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Adrec proposes

Digitalization of screw tightening operations

Prevents forgetting to tighten screws and improves work efficiency!

Digital Torque Wrench / *Wireless Receiver* / *Various Software*

Digital Torque Wrench

Digitization of screw tightening operations makes
torque management more accurate.
By wirelessly linking to PC or PLC, data can be stored and used,
and Poka-Yoke system can be constructed.

Reliable support for tightening work

Bar gragh&LED display/ Buzzer sound/ Vibration/
Notice with three senses

Blue LED

Lower limit to upper limit:
Blue LED lights up.

Red LED

Over upper limit:
Red LED lights up.

Buzzer sound & Vibration

Wireless Receiver : ZE

*For HTW it is optional

One receiver (PC) supports up to 255 Torque Wrenches.

*For simultaneous reception it supports up to 16 Torque Wrenches.

Angle specifications (Optional)

When using the double-tightening prevention/screw tightening inspection function

[Dch] is without angle calibration

*Not supported for HTWS only

Since angle calibration is not performed, angular accuracy is not guaranteed,
but it can be used to prevent double-tightening and for screw tightening inspection.

Angle measurement starts from 10% of the lower limit torque.

Double tightening prevention It will detect when a screw tightened to the specified torque is tightened again.

▶ When the specified angle is 10 degrees

[OK] If the tightening angle is 10 degrees or more.

[NG] If the tightening angle is less than 10 degrees.

Screw tightening inspection It will detect a loose screw and complete tightening at the same time.

▶ When the allowable angle is 5 degrees

[OK] If the tightening angle is less than 5 degrees.

[NG] If the tightening angle is 5 degrees or more.
Then Data is output, and the history of re-tightening
with the specified torque remains.

When tightening with the rotary angle method or measuring exact angles

[Ang] has angle calibration

*Not supported for HTWS only

Angular accuracy of ±2 degrees is guaranteed due to angle calibration.
Double-tightening prevention and screw-tightening inspection functions are also available.

Tightening with the rotary angle method Torque to the snag point and measure the angle after reaching it.

It measures the torque until
reaching the snag torque value.

After it reaches the snag torque value
it measures the angle.

Drip-proof / Indicator specifications (Optional)

LED lamps and loud buzzer allow work day and night.
Drip-proof is compatible with IPX6.

「TG」,「ID」or「TI」

*Not supported by some models

Stage warning

Specified value

Over torque

Large Torque Wrench
HTWC-400Ⅱ
Drip-proof/
Indicator specifications

Wireless Receiver

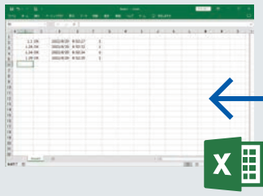
Receiver

Receiver simply connects to a computer (ZC-202W etc.)

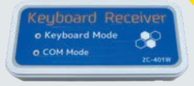
- Communication distance: 30 to 60 meters
- Torque Wrench ID management: Maximum 255 wrenches

Receiver with keyboard input capability (ZC-401W)

- In addition to the functions of ZC-202W, direct input to Excel, etc. is included.
- Not only torque values, but also tightening date and time, and judgment results can be output.



Direct input
of tightening results, etc.



ZC-401W

Serial communication/external output compatible device (ZC-601W)

- Send tightening data to PLC or other devices via serial communication
- Torque wrench settings can be changed from PLC
- 16 external contact outputs (OK signal: 8 points, NG signal: 8 points)

PLC Equipment

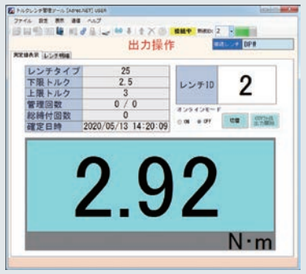
ZC-601W

Various Software

Various Software will be provided free of charge.

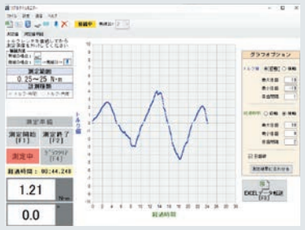
Standard Software [Adrec. Net]

for basic settings of
Torque Wrench



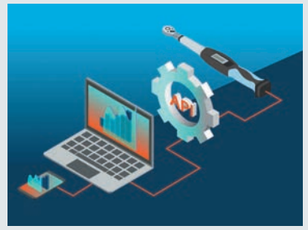
Real-time Monitor

to analyze the relationship
between torque and angle



Communication Class Library

that makes it easy to
build your own software



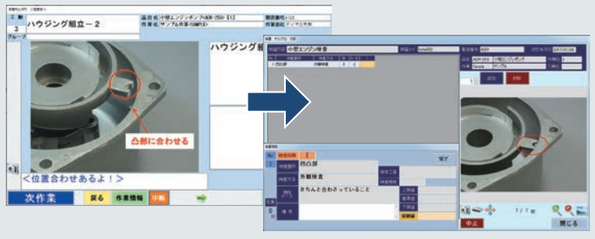
Software for manufacturing support and traceability management is also available (at cost).

