0~999	┐ 3 0
MEMO	MEMO mode setting status 0 : invalid 1 : valid	—

Example of send and receive

Destination device →ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	02h	C	3	,	┐	1	,	7	,	0	,	┐	┐	8	.	0	0
	Tightening writing (inspection)			Wireless ID 1				25Nm		Nm		Lower limit torque 8.00Nm					
	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
	,	┐	1	0	.	0	0	,	┐	┐	1	0	.	0	,	3	,
Upper limit torque 10.0Nm							Allowable angle 10°					Interval 3sec					
35	36	37	38	39	40	41	42										
┐	┐	0	,	0	,	03h	53h										
Management times 0				MEMO OFF													
Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12					
	02h	C	3	,	┐	1	,	F	0	,	03h	3Bh					
Tightening writing (inspection)			Wireless ID 1				Normal										

■ Angle wrench mode (C4)

This mode judges tightening by the lower and upper limit angles.

When the snug torque is reached, it starts measuring the angle.

Destination device →ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
	STX	C	4	,	Wireless ID			,	Type	,	Unit	,	Snug torque					
	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	
	,	Lower limit angle						,	Upper limit angle						,			
	35	36	37	38	39	40	41	42	Interval									
Management times			,	MEMO	,	ETX	BCC											
Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12						
	STX	C	4	,	Wireless ID			,	Response code		,	ETX	BCC					

Item description

Item	Description	Example
Snug torque	angle measurement starting torque with sign	_ _ 1 . 2 5 - _ 1 . 2 5
Lower limit torque	Angle value with 1 decimal place	_ _ 3 0 . 0
Upper limit torque	Setting range : 0~6000	
Interval	Measurement state retention time when loosening by ratchet action during tightening Setting range : 2~8 (Sec)	—
Management times	Management count setting Setting range : 0~999	_ 3 0
MEMO	MEMO mode setting status 0 : invalid 1 : valid	—

Example of send and receive

Destination device →ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	02h	C	4	,	_	1	,	A	,	0	,	-	_	1	0	.	0
	Tightening writing (Angle)			Wireless ID 1				200Nm		Nm		Snug torque -10.0Nm					
	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
	,	_	_	9	0	.	0	,	_	1	8	0	.	0	,	3	,
Lower limit angle 90.0°						Upper limit angle 180°						Interval 3sec					
35	36	37	38	39	40	41	42										
_	_	0	,	0	,	03h	26h										
Management times 0				MEMO OFF													
Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12					
	02h	C	4	,	_	1	,	F	0	,	03h	3Ch					
Tightening writing (Angle)			Wireless ID 1				Normal										

(2) Operation setting

Write operation settings such as vibration operation and warning alerts.

Destination device →ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	STX	C	7	,	WirelessID	,	Type	,	Unit	,	Vibration	,	Lock	,	Reset	,	
	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
	Buzzer	,	Communi- cation	,	AUTO	,	Auto off	,	advance notice1	,	advance notice2	,	advance notice3	,	advance notice4	,	advance notice5
	35	36	37	38	39	40	41	42	43	44	45	46	47				
	,	Sound1	,	Sound2	,	Sound3	,	Sound4	,	Sound5	,	ETX	BCC				
Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12					
	STX	C	7	,	WirelessID	,	Response code	,	ETX	BCC							

Item description

item	description
vibration	Vibration working state 0 : invalid 1 : valid
lock	Wrench body operation lock state 0 : invalid 1 : valid
reset	Tightening control count reset state 0 : manual 1 : auto
Buzzer	Buzzer operating status 0 : OFF 1 : ON
communication	State of communication interval mode 0 : normal 1 : system
AUTO	AUTO mode status 0 : confirmation 1 : Auto
Auto off	auto off timer 0 : OFF 1 : 1hour 2 : 4hour 3 : 8hour
advance notice 1~5	advance warning1~5 0 : OFF 1 : 10% 2 : 20% 3 : 30% 4 : 40% 5 : 50% 6 : 60% 7 : 70% 8 : 80% 9 : 90%
sound 1~5	Advance warning buzzer sound1~5 ※0(Low)<->10(high) 0 : pattern 0 1 : pattern 1 2 : pattern 2 3 : pattern 3 4 : pattern 4 5 : pattern 5 6 : pattern 6 7 : pattern 7 8 : pattern 9 A : pattern 10 E : OFF

About the advance warning

The warning alerts should be set in order from warning 1, and must always be greater than the previous value.

