MAKERSAN

Intelligent Control & Connectivity Platforms for Mobile and Stationary Systems

Rugged controllers, displays, sensors, pedals, joysticks and keypads — together with the embedded software and IoT platforms that power them — engineered for the harshest off-road, agricultural, construction, marine and industrial environments.

CORPORATE PRESENTATION · 2026



CONTENTS

Presentation Overview

From company profile and product ecosystem to capabilities and global reach.

03	**Company**	Who We Are · Journey · Facility & Location
08	**Solutions**	Markets · Product Ecosystem · Digital Platforms
16	**Technologies**	R&D · Development Model · Manufacturing · System Engineering
26	**References**	Validation · Certifications · Test Capabilities · References

Engineering for the machine world since 1978

Makersan combines mechanical engineering, electronics, embedded software and connected technologies to support OEMs from concept to series production.

1978

Founded

From mechanical roots to intelligent, connected systems.

Multidisciplinary Engineering

Mechanical design, electronics, embedded software and application engineering.

Integrated Manufacturing

Production, assembly, programming and testing under one roof.

OEM Partnership

Application-specific development and integration support.

Connected Systems

Interfaces, controllers, sensors and connectivity for machines and equipment.

GEBZE · KOCAELI · TURKEY



FROM CONCEPT TO SERIES PRODUCTION

Requirments · Development · Prototyping · Verification · Industrialization · Production

MOBILE SYSTEMS Off high way machinery . Commercial Vehicles . Mobile Robotics

STATIONARY SYSTEMS Building & HVAC . Energy . Equipment . Connected Assets

JOURNEY

From mechanics to mechatronics, from electronics to connected systems

Makersan’s growth has been driven not only by a broader product portfolio, but by an expanding engineering scope.



1978

Mechanical manufacturing

Mechanical components and locking systems for commercial vehicles.

2009

Mechatronics

A new era with electronic pedals and sensor-based products.

2012

Embedded electronics

Expansion into control, HMI and embedded software.

2021

Connectivity & IoT

Telematics, cloud connectivity and remote monitoring solutions.

TODAY

Integrated systems

Hardware + software + manufacturing + validation in one ecosystem.

FACILITY & PEOPLE

The scale behind the engineering.

An integrated campus in Gebze combines engineering, production and industrialization in one organization.

11,500 m²
ENCLOSED AREA

50,000 m²
OPEN AREA

1,000 m²
ADMINISTRATIVE AREA

180
EMPLOYEES

45
WHITE-COLLAR

35
R&D ENGINEERS

R&D presence in İzmir Teknopark complements the integrated Gebze engineering and manufacturing campus.

GEBZE · KOCAELI · TÜRKİYE



GLOBAL PRESENCE

From Türkiye to 74 countries

International market reach backed by commercial teams in key regions.



Export / active market Sales & regional office

EUROPE

Germany · Austria · Belgium · UK · Czechia · Denmark · Finland · France · Netherlands · Ireland · Spain · Sweden · Switzerland · Italy · Hungary · North Macedonia · Norway · Poland · Serbia · Slovakia · Ukraine

AMERICAS

United States · Canada · Argentina

MIDDLE EAST & AFRICA

UAE · Egypt · South Africa

ASIA-PACIFIC

India · Indonesia · Japan · South Korea · Thailand · Australia · New Zealand

MAKERSAN

74 COUNTRIES SERVED

SALES & REGIONAL OFFICES

- **TÜRKİYE**
  Headquarters · Gebze
- **USA**
  Regional office · since 2024
- **GERMANY**
  Regional office · since 2023
- **INDIA**
  Regional office · since 2017

GLOBAL COMMERCIAL REACH

74 active markets across Europe, the Americas, the Middle East, Africa and Asia-Pacific.

Local commercial teams support project discussions, applications and long-term OEM relationships in key regions.

Engineered in Türkiye. Supported globally.

Innovation translated into intellectual property

Patent activity and long-term recognition reflect a culture of differentiated engineering solutions.



20+

ACTIVE PATENTS

2024 Patent Ranking

Makersan was ranked among Türkiye's leading organizations for EPO and U.S. patent activity in 2024.

Recognition

Most Innovative SME recognition, national innovation awards and Turkish patent awards are part of a long-running innovation record.

