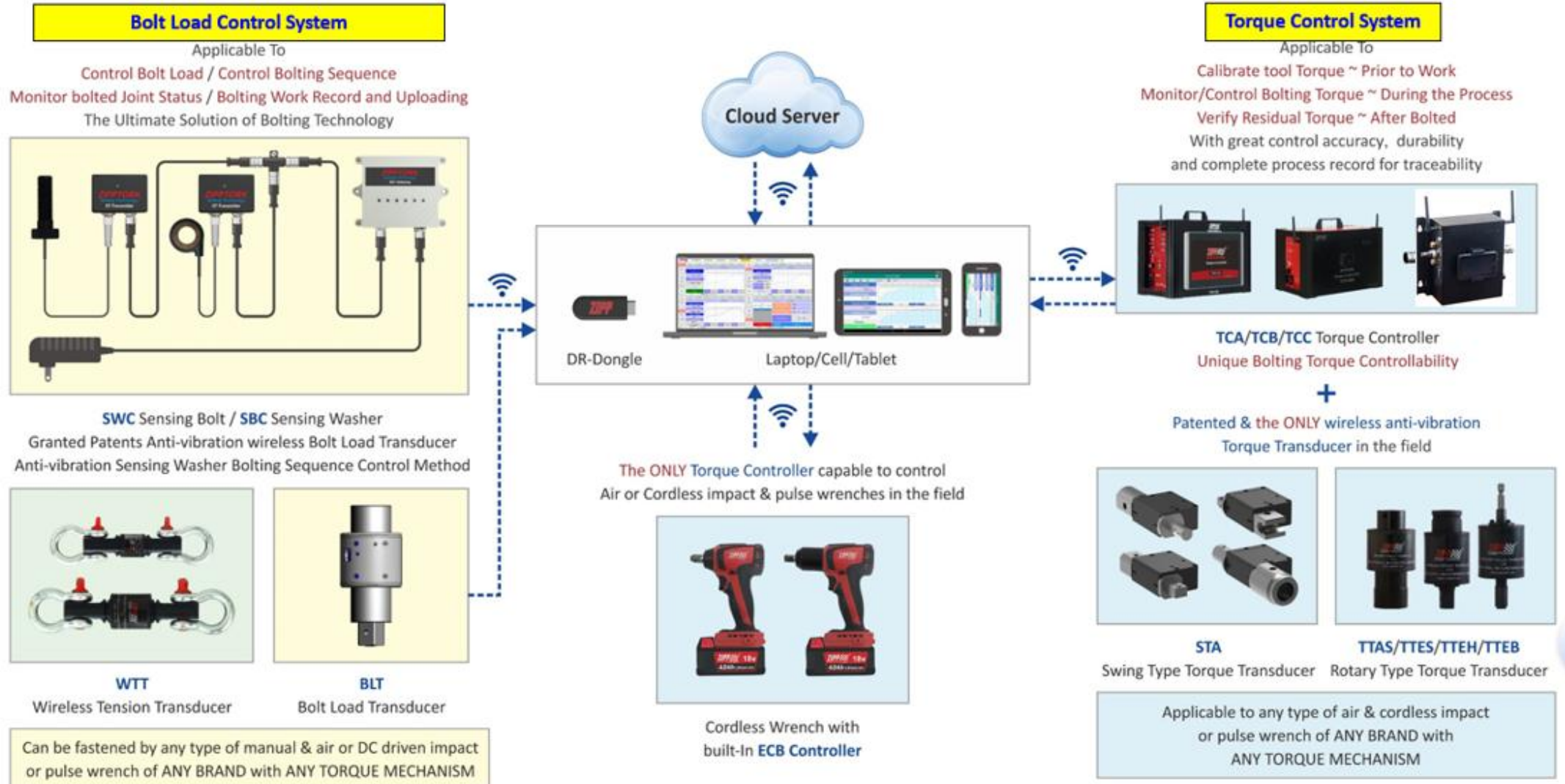




Smart Fastening Solutions Overview

ZIPPTORK

Torque Control & Bolt Load Control System



ZIPPTORK

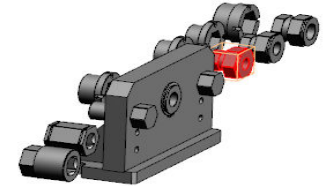
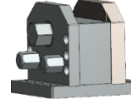
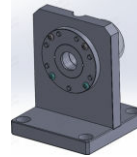
Bolting Control Series Products



TCA / TCB / TCC
Torque Controller



ECBI / ECPB
Built-in Torque Control Board



TT+TTT
Torque Tester+ Torque Tension Tester



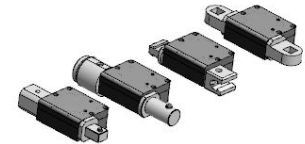
TTAS / TTES / TTEB
Wireless Rotary Type Torque Transducer



