About Sinomach-IT
China National Machinery Industry Corporation (SINOMACH) - An international, diversified, comprehensive equipment industrial group

- State-owned backbone enterprise directly managed by the central government;

- Ranked as 281 of Fortune Global 500 Enterprises with turnover $40Billion in 2020;

- 110,000 employees, over 40 wholly-owned or majority-owned subsidiaries;

- Three main areas of R&D and manufacturing: mechanical equipment R&D, project contracting, and trade and services
About Sinomach-IT

- In 2012, founded as Central Research Institute, dedicated to a high-end R&D platform for smart manufacturing.
- In 2015, as SINOMACH Group concentrated its strengths on the development of intelligent manufacturing, Sinomach Intelligent Technology Corporation (Sinomach-IT) was founded.
- After several years of development and tempering, we have become a well-known intelligent manufacturing system solution provider in China, centered on independent and controllable industrial software and intelligent equipment.
To relieve development bottlenecks of manufacturing enterprises (mainly for machinery equipment)

Difficulty in finding and keeping production management personnel

Product quality relies on human factors

Increasing labor price

Increasing remote collaboration

Increasing needs for customized products

Decreasing product lifecycle

Increasing comprehensive competition

Difficulty in know-how accumulation and transfer
Main Products

Industrial Software
iMOM/iMES
Manufacturing Operation Management Platform

Equipment
iSNM Series
Industrial Robot Platform

Smart Manufacturing Solution

Industry Platform

Product Platform

Technology Platform

Fundamental Platform

Platform + Industrial Application
Platform + Function Extension
Platform + Technological Application
Platform + Innovation

Customer- & Market-Oriented
Product- & System-Resulted
New Technology & New Techniques
Industrial Standards & Patents
To set up “the brain and central nerve system” of smart factory
Main iMOM Functionalities

- Low-code IDE
- Nesting integration optimization
- Production scheduling optimization
- OEE real-time analysis
iMOM for Smart Factory

- Based on latest IEC/ANSI/MESA standard
Main Products - industrial robots

iSNM series industrial robots

Special robot

Live working robot

Vacuum robot

Robot core components and systems

Control System

3D vision system

Server Driver

Precision Reducer
Main Products - Robot 3D Vision

- Line laser scanning
- 3D positioning
- Precise picking
- 3D reconstruction
Standard Establishment

Based on the smart factory/digital workshop
- GB/T 37393-2019《Digital workshop General technical requirements》
- GB/T 37413-2019《Digital workshop Terms and definitions》

Based on MOM products
- 《Standard for Platform-based Manufacturing Operation Management System of Agricultural Machinery Equipment Intelligent Factory》
- 《General integration model standard for agricultural machinery equipment smart factory》
- 《Information Integration Standard for Digital Workshop of Medium and Low Voltage Switchgear》
- 《Design and implementation of integrated safety for smart factories/digital workshops》
- 《Guidelines and Standards for Smart Factory Construction》
- 《Agricultural machinery design process simulation and information integration standards》

Based on the core technology of robots,
- CRIA 0001-2019《Industrial robot control system》

Condensing the industrial knowledge of SINOMACH
- 《Research on the Planning and Technical Standards of SINOMACH Smart Factory》（1 Overall + 5 Industries）
Use Cases
Application Areas and Industries

- Machinery Equipment
- Agricultural Equipment
- Textile
- Petroleum
- Chemical
- Mine
- Injection
- Pharmaceutical Industry
- Agricultural
- Petrol
- Chemical
- Mine
- Injection
- Pharmaceutical Industry
- Automobile
- Automobile Parts
- New Material
- New Infrastructure
- Defense
- Education
- Overall Design
- MOM Application
- Robot Application
- Electricity Equipment
- Power generation
- Transmission
- Power distribution
- Automobile
Representative Use Cases - Rail transit industry

- Automated production line with robotic for beam sleeper manufacturing (The first set in China, the top ten annual cases of Chinese smart manufacturing 2019)

- Robot type: iSNM0600-16
- Product: Sleeper for railway
- Application: Assembly, welding, loading and unloading
- Advantages: The efficiency is increased by 5 times, and the pass rate is more than 95%.
Representative Use Cases – Environmental protection industry

- Environmentally friendly refrigerant filling production line (first set in China)
Environmental protection industry

- Environmentally friendly refrigerant filling production line (the first set in China)