DigiProMaster

for manufacturing
support software

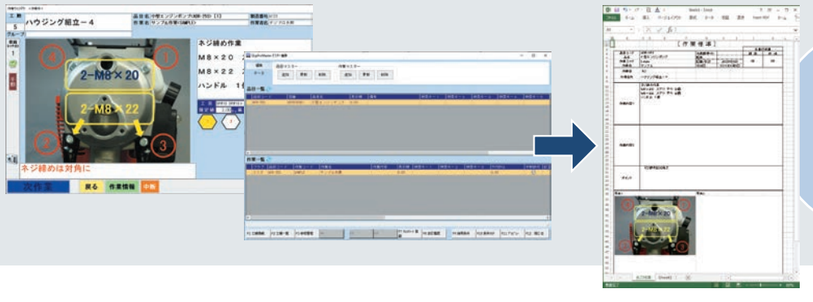
Digipro Inspection

linked to DigiProMaster
and can keep inspection history



Digipro Work Standard Creation

for creating work standards from DigiProMaster



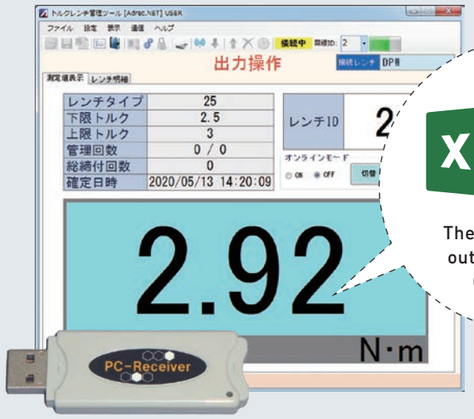
Photos can be
output as is.

《Various construction examples》

Torque Wrench setting management

Standard Software [Adrec.Net]

Tightening data management



The results will be output in Excel or CSV format.

If you want to save the tightened torque value as data. Case 1

If you want to use it for outdoor work. Case 2

See page 8 for details.

Linking with manufacturing support software

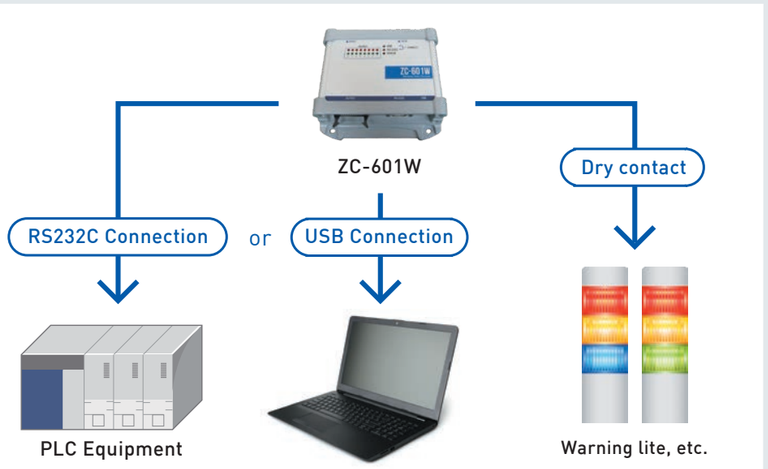
DigiProMaster &
DigiProInspecton

If you want to install manufacturing support software. Case 5

See page 10 for details.

Adrec's Torque Wrench can meet various needs of customers!

Control of various devices

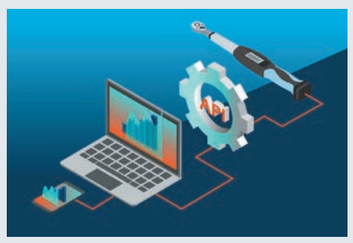


If you want to control the line from the result of tightening. Case 3

See page 9 for details.

Linking with in-house system

[Adrec Class Library]



If you want to link Torque Wrench with in-house system. Case 4

See page 9 for details.

Real-time display of torque and angle

Free supply
[Realtime Monitor]

If you want to experiment and verify.
(Rupture torque verification, etc.) 事例 6

See page 10 for details.

