

MTBR **///X**

The Universal Diesel & Gasoline Test Bench

Flagship Specialist Service Station. Every System. Every Brand. Zero Compromise.



Authorized Solution for
Schaeffler / Continental



CloudX AZO

MTBR ///X | PTBR ///X

The Ultimate Diesel Test Bench

All-in-One Specialist Service Station.
One Platform. Every System.

PTBR ///X

The Dedicated High-Pressure
Pump Test Bench

Specialist Service Station. Every
Diesel & GDi Pump Diagnostics in
One Bench.



MTBR ///X

The Universal Diesel &
Gasoline Test Bench

Flagship Specialist Service
Station. Every System. Every
Brand. Zero Compromise.



CRI · CRp · HEUi · EUi/EUp · HEUp · GDI · MI · FSC

CRp · HEUp · GDp · FSC

MTBR-X Portable Tool Cart

Organized storage for adapters, fittings,
cables and injector/pump clamping sets,
within arm's reach of the bench.

MTB | PLATFORM

MTBR-X

PTBR-X

SPECIALISTS SOLUTIONS

OVERVIEW

MTBR //X | PTBR //X

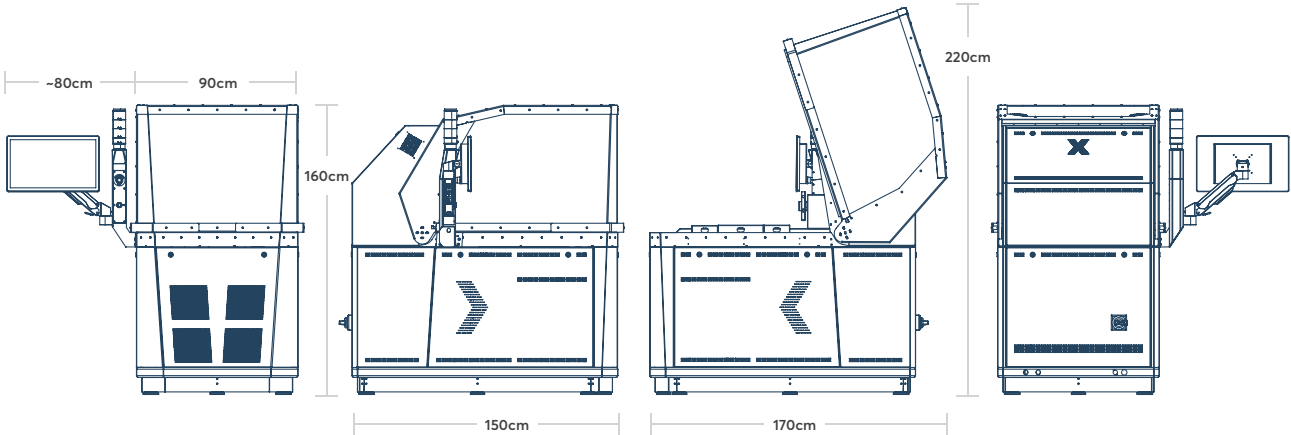


Every System.
One Platform.
Zero Compromise.

The MTBR-X does the work of an entire diesel-and-gasoline test room, CR injectors and pumps, GDi injectors and pumps, EUI / EUP and fuel-system components, on a single platform, one database, one operator.

SPECS & METRICS

Weight	915kg	Voltage	380-480 V · 3P+PE · 50/60 Hz	Current	63 A
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EU6 / EU7
testing standards.

Future-proof from day one

Pressure up
to 3,000 bar

for the highest-performance
injectors on the road

Authorized Solution for
Schaeffler / Continental
Continental

CloudX AZO

TOTAL SYSTEM COVERAGE

- All major systems on one platform:
CRi · CRp · HEUi · EUI/EUp · HEUp · GDI · MI · FSC
- The market's most extensive injector coding capability
- Drive power: 18.5 kW / 25 HP
- 11,000+ part numbers in the factory database, continuously updated
- Built-in Test Plan Editor: for OEMs, remanufacturers and engineering labs

ENGINEERED FOR PRECISION

- Integrated waste tank with injector and pump flushing
- Advanced closed-loop temperature control: EU6 / EU7 compliant
- Water or Air cooling system
- Powered by CloudX: every result encrypted, cloud-stored, GDPR-compliant. No third-party sharing. Industry 4.0 ready.
- AZO operating system: the most intuitive, user-friendly HMI on the market

OEM-AUTHORIZED. OEM-TRUSTED.

