Signal srl - custom solutions in Industrial Electronics
Signal works in electronic field, designing and producing electronic boards and software for the industrial and domestic market.

Signal has obtained the ISO 9001:2008 certification. All products have been designed according to the CE and EMC standards in force and to the sector specific standards. M.T.B.F., F.M.E.A., H.A.L.T.. Advanced techniques are routinely used to match short time to market and high reliability.

Signal uses a complete set of instruments for the products qualification in laboratory. At request we have well-established partnership with EMC-EMI and vibration labs. Production and test are made with “zero defect” target in mind. Strong S.P.C. background. A.T.E., Labview and functional test system.
Signal employs 15 engineers divided in 9 software and 6 hardware division. All engineers are skilled and well trained summing roughly up to 4 hundred years/man history in designing. Total staff at the moment is: 35 Italy and 14 China.

Signal have 25 years of electronic, software and system design experience.

Signal have many relationships with Universities and researchers for application with strong innovation or modelling or deep mathematical request.

Signal works in many market branches with different technologies so we can cross-fertilize the applications.
• Torque, speed, position and electronic gear controls
• CAN connection up to 64 motors
• DC brushless Driver for small motors
• Commutation by encoder, by resolver, with or without Hall

• Dedicated brushless driver from mains.
• Special driver for high starting torque
• Special drive for water pumps (sensorless)
• For standard drivers we buy on the market (commodity).
• AC brushless with safety function
• Current 20 Amps. continuous, 200 Amps peak (1:10 ratio) 400Vac.
• Commutation from resolver
• Torque and speed loops
• CAN connection
• Half bridge IGBT modules

• DC brushless Current 2 Amps. Continuous, 4 Amps peak 230Vac.
• Commutation from encoder
• Torque, speed and position loops
• CAN connection
• IPM module
• Pancake motor for direct drive
• 2.5Kw and 500W 500 rpm
• Commutation from Facoder
• No bearing for motor and feedback, items mounted on customer shaft
• Hi efficiency, stiffness, no backlash
• Dual or single stepper motors driver
  • From 1.5 to 12Amps. 100Vdc, from 12V to 190V
  • Open loop microstepping
  • Inside S ramp, inside SD card for trajectories database
  • CAN, digital control, interpolation

• Closed loop FOC controller
• Smoothed current waveform for high reciprocated movement.
• No resonance.
• Used for loom Leno.
Solenoid driver 55-8 Amps. 9-36V
- Potted module for automotive IP67
- Actuation feedback from solenoid (no sensor)
- Thermal protection (no sensor)
- Full digital with serial link

Solenoid driver 190-35 milliamps. 19-30V
- Automatic insertion on actuator
- Very low stand-by power (25uA)
- Very low cost
- Discarded items: parts per million (6 sigma)

- Mono-stable and bi-stable solenoid driver
- Single and multiple channel
- Full digital time and current setting
- Short circuit proof with diagnosis
- Digital serial link (CAN, SPI)
- Local or remote board
PIEZOELECTRIC DRIVER

• ON-OFF bending element driving
• Two or three wire driving
• Up to 250 Volt driving
• Driving of proportional movement at request
• We produce various boards (multiple channels: 16 to 80)
• Short circuit proof with diagnosis
• Digital serial link (CAN, SPI)

• Special piezo sonar driver for underwater application
• Bidirectional piezo-coupling (emits and receives ultrasonic burst)
• Isolated driver from low voltage
• Digital echo cancellation
• Resonant ultrasonic generator (e.g. atomizer)
SPECIAL ACTUATOR DRIVER

- Piezoelectric injectors
- Magnetic injectors
- Proportional solenoid for proportional valves. Closed loop on pressure or position. Innovative algorithm (not only PID)
- Voice coil dc motor for positioning of gasoline injectors
- In any case: short -circuit proof with diagnosis and digital link
• Temperature: NTC, thermocouple, Pt100
• Position: encoder, resolver, potentiometer, linear Hall arrangement, magnetoresistor
• Special sensor: LVDT and RVDT
• Pressure: MEMS sensor
• Acceleration: MEMS sensor (many axis)
• Automatic calibration on few points with special interpolation.
• Piezo sensor for ultrasonic data transmission
• IRDA and optical data transmission
FIELD BUSSES

- CAN (SIGNAL PROTOCOL)
- CANOPEN
- AS-I (TWO WIRE CONNECTION)
- SPI
- ETHERNET
- GPRS and GSM
- SHORT-RANGE R.F. (DEDICATED and ZIGBEE)
- STANDARD RS232 AND 485
- IRDA
- CURRENT LOOP (ANALOG TRANSMISSION)
ENERGY HARVESTING

