We design solutions.

Computers for the Industry

Application-Oriented System Solutions

- Operation
- Monitoring
- Visualization
- Control
- Communication
## The Topics at a Glance

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About MSC

Competence and Know-How

The MSC Tuttlingen GmbH sees itself as an OEM technology partner and engineering service provider in all areas of industrialized computer technology. As a part of the privately owned and independent MSC group of companies the potential of Europe’s leading high-tech distributor of electronic components and modules stands behind the MSC Tuttlingen GmbH.

More than 30 years of know-how in control and almost 20 years of experience in the development of industrial PCs are the basis of advanced automation concepts. Market-oriented solutions with modern technology in the fields of operation + monitoring, visualization + control, communication + networking – this is where we see our core competences.

All our products are the results of a steadily increasing innovative strength, of our high standards of quality and reliability and of the personal commitment of our team which plans, projects, develops, designs and produces individual solutions.

Our customers include companies with highest demands to industrial requirements, among others from the industries of machine building, packaging machines, plastics and chemical engineering, the food and beverage industry, textile and wood processing, medical and measuring engineering.

- MSC synergies for the uninterrupted total responsibility for your product.
- Technological know-how and application experience of many years.
- More than 100 employees strive for your trust every day.
- Only those offering countable customer value gain long-term success.
About MSC

Thinking in Terms of Solutions

We bring hardware and function together, i.e. we design complete OEM-solutions for individual customer projects, from small to complex. These are industrial systems and components on the basis of integrated PC-technology:

- which fit precisely
- which excel by sturdy design
- which meet specific requirements
- which are designed in a professional way

For every functionality we arrange the adequate automation package, attuned to the immediate environment and the user: user-oriented hardware, custom-fit instrument engineering, fieldbus integration as well as the complete software pre-installation – e.g. with embedded operating systems and BIOS-adaptation, process visualization, soft-PLC and client-server-configuration.

- **System Design**
  In order to provide you with the best solution possible we either use modules and components from our IPC-standard design or modify them or develop hardware and software from the start.

- **System Platform**
  No matter whether single-board computer or embedded design, whether low-cost or high-end specification – with its scalable structures and open standards our portfolio will meet most requirements.

- **System Integration**
  From simple applications to complex processes we realize IPC-based customer projects with the know-how of the system integrator, taking advantage of current technologies and proven architectures.
Perfect components alone are not enough. Only in connection with sector-specific expertise qualified solutions can be found economically. From MSC you do not just get a product. We consider the general context, give advice on system analysis and together with you define an overall solution package from which you will automatically gain added value:

- more flexibility for your individual system specifications
- more resources for future performance adaptations
- more efficiency in your productivity and with your costs
- more time for your core competence
- more system availability

And more product continuity: We count on long-term availability, ongoing product support and functional compatibility. For many of our products we guarantee 5 years of supply availability in terms of “form/fit/function”. You profit from a long product life cycle, a high investment security and safety in service and maintenance.

Our customers appreciate the advantage of obtaining all project relevant services from one source – from a partner who is always capable of assuming the total product responsibility. Due to our group synergies we can provide you with a comprehensive project support:

- continuous project management
- own board level portfolio
- own system design and prototyping
- own design of housings
- own production, modern production plants
- intragroup logistics centre
- world-wide procurement of components
System Setup

Professional Concept

Modular
Our IPC-family provides a selection of devices in different categories of performance and offers a number of options for customized system design, e.g. scalable computer platforms, different display formats and front plates as well as memory expansion. Depending on the device additional slots, pluggable compact flash card, optical drives and more is available.

Communicative
Along with the connection of standard fieldbus systems both the usual PC interfaces – included USB and multiple Ethernet – support the extremely important ability to communicate with networked systems. They do not only allow for the fast exchange of data and signals but also for the real-time properties in control applications.

Ergonomic
The IPC-design particularly considers the wishes of the customers concerning user-friendliness. This includes the visual, clear arrangement of the front plate layout and the contrasty keypad for the clear perception of the membrane keyboard. No less convenient are the high-quality luminous TFT-displays with long service-life and integrated touch screen.

Sturdy
The display basin and the added computer module form the mechanical platform. Front plates and housings are available in device-specific modifications and materials (aluminium, stainless steel, zinc-plated steel sheet), depending on environment, resistance, noise immunity, processing and weight. The sturdy design enables the universal installation of the IPCs as integrated panels or at supporting arms.
Customer-Specific Design

Customized
A customized appearance of your systems is important to you? You need an application-specific device design or you prefer special software images? MSC offers different stages for the execution of customer solutions. Contact us about the possibilities and minimum quantities for the individual design of "your" OEM-solution.

Individual
The variety of IPC-applications accounts for quite different requirements – thus creating the need for an individual design of the solutions: optical and/or constructive adaptations in design, modifications for OEM-functionality and turnkey machines.

You benefit from our know-how gained in embedded designs already implemented but also from the basic and system developments of our company.

- Adaptation of the front membrane with the integration of your logo, the free design of key labelling, key symbols and print colours at your option
- Adaptation of the front plate in terms of the arrangement or number resp. type of keys and switches [e.g. emergency stop]
- Adaptation of customer-specific design [basin, secondary housing, passive cooling, etc.]
- Adaptation of extensions: touchscreen and display technology, plug-in cards, software modules, ...
Resistant
Our industrial computers meet the high requirements necessary to ensure a safe and reliable operation if integrated near other machinery. This is achieved by a number of activities:

- **Constructive:**
  Sturdy, EMC-hardened housings, integration of specifically selected components for industrial use (HDD-alternatives, temperature-resistant displays). Vibration-resistant assembly of the PCBs. Use of non-rotating storage devices (CompactFlash).

- **Electrical:**
  Special ground-earth decoupling with board and interfaces in order to avoid system and machine malfunctions by ground loops. Abandonment of internal cable connections as far as possible, i.e. nearly cableless layout. Voltage supply with filter and buffer function.

- **Integrative:**
  Watchdog, interrupt events controllable by the software. Storage of remanent data, power-fail recognition. “Environment” controllers and associated diagnostic software as an additional monitoring program for the system’s functions. It registers all safety relevant parameters (CPU-/system temperature, fan speed, voltage supply, etc.) as well as the operating hours and device data (individual upper and lower limits for each device model). If a limit value is exceeded, the problem can be solved quickly without stillstand of the machinery.
System Setup

Integrated Reliability

Operationally Reliable
Due to extended performance resp. more expensive ULV processors, a fully fanless system can not be economically justified for every utilization. Therefore, we have modified the cooling concept of our current IPC-series. As a constructive base a heat collector with cooling fins is attached to the processor over its entire surface area, thus transmitting its thermal dissipation loss directly to the housing.

The IPC-systems have a fanless design when embedded processors with a lower power requirement are used. There are no rotating parts (in connection with compact flash cards no hard disk drives either) which are subjected to mechanical wear. This concept is completely maintenance-free. There are no service works necessary such as the regular exchange of air-filters.

In case performant standard CPUs are used a temperature-controlled fan which runs almost silently with a low rotational speed is used. It only accelerates at increased temperature values. Therefore, a constant thermal performance over a wide temperature range is granted. At the same time, compared to conventional fan cooling the maintenance intervals and the service life are significantly increased.

Approved
We lay special emphasis on system safety. EMC-tests confirm a high immunity to electrical noise. Vibration and shock tests prove the mechanic resistance against vibrations and shocks. Before dispatch all products are exposed to temperature and functional tests in a documented burn-in-phase. Our devices are approved according to CE, in their majority also according to UL. Not least the certification according to DIN ISO 9001:2000 underlines the quality of our products.
Open Design

Different computer boards with their respective industrial features form the basis of our huge variety of open IPC-systems. For particularly robust systems in a machine-oriented environment we use self-developed single-board computers ("high-grade"). For the use in basic applications we equip the systems with standardized computer modules ("economy").