Authorized by Schaeffler / Continental; built to OEM testing standards across Bosch, Delphi, Denso, Stanadyne, Caterpillar, Liebherr, MTU, L'Orange and Cummins platforms. Additional authorizations pending.

AFTERMARKET-READY. INDUSTRY-CONNECTED.

CLOUDX REPAIR HUB. Certified third-party repair solutions, built to complement the market, not compete with it. Hard-to-source parts, test plans not published by OEMs, and calibrations from approved specialists. Co-branded with our partners. OEM testing stays primary; the Repair Hub fills the gaps, optional and clearly marked. You decide what to use.

ERGONOMICS

- All-round workspace access
- 22" industrial-grade Android HMI (fully adjustable)
- Easy pump and cambox mounting (portable trolley); fast cambox setup (EZO kit)
- Injector mounting designed for mass production
- HP-hose-free injector system (fully adjustable)
- Intuitive cable and hose management; auxiliary racks and shelves (optional)



MTB | PLATFORM

MTBR-X

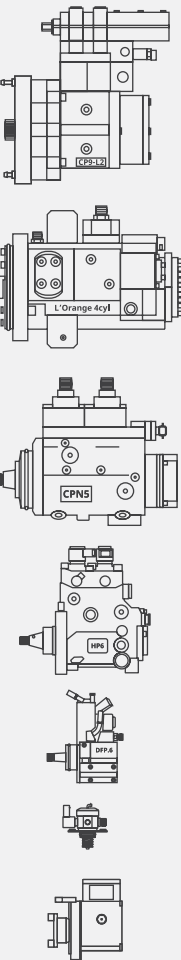
PTBR-X

SPECIALISTS SOLUTIONS

PUMPS

MTBR PTBR

Universal high-pressure testing for every diesel & gasoline pump in production worldwide.



FEATURES

- Tested to OEM Standards
- Lubrication supply / drainage: no mess, no oil waste (aCPL)
- CAN-Bus communication protocol
- 18.5 kW / 25 HP drive power: covers heavy-duty CP9, CPN5/6, XPI 3-cyl, L'Orange DCO
- Dual measurement system: up to 1,000 L/H

TESTS PERFORMED

- Flow vs pressure
- Flow vs speed (RPM)
- Multiple conditions, torque, power up to 5,000 RPM
- Control valves (PCV, VCV, IMV, EAV, ZME, SCV)
- Smart Sync Control Valve [EU6]: Bosch CP4-EU6, Denso HP5, Schaeffler / Continental
- Return flow • Seal integrity • IP transfer-pump pressure (auto) • VAC transfer-pump vacuum (auto) • Control valve electrical / insulation • Pressure-curve visual analysis (plunger) • Pump pressure-sensor test



Test time:
5–20 min

Max RPM:
5,000

Pressure: up
to 3,000 bar

Database:
4,500+
part numbers

Brand	Families & Applications
Bosch	CP1x, CPN2, CP3x, CP4x, CP5, CPN5, CP8, CPN6, CBxx, CP9-L2
Delphi	DFP1, DFP3, DFP4, DFP5, DFP6, DFP7, DFP8, DFP9*
Denso	HP0, HP2, HP3, HP4, HP5 (S/D), HP6, HP7
Schaeffler / Continental	K10, K16, PCR1, PCR2, PCR2.1, PCR3
Stanadyne	DCR (1 / 2 / 6 piston)
Caterpillar	C-HPCR – C4.4, C6.6, C7.1, C9.3 ACERT
Cummins	XPI 1-cyl, XPI 2-cyl, XPI 3-cyl, Denso HPCR
Liebherr	LP7.2, LP11.2, LP11.5, LP11.6
Woodward L'Orange	DCO (4-cyl)
GDI High-Pressure Pumps	All rotary & cam-driven – Bosch HDP1/2/3/5, Continental, Hitachi, Denso; Ford EcoBoost, VW TSI/TF SI, BMW N20/N55/B58, GM Ecotec, Hyundai GDI

MTB | PLATFORM

MTBR-X

PTBR-X

SPECIALISTS SOLUTIONS

INJECTORS

MTBR

Complete coverage of every Common-Rail Diesel and Gasoline injector platform, from passenger-car piezo to large-engine CRIN-LE. Full testing and coding, extending the MTBR-X beyond diesel to modern gasoline direct injection.