If the settings are not correct, an error will result.

Judgement	advance notice1	advance notice2	advance notice3	advance notice4	advance notice5	Reason for judgment
○	1	2	4	8	0	Normal
×	4	2	0	0	0	Next notice less than previous notice
×	2	4	0	8	0	OFF is included in the middle of the notice

Example of send and receive

Destination device →ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
	02h	C	7	,	└	1	,	6	,	0	,	1	,	1	,	0	,	
	Operation setting			Wireless ID 1			10Nm			Nm			vibration Valid		Lock Valid		Reset Manual	
	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	
	1	,	1	,	1	,	0	,	2	,	4	,	6	,	8	,	0	
	Buzzer On		Communication System			AUTO Auto		Auto off Off		Advance notice1 20%		Advance notice2 40%		Advance notice3 60%		Advance notice4 80%		Advance notice5 Off
35	36	37	38	39	40	41	42	43	44	45	46	47						
,	A	,	8	,	6	,	4	,	F	,	03h	7Ah						

Sound1 PT10 Sound2 PT8 Sound3 PT6 Sound4 PT4 Sound5 Off

Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12
	02h	C	7	,	└	1	,	F	0	,	03h	3Fh

Operation setting Wireless ID 1 Normal

(3) Date and time setting

Write date and time data in the torque wrench.

Destination device →ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
	STX	C	8	,	Wireless ID			,	Type	,	Unit	,	Year		,	Month		,
	18	19	20	21	22	23	24	25	26	27	28	29	30	31				
	Day		,	Hour		,	Minutes		,	Seconds		,	ETX	BCC				
Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12						
	STX	C	8	,	Wireless ID			,	Response code		,	ETX	BCC					

Item description

Item	Description
Year	year setting range : 0~99(yy)
Month	month setting range : 1~12
Day	day setting range : 1~31
Hour	hour setting range : 0~23
Minutes	minutes setting range : 0~59
Seconds	seconds setting range : 0~59

Example of send and receive

Destination device →ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	02h	C	8	,	┌	1	,	6	,	0	,	2	3	,	┌	3	,
	Date and time setting			Wireless ID 1			10Nm		Nm		23 years			March			
	18	19	20	21	22	23	24	25	26	27	28	29	30	31			
		1	0	,	1	8	,	1	5	,	┌	0	,	03h	62h		
		The 10th		18 Hour		15 Minutes		21 Seconds									
Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12					
	02h	C	8	,	┌	1	,	F	0	,	03h	30h					
		Date and time setting			Wireless ID 1			Normal									

6.3.4 Measured value (E1)

When the torque wrench has been tightened, the peak value is automatically transmitted to the destination device. It is transmitted at the end of measurement.

Destination device ← ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
	STX	E	1	,	Wireless ID		,	Type	,	Unit	,	Mode	,	Result	
	15	16	17	18	19	20	21	22	23	24	25	26	27	28	
	,	Fixed value(torque)						,	Fixed value(angle)						
	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43
	,	Year		,	Month		,	Day		,	Hour		,	minutes	
	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58
	,	Second		,	Serial number										
	59	60	61	62	63	64	65	66	67	68					
	Serial number					,	Battery	,	ETX	BCC					

Item description

Item	Description
Mode	Torque wrench operating mode 1 : Torque Wrench 2 : Prevention of double tightening 3 : Screw tightening inspection 4 : Angle wrench
Result	OK/NG judgment of tightening result 1 : OK 2 : torque over 3 : angle over 4 : Both torque and angle are over
Fixed value (Torque)	Peak torque value at completion of tightening
Fixed value (Angle)	Peak angle value at completion of tightening
Year	Date and time when measurement was completed
Month	
Day	
Hour	
Minutes	
Second	
Battery	Torque wrench battery level 4(much)~1(low)
Serial number	Serial number of torque wrench