Economy-Design

These architectures offer a functionally complete range of PCs for industrial use. They are based on industrial standard mainboards and offer a good price/performance ratio in the price-sensitive market.

- Technologically up-to-date hardware, availability up to 3 years
- All standard PC functions
- Full multimedia compliance
- Integrated all-in-one alternative to desktop systems in industrial environment
- Extension options
High-grade Design
Our IPC-boards which have been especially developed for industrial applications stand for highest system stability and long-term availability. The all-in-one boards are developed and produced entirely within the MSC group. They provide all functions and features which machine-oriented applications require.

- All by MSC
- Particularly suitable for industrial use
- Long-term availability [5 years] and investment security
- All standard PC functions
- Multiple Ethernet
- Fieldbus
- Reduction of flat cable connections
- Ground-earth decoupling
- Particularly resistant to shocks and vibrations
- Power supply unit with a minimum power loss, efficiency appr. 90%
- Integrated system monitoring functions
Platforms for Targeted System Design
With the embedded platforms developed by MSC we decouple the complex CPU-design from the applicative part in order to create applications with short development times. Embedded systems are designed without mechanical wearing parts (e.g. fans or hard disks) and are therefore particularly low-maintenance and reliable.

Our embedded systems allow for specific and sturdy solutions. All components are developed and produced within the MSC group. They provide both the hardware and the software functions which are specifically required for the applications.

- CPU-module and baseboard: all by MSC
- ETX and COM Express
- Particularly suitable for industrial use
- Long-term availability [5 years] and investment security
- All standard PC functions
- Specific functions for the respective application, e.g. power-fail recognition
- No rotating parts
- Highest resistance to shocks and vibrations
- Integrated system monitoring functions
- Reduced time-to-market
System Setup

Application-specific baseboard
Functional extensions, e.g. fieldbus
COM Express
ETX
Remote Display

**Separated Visualization**
If due to environmental conditions a separation of computer and display unit becomes necessary the applications require separated control and visualization stations. In these cases we rely on industrial displays or modern embedded clients with remote desktop connection.
By means of the remote desktop connection a single-user session can be transmitted to a client panel. In this case the desktop of the host computer is completely transmitted to the embedded panel and operated from there. Separated single-user visualizations with embedded clients are particularly suitable for highly EMC-contaminated environments or in order to bridge long distances.

For more on this topic see chapter “Server-based Computing”
The MSC group is one of the few worldwide distribution and development partners of the leading BIOS-manufacturer Phoenix Technologies. Due to this close partnership we are in a position to attune the BIOS-features to the requirements in the industrial environment.

All BIOS-functions are flexibly adapted to the respective requirements, e.g. definitions of different boot media, power and heat management or the most suitable parameters configuration which are relevant for operational safety. The BIOS adaptations are optimized for each CPU and chip set.
Operating Systems

Apart from standard operating systems such as Windows XP Prof. we offer comprehensive support for the use of embedded operating systems. Windows CE, Windows XP Embedded or Embedded Linux guarantee – depending on application, required system performance and desired scope of functions – highest data security, availability and functionality.

An image of the operating system based on configurable software modules is created, precisely attuned to the application. By specific selection of the components the memory requirements are minimized and the system’s performance is increased.

The image of the operating system is always focused on a clearly defined device configuration, e.g. as a:

- Control computer
- Visualization unit
- Thin client
- Web Client
- ERP terminal for SAP Business One
- Customer-specific application including integration of software from third party providers or developments made by the customer
Server Based Computing

With the operation and visualization of machines and plants separated solutions are becoming increasingly important. Especially in multi-user environments high cost-savings are achieved through up-to-date client-server-structures. Especially the central software installation and maintenance on few remote servers result in significantly lower total costs as opposed to using several panel-PCs with complete software installation. The control stations are equipped with cost-effective thin clients.

- The embedded clients receive all data from a server.
- Data processing and administration is performed on the server.
- Software is only installed and maintained on the server, the clients are not affected.
- The embedded clients need less CPU-performance and are therefore energy-efficient and maintenance-free, i.e. completely fanless and without rotating media (hard disk, CD/DVD).

Peer-to-Peer Connection

TC as an separated display and operation unit [alternative desktop]
**System Setup**

### Thin Client Connection

**TCP/IP with RDP or CITRIX-protocol**

Windows server 2003 with Terminal Services or CITRIX server, visualization server

TC<sub>1</sub>  
TC<sub>n</sub>

TCs as separate display and operator stations at terminal servers

### Thin Client Connection

**TCP/IP RFB-protocol**

Windows or Linux, VNC server, Visualization server

TC<sub>1</sub>  
TC<sub>n</sub>

TCs as VNC client

### Web Connection

**TCP/IP HTTP**

Web server, Visualization server with Java applets

TC<sub>1</sub>  
TC<sub>n</sub>

TCs as web terminals to visualization server with Java applets for dynamic graphics generation
No matter which operating system you prefer, whether you rely on web or client-server-visualization – through the close cooperation with our software partners we create the required SCADA-solution, from single-user operation to complex visualization tasks.

Important features of the different SCADA-solutions:

- Support of all current operating systems and platform-independent projection
- Industry-specific functions and software modules
- Web functions and web visualization
- Recipe administration
- User administration and protocol generation according to 21 CFR Part 11
Soft-PLC

The great advantage of PC-based controls is their openness. On the basis of a single hardware you can run quite different software. This results in a significantly reduced effort for the user by working with universal projection tools.

As the embedded operating systems are especially adapted to the hardware, PC-based control units from MSC are as reliable as Hard-PLCs: In the event of fault the power-fail function detects a power failure, and the remanent data are written into the battery backed SRAM.

As PC-based control units continuously grow with the current technology, use standard components and integrate a wider range of functions they are significantly cheaper than a conventional PLC.

Major features of the different Soft-PLC-systems:

- Support of all five languages acc. IEC 61131-3
- Step®7 compatibility
- Hard real-time performance
- Flexibility with OPC, ActiveX, DDE, COM and XML
- Integrated web server
- Convenient projection tools
FOCUS/BeBo

Compact Panel PCs

- Shallow installation depth for minimum space requirements
- Touchscreen (resistive-analogue)
- TFT color display (12.1” up to 19”)
- Fanless cooling (option)
- Cable reduced construction
- High operating reliability due to industrial design
- Long term available single-board computer
- Supply warranty: 5 years on form/fit/function

The industrial computers of the FOCUS/BeBo series are extremely robust systems. Therefore, the devices are the ideal platform for different automation tasks, e. g. in machine building or in the process industries.

FOCUS/BeBo systems are designed as compact operator panels. They feature solid front panel installation possibilities and a small component depth – even for fitting in slim housing systems or cabinet with smaller spatial depth.
Characteristics ■ FOCUS/BeBo ■ ■ ■

FOCUS
The FOCUS is “focused” on the essential function and design of a classical human-machine interface.

BeBo
The BeBo features a passive backplane with a PCI slot. The computer market offers numerous additional cards peculiar to certain industries which allow very individual applications to be realized in a cost-effective manner.