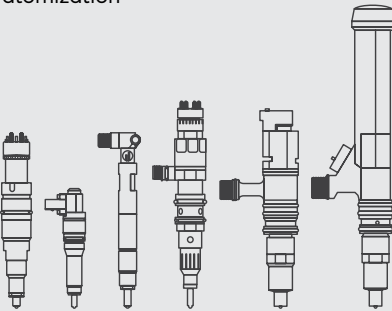
Brand	Families & Applications
Bosch	CR11, CR12, CR13, CRIN1, CRIN2, CRIN3, CRIN4.2X, CRIN-LE, NCC / VCC
Delphi	F2P, F2E, F2R, F3P, F3E, C2i, C3i, C4i
Denso	iART, G4X, G3X, G2X – Volvo, John Deere, Komatsu, Isuzu, GM, Hino, CAT, Case, New Holland, PACCAR
Schaeffler / Continental	PCRS5-EU6, EU5, EU3/4, Ford Power Stroke
Cummins / Scania	XPI – ISX15, X15, QSX15, Scania DC13/DC16
Caterpillar	C4.4, C6.6, C7.1, C9.3, C175, 3512C / 3516C, Perkins 6.6, C3500
Detroit Diesel	DD13, DD15, DD16
MAN / DAF / Volvo / Renault	Bosch CRIN2 / CRIN3 platforms
Liebherr	LI2, LI3 – D946, D966, D9812
MTU / L'Orange	Series 2000, 4000 (VTO), 8000
Cummins QSK MCRS	Bosch CRIN-LE – QSK19 / 23 / 38 / 45 / 50 / 60 / 78 / 95
GDI – Coil	Bosch HDEV (1, 4, 5, 6), Continental, Delphi, Denso, Hitachi; VW, BMW, Mercedes, Ford, GM, PSA, Hyundai/Kia, Toyota, Mazda, Volvo, JLR
GDI – Piezo	Bosch HDEV5/6 Piezo, Siemens-Continental Piezo GDI
Gasoline low-pressure	All makes & types - AdBlue - LPG / CNG / alt-fuels

FEATURES

- Tested to OEM Standards: Bosch, Delphi, Denso, Caterpillar, L'Orange, Cummins procedures
- OEM authorized: Schaeffler / Continental; additional authorizations pending
- EU7-compliant architecture
- Full coding: Bosch IQA/IMA/ISA/ IMA4.2, Denso QR, Delphi C2i/C3i/C4i/ F2x/F3x, Schaeffler / Continental IIC/ IIC.2, Cummins XPI, CAT (TRM), QSK and GCC (GDi coding)
- Up to 9 multiple injections (pilot / main / post), fully configurable
- SPAR: automated piezo-stack degassing: zero trapped air, zero hydraulic lock
- Reverse flushing at 35 bar (GDi)
- Dynamic ultrasonic cleaning (gasoline)

TESTS PERFORMED

- Electrical (coil / piezo) • Insulation
- Back-leak (static / dynamic)
- ISA detection • Volumetric flow (all conditions) • aNOP • Response time (RSP – eRSP) • EU6 technology • iART
- VCC / NCC • DFI mapping • CRG piezo-stack regeneration • CGL gap-lift (OEM method) • NLT / LKT • Low-pressure 0–10 bar • Spray pattern & atomization



Test & code:
6–15 min

Pressure:
up to 3,000 bar

Database:
6,500+ part numbers, online-updated

CAMBOX

MTBR X

EUi · EUp · UI · UP – CAMBOX

Multi-profile camshaft-drive testing for every major Electronic Unit Injector, Unit Pump and Unit Injector platform in production globally.