TTEH
Socket Type Torque Transducer



TTEM / TTAM
Wireless Torque Transducer for Torque Multiplier



STA / STA-m / STA-M
Wireless Swing Type Torque Transducer



BLT
Wireless Bolt Load Transducer



SWC
Anti-Vibration Sensing Washer



ST
Signal Transmitter



SG
SWC Gateway



ATM / ATMT
Air Torque Multiplier



ETM / ETMC / ETMCT
Cordless Torque Multiplier



DR-RF
Dongle



BG
1 to 7 BT Gateway



BLSD
Break Load Sensing Device



SFSD
Squeeze Force Sensing Device



WTT
Wireless Tension Transmitter



DDT
Data Display Transceiver

Application Map

Stage	Solution
Before	Torque Calibration (TT/TTT)
During	Torque Control (TCB/TCC + TTES/STA)
After	Residual Torque Verification (STA / TTA)/(ATM/ETMC +TTEM)>1000Nm

Torque Control System

Define real torque tool performance

Torque Tester

TT

Calibrate the torque tool accuracy
and consistency

Torque Tension Tester

TTT

Define the real bolting capability of an
impact or pulse wrench

Make **uncontrolled tools** **controllable**

Torque Controller

TCA / TCB / TCC

- Pressure Mode
- Transducer Mode
- ACCU Mode

Air Impact Wrench/Pulse Wrench **compatible**

Wireless Torque Transducer

Rotary Type / Reaction Type

TTEB / TTES / TTEH / TTEM / TTAM

Swing Type

STA / STA-m / STA-M

TTES / TTEH **~ Impact-type tool** **compatible**

Bolt Load Control System

An alternative to ultrasonic bolting technology

BLMS

Bolt Load Monitoring System

SWN/SWR Sensing Washer

**For direct bolt load control and
bolted joint remote monitoring**

Any Torque tool compatible

BLT

Rotary-type

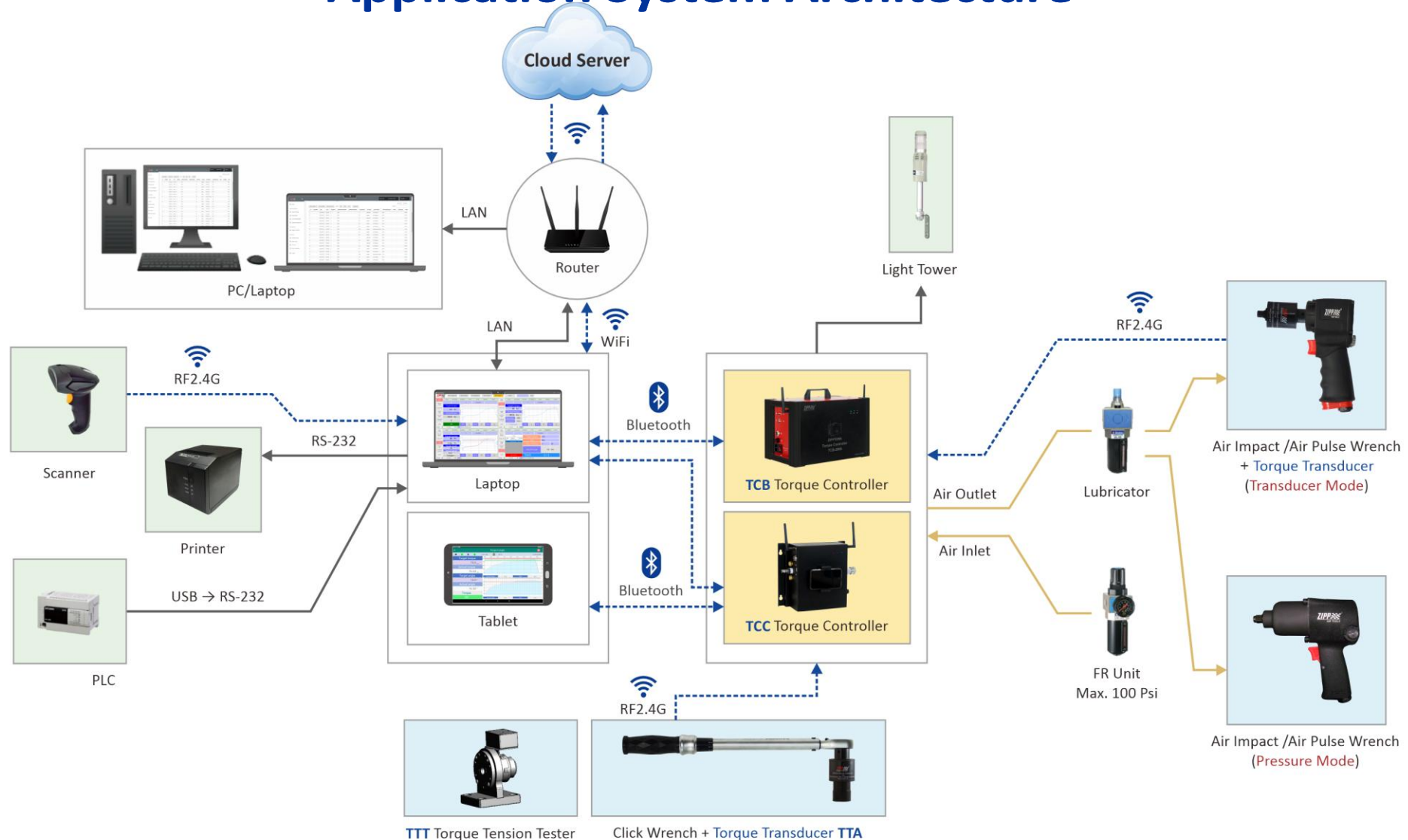
Wireless Bolt Load Transducer

**For instant bolt load sensing and
transmitting throughout the process**

Any manual/geared torque tool compatible

TCB/TCC Torque Controller

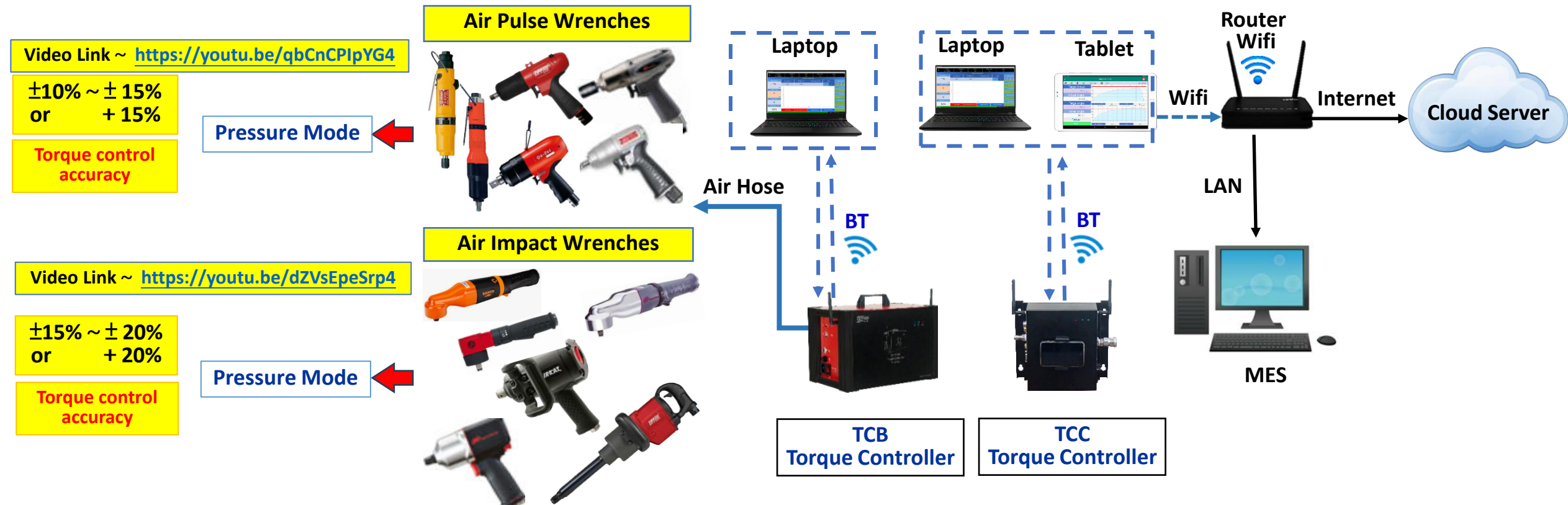
Application System Architecture



Bolting Torque Control of Air Impact Wrenches & Pulse Wrenches

Air Impact Wrenches or Pulse Wrenches + TCA/TCB/TCC Torque Controller + Laptop, under **Pressure Mode** →
WiFi → peripheral devices or cloud server