Innovation is treated as a repeatable engineering capability — not a one-off project result.

MARKETS

Technology engineered for machines that work in the field.

MOBILE MACHINERY

— Agricultural machinery

— Construction machinery

— Material handling

— Autonomous & Mobile Robotics

COMMERCIAL & SPECIAL VEHICLES

— Buses & Minibuses

— Special Purpose Vehicles

— Recreational & Utility Vehicles

— Yachts & Commercial Vessels

INDUSTRIAL MACHINERY & AUTOMATION

— Industrial & Stationary Equipment

— Factory Automation

BUILDINGS, INFRASTRUCTURE & FACILITIES

— Building Automation

— Infarstructure System



MAKERSAN

A complete portfolio for mobile & industrial machines.

Makersan products span operator interfaces, control, sensing, connectivity and software — engineered to work together as one machine ecosystem.

SYSTEM ENGINEERING

Engineering services from machine architecture and integration to validation, deployment and modernization.

- Retrofit Integration
- Application Engineering
- System Architecture
- Validation & Calibration
- Machine Modernization
- End-to-End Engineering Support

ONE MACHINE ECOSYSTEM

Operator input → HMI → Control → Sensing → Connectivity → Data

CAN / CAN FD / J1939 · Ethernet / Modbus · GNSS / Cellular · API / third-party integration

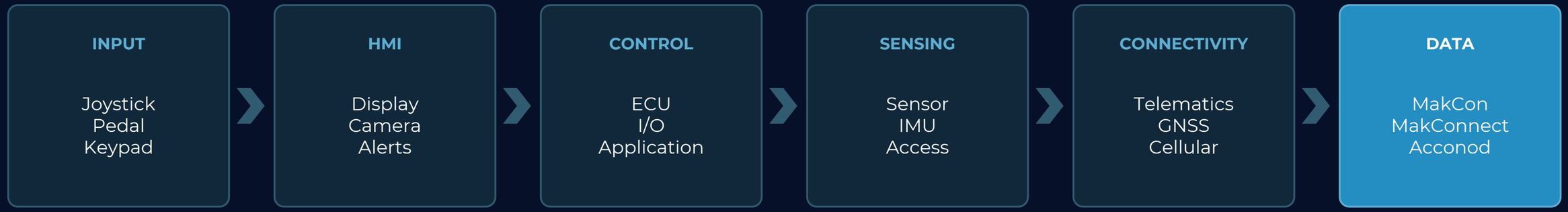
- OEM projects
- Retrofit integration
- Application engineering
- Machine modernization

PRODUCT ECOSYSTEM

MAKERSAN

From operator input to connected intelligence.

Makersan products connect the different layers of the machine as one integrated system.



CAN / CAN FD / J1939 · Ethernet / Modbus · GNSS / Cellular · API / Third-party integration

Operator Interfaces

01



Displays

Rugged HMI displays for machine visualization, diagnostics and operator interaction.

02



Keypads & Buttons

Sealed CAN-bus keypads and buttons for simplified harness architectures.

03



Pedals & Levers

Hall-effect pedals and levers for precise, contactless operator input.

04



Joysticks

Single and multi-axis joystick families for demanding HMI workflows.

PRODUCT FAMILY

Controls & Connectivity

01



CRA SIL2 PLd FREELY PROGRAMMABLE

Controllers

Sealed control and I/O units for valves, motors, relays and distributed machine control.

02



Connectivity

Telematics, CAN-bus and IoT hardware for machine communication and integration.

03



Application-Specific Controllers

Purpose-built controllers for RKEaccess and hitch/header height management.



PRODUCT FAMILY

Sense & Actuate

01



Sensors

Reliable sensing solutions for automation, detection and machine safety in demanding conditions.

02



Actuators

Electric and pneumatic actuators delivering precise, reliable motion for industrial machinery, mobile equipment, and vehicle systems.

PRODUCT FAMILY

Access Systems

01

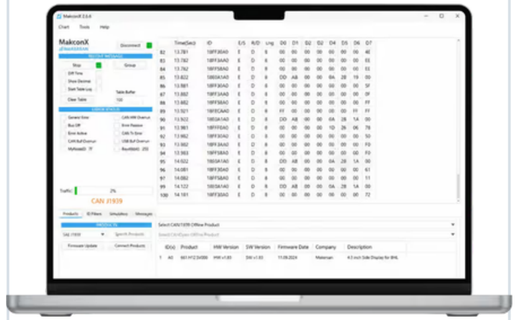


Access

Handles, latches, locks and RKE components proven in bus and coach platforms.