Both systems are based on the in-house IPC platform, that provides all functions and interfaces for the industrial use. An environment controller and the according diagnostic tool will monitor important values, e.g. CPU and system temperature, fan speed. Minimum and maximum values are logged as well as the systems’s operating hours. The panels offers two USB interfaces under a IP65 protected covering in the front.
**FOCUS/BeBo Device Variants**

**Front panels (W x H)**
- FOCUS/BeBo 12.1”:
  374 x 282 mm
- FOCUS/BeBo 15”/17”:
  482.6 (19”) x 354.8 mm (8 HE)
- FOCUS/BeBo 19”:
  482.6 (19”) x 399.2 mm (9 HE)

**Installation depth**
- FOCUS 12.1”: 77.0 mm
- FOCUS 15”/17”: 79.6 mm
- FOCUS 19”: 89.6 mm
- BeBo 12.1”: 112.0 mm
- BeBo 15”/17”: 114.5 mm
- BeBo 19”: 124.5 mm

**Connections**

*Note: The exact mechanical dimensions are available on the internet: www.msc-tuttlingen.com*
### Technical Data ■ FOCUS/BeBo ■ ■ ■ ■ ■

| Housing | ■ Mechanically stable, robust system-unit cover made of galvanized sheet-steel can be installed in all racks, cabinets, desks and swivel frames.  
■ Industrial, EMC housing design that also allows an emergency operation with broken CPU fan without machine stop. |
| Front panel | ■ Seamlessly sealed front panel (milled aluminium with integrated membrane) protects reliably against ingress of dust, dirt and spray water  
■ Touchscreen resistive-analogue is integrated  
■ 2x USB [IP 65]  
■ Stainless steel front panel (option)  
■ Specific customized design (option) |
| Protection class | ■ Front: IP65, rear: IP20 |
| Display | ■ 12.1” TFT [SVGA], 15” TFT [XGA], 17” TFT [SXGA], 19” TFT (SXGA) |
| Baseboard/CPU | ■ Long term available All-In-One-Board IPC479, chip set Intel 82855 GME  
■ Celeron M 370 (1.5 GHz)/Pentium M 745 (1.8 GHz)  
■ Fanless variant with ULV Celeron M 373 1.0 GHz  
■ Onboard graphics, 32/64 MB shared memory  
■ Watchdog for system safety  
■ Integrated keyboard controller  
■ Environment controller and diagnostic software to control temperature values and fan speed |
| Slots 1) | ■ FOCUS  
■ BeBo  
■ Passive backplane with 1x PCI |
| Memory | ■ Up to 2 GB DDR-RAM |
| Drive units | ■ Hard disk 2.5” ≥ 60 GB  
■ Optional drive unit on the side: DVD-R or DVD-RW, slimline |
| Interfaces | ■ COM1 / COM2 as RS 232 [COM2 internally used by touch controller]  
■ 2x PS/2, 1x VGA  
■ 2x Ethernet (1x 10/100 Mbit, 1x 10/100/1000 Mbit)  
■ 6x USB 2.0, thereof 4x on the side [periphery connection]  
■ and 2x in the front behind protective cap [IP65] |
| Interface options | ■ COM3/COM4 as RS 232 or RS 485/422  
■ Fieldbus (alternative to COM3 and COM4) CANopen, InterBus, PROFIBUS et al.  
■ LPT1  
■ Audio module AC97 |
| Supply voltage | ■ 24 VDC [18...36 VDC] |
| Power consumption | ■ Max.  
■ Typ. 2)  
■ 115 W  
■ 32 W [12.1”], 50 W [15”], 60 W [17”], 65 W [19”]  
■ ULV-CPU: 12 W [12.1”], 30 W [15”], 53 W [17”], 57 W [19”] |
| Ambient temperature | ■ +5 °C up to +45 °C |
■ According to EN 55024:1998 und EN 61000-6-2:2001 |
| Shock load in operation/Oscillating load in operation | ■ EN 60068-2-27  
■ EN 60068-2-6 |
| Operating system | ■ Windows® XP Prof. |
| Endurance test | ■ 48 h burn-in before delivery |
| Test certificate | ■ CE, UL 508 |

1) Depending on the application respectively system configuration, please note possible restrictions regarding the electrical power supply for the slot cards!  
2) These information correspond to the basic version.

Issue 4.01 · Subject to change without notice.
Universal Industrial Computer

- Membrane keyboard
- TFT color display (15”)
- 4 PCI slots
- Drive units in front accessible
- High operating reliability due to industrial design
- Long term available single-board computer
- Supply warranty: 5 years on form/fit/function

The industrial computers of the DIALOG series are extremely robust allround devices, designed for demanding tasks in the industrial field, e.g. in automation/robotics, in the machine building or in the packaging industries.

Due to the highly integrated features, the computer supports the use for universal purposes. The industrial computers of the DIALOG series are qualified for operation applications and for use as host computer.
The DIALOG features a fully equipped membrane keyboard. In the front, a DVD-RW drive and two USB interfaces are integrated, all protected IP65 under flap.

All DIALOG panels are based on the in-house IPC platform, that provides all functions and interfaces for the industrial use. An environment controller and the according diagnostic tool will monitor important values, e.g. CPU and system temperature, fan speed. Minimum and maximum values are logged as well as the systems’s operating hours. These systems offers four free PCI slots, four USB interfaces on the side accessible (periphery connection) et. al.
DIALOG Device Variants

Front panels (W x H)
- DIALOG 15”:
  482.6 (19") x 354.8 mm (8 HE)

Installation depth
- DIALOG 15”:
  170.5 mm

Connections

Note: The exact mechanical dimensions are available on the internet: www.msc-tuttlingen.com
### Technical Data

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<th>Housing</th>
<th>Mechanically stable, robust system-unit cover made of galvanized sheet-steel can be installed in all racks, cabinets, desks and swivel frames.</th>
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<tbody>
<tr>
<td></td>
<td>Industrial, EMC housing design with integrated system fan.</td>
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<td><strong>Front panels</strong></td>
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<td></td>
<td>Seamslessly sealed front panel (milled aluminium with integrated membrane) protects reliably against ingress of dust, dirt and spray water.</td>
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<td></td>
<td>Display: scratchproof, dereflected special glass pane (only with mere membrane keyboard)</td>
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<td>Membrane keyboard, touchscreen resistive-analogue as option</td>
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<td></td>
<td>Specific customized design (option)</td>
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<td><strong>Protection class</strong></td>
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<td><strong>Slots</strong></td>
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<td>4x PCI, maximum card length Slot 1 = 180 mm, Slot 2 = 260 mm</td>
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<td><strong>Memory</strong></td>
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<td><strong>Interfaces</strong></td>
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<td>2x PS/2, 1x VGA</td>
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<td>2x Ethernet (1x 10/100 Mbit, 1x 10/100/1000 Mbit)</td>
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<td>6x USB 2.0, therefor 4x on the side (periphery connection) and 2x in the front (IP65 under protective cap of DVD drive)</td>
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<td><strong>Interface options</strong></td>
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<td>Max.</td>
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<tr>
<td></td>
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</tr>
<tr>
<td></td>
<td>Typ.</td>
</tr>
<tr>
<td></td>
<td>89 VA</td>
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<tr>
<td></td>
<td><strong>Ambient temperature</strong></td>
</tr>
<tr>
<td></td>
<td>+5 °C up to +45 °C</td>
</tr>
<tr>
<td></td>
<td><strong>EMC: interference emission/interference resistance</strong></td>
</tr>
<tr>
<td></td>
<td>According to EN 55024:1998 und EN 61000-6-2:2001</td>
</tr>
<tr>
<td></td>
<td><strong>Shock load in operation/Oscillating load in operation</strong></td>
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<td>EN 60068-2-27</td>
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<td></td>
<td>EN 60068-2-6</td>
</tr>
<tr>
<td></td>
<td><strong>Operating system</strong></td>
</tr>
<tr>
<td></td>
<td>Windows® XP Prof.</td>
</tr>
<tr>
<td></td>
<td><strong>Endurance test</strong></td>
</tr>
<tr>
<td></td>
<td>48 h burn-in before delivery</td>
</tr>
<tr>
<td></td>
<td><strong>Test certificate</strong></td>
</tr>
<tr>
<td></td>
<td>CE, UL 508</td>
</tr>
</tbody>
</table>

1) Depending on the application respectively system configuration, please note possible restrictions regarding the electrical power supply for the slot cards!

2) These information correspond to the basic version.

Issue 4.01 · Subject to change without notice.
The Enclosed Panel PC

- Front part machined from an aluminum block and naturally anodized
- Rear side covering made of stainless steel (V2A)
- Protection class IP54 all-around
- Touchscreen (resistive-analogue)
- 1 PCI slot
- High operating reliability due to industrial design
- Long term available single-board computer
- Supply warranty: 5 years on form/fit/function

The VISCO is designed as stand-alone industrial computer to be used on site in machines and plants of the food industry, the chemical industry and the pharmaceutical industry in particular, but also in other industries where an on-site panel is required.