Capacities: 1500 bottles/8 hours, continuously in 24 hours

- Improve production capacity based on the modular combination of smart units
- Realize unmanned automatic production based on robot continuous operation
- Realize flexible production based on machine vision dynamic recognition
- Realize system security guarantee based on automatic perception technology
Representative Use Cases – Robotic production line

- Service robot intelligent manufacturing production line (first set in China)
Representative Use Cases—Robotic production line

- Service robot intelligent manufacturing production line (first set in China)

- 3D vision inspection technology
- Robotic gripper quick change technology
- Automatic screw tightening technology
- Service robot detection technology
- Intelligent warehousing and logistics technology
- MOM system integration application
<table>
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<tbody>
<tr>
<td>1</td>
<td>Electricity</td>
<td>Collaborative robotic arm and power supply</td>
<td>Xu Ji Group</td>
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<td>2</td>
<td>Master-slave (same configuration) robotic arm components and accessories</td>
<td>Xu Ji Group</td>
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<td>3</td>
<td>10kV live working robot vision module</td>
<td>Xu Ji Group</td>
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<td>4</td>
<td>Electricity</td>
<td>Electric tools for live working on distribution network</td>
<td>Guangzhou Power Supply Bureau Co., Ltd.</td>
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<td>5</td>
<td>Machinery Equipment</td>
<td>Sleeper size 3D measuring equipment system</td>
<td>China Railway No. 3 Engineering Group Co., Ltd.</td>
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<td>6</td>
<td>Textile</td>
<td>The development of spinning frame robot static yarn breaking and continuous splicing technology</td>
<td>JINGWEI Textile Machinery</td>
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<td>7</td>
<td>Textile</td>
<td>Intelligent cotton spinning complete set of spinning equipment, automatic cotton matching robot</td>
<td>JINGWEI Textile Machinery</td>
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<td>8</td>
<td>Defense</td>
<td>Research and development of intelligent plug-in robot system</td>
<td>Beijing Jiutian Discovery Technology</td>
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<td>9</td>
<td>Application development of iSNM1500-160 custom six-axis industrial robot in complex environment</td>
<td>CASIC</td>
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## List of Use Cases – Industrial robots & machine vision

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<td>Mechanical</td>
<td>Intelligent manufacturing robot production line for the key components of rail transit</td>
<td>China Railway No. 3 Engineering Group</td>
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<td>Intelligent production line of high-performance resin bond super-hard abrasive tools</td>
<td>Zhengzhou Abrasives Grinding Research Institute</td>
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<tr>
<td>3</td>
<td></td>
<td>Application of industrial robots in automatic drill pipe sorting system</td>
<td>China University of Geosciences</td>
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<td>4</td>
<td></td>
<td>Automatic filling production line for environmentally friendly refrigerant cylinders</td>
<td>Sinochem Engineering Group Environmental Protection</td>
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<td>5</td>
<td></td>
<td>Eight-station automatic production line for intelligent manufacturing of Xiaozi service robots</td>
<td>Kangli Youlan Robot Technology</td>
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<td>6</td>
<td>Defense</td>
<td>Multi-dimensional loading test bench for intelligent walking equipment</td>
<td>Inner Mongolia First Machinery Group</td>
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<tr>
<td>7</td>
<td></td>
<td>Magnetron sputtering coating machine coating robot</td>
<td>AVIC Chengdu Aircraft Industrial (Group)</td>
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<tr>
<td>8</td>
<td>Education</td>
<td>Intelligent manufacturing production line integrating demonstration and training</td>
<td>National Machine Intelligence (Suzhou)</td>
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<td>9</td>
<td></td>
<td>Intelligent manufacturing experimental teaching platform</td>
<td>Beihang University</td>
</tr>
</tbody>
</table>
Representative Use Cases – iMOM

- Workshop Job Management
- Logistics
- Equipment Monitoring
- Workshop Roaming
Representative Use Cases – iMOM

- Final assembly workshop
- Sheet metal workshop
- Welding workshop
- Part assembly workshop
- Busbar workshop
- Stereoscopic Warehouse
- Workshop logistics
Representative Use Cases— iMOM