Software

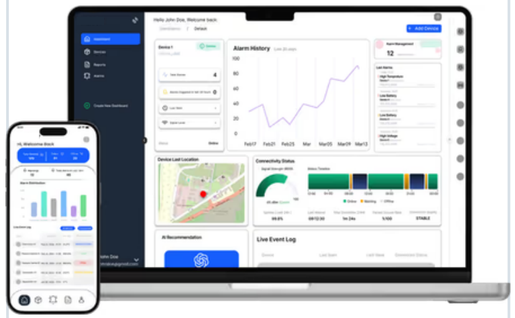
01



MakCon

Configuration, diagnostic and calibration tools for machinery.

02



MakConnect

IoT, data management and remote access for connected machines.

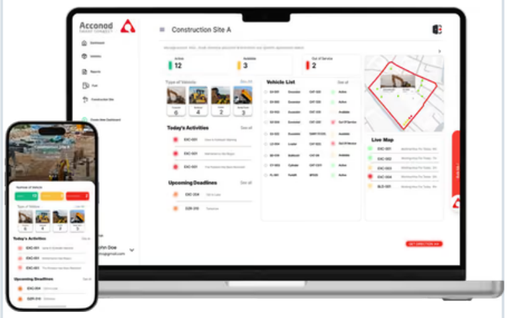
03



Acconod Agriculture

Smart agriculture platform for fleet, operations and farm management.

04



Acconod Construction

Industrial platform for monitoring and asset tracking.

TECHNOLOGIES

Engineering, production and validation under one roof.

- System Engineering
- Technical Capabilities
- Research & Development
- Manufacturing Capabilities
- Quality Assurance



MAKERSAN

Machine electronics engineered as one system.

From requirements and control architecture to software, integration and machine-level validation.

OUR ENGINEERING SCOPE

01	**Requirements & system definition**	Machine functions, interfaces, I/O and performance targets.
02	**Control & electronic architecture**	Control units, I/O topology, CAN network and power budgets.
03	**Software, HMI & connectivity**	Embedded logic, operator screens, diagnostics and telematics.
04	**Mechanical & installation integration**	Enclosures, mounting, harness routing and panel layouts.
05	**Validation & deployment support**	Machine tests, EMC pre-checks, calibration and release.

PROGRAMS & APPLICATIONS

OEM projects / Retrofit integration / Application engineering / Machine modernization

MAKERSAN

System architecture & embedded software

One shared engineering foundation connects machine hardware, real-time software and connected services.

01
INPUT & SENSING
Joysticks, pedals, keypads and sensors

›

02
CONTROL & I/O
Controllers, auxiliary I/O and machine logic

›

03
HMI & EDGE
Displays, RTOS / Linux and edge compute

›

04
COMMUNICATION
Machine networks, gateways and telemetry

›

05
CLOUD & DATA
Remote monitoring and asset services

SOFTWARE & ENGINEERING PLATFORMS

RTOS / Embedded C
Sensor acquisition, output control, fieldbus communication and diagnostics

Linux / Edge computing
Graphical operator displays, edge data handling and application interfaces

MakCon / SDK
Parameter configuration, diagnostics and supported customer application logic

MakConnect / Connected services
Remote machine data, monitoring, diagnostics and connected asset services

OEM VALUE • Reusable building blocks / Application-specific engineering / Maintainable software

MAKERSAN

Application domains & OEM integration

Shared technology is adapted to specific equipment, operating environments and customer requirements.