Notification example

Destination device ← ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
	02h	E	1	,	□	1	,	6	,	0	,	2	,	1	
	Fixed value			Wireless ID1			10Nm		Nm		Prevention of double tightening		OK		
	15	16	17	18	19	20	21	22	23	24	25	26	27	28	
	,	□	□	3	.	8	2	,	1	2	3	4	.	5	
	Fixed value (torque)3.82						Fixed value (angle)1234.5								
	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43
	,	2	3	/	□	3	/	1	0	□	1	8	:	1	2
	23 years			March			The 10th			18Hour			12Minutes		
	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58
	:	2	1	,	4	0	6	2	3	0	3	□	0	7	0
	21Second					Serial number 406230307001R									
	59	60	61	62	63	64	65	66	67	68					
	1	R	□	□	□	,	2	,	03h	24h					

6.3.5 On-line mode measured value(E2)

When the torque wrench is tightened in the online mode, the measured value is transmitted to the destination device until tightening is completed. In online mode, the torque value is peak held when the lower limit is reached.

Transmission interval of measured value: Approx. every 50 ms (varies depending on communication conditions)

Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	STX	E	2	,	Wireless ID		,	Type	,	Unit	,	Mode	,	Result	,
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
	Torque value						,	Peak angle value						,	Battery
	31	32	33												
	,	ETX	BCC												

Item description

Item	Description
Mode	Torque wrench operating mode 1 : Torque Wrench 2 : Prevention of double tightening 3 : Screw tightening inspection 4 : Angle wrench
Result	OK/NG judgment of tightening result 0:Before reaching the lower limit 1 : OK 2 : torque over 3 : angle over 4 : Both torque and angle are over
Torque value	Current torque value After reaching the lower limit, it becomes the peak value
Peak angle value	Current peak angle value
Battery	Torque wrench battery level 4(much)~1(low)

Notification example

Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	02h	E	2	,	┌	1	,	6	,	0	,	2	,	0	,
	Online measurements				Wireless ID 1		10Nm		Nm		Prevention of double tightening			Before reaching the lower limit	
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
	┌	┌	3	.	8	2	,	┌	1	2	3	.	4	,	2
Torque value 3.82						Peak angle value 123.4						Battery			
31	32	33													
	,	03h	61h												

6.3.6 Real-time mode measured value (E3)

When tightening the torque wrench in the real-time mode, the measured value is transmitted to the destination device until the tightening is completed. In real-time mode, no peak hold is performed even if the lower limit value is reached (except in angle wrench mode).

When in torque wrench mode, it measures torque only; when in double-tightening prevention or screw tightening inspection mode, it measures torque and angle.

Transmission interval of measured values: Approx. every 40 ms (varies depending on communication conditions)

Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12	13
	STX	E	3	,	Wireless ID	,	Type	,	Unit	,	Mode	,	
	14	15	16	17	18	19	20	21	22	23	24	25	26
	Torque value						,	Peak angle value					
	27	28	29	30	31	32	33	34	35	36	37	38	39
	,	Hour			:	Minutes	:	Second	.	millisecond			
	40	41	42	43	44								
,	Battery	,	ETX	BCC									

Item description

Item	Description
Mode	Torque wrench operating mode 1 : Torque Wrench 2 : Prevention of double tightening 3 : Screw tightening inspection 4 : Angle wrench
Torque value	Current torque value
Peak angle value	Current peak angle value
Hour	Elapsed time from start of measurement Hour : 0~23 Minutes : 0~59 Second : 0~59 Millisecond : 0~999
Minutes	
Second	
Millisecond	
Battery	Torque wrench battery level 4(many)~1(low)

Notification example

Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12			
	02h	E	3	,	┐	1	,	6	,	0	,	2			
	real-time measurements				Wireless ID			10Nm		Nm		Preventior double tight			
							1								
	14	15	16	17	18	19	20	21	22	23	24	25			
	┐	┐	3	.	8	2	,	┐	1	2	3	.			
	Torque value 3.82						peak angle value 123.4								
	27	28	29	30	31	32	33	34	35	36	37	38			
	,	0	0	:	0	2	:	1	5	.	6	5			
	0 Hour			2 Minutes			15 Second			654Millisec					
40	41	42	43	44											
,	3	,	03h	4Eh											