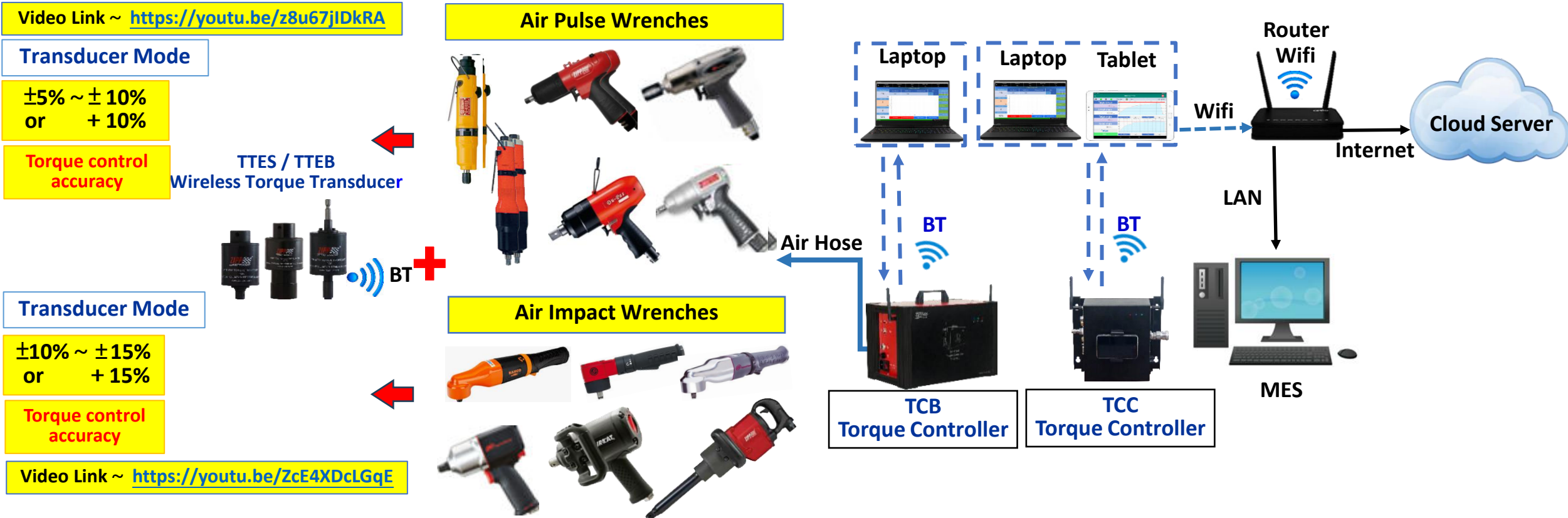
Application System Architecture



Bolting Torque Control of Air Impact Wrench & Pulse Wrenches

Air Impact Wrenches or Pulse Wrenches + TCB/TCC Torque Controller + TTES wireless Torque Transducer + Laptop,
under **Transducer Mode** → WiFi → peripheral devices or cloud server

Application System Architecture



Bolting Torque Control Application Embodiments

Compatible with all air impact and pulse wrenches, regardless of brand or mechanism

Torque Controllers are not recommended for clutch type 、 ratchet type & auto-shutoff type torque tools