MOBILE SYSTEMS

Construction & mining	Machine control, displays and telematics
Agriculture & forestry	Implement electronics and operator interfaces
Material handling	Joysticks, pedals, controllers and access
Commercial & special vehicles	Subsystem control, diagnostics and integration

STATIONARY SYSTEMS

Building & HVAC	Control and connected building equipment
Energy & distributed power	Monitoring and energy-system interfaces
Stationary equipment	Pumps, generators and compressors
Connected assets	Condition data and remote visibility

OEM CUSTOMIZATION & SYSTEM INTEGRATION

01 DEFINE

Functions, operating conditions, interfaces and acceptance criteria

02 DESIGN

Electronics, enclosures, embedded software and interfaces

03 INTEGRATE

CAN networks, HMI, sensors, actuators and remote services

04 VERIFY

Prototype, bench and machine-level testing before release

CUSTOMER VALUE • Tailored interfaces / Easier integration / Controlled revisions / Production-ready design

MAKERSAN

Communication, connectivity & positioning

Industrial protocols, wireless links and positioning methods are selected for each system architecture.

MOBILE & VEHICLE

SAE J1939
Heavy-duty and off-highway CAN networks

ISOBUS
Agricultural tractors and implements

NMEA 2000
Marine electronics

INDUSTRIAL CONTROL

CANopen
Embedded machine subsystems

Modbus RTU/TCP
Equipment and controller integration

OPC UA
Supervisory systems and industrial data

BUILDING & CONNECTED DATA

BACnet
Building and HVAC automation

MQTT
Telemetry, edge and cloud messaging

CONNECTIVITY & POSITIONING

GNSS / RTK
Position, navigation and precision timing

LTE / Cellular
Wide-area telemetry and remote service

NB-IoT
Low-data-rate cellular asset monitoring

LoRaWAN
Long-range, low-power telemetry

Wi-Fi / Bluetooth
Local configuration, maintenance and access

Ethernet / USB
Wired diagnostics and data exchange

SELECTION CRITERIA • Coverage / Latency / Data rate / Power budget / Antenna layout / Regional approvals

MAKERSAN

Safety, lifecycle & technical characteristics

Safety, compliance and environmental requirements are assessed for the intended product, configuration and market.

FUNCTIONAL SAFETY

IEC 61508 / SIL and ISO 13849 / PL: risk assessment, safety functions and project-specific verification

CYBERSECURITY & REGULATION

EU CRA and PLD considerations: secure design, vulnerability handling, product support and traceability

ENGINEERING LIFECYCLE

Requirements, HW/SW revisions, verification evidence, controlled changes, release and support

REQUIREMENTS → DESIGN → INTEGRATION → VERIFICATION → RELEASE & SUPPORT

REPRESENTATIVE TECHNICAL DATA

PROTECTION / POWER

IP67 / IP6K9K • -40 to +85°C • 12V / 24V

Product-specific ingress, environmental and supply ratings

COMPLIANCE

CE / EMC • IEC 61508 • ISO 13849 • CRA • PLD

Applicable regulations and safety targets are project-specific

QUALITY SYSTEM

ISO 9001 / 14001 / 45001 / IATF 16949

Certified management systems supporting industrial production

INTERFACES • J1939 / CANopen / Modbus / Ethernet / USB / Wi-Fi | GNSS / LTE / NB-IoT / LoRaWAN / Bluetooth

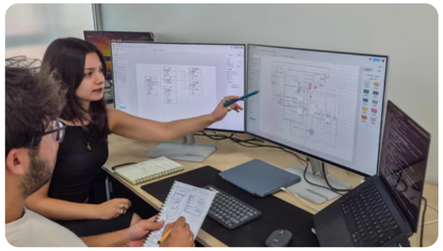
MAKERSAN

From idea to validated product.

Mechanical and electronic component development backed by contemporary CAD, CAM and CAE tools, an extensive test and validation laboratory, and an experienced, solution-oriented engineering team.

01 System architecture design

Requirements, product architecture, interface planning and simulation-driven development set the technical foundation before implementation starts.



02 Electronic design

Control units, operator interfaces, power electronics and connectivity hardware take shape through schematic design, PCB layout, component selection and verification.



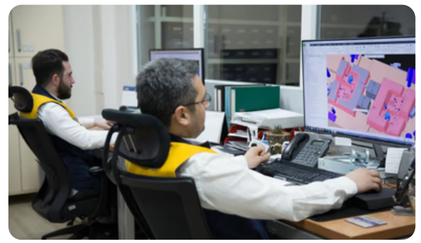
03 Software design

Embedded software, application software and test tools are built for reliability, maintainability, cybersecurity and clean system integration.