Battery 3

6.3.7 Tightening history readout (D1)

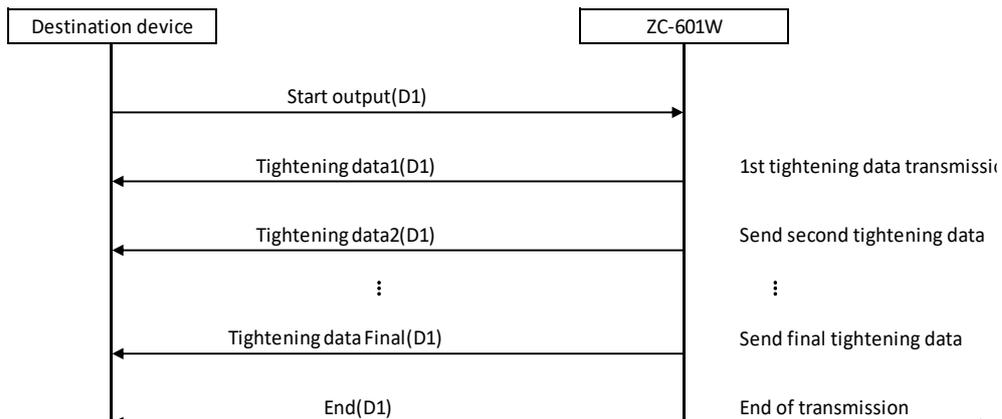
Read out the tightening history in the torque wrench when it is in the output mode.

Readout is possible with at least one tightening history stored in the torque wrench.

Start output	Destination device →ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12						
		STX	D	1	,	Wireless ID	,	0	0	,	ETX	BCC							
Tightening data	Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15			
		STX	D	1	,	Wireless ID	,	Type	,	Unit	,	Mode	,	Result	,				
		16	17	18	19	20	21	22	23	24	25	26	27	28	29				
		Torque value						,	Peak angle value						,				
		30	31	32	33	34	35	36	37	38	39	40	41	42	43	44			
		Year			/	Month			/	Day		SP	Hour		:	Minutes	:		
		45	46	47	48	49	50	51	52	53	54								
Second			,	Tightening count			,	Management times											
		55	56	57	58	59	60	61	62										
		history number				,	ETX	BCC											
end	Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12						
		STX	D	1	,	Wireless ID	,	Response code	,	ETX	BCC								

The tightening data readout starts reading the tightening data of the torque wrench when the output start command is received from the destination device.

Tightening data is sent to the other device in order from the oldest history, and when all tightening data transmission is completed, the transmission end command is sent to end the transmission.



Item description

Item	Description
Mode	Torque wrench operating mode 1 : Torque Wrench 2 : Prevention of double tightening 3 : Screw tightening inspection 4 : Angle wrench
Result	OK/NG judgment of tightening result 1 : OK 2 : torque over 3 : angle over 4 : Both torque and angle are over
Fixed value (Torque)	Peak torque value at completion of tightening
Fixed value (Angle)	Peak angle value at completion of tightening
Year	Date and time when measurement was completed
Month	
Day	
Hour	
Minutes	
Second	
history number	Nth tightening history

Example of send and receive

Destination device →ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12
	02h	D	1	,	┘	1	,	0	0	,	03h	48h

History reading Wireless ID1

Destination device ←ZC-601W (1st case)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	02h	D	1	,	┘	1	,	6	,	0	,	2	,	1	,
	History reading			Wireless ID1			10Nm		Nm		Prevention of double tightening			Result OK	
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	
	┘	┘	3	.	1	0	,	┘	┘	2	3	.	4	,	
	Fixed value(Torque) 3.10					Fixed value(Angle) 23.4									
	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
	2	3	/	┘	3	/	1	6	,	1	1	:	3	1	:
	2023(Year)			March			16th		11Hour			31minutes			
	45	46	47	48	49	50	51	52	53	54	55	56	57	58	
4	2	,	┘	┘	┘	1	,	┘	┘	0	,	03h	56h		
42second			1st tightening history				Management times0								

Destination device ←ZC-601W (2nd case)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	02h	D	1	,	┘	1	,	6	,	0	,	2	,	2	,
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	
	┘	┘	3	.	8	0	,	┘	┘	2	0	.	1	,	
	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
	2	3	/	┘	3	/	1	6	.	1	1	:	4	2	:
	45	46	47	48	49	50	51	52	53	54	55	56	57	58	
	1	1	,	┘	┘	┘	2	,	┘	┘	0	,	03h	59h	

⋮

Destination device ←ZC-601W (Last 100th)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	02h	D	1	,	┘	1	,	6	,	0	,	2	,	1	,
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	
	┘	┘	3	.	4	2	,	┘	┘	2	4	.	9	,	
	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
	2	3	/	┘	3	/	1	7	.	1	7	:	┘	0	:
	45	46	47	48	49	50	51	52	53	54	55	56	57	58	
3	7	,	┘	1	0	0	,	┘	┘	0	,	03h	4Eh		
Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12			
	02h	D	1	,	┘	1	,	F	0	,	03h	3Eh			
History reading			Wireless ID1			End (Normal)									

6.3.8 Erase tightening history (F1)

Perform erasure of the tightening history in the torque wrench.