Air Pulse Wrench

Video Link ~ <https://youtu.be/qbCnCIpYG4>

$\pm 10\% \sim \pm 15\%$
or $+ 15\%$

Pressure Mode

Torque control
accuracy

Video Link ~ <https://youtu.be/z8u67jIDkRA>

$\pm 5\% \sim \pm 10\%$
or $+ 10\%$

Transducer Mode

Torque control
accuracy



Wireless Torque Transducer



TCA / TCB / TCC
Torque Controller



Video Link ~ <https://youtu.be/dZVsEpeSrp4>

Pressure Mode

$\pm 15\% \sim \pm 20\%$
or $+ 20\%$

Torque control
accuracy

Video Link ~ <https://youtu.be/ZcE4XDcLGqE>

Transducer Mode

$\pm 10 \sim 15\%$
or $+ 15\%$

Torque control
accuracy



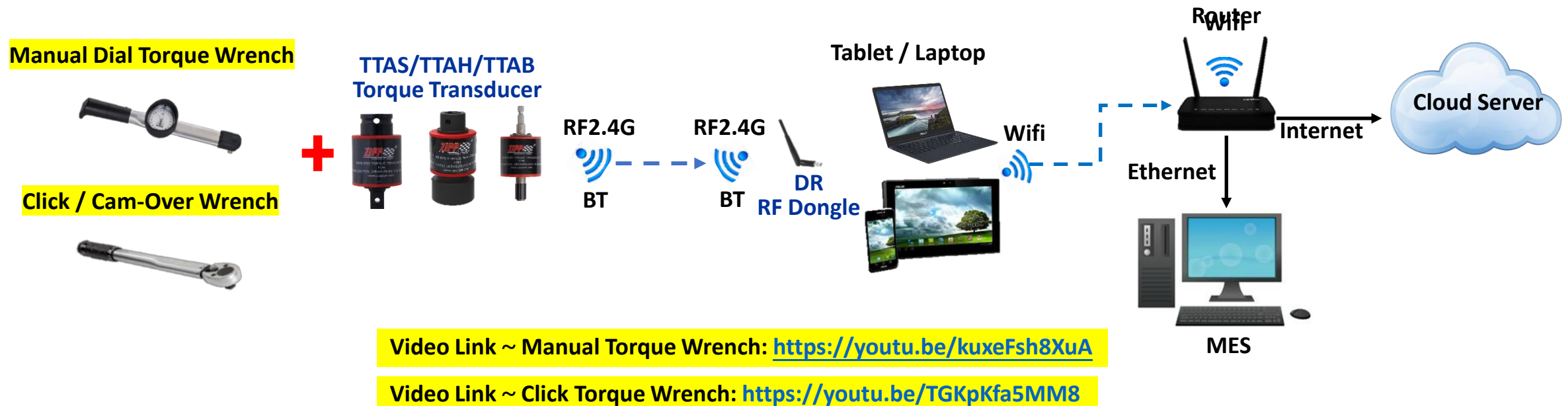
Wireless Torque Transducer

Data Collection for Manual Torque Wrenches

Manual Torque Wrench / Click Wrench / Cam-Over Wrench + **TTAS/TTAB wireless Rotary Type Torque Transducer**
→ RF2.4G / BT

→ **DR-RF Dongle** (RF only) + Tablet / Laptop (**APP**~Android/Windows) → WiFi → peripheral devices or Cloud Server
Torque control accuracy within $\pm 5\%$ or less, depending on the quality and stability of the tool used and the grip of the tool during operation

Application System Architecture



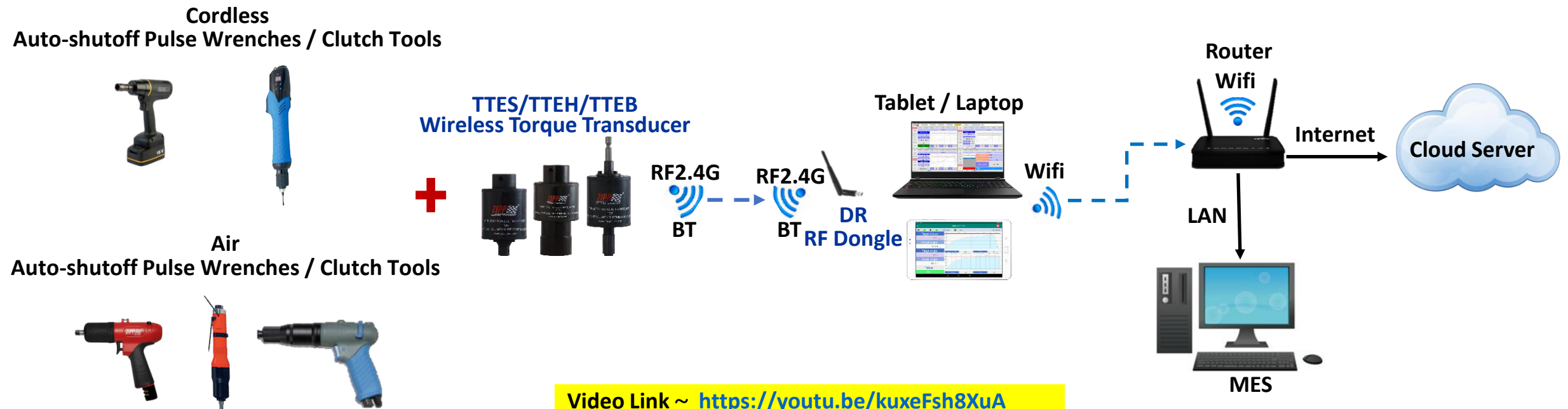
Bolting Torque Control Application Embodiments

Monitoring bolting torque of clutch or Auto-shutoff Type Tool

Any Air or DC driven torque tool with the **clutch or auto-shutoff mechanism** + **TTES/TTEB wireless Rotary Torque Transducer**
→ RF2.4G/BT → **DR- RF Dongle (RF only)** + Tablet/Laptop (**Android APP/Windows software**) →
WiFi → Peripheral Devices or cloud server

Torque control accuracy within $\pm 5\%$ or less, depending on the quality and stability of the tool used and the grip of the device during operation