04 Mechanical design

Enclosures, mounting solutions, thermal behaviour and manufacturing-oriented detailing are designed for rugged industrial environments.



FROM PROTOTYPE TO VALIDATION

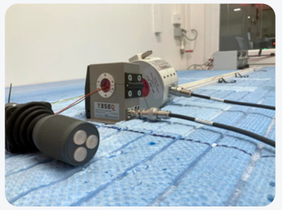
01 Prototyping & testing

Prototypes are produced in-house with 3D printing, CNC machining and plastic injection, then pushed through durability tests in dedicated laboratories.



02 Validation & production readiness

Designs are verified against international standards in the metrology and validation lab, then prepared for repeatable mass production.



MAKERSAN

Mechanical, electronic and validation work under one roof.

Makersan's strength comes from owning the critical steps of the product lifecycle: design, tooling, machining, plastic injection, programming, electronic assembly and validation testing.

01 Mold workshop

Production molds and tooling are designed and maintained in-house, which keeps part quality repeatable and design iterations fast.



02 Electronic SMT workshop

SMT lines cover precision PCB assembly, soldering, inspection and traceability for industrial electronics.



03 Plastic injection workshop

Controlled injection molding produces durable enclosures and application-specific plastic parts.



04 CNC milling workshop

CNC milling delivers metal and plastic parts at the tight tolerances rugged assemblies depend on.



05 Assembly lines

Mechanical, electronic and electro-mechanical assemblies come together on lines configured for quality and scale.



06 Quality controls

Functional, visual and dimensional inspections run at defined checkpoints, so every product meets specification before it ships.



07 Warehouse & logistics

Incoming material, inventory and outbound shipments run on structured warehouse and logistics processes.



MAKERSAN

Certified standards. Field-proven engineering.

Production controls, in-house testing and traceability support quality throughout the product lifecycle.

01 Incoming quality control (IQC)

Materials and components checked against specifications and supplier documents before production.

02 In-process quality control (IPQC)

Line checkpoints monitor critical parameters and detect deviations during manufacturing.

03 In-house testing & validation

Electrical, functional and performance testing during development and serial production.

04 In-house EMC testing & pre-compliance

Emission and immunity measurements identify issues ahead of external certification.

05 Environmental & reliability testing

Temperature, humidity, vibration and endurance cycles evaluate field reliability.

06 Final inspection & release

Visual, functional and documentation checks before shipment.

ALL STAGES

Traceability & Documentation

Serial-level tracking, inspection records and quality documentation throughout the product lifecycle.

MEASUREMENT & TEST EQUIPMENT

Traceability & Documentation

OGP SmartScope MVP 250

X-ray inspection

Hawkeye 2000 X-ray

Functional & electrical test

Programmable supply & data acquisition

Environmental & endurance testing

ESPEC TSE-12 & climatic chambers

Products are validated for the conditions they will face in the field

The quality system combines metrology, environmental testing, electrical validation and process discipline under one roof.



MAKERSAN QUALITY LABORATORY

- IATF 16949:2016
- ISO 45001:2018
- ISO 9001:2015
- ISO 14001:2015

MAKERSAN

Comprehensive Validation. Proven Performance.

In-house inspection, testing and validation capabilities covering dimensional, electrical, structural and environmental performance.

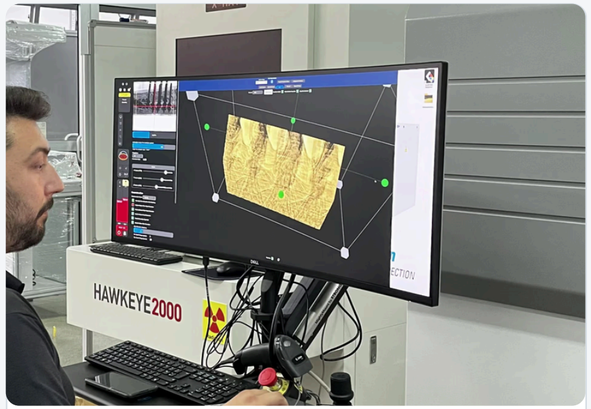


01 Dimensional metrology

Precision dimensional verification

Advanced measurement systems verify critical dimensions, geometries and tolerances of mechanical components and assemblies.