Destination device →ZC-601W	1	2	3	4	5	6	7	8	9			
	STX	F	1	,	Wireless ID		,	ETX	BCC			
Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12
	STX	F	1	,	Wireless ID		,	Response code		,	ETX	BCC

Example of send and receive

Destination device →ZC-601W	1	2	3	4	5	6	7	8	9
	02h	F	1	,	␣	1	,	03h	66h

Delete tightening history Wireless ID1

Destination device ←ZC-601W	1		1	2	3	4	5	6	7	8	9	10
	02h	F	1	,	␣	1	,	F	0	,	03h	3Ch

Delete tightening history Wireless ID1 Normal

6.3.9 Sleep (F2)

Put the torque wrench to sleep. During sleep mode, measurement will not be possible even if the torque wrench is operated. To return from sleep, it is necessary to execute [Return to Sleep \(F3\)](#) or reconnect power.

Destination device →ZC-601W	1	2	3	4	5	6	7	8	9			
	STX	F	2	,	Wireless ID		,	ETX	BCC			
Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12
	STX	F	2	,	Wireless ID		,	Response code		,	ETX	BCC

Example of send and receive

Destination device →ZC-601W	1	2	3	4	5	6	7	8	9	
	02h	F	2	,	┘	1	,	03h	65h	
sleep request				Wireless ID1						

Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12
	02h	F	2	,	┘	1	,	F	0	,	03h	3Fh
sleep request				Wireless ID1			Normal					

6.3.10 Return to sleep (F3)

Restore the torque wrench from sleep mode.

Destination device →ZC-601W	1	2	3	4	5	6	7	8	9			
	STX	F	3	,	WirelessID		,	ETX	BCC			
Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12
	STX	F	3	,	WirelessID		,	Response code		,	ETX	BCC

Example of send and receive

Response code →ZC-601W	1	2	3	4	5	6	7	8	9	
	02h	F	2	,	┘	1	,	03h	65h	
return request				Wireless ID1						

Response code ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12
	02h	F	2	,	┘	1	,	F	0	,	03h	3Fh
return request				Wireless ID1			Normal					

6.3.11 Call (F4)

Call up the torque wrench with the corresponding ID number.

When the torque wrench receives this command, the LED blinks at the start and turns off at the end.

Destination device →ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	STX	F	4	,	WirelessID		,	Type	,	Unit	,	situation	,	ETX
Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12		
	STX	F	4	,	WirelessID		,	Response code		,	ETX	BCC		

Item description

Item	Description
Situation	Call start/end 0 : End 1 : Start

Example of send and receive

Destination device →ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	02h	F	4	,	└	1	,	6	,	0	,	1	,	03h	78h

Call request
Wireless ID1
10Nm
Nm
Call start

Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12
	02h	F	4	,	└	1	,	F	0	,	03h	39h

Call request
Wireless ID1
Normal

6.3.12 Operation status (F5)

Notification is given when the torque wrench button is operated or the lower or upper limit is reached.

Example of send and receive

Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	STX	F	5	,	Wireless ID		,	Type	,	Unit	,	Situation	,	ETX	BCC

Item description

Item	説明
Situation	Torque wrench button operation and status notification when lower limit/upper limit is reached 1 : Press SW before measurement 2 : Tightening result display cancellation (AUTO mode confirmation) 3 : Out-of-range warning release (Out-of-range warning function retained) A : Lower limit reached (measurement arrival status transmission function enabled) B : Reached upper limit (measurement arrival status transmission function enabled)

※Out-of-range warning function and measurement arrival status transmission function can be switched

Example of send and receive

Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	02h	F	5	,	┘	1	,	6	,	0	,	1	,	03h	79h
	Operation state			Wireless ID1			10Nm		Nm		SW before measurement				

6.3.13 Wireless communication confirmation (W1)

You can check if wireless communication with the torque wrench is established.