Case 1 If you want to save the tightened torque value as data.

With Standard Software, the task can be done easily!

Please consult with us about customization of Standard Software.

Application example
■ Assembly work

Screw tightening work

Standard Software receives the results in real time.

The file will be saved in Excel or CSV format.

Wireless Receiver

Various types of receivers are available to suit different usage situations!

Case 2 If you want to use it for outdoor work.

Without a computer Torque Wrench can store 6000 data!

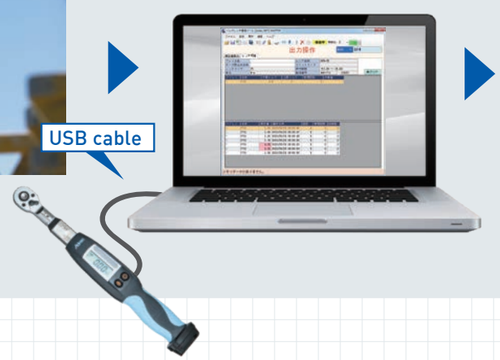
Application example
■ Solar panel installation work
■ Railroad wire maintenance work
■ Outdoor work

Outdoor screw tightening work

Torque Wrench can store 6000 tightening results!

After the work is finished, Torque Wrench is wired to a PC and the results are extracted with Standard Software.

USB cable



The file will be saved in Excel or CSV format.

Case 3 If you want to control the line from the result of tightening.

Receiver ZC-601W makes it possible!

Application example
■ Assembly work

- PLC receives tightening data, and line control from tightening results can be realized.
- Communication specifications are disclosed free of charge.

It counts the number of times of tightening with normal torque, and directs the line control.

PLC Equipment
Serial communication with RS232

Data-Controller ZC-601W

Assembly work line

Case 4 If you want to link Torque Wrench with in-house system.

Our Class Library (free of charge) makes it possible!

Application example
■ Various engine assembly
■ Aircraft-related equipment
■ Switchgear assembly
■ Automotive electrical equipment

- It can be linked with your own production software (such as manufacturing support software).
- System development can be greatly reduced with the Class Library.
- It allows even those unfamiliar with communication control to build a torque management system.

The communication format is also be disclosed free of charge.

Communication Class Library

All communication with Torque Wrench is done through the Class Library.

- Simplified command set
- Various events
- Cumbersome communication control process

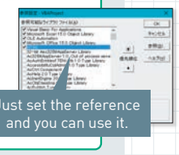
Notify completion of data reception

Execute commands for various settings

Application Development Environment

Just set the values in the provided properties and call the instruction command!

[Excel] Communication in a macro environment is also possible.



Just set the reference and you can use it.

*Operating environment: Windows 8.1, 10, or 11, and Microsoft.NET Framework3.5 are required.

Case 5 **If you want to install manufacturing support software.**

Please use our manufacturing support software "DigiProMaster"!

Application example
- Various engine assembly
- Motorcycle related
- Industrial robot assembly
- Valve Equipment

- First, link Torque Wrench to DigiProMaster.
- Next, set the torque value registered in the procedure master to Torque Wrench from the software side.
- Then, all your work history will be saved.

DigiPro work monitor

The operator follows the steps displayed on the monitor.

The set torque value registered in the master is automatically set.

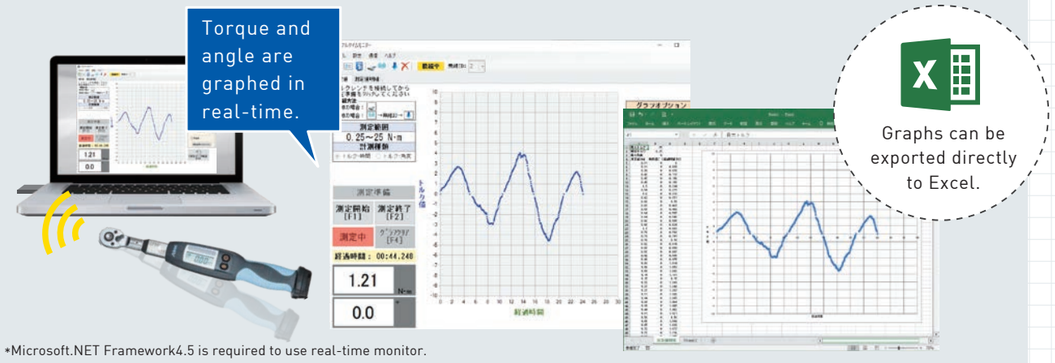
Case 6 **If you want to experiment and verify.** (Rupture torque verification, etc.)