UIS – Unit Injection Systems (Coverage)

Bosch UIS – Passenger Car (PDE) / Commercial Vehicle / Off-Highway / Agricultural
Delphi EUI – A Series / E1 / E3 / Off-Highway / Land Rover TD5 / F2x / F3x
Schaeffler / Continental
Caterpillar EUI / MEUI-C / Large Bore (3500 Series) / MUI
Cummins SELECT EUI / HPI / QSK / ISX
Detroit Diesel EUI
Volvo / Volvo Penta / Iveco / Scania / Renault / Hyundai / Mack / Actros / Atego / Paccar / John Deere / PF

Strategic Partnership with Hartridge.
HK1400 Cambox Platform

Carbon Zapp integrates Hartridge’s industry-recognized HK1400 cambox as the mechanical heart of our EUI / EUP / HPI testing platform, chosen for its proven flexibility and adaptability between cam profiles and systems. Around it, Carbon Zapp engineers the complete peripheral architecture, controls, hydraulics, electronics and software, all powered by AZO, with a continuously expanding database now exceeding 1,150+ part numbers.

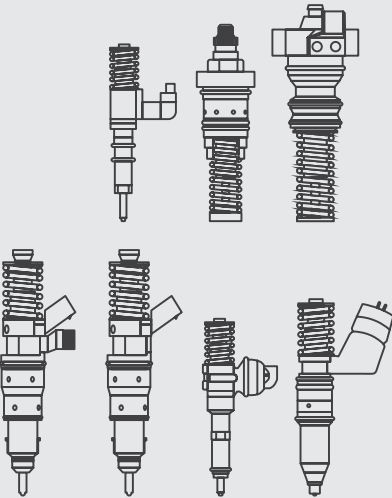
FEATURES

- Tested to OEM Standards
- Cam-angle precision via closed-loop system
- Quick cam setup: no mess, no oil waste (EZO-Kit)
- 12 separate cam profiles
- Cummins HPI / QSK / ISX 16-bar supply control circuit using OE valves (LP-EXT-Control)
- Expandable to new systems

TESTS PERFORMED

- Electrical (coil & piezo)
- Insulation
- Volumetric flow (all conditions)
- Response time (RSP – eRSP)
- Valve response (aBIP)
- Piston leak check
- Multiple-injection profiles (pilots / mains / posts)
- Spray pattern & atomization
- Dual-coil testing (Delphi E3)

HK1400 Cambox



Test & code:
6–15 min

Injector Coding
for Delphi
E1, E3, F2x, F3x*, CAT (TRM file)

Database:
1,250+ Part
Numbers



MTB | PLATFORM

MTBR-X

PTBR-X

SPECIALISTS SOLUTIONS

COMPONENTS

MTBR //X | PTBR //X

FSC · FUEL-SYSTEM COMPONENTS

Integrated diagnostics for HP and LP components: valves, rails, sensors, pump-heads, pumps and regulators.

INTEGRATED FSC DIAGNOSTICS. Dedicated test plans for every major valve, rail, sensor and high-pressure head on the market. Modular FSC kits unlock the hardware you need, purchased separately, configured around the components you service. Software, database and workflow already inside AZO.



Components Tested
RPS / RDS – Rail Pressure Sensor
DRV / PCV – Rail Pressure Control Valve
DBV / PLV – Pressure Limiter Valve (mechanical)
ZME / MPROP / FMU – Suction Metering Unit (Bosch)
IMV – Inlet Metering Valve (Delphi)
SCV – Suction Control Valve (Denso)
ESV – Electric Suction Valve (Bosch HD / large-engine)
HPI Unit Control Valves
High-Pressure Rails
CP4 High-Pressure Head / Pump Element
Transfer / Lift Pumps