Communication NG will be set if communication is not possible for 10 seconds.

Destination device →ZC-601W	1	2	3	4	5	6	7	8	9			
	STX	W	1	,	Wireless ID		,	ETX	BCC			
Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12
	STX	W	1	,	Wireless ID		,	Response code	,	ETX	BCC	

Item description

Item	Description
Response code	F0 : Communication OK F2 : Communication NG

Example of send and receive

Destination device →ZC-601W	1	2	3	4	5	6	7	8	9
	02h	W	1	,	┘	1	,	03h	77h
	Wireless communication status				Wireless ID1				

Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12
	02h	W	1	,	┘	1	,	F	0	,	03h	2Dh
	Wireless communication status				Wireless ID1		Normal(Communication OK)					

6.3.14 Wireless CH Read (Z1)

Read the wireless channel number of the ZC-601W.

Destination device →ZC-601W	1	2	3	4	5	6	7	8	9			
	STX	Z	1	,	0	0	,	ETX	BCC			
Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12
	STX	Z	1	,	0	0	,	Channel		,	ETX	BCC

Item description

Item	Description
Channel	Wireless channel number CH11~C26

Example of send and receive

Destination device →ZC-601W	1	2	3	4	5	6	7	8	9
	02h	Z	1	,	0	0	,	03h	6Bh

Wireless CH readout

Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12
	02h	Z	1	,	0	0	,	1	1	,	03h	47h

Wireless CH readout

Wireless CH 11

6.3.15 Wireless CH change (Z2)

Change the wireless channel number of ZC-601W.

Destination device →ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12
	STX	Z	2	,	0	0	,	Channel		,	ETX	BCC
Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12
	STX	Z	2	,	0	0	,	Response code		,	ETX	BCC

Item description

Item	Description
Channel	Wireless channel number CH11~C26

Example of send and receive

Destination device →ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12
	02h	Z	2	,	0	0	,	2	0	,	03h	46h

Wireless CH change

Wireless CH 20

Destination device← ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12
	02h	Z	2	,	0	0	,	F	0	,	03h	32h

Wireless CH change

Normal

6.3.16 Version information (ZV)

Call up the program version of ZC-601W.

Destination device →ZC-601W	1	2	3	4	5	6	7	8	9									
	STX	Z	V	,	0	0	,	ETX	BCC									
Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15			
	STX	Z	V	,	0	0	,	Version information										
	16	17	18	19	20	21	22	23	24	25	26	Version information					,	ETX

Example of send and receive

Destination device →ZC-601W	1	2	3	4	5	6	7	8	9
	02h	Z	V	,	0	0	,	03h	0Ch

Check version

Destination device ←ZC-601W	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
	02h	Z	V	,	0	0	,	1	.	0	.	0	_	_				
	Check version								Version 1.0.0_ _ _									
	16	17	18	19	20	21	22	23	24	25	26	_ _ _ _ _					,	03h

7 Troubleshooting

Cannot communicate with torque wrench	<ul style="list-style-type: none">➤ Check that the wireless channels of the ZC-601W and the torque wrench are matched.➤ Check that the antenna is not disconnected.
Serial communication not possible	<ul style="list-style-type: none">➤ Check if the communication method setting is correct.➤ Check if the pin assignment is correct.➤ Check if the port used is correct.
ERROR LED lights up	<ul style="list-style-type: none">➤ Excessive communication with the torque wrench. Please reduce the number of torque wrenches.
Power will not turn on	<ul style="list-style-type: none">➤ Check that the power cable is not disconnected.➤ Check if the DC jack/plug is not deformed.
Judgment result LED does not light up	<ul style="list-style-type: none">➤ Check if the wireless ID number of the torque wrench is within range.

8 Warranty

The warranty period for this product is one year from the date of purchase. During the warranty period, any failure of the product under normal use will be repaired free of charge or replaced with a substitute product. However, in the following cases, the product will be repaired for a fee even if it is still within the warranty period.

- (i) When the failure is caused by careless handling
- (ii) Due to impact during transportation/transfer by the customer
- (iii) Failure or damage due to acts of God, pollution, abnormal voltage, or other external causes
- (iv) When it is determined that there has been modification or repair by the customer himself/herself