The device is an enclosed system – the housing is designed as a hermetic capsule. All functions of an industrial computer from the visualization and the operation up to processing extensive tasks are integrated into a rugged and nevertheless elegant housing at the VISCO.
The front panel is machined from a massive aluminum block and naturally anodized. The panel offers a covering made of stainless steel on the rear side. The casing is prepared for mounting on support arm as well as on pedestal or for fixing on a ball pivot foot by means of a coupling of the Rittal CP series. Large area cooling fins conduct the residual heat. They also serve as handle bars to adjust the direction of the panel.

The VISCO is based on the in-house IPC platform, that provides all functions and interfaces for the industrial use. An environment controller and the according diagnostic tool will monitor important values, e.g. CPU and system temperature, fan speed. Minimum and maximum values are logged as well as the system’s operating hours. The VISCO offers one free PCI slots and four USB interfaces. One USB connector is wired to the outside under a IP65 protected covering.
VISCO ▶ Device Variants

Front panels (W x H)
- VISCO 12.1": 380 x 278 mm
- VISCO 15": 450 x 330 mm

Component depth
- VISCO 12.1": 122.5 mm
- VISCO 15": 122.5 mm

Connections
- USB IP65 covered
- Flange mounting

Note: The exact mechanical dimensions are available on the internet: www.msc-tuttlingen.com
### Technical Data

| Housing                  | Closed housing all over, aluminium and stainless steel  
|                         | Flange mounting for support arm or pedestal, panel couplings of Rittal CP 6664.000  
|                         | Industrial, EMC housing design with integrated circulation fan.  
| Front panels            | Aluminium front panel, seamlessly sealed  
|                         | Touchscreen (resistive-analogue)  
|                         | Power LED integrated in front  
| Protection class        | IP54 all-around, IP65 upon request  
| Display                 | 12.1" TFT [SVGA], 15" TFT [XGA]  
| Baseboard/CPU           | Long term available All-In-One-Board IPC479, chip set Intel 82855 GME  
|                         | ULV Celeron M 373 (1.0 GHz), fanless CPU cooling  
|                         | Onboard graphics, 32/64 MB shared memory  
|                         | Watchdog for system safety  
|                         | Integrated keyboard controller  
|                         | Environment controller and diagnostic software to control temperature values and fan speed  
| Slots                   | 1x PCI  
| Memory                  | Up to 2 GB DDR-RAM  
| Drive units             | Hard disk 2.5" ≥ 60 GB  
|                         | Optional drive unit on the rear side: DVD-R or DVD-RW, slimline  
| Interfaces              | COM1 / COM2 as RS 232 [COM2 internally used by touch controller]  
|                         | 2x PS/2, 1x VGA  
|                         | 2x Ethernet [1x 10/100 Mbit, 1x 10/100/1000 Mbit]  
|                         | 4x USB 2.0, [1x USB wired to outside, IP65]  
| Interface options       | COM3/COM4 as RS 232, RS 485/422  
|                         | Fieldbus (alternative to COM3 and COM4) CANopen, InterBus, PROFIBUS et al.  
|                         | LPT1  
|                         | Audio module AC97  
| Supply voltage          | 24 VDC [18 ... 36 VDC]  
| Power consumption       | Max.  
|                         | 115 W  
|                         | 16 W [12.1"], 30 W [15"]  
| Ambien temperature      | +5 °C up to +40 °C [12.1"], +5 °C up to +35 °C [15"]  
|                         | According to EN 55024:1998 und EN 61000-6-2:2001  
| Shock load in operation/Oscillating load in operation | EN 60068-2-27  
|                         | EN 60068-2-6  
| Operating system        | Windows® XP Prof.  
| Endurance test          | 48 h burn-in before delivery  
| Test certificate         | CE, UL 508  

1) Depending on the application respectively system configuration, please note possible restrictions regarding the electrical power supply for the slot cards!  
2) These information correspond to the basic version.  

Issue 3.01 · Subject to change without notice.
The ALPHA series is designed as a rugged stand-alone industrial computer and is integrated as complete operating terminal into machines and plants. The enclosed system in its own housing permits the use in production sites with highest degree of protection requirements.

The IP65 enclosed system is reliably encapsulated against ingress of dust, dirt and water. Thus the system is suitable for use in production sites with highest degree of protection requirements, e.g. in steel and roller mills, in metal foundries, butcheries and also chemical industries.

The system offers an extremely robust design. The cooling concept provides the base for the rugged, industrial and maintenance free long-term operation. Large area cooling fins, which are integrated in the aluminum housing, conduct the residual heat to the environment.
Excellent ergonomic design and the comfortable handling assist operating the ALPHA. The standard flange on the housing offers the possibility to mount the device on support arm systems as well as on pedestals.

The ALPHA is based on the in-house IPC platform, that provides all functions and interfaces for the industrial use – inclusive four USB interfaces and one free PCI slot. An environment controller and the according diagnostic tool will monitor important values, e.g. CPU and system temperature, fan speed. Minimum and maximum values are logged as well as the systems’s operating hours. Due to the design characteristics, the ALPHA features only a 15” graphics display.
**ALPHA Device Variants**

**Front panel (W x H)**
- ALPHA 15":
  - 590 x 424 mm

**Component depth**
- ALPHA 15":  170 mm

*Note: The exact mechanical dimensions are available on the internet: www.msc-tuttlingen.com*
### Housing
- Enclosed housing made of aluminium
- Flange connection for support arm systems: Bernstein 'CS-2000 SL' 45/60, Rittal 'CP-L' 120 x 65 mm, Rose 'GT 48/2'
- Industrial, EMC housing design, heatpipe cooling

### Front panels
- Seamlessly sealed front panel (milled aluminium with integrated membrane) protects reliably against ingress of dust, dirt and spray water
- Display: scratchproof, dereflected special glass pane (only with mere membrane keyboard)
- Keyboard membrane and/or touchscreen resistive-analogue
- Specific customized design and integration of additional switching elements, buttons and emergency stop keys (option)

### Protection class
- IP65 all-around

### Display
- 15" TFT (XGA)

### Baseboard/CPU
- Long term available All-In-One-Board IPC479, chip set Intel 82855 GME
- ULV Celeron M 373 (1.0 GHz), completely fanless cooling
- Pentium M 745 (1.8 GHz), internal circulation fan
- Onboard graphics, 32/64 MB shared memory
- Integrated keyboard controller
- Environment controller and diagnostic software to control temperature values and fan speed

### Slots
- 1x PCI

### Memory
- Up to 2 GB DDR-RAM

### Drive units
- Hard disk 2.5" ≥ 60 GB
- Optional drive unit internal integrated: DVD-R or DVD-RW, slimline

### Interfaces
- COM1 / COM2 as RS 232 (COM2 internally used by touch controller)
- 2x PS/2, 1x VGA
- 2x Ethernet (1x 10/100 Mbit, 1x 10/100/1000 Mbit)
- 4x USB 2.0

### Interface options
- COM3/COM4 as RS 232, RS 485/422
- Fieldbus (alternative to COM3 and COM4) CANopen, InterBus, PROFIBUS et al.
- LPT1
- Audio module AC97

### Supply voltage
- 24 VDC (18 ... 36 VDC)

### Power consumption
- Max. 115 W
- Typ. 50 W
- ULV-CPU: 30 W

### Ambient temperature
- +5 °C up to +45 °C

### EMC: interference emission/interference resistance
- According to EN 55024:1998 und EN 61000-6-2:2001

### Shock load in operation/Oscillating load in operation
- EN 60068-2-27
- EN 60068-2-6

### Operating system
- Windows® XP Prof.

### Endurance test
- 48 h burn-in before delivery

### Test certificate
- CE, UL 508

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1 Depending on the application respectively system configuration, please note possible restrictions regarding the electrical power supply for the slot cards!
2 These information correspond to the basic version.