Application System Architecture



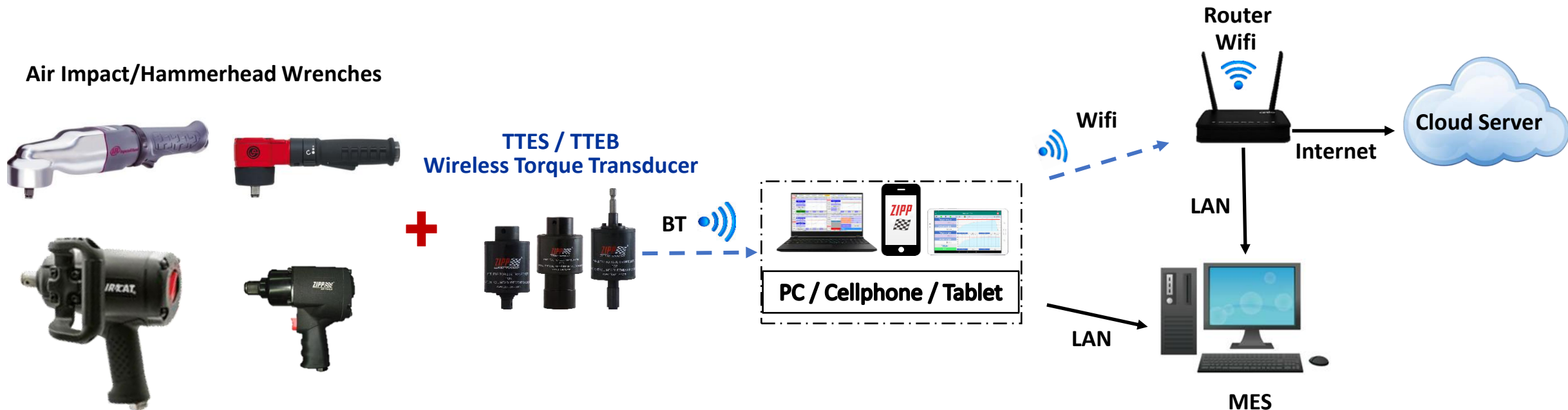
Video Link ~ <https://youtu.be/kuxeFsh8XuA>

Video Link ~ <https://youtu.be/oZ5SyGbxnbl>

Bolting Torque Control of Air Impact Wrenches

Air Impact Wrenches + **TTES wireless Torque Transducer** + **TMS APP** + Laptop, under **Timer Mode** →
Wi-Fi → peripheral devices or cloud server
Torque control accuracy within $\pm 15\% \sim \pm 20\%$ or $+20\%$