• THERMAL ENERGY HARVESTING
• EXHAUSTED AIR HARVESTING
• VIBRATION HARVESTING
• MICRO HYDRAULIC
• VERY LOW VOLTAGE DC/DC KNOWLEDGE (FROM MILLIVOLT)
• RESERVOIR ENERGY BY THIN FILM LITHIUM BATTERY OR SUPERCAP
• SHORT-RANGE RADIO LINK (SPECIAL and ZIGBEE)
• DEEP SLEEP CPU WORKING
• SENSOR NETWORK
• POWER GENERATION WITHOUT CABLING (ATEX ENVIRONMENT)
• REMOTE CONTROL
• Fire-fighting with automotive PLC, dedicated touch-panel. Harsh environment (temperature, vibrations, ..).
• “Mission critical” vehicle with distributed control.
• Mobile lightening tower with wireless governance, HID lamp ballast from battery
• Garbage collecting and snow-removing vehicle

• Water gun control
• Water and oil compressor control
TICKETING AND BANKING

- Ticket emission, ticket reading,
- Printed, ISO 7816 and RFID ticket
- Printers for “millions ticket emission” (with or without magnetic trace)
- Personal computer based ticket emission and payment
- Bus terminal for general management
- GPRS, GPS, IRDA, Ethernet link.
- Voice capability
OTHERS SPECIAL MARKET BRANCHES

• Special pneumatic devices
• Military (underwater weapons)
• Hi-level automatic vendor machine (cigarettes)
• Professional cooking system: resistive and induction heating
• Electromechanical buck-boost power stabilizer
• “Full electronic” mains power quality conditioner
• Automatic line for steaming, cleaning and sanitization
• Automatic line for pressing and ironing
• Unit for tape bonding on garments

• Glue-Tape matching station
• Tape constant tension regulation, serial link, four quadrants.
uLinux® based operating system
- High level of interconnectivity
- High flexibility to comply with several types of needle selection system
- Easy and quick programming of the thanks to a large graphic display with highly interactive icons

Electronic controller for closed toe according to:
✓ LIN-TOE® “Frullini” patent “Frullini”
✓ “NTA” patent Stand-alone system with dedicated interface or machine linked
• Controls for sewing machine
• Control of bar-tacking machine
• Control of mini-embroidery
• Main board and servo motor board
• HMI with graphics LCD and keyboard
• High speed X-Y stepper motors
• High torque servo motor, direct drive
• Working speed very high
• Foot and scissor solenoids
• Dedicated sensors
• Personal computer drawing tool
• A COMPLETE SOLUTION FOR BASE, STRIPER AND JACQUARD MACHINES

• FULL INTEGRATION IN SIGNAL FACTORY NETWORK FOR DATA TRANSFER (PROGRAM AND PRODUCTION DATA)

• TOUCH SCREEN ALSO ON BASE MACHINE

• ELECTRONIC TAKE-DOWN WITH OPEN FABRIC CAPABILITY

• POSSIBILITY OF FULL KIT WITH J&M ACTUATOR
SKMON data collection

- Ready to use, standard inside each Signal machine (Ethernet based)
- Collection monitors machine status and efficiency
- SW analyse the stopping causes using data and graphs
- Simple connection, Ethernet by wire or Radio link
- Remote plant management by standard Internet connection
- Articles and message can be downloaded and uploaded from central computer
- Open database (ODBC ®) for additional elaborations
Many hundreds of wires

Modular rack solution based on VME backplane
TEXTILE: FULLY TAYLORED KIT

At request we can design and produce fully dedicated board with special lay-out e.g. ready to fit in the carriage.

Example CSC811: 2 feeds
- 6 stepper motor with zero.
- 12 Jacquard solenoid drive. Short circuit proof.
- 16 valves drive. Short circuit proof.
- 28 input for proximity, switch,….
- 2 analog output setting
- 2 analog input reading
- 2 encoders management

Simple connection due to field-bus (two couple of wires + power)
TEXTILE: EXAMPLE OF FLAT KNITTING MACHINE

- Up to 64 motorized yarn-carrier with brushless servomotor
- Touch panel user interface with WinCE or Linux platform-based application
- Multi-languages and self-diagnostic functions
- Centralized management for stitch height and yarn feeding adjustment
- Needle selection control through mono-level actuator and mostable or bistable multi-level actuator
- Electronic take-down
- Comb controller with torque motor
Modular system composed by electronics boards mounted directly on carriage. By backplane customer can add the required function (motors, selection groups or mono-system, output).
Moving parts connected by CAN to other boards to drastically reduce cabling.
Control for main motor, take-down, racking, comb and general management fitted on the machine frame. A full set for stepper, d.c. and brushless motors.
Human Machine Interface with touch screen and TFT color LCD; friendly interface. USB and network connection.
The yarn-carriers are no longer driven by plungers on the upper part of the carriage bow but by individual motors placed at the end of the yarn-carrier bars. We drive up to 32 motors. Dedicated software (motion engine and hi-level management).

- Maximum textile creativity
- More complex design capability
- Maximum machine productivity
- Long lasting fabric
The wide range of different applications developed gives us the necessary experience and technical competence to find the right solution.

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