Issue 4.01 · Subject to change without notice.
The Desktop Alternative

- IPC for standard requirements
- Positioning in the price-sensitive segment
- Touchscreen
- Up to 2 PCI slots
- 2x USB in front
- Connection for VESA 75/100 at the rear side
- Long term available standard industrial mainboard

The industrial computers of the ECCO series offers CPU performance which meets a variety of uses at a cost-effective price. The devices are designed especially for applications, with lower requirements regarding resistance to oscillations and shocks.

They are an alternative in function as well as in price to the use of desktop PCs in industrial surroundings, e.g. for visualization, POS terminals, production data acquisition.
All devices are equipped with the standard PC interfaces. Two of four USB connectors are available at the front side, IP65 covered. Two PCI slots and also the DVD drive (option) feature enough reserve for functional extensions.

The housing can be installed in all racks, cabinets, desks and swivel frames. In addition, it is possible to mount the panel on support arm systems. The rear side is prepared with a flange-connection.
ECCO-Panel ■ Device Variants

Front panels (W x H)
- ECCO-Panel 15": 482.6 (19") x 354.8 mm (8 HE)
- ECCO-Panel 17": 482.6 (19") x 354.8 mm (8 HE)

Installation depth
- ECCO-Panel 15": 100 mm
- ECCO-Panel 17": 100 mm

Connections

Note: The exact mechanical dimensions are available on the internet: www.msc-tuttlingen.com
Technical Data  ■  ECCO-Panel

| Housing | Mechanically stable, robust system-unit cover made of galvanized sheet-steel can be installed in all racks, cabinets, desks and swivel frames.  
|         | Flange connection backside for support arm systems: VESA 75 / 100  
|         | Industrial, EMC housing design with integrated system fan  
| Front panels | Seamless sealed front panel (powder-coated) protects reliably against ingress of dust, dirt and spray water  
|         | Touchscreen (resistive-analogue)  
|         | 2x USB, IP65  
|         | Specific customized design (option)  
| Protection class | Front: IP65, rear: IP20  
| Display | 15” TFT (XGA), 17” TFT (SXGA)  
| Baseboard/CPU | Industrial standard board, chip set Intel 82855GME  
|         | Celeron M 370 [1.5 GHz], Pentium M 745 [1.8 GHz]  
|         | Onboard graphics (shared memory)  
| Slots1) | 2x PCI, short-card format (length approx. 174 mm in combination with DVD drive only 1x PCI)  
| Memory | Up to 1 GB DDR-RAM  
| Drive units | Hard disk 2.5” ≥ 60 GB  
|           | Optional drive unit on the bottom side: DVD-R or DVD-RW, slimline  
| Interfaces | COM1, COM2, LPT1, 2x PS/2, 1x VGA  
|           | 1x Ethernet [10/100/1000 Mbit]  
|           | 4x USB 2.0, 2x in front, IP 65 protected  
|           | Sound: Speaker Out  
| Interface options | 2nd Ethernet interface 10/100/1000 Mbit  
| Supply voltage | 24 VDC [18 ... 36 VDC] bzw. 100-240 VAC [90 ... 264 VAC]  
| Power consumption | 130 W  
|           | 59 W [15"], 71 W [17"]  
| Ambient temperature | +5 °C up to +45 °C  
|           | According to EN 55024:1998 und EN 61000-6-2:2001  
| Operating systems | Windows® XP Prof., other upon request  
| Endurance test | 48 h burn-in before delivery  
| Test certificate | CE  

1) Depending on the application respectively system configuration, please note possible restrictions regarding the electrical power supply for the slot cards!  
2) These informations correspond to the basic version.  

Issue 5.01 - Subject to change without notice.
**The Compact Cabinet Computer**

- Application server with compact dimensions
- Host for remote visualization
- Up to 4 PCI slots
- Long term available base board
- DVD drive (option)
- DVI option
- Differently realizable mounting situations
- Supply warranty: 5 years on form/fit/function

Increased robust host computers are used for remote visualization PC-based Control and as application servers.

The BASIC is especially designed for these applications. It offers a very dependable, industrial computer solution for the use in machine industries and plant engineering.

The BASIC is a highly capable host for remote operating units in separated computer/display system architectures.
The cabinet computer BASIC with up to four PCI slots is based on the in-house IPC platform and is especially suitable for the installation in rugged industrial ambience. An environment controller and the according diagnostic tool will monitor important values, e.g. CPU and system temperature, fan speed. Minimum and maximum values are logged as well as the system’s operating hours.

The computers can be mounted vertically and horizontally into all cabinet systems. The side tub can be removed easily in the mounted status. Due to this, PCI cards and internal drives can be accessed easily. Connection ports as well as drive units are conveniently manageable.
BASIC Device Variants

Dimensions (W x H x D)
- BASIC1:
  110 x 304 x 251 mm

- BASIC4:
  164 x 304 x 251 mm

Connections

Note: The exact mechanical dimensions are available on the internet: www.msc-tuttlingen.com
### Technical Data ■ BASIC

| **Housing** | ■ Mechanically stable, robust system-unit cover made of galvanized sheet-steel to be installed in cabinets (vertically or horizontally).  
■ Industrial, EMC housing design that also allows an emergency operation with broken CPU fan without machine stop. |
| **Protection class** | ■ IP20 |
| **Baseboard/CPU** | ■ Long term available All-In-One-Board IPC479, chip set Intel 82855 GME  
■ Celeron M 370 [1,5 GHz], Pentium M 745 [1,8 GHz]  
■ Onboard graphics, 32/64 MB shared memory  
■ Watchdog for system safety  
■ Environment controller and diagnostic software to control temperature values and fan speed |
| **Slots**<sup>1</sup> | ■ 1x or 4x PCI |
| **Memory** | ■ Up to 2 GB DDR-RAM |
| **Drive unit** | ■ Hard disk 2.5" ≥ 60 GB  
■ Optional drive unit on the front side: DVD-R or DVD-RW, slimline |
| **Interfaces** | ■ COM1/COM2 as RS 232  
■ 2x PS/2, 1x VGA  
■ 2x Ethernet (1x 10/100 Mbit, 1x 10/100/1000 Mbit)  
■ 4x USB 2.0  
■ DVI (option) |
| **Interface options** | ■ COM3/COM4 as RS 232, RS 485/422  
■ Fieldbus (alternative to COM3 and COM4) CANopen, InterBus, PROFIBUS et al.  
■ LPT1  
■ Audio module AC97 |
| **Supply voltage** | ■ 24 VDC (18...36 VDC) |
| **Power consumption** | Max.  
■ 115 W  
■ 33 W |
| **Ambient temperature** | ■ +5 °C up to +45 °C |
■ According to EN 55024:1998 und EN 61000-6-2:2001 |
| **Shock load in operation/Oscillating load in operation** | ■ EN 60068-2-27  
■ EN 60068-2-6 |
| **Operating system** | ■ Windows® XP Prof. |
| **Endurance test** | ■ 48 h burn-in before delivery |
| **Test certificate** | ■ CE, UL 508 |

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<sup>1</sup> Depending on the application respectively system configuration, please note possible restrictions regarding the electrical power supply for the slot cards!

<sup>2</sup> These information correspond to the basic version.

Issue 4.01 · Subject to change without notice.
The Performant Cabinet Computer

- Powerful application server
- High-performance CPU for every application
- DVD drive in a removable cage
- PCI and PCI express slots
- DVI interface (option)
- Cooling concept for high-performance non-stop operation
- Installation optionally in vertical or horizontal position
- Long term available standard industrial mainboard

Many applications demand a high CPU performance. Some industrial computers do not satisfy these requirements however, and desktop PCs are often used. But they can not be mounted in the control cabinet and have to be installed into separate cases what leads to higher integration costs.