FSC Test Capabilities

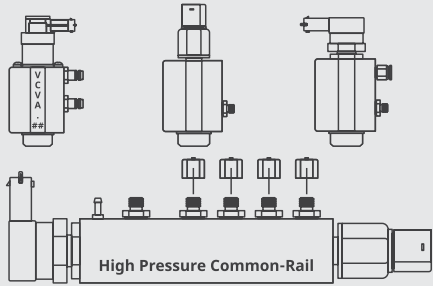
FEATURES

- Electrical tests: resistance, insulation, current draw, response time
- Hydraulic tests: pressure regulation, flow characterization, leak detection
- Closed-loop validation: DRV / ZME / VCV / PCV / IMV / SCV operating curves vs OEM data
- Sensor verification: RDS curve plotting and tolerance check
- CP4 head diagnostics: low / high-pressure side validation

Why It Matters

FSC failures are often misdiagnosed as pump or injector failures. Testing the FSC components first saves the customer the cost of replacing the wrong part. The MTBR-X is the only test bench with full integrated FSC diagnostics.

Future-ready specification. New database and coding continuously updated to new EU6 applications. Specifications subject to configuration.



MTB | PLATFORM

PTBR-X | MTBR-X

SPECIALISTS SOLUTIONS

AZO

The intelligence inside every Carbon Zapp machine.

Every Carbon Zapp X-Series bench is driven by AZO, the software platform at the heart of the machine's powerful touchscreen HMI. AZO turns complex injection diagnostics into a guided, fully automatic process: select the component, mount it, and let the machine run the complete OE-level test plan, from actuation and leak checks to dynamic precision flow measurement and coding. The result is expert-level diagnosis, delivered consistently, regardless of who is operating the bench.



AZO on the X-Series touchscreen HMI: one interface for every test, every system, every brand.

Built for the operator.

Fully automatic testing.

Guided sequences take the component from mounting to final verdict in minutes, with no guesswork. Live actuation signals for advanced analysis and R&D work.

Fast by design.

Complete test cycles measured in minutes, not hours, e.g. **4 Bosch CRDi injectors tested and coded in 8–10 minutes, Delphi C4i in 10–15 minutes, 4 GDi injectors tested and coded in 8–10 minutes; pumps in 5–15 minutes.**

Clear, sellable reports.

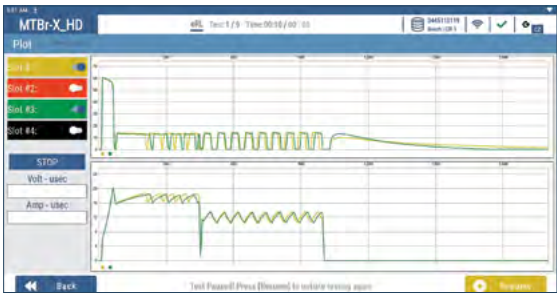
Color-coded pass/fail results per component, a single-page quick report for the customer or a multi-page analytic report for the specialist. Pick your slots with a tap, print or share on the spot, tablet-easy, workshop-fast, and simply incomparable to anything else in the market.

Real-time oscilloscope.

Live actuation signals for advanced analysis and R&D work.



The fail-track color report, results your customer understands at a glance.



The live oscilloscope view, every actuation, every microsecond.



Every connection, mapped on screen: numbered points, exact part numbers and adapters for each component, mount, connect and test with zero guesswork.

One database. Every system.

Complete OE & CZ database.

Test plans for all makes and types, continuously updated:

- CRDi** - Common Rail Diesel Injectors
- CRp** - Common Rail Diesel Pumps
- EUi/EUp** - Electronic Unit Injectors & Pumps
- HEUi** - Hydraulic Electronic Unit Injectors
- GDi** - Gasoline (High & Low Pressure) Injectors
- GDP** - Gasoline Rotary & Piston High Pressure Pumps
- Marine & Large Engine components**

Your tests, your rules.

User-defined test plans and developer-level customization alongside the factory database, shared to all your Carbon Zapp machines effortlessly.

Machine self-diagnosis.

AZO continuously monitors all the critical points of the bench, sensors, pressures, actuation circuits, and reports the machine's own health before it can affect your results.

Always connected.

On-board Wi-Fi and LAN connectivity for updates, printing, sharing and the live CloudX link.

Always current.

Software and database updates delivered over the air, powered by CloudX (see next spread).

CloudX

Your machines, beyond the workshop walls.