- High-accuracy dimensional inspection
- Geometry and tolerance verification
- CAD comparison and measurement reporting

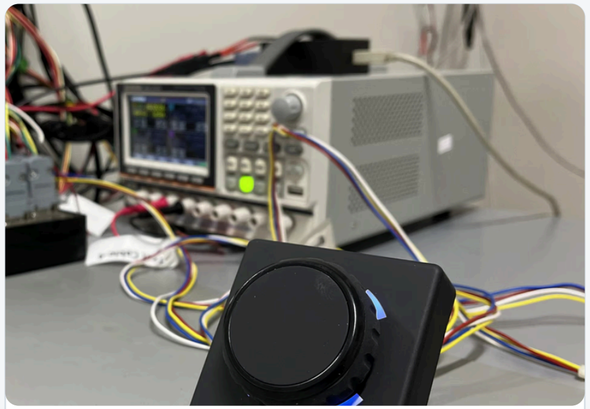


02 X-Ray Inspection

Internal structure verification

X-ray inspection enables non-destructive analysis of internal structures, assemblies and hidden defects without disassembling the product.

- Non-destructive internal inspection
- Solder joint and assembly verification
- Detection of voids, cracks and hidden defects

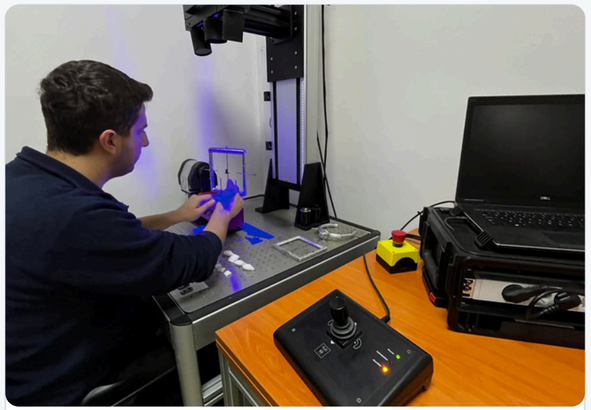


03 Functional & Electrical Test

Performance and electrical validation

Functional and electrical testing verifies product operation, signal integrity and electrical performance before release to production.

- Functional performance verification
- Voltage, current and signal measurements
- Automated and application-specific test procedures



04 3D dimensional measurement

Precision for consistent quality

3D coordinate measurement systems verify critical dimensions, geometries and tolerances of plastic and metal parts.

- High-accuracy dimensional control
- CAD comparison and reporting
- Incoming, in-process and final inspection

High-precision validation

Measurement and inspection methods support accurate verification of critical product characteristics.

Non-destructive inspection

Internal structures and hidden defects can be evaluated without damaging the product.

Production readiness

Functional and electrical performance is verified before release to serial production.

Reliability & endurance

Products are evaluated under demanding environmental and long-duration operating conditions

Advanced testing. Reliable in real conditions.

In-house test equipment to verify mechanical, environmental and functional performance under harsh operating conditions.



01 Environmental & Endurance Testing

Reliability under demanding conditions

Environmental and endurance testing evaluates product durability and long-term performance under representative operating conditions.

- Temperature, humidity and environmental testing
- Vibration and mechanical endurance validation
- Extended-duration reliability and lifecycle testing



02 Salt spray test

Corrosion resistance

Salt spray testing evaluates material, coating and surface durability against corrosive environments.

- Corrosion-resistance evaluation
- Coating and metal surface checks
- Pre- and post-test visual inspection

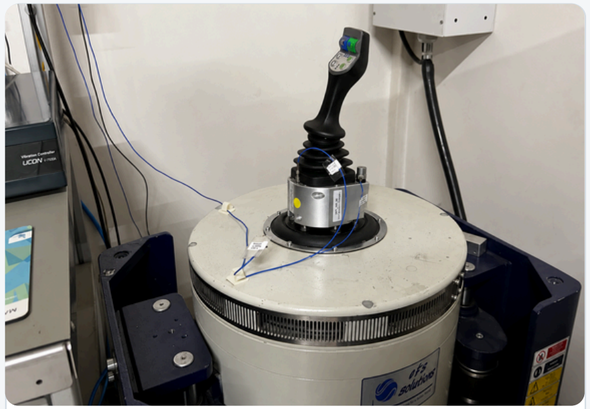


03 Water ingress test

Sealing performance

Water exposure testing verifies enclosure sealing and product integrity under demanding wet operating conditions.