Component assembly MES workstation

Drawer assembly MES workstation

Instrument box production line kanban

Vertical MES touch terminal

Hanging MES touch terminal

Workshop electronic kanban

Factory Control Center
# List of Use Cases — iMOM

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<td>Machinery Equipment Manufacturing</td>
<td>New-type wheeled tractor intelligent manufacturing machine processing digital workshop MES</td>
<td>YTO Group Corporation</td>
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<td>2</td>
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<td>Large-scale injection molding equipment manufacturing intelligent factory manufacturing operation system</td>
<td>Borch Intelligent Equipment</td>
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<td>3</td>
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<td>Intelligent manufacturing operation management system for high-performance super-hard material abrasive tools</td>
<td>Zhengzhou Abrasives Grinding Research Institute</td>
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<td>4</td>
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<td>MES platform of Jingwei Textile Machinery Co., Ltd.</td>
<td>JINGWEI Textile Machinery</td>
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<td>5</td>
<td></td>
<td>Implementation of Qingdao Hongda Intelligent Manufacturing MES System</td>
<td>Qingdao Hongda Textile Machinery</td>
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<td>MES/DNC system for processing and manufacturing digital factory</td>
<td>CNOOC Offshore Energy Development</td>
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<td>7</td>
<td>Electricity Equipment Manufacturing</td>
<td>Construction of Digital Factory for Complete Switchgear of Intelligent Distribution Network</td>
<td>Ningxia Licheng Electric Group</td>
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<td>Machine plus digital workshop MES for key parts of large hydropower and gas turbine equipment</td>
<td>China Second Heavy Machinery Group</td>
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<td>10</td>
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<td>Intelligent factory information management system for dual-equipment flywheel energy storage device</td>
<td>China Second Heavy Machinery Group</td>
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<td>11</td>
<td>Automobile automobile parts Manufacturing</td>
<td>The overall solution of intelligent automobile manufacturing engineering</td>
<td>China Automotive Industry Engineering</td>
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<td>12</td>
<td></td>
<td>Digital workshop solutions and demonstration applications for seals</td>
<td>Guangzhou Institute of Mechanical Science Co., Ltd.</td>
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<td>13</td>
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<td>Vulcanization equipment networking transformation and remote operation and maintenance management system development project</td>
<td>Guangzhou Guoji Sealing Technology Co., Ltd.</td>
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<tr>
<td>14</td>
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<td>Shandong Liancheng Precision Manufacturing Co., Ltd. MES platform software implementation</td>
<td>Shandong Liancheng Precision Manufacturing Co., Ltd.</td>
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<td>15</td>
<td></td>
<td>High-end medical equipment intelligent new mode application manufacturing operation management system</td>
<td>Chutian Technology Co., Ltd.</td>
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<td>16</td>
<td>Pharmaceutical</td>
<td>Digitization and Information Construction Project of Diwan Intelligent Manufacturing Base</td>
<td>Tianjin Zhongxin Pharmaceutical Group Co., Ltd.</td>
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<td>Machinery Equipment</td>
<td>Intelligent Manufacturing Master Plan of New Wheel Tractor</td>
<td>YTO Group Corporation</td>
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<td>Machinery Equipment</td>
<td>CNOOC Offshore Energy's 14th Five-Year Plan for Intelligent Manufacturing</td>
<td>CNOOC Offshore Energy Development</td>
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<tr>
<td>3</td>
<td>Machinery Equipment</td>
<td>PDM, CAPP, DNC, MES and automation system design</td>
<td>CNOOC Offshore Energy Development</td>
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<td>Machinery Equipment</td>
<td>Equipment intelligent manufacturing consulting planning</td>
<td>PMJ Coal Mine Machinery Equipment</td>
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<td>Intelligent manufacturing consulting planning</td>
<td>China Railway Engineering Equipment Group</td>
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<td>Intelligent manufacturing consulting planning</td>
<td>CITIC Heavy Industry Machinery Co., Ltd.</td>
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<td>Application of the new mode of intelligent spinning in the whole process</td>
<td>Wuhan Yudahua Textile &amp; Garment Group</td>
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<td>Machinery Equipment</td>
<td>High-end knitting yarn whole-process smart factory</td>
<td>Hunan Kelijia Textile</td>
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<td>Electricity Equipment</td>
<td>Construction consultation and planning of transformer intelligent manufacturing plant</td>
<td>Pearl Electric</td>
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<td>Electricity Equipment</td>
<td>Application of new mode of intelligent manufacturing of power distribution equipment based on full life cycle management</td>
<td>Baiyun Electric Equipment</td>
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