CloudX is Carbon Zapp's IoT cloud platform the natural extension of AZO. Every connected bench becomes part of a secure cloud environment where data, updates, features and support flow both ways. Fully Industry 4.0 compliant, CloudX means the machine you buy today keeps gaining capabilities tomorrow, without a single technician visit.

What CloudX does for your business

Live updates.

Database and software updates arrive online, automatically, your bench always tests to the latest specifications.

Complete cloud backup.

Machine data, settings and test history safely mirrored in the cloud, recover everything in minutes.

Features on demand.

Activate new capabilities instantly, online, forever or on a Pay-As-You-Go basis, and invest only when the work demands it.

Remote monitoring & reports.

Check machine status and generate, file and print test reports from anywhere, on any device.

Fleet management.

Run one bench or twenty: manage every machine, user and location from a single account.

Smart maintenance.

Notifications on your phone for oils, filters and service intervals, before downtime finds you.

24/7

Machine visibility from any device

1 Account

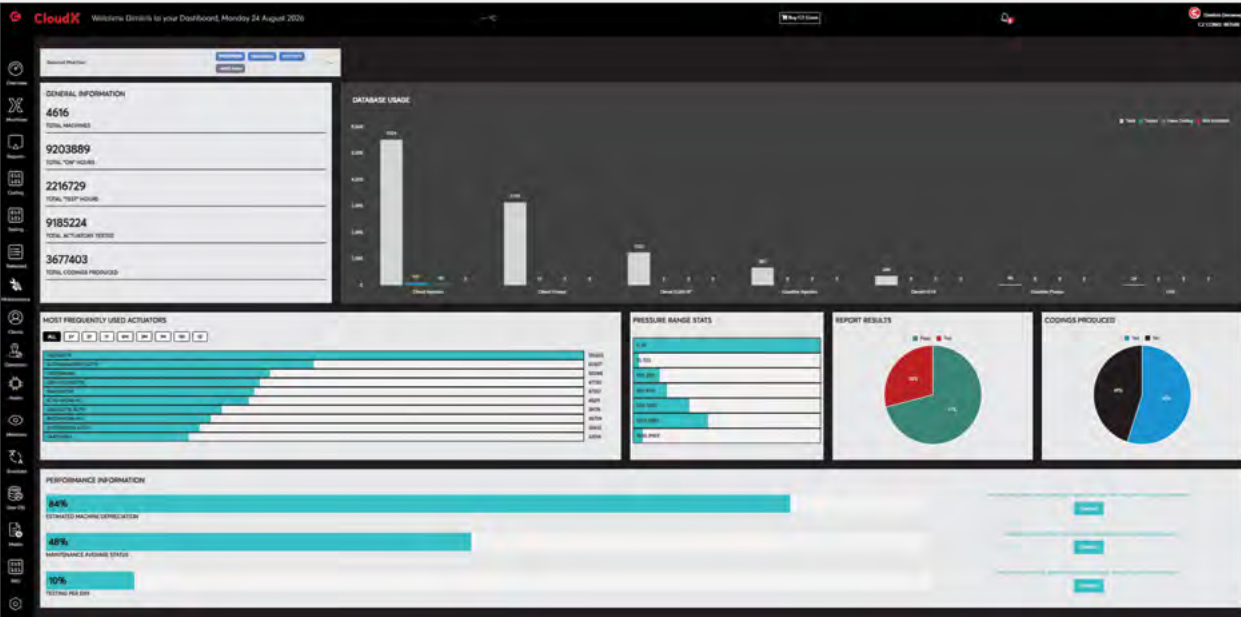
Your entire machine fleet

Minutes

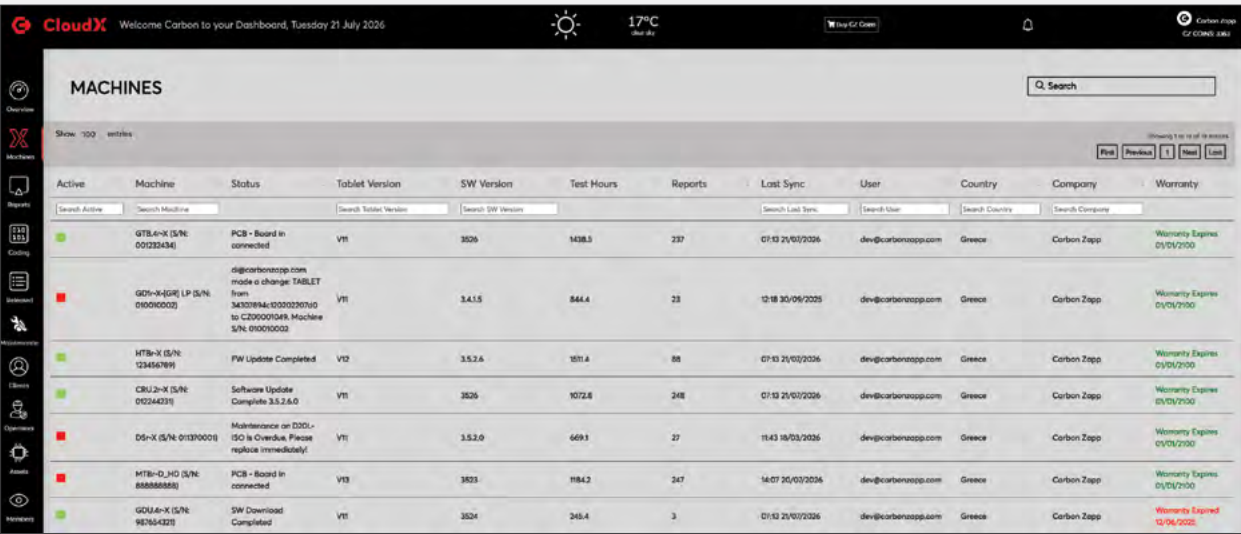
To activate a new feature online



CloudX
is Carbon Zapp IoT Cloud
computing Platform.



The CloudX overview at cloudx.carbonzapp.com Your job in numbers.