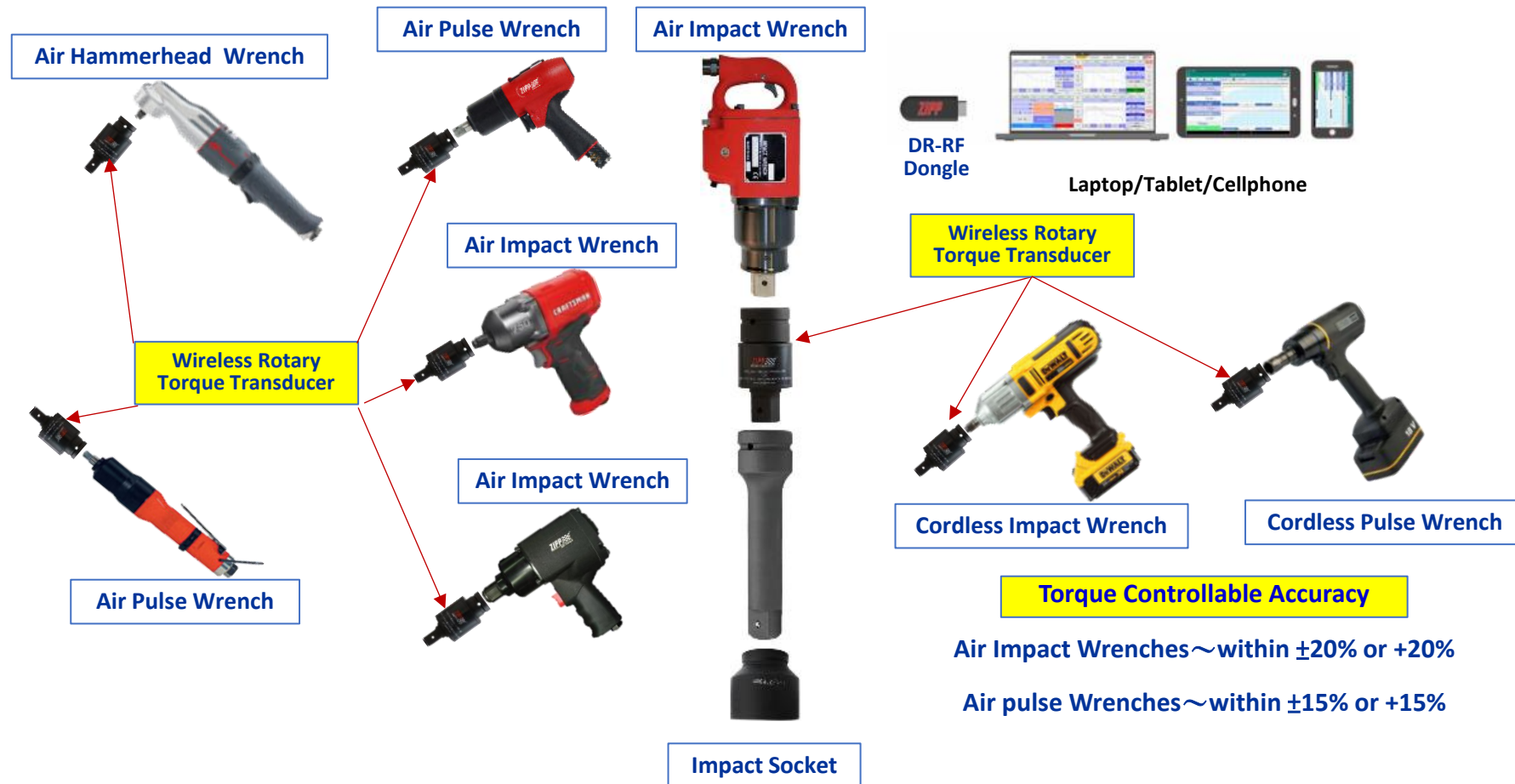
Application System Architecture



Video Link ~
<https://www.youtube.com/watch?v=bAj6y32qpqE>

Wireless Rotary Torque Transducer Application Embodiments

The **wireless rotary torque transducer** can be externally attached to the output square drive of air impact wrenches or hydraulic pulse tools. When used together with the **free software**, it enables simplified torque control. Once the preset fastening time is reached, the system issues an alert on a laptop or tablet, prompting the operator to release the trigger and stop operation. At the same time, the fastening data is recorded and can also be transmitted wirelessly.



Wireless Rotary Torque Transducer Applications

Patented anti-vibration and wireless design

Applicable to any power torque tools with **clutch or auto-shutoff mechanism** for torque monitoring and data collection



DR-RF Dongle



TTES/TTEB
Wireless Torque Transducer

Cordless Clutch Type Tool/ Auto Shutoff Type Pulse Wrench



Air Clutch Type Tool / Auto Shutoff Type Pulse Wrench



Applicable to any brand power torque tools with impact or pulse mechanism for torque control and data collection under various control modes while use the **Torque Controller** designed with **patented control algorithm and device**

Air Oil Pulse Wrench



Air Impact / Hammerhead-Angle Impact Wrench



TCA / TCB / TCC
Torque Controller

Smart Alternatives to Pulse Wrench Bolting

Replace Heavy Pulse Wrenches with ZIPPTORK's Lightweight Smart Solution

ATLAS COPCO EP25PTX900 GR25-RE 900Nm / EP19PTX450 HR20-RE450Nm



EP25PTX900 GR25-RE
1" Dr. 900Nm, 11.87Kg

US\$16,189



EP19PTX450 HR20-RE
3/4" Dr. 450Nm, 4.2Kg

US\$9,588



UXR-3000S
1" Dr. 850Nm, 13.3Kg

US\$11,240



UXR-2000
3/4" Dr. 450Nm, 6.5Kg

US\$5,592



ZIPPTORK's Alternative ~ Achieve a cost-effective and lightweight replacement by pairing an air impact wrench with a shock-proof wireless rotary torque transducer and a torque controller, complete with data collection and transmission capabilities.

±10% ~ ±15%
or +15%

Pressure
Mode



ZIW1015C 1/2 " Dr.
Composite Air Impact Wrench
880Nm, 2.1Kg

± 5% ~ ±10%
or + 10%

Transducer
Mode



US\$4,100



US\$420

ZIW1078C 1 " Dr.
Composite Air Impact Wrench
1,630Nm, 3.7Kg

TTES/TTEH-1000
Wireless Torque Transducer

Video Link ~ <https://youtu.be/qbCnCPlpYG4>



TCB
Torque Controller

US\$6,000



TCC
Torque Controller

US\$3,000



Router
Wifi



Internet

Cloud Server



LAN



MES

Video Link ~ <https://youtu.be/z8u67jIDkRA>

Bolt Load Control Series Products

BLMS Bolt Load Monitoring System

Ideal for critical bolted joints where bolt load control is important & bolted joint status monitoring is required

Precision bolt load control / Patented anti-vibration design/ideal for transmission equipment