The ECCO-Box offsets these disadvantages and is suitable for high-performance industrial use. It is based on an industrial mainboard and provides the performance of the current CPU generation and state-of-the-art computer technology.
The cabinet computer ECCO-Box features always a current base board. In addition, it offers PCI and PCI express interfaces as well as USB and Ethernet connectors for functional extensions. An industrial remote display can be connected via VGA or the DVI interface.

The ECCO-Box can be used universally and mounted into all usual control cabinet systems. It can be installed optionally in vertical or horizontal position. Interfaces and drives are always accessible on the front of the device.
ECCO-Box  ■  Device Variants

Dimensions (W x H x D)
- 170 x 431.5 x 270 mm

Connections

Note: The exact mechanical dimensions are available on the internet: www.msc-tuttlingen.com
Technical Data ▪ ECCO-Box ▪ ▪ ▪ ▪ ▪ ▪

<table>
<thead>
<tr>
<th>Housing</th>
<th>■ Mechanically stable, robust system-unit cover made of galvanized sheet-steel to be installed in cabinets (vertically or horizontally).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection class</td>
<td>■ IP20</td>
</tr>
<tr>
<td>Baseboard/CPU</td>
<td>■ Industrial standard board, chip set Intel 945G</td>
</tr>
<tr>
<td></td>
<td>■ Celeron D341 [2.93 GHz] or Intel Core™2 Duo E6400 [2.13 GHz]</td>
</tr>
<tr>
<td></td>
<td>■ Onboard graphics (shared memory)</td>
</tr>
<tr>
<td>Slots[^1]</td>
<td>■ 3x PCI, 2x PCI express x1, 1x PCI express x16</td>
</tr>
<tr>
<td>Memory</td>
<td>■ Up to 4 GB DDR2-RAM</td>
</tr>
<tr>
<td>Drive units</td>
<td>■ Hard disk 2.5” ≥ 80 GB (SATA as standard), exchange possible from outside</td>
</tr>
<tr>
<td></td>
<td>■ Optional drive unit on the front side: DVD-R or DVD-RW, slimline</td>
</tr>
<tr>
<td>Interfaces</td>
<td>■ COM1 as RS 232, LPT1, 2x PS/2, 1x VGA</td>
</tr>
<tr>
<td></td>
<td>■ 1x Ethernet [10/100/1000 Mbit]</td>
</tr>
<tr>
<td></td>
<td>■ 4x USB 2.0</td>
</tr>
<tr>
<td></td>
<td>■ Audio: MIC IN/Line IN/Line OUT</td>
</tr>
<tr>
<td>Interface options</td>
<td>■ 1x DVI-D</td>
</tr>
<tr>
<td>Supply voltage</td>
<td>■ 100-240 VAC (90...264 VAC)</td>
</tr>
<tr>
<td>Power consumption Max. Typ.[^2]</td>
<td>■ 540 VA</td>
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<tr>
<td></td>
<td>■ 105 VA</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>■ +5 °C up to +45 °C</td>
</tr>
<tr>
<td></td>
<td>■ According to EN 55024:1998 und EN 61000-6-2:2001</td>
</tr>
<tr>
<td>Shock load in operation/Oscillating load in operation</td>
<td>■ EN 60068-2-27</td>
</tr>
<tr>
<td></td>
<td>■ EN 60068-2-6</td>
</tr>
<tr>
<td>Operating system</td>
<td>■ Windows® XP Prof., other upon request</td>
</tr>
<tr>
<td>Endurance test</td>
<td>■ 48 h burn-in before delivery</td>
</tr>
<tr>
<td>Test certificate</td>
<td>■ CE</td>
</tr>
</tbody>
</table>

[^1] Depending on the application respectively system configuration, please note possible restrictions regarding the electrical power supply for the slot cards!

[^2] These information correspond to the basic version.

Issue 4.01 · Subject to change without notice.

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www.msc-tuttlingen.de/ipc
Remote solutions are becoming more and more important for the operation and visualization of machines. Particularly the central software installation and maintenance of a server lead to considerable cost savings compared to applications with several panel computers with complete installation. In addition, the increasing circulation of web servers in PLC and SCADA systems lead to further savings for the client license costs.

TC/BC operation terminals are completely configured for most server environments e.g. RDP, web or extended configurations.
Both panels are characterized by high operational reliability at rough conditions. The difference between TC and BC-design is in the installation possibilities:

The TC is a stand-alone unit, IP65 all-around, and prepared for support arm or pedestal mounting. It features four function keys and additional USB interfaces. The BC is a typical build-in unit with a front panel made of stainless steel (V2A) and is suitable for hygienically sophisticated applications.
TC/BC ■ Device Variants

Front panels (W x H)
- TC 12.1": 315 x 280 mm
- TC 17": 410 x 370 mm
- BC 12.1": 261.6 x 212 mm
- BC 17": 457 x 335.8 mm

Device/installation depth
- TC 12.1": 85 mm
- TC 17": 95 mm
- BC 12.1": 45 mm
- BC 17": 68 mm

System configurations

<table>
<thead>
<tr>
<th>Assemblies</th>
<th>Standard Variants</th>
<th>Customized Variants</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU</td>
<td>LX800</td>
<td>Celeron M 600 / 1000</td>
</tr>
<tr>
<td>RAM</td>
<td>256 MB</td>
<td>256 MB / 1 GB</td>
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<tr>
<td>Display</td>
<td>12&quot; / 17&quot;</td>
<td>12&quot; / 17&quot;</td>
</tr>
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<td>Front panel</td>
<td>MSC or neutral design</td>
<td>According for requirements</td>
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<td>CompactFlash</td>
<td>512 MB</td>
<td>1 GB</td>
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<tr>
<td>Operating system</td>
<td>Embedded Linux</td>
<td>Windows XP Embedded</td>
</tr>
<tr>
<td></td>
<td>Web/VNC/RDP client</td>
<td>XPe base function</td>
</tr>
<tr>
<td>Funktions</td>
<td>XPe base function</td>
<td>Freely definable</td>
</tr>
</tbody>
</table>

Note: The exact mechanical dimensions are available on the internet: www.msc-tuttlingen.com
### Technical Data ▪ TC/BC ▪

| Housing | TC  | - Mechanically stable aluminium housing  
|         |     | - Industrial, EMC housing design, completely fanless cooling  
|         |     | - Flange mounting for support arm or pedestal (internal pipe diameter min. 40 mm)  
|         |     | Possible standard flange systems:  
|         |     | - Rittal: CP-S  
|         |     | - Bernstein: CS-2000 SL  
|         |     | - Rose: GT48/2  
|         |     | - MSC flange adapter for VESA 100 system, complete IP65  
| Front panels | TC  | - Aluminium front panel, surface powder-coated, seamlessly sealed front panel protects reliably against ingress of dust, dirt and spray water  
|          |     | - Touchscreen (resistive-analogue)  
|          |     | - 2x USB, IP65 protected  
|          |     | - Status LED  
|          |     | - 4 function keys (call soft keyboard, configuration, touch calibration, standby mode)  
|          |     | - Stainless steel front panel (V2A), seamlessly sealed front panel protects reliably against ingress of dust, dirt and spray water  
|          |     | - Touchscreen (resistive-analogue)  
| Protection class | TC  | - IP 65 all-around  
|          |     | - Front IP65, rear IP20  
| Display | BC  | - 12.1” TFT (SVGA), 17” TFT (SXGA)  
| Baseboard / CPU-Modul | TC  | - Long term available base board for client applications, particularly designed for integration of ETX CPU modules  
|          |     | - Geode LX 800, Celeron M 600 MHz, Celeron M 1.0 GHz; fanless cooling  
|          |     | - Onboard graphics, shared memory  
| Memory | TC  | - 256 MB/512 MB/1 GB SD-RAM (depends on the device’s configuration)  
|          |     | - CompactFlash 512 MB/1 GB, customized up to 4 GB CF card  
| Interfaces | TC  | - 4x USB 2.0, 2x in front, cover IP65  
|          |     | - Use e.g. for server updates  
|          |     | - 1x Ethernet (10/100 Mbit)  
|          |     | - 2x USB 2.0  
|          |     | - 1x Ethernet (10/100 Mbit)  
| Supply voltage | BC  | - 24 VDC (18...36 VDC)  
| Power consumption | Max. Typ. | - 75 W  
|          |     | - 30 W (12.1”), 50 W (17”)  
| Ambient temperature | | - +0 °C up to +50 °C (12.1” TFT, basic type of configuration)  
|          |     | - +0 °C up to +45 °C (17” TFT)  
|          |     | - According to EN 55024:1998 und EN 61000-6-2:2001  
| Shock load in operation/ Oscillating load in operation | | - EN 60068-2-27  
|          |     | - EN 60068-2-4  
| Operating system | | - Embedded Linux oder Windows® XP Embedded (depends on the device’s configuration)  
| Endurance test | | - 48 h burn-in before delivery  
| Test certificate | | - CE, UL-Recognized-Component  

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1 These information correspond to the basic version.