The screenshot shows the 'MACHINES' dashboard with a table of machine data. The table has columns for Active status, Machine ID, Status, Tablet Version, SW Version, Test Hours, Reports, Last Sync, User, Country, Company, and Warranty. The data is filtered to show 100 entries.

Active	Machine	Status	Tablet Version	SW Version	Test Hours	Reports	Last Sync	User	Country	Company	Warranty
Active	0784-N (S/N: 00030434)	PCB - Board in connected	V71	3.0.6	1438.3	237	07/13 21/03/2026	dev@carbonzapp.com	Greece	Carbon Zapp	Warranty Expires 01/05/2030
Inactive	020-N-4GR (LP (S/N: 00006003)	made a change: TABLET from 34307894:030020070 to C200007049. Machine S/N: 01007003	V71	3.1.1.5	844.4	23	12/18 30/06/2025	dev@carbonzapp.com	Greece	Carbon Zapp	Warranty Expires 01/05/2030
Active	HT8-N (S/N: 123456789)	FW Update Completed	V12	3.5.2.4	101.4	88	07/13 21/03/2026	dev@carbonzapp.com	Greece	Carbon Zapp	Warranty Expires 01/05/2030
Active	CRU-2-N (S/N: 00244331)	Software Update Complete 3.5.2.6.0	V71	3.0.6	1072.8	248	07/13 25/03/2026	dev@carbonzapp.com	Greece	Carbon Zapp	Warranty Expires 01/05/2030
Inactive	D5-X (S/N: 01070001)	Maintenance on DDL - ISO is Overdue. Please replace immediately!	V71	3.5.2.0	669.1	27	11/43 18/03/2026	dev@carbonzapp.com	Greece	Carbon Zapp	Warranty Expires 01/05/2030
Inactive	HT8-N-HD (S/N: 888888888)	PCB - Board in connected	V13	3.0.3	1184.3	247	14/07 30/03/2026	dev@carbonzapp.com	Greece	Carbon Zapp	Warranty Expires 01/05/2030
Active	020-N (S/N: 987654321)	SW Download Completed	V71	3.0.4	245.4	3	07/13 21/03/2026	dev@carbonzapp.com	Greece	Carbon Zapp	Warranty Expires 01/05/2030

The CloudX fleet dashboard at cloudx.carbonzapp.com Every machine, status and info in one secure view.