- Water-ingress validation
- High-pressure spray testing
- Functional check before and after test



04 Vibration test

Mechanical robustness

Vibration testing verifies the durability of electronic assemblies and mechanical structures under machine-like loads.

- Sinusoidal and random vibration
- Application-specific test profiles
- Functional monitoring during testing

Real-world conditions

Testing reflects agricultural, industrial and mobile-machine environments.

Standards & compliance

Test procedures support relevant customer and industry requirements.

Pre-production validation

Performance is checked before release to serial production.

Detailed reporting

Results and observations are documented for traceability.

MAKERSAN

Digital tools support a multidisciplinary development process

Mechanical design, electronics, simulation and product lifecycle data are managed through dedicated engineering platforms.

SYSTEM ARCHITECTURE

Windchill

Controlled product data, revisions and lifecycle information across development.

ELECTRONICS

Altium Designer

Schematics, PCB layout and electronic design for embedded control platforms.

QT

Embedded UI framework for developing modern HMI applications and responsive user interfaces.

MECHANICAL

Creo Parametric

Product architecture, enclosures, mechanisms and production-ready mechanical design.

ANSYS

Simulation-driven evaluation of mechanical and physical behavior before tooling.



WHY MAKERSAN ?

MAKERSAN

One partner. From concept to connected machine.

ENGINEERING • ELECTRONICS
CONTROL • CONNECTIVITY •
SOFTWARE

Engineering depth, vertical integration and field-proven technology in one ecosystem.

01

SINCE 1978

Engineering heritage

Nearly five decades of machine-industry experience, evolving from mechanical systems to electronics and connected platforms.

02

ONE ROOF

Vertical integration

R&D, mechanical and electronic design, manufacturing, validation and industrialization managed within one organization.

03

END-TO-END

Technology ecosystem

Operator input, HMI, control, sensing, connectivity and cloud software engineered as one integrated machine architecture.

04

74 COUNTRIES

Global OEM reach

International commercial presence supports project discussions, applications and long-term OEM relationships across key regions.

05

FIELD-PROVEN

Validation for harsh environments

EMC pre-compliance, dimensional, salt spray, water ingress, vibration and reliability testing before release to serial production.

06

20+ PATENTS

Innovation culture

A repeatable engineering capability backed by active patents, multidisciplinary development and long-term innovation recognition.

FROM CONCEPT → SYSTEM DESIGN → PROTOTYPE → VALIDATION → SERIAL PRODUCTION → CONNECTED MACHINE

ENGINEERED IN TÜRKİYE.
SUPPORTED GLOBALLY.

MAKERSAN

Long-standing application experience across multiple machine classes

Selected examples from Makersan's reference base across automotive, construction, material handling, agricultural machinery and special-purpose vehicles.

AUTOMOTIVE & COMMERCIAL VEHICLES

Ashok Leyland, BMC, Irizar, Isuzu, Iveco, Karsan, MAN, Mercedes-Benz, Otokar, Temsa, VanHool, Volvo

CONSTRUCTION MACHINERY

Bobcat, Hidromek, JCB, JLG, Manitou, Manitowoc, Toro, Wacker Neuson, Kramer, Bull

MATERIAL HANDLING

Cargotec, Ceylift Material Handling, JLG, Linde Material Handling, Manitou, Manitowoc, Merlo, Simer Lift

AGRICULTURAL MACHINERY

Basak, Case IH Agriculture, Erkunt, Hattat Traktör, New Holland, Pöttinger, SDF, Tafe, Tümosan, VST, Yanmar

SPECIAL PURPOSE VEHICLES

Denge, Erdemli Makina, Ersencer Engineering, Mulag, Pilotcar Electric Vehicles, Terberg Special Vehicles, Titan, Volkan, Schwing Stetter, beck industrial concrete mixers

Selected customers may appear in more than one application category.

MAKERSAN

Let’s build the next generation of machines together

Engineering · Electronics · Control · Connectivity · Software

www.makersan.com
contact@makersan.com
+90 262 751 25 05
Gebze · Kocaeli · Türkiye

THANK YOU