Remote monitoring after bolting / The ultimate solution of bolting technology

The most economic & effective alternative to ultrasonic bolting technology



SWN / SWR
Sensing Washer



ST
Transceiver

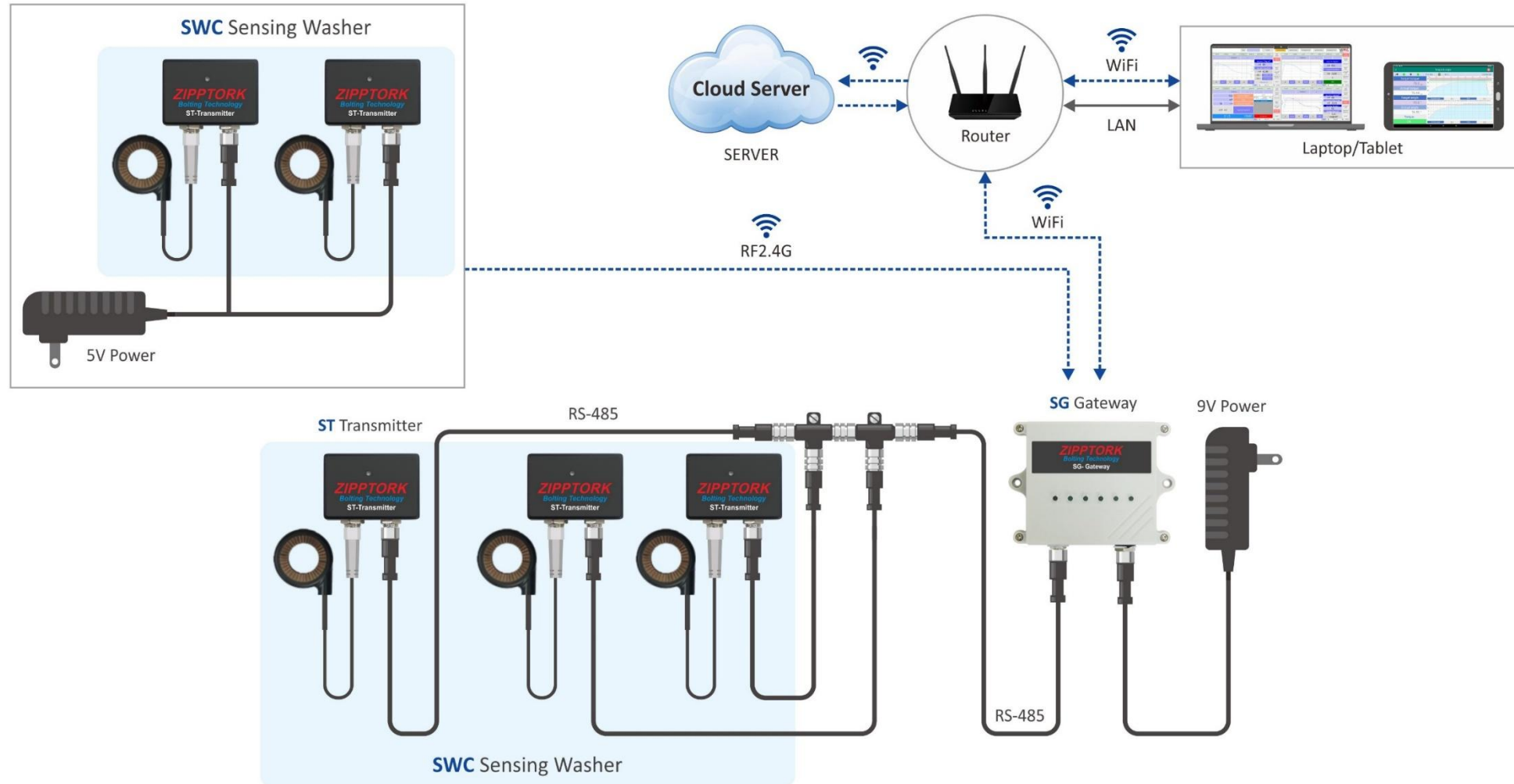


SG
Gateway



BLT
Wireless Bolt Load Transducer

Bolt Load Monitoring System Application System Architecture



Product Selection Guide

Application	Solution
Manual torque wrench torque calibration/Power torque tool output torque verification	TT + Tablet/Laptop or DDT
Discrete-type power torque tool bolting torque capability test and bolting torque simulation	TTT + Tablet/Laptop or DDT

Application	Solution
Air /DC Clutch-type & Auto-shut-off-type torque monitoring & data logging	TTEB/TTES + Tablet/Laptop

Application	Solution
Air Impact wrench torque control <20%	TCB/TCC/TCD
Need higher accuracy <15%	+ TTEs
Air Pulse wrench torque control <15%	TCB/TCC/TCD
Need higher accuracy <10%	+ TTEs

Application	Solution
Air torque multiplier torque control <10%	ATM+TCB/TCC/TCD
Air torque multiplier + Transducer <3%	ATMT / ATM + TTAM/TTEM
DC torque multiplier torque control <10%	ETM / ETMCT
DC torque multiplier torque control <3%	ETMCT or ETMC+ TTAM/TTEM

Application	Solution
Residual torque verification / QC	STA / TTA + DDT /Tablet

Application	Solution
High Residual torque verification/QC	ATM/ETM + TTEM + DDT

Application	Solution
Real-time bolt load control during the process <5%	BLT + DDT /Tablet
Bolt Load Control & Bolted Joint Remote Monitoring <5%	BLMS + DDT /Tablet