

Market Analysis & Forecasts



Industrial/Medical Semiconductor Forecast — 2018 Edition

Market Analysis and Forecasts to 2023
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Abstract

The industrial and medical market remains the most challenging sector for semiconductor manufacturers to serve and the supply chain is both complicated and fragmented. In practice industrial is a collection of markets within a market, while medical applications range from high reliability medical imaging and implantable electronics, to consumer wearables such as health & fitness monitors. Owing to this complexity, the sector has historically been overlooked by many semiconductor vendors, who have elected instead to focus their marketing efforts on higher value and less complicated verticals.

Accounting for about twelve percent of the semiconductor TAM, the industrial and medical sector is small compared with the compute, mobile, home and communications sectors, but revenues have exceeded those in automotive for over five years. Accordingly, many semiconductor suppliers have been advancing their understanding of this diverse and growing market, particularly as medium term growth prospects have begun to slow in other end-use sectors, such as mobile and PCs.

To support this need, Semicast has developed this research to focus on the strategic needs of semiconductor suppliers looking to identify the key equipment types driving semiconductor revenues in the industrial and medical sector and which market segments are forecast to have highest revenue growth. First published in 2006, the latest edition of the research builds on the work of the previous studies, using 2017 as the base year, with forecasts provided to 2023.

This study has been developed to be used as a companion to the Semicast study [**Tactical Analysis of the World Industrial/Medical Electronics Market & Supply Chain**](#), which provides analysis of tactical issues for semiconductor suppliers in the industrial and medical sector. Used together, the two studies provide a comprehensive tactical and strategic analysis of the industrial and medical sector.

Overview & Key Features

- Analysis of 130 industrial/medical equipment types (full list provided on pages 3&4).
- Estimate and forecast for worldwide production volumes for each equipment type (2017-2023).
- Estimate and forecast for semiconductor value in each equipment type (2017-2023).
- Estimate and forecast for semiconductor TAM for each equipment type (2017-2023).
- Market analysis segmented into 18 semiconductor product types.
- Identification and ranking of top 25 highest semiconductor revenue applications (2017-2023).
- Supplier market share estimates for industrial/medical semiconductors in 2017.
- Highly quantitative analysis, with discussion summarized in short, easy to read bullet points.
- Analyst support time to answer all reasonable questions relating to forecasts and conclusions.

New for 2018 Edition

- Segmentation of the lighting market from building automation, HVAC & refrigeration.
- Analysis of the market for image sensors & MMICs added.

Industrial/Medical Market Segments & Sub-segments

The study segments the market for industrial/medical electronics systems into ten segments as follows:

Segment

- Factory Automation & Control
- Motor Drives
- Lighting
- Building Automation , HVAC & Refrigeration
- EPOS, EFT & ID
- Test & Measurement
- Consumer Medical
- Medical Imaging & Diagnostics
- Power & Energy
- Industrial Transport
- Other Industrial Applications

Additional sub-segmentation

- Control & Compute, Process Measurement & Field Instruments, Switchgear, Misc. Automation
- Building Automation, HVAC & Refrigeration
- Application Specific Test & Measurement, General Purpose Test & Measurement, Instrumentation & Other Equipment
- Medical Imaging, Diagnostics/Therapy & Monitoring

Industrial/Medical Equipment Coverage

The equipment types analyzed in the study are as follows:

Factory Automation & Control: Control & Compute [Industrial Ethernet Infrastructure, Computer Numerical Control, Industrial PCs, Embedded Computer Boards & Modules, HMIs & Operator Panels, Machine Vision Inspection Systems, PLCs & PACs, Distributed & Remote I/O Modules] ; **Process Measurement & Field Instruments** [Process Analytical Instruments, Flow Measurement, Level Measurement, Pressure Measurement, Temperature Measurement, Process Variable Transmitters, Telemetry / RTUs, Process/Temperature Controllers, Position Sensing] ; **Switchgear** [Circuit Breakers, Contactors, Protection Relays, Solid State Relays] ; **Miscellaneous Automation** [Pumps, Robotics, Semiconductor Manufacturing & Test Equipment, Welding].

Motor Drives: AC Drives, DC Drives, Servo Drives, Stepper Drives, Soft Starters/Brakes.

Lighting: Electronic Ballasts/Lamps & Modules, Lighting Controls, Street Lights/Traffic Lights & Control.