Please use our Real-time Monitor (free of charge)!

Application example
- Manufacturers
- Development and Design Division

- Torque value and angle are output in real-time mode (Wired: every 15 ms, Wireless: every 40 ms).
- You can analyze the relationship between torque and angle.

Torque and angle are graphed in real-time.



Graphs can be exported directly to Excel.

*Microsoft.NET Framework4.5 is required to use real-time monitor.
The name Excel and its logo are registered trademarks of Microsoft Corporation.

Tightening Torque for Bolts

Nominal Diameter of bolts and screws	Bolt Two Side Width Dimensions (unit: mm)					Reference Standard Tightening Torque (Unit: N·m)			
	Hexagonal bolt	Small hexagonal bolt	Hexagonal bolt for high-strength structural bolting	Hexagon socket set screw	Hexagon socket head cap volt	Standard T series (General)	1.8 series (Vehicle body/Internal combustion engine)	2.4 series (Architecture/ Construction)	0.5 series (Electronic products)
M2	4	–	–	0.9	1.5	0.176	0.315	0.42	0.088
M2.5	5	–	–	1.3	2	0.36	0.65	0.86	0.18
M3	5.5	–	–	1.5	2.5	0.63	1.14	1.5	0.315
(M3.5)	6	–	–	–	–	1	1.8	2.4	0.5
M4	7	–	–	2	3	1.5	2.7	3.6	0.75
(M4.5)	8	–	–	–	–	2.15	3.9	5.2	1.08
M5	8	–	–	2.5	4	3	5.4	7.2	1.5
M6	10	–	–	3	5	5.2	9.2	12.2	2.6
(M7)	11	–	–	–	–	8.4	15	20	4.2
M8	13	12	–	4	6	12.5	22	29.5	6.2
M10	16 (17)	14	–	5	8	24.5	44	59	12.2
M12	18 (19)	17	22	6	10	42	76	100	21
(M14)	21 (22)	19	–	–	12	68	120	166	34
M16	24	22	27	8	14	106	190	255	53
(M18)	27	24	–	–	–	146	270	350	73
M20	30	27	32	10	17	204	370	490	102
(M22)	34 (32)	30	36	–	–	282	500	670	140
M24	36	32	41	12	19	360	650	860	180
(M27)	41	36	46	–	–	520	940	1,240	260
M30	46	41	50	–	22	700	1,260	1,700	350
(M33)	50	46	–	–	–	960	1,750	2,300	480
M36	55	50	–	–	27	1,240	2,250	3,000	620
(M39)	60	55	–	–	–	1,600	2,900	3,800	800
M42	65	–	–	–	32	2,000	3,600	4,800	1,000
Related Standards	JIS B1180		JIS B1186	JIS B1177	JIS B1176				
Material						SS	SCr	SCr	CR
						SC	SNC	SCM	CB
							SCM	SNCM	AB
Strength Classification (JIS B 1051)						4.6～6.8	8.8～12.9	10.9～12.9	–

*Reference axis stress:210 N/mm²

Torque Unit/Conversion Table

	Gravitational unit system	SI unit system	Yard-Pound units
Torque Unit	kgf·m	N·m	lbf·in
	kgf·cm	cN·m	lbf·ft
	gf·cm		ozf·in
Conversion within units	1 kgf·m = 100 kgf·cm	1 N·m = 100 cN·m	1 lbf·ft = 12 lbf·in
	1 kgf·cm = 1000 gf·cm		1 lbf·in = 16 ozf·in
	1 kgf·cm = 10 kgf·mm		
Conversion between units	1 kgf·cm = 0.0981 N·m	1 N·m = 10.197 kgf·cm	1 lbf·in = 1.1521 kgf·cm
	1 kgf·cm = 0.8680 lbf·in	1 N·m = 8.8508 lbf·in	1 lbf·in = 0.1130 N·m
	1 kgf·cm = 0.0723 lbf·ft	1 N·m = 0.7376 lbf·ft	1 lbf·ft = 13.825 kgf·cm
			1 lbf·ft = 1.3558 N·m
Unit of Force	1 kgf = 9.8067 N	1 N = 0.1020 kgf	1 lbf = 0.4536 kgf
	1 kgf = 2.2046 lbf	1 N = 0.2248 lbf	1 lbf = 4.4482 N
			(1 lbf = 16.000 ozf)
Unit of Length	1 cm = 0.3937 in	1 m = 3.2808 ft	1 in = 2.5400 cm
			1 ft = 0.3048 m
			(1 ft = 12.000 in)