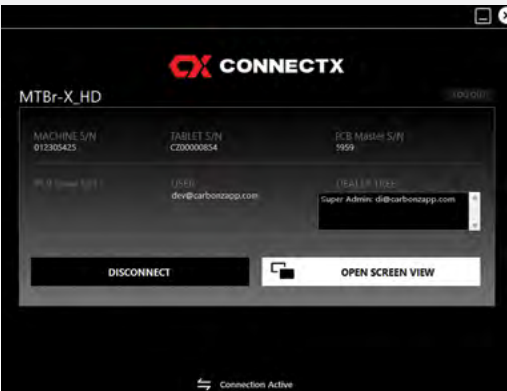
cloudx.carbonzapp.com
carbonzapp.com

EXPERT FEATURES

CloudX unlocks three expert-level extensions
ConnectX, API Integration and the Repair Kit Solution (RKS).



A ConnectX session in progress: the machine's screen, live, wherever support happens to be.



ConnectX

Support at the speed of a click.

ConnectX gives authorized eyes and hands on the machine, remotely and per account. When something needs attention, whether a question, a setting or a fault, Carbon Zapp support, your distributor or your own fleet manager can securely connect to the bench and act immediately. No travel, no waiting, no lost workdays.

Instant troubleshooting.

Direct remote assistance from the Carbon Zapp factory or your local distributor, right on the machine screen.

Fleet control.

Fleet managers reach any machine in their network to monitor, adjust, update or resolve, from anywhere.

Per-account access.

Connections are permission-based and tied to accounts: you decide who can reach which machine.

Minimum downtime.

Most issues are resolved in a single remote session. The bench is back to testing the same day.



API Integration

Your test data, in your business systems.

Test data shouldn't stop at the bench. The CloudX API bridges your machines to your own IT environment, so results, reports and machine information flow automatically into the systems your business already runs on: ERP, workshop management, quality and warranty platforms.

Automated workflows.

Test results attach themselves to job cards, invoices and warranty files. No re-typing, no lost paperwork.

Built for scale.

Ideal for remanufacturers, OE service networks and multi-site operations with existing infrastructure.

Secure by design.

Data travels over the same secure cloud environment that powers CloudX.



From the test chamber to your ERP: one connected data path, no manual steps.



Repair Kit Solution

The authorized channel

For kit providers

Deploy to your network.

Publish your repair kits, data and test plans directly to your authorized workshops through CloudX.

Control who buys.

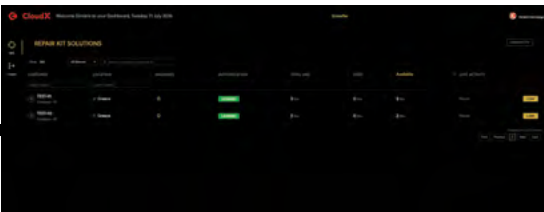
Entitlements are managed per user: only your authorized network can access and purchase your kits.

Protect your brand.

Every kit is diagnosed and validated on a Carbon Zapp bench, against your specifications. Quality and warranty stay in your hands.

A complete, branded solution.

From kit deployment to the final test report, the whole workflow carries your brand, a professional, consistent outcome across your entire network.



The RKS area in CloudX: providers publish, workshops access, and every kit is tested the authorized way.

For workshops

Genuine kits, on the bench.

Access authorized repair kits with the matching test plans, right where the work happens.

No more parts hunting.

Become an authorized workshop with any of the available providers for your systems, the right kit is always one click away.

Certified results.

Diagnosis and post-repair testing follow the provider's approved procedure, every repair leaves with proof.

One machine. One platform. The complete ecosystem.

AZO runs the test. CloudX connects the machine. ConnectX keeps it running. The API brings the data home. RKS closes the loop between component, kit and certified repair. Together, they turn a Carbon Zapp bench into a business platform.



Built to Move the Industry Forward.

From advanced testing equipment and connected intelligence to technical expertise and global support, Carbon Zapp brings every solution together in one complete ecosystem.

Let's Connect and Discover Future Opportunities.



Scan the QR Code
and easily download
the Product Catalog
to your phone.



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Scan and Explore
Complete CZ Solutions