Issue 2.01 · Subject to change without notice.
Second Operator Panel for (C)NCs

- Embedded platform, application specific base board
- ETX-CPU modules
- Fanless system, no rotating parts
- Integrated VNC client to connect to CNC systems with VNC extension
- Completely configured second operator panel
- Vertical or horizontal version available
- OEM version in customized design
- Long term available CPU boards (made by MSC)

Many machine tools require remote, second operator panels, e.g. next to a tool load station. While the NC/CNC is installed in the cabinet of the machine tool, the remote operator panels are mounted directly on site and connected with the (C)NC via Ethernet.

The CC has been especially developed as an alternative operator panel, that enables the decentralized access on NC/CNC control systems with VNC expansion (Virtual Network Computing) of manufacturers like Siemens, Fanuc and Heidenhain. Due to of the familiar “look and feel”, the NC/CNC control can be operated intuitively also at the client.

The operator terminals are optionally available in specific OEM design, so that the machine tool manufacturer can implement a consistent operating concept, even it he utilizes different NC/CNC systems, with the optionally available direct-key module, freely assignable keys of the membrane keyboard panel can be assigned to specific, time-critical functions which will be transmitted directly via PROFIBUS to the control system.
Characteristics - CC

CC - Standard design

Siemens
CNC control
e.g. solution line,
power line

VNC server
DHCP server

Direct-key module (option)

PROFIBUS

CC - OEM design

Siemens
CNC control
e.g. solution line,
power line

VNC server
DHCP server

Direct-key module (option)

PROFIBUS

iTNC is a trademark of the Heidenhain company.

CNC control,
e.g. GE Fanuc,
Heidenhain (iTNC),
Bosch Rexroth

VNC server

Direct-key module (option)

PROFIBUS

iTNC is a trademark of the Heidenhain company.
Front panels (W x H)
- Horizontal: 482.6 [19"] x 310.3 mm [7 HE]
- Vertical: 365 x 440 mm

Installation depth
- Both Variants: 82 mm

Connections

Note: The exact mechanical dimensions are available on the internet: www.msc-tuttlingen.com
## Technical Data

| **Housing** | ■ Mechanically stable, robust system-unit cover made of galvanized sheet-steel  
■ Industrial, EMC housing design, completely fanless cooling |
| **Front panel** | ■ Seamlessly sealed front panel [milled aluminium with integrated membrane] protects reliably against ingress of dust, dirt and spray water  
■ Integrated membrane keyboard, Touchscreen resistive-analogue (option)  
■ 2 USB interfaces in the front, IP65 coverd  
■ Specific customized design (option) |
| **Protection class** | ■ Front: IP65, rear: IP20 |
| **Display** | ■ 12.1” TFT (SVGA) |
| **Baseboard/CPU-Modul** | ■ Long term available base board, applications particularly designed for integration of CPU modules in the ETX form factor  
■ CPU Geode LX800  
■ Onboard graphics, shared memory |
| **Memory** | ■ 256 MB SDRAM |
| **CompactFlash** | ■ 256 MB CF card |
| **Interfaces** | ■ 1x Ethernet (10/100 Mbit), maximum distance between two network nodes up to 100 m, any extension via more network structure elements (e.g. switch, hub)  
■ 4x USB 2.0, 2x in front, IP65 coverd |
| **Interface options** | ■ Profibus for direct-key module (option) |
| **Supply voltage** | ■ 24 VDC (18...36 VDC) |
| **Power consumption Max., Typ.** | ■ 60 W  
■ 28 W |
| **Ambient temperature** | ■ 0 °C up to +45 °C |
■ According to EN 55024:1998 und EN 61000-6-2:2001 |
| **Shock load in operation/Oscillating load in operation** | ■ EN 60068-2-27  
■ EN 60068-2-6 |
| **Operating system** | ■ Operating system based on Embedded Linux  
■ Web based configuration menue, remote access possible  
■ VNC client (CNC systems with VNC server required)  
■ DHCP client |
| **Endurance test** | ■ 24 h burn-in before delivery |
| **Test certificate** | ■ CE, UL-Recognized-Component |

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1) These information correspond to the basic version.

Issue 2.01 · Subject to change without notice.
Embedded Control and SCADA

- Fanless, compact panel and box design
- Ethernet, fieldbus and USB onboard
- SRAM to save remanent data
- Power fail detection, watchdog
- Low-power design [ULV CPU]
- Long term available CPU board [made by MSC]
- Embedded operating system with dedicated-software

Dedicated hardware plus embedded operating systems: The performance of the system can be adapted very well to specific tasks by selecting the display format and the ETX/ET(e) CPU. Thanks to the flexibility in the selection and configuration of the operating system and the software packages, the embedded devices can be integrated in almost any communication structure, e.g. in distributed systems, client/server networks or as autonomous mini-controller.

CARAT series
The systems are exactly configured upon the customer’s requirements. Both designs offer the latest ULV mobile CPU technology in ETX form factor. All important communication interfaces for the integration into current control structures are available. Both, the fieldbus standards such as PROFIBUS and CANopen, and the networking with Ethernet are provided.
Characteristics ▪ CARAT-Panel/Box

CARAT-Panel
It’s possible to select between different TFT display formats with resistive-analogue touchscreen. An aluminum front panel is available as standard, a stainless steel front panel is optional.

CARAT-Box
Mechanically stable housing in “book format” for the cabinet assembly. All interfaces and the CF socket for user data are accessible from outside. This permits an easy mounting and installation.
CARAT-Panel/Box  ■  Device Variants

Front panels (W x H)
- CARAT-Panel 12.1”:
  335 x 275 mm
- CARAT-Panel 15”:
  395 x 310 mm

Installation depth and Connections
- CARAT-Panel 12.1”:
  84.5 mm
- CARAT-Panel 15”:
  89.5 mm

Dimensions (W x H x D) and Connections
- CARAT-Box:
  59.5 x 255.5 x 193 mm

Note: The exact mechanical dimensions are available on the internet: www.msc-tuttlingen.com
**Technical Data** ■ **CARAT-Panel/Box** ■ ■ ■

<table>
<thead>
<tr>
<th><strong>Housing</strong></th>
<th>Panel Box</th>
</tr>
</thead>
<tbody>
<tr>
<td>■ Mechanically stable, robust system-unit cover made of galvanized sheet-steel can be installed in all racks, cabinets, desks and swivel frames.</td>
<td></td>
</tr>
<tr>
<td>■ Industrial, EMC housing design, completely fanless cooling</td>
<td></td>
</tr>
<tr>
<td>■ Mechanically stable housing (aluminium anodized/stainless steel ground) surface housing to be installed in cabinets), completely fanless cooling</td>
<td></td>
</tr>
<tr>
<td>■ Note: The housing of the CARAT-Box does not feature any fire protection according to DIN EN 60950 since the application is explicitly designed for cabinet mounting.</td>
<td></td>
</tr>
</tbody>
</table>