Building Automation, HVAC & Refrigeration: **Building Automation** [Fire Detection, Fire Alarm Control Panels & Annunciators, Fire Alarm Notification, Intruder Alarm Control Panels, Intruder Detection & Notification, CCTV/Video Surveillance Cameras, CCTV/Video Surveillance Equipment, Electronic Access Control, Elevators & Escalators] ; **HVAC & Refrigeration** [Boilers & Warm Air Furnaces, Circulator Pumps, Compressors, Electronic Room Thermostats & Controls, Humidifiers/Dehumidifiers, Unitary Air Conditioners, Commercial Refrigeration].

EPOS, EFT & ID: ATMs, Handheld EFT Transaction Terminals, POS Authentication Pads, EPOS/ECR/Cash Drawer, Handheld Data Terminals, Fuel Dispensers, Vending/Payment/Change Machines, Card Readers, Coin Acceptors & Currency Validators, Printers, Scanners, Smart Cards.

Test & Measurement: **Application Specific T&M** [Automotive Test Equipment, Broadband Test Equipment, Fiber Optic Test Equipment, Wireless Test Equipment, Other Test Equipment] ; **General Purpose T&M** [Counters & Timers, Logic Analyzers, Digital Multimeters, Network Analyzers, Digital Oscilloscopes, PC-based Test Equipment, RF Power Meters, PXI/VXI-based Test Equipment, Signal/Function Generators, Spectrum Analyzers, Other General Purpose T&M] ; **Instrumentation & Other Equipment** [Calibration Instruments, pH/ORP Instruments, Chart Recorders & Data Acquisition, Laboratory Instrumentation, Scales & Weighing Equipment, Non-Destructive Test Equipment].

Consumer Medical: Blood Glucose Meters, Blood Pressure Monitors, Telehealth Gateways, Fitness Monitors, Electronic Thermometers, Pregnancy Testers/Fertility Monitors.

Medical Imaging & Diagnostics: **Medical Imaging** [CT, Ultrasound, MRI, PET/PET-CT, Digital X-Ray, Picture Archiving & Communications] ; **Diagnostics, Therapy & Monitoring** [ECG, Dialysis Machines, Medical Ventilators, Point-of-care Testing, Pulse Oximetry Monitoring, Multiparameter Patient Monitors, Medical Lasers, Medical Endoscopes, Infusion Pumps, Pacemakers, Implantable Cardioverter Defibrillators, Cardiac Resynchronization Therapy, Pain Management Devices, External Defibrillators, Digital Hearing Aids, Sleep Diagnostics, Therapy & Interfaces, Fitness Machines, Electronic Beds, Electronic Wheelchairs, Powered Scooters].

Power & Energy: AC/DC Power Supplies, DC/DC Converters, DC/AC Power Inverters, Industrial Battery Chargers, UPS, Generators, Smart Utility Meters, Electric Vehicle Charging Stations & Infrastructure, Distribution & Substation Automation, Renewable Energy.

Industrial Transport: Construction, Lifting & Mining, Agricultural Equipment, Materials Handling Vehicles, Refrigerated Trailers, Electric Motorized Vehicles, Rolling Stock, Signaling & Systems, Heavy Trucks & Buses.

Other Industrial Applications: Airport Security, Arcade/Casino/Gambling Machines, Broadcast Equipment, Commercial Drones, Digital Signage, Industrial Catering Equipment, Industrial Printers & 3D Printing, Janitorial & Laundry Equipment, Professional Audio Equipment, Professional Power Tools, Unassigned Industrial.

Semiconductor Market Segmentation

The study provides analysis of the market for industrial/medical semiconductors into 18 product types:

- Actuators & Sensors
- Application Specific Analog ICs
- General Purpose Analog ICs
- Power Discretes & Modules
- Other Discretes
- Gate Arrays & Standard Cells
- PLDs/FPGAs
- Other Logic
- Image Sensors & MMICs
- 4/8-bit MCU
- 16-bit MCU
- 32-bit MCU
- 32/64-bit MPU
- DSP
- DRAM/SRAM
- PROM/EPROM/Flash/Other
- LEDs
- Other Optoelectronics

Further segmentation of the 32&64-bit MCU/MPU categories is also provided by architecture:

- ARM MCU
- ARM MPU
- MIPS
- Power Architecture
- 68K/Coldfire
- x86
- SuperH
- TriCore
- V850/RH850/RX
- Other 32/64-bit

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Example Tables

Global Equipment Production Estimates and Forecasts in the Factory Automation & Control Sector