**Front panel (only CARAT panel)**

| ■ Seamlessly sealed front panel (milled aluminium with integrated membrane) protects reliably against ingress of dust, dirt and spray water |
| ■ Touchscreen (resistive-analogue) |
| ■ 3 status LEDs, freely configurable |
| ■ Stainless steel front panel (option) |
| ■ Specific customized design (option) |

**Protection class**

| ■ Panel: front: IP65, rear: IP20 |
| ■ Box: IP20 |

**Display (only CARAT-Panel)**

| ■ 12.1” TFT (SVGA), 15” TFT (XGA) |

**Baseboard/CPU modules**

| ■ Especially designed, long term available base board with specific functions ETX-CPU |
| ■ CPU ULV Celeron M 600 MHz, Celeron M 1.0 GHz; fanless cooling, chip set Intel 855GME |
| ■ Onboard graphics, 32 MB shared memory |
| ■ Integrated keyboard controller |
| ■ 1 MB SRAM with back-up battery for remanent data |
| ■ Power fail detection, buffer capacitor as option |
| ■ Watchdog for system safety |
| ■ Diagnostic tool and bootloader software |

**Memory**

| ■ Up to 1 GB SD-RAM |

**CompactFlash**

| ■ Internal CF card contains operating system |
| ■ External CF socket free for user data 256 MB / 512 MB / 1 GB / 2 GB |

**Interfaces**

| ■ COM1 as RS 232, 1x PS/2 [keyboard], 1x VGA |
| ■ Fieldbus (CANopen, DeviceNet, PROFIBUS, MPI et al.) or PC/104 slot |
| ■ 1x Ethernet (10/100 Mbit) |
| ■ 2x USB 2.0 |
| ■ Interface options |
| ■ COM2 as RS 232 / RS 485 |

**Supply voltage**

| ■ 24 VDC (18...36 VDC) |

**Power consumption**

<table>
<thead>
<tr>
<th>■ Max.</th>
<th>Typ. 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>75 W</td>
<td>30 W (12.1”), 44 W (15”), 16 W (Box version)</td>
</tr>
</tbody>
</table>

**Ambient temperature**

| ■ 0 °C up to +45 °C |

**EMC: interference emission/ interference resistance**

| ■ According to EN 55024:1998 und EN 61000-6-2:2001 |

**Shock load in operation/ Oscillating load in operation**

| ■ EN 60068-2-27 |
| ■ EN 60068-2-6 |

**Operating system**

| ■ Windows XP Embedded, other upon request |

**Endurance test**

| ■ 24 h burn-in before delivery |

**Test certificate**

| ■ CE, UL-Recognized-Component |

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Issue 3.01 · Subject to change without notice.
ECCO-Terminal

Industrial Touch Panel

- TFT displays with resistive-analogue touchscreen
- Graphics interface DVI or VGA
- USB interface for transfer of touch signal
- Display adjustments are not necessary in DVI mode
- Auto-adjust function in VGA mode
- Up to 25 m distance from the remote host
- Completely maintenance-free, no mechanical wear parts
- Flexible mounting possibilities

The ECCO-TERMINAL is designed as low cost operator panel. It guarantees flexibility in positioning an operator station at machines or in sites.

The panel is connected to the host computer via USB for transmitting the touch signals and the DVI-D or VGA interface, which is attached to the graphics card of the host.
The ECCO-TERMINAL is an operator panel with 15", 17" or 19 TFT display and resistive-analogue touchscreen. The stable housing is designed for assembly in all racks, cabinets, desks and swivel frames and also for attaching to support arm or pedestal systems.

The system is immediately ready for use in DVI-D mode, no display settings are necessary after initial connection. The touch-signals are transmitted via USB.

In VGA mode, an auto-adjust process has to be executed when the images are blurred, e.g. after connecting to the host computer. This process must be started via the OSD push buttons manually. Thereby frequency, phase and image position of the display are synchronized automatically with the video signal. If required, the values can be adjusted in detail with push buttons at the rear side as well.
ECCO-Terminal  ■ Device Variants

Front panels (W x H)
- ECCO-T 15 / 17”:
  482.6 (19") x 354.8 mm (8 HE)
- ECCO-T 19”:
  482.6 (19") x 399.2 mm (9 HE)

Installation depth
- ECCO-T 15” / 17”:
  79.5 mm
- ECCO-T 19”:
  89.5 mm

Connections

Note: The exact mechanical dimensions are available on the internet: www.msc-tuttlingen.com
### Technical Data ■ ECCO-Terminal

| Housing | ■ Mechanically stable, robust system-unit cover made of galvanized sheet-steel can be installed in all racks, cabinets, desks and swivel frames.  
|         | ■ Flange connection at the rear side for mounting arm systems VESA 75/100  
|         | ■ Industrial, EMC housing design without mechanical wear parts.  
| Front panel | ■ Aluminium front panel, surface powder-coated, seamlessly sealed front panel protects reliably against ingress of dust, dirt and spray water  
|           | ■ Touchscreen (resistive-analogue)  
|           | ■ Stainless steel front panel (option)  
| Protection class | ■ Front: IP65, rear: IP20  
| Display | ■ TFT 15” [XGA], 17” [SXGA], 19” [SXGA]  
| Interfaces | ■ Connections to the host computer  
|           | ■ 1x VGA  
|           | ■ 1x DVI-D  
|           | ■ 1x USB (transmission of touch signals)  
| Further features | ■ Rescaling function if resolution of the host computer is smaller  
|           | ■ Auto-adjust of position, frequency, phase in VGA mode, no screen settings required in DVI mode  
|           | ■ On-screen menu via rear side keys accessible  
| Supply voltage | ■ 24 VDC [19 ... 36 VDC] bzw. 100-240 VAC [90 ... 264 VAC]  
| Power consumption | ■ 75 W  
| Max. Typ. | ■ 26 W [15"], 37 W [17"], 44 W [19"]  
| Ambient temperature | ■ +5 °C up to +45 °C  
|           | ■ According to EN 55024:1998 und EN 61000-6-2:2001  
| Shock load in operation/ Oscillating load in operation | ■ EN 60068-2-27  
|           | ■ EN 60068-2-6  
| Endurance test | ■ 24 h burn-in before delivery  
| Test certificate | ■ CE  

1 These information correspond to the basic version.

Issue 2.01 · Subject to change without notice.
Dedicated to Automation

On the basis of our standard systems manifold modifications can be incorporated to create OEM-products which fully meet your wishes and requirements and whose outer appearance does not reveal that it is an MSC-device.

Here are some OEM-solutions – from simple panel application to IPC-based systems to be used as visualization and/or control platforms – as examples for customer projects carried out in different industries. Take advantage of our comprehensive know-how so that you can fully concentrate on your own core competence.

Example:
PC-Controlled Sharpening of Saw Blades
- Diversification of the IPC-series “TERMINAL/BASIC”
- PLC direct keys with CANopen connection
- Front plate with adapted CNC control panel
Sectoral Solutions

Example:
Control and Visualization Panel
- Diversification of the IPC-series “BeBo”
- Reduced installation depth, embedded operating system
- Soft-PLC

Example:
Thin Client in Communications Network
- Diversification of the IPC-series “CARAT”
- Customer-specific ETX base board
- Long-distance power supply for worldwide use

Example:
Visualization of Laser Processes
- IPC-based on IPC-series “BeBo”
- Customer-specific housing
- Control elements and drives adapted

Example:
Industrial PC for Clean-Room Operation
- Diversification of the IPC-series “FOCUS”
- Fully capsuled stainless steel housing
- Protection class IP65 all around

Example:
Embedded Client for Production Data Acquisition
- Embedded computer platform for scalable CPU-performance
- Task-oriented design of operating system
- Fanless system for industrial, maintenance-free operation, IP65 all around
Further Attractive Offers

Tool and Object Monitoring
- Broken tool detection
- Feeding control
- Worn tool detection

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