Units (KU)	2017	2018	2019	2020	2021	2022	2023	CAGR (17/23)	DIFF (17-23)	SUM (17>23)
Control & Compute										
Industrial Ethernet Infrastructure										
Computer Numerical Control (CNC)										
Industrial PCs										
Embedded Computer Boards & Modules										
HMI's & Operator Panels										
Machine Vision Inspection Systems										
PLCs & PACs										
Distributed & Remote I/O Modules										
Process Measurement & Field Instruments										
Process Analytical Instruments										
Flow Measurement										
Level Measurement										
Pressure Measurement										
Temperature Measurement										
Process Variable Transmitters										
Telemetry / RTUs										
Process/Temperature Controllers										
Position Sensing										
Switchgear										
Circuit Breakers										
Contactors										
Protection Relays										
Solid State Relays										
Miscellaneous Automation										
Pumps										
Robotics										
Semiconductor Manufacturing & Test Equipment										
Welding										
Sector Total										
Annual Growth Rate										
Source: Semicast Research Table Revised: May 2018										

Global Market for Semiconductors in the Factory Automation & Control Sector by Equipment Type

Revenues (US\$ Millions)	2017	2018	2019	2020	2021	2022	2023	CAGR (17/23)	DIFF (17-23)	SUM (17>23)
Control & Compute										
Industrial Ethernet Infrastructure										
Computer Numerical Control (CNC)										
Industrial PCs										
Embedded Computer Boards & Modules										
HMI's & Operator Panels										
Machine Vision Inspection Systems										
PLCs & PACs										
Distributed & Remote I/O Modules										
Process Measurement & Field Instruments										
Process Analytical Instruments										
Flow Measurement										
Level Measurement										
Pressure Measurement										
Temperature Measurement										
Process Variable Transmitters										
Telemetry / RTUs										
Process/Temperature Controllers										
Position Sensing										
Switchgear										
Circuit Breakers										
Contactors										
Protection Relays										
Solid State Relays										
Miscellaneous Automation										
Pumps										
Robotics										
Semiconductor Manufacturing & Test Equipment										
Welding										
Other Factory Automation & Control										
Sector Total										
Annual Growth Rate										
Source: Semicast Research Table Revised: July 2018										

Example Tables

Global Market for Semiconductors in the Factory Automation & Control Sector by Product

Revenues (US\$ Millions)	2017	2018	2019	2020	2021	2022	2023	CAGR (17/23)	DIFF (17-23)	SUM (17>23)
Actuators & Sensors										
Analog ICs										
Application Specific Analog										
General Purpose Analog										
Discretes & Modules										
Power Discretes & Modules										
Other Discretes										
Logic ICs										
Gate Arrays & Standard Cells										
PLD/FPGA										
Other Logic										
MCU/MPU/DSP										
4/8-bit MCU										
16-bit MCU										
32-bit MCU										
32/64-bit MPU										
-ARM MCU sub-total										
-ARM MPU sub-total										
-MIPS sub-total										
-Power Architecture sub-total										
-68K/Coldfire sub-total										
-x86 sub-total										
-SuperH sub-total										
-TriCore sub-total										
-V850/RH850/RX sub-total										
-Other 32/64-bit sub-total										
DSP										
Memory ICs										
DRAM/SRAM										
PROM/EPROM/Flash/Other										
Optoelectronics										
LEDs										
Image Sensors & MMICs										
Other Optoelectronics										

Total

Annual Growth Rate

Source: Semicast Research

Table Revised: July 2018

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Analyst Biography

Colin Barnden - Principal Analyst



Colin joined Semicast Research in 2006 and is principal analyst for semiconductor research and vice president of business development. Prior to joining Semicast, he worked for 12 years at IMS Research, rising to the position of Senior Research Director of its Semiconductor Research Group and responsible for analyst coverage on the analog/mixed signal, optoelectronic and embedded processing industries. Colin also set-up and established IMS Research's Automotive Electronics Group. During his tenure, Colin authored dozens of reports and became a well respected industry analyst. He holds a B.S. in Electronic Engineering from Aston University, England and has almost twenty-five years of experience as an industry analyst.

About Semicast

Founded in 2006, Semicast has an established reputation at most top 20 semiconductor suppliers, with areas of expertise covering industrial and medical electronics and semiconductors; automotive electronic controllers; automotive audio, infotainment & navigation systems; automotive semiconductors; and 32-bit micro-controllers.

Our analysts use a combination of technical expertise, a proven method for producing electronics focused market research and specific applications knowledge to produce concise and timely research to help you make effective business decisions.

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